



User Manual

Model: AirConnect® 8231

Product: 5G CBRS Outdoor Router

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Support Contact Information

If you come across any problems, please contact the dealer from where you have purchased the product or contact BEC directly via the following methods:

		
Submit A Ticket	Send An Email	Contact By Phone
https://helpdesk.becentral.io/ Create an account and submit support requests in our Help Desk Portal. We will respond to your ticket during our normal working hours.	teamsupport@bectechnologies.net Please include a description of the issue, product model, firmware version, application involved, and any relevant error messages.	+1-972-422-0877 Option 2 Our Support Team is available by phone Monday through Friday 9am to 5pm CST

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CHAPTER 1: INTRODUCTION

Introduction to your Router

Congratulations on your purchase of the **AirConnect® 8231 5G CBRS Outdoor Router**.

The AirConnect® 8231 5G CBRS Outdoor Router adapts 3GPP Rel 16 and supports 5G sub-6 GHz Non-Standalone (NSA) and Standalone (SA) modes.

The AirConnect® 8231 brings secure, high-performance mission-critical cellular connectivity to outside locations and harsh environments, and with the flexible routing modes, router and bridge, it can be easily integrated into any existing local network. The rugged, compact IP68 rated enclosure enables the AirConnect® 8231 to stand up to dirt, harmful ingress of water, humidity, and extreme temperatures for years of dependable operation. The AirConnect® 8231 is good for industries, businesses, remote locations, residences, rural areas, and the underserved.

4x4 MIMO Wideband Antenna Technology

Operators need innovative antenna technology to meet capacity and throughput demands in challenging deployment scenarios such as Fixed Wireless Access (FWA). The MIMO high gain embedded dual polarization/dual slant antenna technology ensures faster and efficient bi-directional transmission for maximum bandwidth and coverage. The Physical size and weight were key design considerations of the AirConnect® 8231, it can be mounted directly on exterior walls, chimneys, lightweight poles and used for retrofitting applications such as the replacement of older generation wireless technology.

Rugged Weatherproof Design

The AirConnect® 8231 is built to last, fully ruggedized with industrial-grade components. Unique to BEC devices are GORE® Vents for pressure equalization, humidity, and airflow. The AirConnect® 8231 is also accompanied with lightning/ESD Protection and the IP68/UL 50E enclosure ensure protection against dirt, harmful ingress of water and extreme temperatures for years of dependable operation

5G Mobility

With 5G based Internet connection (5G embedded module, requires an additional SIM card), you can access to the Internet through 5G whether you are seated at your desk or taking a cross-country trip.

5G Management Center

AirConnect® 8231 Mobile Management Center visually displays its current 5G signal status also calculates the total amount of hours or data traffic used per month, allowing you to manage your 5G monthly subscriptions.

24/7 Cloud Management and Network Visibility

Remote monitoring, management and control of devices in real-time is essential for IoT networking devices, M2M and critical applications. BECentral®, BEC's Cloud Based Remote Management, is a comprehensive device management platform designed to minimize deployment, lower support expenses and maximize the operational efficiency and profitability of the operator. BECentral® provides access to critical information for 5G Network diagnostics and troubleshooting, such as: signal quality measurements (RSSI, RSRP, RSRQ and SINR), network status/APN, location ID and Cell ID. Additional functionality includes OTA firmware upgrades (individual or batch), multi-user account management, local network configuration settings on the AirConnect® 8231.

IPv6 Supported

Internet Protocol version 6 (IPv6) is a version of the Internet Protocol that is designed to succeed IPv4. IPv6 has a vastly larger address space than IPv4. The router is already supporting IPv6, you can use it in IPv6 environment no need to change device. The dual-stack protocol implementation in an operating system is a fundamental IPv4-to-IPv6 transition technology. It implements IPv4 and IPv6 protocol stacks either independently or in a hybrid form. The hybrid form is commonly implemented in modern operating systems supporting IPv6.

Quick Start Wizard

Support a WEB GUI page to install this device quickly. With this wizard, simple steps will get you connected to the Internet immediately.

Firmware Upgradeable

Device can be upgraded to the latest firmware through the WEB based GUI.

Features & Specifications

- High-speed 5G SA connection up to downlink of 2.5Gbps and uplink of 650Mbps data rate
- 5 x CA, 256QAM, up to 4x4 MIMO
- Outdoor 5G for high-speed mobile connectivity
- 5G embedded with a built-in SIM card slot
- 5G Management Center for connection monitoring
- Firewall security with DoS prevention and SPI
- Quality of Service control
- Syslog monitoring
- Ease of Use with Quick Installation Wizard
- Ideal for fixed wireless broadband, last mile access, mission-critical & performance intensive networks, industrial connectivity applications, and urban and rural environments

Operational Mode

- Bridge or Routed mode

Network Protocols and Features

- IPv4, IPv6 or IPv4 / IPv6 Dual Stack
- NAT, static (v4/v6) routing and RIP-1 / 2
- DHCPv4 / v6
- Universal Plug and Play (UPnP) Compliant
- Dynamic Domain Name System (DDNS)
- Virtual Server and DMZ
- SNTP, DNS proxy
- IGMP snooping and IGMP proxy
- MLD snooping and MLD proxy

Firewall

- Built-in NAT Firewall
- Stateful Packet Inspection (SPI)
- DoS attack prevention including Land Attack, Ping of Death, etc.
- Access control
- IP&MAC filter, URL Content Filter
- Password protection for system management
- VPN pass-through

Quality of Service Control

- Traffic prioritization management based-on Protocol, Port Number, and IP Address (IPv4/ IPv6)

Management

- Quick Installation wizard
- Web-based GUI for remote and local management (IPv4/IPv6)
- Firmware upgrades and configuration data upload and download via web-based GUI
- Supports DHCP server / client / relay
- Supports SNMP v1, v2, v3, MIB-I and MIB-II
- TR-069 supports remote management

Hardware Specifications

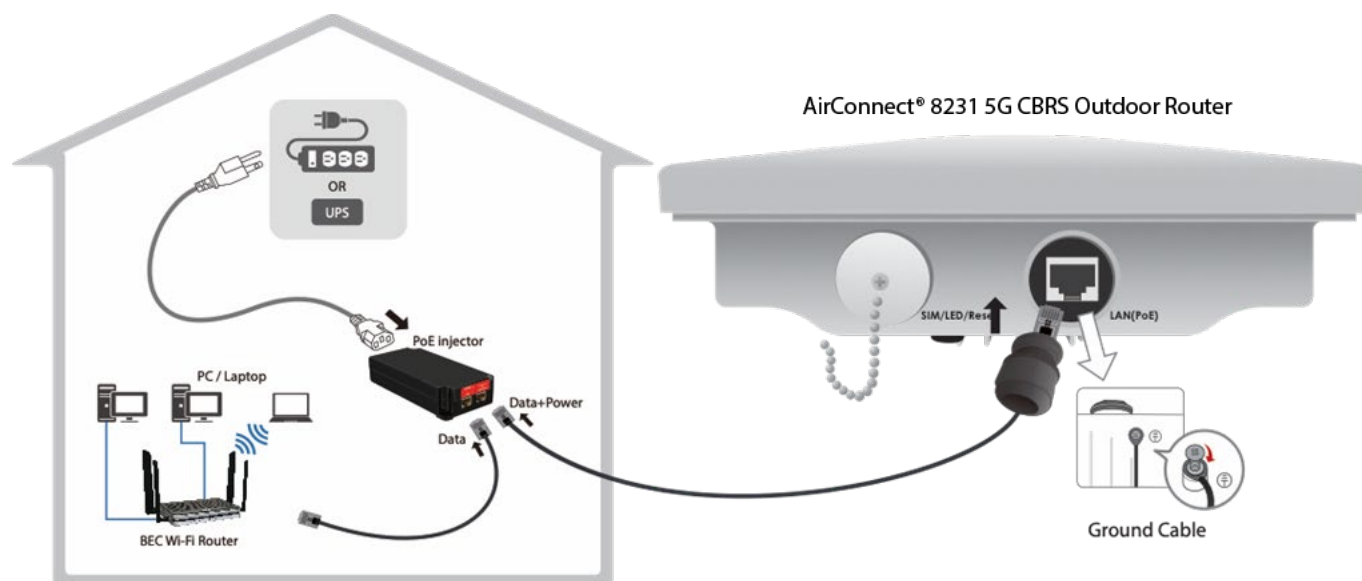
Physical interface

- (2) 10/100/1000 Gigabit Ethernet LAN with IEEE802.3at compliant Gigabit PoE PD
- IEEE 802.3at PD complaint (25.5W)
- (1) SIM slot, mini-SIM (2FF) (SIM card from Telco / ISP)
- Reset Button
- LED Indicators: Power/Boot, LAN(PoE), RF RSSI, and Internet

Physical Specifications

- Dimensions (W*H*D): 8.5" x 7.5" x 3"(257mm x 227mm x 91mm)
- Industrial-grade IP68 and Vent integration enclosure
- Top cover material UL-746C compliant for UV-resistant
- Surge Protection: K.21 enhanced mode 6KV
- ESD Protection: Contact $\pm 8KV$ / Air: $\pm 15KV$

Application Diagram



CHAPTER 2: PRODUCT OVERVIEW

Important Note for Using This Router



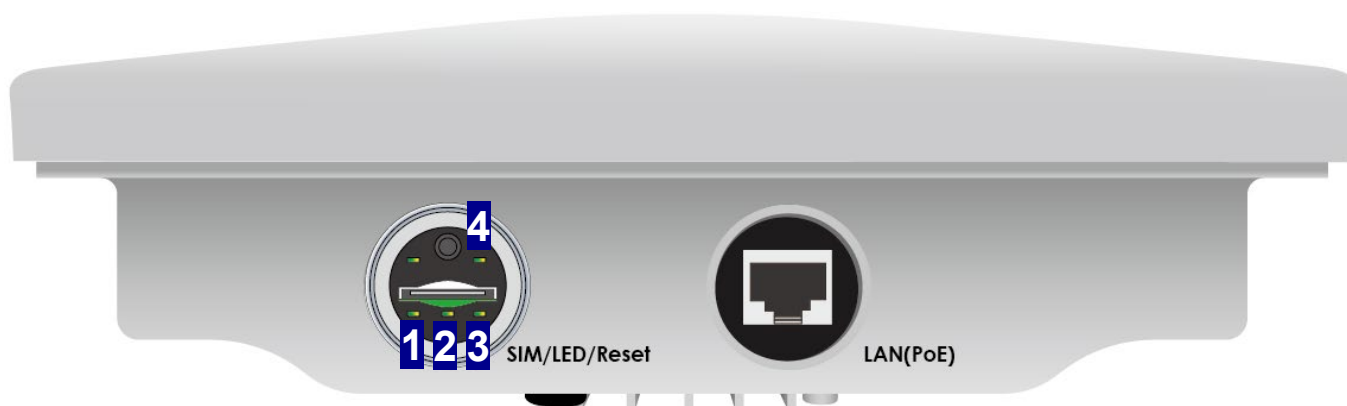
Attention

- ✓ Do not remove, open or repair the case yourself. Contact with your Internet Service Provider or have it repaired at a qualified service center.
- ✓ Use the supplied PoE (Power-over-Ethernet) injector for indoor only or with any 802.3at capable PoE injectors to connect with the AirConnect® 8231.
- ✓ It is mandatory to earth ground the AirConnect® 8231. Improper grounding not only could damage the unit but also all equipment connected to it.

Package Contents

- ✓ The AirConnect® 8231 5G CBRS Outdoor Router x 1
- ✓ M25 Cable Gland x 2
- ✓ Quick Start Guide x 1
- ✓ Outdoor LAN Cable x 1
- ✓ Gigabit Power-over-Ethernet (PoE) Injector x 1
- ✓ Grounding Wire x 1
- ✓ Mounting Kit x 1

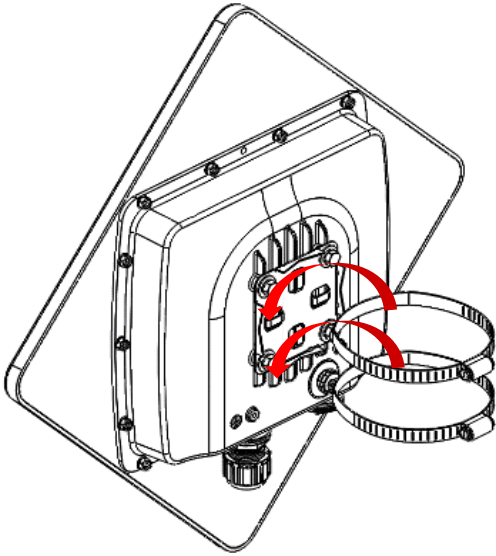
Device Description



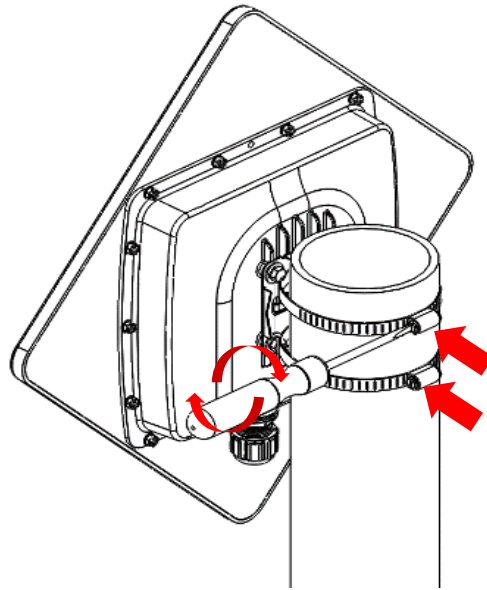
CONNECTORS	DESCRIPTION
SIM / LED / Reset	Insert the SIM card into the SIM slot. Press the reset button to reset device or restore to factory default settings
Gigabit LAN(PoE)	Connect the supplied PoE injector, 802.3at compliant, using an Ethernet cable.

LED	STATUS	DESCRIPTION
1. Power	Orange	System is either in initial startup phase or has boot failure
	Green	System is up and ready
	Off	No input power
2. LAN(PoE)	Orange	Transmission speed is at 10/100Mbps
	Green	Transmission speed is at gigabit speed (1000Mbps)
	Blinking	Data being transmitted/received
	Off	No device is being connected
3. Internet	Orange	IP request failed or System is in initial booting phase
	Green	IP connected and traffic is passing thru the device
4. 5G Signal Strength	Green	RSSI greater than -69 dBm. Excellent signal condition
	Green Flashing quickly	RSSI from -81 to -69 dBm. Good signal condition
	Orange Flashing quickly	RSSI from -99 to -81 dBm. Fair signal condition
	Orange Flashing slowly	RSSI less than -99 dBm. Poor signal condition
	Orange	No signal. 5G module is still in connected mode
	Off	No 5G module or 5G module has failed

2. Pole Mounting for Pole 1" ~ 3" (25.4 ~ 76.2mm)

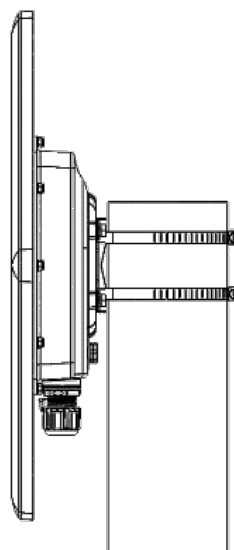
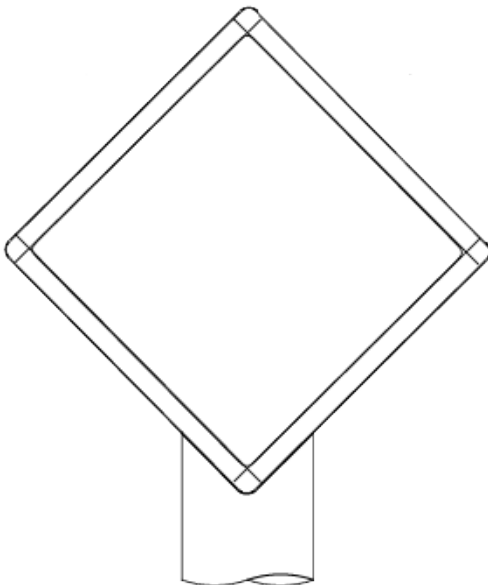


Use 1~3" hose clamps through the stainless-steel bracket.



Fix the stainless-steel bracket to the pole by using the supplied stainless hose clamps (1" ~ 3"). Use a flat-head screwdriver to turn the head of the screw clockwise to tighten it.

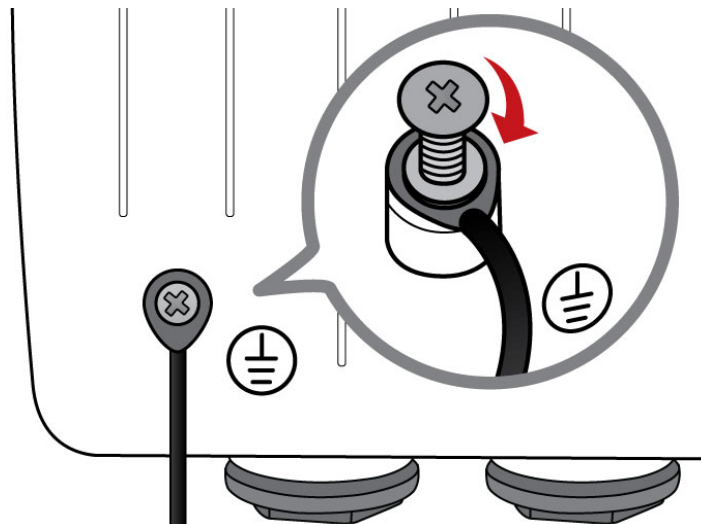
The AirConnect® 8231 must be directed towards the nearest base station.



Completed

3. Proper Grounding to Complete the Installation

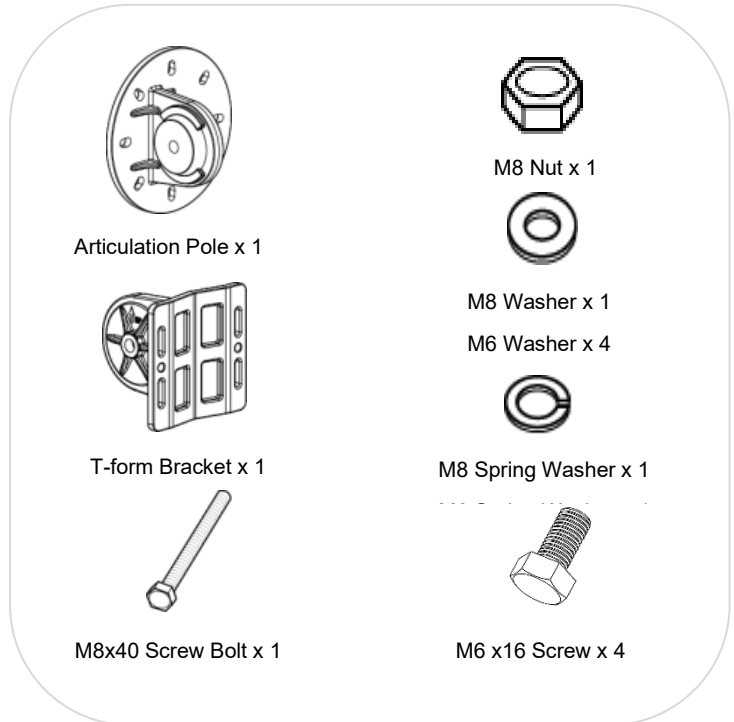
Attach the grounding wire to the AirConnect® 8231 and tighten the screw.



Mounting Kit Installation (RT4R Mounting Kit)

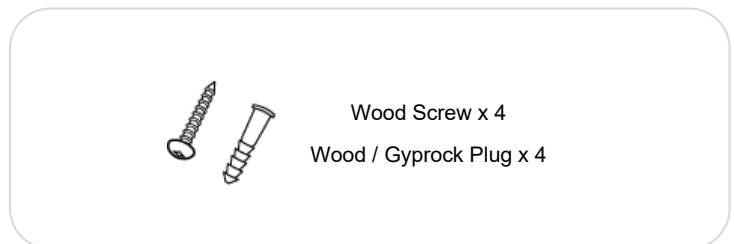
Mounting Kit includes:

1. Articulation Pole x 1
2. T-formed Bracket x 1
3. M8x40 Screw Bolt x 1
4. M8 Nut x 1
5. M8 Washer x 1
6. M6 Washer x 4
7. M8 Spring Washer x 1
8. M6 Spring Washer x 4
9. M6x16 Screw x 4



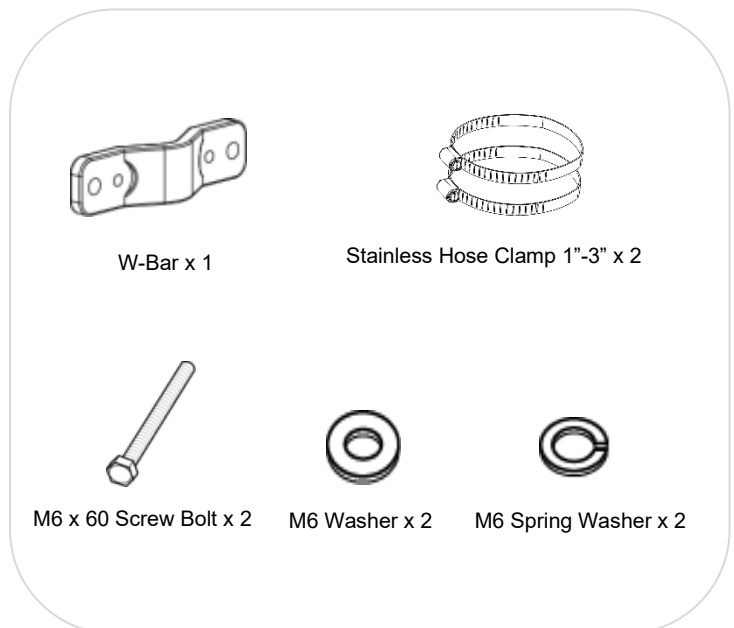
For **Wall Mount Installation**, you'll need:

10. Wood Screw x 4
11. Wood / Gyprock x 4



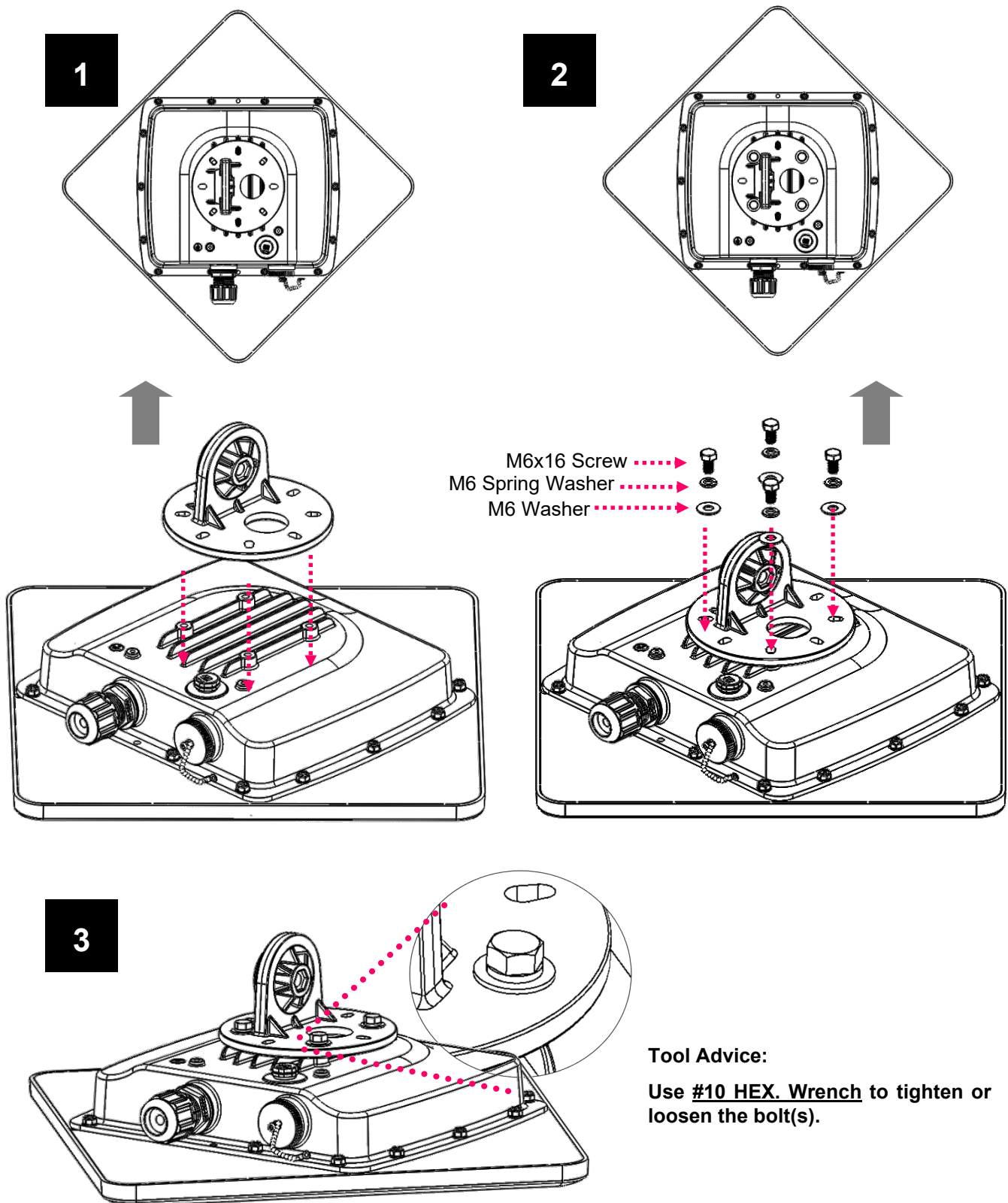
For **Pole Mount Installation**, you'll need:

12. W-Bar x 1
13. Stainless Hose Clamp x 2
14. M6x60 Screw Bolt x 2
15. M6 Washer x 2
16. M6 Spring Washer x 2



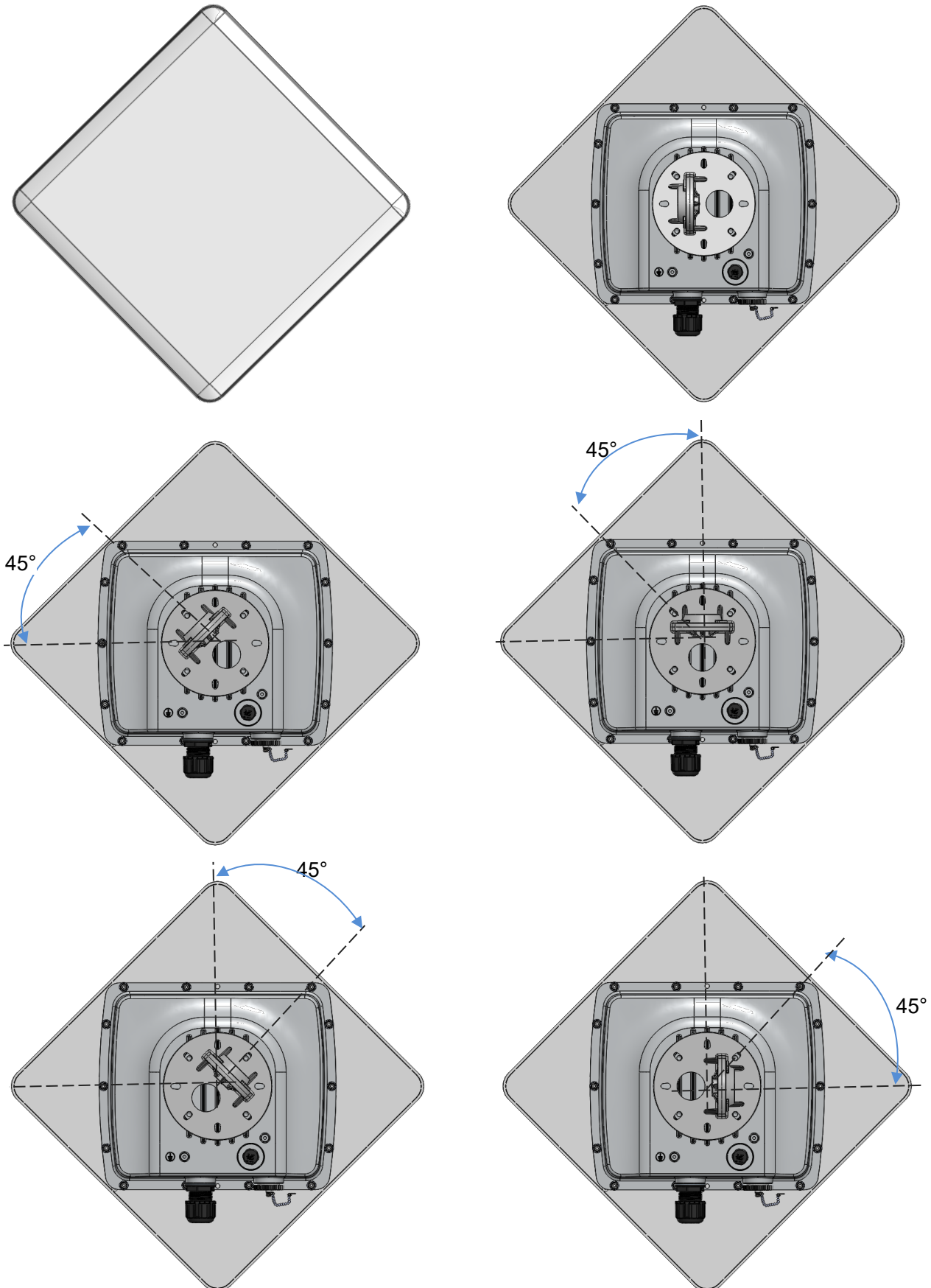
1. Attach the Articulation Pole to the Enclosure

Attach the articulation pole to the back of the AirConnect® 8231 enclosure using the supplied **M6 screws**, **M6 spring washers** and **M6x16 screws** which are included in the mounting kit.



Note:

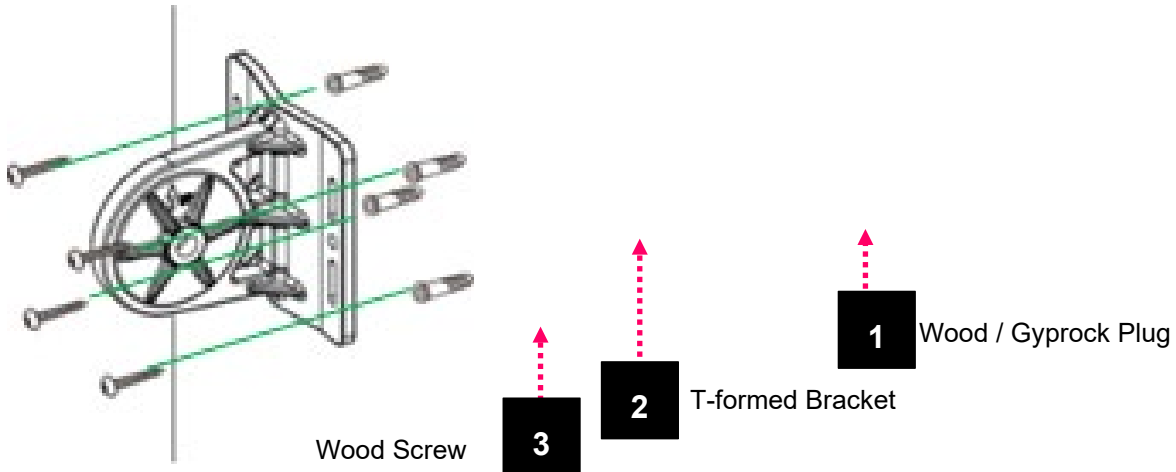
The flexible mounting kit can be adjusted in multiple angles to align with the base station for higher efficiency.



2. Wall or Pole Mount Installation

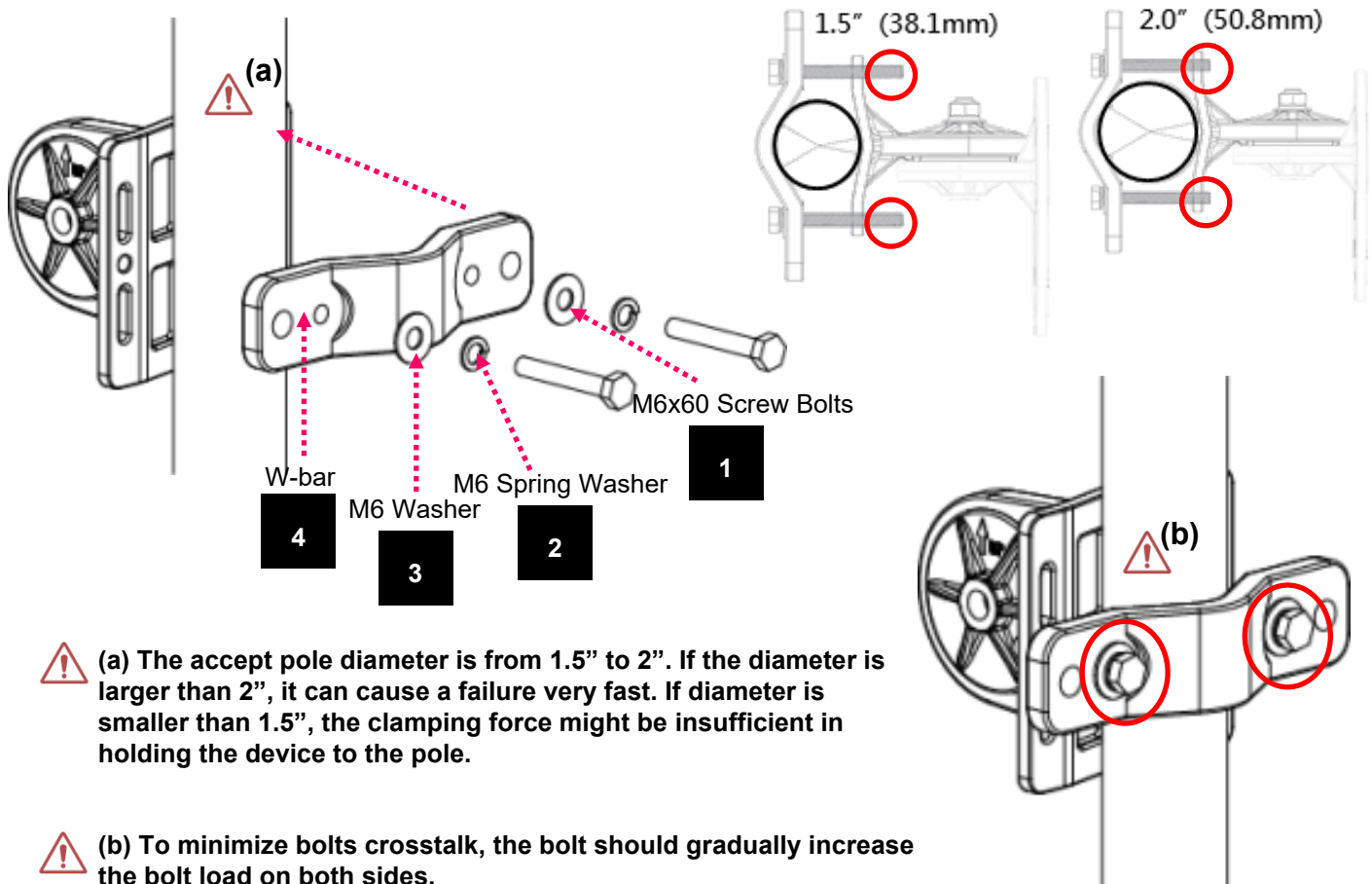
Mounting on Wall

Fix the T-formed Bracket to the wall by using wood screws and Gyprock plugs.

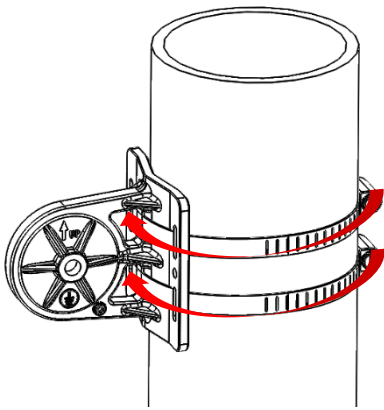


Mounting on a Pole between 1.5" to 2" (38.1~50.8mm)

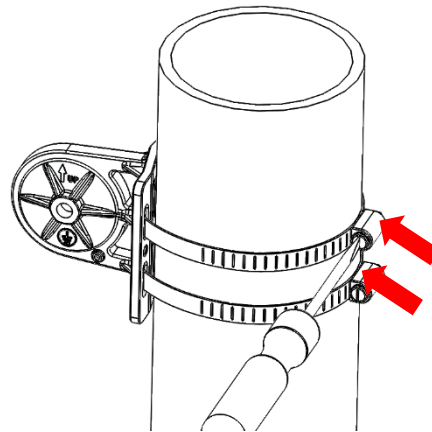
Attach the T-formed Bracket and the W-bar to the pole then use M6x60 bolts, M6 spring washers and M6 washers to fix the mounting kit onto the pole.



Mounting on a Pole between 1" to 3" (25.4 ~ 76.2mm)



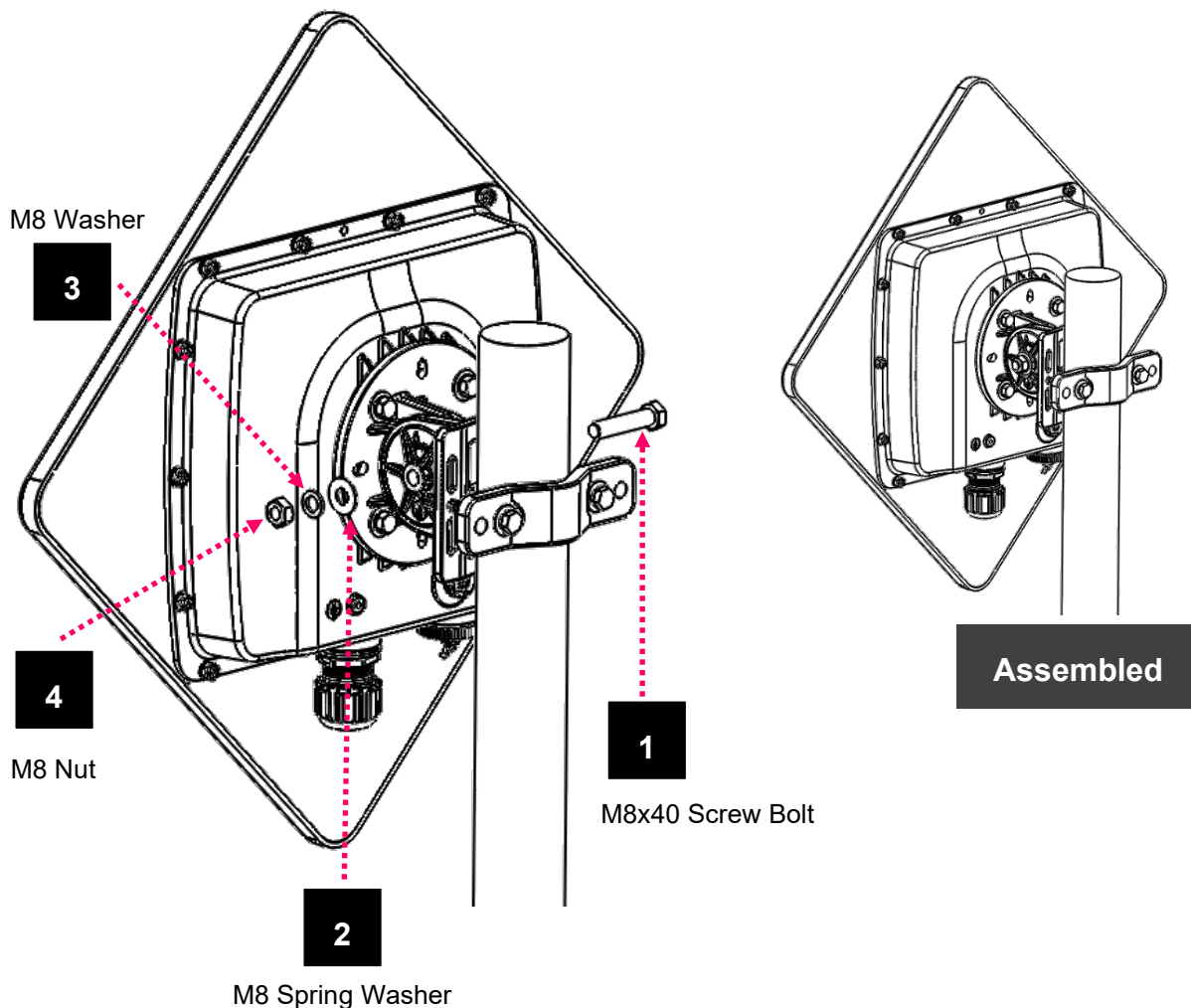
Use the stainless hose clamps through the T-formed Bracket.



Fix the T-formed Bracket to the pole by using the supplied stainless hose clamps. Use a flat-head screwdriver to turn the head of the screw clockwise to tighten it.

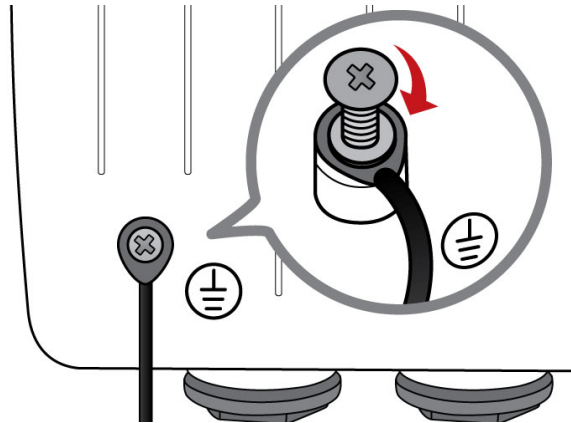
Attach the BEC 5G CBRS ODU Enclosure to the Pole

Attach the articulation pole (AirConnect® 8231 enclosure) to the T-formed bracket using the supplied **M8 nut**, **M8 spring washer**, **M8 washer** and **M8x40 screw bolt**.



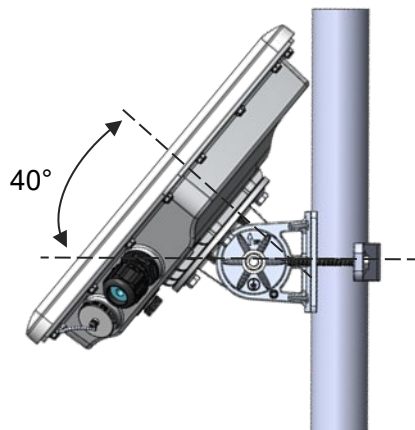
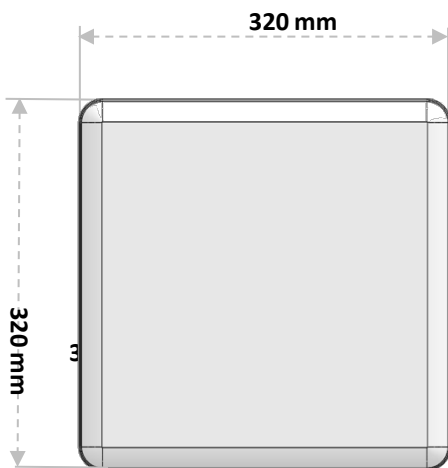
3. Proper Grounding to Complete the Installation

Attach the grounding wire to the AirConnect® 8231 and tighten the screw.

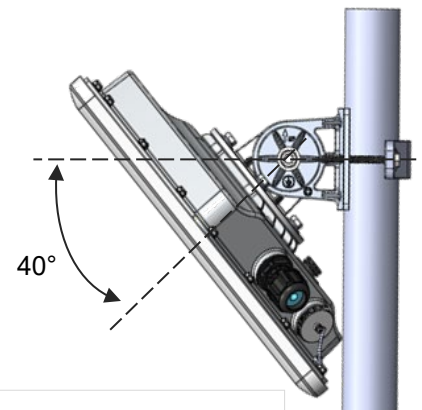


4. Position Adjustment

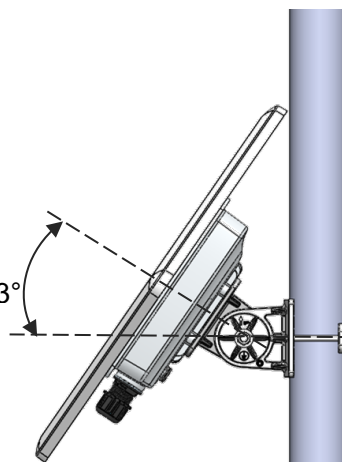
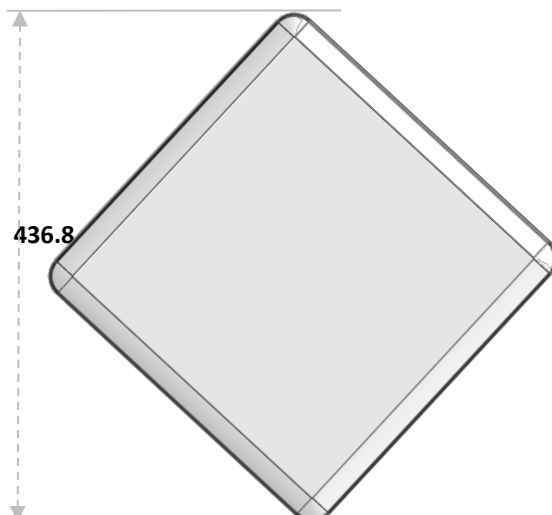
Adjust the AirConnect® 8231 until it reaches the desired elevation and depression angle, then tight the **M8 nut** (see **Attach the AirConnect® 8231 Enclosure to the Pole** for more information)



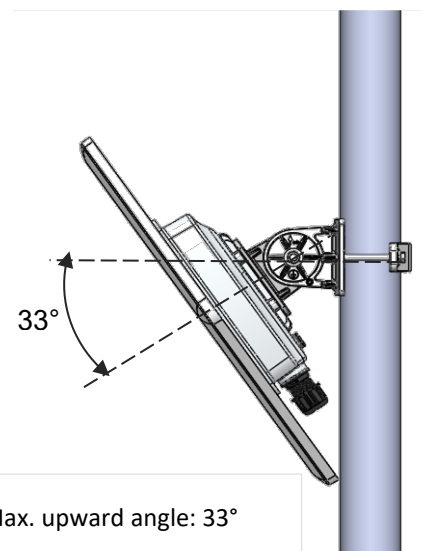
Completed



Max. upward angle: 40°
Max. downward angle: 40°



Completed

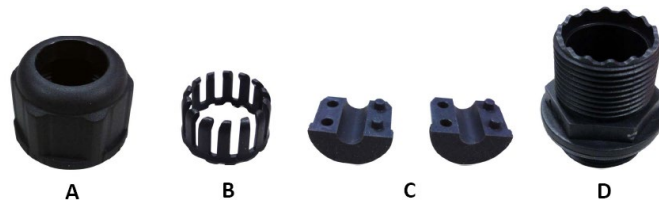


Max. upward angle: 33°
Max. downward angle: 33°

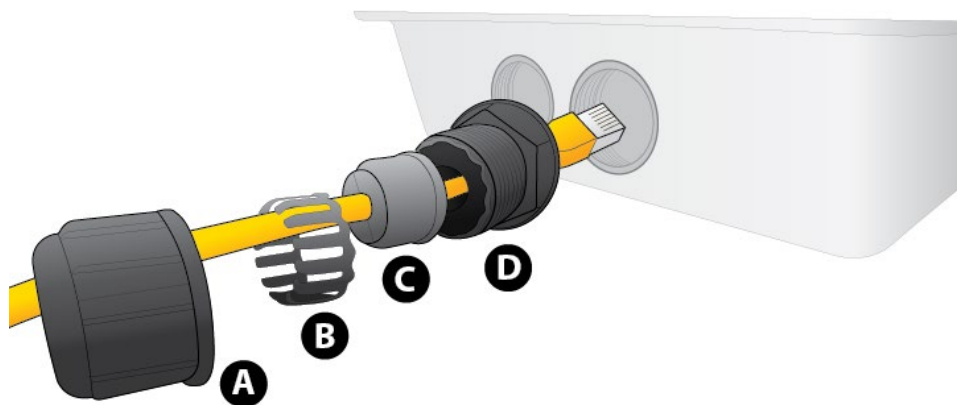
Router Installation Instructions

Power on your AirConnect® 8231

Step 1: Assemble M25 cable gland

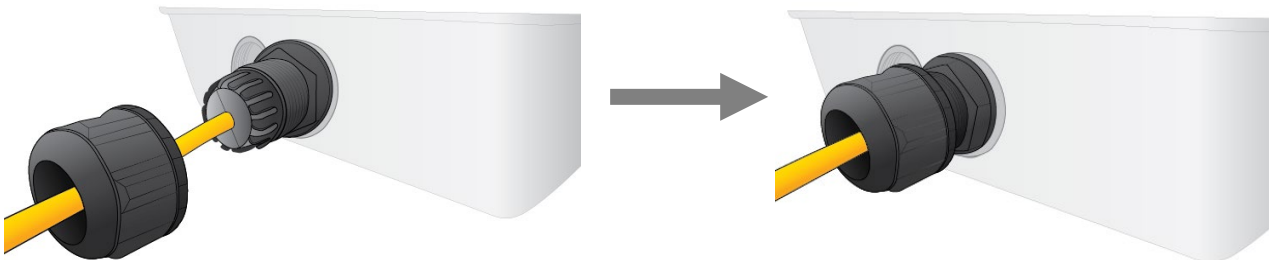


Step 2: Unscrew the LAN (PoE) cap then insert an outdoor Ethernet cable (RJ-45) through material A-D, and then connect the RJ-45 Ethernet cable into the LAN (PoE) port.



Step 3:

- 3.1: Insert **C** at the back end of **D**
- 3.2: clip **B** on **C**
- 3.3: keep **B** close to **D**
- 3.4: then tighten **A**

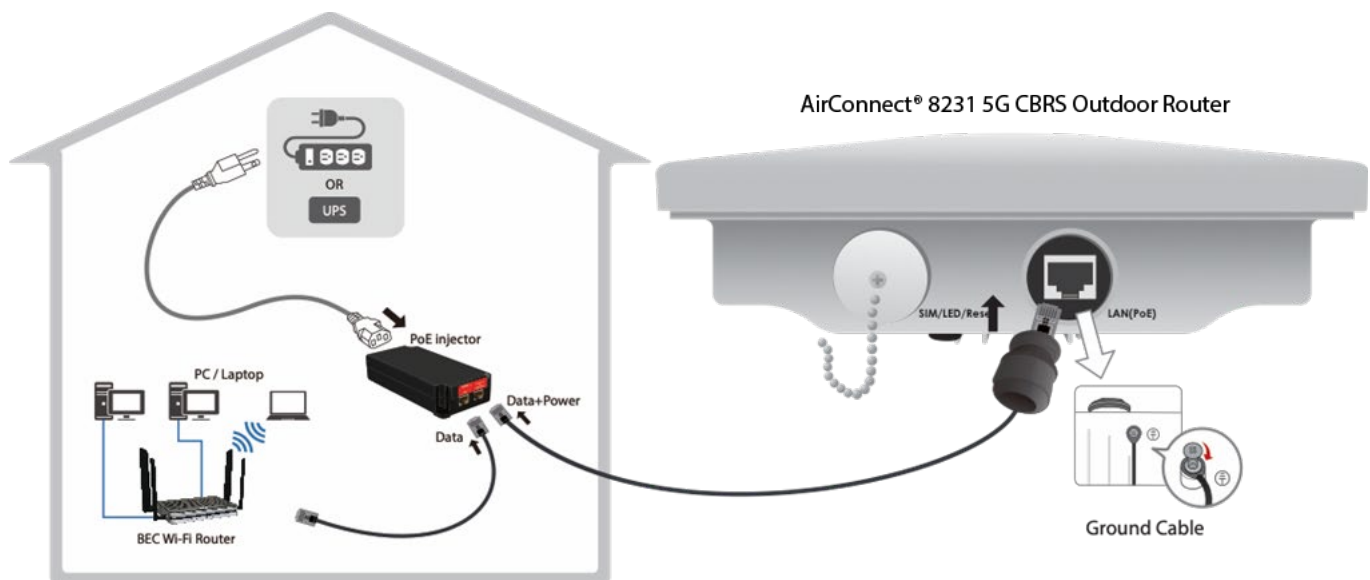


Step 4:

Insert the other end of outdoor Ethernet cable (RJ-45) to the supplied Gigabit PoE injector **Data+Power** port. Connect another Ethernet cable (RJ-45) directly to the **Data** port and the other end of cable to a switch or broadband router.

IMPORTANT:

It is recommended to put the Gigabit PoE Injector on an UPS or Surge Protector. Use a grounding wire to ground your AirConnect® 8231 is REQUIRED!



System Recovery Procedures

The purpose is to allow users to restore the AirConnect® 8231 to its initial stage when the device is outage, upgraded to a wrong / broken firmware, cannot access to the GUI with wrong username and/or password, etc.

Step 1 – Configure your PC Network IP Address

Before performing the system recovery, assign this IP address and Netmask to your PC, **192.168.1.100** and **255.255.255.0** respectively.

Step 2 – Reset your AirConnect® 8231 Device

- 2.1 Power off your AirConnect® 8231
- 2.2 Power on the AirConnect® 8231 while pushing the RESET button with a small and pointed object (such as paper clip, needle, toothpick, and etc.).
- 2.3 When the POWER LED turns RED, keep holding and pushing the RESET button for more 6 seconds then release it. The INTERNET LED will flash in GREEN afterward.

Step 3 – Restore your AirConnect® 8231 Device

With INTERNET light flashes green, AirConnect® 8231 is in recovery mode and ready for a new Firmware.

- 3.1 Open a web browser and type the IP address, **192.168.1.1**, to access to the recovery page.

NOTE: In the recovery mode, AirConnect® 8231 will not respond to any PING or other requests.

- 3.2 Browse to the new Firmware image file then click Upload to start the upgrade process.
- 3.3 INTERNET LED turns red means the Firmware upgrade is in process.
DO NOT power off or reboot the device, it would permanently damage your AirConnect® 8231.
- 3.4 INTERNET LED turns green after the Firmware upgrade completed
- 3.5 Power cycle on & off to regain access to the AirConnect® 8231.

CHAPTER 3: BASIC INSTALLATION

The router can be configured with your web browser. A web browser is included as a standard application in the following operating systems: Windows 7 / 8 / 10, Linux, Mac OS, etc. The product provides an easy and user-friendly interface for configuration.

PCs must have an Ethernet interface installed properly and be connected to the router either directly or through an external repeater hub and have TCP/IP installed or configured to obtain an IP address through a DHCP server or a fixed IP address that must be in the same subnet as the router. The default IP address of the router is **192.168.1.254** and the subnet mask is **255.255.255.0** (i.e. any attached PC must be in the same subnet and have an IP address in the range of 192.168.1.1 to 192.168.1.253). The best and easiest way is to configure the PC to get an IP address automatically from the router using DHCP. If you encounter any problems accessing the router's web interface it may also be advisable to **uninstall** any kind of software firewall on your PCs, as they can cause problems accessing the 192.168.1.254 IP address of the router. Users should make their own decisions on how to best protect their network.

Please follow the steps below for your PC's network environment installation. First of all, please check your PC's network components. The TCP/IP protocol stack and Ethernet network adapter must be installed. If not, please refer to your Windows-related or other operating system manuals.



Attention

Any TCP/IP capable workstation can be used to communicate with or through the AirConnect® 8231. To configure other types of workstations, please consult the manufacturer's documentation.

Network Configuration – IPv4

Configuring PC in Windows 10 (IPv4)

1. Click .
2. Click .
3. Then click on **Network and Internet**.



4. Under **Related settings**, select **Network and Sharing Center**
5. When the **Network and Sharing Center** window pops up, select and click on **Change adapter settings** on the left window panel.
6. Select the **Local Area Connection**, and right click the icon to select **Properties**.

Related settings

Change adapter options

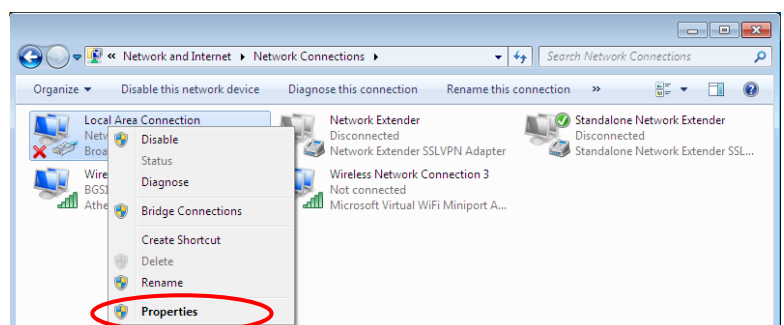
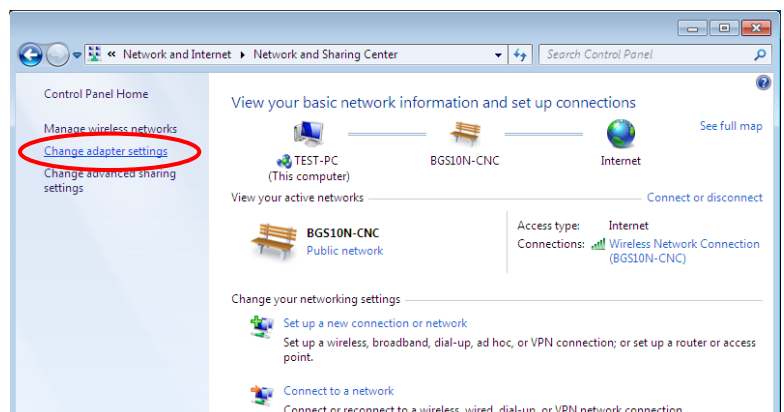
Change advanced sharing options

Network and Sharing Center

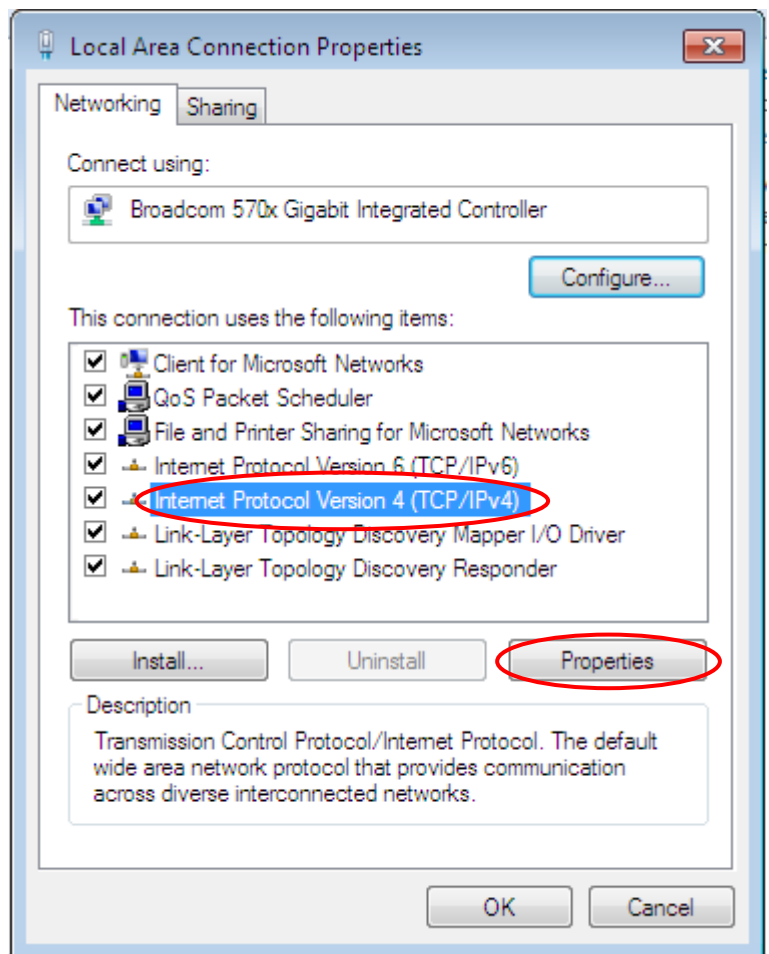
HomeGroup

Internet options

Windows Firewall

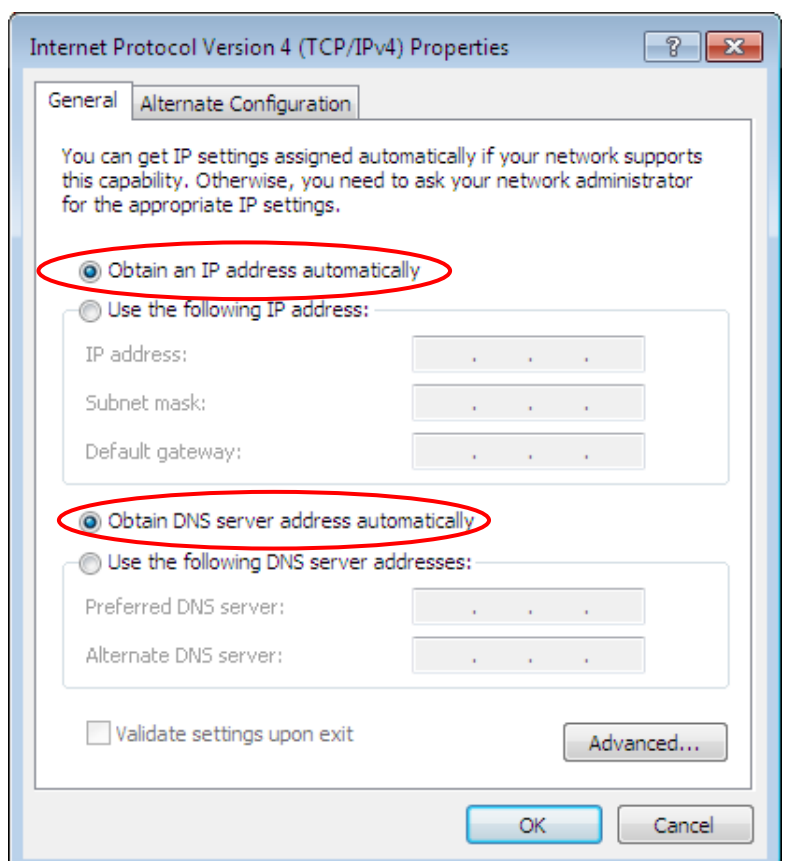


7. Select **Internet Protocol Version 4 (TCP/IPv4)** then click **Properties**.



8. In the **TCP/IPv4 properties** window, select the **Obtain an IP address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.

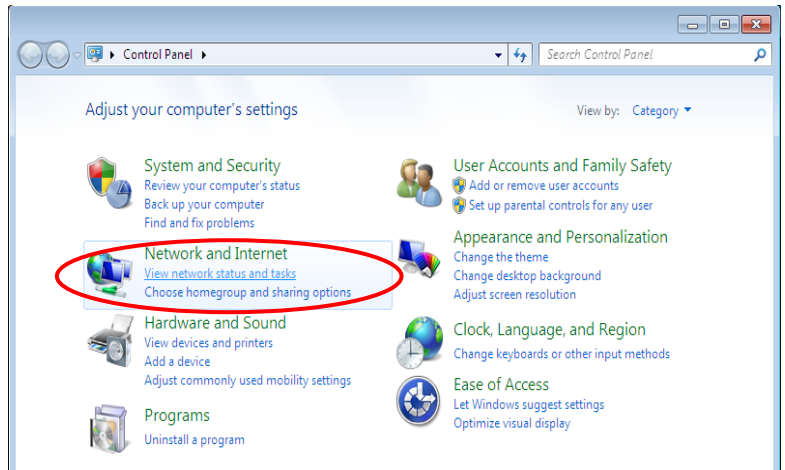
9. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



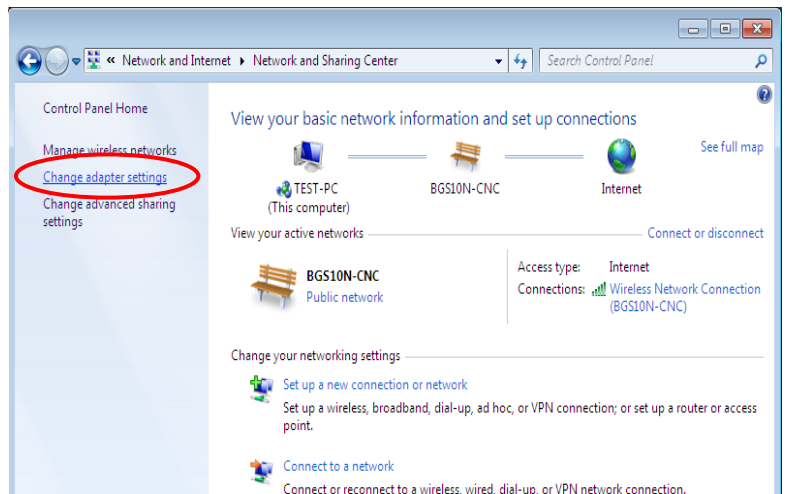
Configuring PC in Windows 7/8 (IPv4)

1. Go to **Start**. Click on **Control Panel**.

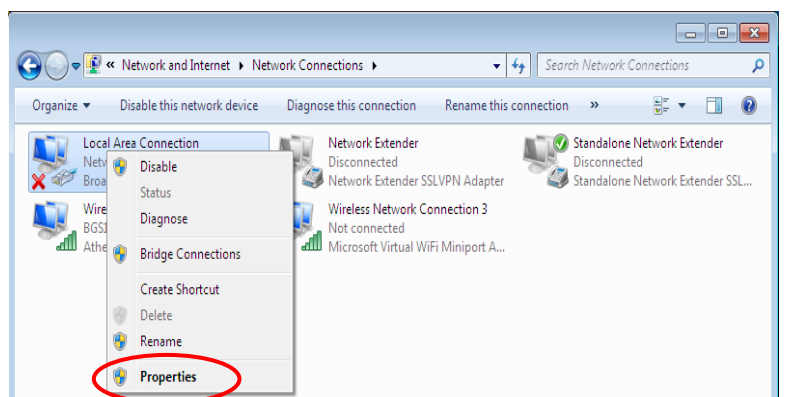
2. Then click on **Network and Internet**.



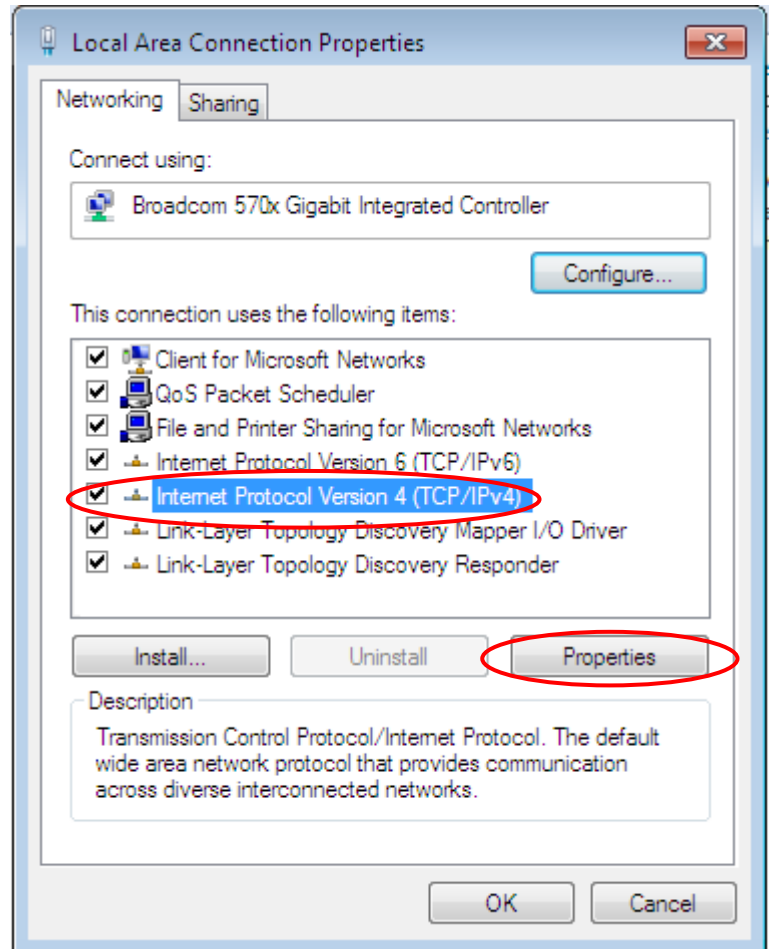
3. When the **Network and Sharing Center** window pops up, select and click on **Change adapter settings** on the left window panel.



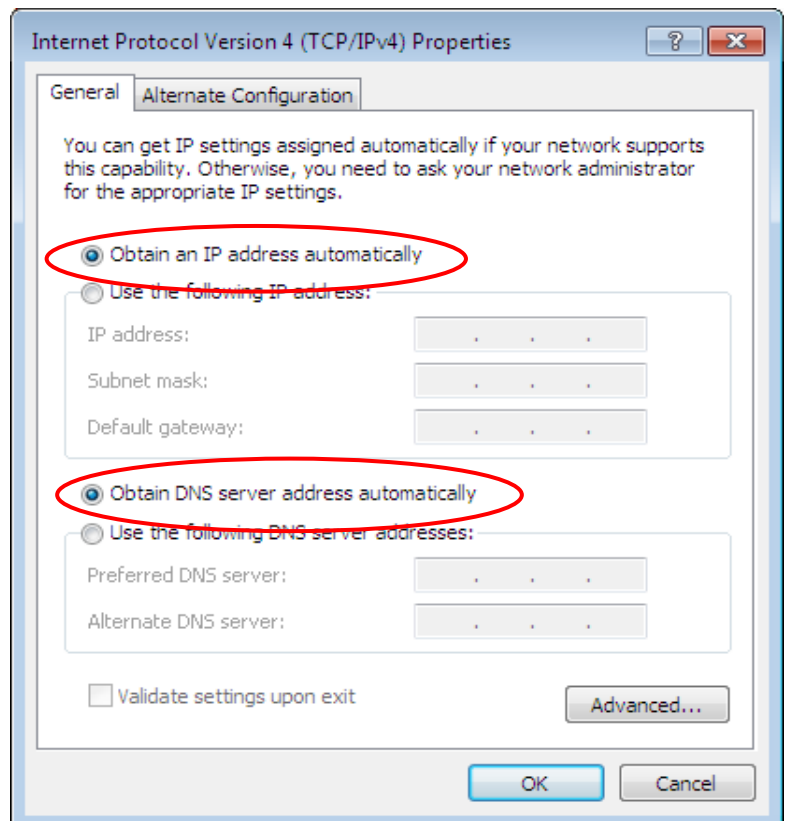
4. Select the **Local Area Connection**, and right click the icon to select **Properties**.



5. Select **Internet Protocol Version 4 (TCP/IPv4)** then click **Properties**.

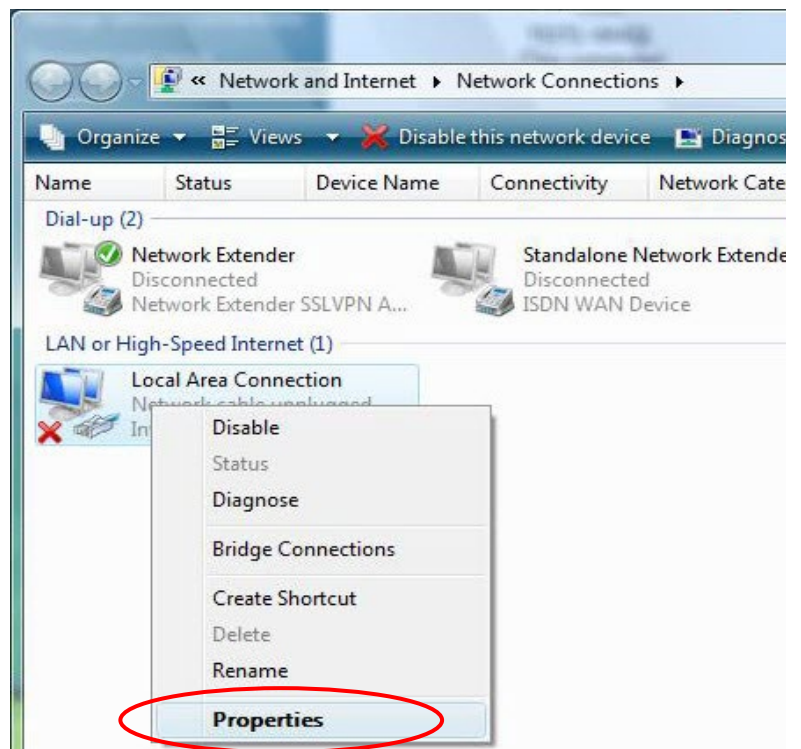
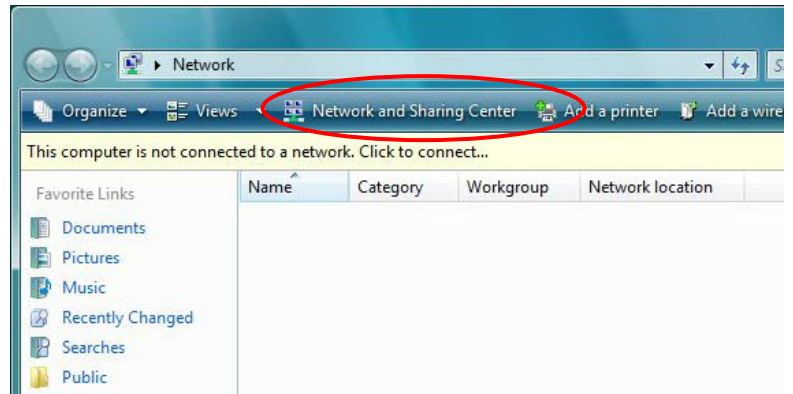


6. In the **TCP/IPv4 properties** window, select the **Obtain an IP address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.
7. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.

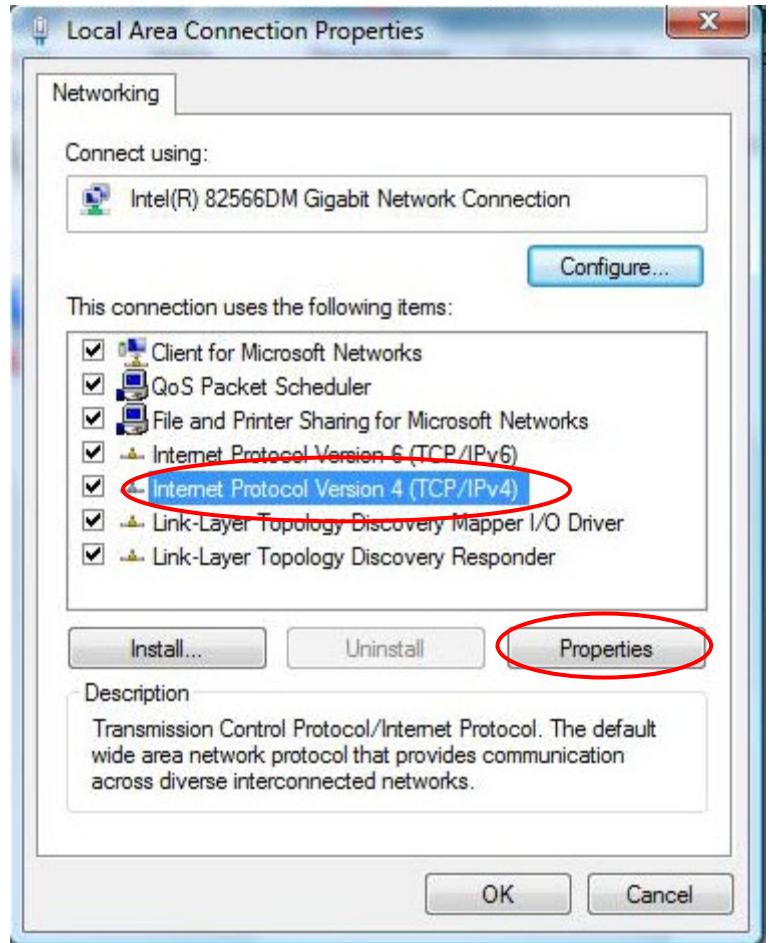


Configuring PC in Windows Vista (IPv4)

1. Go to **Start**. Click on **Network**.
2. Then click on **Network and Sharing Center** at the top bar.
3. When the **Network and Sharing Center** window pops up, select and click on **Manage network connections** on the left window panel.
4. Select the **Local Area Connection**, and right click the icon to select **Properties**.

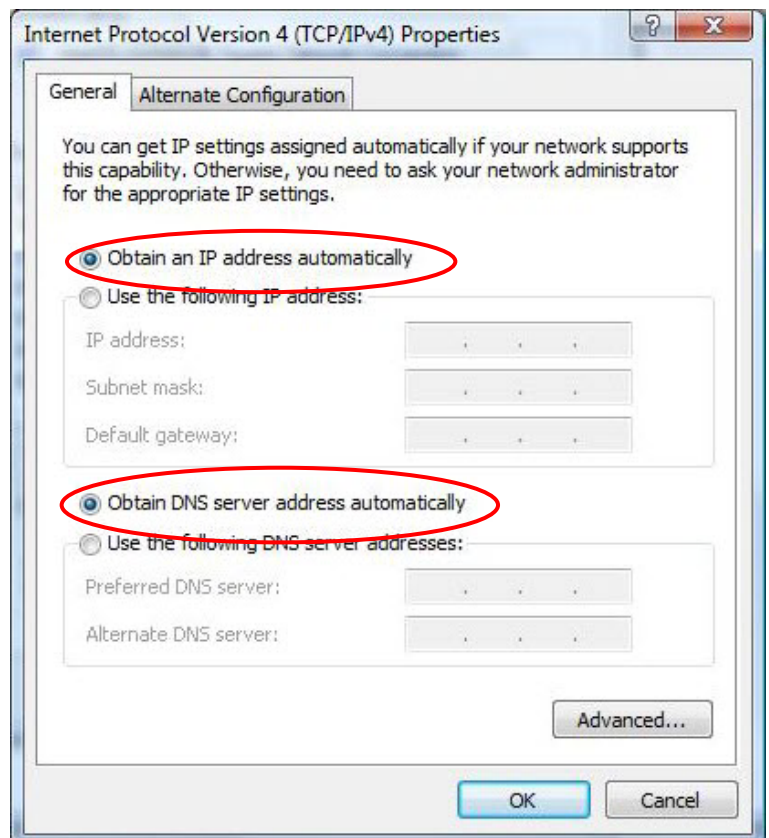


5. Select **Internet Protocol Version 4 (TCP/IPv4)** then click **Properties**.



6. In the **TCP/IPv4 properties** window, select the **Obtain an IP address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.

7. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



Network Configuration – IPv6

Configuring PC in Windows 10 (IPv6)

1. Click .
2. Click  Settings
3. Then click on **Network and Internet**.



4. Under **Related settings**, select **Network and Sharing Center**

Related settings

Change adapter options

Change advanced sharing options

Network and Sharing Center

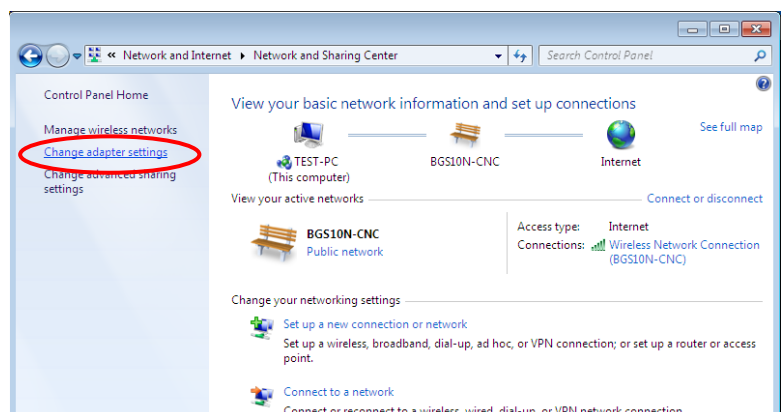
HomeGroup

Internet options

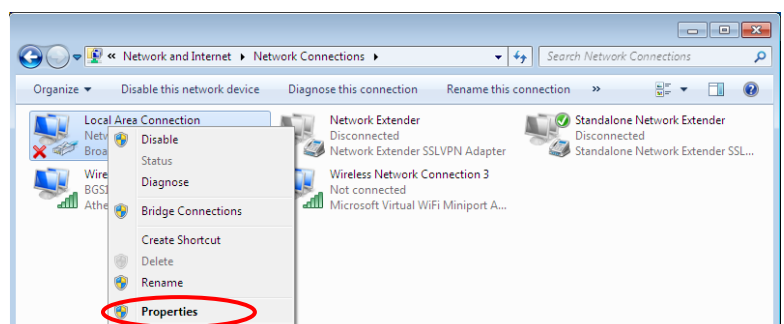
Windows Firewall



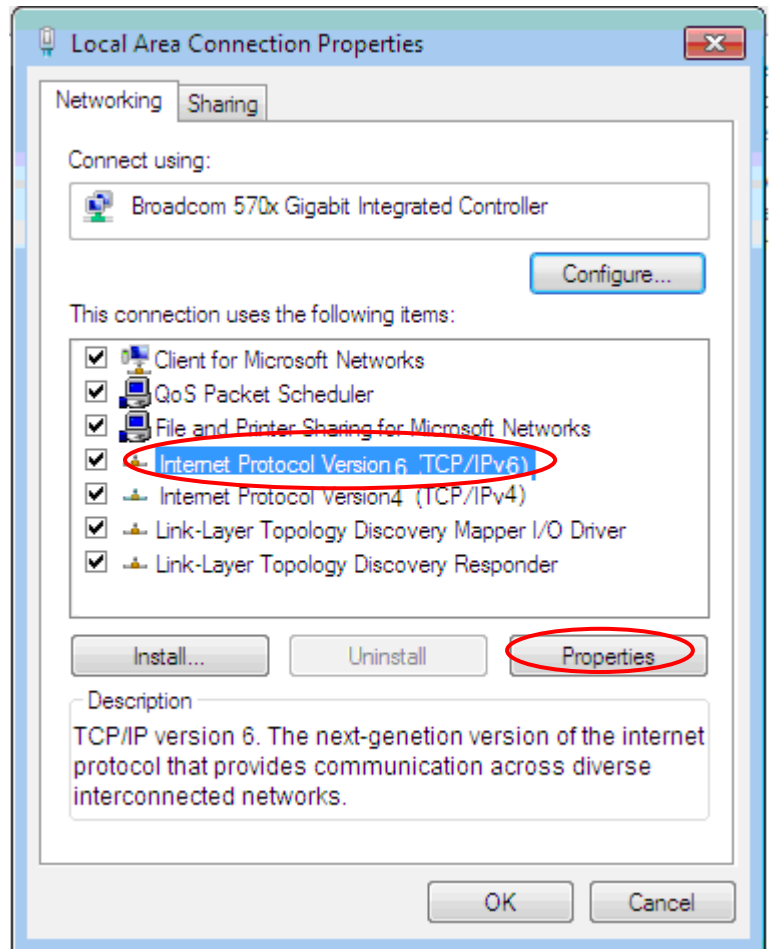
5. When the **Network and Sharing Center** window pops up, select and click on **Change adapter settings** on the left window panel.



6. Select the **Local Area Connection**, and right click the icon to select **Properties**.

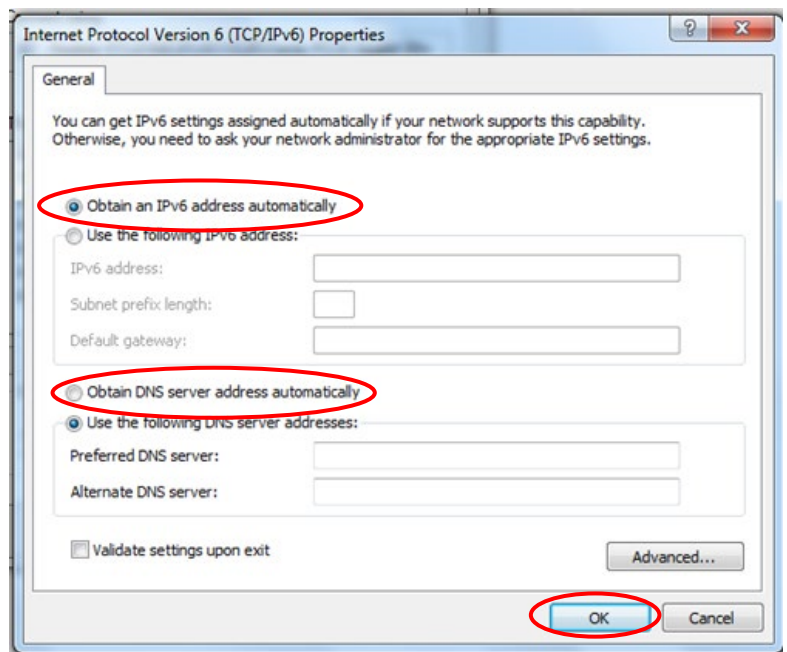


7. Select **Internet Protocol Version 6 (TCP/IPv6)** then click **Properties**.



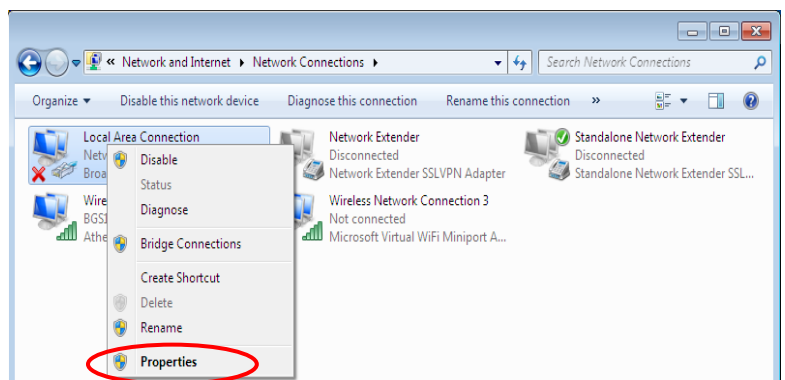
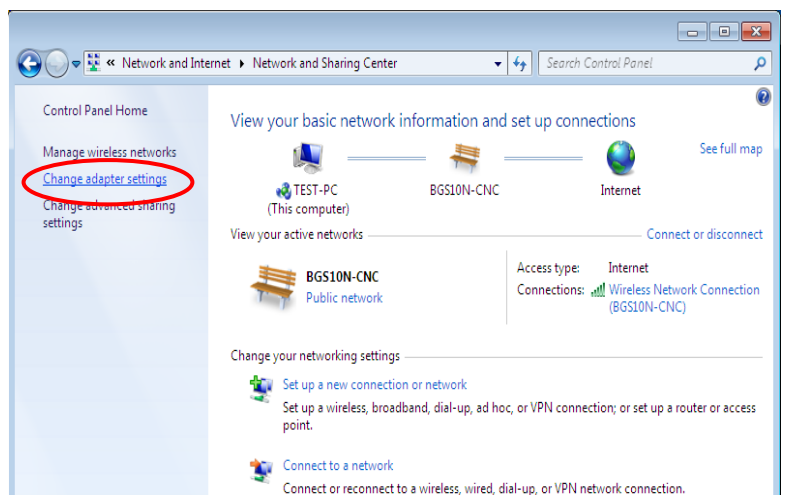
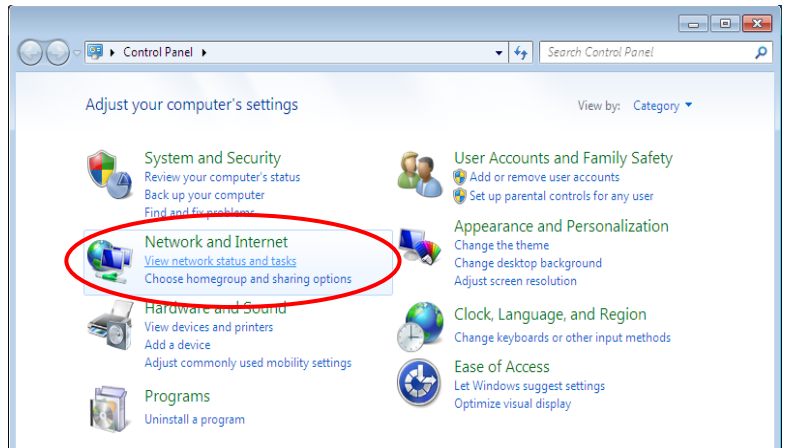
8. In the **TCP/IPv6 properties** window, select the **Obtain an IPv6 address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.

9. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.

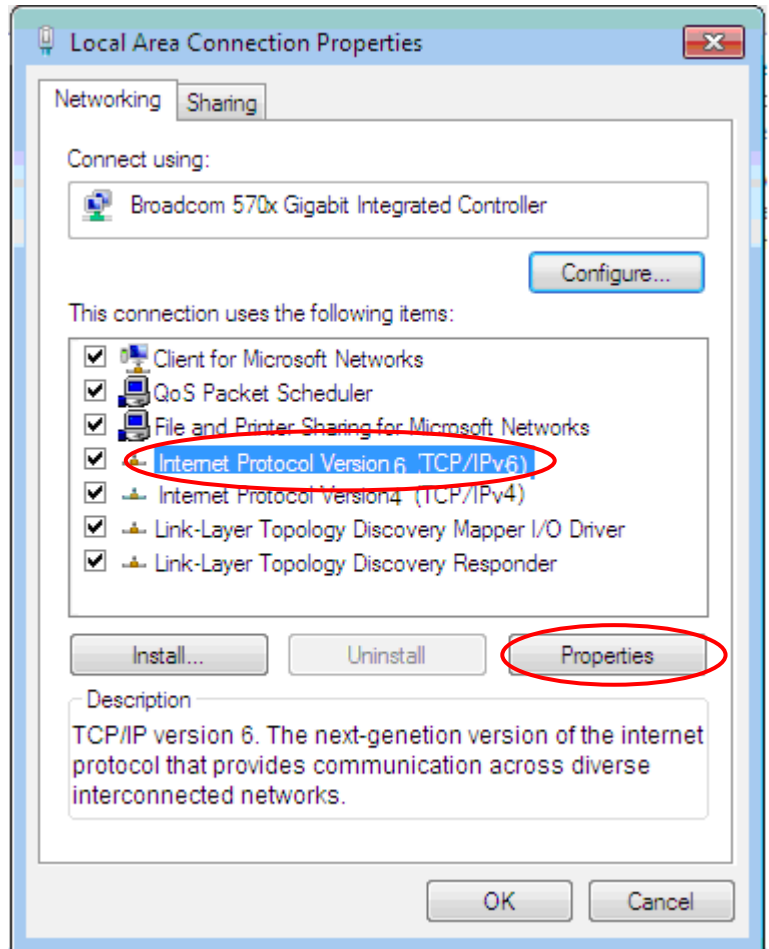


Configuring PC in Windows 7/8 (IPv6)

1. Go to **Start**. Click on **Control Panel**.
2. Then click on **Network and Internet**.
3. When the **Network and Sharing Center** window pops up, select and click on **Change adapter settings** on the left window panel.
4. Select the **Local Area Connection**, and right click the icon to select **Properties**.

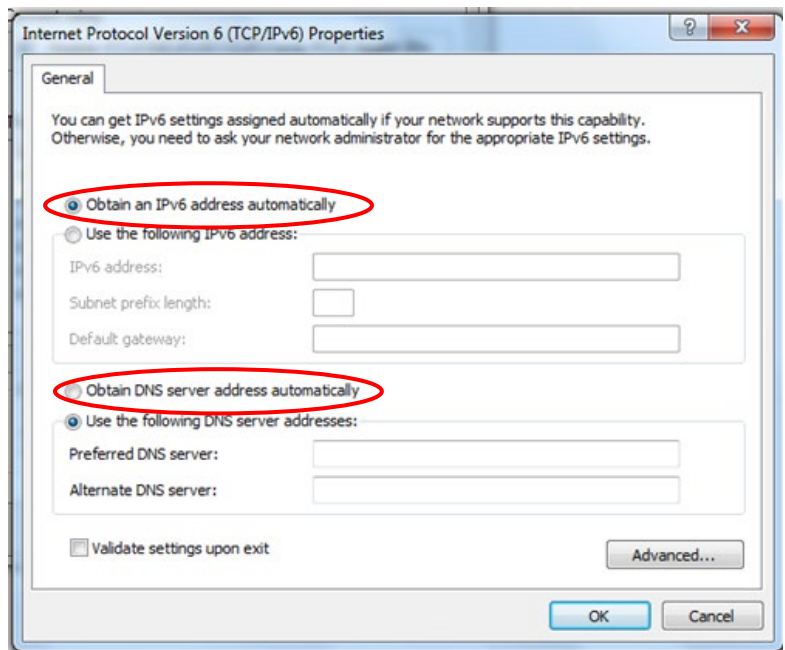


5. Select **Internet Protocol Version 6 (TCP/IPv6)** then click **Properties**.



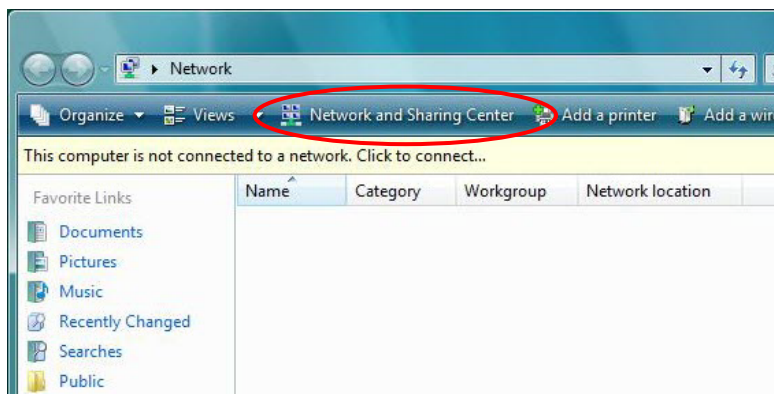
6. In the **TCP/IPv6 properties** window, select the **Obtain an IPv6 address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.

7. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



Configuring PC in Windows Vista (IPv6)

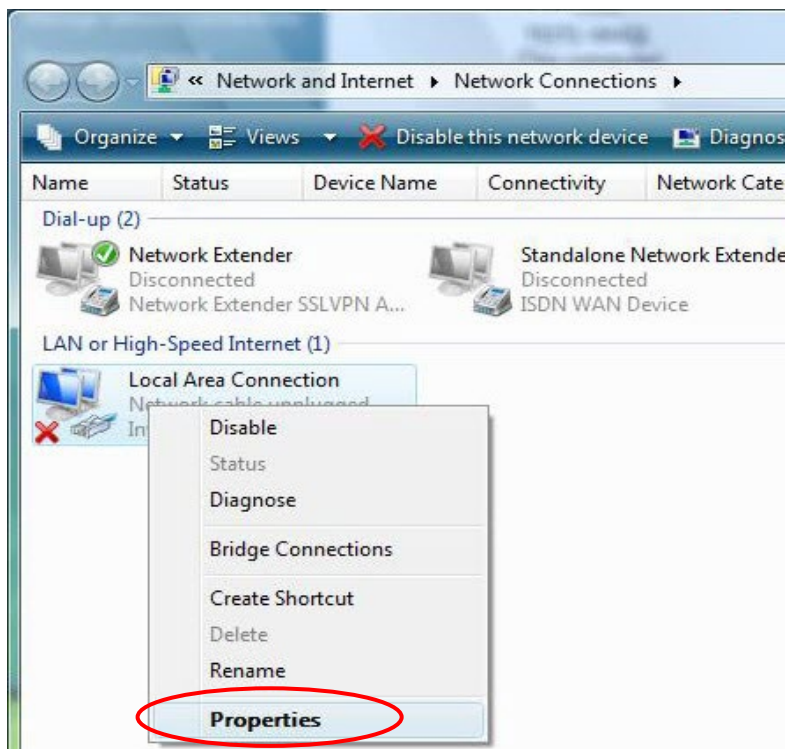
1. Go to **Start**. Click on **Network**.
2. Then click on **Network and Sharing Center** at the top bar.



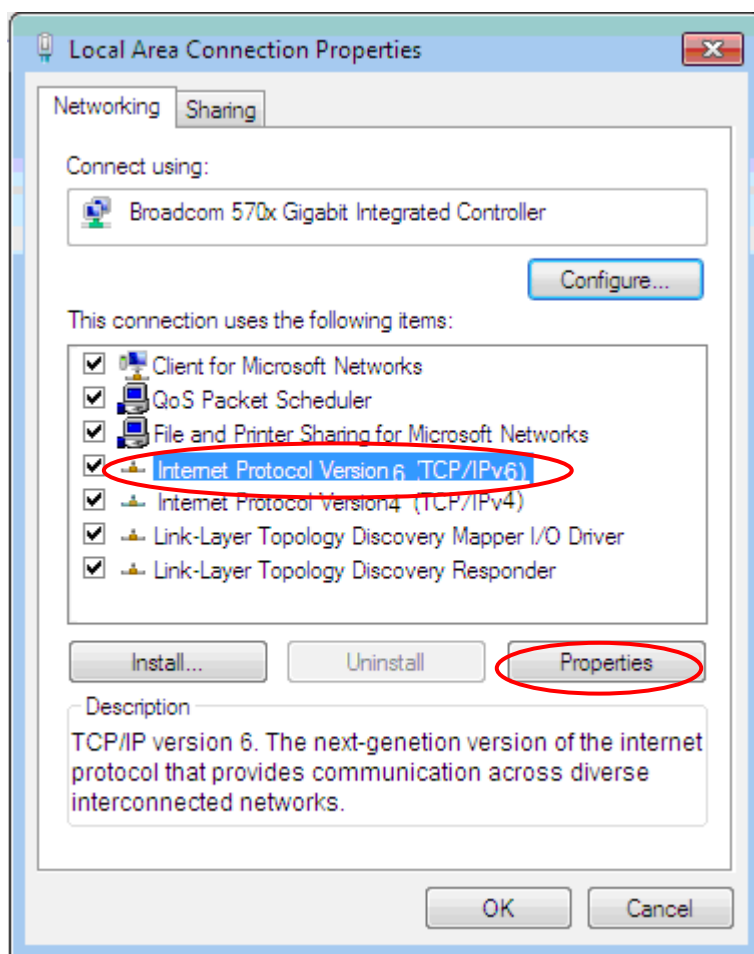
3. When the **Network and Sharing Center** window pops up, select and click on **Manage network connections** on the left window panel.



4. Select the **Local Area Connection**, and right click the icon to select **Properties**.

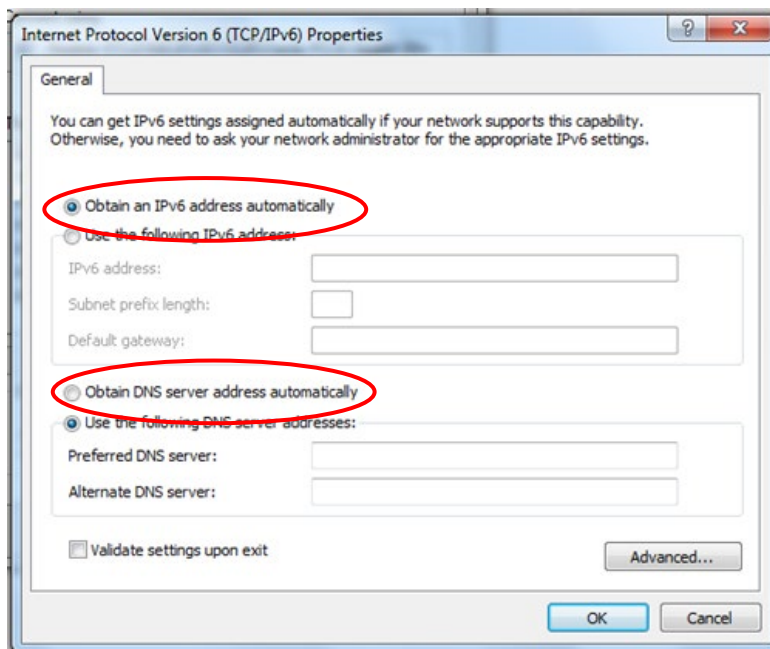


5. Select **Internet Protocol Version 6 (TCP/IPv6)** then click **Properties**.



6. In the **TCP/IPv6 properties** window, select the **Obtain an IP address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.

7. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



Default Settings

Before configuring the router, you need to know the following default settings.

Web Interface: (Username and Password)

Administrator

- ✓ Username: admin
- ✓ Password: admin



If you ever forget the username/password to login to the router, you may press the RESET button up to 6 seconds then release it to restore the factory default settings.

Caution: After pressing the RESET button for more than 6 seconds then release it, to be sure you power cycle the device again.

Device LAN IP Settings

- ✓ IP Address: 192.168.1.254
- ✓ Subnet Mask: 255.255.255.0

DHCP Server:

- ✓ DHCP server is enabled.
- ✓ Start IP Address: 192.168.1.100
- ✓ IP pool counts: 100

Information from Your ISP

Before configuring this device, you have to check with your ISP (Internet Service Provider) what kind of service is provided, Dynamic IP address, Static IP address, PPPoE or Bridge Mode).

Gather the information as illustrated in the following table and keep it for reference.

PPPoE	Username, Password, Service Name, and Domain Name System (DNS) IP address (it can be automatically assigned by your ISP when you connect or be set manually).
Dynamic IP Address	DHCP Client (it can be automatically assigned by your ISP when you connect or be set manually).
Static IP Address	IP address, Subnet mask, Gateway address, and Domain Name System (DNS) IP address (it is fixed IP address).

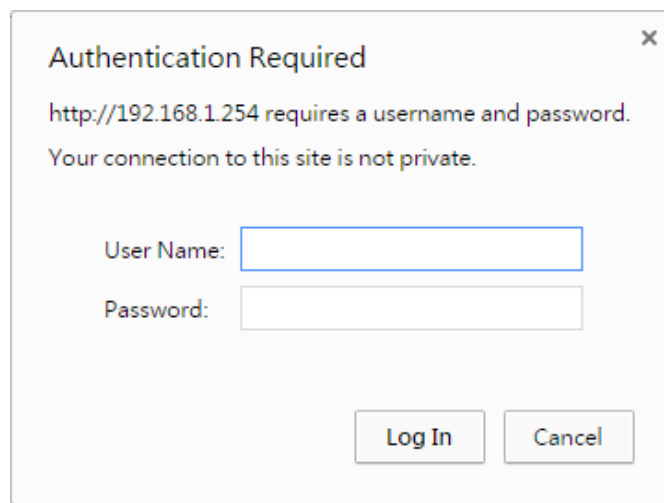
CHAPTER 4: DEVICE CONFIGURATION

Login to your Device

Open your web browser, enter the IP address of your router, which by default is **192.168.1.254**, and click “Go”, a username and password window prompt appears.

The default username & password is “**admin**” & “**admin**” respectively for the **Administrator**.

NOTE: This username / password may vary by different Internet Service Providers.

A screenshot of a web browser's authentication dialog box. The title bar says "Authentication Required" with a close button (X) in the top right corner. The main text inside the dialog reads: "http://192.168.1.254 requires a username and password." followed by "Your connection to this site is not private." Below this text are two input fields: "User Name:" followed by a text box, and "Password:" followed by a password box. At the bottom right of the dialog are two buttons: "Log In" and "Cancel".

Authentication Required

http://192.168.1.254 requires a username and password.
Your connection to this site is not private.

User Name:

Password:

Log In Cancel

Congratulations! You have successfully logged on to your AirConnect® 8231.

Once you have logged on to your AirConnect® 8231 via your web browser, you can begin to set it up according to your requirements. On the configuration homepage, the left navigation pane links you directly to the setup pages, which includes:

Section	Status	Quick Start (Wizard Setup)	Configuration
Sub-Items	Device Info		Interface Setup - Internet - LAN - IPv6-464XLAT - Loopback
	System Status		
	System Log		
	5G Status		Advanced Setup - Firewall - Routing - Dynamic Routing - NAT - VRRP - Static DNS - QoS - Time Schedule - Mail Alert
	Statistics		
	DHCP Table		
	ARP Table		
	VRRP Status		Access Management - Device Management - SNMP - Syslog - Universal Plug & Play (UPnP) - Dynamic DNS - Access Control - Packet Filter - CWMP (TR-069) - Parental Control - BECentral Management Maintenance - User Management - Time Zone - Firmware & Configuration - System Restart - Auto Reboot - Diagnostic Tool

Please see the relevant sections of this manual for detailed instructions on how to configure your AirConnect® 8231.

Status

Device Info

It provides brief status summary of the device.

▼ Device Information	
Model Name	8231
Firmware Version	1.00.1.83
MAC Address	60:03:47:51:e5:70
Date-Time	Tue Aug 16 07:41:33 2022
System Up Time	4 mins

▼ Physical Port Status	
5G NR	✓
Ethernet	✓

▼ WAN					
Interface	Protocol	Connection	IP Address	Default Gateway	DNS Server
5G NR	Dynamic IP	0d: 0h: 2m: 19s Connected	172.19.184.232/255.255.255.240	172.19.184.233	8.8.8.8/8.8.4.4

▼ LAN		
IP Address	Subnet Mask/Prefix Length	DHCP Server
192.168.1.254	255.255.255.0	Enable / 192.168.1.100~192.168.1.199 Enable / Stateless

Device Information

Model Name: Name of the router for identification purpose.

Firmware Version: Software version currently loaded in the router.

MAC Address: A unique number that identifies the router.

Data Time: Setup correct time on the **AirConnect® 8231** with your PC. Check on [Time Zone](#) section for more configuration information.

System Uptime: Display how long the **AirConnect® 8231** has been powered on.

Physical Port Status

Physical Port Status : Display available connection interfaces supported in the 8231.

WAN

Interface: List current available WAN connections.

Protocol: Display selected WAN connection protocol

Connection: The current connection status.

IP Address: WAN port IP address.

Default Gateway: The IP address of the default gateway.

LAN

IP Address: LAN port IPv4 address.

Subnet Mask/Prefix Length: Display LAN port IP subnet mask of IPv4 and/or Prefix length of IPv6.

DHCP Server: Display LAN DHCP status of IPv4 and IPv6.

- ▶ **Enable / 192.168.1.100~199:** DHCPv4 server status on or off / DHCP IP range.
- ▶ **Enable / Stateless:** DHCPv6 server status on or off / DHCPv6 server Type.

System Status

System status displays the current router system (CPU and Memory) usage.

System Status	
CPU	
Usage	16%
Memory	
Total	61092 kB
Free	21304 kB
Cached	16072 kB
Refresh	

CPU

Usage: Display the amount of CPU's processing capacity is being used in percentage (%). Higher the % rate may result in slow Internet loading, experiencing video lags, etc. To reduce high CPU consumption by resetting the device, power off and on, the easiest way to regain the service.

Memory

Total / Free / Cached (in Kbyte): Display the memory consumptions in kilobytes (kB).

Click **Refresh** button to update the status.

System Log

In system log, you can check the operations status and any glitches to the router.

System Log	
<pre> Jan 1 00:00:48 syslogd started: BusyBox v1.00 (2022.02.08-04:41+0000) Jan 1 00:00:48 syslog: [3GFUN]: 3gfun Started PID = 2721 (1) Jan 1 00:00:49 syslog: [3GFUN]: usb3.0 bus... Apr 10 00:00:01 PPOELOGIN: bind service port Apr 10 00:00:01 PPOELOGIN: begin service loop Apr 10 00:00:01 syslog: Model Name : 8231 Apr 10 00:00:04 syslog: Firmware Version : 1.00.1.83 Apr 10 00:00:04 syslog: [3GFUN]: "0-AE" model. Apr 10 00:00:04 syslog: [SELF CHECK]: System reboot(11) --- Apr 10 00:00:04 syslog: [SELF CHECK]: WebGUI issue reboot Apr 10 00:00:05 udhcpd[2576]: Re-init host(Lease number 1). Apr 10 00:00:09 syslog: [3GFUN]: Issue gobi_services begin Apr 10 00:00:09 syslog: [3GFUN]: Issue gobi_services ... Apr 10 00:00:09 syslog: [GB_Service]: Connect2Gobi(1) successfully!!! Apr 10 00:00:10 syslog: [GB_Service]: Connect2Gobi(2) successfully!!! Apr 10 00:00:10 syslog: [GB_Service]: netIfnum(4) Apr 10 00:00:10 syslog: [GB_Service]: PDN 2 handler 106a4d98 </pre>	
Refresh Backup Back up the last System Log	

Refresh: Press this button to refresh the statistics.

Backup: Press to save the System log, log.cfg, to your PC.

Backup Last System Log: Press to save the last log saved in the system.

5G Status

This page contains 5G connection information.

5G NR Status	
Status	Up
SIM Status	SIM Card Ready
Card Temperature	32°C
Network Mode	LTE
Signal Strength	 RSSI: -59dbm
Network Band	B48 , Bandwidth:20MHz , Channel 56442
Signal Information	RSRP: -85 , RSRQ: -6 , SINR: 5
CA SCell Information	"INACTIVE" "DL" B48/20MHz Channel: 56640 RSSI: -73dbm RSRP: -90 RSRQ: -8 SINR: 0
Network Name	314 030
Cell ID	83C992C
Physical Cell ID	66
Card IMEI	867197050043500
Card IMSI	314030000046900
SIM Card Number (ICCID)	20200709000000017850
Auto Refresh	Disable ▾
Refresh Neighbour Cell ▶	

Status: Display current status of the 5G connection.

SIM Status: Identify current status of the SIM, **Activate** or **SIM Card Not Found**.

Network Mode: Display current network operating mode.

Network Band: Indicated the current radio frequency band used.

Signal Strength: The signal strength bar and dBm value indicates the current 5G signal strength. The front panel 5G Signal Strength LED indicates the signal strength as well.

Network Name: The name of the 5G network the router is connecting to.

Cell ID: The ID of base station that the device is connected to.

Card IMEI: The unique identification number that is used to identify the 5G module.

Card IMSI: The international mobile subscriber identity used to uniquely identify the 5G module.

SIM Card Number (ICCID): It is a unique and specific serial number, consists of 19 or 20 characters, assigned to your SIM card.

Auto Refresh: Select **Disable** or **Enable** to reload the mobile status information.

Refresh: Click to refresh the statistics.

Usage Allowance

To enable this feature, please go to **Configuration >> Interface Setup >> Internet >> click “Usage Allowance” >> enable “Save the statistics to ROM”**

Usage Allowance

Amount used	 0Hours of 720Hours
Billing period	 Day:15

Amount Used: Display the amount of mobile data used and remaining in current billing cycle.

Billing Cycle: Display the start date and number of days remaining in current billing cycle.

Clean: Reset current saved mobile usage.

Save: Click to save current mobile status to ROM.

Statistics

❖ 5G Status

Take 5G as an example to describe the following connection transmission information.

▼ Statistics			
Traffic Statistics			
Interface	☒ 5G NR ☐ Ethernet		
Transmit Statistics		Receive Statistics	
Transmit Frames of Current Connection	59556	Receive Frames of Current Connection	202133
Transmit Bytes of Current Connection	4436893	Receive Bytes of Current Connection	196909779
Transmit Total Frames	4332	Receive Total Frames	202133
Transmit Total Bytes	8880626	Receive Total Bytes	196909779
Transmit Speed	150.96KBps	Receive Speed	3905.10KBps
Refresh		Auto Refresh None	

Traffic Statistics

Interface: List all available network interfaces in the router. You are currently checking on the physical status of **CBRS** interface.

Transmit Statistics

Transmit Frames of Current Connection: Display the total number of 5G frames transmitted until the latest second for the current connection.

Transmit Bytes of Current Connection: Display the total bytes transmitted till the latest second for the current connection for the current connection.

Transmit Total Frames: Display the total number of frames transmitted till the latest second since system is up.

Transmit Total Bytes: Display the total number of bytes transmitted until the latest second since system is up.

Transmit Speed: Display the data rate can be transferred to the server, the mobile Internet.

Receive Statistics

Receive Frames of Current Connection: Display the number of frames received until the latest second for the current connection.

Receive Bytes of Current Connection: Display the total bytes received till the latest second for the current connection.

Receive Total Frames: Display the total number of frames received until the latest second since system is up.

Receive Total Bytes: Display the total frames received till the latest second since system is up.

Receive Speed: Display the data rate receives from the mobile Internet.

Refresh: Click to manually refresh the data.

Auto Refresh: Select a time interval to refresh the data automatically or none to disable the feature.

❖ Ethernet

▼ Statistics			
Traffic Statistics			
Interface	☐ 5G NR ☒ Ethernet		
Transmit Statistics		Receive Statistics	
Transmit Frames	103765	Receive Frames	338357
Transmit Multicast Frames	0	Receive Multicast Frame	0
Transmit Total Bytes	9241918	Receive Total Bytes	308335136
Transmit Collision	0	Receive CRC Errors	0
Transmit Error Frames	0	Receive Under-size Frames	0
Traffic Speed			
Transmit Speed	0.22KBps	Receive Speed	0.39KBps
Refresh		Auto Refresh None ▼	

Traffic Statistics

Interface: List all available network interfaces in the router. You are currently checking on the physical status of the **Ethernet** port.

Transmit Statistics

Transmit Frames: Display the number of frames transmitted until the latest second.

Transmit Multicast Frames: Display the number of multicast frames transmitted until the latest second.

Transmit Total Bytes: Display the number of bytes transmitted until the latest second.

Transmit Collision: Numbers of collisions have occurred on this port.

Transmit Error Frames: Display the number of error packets on this port.

Receive Statistics

Receive Frames: Display the number of frames received until the latest second.

Receive Multicast Frames: Display the number of multicast frames received until the latest second.

Receive Total Bytes: Display the number of bytes received until the latest second.

Receive CRC Errors: Display the number of error packets on this port.

Receive Under-size Frames: Display the number of under-size frames received until the latest second.

Traffic Speed

Transmit Speed: Display the data rate can be transferred to the server, the Broadband Internet Service Provider.

Receive Speed: Display the data rate receives from the Broadband Internet Service Provider.

Refresh: Click to manually refresh the data.

Auto Refresh: Select a time interval to refresh the data automatically or none to disable the feature.

DHCP Table

DHCP table displays the devices connected to the router with clear information.

▼DHCP Table				
Index	Host Name	IP Address	MAC Address	Expire Time
1	Billion-HC-ee	192.168.1.101	00:C0:9F:D1:E1:CA	0days 23:36:1

Index #: The indication of the rule number.

Host Name: Show the hostname of the PC.

IP Address: The IP allocated to the device.

MAC Address: The MAC of the connected device.

Expire Time: The total remaining interval since the IP assignment to the PC.

ARP Table

This section displays the router's ARP (Address Resolution Protocol) Table, which shows the mapping of Internet (IP) addresses to Ethernet (MAC) addresses. This is useful as a quick way of determining the MAC address of the network interface of your PCs to use with the router's **Firewall - MAC Address Filter** function. See the Firewall section of this manual for more information on this feature.

▼ARP Table		
#	IP	MAC Address
1	192.168.1.11	00:0C:29:00:00:00

Index #: The indication of the APR table number.

IP Address: It is IP Address of internal host that join this network.

MAC Address: The MAC address of internal host.

VRRP Status

▼VRRP Status	
Current Status	N/A
Current Master	N/A

Current Status: Display current VRRP status, Master or Backup.

Current Master: Display the IP address of the Master.

Quick Start

This is a useful and easy utility to help you to setup the router quickly and to connect to your ISP (Internet Service Provider) with only a few steps. It will guide you step by step to setup password, time zone, wireless, and WAN settings of your device. The Quick Start Wizard is a helpful guide for the first-time users to the device.

Quick Start

The 'Quick Start' wizard will guide you to configure the device to connect to your ISP(Internet Service Provider).
Please follow the 'Quick Start' wizard step by step to configure the device. It will allow you to have Internet access within minutes.

Run Wizard

For detailed instructions on configuring WAN settings, see refer to the **Interface Setup** section.

Quick Start

Follow these simple steps to configure your BEC device. Click NEXT to begin.

Step 1. Set your new password .

Step 2. Choose your time zone.

Step 3. Set your internet connection.

Step 4. Confirm the configuration and save it.

Next

Click **NEXT** to move on to Step 1.

Step 1 – Password

Set new password of the “admin” account to access for router management. The default is “admin”. Once changed, please use this new password next time when accessing to the router. Click **NEXT** to continue.

Quick Start - Password

You may change the admin account password by entering in a new password. Click NEXT to continue.

New Password

Confirm Password

BackNext

Step 2 – Time Zone

Choose your time zone. Click **NEXT** to continue.

Quick Start - Time Zone

Select the appropriate time zone for your location and click NEXT to continue.

Time Zone

(GMT-06:00) Central Time (US & Canada), Mexico City, Saskatchewan ▼

BackNext

Step 3 – ISP Connection Type

Set up your WAN Internet connection.

3.1 Select an appropriate WAN connection protocol then click **NEXT** to continue.

Quick Start - ISP Connection Type

Select the WAN Interface and Internet Connection Type to connect to your ISP. Click NEXT to continue.

WAN Interface5G NR

BackNext

3.2 Input all relevant 5G parameters from your ISP.

Quick Start - 5G NR

The settings may vary by carrier and plan. Enter the settings provided by your carrier and click NEXT to continue.

TEL No.*99***1#

APN

PDN Type☒ IPv4 ☐ IPv4/IPv6 ☐ IPv6

Authentication ProtocolDisable

Username

Password

PIN

Keep Alive☐ Yes ☒ No

MTU0 (0 means use default: 1500)

BackNext

Click **Next** to save changes.

Step 4 – Quick Start Completed

The Setup Wizard has completed. Click on **BACK** to make changes or correct mistakes. Click **NEXT** to save the current settings and complete the Quick Start setups.

Quick Start - Quick Start Completed

Quick Start Completed !!

The Setup Wizard has completed. Click on BACK to modify changes or mistakes. Click NEXT to exit the Setup Wizard.

BackNext

Quick Start - Quick Start Completed !!

Quick Start Completed !!

Saved Changes.

Go back to the **Status > Device Info** to view the status.

Configuration

Click to access and configure the available features in the following: **Interface Setup**, **Advanced Setup**, **Access Management**, and **Maintenance**.

These functions are described in the following sections.

Interface Setup

Here are the features under **Interface Setup**: Internet, LAN, IPv6-464XLAT, and Loopback Interface.

Internet

❖ 5G

▼ Internet	
WAN Interface	5G NR ▼
Status	☒ Activated ☐ Deactivated
Usage Allowance ▶	☐ Enable
IP Pass-Through Mode	☐ Enable
Network Mode	Automatic ▼
TEL No.	*99***1#
Dual APN	Single APN ▼
APN	
Authentication Protocol	Disable ▼
Username	
Password	
PIN	
Connection	☒ Always On (Recommended)
Keep Alive	☐ Yes ☒ No
Keep Alive IP	Check Interval 5 x 1 Seconds
Background Ping	☐ Yes ☒ No
Background Ping IP	Interval Seconds
Default Route	☒ Yes ☐ No
Second APN as Default Route	☐ Yes ☒ No
NAT	Enable ▼
MTU	1428 (0 means use default:1500)
Save	

Status: Choose Activated to enable the 5G connection.

Usage Allowance: Click **Enable** to activate the feature. Click the link to setup the usage settings.

Usage Allowance

Parameters

Period	☒ Month ☐ Day
Mode	☐ Volume-based Only Download MB data volume per month/day included
	☒ Time-based 720 hours per month/day included The billing period always begins on day/o'clock 1 of a month.
Over usage allowance action	None
Save the statistics to ROM	Disable

Save

Back

Period: Pick a period, **Month** or **Day**.

Mode: Include **Volume-based** and **Time-based** control.

- ▶ **Volume-based** include “only Download”, “only Upload”, and “Download and Upload” to limit the flow.
- ▶ **Time-based** control the flow by providing specific hours per month.
 - **720 hours** if selected period **Month**
 - **12 hours** if selected period **Day**

The billing period begins on the beginning day of billing each month.

Over usage allowance action: Here are actions to perform when mobile data usage, defined in **Mode**, reached to its maximum.

- ▶ **None:** No action taken
- ▶ **Disconnect:** Disconnect mobile connection
- ▶ **Email Alert:** Send an e-mail alert and keep the mobile connection alive.
- ▶ **Email Alert and Disconnect:** Disconnect mobile connection after an alert e-mail is being sent.

Save the statistics to ROM:

- ▶ **Every hour:** Activate the 5G statistics on data usage and this info will get updated and saved to the internal memory (ROM) in every hour.

Once the feature is turned on, you can see the amount of data used and how many days left before next billing cycle starts. Go to **Status >> 5G Status** page for details.

Usage Allowance

Amount used	0Hours of 720Hours
Billing period	Day:15

Clean

Save

NOTE: This statistic information will get deleted after a factory reset.

- ▶ **Disable:** No action taken

IP Pass-Through Mode: When **enabled**, AirConnect® 8231 is in bridge mode and will not obtain a WAN IP address, features such as routing capabilities, NAT, firewall, etc., will be disabled by default. However, the client router behind the AirConnect® 8231 can get a WAN IP address instead.

When **disabled**, AirConnect® 8231 is in router mode that it handles a WAN IP address and all routing-related features become available.

Network Mode: Select a cellular mode. Select **Automatic** to auto detect the best mode for you.

TEL No.: The dial string to make a 5G user internetworking call. It may provide by your mobile service provider.

Dual or Multiple APN: AirConnect® 8231 can support up to two (2) APNs, **Single** or **Dual**.

APN: An APN is similar to a URL on the WWW; it is what the unit makes a GPRS / UMTS call. The service provider is able to attach anything to an APN to create a data connection, requirements for APNs varies between different service providers. Most service providers have an internet portal which they use to connect to a DHCP Server, thus giving you access to the internet i.e. some mobile/cellular operators use the APN 'internet' for their portal. The default value is "internet".

Authentication Protocol: Manually specify CHAP (Challenge Handshake Authentication Protocol) or PAP (Password Authentication Protocol). When using PAP, the password is sent unencrypted, while CHAP encrypts the password before sending, and also allows for challenges at different periods to ensure that an intruder has not replaced the client.

Username/Password: Enter the username and password provided by your service provider. The username and password are case sensitive.

PIN: PIN stands for Personal Identification Number. A PIN code is a numeric value used in certain systems as a password to gain access and authenticate. In mobile phones a PIN code locks the SIM card until you enter the correct code. If you enter the PIN code incorrectly into the phone 3 times in a row, then the SIM card will be blocked, and you will require a PUK code from your network/service provider.

Connection: Default set to Always on to keep an always-on 5G connection.

Keep Alive: Select **Yes** to ensure the 5G internet connection is always available.

Keep Alive IP: Enter the IP address that the AirConnect® 8231 can ping the IP to find whether the connection is on or not, if not, router will recover the connection.

Background Ping: Select **Yes** to keep the 5G active at all time, prevent AirConnect® 8231 from entering idle state.

Background Ping IP: Enter the IP address that the AirConnect® 8231 can ping the IP address.

Default Route: Select **Yes** to use this interface as default route interface.

NAT: Select this option to Disabled/Enable the NAT (Network Address Translation) function. Enable NAT to grant multiples devices in LAN to access to the Internet through a single WAN IP.

MTU: Enter the maximum packet that can be transmitted. Use default 1500 bytes by entering MTU 0.

LAN

A Local Area Network (LAN) is a shared communication system to which many computers are attached and is limited to the immediate area, usually the same building or floor of a building.

IPv4 Parameters

▼ LAN	
IPv4 Parameters	
IP Address	192.168.1.254
IP Subnet Mask	255.255.255.0
Alias IP Address	0.0.0.0 (0.0.0.0 means to close the alias ip)
Alias IP Subnet Mask	0.0.0.0
Snooping	☐ Activated ☒ Deactivated
Dynamic Route	RIP1 ▼ Direction None ▼

IP Address: Enter the IP address of Router in dotted decimal notation, for example, 192.168.1.254 (factory default).

IP Subnet Mask: The default is 255.255.255.0. User can change it to other such as 255.255.255.128.

Alias IP Address: This is for local networks virtual IP interface. Specify an IP address on this virtual interface.

Alias IP Subnet Mask: Specify a subnet mask on this virtual interface.

IGMP Snooping: Select **Activated** to enable IGMP Snooping function, Without IGMP snooping, multicast traffic is treated in the same manner as broadcast traffic - that is, it is forwarded to all ports. With IGMP snooping, multicast traffic of a group is only forwarded to ports that have members of that group.

Dynamic Route:

- ▶ **RIP Version:** (Routing Information protocol) Select this option to specify the RIP version, including RIP-1, RIP-2.
- ▶ **RIP Direction:** Select this option to specify the RIP direction.
 - **None** is for disabling the RIP function.
 - **Both** means the router will periodically send routing information and accept routing information then incorporate into routing table.
 - **IN only** means the router will only accept but will not send RIP packet.
 - **OUT only** means the router will only send but will not accept RIP packet.

DHCPv4 Server

DHCP (Dynamic Host Configuration Protocol) allows individual clients to obtain TCP/IP configuration at start-up from a server.

DHCPv4 Server	
DHCPv4 Server	☐ Disabled ☒ Enabled ☐ Relay
Start IP	192.168.1.100
IP Pool Count	100
Lease Time	86400 seconds (0 sets to default value of 259200)
DNS Relay	☒ Automatically ☐ Manually
Primary DNS	
Secondary DNS	
Option 66	
Option 160	

DHCPv4 Server: If set to **Enabled**, your AirConnect® 8231 can assign IP addresses, default gateway and DNS servers to the DHCP client.

- ▶ If set to **Disabled**, the DHCP server will be disabled.
- ▶ If set to **Relay**, the AirConnect® 8231 acts as a surrogate DHCP server and relays DHCP requests and responses between the remote server and the clients. Enter the IP address of the actual, remote DHCP server in the Remote DHCP Server field in this case.
- ▶ When DHCP is used, the following items need to be set.

Start IP: This field specifies the first of the contiguous addresses in the IP address pool.

IP Pool Count: This field specifies the count of the IP address pool.

Lease Time: The current lease time of client.

DNS Relay:

- ▶ Select **Automatic** detection or
- ▶ **Manually** specific Primary and Secondary DNS IP addresses

Primary / Secondary DNS Server: Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the subnet mask.

Option 66: Set the IP or hostname of the TFTP server for devices, like IPTV Set Box, to get configuration settings from the TFTP server.

Option 160: Set the IP or hostname of the TFTP server for devices, like IPTV Set Box, to get configuration settings from the TFTP server. (The option 160 is an extended feature in DHCP option, similar to option 66, but using http or https protocols.)

Fixed Host

In this field, users can map the specific IP (must in the DHCP IP pool) for some specific MAC, and this information can be listed in the following table.

Fixed Host	
IP Address	
MAC Address	

IP Address: Enter the specific IP. For example: 192.168.1.110.

MAC Address: Enter the responding MAC. For example: 00:0A:F7:45:6D:ED

When added, you can see the ones listed as showed below:

Fixed Host Listing			
Index	IP Address	MAC Address	Delete
1	192.168.1.110	00:04:ED:01:01:10	

IPv6 Parameters

The IPv6 address composes of two parts, thus, the prefix and the interface ID.

IPv6 Parameters	
Interface Address/Prefix Length	/
MLD Snooping	☐ Activated ☒ Deactivated
DHCPv6 Server	
DHCPv6 Server	☐ Disable ☒ Enable
DHCPv6 Server Type	☒ Stateless ☐ Stateful
Start Interface ID	
End Interface ID	
Lease Time	seconds(0 sets to default value of 4800)
Router Advertisements	☐ Disable ☒ Enable

Interface Address / Prefix Length: Enter a static LAN IPv6 address. If you are not sure what to do with this field, please leave it empty as if contains false information it could result in LAN devices not being able to access other IPv6 device. Router will take the same WAN's prefix to LAN side if the field is empty.

DHCPv6 Server

DHCPv6 Server	
DHCPv6 Server	☐ Disable ☒ Enable
DHCPv6 Server Type	☒ Stateless ☐ Stateful
Start Interface ID	
End Interface ID	
Lease Time	seconds(0 sets to default value of 4800)
Router Advertisements	☐ Disable ☒ Enable

There are two methods to dynamically configure IPv6 address on hosts, **Stateless** and **Stateful**.

Stateless auto-configuration requires no manual configuration of hosts, minimal (if any) configuration of routers, and no additional servers. The stateless mechanism allows a host to generate its own addresses using a combination of locally available information (MAC address) and information (prefix) advertised by routers. Routers advertise prefixes that identify the subnet(s) associated with a link, while hosts generate an "interface identifier" that uniquely identifies an interface on a subnet. An address is formed by combining the two. When using stateless configuration, you needn't configure anything on the client.

Stateful configuration, for example using DHCPv6 (which resembles its counterpart DHCP in IPv4.) In the stateful auto configuration model, hosts obtain interface addresses and/or configuration information and parameters from a DHCPv6 server. The Server maintains a database that keeps track of which addresses have been assigned to which hosts.

DHCPv6 Server: Click **Enable** to activate the DHCPv6 server.

DHCPv6 Server Type: Select Stateless or Stateful. When DHCPv6 is enabled, this parameter is available.

- ▶ **Stateless:** If selected, the PCs in LAN are configured through RA mode, thus, the PCs in LAN are configured through RA mode, to obtain the prefix message and generate an address using a combination of locally available information (MAC address) and information (prefix) advertised by routers, but they can obtain such information like DNS from DHCPv6 Server.
- ▶ **Stateful:** If selected, the PCs in LAN will be configured like in IPv4 mode, thus obtain addresses and DNS information from DHCPv6 server.

Start interface ID: enter the start interface ID. The IPv6 address composed of two parts, thus, the prefix and the interface ID. Interface is like the Host ID compared to IPv4.

End interface ID: enter the end interface ID.

Leased Time (seconds): the leased time, similar to leased time in DHCPv4, is a time limit assigned to clients, when expires, the assigned ID will be recycled and reassigned.

Router Advertisement: Check to Enable or Disable the Issue Router Advertisement feature. This feature is to send Router Advertisement messages periodically which would multicast the IPv6 Prefix information (similar to v4 network number 192.168.1.0) to all LAN devices if the field is enabled. We suggest enabling this field.

Click **Save** to apply settings.

IPv6-464XLAT

This feature is to translate the IPv4 packet into IPv6 then send it over an IPv6 network to the PLAT.

IPv6-464XLAT

IPv6-464XLAT	☐ Activated ☒ Deactivated	
CLAT IPv4 Address	192.0.0.1	
Destination IPv6 Prefix	☒ Automatically ☐ Manually	
IPv6 Prefix/Length		96
Save		

IPv6-464XLAT: Choose **Activated** to enable the 464XLAT feature.

CLAT IPv4 Address: Enter the received WAN IP in IPv4 from your internet service provider.

Destination IPv6 Prefix: if select **Manually**, enter the IPv6 prefix of the PLAT. If you are not sure what to do with this field, select **Automatically**; device will request the IPv6 prefix from your internet service provider.

Click **Save** to apply settings

Loopback Interface

Loopback interface is a widely known virtual interface, not the physical interface, on router and is highly robust and always up. The loopback interface has its own IP and subnet mask, often used for router management as Telnet management IP and involved in BGP as BGP Update-Source and OSPF as Router ID.

▼ Loopback

Loopback interface	☐ Activated ☒ Deactivated
IP Address	127.0.0.1
IP Subnet Mask	255.0.0.0
Save	

IP Address: Enter a dedicated IP address for the loopback interface.

IP Subnet Mask: Enter the subnet mask for the loopback interface.

Click **Save** to apply settings

Advanced Setup

Advanced Setup provides advanced features including [Firewall](#), [Routing](#), [Dynamic Routing](#), [NAT](#), [VRRP](#), [Static DNS](#), [QoS](#), [Time Schedule](#), and [Mail Alert](#) for advanced users.

Firewall

Your router includes a firewall for helping to prevent attacks from hackers. In addition to this, when using NAT (Network Address Translation) the router acts as a “natural” Internet firewall, since all PCs on your LAN use private IP addresses that cannot be directly accessed from the Internet.

Firewall	
Firewall	☐ Enabled ☒ Disabled
SPI	☐ Enabled ☒ Disabled
(WARNING: If You enabled SPI, all traffics initiated from WAN would be blocked, including DMZ, Virtual Server, and ACL WAN side.)	
Save	

Firewall: To automatically detect and block Denial of Service (DoS) attacks, such as Ping of Death, SYN Flood, Port Scan and Land Attack.

- ▶ **Enabled:** Activate your firewall function.
- ▶ **Disabled:** Deactivate the firewall function.

SPI: If you enabled SPI, all traffics initiated from WAN would be blocked, including DMZ, Virtual Server, and ACL WAN side.

- ▶ **Enabled:** Activate your SPI function.
- ▶ **Disabled:** Deactivate the SPI function.

Click **Save** to apply settings.

Static Routing

This is static route feature. You are equipped with the capability to control the routing of all the traffic across your network. With each routing rule created, user can specifically assign the destination where the traffic will be routed to.

▼ Routing Table							
Index	Destination IP Address	Subnet Mask	Gateway IP Address	Metric	Interface	Edit	Drop
0	192.168.1.0	255.255.255.0	0.0.0.0	0	br0		
1	127.0.0.0	255.255.0.0	0.0.0.0	0	loopback		

Add Route

Index #: The indication of the routing table number.

Destination IP Address: IP address of the destination network

Subnet Mask: The subnet mask of destination network.

Gateway IP Address: IP address of the gateway or existing interface that this route uses.

Metric: It represents the cost of transmission for routing purposes. The number need not be precise, but it must be between 1 and 15.

Interface: Media/channel selected to append the route.

Edit: Edit the route; this icon is not shown for system default route.

Drop: Drop the route; this icon is not shown for system default route.

Add Route

▼ Static Route	
Destination IP Address	0.0.0.0
Destination Subnet Mask	0.0.0.0
Gateway IP Address / Interface	☐ 0.0.0.0 ☒ EWAN ▼
Metric	1

Save Back

Destination IP Address: This is the destination subnet IP address.

Destination Subnet Mask: The subnet mask of destination network.

Gateway IP Address or Interface: This is the gateway IP address or existing interface to which packets are to be forwarded.

Metric: It represents the cost of transmission for routing purposes. The number need not be precise, but it must be between 1 and 15.

Click **Save** to add this route.

Dynamic Routing

The NAT (Network Address Translation) feature transforms a private IP into a public IP, allowing multiple users to access the internet through a single IP account, sharing the single IP address. NAT break the originally envisioned model of IP end-to-end connectivity across the internet so NAT can cause problems where IPSec/ PPTP encryption is applied or some application layer protocols such as SIP phones are located behind a NAT. And NAT makes it difficult for systems behind a NAT to accept incoming communications.

❖ Open Shortest Path First (OSPF)

OSPF

☐ Enable

Rule Index

1 ▾

Interface

5G NR ▾

Area ID

Save

Delete

OSPF Listing

Index	Interface	Area ID
-------	-----------	---------

OSPF: Enable to activate OSPF routing.

Rule Index: The indication of the rule number. The maximum entry is up to 10, ranging from 0 to 9.

Interface: Set the interface which runs the OSPF process (involved in OSPF routing). It can be WAN interfaces or established GRE tunnels.

Area ID: The OSPF area identifier. It is a decimal number in the range of 0-4294967295. Enter the area ID in which the interface belongs to. The area with area-id="0" is the backbone area.

If the router has networks in more than one area, then an area with area-id="0" (the backbone) must always be present. All other areas are connected to it. The backbone is responsible for distributing routing information between non-backbone areas. The backbone must be contiguous, i.e. there must be no disconnected segments. However, area border routers do not need to be physically connected to the backbone - connection to it may be simulated using a virtual link.

Click **Save** to apply settings.

❖ Border Gateway Protocol (BGP)

A standardized exterior gateway protocol (an uniquely TCP based inter-Autonomous System routing protocol) designed to allow setting up an inter-domain dynamic routing system that automatically updates routing tables of devices running BGP in case of network topology changes.

▼ BGP

BGP	☐ Enable
As Number	
Rule Index	1 ▼
Neighbor IP	
Neighbor As Number	
Allowas-in	☐ Enable
Next-Hop-Self	☐ Enable
Soft-reconfiguration inbound	☐ Enable
EBGP-multihop	☐ Enable

Save

Delete

BGP Listing

Index	Neighbor IP	Neighbor As Number	Allowas-in
-------	-------------	--------------------	------------

BGP: Enable to activate BGP routing.

AS Number: Designate the AS number of the local router. The AS number is used to identify the IBGP or EBGP your neighbor is running. The same AS number means the IBGP, and the different means EBGP.

Rule Index: The indication of the rule number. The maximum entry is up to 10, ranging from 0 to 9.

Neighbor IP: Enter the neighbor IP address.

Neighbor AS Number: Enter the neighbor AS number.

Allowas-in: Enable to allow inter-communication between devices in the same AS. If the local and neighbor AS number are the same, thus, an inter-AS communication, please enable the allowas-in. Otherwise, the router only support EBGP routing between different domains.

Next-Hop-Self: Enable to use the router's own loopback address as the next-hop address.

Soft-reconfiguration inbound: Enable to save, pre-stored, a new inbound policy to the BGP table without interrupting the network when applying this new policy.

EBGP (External BGP)-multihop: Enable to build up peer connection/information with external neighbors.

Click **Save** to apply settings.

NAT

The NAT (Network Address Translation) feature transforms a private IP into a public IP, allowing multiple users to access the internet through a single IP account, sharing the single IP address. NAT break the originally envisioned model of IP end-to-end connectivity across the internet so NAT can cause problems where IPSec/ PPTP encryption is applied or some application layer protocols such as SIP phones are located behind a NAT. And NAT makes it difficult for systems behind a NAT to accept incoming communications.

▼ NAT	
NAT Status	Enable
ALG	
VPN Passthrough	☒ Enabled ☐ Disabled
SIP ALG	☐ Enabled ☒ Disabled
SIP Port	5060 (Such as 5060,5070...) SET
DMZ / Virtual Server	
Interface	5G NR ▼
DMZ	Edit
Virtual Server	Edit

NAT Status: Enabled. (Disabled if WAN connection is in **BRIDGE** mode)

VPN Passthrough: VPN pass-through is a feature of routers which allows VPN client on a private network to establish outbound VPNs unhindered.

SIP ALG: Enable the SIP ALG when SIP phone needs ALG to pass through the NAT. Disable the SIP ALG when SIP phone includes NAT-Traversal algorithm.

Interface: Select a WAN interface connection to allow external access to your internal network.

Click **DMZ** Edit or **Virtual Server** Edit to move on to set the DMZ or Virtual Server parameters, which are represented in the following scenario.

DMZ

NOTE: This feature disables automatically if WAN connection is in BRIDGE mode or NAT is being turned OFF.

The DMZ Host is a local computer which has all UDP and TCP ports exposed to the Internet. When setting an internal IP address as the DMZ Host, all incoming packets will be forwarded to this local host device. Packet filter or virtual server entries will take priority over forwarding internet packets to the DMZ host.

DMZ

DMZ for	5G NR		
DMZ	☐ Enabled ☒ Disabled		
DMZ Host IP Address	0.0.0.0		
Exception Action	☐ Allow ☐ Block		
Exception IP Address	0.0.0.0	~	0.0.0.0 (0.0.0.0 ~ 0.0.0.0 means all IPs)

Save

Back

Except Ports

Rule Index	1		
Port			
Protocol	TCP ▼		
Description		ADD	

DMZ Export Ports Listing

Index	Description	Protocol	Port	Edit	Delete
1	N/A	N/A	N/A		
2	N/A	N/A	N/A		

DMZ for (via a WAN Interface): Allows outside network to connect in and communicate with internal LAN devices via a specific WAN interface.

DMZ:

- ▶ **Enabled:** Activate the DMZ function.
- ▶ **Disabled:** Deactivate the DMZ function.

DMZ Host IP Address: Give a static IP address to the DMZ Host when **Enabled** radio button is checked. Be aware that this IP will be exposed to the WAN/Internet.

Click **Save** to apply settings.

Except Ports

Except Ports: Bypass UDP or/and TCP ports, in the list, being forwarded to the DMZ host.

Port: Enter port to be monitored.

Protocol: Enter the protocol to be monitored.

Description: Enter a description to this rule.

Example: Skip port 80 (UDP/TCP) in the list. All Incoming request to access to port 80 (Web GUI) will be forwarded to the embedded HTTP server of AirConnect® 8231 instead of the DMZ host.

Click **Add** to add an entry to the Except Listing.

Virtual Server

NOTE: This feature disables automatically if WAN connection is in BRIDGE mode or NAT is being turned OFF.

Virtual Server is also known as Port Forwarding that allows AirConnect® 8231 to direct all incoming traffic to the servers on the LAN.

Configure a virtual rule in AirConnect® 8231 for remote users accessing services such as Web or FTP services via the public (WAN) IP address that can be automatically redirected to local servers in the LAN network. Depending on the requested service (TCP/UDP port number), the device redirects the external service request to the appropriate server within the LAN network.

Virtual Server

Virtual Server for	5G NR		
Rule Index	1		
Protocol	TCP		
Start Port Number			
End Port Number			
Local IP Address			
Start Port Number (Local)			
End Port Number(Local)			
Exception Action	☐ Allow ☐ Block		
Exception IP Address	0.0.0.0 ~ 0.0.0.0 (0.0.0.0 ~ 0.0.0.0 means all IPs)		

Save

Back

Virtual Server Listing

Rule	Protocol	Start Port	End port	Local IP Address	Start Port Local	End Port Local	Exception Action	Exception Start IP Address	Exception End IP Address	Edit	Drop
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

Virtual Server for: Indicate the related WAN interface to allow outside network to communicate with the internal LAN device.

Protocol: Choose the application protocol.

Start / End Port Number: Enter a port or port range you want to forward.

(Example: Start / End: 1000 or Start: 1000 & End: 2000).

The starting port must be greater than zero (0). The end port must be greater than or equal to the start port.

Local IP Address: Enter the server IP address in the network to receive the traffic/packets.

Start / End Port Number (Local): Enter the start / end port number of the local application (service).

Click **Save** to apply settings.

Examples of well-known and registered port numbers are shown below. For further information, please see IANA's website at <http://www.iana.org/assignments/port-numbers>

Well-known and Registered Ports

Port Number	Protocol	Description
21	TCP	FTP Control
22	TCP & UDP	SSH Remote Login Protocol
23	TCP	Telnet
25	TCP	SMTP (Simple Mail Transfer Protocol)
53	TCP & UDP	DNS (Domain Name Server)
69	UDP	TFTP (Trivial File Transfer Protocol)
80	TCP	World Wide Web HTTP
110	TCP	POP3 (Post Office Protocol Version 3)
443	TCP & UDP	HTTPS
1503	TCP	T.120
1720	TCP	H.323
7070	UDP	RealAudio



Attention

Using port forwarding does have security implications, as outside users will be able to connect to PCs on your network. For this reason you are advised to use specific Virtual Server entries just for the ports your application requires, instead of using DMZ. As doing so will result in all connections from the WAN attempt to access to your public IP of the DMZ PC specified.

If you have disabled the NAT option in the WAN-ISP section, the Virtual Server function will hence be invalid.

If the DHCP server option is enabled, you have to be very careful in assigning the IP addresses of the virtual servers in order to avoid conflicts. The easiest way of configuring Virtual Servers is to manually assign static IP address to each virtual server PC, with an address that does not fall into the range of IP addresses that are to be issued by the DHCP server. You can configure the virtual server IP address manually, but it must still be in the same subnet as the router.

Example: How to setup Port Forwarding for port 21 (FTP server)

If you have FTP server in your LAN network and want others to access it through WAN.

Step 1: Assign a static IP to your local computer that is hosting the FTP server.

Step 2: Login to the Gateway and go to **Configuration / Advanced Setup / NAT / Virtual Server**.

FTP server uses TCP protocol with port 21.

Enter "21" to Start and End Port Number. The AirConnect® 8231 will accept port 21 requests from WAN side.

Enter the static IP assigned to the local PC that is hosting the FTP server. Ex: 192.168.1.111

Enter "21" to Local Start and End Port number. The AirConnect® 8231 will forward port 21 request from WAN to the specific LAN PC (Example: 192.168.1.111) in the network.

Step 3: Click **Save** to save settings.

Virtual Server

Virtual Server for	EWAN
Protocol	TCP ▼
Start Port Number	21
End Port Number	21
Local IP Address	192.168.1.111
Start Port Number (Local)	21
End Port Number(Local)	21

Save

Back

Virtual Server Listing

Rule	Protocol	Start Port	End port	Local IP Address	Start Port Local	End Port Local	Edit	Drop
0	TCP	21	21	192.168.1.111	21	21		
1	N/A	N/A	N/A	N/A	N/A	N/A		

VRRP

VRRP is designed to eliminate the single point of failure inherent in the static default routed environment. VRRP specifies an election protocol that dynamically assigns responsibility for a virtual router to one of the VRRP routers in a LAN. The VRRP router controlling the IP address associated with a virtual router is called the Master, and forwards packets sent to these IP addresses. The election process provides dynamic fail-over in the forwarding responsibility should the Master become unavailable. Any of the virtual router's IP addresses in a LAN can then be used as the default first hop router by end-hosts. The advantage gained from using VRRP is a higher availability default path without requiring configuration of dynamic routing or router discovery protocols on every end-host.

▼ VRRP	
VRRP	☐ Activated ☒ Deactivated
VRID	1 (1~255)
Priority	100 (1~254)
Preempt Mode	☒ Activated ☐ Deactivated
VRIP	192.168.1.253
Advertisement Period	1 (1~2147483647)
Save	

VRRP: Click to activate the feature.

VRID: Virtual Router Identifier, range from 1-255 (decimal). A master or backup router running the VRRP protocol may participate in one VRID instance.

Priority: Specifies the sending VRRP router's priority for the virtual router. Higher values equal higher priority. The priority value for the VRRP router that owns the IP address associated with the virtual router **MUST** be 255. VRRP routers backing up a virtual router **MUST** use priority values between 1 and 254. The default priority value for VRRP routers backing up a virtual router is 100. The priority value zero (0) has special meaning indicating that the current Master has stopped participating in VRRP. This is used to trigger Backup routers to quickly transition to Master without having to wait for the current Master to timeout.

Preempt Mode: When preempt mode is activated, a backup router always takes over the responsibility of the master router. When deactivated, the lower priority backup is left in the master state.

VRIP: An IP address which is associated with the virtual router.

Advertisement period: Indicates the time interval in seconds between advertisements. Default in 1 second.

Click **Save** to apply settings.

Static DNS

The Domain Name System (DNS) is a hierarchical naming system built on a distributed database for computers, services, or any resource connected to the Internet or a private network associated with various information with domain names assigned to each of the participating entities. Most importantly, it translates domain names meaningful to humans into the numerical identifiers associated with networking equipment for the purpose of locating and addressing these devices worldwide.

An often-used analogy to explain the Domain Name System is that it serves as the phone book for the Internet by translating human-friendly computer hostnames into IP addresses. For example, the domain name `www.example.com` can be translated into the addresses `192.0.32.10` (IPv4).

▼ Static DNS

IP Address

Domain Name

Save

Static DNS Listing

Index	IP Address	Domain Name	Edit	Delete
-------	------------	-------------	------	--------

- IP Address:** Enter a static DNS IP address.
- Domain Name:** Enter a domain name which can be converted to the IP address from above.

Click **Save** to apply settings.

QoS

QoS helps you control the upload traffic of each application from LAN (Ethernet and/or Wireless) to WAN (Internet).

It facilitates you the features to control the quality of throughput for each application. This is useful when there on certain types of data you want give higher priority to, such as voice data packets given higher priority than web data packets.

Quality of Service			
SW QoS *1	☒ Activated ☐ Deactivated		
Bandwidth Limitation			
LAN to WAN	Bandwidth	100 Mbps	
WAN to LAN	EWAN	Bandwidth	100 Mbps
	Specify Bandwidth Limitation		
	Specify LAN Host Bandwidth		

SW QoS: Select **Activate** to enable the feature.

Bandwidth Limitation

LAN to WAN (Bandwidth): Display maximum upstream bandwidth.

WAN to LAN (Bandwidth): Display maximum downstream bandwidth.

Specify Bandwidth Limitation: Click to update/change the allowed bandwidth.

- ▶ **LAN to WAN (Upstream):** Enter the maximum upstream bandwidth.
- ▶ **WAN to LAN (Downstream):** Enter the maximum downstream bandwidth.

Click **Bandwidth Save** to save settings.

Bandwidth Limitation			
LAN to WAN	Bandwidth	1000	Mbps
WAN to LAN	EWAN	Bandwidth	1000 Mbps
Save Back			

Specify LAN Host Bandwidth: Allow specific LAN device(s) to skip the bandwidth control.

- ▶ **Index:** The rule indicator (1-32) for identifying each host device.
- ▶ **MAC Address:** Enter the host's MAC address. For example: 00:04:ed:12:34:56
- ▶ **Upload / Download (Bandwidth):** Enter maximum available upload and download bandwidth for the specific device.

Click **Save** to apply settings.

LAN Host Bandwidth

Rule Index	1 ▼		
MAC Address	00:04:ed:12:34:56		
Upload	1000	Mbps	Download 1000 Mbps
Save Delete Back			

LAN Host Bandwidth Listing

Index	MAC Address	Upload Bandwidth	Download Bandwidth
1	00:04:ed:12:34:56	1000.0	1000.0

SW QoS Rule

SW QoS Rule			
Rule Index	1 ▼		
Application			
Direction	LAN to WAN ▼	WAN Interface	ALL ▼
QoS Type	Limited(Maximum) ▼	Priority	High ▼
Bandwidth Type	☒ Share Bandwidth ☐ Bandwidth per Host		
Bandwidth		Mbps	DSCP Marking Disable ▼
Protocol	Any ▼		
Internal IP Address	0.0.0.0 ~ 0.0.0.0 *2	Internal Port	0 ~ 0 *3
External IP Address	0.0.0.0 ~ 0.0.0.0 *2	External Port	0 ~ 0 *3
Note *1 : The hardware acceleration of packet processing will be disable if active SW QoS. Note *2 : 0.0.0.0 ~ 0.0.0.0 means all IPs Note *3 : 0 ~ 0 means all Ports			
Save Delete			

Rule Index: Index marking for each rule up to maximum of 16.

Application: Assign a name that identifies the new QoS application rule, e.g. FTP, HTTP, etc.

Direction: Shows the direction mode of the QoS application

- **WAN Interface:** Select a WAN interface connection to allow external access to your internal network.

QoS Type: Choose **Limited** (Maximum) or **Guaranteed** (Minimum) to specify the data rate is allowed for this policy.

- **Priority:** Set the priority given to each policy/application. Specify the priority for the use of bandwidth. You can specify which application can have higher priority to acquire the bandwidth. Its default setting is set to High. You may adjust this setting to fit your policy / application.

Bandwidth Type: It is available when select **Limited (Maximum)** of QoS Type.

- ▶ **Share Bandwidth** – The specific bandwidth, can be configured below, is shared by all devices within the internal IP address/range.
 - **Example:** Share Bandwidth, Bandwidth set to 100Mbps, Internal IP Address: 192.168.1.100-104 (total of 5).
Result: IP 192.168.100-104, those 5 devices will share bandwidth of 100Mbps.
- ▶ **Bandwidth per Host** – Each of the LAN devices within the internal IP address/range obtain the specific bandwidth configured below.
 - **Example:** Bandwidth per Host, Bandwidth set to 50Mbps, Internal IP Address: 192.168.1.100-104 (total of 5).
Result: The IP address/device, 192.168.100-104, each will obtain up to 50Mbps bandwidth/data to access to the Internet.

Bandwidth (Mbps): Specify the bandwidth for this application.

DSCP Marking: Differentiated Services Code Point (DSCP), it is the first 6 bits in the ToS byte. DSCP Marking allows users to classify the traffic of the application to be executed according to the DSCP value.

Protocol: Select a protocol from the drop-down list

Internal IP Address: The IP address values for Local LAN devices you want to give control.

- ▶ **Internal Port:** The Port number on the LAN side, it is used to identify an application.

External IP Address: The IP address on remote / WAN side.

- ▶ **External Port:** The Port number on the remote / WAN side.

Click **Save** to apply settings.

To Remove a Policy: Simply select the Index then hit the **Delete** button to remove from the list.

Time Schedule

The Time Schedule supports up to **16** timeslots which helps you to manage your Internet connection. In each time profile, you may schedule specific day(s) i.e. Monday through Sunday to restrict or allowing the usage of the Internet by users or applications.

This Time Schedule correlates closely with router's time, since router does not have a real time clock on board; it uses the Simple Network Time Protocol (SNTP) to get the current time from an SNTP server from the Internet.

Time Schedule

Rule Index	1 ▼						
Rule Name	TimeSlot1						
	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
Day of Week	☐	☐	☐	☐	☐	☐	☐
Start Time	00:00	00:00	00:00	00:00	00:00	00:00	00:00
End Time	00:00	00:00	00:00	00:00	00:00	00:00	00:00
Save							

Time Index: The rule indicator (1-16) for identifying each timeslot.

Name: User-defined identification for each time period.

Day of Week: Mon. to Sun. Specify the time interval for each timeslot from “Day of Week”.

Start Time: The starting point of the interval for the timeslot, anytime in 00:00 – 24:00.

End Time: The ending point of the interval for the timeslot, anytime in 00:00 – 24:00.

Click **Save** to apply your settings.

Example, you can add a timeslot named “TimeSlot1” which features a period from 9:00 of Monday to 18:00 of Tuesday.

Time Schedule

Rule Index	1 ▼						
Rule Name	TimeSlot1						
	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
Day of Week	☒	☒	☐	☐	☐	☐	☐
Start Time	09:00	00:00	00:00	00:00	00:00	00:00	00:00
End Time	24:00	18:00	00:00	00:00	00:00	00:00	00:00
Save							

“TimeSlot2” from 09:00 to 18:00 of Wednesday

Time Schedule

Rule Index	2 ▼						
Rule Name	TimeSlot2						
	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
Day of Week	☐	☐	☒	☐	☐	☐	☐
Start Time	00:00	00:00	09:00	00:00	00:00	00:00	00:00
End Time	00:00	00:00	18:00	00:00	00:00	00:00	00:00
Save							

Mail Alert

Mail alert is designed to keep system administrator or other relevant personnel alerted of any unexpected events that might have occurred to the network computers or server for monitoring efficiency. With this alert system, appropriate solutions may be tackled to fix problems that may have arisen so that the server can be properly maintained.

Mail Alert

Server Information

SMTP Server

Username

Password

Sender's E-mail

(Must be XXX@yyy.zzz)

SSL/TLS

☐ Enable

Port

25

(1~65535)

Account Test

WAN IP Change Alert

Recipient's E-mail

(Must be XXX@yyy.zzz)

4G/LTE Usage Allowance

Recipient's E-mail

(Must be XXX@yyy.zzz)

Apply

SMTP Server: Enter the SMTP server that you would like to use for sending emails.

Username: Enter the username of your email account to be used by the SMTP server.

Password: Enter the password of your email account.

Sender's Email: Enter your email address.

SSL/TLS: Check to whether to enable SSL encryption feature.

Port: the port, default is 25.

Account Test: Click the button to test the connectivity and feasibility to your sender's e-mail.

WAN IP Change Alert

WAN IP Change Alert (Recipient's Email): Enter a valid e-mail address to receive an alert message when WAN IP change has been detected.

5G Usage Allowance (Recipient's Email): Enter a valid e-mail address to receive an alert message when the 5G data usage is over the maximum (See **Interface Setup > Internet (5G) > Usage Allowance**)
Hotspot Status Log (Recipient's Email): Enter a valid e-mail address to receive hotspot status log.

Click **Apply** button to save settings.

Access Management

Device Management

Device Management

Device Host Name

Host Name

Save

Embedded Web Server

HTTP Port
(The default HTTP port number is 80.)

HTTPS Port
(The default HTTPS port number is 443.)

HTTPS Server Certificate Index

Save

Device Host Name

Host Name: Enter the host name of the router. Default is **home.gateway**

Embedded Web Server

HTTP Port: It is the embedded web server (Web GUI) accessing port, default is **80**. It can be changed other port other than port 80, e.g. port 8080.

HTTPS Port: Similar to HTTP which is an unencrypted communication using port 80. HTTPS is encrypted by SSL using port 443 instead.

HTTPS Server Certificate Index: *HTTPS* known as HTTP-over-SSL tunnel protocol. Select a certificate to identify the system web server. When accessing to the web server (Web GUI), the browser will issue a warning page.

To import certificates, go to **Maintenance >> Certificate Management** to upload files. Otherwise, select **Default** certificate and CA.

Click **Save** to apply settings.

SNMP

Simple Network Management Protocol (SNMP) is a protocol used for exchanging management information between network devices. Your AirConnect® 8231 serves as a SNMP agent that allows a manager station to manage and monitor the router through the network.

SNMP

☐ Activated
☒ Deactivated

Get Community

Set Community

Trap Manager IP

0.0.0.0

System Name

System Location

System Contact

Interface

ALL ▼

SNMPv3

SNMPv3

☐ Enable
☒ Disable

Username

Access Permissions

Read Only ▼

Authentication Protocol

MD5 ▼

Authentication Key

(8~31 characters)

Privacy Protocol

DES ▼

Privacy Key

(8~31 characters)

Save

SNMP: Activate to enable SNMP.

Get Community: Type the Get Community, which is the password for the incoming Get-and-GetNext requests from the management station.

Set Community: Type the Set Community, which is the password for incoming Set requests from the management station.

Trap Manager IP: Enter the IP of the server receiving the trap message (when some exception occurs) sent by this SNMP agent.

System Name / Location / Contact: String descriptions of the SNMP agent.

Interface: Select the access interface. Choices are **LAN** or **ALL** (Both LAN and WAN).

SNMPv3

SNMPv3: Enable to activate the SNMPv3.

Username: Enter the name allowed to access the SNMP agent.

Access Permissions: Set the access permissions for the user; RO--read only and RW--read and writer.

Authentication Protocol: Select the authentication protocol, MD5 and SHA. SNMP agent can communicate with the manager station through authentication and encryption to secure the message exchange. Set the authentication and encryption information here and below.

Authentication Key: Set the authentication key, 8-31 characters.

Privacy Protocol: Select the privacy mode, DES and AES.

Privacy Key: Set the privacy key, 8-31 characters.

Click **Save** to apply settings.

Syslog (System Log)

Use the Syslog to collect system event information to a remote log server.

▼ Syslog	
Remote System Log	☐ Activated ☒ Deactivated
Server IP Address	0.0.0.0
Server UDP Port	514
Save	

Remote System Log: Select **Activated** to enable this feature

Server IP Address: Assign the remote log server IP address.

Server UDP Port: Assign the remote log server port, 514 is commonly used.

Click **Save** to apply settings.

Universal Plug & Play

UPnP offers peer-to-peer network connectivity for PCs and other network devices, along with control and data transfer between devices. UPnP offers many advantages for users running NAT routers through UPnP NAT Traversal, and on supported systems makes tasks such as port forwarding much easier by letting the application control the required settings, removing the need for the user to control advanced configuration of their device.

Both the user's Operating System and the relevant application must support UPnP in addition to the router.

Universal Plug & Play	
UPnP	☒ Activated ☐ Deactivated
Auto-configured	☐ Activated ☒ Deactivated (by UPnP-enabled Application)
Save	

UPnP: Select this checkbox to activate UPnP. Be aware that anyone could use an UPnP application to open the web configuration's login screen without entering the device's IP address.

Auto-configured: Select this check box to allow UPnP-enabled applications to automatically configure the AirConnect® 8231 so that they can communicate through the AirConnect® 8231, for example by using NAT traversal, UPnP applications automatically reserve a NAT forwarding port in order to communicate with another UPnP enabled device; this eliminates the need to manually configure port forwarding for the UPnP enabled application.

Click **Save** to apply settings.

Dynamic DNS (DDNS)

The Dynamic DNS function allows you to alias a dynamic IP address to a static hostname, allowing users whose ISP does not assign them a static IP address to use a domain name. This is especially useful for hosting servers via your internet connection, so that anyone wishing to connect to you may use your domain name, rather than having to use your dynamic IP address, which changes from time to time. This dynamic IP address is the WAN IP address of the router, which is assigned to you by your ISP.

Here users can register different WAN interfaces with different DNS Providers.

If you do not have a DDNS account, please choose a DDNS Service Provider from the list then go to their website to create an account first.

Dynamic DNS	
Dynamic DNS	☐ Activated ☒ Deactivated
Service Provider	www.dyndns.org (dynamic) ▼
My Host Name	
Username	
Password	
Wildcard support	☐ Yes ☒ No
Period	25 Day(s) ▼
Save	

Dynamic DNS: Select this check box to activate Dynamic DNS.

Service Provider: Select from drop-down menu for the appropriate service provider, for example: www.dyndns.org.

My Host Name: Type the domain name assigned to your AirConnect® 8231 by your Dynamic DNS provider.

Username / Password: Enter the username and password of the account you created with this service provider.

Wildcard support: Select this check box to enable DYNDNS Wildcard.

Period: Set the time period on how often the AirConnect® 8231 will update the DDNS server with your current external IP address.

Click **Save** to apply settings.

Example: How to register a DDNS account

If you do not have an account with Dynamic DNS, please go to www.dyndns.org to register an account first.

User **test1** register a Dynamic Domain Names in DDNS provider <http://www.dyndns.org/>.

DDNS: www.hometest.com using username/password test/test

Dynamic DNS	
Dynamic DNS	☒ Activated ☐ Deactivated
Service Provider	www.dyndns.org (dynamic)
My Host Name	myhome.dyndns.org
Username	myhome-123
Password	*****
Wildcard support	☐ Yes ☒ No
Period	25 Day(s)
Save	

Access Control

Access Control Listing allows you to determine which services/protocols can access your AirConnect® 8231 interface from which computers. It is a management tool aimed to allow IPs (set in secure IP address) to access specified embedded applications (Web, etc., user can set) through some specified interface (LAN, WAN or both). User can have an elaborate understanding in the examples below.

The maximum number of entries is **16**.

Access Control

☒ Activated
 ☐ Deactivated

Access Control Editing

Rule Index

1 ▾

Active

☒ Yes
 ☐ No

IP Version

IPv4 ▾

Secure IP Address

0.0.0.0

~

0.0.0.0

(0.0.0.0 ~ 0.0.0.0 means all IPs)

Application

ALL ▾

User Defined Application

Interface

LAN ▾

Time Schedule

Always ▾

Save

Delete

Access Control Listing

Index	Active	IP Version	Secure IP Address	Application	Interface
1	Yes	IPv4	0.0.0.0-0.0.0.0	ALL	LAN
2	Yes	IPv4	0.0.0.0-0.0.0.0	Ping	WAN

Access Control: Click **Activate** to enable the Access Control function.

Rule Index: The numeric rule indicator.

Active: **Yes** to activate the rule.

Secure IP Address: The default 0.0.0.0 allows any client to use this service to manage the 8231. Type an IP address range to restrict access to the client(s) without a matching IP address.

Application: Choose a service that you want to all access to all the secure IP clients. The drop-down menu lists all the commonly used applications or manually create an application.

Interface: Select the access interface. Choices are **LAN**, **WAN**, **GRE** and **ALL**.

Click **Save** to apply settings.

User Defined Application

User Defined Application

Add User Defined Application to ACL Application Item

Rule Index

1 ▾

User Application Active

☐ Yes
 ☒ No

Save

Delete

Back

User Defined Application Listing

Index	Active	Application Name	Application Protocol	Application Port
-------	--------	------------------	----------------------	------------------

Rule Index: The numeric rule indicator.

User Application Active: Yes to add a new rule.

User Application Name	
User Application Protocol	UDP/TCP ▼
User Application Port	
Save Delete Back	

User Application Name: A self-define name to identify the application.

User Application Protocol: Enter a protocol, TCP, UDP, UDP/TCP, to use for this application.

User Application Port: Enter the port number which defines the application.

Click **Save** to save the rule.

By default, the “Access Control” has **two default rules**.

Default Rule 1: (Index 1), a rule to allow only clients from LAN to have access to all embedded applications (Web, FTP, etc.). Under this situation, clients from WAN cannot access the router even from Ping.

▼ Access Control

Access Control

☒ Activated
 ☐ Deactivated

Access Control Editing

Rule Index

1 ▼

Active

☒ Yes
 ☐ No

Secure IP Address

~
(0.0.0.0 ~ 0.0.0.0 means all IPs)

Application

ALL ▼

Interface

LAN ▼

Access Control Listing

Index	Active	Secure IP Address	Application	Interface
1	Yes	0.0.0.0-0.0.0.0	ALL	LAN
2	Yes	0.0.0.0-0.0.0.0	Ping	WAN

Default Rule 2: (Index 2), an ACL rule to open Ping to WAN side.

▼ Access Control

Access Control

☒ Activated ☐ Deactivated

Access Control Editing

Rule Index

1 ▼

Active

☒ Yes ☐ No

Secure IP Address

0.0.0.0

 ~

0.0.0.0

 (0.0.0.0 ~ 0.0.0.0 means all IPs)

Application

ALL ▼

Interface

LAN ▼

Save

Delete

Access Control Listing

Index	Active	Secure IP Address	Application	Interface
1	Yes	0.0.0.0-0.0.0.0	ALL	LAN
2	Yes	0.0.0.0-0.0.0.0	Ping	WAN



Packet Filter

You can filter the packages by MAC address, IP address, Protocol, Port number and Application or URL.

❖ Packet Filter - IP & MAC Filter

▼ Packet Filter	
Packet Filter	
Filter Type	IP & MAC Filter ▼
IP & MAC Filter Editing	
Action	Black List ▼
Rule Index	1 ▼
Individual Active	☐ Yes ☒ No
Interface	5G NR ▼
Direction	Both ▼
Type	IPv4 ▼
Protocol	Any ▼
Source IP Address	0.0.0.0 (0.0.0.0 means Don't care)
Source Subnet Mask	0.0.0.0
Source Port Number	0 (0 means Don't care)
Destination IP Address	0.0.0.0 (0.0.0.0 means Don't care)
Destination Subnet Mask	0.0.0.0
Destination Port Number	0 (0 means Don't care)
DSCP	64 (Value Range:0~64, 64 means Don't care)
Time Schedule	Always ▼
Save Delete	

IP & MAC Filter Editing

Rule Index: The indication of the rule number.

Individual Active: **Yes** to enable the rule.

Action: This is how to deal with the packets matching the rule. Allow please select White List or Black selecting Blacklist.

Interface: Select to determine which interface the rule will be applied to.

Direction: Select to determine whether the rule applies to outgoing packets, incoming packets or packets of both directions.

Type: Choose type of field you want to specify to monitor. Select “IPv4” for IPv4 address, port number and protocol. Select “IPv6” for IPv6 address, port number and protocol. Select “MAC” to enter a source MAC address”.

► IPv4

Source IP Address	0.0.0.0	(0.0.0.0 means Don't care)
Source Subnet Mask	0.0.0.0	
Source Port Number	0	(0 means Don't care)
Destination IP Address	0.0.0.0	(0.0.0.0 means Don't care)
Destination Subnet Mask	0.0.0.0	
Destination Port Number	0	(0 means Don't care)
DSCP	0	(Value Range:0~64, 64 means Don't care)
Protocol	TCP ▼	

Source IP Address: The source IP address of packets to be monitored. 0.0.0.0 means “Don’t care”.

Source Subnet Mask: Enter the subnet mask of the source network.

Source Port Number: The source port number of packets to be monitored. 0 means “Don’t care”.

Destination IP Address: The destination IP address of packets to be monitored. 0.0.0.0 means “Don’t care”.

Destination Subnet Mask: Enter the subnet mask of the destination network.

Destination Port Number: This is the Port that defines the application. (E.g. HTTP is port 80.)

DSCP: Differentiated Services Code Point, it is recommended that this option be configured by an advanced user or keep 0. (0 means Don’t care.)

Protocol: Specify the packet type (TCP, UDP, ICMP, and ICMPv6) that the rule applies to.

► IPv6

Source IPv6 Address	0:0:0:0:0:0:0:0	(0:0:0:0:0:0:0:0 means Don't care)
Source IPv6 Prefix	32	
Source Port Number	0	(0 means Don't care)
Destination IPv6 Address	0:0:0:0:0:0:0:0	(0:0:0:0:0:0:0:0 means Don't care)
Destination IPv6 Prefix	32	
Destination Port Number	0	(0 means Don't care)
DSCP	0	(Value Range:0~64, 64 means Don't care)
Protocol	TCP ▼	

Source IP (IPv6) Address/ Prefix: The source IP address or range of packets to be monitored.

Source Port Number: The source port number of packets to be monitored.

Destination IP (IPv6) Address/ Prefix: The destination subnet IP address.

Destination Port Number: This is the Port or Port Ranges that defines the application.

DSCP: show the set DSCP.

Protocol: It is the packet protocol type used by the application. Select either **TCP** or **UDP** or **ICMP** or **ICMPv6**.

► **MAC**

Type	MAC ▼
Source MAC Address	

Source MAC Address: show the MAC address of the rule applied.

Time Schedule: Select a TimeSlot to activate the rule. Go to [Time Schedule](#) to configure a time control first.

Click **Save** to apply settings.

❖ Filter Type - URL Filter

▼ Packet Filter

Packet Filter

Filter Type

URL Filter ▼

URL Filter Editing

URL Filter Rule Index

1 ▼

Individual Active

☐ Yes
☒ No

URL (Host)

Time Schedule

Always ▼

Save

Delete

URL Filter Listing

Index	Active	URL
-------	--------	-----

URL Filter Rule Index: The indication of the rule number.

Individual Active: Click **Yes** to enable this rule/policy.

Domain: Enter the domain name in the blank field to be allowed or prohibited.

URL (Host): Enter the specific URL in the blank field to be blocked.

Time Schedule: Select a TimeSlot to activate the rule. Go to [Time Schedule](#) to configure a time control first.

Click **Save** to apply settings.

❖ Filter Type - Domain Filter

▼ Packet Filter

Packet Filter

Filter Type

Domain Filter ▼

Domain Filter Editing

Action

Black List ▼

Domain Filter Rule Index

1 ▼

Individual Active

☐ Yes
 ☒ No

Domin

Save

Delete

DomainFilterlist

Index	Active	Domain
-------	--------	--------

Action: This is how to deal with the packets matching the rule. Allow please select White List or Black selecting Blacklist.

Domain Filter Rule Index: The indication of the rule number.

Individual Active: Click **Yes** to enable this rule/policy.

Domain: Enter the domain name in the blank field to be allowed or prohibited.

Click **Save** to apply settings.

CWMP (TR-069)

CWMP, short for CPE WAN Management Protocol, also called TR069 is a Broadband Forum technical specification entitled CPE WAN Management Protocol (CWMP). It defines an application layer protocol for remote management of end-user devices. It defines an application layer protocol for remote management of end-user devices.

As a bidirectional SOAP/HTTP based protocol it can provides the communication between customer premises equipment (CPE) and Auto Configuration Server (ACS). It includes both a safe configuration and the control of other CPE management functions within an integrated framework. In the course of the booming broadband market, the number of different internet access possibilities grew as well (e.g. modems, routers, gateways, set-top box, VoIP-phones).At the same time the configuration of this equipment became more complicated –too complicated for end-users. For this reason, TR-069 was developed. It provides the possibility of auto configuration of the access types. Using TR-069 the terminals can get in contact with the Auto Configuration Servers (ACS) and establish the configuration automatically and let ACS configure CPE automatically.

CWMP (TR-069)

CWMP

☐ Activated
☒ Deactivated

ACS Login Information

URL

http://cpe.bectechnologies.com/comserver/node1/tr069

Username

testcpe

Password

ac5entry

Connection Request Information

Path

Username

conexant

Password

welcome

Periodic Inform Config

Periodic Inform

☒ Activated
☐ Deactivated

Interval

870

Bind Wan Interface

Interface

Auto ▼

NATT Config

NATT Server

NATT Period

Save

CWMP: Select activated to enable CWMP.

ACS Login Information

URL: Enter the ACS server login URL.

Username: Specify the ACS Username for ACS authentication to the connection from CPE.

Password: Enter the ACS server login password.

Connection Request Information

Path: Local path in HTTP URL for an ACS to make a Connection Request notification to the CPE.

Username: Username used to authenticate an ACS making a Connection Request to the CPE.

Password: Password used to authenticate an ACS making a Connection Request to the CPE.

Periodic Inform Config

Periodic Inform: Select Activated to authorize the router to send an Inform message to the ACS automatically.

Interval(s): Specify the inform interval time (sec) which CPE used to periodically send inform message to automatically connect to ACS. When the inform interval time arrives, the CPE will send inform message to automatically connect to ACS.

Bind WAN Interface

Interface: Specify any available or a single WAN interface to handle TR-069 requests.

NATT Config - This is a proprietary feature provided by BEC. May leave them in blank, no configuration is required.

NATT Server: By BEC administrator only.

NATT Period: By BEC administrator only.

Click **Save** to apply settings

Parental Control

This feature provides Web content filtering offering safer and more reliable web surfing for users especially for parents to protect network security and control the contents for children at home.

▼ Parental Control	
Provider	www.opendns.com
Parental Control	☐ Activated ☒ Deactivated
Host Name	
Username	
Password	
**Parental Control provides Web content filtering while surfing the web safer and more reliable. Please get an account and configure at the selected Provider in advance.	
Save	

To activate this feature, please log on to www.opendns.com to get an OpenDNS account first.

Parent Control Provider: Hosted by www.opendns.com

Parent Control: Enable the feature by clicking the **Activated**

Host Name: It is the domain name of your OpenDNS. If you don't have one, please leave it blank.

Username / Password: Put down your OpenDNS account username and password

Click **Save** to apply settings.

BECentral Management

BECentral is a cloud-based device management platform that provides operators with a comprehensive suite of services to manage devices in real-time.

▼ BECentral Management	
BECentral Management	☐ Activated ☒ Deactivated
BECentral Management URL	becentral.becloud.io
BECentral Management Port	48883
Organization ID	DEFAULT
Tag ID	
Device Report Interval	480
Interface	ALL
Save	

BECentral Management: Activate to enable the feature.

BECentral Management URL: Access path to the BECentral.

BECentral Management Port: Port listened by the BECentral.

Organization ID: Customer ID (By BE C administrator only)

Tag ID: By BEC administrator only.

Device Report Interval: Enter the interval time in seconds to send inform message periodically to the BECentral.

Interface: Specify any available or a single WAN interface to handle BECentral requests.

Click **Save** to apply settings.

Maintenance

Maintenance equipment the users with the ability of maintaining the device as well as examining the connectivity of the WAN connections, including User Management, Time Zone, Firmware & Configuration, System Restart, Auto Reboot and Diagnostic Tool.

User Management

User Management provides the Administrator with the ability to grant access control and manage GUI login credentials for each user.

There are two access management levels, Administrator and User.

The default root account, Administrator (admin), has full access to all the features listed and ability to create other accounts with features to allow other users to access to. The User account is with limited access (specified by advanced users with admin account) to the GUI.

Total of 8 accounts can be created to grant access to manage the AirConnect® 8231 via the web page.

❖ Administrator Account

admin/admin is the root/default account username and password.

NOTE: This username / password may vary by different Internet Service Providers.

Login using the Administrator account, you will have the full accessibility to manage & control your gateway device and can also create user accounts for others to control some of the open configuration settings.

The Administrator account cannot be deleted or removed.

User Management

User Account

Index

1 ▼

Username

admin

New Password

.....

Confirm Password

.....

Save

Delete

User Account Listing

Index	User Name
1	admin

User Account

Index: The indication of the rule number. The maximum entry is up to 8 accounts.

Username: Create account(s) username for GUI management.

New Password: Enter a new password for this user account.

Confirmed Password: Re-enter the new password again; you must enter the password exactly the same as in the previous field.

Click **Save** to apply settings.

Maintenance – User Management (Creating Other User Accounts)

❖ Creating Other User Accounts

▼ User Management	
User Account	
Index	2 ▼
Username	
New Password	
Confirm Password	
Web GUI Permission	
Guest Account	☐ Enable ☒ Disable
Interface Setup	☒ Enable ☐ Disable
Advanced Setup	☒ Enable ☐ Disable
Access Management	☒ Enable ☐ Disable
Maintenance	☒ Enable ☐ Disable
Save Delete	

User Account Setup

Index #: The indication of the rule number. The maximum entry is up to 8.

Username: Create account(s) username for GUI management.

New Password: Password for the user account.

Confirm Password: Re-enter the password.

Web GUI Permission

Guest Account: Enable to create this new guest account and select features to allow user account to access to.

When someone accesses to your AirConnect® 8231 using this “user” account, he/she can only manage and configure the features that is pre-selected in **Web GUI Permission** for this account.

Click **Save** to apply settings.

Time Zone

With default, AirConnect® 8231 does not contain the correct local time and date.

There are several options to setup, maintain, and configure current local time/date on the AirConnect® 8231. If you plan to use **Time Schedule** feature, it is extremely important you set up the Time Zone correctly.

Time Zone	
Current Date/Time	N/A (Can't find NTP server)
Time Synchronization	
Synchronize time with	☒ NTP Server ☐ PC's Clock ☐ Manually
Time Zone	(UTC-06:00) Central Time (US & Canada), Mexico City, Saskatchewan ▼
Daylight Saving	☐ Enabled ☒ Disabled
NTP Server Address	0.0.0.0 (0.0.0.0: Default Value)
Save	

Synchronize time with: Select the methods to synchronize the time.

- ▶ **NTP Server automatically:** To synchronize time with the NTP servers to get the current time from an NTP server outside your network then choose your local time zone. After a successful connection to the Internet, AirConnect® 8231 will retrieve the correct local time from the NTP server this is specified.
- ▶ **PC's Clock:** To synchronize time with the PC's clock.
- ▶ **Manually:** Select this to enter the SNMP server IP address manually.
 - ◆ **Date:** Month / Date / Year. Month – 1 ~ 12 (January ~ December).
 - ◆ **Time:** Hour: Minute: Second

Time Zone: Choose the time zone of your location. This will set the time difference between your time zone and Greenwich Mean Time (GMT).

Daylight Saving: Select this option if you use daylight savings time.

NTP Server Address: Enter the IP address of your time server. Check with your ISP/network administrator if you are unsure of this information.

Click **Save** to apply settings

System Restart

Click **System Restart** with option **Current Settings** to reboot your router.

▼ System Restart

System Restart with

☒ Current Settings

☐ Factory Default Settings

Restart

If you wish to restart the router using the factory default settings (for example, after a firmware upgrade or if you have saved an incorrect configuration), select **Factory Default Settings** to restore to factory default settings.

You may also restore your router to factory settings by holding the small Reset pinhole button on the back of your router in about more than 6s seconds whilst the router is turned on.

Auto Reboot

Schedule an automatic reboot for your AirConnect® 8231 to ensure proper operation and best performance.

This reboot will only reboot with current configuration settings and not overwrite any existing settings.

▼ Auto Reboot

Schedule	1. ☐ Enable	☐ MON	☐ TUE	☐ WED	☐ THU	☐ FRI	☐ SAT	☐ SUN	Time	00	:	00	
	2. ☐ Enable	☐ MON	☐ TUE	☐ WED	☐ THU	☐ FRI	☐ SAT	☐ SUN	Time	00	:	00	
	3. ☐ Enable	☐ MON	☐ TUE	☐ WED	☐ THU	☐ FRI	☐ SAT	☐ SUN	Time	00	:	00	
	4. ☐ Enable	☐ MON	☐ TUE	☐ WED	☐ THU	☐ FRI	☐ SAT	☐ SUN	Time	00	:	00	
	5. ☐ Enable	☐ MON	☐ TUE	☐ WED	☐ THU	☐ FRI	☐ SAT	☐ SUN	Time	00	:	00	

Save

Click **Save** to apply settings

Example: Schedule your AirConnect® 8231 to reboot at 10:00pm (22:00) every weekday (Monday thru Friday) and reboot at 9:00am on Saturday and Sunday.

▼ Auto Reboot

Schedule	1. ☒ Enable	☒ MON	☒ TUE	☒ WED	☒ THU	☒ FRI	☐ SAT	☐ SUN	Time	22	:	00	
	2. ☒ Enable	☐ MON	☐ TUE	☐ WED	☐ THU	☐ FRI	☒ SAT	☒ SUN	Time	09	:	00	
	3. ☐ Enable	☐ MON	☐ TUE	☐ WED	☐ THU	☐ FRI	☐ SAT	☐ SUN	Time	00	:	00	
	4. ☐ Enable	☐ MON	☐ TUE	☐ WED	☐ THU	☐ FRI	☐ SAT	☐ SUN	Time	00	:	00	
	5. ☐ Enable	☐ MON	☐ TUE	☐ WED	☐ THU	☐ FRI	☐ SAT	☐ SUN	Time	00	:	00	

Save

Diagnostics Tool

The Diagnostic Test page shows the test results for the connectivity of the physical layer and protocol layer for both LAN and WAN sides.

5G or EWAN

Diagnostic Tool

WAN Interface

5G NR

Testing Ethernet LAN Connection

N/A

Ping Primary DNS (198.224.156.135)

N/A

Ping www.google.com

N/A

Ping other IP Address or Domain

Yes

No

N/A

Start

Trace Route

Yes

No

Start Trace Route

Start Speed Test

Download

N/A

Upload

N/A

Latency

N/A

Ping other IP Address: Click **Yes** if you wish to ping other IP address rather than google.com
Click **START** to begin to diagnose the connection.

Diagnostic Tool

WAN Interface

EWAN

Testing Ethernet LAN Connection

N/A

Ping Primary DNS (N/A)

N/A

Ping www.google.com

N/A

Ping other IP Address or Domain

Yes

No

N/A

Start

Speed Test: Measure the current uplink and downlink speed rate.

- ▶ Take less than a minute to run the test.

Speed Test

Testing

- ▶ Result in Uplink / Downlink

Speed Test

Result

NA

NA

Back

Click **Back** to go back to the Diagnostic Tool

Trace Route is to display how many hops (also view the exact hops) required to get to the destination. Click **Yes**, enter the IP address or domain then **Start Trace Route**.

Trace Route ☒ Yes ☐ No	
IP Address or Domain	
Max TTL Value	16 [2-30]
Start Trace Route	

IP Address or Domain: Set the destination host (IP, domain name) to be traced.

Max TTL value: Set the max Time to live (TTL) value.

Shown as we “trace” www.billion.com below.

▼ Trace www.billion.com

```
tracert to www.billion.com (125.227.205.188), 16 hops max, 60 byte packets
 1  172.16.1.254 (172.16.1.254)  0.472 ms  0.488 ms  0.643 ms
 2  122.96.153.233 (122.96.153.233)  7.354 ms  7.517 ms  7.704 ms
 3  221.6.12.69 (221.6.12.69)  7.921 ms  8.108 ms  8.256 ms
 4  221.6.1.253 (221.6.1.253)  8.392 ms  8.544 ms  *
 5  219.158.99.245 (219.158.99.245)  36.110 ms  36.839 ms  37.001 ms
 6  * * *
 7  * * 219.158.103.26 (219.158.103.26)  40.731 ms
 8  211.72.233.194 (211.72.233.194)  65.969 ms  66.040 ms  66.019 ms
 9  220.128.6.126 (220.128.6.126)  61.726 ms  61.831 ms  61.960 ms
10  220.128.11.170 (220.128.11.170)  61.543 ms  61.583 ms  65.127 ms
11  220.128.17.85 (220.128.17.85)  63.436 ms  62.133 ms  65.862 ms
12  220.128.17.229 (220.128.17.229)  64.695 ms  64.849 ms  65.063 ms
13  168.95.229.145 (168.95.229.145)  61.915 ms  60.715 ms  60.825 ms
14  * * *
15  * * *
16  * * *
```

LAN

Ping other IP Address: Click **Yes** to ping any desired IP address or a domain.

Click **START** to begin to diagnose the connection.

Speed Time: Measure the current uplink and downlink speed rate.

- ▶ Take less than a minute to run the test.

▼ Speed Test

Testing 

- ▶ Result in Uplink / Downlink

▼ Speed Test

Result	NA	NA
Back		

Click **Back** to go back to the Diagnostic Tool.

Chapter 5: Troubleshooting

If your AirConnect® 8231 is not functioning properly, you can refer to this chapter for simple troubleshooting before contacting your service provider support. This can save you time and effort but if symptoms persist, consult your service provider.

Problems with the Router

Problem	Suggested Action
None of the LEDs is on when you turn on the router	Check the connection between the router and the adapter. If the problem persists, most likely it is due to the malfunction of your hardware. Please contact your service provider or BEC for technical support.
You have forgotten your login username or password	Try the default username "admin" and password "admin". If this fails, you can restore your router to its factory settings by pressing the reset button on the device rear side.

Problem with LAN Interface

Problem	Suggested Action
Cannot PING any PC on LAN	Check the Ethernet LEDs on the front panel. The LED should be on for the port that has a PC connected. If it does not light, check to see if the cable between your router and the PC is properly connected. Make sure you have first uninstalled your firewall program before troubleshooting.
	Verify that the IP address and the subnet mask are consistent for both the router and the workstations.

Recovery Procedures

Problem	Suggested Action
- The front LEDs display incorrectly - Still cannot access to the router management interface after pressing the RESET button. - Software / Firmware upgrade failure	Before starting recovery process, please configure the IP address of the PC as 192.168.1.100 and proceed with the following step-by-step guide. 1. Power the router off. 2. Press reset button and power on the router, once the Power lights Red, keeping press reset button over 6 seconds. 3. Internet LED flashes Green, router entering recovery procedure and router's IP will reset to Emergency IP address (Say 192.168.1.1). 4. Open browser and access http://192.168.1.1 to upload the firmware. 5. Internet LED lit Red, and router starts to write firmware into flash. Please DO NOT power off the router at this step. 6. Internet LED lit Green when successfully upgrade firmware. 7. Power cycle off/on the AirConnect® 8231

APPENDIX: PRODUCT SUPPORT & CONTACT

If you come across any problems, please contact the dealer from where you have purchased the product or contact BEC directly via the following methods:

		
Submit A Ticket	Send An Email	Contact By Phone
https://helpdesk.becentral.io/ Create an account and submit support requests in our Help Desk Portal. We will respond to your ticket during our normal working hours.	teamsupport@bectechnologies.net Please include a description of the issue, product model, firmware version, application involved, and any relevant error messages.	+1-972-422-0877 Option 2 Our Support Team is available by phone Monday through Friday 9am to 5pm CST

MAC OS is a registered Trademark of Apple Computer, Inc.

Windows 11/10/8/7 are registered Trademarks of Microsoft Corporation

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CAUTION: Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

FCC Caution:

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
- (2) This device must accept any interference received, including interference that may cause undesired operation.

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 and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

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 23cm between the radiator & your body.

Professional Installation Instructions

1. Installation Personal

This product is designed for specific application and needs to be installed by a qualified personal who has RF and related rule knowledge. The general user shall not attempt to install or change the setting.

2. Installation Location

The product shall be installed at a location where the radiating antenna can be kept 23 cm from nearby person in normal operation condition to meet regulatory RF exposure requirement.

3. Antenna

Use only the antennas which have been approved by the applicant. The non-approved antenna(s) may produce unwanted spurious or excessive RF transmitting power which may lead to the violation of FCC limit and is prohibited.

4. Installation Procedure

Please refer to user's manual for the detail.

5. Warning

Please carefully select the installation position and make sure that the final output power does not exceed the limit set force in relevant rules. The violation of the rule could lead to serious federal penalty.

(CBRS Category B Device)

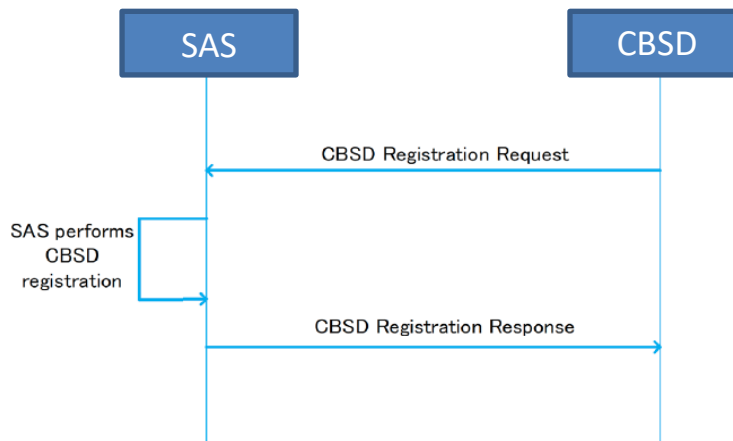
The AirConnect® 8231 requires installation by a CPI (Certified Professional Installer) as defined in Section 96.39 and 96.45 of FCC part 96 requirements. The AirConnect® 8231 is Classified as a Category B CBSD (Citizen Broadband Radio Device), which requires the following information be recorded and uploaded as part of the CPI process per section 96.45.

All CSBDs	Category B Devices
Geographic location	Limited to Outdoor operation
Antenna height AGL (m)	Antenna gain
CBSD class (Category A or B)	Antenna Beamwidth
Requested authorization status (PAL or GAA)	Antenna Azimuth
FCC ID	Antenna Down tile angle
Call sign (PALs only)	
User contact info	
Air interference technology	
Serial #	
Sensing capability (if supported)	

CBSD Protocol

The SAS-CBSD protocol is based on the HTTPS (HTTP over TLS) protocol. The HTTPS protocol provides transport level assurance that a message has been received by the intended recipient. During discovery, the HTTPS protocol manages SAS-CBSD message delivery.

Communications between the CBSD and SAS are initiated by the CBSD when it is in an Unregistered state.



TLS mutual authentication shall be performed per whenever a CBSD communicates with a SAS. TLS-v1.2 shall be used to perform authentication. Previous versions of TLS (e.g., TLS-v1.1 per RFC-4346, TLS-v1.0 per RFC-2246 or SSL-v3.0) shall not be used. During the TLS exchange, mutual authentication shall be performed. The CBSD initiating the TLS connection shall authenticate the SAS, and the SAS shall authenticate the CBSD.

During the TLS message exchange, the CBSD shall authenticate a SAS. Server certificate validation shall be performed. A CBSD which is unable to successfully authenticate a SAS shall abort the TLS connection establishment procedure. It is implementation specific when the CBSD should re-attempt the TLS connection establishment procedure.

During the TLS message exchange, the CBSD provides its client certificate to the SAS. The SAS shall perform client certificate validation.

A SAS which is unable to successfully authenticate a CBSD shall abort the TLS connection establishment procedure. A CBSD which is unable to successfully setup such an encrypted connection with a SAS shall abort the TLS connection establishment procedure. It is implementation specific when the CBSD should re-attempt the TLS connection establishment procedure.

Subsequent to successful authentication, the CBSD and SAS shall negotiate a ciphersuite to use for encrypting all communications between the two entities. The ciphersuite shall be selected from the following list (ref. [n.1]):

- TLS RSA with AES 128 GCM SHA256
- TLS RSA with AES 256 GCM SHA384
- TLS ECDHE ECDSA with AES 128 GCM SHA 256

The CBSD first creates a secure association and then initiates the Registration procedure by sending a *RegistrationRequest* object to the SAS with parameters that identify the CBSD to the SAS, provide specific information on the CBSD equipment capabilities, and identifies the measurement reporting capabilities of the CBSD. Optionally the CBSD may request the SAS to enroll the CBSD as a member of one or more Groups. The SAS responds to the CBSD with parameters that indicate whether the registration succeeded or failed. If the CBSD has any existing Grants prior to sending the Registration Request, all Grants shall be deleted. If the SAS had any existing Grants assigned to the CBSD, upon receiving the Registration Request from the CBSD, all such Grants shall be deleted.

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