ECB7510

Dual Band Concurrent AP

(IEEE 802.11 a/b/g/n)

User Manual

Revision History

Version	Date	Notes
1.0	2010/8/22	Initial

Table of Content

1. Introduction

1.1. Summary

ECB7510 is a Dual Band Concurrent Wireless 11A/B/G/N AP with dual CPU that offers user unprecedented network performance. WMM support boosts streaming and multimedia intensive services. It supports 2.4Ghz band under 802.11 b/g/n mode while providing 5Ghz band to guarantee an interference-free network access.

Multiple SSID provides advance users to manage multiple users of various needs. TX power control enables flexible transmission tuning for different installation needs and prevents malicious eaves-dropping. Isolation, filter, firewall and full coverage of security standards promise a securer network environment.

Dual CPU operates work simultaneously therefore users can enjoy gaming, music or HD video on 5GHz band while web-surfing or emailing on 2.4Ghz. It also provides with built-in 1-port full-duplex 10/100/1000 Fast Switch. ECB7510 is definitely the optimal choice for middle & small businesses.

1.2. Key Features

Features	Advantages
2.4Ghz & 5GhzDual Band Concurrent	**Less interference and better performance**
Incredible Data Rate up to 300+300Mbps**	**Heavy data payloads such as MPEG video streaming**
802.3at PoE Support	**User Ethernet cable as power supply medium**
SNMP	**Perfect for network management**
Multiple SSIDs	**Enhanced management among multiple users groups**
One 10/100/1000 Mbps Fast Switch Ports (Auto-Crossover)	**Scalability, extend your network.**
Firewall supports Virtual Server Mapping, DMZ, IP Filter, ICMP Blocking, SPI	**Avoids the attacks of Hackers or Viruses from Internet**
Support 802.1x Authenticator, 802.11i (WPA/WPA2, AES), VPN pass-through	**Provide mutual authentication (Client and dynamic encryption keys to enhance security**
WDS (Wireless Distribution System)	**Make wireless AP and Bridge mode simultaneously as a wireless repeater**
WPS button support	**Quick WiFi Security Setup**
WMM & QoS	**Wireless QoS mechanism**
Best channel selection	**Automatic optimal channel search**

** Theoretical wireless signal rate based on IEEE standard of 802.11a, b, g, n chipset used. Actual throughput may vary. Network conditions and environmental factors lower actual throughput rate. All specifications are subject to change without notice.

1.3. Package Contents

Open the package carefully, and make sure that none of the items listed below are missing. Do not discard the packing materials, in case of return; the unit must be shipped back in its original package.

- 1 * Dual Band Concurrent AP (ECB7510)
- 1 * Power Adapter
- 2.* Dual Band Antennas
- 1 * CAT 5 UTP cable
- 1 * Quick Guide
- 1 * CD (User Manual)

1.4. Product Layout
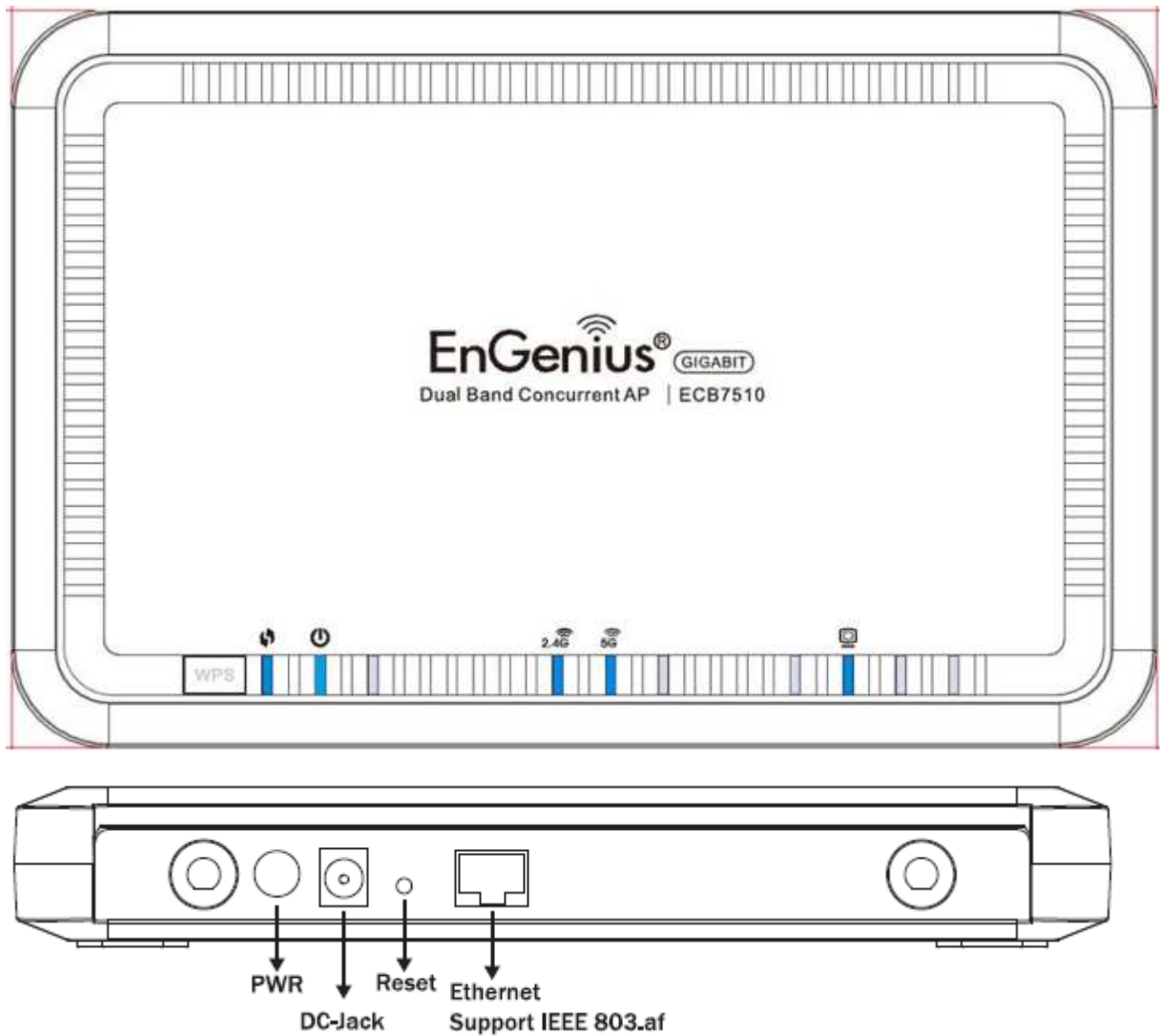
Physical Interface	● LAN: 1 * 10/100/1000 Fast Ethernet RJ-45
	● Reset Button
	● DC Jack
	● Power push button (Wi-Fi Protected Setup)
	● SMA connectors
LEDs Status	● WPS LED
	● Power/ Status
	● WLAN 2.4GHz
	● WLAN 5GHz
	● Ethernet

2. Installation

2.1. Network + System Requirements

To begin using the ECB7510, make sure you meet the following as minimum requirements:

- PC/Notebook.
- Operating System – Microsoft Windows 7/XP/2000/VISTA
- 1 Free Ethernet port.
- Wi-Fi card/USB dongle (802.11 a/b/g/n) – optional.
- PC with a Web Browser (Internet Explorer, Safari, Firefox, Opera etc.)
- One Ethernet compatible CAT5 cables.

2.2. ECB7510 Placement

You can place ECB7510 on a desk or any other flat surface, or you can mount it on a wall. For optimal performance, place your device in the center of your office (or your home) in a location that is away from any potential source of interference, such as a metal wall or microwave oven. You may need to tune your antenna angle to get optimized wireless performance.

Wall Mount Instruction

You can mount the device on the wall. There are two mounting points on the bottom of the device. Please find a proper spot where two nails can be applied. Finally, carefully mount the device onto the wall and make sure the nails are firmly locked on the mount points.

Screw Dimension: 18mm x 5mm
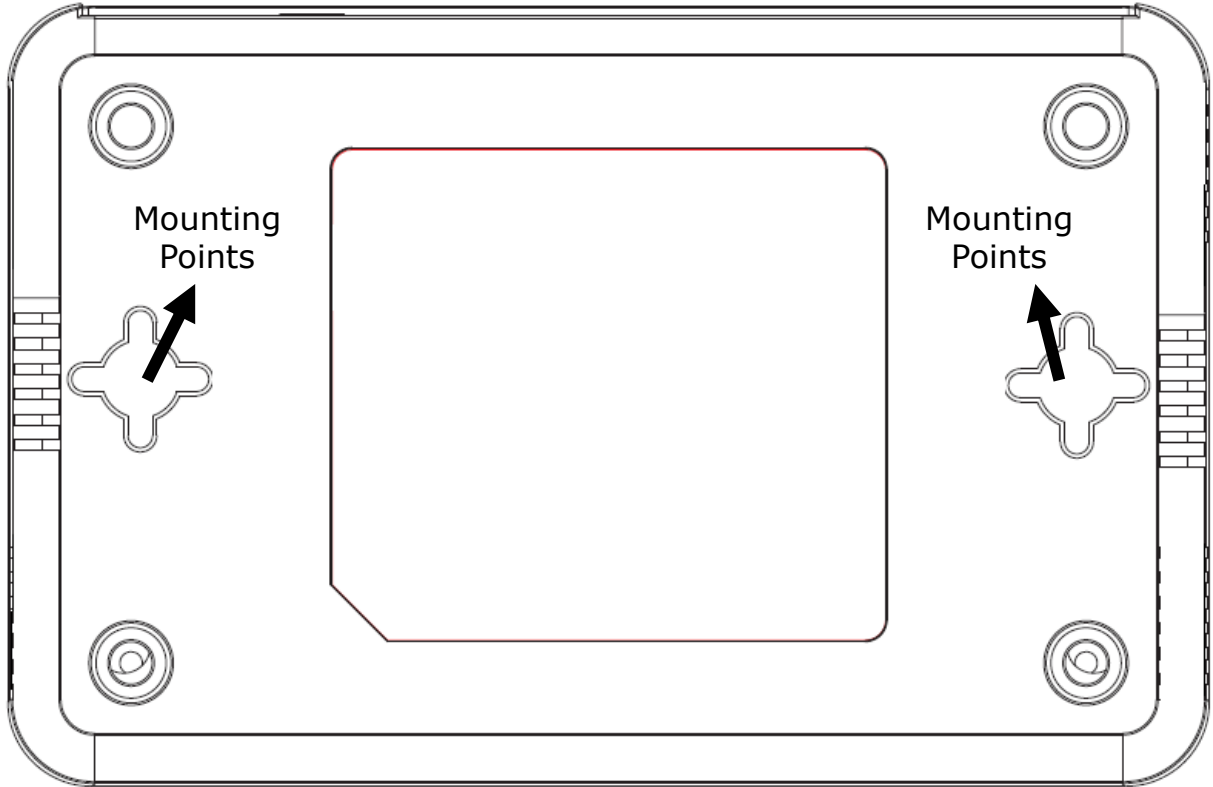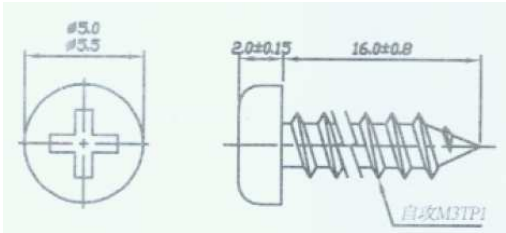
2.3. Setup LAN & WAN

Ethernet connection:

Connect Ethernet cable between your PC/Notebook LAN port & LAN port on ECB7510.
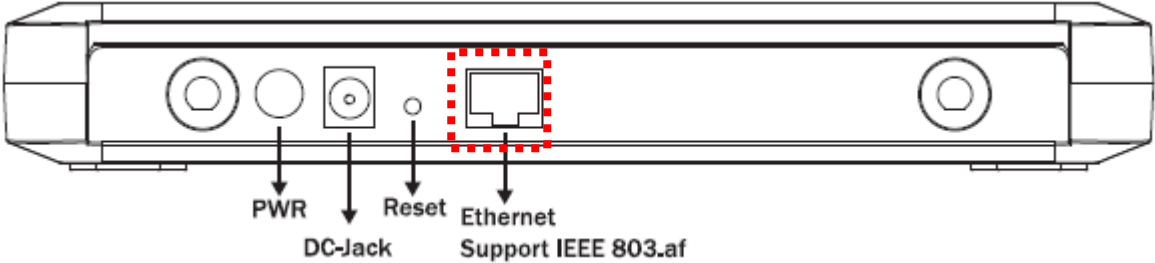
2.4. PC Network Adapter setup (Windows XP)

● Enter [Start Menu] → select [Control panel] → select [Network].

● Select [Local Area Connection]) icon=>select [properties]
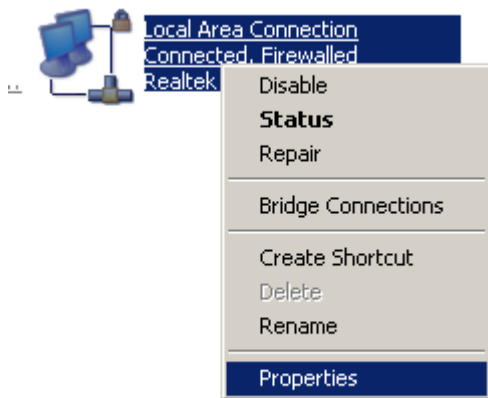
- Select [Internet Protocol (TCP/IP)] =>Click [Properties].
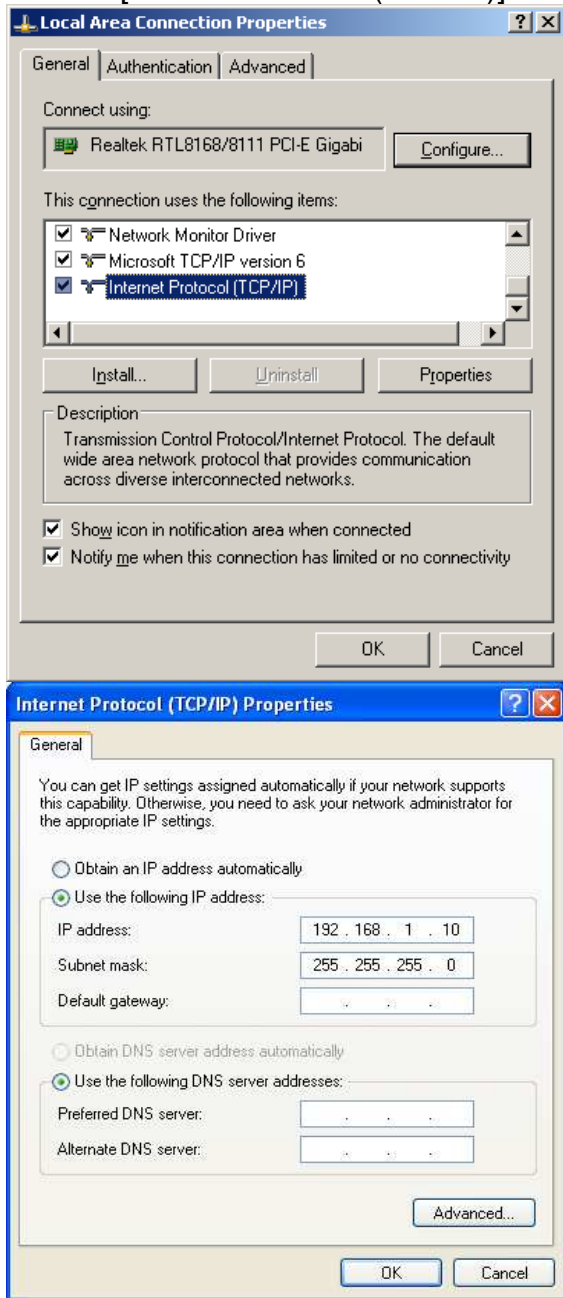
- Select the [General] tab.
- Select both [Use the following IP address] and [Use the following DNS server addresses].

Note: ECB7510 does not support DHCP server so it will not assign any IP addresses to any clients.

2.5. Initial Setup ECB7510

ECB7510 provides web-interface for configuration through web browser, such as Internet Explorer, Firefox or Safari.

1. Open your browser (e.g. Internet Explorer).
2. Type in **http://192.168.1.1** in the address bar and press [Enter].
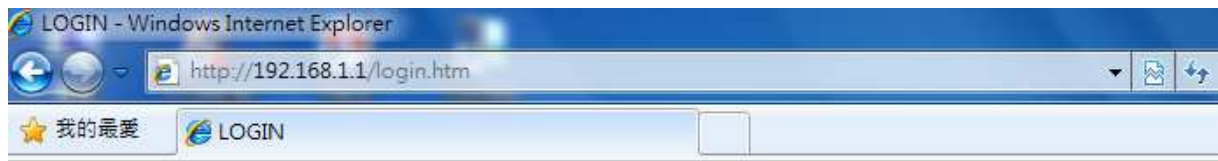
3. The webpage will ask you to enter Username and Password. Please Use [**admin**] for both Username and Password.
4. Click **<Login>** to navigate into ECB7510 configuration home page.
5. You will see the home page of ECB7510 as follows.

EnGenius | **Dual Band Concurrent AP**

Access Point Mode

- System
- Wireless
- Network
- Management
- Tools
- Logout

You can use the Status page to monitor the connection status for WLAN/LAN interfaces, firmware and hardware version numbers.

System

System Time	2009/01/01 00:31:12
System Up Time	31 min 10 sec
Hardware Version	1.0.0
Kernel Version	1.0.1
Application Version	1.0.1

LAN Settings

IP Address	192.168.1.1
Subnet Mask	255.255.255.0
MAC Address	00:02:6F:56:67:61
Default Gateway	---
First DNS Address	192.168.1.1
Second DNS Address	---

WLAN Settings

Radio 1 Settings

3. SYSTEM

3.1. Operation Mode

You are allowed to change the operation mode for both 2.4GHz and 5GHz radios. However, there are combinations that are not allowed. Please refer the following table for the mode combinations. Those that marked **Yes** are considered legal settings.

Operation Mode Matrix

	AP	WDS	CB	UR	Disable
AP	Yes	Yes	Yes	Yes	Yes
WDS	Yes	n/a	n/a	n/a	Yes
CB	Yes	n/a	n/a	n/a	Yes
UR	Yes	n/a	n/a	n/a	Yes
Disable	Yes	Yes	Yes	Yes	Yes

This page allows you to change the operating mode for both radios. You can use the drop down menu to select AP/CB/WDS Repeater/Repeater mode and you can also disable certain radio.

Radio1 (11b/g/n)   **Radio2 (11a/n)**
AP   AP

The following combination can not be set.

- One is CB and the other is CB ,WDS or Repeater.
- One is WDS and the other is CB ,WDS or Repeater.
- One is Repeater and the other is CB ,WDS or Repeater.

Apply   Cancel

Caution: CB/ WDS Repeater/Repeater can only operate in one single radio. You can not use those operating modes on both radios.

3.2. Status

This page allows you to monitor the current status of your AP. You can use the status page to quickly review if you have any updated firmware available (bug fixes, updates). You can navigate from this page with a few interesting options for reminding or skipping this page forever & so forth.

System: You can see the system time, system up time, hardware information, firmware version and kernel version information.

System	
System Time	2009/01/01 00:37:26
System Up Time	37 min 27 sec
Hardware Version	1.0.0
Kernel Version	1.0.1
Application Version	1.0.1

LAN Settings: This section displays the AP LAN port's current LAN & WLAN information. It also shows whether the DHCP status.

LAN Settings	
IP Address	192.168.1.1
Subnet Mask	255.255.255.0
MAC Address	00:02:6F:56:67:61
Default Gateway	---
First DNS Address	192.168.1.1
Second DNS Address	---

WLAN Settings: This section displays the current WLAN configuration settings. Wireless configuration details such as SSID, Security settings, BSSID, Channel number, mode of operation are briefly shown.

WLAN Settings

Radio 1 Settings

Operation Mode	Access Point
Channel	11

SSID_1

ESSID	EnGenius566788_1
Security	Disable
BSSID	00:02:6F:56:67:88

Radio 2 Settings

Operation Mode	Access Point
Channel	36

SSID_1

ESSID	EnGenius566789_1
Security	Disable
BSSID	00:02:6F:56:67:89

3.3. Schedule

In the schedule section, you can review your schedule such as Firewall and Power Saving feature. If you would like to modify/add/remove the schedule, you must go to Management->Schedule Setting to do so.

This page is displayed the registed schedules.

Schedule Table :

Content	Day Time	
		Apply Cancel

You must click [Apply] button after clicking [Delete] button.

3.4. Event Log

View **operation event log**. This page shows the current system log of the AP. It displays any event occurred after system start up. At the bottom of the page, the system log can be saved **<Save>** to a local file for further processing or the system log can be cleared **<Clear>** or it can be refreshed **<Refresh>** to get the most updated information. When the system is powered down, the system log will disappear if not saved to a local file.

View the system operation information.

```
Jan  1 00:30:52 [SYSTEM]: HTTP, Address "192.168.1.100" login success
Jan  1 00:00:04 [SYSTEM]: HTTP, start
Jan  1 00:00:04 [SYSTEM]: SNMP, start SNMP server
Jan  1 00:00:03 [SYSTEM]: SCHEDULE, stop Power Save
Jan  1 00:00:03 [SYSTEM]: NTP, start NTP Client
Jan  1 00:00:03 [SYSTEM]: WLAN2, Preamble = Short Preamble
Jan  1 00:00:03 [SYSTEM]: WLAN2, DTIM period = 1
Jan  1 00:00:03 [SYSTEM]: WLAN2, Beacon Interval = 100(ms)
Jan  1 00:00:03 [SYSTEM]: WLAN2, Max client number = 128
Jan  1 00:00:03 [SYSTEM]: WLAN2, Channel = 36
Jan  1 00:00:03 [SYSTEM]: WLAN2, SSID1 = EnGenius566789_1
Jan  1 00:00:03 [SYSTEM]: WLAN2, Wireless mode = 802.11 5G a/n
Jan  1 00:00:01 [SYSTEM]: WLAN1, Preamble = Short Preamble
Jan  1 00:00:01 [SYSTEM]: WLAN1, DTIM period = 1
Jan  1 00:00:01 [SYSTEM]: WLAN1, Beacon Interval = 100(ms)
Jan  1 00:00:01 [SYSTEM]: WLAN1, Max client number = 128
Jan  1 00:00:01 [SYSTEM]: WLAN1, Channel = 11
Jan  1 00:00:01 [SYSTEM]: WLAN1, SSID1 = EnGenius566788_1
Jan  1 00:00:01 [SYSTEM]: WLAN1, Wireless mode = 802.11 2.4G b/g/n
Jan  1 00:00:01 [SYSTEM]: LAN, IP address=192.168.1.1
Jan  1 00:00:01 [SYSTEM]: LAN, start
Jan  1 00:00:01 [SYSTEM]: BR, start
Jan  1 00:00:01 [SYSTEM]: SYS, Kernel Version: 1.0.1
```

Save   Clear   Refresh

3.5. Monitor

Show histogram for network connection on Ethernet, WLAN1 & WLAN2. Auto refresh keeps information updated frequently.

Ethernet Daily Graph (5 Minute Average)
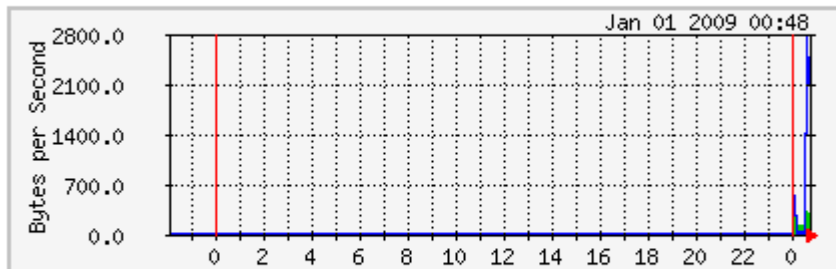
	Maximum	Average	Current
RX	315 b/sec	185 b/sec	248 b/sec
TX	2747 b/sec	828 b/sec	1982 b/sec

WLAN1 Daily Graph (5 Minute Average)
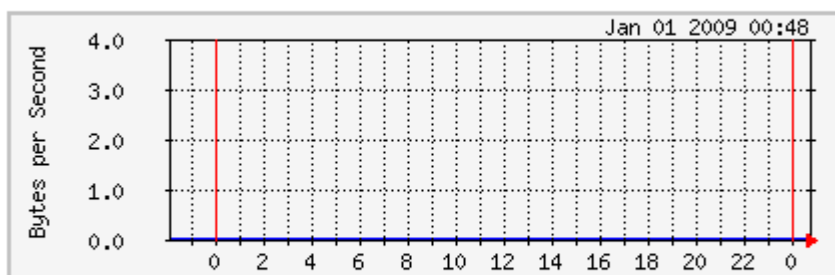
	Maximum	Average	Current
RX	0 b/sec	0 b/sec	0 b/sec
TX	0 b/sec	0 b/sec	0 b/sec

WLAN2 Daily Graph (5 Minute Average)
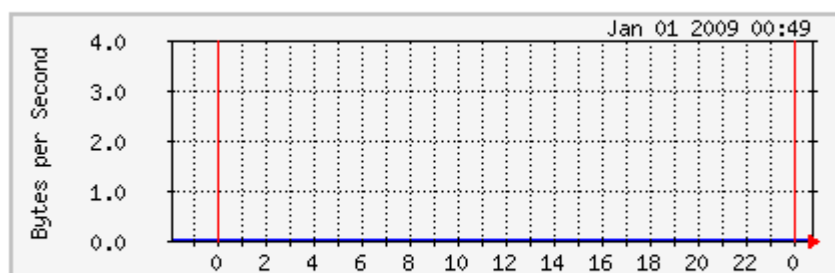
	Maximum	Average	Current
RX	0 b/sec	0 b/sec	0 b/sec
TX	0 b/sec	0 b/sec	0 b/sec

Note: You can click on the [Detail] to view the statistic data generated by Weekly and Monthly.

4. Network Diagram Example
4.1. Access Point

In the Access Point Mode, ECB7510 function likes a central connection for any stations or clients that support IEEE 802.11a/b/g/n network. Stations and Client must configure the same SSID and Security Password to associate within the range. ECB7510 supports 4 different SSIDs to separate different clients at the same time.
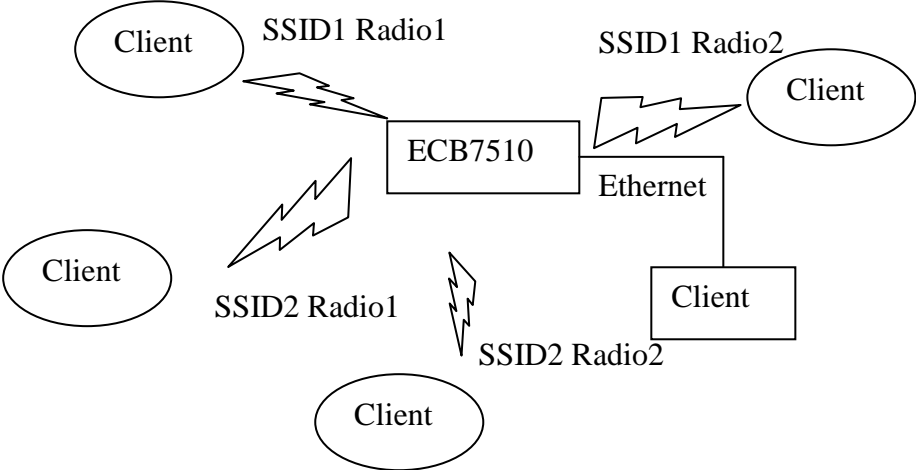
4.2. Client Bridge

In the Client Bridge Mode, the ECB7510 function as a wireless client. Connected to an Access Point wirelessly and surf internet whenever you want. Using Site Survey to scan all the Access Point within the range and configure its SSID and Security Password to associate with it. Connect you station to the LAN port of the ECB7510 via Ethernet. Another radio can still operate as an Access Point.
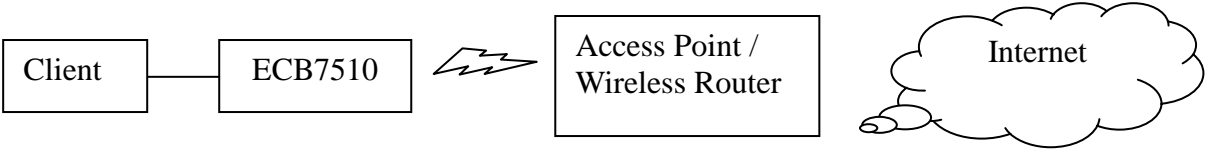
4.3. WDS mode

ECB7510 is a Dual Band Concurrent Access Point. It can operate the Access Point mode and WDS mode at the same time. Therefore, the two operate can be combined as the WDS repeater mode. It can have Repeater's ability and it also has the Access Point's capabilities. Connect to any of the Access Point via WDS radio and share the same network with Access Point's radio. WDS links support up to 4 different WDS networks.

The following example shows an WDS network that uses 2.4GHz as backbone and 5GHz for wireless client access. A WDS AP is set in the center while the other 4 are configured as WDS STA (station).

4.4. Repeater

In the Repeater Mode, ECB7510 can extend the wireless coverage area of another Access Point or Wireless Router. Access Point or Wireless Router must within the range so ECB7510 can associate with it by using the same SSID, Security Password and Channel.
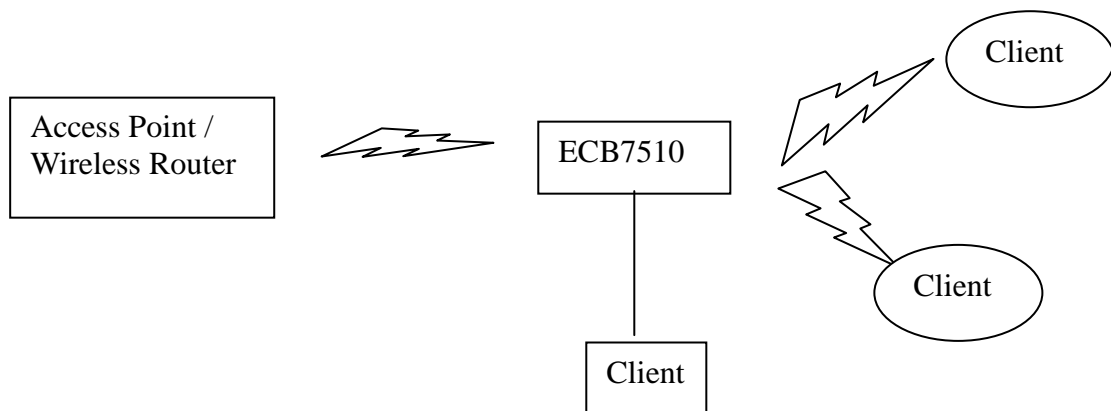
5. WIRELESS 2.4G & 5G

ECB7510 is a dual band concurrent product, therefore two wireless radio configurations are provided. Both radios share the same features except for open band and available channels under "Basic" section.

5.1. Status

This page shows the current wireless status such as your SSID, security type and BSSID.

View the current internet connection status and related information.

WLAN Settings	
Channel	11
SSID_1	
ESSID	EnGenius566788_1
Security	Disable
BSSID	00:02:6F:56:67:88

5.2. Basic: Mode: AP

This page allows you to define Mode, Band, Multiple ESSID. You can also set up a static wireless channel or make Wireless Router move to a clean Wireless Channel automatically.

Radio :	● Enable ○ Disable
Band :	2.4 GHz (802.11b/g/n) ▼
Enabled SSID#:	1 ▼
ESSID1 :	EnGenius566788_1
Auto Channel :	○ Enable ● Disable
Channel :	11 2.462 GHz ▼

Apply   Cancel

Radio: You can turn on/off wireless radio. If wireless Radio is off, you cannot associate with AP through wireless.

Band: You can select the wireless standards running on your network environment.
- **Band 2.4G:**
  - **2.4 GHz(B):** If all of your clients are 802.11b, select this one.
  - **2.4 GHz(G):** If all of your clients are 802.11g, select this one.

2.4 GHz(B/G): Either an 802.11b or an 802.11g wireless devices are in your environment.
2.4 GHz(N): If all of your clients are 802.11n, select this one.
2.4 GHz(B/G/N): Either 802.11b, 802.11g, or 802.11n wireless devices are in your environment.

- **Band 5G (Only available in Radio 2)**
  5 GHz (A): If all of your clients are 802.11a, select this one.
  5 GHz (N): If all of your clients are 802.11n, select this one.
  5 GHz (A/N): Either 802.11a or 802.11n wireless devices are in your environment.

Enable ESSID: We support 4 multiple SSIDs in this device. Please select how many SSIDs you would like to use in your network environment.

ESSID1~4: ESSID is the name of your wireless network. It might be a unique name to identify this wireless device in the Wireless LAN. It is case sensitive and up to 32 printable characters. You might change the default ESSID for added security.

Auto Channel: Device will search all valid channels, then decide a most clean channel and change to this channel if you enable this function. Depend on this function enable or not, you will see different item below **Auto Channel**.

Channel: If Auto Channel is disabled, you should choose a static channel and AP will use this channel to communicate with other clients.

Check Channel Time: If Auto Channel is enabled, you can choose a period from the drop-down menu. AP will change to a clean channel periodically.

5.3. Mode: CB

This page allows you to define Mode, Band, Multiple ESSID. You can also set up a static wireless channel or make Wireless Router move to a clean Wireless Channel automatically.

Radio :	⦿ Enable ○ Disable
Band :	5 GHz (802.11a/n) ▾
Site Survey :	Site Survey

Radio: You can turn on/off wireless radio. If wireless Radio is off, you cannot associate with AP through wireless.

Band: You can select the wireless standards running on your network environment.
- **Band 2.4G:**
  2.4 GHz(B): If all of your clients are 802.11b, select this one.
  2.4 GHz(G): If all of your clients are 802.11g, select this one.
  2.4 GHz(B/G): Either an 802.11b or an 802.11g wireless devices are in your environment.
  2.4 GHz(N): If all of your clients are 802.11n, select this one.
  2.4 GHz(B/G/N): Either 802.11b, 802.11g, or 802.11n wireless devices are in your environment.

- **Band 5G (Only available in Radio 2)**
  5 GHz (A): If all of your clients are 802.11a, select this one.
  5 GHz (N): If all of your clients are 802.11n, select this one.
  5 GHz (A/N): Either 802.11a or 802.11n wireless devices are in your environment.

Set Security: WDS Security depends on your AP security settings. Note: it does not support **mixed mode** such as WPA-PSK/WPA2-PSK Mixed mode.

5.4. Mode: WDS

Wireless Distribution System, a system that enables the wireless interconnection of access point, allows a wireless network to be expended using multiple access points without a wired backbone to like them. Each WDS APs need setting as same channel and encryption type.

This page allows you to define Mode, Band, Multiple ESSID. You can also set up a static wireless channel or make Wireless Router move to a clean Wireless Channel automatically.

Radio :	⦿ Enable ⦾ Disable
Band :	5 GHz (802.11a/n) ▾
Enabled SSID#:	1 ▾
ESSID1 :	EnGenius566789_1
Channel :	36 5.180 GHz ▾
WDS Type :	⦿ WDS AP ⦾ WDS Client
MAC Address 1 :	000000000000
MAC Address 2 :	000000000000
MAC Address 3 :	000000000000
MAC Address 4 :	000000000000
Set Security :	Set Security

Apply Cancel

MAC address 1~4: Please enter the MAC address of the neighboring APs that participates in WDS, we support 4 devices now.

Set Security: WDS Security depends on your AP security settings. Note: it does not support **mixed mode** such as WPA-PSK/WPA2-PSK Mixed mode.

5.5. Mode: Repeater

This page allows you to define Mode, Band, Multiple ESSID. You can also set up a static wireless channel or make Wireless Router move to a clean Wireless Channel automatically.

Radio :	● Enable ○ Disable
Band :	5 GHz (802.11a/n) ▾
Enabled SSID#:	1 ▾
ESSID1 :	EnGenius566789
Site Survey :	Site Survey

Radio: You can turn on/off wireless radio. If wireless Radio is off, you cannot associate with AP through wireless.

Band: You can select the wireless standards running on your network environment.
- **Band 2.4G:**
  2.4 GHz(B): If all of your clients are 802.11b, select this one.
  2.4 GHz(G): If all of your clients are 802.11g, select this one.
  2.4 GHz(B/G): Either an 802.11b or an 802.11g wireless devices are in your environment.
  2.4 GHz(N): If all of your clients are 802.11n, select this one.
  2.4 GHz(B/G/N): Either 802.11b, 802.11g, or 802.11n wireless devices are in your environment.

- **Band 5G (Only available in Radio 2)**
  5 GHz (A): If all of your clients are 802.11a, select this one.
  5 GHz (N): If all of your clients are 802.11n, select this one.
  5 GHz (A/N): Either 802.11a or 802.11n wireless devices are in your environment.

Enable ESSID: We support 4 multiple SSIDs in this device. Please select how many SSIDs you would like to use in your network environment.

ESSID1~4: ESSID is the name of your wireless network. It might be a unique name to identify this wireless device in the Wireless LAN. It is case sensitive and up to 32 printable characters. You might change the default ESSID for added security.

Site Survey: Use site survey to scan nearby area and connect one available AP/AP Router.

5.6. Advanced

This tab allows you to set the advanced wireless options. The options included are Authentication Type, Fragment Threshold, RTS Threshold, Beacon Interval, and Preamble Type. You should not change these parameters unless you know what effect the changes will have on the router.

These settings are only for expert user who is familiar with Wireless LAN procedure. Do not change these settings unless you know what effect the changes will have on your AP. Incorrect settings might reduce wireless performance.

Fragment Threshold :	2346	(256-2346)
RTS Threshold :	2346	(1-2346)
Beacon Interval :	100	(20-1000 ms)
DTIM Period :	1	(1-255)
N Data Rate:	Auto ▾	
Channel Bandwidth	◉ Auto 20/40 MHZ ○ 20 MHZ	
Preamble Type :	○ Long Preamble ◉ Short Preamble	
CTS Protection :	◉ Auto ○ Always ○ None	
Tx Power :	100 % ▾	
Power Saving Mode :	○ Enable ◉ Disable	
Max Client Number :	128	(1- 128)

Fragment Threshold: This specifies the maximum size of a packet during the fragmentation of data to be transmitted. If you set this value too low, it will result in bad performance.

RTS Threshold: When the packet size is smaller than the RTS threshold, the wireless router will not use the RTS/CTS mechanism to send this packet.

Beacon Interval: is the interval of time that this wireless router broadcasts a beacon. A Beacon is used to synchronize the wireless network.

DTIM Period: Enter a value between 1 and 255 for the Delivery Traffic Indication Message (DTIM). A DTIM is a countdown informing clients of the next window for listening to broadcast and multicast messages

Data Rate: The "Data Rate" is the rate that this access point uses to transmit data packets. The access point will use the highest possible selected transmission rate to transmit the data packets.

N Data Rate: The "Data Rate" is the rate that this access point uses to transmit data packets for N compliant wireless nodes. Highest to lowest data rate can be fixed.

Channel Bandwidth: This is the range of frequencies that will be used.

Preamble Type: The "Long Preamble" can provide better wireless LAN compatibility while the "Short Preamble" can provide better wireless LAN performance.

CTS Protection: It is recommended to enable the protection mechanism. This mechanism can decrease the rate of data collision between 802.11b and 802.11g wireless stations. When the protection mode is enabled, the throughput of the AP will be a little lower due to a lot of frame-network that is transmitted.

TX Power: This can be set to a bare minimum or maximum power.
Power Saving Mode: Enable or disable the wireless power saving feature.
Max Client Number: Define the maximum number of clients that can associate to the AP.

5.7. Security

This Access Point provides complete wireless LAN security functions, included are WEP, IEEE 802.1x, IEEE 802.1x with WEP, WPA with pre-shared key and WPA with RADIUS. With these security functions, you can prevent your wireless LAN from illegal access. Please make sure your wireless stations use the same security function, and are setup with the same security key.

This page allows you setup the wireless security. You can turn on WEP or WPA by using Encryption Keys, besides you can enable 802.1x Authentication or RADIUS to coordinate with RADIUS server.

ESSID Selection :	EnGenius566788_1 ▾
Separate :	☐ SSID ☐ STA
Broadcast ESSID :	Enable ▾
Encryption :	Disable ▾

ESSID Selection: This broadband router support multiple ESSID, you could select and set up the wanted ESSID.

Separate: Group you security settings by SSID or Station.

Broadcast ESSID: If you enabled "Broadcast ESSID", every wireless station located within the coverage of this access point can discover this access point easily. If you are building a public wireless network, enabling this feature is recommended. Disabling "Broadcast ESSID" can provide better security.

Encryption: When you choose to disable encryption, it is very insecure to operate ECB7510.

WEP Encryption

When you select 64-bit or 128-bit WEP key, you have to enter WEP keys to encrypt data. You can generate the key by yourself and enter it. You can enter four WEP keys and select one of them as a default key. Then the router can receive any packets encrypted by one of the four keys.

> This page allows you setup the wireless security. You can turn on WEP or WPA by using Encryption Keys, besides you can enable 802.1x Authentication or RADIUS to coordinate with RADIUS server.

ESSID Selection :	EnGenius566788_1 ▾
Separate :	☐ SSID ☐ STA
Broadcast ESSID :	Enable ▾
Encryption :	WEP ▾
Authentication Type :	◉ Open System ○ Shared Key
Key Length :	64-bit ▾
Key Type :	ASCII (5 characters) ▾
Default Key :	Key 1 ▾
Encryption Key 1 :	
Encryption Key 2 :	
Encryption Key 3 :	
Encryption Key 4 :	

☐ **Enable 802.1x Authentication**

Authentication Type: There are two authentication types: **"Open System"** and **"Shared Key"**. When you select **"Open System"**, wireless stations can associate with this wireless router without WEP encryption. When you select **"Shared Key"**, you should also setup a WEP key in the **"Encryption"** page. After this has been done, make sure the wireless clients that you want to connect to the device are also setup with the same encryption key.

Key Length: You can select the WEP key length for encryption, 64-bit or 128-bit. The larger the key will be the higher level of security is used, but the throughput will be lower.

Key Type: You may select ASCII Characters (alphanumeric format) or Hexadecimal Digits (in the "A-F", "a-f" and "0-9" range) to be the WEP Key.

Key1 - Key4: The WEP keys are used to encrypt data transmitted in the wireless network. Use the following rules to setup a WEP key on the device. 64-bit WEP: input 10-digits Hex values (in the "A-F", "a-f" and "0-9" range) or 5-digit ASCII character as the encryption keys.
128-bit WEP: input 26-digit Hex values (in the "A-F", "a-f" and "0-9" range) or 13-digit ASCII characters as the encryption keys.

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other sections by choosing Continue, or choose Apply to apply the settings and reboot the device.

Enable 802.1x Authentication

IEEE 802.1x is an authentication protocol. Every user must use a valid account to login to this Access Point before accessing the wireless LAN. The authentication is processed by a RADIUS server. This mode only authenticates users by IEEE 802.1x, but it does not encrypt the data during communication.

This page allows you setup the wireless security. You can turn on WEP or WPA by using Encryption Keys, besides you can enable 802.1x Authentication or RADIUS to coordinate with RADIUS server.

ESSID Selection :	EnGenius566788_1 ▼
Separate :	☐ SSID ☐ STA
Broadcast ESSID :	Enable ▼
Encryption :	WEP ▼
Authentication Type :	◉ Open System ◯ Shared Key
Key Length :	64-bit ▼

☑ **Enable 802.1x Authentication**

RADIUS Server IP Address :	
RADIUS Server Port :	1812
RADIUS Server Shared Secret :	

WPA Pre-Shared Key Encryption

Wi-Fi Protected Access (WPA) is an advanced security standard. You can use a pre-shared key to authenticate wireless stations and encrypt data during communication. It uses TKIP or CCMP (AES) to change the encryption key frequently. So the encryption key is not easy to be cracked by hackers. This is the best security available.

This page allows you setup the wireless security. You can turn on WEP or WPA by using Encryption Keys, besides you can enable 802.1x Authentication or RADIUS to coordinate with RADIUS server.

ESSID Selection :	EnGenius566788_1
Separate :	☐ SSID ☐ STA
Broadcast ESSID :	Enable
Encryption :	WPA pre-shared key
WPA Type :	WPA(TKIP)
Pre-shared Key Type :	Passphrase
Pre-shared Key :	5JCVUYO3WXJS
WPA Rekey Interval :	No Schedule

WPA-Radius Encryption

Wi-Fi Protected Access (**WPA**) is an advanced security standard. You can use an external RADIUS server to authenticate wireless stations and provide the session key to encrypt data during communication.

It uses **TKIP** or CCMP (**AES**) to change the encryption key frequently. Press **<Apply>** button when you are done.

This page allows you setup the wireless security. You can turn on WEP or WPA by using Encryption Keys, besides you can enable 802.1x Authentication or RADIUS to coordinate with RADIUS server.

ESSID Selection :	EnGenius566788_1
Separate :	☐ SSID ☐ STA
Broadcast ESSID :	Enable
Encryption :	WPA RADIUS
WPA Type :	WPA(TKIP)
RADIUS Server IP Address :	
RADIUS Server Port :	1812
RADIUS Server Shared Secret :	
WPA Rekey Interval :	No Schedule

5.8. Filter

This wireless router supports MAC Address Control, which prevents unauthorized clients from accessing your wireless network.

Using MAC Address Filtering could prevent unauthorized MAC Address to associate with the AP.

Enable Wireless MAC Filtering   ○ **Enable** ◉ **Disable**

○ Deny all clients with MAC address listed below to access the network
◉ Allow all clients with MAC address listed below to access the network

Description	MAC Address

[Add] [reset]

Only the following MAC addresses can use network:

NO.	Description	MAC Address	Select

[Delete Selected] [Delete All] [reset]

Enable Wireless MAC Filtering: Enable the wireless access control function

Adding an address into the list

Enter the "MAC Address" and "Comment" of the wireless station to be added and then click **<Add>**. The wireless station will now be added into the "Current Access Control List" below. If you are having any difficulties filling in the fields, just click "Clear" and both "MAC Address" and "Comment" fields will be cleared.

Remove an address from the list

If you want to remove a MAC address from the "Current Access Control List ", select the MAC address that you want to remove in the list and then click "Delete Selected". If you want to remove all the MAC addresses from the list, just click the **<Delete All>** button. Click **<Reset>** will clear your current selections.

Click **<Apply>** at the bottom of the screen to save the above configurations.

5.9. WPS (Wi-Fi Protected Setup)

WPS is the simplest way to establish a connection between the wireless clients and the wireless router. You don't have to select the encryption mode and fill in a long encryption passphrase every time when you try to setup a wireless connection. You only need to press a button on both wireless client and wireless router, and the WPS will do the rest for you.

The wireless router supports two types of WPS: WPS via Push Button and WPS via PIN code. If you want to use the Push Button, you have to push a specific button on the wireless client or in the utility of the wireless client to start the WPS mode, and switch the wireless router to WPS mode. You can simply push the WPS button of the wireless router, or click the 'Start to Process' button in the web configuration interface. If you want to use the PIN code, you have to know the PIN code of the wireless client and switch it to WPS mode, then fill-in the PIN code of the wireless client through the web configuration interface of the wireless router.

WPS: Enable/Disable WPS function from drop-down list.

Server-side Setup

Self Pin Code: This is the WPS PIN code of the wireless router. You may need this information when connecting to other WPS-enabled wireless devices.

WPS Current Status: If the wireless security (encryption) function of this wireless router is properly set, you'll see a 'Configured' message here. Otherwise, you'll see '**UnConfigured**'.

Software WPS button: Click on the Start to Process to begin the process of the WPS function.

Client-side Setup

WPS via PIN: You can fill-in the PIN code of the wireless device and press the button to start the WPS process. The router will wait for the WPS request from the wireless device within 2 minutes.

5.10. Client List

This WLAN Client Table shows the Wireless client associate to this Wireless Router.

WLAN Client Table :

This WLAN Client Table shows client MAC address associated to this device.

Interface	MAC Address	Rx	Tx	Signal(%)	Idle Time
No WLAN client is connected to the device.					

Refresh

5.11. WMM

WMM technology maintains the priority of audio, video and voice applications in a Wi-Fi network so that other applications and traffic are less likely to slow them.

WMM Parameters of Access Point						
	Aifsn	CWMin	CWMax	Txop	ACM	AckPolicy
AC_BE	3	15 ▾	63 ▾	0	☐	☐
AC_BK	7	15 ▾	1023 ▾	0	☐	☐
AC_VI	1	7 ▾	15 ▾	94	☐	☐
AC_VO	1	3 ▾	7 ▾	47	☐	☐

WMM Parameters of Station					
	Aifsn	CWMin	CWMax	Txop	ACM
AC_BE	3	15 ▾	1023 ▾	0	☐
AC_BK	7	15 ▾	1023 ▾	0	☐
AC_VI	2	7 ▾	15 ▾	94	☐
AC_VO	2	3 ▾	7 ▾	47	☐

Reset to Default

6. Network
6.1. Status

The status page shows the current LAN settings.

View the current internet connection status and related information.

LAN Settings

IP Address	192.168.1.1
Subnet Mask	255.255.255.0
MAC Address	00:02:6F:56:67:61

6.2. LAN

Configure you LAN settings by changing IP address, subnet mask, default gateway and DNS settings.

You can enable the DHCP server to dynamically allocate IP Addresses to your LAN client PCs. The device must have an IP Address for the Local Area Network.

Bridge Type :	Static IP ▼			
IP Address :	192	. 168	. 1	. 1
IP Subnet Mask :	255	. 255	. 255	. 0
Default Gateway :	0	. 0	. 0	. 0
DNS Type:	Static ▼			
First DNS Address:	192	. 168	. 1	. 1
Second DNS Address:	0	. 0	. 0	. 0

7. Management

7.1. Admin

You can change the password required to log into the broadband router's system web-based management. By default, the password is: admin. Passwords can contain 0 to 12 alphanumeric characters, and are case sensitive.

You can change the password that you use to access the device. This is not your ISP account password.

Old Password :	
New Password :	
Repeat New Password :	
Idle Timeout :	10 (1~10 minutes)

Old Password: Fill in the current password to allow changing to a new password.

New Password: Enter your new password and type it again in **Repeat New Password** for verification purposes

Idle Timeout: Define the automatically log out period.

Click <**Apply**> at the bottom of the screen to save the above configurations.

7.2. SNMP

SNMP is used in network management systems to monitor network-attached devices for conditions that warrant administrative attention.

SNMP Active	Disabled ▾
SNMP Version	All ▾
Read Community	public
Set Community	private
System Location	EnGenius Technologies, Inc.
System Contact	SENAO Networks, Inc.
Trap Active	Disabled ▾
Trap Manager IP	192.168.1.100
Trap Community	public

SNMP Active: Enable/Disable SNMP function from drop-down list.
SNMP Version: EOC7510 supports SNMP version v1 and v2c.
Read Community: Setup the read only community password.
Set Community: Setup the read and write community password.
System Location: Define the device location.
System Contact: Define the device contact information.
Trap Active: Enable/Disable Trap function.
Trap Manager IP: Setup the destination IP address that the trap message goes to.
Trap Community: Setup the Trap community password.

7.3. Schedule Settings

Action :	○ Radio Off ○ Radio On ○ Mail notification ● Restart
Days :	☐ Mon ☐ Tue ☐ Wed ☐ Thu ☐ Fri ☐ Sat ☐ Sun [Everyday]
Time of day :	0 hour 0 minute

Action: Select the feature you would like to active.
Days: Define activate/deactivate period.
Time of day: Define activate/deactivate time.

7.4. Firmware

This page allows you to upgrade the router's firmware. To upgrade the firmware of your Broadband router, you need to download the firmware file to your local hard disk, and enter that file name and path in the appropriate field on this page. You can also use the Browse button to find the firmware file on your PC.

You can upgrade the firmware of the router in this page. Ensure, the firmware you want to use is on the local hard drive of your computer. Click on Browse to browse and locate the firmware to be used for your update.

Once you've selected the new firmware file, click <**Apply**> at the bottom of the screen to start the upgrade process

7.5. Configure

This page allows you to save the current router configurations. When you save the configurations, you also can re-load the saved configurations into the router through the **Restore Settings**. If extreme problems occur you can use the **Restore to Factory Defaults** to set all configurations to its original default settings.

The current system settings can be saved as a file onto the local hard drive. The saved file can be loaded back on the device. To reload a system settings file, click on BROWSE to locate the system file to be used. You may also reset the Broad Router back to factory default settings by clicking RESET.

Restore Settings: This can save the Broadband router current configuration to a file named "**config.bin**" on your PC. You can also use the **<Upload>** button to restore the saved configuration to the Broadband router. Alternatively, you can use the "**Restore to Factory Defaults**" tool to force the Broadband router to perform a power reset and restore the original factory settings.

7.6. Reset

You can reset the AP when system stops responding correctly or stop functions.

In the event the system stops responding correctly or stops functioning, you can perform a reset. Your settings will not be changed. To perform the reset, click on the APPLY button. You will be asked to confirm your decision. The reset will be completed when the LED Power light stops blinking.

Apply   Cancel

8. Tools
8.1. Time Setting

The Time Zone allows your router to reference or base its time on the settings configured here, which will affect functions such as Log entries and Firewall settings.

The device reads the correct time from NTP servers on the Internet and sets its system clock accordingly. The Daylight Savings option merely advances the system clock by one hour. The time zone setting is used by the system clock when displaying the correct time in schedule and the log files.

Type :	NTP ▼
Time Zone :	(GMT)Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London ▼
NTP Time Server :	
Daylight Saving :	☐ Enable From January ▼ 1 ▼ To January ▼ 1 ▼

[Apply] [Cancel]

Type: Define the time is Synchronize with PC or from NTP server.
Time Zone: Select the time zone of the country you are currently in. The router will set its time based on your selection.

NTP Time Server: The router can set up external NTP Time Server.

Daylight Savings: The router can also take Daylight Savings into account. If you wish to use this function, you must select the Daylight Savings Time period and check/tick the enable box to enable your daylight saving configuration.

Click **<Apply>** at the bottom of the screen to save the above configurations.
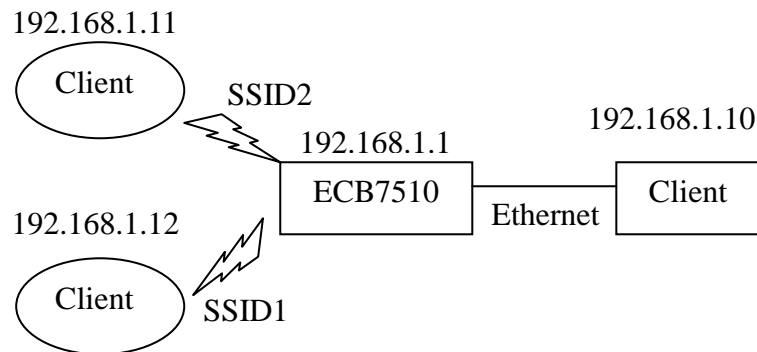
8.2. Diagnosis

This page could let you diagnosis your current network status.

This page can diagnose the current network status

Address to Ping :	
Ping Count :	1 ▾ Start

9. Network Configuration Example

9.1. Access Point

192.168.1.11

Client

SSID2

192.168.1.1

192.168.1.10

ECB7510

Ethernet

Client

192.168.1.12

Client

SSID1

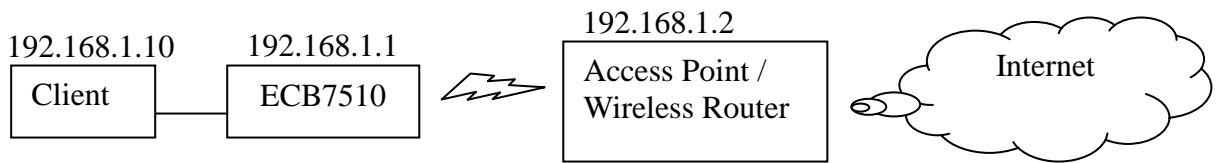| Access Point	
Step1	Login to the web-based configuration interface with default IP 192.168.1.1
Step2	Select the Radio you would like it function as an Access Point
Step3	Select 802.11 a/b/g/n as your wireless mode.
Step4	Select channel with less interferences or enable auto channel feature.
Step5	Specify the SSID for your broadcast SSID and you can also configure multiple SSID at the same time.
Step6	Verify VLAN identifier to separate services among clients
Step7	Setup the authentication settings for each SSID.
Step8	Press Apply to save all changes.
Note: For more advanced settings, please refer to the previous chapters.	

Wireless Client	
Step1	Open wireless client utility software page.
Step2	Use site survey to scan nearby Access Point and select the certain AP you would like to connect with or enter SSID manually.
Step3	Configure VLAN ID in your wireless device if available.
Step4	Select correct authentication type and password.

Caution: ECB7510's Access Point Mode does not provide DHCP server so the Wireless Client IP address must configure manually at the same subnet in Local Area Network

9.2. Client Bridge

Client Bridge Mode functions like a wireless dongle. It must connect to an Access Point/AP Router to join the network.

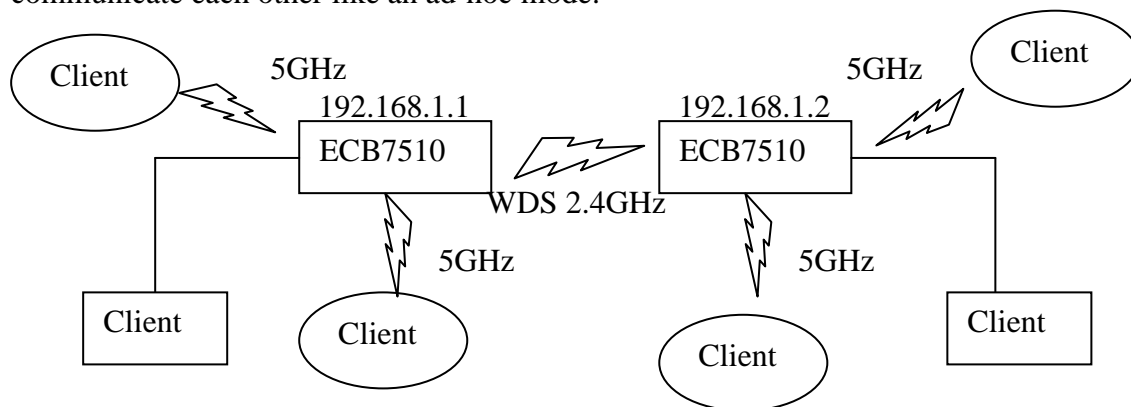Please refer to the previous section to check Access point's configuration.

Client Bridge	
Step1	Login to the web-based configuration interface with default IP 192.168.1.1
Step2	Select a Radio to change Operation Mode to **Client Bridge(CB)** from **System -> Operation Mode**.
Step3	Select 802.11a/b/g/n as your wireless mode.
Step4	Use site survey to scan Access Points that are available in nearby area.
Step5	Select the AP you would like to associate with.
Step6	Setup the authentication settings that match to the Access Point's setting.
Step7	Press Apply to process all the configurations.

Note: Client Bridge's IP setting must match to the Access Point's subnet.

9.3. WDS Repeater

Use this feature to link multiple APs in a network, All clients associated with any APs can communicate each other like an ad-hoc mode.

Please refer to the previous section to check Access point's configuration.
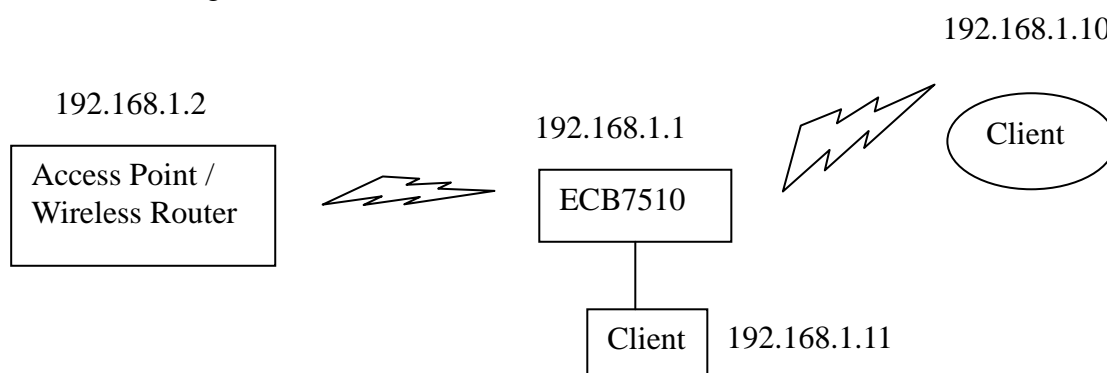
WDS Bridge	
Step1	Login to the web-based configuration interface with default IP 192.168.1.1
Step2	Select a Radio to change Operation Mode to **WDS** from **System -> Operation Mode**.
Step3	Select 802.11a/b/g/n as your wireless mode.
Step4	Select channel you would like to use.
Step5	Setup the authentication settings
Step6	Setup WDS Link Settings.
Step7	Specify the AP's MAC address you would like to connect with.
Step8	Press Apply to process all the configurations.

Caution: Each WDS bridge's device must use the same **Subnet**, **Wireless Mode**, **Wireless Channel**, and **Security Setting**.

9.4. Repeater

Repeater is used to extend the wireless coverage area of the Access Point. Please refer to the previous section to configure the Access Point.

Repeater	
Step1	Login to the web-based configuration interface with default IP 192.168.1.1
Step2	Select a Radio to change Operation Mode to **Repeater** from **System -> Operation Mode**.
Step3	Select 802.11a/b/g/n as your wireless mode.
Step4	Use site survey to scan nearby Access Point and select the certain AP you would like to connect with or enter SSID manually.
Step5	Select correct authentication type and password the same as Access Point.

Note: 1. For more advanced settings, please refer to the previous chapters.
2. Repeater IP subnet must the same as the Access Point, please refer to the **IP Settings** section for details.

Wireless Client	
Step1	Open wireless client utility software page.
Step2	Use site survey to scan nearby Access Point and select the certain AP you would like to connect with or enter SSID manually.
Step3	Configure VLAN ID in your wireless device if available.
Step4	Select correct authentication type and password.

Caution: Wireless Client IP address must configure manually at the same subnet in Local Area Network or enable DHCP server of ECB7510 to retrieve IP automatically.

Europe – EU Declaration of Conformity

This device complies with the essential requirements of the R&TTE Directive 1999/5/EC. The following test methods have been applied in order to prove presumption of conformity with the essential requirements of the R&TTE Directive 1999/5/EC:

- EN60950-1:2006 A11:2009+A1:2010
  Safety of Information Technology Equipment

- EN50385 : 2002
- Generic standard to demonstrate the compliance of electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (0 Hz - 300 GHz)

- EN 300 328 V1.7.1: 2006-10
- Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive
-
  EN 301 489-1 V1.8.1: 2008-04
  Electromagnetic compatibility and Radio Spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements

- EN 301 489-17 V2.1.1 2009-05
- Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for 2,4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment

This device is a 2.4 GHz wideband transmission system (transceiver), intended for use in all EU member states and EFTA countries, except in France and Italy where restrictive use applies.

In Italy the end-user should apply for a license at the national spectrum authorities in order to obtain authorization to use the device for setting up outdoor radio links and/or for supplying public access to telecommunications and/or network services.

This device may not be used for setting up outdoor radio links in France and in some areas the RF output power may be limited to 10 mW EIRP in the frequency range of 2454 – 2483.5 MHz. For detailed information the end-user should contact the national spectrum authority in France.

CE0560①

Česky [Czech]	*[Jméno výrobce]* tímto prohlašuje, že tento *[typ zařízení]* je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
Dansk [Danish]	Undertegnede *[fabrikantens navn]* erklærer herved, at følgende udstyr *[udstyrets typebetegnelse]* overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
Deutsch [German]	Hiermit erklärt *[Name des Herstellers]*, dass sich das Gerät *[Gerätetyp]* in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen

	Bestimmungen der Richtlinie 1999/5/EG befindet.
Eesti [Estonian]	Käesolevaga kinnitab *[tootja nimi = name of manufacturer]* seadme *[seadme tüüp = type of equipment]* vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
English	Hereby, *[name of manufacturer]*, declares that this *[type of equipment]* is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Español [Spanish]	Por medio de la presente *[nombre del fabricante]* declara que el *[clase de equipo]* cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ *[name of manufacturer]* ΔΗΛΩΝΕΙ ΟΤΙ *[type of equipment]* ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
Français [French]	Par la présente *[nom du fabricant]* déclare que l'appareil *[type d'appareil]* est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Italiano [Italian]	Con la presente *[nome del costruttore]* dichiara che questo *[tipo di apparecchio]* è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo *[name of manufacturer / izgatavotāja nosaukums]* deklarē, ka *[type of equipment / iekārtas tips]* atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]	Šiuo *[manufacturer name]* deklaruoja, kad šis *[equipment type]* atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Nederlands [Dutch]	Hierbij verklaart *[naam van de fabrikant]* dat het toestel *[type van toestel]* in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
Malti [Maltese]	Hawnhekk, *[isem tal-manifattur]*, jiddikjara li dan *[il-mudel tal-prodott]* jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
Magyar [Hungarian]	Alulírott, *[gyártó neve]* nyilatkozom, hogy a *[... típus]* megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
Polski [Polish]	Niniejszym *[nazwa producenta]* oświadcza, że *[nazwa wyrobu]* jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
Português [Portuguese]	*[Nome do fabricante]* declara que este *[tipo de equipamento]* está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Slovensko [Slovenian]	*[Ime proizvajalca]* izjavlja, da je ta *[tip opreme]* v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak]	*[Meno výrobcu]* týmto vyhlasuje, že *[typ zariadenia]* spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Suomi [Finnish]	*[Valmistaja = manufacturer]* vakuuttaa täten että *[type of equipment = laitteen tyyppimerkintä]* tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Svenska [Swedish]	Härmed intygar *[företag]* att denna *[utrustningstyp]* står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

Federal Communication Commission Interference Statement

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

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

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

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Operations in the 5.15-5.25GHz band are restricted to indoor usage only.

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 20cm between the radiator & your body.