ZG-7600H User Manual

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About the manual

The purpose to use this manual is for install the wireless Access Point. This manual is including disposing course and method and helping the customer to solve the unpredictable problem.

The following typographical conventions are used in this purpose:

Warning:

Class B:

FEDERAL COMMUNICATIONS COMMISSION INTERFERENCE STATEMENT

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

CAUTION:

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

RF exposure warning ·

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Bold: Indicates the function, important words, and so on.

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Chapter 1 Introduction

Introduction to Product

ZG-7600H, a 4-in-1 SMB High Power WLAN Access Point, 200mW Output Power, can be operated in one of the following 4 modes, except general access point, also include AP client, repeater and point to point bridge.

The 802.11g-compatible device delivers a 54Mbps high-speed, reliable and easy-to-use wireless connection throughout your home or small office at an affordable price. By connecting the device to your wired network, users can enjoy wireless Internet access faster than ever before. Meanwhile, robust security ensures the Internet connection is protected.

See its panel as follow picture.

Figure 1 Product Panel

LED and Port Definition

The detail definition follows the underside tables:

Diagram 1 LED and Port Definition

LED	Description
POWER	Green ON: Power ON (Successful reboot) Blinking: Device is not ready or system booting
LAN	Green ON : 10M connection Amber ON : 100M connection Blinking: Sending/receiving data

WLAN	Blinking : Data TX/RX through wireless access point
Port	**Description**
POWER	DC 12v/0.83A
Reset	Reboot- Press & release right away Restore- Press for 5 secs and then release
Ethernet	Connect to network

Chapter 2 Hardware Installation

System Requirements

1. A computer has a 10/100Base-TX Ethernet that is connected to the same IP segment as the AP.
2. The computer has one Web browser, such as Microsoft Internet Explorer 6.0.

Chapter 3 Safely Use Your Device

Safely Use in Installation

1. Please do not put Access Point near these places: electric power line, electric light, electricity or any places nearby strong electric power, otherwise it may make damage to Access Point.

Safely Use in Management

Do not try to turn off the Access Point, shutdown the computer or do anything else to the Access Point until the Access Point finishes restarting!

Chapter 4 Basic Configuration

Default Settings

Diagram 2 Default Settings

Options	Default Value
User Name	admin
password	password
Device Name	APxxxxxx（xxxxxx indicate the last 6 MAC address of AP）
Country/Region	China
IP Address	IP Type: Fixed IP Address :192.168.0.228 Mask ： 255.255.255.0 Gateway：0.0.0.0
Operating Mode	AP Mode
Wireless Mode	Auto(11g/11b)
Channel/Frequency	6/2.437GHz
SSID	Wireless
Broadcast SSID	Yes
Beacon Interval	100
DTIM Interval	1
WMM Support	No
Number of Wireless Stations Allowed to Associate	32
Radio Enable	Yes
Output Power Management	Full
Preamble Type	Dynamic
Super-G Mode	Disable
Turbo-G Mode	Disable
RTS/CTS Threshold	2346
Fragmentation	2346
SNMP	Disable

Using the Web Management

The Web Management provides you with a user-friendly graphical user interface. The Access Point allows you via web browser (MS Internet Explorer 6.0) to monitor and configure the device.

1. Run Web Explorer, Enter default IP Address: **http://192.168.0.228** in the Address field. And press Enter.

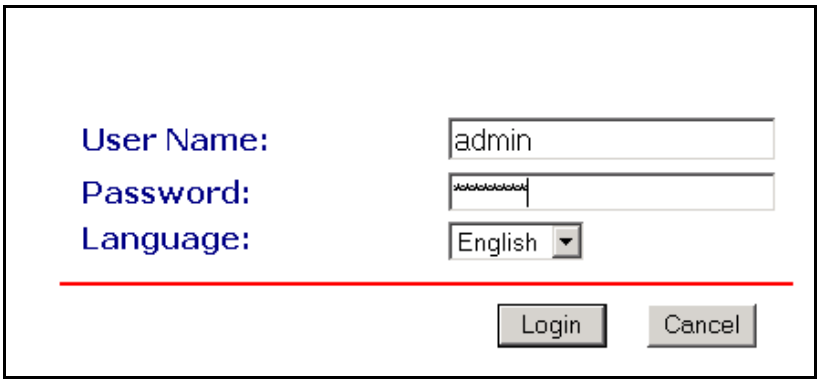
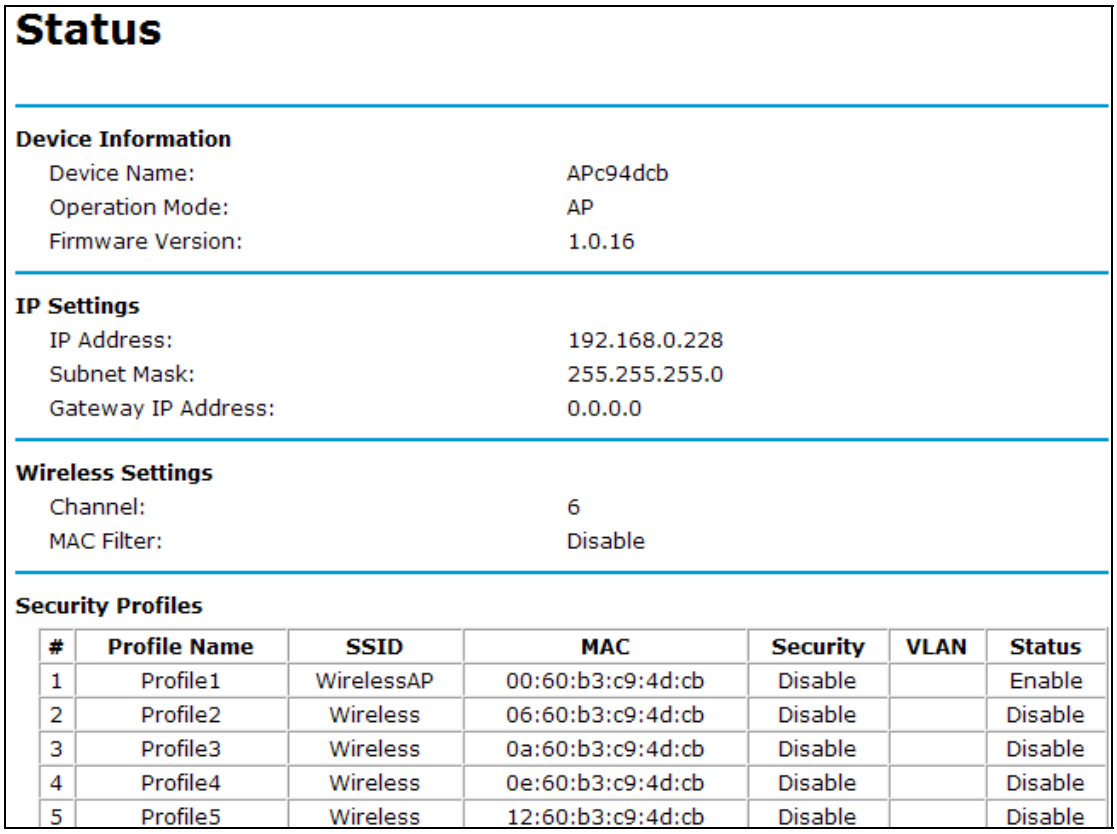


Figure 2 login

2. Enter default Password (password), Click Login. The home page will show up.



Status

Device Information

Device Name:	APc94dcb
Operation Mode:	AP
Firmware Version:	1.0.16

IP Settings

IP Address:	192.168.0.228
Subnet Mask:	255.255.255.0
Gateway IP Address:	0.0.0.0

Wireless Settings

Channel:	6
MAC Filter:	Disable

Security Profiles

#	Profile Name	SSID	MAC	Security	VLAN	Status
1	Profile1	WirelessAP	00:60:b3:c9:4d:cb	Disable		Enable
2	Profile2	Wireless	06:60:b3:c9:4d:cb	Disable		Disable
3	Profile3	Wireless	0a:60:b3:c9:4d:cb	Disable		Disable
4	Profile4	Wireless	0e:60:b3:c9:4d:cb	Disable		Disable
5	Profile5	Wireless	12:60:b3:c9:4d:cb	Disable		Disable

Figure 3 Status Page

System Setup

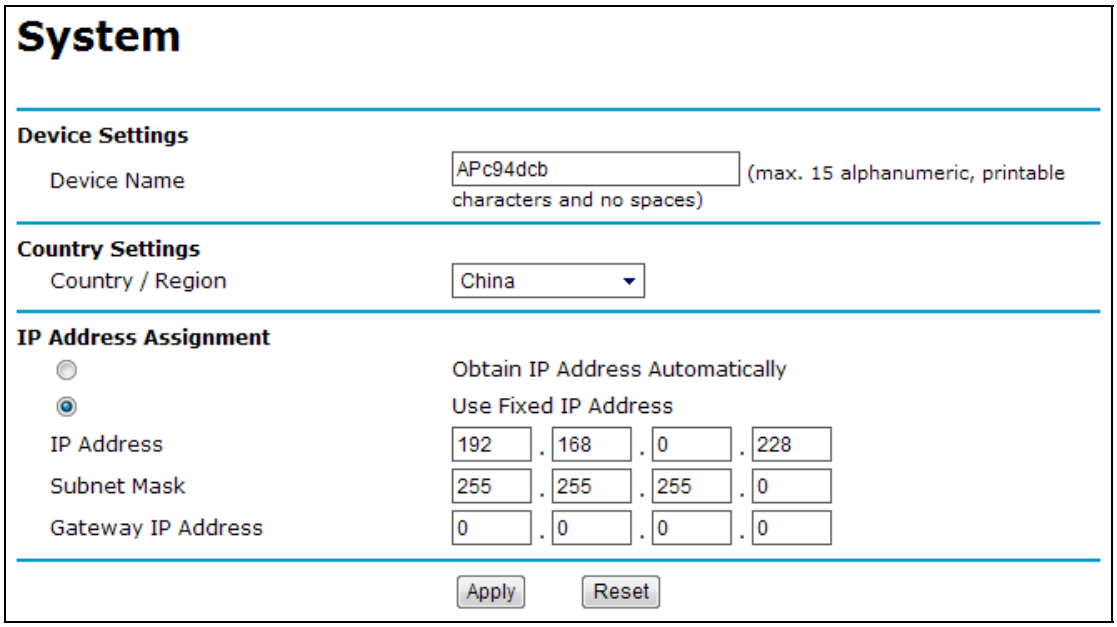


Figure 4 System Setup

- **Device Name**

  This is the NetBIOS name of Access Point; you may modify the default name with a unique name up to 15 characters long including numbers from 0 to 9, letters (A-Z; a-z) and digraphs (-), the name supports WINS so you can ping Access Point using *ping Access Point Name* or use web browser to open web utility by inputting Access Point Name in the IE address.

- **Country/Region**

  Select your country or region from the drop-down list. This field displays countries/regions of operation which might be not legal in other countries/regions.

- **IP Address**

  There two IP type:

  - Use Fixed IP Address: You should manually configure IP address, subnet mask, gateway
  - Obtain IP Address Automatically: AP can get IP settings from DHCP Server.

Wireless Settings

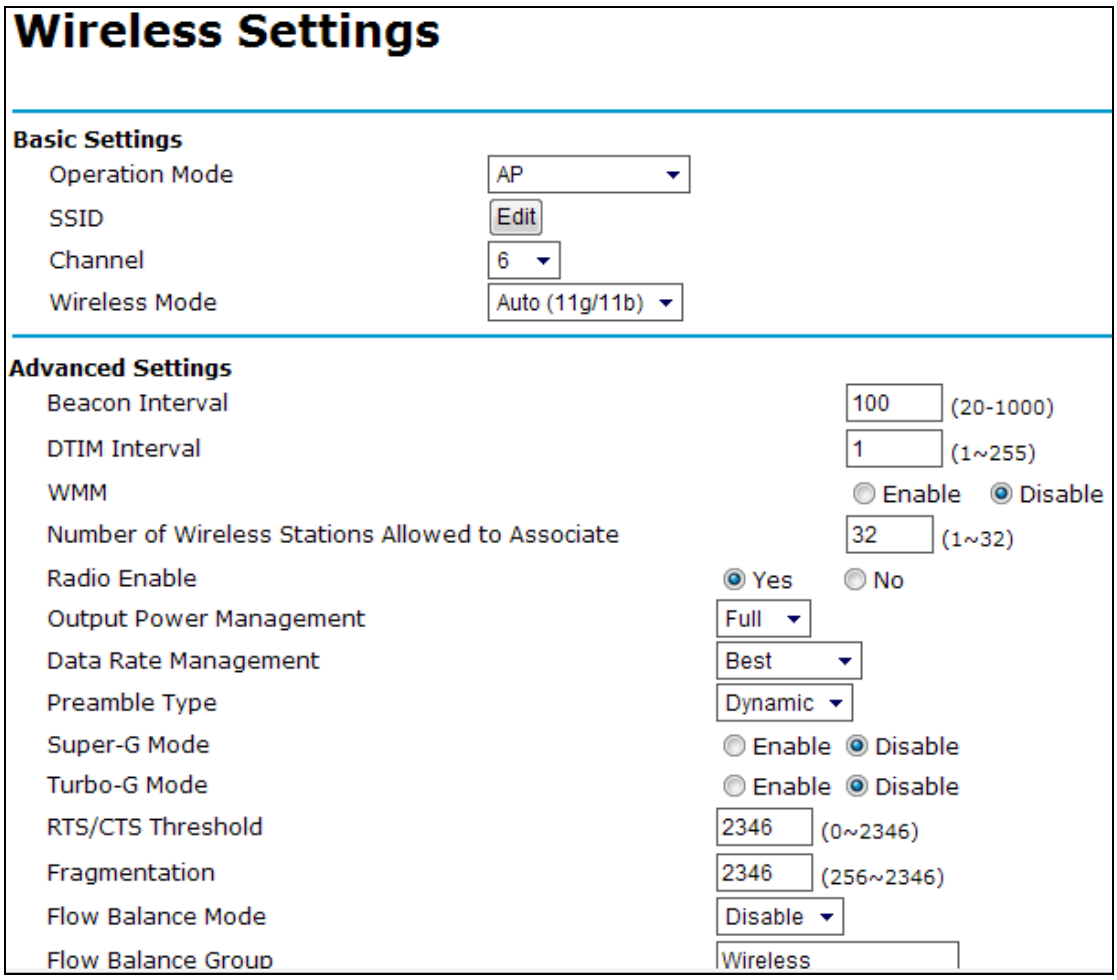


Figure 5 Wireless Settings

- **Operating Mode**
  - AP: This mode is used to build cover with wireless network which allowing wireless device connection.
  - Bridge: This mode is used to build point to point and point to multi point network which allowing other wireless bridge connection by wireless.
  - AP + Reporter: This mode allows both cover with wireless network and wireless bridge connection by wireless.
  - AP Client: This mode is used to connect with an AP.
- **Channel/Frequency**

  Select the channel that you plan to use.
- **Wireless Mode**

- 802.11g Only: Setup 802.11g network and only 802.11g STA could connect up it.
- 802.11b Only: Setup 802.11b network and only 802.11g/b STA could connect up it.
- Auto(11g and 11b):Setup 802.11g/b network and only 802.11g/b STA could connect up it.

- **Beacon Interval**

  Specifies the interval time (20 ~1000ms) for each beacon transmission.

- **DTIM Interval**

  The Delivery Traffic Indication Message, Specifies the data beacon rate between 1 and 255.

- **WMM Support**

  Enable this option can ensure the throughput of the voice and video data stream.

- **Number of Wireless Stations Allowed to Associate**

  This feature could control STA connection. While the number is more than the max value, it will stop STA connecting.

- **Radio Enable**

  When disable radio, device will stop sending beacon.

- **Output Power Management**

  Adjust the transmit power of the Access Point. The more the Output Power the more area of the wireless signal can reach

- **Data Rate Management**

  To set device's send data rate, the default value is Best. The available transmit data rate of the wireless network. You also can choose lower data rate in order to transmit data in longer distance.

- **Preamble Type**

  A long preamble ensures compatibility between the access point and all early Wireless LAN Adapters. And Auto include Short and Long preamble.

- **Super-G Mode**

  Super-G mode provides higher speed transmissions than regular IEEE 802.11g. The other device must also support Super mode in order for the device to use it for the wireless connection. This is available when you select a Wireless Mode that includes IEEE 802.11g.

- **Turbo-G Mode**

Turbo-G mode provides higher speed transmissions than Super-G mode.

- **RTS/CTS Threshold**

Request to Send Threshold. Its value is from 0 to 2346 bytes, RTS is designed to solve Network collision. It will make signals lose if two stations send data to AP at the same time. When the transmitted data size is larger than RTS threshold, the RTS mechanism will be active. The transmitting station sends out an RTS packet to the receiving station, and waits for the receiving station to send back a CTS (Clear to Send) packet before sending the actual packet data. The other station which have listen the CTS will waits for a time before send data. The default value is 2346 and not active. If set it to zero, this function will be active always.

- **Fragmentation**

This is the maximum packet size used for fragmentation and can only be set as even number. Packets larger than the size programmed in this field will be fragmented. The little packet data can reduce loses and raises the quality of transmission.

Notice:

The Fragment Threshold value should be larger than the RTS Threshold value or the RTS Threshold is zero, otherwise the RTS function will not work.

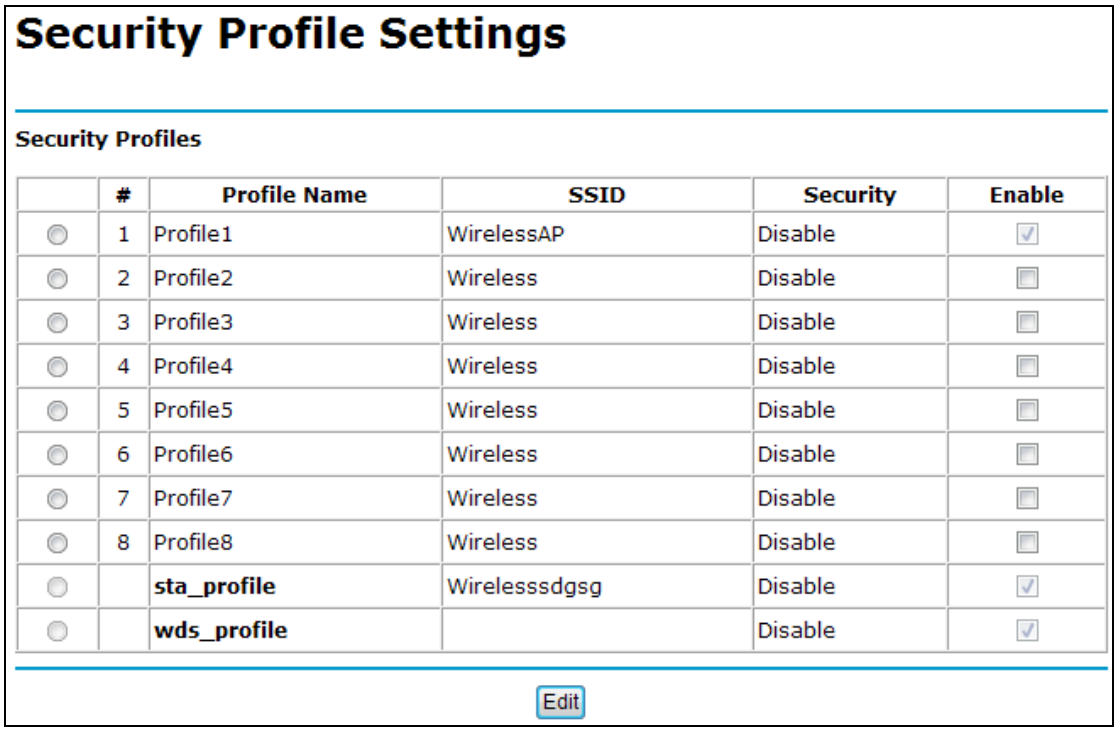
- **Load Balance**

There are two modes: User and Flux. In order to enhance performance, some devices could be united in one group with the same group name via a hub or switch. Several AP use the same ESSID and Encryption. When many users access the Internet, these devices can give a balance state.

Chapter 5 Advanced Configuration

VAP(Virtual AP) Setup

One device could be used to eight devices. So you could easy setup your network and manage different users. And the eight VAP could set different security to protect your network.



Security Profile Settings

Security Profiles

	#	Profile Name	SSID	Security	Enable
	1	Profile1	WirelessAP	Disable	☑
	2	Profile2	Wireless	Disable	☐
	3	Profile3	Wireless	Disable	☐
	4	Profile4	Wireless	Disable	☐
	5	Profile5	Wireless	Disable	☐
	6	Profile6	Wireless	Disable	☐
	7	Profile7	Wireless	Disable	☐
	8	Profile8	Wireless	Disable	☐
		sta_profile	Wirelesssdgsg	Disable	☑
		wds_profile		Disable	☑

Edit

Figure 6 VAP Settings

You could select one profile to edit as follow:

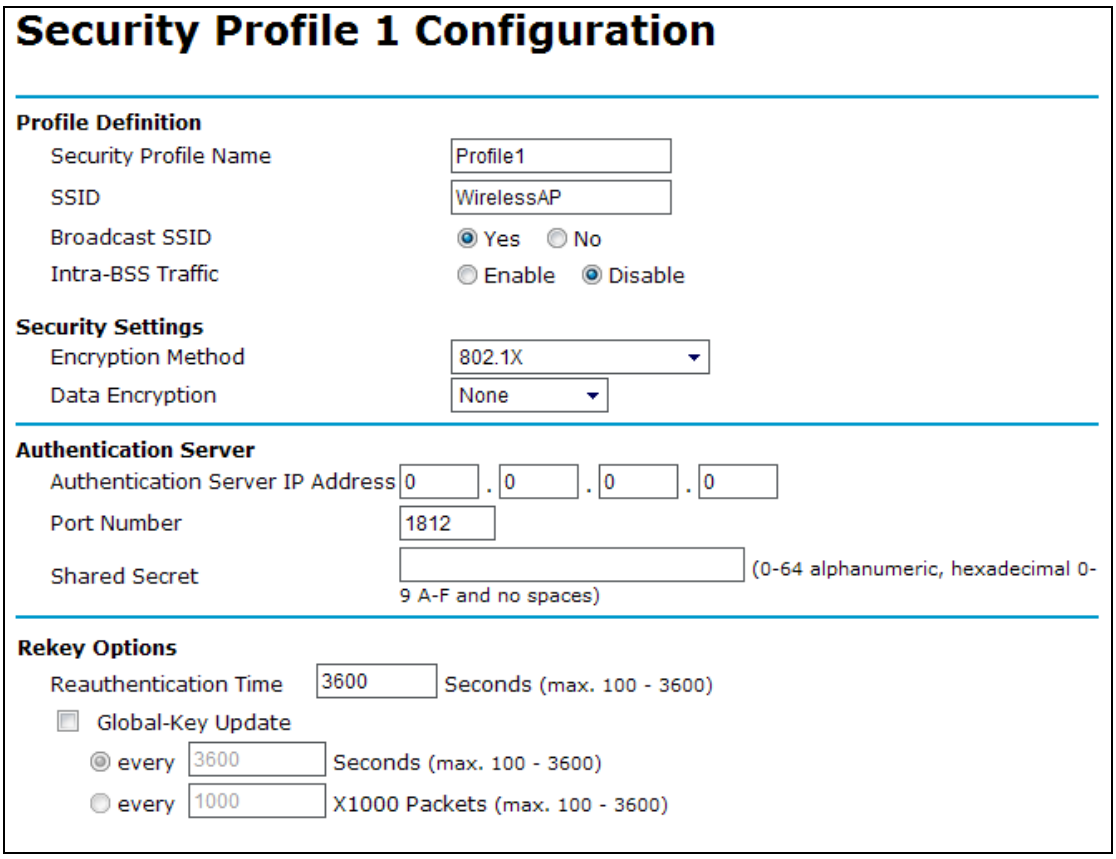


Figure 7 Security Set

- **Security Profile Name**

  You could use a friendly name to manage different VAP.

- **SSID**

  The SSID is a unique ID used by Access Points and Stations to identify a wireless LAN. Wireless clients associating to any Access Point must have the same SSID. The default ESSID is "**Wireless**". The ESSID can up to 32 characters

- **Broadcast SSID**

  If you hide the SSID, then the device cannot be seen when a wireless client scans for local APs. The trade-off for the extra security of "hiding" the device may be inconvenience for some valid WLAN clients.

- **Wireless Client Security Separation**

  Wireless Client Security Separation could stop the connected STA communicating with each other.

- **Encryption Method**

Choose the following type.

- WEP
  1. Open System: wireless device does not any authentication and can be connected with Access point. But the message between wireless device and Access point also use encryption through the following type “authentication type”.
  2. Shared Key: If Shared Key is selected, you need to enabled WEP and enter at least one shared key. “Shared Key” authentication type is working cooperate with “data encryption type”. The specify key of WEP encryption configure not only be encrypted the message between wireless device and Access point ,but also it will be use validated the wireless Access point ,when wireless device attempt to connected with Access point .
- 802.1x: IEEE 802.1x is a standard for network access control (port based), which was introduced especially for distributing encryption keys in a wireless network. The Access Point supports 802.1x for keeping out unauthorized users and for verifying the credentials of users with RADIUS so that authorized users can access the network and services. To use 802.1x, you will need at least one common Extensible Authentication Protocol (EAP) method on your authentication server, Access Points (authenticator) and stations (supplicant). 802.1x is also used to perform generation and distribution of encryption keys with enabling Data Encryption as WEP from AP to the station as part of or after the authentication process.
- WPA, WPA2 WPA & WPA2: In cooperation with RADIUS, systems with WPA-EAP will be used with a new encryption method called Temporal Key Integrity Protocol (TKIP) implementation with 802.1x dynamic key exchange.
- WPA-PSK, WPA2-PSK, WPA-PSK & WPA2-PSK: Instead of using RADIUS for authentication, systems with WPA-PSK will be configured with a secret password phrase. Enter your password phrase and press “Generate”. You can now create a pre-shared key in the Access Point and copy the characters you input to the station's WPA-PSK entry. A shared secret is only secure as long as no third party knows about it.

Notice:

You must configure RADIUS Server Settings with either Legacy 802.1x, WPA or WPA2 option.

- **Authentication Server**

  This configuration is required for authentication using RADIUS. IP Address, Port No. and Shared Secret is required for communication with RADIUS Server.

  - IP Address: IP address of the RADIUS Server. The default is 0.0.0.0
  - Port Number: Port number of the RADIUS Server. The default is 1812.
  - Shared Secret: This is shared between the Wireless Access Point and the RADIUS Server while authenticating the supplicant.

Bridge Mode Setup

In Wireless Settings page, you could set operation mode to bridge. And you should input remote MAC address to setup WDS link.

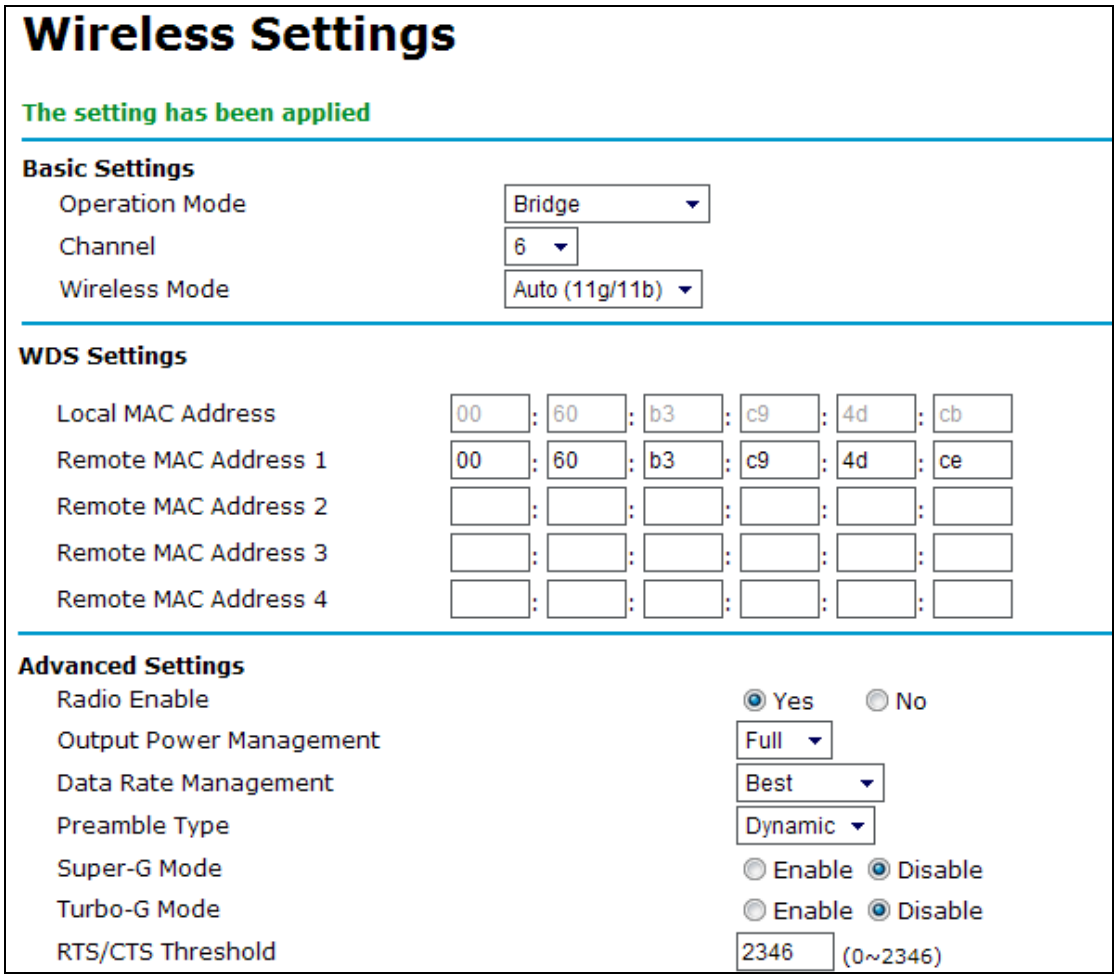


Figure 8 Bridge Mode Setup

In Security Profile page, you could select WDS_Profile to edit. And set the encryption between the devices.

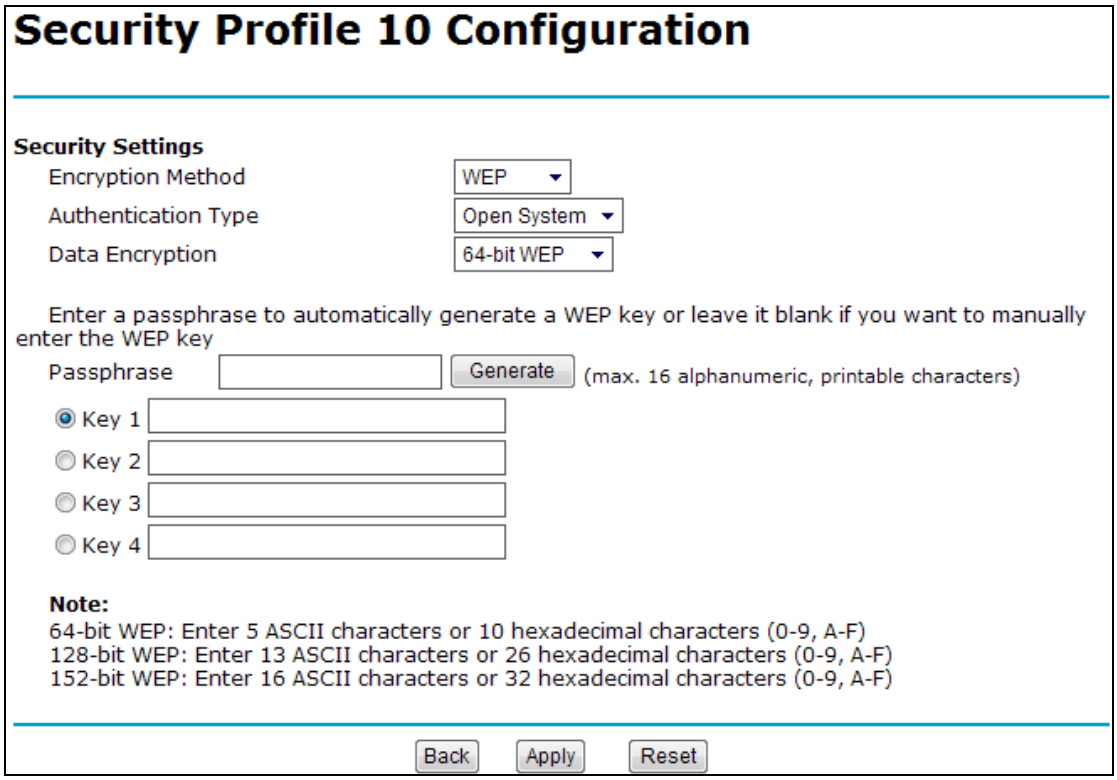


Figure 9 Security Set in Bridge Mode

AP Client Mode Setup

In Wireless Settings page, you could set operation mode to AP Client mode. And you should input the SSID to connect with AP.

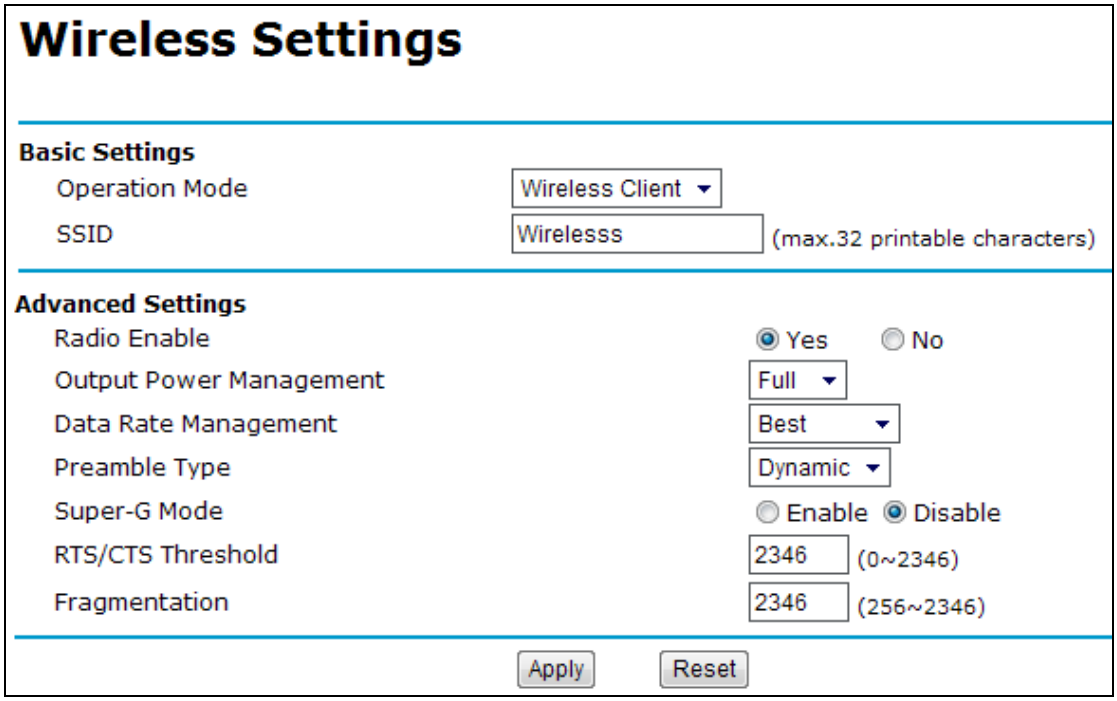


Figure 10 AP Client Mode Setup

In Security Profile page, you could select STA_Profile to edit. And set the encryption between the devices.

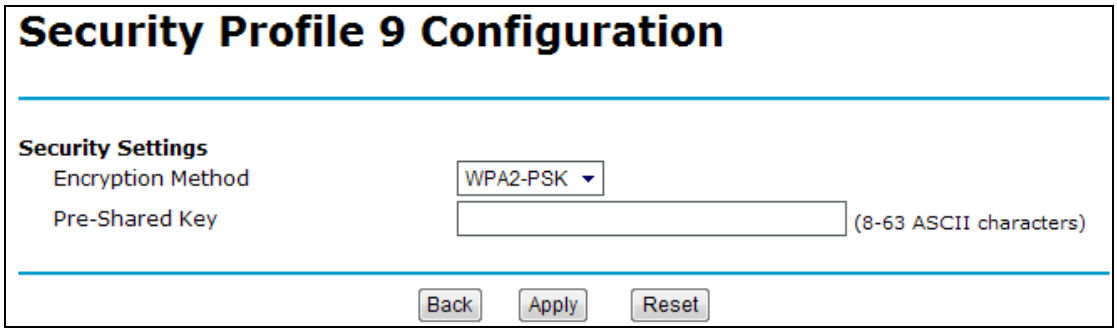


Figure 11 Security Set in AP Client Mode

802.1Q VLAN Setup

In AP mode, you could enable 802.1Q VLAN to manage users.

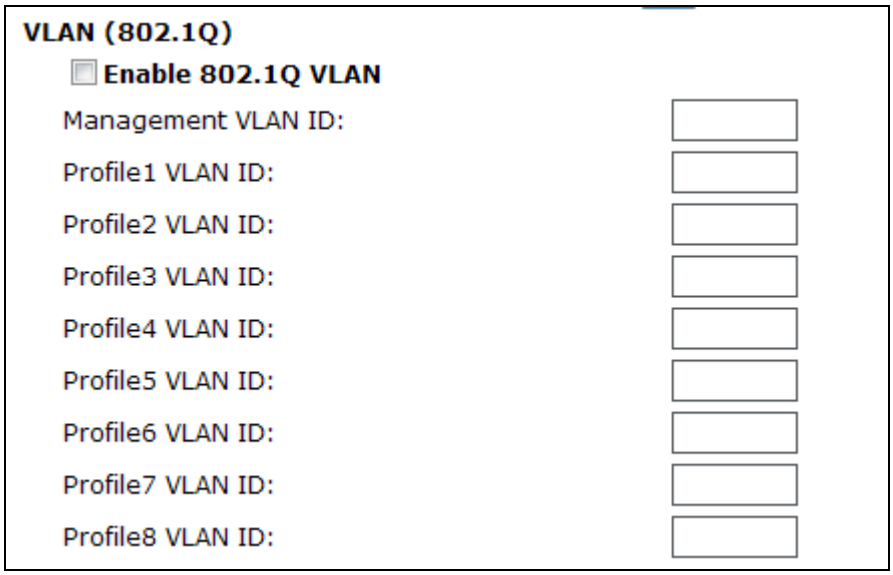


Figure 12 802.1Q VLAN

- **Management VLAN ID**

  Management VLAN ID is used to manage device and monitor the network.

- **Profile VLAN ID**

  Profile VLAN ID is used to manage VLAN. You could set ID 1~4049.

MAC Filter

The optional MAC Filter window lets you block the network access privilege of the specified stations through the Access Point. This provides an additional layer of security. There are two kinds of MAC Filter.

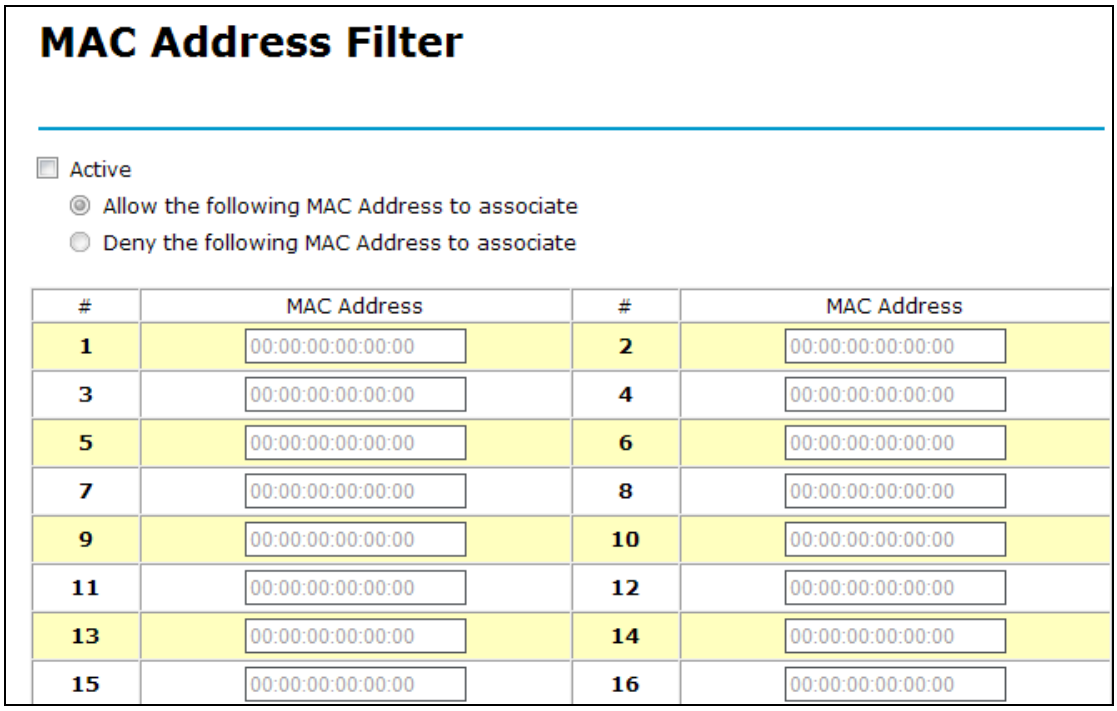


Figure 13 MAC Filter

You could enable MAC Filter and input the allowed or denied STA's MAC.

Throughput Accelerate

There are two ways to accelerate throughput in our Access Points: Super-G and Turbo-G.

- **Super-G Application**

If open Super-G Function, it can obviously improve the throughput of wireless network. The following table gives you a reference.

Diagram 3 Super-G Reference Throughput

Mode	Super-G OFF	Super-G ON
AP mode	20Mbps	26Mbps
Bridge mode	20Mbps	27Mbps
AP Client mode	20Mbps	26Mbps

Notice:

AP and client support Super-G.

- **Turbo-G**

  The following table gives you a reference.

  Diagram 4 Turbo-G Reference Throughput

Mode	Turbo-G OFF	Turbo-G ON
AP mode	20Mbps	30Mbps

Notice:

AP and client support Turbo-G.

Chapter 6 Management

View Device's Status

Status

Device Information

Device Name:	APc94dcb
Operation Mode:	AP
Firmware Version:	1.0.16

IP Settings

IP Address:	192.168.0.228
Subnet Mask:	255.255.255.0
Gateway IP Address:	0.0.0.0

Wireless Settings

Channel:	6
MAC Filter:	Disable

Security Profiles

#	Profile Name	SSID	MAC	Security	VLAN	Status
1	Profile1	WirelessAP	00:60:b3:c9:4d:cb	Disable		Enable
2	Profile2	Wireless	06:60:b3:c9:4d:cb	Disable		Disable
3	Profile3	Wireless	0a:60:b3:c9:4d:cb	Disable		Disable
4	Profile4	Wireless	0e:60:b3:c9:4d:cb	Disable		Disable
5	Profile5	Wireless	12:60:b3:c9:4d:cb	Disable		Disable

Figure 14 Status

The Status page displays current settings and statistics of your Access Point that is Read-only, and any change of settings must be made on other pages.

View Association List

Association list

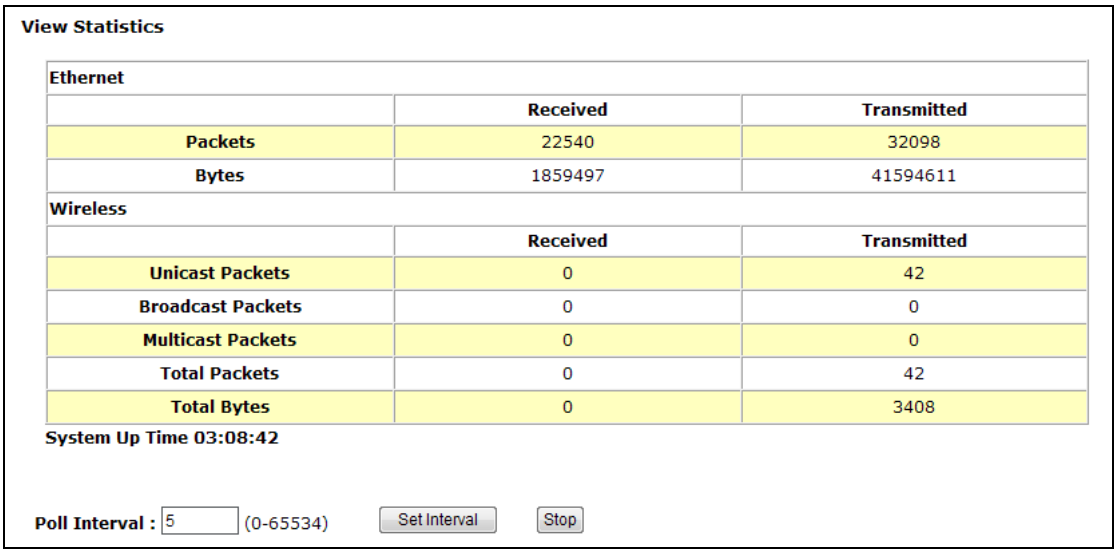
#	MAC Address	IP Address	Signal Strength	Status
1	00:16:6f:06:b7:ae	169.254.119.229	68%	Associated

Rescan

Figure 15 Association List

In Status page, click **View Association List** to show the wireless stations that are currently associated to the device.

View Statistics



View Statistics

Ethernet		
	Received	Transmitted
Packets	22540	32098
Bytes	1859497	41594611
Wireless		
	Received	Transmitted
Unicast Packets	0	42
Broadcast Packets	0	0
Multicast Packets	0	0
Total Packets	0	42
Total Bytes	0	3408

System Up Time 03:08:42

Poll Interval : 5 (0-65534) Set Interval Stop

Figure 16 Statistics Info

In Status page, click **View Statistics** to see performance statistics such as number of packets sent and number of packets received.

Change Password

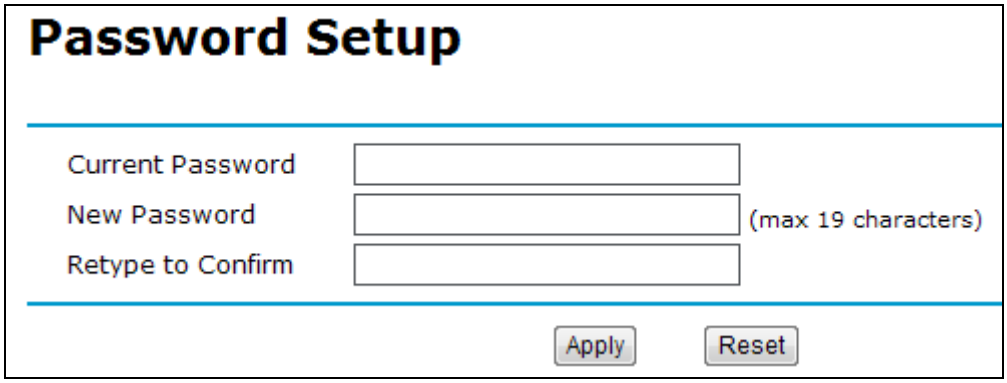


Figure 17 Change Password

In Password Setup page, you could change the password for accessing the Settings pages.

Firmware Upload

In F/W Upload page, you could upgrade Access Point software.

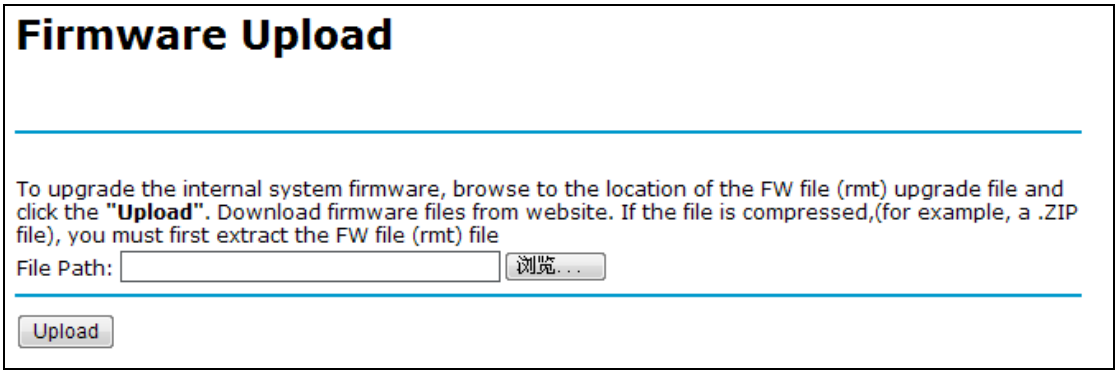


Figure 18 Firmware Upload

1. Open Upgrade Firmware page
2. Click browser button and select the firmware file in local hard disk.
3. Click Upload button.
4. After upgrade, login again and check the software version.

Warning:

Do not try to turn off the Access Point, shutdown the computer or do anything else to the Access Point until the Access Point finishes restarting!

Configuration File

There are two kinds way to backup or restore Access Point.

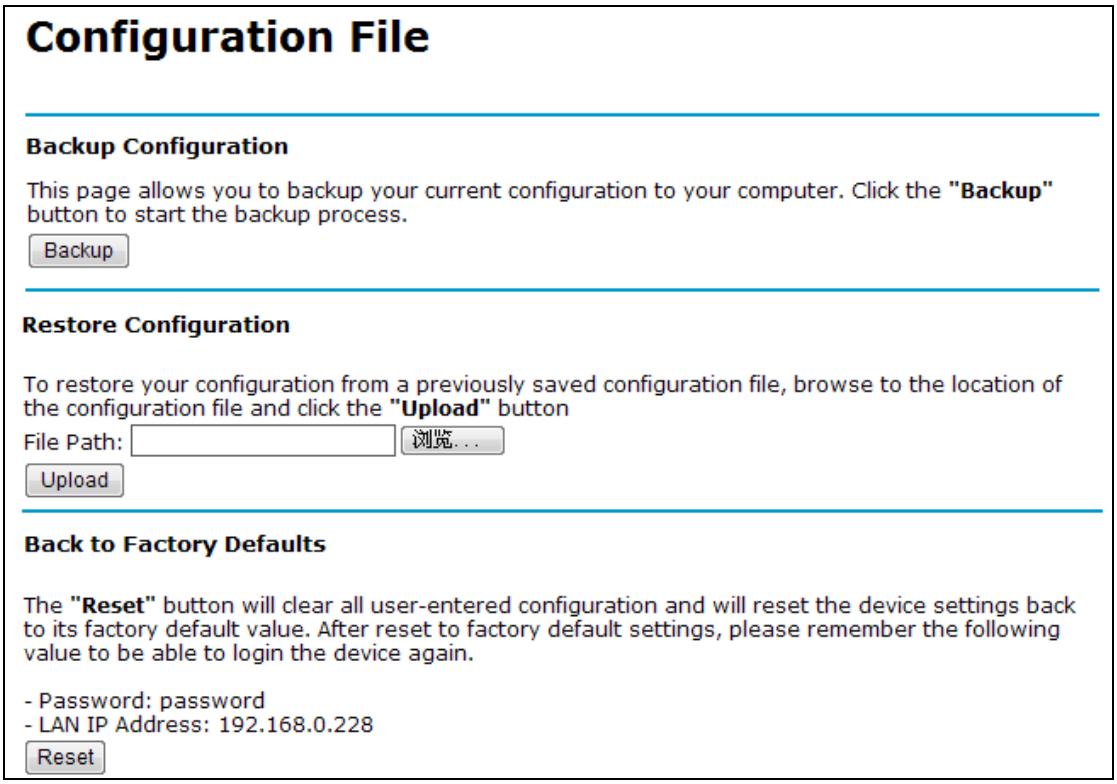


Figure 19 Configuration File

Click button to save backup file to hard disk.

Click Browser button to locate the backup file you want to retrieve and click retrieve button, then the AP will restart.

Notice:

Do not try to turn off the Access Point, shutdown the computer or do anything else to the Access Point until the Access Point finishes restarting!

Restore to Factory

There are two kinds way to restore Access Point to factory.

- **Software Default**

  Open Configuration File page, click Reset button then the AP will restart to factory.

- **Hardware Default Button**

  Press the Reset button about five seconds when AP works.

Management Control

Management Control function lets you allow or deny the specified IP address to manage the device.

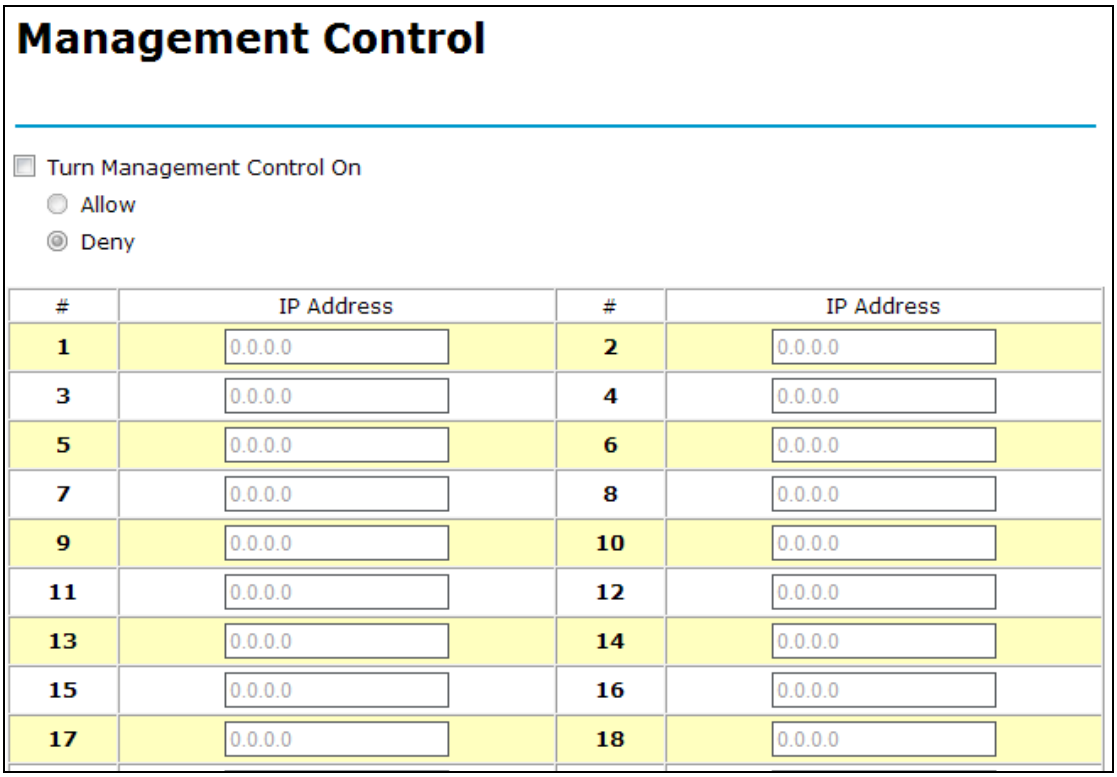


Figure 20 Management Control

Reboot AP

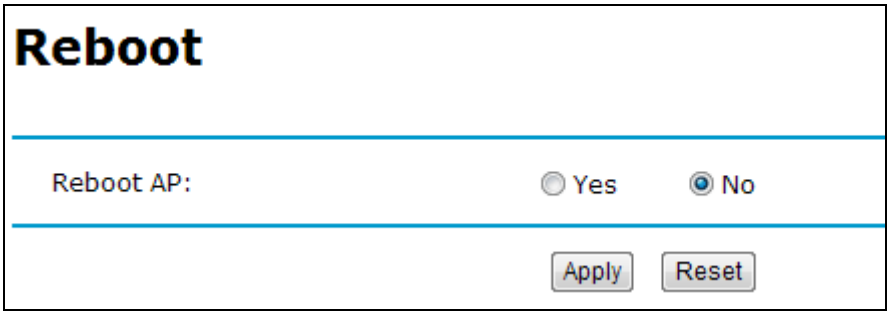


Figure 21 Reboot AP

You may select Yes on Reboot page and then click on Apply button to reboot the access point.

Remote Management

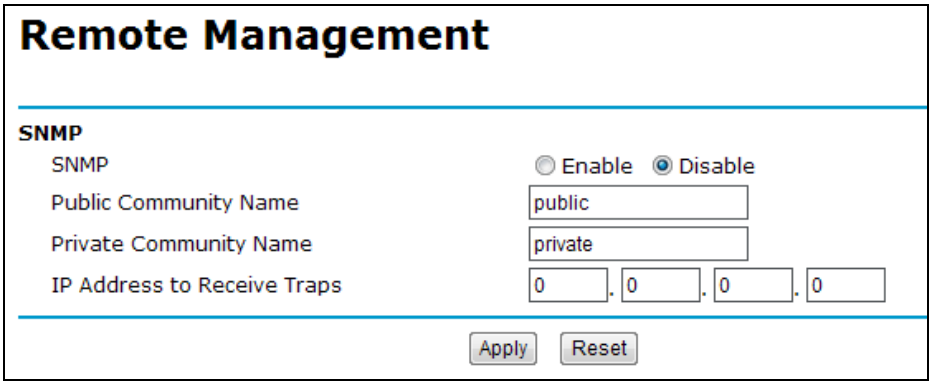


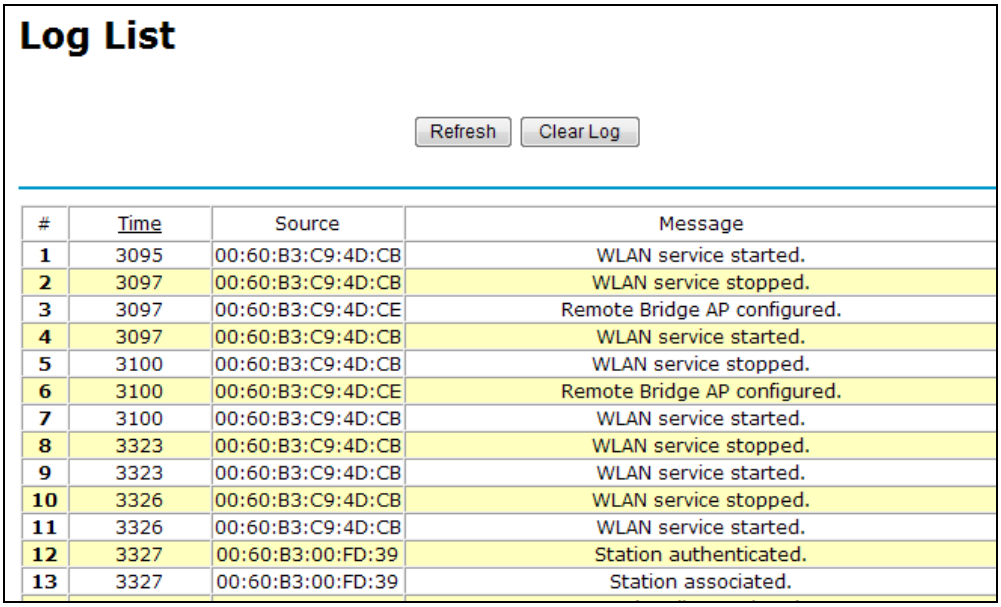
Figure 22 Remote Management

SNMP Settings.

- IP Address to Receive Traps: You can find the unusual log on the Trap Server.
- Public Community Name: Set the Read Community;
- Private Community Name: Set the write Community;

View Log

You could check system log to view the operations between AP and STA.



#	Time	Source	Message
1	3095	00:60:B3:C9:4D:CB	WLAN service started.
2	3097	00:60:B3:C9:4D:CB	WLAN service stopped.
3	3097	00:60:B3:C9:4D:CE	Remote Bridge AP configured.
4	3097	00:60:B3:C9:4D:CB	WLAN service started.
5	3100	00:60:B3:C9:4D:CB	WLAN service stopped.
6	3100	00:60:B3:C9:4D:CE	Remote Bridge AP configured.
7	3100	00:60:B3:C9:4D:CB	WLAN service started.
8	3323	00:60:B3:C9:4D:CB	WLAN service stopped.
9	3323	00:60:B3:C9:4D:CB	WLAN service started.
10	3326	00:60:B3:C9:4D:CB	WLAN service stopped.
11	3326	00:60:B3:C9:4D:CB	WLAN service started.
12	3327	00:60:B3:00:FD:39	Station authenticated.
13	3327	00:60:B3:00:FD:39	Station associated.

Figure 23 Log

Chapter 7 Typical Applications

Wireless Coverage

In the AP mode, it can be set as wireless coverage spot.

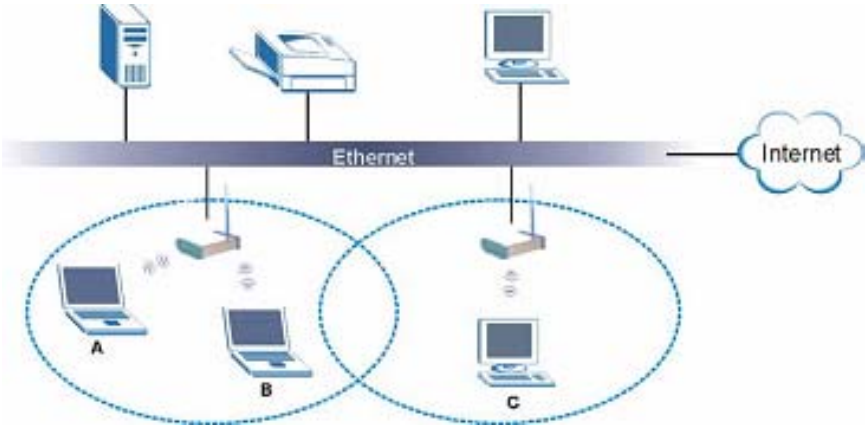


Figure 24 Wireless Coverage Application

STA-A/B/C connect AP by SSID, and then they can access PC in Ethernet and internet.

Do steps as following:

1. Set Operation Mode as AP mode in Wireless Settings page. If you want to be compatibility with 802.11b device, you should set Wireless Mode as Auto.
2. Open Security Profile page, you could enable profile 1~8 and 802.1Q VLAN
3. Select a profile to edit, and set basic parameters as SSID, Security, etc. If you want to use 802.1x, you should set Radius.
4. STA use the same authentication to connect with AP, and then STA could access Internet, mobile office freely.

Wireless Bridge

The wireless bridge between two places is one application condition, here we will introduce you how to build such network quickly.

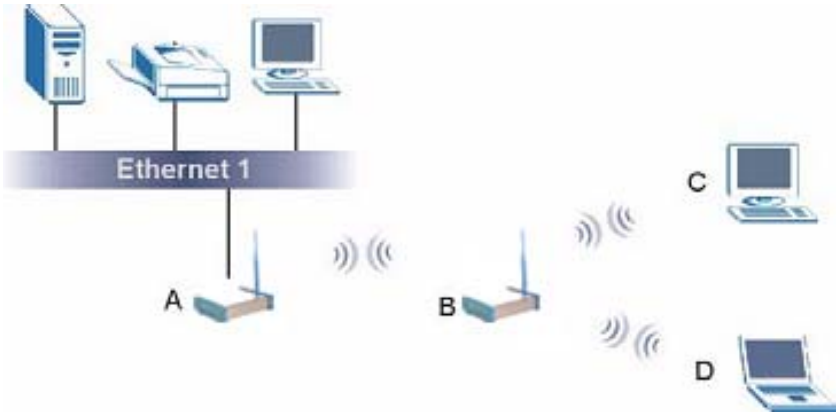


Figure 25 Point to Multi-Point Application

Access Points builds connection by WDS (Wireless Distribution System) mode. The main setting is remote MAC address. The following steps are the way.

1. After power on two Access Points, use two computers to connect each of them by network cable.
2. Set Operation Mode as Bridge mode in Wireless Settings page, add MAC address of remote wireless bridge and set the real Wireless Space.
3. Now the two Access Points have normally worked. You can change settings account to your need. The detail about changing settings is in above chapter.
4. .You could check the link in View Association List page.

Chapter 8 Troubleshooting

How to know the MAC address of the Access Point?

- The MAC address is written in a label which is in the bottom of Access Point.
- From the General page of WEB configuration, you also can get the MAC address of AP.

Why STA can't connect with AP?

The process of STA connects with AP need probe request, auth, connect steps, so you could do:

- STA can't detect AP. So you could check the domain or country, to keep AP and STA use the same one.
- STA and AP use different authentication and keys.
- To check the other AP exists or not. If it exists, you may try to turn it off or move other place.
- To check other devices exists or not, such as microwave oven. If it exists, you may try to turn it off or move other place.
- STA can't be compatibility with AP. STA may not pass Wi-Fi authentication.

Why the throughput is not high?

You should adjust antenna to get highest signal strengthens. If can not get higher signal strengthens, please check the following steps:

- Wireless Channel/Frequency. Try to change other channel.
- Wireless disturbance. Check whether there are other wireless equipments nearby AP; make sure they do not disturb AP.
- To check if the antenna becomes flexible.
- To check signal strength. If the signal strength is very low, you may check the antenna or the device aging.
- To check the STA, and its output power may be low.

Why two Access Points can not build connection after setting?

- Check the “Operating Mode” whether is “Bridge Mode”.
- Check the “remote MAC address” whether is right.
- Check the “Country/Region” whether is same.
- Check the “Channel/Frequency” whether is same.
- Check the “Data Encryption” and “Key” whether is same.

The wireless becomes unstable such as ping timed out and lose packet after a period of well work?

This situation may the wireless network is disturbed by something, what you can do is following steps:

- check whether every joint point of network is well（such as Ethernet port，antenna connection）
- Change the channel if the Link Test value is not high，excluding other wireless equipments disturb AP.
- Restart AP.
- Default AP and restore last settings.
- Check the wireless port and Ethernet port environment and virus exist or not.

Please call the sales if can not solve problem after all.

Why can not open WEB page of remote wireless bridge in local network?

Because this kind of settings will slow the response of remote AP WEB Server, just waiting for several minutes or restarting remote wireless bridge is a way to solve problem. We suggest you set AP in local wired Ethernet network.

Appendix A. Specifications

Diagram 5 Device Specification

ZG-7600H IEEE 802.11g 54Mbps Wireless Access Point

	Designing to IEEE 802.11g WLAN network that works at 2.4 GHz Direct Sequence Spread Spectrum (DSSS), ZDC ZG-7600H, a 4-in-1 WLAN Access Point, can be operated in one of the following 4 modes, except general access point, also include AP client, repeater and point to point bridge. With data rate of up to 108Mbps, ZG-7600H is capable of delivering large files and streams MPEG video. It is ideal WLAN application in home or small office environment. With latest WPA2 and 802.11i standard, ZG-7600H has much higher level of security to connect to your network With ZG-7600H,users can have productive and freedom of wireless mobility in home , office and public environment **●200mW Output Power** **●Accord with ROHS** **●Three color options：Red、Black、Blue** **●Support power over Ethernet （802.3af）** **● Multi-operating mode options ：AP/Bridge/WDS/AP Client** **●Provide the highest available level of WEP / WPA / WPA2 / 802.1X and Limitation of client connections to enhance security.** **● Support the function of QoS (WMM) / Multi-BSSID / VLAN / Load Balance of Multi AP** **●Support Super G / Turbo G**
System	
Description	**54M 11g Wireless Access Point**

Standard	**IEEE 802.11g IEEE 802.11b** **IEEE 802.3 and IEEE 802.3u** **IEEE 802.3af**
POE	**Yes, IEEE802.3af**
Ethernet Data Rate	**Auto / 10M / 100M**
Rate Select	**SuperG/11g:** **108 /54 /48 /36 /24 /18 /12 /9 /6 Mbps Auto** **11b:** **11 /5.5 /2 /1 Mbps Auto**
Data modulation type	**OFDM/BPSK/QPSK/CCK/PBCC/DQPSK/DBPSK**
Output Power (from MiniPCI)	**11g:21+/-1dBm @54Mbps** **11b:23+/-1dBm @11Mbps**
Sensitivity	**11g：** **11b:** **54M : ≤-72dBm** **11M : ≤-87dBm** **48M : ≤-75dBm** **5.5M: ≤-88dBm** **36M : ≤-78dBm** **2M : ≤-90dBm** **24M : ≤-82dBm** **1M : ≤-92dBm** **18M : ≤-84dBm** **12M : ≤-86dBm** **9M : ≤-88dBm** **6M : ≤-90dBm**
Antenna	**1 external detachable 5dBi dipole antenna with R-SMA connector**
RF frequency range	**Europe: 2.412GHz~2.472GHz** **America: 2.412GHz~2.462GHz** **Japan: 2.412GHz~2.484GHz**
Feature	
AP Mode	**Yes**
Bridge Mode	**Point-to-Point, Point-to-Multipoint**

WDS Mode	**AP + Repeater**
AP Client Mode	**Yes, Support Multiple Client**
DHCP	**DHCP Client**
Super G	**Yes**
Turbo G	**Yes**
QoS (WMM)	**Yes**
Multi-BSSID	**Yes**
VLAN	**Yes**
Output power configurable	**Yes (4 levels)**
System log	**Yes**
STA list	**Yes**
Radio ON/OFF	**Yes**
Load Balance of Multi AP	**Yes**
Security	
WEP Encryption	**64/128/152-bits**
802.1x	**EAP-TLS, EAP-TTLS, EAP-PEAP**
WPA	**Yes**
WPA2	**Yes**
MAC address filtering through	**Yes**
Limitation of client connections	**Yes**
Wireless Client Separator	**Yes**
Management	
Web Management	**Yes**
Telnet	**Yes**
Backup Settings	**Web/FTP**
SNMP	**Yes**
Interface	
LAN	**One 10/100-BaseTX RJ-45 Ethernet Port**
Default Button	**Yes**

LED	**Power / LAN / WLAN**
Power Supply	**12V/1.25A**
Physical	
Dimension	**142mm(L)*134mm(W)*46mm(H)**
Weight	**Approx: 0.9Kg**
Environment	
Operating Temperature	**0～55℃**
Storage Temperature	**－30～60℃**
Humidity	**20～95％**

Appendix B. ASCII Character Chart

You can dispose hexadecimal number system counting or ACSII one yard of keys encrypted as WEP. Hexadecimal number system is made up by 0-9 and A-F (letter does not distinguish capital and small letter); ACSII yard is by 0-9 figures, A-F, a-f (letter distinguishes capital and small letter), and the punctuation mark makes up. Each ACSII yard can is it says to count by one hexadecimal number system of two. One-one ASCII yard of all and hexadecimal number system are counted to make forms and list all.

Diagram 6 ASCII

ASCII Character	Hex Equivalent	ASCII Character	Hex Equivalent	ASCII Character	Hex Equivalent	ASCII Character	Hex Equivalent
!	21	9	39	Q	51	i	69
"	22	:	3A	R	52	j	6A
#	23	;	3B	S	53	k	6B
$	24	<	3C	T	54	l	6C
%	25	=	3D	U	55	m	6D
&	26	>	3E	V	56	n	6E
‘	27	?	3F	W	57	o	6F
(	28	@	40	X	58	p	70
)	29	A	41	Y	59	q	71
*	2A	B	42	Z	5A	r	72
+	2B	C	43	[	5B	s	73
,	2C	D	44	\	5C	t	74
-	2D	E	45	]	5D	u	75
.	2E	F	46	^	5E	v	76
/	2F	G	47	_	5F	w	77
0	30	H	48	`	60	x	78
1	31	I	49	a	61	y	79
2	32	J	4A	b	62	z	7A
3	33	K	4B	c	63	{	7B
4	34	L	4C	d	64	|	7C
5	35	M	4D	e	65	}	7D
6	36	N	4E	f	66	~	7E
7	37	O	4F	g	67		
8	38	P	50	h	68		

Appendix C. Country/Region and Channel

Diagram 7 Country/Region frequency list

Country/Region	5.8G Frequency(MHz)	2.4G Frequency(MHz)
Australia	36-64,149-165	1-13
Austria	36-48	1-13
Canada	36-64,149-165	1-11
China	149-165	1-13
Denmark	36-64,100-140	1-13
Finland	36-64,100-140	1-13
France	36-64	1-13
Germany	36-64,100-140	1-13
Hong Kong	36-64,149-165	1-13
Iceland	36-64,100-140	1-13
Ireland	36-64,100-140	1-13
Italy	36-64,100-140	1-13
Japan	34-46	11g: 1-13 / 11b: 1-14
Liechtenstein	36-64	1-13
Luxemburg	36-64,100-140	1-13
Netherlands	36-64,100-140	1-13
New Zealand	36-64,149-165	1-13
Norway	36-64,100-140	1-13
Portugal	36-64,100-140	1-13
Singapore	36-64,149-165	1-13
Spain	36-64,100-140	1-13
Sweden	36-64,100-140	1-13
Switzerland	36-64	1-13
Taiwan	56-64,149-161	1-13
United Kingdom	36-64,100-140	1-13
United States	36-64,149-165	1-11

Diagram 8 Channel/Frequency List

5.8G Channel	Frequency(MHz)	2.4G Channel	Frequency(MHz)
34	5170	1	2412
36	5180	2	2417
38	5190	3	2422
40	5200	4	2427
42	5210	5	2432
44	5220	6	2437
46	5230	7	2442
48	5240	8	2447
52	5260	9	2452
56	5280	10	2457
60	5300	11	2462
64	5320	12	2467
100	5500	13	2472
104	5520	14	2484
108	5540		
112	5560		
116	5580		
120	5600		
124	5620		
128	5640		
132	5660		
136	5680		
140	5700		
149	5745		
153	5765		
157	5785		
161	5805		
165	5825		