廠牌: 益網科技股份有限公司
器材名稱: Industrial Dual Radio Multi-function Wireless Device
型號: WA4271

User's Manual

BEFORE INSTALLING THE UNIT, PLEASE READ THIS MANUAL THOROUGHLY, AND RETAIN IT FOR FUTURE REFERENCE.

User's Manual

Release 1.0

Table of Contents

Revision History

Release	Date	Revision
1.0	11/16/2010	A1

Caution

Circuit devices are sensitive to static electricity, which can damage their delicate electronics. Dry weather conditions or walking across a carpeted floor may cause you to acquire a static electrical charge.

To protect your device, always:

- **Touch the metal chassis of your computer to ground the static electrical charge before you pick up the circuit device.**
- **Pick up the device by holding it on the left and right edges only.**
- **The Web UI′s Main Menu links are used to navigate to other menus, and display configuration parameters and statistics with suggestive value 1024x768.**
- **If you need using outdoor device connects to this device with cable, then you need to add an arrester on the cable between outdoor device and this device.**

Electronic Emission Notices

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a class A computing device pursuant to Subpart B of part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in an industrial environment.

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.**

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.

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.

For operation within 5.15 ~ 5.25GHz frequency range, it is restricted to indoor environment.

IEEE 802.11b or 802.11g operation of this product in the U.S.A. is firmware-limited to channels 1 through 11.

IMPORTANT NOTE:
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 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

European Community (CE) Electromagnetic Compatibility Directive

This equipment has been tested and found to comply with the protection requirements of

European Emission Standard EN55022/EN61000-3 and the Generic European Immunity Standard EN55024.

EMI	**EN55022:1998+A1:2000+A2:2003,Class A**
	EN61000-3-2:2000
	EN61000-3-3:1995+A1:2001
EMS	**EN55024/1998+A1:2001+A2:2003**
	à IEC61000-4-2:2001
	à IEC61000-4-3:2002+A1:2002
	à IEC61000-4-4:1995+A1:2000+A2:2001
	à IEC61000-4-5:2001
	à IEC61000-4-6:2003
	à IEC61000-4-8:2001
	à IEC61000-4-11:2001

NCC 警語

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率

在5.25-5.35秭赫(GHz)頻帶內操作之無線資訊傳輸設備，限於室內使用。

About this user's manual

In this user's manual, it will not only tell you how to install and connect your network system but configure and monitor the Outdoor Wireless Access Point through the built-in web UI step-by-step. Many explanations in details of hardware and software functions are shown as well as the examples of the operation for web-based interface.

Overview of this user's manual

- **Chapter 1 'Introduction' describes the features of Outdoor Wireless Access Point**
- **Chapter 2 'Installation'**
- **Chapter 3 'Operation of Web-based Management'**

1. Introduction

1-1. Overview of Outdoor Wireless Access Point

This Outdoor Wireless Access Point is a 802.11a/b/g Dual Radio Outdoor Multi-Function Wireless Access Point with Power over Ethernet (PoE) supported.

The Outdoor Wireless Access Point also operates as multi-function wireless system that includes MESH, Point-to-Point/Point-to-Multipoint Bridge, Access Point, Wireless Client, and Repeater.

The dual radio of Outdoor Wireless Access Point can be functioned dual band and maintain each radio up to 54Mbps data rate simultaneously on both directions.

†Key Features in the Device

- **Dual Radio: Two high-power IEEE 802.11 a/b/g radio for backhaul and local access.**
- **Multi operating modes support: OLSR_AP, AODV_AP, AP-Bridge, AP-CB-Bridge, AP-CB-ROUTE, CB-CB-ROUTE, VLAN-AP, AP_WDS_BRG, AP4_WDS_BRG**
- **Bandwidth limitation: Traffic shaping by IP in MESH and ROUTE model up to 30 list**
- **Power over Ethernet**
- **PoE Power Forwarding**
- **Mac filtering**
- **IP filtering**
- **QOS (WMM) Enhance performance and density**
- **LLDP Link Layer Discovery Protocol**
- **Up to 8 SSID support.**
- **Supports WEP 64/128, WPA, WPA2 Authentication**
- **Support SNMP V1/V2c/V3**
- **Support STP/RSTP**
- **IP65 Industrial standard**
- **Net Weight: 1200g**

1-2. Specification

General	
Data Rates	802.11b: 1, 2, 5.5, 11Mbps 802.11g: 6,9,12,18,24,36,48,54 Mbps 802.11a: 6,9,12,18,24,36,48,54 Mbps
Standards	IEEE802.11 a/b/g, IEEE802.1x, IEEE802.3, IEEE802.3u ,IEEE802.3af
Radio Technology	802.11a / OFDM, 802.11b / DSSS, 802.11g/ OFDM
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM CCK, DQPSK, DBPSK for DSSS
Channel Spacing	11a 20MHz / 11b/g 5MHz
11b/g Frequency Range (Number Of Channel)	FCC/NCC: 2412MHz ~ 2462MHz (11) CE: 2412MHz ~ 24&2MHz (13)
11a Frequency Range (Number Of Channel)	FCC:5150~5250MHz(4ch) / 5250~5350MHz(4ch) / 5470~5725MHz(11ch) / 5725~5825MHz(4ch) NCC:5250~5350MHz / 5470~5725MHz / 5725~5825MHz CE: 5150~5250MHz / 5250~5350MHz / 5470~5725MHz
Power Requirements	Active Ethernet (Power over Ethernet) 48 VDC/0.375A External Power Unit: Auto sensing 100/240 VAC; 50/60 Hz
Regulation Certifications	FCC/CE (by request), IP65
Hard Ware Information	
CPU	Intel IXP 425 533MHz network processor
Interface	1* RJ-45 Ethernet Port (for POE input) 1* RJ-45 Ethernet Port (for POE power forwarding)
Flash	16MB
Memory	64MB SDRAM
RF Information	
Output power (+1.5/-1.5dBm)	For United State: For 15.407 802.11a: 24.5mW For 15.247 (2.4GHz) 802.11b: 109.6mW 802.11g: 371.5mW

	For 15.247 (5GHz) 802.11a: 537mW For Japan: 802.11a: 2mW/MHz 802.11b (Ch1~Ch13): 5mW/MHz 802.11b (Ch14): 5mW/MHz 802.11g (Ch1~Ch13): 3mW/MHz For Taiwan: 2.4GHz 802.11b: 20.4dBm 802.11g: 25.7dBm 5GHz (5.25~5.35GHz band) 802.11a: 13.8dBm 5GHz (5.725~5.85GHz band) 802.11a: 27.3dBm
Sensitivity (Typical)	802.11a -91dBm @ 6Mbps, -72dBm @ 54Mbps 802.11b -97dBm @ 1Mbps, -88dBm @ 11Mbps 802.11g -91dBm @ 6Mbps, -74dBm @ 54Mbps
Networking Information	
Topology	Ad-Hoc, Infrastructure
Operation Model	OLSR_AP, AODV_AP, AP-Bridge, AP-CB-Bridge, AP-CB-ROUTE, CB-CB-ROUTE, VLAN-AP , AP_WDS_BRG, AP4_WDS_BRG
SSID	Multiple SSID
Interface	Two 10/100Mbps RJ-45 LAN Ports
Security	•IEEE802.1x / RADIUS Client (TTLS, PEAP) Support in AP Mode • IEE802.1x Supplicant (TTLS, PEAP) support in Client Bridge Mode • WPA-WiFi Protected Access • WPA2 (802.11i) • WEP 64,128 bits • IP address filtering • MAC address filtering • Layer2 Isolation • VLAN tunneling Support • Hide SSID • Rogue AP Scan
STP/RSTP	STP/RSTP
QOS	WMM

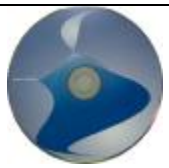
Bandwidth limitation	**Traffic shaping by IP address in MESH and ROUTE mode**
Management Features	
IP Auto-configuration	**DHCP client/ server**
SNMP	**V1/V2c/V3**
LLDP	**Link Layer Discovery Protocol**
NTP	**Support NTP client**
Remote Configuration	**Web-based configuration (HTTP/HTTPS)**
Firmware Upgrade	**Upgrade firmware via WEB, TFTP and FTP**
Max Client	**32 users (simultaneously) per radio**
Network management	**English**
Environmental Temperature Range	**• Operating: -20°C to 70°C • Storage: -40°C to 80°C**
Humidity (non-condensing)	**5%~95% Typical**

1-3. Package Contents

May sure that you have following items:

1. **1 x Outdoor Wireless Access Point unit**
2. **1 x Grounding wire 1.8m**
3. **1 x RJ-45 CAT-5 Cross-over Ethernet cable 1.8m**
4. **1 x RJ-45 CAT-5 Ethernet cable 30m (optional)**
5. **2 x Strain Relief**
6. **1 x User manual CD**
7. **2 x 7dBi dual band Omni Antenna**
8. **1 x Pole mount kit and Screws pack**

1. Main Unit	2. 1.8m Grounding wire	3. 1.8m cable	4. 30m cable (optional)
			
5. Strain Relief	**6. User manual CD**	**7. Antenna**	

			
8. Pole mount kit and screws pack			
 			

Please notify your sales representative immediately if any of the aforementioned items is missing or damaged.

2. Installation

2-1. Full View of Outdoor Wireless Access Point

Interface on the Outdoor Wireless Access Point Unit:

- **eth1: For connecting the RJ-45 CAT-5 Ethernet cable to receiving the power and for user to configure the Access Point.**
- **eth0: For connecting and provide power to outer device, such as IPCAM. By default it is disabled.**

***Please note: the voltage supply by eth0 is 48V and** maximum **output power (watt) is** the outcome of AP's power usage deduct from total input power. For example, with standard power adaptor, the total input power is 48V x 0.375A = 18W. The AP use about 6W when it's full load. Therefore, the maximum power that eth0 can support is about 12W.

- **N-type antenna connector: for connecting N-type antennas.**

2-2. Mount Kit for Outdoor Wireless Access Point

The Outdoor Wireless Access Point can be mounted on a pole; user can use the Pole Mount kit to mount the Outdoor Wireless Access Point as shown in Figure 2-1.

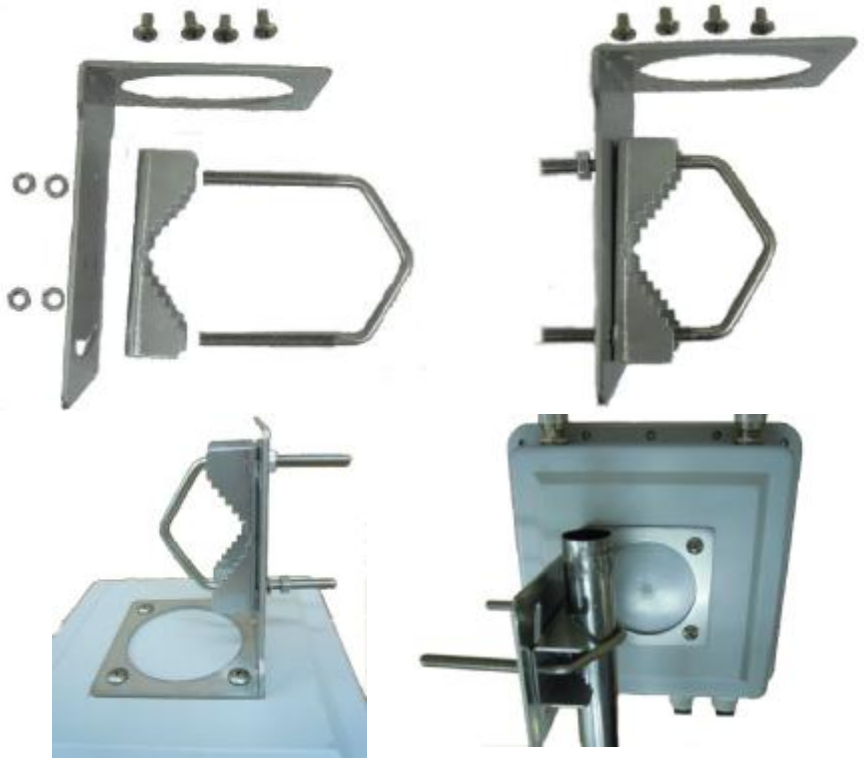


Figure 2-1

2-3. System Requirements

Installation of the Outdoor Wireless Access Point requires the following:

1. **A PC with 10/100/1000 Ethernet port and web browser (e.g. Internet Explore or Firefox).**

2. **RJ-45 Ethernet cable connected to the Ethernet network.**

3. **An AC power outlet (100~240V, 50~60Hz) supplies the power.**

2.3.1 Preparing Installation

Before installing Outdoor Wireless Access Point for outdoor application

or hard-to-reach location, we recommend configure and test all the devices first.

For configuring the Outdoor Wireless Access Point, please follow the quick steps below to power up the Outdoor Wireless Access Point. Refer to Figure 2-2 for steps 1 through 4.

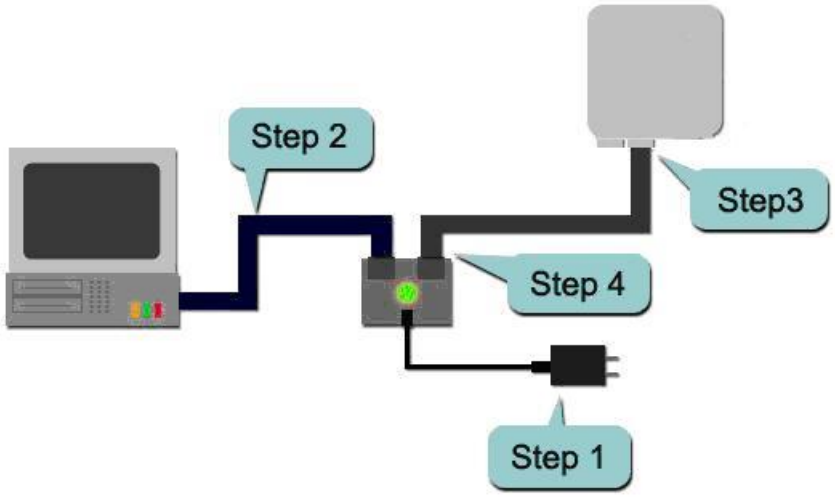


Figure 2-2

Step1: Connect the DC plug of the AC/DC power adapter into the DC Input Port of Inline Power Injector and the AC plug into a power outlet. The Green LED on the Inline Power Injector will light up.

Step2: Connect the cross-over Ethernet cable from PC/SW Port to the Ethernet port on a PC.

Step3: Connect another Ethernet cable to the eth1 on Outdoor Wireless Access Point. Hand tightens the water proof strain relief after you connect the connector.

Step4: Connect the remaining end of the CAT 5 cable into the labeled AP/CB port on PoE injector. This is the power side of the PoE that will power up the Outdoor Wireless Access Point.

When the Outdoor Wireless Access Point receives power over the Ethernet cable, the Outdoor Wireless Access Point will start it's boot up sequence.

User can configure the Outdoor Wireless Access Point via HTML browser, such as Microsoft Internet Explorer or FireFox from a remote host or PC.

3. Operation of Web-based Management

3.1 Basic Configuration

This chapter instructs user how to configure and manage the Outdoor Wireless Access Point through the web user interface.

The default values of the AP are listed in the table below:

IP Address	**192.168.1.1**
Subnet Mask	**255.255.255.0**
Gateway Address	**192.168.1.254**
Username	**admin**
Password	**admin**

Table 3-1

Open your web browser and enter the default IP http://192.168.1.1 in the address bar, it will show the following screen (see Fig.3-1) and ask user enter the username and password. The default username and password are both 'admin'. For the first time to use, please enter the default username and password, then click the <LOGIN> button. The login process now is completed.

To optimize the display effect, we recommend user use Microsoft IE 7 or above, FireFox 3 or above and have the resolution 1024x768.

† Web Access Procedures

Now user can use web browser to configure Outdoor Wireless Access Point. The following procedure explains how to configure each item.

Step1: Open your web browser and enter the IP Address (192.168.1.1 as default)

Step2: Press <ENTER> key and the Outdoor Wireless Access Point Login screen will appear as shown in Figure 3-1.

Figure 3-1

Step3: Enter 'admin' in the Username and Password fields, and click <LOGIN> to enter the web configuration page as shown in Figure 3-2. This page includes all basic configurations for the Access Point. The items are list in left hand side of the menu.

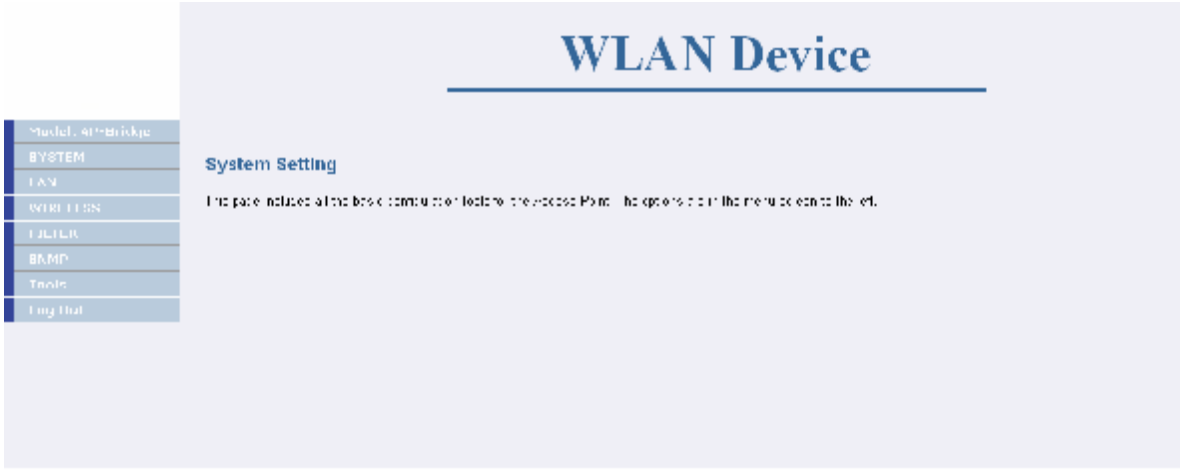


Figure 3-2

3.2 AP-Bridge Mode

The default operating model for Outdoor Wireless Access Point is AP-Bridge, this model is to set the device as a normal AP. The functions and settings are list as following:

▽ **SYSTEM**

- **Administrator**
- **Firmware**
- **Configuration Tools**
- **General Status**
- **Power Control**

- **Bridge Status**
- **WIFI Status**
- **Log**
- **System Time**
- **Reboot**

▽ **LAN**
- **Bridge LAN settings**

▽ **WIRELESS**
- **WIFI ath0 Setting**
- **WIFI ath1 Setting**
- **WIFI ath2 Setting**
- **WIFI ath3 Setting**
- **WIFI ath4 Setting**
- **WIFI ath5 Setting**
- **WIFI ath6 Setting**
- **WIFI ath7 Setting**

▽ **FILTER**
- **MAC Filtering**

▽ **SNMP**
- **Basic Setting**
- **VACM Setting**
- **Trap Setting**

▽ **Tools**
- **Tools**

▽ **Log Out**

3.2.1 System

This page shows the current status and some basic settings of the device, including Administrator, Firmware, Configuration Tools, General Status, Power Control, Bridge Status, WIFI Status, Log, System Time and Reboot; screen as shown in Figure 3-2-1.

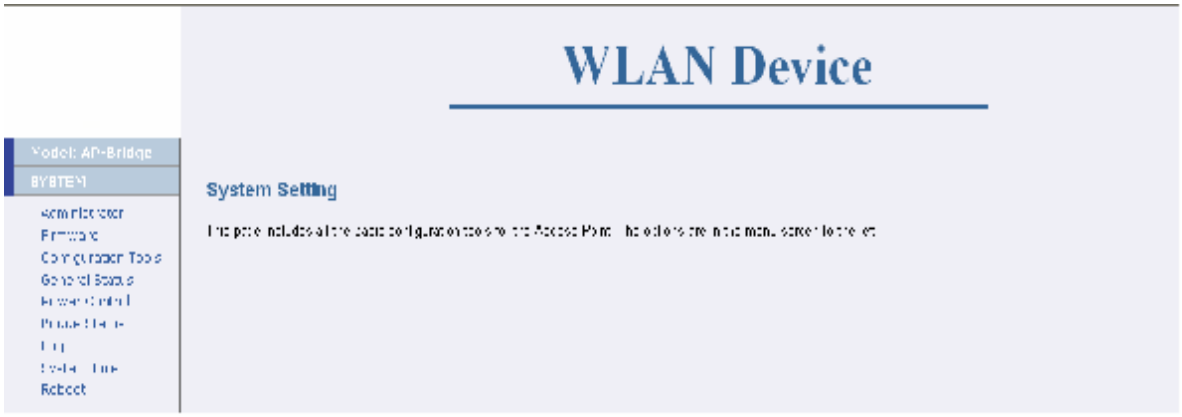


Figure 3-2-1

3.2.1.1 Administrator

By selecting the item of Administrator under System, User will see the screen shown in Figure 3-2-2. These settings allow user to configure the device Name, language, model, password, remote management and WIFI Loading Warning Threshold.

† Device Name

This is a host name or system name for the device. The maximum length is 20 characters. User can only input '0'~'9', 'a'~'z', 'A'~'Z', '_' or '-'.

† Model Select

OLSR_AP: To set this device as an AP with layer 3 MESH function.
AODV_AP: To set this device as an AP with layer 3 MESH function.
AP-Bridge: To set this device as a normal AP.
AP-CB-Bridge: To set this device as an AP and Client Bridge device.
AP-CB-ROUTE: To set this device as a router device with AP and CB functions.
CB-CB-ROUTE: To set this device as a router device with dual CB functions.
VLAN-AP: To set this device as a VLAN AP device. Each SSID can have its own VLAN ID.
AP_WDS_BRG: To set this device as a WDS device with AP function.
AP4_WDS_BRG: To set this device as WDS device with AP function and support up to 4 SSID.

Figure 3-2-2

† Password Settings

If user wants to change the password for admin account, the user should enter the current password, a new password and, re-type the new password.

The Idle Time Out is the amount of time of inactivity allowed before user proceeds next action. The user needs to re-login if the idle time passes timeout.

† Remote Management

User can enable/disable the management of the Access Point from a remote host. Just tick the <Enable> check box and enter an IP address of the remote host. Then, only the host with the entered IP address can access this device.

† WIFI Loading Warning Threshold

The threshold value is used by network management system. Network management software will monitor the WIFI loading, when the loading is over this value, network management software will change the color of the link line on network topology to notify the user about condition of the link quality. The threshold value is between 5 and 25.

3.2.1.2 Firmware Update

By selecting the item of Firmware under System, User will see the screen shown in Figure 3-2-3. This page shows current firmware version and date. This page also allow user to using TFTP or WEB or FTP method to upgrade to the new version of the firmware.

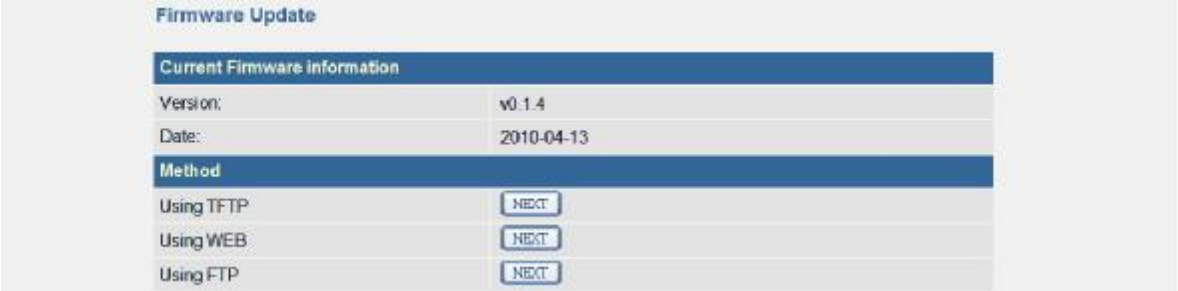


Figure 3-2-3

†Using TFTP

On any computer in the network or a computer direct connect to the AP. Install a TFTP Server utility, and put the firmware file named `upgradeFW.tar′ in a folder.

Run TFTP server utility and specify the folder in which the firmware file located. Enter the TFTP server IP and click on <APPLY> button. At the end of the upgrade process, this device may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

†Using WEB

Click on <Browse> button and select the correct firmware file path and file name. Then, click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands while uploading the firmware. This is normal behavior and do not turn off the Access Point while firmware is upgrading.

†Using FTP

On FTP server, there should have valid firmware which includes fs-opn.img and/or kernel-opn.img. On the Firmware Update - FTP page, enter the IP address of the FTP server, firmware name and FTP user name and password. Then click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

3.2.1.3 Configuration Tools

By selecting the item of Configuration Tools under System, the screen will show in Figure 3-2-4. This page includes three selections: Restore Factory Default Configuration, Local Backup settings/Restore settings and Remote Backup Settings/Restore settings.

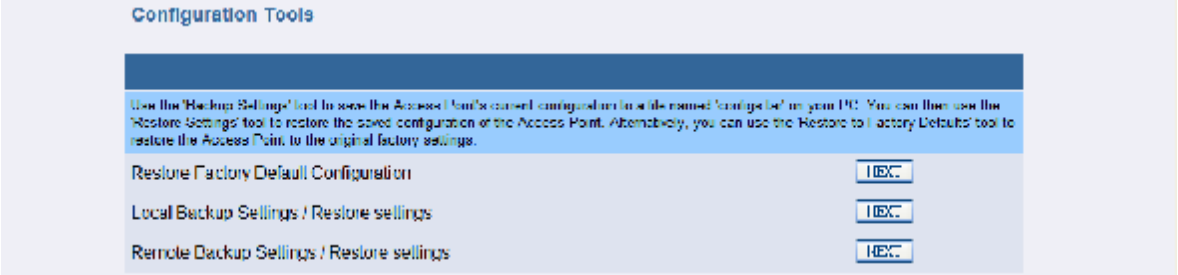


Figure 3-2-4

† **Restore Factory Default Configuration:**

To reset configuration settings to the factory default values, just click on <NEXT> button beside 'Restore Factory Default Configuration'.

Figure 3-2-5

Then click on <Restore> button on next page, now the system will reset to factory default value.

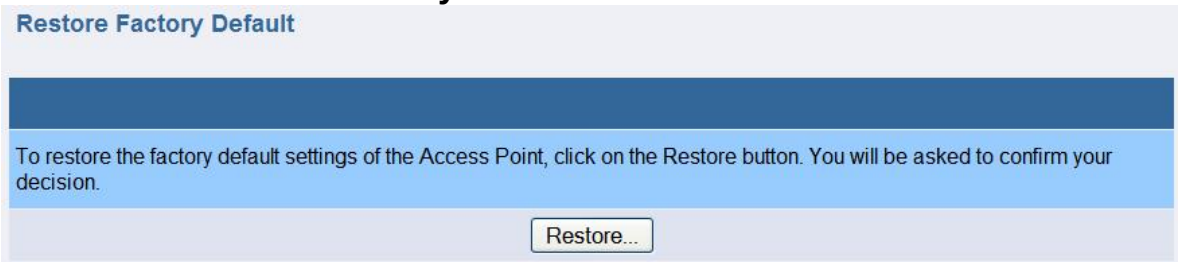


Figure 3-2-6

† **Local Backup Settings / Restore settings**

To backup or restore the configuration for this device, click on <NEXT> button beside 'Local Backup Settings/Restore settings'.

Figure 3-2-7

Click on <Backup Settings> button on next page to save the settings of this device to a file named 'configs.tar' on user's PC.

To restore the settings, click on <Browse> button and select the correct file path and file name. Then, click on <Restore Settings> button to start the restore settings process.

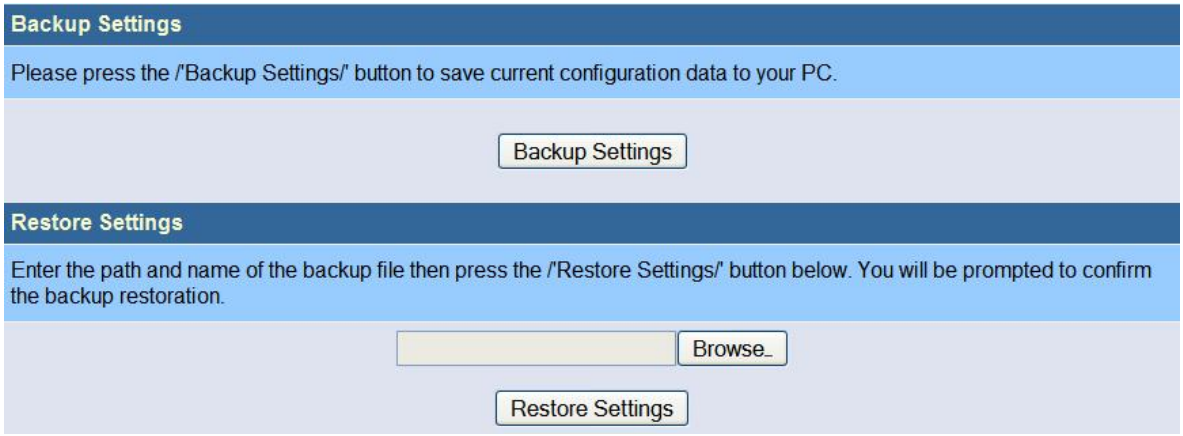


Figure 3-2-8

†Remote Backup Settings/Restore settings

User can also backup/restore the configuration of this device remotely.

Click on <NEXT> button beside `Remote Backup Settings/Restore settings'.

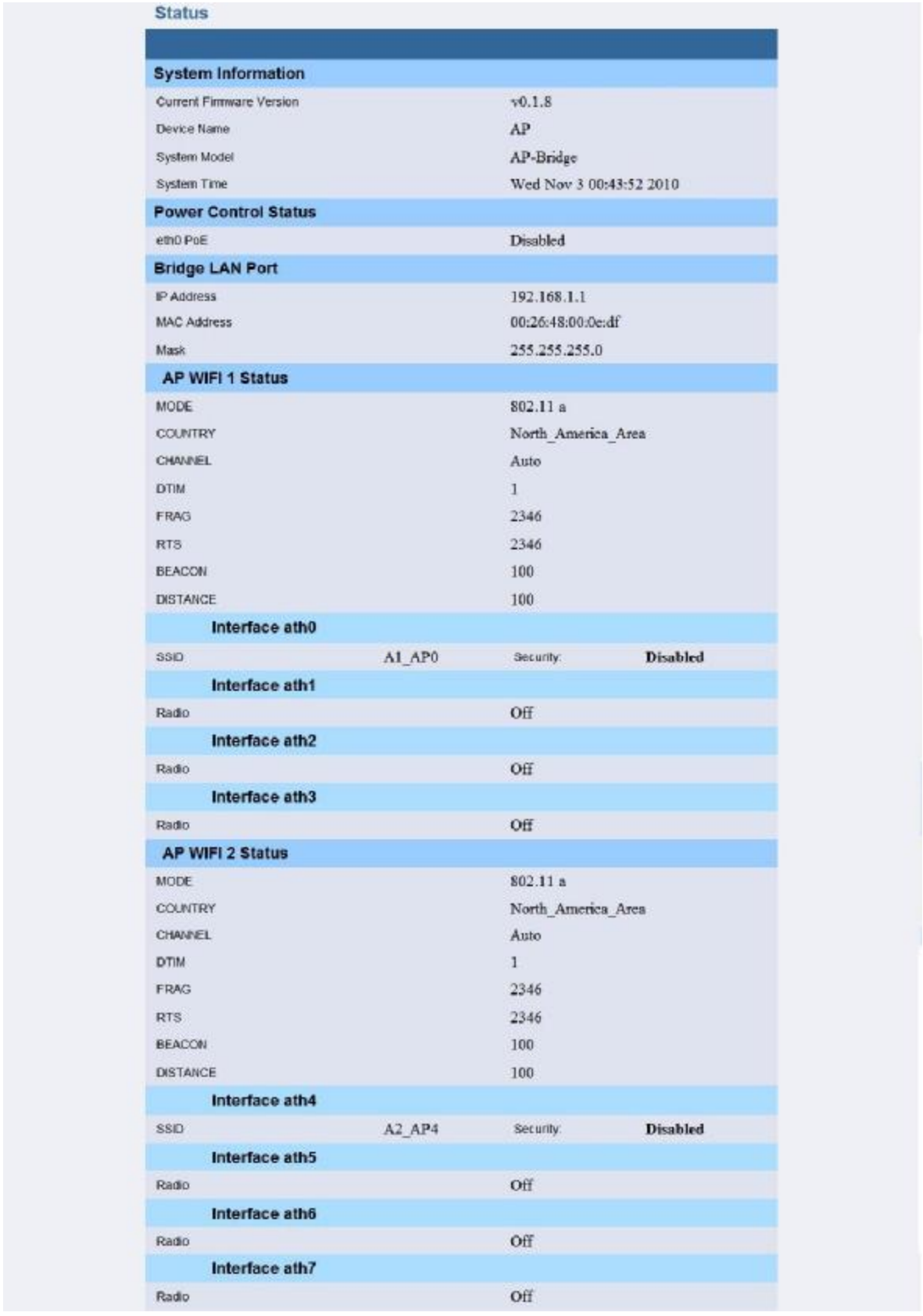
Figure 3-2-9

Enter the necessary setting in next page, then click on <Backup To Server> or <Restore From Server> to start the process.

Figure 3-2-10

3.2.1.4 General Status

In this page user could see the detail settings of this device, including the System Information, Power Control, Bridge LAN port, AP WIFI 1 Status, AP WIFI 2 Status.



Status

System Information			
Current Firmware Version		v0.1.8	
Device Name		AP	
System Model		AP-Bridge	
System Time		Wed Nov 3 00:43:52 2010	
Power Control Status			
eth0 PoE		Disabled	
Bridge LAN Port			
IP Address		192.168.1.1	
MAC Address		00:26:48:00:0e:df	
Mask		255.255.255.0	
AP WIFI 1 Status			
MODE		802.11 a	
COUNTRY		North_America_Area	
CHANNEL		Auto	
DTIM		1	
FRAG		2346	
RTS		2346	
BEACON		100	
DISTANCE		100	
Interface ath0			
SSID	A1_AP0	Security:	**Disabled**
Interface ath1			
Radio		Off	
Interface ath2			
Radio		Off	
Interface ath3			
Radio		Off	
AP WIFI 2 Status			
MODE		802.11 a	
COUNTRY		North_America_Area	
CHANNEL		Auto	
DTIM		1	
FRAG		2346	
RTS		2346	
BEACON		100	
DISTANCE		100	
Interface ath4			
SSID	A2_AP4	Security:	**Disabled**
Interface ath5			
Radio		Off	
Interface ath6			
Radio		Off	
Interface ath7			
Radio		Off	

Figure 3-2-11

3.2.1.5 Power Control/Status

In this page user can enable the eth0 port to provide PoE power and data forwarding function.

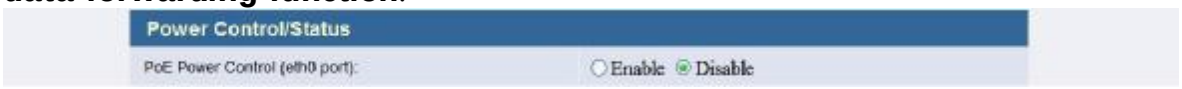


Figure 3-2-12

3.2.1.6 Bridge Status

In this page user could see the bridge interfaces information of this device, such as interface information, STP status, MAC address information etc.

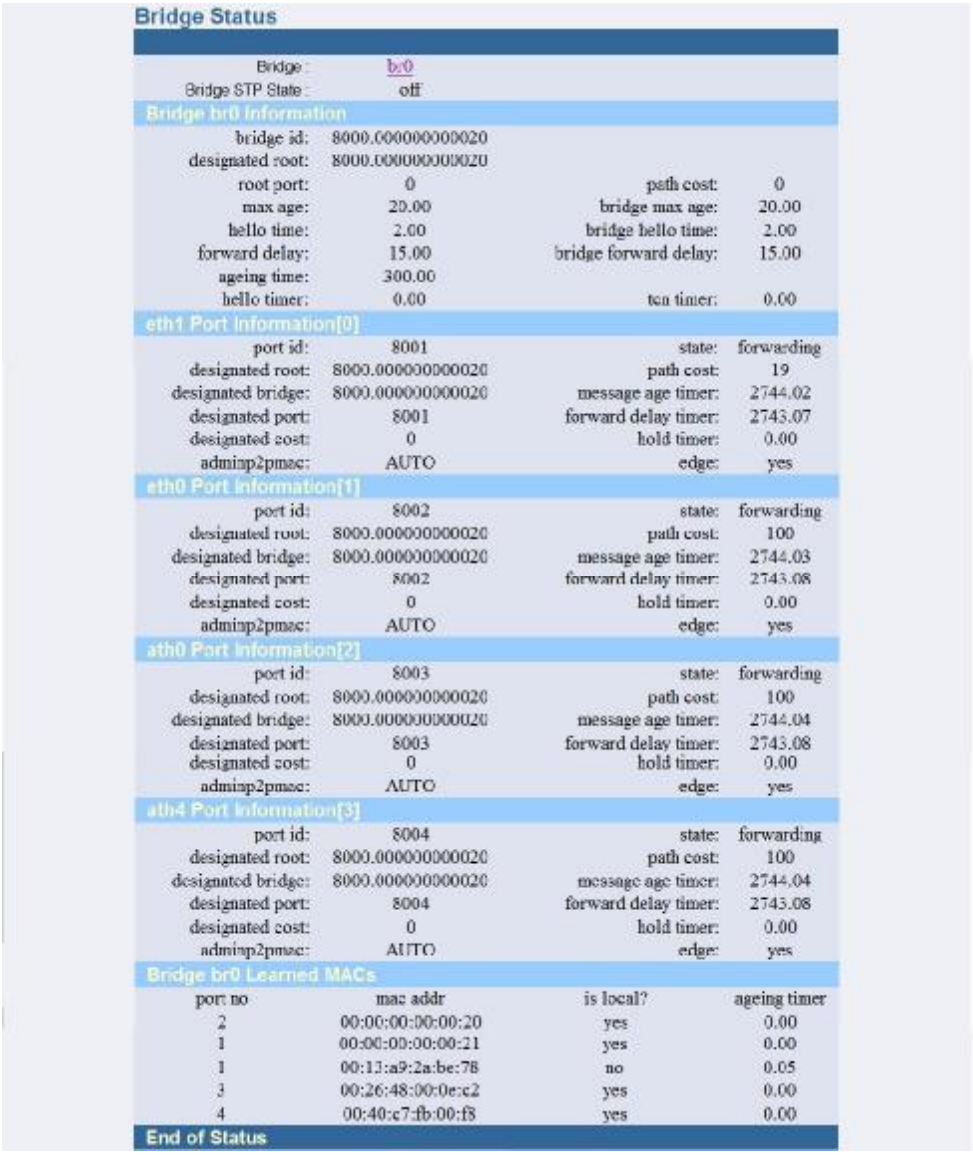


Figure 3-2-13

3.2.1.7 WIFI Status

In this page user could see the WIFI information of this device, such as: Interface information, Security information, Associated AP/Station.

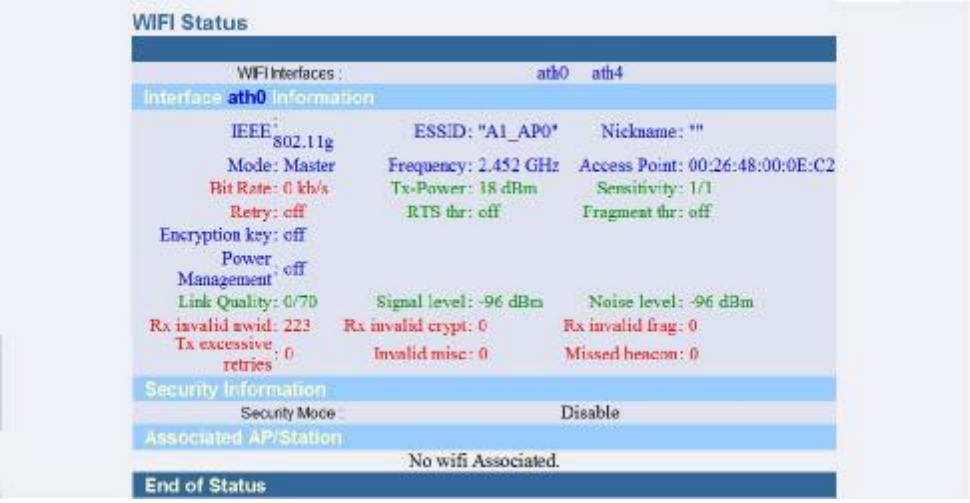


Figure 3-2-14

3.2.1.8 Log

In this page user could see the system logs record of this device.

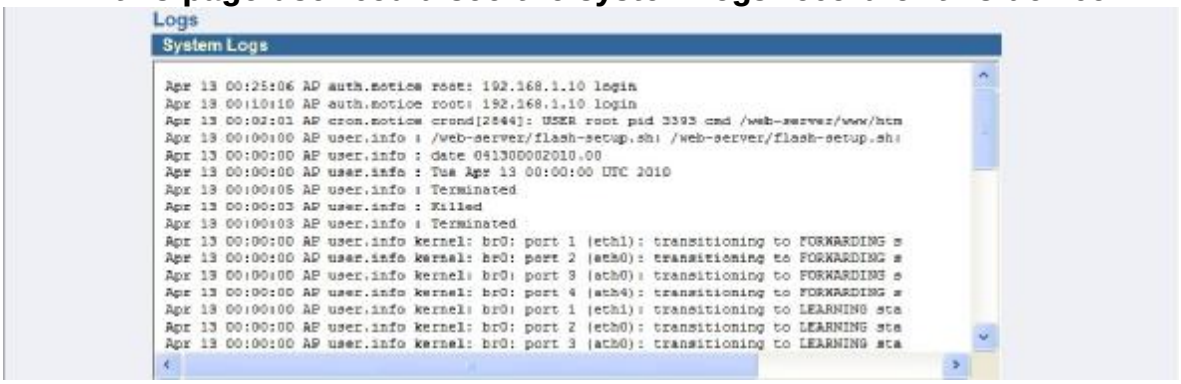


Figure 3-2-15

3.2.1.9 System Time

†Select Setting Type

Setting by: User can set system time in two ways. One is manual setting, the other one is synchronize with an Internet Time Server.

†Manual Setting

User can manually enter the Year/ Month/ Day and Hour: Minute: Second.

†Using Internet Time Server

Hours from GMT: User can enter the Hours from GMT, for example Taiwan is GMT +8 Hours.

Server IP: User should enter the Internet time server IP address here.

Time Update for Every: User can set time update interval by enter the days, hours, and minutes.

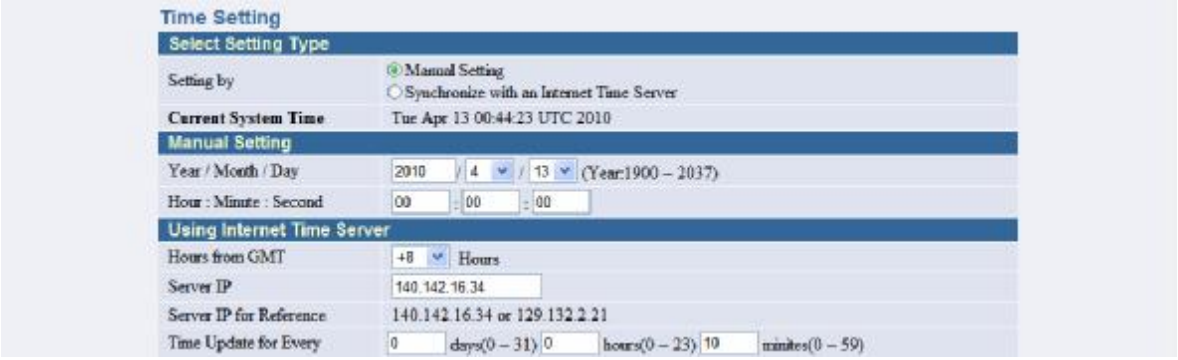


Figure 3-2-16

3.2.1.10 Reboot

User can perform reboot function in case of the device is not function normally, or after user change some major settings for example: change system model. The existing settings will not be changed. To perform the reboot, click on the <Reboot> button and click on <OK> on pop-up screen to confirm user's decision.

Figure 3-2-17

3.2.2 LAN Configuration

† Interface br0 Setting

IP Authentication: Indicate how the IP address of this device will be assigned. There are two options available here: Static option - the IP address should be entered in 'Network IP Parameters' and DHCP option - the IP address will be assigned from other DHCP server.

† Network IP Parameters

User can change the network settings of this device from LAN Configuration; it is including IP address, Subnet mask, and Gateway address.

† Bridge STP Setting

User can also set the Bridge STP setting in this page.
STP/RSTP: Disable the bridge STP or set the bridge mode as STP or RSTP mode.

Bridge Priority: Set the priority value of the bridge. The priority value is a number between 0 and 65535. The bridge with the lowest priority will be elected 'root bridge'.
Hello Time: Set the bridge's 'bridge hello time' value (seconds).
Forwarding Delay: Set the bridge's 'bridge forward delay' value (seconds).
Max Age: Set the bridge's 'maximum message age' value (seconds).
Port Cost: Set the port cost of the port.
Port Priority: Set the port priority of the port (interface). It is used in the designated port and root port selection algorithms.
P to P: If a bridge port is operating in full-duplex mode, than the port is functioning as point-to-point. The available options are: auto, true or false. By default, it is set to auto.
Edge: If a port is operating in half-duplex mode and is not connected to any further bridges participating in STP or RSTP, then the port is an edge port. The available options are: yes or no. By default, it is set to no.

Figure 3-2-18

3.2.3 Wireless

User can configure the wireless related settings in this page.

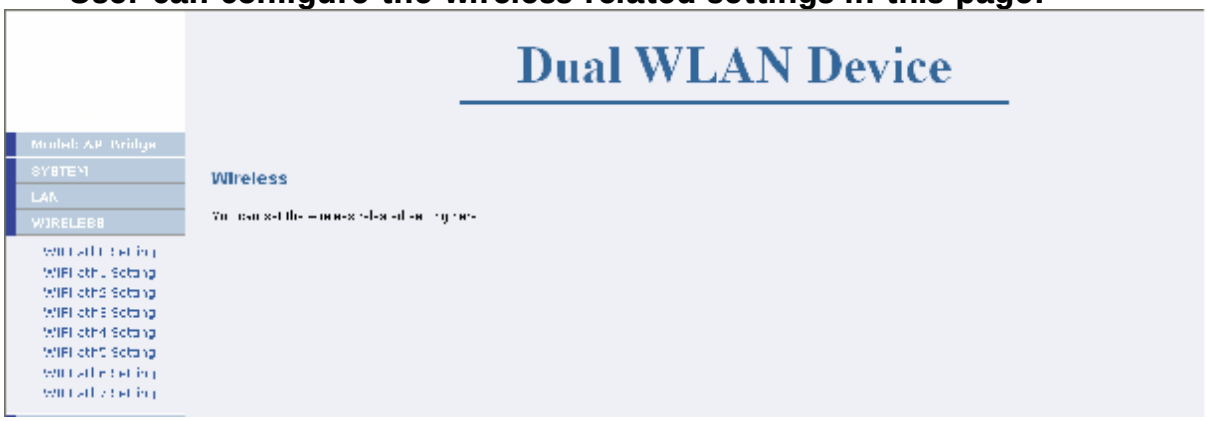


Figure 3-2-19

3.2.3.1 WIFI ath0~7 Setting

†**General**

Radio Power: Turn this interface on or off.

Wireless Mode: Select which wireless mode that user wants to use. The options available here are: 802.11a, 802.11b, 802.11g and 802.11b+g.

SSID: The SSID (service set identifier) is an identifier of an AP in user's wireless network. The SSID must be identical for all access points in the network. It is case sensitive and maximum length is 32.

SSID Hide: This function is to hide the SSID in the wireless network.

Channel: Set the operating frequency/channel for this device.

Figure 3-2-20

†**Advanced Settings**

Peer Node Distance: Set the distance between this device and it's adjacent. If select 'manual', the distance will be determined by 'Slot time', 'ACK timeout' and 'CTS timeout' three values.

Beacon Period: This item contains the length of the beacon interval. Enter a value between 20 and 1000 to specify the Beacon Period.

DTIM Period: This item contains the number of Beacon intervals between Delivery Traffic Indication Message (DTIM). Enter a number between 1 and 255 to specify.

Fragment Threshold: It is the maximum frame size that wireless device can transmit without fragmenting the frame. Enter a value between 256 and 2346 to specify the Fragment Threshold.

RTS/CTS Threshold: Packets larger than the value are transmitted by the RTS/CTS handshake. Enter a value between 1 and 2346 to specify the value of the RTS /CTS Threshold.

Tx Power: To set the tx power as off to turn off the tx power, set auto to let device determine the tx power value automatically, or set manual to set the tx power value. The max value is depending on the wireless module.

Rate: Set the bit rate for wireless interface to supporting multiple bit rates. The value `Auto' causes the device to use the bit rate selected by the rate control module.

Layer 2 Isolation: It is used in AP mode only. If enabled, all of the clients connect to the same AP will not be able to access each

other.

WEP Key Setting: It uses two kinds of WEP Encryption key length: 5-bytes and 13-bytes. The key format can either use 'ASCII' to set the key values (ie. 0~9, a~z) or use 'HEX' to set the key value in hexadecimal. (ie. 0~9, a~f). User can set maximum 4 keys, but only one key will functional at one time.

Figure 3-2-21

†SSID Security Mode

Authentication: User can choose which authentication type to secure the wireless network. There are four options for authentication: Disable, WEP, WPA-personal and WPA-enterprise.

WEP: Short for Wired Equivalent Privacy, a security protocol for wireless local area networks (WLANs) defined in the 802.11 standard.

Open or Restricted: An open system allows any client to authenticate as long as it conforms to any MAC address filter policies that may have been set. All authentication packets are transmitted without encryption. If the 'Restricted' selected, all the packets are transmitted with encryption.

Select Key: Check the radio box in front of the key that user would like to use for this AP.

Figure 3-2-22

WPA-Personal: The method of authentication is similar to WEP, user can define a 'Pre-Shared Key', once the key is confirmed and satisfied on both the client and access point, then access is granted. The encryption method used is referred to as the Temporal Key Integrity Protocol (TKIP).
WPA MODE: In this setting, user can choose WPA or WPA2 or WPA & WPA2. (WPA2 is far superior to WPA, because the encryption of method used is Advanced Encryption Standard (AES)).
Share Key: User should define the pre-share key in here; the length of the key is 8-23 characters.
WPA Encryption: User can choose the encryption method of the pre-shared key here; there are three options: Auto, AES and TKIP.
Group Key Update Interval: Time interval for rekeying the GTK (broadcast/multicast encryption keys) in seconds.

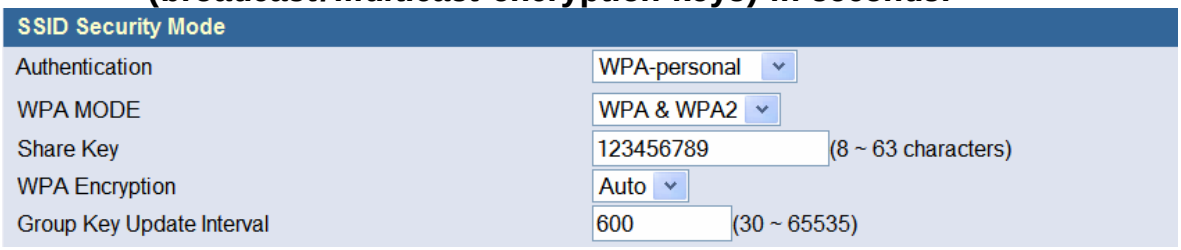


Figure 3-2-23

WPA-enterprise:
WPA-Enterprise includes all of the features of WPA-PSK plus support the 802.1x authentication. To use this function, a separate RADIUS server is required. User should enter the IP and port number of the Authentication Server and Shared Secret here. In case if a backup server has been deployed in user's network, user can also enter the necessary information here.

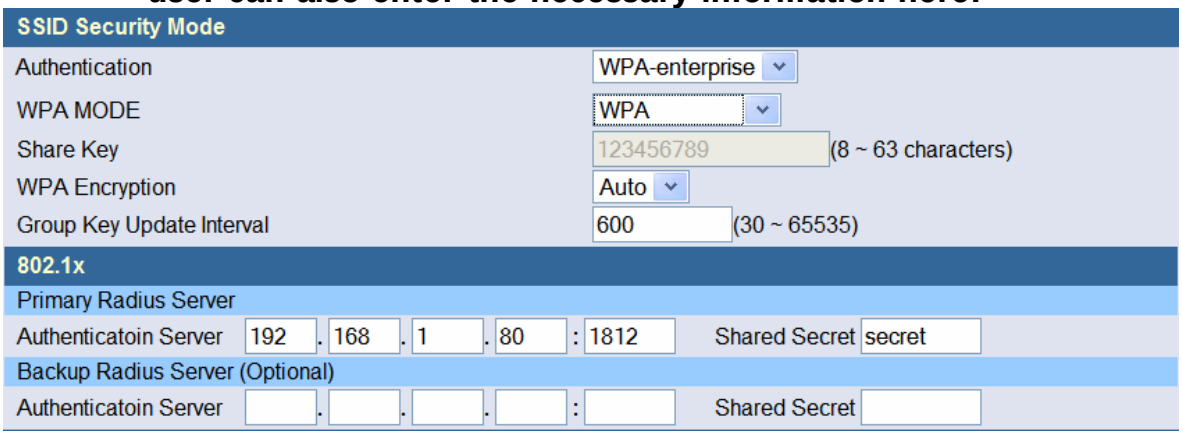


Figure 3-2-24

† QoS
WMM: Enable/disable WMM support.
MAX Associated Station: Maximum number of stations allowed in

station table.

Common Parameters:
CWmin: Minimum Contention Window. The valid values for 'CWmin' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047, or 4095. The value for 'CWmin' must be lower than the value for 'CWmax'.
CWmax: Maximum Contention Window. The Valid values for 'CWmax' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047 or 4095. The value for 'CWmax' must be higher than the value for 'CWmin'.
AIFS: Arbitration Inter-Frame Spacing.
Burst: Maximum length (in milliseconds with precision of up to 0.1 ms) for bursting.

AP Parameters:
This affects traffic flowing from the access point to the client station. These parameters are used by the access point when transmitting frames to the clients.

AP Tx-Best Effort: Medium Priority. Medium throughput and delay. Most traditional IP data is sent to this queue.
AP Tx-Background: Low Priority. High throughput. Bulk data that requires maximum throughput and is not time-sensitive is sent to this queue (FTP data, for example).
AP Tx-Video: High Priority. Minimum delay. Time-sensitive video data is automatically sent to this queue.
AP Tx-Voice: High Priority. Time-sensitive data like VoIP and streaming media are automatically sent to this queue.

STA Parameters:
These parameters are sent to WMM clients when they associate. The parameters will be used by WMM clients for frames transmitted to the access point.

STA Tx-Best Effort: Medium Priority, Medium throughput and delay. Most traditional IP data will be sending to this queue.
STA Tx-Background: Low Priority, High throughput. Bulk data that requires maximum throughput and it's not time-sensitive will be sending to this queue (FTP data, for example).
STA Tx-Video: High Priority, Minimum delay. Time-sensitive video data will be automatically sent to this queue.
STA Tx-Voice: High Priority, Time-sensitive data like VoIP and streaming media are automatically sent to this queue.
TXOP: Transmission Opportunity is an interval of time when a WMM Client Station has the right to initiate transmissions onto the wireless medium (WM). This value specifies (in milliseconds) the Transmission Opportunity (TXOP) for Client Station; that is,

the interval of time when the WMM AP has the right to initiate transmissions on the wireless network.

ACM: Admission control mandatory.

Figure 3-2-25

3.2.4 Filtering

The MAC address filter can be used to filter network access by machines based on the unique MAC addresses of their network adapter(s). It is most useful to prevent unauthorized wireless devices from connecting to user's network. A MAC address is a unique ID assigned by the manufacturer of the network adapter.

3.2.4.1 MAC Filtering

User can block certain clients from accessing this AP based on its MAC address. Use Filtering type to define the filtering scenario:

- **General**

  Disabled: Disable this filtering function. If this option is selected, all PCs can access this AP.

  Accept: All PCs are filtered out except those MAC addresses in the following MAC address table. In other words, only those interfaces/ PCs with MAC address in the MAC address table can access this AP.

  Reject: All PCs/interfaces can access this AP except those interfaces/PCs with MAC address in the MAC address table.

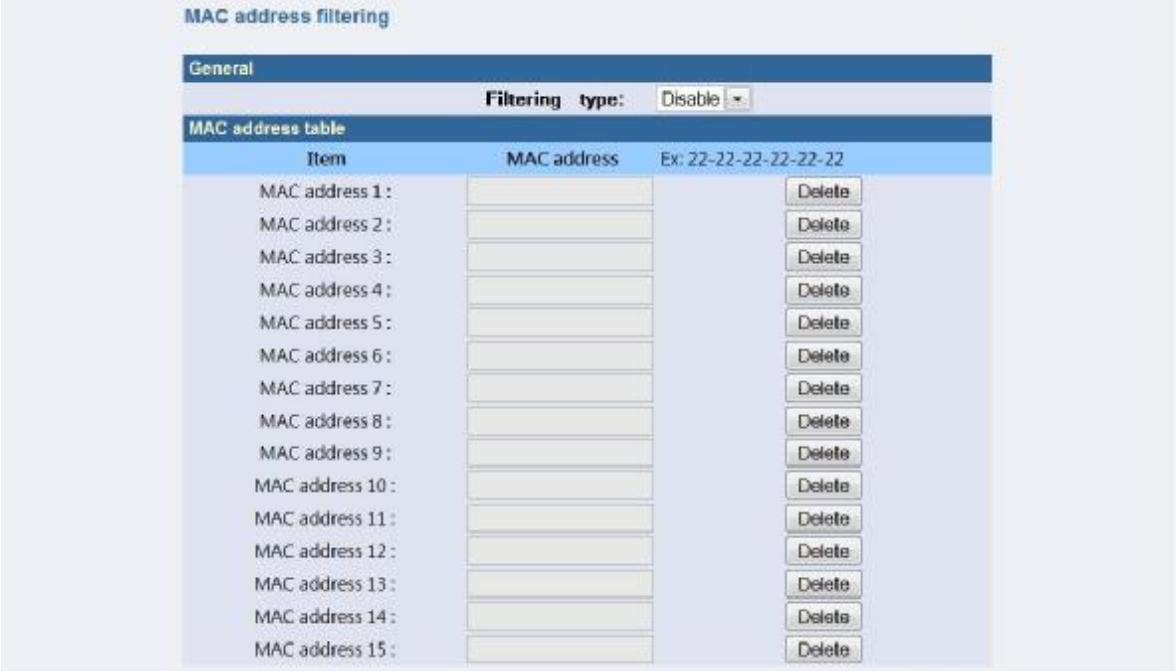


Figure 3-2-26

3.2.5 SNMP

The Outdoor Wireless Access Point support SNMP V1/V2C/V3, this page is to define the SNMP access control and SNMP traps.

3.2.5.1 Basic Setting

†SNMP Agent

Check the <Enable> check box to turn on SNMP. Please Note: Enable the SNMP will also enable the LLDP (Link Layer Discovery Protocol) function. This function will be used if user wants to remote management the AP and draw the network topography.

†System Information

Contact: Specify the contact name for this managed node as well as information about how to contact this person.
Location: It is used to define the location of the host on which the SNMP agent is running.

†V1/V2C

User can change user's SNMP community settings on this page.
Access Right: Select an access right for the SNMP manager. 'Read' is read only, 'Write' is read-write, and 'Deny' means this community name is not implemented.
Community: Specify the name of community for the SNMP manager.
SNMP Community provides a simple protection by using the community name to control the access to the SNMP. The

community name can be thought of as a password. If user doesn't have the correct community name, user can't retrieve any data (get) or make any change (set). Multiple SNMP managers may be organized in a specified community.

† **V3**

The SNMP V3 is a Security Enhancement for SNMP, it provides secure access to devices by a combination of User ID, authenticating and encrypting packets over the network.

User ID: A string representing the name of the user.

Security Level: User can select which security level that user wants to use. The available options for this field are: NoAuthNoPriv, AuthNoPriv or AuthPriv.

Auth Type (Authentication Protocol): An indication of which authentication protocol is used. The available options for this field are: MD5, and SHA.

Auth Passphrase (Authentication Key): A secret key used by the authentication protocol for authenticating messages.

Privacy Protocol: An indication of which privacy protocol is used. The available options for this field is: DES.

Priv Passphrase (Privacy Key): The secret key used by the privacy protocol for encrypting and decrypting messages.

Access Right: Assign the access right for account. The options are:

Unused – The account is disabled.

Read Only – The account has read only access rights.

Read Write – The account has read and writes access rights.

usm – This account will be an usm account and assign access rights by VACM.

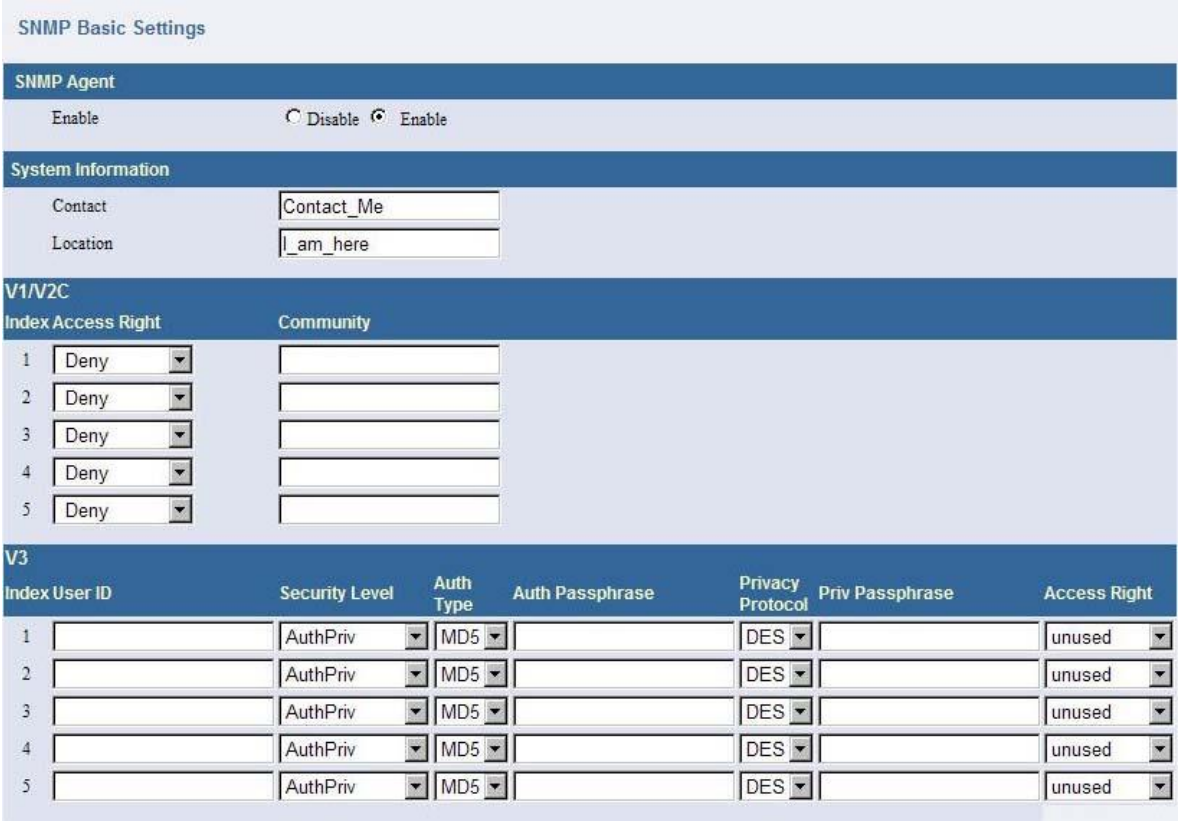


Figure 3-2-27

3.2.5.2 VACM Setting

User can use the View-based Access Control Model (VACM) to define whether access to a specified managed object is authorized. Access control is done at the following points:

- **When processing retrieval request messages from the SNMP manager.**
- **When processing modification request messages from the SNMP manager.**
- **When notification messages must be sent to the SNMP manager.**

The following tokens for VACM access security that user can use:

† Community to Security for V1/V2c

Map the community name (COMMUNITY) into a security name. The Community to Security token takes NAME SOURCE and COMMUNITY options. User can use this token to give SNMPv3 security privileges to SNMPv1 and SNMPv2 users and communities

Index: Index of Community to Security. Tick the checkbox to enable the recordset.

Security Name: is a name that will use by the group table.

IP source: Describes a host or network.

Community: The community name that is used.

†Group

Map the security names into group names. (For SNMP V3, the security Name is the user ID in Basic setting.)
Index: Index of Group. Tick the checkbox to enable the recordset.
Group Name: A group name is given to a group of users and is used when managing their access rights.
Security Model: Assign security model for group.
Security Name: Assign security name for group. This field will obtain from the 'Security Name' of 'Community to Security' when security model is v1 or v2c, or obtain from the 'User ID' of 'usm' when security model is usm.

Figure 3-2-28

† **View**

Create a view for user to let the groups have rights to view the MIB tree.
Index: Index of View. Tick the checkbox to enable the recordset.
View Name: The name of view.
Include: Assign include or exclude in this record for certain subtree.
Sub Tree: the OID value. For example: '1.3.6.1.2.1'.

Figure 3-2-29

† **Access**

The Access table grants the groups access right to certain views. Each group can have multiple access rights. The most secure access right is chosen.

Index: Index of Access. Tick the checkbox to enable recordset.

Group: Returned and lookup the 'Group Name' from the Group table.

Security model: Specified in the message's msgSecurityModel parameter. The available options for this field are: any, v1, v2c and usm.

Security level: Specified in the message's msgFlags parameter. The available options for this field are: NoAuthNoPriv, AuthNoPriv and AuthPriv.

Read: Specified in the message's msgSecurityModel parameter. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Write: Authorized View Name for write access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Notify: Authorized View Name for notify access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

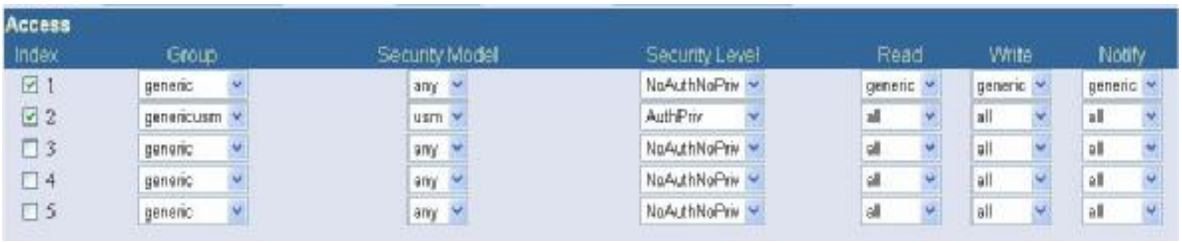


Figure 3-2-30

3.2.5.3 SNMP Trap

It is an SNMP application that uses the SNMP TRAP operation to send information to a network management system.

† **SNMP Trap**

Trap Active: To enable or disable SNMP Trap function.

† **v1 / v2c Trap**

Version: Indicate the traps will be sent in v1 or v2c or not send (disable).

IP Address & Port: The IP and Port to receive traps.

Community: The community string to be used when sending traps.

† **v3 Trap**

Trap: Index of SNMP v3 traps. Tick the checkbox to enable recordset.

User: The usm User ID.

IP Address & Port: The IP and Port of a device to receive traps.
Security Level: Assign security level in this record. The Options are: NoAuthNoPriv, AuthNoPriv, AuthPriv.

Figure 3-2-31

†Trap Items

Enable/Disable which trap items to send.

Figure 3-2-32

3.2.6 Tools

†Command Ping

It runs ping command to test the connection capability of this device with the other Ethernet device.

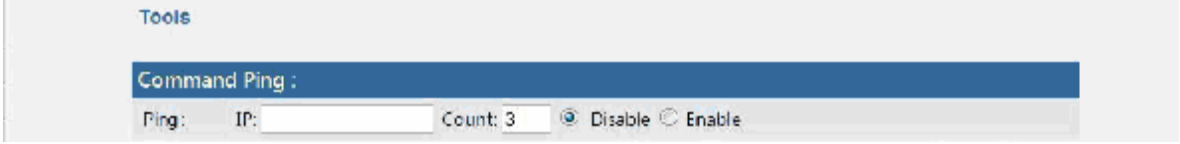


Figure 3-2-33

3.2.7 Log Out

User can manually logout by click on <Log Out>.

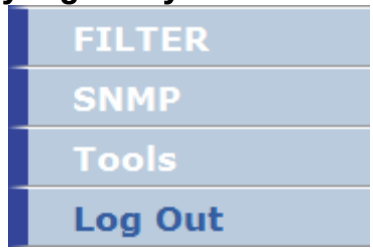


Figure 3-2-34

3.3 AP-CB-Bridge Mode

AP-CB-Bridge mode is to set this device as an AP and Client Bridge device, the setting and functions as following:

▽ **SYSTEM**
- **Administrator**
- **Firmware**
- **Configuration Tools**
- **General Status**
- **Power Control**
- **Bridge Status**
- **WIFI Status**
- **Log**
- **System Time**
- **Reboot**

▽ **LAN**
- **Bridge LAN settings**

▽ **WIRELESS**
- **Rogue Ap Scan**
- **WIFI ath3 Setting**
- **WIFI ath4 Setting**
- **WIFI ath5 Setting**
- **WIFI ath6 Setting**
- **WIFI ath7 Setting**

▽ **FILTER**
- **MAC Filtering**

▽ **SNMP**
- **Basic Setting**
- **VACM Setting**
- **Trap Setting**

▽ **Tools**
- **Tools**

▽ **Log Out**

3.3.1 System

This page shows the current status and some basic settings of the device, including Administrator, Firmware, Configuration Tools, General Status, Power Control, Bridge Status, WIFI Status, Log, System Time and Reboot; screen as shown in Figure 3-3-1.

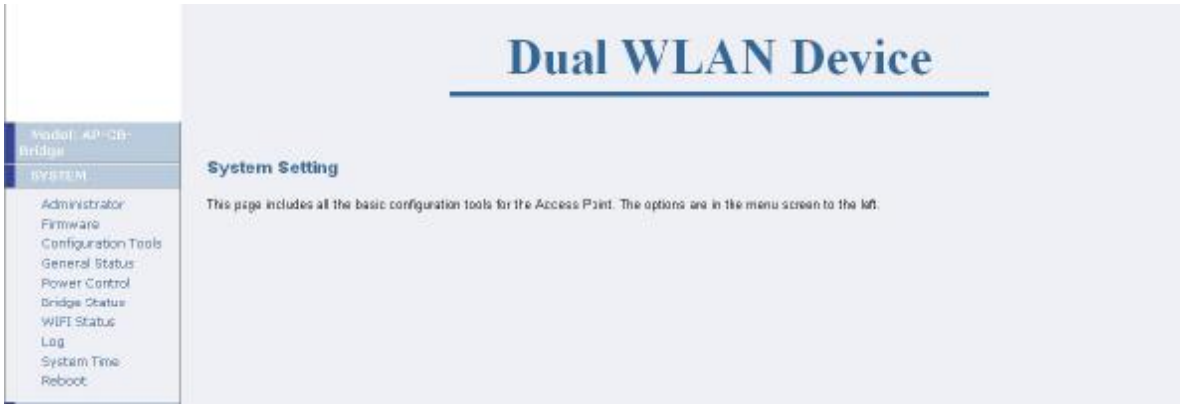


Figure 3-3-1

3.3.1.1 Administrator

By selecting the item of Administrator under System, User will see the screen shown in Figure 3-3-2. These settings allow user to configure the Device Name, Language, Model, Password, Remote Management and WIFI Loading Warning Threshold.

† Device Name

This is a host name or system name for the device. The maximum length is 20 characters. User can only input '0'~'9', 'a'~'z', 'A'~'Z', '_' or '-'.

† Model Select

OLSR_AP: To set this device as an AP with layer 3 MESH function.
AODV_AP: To set this device as an AP with layer 3 MESH function.
AP-Bridge: To set this device as a normal AP.
AP-CB-Bridge: To set this device as an AP and Client Bridge device.
AP-CB-ROUTE: To set this device as a router device with AP and CB functions.
CB-CB-ROUTE: To set this device as a router device with dual CB functions.
VLAN-AP: To set this device as a VLAN AP device. Each SSID can have its own VLAN ID.
AP_WDS_BRG: To set this device as a WDS device with AP function.
AP4_WDS_BRG: To set this device as WDS device with AP function and support up to 4 SSID.

Figure 3-3-2

†Password Settings

If user wants to change the password for admin account, the user should enter the current password, a new password and, re-type the new password.

The Idle Time Out is the amount of time of inactivity allowed before user proceeds next action. The user needs to re-login if the idle time passes timeout.

†Remote Management

User can enable/disable the management of the Access Point from a remote host. Just tick the <Enable> check box and enter an IP address of the remote host. Then, only the host with the entered IP address can access this device.

†WIFI Loading Warning Threshold

The threshold value is used by network management system. Network management software will monitor the WIFI loading, when the loading is over this value, network management software will change the color of the link line on network topology to notify the user about condition of the link quality. The threshold value is between 5 and 25.

3.3.1.2 Firmware Update

By selecting the item of Firmware under System, User will see the screen shown in Figure 3-3-3. This page shows current firmware version and date. This page also allow user to using TFTP or WEB or FTP method to upgrade to the new version of firmware.

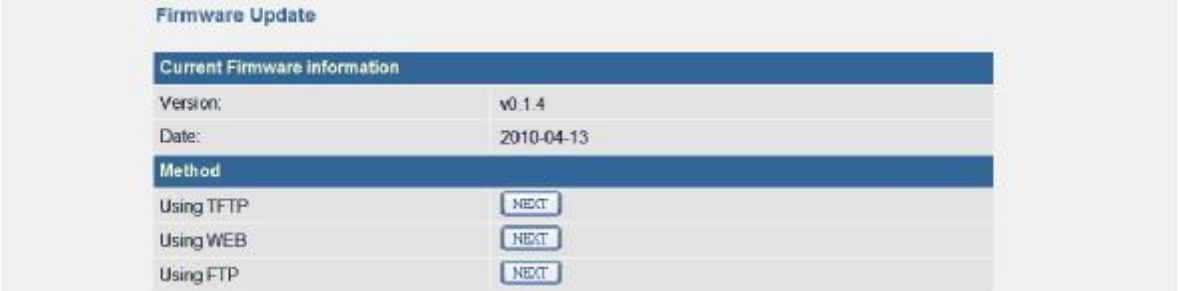


Figure 3-3-3

† **Using TFTP**

On any computer in the network or a computer direct connect to the AP. Install a TFTP Server utility, and put the firmware file named 'upgradeFW.tar' in a folder.

Run TFTP server utility and specify the folder in which the firmware file located. Enter the TFTP server IP and click on <APPLY> button. At the end of the upgrade process, this device may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

† **Using WEB**

Click on <Browse> button and select the correct firmware file path and file name. Then, click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands while uploading the firmware. This is normal behavior and do not turn off the Access Point while firmware is upgrading.

† **Using FTP**

On FTP server, there should have valid firmware which includes fs-opn.img and/or kernel-opn.img. On the Firmware Update - FTP page, enter the IP address of the FTP server, firmware name and FTP user name and password. Then click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

3.3.1.3 Configuration Tools

By selecting the item of Configuration Tools under System, the screen will show in Figure 3-3-4. This page includes three selections: Restore Factory Default Configuration, Local Backup Settings/Restore settings and Remote Backup Settings/Restore settings.

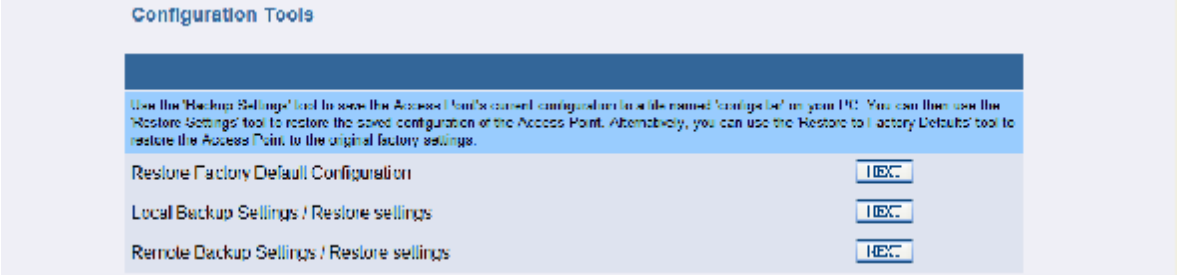


Figure 3-3-4

† **Restore Factory Default Configuration:**

To reset configuration settings to the factory default values, just click on <NEXT> button beside 'Restore Factory Default Configuration'.

Figure 3-3-5

Then click on <Restore> button on next page, now the system will reset to factory default value.

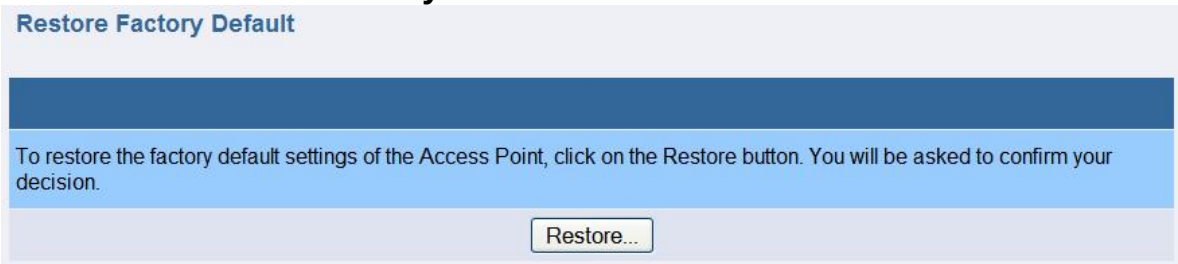


Figure 3-3-6

† **Local Backup Settings / Restore settings**

To backup or restore the configuration for this device, click on <NEXT> button beside 'Local Backup Settings/Restore settings'.

Figure 3-3-7

Click on <Backup Settings> button on next page to save the settings of this device to a file named 'configs.tar' on user's PC.

To restore the settings, click on <Browse> button and select the correct file path and file name. Then, click on <Restore Settings> button to start the restore settings process.

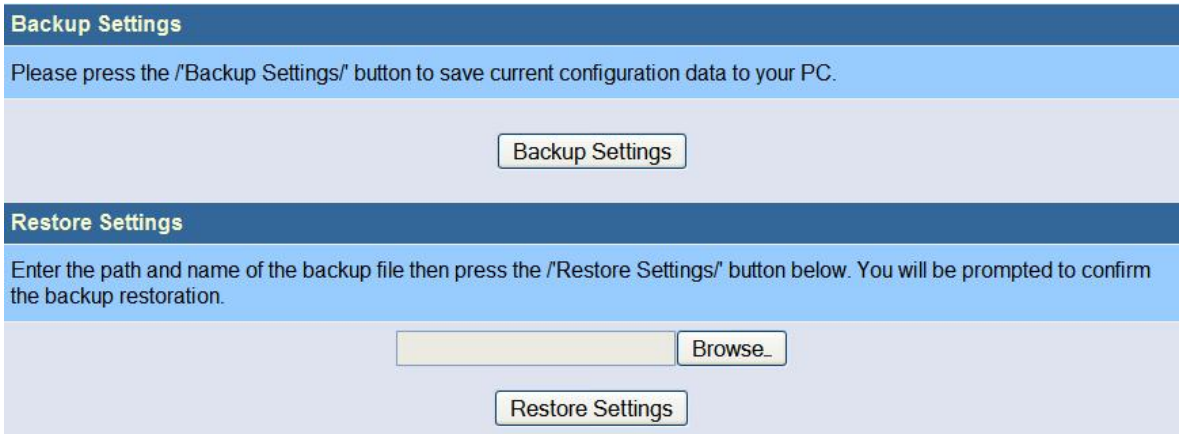


Figure 3-3-8

† Remote Backup Settings / Restore settings

User can also backup/restore the configuration of this device remotely.

Click on <NEXT> button beside 'Remote Backup Settings/Restore settings'.

Figure 3-3-9

Enter the necessary setting in next page, then click on <Backup To Server> or <Restore From Server> to start the process.

Figure 3-3-10

3.3.1.4 General Status

In this page user could see the detail settings of this device, including the System Information, Power Control, Bridge LAN port, AP WIFI 1 Status, AP WIFI 2 Status.

Figure 3-3-11

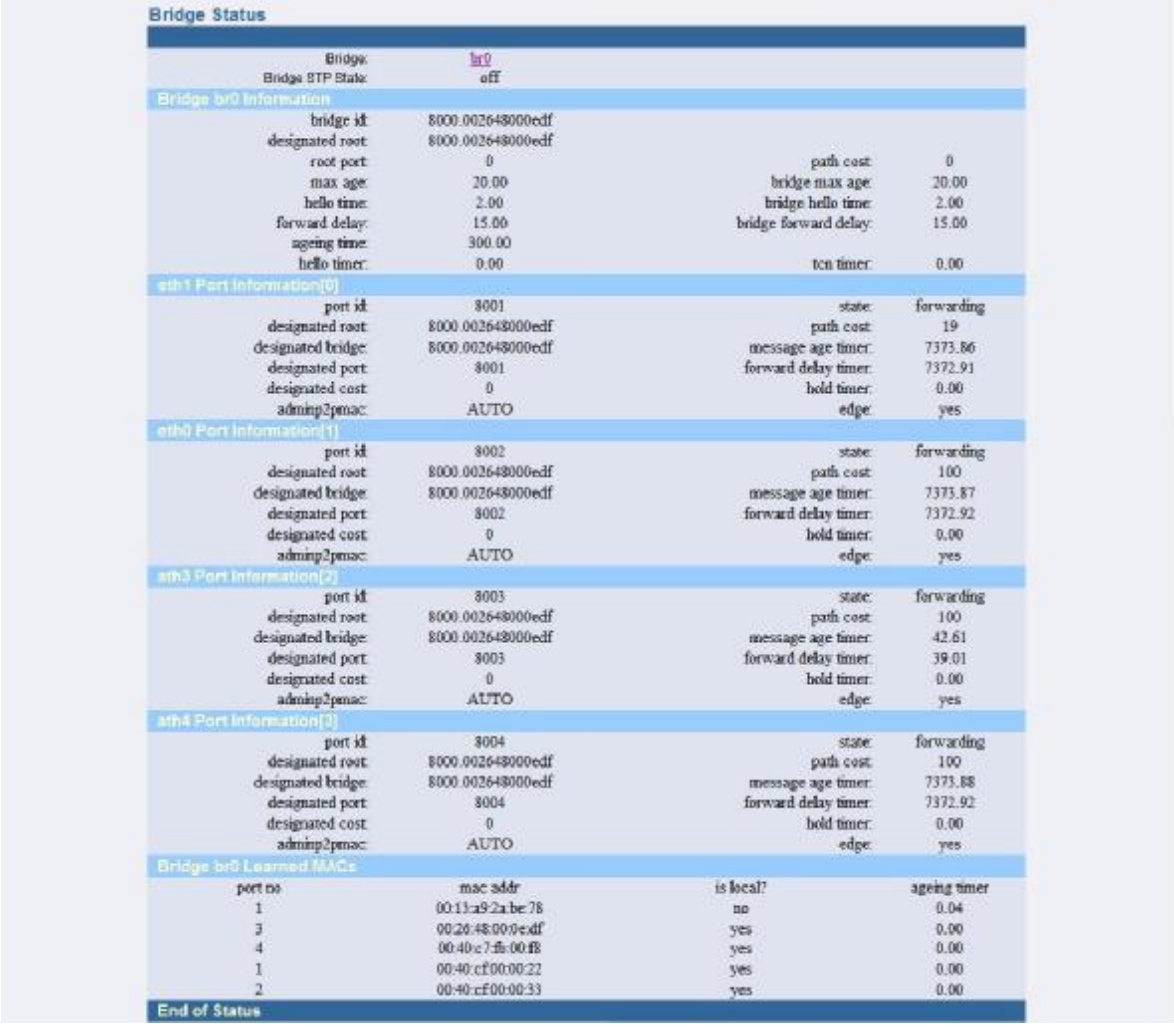
3.3.1.5 Power Control/Status

In this page user can enable the eth0 port to provide PoE power and data forwarding function.

Figure 3-3-12

3.3.1.6 Bridge Status

In this page user could see the bridge interfaces information of this device, such as interface information, STP status, MAC address information etc.



Bridge Status

Bridge:	br0		
Bridge STP State:	off		
Bridge br0 Information			
bridge id:	8000.002648000edf		
designated root:	8000.002648000edf		
root port:	0	path cost:	0
max age:	20.00	bridge max age:	20.00
hello time:	2.00	bridge hello time:	2.00
forward delay:	15.00	bridge forward delay:	15.00
ageing time:	300.00		
hello timer:	0.00	tcn timer:	0.00
eth1 Port Information[0]			
port id:	8001	state:	forwarding
designated root:	8000.002648000edf	path cost:	19
designated bridge:	8000.002648000edf	message age timer:	7373.86
designated port:	8001	forward delay timer:	7372.91
designated cost:	0	hold timer:	0.00
adminp2pmac:	AUTO	edge:	yes
eth0 Port Information[1]			
port id:	8002	state:	forwarding
designated root:	8000.002648000edf	path cost:	100
designated bridge:	8000.002648000edf	message age timer:	7373.87
designated port:	8002	forward delay timer:	7372.92
designated cost:	0	hold timer:	0.00
adminp2pmac:	AUTO	edge:	yes
ath3 Port Information[2]			
port id:	8003	state:	forwarding
designated root:	8000.002648000edf	path cost:	100
designated bridge:	8000.002648000edf	message age timer:	42.61
designated port:	8003	forward delay timer:	39.01
designated cost:	0	hold timer:	0.00
adminp2pmac:	AUTO	edge:	yes
ath4 Port Information[3]			
port id:	8004	state:	forwarding
designated root:	8000.002648000edf	path cost:	100
designated bridge:	8000.002648000edf	message age timer:	7373.88
designated port:	8004	forward delay timer:	7372.92
designated cost:	0	hold timer:	0.00
adminp2pmac:	AUTO	edge:	yes
Bridge br0 Learned MACs			
port no	mac addr	is local?	ageing timer
1	00:13:a9:2a:be:78	no	0.04
3	00:26:48:00:0e:df	yes	0.00
4	00:40:c7:fb:00:f8	yes	0.00
1	00:40:cf:00:00:22	yes	0.00
2	00:40:cf:00:00:33	yes	0.00
End of Status			

Figure 3-3-13

3.3.1.7 WIFI Status

In this page user can click WIFI Interfaces to see each WIFI's information of this device, such as: Interface information, Security information, Associated AP/Station.

The *Figure 3-3-14* shows the ath3 (CB) interface is waiting for connecting to an AP.

WIFI Status

WiFi Interfaces:	ath3 ath4
Interface ath3:	Waiting for Connecting...
End of Status	

Figure 3-3-14

The *Figure 3-3-15*shows that the ath3 (CB model) has connected to an AP, and display the relevant information.

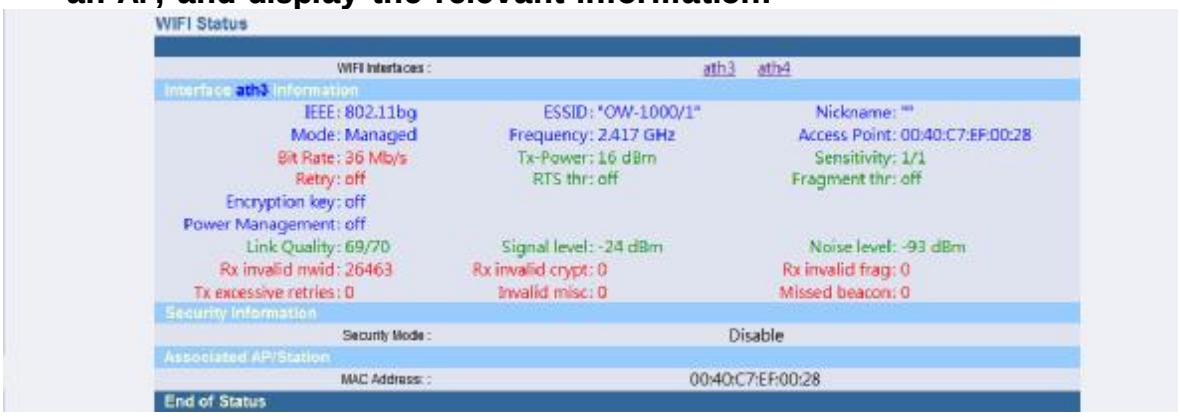


Figure 3-3-15

The *Figure 3-3-16* shows ath4 (AP model) information.

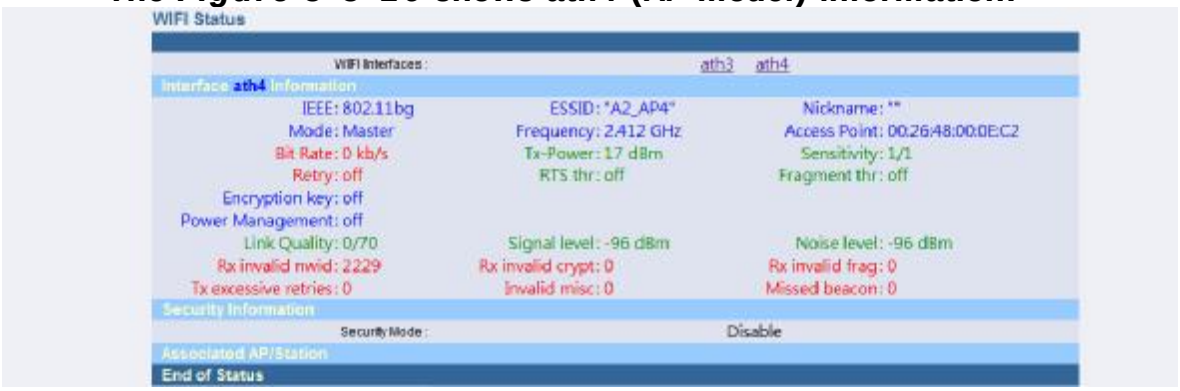


Figure 3-3-16

3.3.1.8 Log

In this page user could see the system logs record of this device.

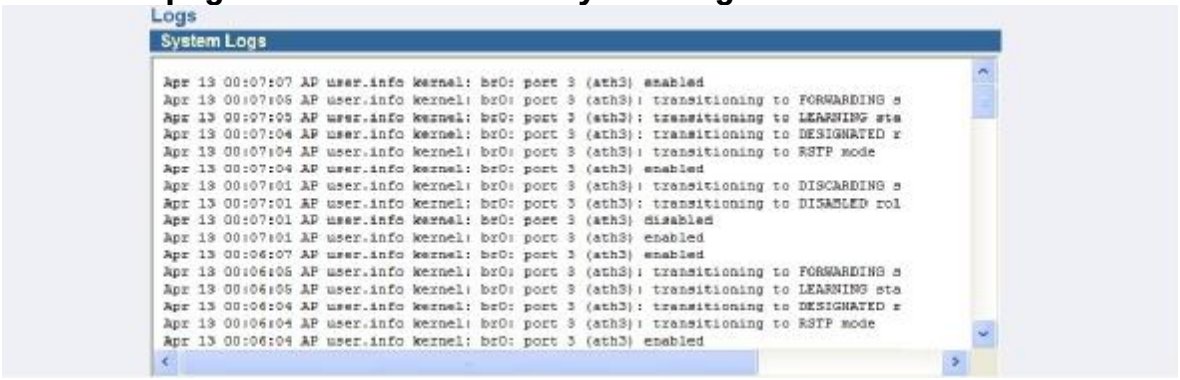


Figure 3-3-17

3.3.1.9 System Time

†Select Setting Type

Setting by: User can set system time in two ways. One is manual setting, the other one is synchronize with an Internet Time Server.

† **Manual Setting**

User can manually enter the Year/ Month/ Day and Hour: Minute: Second.

† **Using Internet Time Server**

Hours from GMT: User can enter the Hours from GMT, for example Taiwan is GMT +8 Hours.

Server IP: User should enter the Internet time server IP address.

Time Update for Every: User can set time update interval by enter the days, hours, and minutes.

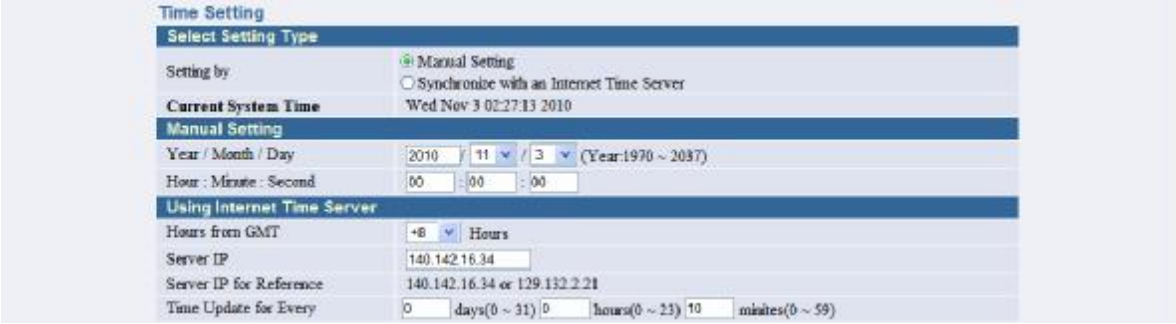


Figure 3-3-18

3.3.1.10 Reboot

User can perform reboot function in case of the device is not function normally, or after user change some major settings for example: change system model. The existing settings will not be changed. To perform the reboot, click on the <Reboot> button and click on <OK> on pop-up screen to confirm user's decision.

Figure 3-3-19

3.3.2 LAN Configuration

† **Interface br0 Setting**

IP Authentication: Indicate how the IP address of this device will be assigned. There are two options available here: Static option - the IP address should be entered in 'Network IP Parameters' and DHCP option - the IP address will be assigned from other DHCP server.

† Network IP Parameters

User can change the network settings of this device from LAN Configuration; it is including IP address, Subnet mask, and Gateway address.

† Bridge STP Setting

User can also set the Bridge STP setting in this page.

STP/RSTP: Disable the bridge STP or set the bridge mode as STP or RSTP mode.

Bridge Priority: Set the priority value of the bridge. The priority value is a number between 0 and 65535. The bridge with the lowest priority will be elected 'root bridge'.

Hello Time: Set the bridge's 'bridge hello time' value (seconds).

Forwarding Delay: Set the bridge's 'bridge forward delay' value (seconds).

Max Age: Set the bridge's 'maximum message age' value (seconds).

Port Cost: Set the port cost of the port.

Port Priority: Set the port priority of the port (interface). It is used in the designated port and root port selection algorithms.

P to P: If a bridge port is operating in full-duplex mode, than the port is functioning as point-to-point. The available options are: auto, true or false. By default, it is set to auto.

Edge: If a port is operating in half-duplex mode and is not connected to any further bridges participating in STP or RSTP, then the port is an edge port. The available options are: yes or no. By default, it is set to no.

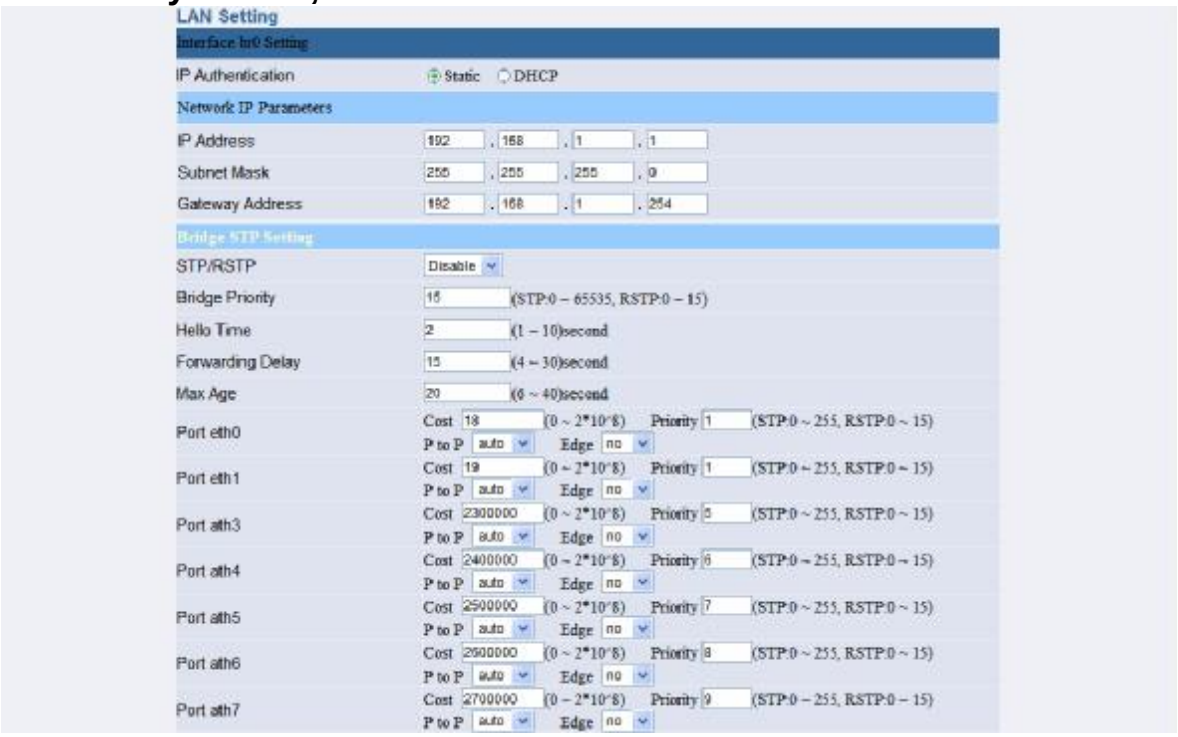


Figure 3-3-20

3.3.3 Wireless

User can set the wireless related setting here.

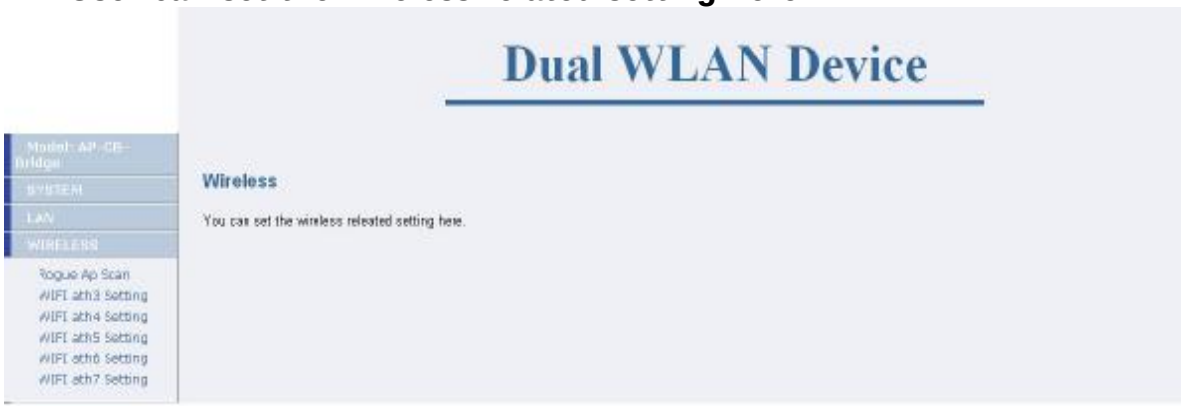


Figure 3-3-21

3.3.3.1 Rogue AP Scan

†Rouge Enable

Check the radio box in front of <Enable> to enable the Rouge AP detection, and Press <Add> or <Del> button to apply.

†Allow AP

The allowable AP list. The AP in the list is a legal AP for CB to connect. Check the box and press the <Del> button to remove it.

†Rogue AP

The nearby AP list, not include the allowed APs. Check the box and press the <Add> button to add it as a legal AP.

†Re-Scan

Press <WIFI x> button to Re-scan the APs nearby which are scanned by wifi card x (x:1 or 2).

Figure 3-3-22

3.3.3.2 WIFI ath3 Setting

†General

Radio Power: Turn this interface on or off.

Wireless Mode: Select which wireless mode that user wants to use. The options available here are: 802.11a, 802.11b, 802.11g and 802.11b+g.

SSID: The SSID (service set identifier) is an identifier of an AP in user′s wireless network. In station mode (CB), this SSID must be same as the AP that user wish to connect. User can either type in the SSID by themself or simply press the <Scan> button and select the AP form the popup list, then click <submit>.

MAC Cloning: This feature controls the MAC Address of the Wireless Bridge seen by other devices (wired or wireless). If set to `Ethernet Client′, the MAC Address from the first Ethernet client that transmits data through the Wireless Bridge will be used. When multiple Ethernet devices are connected to the Wireless Bridge, it may not be obvious which MAC Address will be used. If set to `WDS′, it will include 4 MAC address while transmit the data through Wireless Bridge. It is only available on bridge mode in station interface. If the AP to associate does not support 4-WAY-HANDSHAKE, the 'Ethernet client' should be selected.

Peer Node Distance: Set the distance between this device and it′s adjacent. If select 'manual', the distance will be determined by 'Slot time', 'ACK timeout' and 'CTS timeout' three values.

Beacon Period: This item contains the length of the beacon interval. Enter a value between 20 and 1000 to specify the Beacon Period.

DTIM Period: This item contains the number of Beacon intervals between Delivery Traffic Indication Message (DTIM). Enter a number between 1 and 255 to specify.

Fragment Threshold: It is the maximum frame size that wireless device can transmit without fragmenting the frame. Enter a value between 256 and 2346 to specify the Fragment Threshold.

RTS/CTS Threshold: Packets larger than the value are transmitted by the RTS/CTS handshake. Enter a value between 1 and 2346 to specify the value of the RTS /CTS Threshold.

Tx Power: To set the tx power as off to turn off the tx power, set auto to let device determine the tx power value automatically, or set manual to set the tx power value. The max value is depending on the wireless module.

WEP Key Setting: It uses two kinds of WEP Encryption key length: 5-bytes and 13-bytes. The key format can either use 'ASCII' to set the key values (ie. 0~9, a~z) or use 'HEX' to set the key value in hexadecimal. (ie. 0~9, a~f). User can set maximum 4 keys, but only one key will functional at one time.

Figure 3-3-23

†**SSID Security Mode**

Authentication: User can choose which authentication type to secure the wireless network. There are four options for authentication: Disable, WEP, WPA-personal and WPA-enterprise.
WEP: Short for Wired Equivalent Privacy, a security protocol for wireless local area networks (WLANs) defined in the 802.11 standard.
Open or Restricted: An open system allows any client to authenticate as long as it conforms to any MAC address filter policies that may have been set. All authentication packets are transmitted without encryption. If the 'Restricted' selected, all the packets are transmitted with encryption.
Select Key: Check the radio box in front of the key that user would like to use for this AP.

Figure 3-3-24

WPA-Personal: The method of authentication is similar to WEP, user can define a `Pre-Shared Key′, once the key is confirmed and satisfied on both the client and access point, then access is granted. The encryption method used is referred to as the Temporal Key Integrity Protocol (TKIP).
WPA MODE: In this setting, user can choose WPA or WPA2 or WPA & WPA2. (WPA2 is far superior to WPA, because the encryption of method used is Advanced Encryption Standard (AES)).
Share Key: User should define the pre-share key in here; the length of the key is 8-23 characters.
WPA Encryption: User can choose the encryption method of the pre-shared key here; there are three options: Auto, AES and TKIP.

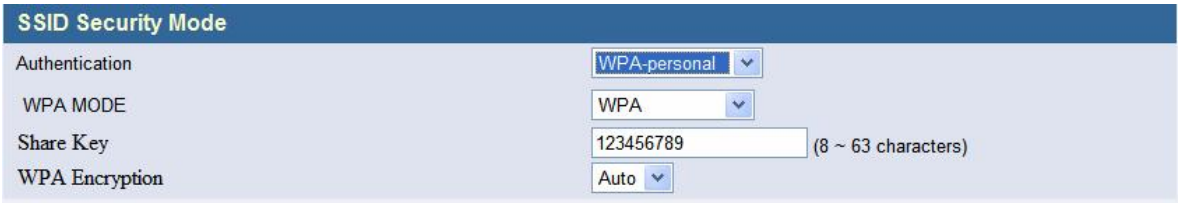


Figure 3-3-25

WPA-enterprise:

WPA-Enterprise includes all of the features of WPA-PSK plus support the 802.1x authentication. To use this function, a separate RADIUS server is required

User should enter their account and password to pass the authentication.

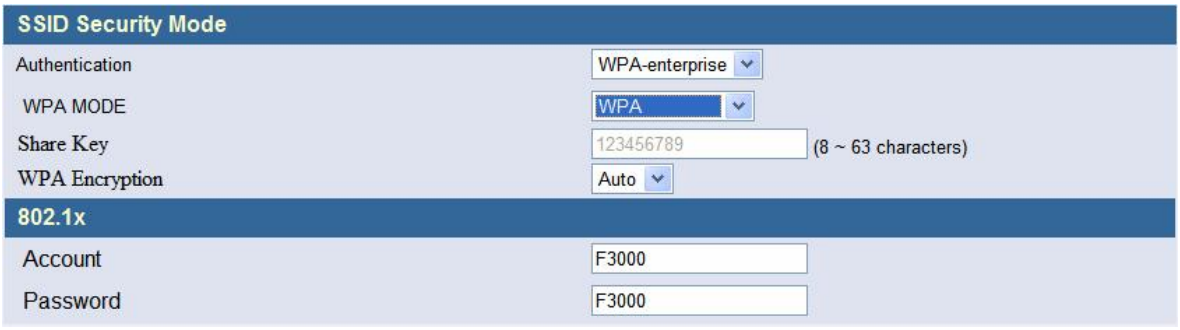


Figure 3-3-26

Please Note: In wifi station model, the security setting must be same as the AP that user wish to connect.

3.3.3.3 WIFI ath4~7 Setting

†General

Radio Power: Turn this interface on or off.

Wireless Mode: Select which wireless mode that user wants to use. The options available here are: 802.11a, 802.11b, 802.11g and 802.11b+g.

SSID: The SSID (service set identifier) is an identifier of an AP in user's wireless network. The SSID must be identical for all access points in the network. It is case sensitive and maximum length is 32.

SSID Hide: This function is to hide the SSID in the wireless network.

Channel: Set the operating frequency/channel for this device.

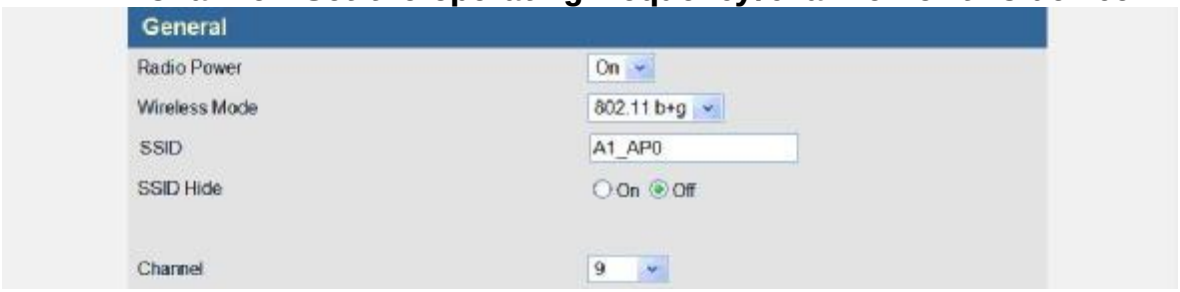


Figure 3-3-27

†Advanced Settings

Peer Node Distance: Set the distance between this device and it's adjacent. If select 'manual', the distance will be determined by 'Slot time', 'ACK timeout' and 'CTS timeout' three values.

Beacon Period: This item contains the length of the beacon interval. Enter a value between 20 and 1000 to specify the Beacon Period.

DTIM Period: This item contains the number of Beacon intervals between Delivery Traffic Indication Message (DTIM). Enter a number between 1 and 255 to specify.

Fragment Threshold: It is the maximum frame size that wireless device can transmit without fragmenting the frame. Enter a value between 256 and 2346 to specify the Fragment Threshold.

RTS/CTS Threshold: Packets larger than the value are transmitted by the RTS/CTS handshake. Enter a value between 1 and 2346 to specify the value of the RTS /CTS Threshold.

Tx Power: To set the tx power as off to turn off the tx power, set auto to let device determine the tx power value automatically, or set manual to set the tx power value. The max value is depending on the wireless module.

Rate: Set the bit rate for wireless interface to supporting multiple bit rates. The value 'Auto' causes the device to use the bit rate selected by the rate control module.

Layer 2 Isolation: It is used in AP mode only. If enabled, all of the clients connect to the same AP will not be able to access each other.

WEP Key Setting: It uses two kinds of WEP Encryption key length: 5-bytes and 13-bytes. The key format can either use 'ASCII' to set the key values (ie. 0~9, a~z) or use 'HEX' to set the key value in hexadecimal. (ie. 0~9, a~f). User can set maximum 4 keys, but only one key will functional at one time.

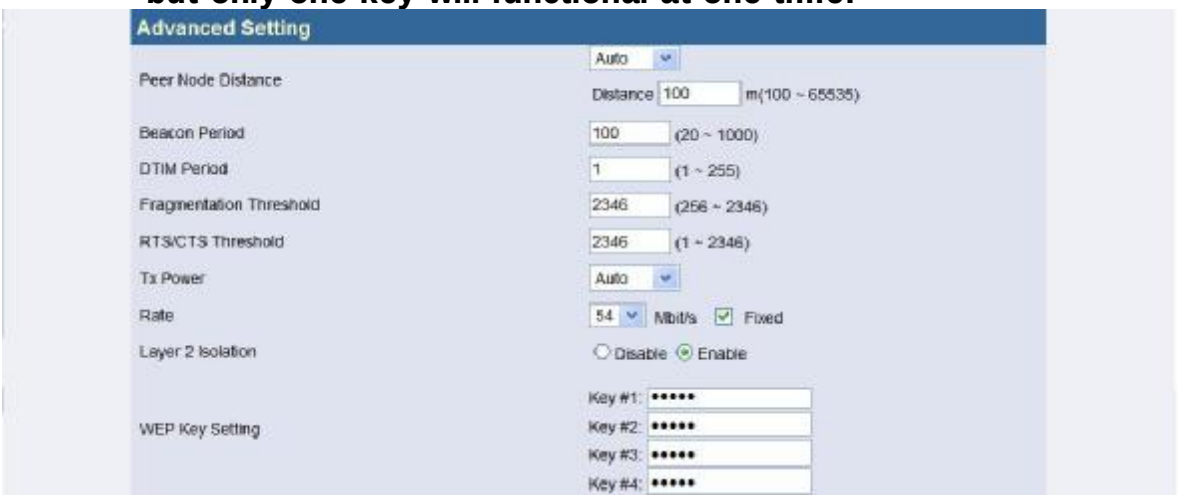


Figure 3-3-28

†SSID Security Mode

Authentication: User can choose which authentication type to secure the wireless network. There are four options for

authentication: Disable, WEP, WPA-personal and WPA-enterprise.

WEP: Short for Wired Equivalent Privacy, a security protocol for wireless local area networks (WLANs) defined in the 802.11 standard.

Open or Restricted: An open system allows any client to authenticate as long as it conforms to any MAC address filter policies that may have been set. All authentication packets are transmitted without encryption. If the 'Restricted' selected, all the packets are transmitted with encryption.

Select Key: Check the radio box in front of the key that user would like to use for this AP.

Figure 3-3-29

WPA-Personal: The method of authentication is similar to WEP, user can define a 'Pre-Shared Key', once the key is confirmed and satisfied on both the client and access point, then access is granted. The encryption method used is referred to as the Temporal Key Integrity Protocol (TKIP).

WPA MODE: In this setting, user can choose WPA or WPA2 or WPA & WPA2. (WPA2 is far superior to WPA, because the encryption of method used is Advanced Encryption Standard (AES)).

Share Key: User should define the pre-share key in here; the length of the key is 8-23 characters.

WPA Encryption: User can choose the encryption method of the pre-shared key here; there are three options: Auto, AES and TKIP.

Group Key Update Interval: Time interval for rekeying the GTK (broadcast/multicast encryption keys) in seconds.

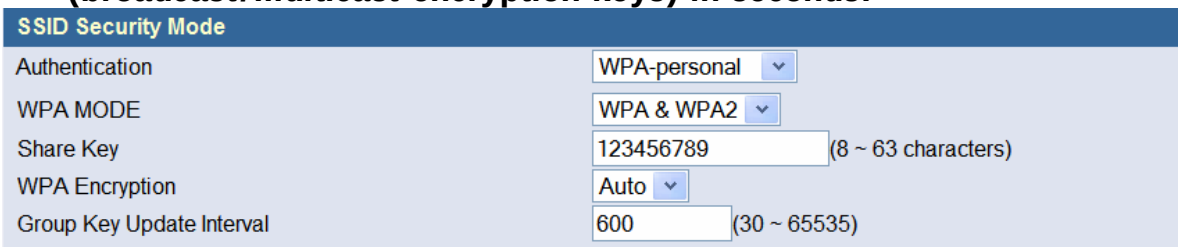


Figure 3-3-30

WPA-enterprise:

WPA-Enterprise includes all of the features of WPA-PSK plus support the 802.1x authentication. To use this function, a separate RADIUS server is required.

User should enter the IP and port number of the Authentication Server and Shared Secret here. In case if a backup server has been deployed in user's network, user can also enter the necessary information here.

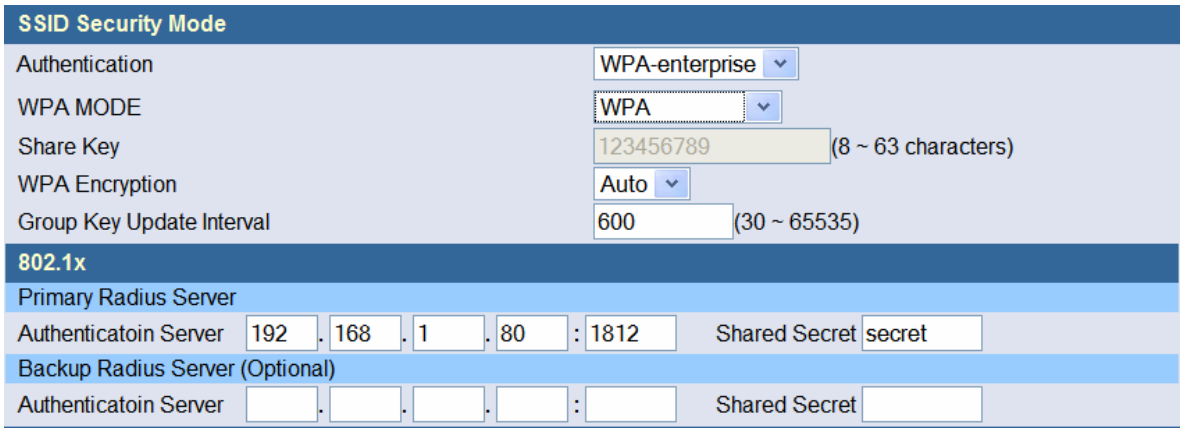


Figure 3-3-31

† **QoS**

WMM: Enable/disable WMM support.
MAX Associated Station: Maximum number of stations allowed in station table.

Common Parameters:
CWmin: Minimum Contention Window. The valid values for 'CWmin' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047, or 4095. The value for 'CWmin' must be lower than the value for 'CWmax'.
CWmax: Maximum Contention Window. The Valid values for 'CWmax' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047 or 4095. The value for 'CWmax' must be higher than the value for 'CWmin'.
AIFS: Arbitration Inter-Frame Spacing.
Burst: Maximum length (in milliseconds with precision of up to 0.1 ms) for bursting.
AP Parameters:
This affects traffic flowing from the access point to the client station. These parameters are used by the access point when transmitting frames to the clients.

AP Tx-Best Effort: Medium Priority. Medium throughput and delay. Most traditional IP data is sent to this queue.
AP Tx-Background: Low Priority. High throughput. Bulk data that requires maximum throughput and is not time-sensitive is sent to this queue (FTP data, for example).
AP Tx-Video: High Priority. Minimum delay. Time-sensitive video data is automatically sent to this queue.
AP Tx-Voice: High Priority. Time-sensitive data like VoIP and streaming media are automatically sent to this queue.

STA Parameters:
These parameters are sent to WMM clients when they associate. The parameters will be used by WMM clients for frames

transmitted to the access point.

STA Tx-Best Effort: Medium Priority, Medium throughput and delay. Most traditional IP data will be sending to this queue.
STA Tx-Background: Low Priority, High throughput. Bulk data that requires maximum throughput and it's not time-sensitive will be sending to this queue (FTP data, for example).
STA Tx-Video: High Priority, Minimum delay. Time-sensitive video data will be automatically sent to this queue.
STA Tx-Voice: High Priority, Time-sensitive data like VoIP and streaming media are automatically sent to this queue.
TXOP: Transmission Opportunity is an interval of time when a WMM Client Station has the right to initiate transmissions onto the wireless medium (WM). This value specifies (in milliseconds) the Transmission Opportunity (TXOP) for Client Station; that is, the interval of time when the WMM AP has the right to initiate transmissions on the wireless network.
ACM: Admission control mandatory.

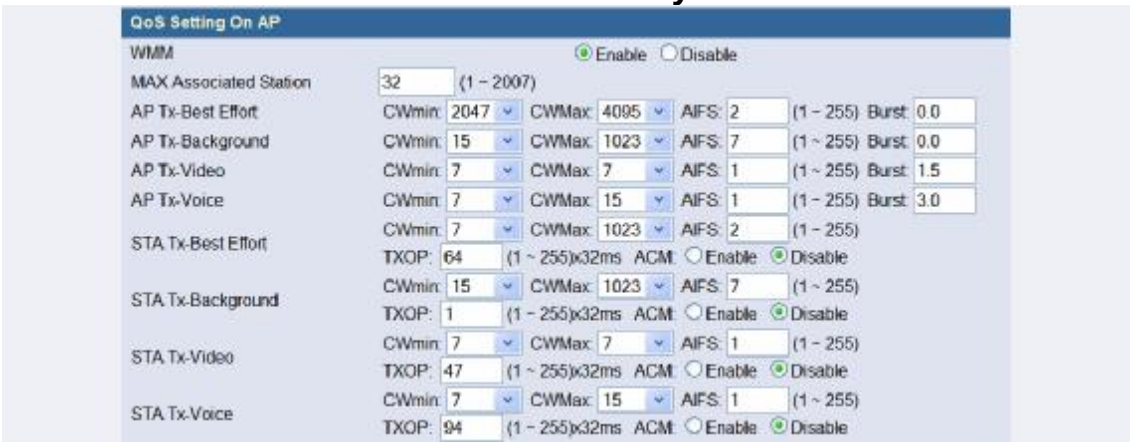


Figure 3-3-32

3.3.4 Filtering

The MAC address filter can be used to filter network access by machines based on the unique MAC addresses of their network adapter(s). It is most useful to prevent unauthorized wireless devices from connecting to user's network. A MAC address is a unique ID assigned by the manufacturer of the network adapter.

3.3.4.1 MAC Filtering

User can block certain clients from accessing this AP based on its MAC address. Use Filtering type to define the filtering scenario:

†General

Disabled: Disable this filtering function. If this option is selected, all PCs can access this AP.
Accept: All PCs are filtered out except those MAC addresses in the following MAC address table. In other words, only those interfaces/ PCs with MAC address in the MAC address table can access this AP.

Reject: All PCs/interfaces can access this AP except those interfaces/PCs with MAC address in the MAC address table.

Figure 3-3-33

3.3.5 SNMP

The Outdoor Wireless Access Point support SNMP V1/V2C/V3, this page is to define the SNMP access control and SNMP traps.

3.3.5.1 Basic Setting

†SNMP Agent

Check the <Enable> check box to turn on SNMP. Please Note: Enable the SNMP will also enable the LLDP (Link Layer Discovery Protocol) function. This function will be used if user wants to remote management the AP and draw the network topography.

†System Information

Contact: Specify the contact name for this managed node as well as information about how to contact this person.
Location: It is used to define the location of the host on which the SNMP agent is running.

†V1/V2C

User can change user's SNMP community settings on this page.
Access Right: Select an access right for the SNMP manager. 'Read' is read only, 'Write' is read-write, and 'Deny' means this community name is not implemented.
Community: Specify the name of community for the SNMP manager.

SNMP Community provides a simple protection by using the community name to control the access to the SNMP. The community name can be thought of as a password. If user doesn't have the correct community name, user can't retrieve any data (get) or make any change (set). Multiple SNMP managers may be organized in a specified community.

† **V3**

The SNMP V3 is a Security Enhancement for SNMP, it provides secure access to devices by a combination of user ID, authenticating and encrypting packets over the network.

User ID: A string representing the name of the user.

Security Level: User can select which security level that user wants to use. The available options for this field are: NoAuthNoPriv, AuthNoPriv or AuthPriv.

Auth Type (Authentication Protocol): An indication of which authentication protocol is used. The available options for this field are: MD5, and SHA.

Auth Passphrase (Authentication Key): A secret key used by the authentication protocol for authenticating messages.

Privacy Protocol: An indication of which privacy protocol is used. The available options for this field is: DES.

Priv Passphrase (Privacy Key): The secret key used by the privacy protocol for encrypting and decrypting messages.

Access Right: Assign the access right for account. The options are:

Unused − The account is disabled.

Read Only − The account has read only access rights.

Read Write − The account has read and writes access rights.

usm − This account will be an usm account and assign access rights by VACM.

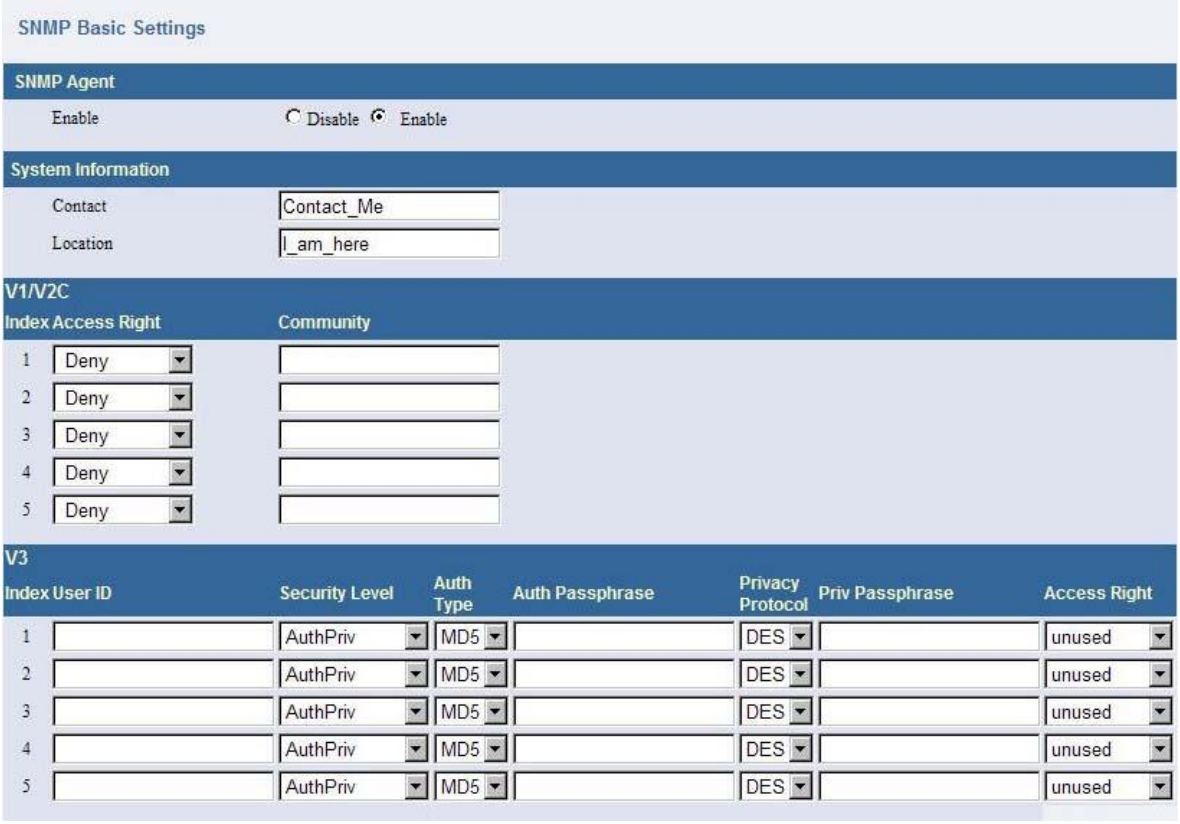


Figure 3-3-34

3.3.5.2 VACM Setting

User can use the View-based Access Control Model (VACM) to define whether access to a specified managed object is authorized. Access control is done at the following points:

- **When processing retrieval request messages from the SNMP manager.**
- **When processing modification request messages from the SNMP manager.**
- **When notification messages must be sent to the SNMP manager.**

The following tokens for VACM access security that user can use:

† **Community to Security for V1/V2c**

Map the community name (COMMUNITY) into a security name. The Community to Security token takes NAME SOURCE and COMMUNITY options. User can use this token to give SNMPv3 security privileges to SNMPv1 and SNMPv2 users and communities

Index: Index of Community to Security. Tick the checkbox to enable the recordset.

Security Name: is a name that will use by the group table.

IP source: Describes a host or network.

Community: The community name that is used.

†**Group**

Map the security names into group names. (For SNMP V3, the security Name is the user ID in Basic setting.)
Index: Index of Group. Tick the checkbox to enable the recordset.
Group Name: A group name is given to a group of users and is used when managing their access rights.
Security Model: Assign security model for group.
Security Name: Assign security name for group. This field will obtain from the 'Security Name' of 'Community to Security' when security model is v1 or v2c, or obtain from the 'User ID' of 'usm' when security model is usm.

Figure 3-3-35

† **View**

Create a view for user to let the groups have rights to view the MIB tree.
Index: Index of View. Tick the checkbox to enable the recordset.
Include: Assign include or exclude in this record for certain subtree.
Sub Tree: the OID value. For example: '1.3.6.1.2.1'.

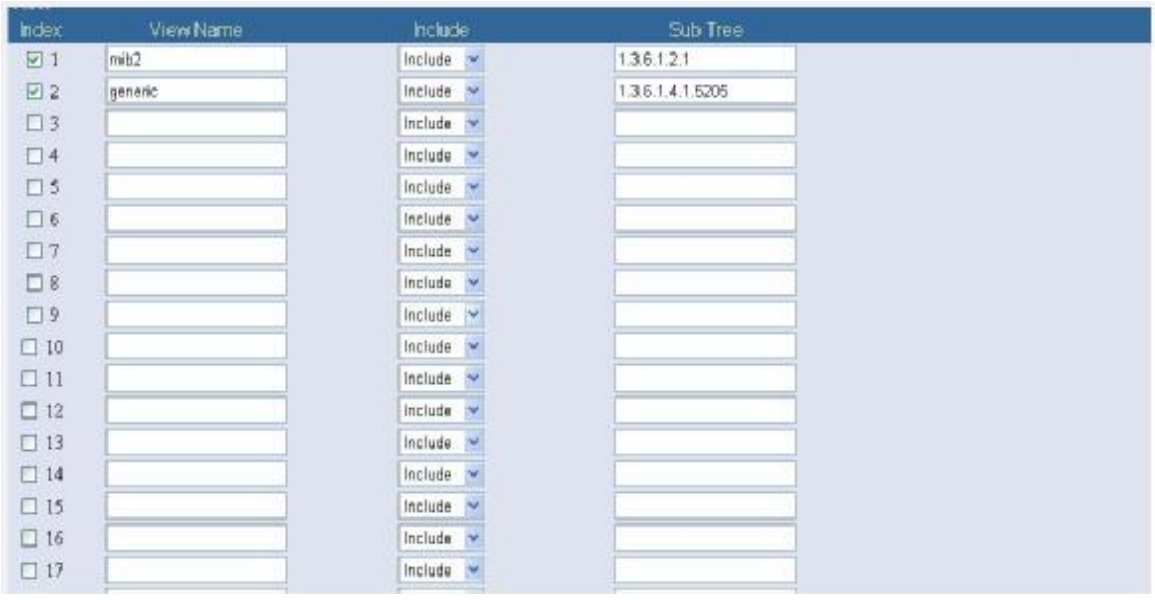


Figure 3-3-36

† **Access**

The Access table grants the groups access right to certain views. Each group can have multiple access rights. The most secure access right is chosen.

Index: Index of Access. Tick the checkbox to enable recordset.

Group: Returned and lookup the 'Group Name' from the Group table.

Security model: Specified in the message's msgSecurityModel parameter. The available options for this field are: any, v1, v2c and usm.

Security level: Specified in the message's msgFlags parameter. The available options for this field are: NoAuthNoPriv, AuthNoPriv and AuthPriv.

Read: Specified in the message's msgSecurityModel parameter. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Write: Authorized View Name for write access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Notify: Authorized View Name for notify access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

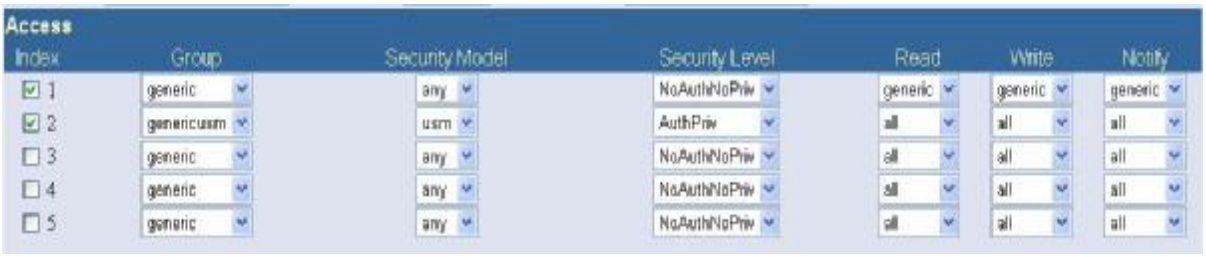


Figure 3-3-37

3.3.5.3 SNMP Trap

It is an SNMP application that uses the SNMP TRAP operation to send information to a network management system.

† **SNMP Trap**

Trap Active: To enable or disable SNMP Trap function.

† **v1 / v2c Trap**

Version: Indicate the traps will be sent in v1 or v2c or not send (disable).

IP Address & Port: The IP and Port to receive traps.

Community: The community string to be used when sending traps.

†v3 Trap

Trap: Index of SNMP v3 traps. Tick the checkbox to enable recordset.

User: The usm User ID.

IP Address & Port: The IP and Port of a device to receive traps.

Security Level: Assign security level in this record. The Options are: NoAuthNoPriv, AuthNoPriv, AuthPriv.

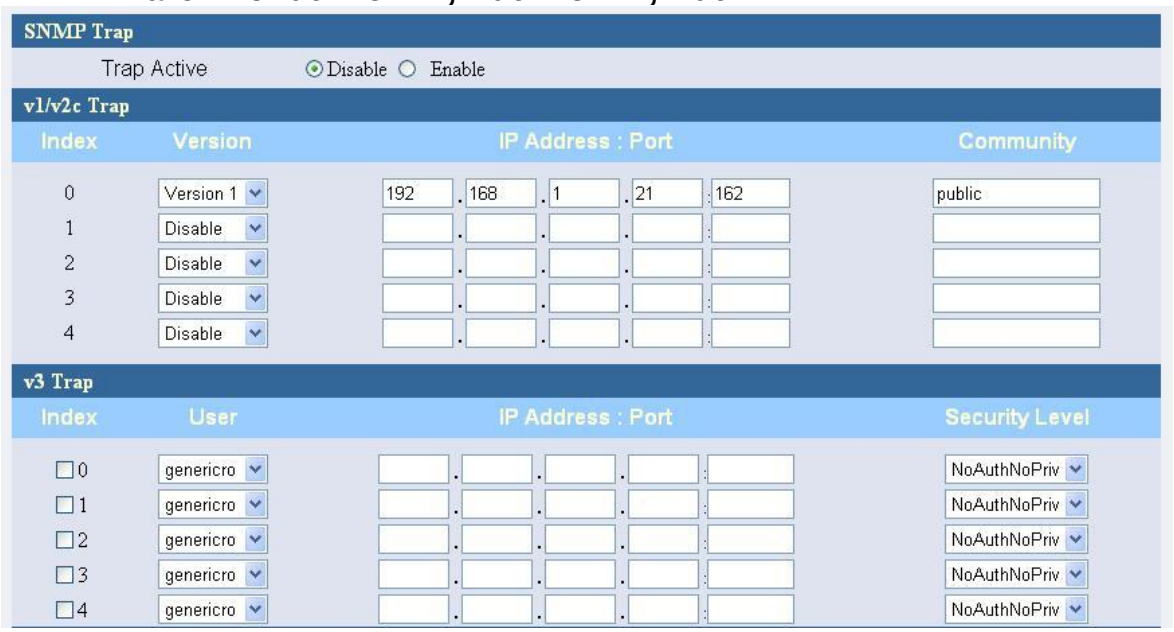


Figure 3-3-38

† Trap Items

Enable/Disable which trap items to send.

Figure 3-3-39

3.3.6 Tools

†Command Ping

It runs ping command to test the connection capability of this device with the other Ethernet device.

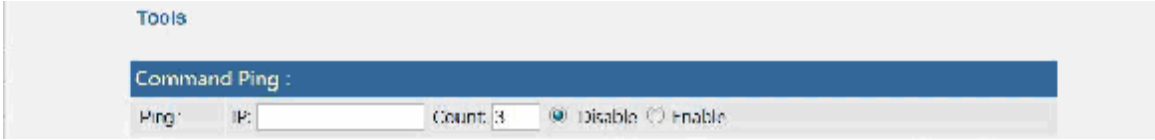


Figure 3-3-40

3.3.7 Log Out

User can manually logout by click on <Log Out>.

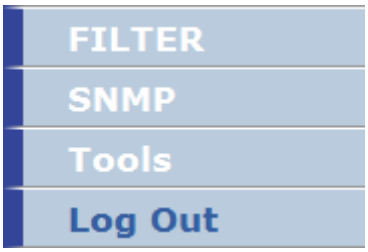


Figure 3-3-41

3.4 AP-CB-Router Mode

AP-CB-Router mode is to set this device as a router device with AP and CB functions. The setting and functions as following:

▽ **SYSTEM**
- **Administrator**
- **Firmware**
- **Configuration Tools**
- **General Status**
- **Power Control**
- **WIFI Status**
- **Log**
- **System Time**
- **Reboot**

▽ **WAN**
- **WAN Setting**
- **Bandwidth Management**

▽ **LAN**
- **Eth0 Settings**
- **Eth1 Settings**
- **AP ath4 Setting**
- **AP ath5 Setting**
- **AP ath6 Setting**
- **AP ath7 Setting**

▽ **WIRELESS**
- **Rogue Ap Scan**
- **WIFI ath3 Setting**
- **WIFI ath4 Setting**
- **WIFI ath5 Setting**
- **WIFI ath6 Setting**
- **WIFI ath7 Setting**

▽ **FILTER**
- **IP Filtering**
- **MAC Filtering**

▽ **SNMP**

- **Basic Setting**
- **VACM Setting**
- **Trap Setting**

▽ Tools

- **Tools**

▽ Log Out

3.4.1 System

This page shows the current status and some basic settings of the device, including Administrator, Firmware, Configuration Tools, General Status, Power Control, WIFI Status, Log, System Time and Reboot; screen as shown in Figure 3-4-1.

Figure 3-4-1

3.4.1.1 Administrator

By selecting the item of Administrator under System, User will see the screen shown in Figure 3-4-2. These settings allow user to configure the Device Name, Language, Model, Password, Remote Management and WIFI Loading Warning Threshold.

† Device Name

This is a host name or system name for the device. The maximum length is 20 characters. User can only input '0'~'9', 'a'~'z', 'A'~'Z', '_' or '-'.

† Model

OLSR_AP: To set this device as an AP with layer 3 MESH function.
AODV_AP: To set this device as an AP with layer 3 MESH function.
AP-Bridge: To set this device as a normal AP.
AP-CB-Bridge: To set this device as an AP and Client Bridge device.
AP-CB-ROUTE: To set this device as a router device with AP and CB functions.
CB-CB-ROUTE: To set this device as a router device with dual CB

functions.

VLAN-AP: To set this device as a VLAN AP device. Each SSID can have its own VLAN ID.

AP_WDS_BRG: To set this device as a WDS device with AP function.

AP4_WDS_BRG: To set this device as WDS device with AP function and support up to 4 SSID.

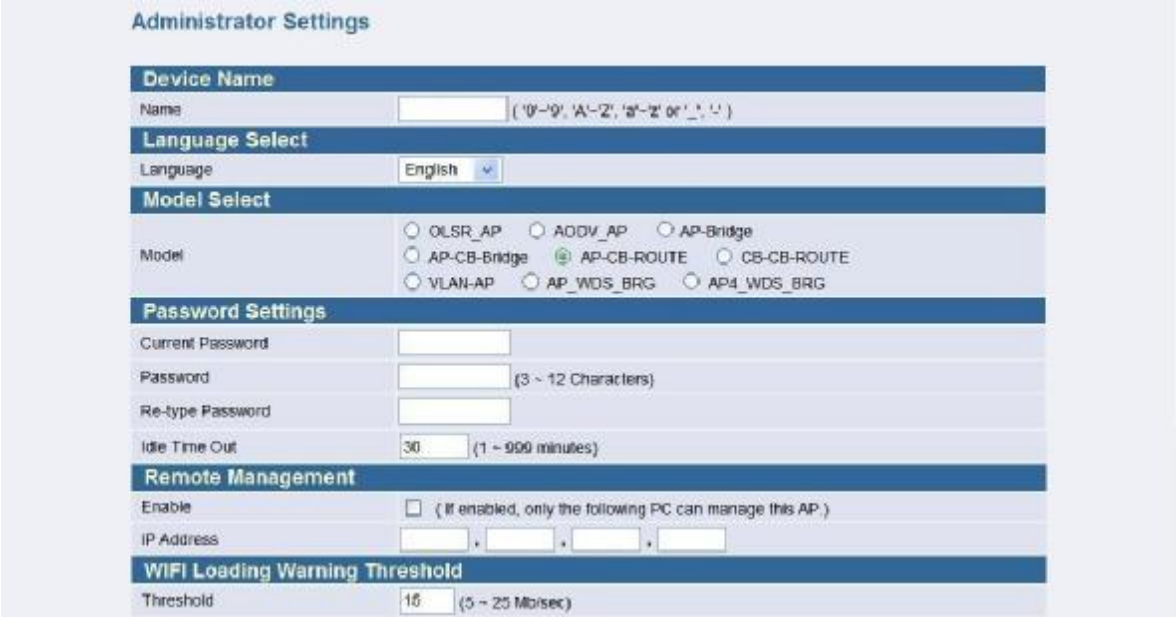


Figure 3-4-2

† Password Settings

If user wants to change the password for admin account, the user should enter the current password, a new password and, re-type the new password.

The Idle Time Out is the amount of time of inactivity allowed before user proceeds next action. The user needs to re-login if the idle time passes timeout.

† Remote Management

User can enable/disable the management of the Access Point from a remote host. Just tick the <Enable> check box and enter an IP address of the remote host. Then, only the host with the entered IP address can access this device.

† WIFI Loading Warning Threshold

The threshold value is used by network management system. Network management software will monitor the WIFI loading, when the loading is over this value, network management software will change the color of the link line on network topology to notify the user about condition of the link quality. The threshold value is between 5 and 25.

3.4.1.2 Firmware Update

By selecting the item of Firmware under System, User will see the screen shown in Figure 3-4-3. This page shows current firmware version and date. This page also allow user to using TFTP or WEB or FTP method to upgrade to the new version of the firmware.

Figure 3-4-3

†Using TFTP

On any computer in the network or a computer direct connect to the AP. Install a TFTP Server utility, and put the firmware file named 'upgradeFW.tar' in a folder.

Run TFTP utility and specify the folder in which the firmware file located. Enter the TFTP server IP and click on <APPLY> button. At the end of the upgrade process, this device may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

†Using WEB

Click on <Browse> button and select the correct firmware file path and file name. Then, click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands while uploading the firmware. This is normal behavior and do not turn off the Access Point while firmware is upgrading.

†Using FTP

On FTP server, there should have valid firmware which includes fs-opn.img and/or kernel-opn.img. On the Firmware Update - FTP page, enter the IP address of the FTP server, firmware name and FTP user name and password. Then click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

3.4.1.3 Configuration Tools

By selecting the item of Configuration Tools under System, the screen will show in Figure 3-4-4. This page includes three selections: Restore Factory Default Configuration, Local Backup Settings/Restore settings and Remote Backup Settings/Restore settings.

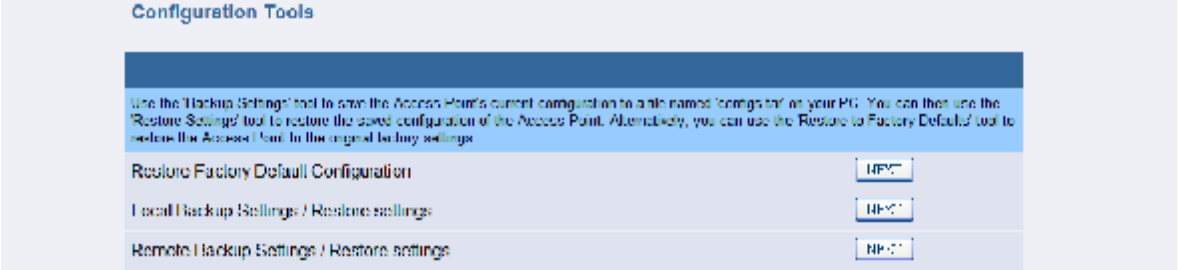


Figure 3-4-4

† Restore Factory Default Configuration:

To reset configuration settings to the factory default values, just click on <NEXT> button beside 'Restore Factory Default Configuration'.

Figure 3-4-5

Then click on <Restore> button on next page, now the system will reset to factory default value.

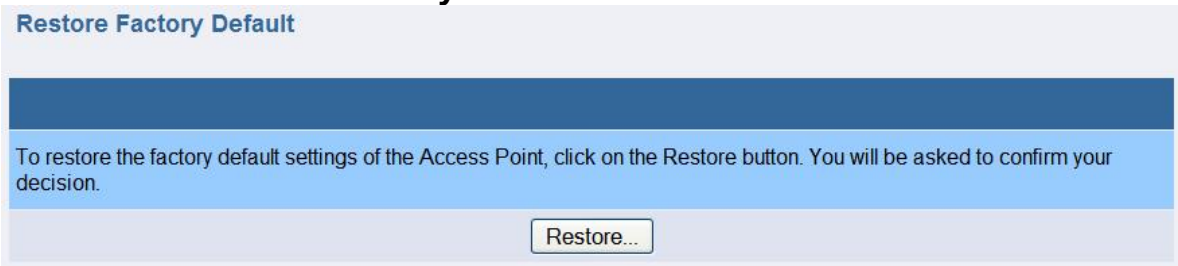


Figure 3-4-6

† Local Backup Settings / Restore settings

To backup or restore the configuration for this device. Click on <NEXT> button beside 'Local Backup Settings/Restore settings'.

Figure 3-4-7

Click on <Backup Settings> button on next page to save the settings of this device to a file named 'configs.tar' on user's PC.

To restore the settings, click on <Browse> button and select the correct file path and file name. Then, click on <Restore Settings> button to start the restore settings process.

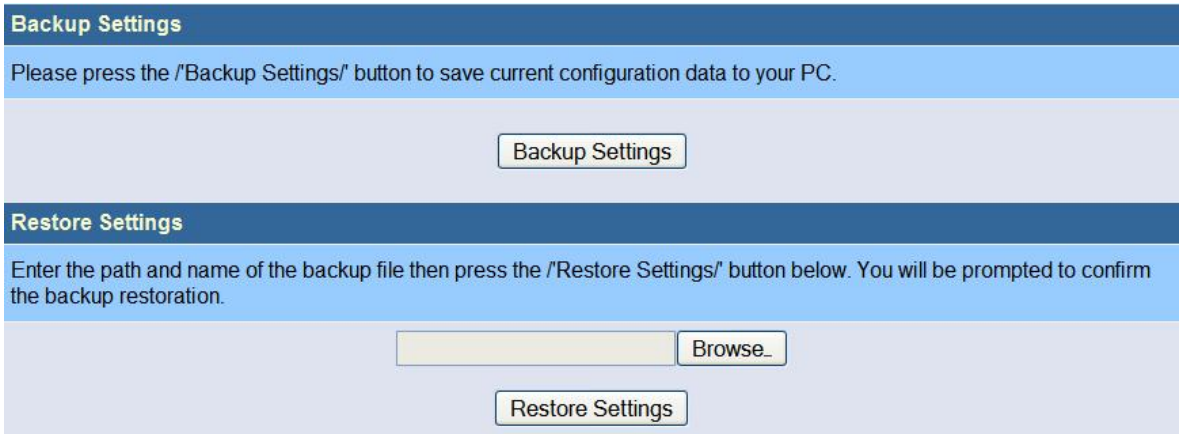


Figure 3-4-8

† Remote Backup Settings / Restore settings

User can also backup/restore the configuration of this device remotely.

Click on <NEXT> button beside 'Remote Backup Settings/Restore settings'.

Figure 3-4-9

Enter the necessary setting in next page, then click on <Backup To Server> or <Restore From Server> to start the process.

Figure 3-4-10

3.4.1.4 General Status

In this page user could see the detail settings of this device, including the System Information, Power Control Status, WAN Port, eth0 LAN Port, eth1 LAN Port, Station WIFI 1 Status, AP WIFI 2 Status.

Status

System Information			
Current Firmware Version		v0.1.8	
Device Name		AP	
System Model		AP-CB-ROUTE	
System Time		Wed Nov 3 00:17:44 2010	
Power Control Status			
eth0 PoE		Disabled	
WAN Port			
IP Address		192.168.23.1	
MAC Address		00:26:48:00:0e:df	
Mask		255.255.255.0	
Gateway		NA	
DHCP		Disabled	
eth0 LAN Port			
IP Address		192.168.0.1	
MAC Address		00:40:cf:00:00:33	
Mask		255.255.255.0	
DHCP		Disabled	
eth1 LAN Port			
IP Address		192.168.1.1	
MAC Address		00:40:cf:00:00:22	
Mask		255.255.255.0	
DHCP		Disabled	
Station WIFI 1 Status			
MODE		802.11 a	
COUNTRY		North_America_Area	
DTIM		1	
FRAG		2346	
RTS		2346	
BEACON		100	
DISTANCE		100	
Interface ath0			
Radio		Off	
Interface ath1			
Radio		Off	
Interface ath2			
Radio		Off	
Interface ath3			
IP Address		192.168.23.1	
MAC Address		00:26:48:00:0e:df	
Mask		255.255.255.0	
DHCP		Disabled	
SSID	A1_AP3	Security:	**Disabled**
AP WIFI 2 Status			
MODE		802.11 a	
COUNTRY		North_America_Area	
CHANNEL		Auto	
DTIM		1	
FRAG		2346	
RTS		2346	
BEACON		100	
DISTANCE		100	
Interface ath4			
IP Address		192.168.24.1	
MAC Address		00:40:c7:ff:00:f8	
Mask		255.255.255.0	
DHCP		Disabled	
SSID	A2_AP4	Security:	**Disabled**
Interface ath5			
Radio		Off	
Interface ath6			
Radio		Off	
Interface ath7			
Radio		Off	

Figure 3-4-11

3.4.1.5 Power Control/Status

In this page user can enable the eth0 port to provide PoE power and data forwarding function.

Figure 3-4-12

3.4.1.6 WIFI Status

In this page user can click WIFI Interfaces to see each WIFI information of this device, such as: Interface information, Security information, Associated AP/Station.

The *Figure 3-4-13* shows the ath3 (CB) interface is waiting for connecting to an AP.

Figure 3-4-13

The *Figure 3-4-14* shows that the ath3 (CB model) has connected to an AP, and display the relevant information.

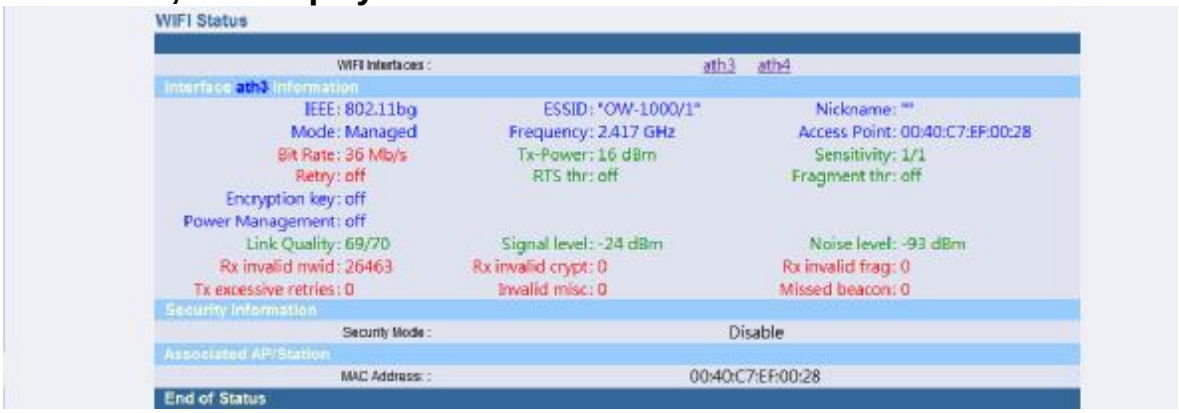


Figure 3-4-14

The *Figure 3-4-15* shows ath4 (AP model) information.

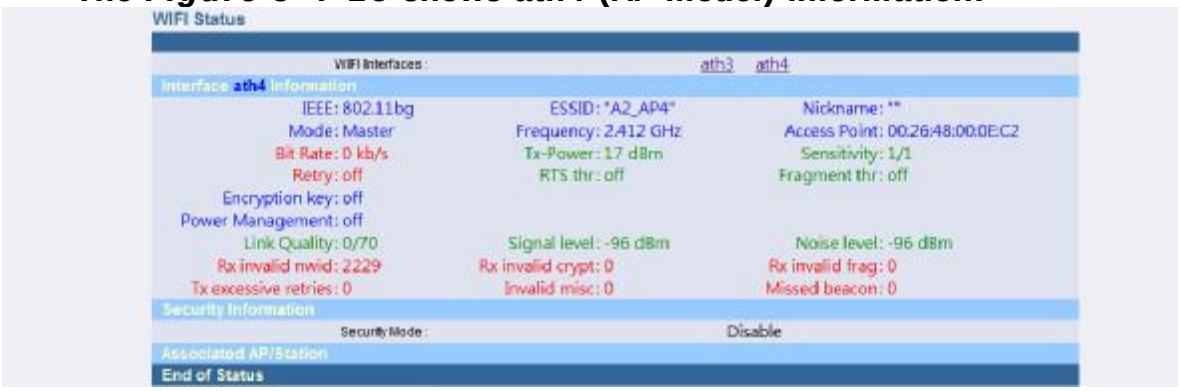


Figure 3-4-15

3.4.1.7 Log

In this page user could see the system logs record of this device.

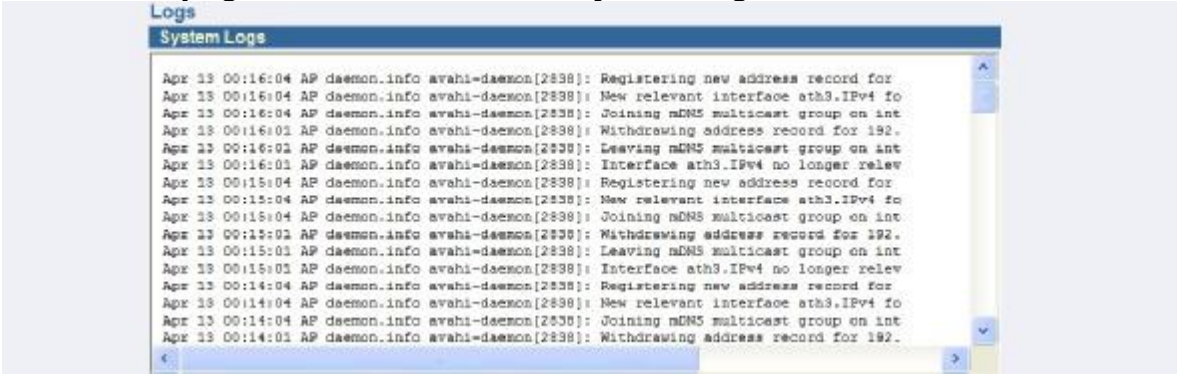


Figure 3-4-16

3.4.1.8 System Time

†Select Setting Type

Setting by: User can set system time in two ways. One is manual setting, the other one is synchronize with an Internet Time Server.

†Manual Setting

User can manually enter the Year/ Month/ Day and Hour: Minute: Second.

†Using Internet Time Server

Hours from GMT: User can enter the Hours from GMT, for example Taiwan is GMT +8 Hours.

Server IP: User should enter the Internet time server IP address here.

Time Update for Every: User can set time update interval by enter the days, hours, and minutes.

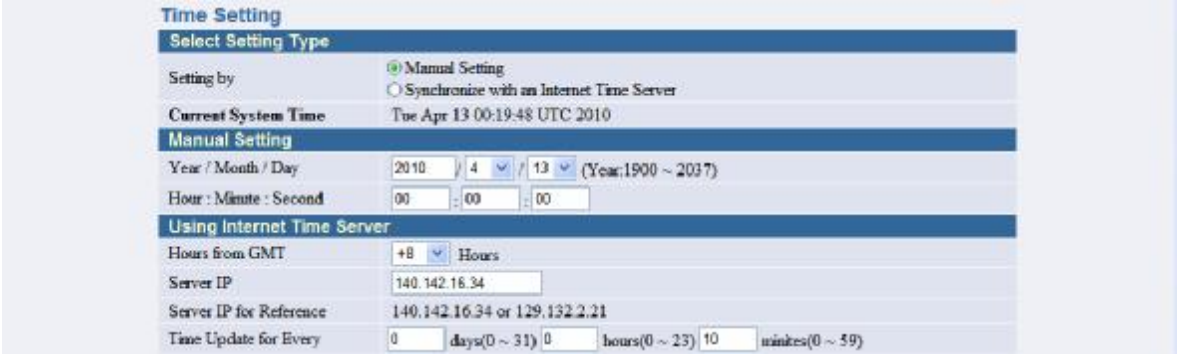


Figure 3-4-17

3.4.1.9 Reboot

User can perform reboot function in case of the device is not function normally, or after user change some major settings for example: change system model. The existing settings will not be changed. To

perform the reboot, click on the <Reboot> button and click on <OK> on pop-up screen to confirm user's decision.

Figure 3-4-18

3.4.2 WAN Configuration

3.4.2.1 WAN Settings

This function is to establish a connection with user's WAN network, select the IP Allocation Mode that ISP is used.

† Interface ath3 Setting

IP Authentication: Indicate how the IP address of this device will be assigned. There are two options available here: Static option - the IP address should be entered in 'Network IP Parameters' and DHCP option - the IP address will be assigned from other DHCP server.

† Network IP Parameters

User can change the network settings of this device from WAN Configuration; it is including IP address, Subnet mask, and Gateway address.

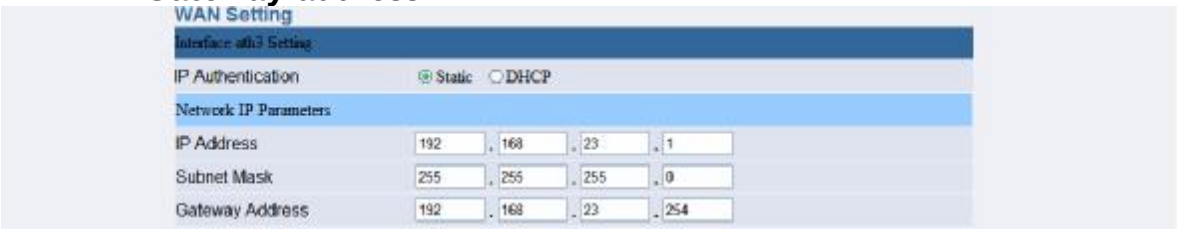


Figure 3-4-19

3.4.2.2 Bandwidth Management

This function allows user to set the limitation of total upload/download bandwidth on WAN interface, and also can set the limitation of upload/download bandwidth for each user or a group of users by IP address.

† Bandwidth Management

Bandwidth Management: Enable bandwidth limitation function.
Upload Bandwidth: The total upload bandwidth (in Mbps).
Download Bandwidth: The total download bandwidth (in Mbps).

† Bandwidth Limitation

Action: To set the action type of bandwidth limitation. The options available here are: disable, upload, download and upload/download.
Start IP Address: To set the start IP of bandwidth limitation.

End IP Address: To set the end IP of bandwidth limitation.
Bandwidth Limitation: To set the bandwidth (in Kbps) of bandwidth limitation.
User can press <Add> button to add IP address to the Bandwidth Limitation list.
User can tick the check box and press <Del> button to delete the IP address from the Bandwidth Limitation list.

Figure 3-4-20

3.4.3 LAN Configuration

User can change the local network settings of this device from LAN Configuration for eth0~eth1 and ath4~ath7, which include the IP address, Subnet mask and DHCP server related settings.

† Network IP Parameters

User can change the network settings of this interface from LAN configuration; it is including IP address, Subnet mask and enable/disable the DHCP server Function.

† DHCP Server Parameters

Primary / Secondary DNS Address: The domain-name-servers option specifies a list of Domain Name System name servers available to the client
IP Pool Starting / Ending Address: The IP Address range which will be assigned.
Lease Time: How long does the IP address can be leased by DHCP server.

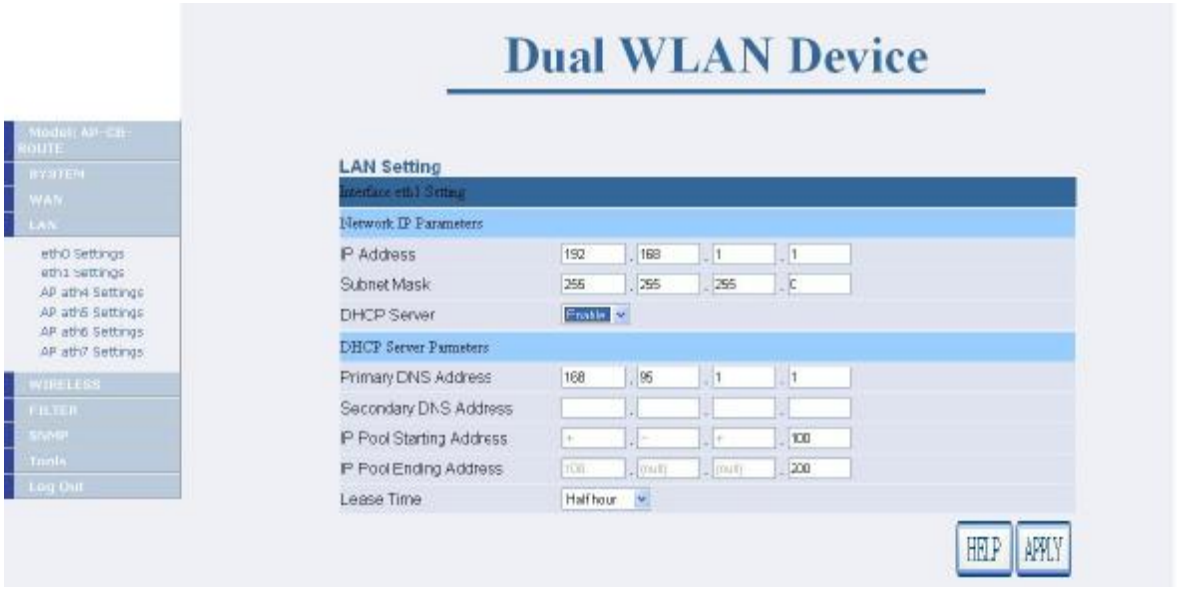


Figure 3-4-21

3.4.4 Wireless

User can set the wireless related setting here.

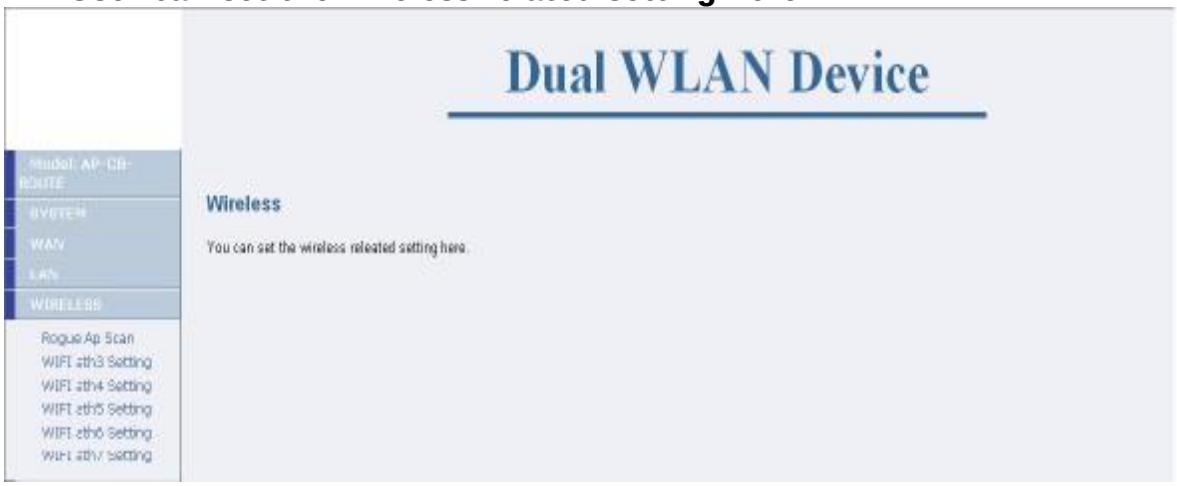


Figure 3-4-22

3.4.4.1 Rogue AP Scan

In wifi station mode (CB), user must enable this function, only the APs in the 'Allow AP' list can be connected.

† Rouge Enable

Check the radio box in front of <Enable> to enable the Rouge AP detection, and Press <Add> or <Del> button to apply.

† Allow AP

The allowable AP list. The AP in the list is a legal AP for CB to connect. Check the box and press the <Del> button to remove it.

†**Rogue AP**

The nearby AP list, not include the allowed APs. Check the box and press the <Add> button to add it as a legal AP.

†**Re-Scan**

Press <WIFI x> button to Re-scan the APs nearby which are scanned by wifi card x (x:1 or 2).

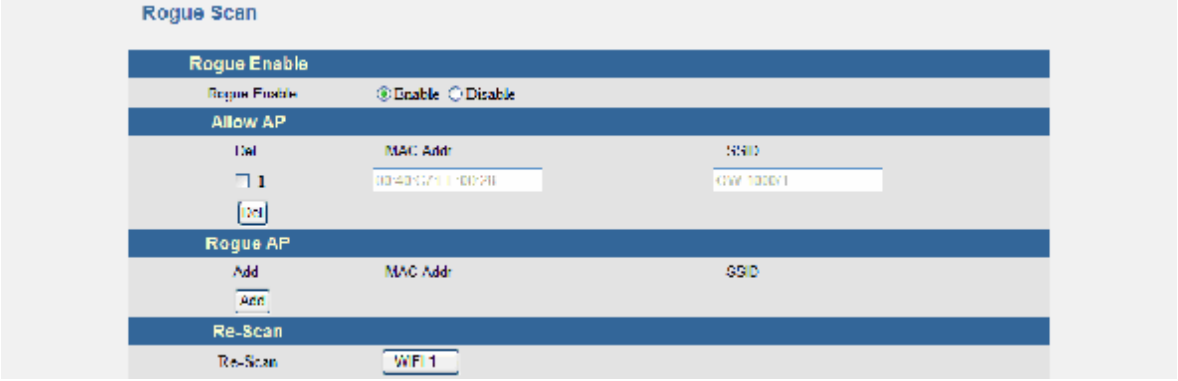


Figure 3-4-23

3.4.4.2 WIFI ath3 Setting

†**General**

Radio Power: Turn this interface on or off.

Wireless Mode: Select which wireless mode that user wants to use. The options available here are: 802.11a, 802.11b, 802.11g and 802.11b+g.

SSID: The SSID (service set identifier) is an identifier of an AP in user's wireless network. In station mode (CB), this SSID must be same as the AP that user wish to connect. User can either type in the SSID by themself or simply press the <Scan> button and select the AP form the popup list, then click <submit>.

MAC Cloning: This feature controls the MAC Address of the Wireless Bridge seen by other devices (wired or wireless). If set to 'Ethernet Client', the MAC Address from the first Ethernet client that transmits data through the Wireless Bridge will be used. When multiple Ethernet devices are connected to the Wireless Bridge, it may not be obvious which MAC Address will be used. If set to 'WDS', it will include 4 MAC address while transmit the data through Wireless Bridge. It is only available on bridge mode in station interface. If the AP to associate does not support 4-WAY-HANDSHAKE, the 'Ethernet client' should be selected.

Peer Node Distance: Set the distance between this device and it's adjacent. If select 'manual', the distance will be determined by 'Slot time', 'ACK timeout' and 'CTS timeout' three values.

Beacon Period: This item contains the length of the beacon interval. Enter a value between 20 and 1000 to specify the Beacon Period.

DTIM Period: This item contains the number of Beacon intervals between Delivery Traffic Indication Message (DTIM). Enter a

number between 1 and 255 to specify.

Fragment Threshold: It is the maximum frame size that wireless device can transmit without fragmenting the frame. Enter a value between 256 and 2346 to specify the Fragment Threshold.

RTS/CTS Threshold: Packets larger than the value are transmitted by the RTS/CTS handshake. Enter a value between 1 and 2346 to specify the value of the RTS /CTS Threshold.

Tx Power: To set the tx power as off to turn off the tx power, set auto to let device determine the tx power value automatically, or set manual to set the tx power value. The max value is depending on the wireless module.

WEP Key Setting: It uses two kinds of WEP Encryption key length: 5-bytes and 13-bytes. The key format can either use 'ASCII' to set the key values (ie. 0~9, a~z) or use 'HEX' to set the key value in hexadecimal. (ie. 0~9, a~f). User can set maximum 4 keys, but only one key will functional at one time.

Figure 3-4-24

†SSID Security Mode

Authentication: User can choose which authentication type to secure the wireless network. There are four options for authentication: Disable, WEP, WPA-personal and WPA-enterprise.

WEP: Short for Wired Equivalent Privacy, a security protocol for wireless local area networks (WLANs) defined in the 802.11 standard.

Open or Restricted: An open system allows any client to authenticate as long as it conforms to any MAC address filter policies that may have been set. All authentication packets are transmitted without encryption. If the 'Restricted' selected, all the packets are transmitted with encryption.

Select Key: Check the radio box in front of the key that user would like to use for this AP.

Figure 3-4-25

WPA-Personal: The method of authentication is similar to WEP, user can define a 'Pre-Shared Key', once the key is confirmed and satisfied on both the client and access point, then access is granted. The encryption method used is referred to as the Temporal Key Integrity Protocol (TKIP).
WPA MODE: In this setting, user can choose WPA or WPA2 or WPA & WPA2. (WPA2 is far superior to WPA, because the encryption of method used is Advanced Encryption Standard (AES)).
Share Key: User should define the pre-share key in here; the length of the key is 8-23 characters.
WPA Encryption: User can choose the encryption method of the pre-shared key here; there are three options: Auto, AES and TKIP.

Figure 3-4-26

WPA-enterprise:
WPA-Enterprise includes all of the features of WPA-PSK plus support the 802.1x authentication. To use this function, a separate RADIUS server is required
User should enter their account and password to pass the authentication.

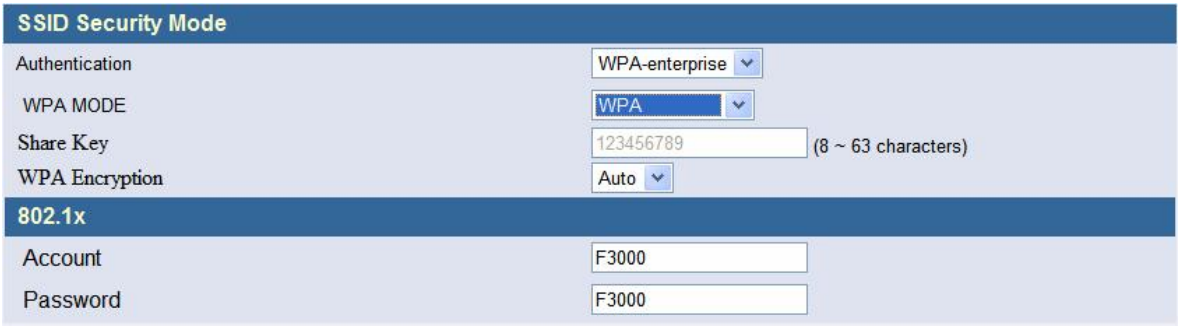


Figure 3-4-27

Please Note: In wifi station model, the security setting must be same as the AP that user wish to connect.

3.4.4.3 WIFI ath4~7 Setting

†General

Radio Power: Turn this interface on or off.
Wireless Mode: Select which wireless mode that user wants to

use. The options available here are: 802.11a, 802.11b, 802.11g and 802.11b+g.

SSID: The SSID (service set identifier) is an identifier of an AP in user's wireless network. The SSID must be identical for all points in the network. It is case sensitive and maximum length is 32.

SSID Hide: This function is to hide the SSID in the wireless network.

Channel: Set the operating frequency/channel for this device.

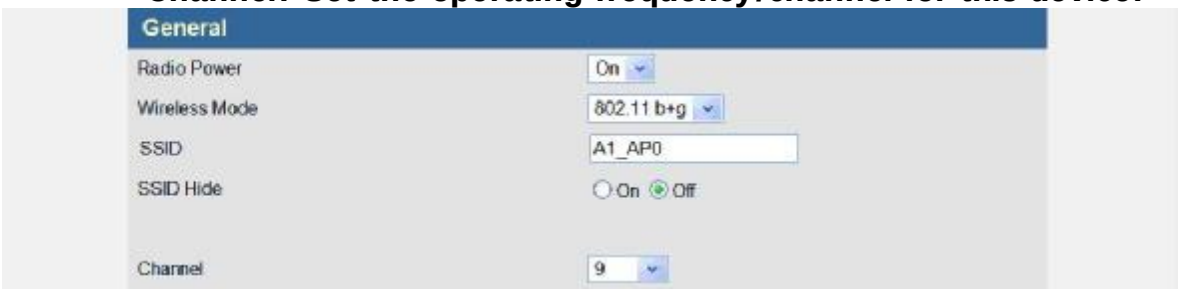


Figure 3-4-28

† **Advanced Settings**

Peer Node Distance: Set the distance between this device and it's adjacent. If select 'manual', the distance will be determined by 'Slot time', 'ACK timeout' and 'CTS timeout' three values.

Beacon Period: This item contains the length of the beacon interval. Enter a value between 20 and 1000 to specify the Beacon Period.

DTIM Period: This item contains the number of Beacon intervals between Delivery Traffic Indication Message (DTIM). Enter a number between 1 and 255 to specify.

Fragment Threshold: It is the maximum frame size that wireless device can transmit without fragmenting the frame. Enter a value between 256 and 2346 to specify the Fragment Threshold.

RTS/CTS Threshold: Packets larger than the value are transmitted by the RTS/CTS handshake. Enter a value between 1 and 2346 to specify the value of the RTS /CTS Threshold.

Tx Power: To set the tx power as off to turn off the tx power, set auto to let device determine the tx power value automatically, or set manual to set the tx power value. The max value is depending on the wireless module.

Rate: Set the bit rate for wireless interface to supporting multiple bit rates. The value 'Auto' causes the device to use the bit rate selected by the rate control module.

Layer 2 Isolation: It is used in AP mode only. If enabled, all of the clients connect to the same AP will not be able to access each other.

WEP Key Setting: It uses two kinds of WEP Encryption key length: 5-bytes and 13-bytes. The key format can either use 'ASCII' to set the key values (ie. 0~9, a~z) or use 'HEX' to set the key value in hexadecimal. (ie. 0~9, a~f). User can set maximum 4 keys, but only one key will functional at one time.

Figure 3-4-29

†SSID Security Mode

Authentication: User can choose which authentication type to secure the wireless network. There are four options for authentication: Disable, WEP, WPA-personal and WPA-enterprise.

WEP: Short for Wired Equivalent Privacy, a security protocol for wireless local area networks (WLANs) defined in the 802.11 standard.

Open or Restricted: An open system allows any client to authenticate as long as it conforms to any MAC address filter policies that may have been set. All authentication packets are transmitted without encryption. If the 'Restricted' selected, all the packets are transmitted with encryption.

Select Key: Check the radio box in front of the key that user would like to use for this AP.

Figure 3-4-30

WPA-Personal: The method of authentication is similar to WEP, user can define a `Pre-Shared Key', once the key is confirmed and satisfied on both the client and access point, then access is granted. The encryption method used is referred to as the Temporal Key Integrity Protocol (TKIP).

WPA MODE: In this setting, user can choose WPA or WPA2 or WPA & WPA2. (WPA2 is far superior to WPA, because the encryption of method used is Advanced Encryption Standard (AES)).

Share Key: User should define the pre-share key in here; the length of the key is 8-23 characters.

WPA Encryption: User can choose the encryption method of the

pre-shared key here; there are three options: Auto, AES and TKIP.
Group Key Update Interval: Time interval for rekeying the GTK (broadcast/multicast encryption keys) in seconds.

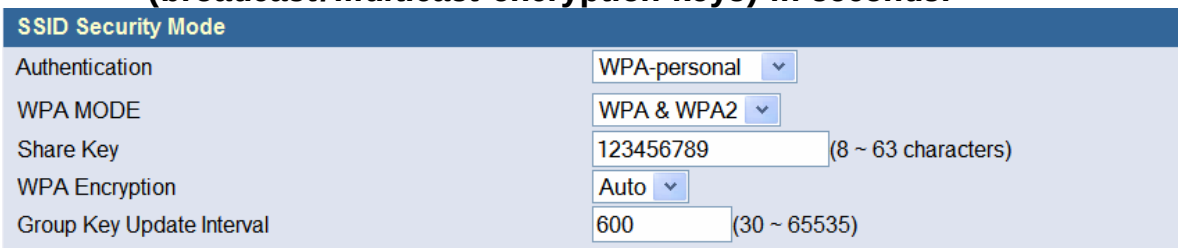


Figure 3-4-31

WPA-enterprise:
WPA-Enterprise includes all of the features of WPA-PSK plus support the 802.1x authentication.
To use this function, a separate RADIUS server is required.
User should enter the IP and port number of the Authentication Server and Shared Secret here. In case if a backup server has been deployed in user's network, user can also enter the necessary information here.

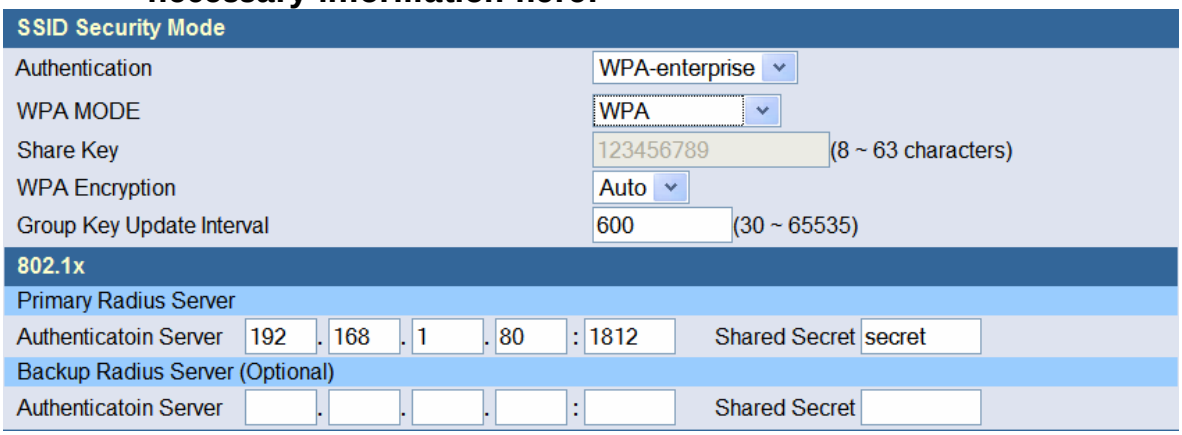


Figure 3-4-32

† QoS
WMM: Enable/disable WMM support.
MAX Associated Station: Maximum number of stations allowed in station table.

Common Parameters:
CWmin: Minimum Contention Window. The valid values for 'CWmin' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047, or 4095. The value for 'CWmin' must be lower than the value for 'CWmax'.
CWmax: Maximum Contention Window. The Valid values for 'CWmax' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047 or 4095. The value for 'CWmax' must be higher than the value for 'CWmin'.

AIFS: Arbitration Inter-Frame Spacing.
Burst: Maximum length (in milliseconds with precision of up to 0.1 ms) for bursting.

AP Parameters:
This affects traffic flowing from the access point to the client station. These parameters are used by the access point when transmitting frames to the clients.

AP Tx-Best Effort: Medium Priority. Medium throughput and delay. Most traditional IP data is sent to this queue.
AP Tx-Background: Low Priority. High throughput. Bulk data that requires maximum throughput and is not time-sensitive is sent to this queue (FTP data, for example).
AP Tx-Video: High Priority. Minimum delay. Time-sensitive video data is automatically sent to this queue.
AP Tx-Voice: High Priority. Time-sensitive data like VoIP and streaming media are automatically sent to this queue.

STA Parameters:
These parameters are sent to WMM clients when they associate. The parameters will be used by WMM clients for frames transmitted to the access point.

STA Tx-Best Effort: Medium Priority, Medium throughput and delay. Most traditional IP data will be sending to this queue.
STA Tx-Background: Low Priority, High throughput. Bulk data that requires maximum throughput and it's not time-sensitive will be sending to this queue (FTP data, for example).
STA Tx-Video: High Priority, Minimum delay. Time-sensitive video data will be automatically sent to this queue.
STA Tx-Voice: High Priority, Time-sensitive data like VoIP and streaming media are automatically sent to this queue.
TXOP: Transmission Opportunity is an interval of time when a WMM Client Station has the right to initiate transmissions onto the wireless medium (WM). This value specifies (in milliseconds) the Transmission Opportunity (TXOP) for Client Station; that is, the interval of time when the WMM AP has the right to initiate transmissions on the wireless network.
ACM: Admission control mandatory.

Figure 3-4-33

3.4.5 Filtering

The MAC address filter can be used to filter network access by machines based on the unique MAC addresses of their network adapter(s). It is most useful to prevent unauthorized wireless devices from connecting to user's network. A MAC address is a unique ID assigned by the manufacturer of the network adapter.

3.4.5.1 IP Filtering

User can block certain client PCs from accessing this AP based on its IP address. If enabled, user should also configure the IP Filtering Address. This option is only available in router and MESH modes.

† **IP Filtering**
Enable/Disable IP Filtering.

† **IP Address**
Enter the Network IP Address and press <Apply> to filter.

Figure 3-4-34

3.4.5.2 MAC Filtering

User can block certain clients from accessing this AP based on its MAC address. Use Filtering type to define the filtering scenario:

- **General**

  Disabled: Disable this filtering function. If this option is selected, all PCs can access this AP.

  Accept: All PCs are filtered out except those MAC addresses in the following MAC address table. In other words, only those interfaces/ PCs with MAC address in the MAC address table can access this AP.

  Reject: All PCs/interfaces can access this AP except those interfaces/PCs with MAC address in the MAC address table.

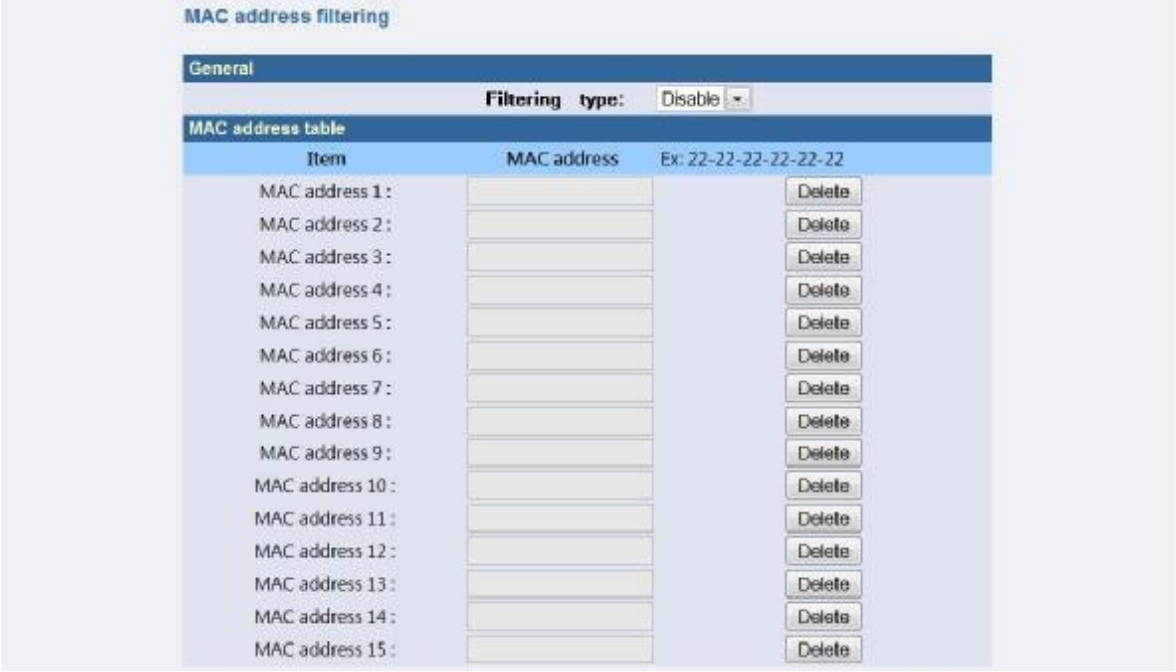


Figure 3-4-35

3.4.6 SNMP

The Outdoor Wireless Access Point support SNMP V1/V2C/V3, this page is to define the SNMP access control and SNMP traps.

3.4.6.1 Basic Setting

†SNMP Agent

Check the <Enable> check box to turn on SNMP. Please Note: Enable the SNMP will also enable the LLDP (Link Layer Discovery Protocol) function. This function will be used if user wants to remote management the AP and draw the network topography.

†System Information

Contact: Specify the contact name for this managed node as well as information about how to contact this person.
Location: It is used to define the location of the host on which the SNMP agent is running.

†V1/V2C

User can change user's SNMP community settings on this page.
Access Right: Select an access right for the SNMP manager. `Read' is read only, `Write' is read-write, and `Deny' means this community name is not implemented.

Community: Specify the name of community for the SNMP manager.

SNMP Community provides a simple protection by using the community name to control the access to the SNMP. The

community name can be thought of as a password. If user doesn't have the correct community name, user can't retrieve any data (get) or make any change (set). Multiple SNMP managers may be organized in a specified community.

† **V3**

The SNMP V3 is a Security Enhancement for SNMP, it provides secure access to devices by a combination of user ID, authenticating and encrypting packets over the network.
User ID: A string representing the name of the user.
Security Level: User can select which security level that user wants to use. The available options for this field are: NoAuthNoPriv, AuthNoPriv or AuthPriv.
Auth Type (Authentication Protocol): An indication of which authentication protocol is used. The available options for this field are: MD5, and SHA.
Auth Passphrase (Authentication Key): A secret key used by the authentication protocol for authenticating messages.
Privacy Protocol: An indication of which privacy protocol is used. The available option for this field is: DES.
Priv Passphrase (Privacy Key): The secret key used by the privacy protocol for encrypting and decrypting messages.
Access Right: Assign the access right for account.
The options are:
Unused – The account is disabled.
Read Only – The account has read only access rights.
Read Write – The account has read and writes access rights.
usm – This account will be an usm account and assign access rights by VACM.

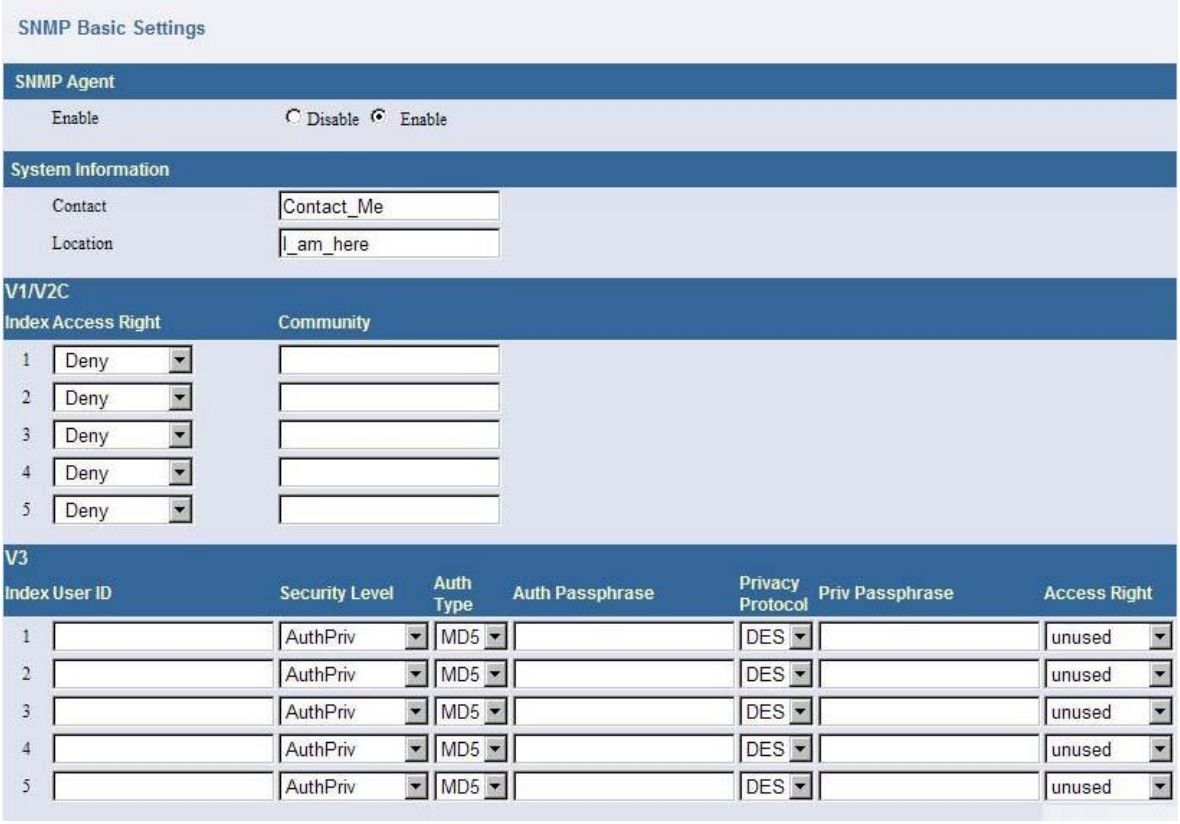


Figure 3-4-36

3.4.6.2 VACM Setting

User can use the View-based Access Control Model (VACM) to define whether access to a specified managed object is authorized. Access control is done at the following points:

- **When processing retrieval request messages from the SNMP manager.**
- **When processing modification request messages from the SNMP manager.**
- **When notification messages must be sent to the SNMP manager.**

The following tokens for VACM access security that user can use:

† **Community to Security for V1/V2c**

Map the community name (COMMUNITY) into a security name. The Community to Security token takes NAME SOURCE and COMMUNITY options. User can use this token to give SNMPv3 security privileges to SNMPv1 and SNMPv2 users and communities

Index: Index of Community to Security. Tick the checkbox to enable the recordset.

Security Name: is a name that will use by the group table.

IP source: Describes a host or network.

Community: The community name that is used.

†**Group**

Map the security names into group names. (For SNMP V3, the security Name is the user ID in Basic setting.)
Index: Index of Group. Tick the checkbox to enable the recordset.
Group Name: A group name is given to a group of users and is used when managing their access rights.
Security Model: Assign security model for group.
Security Name: Assign security name for group. This field will obtain from the 'Security Name' of 'Community to Security' when security model is v1 or v2c, or obtain from the 'User ID' of 'usm' when security model is usm.

Figure 3-4-37

† **View**

Create a view for user to let the groups have rights to view the MIB tree.
Index: Index of View. Tick the checkbox to enable the recordset.
Include: Assign include or exclude in this record for certain subtree.
Sub Tree: the OID value. For example: '1.3.6.1.2.1'.

Figure 3-4-38

† **Access**

The Access table grants the groups access right to certain views. Each group can have multiple access rights. The most secure access right is chosen.

Index: Index of Access. Tick the checkbox to enable recordset.

Group: Returned and lookup the 'Group Name' from the Group table.

Security model: Specified in the message's msgSecurityModel parameter. The available options for this field are: any, v1, v2c and usm.

Security level: Specified in the message's msgFlags parameter. The available options for this field are: NoAuthNoPriv, AuthNoPriv and AuthPriv.

Read: Specified in the message's msgSecurityModel parameter. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Write: Authorized View Name for write access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Notify: Authorized View Name for notify access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

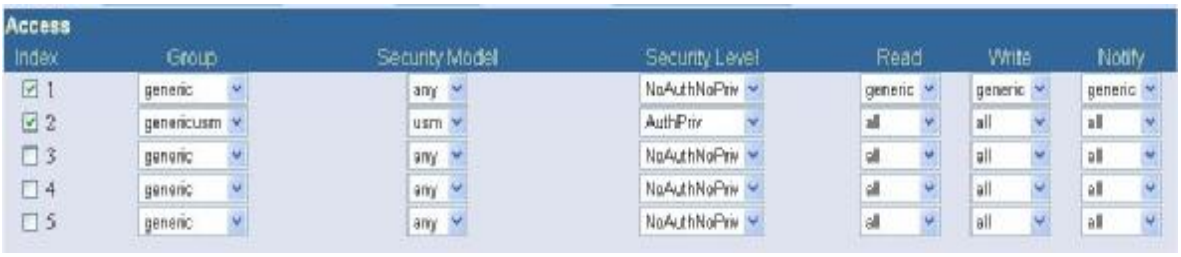


Figure 3-4-39

3.4.6.3 SNMP Trap

It is an SNMP application that uses the SNMP TRAP operation to send information to a network management system.

† **SNMP Trap**

Trap Active: To enable or disable SNMP Trap function.

† **v1 / v2c Trap**

Version: Indicate the traps will be sent in v1 or v2c or not send (disable).

IP Address & Port: The IP and Port to receive traps.

Community: The community string to be used when sending traps.

† **v3 Trap**

Trap: Index of SNMP v3 traps. Tick the checkbox to enable recordset.
User: The usm User ID.
IP Address & Port: The IP and Port of a device to receive traps.
Security Level: Assign security level in this record. The Options are: NoAuthNoPriv, AuthNoPriv, AuthPriv.

Figure 3-4-40

† **Trap Items**

Enable/Disable which trap items to send.

Figure 3-4-41

3.4.7 Tools

†**Command Ping**

It runs ping command to test the connection capability of this device with the other Ethernet device.

Figure 3-4-42

3.4.8 Log Out

User can manually logout by click on <Log Out>.

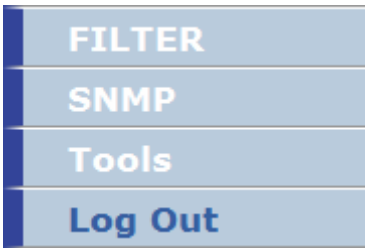


Figure 3-4-43

3.5 CB-CB-Router Mode

CB-CB-Router mode is to set this device as a router device with two CBs (Station mode). For example, one CB connects to an Internet Provider's AP for WAN connection; another CB connects to the intranet's AP.
The setting and functions list as following:

▽ **SYSTEM**
- **Administrator**
- **Firmware**
- **Configuration Tools**
- **General Status**
- **Power Control**
- **WIFI Status**
- **Log**
- **System Time**
- **Reboot**

▽ **WAN**
- **WAN Settings**
- **Bandwidth Management**

▽ **LAN**
- **eth0 Settings**
- **eth1 Settings**
- **Station ath7 Settings**

▽ **WIRELESS**
- **Rogue Ap Scan**
- **WIFI ath3 Setting**
- **WIFI ath7 Setting**

▽ **FILTER**
- **IP Filtering**
- **MAC Filtering**

▽ **SNMP**
- **Basic Setting**
- **VACM Setting**
- **Trap Setting**

▽ **Tools**

- **Tools**

▽ **Log Out**

3.5.1 System

This page shows the current status and some basic settings of the device, including Administrator, Firmware, Configuration Tools, General Status, Power Control, WIFI Status, Log, System Time and Reboot; screen as shown in Figure 3-5-1.

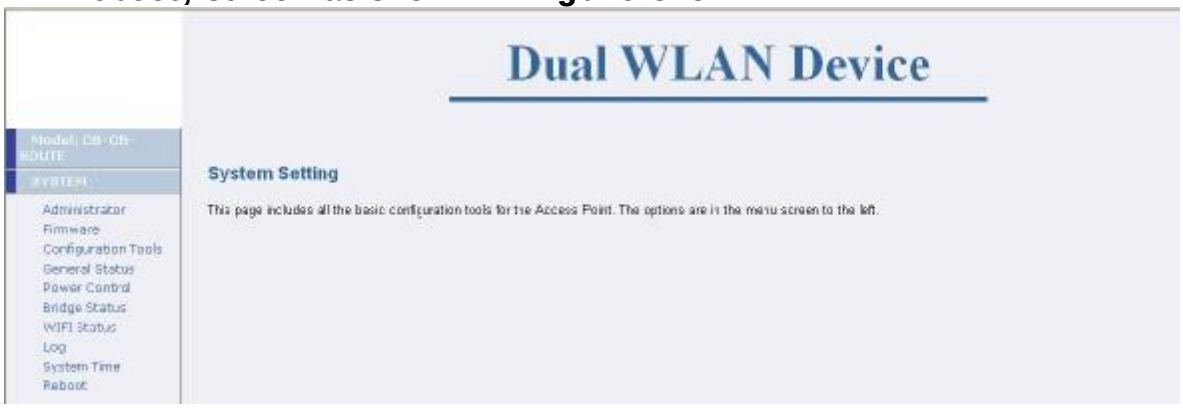


Figure 3-5-1

3.5.1.1 Administrator

By selecting the item of Administrator under System, User will see the screen shown in Figure 3-5-2. These settings allow user to configure the Device Name, Language, Model, Password, Remote Management and WIFI Loading Warning Threshold.

†**Device Name**

This is a host name or system name for the device. The maximum length is 20 characters. User can only input '0'~'9', 'a'~'z', 'A'~'Z', '_' or '-'.

†**Model**

OLSR_AP: To set this device as an AP with layer 3 MESH function.
AODV_AP: To set this device as an AP with layer 3 MESH function.
AP-Bridge: To set this device as a normal AP.
AP-CB-Bridge: To set this device as an AP and Client Bridge device.
AP-CB-ROUTE: To set this device as a router device with AP and CB functions.
CB-CB-ROUTE: To set this device as a router device with dual CB functions.
VLAN-AP: To set this device as a VLAN AP device. Each SSID can have its own VLAN ID.
AP_WDS_BRG: To set this device as a WDS device with AP function.

AP4_WDS_BRG: To set this device as WDS device with AP function and support up to 4 SSID.

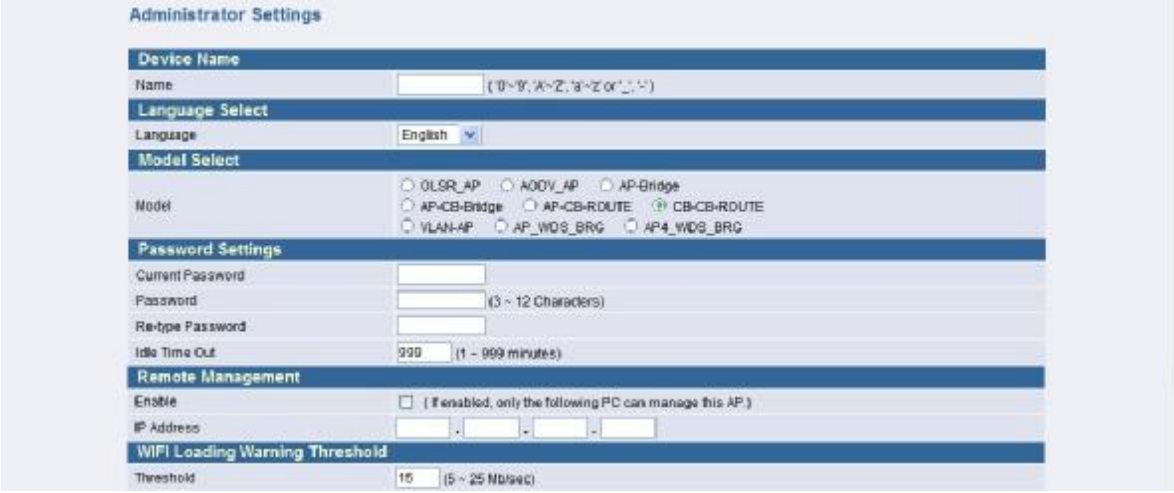


Figure 3-5-2

† **Password Settings**

If user wants to change the password for admin account, the user should enter the current password, a new password and, re-type the new password.

The Idle Time Out is the amount of time of inactivity allowed before user proceeds next action. The user needs to re-login if the idle time passes timeout.

† **Remote Management**

User can enable/disable the management of the Access Point from a remote host. Just click tick the <Enable> check box and enter an IP address of the remote host. Then, only the host with the entered IP address can access this device.

† **WIFI Loading Warning Threshold**

The threshold value is used by network management system. Network management software will monitor the WIFI loading, when the loading is over this value, network management software will change the color of the link line on network topology to notify the user about condition of the link quality. The threshold value is between 5 and 25.

3.5.1.2 Firmware Update

By selecting the item of Firmware under System, User will see the screen shown in Figure 3-5-3. This page shows current firmware version and date. This page also allow user to using TFTP or WEB or FTP method to upgrade to the new version of firmware.

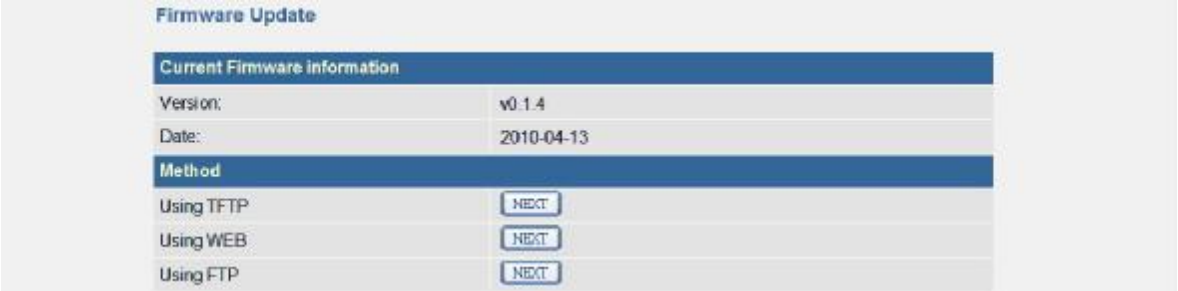


Figure 3-5-3

† **Using TFTP**

On any computer in the network or a computer direct connect to the AP. Install a TFTP Server utility, and put the firmware file named 'upgradeFW.tar' in a folder.

Run TFTP utility and specify the folder in which the firmware file located. Enter the TFTP server IP and click on <APPLY> button. At the end of the upgrade process, this device may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

† **Using WEB**

Click on <Browse> button and select the correct firmware file path and file name. Then, click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands while uploading the firmware. This is normal behavior and do not turn off the Access Point while firmware is upgrading.

† **Using FTP**

On FTP server, there should have valid firmware which includes fs-opn.img and/or kernel-opn.img. On the Firmware Update - FTP page, enter the IP address of the FTP server, firmware name and FTP user name and password. Then click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

3.5.1.3 Configuration Tools

By selecting the item of Configuration Tools under System, the screen will show in Figure 3-5-4. This page includes three selections: Restore Factory Default Configuration, Local Backup Settings/Restore settings and Remote Backup Settings/Restore settings.

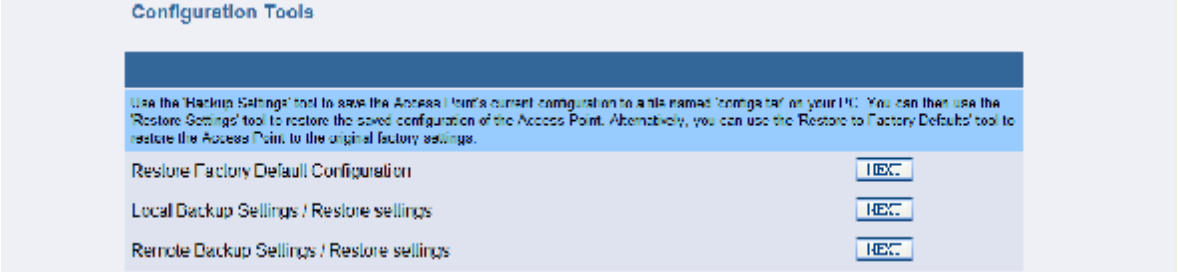


Figure 3-5-4

† Restore Factory Default Configuration:

To reset configuration settings to the factory default values, just click on <NEXT> button beside 'Restore Factory Default Configuration'.

Figure 3-5-5

Then click on <Restore> button on next page, now the system will reset to factory default value.

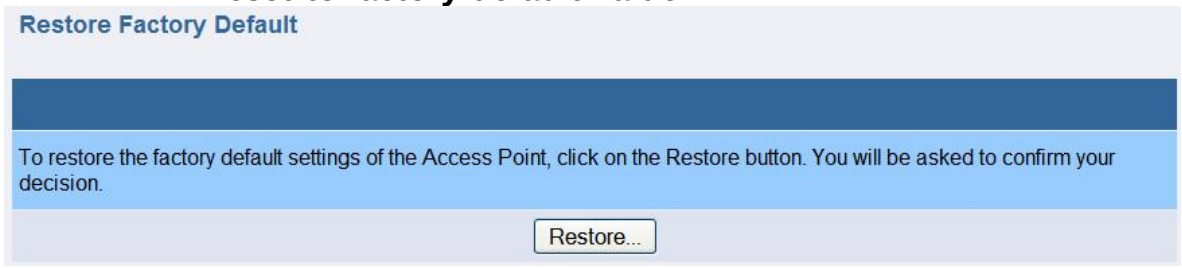


Figure 3-5-6

† Local Backup Settings / Restore settings

To backup or restore the configuration for this device. Click on <NEXT> button beside 'Local Backup Settings/Restore settings'.

Figure 3-5-7

Click on <Backup Settings> button on next page to save the settings of this device to a file named 'configs.tar' on user's PC.

To restore the settings, click on <Browse> button and select the correct file path and file name. Then, click on <Restore Settings> button to start the restore settings process.

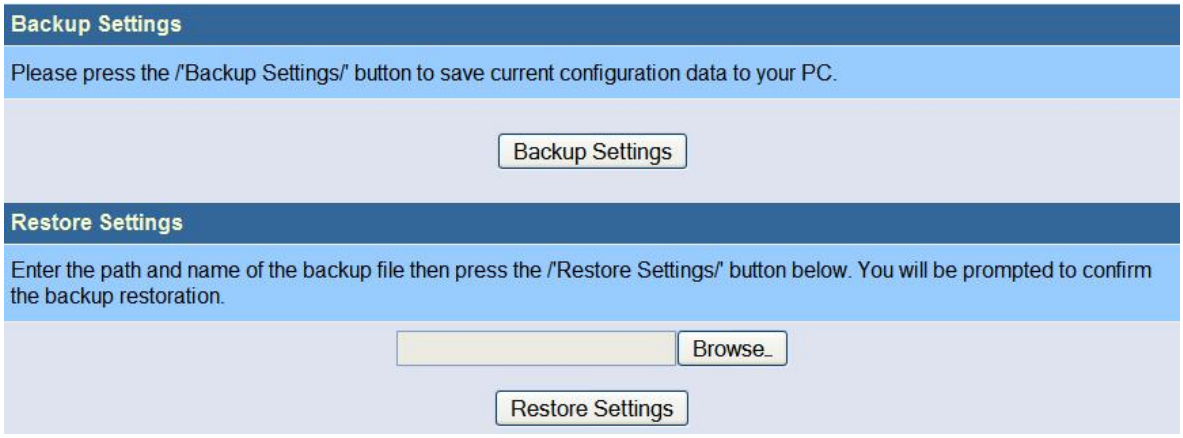


Figure 3-5-8

† Remote Backup Settings / Restore settings

User can also backup/restore the configuration of this device remotely.

Click on <NEXT> button beside `Remote Backup Settings/Restore settings'.

Figure 3-5-9

Enter the necessary setting in next page, then click on <Backup To Server> or <Restore From Server> to start the process.

Figure 3-5-10

3.5.1.4 General Status

In this page user could see the detail settings of this device, including the System Information, Power Control, WAN Port, eth0 LAN Port, eht1 LAN Port, Station WIFI 1 Status and Station WIFI 2 Status.

Status

System Information			
Current Firmware Version		v0.1.8	
Device Name		AP	
System Model		CB-CB-ROUTE	
System Time		Wed Nov 3 00:13:14 2010	
Power Control Status			
eth0 PoE		Disabled	
WAN Port			
IP Address		192.168.23.1	
MAC Address		00:26:48:00:0e:df	
Mask		255.255.255.0	
Gateway		NA	
DHCP		Disabled	
WAN Port			
IP Address		192.168.23.1	
MAC Address		00:26:48:00:0e:df	
Mask		255.255.255.0	
Gateway		NA	
DHCP		Disabled	
eth0 LAN Port			
IP Address		192.168.0.1	
MAC Address		00:40:cf:00:00:33	
Mask		255.255.255.0	
DHCP		Disabled	
eth1 LAN Port			
IP Address		192.168.1.1	
MAC Address		00:40:cf:00:00:22	
Mask		255.255.255.0	
DHCP		Disabled	
Station WIFI 1 Status			
MODE		802.11 a	
COUNTRY		North_America_Area	
DTIM		1	
FRAG		2346	
RTS		2346	
BEACON		100	
DISTANCE		100	
Interface ath0			
Radio		Off	
Interface ath1			
Radio		Off	
Interface ath2			
Radio		Off	
Interface ath3			
IP Address		192.168.23.1	
MAC Address		00:26:48:00:0e:df	
Mask		255.255.255.0	
DHCP		Disabled	
SSID	A1_AP3	Security	**Disabled**
Station WIFI 2 Status			
MODE		802.11 a	
COUNTRY		North_America_Area	
DTIM		1	
FRAG		2346	
RTS		2346	
BEACON		100	
DISTANCE		100	
Interface ath4			
Radio		Off	
Interface ath5			
Radio		Off	
Interface ath6			
Radio		Off	
Interface ath7			
IP Address		192.168.27.1	
MAC Address		00:40:c7:fb:00:f8	
Mask		255.255.255.0	
DHCP		Disabled	
SSID	A2_AP7	Security	**Disabled**

Figure 3-5-11

3.5.1.5 Power Control/Status

In this page user can enable the eth0 port to provide PoE power and data forwarding function.

Figure 3-5-12

3.5.1.6 WIFI Status

In this page user can click WIFI Interfaces to see each WIFI information of this device, such as: Interface information, Security information, Associated AP/Station.

The *Figure 3-5-13* shows the ath3/ath7 (CB) interface is waiting for connecting to an AP.

Figure 3-5-13

The *Figure 3-5-14* shows that the ath3/ath7 (CB model) has connected to an AP, and display the relevant information.

Figure 3-5-14

3.5.1.7 Log

In this page user could see the system logs record of this device.

Figure 3-5-15

3.5.1.8 System Time

†**Select Setting Type**

Setting by: User can set system time in two ways. One is manual setting, the other one is Synchronize with an Internet Time Server.

†**Manual Setting**

User can manually enter the Year/ Month/ Day and Hour: Minute: Second.

†**Using Internet Time Server**

Hours from GMT: User can enter the Hours from GMT, for example Taiwan is GMT +8 Hours.

Server IP: User should enter the Internet time server IP address here.

Time Update for Every: User can set time update interval by enter the days, hours, and minutes.

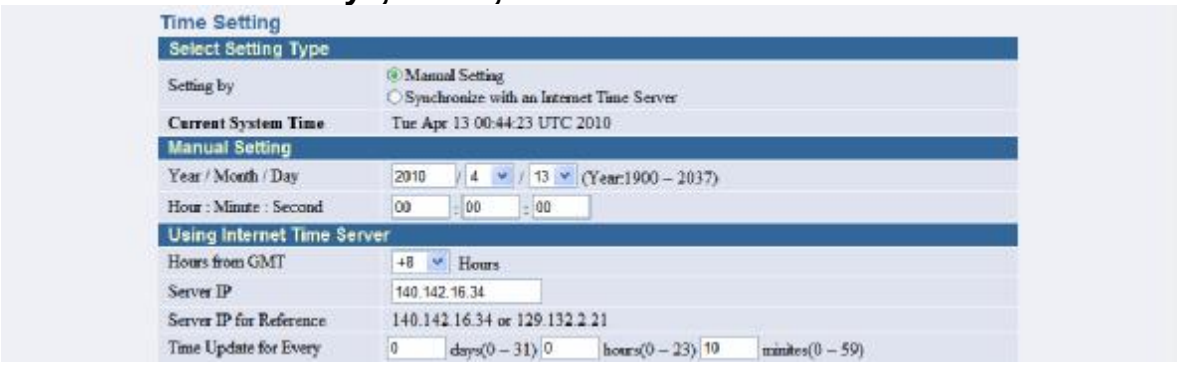


Figure 3-5-16

3.5.1.9 Reboot

User can perform reboot function in case of the device is not function normally, or after user change some major settings for example: change system model. The existing settings will not be changed. To perform the reboot, click on the <Reboot> button and click on <OK> on pop-up screen to confirm user's decision.

Figure 3-5-17

3.5.2 WAN Configuration

3.5.2.1 WAN Settings

This function is to establish a connection with user's WAN network, select the IP Allocation Mode that ISP is used.

† **Interface ath3 Setting**

IP Authentication: Indicate how the IP address of this device will be assigned. There are two options available here: Static option - the IP address should be entered in 'Network IP Parameters' and DHCP option - the IP address will get from DHCP server.

† **Network IP Parameters**

User can change the network settings of this device from WAN Configuration; it is including IP address, Subnet mask, and Gateway address.

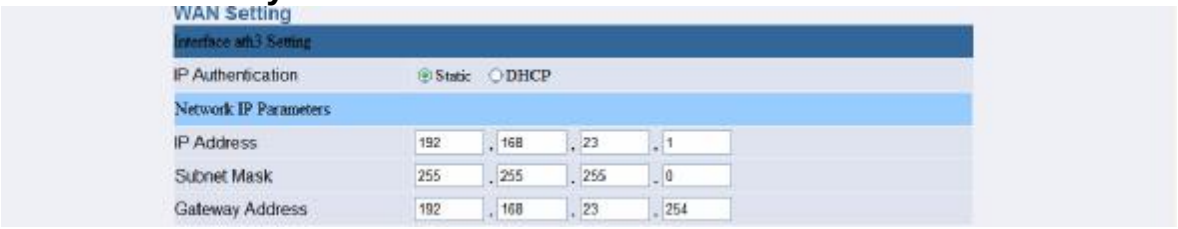


Figure 3-5-18

3.5.2.2 Bandwidth Management

This function allows user to set the limitation of total upload/download bandwidth on WAN interface, and also can set the limitation of upload/download bandwidth for each user or a group of users by IP address.

† **Bandwidth Management**

Bandwidth Management: Enable bandwidth limitation function.
Upload Bandwidth: The total upload bandwidth (in Mbps).
Download Bandwidth: The total download bandwidth (in Mbps).

† **Bandwidth Limitation**

Action: To set the action type of bandwidth limitation. The options available here are: disable, upload, download and upload/download.
Start IP Address: To set the start IP of bandwidth limitation.
End IP Address: To set the end IP of bandwidth limitation.
Bandwidth Limitation: To set the bandwidth (in Kbps) of bandwidth limitation.
User can press <Add> button to add IP address to the Bandwidth Limitation list.
User can tick the check box and press <Del> button to delete the IP address from the Bandwidth Limitation list.

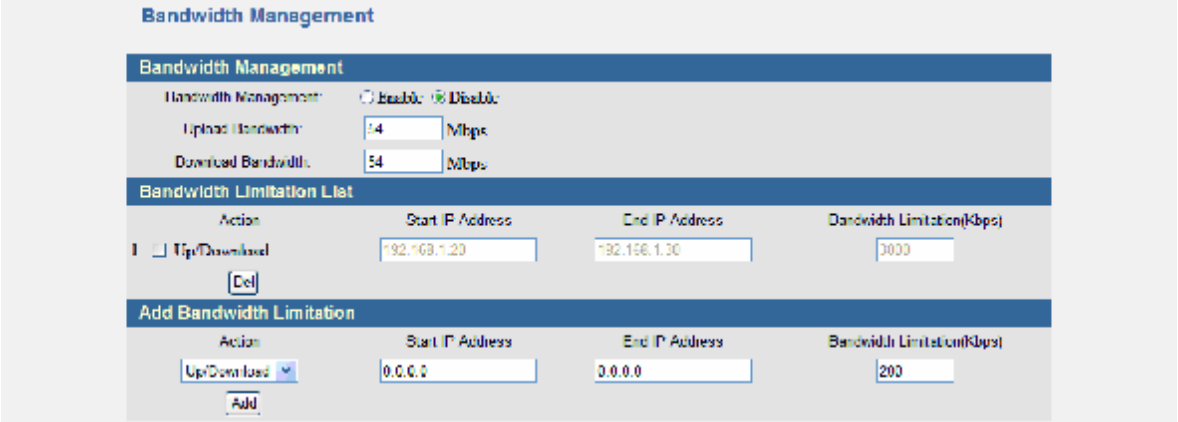


Figure 3-5-19

3.5.3 LAN Configuration

User can change the local network settings of this device from LAN Configuration for eth0 and eth1, which include the IP address, Subnet mask, Gateway, and DHCP server related settings.

† Network IP Parameters

User can change the network settings of this interface from LAN configuration; it is including IP address, Subnet mask and enable/disable the DHCP server Function.

† DHCP Server Parameters

Primary / Secondary DNS Address: The domain-name-servers option specifies a list of Domain Name System name servers available to the client

IP Pool Starting / Ending Address: The IP Address range which will be assigned.

Lease Time: How long does the IP address can be leased by DHCP server.

Figure 3-5-20

In LAN configuration, user can also configure the IP of Station ath7 Settings.

IP Authentication: Indicate how the IP address of this device will be assigned.

Static IP address: Set the IP address and Subnet Mask manually.

Dynamic IP address: If this mode is selected, user's IP Address, and Subnet Mask will be obtained automatically from DHCP

server.

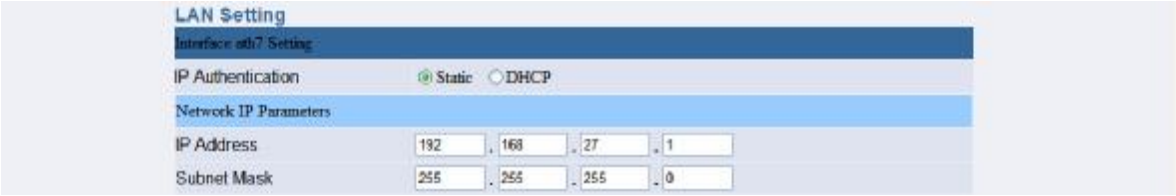


Figure 3-5-21

3.5.4 Wireless

User can configure the wireless related settings in this page.

Figure 3-5-22

3.5.4.1 Rogue AP Scan

†Rouge Enable

Check the radio box in front of <Enable> to enable the Rouge AP detection, and Press <Add> or <Del> button to apply.

†Allow AP

The allowable AP list. The AP in the list is a legal AP for CB to connect. Check the box and press the <Del> button to remove it.

†Rogue AP

The nearby AP list, not include the allowed APs. Check the box and press the <Add> button to add it as a legal AP.

†Re-Scan

Press <WIFI x> button to Re-scan the APs nearby which are scanned by wifi card x (x:1 or 2).

Figure 3-5-23

3.5.4.2 WIFI ath3 and ath7 Settings

†General

Radio Power: Turn this interface on or off.

Wireless Mode: Select which wireless mode that user wants to use. The options available here are: 802.11a, 802.11b, 802.11g and 802.11b+g.

SSID: The SSID (service set identifier) is an identifier of an AP in user's wireless network. In station mode (CB), this SSID must be same as the AP that user wish to connect. User can either type in the SSID by themself or simply press the <Scan> button and select the AP form the popup list, then click <submit>.

MAC Cloning: This feature controls the MAC Address of the Wireless Bridge seen by other devices (wired or wireless). If set to 'Ethernet Client', the MAC Address from the first Ethernet client that transmits data through the Wireless Bridge will be used. When multiple Ethernet devices are connected to the Wireless Bridge, it may not be obvious which MAC Address will be used. If set to 'WDS', it will include 4 MAC address while transmit the data through Wireless Bridge. It is only available on bridge mode in station interface. If the AP to associate does not support 4-WAY-HANDSHAKE, the 'Ethernet client' should be selected.

Peer Node Distance: Set the distance between this device and it's adjacent. If select 'manual', the distance will be determined by 'Slot time', 'ACK timeout' and 'CTS timeout' three values.

Beacon Period: This item contains the length of the beacon interval. Enter a value between 20 and 1000 to specify the Beacon Period.

DTIM Period: This item contains the number of Beacon intervals between Delivery Traffic Indication Message (DTIM). Enter a number between 1 and 255 to specify.

Fragment Threshold: It is the maximum frame size that wireless device can transmit without fragmenting the frame. Enter a value between 256 and 2346 to specify the Fragment Threshold.

RTS/CTS Threshold: Packets larger than the value are transmitted by the RTS/CTS handshake. Enter a value between 1

and 2346 to specify the value of the RTS /CTS Threshold.
Tx Power: To set the tx power as off to turn off the tx power, set auto to let device determine the tx power value automatically, or set manual to set the tx power value. The max value is depending on the wireless module.
WEP Key Setting: It uses two kinds of WEP Encryption key length: 5-bytes and 13-bytes. The key format can either use 'ASCII' to set the key values (ie. 0~9, a~z) or use 'HEX' to set the key value in hexadecimal. (ie. 0~9, a~f). User can set maximum 4 keys, but only one key will functional at one time.

Figure 3-5-24

†**SSID Security Mode**

Authentication: User can choose which authentication type to secure the wireless network. There are four options for authentication: Disable, WEP, WPA-personal and WPA-enterprise.
WEP: Short for Wired Equivalent Privacy, a security protocol for wireless local area networks (WLANs) defined in the 802.11 standard.
Open or Restricted: An open system allows any client to authenticate as long as it conforms to any MAC address filter policies that may have been set. All authentication packets are transmitted without encryption. If the 'Restricted' selected, all the packets are transmitted with encryption.
Select Key: Check the radio box in front of the key that user would like to use for this AP.

Figure 3-5-25

WPA-Personal: The method of authentication is similar to WEP, user can define a 'Pre-Shared Key', once the key is confirmed and satisfied on both the client and access point, then access is

granted. The encryption method used is referred to as the Temporal Key Integrity Protocol (TKIP).

WPA MODE: In this setting, user can choose WPA or WPA2 or WPA & WPA2. (WPA2 is far superior to WPA, because the encryption of method used is Advanced Encryption Standard (AES)).

Share Key: User should define the pre-share key in here; the length of the key is 8-23 characters.

WPA Encryption: User can choose the encryption method of the pre-shared key here; there are three options: Auto, AES and TKIP.

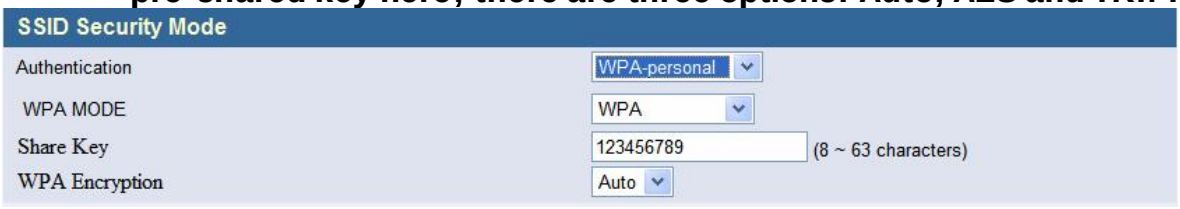


Figure 3-5-26

WPA-enterprise:

WPA-Enterprise includes all of the features of WPA-PSK plus support the 802.1x authentication. To use this function, a separate RADIUS server is required

User should enter their account and password to pass the authentication.

Figure 3-5-27

Please Note: In wifi station model, the security setting must be same as the AP that user wish to connect.

3.5.5 Filtering

The MAC address filter section can be used to filter network access by machines based on the unique MAC addresses of their network adapter(s). It is most useful to prevent unauthorized wireless devices from connecting to user's network. A MAC address is a unique ID assigned by the manufacturer of the network adapter.

3.5.5.1 IP Filtering

User can block certain client PCs from accessing this AP based on its IP address. If enabled, user should also configure the IP Filtering Address. This option is only available in router and MESH modes.

† IP Filtering

Enable/Disable IP Filtering.

† **IP Address**

Enter the Network IP Address and press <Apply> to filter.

Figure 3-5-28

3.5.5.2 MAC Filtering

User can block certain clients from accessing this AP based on its MAC address. Use Filtering type to define the filtering scenario:

† **General**

Disabled: Disable this filtering function. If this option is selected, all PCs can access this AP.

Accept: All PCs are filtered out except those MAC addresses in the following MAC address table. In other words, only those interfaces/ PCs with MAC address in the MAC address table can access this AP.

Reject: All PCs/interfaces can access this AP except those interfaces/PCs with MAC address in the MAC address table.

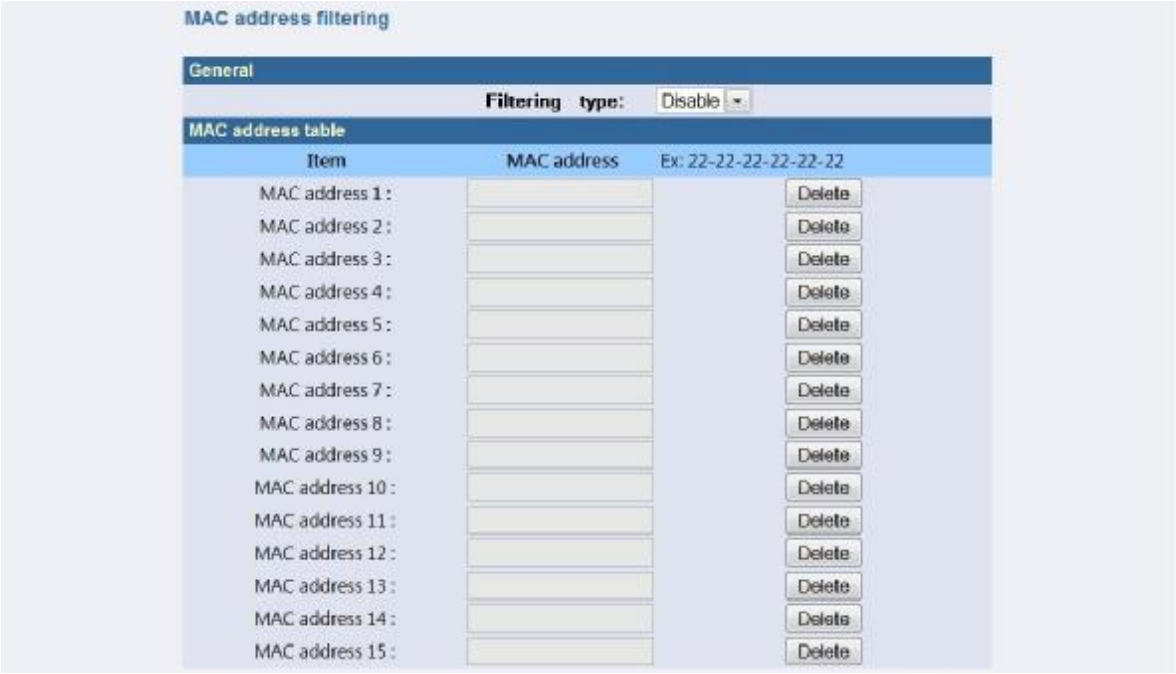


Figure 3-5-29

3.5.6 SNMP

The Outdoor Wireless Access Point support SNMP V1/V2C/V3, this page is to define the SNMP access control and SNMP traps.

3.5.6.1 Basic Setting

†SNMP Agent

Check the <Enable> check box to turn on SNMP. Please Note: Enable the SNMP will also enable the LLDP (Link Layer Discovery Protocol) function. This function will be used if user wants to remote management the AP and draw the network topography.

†System Information

Contact: Specify the contact name for this managed node as well as information about how to contact this person.

Location: It is used to define the location of the host on which the SNMP agent is running.

†V1/V2C

User can change user's SNMP community settings on this page.

Access Right: Select an access right for the SNMP manager. 'Read' is read only, 'Write' is read-write, and 'Deny' means this community name is not implemented.

Community: Specify the name of community for the SNMP manager.

SNMP Community provides a simple protection by using the community name to control the access to the SNMP. The community name can be thought of as a password. If user doesn't have the correct community name, user can't retrieve any data (get) or make any change (set). Multiple SNMP managers may be organized in a specified community.

† **V3**

The SNMP V3 is a Security Enhancement for SNMP, it provides secure access to devices by a combination of user ID, authenticating and encrypting packets over the network.

User ID: A string representing the name of the user.

Security Level: User can select which security level that user wants to use. The available options for this field are: NoAuthNoPriv, AuthNoPriv or AuthPriv.

Auth Type (Authentication Protocol): An indication of which authentication protocol is used. The available options for this field are: MD5, and SHA.

Auth Passphrase (Authentication Key): A secret key used by the authentication protocol for authenticating messages.

Privacy Protocol: An indication of which privacy protocol is used. The available options for this field is: DES.

Priv Passphrase (Privacy Key): The secret key used by the privacy protocol for encrypting and decrypting messages.

Access Right: Assign the access right for account. The options are:

Unused − The account is disabled.

Read Only − The account has read only access rights.

Read Write − The account has read and writes access rights.

usm − This account will be an usm account and assign access rights by VACM.

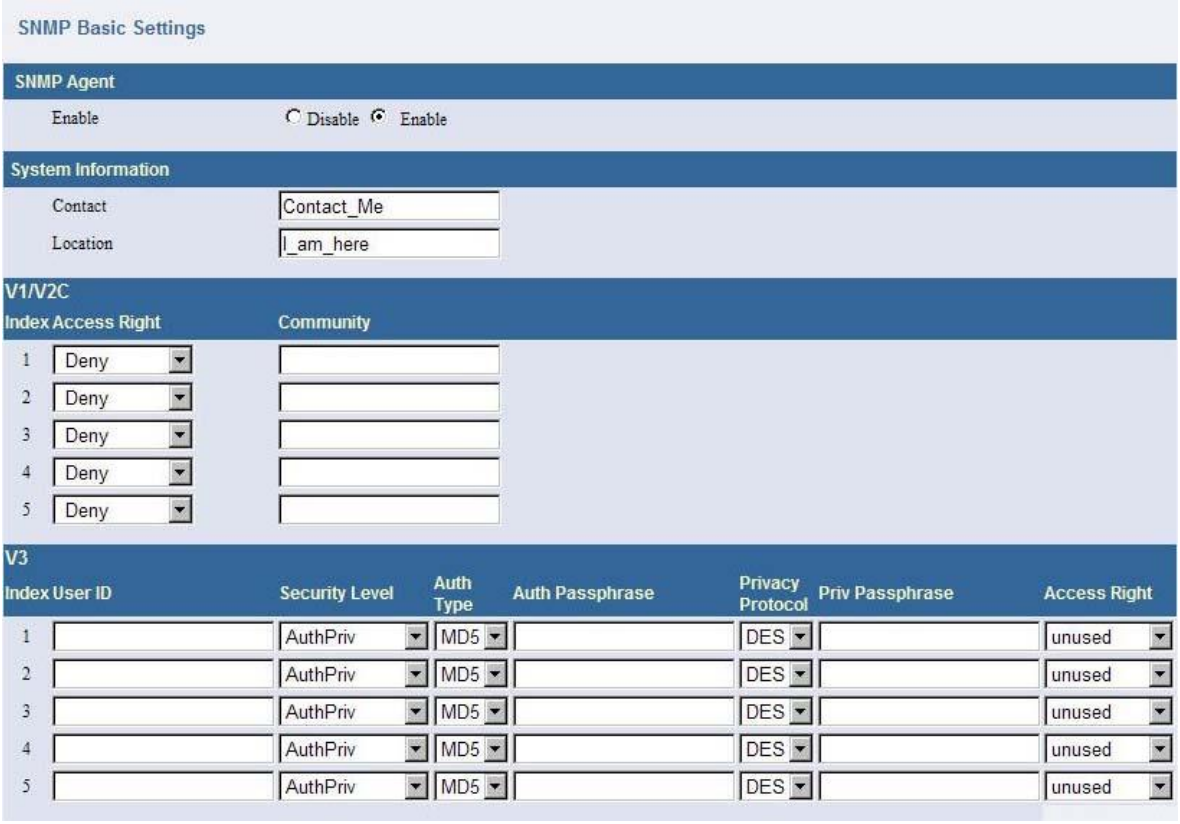


Figure 3-5-30

3.5.6.2 VACM Setting

User can use the View-based Access Control Model (VACM) to define whether access to a specified managed object is authorized. Access control is done at the following points:

- **When processing retrieval request messages from the SNMP manager.**
- **When processing modification request messages from the SNMP manager.**
- **When notification messages must be sent to the SNMP manager.**

The following tokens for VACM access security that user can use:

† **Community to Security for V1/V2c**

Map the community name (COMMUNITY) into a security name. The Community to Security token takes NAME SOURCE and COMMUNITY options. User can use this token to give SNMPv3 security privileges to SNMPv1 and SNMPv2 users and communities

Index: Index of Community to Security. Tick the checkbox to enable the recordset.

Security Name: is a name that will use by the group table.

IP source: Describes a host or network.

Community: The community name that is used.

†**Group**

Map the security names into group names. (For SNMP V3, the security Name is the user ID in Basic setting.)
Index: Index of Group. Tick the checkbox to enable the recordset.
Group Name: A group name is given to a group of users and is used when managing their access rights.
Security Model: Assign security model for group.
Security Name: Assign security name for group. This field will obtain from the 'Security Name' of 'Community to Security' when security model is v1 or v2c, or obtain from the 'User ID' of 'usm' when security model is usm.

Figure 3-5-31

† **View**

Create a view for user to let the groups have rights to view the MIB tree.
Index: Index of View. Tick the checkbox to enable the recordset.
Include: Assign include or exclude in this record for certain subtree.
Sub Tree: the OID value. For example: '1.3.6.1.2.1'.

Figure 3-5-32

† **Access**

The Access table grants the groups access right to certain views. Each group can have multiple access rights. The most secure access right is chosen.

Index: Index of Access. Tick the checkbox to enable recordset.

Group: Returned and lookup the 'Group Name' from the Group table.

Security model: Specified in the message's msgSecurityModel parameter. The available options for this field are: any, v1, v2c and usm.

Security level: Specified in the message's msgFlags parameter. The available options for this field are: NoAuthNoPriv, AuthNoPriv and AuthPriv.

Read: Specified in the message's msgSecurityModel parameter. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Write: Authorized View Name for write access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Notify: Authorized View Name for notify access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

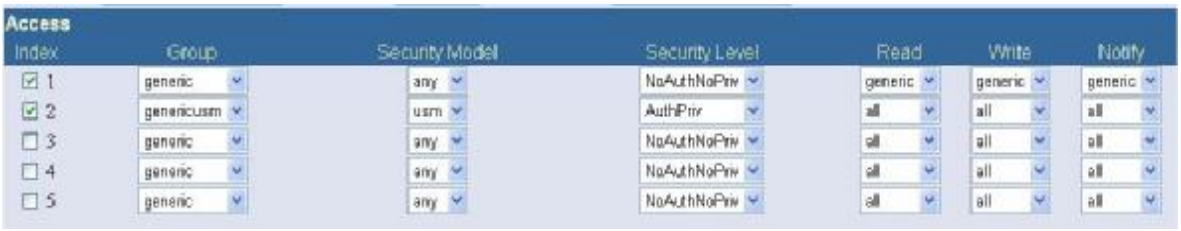


Figure 3-5-33

3.5.6.3 SNMP Trap

It is an SNMP application that uses the SNMP TRAP operation to send information to a network management system.

† **SNMP Trap**

Trap Active: To enable or disable SNMP Trap function.

† **v1 / v2c Trap**

Version: Indicate the traps will be sent in v1 or v2c or not send (disable).

IP Address & Port: The IP and Port to receive traps.

Community: The community string to be used when sending traps.

† **v3 Trap**

Trap: Index of SNMP v3 traps. Tick the checkbox to enable recordset.

User: The usm User ID.

IP Address & Port: The IP and Port of a device to receive traps.

Security Level: Assign security level in this record. The Options are: NoAuthNoPriv, AuthNoPriv, AuthPriv.

Figure 3-5-34

† **Trap Items**

Enable/Disable which trap items to send.

Figure 3-5-35

3.5.7 Tools

†**Command Ping**

It runs ping command to test the connection capability of this device with the other Ethernet device.

Figure 3-5-36

3.5.8 Log Out

User can manually logout by click on <Log Out>.

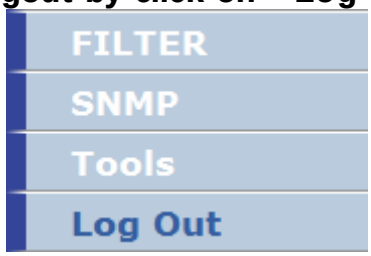


Figure 3-5-3

3.6 VLAN-AP Mode

To set this device as a VLAN-AP device. Each AP bridge (SSID) has its own VLAN ID, the setting and functions as following:

- ▽ **SYSTEM**
  - **Administrator**
  - **Firmware**
  - **Configuration Tools**
  - **General Status**
  - **Power Control**
  - **WIFI Status**
  - **Log**
  - **System Time**
  - **Reboot**
- ▽ **LAN**
  - **LAN settings**
- ▽ **WIRELESS**
  - **WIFI ath0 Setting**
  - **WIFI ath1 Setting**
  - **WIFI ath2 Setting**
  - **WIFI ath3 Setting**
  - **WIFI ath4 Setting**
  - **WIFI ath5 Setting**
  - **WIFI ath6 Setting**
  - **WIFI ath7 Setting**
- ▽ **FILTER**
  - **MAC Filtering**
- ▽ **SNMP**
  - **Basic Setting**
  - **VACM Setting**
  - **Trap Setting**
- ▽ **Tools**
  - **Tools**
- ▽ **Log Out**

3.6.1 System

This page shows the current status and some basic settings of the device, including Administrator, Firmware, Configuration Tools, General Status, Power Control, WIFI Status, Log, System Time and Reboot; screen as shown in Figure 3-6-1.

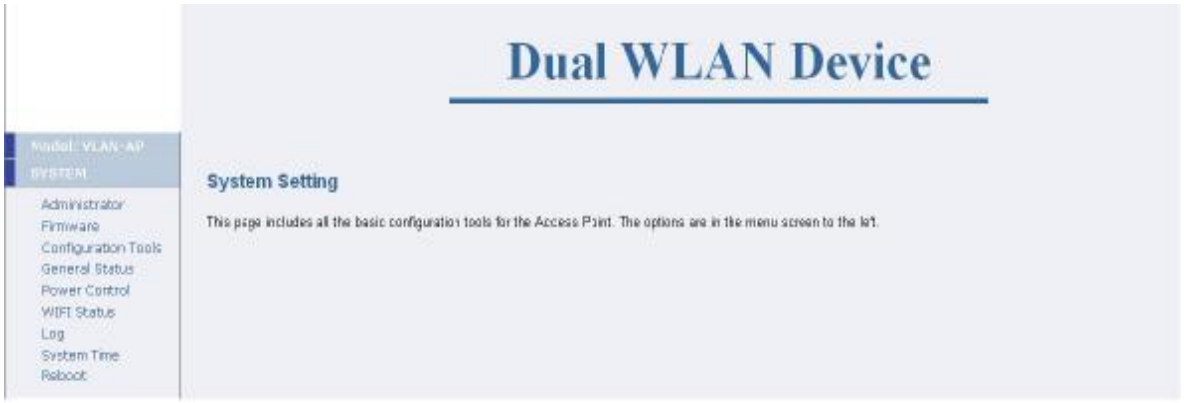


Figure 3-6-1

3.6.1.1 Administrator

By selecting the item of Administrator under System, User will see the screen shown in Figure 3-6-2. These settings allow user to configure the Device Name, Language, Model, Password, Remote Management and WIFI Loading Warning Threshold.

- **Device Name**

  This is a host name or system name for the device. The maximum length is 20 characters. User can only input '0'~'9', 'a'~'z', 'A'~'Z', '_' or '-'.

- **Model**

  OLSR_AP: To set this device as an AP with layer 3 MESH function.
  AODV_AP: To set this device as an AP with layer 3 MESH function.
  AP-Bridge: To set this device as a normal AP.
  AP-CB-Bridge: To set this device as an AP and Client Bridge device.
  AP-CB-ROUTE: To set this device as a router device with AP and CB functions.
  CB-CB-ROUTE: To set this device as a router device with dual CB functions.
  VLAN-AP: To set this device as a VLAN AP device. Each SSID can have its own VLAN ID.
  AP_WDS_BRG: To set this device as a WDS device with AP function.
  AP4_WDS_BRG: To set this device as WDS device with AP function and support up to 4 SSID.

Figure 3-6-2

† **Password Settings**

If user wants to change the password for admin account, the user should enter the current password, a new password and, re-type the new password.

The Idle Time Out is the amount of time of inactivity allowed before user proceeds next action. The user needs to re-login if the idle time passes timeout.

† **Remote Management**

User can enable/disable the management of the Access Point from a remote host. Just tick the <Enable> check box and enter an IP address of the remote host. Then, only the host with the entered IP address can access this device.

† **WIFI Loading Warning Threshold**

The threshold value is used by network management system. Network management software will monitor the WIFI loading, when the loading is over this value, network management software will change the color of the link line on network topology to notify the user about condition of the link quality. The threshold value is between 5 and 25.

3.6.1.2 Firmware Update

By selecting the item of Firmware under System, User will see the screen shown in Figure 3-6-3. This page shows current firmware version and date. This page also allow user to using TFTP or WEB or FTP method to upgrade to the new version of firmware.

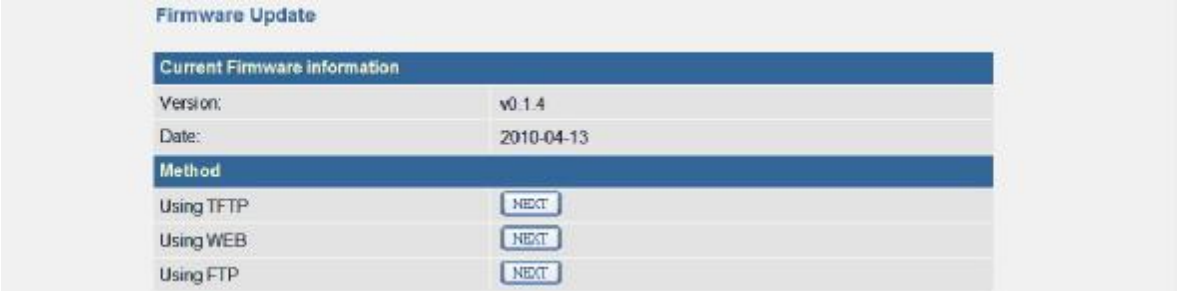


Figure 3-6-3

† **Using TFTP**

On any computer in the network or a computer direct connect to the AP. Install a TFTP Server utility, and put the firmware file named 'upgradeFW.tar' in a folder.

Run TFTP utility and specify the folder in which the firmware file located. Enter the TFTP server IP and click on <APPLY> button. At the end of the upgrade process, this device may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

† **Using WEB**

Click on <Browse> button and select the correct firmware file path and file name. Then, click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands while uploading the firmware. This is normal behavior and do not turn off the Access Point while firmware is upgrading.

† **Using FTP**

On FTP server, there should have valid firmware which includes fs-opn.img and/or kernel-opn.img. On the Firmware Update - FTP page, enter the IP address of the FTP server, firmware name and FTP user name and password. Then click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

3.6.1.3 Configuration Tools

By selecting the item of Configuration Tools under System, the screen will show in Figure 3-6-4. This page includes three selections: Restore Factory Default Configuration, Local Backup Settings/Restore settings and Remote Backup Settings/Restore settings.

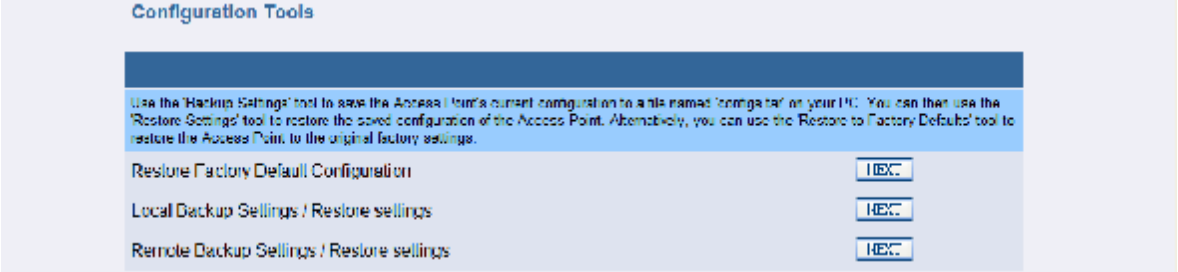


Figure 3-6-4

† Restore Factory Default Configuration:

To reset configuration settings to the factory default values, just click on <NEXT> button beside 'Restore Factory Default Configuration'.

Figure 3-6-5

Then click on <Restore> button on next page, now the system will reset to factory default value.

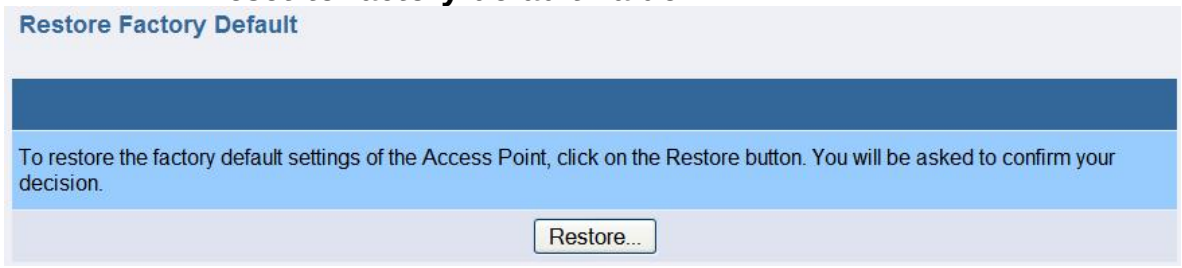


Figure 3-6-6

† Local Backup Settings / Restore settings

To backup or restore the configuration for this device. Click on <NEXT> button beside 'Local Backup Settings/Restore settings'.

Figure 3-6-7

Click on <Backup Settings> button on next page to save the settings of this device to a file named 'configs.tar' on user's PC.

To restore the settings, click on <Browse> button and select the correct file path and file name. Then, click on <Restore Settings> button to start the restore settings process.

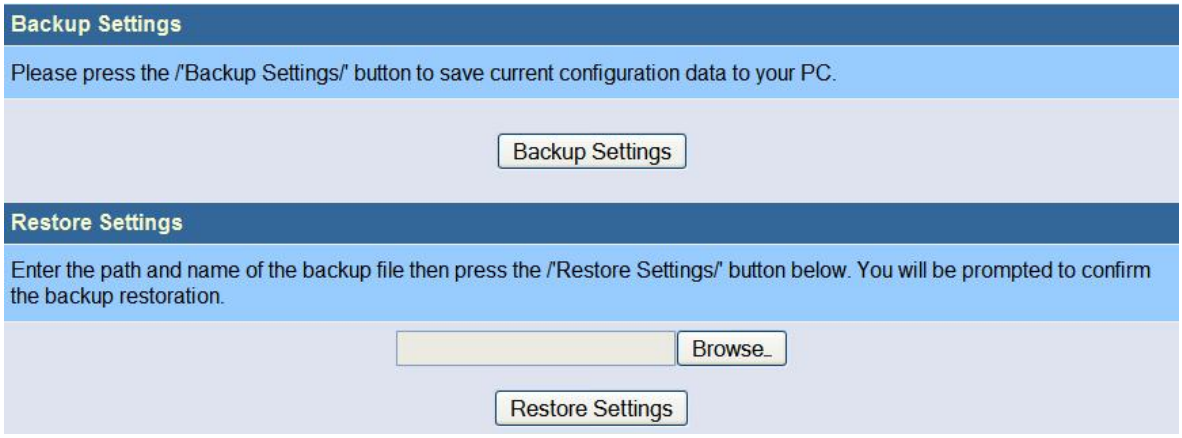


Figure 3-6-8

†Remote Backup Settings/Restore settings

User can also backup/restore the configuration of this device remotely.

Click on <NEXT> button beside `Remote Backup Settings/Restore settings'.

Figure 3-6-9

Enter the necessary setting in next page, then click on <Backup To Server> or <Restore From Server> to start the process.

Figure 3-6-10

3.6.1.4 General Status

In this page user could see the detail settings of this device, including the System Information, Power Control, LAN Port of eth1, AP WIFI 1 Status, AP WIFI 2 Status.

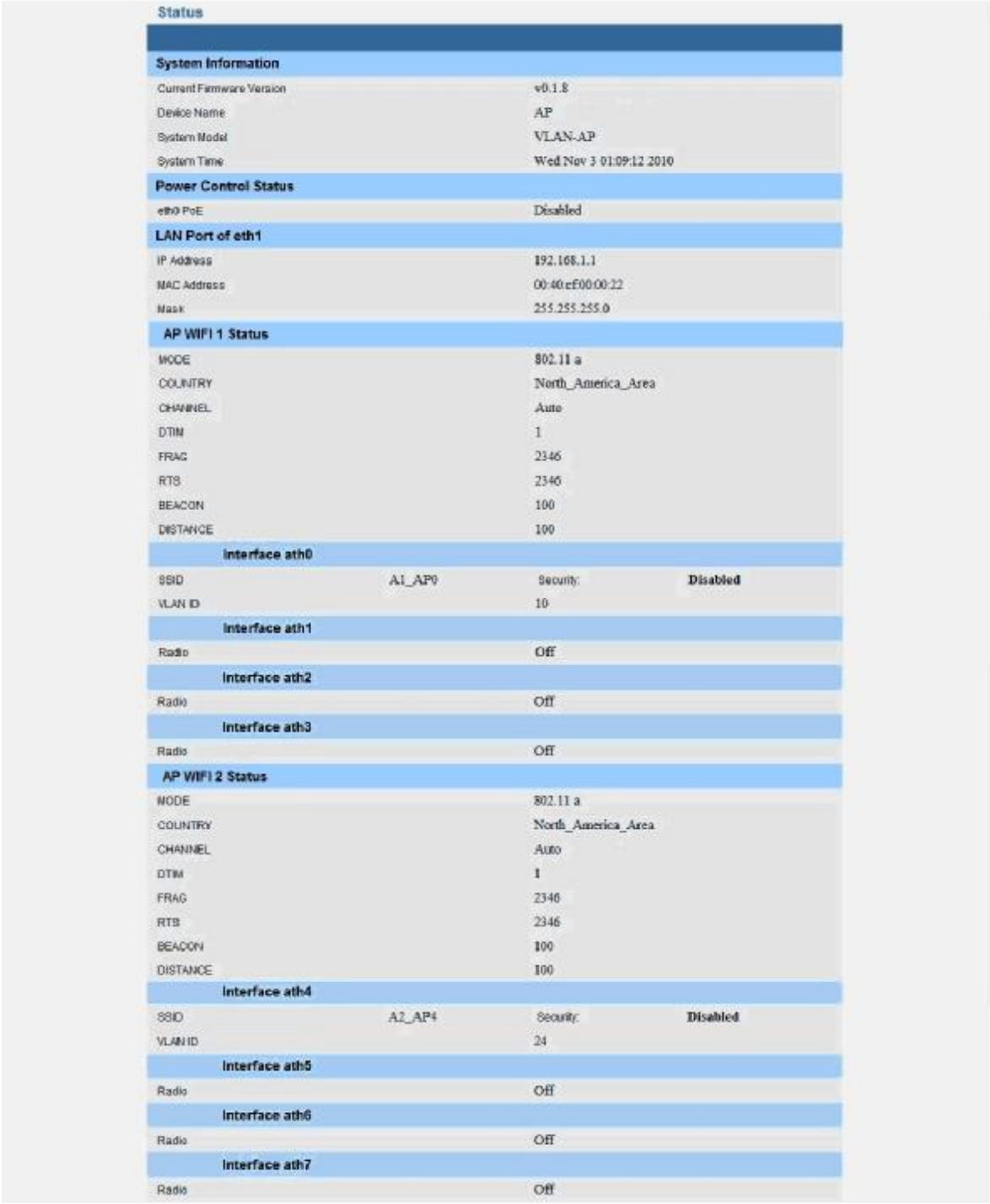


Figure 3-6-11

3.6.1.5 Power Control/Status

In this page user can enable the eth0 port to provide PoE power and data forwarding function.

Figure 3-6-12

3.6.1.6 WIFI Status

In this page user could see the WIFI information of this device, such as: Interface information, Security information, Associated AP/Station.

Figure 3-6-13

3.6.1.7 Log

In this page user could see the system logs record of this device.

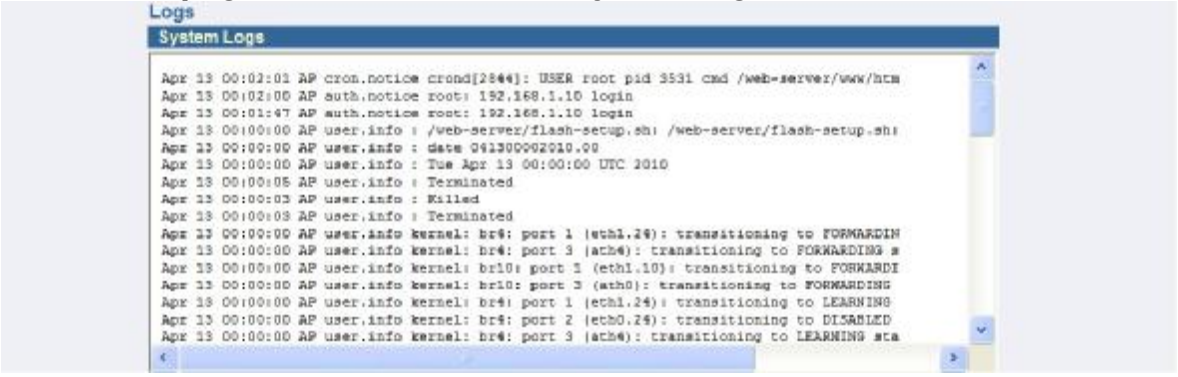


Figure 3-6-14

3.6.1.8 System Time

†Select Setting Type

Setting by: User can set system time in two ways. One is manual setting, the other one is Synchronize with an Internet Time Server.

†Manual Setting

User can manually enter the Year/ Month/ Day and Hour: Minute: Second.

†Using Internet Time Server

Hours from GMT: User can enter the Hours from GMT, for example Taiwan is GMT +8 Hours.

Server IP: User should enter the Internet time server IP address here.

Time Update for Every: User can set time update interval by enter the days, hours, and minutes.

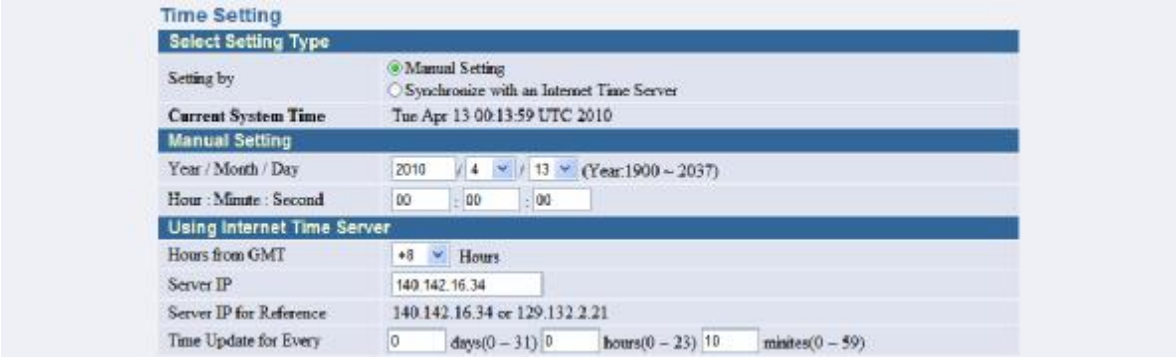


Figure 3-6-15

3.6.1.9 Reboot

User can perform reboot function in case of the device is not function normally, or after user change some major settings for example: change system model. The existing settings will not be changed. To perform the reboot, click on the <Reboot> button and click on <OK> on pop-up screen to confirm user's decision.

Figure 3-6-16

3.6.2 LAN Configuration

†Network IP Parameters

User can change the network settings of this device from LAN Configuration; it is including IP address, Subnet mask, and Gateway address.

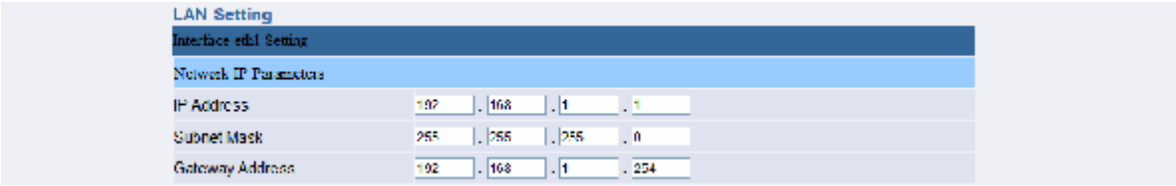


Figure 3-6-17

3.6.3 Wireless

User can configure the wireless related settings in this page.

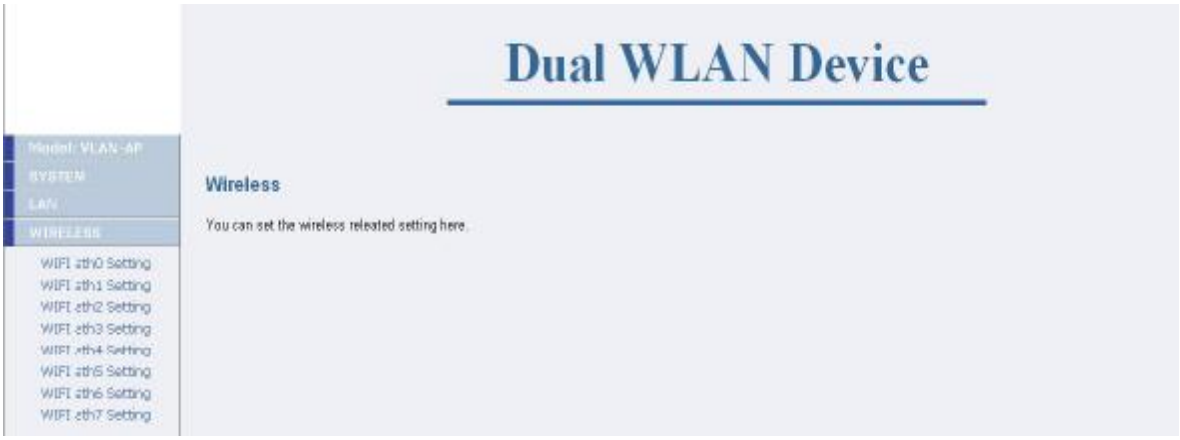


Figure 3-6-18

3.6.3.1 WIFI ath0~7 Setting

†**General**

Radio Power: Turn this interface on or off.

Wireless Mode: Select which wireless mode that user wants to use. The options available here are: 802.11a, 802.11b, 802.11g and 802.11b+g.

VLAN ID: It is only available in VLAN_AP model. It is the VLAN tag value.

SSID: The SSID (service set identifier) is an identifier of an AP in user's wireless network. The SSID must be identical for all access points in the network. It is case sensitive and maximum length is 32.

SSID Hide: This function is to hide the SSID in the wireless network.

Channel: Set the operating frequency/channel for this device.

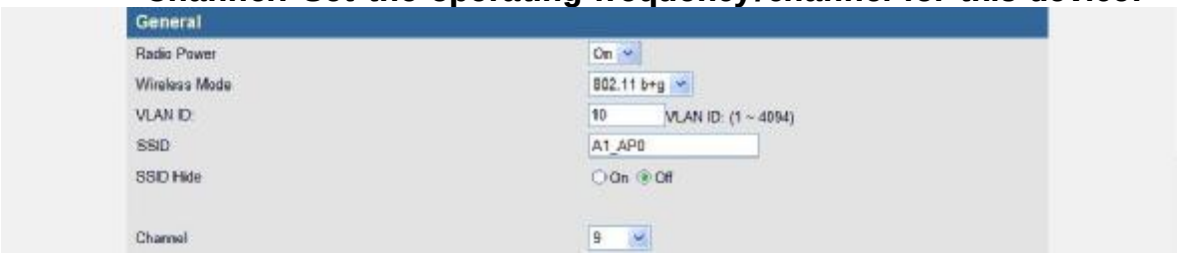


Figure 3-6-19

†**Advanced Settings**

Peer Node Distance: Set the distance between this device and it's adjacent. If select 'manual', the distance will be determined by 'Slot time', 'ACK timeout' and 'CTS timeout' three values.

Beacon Period: This item contains the length of the beacon interval. Enter a value between 20 and 1000 to specify the Beacon Period.

DTIM Period: This item contains the number of Beacon intervals between Delivery Traffic Indication Message (DTIM). Enter a number between 1 and 255 to specify.

Fragment Threshold: It is the maximum frame size that wireless

device can transmit without fragmenting the frame. Enter a value between 256 and 2346 to specify the Fragment Threshold.

RTS/CTS Threshold: Packets larger than the value are transmitted by the RTS/CTS handshake. Enter a value between 1 and 2346 to specify the value of the RTS /CTS Threshold.

Tx Power: To set the tx power as off to turn off the tx power, set auto to let device determine the tx power value automatically, or set manual to set the tx power value. The max value is depending on the wireless module.

Rate: Set the bit rate for wireless interface to supporting multiple bit rates. The value `Auto′ causes the device to use the bit rate selected by the rate control module.

Layer 2 Isolation: It is used in AP mode only. If enabled, all of the clients connect to the same AP will not be able to access each other.

WEP Key Setting: It uses two kinds of WEP Encryption key length: 5-bytes and 13-bytes. The key format can either use 'ASCII' to set the key values (ie. 0~9, a~z) or use 'HEX' to set the key value in hexadecimal. (ie. 0~9, a~f). User can set maximum 4 keys, but only one key will functional at one time.

Figure 3-6-20

†SSID Security Mode

Authentication: User can choose which authentication type to secure the wireless network. There are four options for authentication: Disable, WEP, WPA-personal and WPA-enterprise.

WEP: Short for Wired Equivalent Privacy, a security protocol for wireless local area networks (WLANs) defined in the 802.11 standard.

Open or Restricted: An open system allows any client to authenticate as long as it conforms to any MAC address filter policies that may have been set. All authentication packets are transmitted without encryption. If the 'Restricted' selected, all the packets are transmitted with encryption.

Select Key: Check the radio box in front of the key that user

would like to use for this AP.

Figure 3-6-21

WPA-Personal: The method of authentication is similar to WEP, user can define a 'Pre-Shared Key', once the key is confirmed and satisfied on both the client and access point, then access is granted. The encryption method used is referred to as the Temporal Key Integrity Protocol (TKIP).
WPA MODE: In this setting, user can choose WPA or WPA2 or WPA & WPA2. (WPA2 is far superior to WPA, because the encryption of method used is Advanced Encryption Standard (AES)).
Share Key: User should define the pre-share key in here; the length of the key is 8-23 characters.
WPA Encryption: User can choose the encryption method of the pre-shared key here; there are three options: Auto, AES and TKIP.
Group Key Update Interval: Time interval for rekeying the GTK (broadcast/multicast encryption keys) in seconds.

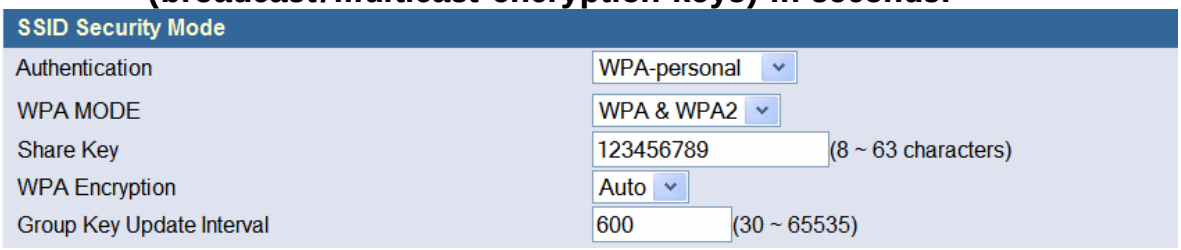


Figure 3-6-22

WPA-enterprise:
WPA-Enterprise includes all of the features of WPA-PSK plus support the 802.1x authentication. To use this function, a separate RADIUS server is required. User should enter the IP and port number of the Authentication Server and Shared Secret here. In case if a backup server has been deployed in user's network, user can also enter the necessary information here.

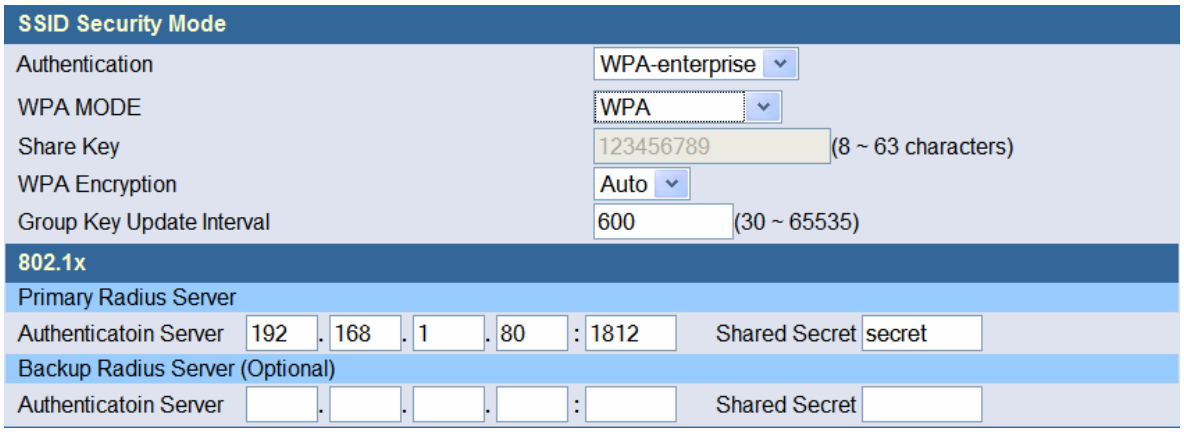


Figure 3-6-23

† **QoS**

WMM Enable/disable WMM support.
MAX Associated Station: Maximum number of stations allowed in station table.

Common Parameters:
CWmin: Minimum Contention Window. The valid values for 'CWmin' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047, or 4095. The value for 'CWmin' must be lower than the value for 'CWmax'.
CWmax: Maximum Contention Window. The Valid values for 'CWmax' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047 or 4095. The value for 'CWmax' must be higher than the value for 'CWmin'.
AIFS: Arbitration Inter-Frame Spacing.
Burst: Maximum length (in milliseconds with precision of up to 0.1 ms) for bursting.

AP Parameters:
This affects traffic flowing from the access point to the client station. These parameters are used by the access point when transmitting frames to the clients.

AP Tx-Best Effort: Medium Priority. Medium throughput and delay. Most traditional IP data is sent to this queue.
AP Tx-Background: Low Priority. High throughput. Bulk data that requires maximum throughput and is not time-sensitive is sent to this queue (FTP data, for example).
AP Tx-Video: High Priority. Minimum delay. Time-sensitive video data is automatically sent to this queue.
AP Tx-Voice: High Priority. Time-sensitive data like VoIP and streaming media are automatically sent to this queue.

STA Parameters:
These parameters are sent to WMM clients when they associate.

The parameters will be used by WMM clients for frames transmitted to the access point.

STA Tx-Best Effort: Medium Priority, Medium throughput and delay. Most traditional IP data will be sending to this queue.
STA Tx-Background: Low Priority, High throughput. Bulk data that requires maximum throughput and it's not time-sensitive will be sending to this queue (FTP data, for example).
STA Tx-Video: High Priority, Minimum delay. Time-sensitive video data will be automatically sent to this queue.
STA Tx-Voice: High Priority, Time-sensitive data like VoIP and streaming media are automatically sent to this queue.
TXOP: Transmission Opportunity is an interval of time when a WMM Client Station has the right to initiate transmissions onto the wireless medium (WM). This value specifies (in milliseconds) the Transmission Opportunity (TXOP) for Client Station; that is, the interval of time when the WMM AP has the right to initiate transmissions on the wireless network.
ACM: Admission control mandatory.

Figure 3-6-24

3.6.4 Filtering

The MAC address filter can be used to filter network access by machines based on the unique MAC addresses of their network adapter(s). It is most useful to prevent unauthorized wireless devices from connecting to user's network. A MAC address is a unique ID assigned by the manufacturer of the network adapter.

3.6.4.1 MAC Filtering

User can block certain clients from accessing this AP based on its MAC address. Use Filtering type to define the filtering scenario:

†General

Disabled: Disable this filtering function. If this option is selected, all PCs can access this AP.
Accept: All PCs are filtered out except those MAC addresses in the following MAC address table. In other words, only those

interfaces/ PCs with MAC address in the MAC address table can access this AP.

Reject: All PCs/interfaces can access this AP except those interfaces/PCs with MAC address in the MAC address table.

Figure 3-6-25

3.6.5 SNMP

The Outdoor Wireless Access Point support SNMP V1/V2C/V3, this page is to define the SNMP access control and SNMP traps.

3.6.5.1 Basic Setting

†SNMP Agent

Check the <Enable> check box to turn on SNMP. Please Note: Enable the SNMP will also enable the LLDP (Link Layer Discovery Protocol) function. This function will be used if user wants to remote management the AP and draw the network topography.

†System Information

Contact: Specify the contact name for this managed node as well as information about how to contact this person.

Location: It is used to define the location of the host on which the SNMP agent is running.

†V1/V2C

User can change user's SNMP community settings on this page.

Access Right: Select an access right for the SNMP manager. 'Read' is read only, 'Write' is read-write, and 'Deny' means this community name is not implemented.

Community: Specify the name of community for the SNMP manager.

SNMP Community provides a simple protection by using the community name to control the access to the SNMP. The community name can be thought of as a password. If user doesn't have the correct community name, user can't retrieve any data (get) or make any change (set). Multiple SNMP managers may be organized in a specified community.

† **V3**

The SNMP V3 is a Security Enhancement for SNMP, it provides secure access to devices by a combination of User ID, authenticating and encrypting packets over the network.
User ID: A string representing the name of the user.
Security Level: User can select which security level that user wants to use. The available options for this field are: NoAuthNoPriv, AuthNoPriv or AuthPriv.
Auth Type (Authentication Protocol): An indication of which authentication protocol is used. The available options for this field are: MD5, and SHA.
Auth Passphrase (Authentication Key): A secret key used by the authentication protocol for authenticating messages.
Privacy Protocol: An indication of which privacy protocol is used. The available options for this field is: DES.
Priv Passphrase (Privacy Key): The secret key used by the privacy protocol for encrypting and decrypting messages.
Access Right: Assign the access right for account. The options are:
Unused – The account is disabled.
Read Only – The account has read only access rights.
Read Write – The account has read and writes access rights.
usm – This account will be an usm account and assign access rights by VACM.

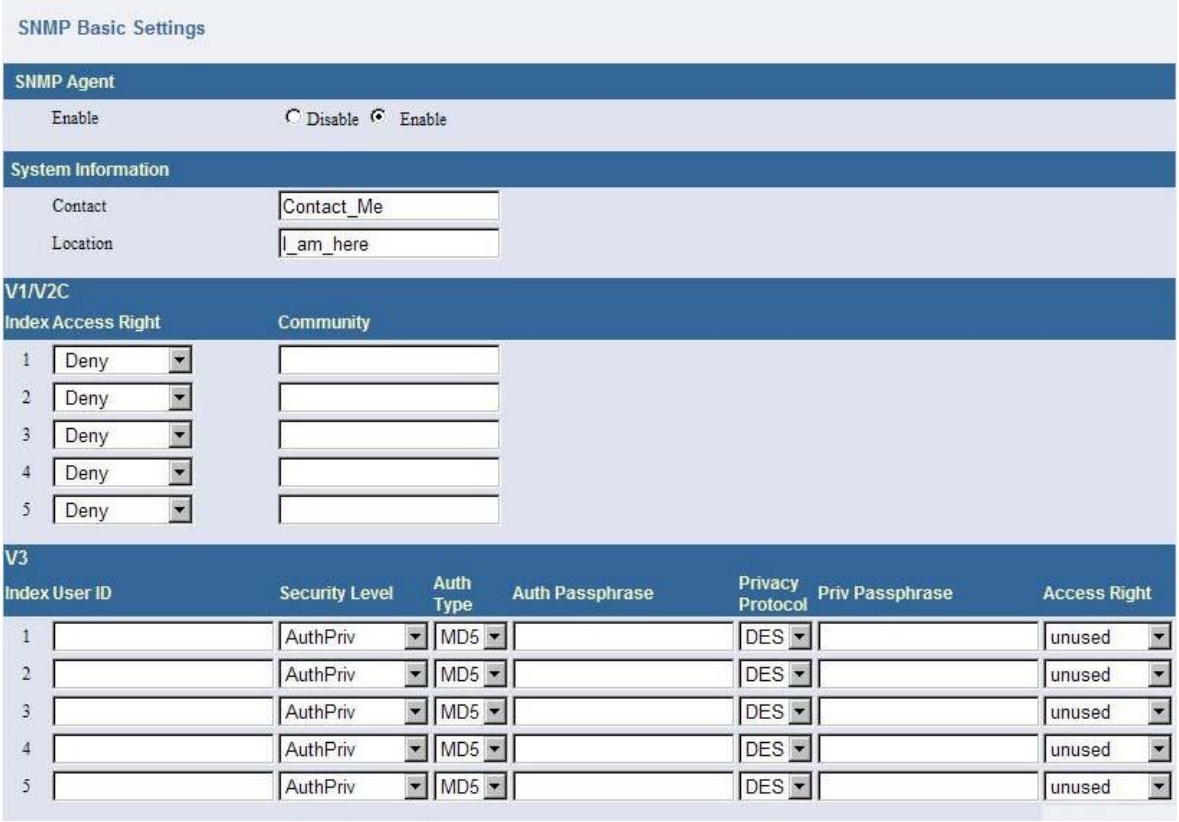


Figure 3-6-26

3.6.5.2 VACM Setting

User can use the View-based Access Control Model (VACM) to define whether access to a specified managed object is authorized. Access control is done at the following points:

- **When processing retrieval request messages from the SNMP manager.**
- **When processing modification request messages from the SNMP manager.**
- **When notification messages must be sent to the SNMP manager.**

The following tokens for VACM access security that user can use:

† **Community to Security for V1/V2c**

Map the community name (COMMUNITY) into a security name. The Community to Security token takes NAME SOURCE and COMMUNITY options. User can use this token to give SNMPv3 security privileges to SNMPv1 and SNMPv2 users and communities

Index: Index of Community to Security. Tick the checkbox to enable the recordset.

Security Name: is a name that will use by the group table.

IP source: Describes a host or network.

Community: The community name that is used.

†**Group**

Map the security names into group names. (For SNMP V3, the security Name is the user ID in Basic setting.)
Index: Index of Group. Tick the checkbox to enable the recordset.
Group Name: A group name is given to a group of users and is used when managing their access rights.
Security Model: Assign security model for group.
Security Name: Assign security name for group. This field will obtain from the 'Security Name' of 'Community to Security' when security model is v1 or v2c, or obtain from the 'User ID' of 'usm' when security model is usm.

Figure 3-6-27

† **View**

Create a view for user to let the groups have rights to view the MIB tree.
Index: Index of View. Tick the checkbox to enable the recordset.
Include: Assign include or exclude in this record for certain subtree.
Sub Tree: the OID value. For example: '1.3.6.1.2.1'.

Figure 3-2-28

† **Access**

The Access table grants the groups access right to certain views. Each group can have multiple access rights. The most secure access right is chosen.

Index: Index of Access. Tick the checkbox to enable recordset.

Group: Returned and lookup the 'Group Name' from the Group table.

Security model: Specified in the message's msgSecurityModel parameter. The available options for this field are: any, v1, v2c and usm.

Security level: Specified in the message's msgFlags parameter. The available options for this field are: NoAuthNoPriv, AuthNoPriv and AuthPriv.

Read: Specified in the message's msgSecurityModel parameter. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Write: Authorized View Name for write access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Notify: Authorized View Name for notify access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

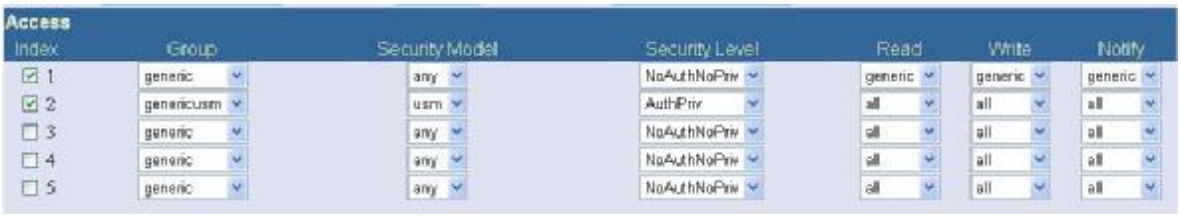


Figure 3-2-29

3.6.5.3 SNMP Trap

It is an SNMP application that uses the SNMP TRAP operation to send information to a network management system.

† **SNMP Trap**

Trap Active: To enable or disable SNMP Trap function.

† **v1 / v2c Trap**

Version: Indicate the traps will be sent in v1 or v2c or not send (disable).

IP Address & Port: The IP and Port to receive traps.

Community: The community string to be used when sending traps.

† **v3 Trap**

Trap: Index of SNMP v3 traps. Tick the checkbox to enable recordset.

User: The usm User ID.

IP Address & Port: The IP and Port of a device to receive traps.
Security Level: Assign security level in this record. The Options are: NoAuthNoPriv, AuthNoPriv, AuthPriv.

Figure 3-6-30

† **Trap Items**

Enable/Disable which trap items to send.

Figure 3-6-31

3.6.6 Tools

†**Command Ping**

It runs ping command to test the connection capability of this device with the other Ethernet device.

Figure 3-6-32

3.6.7 Log Out

User can manually logout by click on <Log Out>.

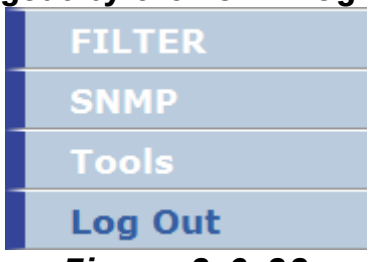


Figure 3-6-33

3.7 AP_WDS_Bridge Mode

To set this device as a WDS device, the setting and functions as following:

▽ **SYSTEM**
- **Administrator**
- **Firmware**
- **Configuration Tools**
- **General Status**
- **Power Control**
- **Bridge Status**
- **WIFI Status**
- **Log**
- **System Time**
- **Reboot**

▽ **LAN**
- **Bridge LAN settings**

▽ **WIRELESS**
- **WIFI ath0 Setting**
- **WIFI ath4 Setting**

▽ **FILTER**
- **MAC Filtering**

▽ **SNMP**
- **Basic Setting**
- **VACM Setting**
- **Trap Setting**

▽ **Tools**
- **Tools**

▽ **Log Out**

3.7.1 System

This page shows the current status and some basic settings of the device, including Administrator, Firmware, Configuration Tools, General Status, Power Control, Bridge Status, WIFI Status, Log, System Time and Reboot; screen as shown in Figure 3-7-1.

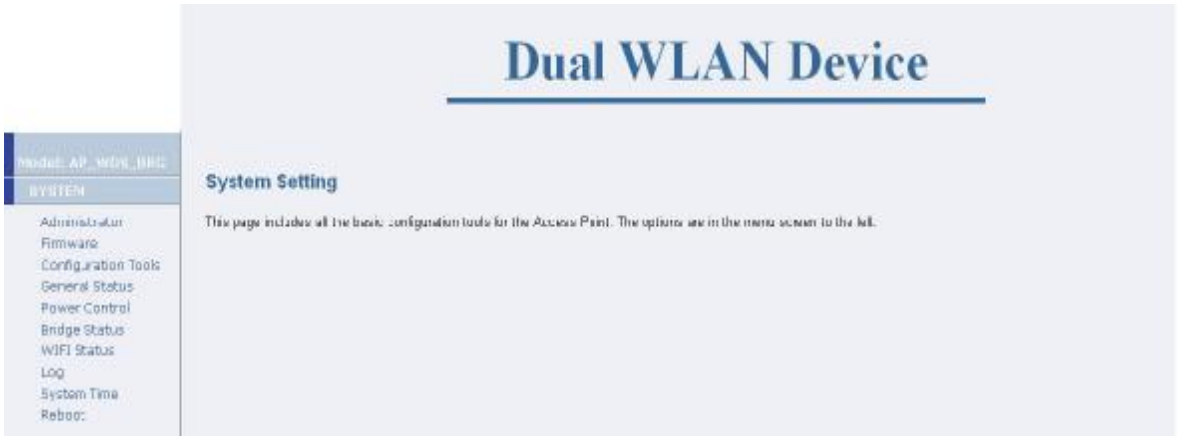


Figure 3-7-1

3.7.1.1 Administrator

By selecting the item of Administrator under System, User will see the screen shown in Figure 3-7-2. These settings allow user to configure the Device Name, Language, Model, Password, Remote Management and WIFI Loading Warning Threshold.

- **Device Name**

  This is a host name or system name for the device. The maximum length is 20 characters. User can only input '0'~'9', 'a'~'z', 'A'~'Z', '_' or '-'.

- **Model**

  OLSR_AP: To set this device as an AP with layer 3 MESH function.
  AODV_AP: To set this device as an AP with layer 3 MESH function.
  AP-Bridge: To set this device as a normal AP.
  AP-CB-Bridge: To set this device as an AP and Client Bridge device.
  AP-CB-ROUTE: To set this device as a router device with AP and CB functions.
  CB-CB-ROUTE: To set this device as a router device with dual CB functions.
  VLAN-AP: To set this device as a VLAN AP device. Each SSID can have its own VLAN ID.
  AP_WDS_BRG: To set this device as a WDS device with AP function.
  AP4_WDS_BRG: To set this device as WDS device with AP function and support up to 4 SSID.

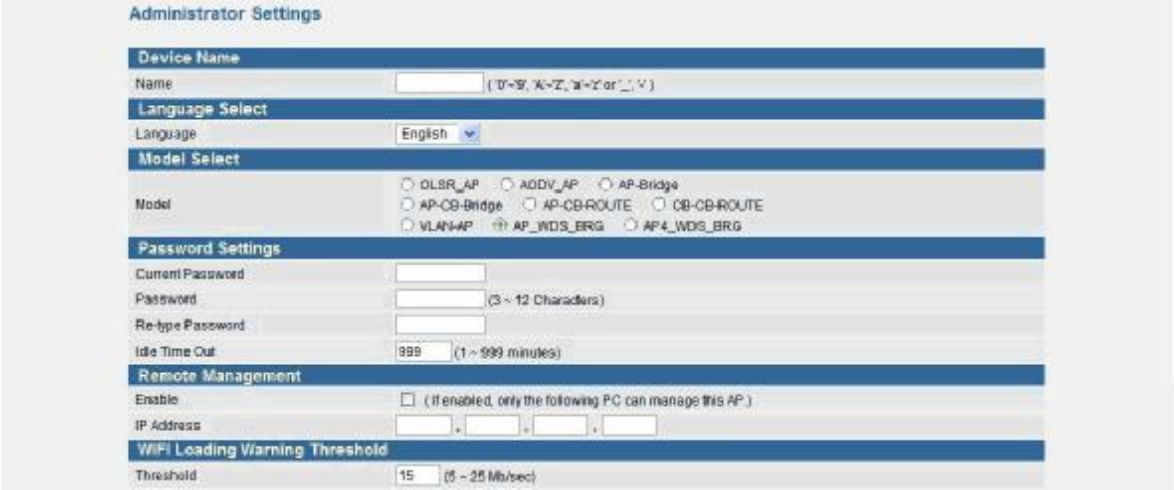


Figure 3-7-2

† Password Settings

If user wants to change the password for admin account, the user should enter the current password, a new password and, re-type the new password.

The Idle Time Out is the amount of time of inactivity allowed before user proceeds next action. The user needs to re-login if the idle time passes timeout.

† Remote Management

User can enable/disable the management of the Access Point from a remote host. Just tick the <Enable> check box and enter an IP address of the remote host. Then, only the host with the entered IP address can access this device.

† WIFI Loading Warning Threshold

The threshold value is used by network management system. Network management software will monitor the WIFI loading, when the loading is over this value, network management software will change the color of the link line on network topology to notify the user about condition of the link quality. The threshold value is between 5 and 25.

3.7.1.2 Firmware Update

By selecting the item of Firmware under System, User will see the screen shown in Figure 3-7-3. This page shows current firmware version and date. This page also allow user to using TFTP or WEB or FTP method to upgrade to the new version of firmware.

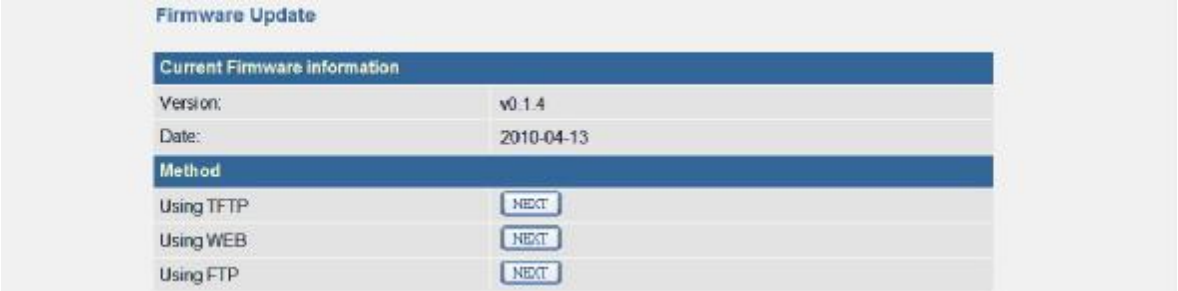


Figure 3-7-3

† **Using TFTP**

On any computer in the network or a computer direct connect to the AP. Install a TFTP Server utility, and put the firmware file named 'upgradeFW.tar' in a folder.

Run TFTP utility and specify the folder in which the firmware file located. Enter the TFTP server IP and click on <APPLY> button. At the end of the upgrade process, this device may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

† **Using WEB**

Click on <Browse> button and select the correct firmware file path and file name. Then, click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands while uploading the firmware. This is normal behavior and do not turn off the Access Point while firmware is upgrading.

† **Using FTP**

On FTP server, there should have valid firmware which includes fs-opn.img and/or kernel-opn.img. On the Firmware Update - FTP page, enter the IP address of the FTP server, firmware name and FTP user name and password. Then click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

3.7.1.3 Configuration Tools

By selecting the item of Configuration Tools under System, the screen will show in Figure 3-7-4. This page includes three selections: Restore Factory Default Configuration, Local Backup Settings/Restore settings and Remote Backup Settings/Restore settings.

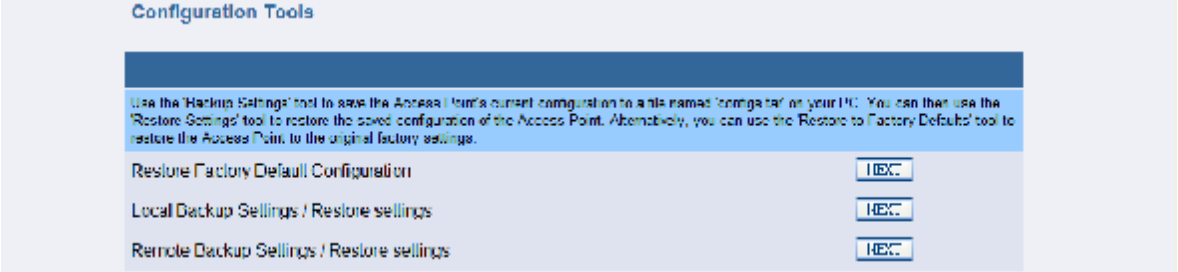


Figure 3-7-4

† Restore Factory Default Configuration:

To reset configuration settings to the factory default values, just click on <NEXT> button beside 'Restore Factory Default Configuration'.

Figure 3-7-5

Then click on <Restore> button on next page, now the system will reset to factory default value.

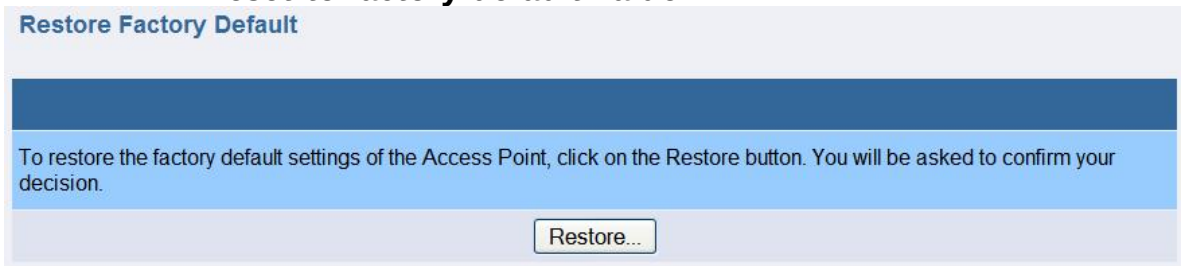


Figure 3-7-6

† Local Backup Settings / Restore settings

To backup or restore the configuration for this device. Click on <NEXT> button beside 'Local Backup Settings/Restore settings'.

Figure 3-7-7

Click on <Backup Settings> button on next page to save the settings of this device to a file named 'configs.tar' on user's PC.

To restore the settings, click on <Browse> button and select the correct file path and file name. Then, click on <Restore Settings> button to start the restore settings process.

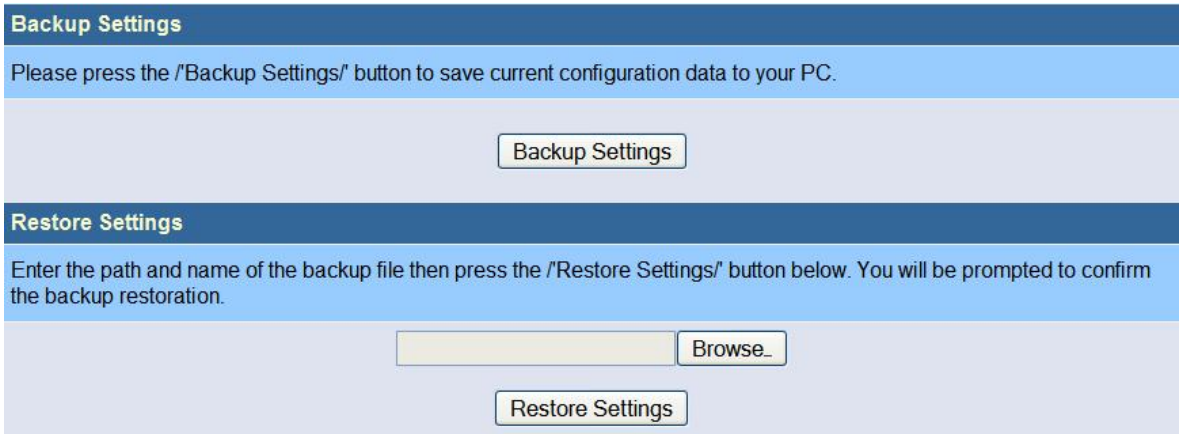


Figure 3-7-8

† **Remote Backup Settings / Restore settings**

User can also backup/restore the configuration of this device remotely.

Click on <NEXT> button beside `Remote Backup Settings/Restore settings'.

Figure 3-7-9

Enter the necessary setting in next page, then click on <Backup To Server> or <Restore From Server> to start the process.

Figure 3-7-10

3.7.1.4 General Status

In this page user could see the detail settings of this device, including the System Information, Power Control, Bridge LAN port, AP WIFI 1 Status, AP WIFI 2 Status.

Figure 3-7-11

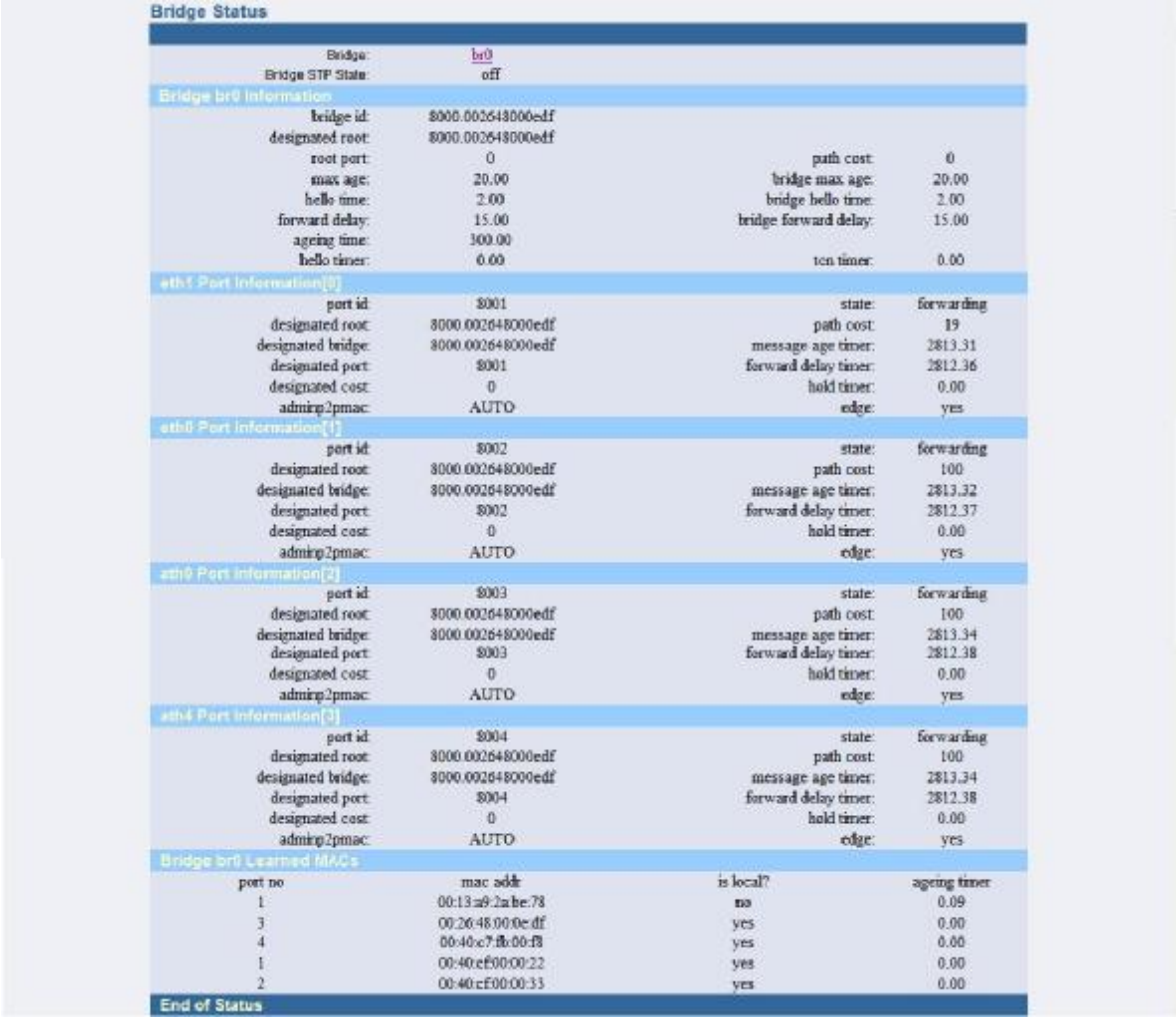
3.7.1.5 Power Control/Status

In this page user can enable the eth0 port to provide PoE power and data forwarding function.

Figure 3-7-12

3.7.1.6 Bridge Status

In this page user could see the bridge interfaces information of this device, such as interface information, STP status, MAC address information etc.



Bridge Status

Bridge:	br0		
Bridge STP State:	off		
Bridge br0 Information			
bridge id:	8000.002648000edf		
designated root:	8000.002648000edf		
root port:	0	path cost:	0
max age:	20.00	bridge max age:	20.00
hello time:	2.00	bridge hello time:	2.00
forward delay:	15.00	bridge forward delay:	15.00
ageing time:	300.00		
hello timer:	0.00	tcn timer:	0.00
eth1 Port Information[0]			
port id:	8001	state:	forwarding
designated root:	8000.002648000edf	path cost:	19
designated bridge:	8000.002648000edf	message age timer:	2813.31
designated port:	8001	forward delay timer:	2812.36
designated cost:	0	hold timer:	0.00
admin p2pmac:	AUTO	edge:	yes
eth0 Port Information[1]			
port id:	8002	state:	forwarding
designated root:	8000.002648000edf	path cost:	100
designated bridge:	8000.002648000edf	message age timer:	2813.32
designated port:	8002	forward delay timer:	2812.37
designated cost:	0	hold timer:	0.00
admin p2pmac:	AUTO	edge:	yes
eth0 Port Information[2]			
port id:	8003	state:	forwarding
designated root:	8000.002648000edf	path cost:	100
designated bridge:	8000.002648000edf	message age timer:	2813.34
designated port:	8003	forward delay timer:	2812.38
designated cost:	0	hold timer:	0.00
admin p2pmac:	AUTO	edge:	yes
eth4 Port Information[3]			
port id:	8004	state:	forwarding
designated root:	8000.002648000edf	path cost:	100
designated bridge:	8000.002648000edf	message age timer:	2813.34
designated port:	8004	forward delay timer:	2812.38
designated cost:	0	hold timer:	0.00
admin p2pmac:	AUTO	edge:	yes

Bridge br0 Learned MACs

port no	mac addr	is local?	ageing timer
1	00:13:a9:2a:be:78	no	0.09
3	00:26:48:00:0e:df	yes	0.00
4	00:40:c7:fb:00:f8	yes	0.00
1	00:40:cf:00:00:22	yes	0.00
2	00:40:cf:00:00:33	yes	0.00

End of Status

Figure 3-7-13

3.7.1.7 WIFI Status

In this page user could see the WIFI information of this device, such as: Interface information, Security information, Associated AP/Station.

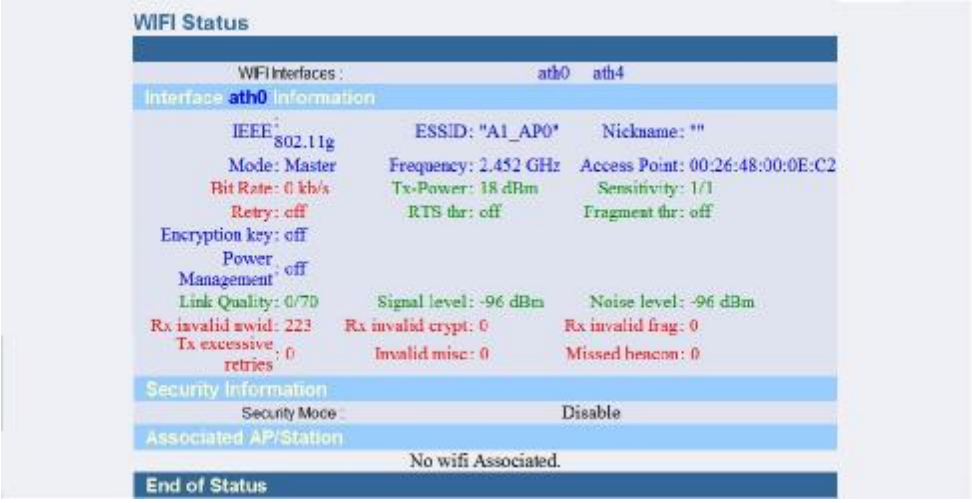


Figure 3-7-14

3.7.1.8 Log

In this page user could see the system logs record of this device.

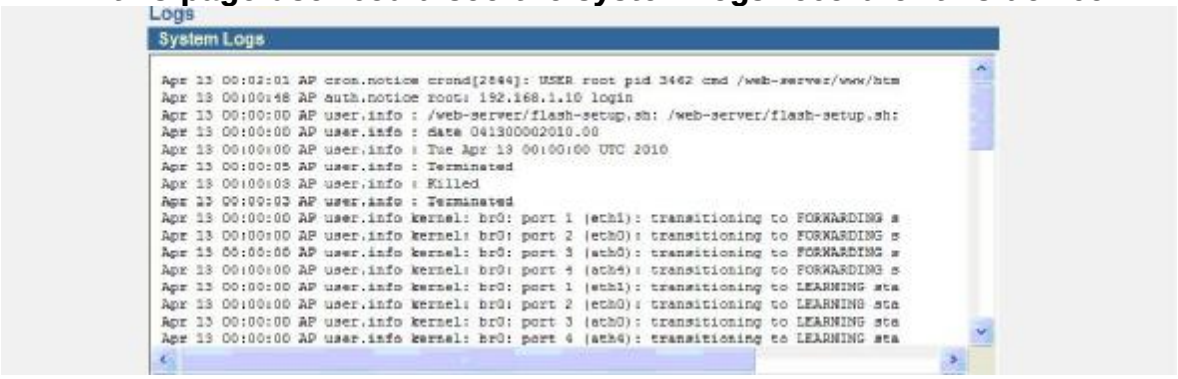


Figure 3-7-15

3.7.1.9 System Time

† Select Setting Type

Setting by: User can set system time in two ways. One is manual setting, the other one is Synchronize with an Internet Time Server.

† Manual Setting

User can manually enter the Year/ Month/ Day and Hour: Minute: Second.

† Using Internet Time Server

Hours from GMT: User can enter the Hours from GMT, for example Taiwan is GMT +8 Hours.

Server IP: User should enter the Internet time server IP address here.

Time Update for Every: User can set time update interval by enter the days, hours, and minutes.

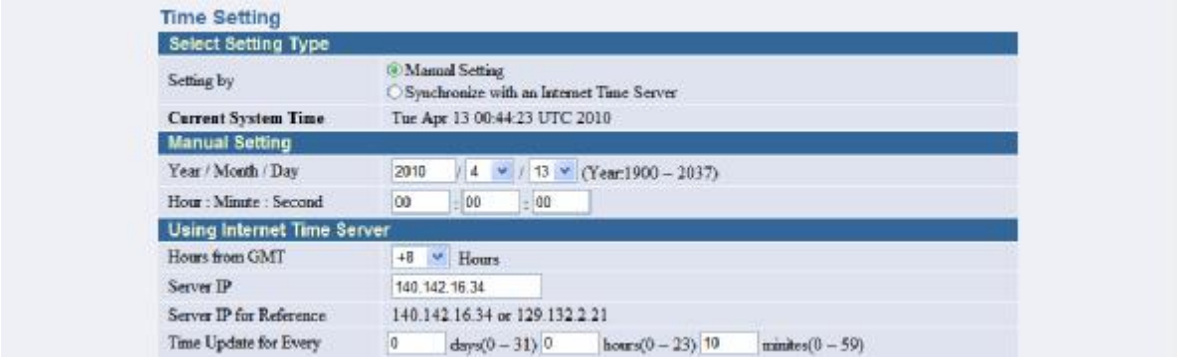


Figure 3-7-16

3.7.1.10 Reboot

User can perform reboot function in case of the device is not function normally, or after user change some major settings for example: change system model. The existing settings will not be changed. To perform the reboot, click on the <Reboot> button and click on <OK> on pop-up screen to confirm user's decision.

Figure 3-7-17

3.7.2 LAN Configuration

† Interface br0 Setting

IP Authentication: Indicate how the IP address of this device will be assigned. There are two options available here: Static option-the IP address will be assigned in 'Network IP Parameters' and DHCP option-the IP address will get from DHCP server.

† Network IP Parameters

User can change the network settings of this device from LAN Configuration; it is including IP address, Subnet mask, and Gateway address.

† Bridge STP Setting

User can also set the Bridge STP setting in this page.
STP/RSTP: Disable the bridge STP or set the bridge mode as STP or RSTP mode.
Bridge Priority: Set the priority value of the bridge. The priority value is a number between 0 and 65535. The bridge with the lowest priority will be elected 'root bridge'.
Hello Time: Set the bridge's 'bridge hello time' value (seconds).
Forwarding Delay: Set the bridge's 'bridge forward delay' value (seconds).
Max Age: Set the bridge's 'maximum message age' value (seconds).

Port Cost: Set the port cost of the port.
Port Priority: Set the port priority of the port (interface). It is used in the designated port and root port selection algorithms.
P to P: If a bridge port is operating in full-duplex mode, than the port is functioning as point-to-point. The available options are: auto, true or false. By default, it is set to auto.
Edge: If a port is operating in half-duplex mode and is not connected to any further bridges participating in STP or RSTP, then the port is an edge port. The available options are: yes or no. By default, it is set to no.

Figure 3-7-18

3.7.3 Wireless

User can set the wireless related setting here.

Figure 3-7-19

3.7.3.1 WIFI ath0 and ath4 Setting

†**General**

Radio Power: Turn this interface on or off.

Wireless Mode: Select which wireless mode that user wants to use. The options available here are: 802.11a, 802.11b, 802.11g and 802.11b+g.

SSID: The SSID (service set identifier) is an identifier of an AP in user's wireless network. The SSID must be identical for all access points in the network. It is case sensitive and maximum length is 32.

SSID Hide: This function is to hide the SSID in the wireless network.

Channel: Set the operating frequency/channel for this device.

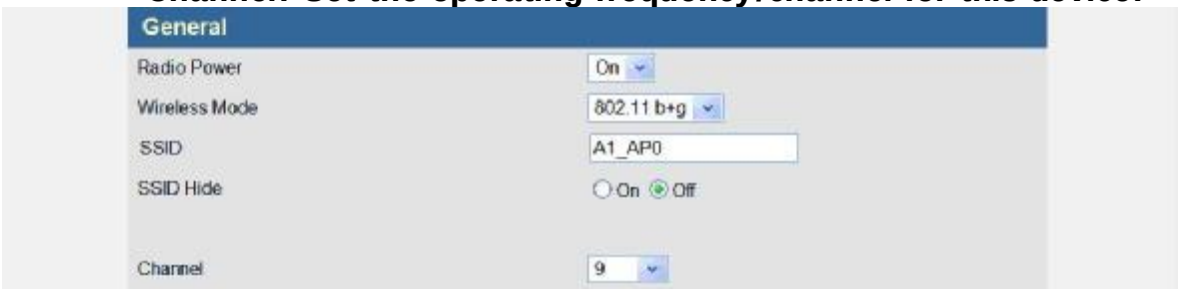


Figure 3-7-19

†**Advanced Settings**

Peer Node Distance: Set the distance between this device and it's adjacent. If select 'manual', the distance will be determined by 'Slot time', 'ACK timeout' and 'CTS timeout' three values.

Beacon Period: This item contains the length of the beacon interval. Enter a value between 20 and 1000 to specify the Beacon Period.

DTIM Period: This item contains the number of Beacon intervals between Delivery Traffic Indication Message (DTIM). Enter a number between 1 and 255 to specify.

Fragment Threshold: It is the maximum frame size that wireless device can transmit without fragmenting the frame. Enter a value between 256 and 2346 to specify the Fragment Threshold.

RTS/CTS Threshold: Packets larger than the value are transmitted by the RTS/CTS handshake. Enter a value between 1 and 2346 to specify the value of the RTS /CTS Threshold.

Tx Power: To set the tx power as off to turn off the tx power, set auto to let device determine the tx power value automatically, or set manual to set the tx power value. The max value is depending on the wireless module.

Rate: Set the bit rate for wireless interface to supporting multiple bit rates. The value `Auto' causes the device to use the bit rate selected by the rate control module.

Layer 2 Isolation: It is used in AP mode only. If enabled, all of the clients connect to the same AP will not be able to access each other.

WEP Key Setting: It uses two kinds of WEP Encryption key length:

5-bytes and 13-bytes. The key format can either use 'ASCII' to set the key values (ie. 0~9, a~z) or use 'HEX' to set the key value in hexadecimal. (ie. 0~9, a~f). User can set maximum 4 keys, but only one key will functional at one time.

Figure 3-7-20

† **WDS MAC Address Setting**

MAC Address: In WDS function, user should enter the MAC address that indicates which AP to connect to.

Figure 3-7-21

† **SSID Security Mode**

Authentication: User can choose which authentication type to secure the wireless network. There are four options for authentication: Disable, WEP, WPA-personal and WPA-enterprise.

WEP: Short for Wired Equivalent Privacy, a security protocol for wireless local area networks (WLANs) defined in the 802.11 standard.

Open or Restricted: An open system allows any client to authenticate as long as it conforms to any MAC address filter policies that may have been set. All authentication packets are transmitted without encryption. If the 'Restricted' selected, all the packets are transmitted with encryption.

Select Key: Check the radio box in front of the key you would like to use for this AP.

Figure 3-7-22

WPA-Personal: The method of authentication is similar to WEP, user can define a `Pre-Shared Key′, once the key is confirmed and

satisfied on both the client and access point, then access is granted. The encryption method used is referred to as the Temporal Key Integrity Protocol (TKIP).

WPA MODE: In this setting, user can choose WPA or WPA2 or WPA & WPA2. (WPA2 is far superior to WPA, because the encryption of method used is Advanced Encryption Standard (AES)).

Share Key: User should define the pre-share key in here; the length of the key is 8-23 characters.

WPA Encryption: User can choose the encryption method of the pre-shared key here; there are three options: Auto, AES and TKIP.

Group Key Update Interval: Time interval for rekeying the GTK (broadcast/multicast encryption keys) in seconds.

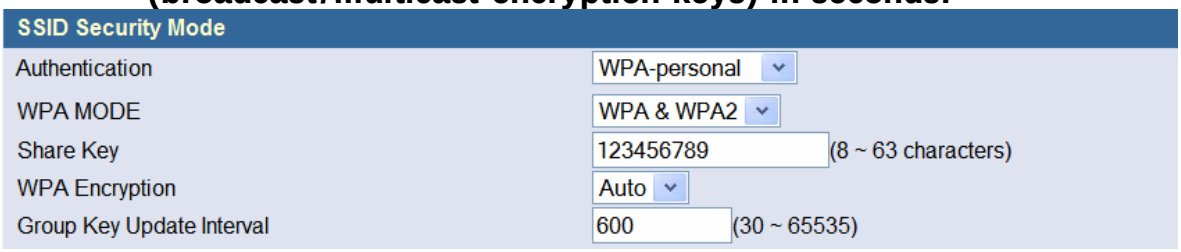


Figure 3-7-23

WPA-enterprise:

WPA-Enterprise includes all of the features of WPA-PSK plus support the 802.1x authentication. To use this function, a separate RADIUS server is required. User should enter the IP and port number of the Authentication Server and Shared Secret here. In case if a backup server has been deployed in user's network, user can also enter the necessary information here.

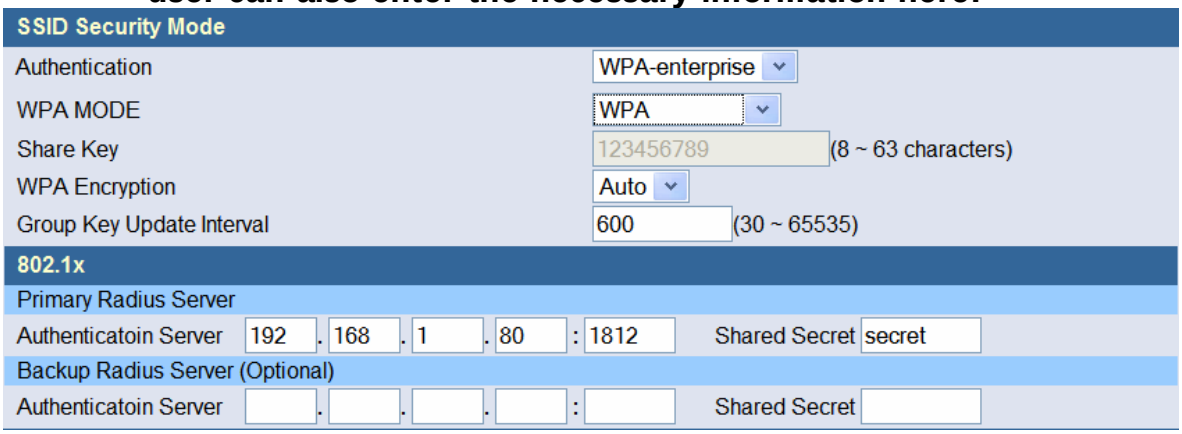


Figure 3-7-24

† QoS

WMM: Enable/disable WMM support.

MAX Associated Station: Maximum number of stations allowed in station table.

Common Parameters:

CWmin: Minimum Contention Window. The valid values for 'CWmin' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047, or 4095. The value for 'CWmin' must be lower than the value for 'CWmax'.
CWmax: Maximum Contention Window. The Valid values for 'CWmax' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047 or 4095. The value for 'CWmax' must be higher than the value for 'CWmin'.
AIFS: Arbitration Inter-Frame Spacing.
Burst: Maximum length (in milliseconds with precision of up to 0.1 ms) for bursting.

AP Parameters:
This affects traffic flowing from the access point to the client station. These parameters are used by the access point when transmitting frames to the clients.

AP Tx-Best Effort: Medium Priority. Medium throughput and delay. Most traditional IP data is sent to this queue.
AP Tx-Background: Low Priority. High throughput. Bulk data that requires maximum throughput and is not time-sensitive is sent to this queue (FTP data, for example).
AP Tx-Video: High Priority. Minimum delay. Time-sensitive video data is automatically sent to this queue.
AP Tx-Voice: High Priority. Time-sensitive data like VoIP and streaming media are automatically sent to this queue.

STA Parameters:
These parameters are sent to WMM clients when they associate. The parameters will be used by WMM clients for frames transmitted to the access point.

STA Tx-Best Effort: Medium Priority, Medium throughput and delay. Most traditional IP data will be sending to this queue.
STA Tx-Background: Low Priority, High throughput. Bulk data that requires maximum throughput and it's not time-sensitive will be sending to this queue (FTP data, for example).
STA Tx-Video: High Priority, Minimum delay. Time-sensitive video data will be automatically sent to this queue.
STA Tx-Voice: High Priority, Time-sensitive data like VoIP and streaming media are automatically sent to this queue.
TXOP: Transmission Opportunity is an interval of time when a WMM Client Station has the right to initiate transmissions onto the wireless medium (WM). This value specifies (in milliseconds) the Transmission Opportunity (TXOP) for Client Station; that is, the interval of time when the WMM AP has the right to initiate transmissions on the wireless network.
ACM: Admission control mandatory.

Figure 3-7-25

3.7.4 Filtering

The MAC address filter can be used to filter network access by machines based on the unique MAC addresses of their network adapter(s). It is most useful to prevent unauthorized wireless devices from connecting to user's network. A MAC address is a unique ID assigned by the manufacturer of the network adapter.

3.7.4.1 MAC Filtering

User can block certain clients from accessing this AP based on its MAC address. Use Filtering type to define the filtering scenario:

- **General**

  Disabled: Disable this filtering function. If this option is selected, all PCs can access this AP.

  Accept: All PCs are filtered out except those MAC addresses in the following MAC address table. In other words, only those interfaces/ PCs with MAC address in the MAC address table can access this AP.

  Reject: All PCs/interfaces can access this AP except those interfaces/PCs with MAC address in the MAC address table.

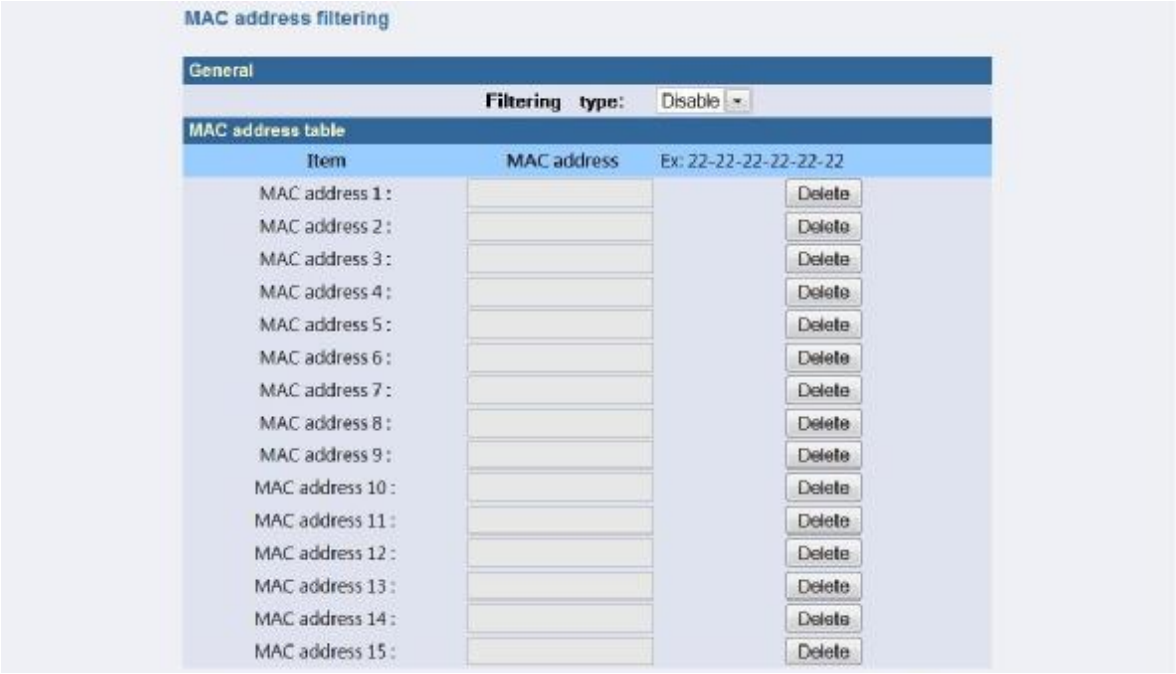


Figure 3-7-26

3.7.5 SNMP

The Outdoor Wireless Access Point support SNMP V1/V2C/V3, this page is to define the SNMP access control and SNMP traps.

3.7.5.1 Basic Setting

†SNMP Agent

Check the <Enable> check box to turn on SNMP. Please Note: Enable the SNMP will also enable the LLDP (Link Layer Discovery Protocol) function. This function will be used if user wants to remote management the AP and draw the network topography.

†System Information

Contact: Specify the contact name for this managed node as well as information about how to contact this person.
Location: It is used to define the location of the host on which the SNMP agent is running.

†V1/V2C

User can change user's SNMP community settings on this screen. Access Right: Select an access right for the SNMP manager. 'Read' is read only, 'Write' is read-write, and 'Deny' means this community name is not implemented.

Community: Specify the name of community for the SNMP manager.

SNMP Community provides a simple protection by using the community name to control the access to the SNMP. The

community name can be thought of as a password. If user doesn't have the correct community name, user can't retrieve any data (get) or make any change (set). Multiple SNMP managers may be organized in a specified community.

† **V3**

The SNMP V3 is a Security Enhancement for SNMP, it provides secure access to devices by a combination of User ID, authenticating and encrypting packets over the network.

User ID: A string representing the name of the user.

Security Level: User can select which security level that user wants to use. The available options for this field are: NoAuthNoPriv, AuthNoPriv or AuthPriv.

Auth Type (Authentication Protocol): An indication of which authentication protocol is used. The available options for this field are: MD5, and SHA.

Auth Passphrase (Authentication Key): A secret key used by the authentication protocol for authenticating messages.

Privacy Protocol: An indication of which privacy protocol is used. The available options for this field is: DES.

Priv Passphrase (Privacy Key): The secret key used by the privacy protocol for encrypting and decrypting messages.

Access Right: Assign the access right for account. The options are:

Unused − The account is disabled.

Read Only − The account has read only access rights.

Read Write − The account has read and writes access rights.

usm − This account will be an usm account and assign access rights by VACM.

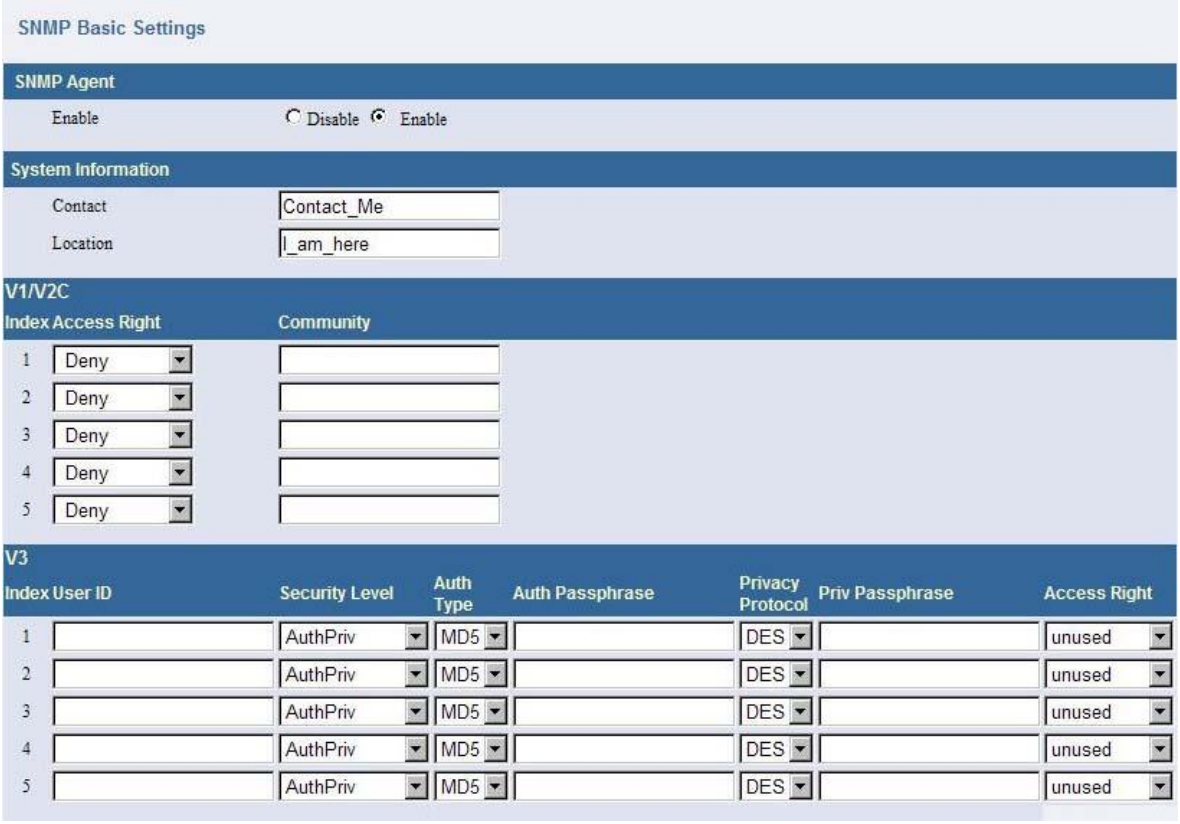


Figure 3-7-27

3.7.5.2 VACM Setting

User can use the View-based Access Control Model (VACM) to define whether access to a specified managed object is authorized. Access control is done at the following points:

- **When processing retrieval request messages from the SNMP manager.**
- **When processing modification request messages from the SNMP manager.**
- **When notification messages must be sent to the SNMP manager.**

The following tokens for VACM access security that user can use:

† **Community to Security for V1/V2c**

Map the community name (COMMUNITY) into a security name. The Community to Security token takes NAME SOURCE and COMMUNITY options. User can use this token to give SNMPv3 security privileges to SNMPv1 and SNMPv2 users and communities

Index: Index of Community to Security. Tick the checkbox to enable the recordset.

Security Name: is a name that will use by the group table.

IP source: Describes a host or network.

Community: The community name that is used.

†**Group**

Map the security names into group names. (For SNMP V3, the security Name is the user ID in Basic setting.)
Index: Index of Group. Tick the checkbox to enable the recordset.
Group Name: A group name is given to a group of users and is used when managing their access rights.
Security Model: Assign security model for group.
Security Name: Assign security name for group. This field will obtain from the 'Security Name' of 'Community to Security' when security model is v1 or v2c, or obtain from the 'User ID' of 'usm' when security model is usm.

Figure 3-7-28

† **View**

Create a view for user to let the groups have rights to view the MIB tree.
Index: Index of View. Tick the checkbox to enable the recordset.
Include: Assign include or exclude in this record for certain subtree.
Sub Tree: the OID value. For example: '1.3.6.1.2.1'.

Figure 3-7-29

† **Access**

The Access table grants the groups access right to certain views. Each group can have multiple access rights. The most secure access right is chosen.

Index: Index of Access. Tick the checkbox to enable recordset.

Group: Returned and lookup the 'Group Name' from the Group table.

Security model: Specified in the message's msgSecurityModel parameter. The available options for this field are: any, v1, v2c and usm.

Security level: Specified in the message's msgFlags parameter. The available options for this field are: NoAuthNoPriv, AuthNoPriv and AuthPriv.

Read: Specified in the message's msgSecurityModel parameter. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Write: Authorized View Name for write access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Notify: Authorized View Name for notify access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

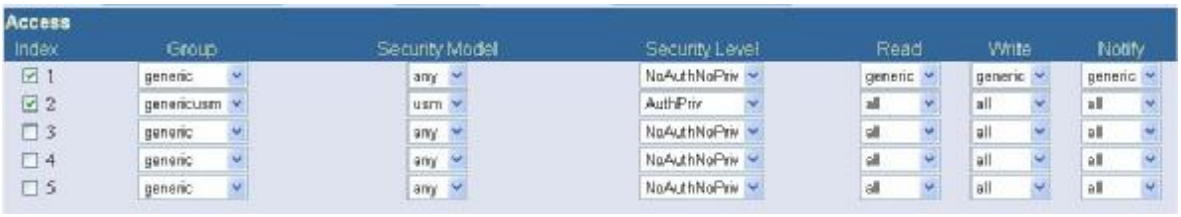


Figure 3-7-30

3.7.5.3 SNMP Trap

It is an SNMP application that uses the SNMP TRAP operation to send information to a network management system.

† **SNMP Trap**

Trap Active: To enable or disable SNMP Trap function.

† **v1 / v2c Trap**

Version: Indicate the traps will be sent in v1 or v2c or not send (disable).

IP Address & Port: The IP and Port to receive traps.

Community: The community string to be used when sending traps.

† **v3 Trap**

Trap: Index of SNMP v3 traps. Tick the checkbox to enable recordset.

User: The usm User ID.
IP Address & Port: The IP and Port of a device to receive traps.
Security Level: Assign security level in this record. The Options are: NoAuthNoPriv, AuthNoPriv, AuthPriv.

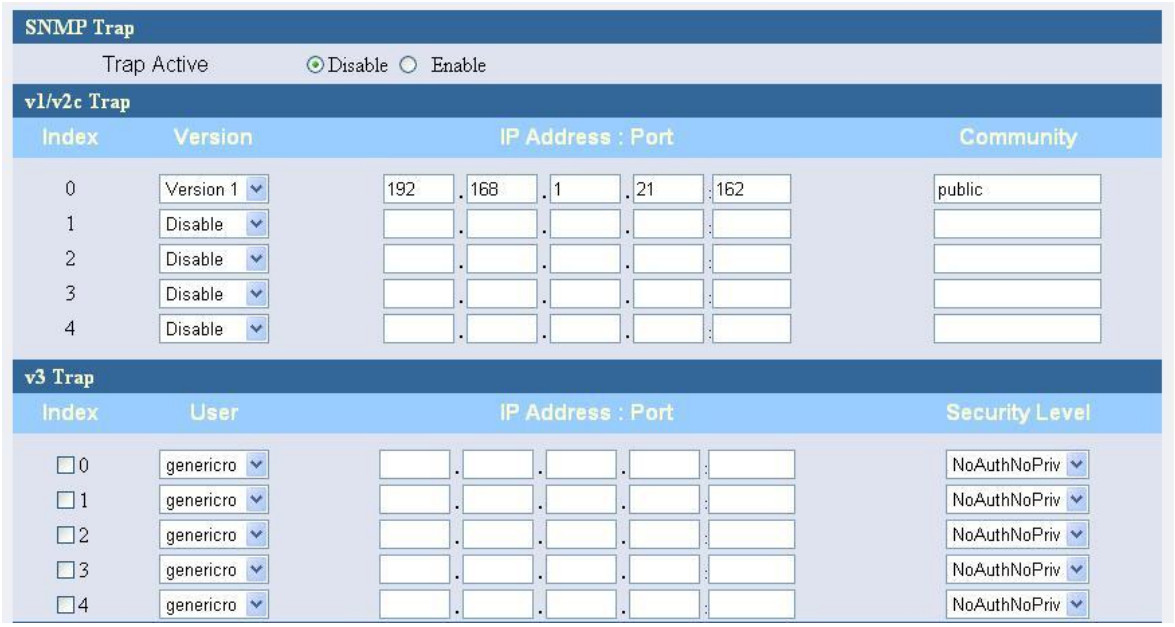


Figure 3-7-31

†Trap Items

Enable/Disable which trap items to send.

Figure 3-7-32

3.7.6 Tools

†Command Ping

It runs ping command to test the connection capability of this device with the other Ethernet device.

Figure 3-7-33

3.7.7 Log Out

User can manually logout by click on <Log Out>.

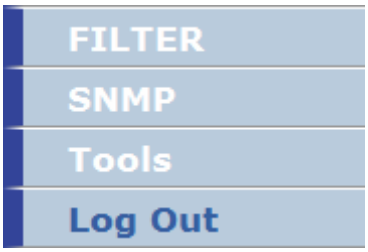


Figure 3-7-34

3.8 AP4_WDS_Bridge Mode

To set this device as a WDS device, the setting and functions as following:

▽ **SYSTEM**
- **Administrator**
- **Firmware**
- **Configuration Tools**
- **General Status**
- **Power Control**
- **Bridge Status**
- **WIFI Status**
- **Log**
- **System Time**
- **Reboot**

▽ **LAN**
- **Bridge LAN settings**

▽ **WIRELESS**
- **WIFI ath0 Setting**
- **WIFI ath4 Setting**
- **WIFI ath5 Setting**
- **WIFI ath6 Setting**
- **WIFI ath7 Setting**

▽ **FILTER**
- **MAC Filtering**

▽ **SNMP**
- **Basic Setting**
- **VACM Setting**
- **Trap Setting**

▽ **Tools**
- **Tools**

▽ **Log Out**

3.8.1 System

This page shows the current status and some basic settings of the device, including Administrator, Firmware, Configuration Tools, General Status, Power Control, Bridge status, WIFI Status, Log, System Time and Reboot; screen as shown in Figure 3-8-1.

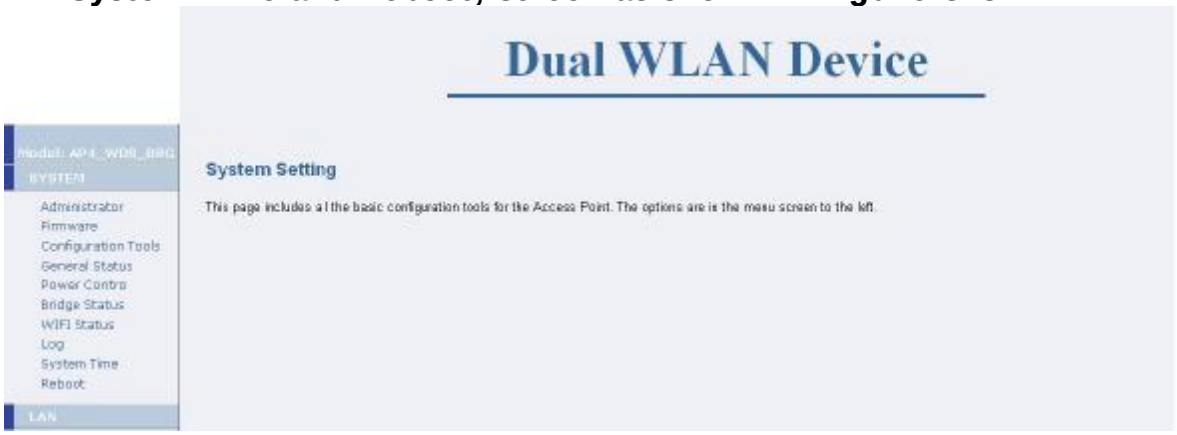


Figure 3-8-1

3.8.1.1 Administrator

By selecting the item of Administrator under System, User will see the screen shown in Figure 3-8-2. These settings allow user to configure the Device Name, Language, Model, Password, Remote Management and WIFI Loading Warning Threshold.

† Device Name

This is a host name or system name for the device. The maximum length is 20 characters. User can only input '0'~'9', 'a'~'z', 'A'~'Z', '_' or '-'.

† Model

OLSR_AP: To set this device as an AP with layer 3 MESH function.
AODV_AP: To set this device as an AP with layer 3 MESH function.
AP-Bridge: To set this device as a normal AP.
AP-CB-Bridge: To set this device as an AP and Client Bridge device.
AP-CB-ROUTE: To set this device as a router device with AP and CB functions.
CB-CB-ROUTE: To set this device as a router device with dual CB functions.
VLAN-AP: To set this device as a VLAN AP device. Each SSID can have its own VLAN ID.
AP_WDS_BRG: To set this device as a WDS device with AP function.
AP4_WDS_BRG: To set this device as WDS device with AP function and support up to 4 SSID.

Figure 3-8-2

† **Password Settings**

If user wants to change the password for admin account, the user should enter the current password, a new password and, re-type the new password.

The Idle Time Out is the amount of time of inactivity allowed before user proceeds next action. The user needs to re-login if the idle time passes timeout.

† **Remote Management**

User can enable/disable the management of the Access Point from a remote host. Just tick the <Enable> check box and enter an IP address of the remote host. Then, only the host with the entered IP address can access this device.

† **WIFI Loading Warning Threshold**

The threshold value is used by network management system. Network management software will monitor the WIFI loading, when the loading is over this value, network management software will change the color of the link line on network topology to notify the user about condition of the link quality. The threshold value is between 5 and 25.

3.8.1.2 Firmware Update

By selecting the item of Firmware under System, User will see the screen shown in Figure 3-8-3. This page shows current firmware version and date. This page also allow user to using TFTP or WEB or FTP method to upgrade to the new version of firmware.

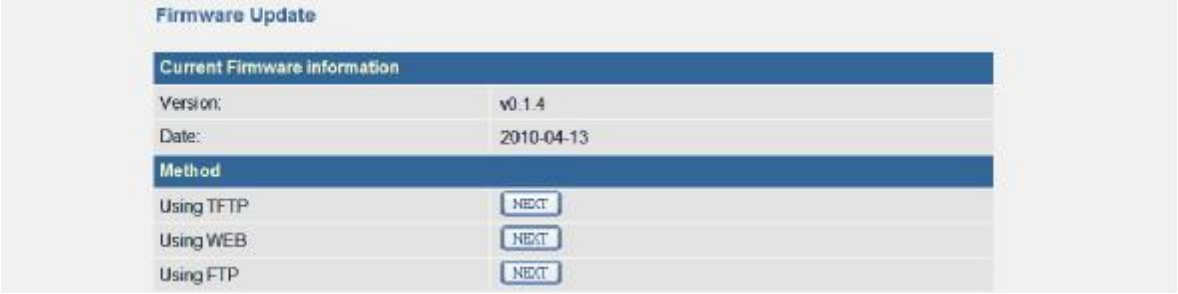


Figure 3-8-3

†Using TFTP

On any computer in the network or a computer direct connect to the AP. Install a TFTP Server utility, and put the firmware file named 'upgradeFW.tar' in a folder.

Run TFTP utility and specify the folder in which the firmware file located. Enter the TFTP server IP and click on <APPLY> button. At the end of the upgrade process, this device may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

†Using WEB

Click on <Browse> button and select the correct firmware file path and file name. Then, click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands while uploading the firmware. This is normal behavior and do not turn off the Access Point while firmware is upgrading.

†Using FTP

On FTP server, there should have valid firmware which includes fs-opn.img and/or kernel-opn.img. On the Firmware Update - FTP page, enter the IP address of the FTP server, firmware name and FTP user name and password. Then click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

3.8.1.3 Configuration Tools

By selecting the item of Configuration Tools under System, the screen will show in Figure 3-8-4. This page includes three selections: Restore Factory Default Configuration, Local Backup Settings/Restore settings and Remote Backup Settings/Restore settings.

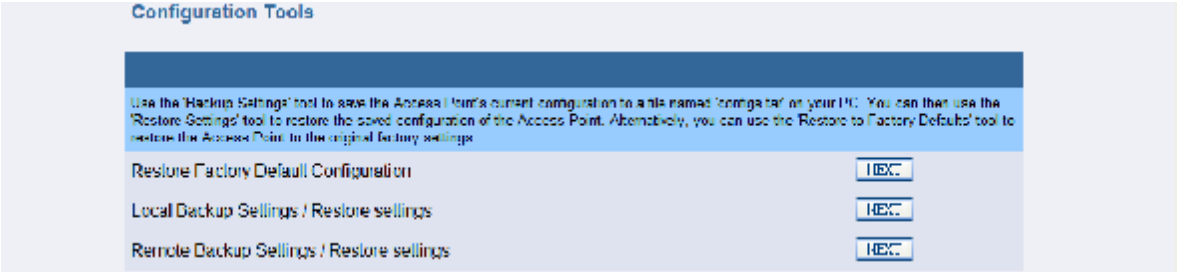


Figure 3-8-4

† **Restore Factory Default Configuration:**

To reset configuration settings to the factory default values, just click on <NEXT> button beside 'Restore Factory Default Configuration'.

Figure 3-8-5

Then click on <Restore> button on next page, now the system will reset to factory default value.

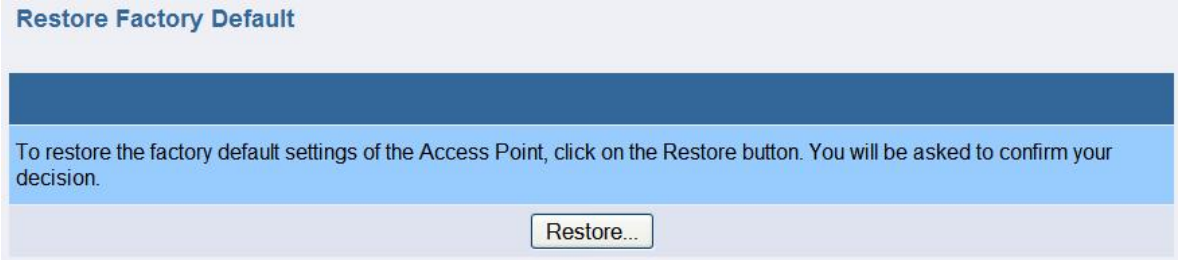


Figure 3-8-6

† **Local Backup Settings / Restore settings**

To backup or restore the configuration for this device. Click on <NEXT> button beside 'Local Backup Settings/Restore settings'.

Figure 3-8-7

Click on <Backup Settings> button on next page to save the settings of this device to a file named 'configs.tar' on user's PC.

To restore the settings, click on <Browse> button and select the correct file path and file name. Then, click on <Restore Settings> button to start the restore settings process.

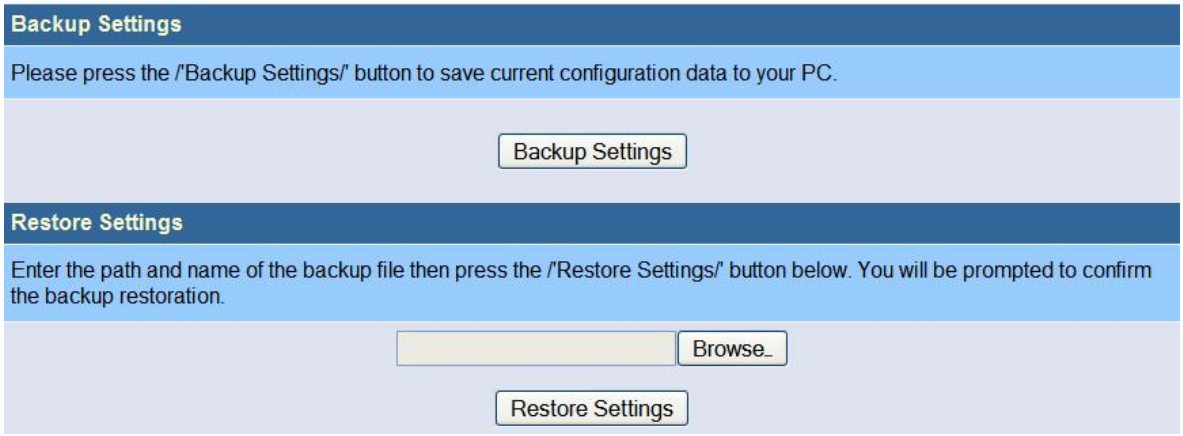


Figure 3-8-8

†Remote Backup Settings/Restore settings

User can also backup/restore the configuration of this device remotely.

Click on <NEXT> button beside `Remote Backup Settings/Restore settings'.

Figure 3-8-9

Enter the necessary setting in next page, then click on <Backup To Server> or <Restore From Server> to start the process.

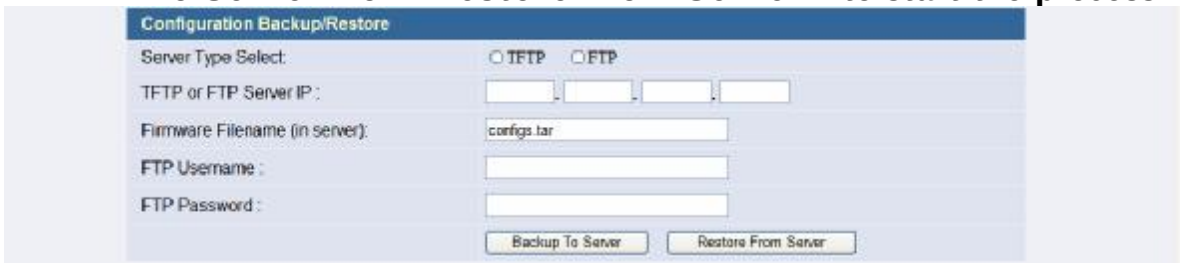


Figure 3-8-10

3.8.1.4 General Status

In this page user could see the detail settings of this device, including the System Information, Power Control, Bridge LAN port, AP WIFI 1 Status, AP WIFI 2 Status.

Figure 3-8-11

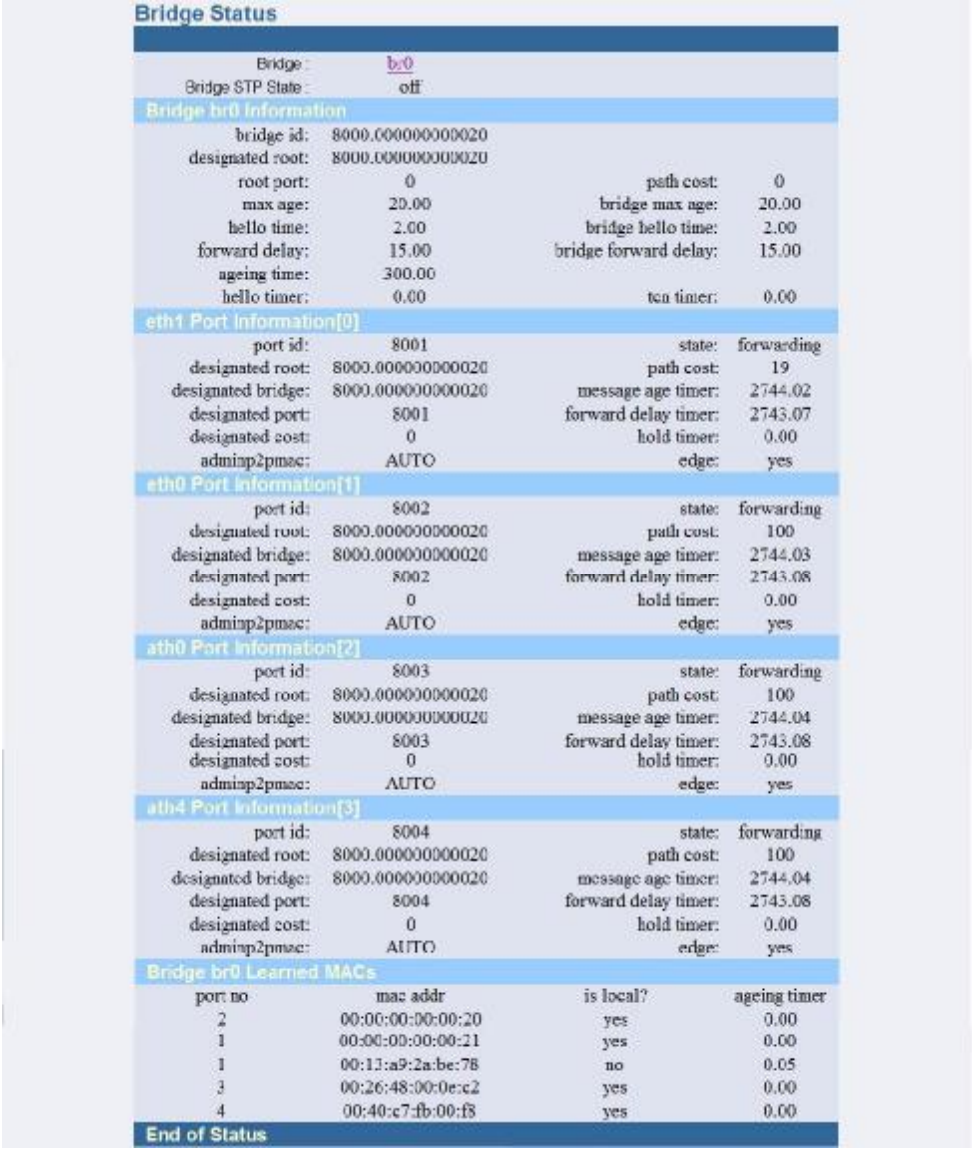
3.8.1.5 Power Control

In this page user can enable the eth0 port to provide PoE power and data forwarding function.

Figure 3-8-12

3.8.1.6 Bridge Status

In this page user could see the bridge interfaces information of this device, such as interface information, STP status, MAC address information etc.



Bridge Status

Bridge :	br0		
Bridge STP State :	off		
Bridge br0 Information			
bridge id:	8000.000000000020		
designated root:	8000.000000000020		
root port:	0	path cost:	0
max age:	20.00	bridge max age:	20.00
hello time:	2.00	bridge hello time:	2.00
forward delay:	15.00	bridge forward delay:	15.00
ageing time:	300.00		
hello timer:	0.00	tcn timer:	0.00
eth1 Port Information[0]			
port id:	8001	state:	forwarding
designated root:	8000.000000000020	path cost:	19
designated bridge:	8000.000000000020	message age timer:	2744.02
designated port:	8001	forward delay timer:	2743.07
designated cost:	0	hold timer:	0.00
adminp2pmac:	AUTO	edge:	yes
eth0 Port Information[1]			
port id:	8002	state:	forwarding
designated root:	8000.000000000020	path cost:	100
designated bridge:	8000.000000000020	message age timer:	2744.03
designated port:	8002	forward delay timer:	2743.08
designated cost:	0	hold timer:	0.00
adminp2pmac:	AUTO	edge:	yes
ath0 Port Information[2]			
port id:	8003	state:	forwarding
designated root:	8000.000000000020	path cost:	100
designated bridge:	8000.000000000020	message age timer:	2744.04
designated port:	8003	forward delay timer:	2743.08
designated cost:	0	hold timer:	0.00
adminp2pmac:	AUTO	edge:	yes
ath4 Port Information[3]			
port id:	8004	state:	forwarding
designated root:	8000.000000000020	path cost:	100
designated bridge:	8000.000000000020	message age timer:	2744.04
designated port:	8004	forward delay timer:	2743.08
designated cost:	0	hold timer:	0.00
adminp2pmac:	AUTO	edge:	yes

Bridge br0 Learned MACs

port no	mac addr	is local?	ageing timer
2	00:00:00:00:00:20	yes	0.00
1	00:00:00:00:00:21	yes	0.00
1	00:13:a9:2a:be:78	no	0.05
3	00:26:48:00:0e:c2	yes	0.00
4	00:40:c7:fb:00:f8	yes	0.00

End of Status

Figure 3-8-13

3.8.1.7 WIFI Status

In this page user could see the WIFI information of this device, such as: Interface information, Security information, Associated AP/Station.

WIFI Status

WIFI Interfaces :	ath0 ath4	
Interface ath0 Information		
IEEE: 802.11bg	ESSID: "A1_AP0"	Nickname: ""
Mode: Master	Frequency: 2.452 GHz	Access Point: 00:40:C7:FB:00:F8
Bit Rate: 0 kb/s	Tx-Power: 16 dBm	Sensitivity: 1/1
Retry: off	RTS thr: off	Fragment thr: off
Encryption key: off		
Power Management: off		
Link Quality: 0/70	Signal level: -97 dBm	Noise level: -97 dBm
Rx invalid nwid: 1615	Rx invalid crypt: 0	Rx invalid frag: 0
Tx excessive retries: 0	Invalid misc: 0	Missed beacon: 0
Security Information		
Security Mode :	Disable	
Associated AP/Station		

End of Status

Figure 3-8-14

3.8.1.8 Log

In this page user could see the system logs record of this device.

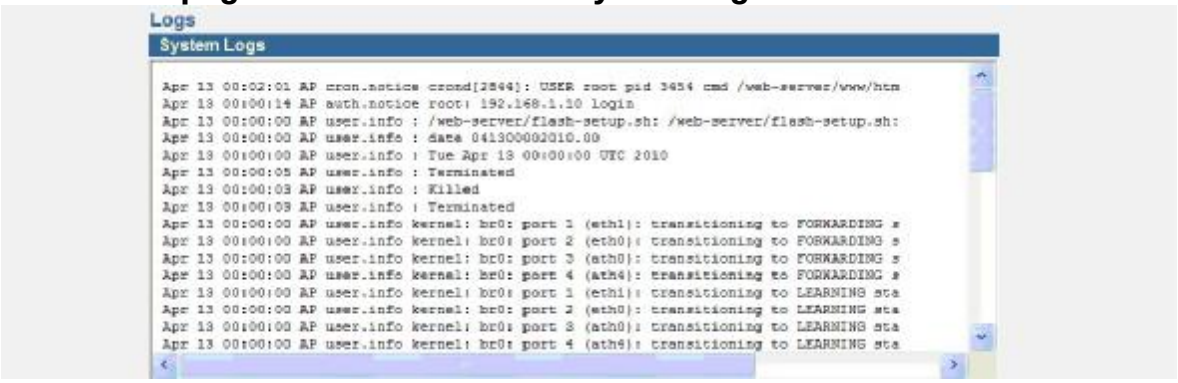


Figure 3-8-15

3.8.1.9 System Time

† Select Setting Type

Setting by: User can set system time in two ways. One is manual setting, the other one is Synchronize with an Internet Time Server.

† Manual Setting

User can manually enter the Year/ Month/ Day and Hour: Minute: Second.

† Using Internet Time Server

Hours from GMT: User can enter the Hours from GMT, for example Taiwan is GMT +8 Hours.

Server IP: User should enter the Internet time server IP address here.

Time Update for Every: User can set time update interval by enter the days, hours, and minutes.

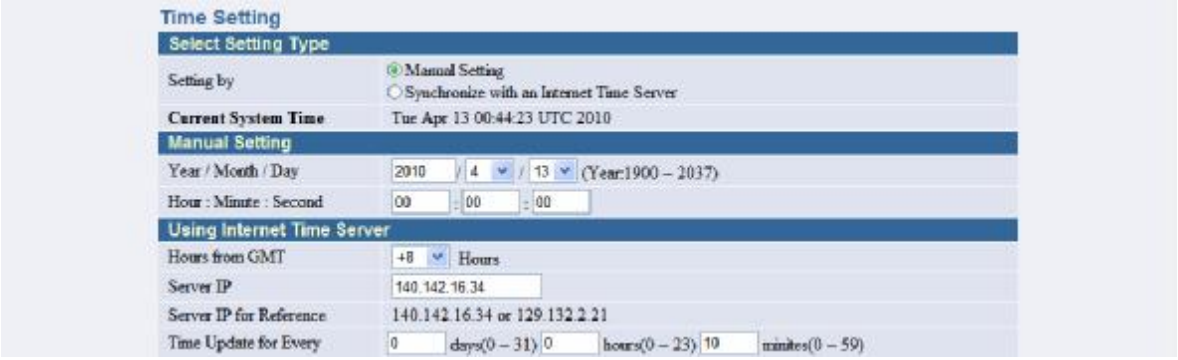


Figure 3-8-16

3.8.1.10 Reboot

User can perform reboot function in case of the device is not function normally, or after user change some major settings for example: change system model. The existing settings will not be changed. To

perform the reboot, click on the <Reboot> button and click on <OK> on pop-up screen to confirm user's decision.

Figure 3-8-17

3.8.2 LAN Configuration

† **Interface br0 Setting**

IP Authentication: Indicate how the IP address of this device will be assigned. There are two options available here: Static option-the IP address will be assigned in 'Network IP Parameters' and DHCP option-the IP address will get from DHCP server.

† **Network IP Parameters**

User can change the network settings of this device from LAN Configuration; it is including IP address, Subnet mask, and Gateway address.

† **Bridge STP Setting**

User can also set the Bridge STP setting in this page.
STP/RSTP: Disable the bridge STP or set the bridge mode as STP or RSTP mode.
Bridge Priority: Set the priority value of the bridge. The priority value is a number between 0 and 65535. The bridge with the lowest priority will be elected 'root bridge'.
Hello Time: Set the bridge's 'bridge hello time' value (seconds).
Forwarding Delay: Set the bridge's 'bridge forward delay' value (seconds).
Max Age: Set the bridge's 'maximum message age' value (seconds).
Port Cost: Set the port cost of the port.
Port Priority: Set the port priority of the port (interface). It is used in the designated port and root port selection algorithms.
P to P: If a bridge port is operating in full-duplex mode, than the port is functioning as point-to-point. The available options are: auto, true or false. By default, it is set to auto.
Edge: If a port is operating in half-duplex mode and is not connected to any further bridges participating in STP or RSTP, then the port is an edge port. The available options are: yes or no. By default, it is set to no.

Figure 3-8-18

3.8.3 Wireless

User can set the wireless related setting here.

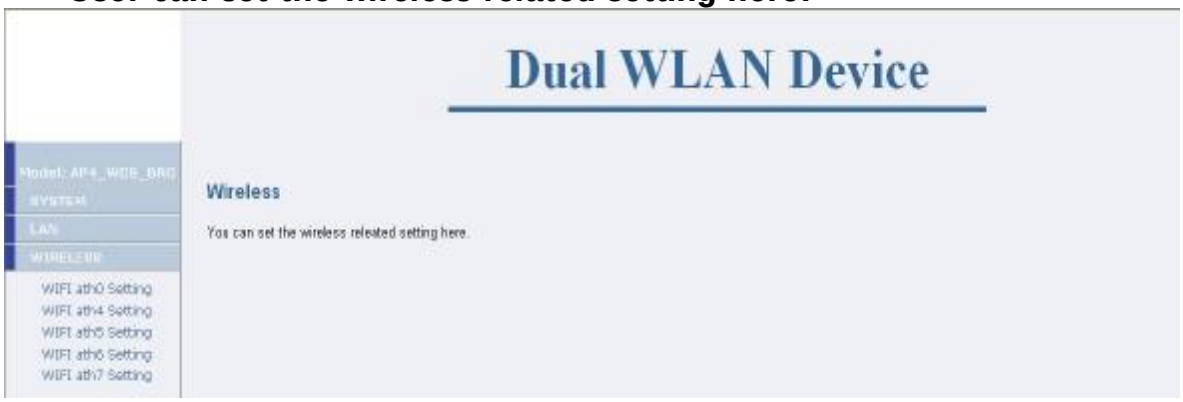


Figure 3-8-19

3.8.3.1 WIFI ath0 Setting

†General

Radio Power: Turn this interface on or off.

Wireless Mode: Select which wireless mode that user wants to use. The options available here are: 802.11a, 802.11b, 802.11g and 802.11b+g.

SSID: The SSID (service set identifier) is an identifier of an AP in user's wireless network. The SSID must be identical for all points in the network. It is case sensitive and maximum length is 32.

Channel: Set the operating frequency/channel for user's AP.

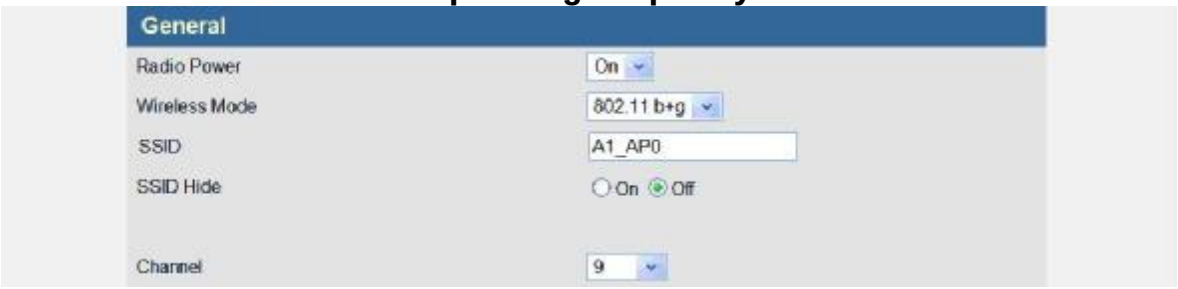


Figure 3-8-20

† **Advanced Settings**

Peer Node Distance: Set the distance between this device and it's adjacent. If select 'manual', the distance will be determined by 'Slot time', 'ACK timeout' and 'CTS timeout' three values.

Beacon Period: This item contains the length of the beacon interval. Enter a value between 20 and 1000 to specify the Beacon Period.

DTIM Period: This item contains the number of Beacon intervals between Delivery Traffic Indication Message (DTIM). Enter a number between 1 and 255 to specify.

Fragment Threshold: It is the maximum frame size that wireless device can transmit without fragmenting the frame. Enter a value between 256 and 2346 to specify the Fragment Threshold.

RTS/CTS Threshold: Packets larger than the value are transmitted by the RTS/CTS handshake. Enter a value between 1 and 2346 to specify the value of the RTS /CTS Threshold.

Tx Power: To set the tx power as off to turn off the tx power, set auto to let device determine the tx power value automatically, or set manual to set the tx power value. The max value is depending on the wireless module.

Rate: Set the bit rate for wireless interface to supporting multiple bit rates. The value `Auto' causes the device to use the bit rate selected by the rate control module.

Layer 2 Isolation: It is used in AP mode only. If enabled, all of the clients connect to the same AP will not be able to access each other.

WEP Key Setting: It uses two kinds of WEP Encryption key length: 5-bytes and 13-bytes. The key format can either use 'ASCII' to set the key values (ie. 0~9, a~z) or use 'HEX' to set the key value in hexadecimal. (ie. 0~9, a~f). User can set maximum 4 keys, but only one key will functional at one time.

Figure 3-8-21

† **WDS MAC Address Setting**

MAC Address: In WDS function, user should enter the MAC address that indicates which AP to connect to.

Figure 3-8-22

Authentication: User can choose which authentication type to secure the wireless network. There are four options for authentication: Disable, WEP, WPA-personal and WPA-enterprise.

WEP: Short for Wired Equivalent Privacy, a security protocol for wireless local area networks (WLANs) defined in the 802.11 standard.

Open or Restricted: An open system allows any client to authenticate as long as it conforms to any MAC address filter policies that may have been set. All authentication packets are transmitted without encryption. If the 'Restricted' selected, all the packets are transmitted with encryption.

Select Key: Check the radio box in front of the key you would like to use for this AP.

Figure 3-8-23

WPA-Personal: The method of authentication is similar to WEP, user can define a 'Pre-Shared Key', once the key is confirmed and satisfied on both the client and access point, then access is

granted. The encryption method used is referred to as the Temporal Key Integrity Protocol (TKIP).

WPA MODE: In this setting, user can choose WPA or WPA2 or WPA & WPA2. (WPA2 is far superior to WPA, because the encryption of method used is Advanced Encryption Standard (AES)).

Share Key: User should define the pre-share key in here; the length of the key is 8-23 characters.

WPA Encryption: User can choose the encryption method of the pre-shared key here; there are three options: Auto, AES and TKIP.

Group Key Update Interval: Time interval for rekeying the GTK (broadcast/multicast encryption keys) in seconds.

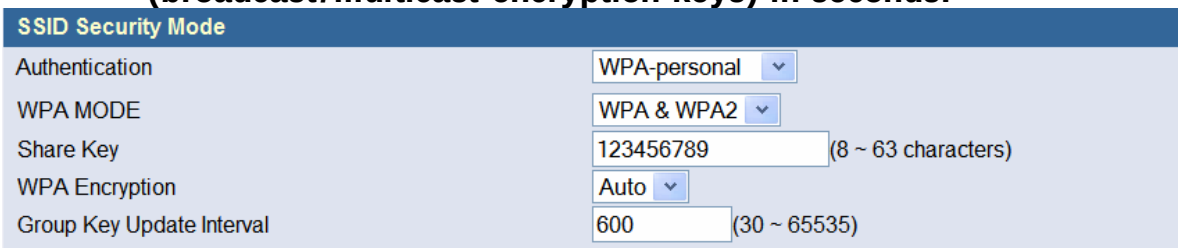


Figure 3-8-24

WPA-enterprise:

WPA-Enterprise includes all of the features of WPA-PSK plus support the 802.1x authentication. To use this function, a separate RADIUS server is required. User should enter the IP and port number of the Authentication Server and Shared Secret here. In case if a backup server has been deployed in user's network, user can also enter the necessary information here.

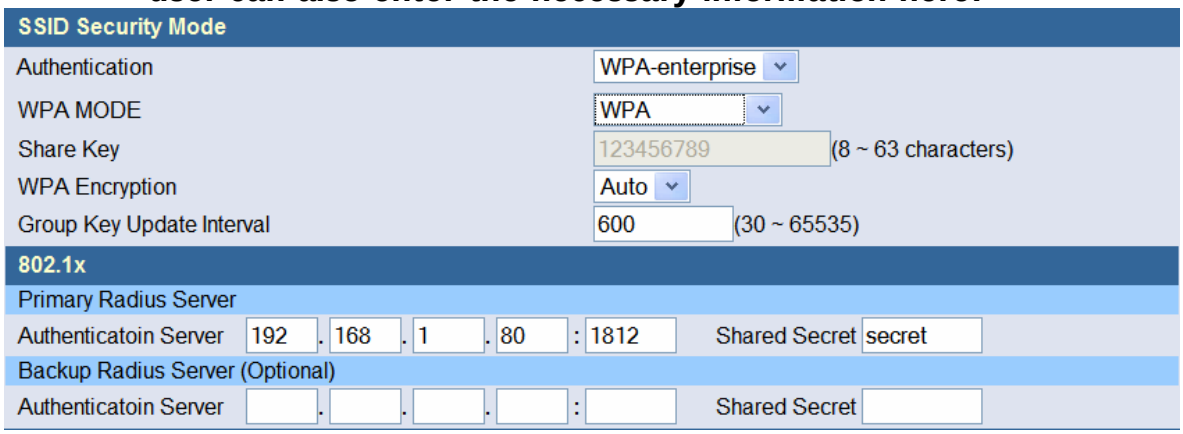


Figure 3-8-25

† QoS

WMM: Enable/disable WMM support.

MAX Associated Station: Maximum number of stations allowed in station table.

Common Parameters:

CWmin: Minimum Contention Window. The valid values for 'CWmin' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047, or 4095. The value for 'CWmin' must be lower than the value for 'CWmax'.
CWmax: Maximum Contention Window. The Valid values for 'CWmax' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047 or 4095. The value for 'CWmax' must be higher than the value for 'CWmin'.
AIFS: Arbitration Inter-Frame Spacing.
Burst: Maximum length (in milliseconds with precision of up to 0.1 ms) for bursting.

AP Parameters:
This affects traffic flowing from the access point to the client station. These parameters are used by the access point when transmitting frames to the clients.

AP Tx-Best Effort: Medium Priority. Medium throughput and delay. Most traditional IP data is sent to this queue.
AP Tx-Background: Low Priority. High throughput. Bulk data that requires maximum throughput and is not time-sensitive is sent to this queue (FTP data, for example).
AP Tx-Video: High Priority. Minimum delay. Time-sensitive video data is automatically sent to this queue.
AP Tx-Voice: High Priority. Time-sensitive data like VoIP and streaming media are automatically sent to this queue.

STA Parameters:
These parameters are sent to WMM clients when they associate. The parameters will be used by WMM clients for frames transmitted to the access point.

STA Tx-Best Effort: Medium Priority, Medium throughput and delay. Most traditional IP data will be sending to this queue.
STA Tx-Background: Low Priority, High throughput. Bulk data that requires maximum throughput and it's not time-sensitive will be sending to this queue (FTP data, for example).
STA Tx-Video: High Priority, Minimum delay. Time-sensitive video data will be automatically sent to this queue.
STA Tx-Voice: High Priority, Time-sensitive data like VoIP and streaming media are automatically sent to this queue.
TXOP: Transmission Opportunity is an interval of time when a WMM Client Station has the right to initiate transmissions onto the wireless medium (WM). This value specifies (in milliseconds) the Transmission Opportunity (TXOP) for Client Station; that is, the interval of time when the WMM AP has the right to initiate transmissions on the wireless network.
ACM: Admission control mandatory.

Figure 3-8-26

3.8.3.2 WIFI ath4~ath7 Setting

†General

Radio Power: Turn this interface on or off.

Wireless Mode: Select which wireless mode that user wants to use. The options available here are: 802.11a, 802.11b, 802.11g and 802.11b+g.

SSID: The SSID (service set identifier) is an identifier of an AP in user's wireless network. The SSID must be identical for all access points in the network. It is case sensitive and maximum length is 32.

SSID Hide: This function is to hide the SSID in the wireless network.

Channel: Set the operating frequency/channel for this device.

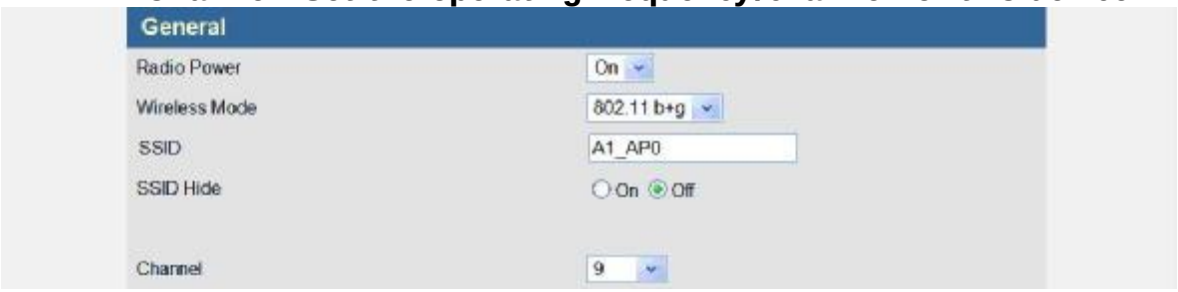


Figure 3-8-27

†Advanced Settings

Peer Node Distance: Set the distance between this device and it's adjacent. If select 'manual', the distance will be determined by 'Slot time', 'ACK timeout' and 'CTS timeout' three values.

Beacon Period: This item contains the length of the beacon interval. Enter a value between 20 and 1000 to specify the Beacon Period.

DTIM Period: This item contains the number of Beacon intervals between Delivery Traffic Indication Message (DTIM). Enter a number between 1 and 255 to specify.

Fragment Threshold: It is the maximum frame size that wireless device can transmit without fragmenting the frame. Enter a value

between 256 and 2346 to specify the Fragment Threshold.
RTS/CTS Threshold: Packets larger than the value are transmitted by the RTS/CTS handshake. Enter a value between 1 and 2346 to specify the value of the RTS /CTS Threshold.
Tx Power: To set the tx power as off to turn off the tx power, set auto to let device determine the tx power value automatically, or set manual to set the tx power value. The max value is depending on the wireless module.
Rate: Set the bit rate for wireless interface to supporting multiple bit rates. The value `Auto' causes the device to use the bit rate selected by the rate control module.
Layer 2 Isolation: It is used in AP mode only. If enabled, all of the clients connect to the same AP will not be able to access each other.
WEP Key Setting: It uses two kinds of WEP Encryption key length: 5-bytes and 13-bytes. The key format can either use 'ASCII' to set the key values (ie. 0~9, a~z) or use 'HEX' to set the key value in hexadecimal. (ie. 0~9, a~f). User can set maximum 4 keys, but only one key will functional at one time.

Figure 3-8-28

†SSID Security Mode

Authentication: User can choose which authentication type to secure the wireless network. There are four options for authentication: Disable, WEP, WPA-personal and WPA-enterprise.
WEP: Short for Wired Equivalent Privacy, a security protocol for wireless local area networks (WLANs) defined in the 802.11 standard.
Open or Restricted: An open system allows any client to authenticate as long as it conforms to any MAC address filter policies that may have been set. All authentication packets are transmitted without encryption. If the 'Restricted' selected, all the packets are transmitted with encryption.
Select Key: Check the radio box in front of the key you would like to use for this AP.

Figure 3-8-29

WPA-Personal: The method of authentication is similar to WEP, user can define a 'Pre-Shared Key', once the key is confirmed and satisfied on both the client and access point, then access is granted. The encryption method used is referred to as the Temporal Key Integrity Protocol (TKIP).
WPA MODE: In this setting, user can choose WPA or WPA2 or WPA & WPA2. (WPA2 is far superior to WPA, because the encryption of method used is Advanced Encryption Standard (AES)).
Share Key: User should define the pre-share key in here; the length of the key is 8-23 characters.
WPA Encryption: User can choose the encryption method of the pre-shared key here; there are three options: Auto, AES and TKIP.
Group Key Update Interval: Time interval for rekeying the GTK (broadcast/multicast encryption keys) in seconds.

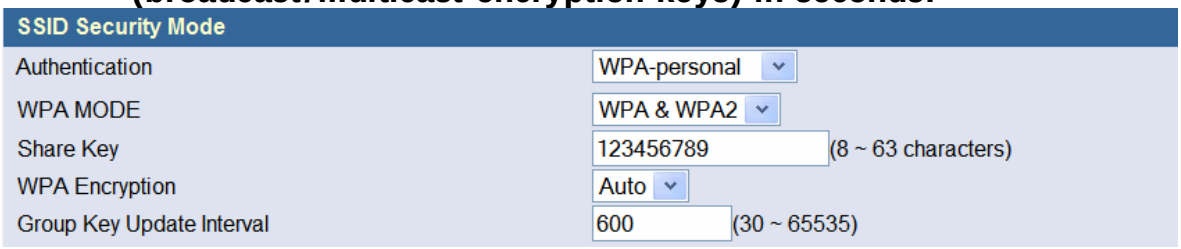


Figure 3-8-30

WPA-enterprise:
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User should enter the IP and port number of the Authentication Server and Shared Secret here. In case if a backup server has been deployed in user's network, user can also enter the necessary information here.

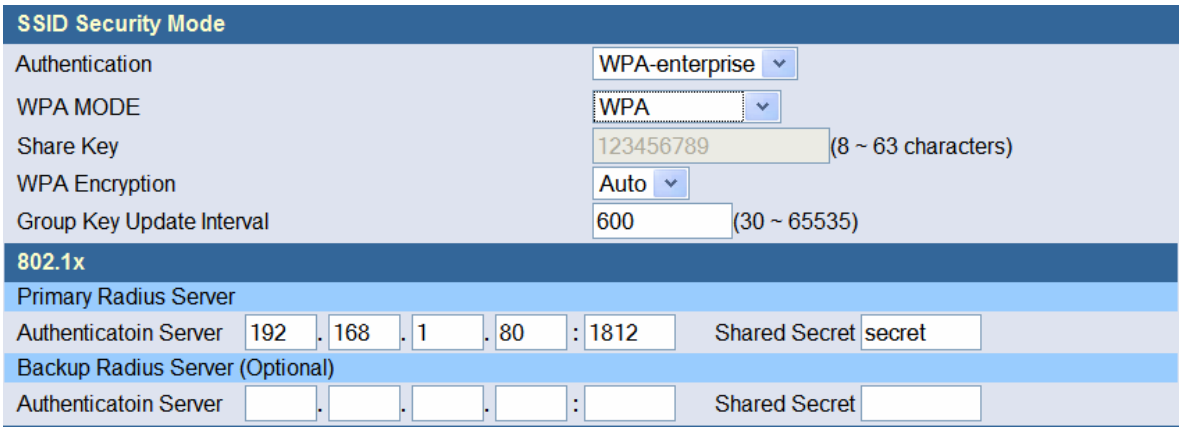

Figure 3-8-31

†QoS

WMM: Enable/disable WMM support.
MAX Associated Station: Maximum number of stations allowed in station table.

Common Parameters:
CWmin: Minimum Contention Window. The valid values for 'CWmin' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047, or 4095. The value for 'CWmin' must be lower than the value for 'CWmax'.
CWmax: Maximum Contention Window. The Valid values for 'CWmax' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047 or 4095. The value for 'CWmax' must be higher than the value for 'CWmin'.
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AP Tx-Video: High Priority. Minimum delay. Time-sensitive video data is automatically sent to this queue.
AP Tx-Voice: High Priority. Time-sensitive data like VoIP and streaming media are automatically sent to this queue.

STA Parameters:
These parameters are sent to WMM clients when they associate. The parameters will be used by WMM clients for frames transmitted to the access point.

STA Tx-Best Effort: Medium Priority, Medium throughput and delay. Most traditional IP data will be sending to this queue.
STA Tx-Background: Low Priority, High throughput. Bulk data that requires maximum throughput and it's not time-sensitive will be sending to this queue (FTP data, for example).
STA Tx-Video: High Priority, Minimum delay. Time-sensitive video data will be automatically sent to this queue.
STA Tx-Voice: High Priority, Time-sensitive data like VoIP and

streaming media are automatically sent to this queue.

TXOP: Transmission Opportunity is an interval of time when a WMM Client Station has the right to initiate transmissions onto the wireless medium (WM). This value specifies (in milliseconds) the Transmission Opportunity (TXOP) for Client Station; that is, the interval of time when the WMM AP has the right to initiate transmissions on the wireless network.

ACM: Admission control mandatory.

Figure 3-8-32

3.8.4 Filtering

The MAC address filter can be used to filter network access by machines based on the unique MAC addresses of their network adapter(s). It is most useful to prevent unauthorized wireless devices from connecting to user's network. A MAC address is a unique ID assigned by the manufacturer of the network adapter.

3.8.4.1 MAC Filtering

User can block certain clients from accessing this AP based on its MAC address. Use Filtering type to define the filtering scenario:

† General

Disabled: Disable this filtering function. If this option is selected, all PCs can access this AP.

Accept: All PCs are filtered out except those MAC addresses in the following MAC address table. In other words, only those interfaces/ PCs with MAC address in the MAC address table can access this AP.

Reject: All PCs/interfaces can access this AP except those interfaces/PCs with MAC address in the MAC address table.

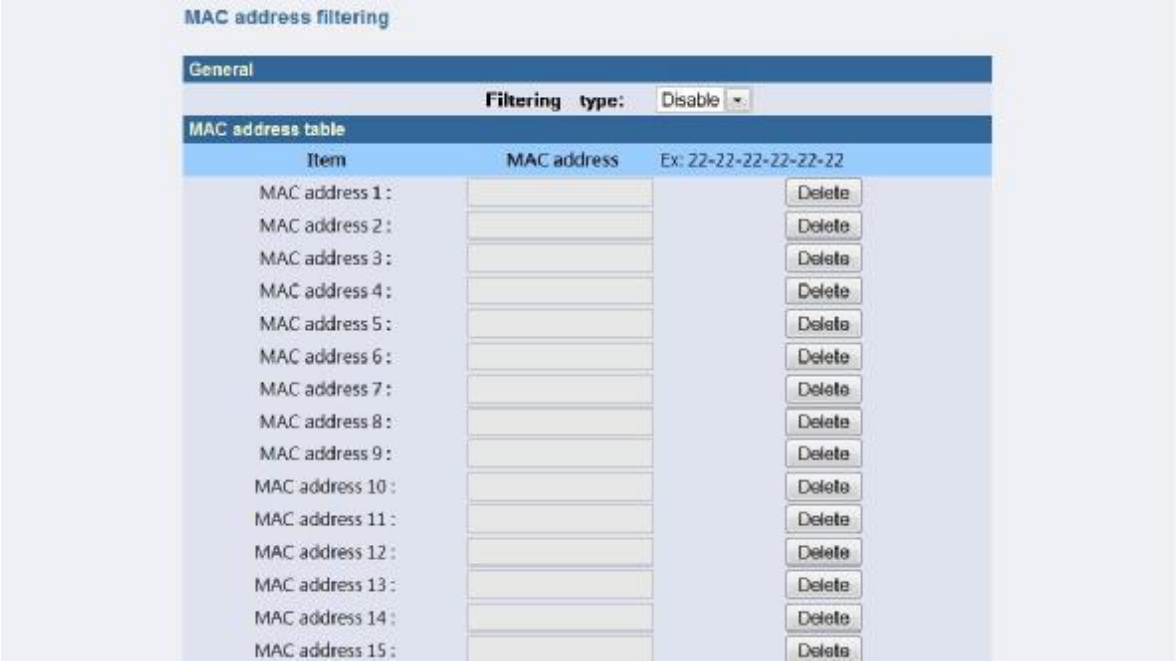

Figure 3-8-33

3.8.5 SNMP

The Outdoor Wireless Access Point support SNMP V1/V2C/V3, this page is to define the SNMP access control and SNMP traps.

3.8.5.1 Basic Setting

†SNMP Agent

Check the <Enable> check box to turn on SNMP. Please Note: Enable the SNMP will also enable the LLDP (Link Layer Discovery Protocol) function. This function will be used if user wants to remote management the AP and draw the network topography.

†System Information

Contact: Specify the contact name for this managed node as well as information about how to contact this person.
Location: It is used to define the location of the host on which the SNMP agent is running.

†V1/V2C

User can change user's SNMP community settings on this screen.

Access Right: Select an access right for the SNMP manager. 'Read' is read only, 'Write' is read-write, and 'Deny' means this community name is not implemented.

Community: Specify the name of community for the SNMP manager.

SNMP Community provides a simple protection by using the community name to control the access to the SNMP. The community name can be thought of as a password. If user doesn't have the correct community name, user can't retrieve any data (get) or make any change (set). Multiple SNMP managers may be organized in a specified community.

† **V3**

The SNMP V3 is a Security Enhancement for SNMP, it provides secure access to devices by a combination of User ID, authenticating and encrypting packets over the network.

User ID: A string representing the name of the user.

Security Level: User can select which security level that user wants to use. The available options for this field are: NoAuthNoPriv, AuthNoPriv or AuthPriv.

Auth Type (Authentication Protocol): An indication of which authentication protocol is used. The available options for this field are: MD5, and SHA.

Auth Passphrase (Authentication Key): A secret key used by the authentication protocol for authenticating messages.

Privacy Protocol: An indication of which privacy protocol is used. The available options for this field is: DES.

Priv Passphrase (Privacy Key): The secret key used by the privacy protocol for encrypting and decrypting messages.

Access Right: Assign the access right for account. The options are:

Unused − The account is disabled.

Read Only − The account has read only access rights.

Read Write − The account has read and writes access rights.

usm − This account will be an usm account and assign access rights by VACM.

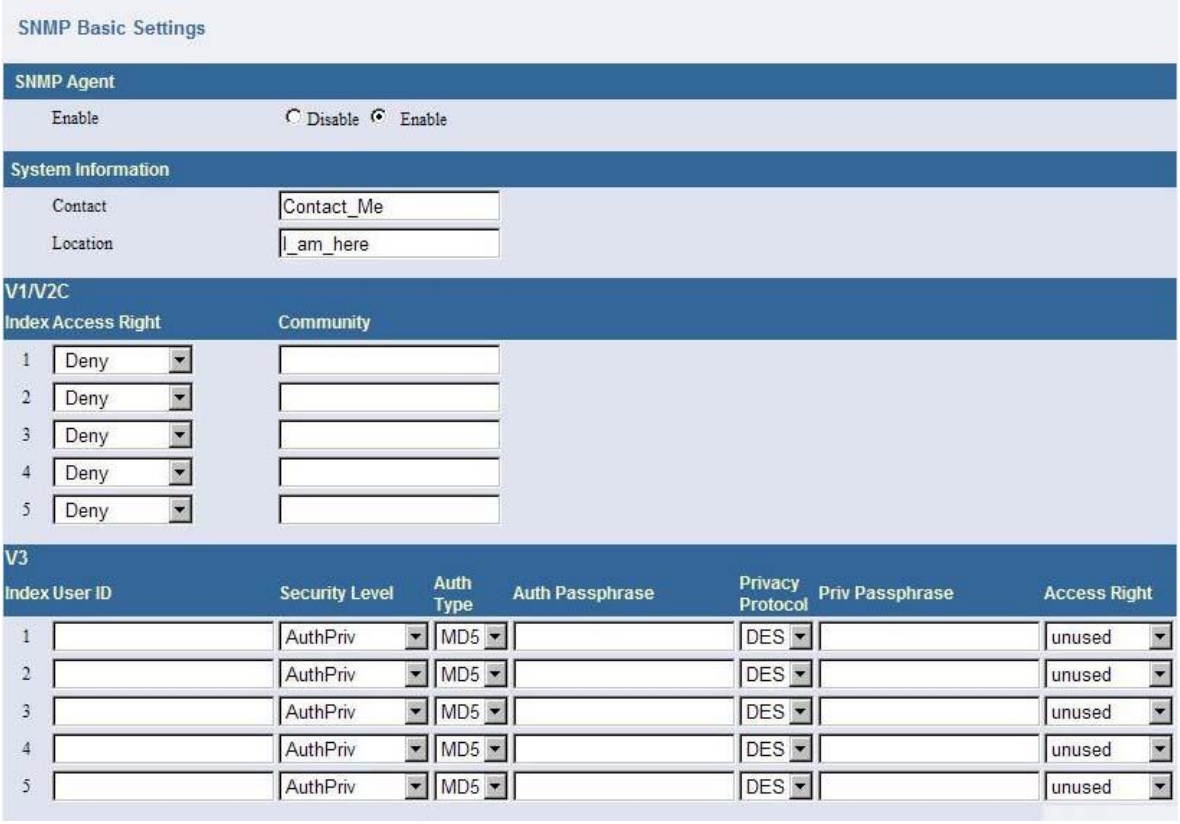

Figure 3-8-34

3.8.5.2 VACM Setting

User can use the View-based Access Control Model (VACM) to define whether access to a specified managed object is authorized. Access control is done at the following points:

- **When processing retrieval request messages from the SNMP manager.**
- **When processing modification request messages from the SNMP manager.**
- **When notification messages must be sent to the SNMP manager.**

The following tokens for VACM access security that user can use:

† Community to Security for V1/V2c

Map the community name (COMMUNITY) into a security name. The Community to Security token takes NAME SOURCE and COMMUNITY options. User can use this token to give SNMPv3 security privileges to SNMPv1 and SNMPv2 users and communities

Index: Index of Community to Security. Tick the checkbox to enable the recordset.

Security Name: is a name that will use by the group table.

IP source: Describes a host or network.

Community: The community name that is used.

†Group

Map the security names into group names. (For SNMP V3, the security Name is the user ID in Basic setting.)
Index: Index of Group. Tick the checkbox to enable the recordset.
Group Name: A group name is given to a group of users and is used when managing their access rights.
Security Model: Assign security model for group.
Security Name: Assign security name for group. This field will obtain from the 'Security Name' of 'Community to Security' when security model is v1 or v2c, or obtain from the 'User ID' of 'usm' when security model is usm.

Figure 3-8-35

† **View**

Create a view for user to let the groups have rights to view the MIB tree.
Index: Index of View. Tick the checkbox to enable the recordset.
Include: Assign include or exclude in this record for certain subtree.
Sub Tree: the OID value. For example: '1.3.6.1.2.1'.

Figure 3-8-36

† **Access**

The Access table grants the groups access right to certain views. Each group can have multiple access rights. The most secure access right is chosen.

Index: Index of Access. Tick the checkbox to enable recordset.

Group: Returned and lookup the 'Group Name' from the Group table.

Security model: Specified in the message's msgSecurityModel parameter. The available options for this field are: any, v1, v2c and usm.

Security level: Specified in the message's msgFlags parameter. The available options for this field are: NoAuthNoPriv, AuthNoPriv and AuthPriv.

Read: Specified in the message's msgSecurityModel parameter. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Write: Authorized View Name for write access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Notify: Authorized View Name for notify access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

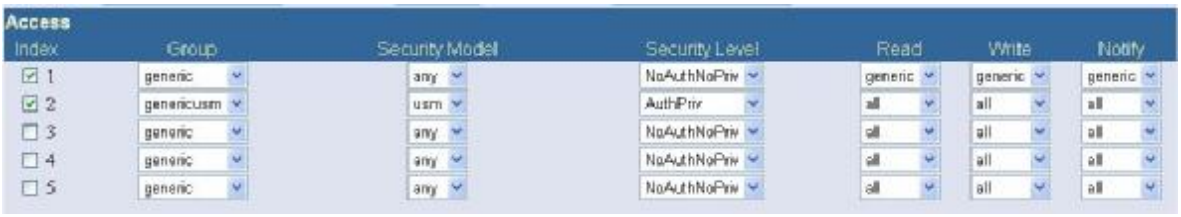

Figure 3-8-37

3.8.5.3 SNMP Trap

It is an SNMP application that uses the SNMP TRAP operation to send information to a network management system.

† **SNMP Trap**

Trap Active: To enable or disable SNMP Trap function.

† **v1 / v2c Trap**

Version: Indicate the traps will be sent in v1 or v2c or not send (disable).

IP Address & Port: The IP and Port to receive traps.

Community: The community string to be used when sending traps.

† **v3 Trap**

Trap: Index of SNMP v3 traps. Tick the checkbox to enable recordset.

User: The usm User ID.

IP Address & Port: The IP and Port of a device to receive traps.

Security Level: Assign security level in this record. The Options

are: NoAuthNoPriv, AuthNoPriv, AuthPriv.

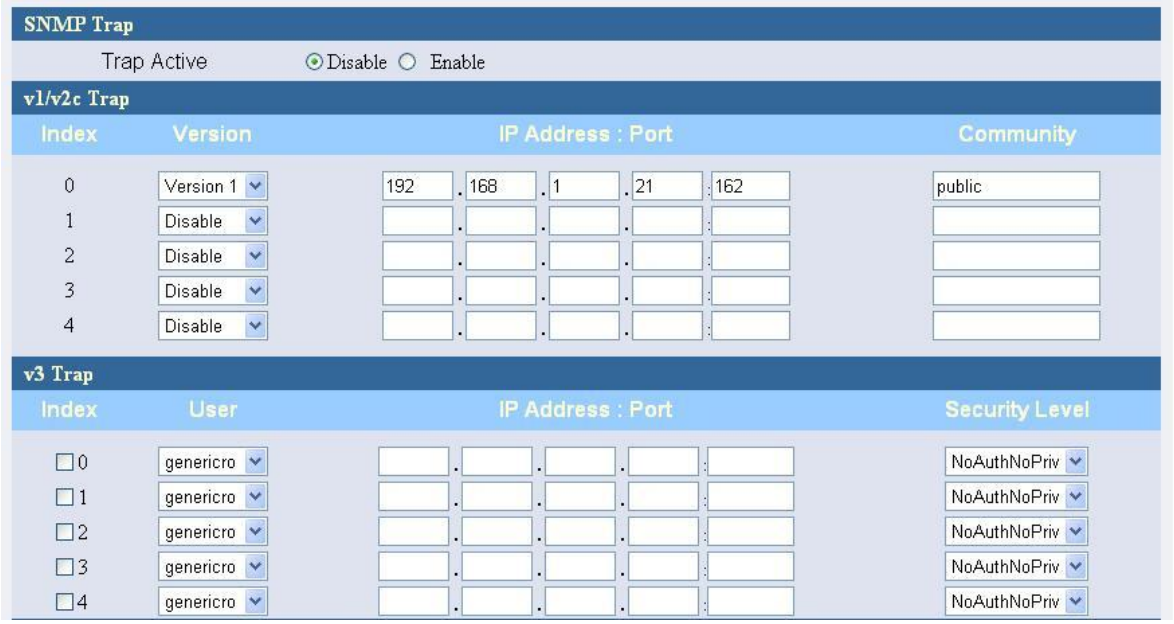

Figure 3-8-38

† **Trap Items**

Enable/Disable which trap items to send.

Figure 3-8-39

3.8.6 Tools

†**Command Ping**

It runs ping command to test the connection capability of this device with the other Ethernet device.

Figure 3-8-40

3.8.7 Log Out

User can manually logout by click on <Log Out>.

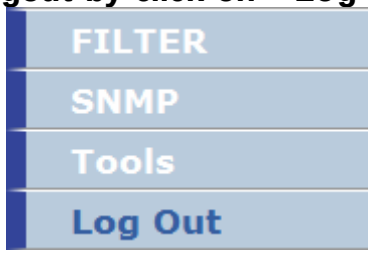

Figure 3-8-41

3.9 OLSR_AP Mode

To set this device as a MESH device, the setting and functions as following:

▽ **SYSTEM**
- **Administrator**
- **Firmware**
- **Configuration Tools**
- **General Status**
- **Power Control**
- **WIFI Status**
- **Log**
- **System Time**
- **Reboot**

▽ **WAN**
- **WAN Settings**
- **Bandwidth Management**

▽ **LAN**
- **Eth0 settings**
- **AP WLAN Settings**
- **MESH WLAN Settings**

▽ **MESH**
- **OLSR-CONFIG**
- **OLSR-ADMIN**
- **OLSR-ROUTES**
- **OLSR-LINKS**

▽ **WIRELESS**
- **WIFI AP Setting**
- **WIFI MESH Setting**

▽ **FILTER**
- **IP Filtering**
- **MAC Filtering**

▽ **SNMP**
- **Basic Setting**
- **VACM Setting**
- **Trap Setting**

▽ **Tools**
- **Tools**

▽ **Log Out**

3.9.1 System

This page shows the current status and some basic settings of the device, including Administrator, Firmware, Configuration Tools, General Status, Power Control, WIFI Status, Log, System Time and Reboot; screen as shown in Figure 3-9-1.

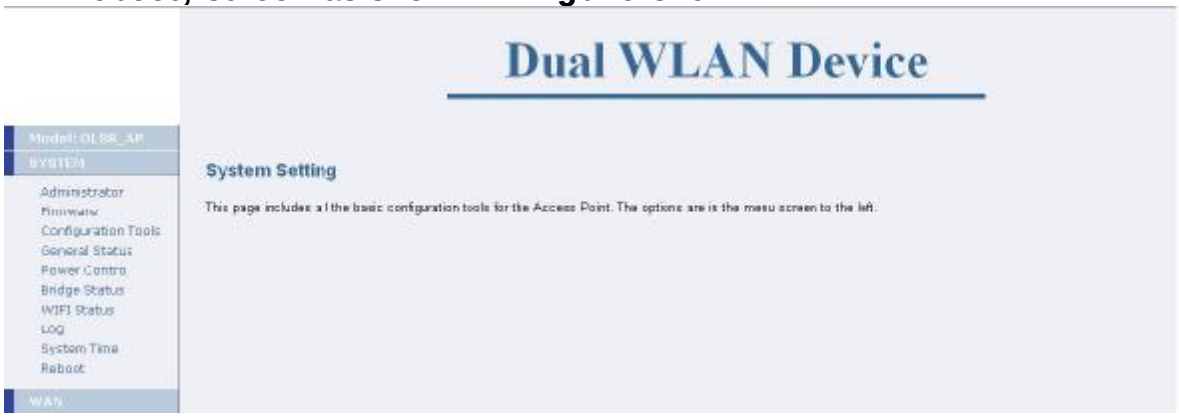

Figure 3-9-1

3.9.1.1 Administrator

By selecting the item of Administrator under System, User will see the screen shown in Figure 3-9-2. These settings allow user to configure the Device Name, Language, Model, Password, Remote Management and WIFI Loading Warning Threshold.

- **Device Name**

  This is a host name or system name for the device. The maximum length is 20 characters. User can only input '0'~'9', 'a'~'z', 'A'~'Z', '_' or '-'.

- **Model**

  OLSR_AP: To set this device as an AP with layer 3 MESH function.
  AODV_AP: To set this device as an AP with layer 3 MESH function.
  AP-Bridge: To set this device as a normal AP.
  AP-CB-Bridge: To set this device as an AP and Client Bridge device.
  AP-CB-ROUTE: To set this device as a router device with AP and CB functions.
  CB-CB-ROUTE: To set this device as a router device with dual CB functions.
  VLAN-AP: To set this device as a VLAN AP device. Each SSID can have its own VLAN ID.
  AP_WDS_BRG: To set this device as a WDS device with AP function.
  AP4_WDS_BRG: To set this device as WDS device with AP function and support up to 4 SSID.

Figure 3-9-2

†Password Settings

If user wants to change the password for admin account, the user should enter the current password, a new password and, re-type the new password.

The Idle Time Out is the amount of time of inactivity allowed before user proceeds next action. The user needs to re-login if the idle time passes timeout.

†Remote Management

User can enable/disable the management of the Access Point from a remote host. Just tick the <Enable> check box and enter an IP address of the remote host. Then, only the host with the entered IP address can access this device.

†WIFI Loading Warning Threshold

The threshold value is used by network management system. Network management software will monitor the WIFI loading, when the loading is over this value, network management software will change the color of the link line on network topology to notify the user about condition of the link quality. The threshold value is between 5 and 25.

3.9.1.2 Firmware Update

By selecting the item of Firmware under System, User will see the screen shown in Figure 3-9-3. This page shows current firmware version and date. This page also allow user to using TFTP or WEB or FTP method to upgrade to the new version of firmware.

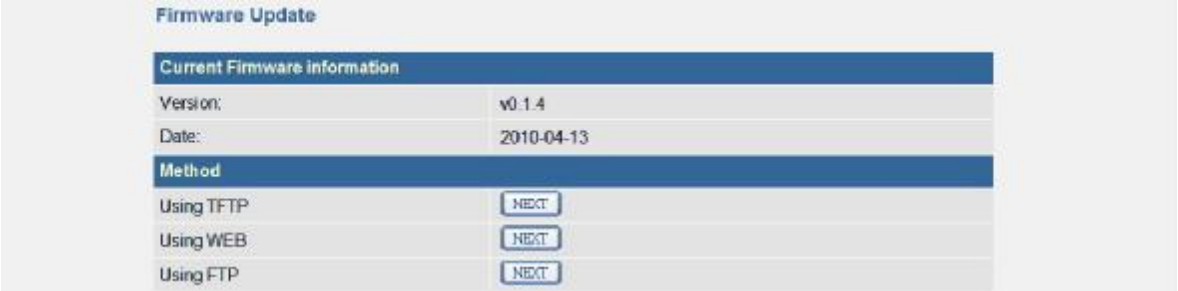

Figure 3-9-3

†Using TFTP

On any computer in the network or a computer direct connect to the AP. Install a TFTP Server utility, and put the firmware file named 'upgradeFW.tar' in a folder.

Run TFTP utility and specify the folder in which the firmware file located. Enter the TFTP server IP and click on <APPLY> button. At the end of the upgrade process, this device may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

†Using WEB

Click on <Browse> button and select the correct firmware file path and file name. Then, click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands while uploading the firmware. This is normal behavior and do not turn off the Access Point while firmware is upgrading.

†Using FTP

On FTP server, there should have valid firmware which includes fs-opn.img and/or kernel-opn.img. On the Firmware Update - FTP page, enter the IP address of the FTP server, firmware name and FTP user name and password. Then click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

3.9.1.3 Configuration Tools

By selecting the item of Configuration Tools under System, the screen will show in Figure 3-9-4. This page includes three selections: Restore Factory Default Configuration, Local Backup Settings/Restore settings and Remote Backup Settings/Restore settings.

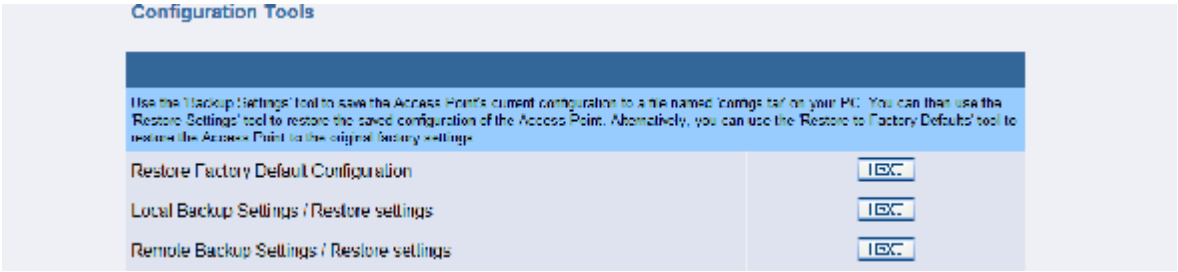

Figure 3-9-4

† **Restore Factory Default Configuration:**

To reset configuration settings to the factory default values, just click on <NEXT> button beside 'Restore Factory Default Configuration'.

Figure 3-9-5

Then click on <Restore> button on next page, now the system will reset to factory default value.

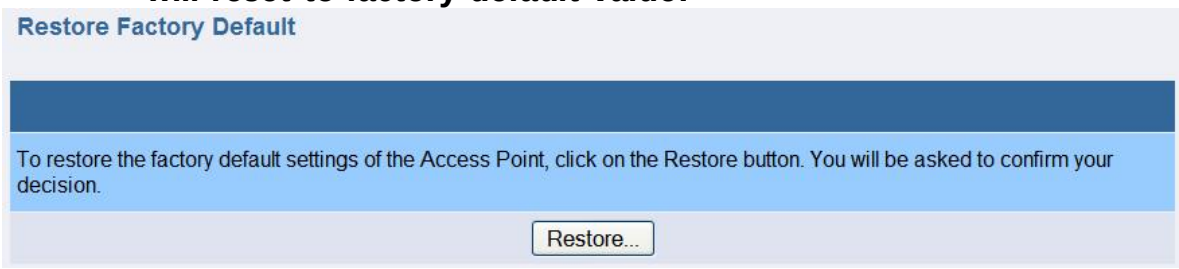

Figure 3-9-6

† **Local Backup Settings / Restore settings**

To backup or restore the configuration for this device. Click on <NEXT> button beside 'Local Backup Settings/Restore settings'.

Figure 3-9-7

Click on <Backup Settings> button on next page to save the settings of this device to a file named 'configs.tar' on user's PC.

To restore the settings, click on <Browse> button and select the correct file path and file name. Then, click on <Restore Settings> button to start the restore settings process.

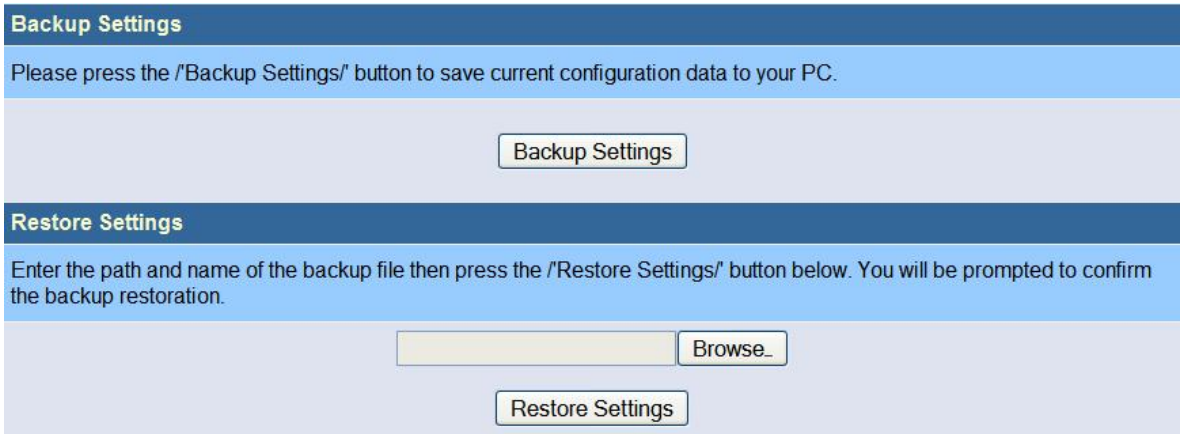

Figure 3-9-8

†Remote Backup Settings/Restore settings

User can also backup/restore the configuration of this device remotely.

Click on <NEXT> button beside `Remote Backup Settings/Restore settings'.

Figure 3-9-9

Enter the necessary setting in next page, then click on <Backup To Server> or <Restore From Server> to start the process.

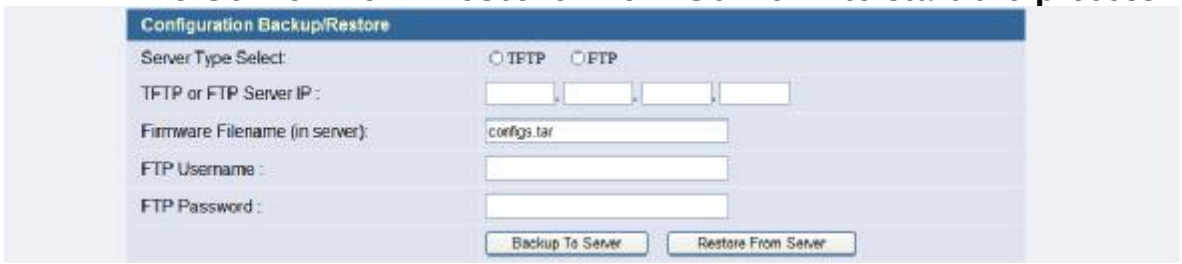

Figure 3-9-10

3.9.1.4 General Status

In this page user could see the detail settings of this device, including the System Information, Power Control, WAN Port, OLSR Status, eth0 LAN Port, MESH WIFI Status, AP WIFI 2 Status.

Figure 3-9-11

3.9.1.5 Power Control

In this page user can enable the eth0 port to provide PoE power and data forwarding function.

Figure 3-9-12

3.9.1.6 WIFI Status

In this page user could see the WIFI information of this device, such as: Interface information, Security information, Associated AP/Station.

Figure 3-9-13

3.9.1.7 Log

In this page user could see the system logs record of this device.

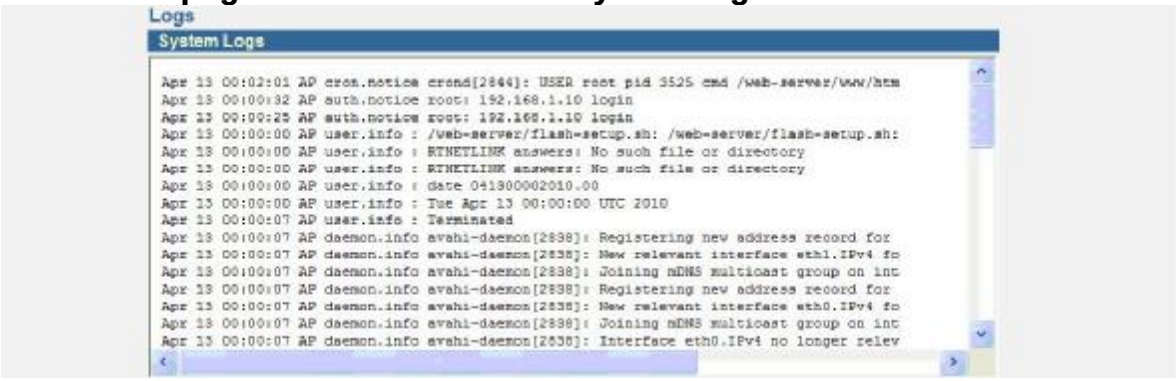

Figure 3-9-14

3.9.1.8 System Time

†Select Setting Type

Setting by: User can set system time in two ways. One is manual setting, the other one is Synchronize with an Internet Time Server.

†Manual Setting

User can manually enter the Year/ Month/ Day and Hour: Minute: Second.

†Using Internet Time Server

Hours from GMT: User can enter the Hours from GMT, for example Taiwan is GMT +8 Hours.

Server IP: User should enter the Internet time server IP address

here.

Time Update for Every: User can set time update interval by enter the days, hours, and minutes.

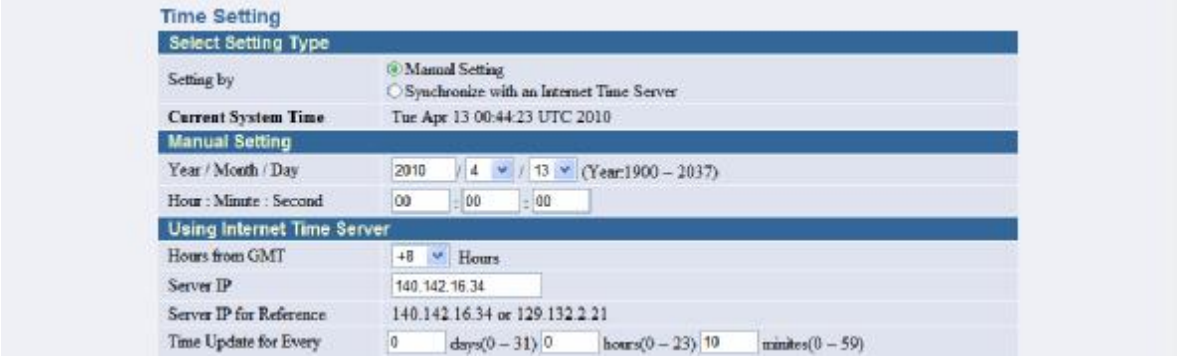

Figure 3-9-15

3.9.1.9 Reboot

User can perform reboot function in case of the device is not function normally, or after user change some major settings for example: change system model. The existing settings will not be changed. To perform the reboot, click on the <Reboot> button and click on <OK> on pop-up screen to confirm user's decision.

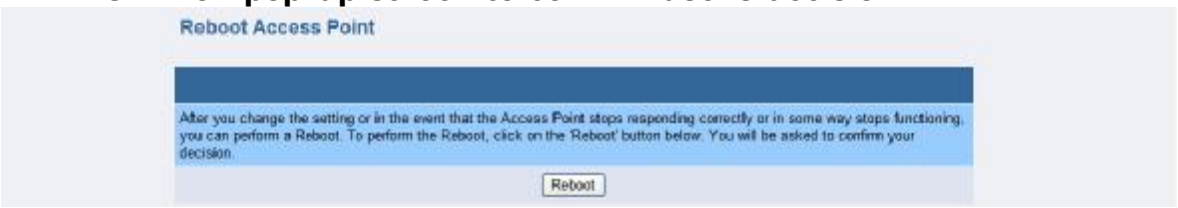

Figure 3-9-16

3.9.2 WAN Configuration

3.9.2.1 WAN Settings

This function is to establish a connection with user's WAN network and also assign the IP to the host behind this AP.

† Network IP Parameters

User can change the network settings of this interface from WAN configuration; it is including IP address, Subnet mask, Gateway address and enable/disable the DHCP server Function.

† DHCP Server Parameters

Primary / Secondary DNS Address: The domain-name-servers option specifies a list of Domain Name System name servers available to the client

IP Pool Starting / Ending Address: The IP Address range which will be assigned.

Lease Time: How long does the IP address can be leased by DHCP server.

Figure 3-9-17

3.9.2.2 Bandwidth Management

This function allows user to set the limitation of total upload/download bandwidth on WAN interface, and also can set the limitation of upload/download bandwidth for each user or a group of users by IP address.

† Bandwidth Management

Bandwidth Management: Enable bandwidth limitation function.
Upload Bandwidth: The total upload bandwidth (in Mbps).
Download Bandwidth: The total download bandwidth (in Mbps).

† Bandwidth Limitation

Action: To set the action type of bandwidth limitation. The options available here are: disable, upload, download and upload/download.
Start IP Address: To set the start IP of bandwidth limitation.
End IP Address: To set the end IP of bandwidth limitation.
Bandwidth Limitation: To set the bandwidth (in Kbps) of bandwidth limitation.
User can press <Add> button to add IP address to the Bandwidth Limitation list.
User can tick the check box and press <Del> button to delete the IP address from the Bandwidth Limitation list.

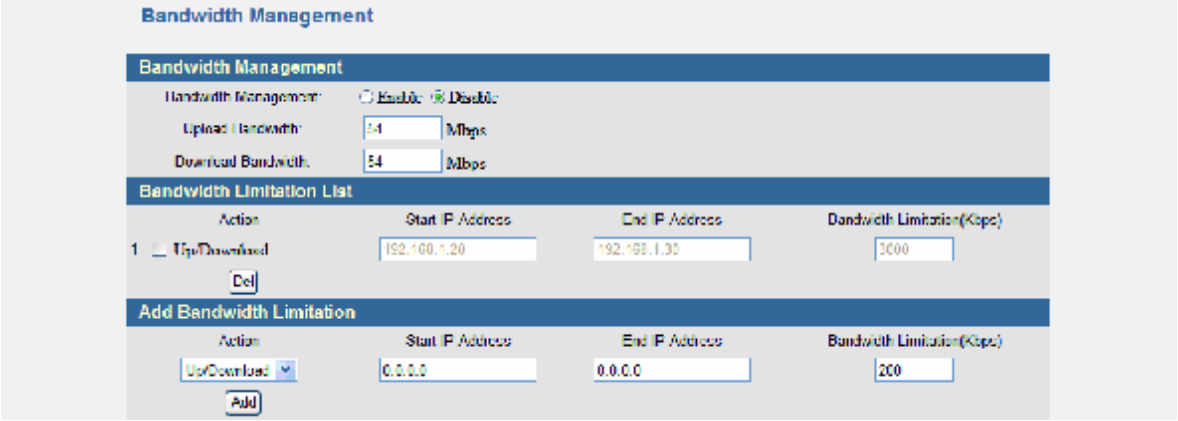

Figure 3-9-18

3.9.3 LAN Configuration

The Access Point must have an IP address for the (wireless) local area network. User can also enable DHCP service to assign IP address to the wireless clients. (Please Note: The DHCP service for MESH network is inhibited.)

3.9.3.1 Eth0 Settings

† Network IP Parameters

User can change the network settings of this interface from LAN configuration; it is including IP address, Subnet mask and enable/disable the DHCP server Function.

† DHCP Server Parameters

Primary / Secondary DNS Address: The domain-name-servers option specifies a list of Domain Name System name servers available to the client

IP Pool Starting / Ending Address: The IP Address range which will be assigned.

Lease Time: How long does the IP address can be leased by DHCP server.

Figure 3-9-19

3.9.3.2 AP WLAN Settings

User can change the local network settings from LAN Configuration for ath4 interface, which include the IP address, Subnet mask, Gateway, and DHCP server related settings.

† Network IP Parameters

User can change the network settings of this interface from LAN configuration; it is including IP address, Subnet mask, Gateway address and enable/disable the DHCP server Function.

† DHCP Server Parameters

Primary DNS Address: The domain-name-servers option specifies a primary Domain Name System servers available to the client.

Secondary DNS Address: In same case user can specifies a secondary Domain Name System servers available to the client.

IP Pool Starting/Ending Address: The range of IP addresses which can be assigned to the client.
Lease Time: How long does the IP address can be leased by DHCP server.

Figure 3-9-20

3.9.3.3 MESH WLAN Settings

User can configure the IP address for MESH ath0 interface in here. The IP address for MESH ath0 must be in the same subnet with other MESH device's ath0 interface, and must be in different subnet with WAN, AP WLAN IP address.

† Network IP Parameters

IP Address: The IP address of the AP on the MESH network.
Subnet Mask: The subnet mask of the IP address.

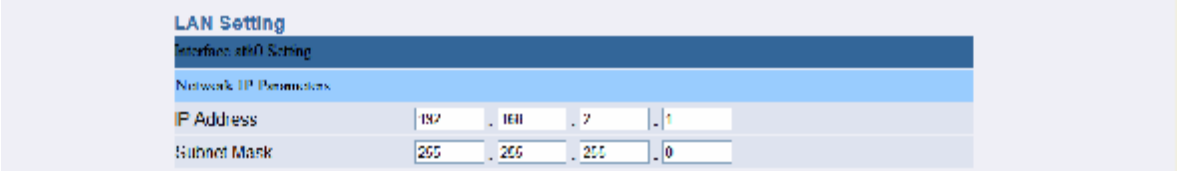

Figure 3-9-21

3.9.4 MESH

This page will show the mesh information. The options available here are: OLSR-CONFIG, OLSR-ADMIN, OLSR-ROUTES, and OLSR-LINKS.

3.9.4.1 OLSR-CONFIG

In this page user can see all the MESH configuration information.

† Variables

In here the table shows Pollrate, TC redundancy, MPR coverage, LQ level LQ winsize, FISHEYE and Willingness information.

† Interface ath0

In here the table shows IP, MASK, BCAST, MTU and STATUS information.

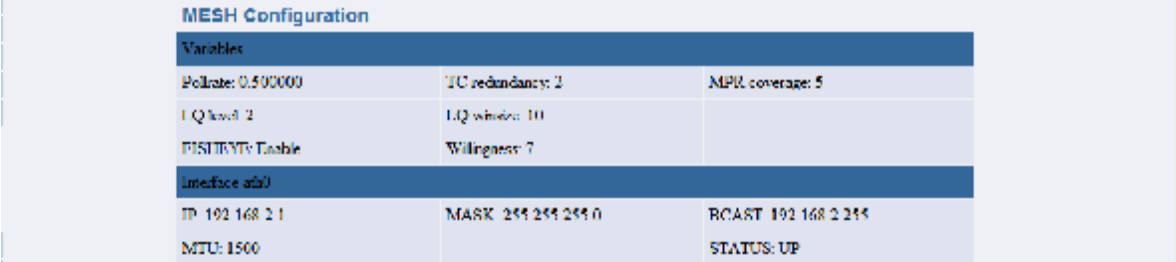

Figure 3-9-22

3.9.4.2 OLSR-ADMIN

In this page, user can set the MESH related settings that shows in OLSR-CONFIG

†Change basic settings

Pollrate [0.0-m.n]: This option sets the interval in seconds, which the mesh scheduler should be poll for events every 0.2 seconds if the pollrate is set to 0.2. The default value is 0.5.

TC redundancy [0|1|2]: This value controls the TC redundancy used by the local node in TC message generation. If set to 0 the advertised link set of the node is limited to the MPR selectors. If set to 1 the advertised link set of the node is the union of its MPR set and its MPR selector set. If set to 2 the advertised link set of the node is the full symmetric neighbor set of the node. The default value is 0.

MPR coverage [1-n]: This value decides how many MPRs a node should attempt to select for every two hop neighbor. The default value is 5.

LQ level [1-2]: This setting decides the Link Quality scheme to use. If set to 0, the link quality is not regarded and mesh system runs in OLSR mode (RFC3626). If set to 1, the link quality is used when calculating MPRs. If set to 2, the route will also be calculated based on distributed link quality information. This option should therefore only be set to 1 or 2 if such a setting is used by all other nodes in the network. The default value is to 2. Please note that if LQ level is set to 1 or 2, the mesh will not compatible with RFC3626!

LQ winsize [1-n]: The total number of packets received up to now. This value starts at 0 immediately after a link has come alive and then counts each packet. It is capped at the link quality window size. The default value is 100.

Willingness [0-7]: Nodes participating in an OLSR routed network will announce their willingness to act as relays for control traffic for their neighbors. This option specifies a fixed willingness value to be announced by the local node. 4 is a neutral option here, while 0 specifies that this node will never act as a relay, and 7 specifies that this node will always act as such a relay. If this option is not set in the configuration file, then mesh system will try to retrieve information about the system power and dynamically update willingness according to this info. The

default value is 7.
Fisheye [Enable, Disable]: To increase stability in a mesh, TC messages should be sent quite frequently. However, the network would then suffer from the resulting overhead. The idea is to frequently send TC messages to adjacent nodes, i.e. nodes that are likely to be involved in routing loops, without flooding the whole mesh with each sent TC message. The default value is Enable.

†Enable local HNA entry

HNA entry [Enable, Disable]: Hosts in an OLSR routed network can announce connectivity to external networks using HNA messages. This function is used to set the IPv4 networks to be announced by this host.

†Security

The function uses this shared secret key for signature generation and verification.
Security [Enable, Disable]: To enable or disable the security function.
Security Key [0123456789abcdef]: For nodes to participate in the OLSR routing domain they need to use the key used by the other nodes. The key is 128-bits.

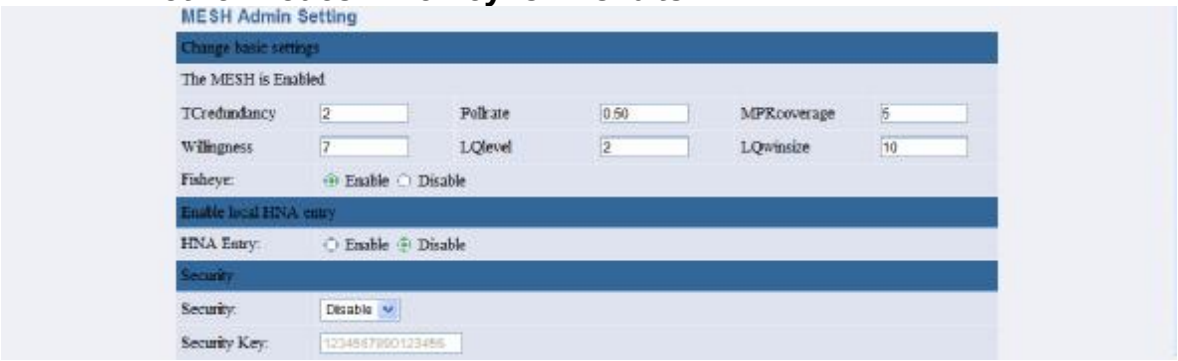

Figure 3-9-23

3.9.4.3 OLSR-ROUTES

†OLSR routes in kernel

Destination	Gateway	Metric	ETX	Interface	Type
192.168.2.15	192.168.2.15	1	3.25	ath0	HOST
0.0.0.0/0.0.0.0	192.168.2.15	1	3.25	ath0	HNA

Destination: The node that packet is sent to.
Gateway: The route packets via which gateway.
Metric: The 'distance' to the target (usually counted in hops).
ETX: the ETX value for this link, calculated by ETX = 1 / (ILQ x LQ).
Interface: the device interface the packets go through.

Type: HOST means that it's belong to node's routing tables. HNA means that node can connect to internet via this routing path.

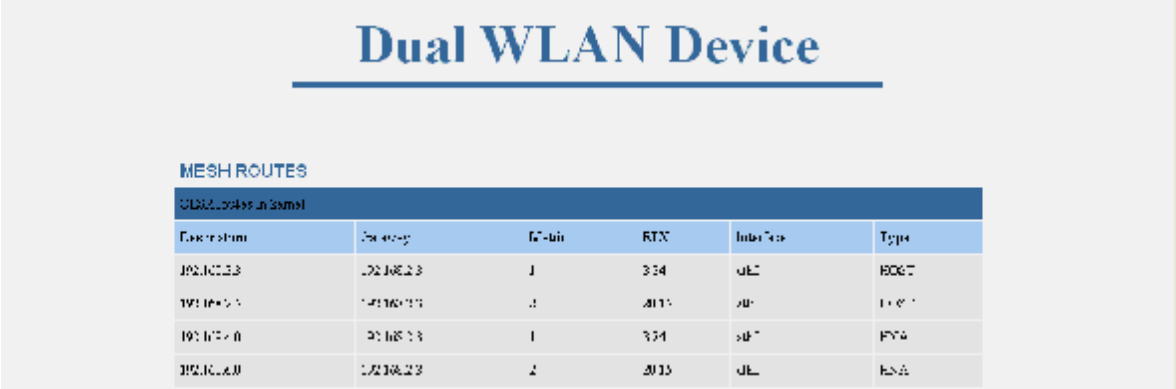

Figure 3-9-24

3.9.4.4 OLSR-LINKS

†**LINKS**

Local IP	Remote IP	LQ	lost	total	NLQ	ETX
192.168.0.2	192.168.0.1	1.000	0	100	1.000	1.00

This table contains the links to our neighbors. It contains the following columns.
Local IP: The IP address of the interface that have contacted to the neighbor.
Remote IP: The IP address of the neighbor.
LinkQuality: The quality of the link determined at our end.
lost: The number of lost packets among the `n' packets most recently sent by our neighbor via this link. `n' is the link quality window size.
total: the total number of packets received up to now. This value starts at 0 immediately after a link has come to alive and then counts each packet. It is capped at the link quality window size.
NLQ: this is our neighbor's view of the link quality. Previously we have called this the Neighbor Link Quality. This value is extracted from LQ HELLO messages received from our neighbors.
ETX: This is the ETX for this link, i.e. 1 / (NLQ x LQ).

†**NEIGHBORS**

IP address	SYM	MPR	MPRS	will	2_Hop_Neighbors
10.0.0.6	YES	YES	YES	7	10.0.0.7

This table contains a list of all our neighbors. It is closely related to the link table in that we are connected to a neighbor via one or more links. The table has the following columns.
IP address: The main IP address of the neighbor.
SYM: This states whether the link to this neighbor is considered symmetric by link detection mechanism.
MPR (multi-point relay): This indicates whether we have selected this neighbor to act as an MPR for us.

MPRS (multi-point relay selector): This indicates whether the neighbor node has selected us to act as an MPR for it.
will: The neighbor's willingness.
2_Hop_Neighbors: The IP address of 2 hops neighbors.

† **Topology entries**

Source_IP	Dest_IP	LQ	ILQ	ETX
0.0.0.6	92.168.0.2	.000	.000	.00
0.0.0.6	0.0.0.5	.000	.000	.00

This table displays the topology information that mesh system has gathered from LQ TC messages. It states which nodes in the network report links to which other nodes and what quality does these links have. This table has the following columns.
Destination IP: The node to which the source node reports the link.
LQ (link quality): The quality of the link as determined by the source node. For the source node this is the Link Quality. For the destination node this is the Neighbor Link Quality.
ILQ (inverse link quality): The quality of the link as determined by the destination node. For the source node this is the Neighbor Link Quality. For the destination node this is the Link Quality.
ETX: The ETX value for this link, calculated by ETX = 1 / (ILQ x LQ).

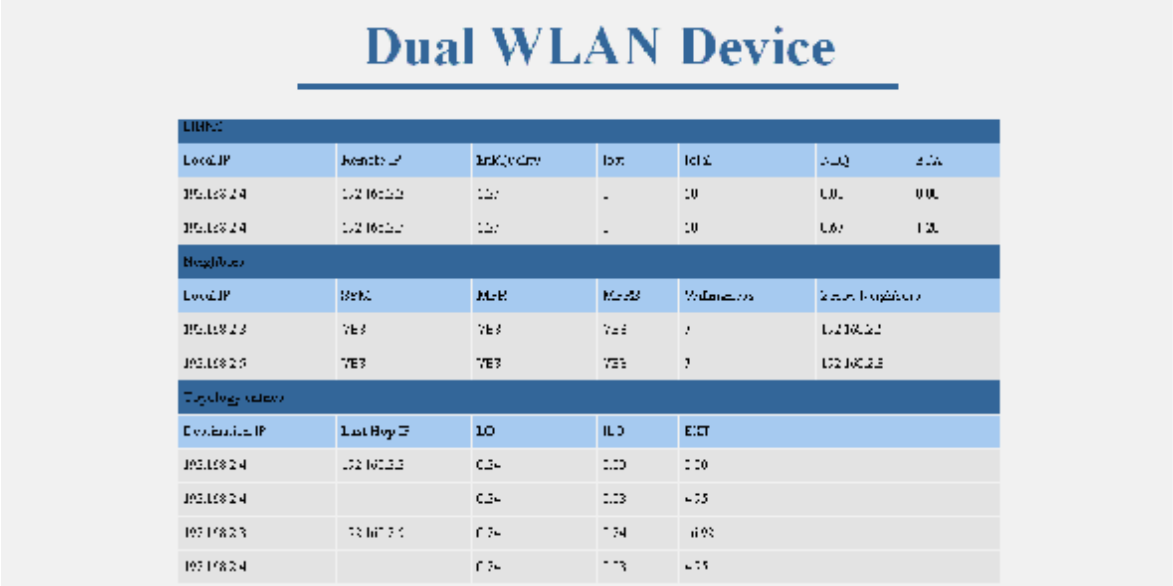

Figure 3-9-25

3.9.5 Wireless

User can set the wireless related setting here.

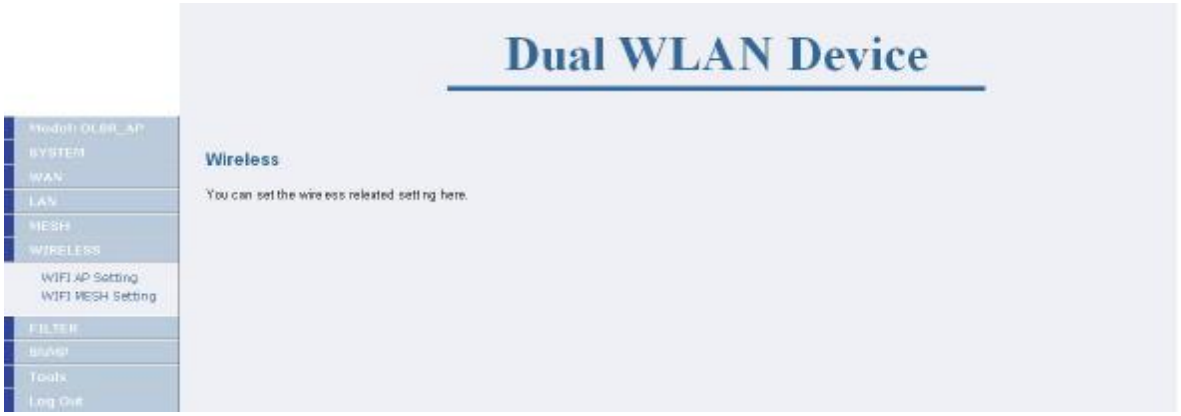

Figure 3-9-26

3.9.5.1 WIFI AP Setting

†**General**

Radio Power: Turn this interface on or off.

Wireless Mode: Select which wireless mode that you want to use. The options available here are: 802.11a, 802.11b, 802.11g and 802.11b+g.

SSID: The SSID (service set identifier) is an identifier of an AP in user's wireless network. The SSID must be identical for all access points in the network. It is case sensitive and maximum length is 32.

SSID Hide: This function is to hide the SSID in the wireless network.

Channel: Set the operating frequency/channel for this device.

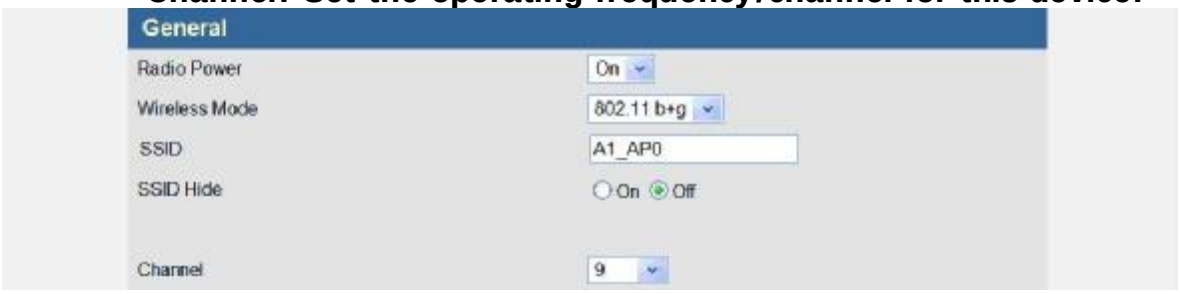

Figure 3-9-27

†**Advanced Settings**

Peer Node Distance: Set the distance between this device and it's adjacent. If select 'manual', the distance will be determined by 'Slot time', 'ACK timeout' and 'CTS timeout' three values.

Beacon Period: This item contains the length of the beacon interval. Enter a value between 20 and 1000 to specify the Beacon Period.

DTIM Period: This item contains the number of Beacon intervals between Delivery Traffic Indication Message (DTIM). Enter a number between 1 and 255 to specify.

Fragment Threshold: It is the maximum frame size that wireless device can transmit without fragmenting the frame. Enter a value between 256 and 2346 to specify the Fragment Threshold.

RTS/CTS Threshold: Packets larger than the value are transmitted by the RTS/CTS handshake. Enter a value between 1 and 2346 to specify the value of the RTS /CTS Threshold.

Tx Power: To set the tx power as off to turn off the tx power, set auto to let device determine the tx power value automatically, or set manual to set the tx power value. The max value is depending on the wireless module.

Rate: Set the bit rate for wireless interface to supporting multiple bit rates. The value 'Auto' causes the device to use the bit rate selected by the rate control module.

Layer 2 Isolation: It is used in AP mode only. If enabled, all of the clients connect to the same AP will not be able to access each other.

WEP Key Setting: It uses two kinds of WEP Encryption key length: 5-bytes and 13-bytes. The key format can either use 'ASCII' to set the key values (ie. 0~9, a~z) or use 'HEX' to set the key value in hexadecimal. (ie. 0~9, a~f). User can set maximum 4 keys, but only one key will functional at one time.

Figure 3-9-28

†SSID Security Mode

Authentication: User can choose which authentication type to secure the wireless network. There are four options for authentication: Disable, WEP, WPA-personal and WPA-enterprise.

WEP: Short for Wired Equivalent Privacy, a security protocol for wireless local area networks (WLANs) defined in the 802.11 standard.

Open or Restricted: An open system allows any client to authenticate as long as it conforms to any MAC address filter policies that may have been set. All authentication packets are transmitted without encryption. If the 'Restricted' selected, all the packets are transmitted with encryption.

Select Key: Check the radio box in front of the key you would like to use for this AP.

Figure 3-9-29

WPA-Personal: The method of authentication is similar to WEP, user can define a 'Pre-Shared Key', once the key is confirmed and satisfied on both the client and access point, then access is granted. The encryption method used is referred to as the Temporal Key Integrity Protocol (TKIP).
WPA MODE: In this setting, user can choose WPA or WPA2 or WPA & WPA2. (WPA2 is far superior to WPA, because the encryption of method used is Advanced Encryption Standard (AES)).
Share Key: User should define the pre-share key in here; the length of the key is 8-23 characters.
WPA Encryption: User can choose the encryption method of the pre-shared key here; there are three options: Auto, AES and TKIP.
Group Key Update Interval: Time interval for rekeying the GTK (broadcast/multicast encryption keys) in seconds.

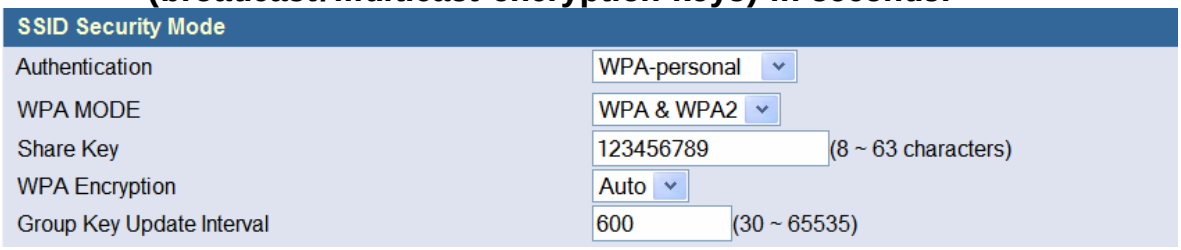

Figure 3-9-30

WPA-enterprise:
WPA-Enterprise includes all of the features of WPA-PSK plus support the 802.1x authentication. To use this function, a separate RADIUS server is required. User should enter the IP and port number of the Authentication Server and Shared Secret here. In case if a backup server has been deployed in user's network, user can also enter the necessary information here.

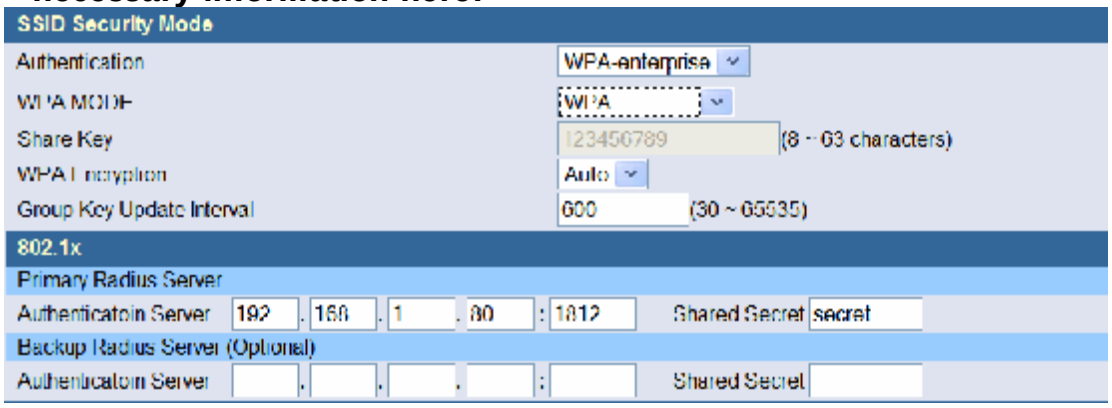

Figure 3-9-31

† **QoS**

WMM: Enable/disable WMM support.
MAX Associated Station: Maximum number of stations allowed in station table.

Common Parameters:
CWmin: Minimum Contention Window. The valid values for 'CWmin' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047, or 4095. The value for 'CWmin' must be lower than the value for 'CWmax'.
CWmax: Maximum Contention Window. The Valid values for 'CWmax' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047 or 4095. The value for 'CWmax' must be higher than the value for 'CWmin'.
AIFS: Arbitration Inter-Frame Spacing.
Burst: Maximum length (in milliseconds with precision of up to 0.1 ms) for bursting.

AP Parameters:
This affects traffic flowing from the access point to the client station. These parameters are used by the access point when transmitting frames to the clients.

AP Tx-Best Effort: Medium Priority. Medium throughput and delay. Most traditional IP data is sent to this queue.
AP Tx-Background: Low Priority. High throughput. Bulk data that requires maximum throughput and is not time-sensitive is sent to this queue (FTP data, for example).
AP Tx-Video: High Priority. Minimum delay. Time-sensitive video data is automatically sent to this queue.
AP Tx-Voice: High Priority. Time-sensitive data like VoIP and streaming media are automatically sent to this queue.

STA Parameters:
These parameters are sent to WMM clients when they associate. The parameters will be used by WMM clients for frames transmitted to the access point.

STA Tx-Best Effort: Medium Priority, Medium throughput and delay. Most traditional IP data will be sending to this queue.
STA Tx-Background: Low Priority, High throughput. Bulk data that requires maximum throughput and it's not time-sensitive will be sending to this queue (FTP data, for example).
STA Tx-Video: High Priority, Minimum delay. Time-sensitive video data will be automatically sent to this queue.
STA Tx-Voice: High Priority, Time-sensitive data like VoIP and streaming media are automatically sent to this queue.
TXOP: Transmission Opportunity is an interval of time when a

WMM Client Station has the right to initiate transmissions onto the wireless medium (WM). This value specifies (in milliseconds) the Transmission Opportunity (TXOP) for Client Station; that is, the interval of time when the WMM AP has the right to initiate transmissions on the wireless network.

ACM: Admission control mandatory.

Figure 3-9-32

3.9.5.2 WIFI MESH Setting

†General

Radio Power: Turn this interface on or off.

Wireless Mode: Select which wireless mode that you want to use. The options available here are: 802.11a, 802.11b, 802.11g and 802.11b+g.

SSID: The SSID (service set identifier) is an identifier of an AP in user's wireless network. The SSID must be identical for all access points in the network. It is case sensitive and maximum length is 32.

SSID Hide: This function is to hide the SSID in the wireless network.

Channel: Set the operating frequency/channel for this device.

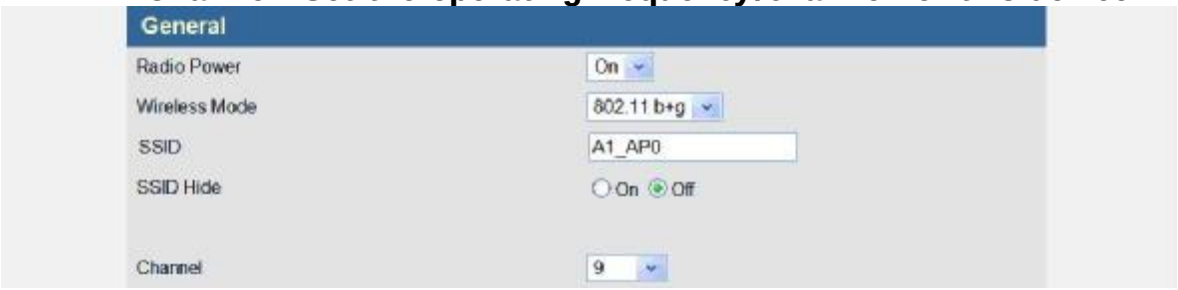

Figure 3-9-33

†Advanced Settings

Peer Node Distance: Set the distance between this device and it's adjacent. If select 'manual', the distance will be determined by 'Slot time', 'ACK timeout' and 'CTS timeout' three values.

Beacon Period: This item contains the length of the beacon interval. Enter a value between 20 and 1000 to specify the

Beacon Period.
DTIM Period: This item contains the number of Beacon intervals between Delivery Traffic Indication Message (DTIM). Enter a number between 1 and 255 to specify.
Fragment Threshold: It is the maximum frame size that wireless device can transmit without fragmenting the frame. Enter a value between 256 and 2346 to specify the Fragment Threshold.
RTS/CTS Threshold: Packets larger than the value are transmitted by the RTS/CTS handshake. Enter a value between 1 and 2346 to specify the value of the RTS /CTS Threshold.
Tx Power: To set the tx power as off to turn off the tx power, set auto to let device determine the tx power value automatically, or set manual to set the tx power value. The max value is depending on the wireless module.
Rate: Set the bit rate for wireless interface to supporting multiple bit rates. The value 'Auto' causes the device to use the bit rate selected by the rate control module.
Layer 2 Isolation: It is used in AP mode only. If enabled, all of the clients connect to the same AP will not be able to access each other.
WEP Key Setting: It uses two kinds of WEP Encryption key length: 5-bytes and 13-bytes. The key format can either use 'ASCII' to set the key values (ie. 0~9, a~z) or use 'HEX' to set the key value in hexadecimal. (ie. 0~9, a~f). User can set maximum 4 keys, but only one key will functional at one time.

Figure 3-9-34

†**SSID Security Mode**
Authentication: User can choose which authentication type to secure the wireless network. There are two options for authentication: Disable, WEP.
WEP: Short for Wired Equivalent Privacy, a security protocol for wireless local area networks (WLANs) defined in the 802.11 standard.
Open or Restricted: An open system allows any client to authenticate as long as it conforms to any MAC address filter

policies that may have been set. All authentication packets are transmitted without encryption. If the 'Restricted' selected, all the packets are transmitted with encryption.
Select Key: Check the radio box in front of the key you would like to use for this AP.

Figure 3-9-35

3.9.6 Filtering

The MAC address filter can be used to filter network access by machines based on the unique MAC addresses of their network adapter(s). It is most useful to prevent unauthorized wireless devices from connecting to user's network. A MAC address is a unique ID assigned by the manufacturer of the network adapter.

3.9.6.1 IP Filtering

User can block certain client PCs from accessing this AP based on its IP address. If enabled, user should also configure the IP Filtering Address. This option is only available in router and MESH modes.

† **IP Filtering**
Enable/Disable IP Filtering.

† **IP Address**
Enter the Network IP Address and press <Apply> to filter.

Figure 3-9-36

3.9.6.2 MAC Filtering

User can block certain clients from accessing this AP based on its MAC address. Use Filtering type to define the filtering scenario:

†General

Disabled: Disable this filtering function. If this option is selected, all PCs can access this AP.

Accept: All PCs are filtered out except those MAC addresses in the following MAC address table. In other words, only those interfaces/ PCs with MAC address in the MAC address table can access this AP.

Reject: All PCs/interfaces can access this AP except those interfaces/PCs with MAC address in the MAC address table.

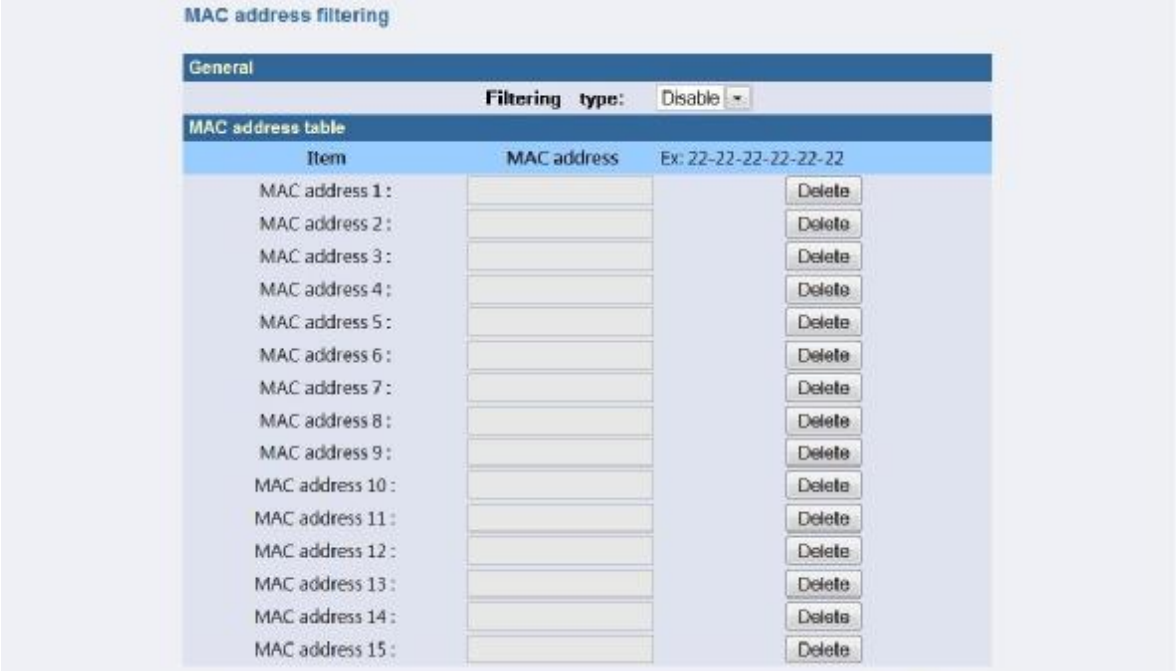

Figure 3-9-37

3.9.7 SNMP

The Outdoor Wireless Access Point support SNMP V1/V2C/V3, this page is to define the SNMP access control and SNMP traps.

3.9.7.1 Basic Setting

†SNMP Agent

Check the <Enable> check box to turn on SNMP. Please Note: Enable the SNMP will also enable the LLDP (Link Layer Discovery Protocol) function. This function will be used if user wants to remote management the AP and draw the network topography.

†System Information

Contact: Specify the contact name for this managed node as well as information about how to contact this person.

Location: It is used to define the location of the host on which the

SNMP agent is running.

† **V1 / V2C**

User can change user's SNMP community settings on this page.
Access Right: Select an access right for the SNMP manager. 'Read' is read only, 'Write' is read-write, and 'Deny' means this community name is not implemented.
Community: Specify the name of community for the SNMP manager.

SNMP Community provides a simple protection by using the community name to control the access to the SNMP. The community name can be thought of as a password. If user doesn't have the correct community name, user can't retrieve any data (get) or make any change (set). Multiple SNMP managers may be organized in a specified community.

† **V3**

The SNMP V3 is a Security Enhancement for SNMP, it provides secure access to devices by a combination of User ID, authenticating and encrypting packets over the network.
User ID: A string representing the name of the user.
Security Level: User can select which security level that user wants to use. The available options for this field are: NoAuthNoPriv, AuthNoPriv or AuthPriv.
Auth Type (Authentication Protocol): An indication of which authentication protocol is used. The available options for this field are: MD5, and SHA.
Auth Passphrase (Authentication Key): A secret key used by the authentication protocol for authenticating messages.
Privacy Protocol: An indication of which privacy protocol is used. The available options for this field is: DES.
Priv Passphrase (Privacy Key): The secret key used by the privacy protocol for encrypting and decrypting messages.
Access Right: Assign the access right for account. The options are:
Unused – The account is disabled.
Read Only – The account has read only access rights.
Read Write – The account has read and writes access rights.
usm – This account will be an usm account and assign access rights by VACM.

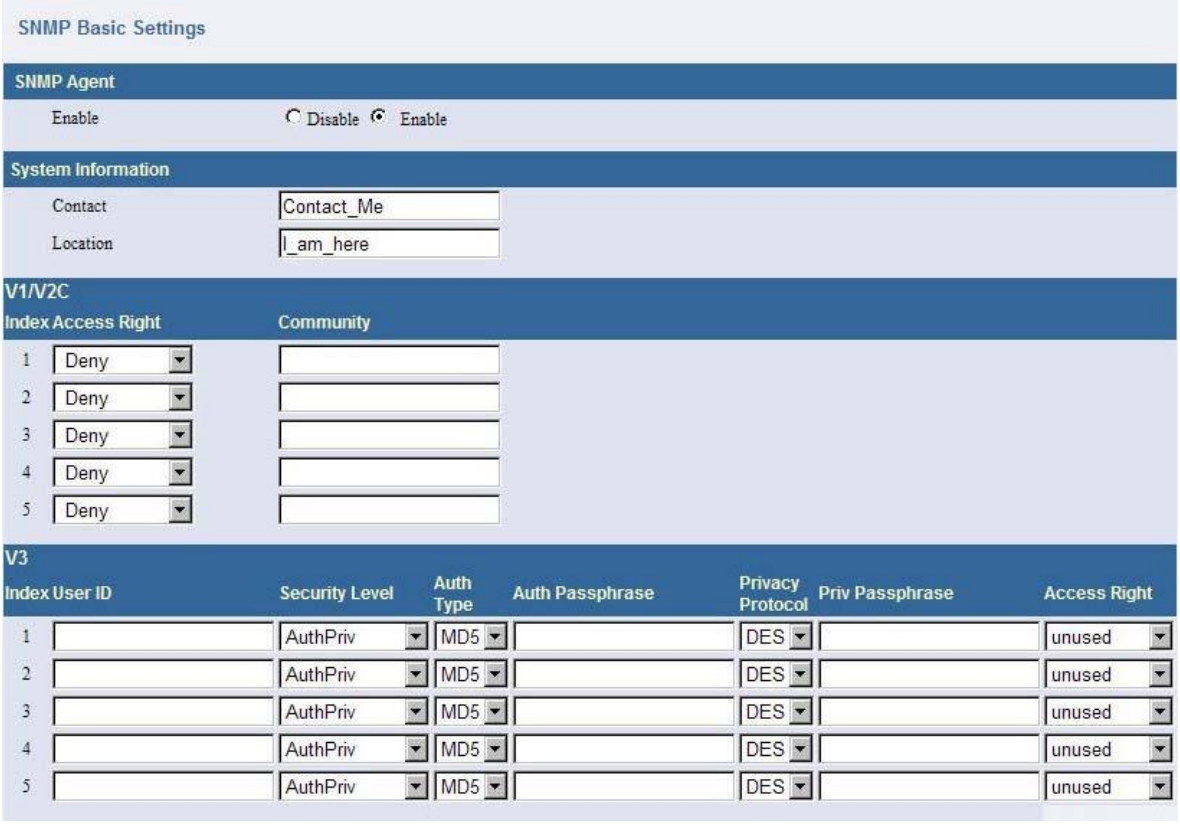

Figure 3-9-38

3.9.7.2 VACM Setting

You can use the View-based Access Control Model (VACM) to define whether access to a specified managed object is authorized. Access control is done at the following points:

- **When processing retrieval request messages from the SNMP manager.**
- **When processing modification request messages from the SNMP manager.**
- **When notification messages must be sent to the SNMP manager.**

The following tokens for VACM access security that you can use:

†Community to Security for V1/V2c

Map the community name (COMMUNITY) into a security name. The Community to Security token takes NAME SOURCE and COMMUNITY options. You can use this token to give SNMPv3 security privileges to SNMPv1 and SNMPv2 users and communities

Index: Index of Community to Security. Tick the checkbox to enable the recordset.

Security Name: is a name that will use by the group table.

IP source: Describes a host or network.

Community: The community name that is used.

†Group

Map the security names into group names. (For SNMP V3, the security Name is the user ID in Basic setting.)
Index: Index of Group. Tick the checkbox to enable the recordset.
Group Name: A group name is given to a group of users and is used when managing their access rights.
Security Model: Assign security model for group.
Security Name: Assign security name for group. This field will obtain from the 'Security Name' of 'Community to Security' when security model is v1 or v2c, or obtain from the 'User ID' of 'usm' when security model is usm.

Figure 3-9-39

† View

Create a view for user to let the groups have rights to view the MIB tree.
Index: Index of View. Tick the checkbox to enable the recordset.
View Name: The name of view.
Include: Assign include or exclude in this record for certain subtree.
Sub Tree: the OID value. For example: '1.3.6.1.2.1'.

Figure 3-9-40

† **Access**

The Access table grants the groups access right to certain views. Each group can have multiple access rights. The most secure access right is chosen.

Index: Index of Access. Tick the checkbox to enable recordset.

Group: Returned and lookup the 'Group Name' from the Group table.

Security model: Specified in the message's msgSecurityModel parameter. The available options for this field are: any, v1, v2c and usm.

Security level: Specified in the message's msgFlags parameter. The available options for this field are: NoAuthNoPriv, AuthNoPriv and AuthPriv.

Read: Specified in the message's msgSecurityModel parameter. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Write: Authorized View Name for write access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Notify: Authorized View Name for notify access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

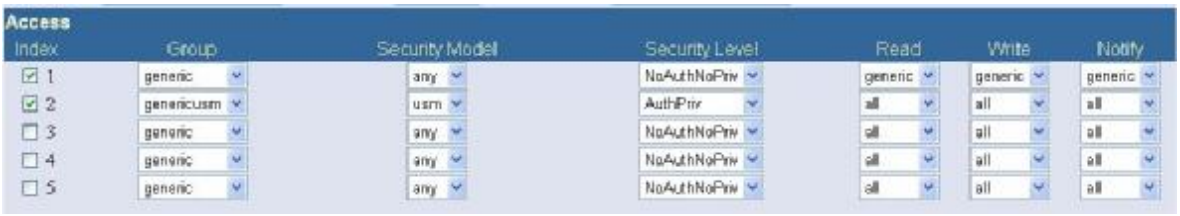

Figure 3-9-41

3.9.7.3 SNMP Trap

It is an SNMP application that uses the SNMP TRAP operation to send information to a network management system.

† **SNMP Trap**

Trap Active: To enable or disable SNMP Trap function.

† **v1 / v2c Trap**

Version: Indicate the traps will be sent in v1 or v2c or not send (disable).

IP Address & Port: The IP and Port to receive traps.

Community: The community string to be used when sending traps.

† **v3 Trap**

Trap: Index of SNMP v3 traps. Tick the checkbox to enable recordset.

User: The usm User ID.

IP Address & Port: The IP and Port of a device to receive traps.
Security Level: Assign security level in this record. The Options are: NoAuthNoPriv, AuthNoPriv, AuthPriv.

Figure 3-9-42

†Trap Items

Enable/Disable which trap items to send.

Figure 3-9-43

3.9.8 Tools

†Command Ping

It runs ping command to test the connection capability of this device with the other Ethernet device.

Figure 3-9-44

3.9.9 Log Out

User can manually logout by click on <Log Out>.

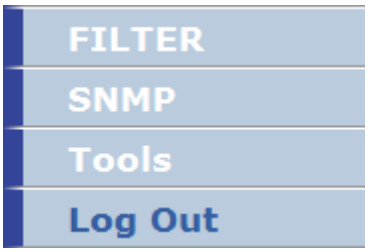

Figure 3-9-45

3.10 AODV_AP Mode

To set this device as a MESH device, the setting and functions as following:

▽ **SYSTEM**
- **Administrator**
- **Firmware**
- **Configuration Tools**
- **General Status**
- **Power Control**
- **WIFI Status**
- **Log**
- **System Time**
- **Reboot**

▽ **WAN**
- **WAN Settings**
- **Bandwidth Management**

▽ **LAN**
- **Eth0 settings**
- **AP WLAN Settings**
- **MESH WLAN Settings**

▽ **MESH**
- **AODV-ADMIN**

▽ **WIRELESS**
- **WIFI AP Setting**
- **WIFI MESH Setting**

▽ **FILTER**
- **IP Filtering**
- **MAC Filtering**

▽ **SNMP**
- **Basic Setting**
- **VACM Setting**
- **Trap Setting**

▽ **Tools**

- **Tools**

▽ **Log Out**

3.10.1 System

This page shows the current status and some basic settings of the device, including Administrator, Firmware, Configuration Tools, General Status, Power Control, WIFI Status, Log, System Time and Reboot; screen as shown in Figure 3-10-1.

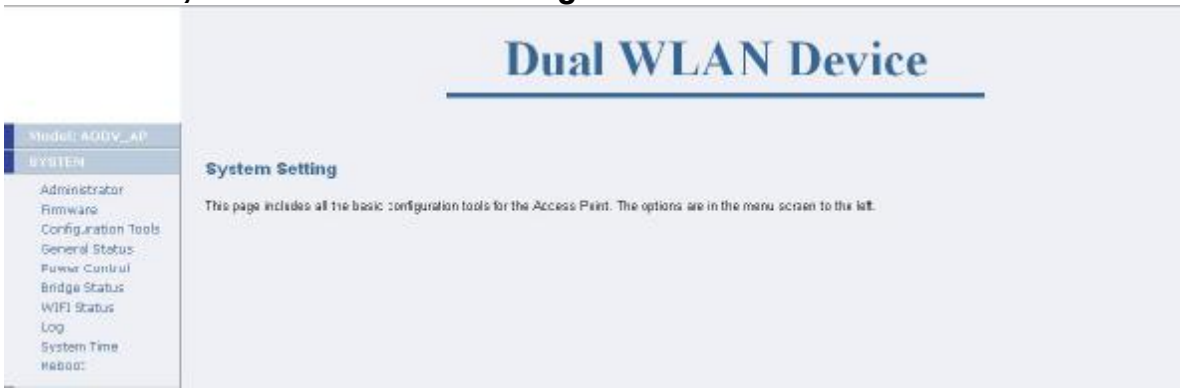

Figure 3-10-1

3.10.1.1 Administrator

By selecting the item of Administrator under System, User will see the screen shown in Figure 3-10-2. These settings allow user to configure the Device Name, Language, Model, Password, Remote Management and WIFI Loading Warning Threshold.

† **Device Name**

This is a host name or system name for the device. The maximum length is 20 characters. User can only input '0'~'9', 'a'~'z', 'A'~'Z', '_' or '-'.

† **Model**

OLSR_AP: To set this device as an AP with layer 3 MESH function.
AODV_AP: To set this device as an AP with layer 2 MESH function.
AP-Bridge: To set this device as a normal AP.
AP-CB-Bridge: To set this device as an AP and Client bridge device.
AP-CB-ROUTE: To set this device as a router device with AP and CB functions.
CB-CB-ROUTE: To set this device as a router device with dual CB functions.
VLAN-AP: To set this device as a VLAN device. Each AP can has it's own VLAN ID.
AP_WDS_BRG: To set this device as a WDS device.
AP4_WDS_BRG: To set this device as WDS and AP device.

Figure 3-10-2

† **Password Settings**

If user wants to change the password for admin account, the user should enter the current password, a new password and, re-type the new password.

The Idle Time Out is the amount of time of inactivity allowed before user proceeds next action. The user needs to re-login if the idle time passes timeout.

† **Remote Management**

User can enable/disable the management of the Access Point from a remote host. Just click on <Enable> button and enter an IP address of the remote host. Then, only the host with the entered IP address can access this device.

† **WIFI Loading Warning Threshold**

The threshold value is used by network management system. Network management software will monitor the WIFI loading, when the loading is over this value, network management software will change the color of the link line on network topology to notify the user about condition of the link quality. The threshold value is between 5 and 25

3.10.1.2 Firmware Update

By selecting the item of Firmware under System, User will see the screen shown in Figure 3-10-3. This page shows current firmware version and date. This page also allow user to using TFTP or WEB or FTP method to upgrade to the new version of firmware.

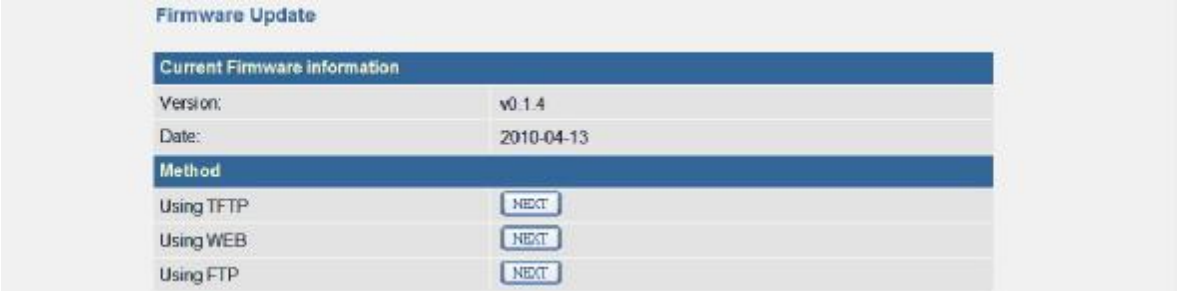

Figure 3-10-3

† **Using TFTP**

On any computer in the network or a computer direct connect to the AP. Install a TFTP Server utility, and put the firmware file named `upgradeFW.tar' in a folder.

Run TFTP utility and specify the folder in which the firmware file located. Enter the TFTP server IP and click on <APPLY> button. At the end of the upgrade process, this device may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

† **Using WEB**

Click on <Browse> button and select the correct firmware file path and file name. Then, click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands while uploading the firmware. This is normal behavior and do not turn off the Access Point while firmware is upgrading.

† **Using FTP**

On FTP server, there should have valid firmware which includes fs-opn.img and/or kernel-opn.img. On the Firmware Update - FTP page, enter the IP address of the FTP server, firmware name and FTP user name and password. Then click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands before the device boots up. This is normal behavior and do not turn off the Access Point while the firmware is upgrading.

3.10.1.3 Configuration Tools

By selecting the item of Configuration Tools under System, the screen will show in Figure 3-10-4. This page includes three selections: Restore Factory Default Configuration, Local Backup settings/Restore settings and Remote Backup Settings/Restore settings.

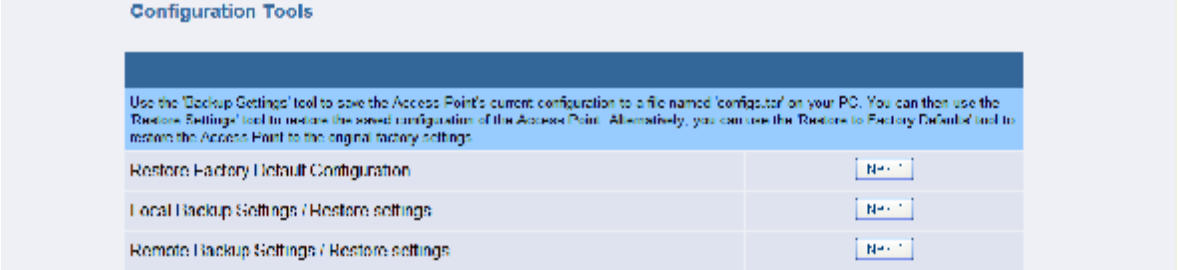

Figure 3-10-4

† **Restore Factory Default Configuration:**

To reset configuration settings to the factory default values, just click on <NEXT> button beside 'Restore Factory Default Configuration'.

Figure 3-10-5

Then click on <Restore> button on next page, now the system will reset to factory default value.

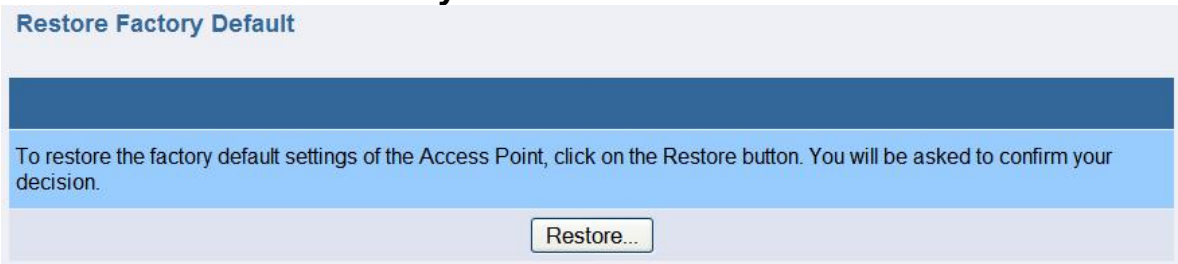

Figure 3-10-6

† **Local Backup Settings / Restore settings**

To backup or restore the configuration for this device. Click on <NEXT> button beside 'Local Backup Settings/Restore settings'.

Figure 3-10-7

Click on <Backup Settings> button on next page to save the settings of this device to a file named 'configs.tar' on user's PC.

To restore the settings, click on <Browse> button and select the correct file path and file name. Then, click on <Restore Settings> button to start the restore settings process.

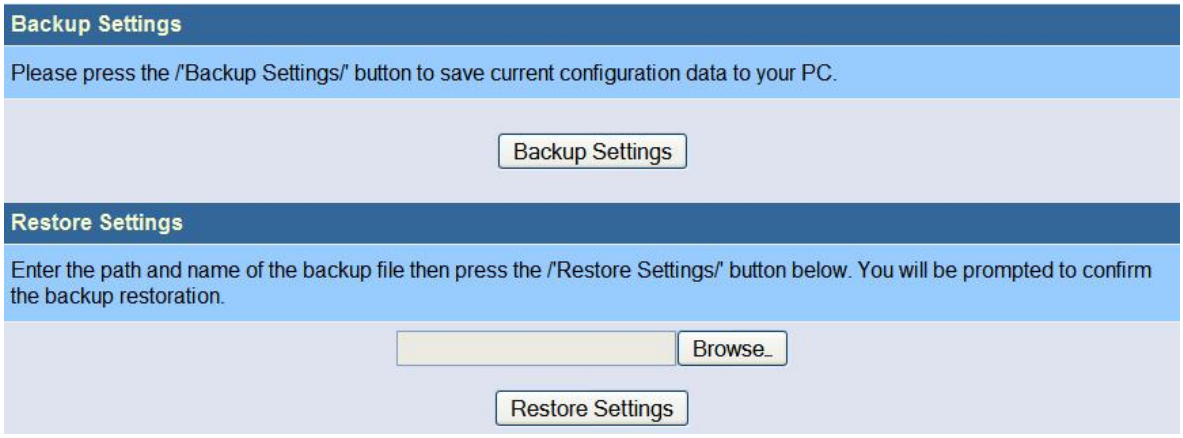

Figure 3-10-8

† Remote Backup Settings / Restore settings

User can also backup/restore the configuration of this device remotely.

Click on <NEXT> button beside `Remote Backup Settings/Restore settings'.

Figure 3-10-9

Enter the necessary setting in next page, then click on <Backup To Server> or <Restore From Server> to start the process.

Figure 3-10-10

3.10.1.4 General Status

In this page user could see the detail settings of this device, including the System Information, Power Control, WAN Port, AODV Status, eth0 LAN Port, MESH WIFI Status, AP WIFI 2 Status.

Figure 3-10-11

3.10.1.5 Power Control

In this page user can enable the eth0 port to provide PoE power and data forwarding function.

Figure 3-10-12

3.10.1.6 WIFI Status

In this page user could see the WIFI information of this device, such as: Interface information, Security information, Associated AP/Station.

Figure 3-10-13

3.10.1.7 Log

In this page user could see the system logs record of this device.

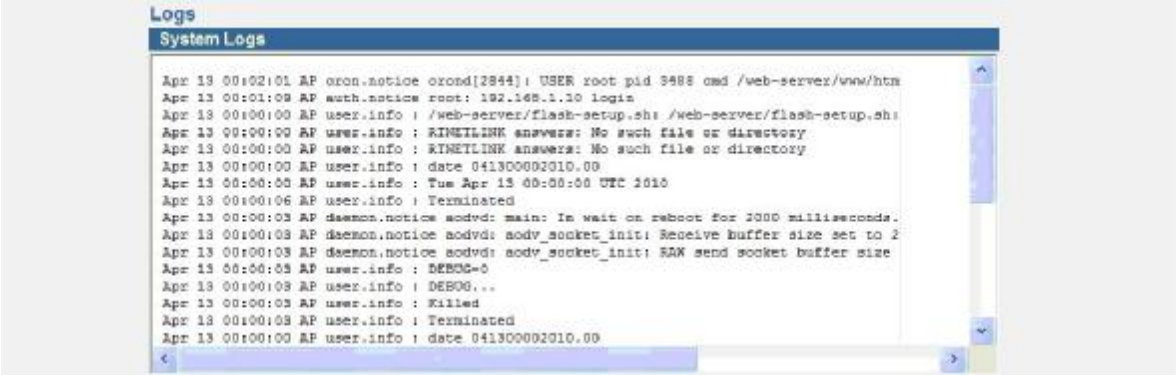

Figure 3-10-14

3.10.1.8 System Time

†Select Setting Type

Setting by: User can set system time in two ways. One is manual setting, the other one is Synchronize with an Internet Time Server.

†Manual Setting

User can manually enter the Year/ Month/ Day and Hour: Minute: Second.

†Using Internet Time Server

Hours from GMT: User can enter the Hours from GMT, for example Taiwan is GMT +8 Hours.

Server IP: User should enter the Internet time server IP address here.

Time Update for Every: User can set time update interval by

enter the days, hours, and minutes.

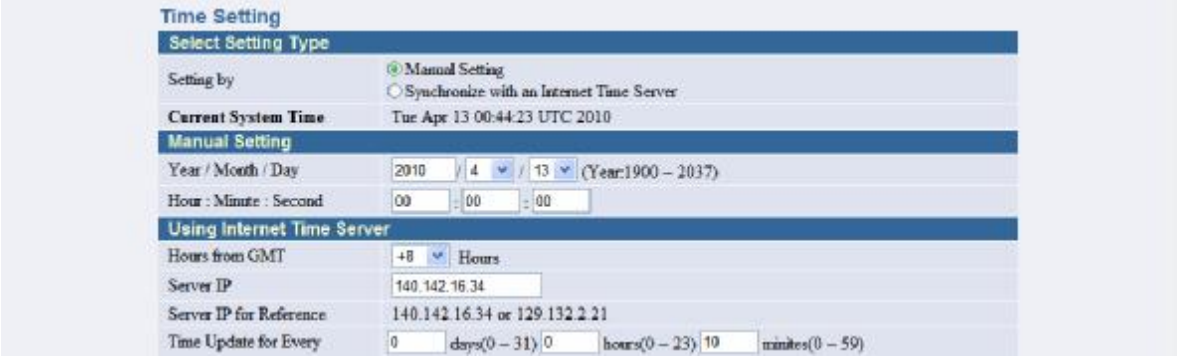

Figure 3-10-15

3.10.1.9 Reboot

User can perform reboot function in case of the device is not function normally, or after user change some major settings for example: change system model. The existing settings will not be changed. To perform the reboot, click on the <Reboot> button and click on <OK> on pop-up screen to confirm user's decision.

Figure 3-10-15

3.10.2 WAN Configuration

3.10.2.1 WAN Settings

This function is to establish a connection with user's WAN network and also assign the IP to the host behind this AP.

† Network IP Parameters

User can change the network settings of this interface from WAN configuration; it is including IP address, Subnet mask, Gateway address and enable/disable the DHCP server Function.

† DHCP Server Parameters

Primary / Secondary DNS Address: The domain-name-servers option specifies a list of Domain Name System name servers available to the client

IP Pool Starting / Ending Address: The IP Address range which will be assigned.

Lease Time: How long does the IP address can be leased by DHCP server.

Figure 3-10-16

3.10.2.2 Bandwidth Management

This function allows user to set the limitation of total upload/download bandwidth on WAN interface, and also can set the limitation of upload/download bandwidth for each user or a group of users by IP address.

†Bandwidth Management

Bandwidth Management: Enable bandwidth limitation function.
Upload Bandwidth: The total upload bandwidth (in Mbps).
Download Bandwidth: The total download bandwidth (in Mbps).

†Bandwidth Limitation

Action: To set the action type of bandwidth limitation. The options available here are: disable, upload, download and upload/download.
Start IP Address: To set the start IP of bandwidth limitation.
End IP Address: To set the end IP of bandwidth limitation.
Bandwidth Limitation: To set the bandwidth (in Kbps) of bandwidth limitation.
User can press <Add> button to add IP address to the Bandwidth Limitation list.
User can tick the check box and press <Del> button to delete the IP address from the Bandwidth Limitation list.

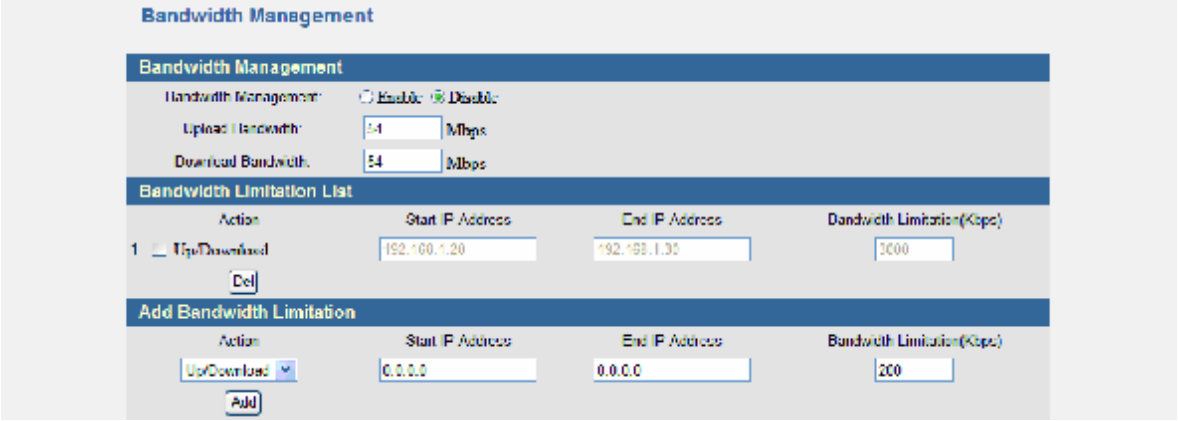

Figure 3-10-17

3.10.3 LAN Configuration

3.10.3.1 Eth0 Settings

† **Network IP Parameters**

User can change the network settings of this interface from LAN configuration; it is including IP address, Subnet mask, and enable/disable the DHCP server Function.

† **DHCP Server Parameters**

Primary / Secondary DNS Address: The domain-name-servers option specifies a list of Domain Name System name servers available to the client

IP Pool Starting / Ending Address: The IP Address range which will be assigned.

Lease Time: How long does the IP address can be leased by DHCP server.

Figure 3-10-18

3.10.3.2 AP WLAN Settings

User can change the local network settings from LAN Configuration for ath4 interface, which include the IP address, Subnet mask, and DHCP server related settings.

† **Network IP Parameters**

User can change the network settings of this interface from LAN configuration; it is including IP address, Subnet mask, Gateway address and enable/disable the DHCP server Function.

† **DHCP Server Parameters**

Primary DNS Address: The domain-name-servers option specifies a primary Domain Name System servers available to the client.

Secondary DNS Address: In same case user can specifies a secondary Domain Name System servers available to the client.

IP Pool Starting/Ending Address: The range of IP addresses which can be assigned to the client.

Lease Time: How long does the IP address can be leased by DHCP server.

Figure 3-10-19

3.10.3.3 MESH WLAN Settings

User can configure the IP address for MESH ath0 interface in here. The IP address for MESH ath0 must be in the same subnet with other MESH device's ath0 interface, and must be in different subnet with WAN, AP WLAN IP address.

† Network IP Parameters

IP Address: The IP address of the AP on the MESH network.

Subnet Mask: The subnet mask of the IP address.

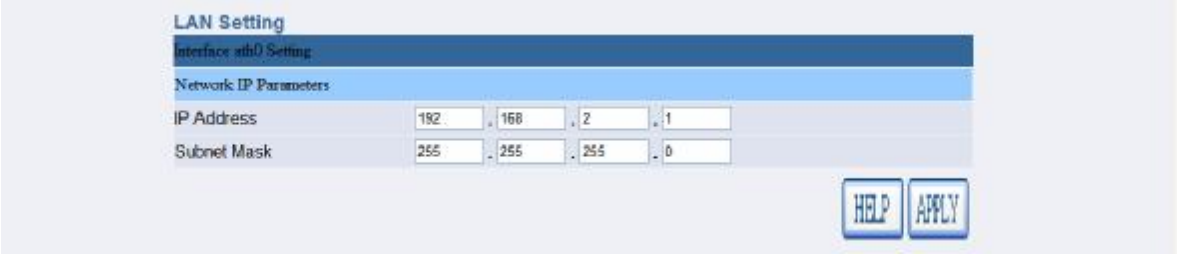

Figure 3-10-20

3.10.4 MESH

This page will show the mesh information.

3.10.4.1 AODV-ADMIN

This page allows user to set AODV Admin settings.

† AODV Parameters Setting

Active Internet: It will provide interfaces to provide internet. When set 'on', the eth1 will be the interface to internet. The default gateway is set within WAN setting page. When set 'off', the default gateway will set on the AODV interface (ath0).
RREQ Gratuitous: Force the gratuitous flag to be set on all RREQs.
Active Hellos: Send HELLOs or not when forwarding data.
Unidir Hack: Detect and avoid unidirectional links.
Hello Interval: The time interval of sending HELLO packet.
Expanding Ring Search: Expanding ring search for RREQs On or Off.
Local Repaire: Enable local repair (repair routing table).
Net Diameter: Net diameter, it measures the maximum possible number of hops between two nodes in the network.
Node Travesal Time: It is a conservative estimate of the average one hop traversal time for packets and should include queuing delays, interrupt processing times and transfer times.
Active Route Timeout: It is the lifetime of an active route. The unit is msec. Select the mobility of nodes on aodv network, Static: active_route_timeout will set as 15000, Dynamic: active_route_timeout=3000. Manual: user can enter the value manually.

†AODV Advance Setting
Timeout Buffer: Its purpose is to provide a buffer for the timeout so that if the RREP is delayed due to congestion, a timeout is less likely to occur while the RREP is still en-route back to the source.
Wait On Reboot: Wait on reboot delay, then, begin to run rec/tx packages.

3.10.5 Wireless

User can set the wireless related setting here.

Figure 3-10-21

3.10.5.1 WIFI AP Setting

†General

Radio Power: Turn this interface on or off.
Wireless Mode: Select which wireless mode that you want to use. The options available here are: 802.11a, 802.11b, 802.11g and 802.11b+g.
SSID: The SSID (service set identifier) is an identifier of an AP in user's wireless network. The SSID must be identical for all access points in the network. It is case sensitive and maximum length is 32.
SSID Hide: This function is to hide the SSID in the wireless network.
Channel: Set the operating frequency/channel for this device.

Figure 3-10-22

† **Advanced Settings**

Peer Node Distance: Set the distance between this device and it's adjacent. If select 'manual', the distance will be determined by 'Slot time', 'ACK timeout' and 'CTS timeout' three values.
Beacon Period: This item contains the length of the beacon interval. Enter a value between 20 and 1000 to specify the Beacon Period.
DTIM Period: This item contains the number of Beacon intervals between Delivery Traffic Indication Message (DTIM). Enter a number between 1 and 255 to specify.
Fragment Threshold: It is the maximum frame size that wireless device can transmit without fragmenting the frame. Enter a value between 256 and 2346 to specify the Fragment Threshold.
RTS/CTS Threshold: Packets larger than the value are transmitted by the RTS/CTS handshake. Enter a value between 1 and 2346 to specify the value of the RTS /CTS Threshold.
Tx Power: To set the tx power as off to turn off the tx power, set auto to let device determine the tx power value automatically, or set manual to set the tx power value. The max value is depending on the wireless module.
Rate: Set the bit rate for wireless interface to supporting multiple bit rates. The value 'Auto' causes the device to use the bit rate selected by the rate control module.
Layer 2 Isolation: It is used in AP mode only. If enabled, all of the clients connect to the same AP will not be able to access each other.
WEP Key Setting: It uses two kinds of WEP Encryption key length: 5-bytes and 13-bytes. The key format can either use 'ASCII' to

set the key values (ie. 0~9, a~z) or use 'HEX' to set the key value in hexadecimal. (ie. 0~9, a~f). User can set maximum 4 keys, but only one key will functional at one time.

Figure 3-10-23

†**SSID Security Mode**

Authentication: User can choose which authentication type to secure the wireless network. There are four options for authentication: Disable, WEP, WPA-personal and WPA-enterprise.

WEP: Short for Wired Equivalent Privacy, a security protocol for wireless local area networks (WLANs) defined in the 802.11 standard.

Open or Restricted: An open system allows any client to authenticate as long as it conforms to any MAC address filter policies that may have been set. All authentication packets are transmitted without encryption. If the 'Restricted' selected, all the packets are transmitted with encryption.

Select Key: Check the radio box in front of the key that user would like to use for this AP.

Figure 3-10-24

WPA-Personal: The method of authentication is similar to WEP, user can define a 'Pre-Shared Key', once the key is confirmed and satisfied on both the client and access point, then access is granted. The encryption method used is referred to as the Temporal Key Integrity Protocol (TKIP).
WPA MODE: In this setting, user can choose WPA or WPA2 or WPA & WPA2. (WPA2 is far superior to WPA, because the encryption of method used is Advanced Encryption Standard (AES)).
Share Key: User should define the pre-share key in here; the length of the key is 8-23 characters.
WPA Encryption: User can choose the encryption method of the pre-shared key here; there are three options: Auto, AES and TKIP.
Group Key Update Interval: Time interval for rekeying the GTK (broadcast/multicast encryption keys) in seconds.

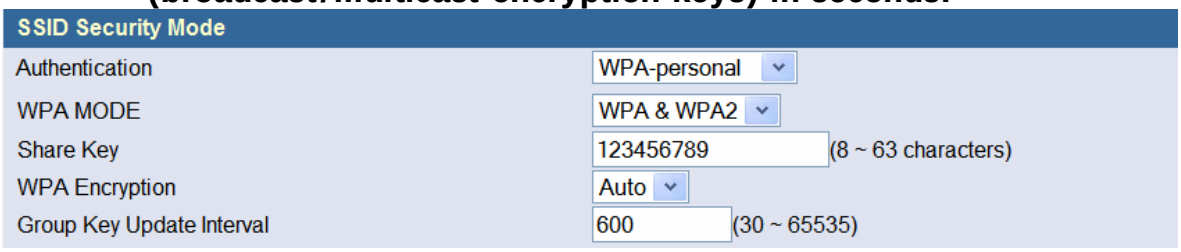

Figure 3-10-25

WPA-enterprise:
WPA-Enterprise includes all of the features of WPA-PSK plus support the 802.1x authentication. To use this function, a separate RADIUS server is required. User should enter the IP and port number of the Authentication Server and Shared Secret here. In case if a backup server has been deployed in user's network, user can also enter the necessary information here.

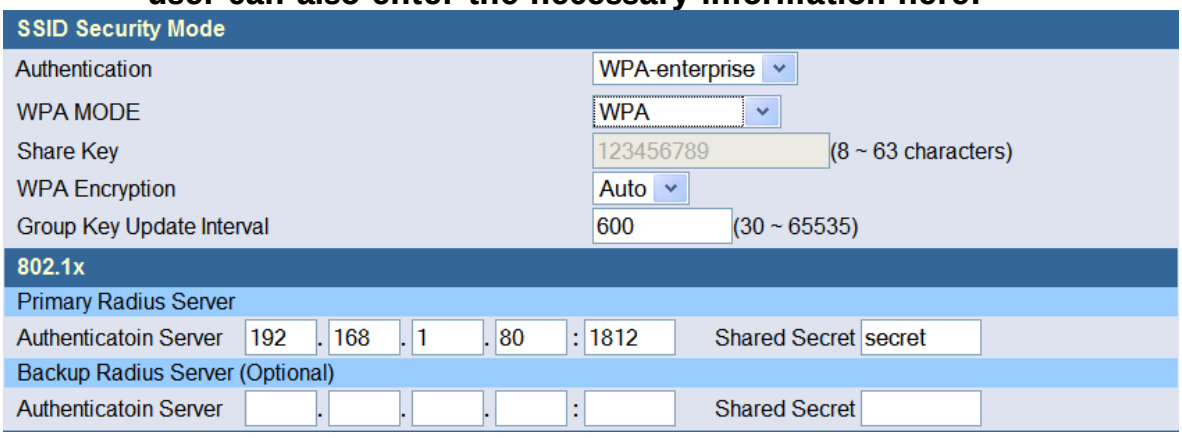

Figure 3-10-26

† QoS
WMM: Enable/disable WMM support.
MAX Associated Station: Maximum number of stations allowed in station table.

Common Parameters:
CWmin: Minimum Contention Window. The valid values for 'CWmin' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047, or 4095. The value for 'CWmin' must be lower than the value for 'CWmax'.
CWmax: Maximum Contention Window. The Valid values for 'CWmax' are 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047 or 4095. The value for 'CWmax' must be higher than the value for 'CWmin'.
AIFS: Arbitration Inter-Frame Spacing.
Burst: Maximum length (in milliseconds with precision of up to 0.1 ms) for bursting.

AP Parameters:
This affects traffic flowing from the access point to the client station. These parameters are used by the access point when transmitting frames to the clients.

AP Tx-Best Effort: Medium Priority. Medium throughput and delay. Most traditional IP data is sent to this queue.
AP Tx-Background: Low Priority. High throughput. Bulk data that requires maximum throughput and is not time-sensitive is sent to this queue (FTP data, for example).
AP Tx-Video: High Priority. Minimum delay. Time-sensitive video data is automatically sent to this queue.
AP Tx-Voice: High Priority. Time-sensitive data like VoIP and streaming media are automatically sent to this queue.

STA Parameters:
These parameters are sent to WMM clients when they associate. The parameters will be used by WMM clients for frames transmitted to the access point.
STA Tx-Best Effort: Medium Priority, Medium throughput and delay. Most traditional IP data will be sending to this queue.
STA Tx-Background: Low Priority, High throughput. Bulk data that requires maximum throughput and it's not time-sensitive will be sending to this queue (FTP data, for example).
STA Tx-Video: High Priority, Minimum delay. Time-sensitive video data will be automatically sent to this queue.
STA Tx-Voice: High Priority, Time-sensitive data like VoIP and streaming media are automatically sent to this queue.
TXOP: Transmission Opportunity is an interval of time when a WMM Client Station has the right to initiate transmissions onto the wireless medium (WM). This value specifies (in milliseconds) the Transmission Opportunity (TXOP) for Client Station; that is, the interval of time when the WMM AP has the right to initiate transmissions on the wireless network.

ACM: Admission control mandatory.

Figure 3-10-27

3.10.5.2 WIFI MESH Setting

†General

Radio Power: Turn this interface on or off.

Wireless Mode: Select which wireless mode that you want to use. The options available here are: 802.11a, 802.11b, 802.11g and 802.11b+g.

SSID: The SSID (service set identifier) is an identifier of an AP in user's wireless network. The SSID must be identical for all access points in the network. It is case sensitive and maximum length is 32.

SSID Hide: This function is to hide the SSID in the wireless network.

Channel: Set the operating frequency/channel for this device.

Figure 3-10-28

†Advanced Settings

Peer Node Distance: Set the distance between this device and it's adjacent. If select 'manual', the distance will be determined by 'Slot time', 'ACK timeout' and 'CTS timeout' three values.

Beacon Period: This item contains the length of the beacon interval. Enter a value between 20 and 1000 to specify the Beacon Period.

DTIM Period: This item contains the number of Beacon intervals between Delivery Traffic Indication Message (DTIM). Enter a number between 1 and 255 to specify.

Fragment Threshold: It is the maximum frame size that wireless device can transmit without fragmenting the frame. Enter a value between 256 and 2346 to specify the Fragment Threshold.

RTS/CTS Threshold: Packets larger than the value are transmitted by the RTS/CTS handshake. Enter a value between 1 and 2346 to specify the value of the RTS /CTS Threshold.

Tx Power: To set the tx power as off to turn off the tx power, set auto to let device determine the tx power value automatically, or set manual to set the tx power value. The max value is depending on the wireless module.

Rate: Set the bit rate for wireless interface to supporting multiple bit rates. The value 'Auto' causes the device to use the bit rate selected by the rate control module.

Layer 2 Isolation: It is used in AP mode only. If enabled, all of the clients connect to the same AP will not be able to access each other.

WEP Key Setting: It uses two kinds of WEP Encryption key length: 5-bytes and 13-bytes. The key format can either use 'ASCII' to set the key values (ie. 0~9, a~z) or use 'HEX' to set the key value in hexadecimal. (ie. 0~9, a~f). User can set maximum 4 keys, but only one key will functional at one time.

Figure 3-10-29

†SSID Security Mode

Authentication: User can choose which authentication type to secure the wireless network. There are four options for authentication: Disable, WEP, WPA-personal and WPA-enterprise.

WEP: Short for Wired Equivalent Privacy, a security protocol for wireless local area networks (WLANs) defined in the 802.11 standard.

Open or Restricted: An open system allows any client to authenticate as long as it conforms to any MAC address filter policies that may have been set. All authentication packets are transmitted without encryption. If the 'Restricted' selected, all the packets are transmitted with encryption.

Select Key: Check the radio box in front of the key that user would like to use for this AP.

Figure 3-10-30

3.10.6 Filtering

The MAC address filter can be used to filter network access by machines based on the unique MAC addresses of their network adapter(s). It is most useful to prevent unauthorized wireless devices from connecting to user's network. A MAC address is a unique ID assigned by the manufacturer of the network adapter.

3.10.6.1 IP Filtering

User can block certain client PCs from accessing this AP based on its IP address. If enabled, user should also configure the IP Filtering Address. This option is only available in router and MESH modes.

† **IP Filtering**

Enable/Disable IP Filtering.

† **IP Address**

Enter the Network IP Address and press <Apply> to filter.

Figure 3-10-31

3.10.7.2 MAC Filtering

User can block certain clients from accessing this AP based on its MAC address. Use Filtering type to define the filtering scenario:

†General

Disabled: Disable this filtering function. If this option is selected, all PCs can access this AP.

Accept: All PCs are filtered out except those MAC addresses in the following MAC address table. In other words, only those interfaces/ PCs with MAC address in the MAC address table can access this AP.

Reject: Only PCs/interfaces with MAC addresses in the following MAC address table are 'included' in the filtering list. In other words, all PCs/interfaces can access this AP except those interfaces/PCs with MAC address in the MAC address table.

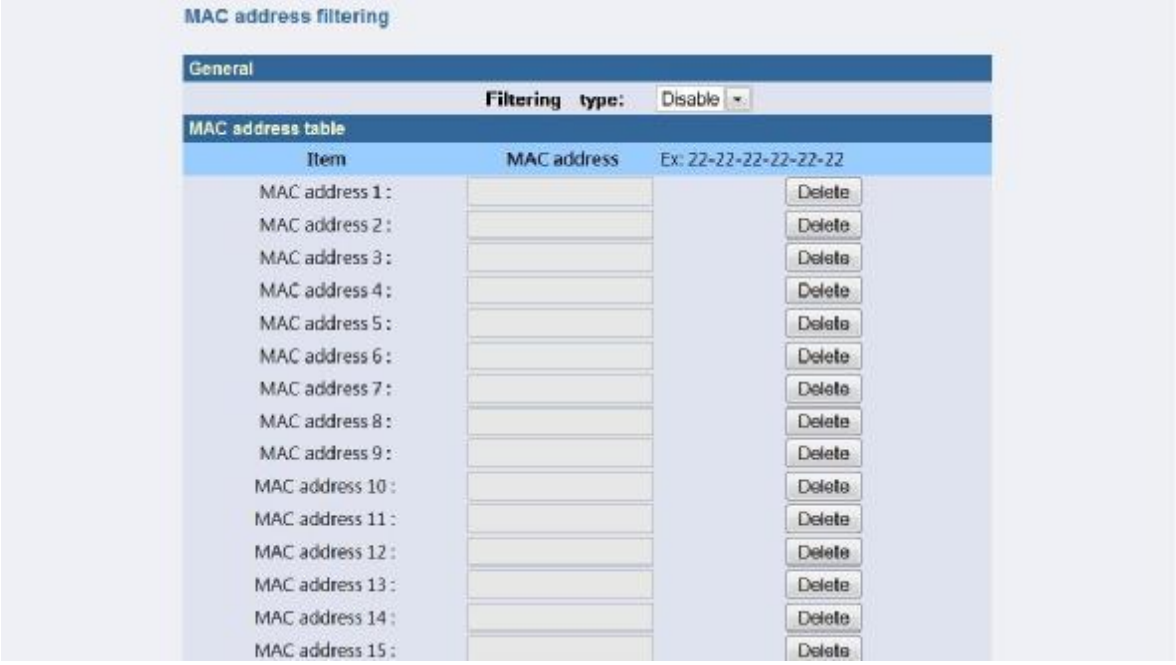

Figure 3-10-32

3.10.7 SNMP

The Outdoor Wireless Access Point support SNMP V1/V2C/V3, this page is to define the SNMP access control and SNMP traps.

3.10.7.1 Basic Setting

†SNMP Agent

Check the <Enable> check box to turn on SNMP. Please Note: Enable the SNMP will also enable the LLDP (Link Layer Discovery Protocol) function. This function will be used if user wants to remote management the AP and draw the network topography.

†System Information

Contact: Specify the contact name for this managed node as well as information about how to contact this person.
Location: It is used to define the location of the host on which the SNMP agent is running.

† **V1 / V2C**

User can change user's SNMP community settings on this screen.
Access Right: Select an access right for the SNMP manager. 'Read' is read only, 'Write' is read-write, and 'Deny' means this community name is not implemented.
Community: Specify the name of community for the SNMP manager.
SNMP Community provides a simple protection by using the community name to control the access to the SNMP. The community name can be thought of as a password. If user doesn't have the correct community name, user can't retrieve any data (get) or make any change (set). Multiple SNMP managers may be organized in a specified community.

† **V3**

The SNMP V3 is a Security Enhancement for SNMP, it provides secure access to devices by a combination of User ID, authenticating and encrypting packets over the network.
User ID: A string representing the name of the user.
Security Level: User can select which security level that user wants to use. The available options for this field are: NoAuthNoPriv, AuthNoPriv or AuthPriv.
Auth Type (Authentication Protocol): An indication of which authentication protocol is used. The available options for this field are: MD5, and SHA.
Auth Passphrase (Authentication Key): A secret key used by the authentication protocol for authenticating messages.
Privacy Protocol: An indication of which privacy protocol is used. The available options for this field is: DES.
Priv Passphrase (Privacy Key): The secret key used by the privacy protocol for encrypting and decrypting messages.
Access Right: Assign the access right for account. The options are:
Unused − The account is disabled.
Read Only − The account has read only access rights.
Read Write − The account has read and writes access rights.
usm − This account will be an usm account and assign access rights by VACM.

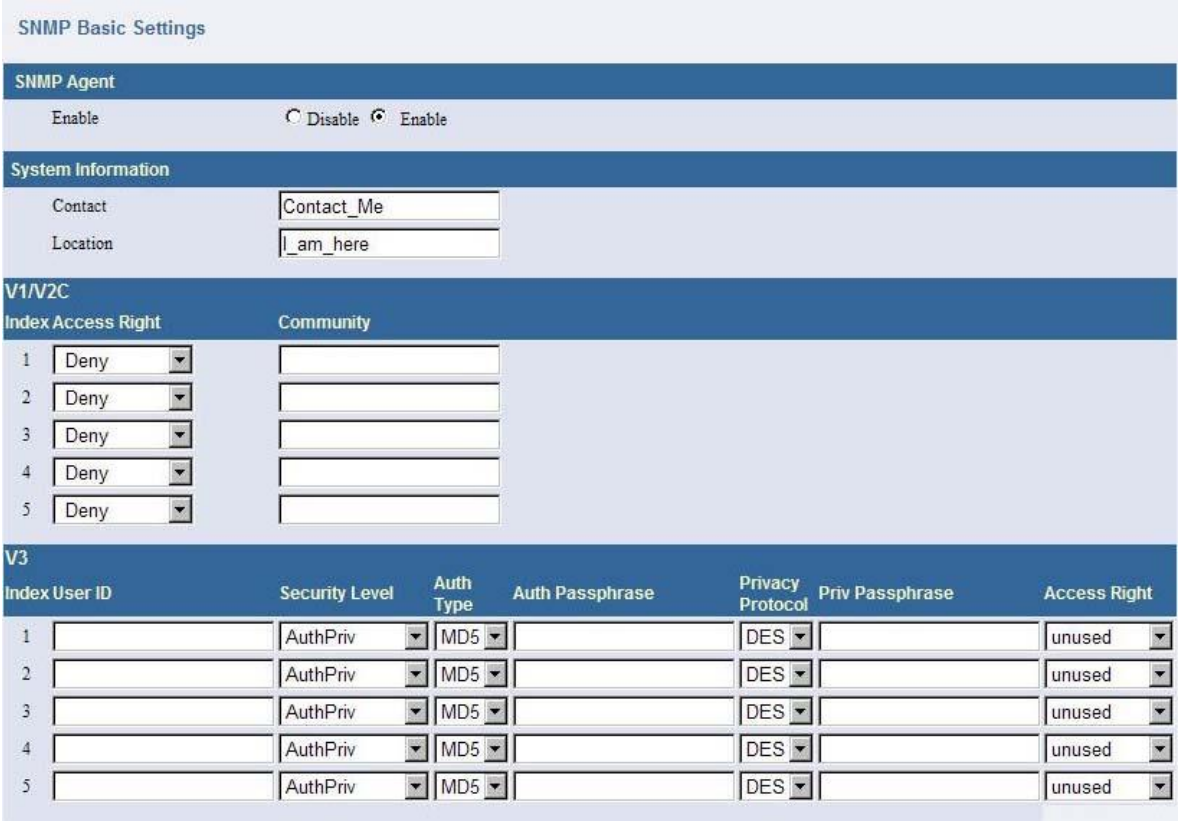

Figure 3-10-33

3.10.8.2 VACM Setting

You can use the View-based Access Control Model (VACM) to define whether access to a specified managed object is authorized. Access control is done at the following points:

- **When processing retrieval request messages from the SNMP manager.**
- **When processing modification request messages from the SNMP manager.**
- **When notification messages must be sent to the SNMP manager.**

The following tokens for VACM access security that you can use:

†Community to Security for V1/V2c

Map the community name (COMMUNITY) into a security name. The Community to Security token takes NAME SOURCE and COMMUNITY options. You can use this token to give SNMPv3 security privileges to SNMPv1 and SNMPv2 users and communities

Index: Index of Community to Security. Tick the checkbox to enable the recordset.

Security Name: is a name that will use by the group table.

IP source: Describes a host or network.

Community: The community name that is used.

†Group

Map the security names into group names. (For SNMP V3, the security Name is the user ID in Basic setting.)
Index: Index of Group. Tick the checkbox to enable the recordset.
Group Name: A group name is given to a group of users and is used when managing their access rights.
Security Model: Assign security model for group.
Security Name: Assign security name for group. This field will obtain from the 'Security Name' of 'Community to Security' when security model is v1 or v2c, or obtain from the 'User ID' of 'usm' when security model is usm.

Figure 3-10-34

† **View**

Create a view for user to let the groups have rights to view the MIB tree.
Index: Index of View. Tick the checkbox to enable the recordset.
View Name: The name of view.
Include: Assign include or exclude in this record for certain subtree.
Sub Tree: the OID value. For example: '1.3.6.1.2.1'.

Figure 3-10-35

† **Access**

The Access table grants the groups access right to certain views. Each group can have multiple access rights. The most secure access right is chosen.

Index: Index of Access. Tick the checkbox to enable recordset.

Group: Returned and lookup the 'Group Name' from the Group table.

Security model: Specified in the message's msgSecurityModel parameter. The available options for this field are: any, v1, v2c and usm.

Security level: Specified in the message's msgFlags parameter. The available options for this field are: NoAuthNoPriv, AuthNoPriv and AuthPriv.

Read: Specified in the message's msgSecurityModel parameter. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Write: Authorized View Name for write access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

Notify: Authorized View Name for notify access. The available options for this field are: all, none, mib2 and the 'View Name' from View table.

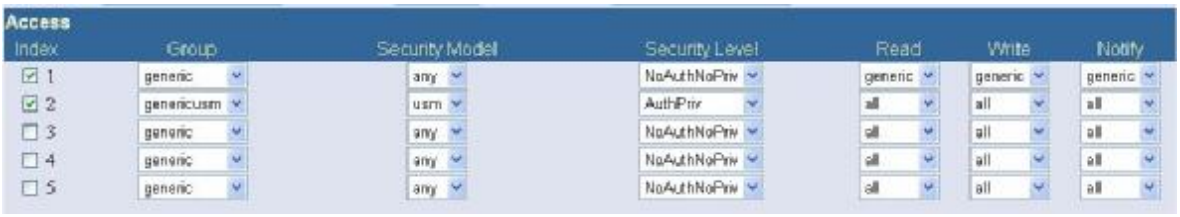

Figure 3-10-36

3.10.7.3 SNMP Trap

It is an SNMP application that uses the SNMP TRAP operation to send information to a network management system.

† **SNMP Trap**

Trap Active: To enable or disable SNMP Trap function.

† **v1 / v2c Trap**

Version: Indicate the traps will be sent in v1 or v2c or not send (disable).

IP Address & Port: The IP and Port to receive traps.

Community: The community string to be used when sending traps.

† **v3 Trap**

Trap: Index of SNMP v3 traps. Tick the checkbox to enable recordset.

User: The usm User ID.

IP Address & Port: The IP and Port of a device to receive traps.

Security Level: Assign security level in this record. The Options are: NoAuthNoPriv, AuthNoPriv, AuthPriv.

Figure 3-10-37

†Trap Items

Enable/Disable which trap items to send.

Figure 3-10-38

3.10.8 Tools

†Command Ping

It runs ping command to test the connection capability of this device with the other Ethernet device.

Figure 3-10-39

3.10.9 Log Out

User can manually logout by click on <Log Out>.

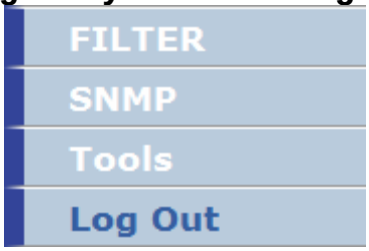

Figure 3-10-40

Caution The Part 15 radio device operates on a non-interference basis with other devices operating at this frequency when using integrated antennas. Any changes or modification to the product not expressly approved by Original Manufacture could void the user's authority to operate this device.

Caution To meet regulatory restrictions and the safety of the installation, strongly recommends this product to be professionally installed.