



廠牌: 益網科技股份有限公司  
器材名稱: Hardened Dual Radio Multi-function Wireless Device  
型號: WA4281

## User's Manual



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

# **User's Manual**

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**Release 1.0**

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## 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 聲語**

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.

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## Overview of this user's manual

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- 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
- IP68 Hardened standard
- Net Weight: 2600g

## 1-2. Specification

General	
<b>Data Rates</b>	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
<b>Standards</b>	IEEE802.11 a/b/g, IEEE802.1x, IEEE802.3, IEEE802.3u, IEEE802.3af
<b>Radio Technology</b>	802.11a / OFDM, 802.11b / DSSS, 802.11g/ OFDM
<b>Modulation Type</b>	64QAM, 16QAM, QPSK, BPSK for OFDM CCK, DQPSK, DBPSK for DSSS
<b>Channel Spacing</b>	11a 20MHz / 11b/g 5MHz
<b>11b/g Frequency Range (Number Of Channel)</b>	FCC/NCC: 2412MHz ~ 2462MHz (11) CE: 2412MHz ~ 24&2MHz (13)
<b>11a Frequency Range (Number Of Channel)</b>	FCC:5150~5250MHz(4ch) / 5725~5825MHz(4ch) NCC:5250~5350MHz /5725~5850MHz CE: 5150~5250MHz / 5470~5725MHz
<b>Power Requirements</b>	Active Ethernet (Power over Ethernet) 48 VDC/1A External Power Unit: Auto sensing 100/240 VAC; 50/60 Hz
<b>Regulation Certifications</b>	FCC/CE (by request), IP68
Hard Ware Information	
<b>CPU</b>	Intel IXP 425 533MHz network processor
<b>Interface</b>	1* RJ-45 Ethernet Port (for POE input) 1* RJ-45 Ethernet Port (for POE power forwarding)
<b>Flash</b>	16MB
<b>Memory</b>	64MB SDRAM
RF Information	
<b>Output power (+1.5/-1.5dBm)</b>	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:

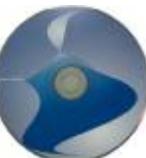
	<p>802.11a: 2mW/MHz      802.11b (Ch1~Ch13): 5mW/MHz      802.11b (Ch14): 5mW/MHz      802.11g (Ch1~Ch13): 3mW/MHz</p> <p>For Taiwan:</p> <p>2.4GHz</p> <p>802.11b: 20.4dBm      802.11g: 25.7dBm      5GHz (5.25~5.35GHz band)      802.11a: 13.8dBm      5GHz (5.725~5.85GHz band)      802.11a: 27.3dBm</p>
<b>Sensitivity (Typical)</b>	<p>802.11a -91dBm @ 6Mbps, -72dBm @ 54Mbps      802.11b -97dBm @ 1Mbps, -88dBm @ 11Mbps      802.11g -91dBm @ 6Mbps, -74dBm @ 54Mbps</p>
<b>Networking Information</b>	
<b>Topology</b>	Ad-Hoc, Infrastructure
<b>Operation Model</b>	OLSR_AP, AODV_AP, AP-Bridge, AP-CB-Bridge, AP-CB-ROUTE, CB-CB-ROUTE, VLAN-AP , AP_WDS_BRG, AP4_WDS_BRG
<b>SSID</b>	Multiple SSID
<b>Interface</b>	Two 10/100Mbps RJ-45 LAN Ports
<b>Security</b>	<ul style="list-style-type: none"> <li>• IEEE802.1x / RADIUS Client (TTLS, PEAP) Support in AP Mode</li> <li>• IEEE802.1x Supplicant (TTLS, PEAP) support in Client Bridge Mode</li> <li>• WPA-WiFi Protected Access</li> <li>• WPA2 (802.11i)</li> <li>• WEP 64,128 bits</li> <li>• IP address filtering</li> <li>• MAC address filtering</li> <li>• Layer2 Isolation</li> <li>• VLAN tunneling Support</li> <li>• Hide SSID</li> <li>• Rogue AP Scan</li> </ul>
<b>STP/RSTP</b>	STP/RSTP
<b>QOS</b>	WMM
<b>Bandwidth limitation</b>	Traffic shaping by IP address in MESH and ROUTE mode
<b>Management Features</b>	

<b>IP Auto-configuration</b>	DHCP client/ server
<b>SNMP</b>	V1/V2c/V3
<b>LLDP</b>	Link Layer Discovery Protocol
<b>NTP</b>	Support NTP client
<b>Remote Configuration</b>	Web-based configuration (HTTP/HTTPS)
<b>Firmware Upgrade</b>	Upgrade firmware via WEB, TFTP and FTP
<b>Max Client</b>	32 users (simultaneously) per radio
<b>Network management</b>	English
<b>Environmental Temperature Range</b>	<ul style="list-style-type: none"> <li>• Operating: -30°C to 80°C</li> <li>• Storage: -40°C to 80°C</li> </ul>
<b>Humidity (non-condensing)</b>	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:

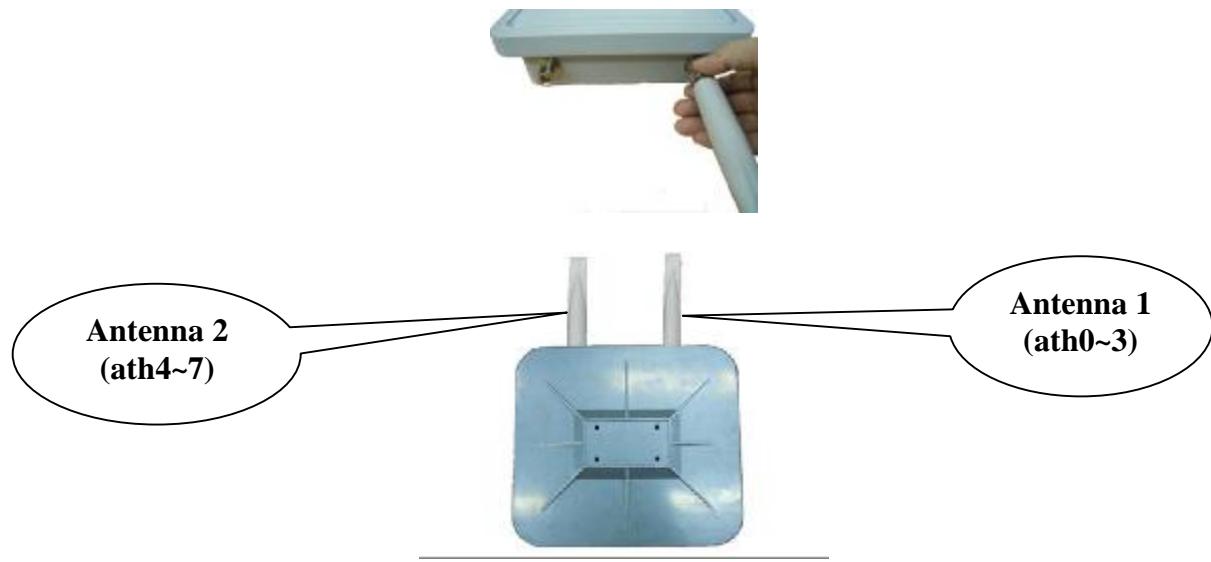
† eth1: For connecting the RJ-45 CAT-5 Ethernet cable to receiving the power and for user to configure the Access Point.

† eth0: For connecting and provide power to outer device, such as IPCAM. By default it is disabled.



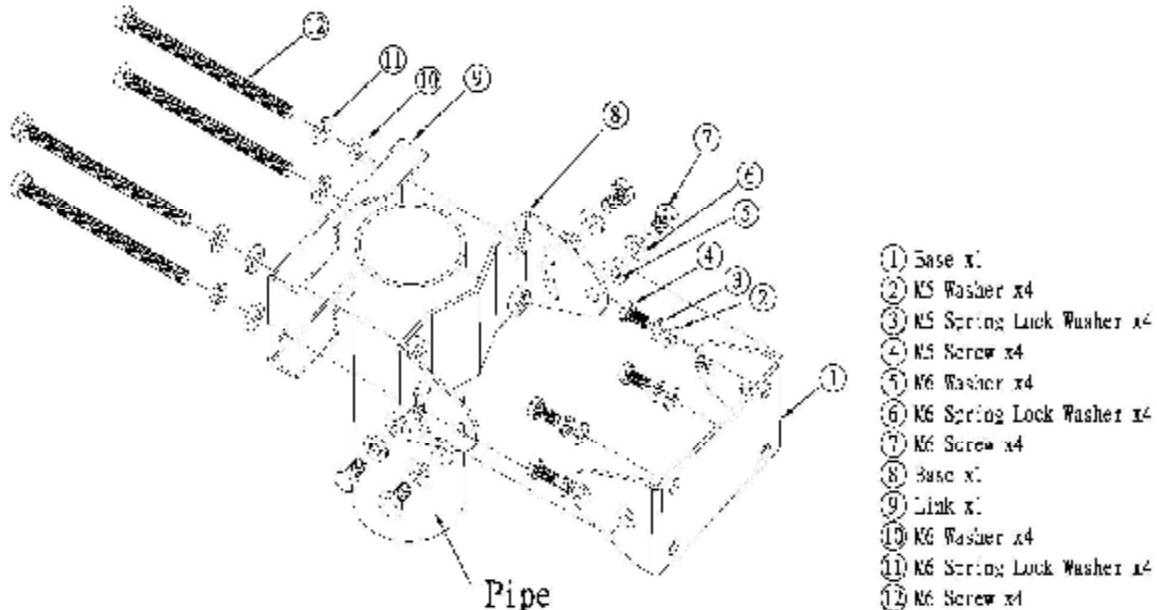
\*Please note: the voltage supply by eth0 is 48V and maximum output power (watt) is the outcome of AP's power usage deduct from total input power. For example, with standard power adaptor, the total input power is  $48V \times 0.375A = 18W$ . The AP uses about 6W when it's full load. Therefore, the maximum 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 or wall; user can use the Pole or Wall Mount kit to mount the Outdoor Wireless Access Point as shown in Figure 2-1.



*Figure 2-1*

### 2-3. System Requirements

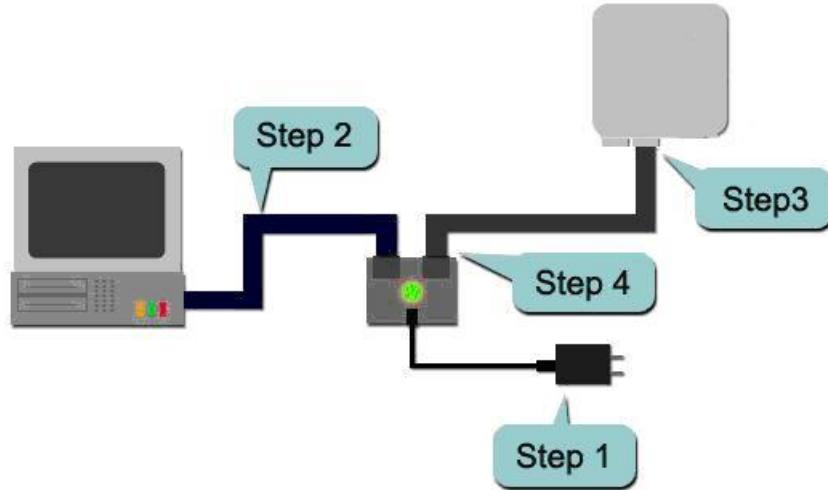
Installation of the Outdoor Wireless Access Point requires the following:

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**.

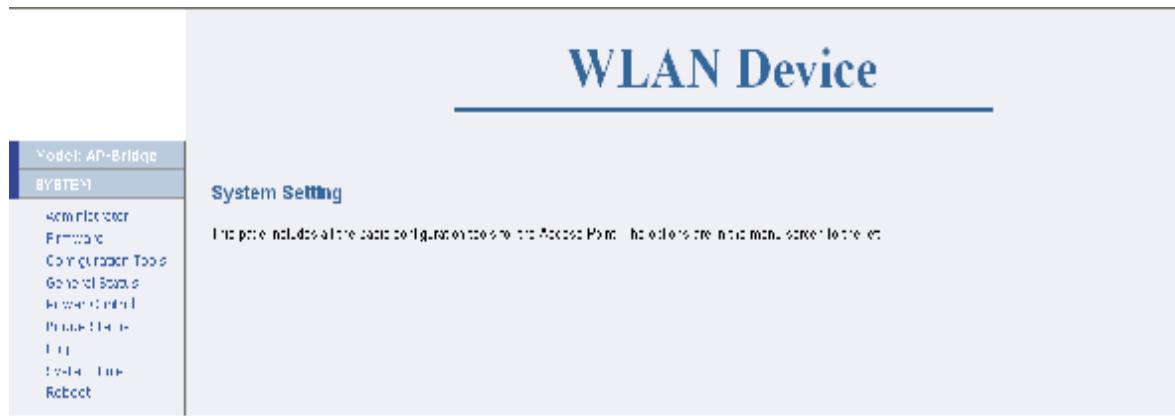


Figure 3-2-1

### 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.

Administrator Settings

<b>Device Name</b>	<input type="text"/>	( '0~9', 'A~Z', 'a~z' or '_')
<b>Language Select</b>		
Language	English <input type="button" value="▼"/>	
<b>Model Select</b>		
Model	<input type="radio"/> OLSR_AP <input type="radio"/> AODV_AP <input checked="" type="radio"/> AP-Bridge <input type="radio"/> AP-CB-Bridge <input type="radio"/> AP-CB-ROUTE <input type="radio"/> CB-CB-ROUTE <input type="radio"/> VLAN-AP <input type="radio"/> AP_WDS_BRG <input type="radio"/> AP4_WDS_BRG	
<b>Password Settings</b>		
Current Password	<input type="password"/>	
Password	<input type="password"/> (3 ~ 12 Characters)	
Re-type Password	<input type="password"/>	
Idle Time Out	30	(1 ~ 999 minutes)
<b>Remote Management</b>		
Enable	<input type="checkbox"/> ( If enabled, only the following PC can manage this AP.)	
IP Address	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>	
<b>WIFI Loading Warning Threshold</b>		
Threshold	15 (3 ~ 25 Mb/sec)	

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

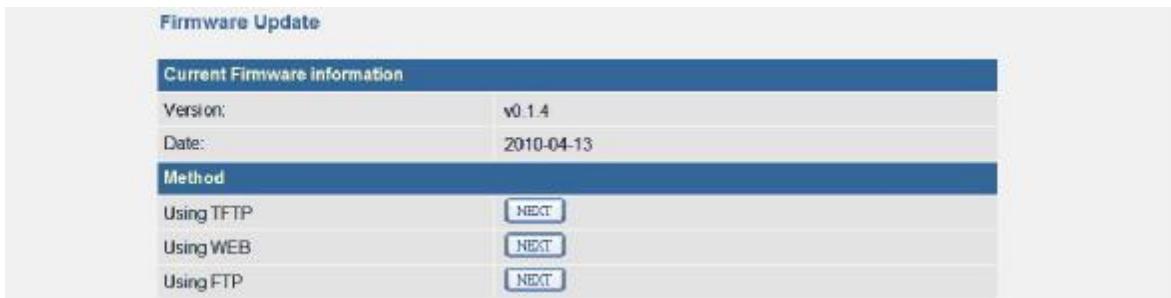
User can enable/disable the management of the Access Point from a remote host. Just tick the <Enable> check box and enter an IP address of the remote host. Then, only the host with the entered IP address can access this device.

#### † 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

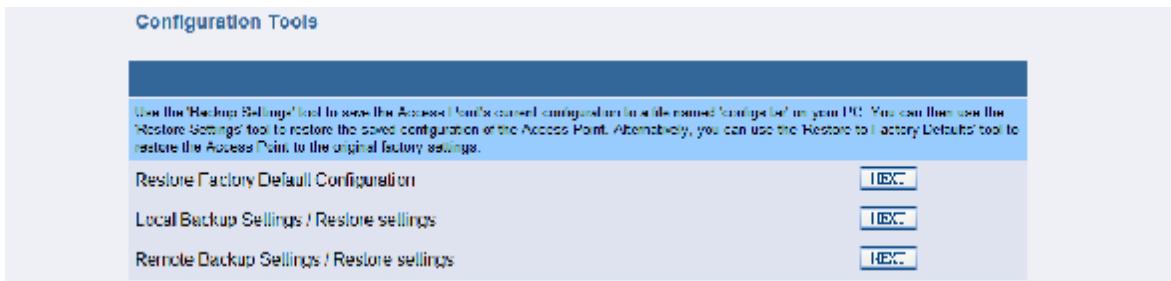
Click on <Browse> button and select the correct firmware file path and file name. Then, click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands while uploading the firmware. This is normal behavior and do not turn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

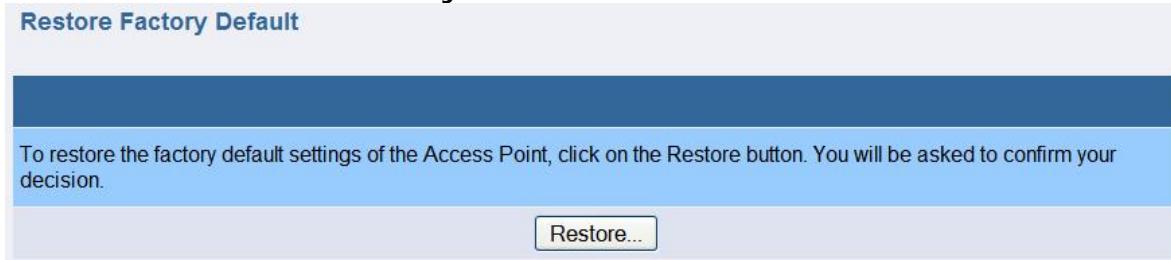
† **Restore Factory Default Configuration:**

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.

**Backup Settings**

Please press the '/Backup Settings/' button to save current configuration data to your PC.

**Restore Settings**

Enter the path and name of the backup file then press the "/Restore Settings/" button below. You will be prompted to confirm the backup restoration.

**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'.

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.

**Configuration Backup/Restore**

Server Type Select:	<input type="radio"/> TFTP <input type="radio"/> FTP
TFTP or FTP Server IP :	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Firmware Filename (in server):	<input type="text" value="config.tar"/>
FTP Username:	<input type="text"/>
FTP Password:	<input type="text"/>
<input type="button" value="Backup To Server"/> <input type="button" value="Restore From Server"/>	

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

Bridge Status			
Bridge: <b>b:0</b>			
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	ten 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 3-2-13

### 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.

WIFI Status				
WIFI Interfaces:	ath0	ath4		
<b>Interface ath0 information</b>				
IEEE: 802.11g	ESSID: "A1_AP0"	Nickname: ""		
Mode: Master	Frequency: 2.452 GHz	Access Point: 00:26:48:00:E:C2		
Bit Rate: 0 kb/s	Tx-Power: 18 dBm	Sensitivity: 1/1		
Retry: off	RTS thr: off	Fragment thr: off		
Encryption key: off				
Power management: off				
Link Quality: 0/70	Signal level: -96 dBm	Noise level: -96 dBm		
Rx invalid swuid: 223	Rx invalid crypt: 0	Rx invalid frag: 0		
Tx excessive retries: 0	Invalid misc: 0	Missed beacon: 0		
<b>Security information</b>				
Security Mode:	Disable			
<b>Associated AP/Station</b>				
No wifi Associated.				
<b>End of Status</b>				

*Figure 3-2-14*

### 3.2.1.8 Log

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

Logs	
System Logs	
<pre>Apr 13 00:25:06 AD auth.notice root: 192.168.1.10 login Apr 13 00:10:10 AD auth.notice root: 192.168.1.10 login Apr 13 00:02:01 AP cron.notice cron[2844]: USR2 Root pid 3393 cmd /web-server/www/htm Apr 13 00:00:00 AP user.info : /web-server/flash-setup.sh:/web-server/flash-setup.sh! Apr 13 00:00:00 AP user.info : date 051300002010.00 Apr 13 00:00:00 AD user.info : Tue Apr 13 00:00:00 UTC 2010 Apr 13 00:00:05 AP user.info : Terminated Apr 13 00:00:03 AP user.info : Killed Apr 13 00:00:03 AP user.info : Terminated Apr 13 00:00:00 AD user.info kernel: br0: port 1 (eth1): transitioning to FORWARDING Apr 13 00:00:00 AD user.info kernel: br0: port 2 (em80): transitioning to FORWARDING Apr 13 00:00:00 AD user.info kernel: br0: port 3 (eth0): transitioning to FORWARDING Apr 13 00:00:00 AD user.info kernel: br0: port 4 (wmb4): transitioning to FORWARDING Apr 13 00:00:00 AD user.info kernel: br0: port 1 (eth1): transitioning to LEARNING Apr 13 00:00:00 AD user.info kernel: br0: port 2 (eth0): transitioning to LEARNING Apr 13 00:00:00 AD user.info kernel: br0: port 3 (em80): transitioning to LEARNING</pre>	

**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.

**Time Setting**

**Select Setting Type**

Setting by  Manual Setting  Synchronize with an Internet Time Server

**Current System Time** Tue Apr 13 00:44:23 UTC 2010

**Manual Setting**

Year / Month / Day 2010 / 4 / 13 (Year:1900 – 2037)

Hour : Minute : Second 00 : 00 : 00

**Using Internet Time Server**

Hours from GMT +8 Hours

Server IP 140.142.16.34

Server IP for Reference 140.142.16.34 or 129.132.2.21

Time Update for Every 0 days(0 – 31) 0 hours(0 – 23) 10 minutes(0 – 59)

**Figure 3-2-16**

### 3.2.1.10 Reboot

User can perform reboot function in case of the device is not functioning 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.

**LAN Setting**

**Interface h0 Setting**

IP Authentication  Static  DHCP

**Network IP Parameters**

IP Address	192	.	168	.	1	.	1
Subnet Mask	255	.	255	.	255	.	0
Gateway Address	192	.	168	.	1	.	254

**Bridge STP Setting**

Port	STP/RSTP	Bridge Priority	Hello Time	Forwarding Delay	Max Age	Cost	Priority
Port eth0	RSTP	15	(STP:0 ~ 65535, RSTP:0 ~ 15)	2	(1 ~ 10)second	18	1 (STP:0 ~ 255, RSTP:0 ~ 15)
Port eth1	RSTP	15	(STP:0 ~ 65535, RSTP:0 ~ 15)	2	(1 ~ 10)second	19	1 (STP:0 ~ 255, RSTP:0 ~ 15)
Port ath0	RSTP	15	(STP:0 ~ 65535, RSTP:0 ~ 15)	2	(1 ~ 10)second	2000000	2 (STP:0 ~ 255, RSTP:0 ~ 15)
Port ath1	RSTP	15	(STP:0 ~ 65535, RSTP:0 ~ 15)	2	(1 ~ 10)second	2000000	3 (STP:0 ~ 255, RSTP:0 ~ 15)
Port ath2	RSTP	15	(STP:0 ~ 65535, RSTP:0 ~ 15)	2	(1 ~ 10)second	2200000	4 (STP:0 ~ 255, RSTP:0 ~ 15)
Port ath3	RSTP	15	(STP:0 ~ 65535, RSTP:0 ~ 15)	2	(1 ~ 10)second	2300000	5 (STP:0 ~ 255, RSTP:0 ~ 15)
Port ath4	RSTP	15	(STP:0 ~ 65535, RSTP:0 ~ 15)	2	(1 ~ 10)second	2400000	6 (STP:0 ~ 255, RSTP:0 ~ 15)
Port ath5	RSTP	15	(STP:0 ~ 65535, RSTP:0 ~ 15)	2	(1 ~ 10)second	2500000	7 (STP:0 ~ 255, RSTP:0 ~ 15)
Port ath6	RSTP	15	(STP:0 ~ 65535, RSTP:0 ~ 15)	2	(1 ~ 10)second	2600000	8 (STP:0 ~ 255, RSTP:0 ~ 15)
Port ath7	RSTP	15	(STP:0 ~ 65535, RSTP:0 ~ 15)	2	(1 ~ 10)second	2700000	9 (STP:0 ~ 255, RSTP:0 ~ 15)

Figure 3-2-18

### 3.2.3 Wireless

User can configure the wireless related settings in this page.

**Dual WLAN Device**

Model: AP\_Bridge

**SYSTEM**

**Wireless**

To access the wireless related configuration

- WIFI ath1 Setting
- WIFI eth1 Setting
- WIFI eth2 Setting
- WIFI eth3 Setting
- WIFI eth4 Setting
- WIFI eth5 Setting
- WIFI eth6 Setting
- WIFI eth7 Setting

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.

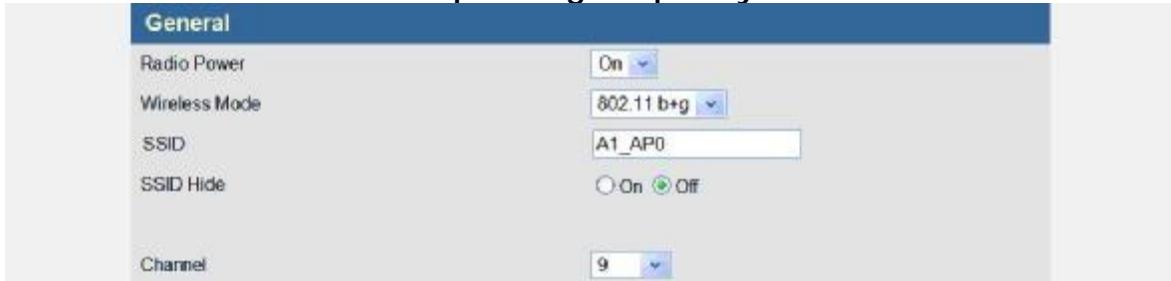


Figure 3-2-20

#### † 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.

SSID Security Mode	
Authentication	WPA-personal
WPA MODE	WPA & WPA2
Share Key	123456789 (8 ~ 63 characters)
WPA Encryption	Auto
Group Key Update Interval	600 (30 ~ 65535)

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.

SSID Security Mode	
Authentication	WPA-enterprise
WPA MODE	WPA
Share Key	123456789 (8 ~ 63 characters)
WPA Encryption	Auto
Group Key Update Interval	600 (30 ~ 65535)
802.1x	
Primary Radius Server	Authenticatoin Server 192 . 168 . 1 . 80 : 1812 Shared Secret secret
Backup Radius Server (Optional)	Authenticatoin Server [ ] . [ ] . [ ] . [ ] : [ ] Shared Secret [ ]

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.

The screenshot shows the 'QoS Setting On AP' window with the 'WMM' tab selected. At the top, there is a radio button group for 'Enable' (selected) and 'Disable'. Below this, a table lists QoS settings for different traffic types:

Category	Setting	Value	Description
AP Tx	MAX Associated Station	32	(1 ~ 2007)
	CWmin	2047	CWMax: 4095 AIFS: 2 (1 ~ 255) Burst: 0.0
	CWmin	15	CWMax: 1023 AIFS: 7 (1 ~ 255) Burst: 0.0
	CWmin	7	CWMax: 7 AIFS: 1 (1 ~ 255) Burst: 1.5
STA Tx	CWmin	7	CWMax: 15 AIFS: 1 (1 ~ 255) Burst: 3.0
	CWmin	7	CWMax: 1023 AIFS: 2 (1 ~ 255) TXOP: 64 (1 ~ 255)x32ms ACM: <input checked="" type="radio"/> Enable <input type="radio"/> Disable
	CWmin	15	CWMax: 1023 AIFS: 7 (1 ~ 255) TXOP: 1 (1 ~ 255)x32ms ACM: <input checked="" type="radio"/> Enable <input type="radio"/> Disable
	CWmin	7	CWMax: 7 AIFS: 1 (1 ~ 255) TXOP: 47 (1 ~ 255)x32ms ACM: <input checked="" type="radio"/> Enable <input type="radio"/> Disable
STA Tx	CWmin	7	CWMax: 15 AIFS: 1 (1 ~ 255) TXOP: 94 (1 ~ 255)x32ms ACM: <input checked="" type="radio"/> Enable <input type="radio"/> Disable

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.

MAC address filtering			
General			
Filtering type: <input type="button" value="Disable"/>			
MAC address table			
Item	MAC address	Ex: 22-22-22-22-22-22	
MAC address 1:			<input type="button" value="Delete"/>
MAC address 2:			<input type="button" value="Delete"/>
MAC address 3:			<input type="button" value="Delete"/>
MAC address 4:			<input type="button" value="Delete"/>
MAC address 5:			<input type="button" value="Delete"/>
MAC address 6:			<input type="button" value="Delete"/>
MAC address 7:			<input type="button" value="Delete"/>
MAC address 8:			<input type="button" value="Delete"/>
MAC address 9:			<input type="button" value="Delete"/>
MAC address 10:			<input type="button" value="Delete"/>
MAC address 11:			<input type="button" value="Delete"/>
MAC address 12:			<input type="button" value="Delete"/>
MAC address 13:			<input type="button" value="Delete"/>
MAC address 14:			<input type="button" value="Delete"/>
MAC address 15:			<input type="button" value="Delete"/>

**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.

SNMP Basic Settings

**SNMP Agent**

Enable  Disable  Enable

**System Information**

Contact	Contact_Me
Location	I_am_here

**V1/V2C**

Index Access Right	Community
1 Deny	
2 Deny	
3 Deny	
4 Deny	
5 Deny	

**V3**

Index User ID	Security Level	Auth Type	Auth Passphrase	Privacy Protocol	Priv Passphrase	Access Right
1	AuthPriv	MD5		DES		unused
2	AuthPriv	MD5		DES		unused
3	AuthPriv	MD5		DES		unused
4	AuthPriv	MD5		DES		unused
5	AuthPriv	MD5		DES		unused

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.

SNMP VACM Settings				
Community to Security for V1/V2c				
Index	Security Name	IP Source	Community	
<input checked="" type="checkbox"/> 1	mypriv	127.0.0.1	public	
<input type="checkbox"/> 2				
<input type="checkbox"/> 3				
<input type="checkbox"/> 4				
<input type="checkbox"/> 5				

Group				
Index	Group Name	Security Model	Security Name	
<input checked="" type="checkbox"/> 1	generic	v1	mypriv	
<input checked="" type="checkbox"/> 2	genericusm	usm	generic	
<input type="checkbox"/> 3		v1	mypriv	
<input type="checkbox"/> 4		v1	mypriv	
<input type="checkbox"/> 5		v1	mypriv	

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'.

Index	View Name	Include	Sub Tree
<input checked="" type="checkbox"/> 1	mib2	Include	1.3.6.1.2.1
<input checked="" type="checkbox"/> 2	generic	Include	1.3.6.1.4.1.5205
<input type="checkbox"/> 3		include	
<input type="checkbox"/> 4		include	
<input type="checkbox"/> 5		include	
<input type="checkbox"/> 6		Include	
<input type="checkbox"/> 7		Include	
<input type="checkbox"/> 8		Include	
<input type="checkbox"/> 9		Include	
<input type="checkbox"/> 10		Include	
<input type="checkbox"/> 11		Include	
<input type="checkbox"/> 12		Include	
<input type="checkbox"/> 13		Include	
<input type="checkbox"/> 14		Include	
<input type="checkbox"/> 15		Include	
<input type="checkbox"/> 16		Include	
<input type="checkbox"/> 17		Include	

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.

Access						
Index	Group	Security Model	Security Level	Read	Write	Notify
<input checked="" type="checkbox"/> 1	generic	any	NoAuthNoPriv	generic	generic	generic
<input checked="" type="checkbox"/> 2	genericusm	usm	AuthPriv	all	all	all
<input type="checkbox"/> 3	generic	any	NoAuthNoPriv	all	all	all
<input type="checkbox"/> 4	generic	any	NoAuthNoPriv	all	all	all
<input type="checkbox"/> 5	generic	any	NoAuthNoPriv	all	all	all

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.

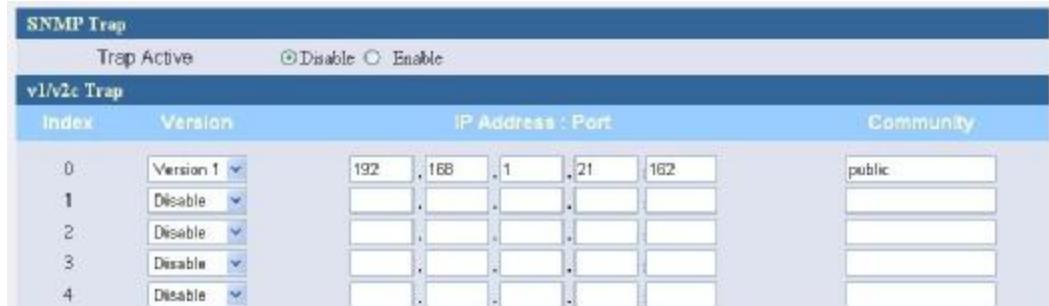
**Community:** The community string to be used when sending traps.

## † v3 Trap

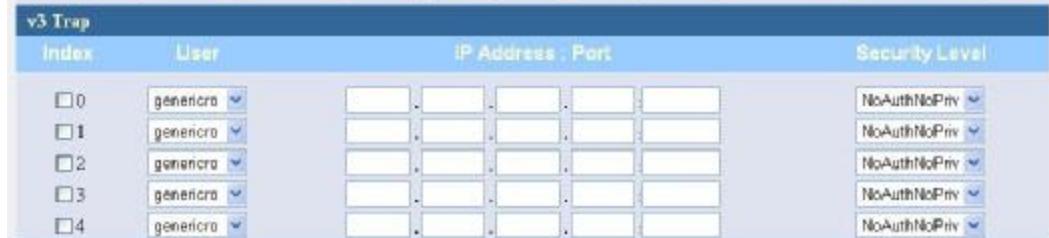
**Trap:** Index of SNMP v3 traps. Tick the checkbox to enable recordset.

**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.



v1/v2c Trap		IP Address : Port						Community
Index	Version	192	168	1	21	162		
0	Version 1						public	
1	Disable							
2	Disable							
3	Disable							
4	Disable							

v3 Trap		IP Address : Port						Security Level
Index	User							
□ 0	genericro						NoAuthNoPriv	
□ 1	genericro						NoAuthNoPriv	
□ 2	genericro						NoAuthNoPriv	
□ 3	genericro						NoAuthNoPriv	
□ 4	genericro						NoAuthNoPriv	

**Figure 3-2-31**

### † Trap Items

Enable/Disable which trap items to send.



Trap Items	
Cold Start	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Warm Start	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Link Up	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Link Down	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Auth Fail	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Log In	<input type="radio"/> Disable <input checked="" type="radio"/> Enable

**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.

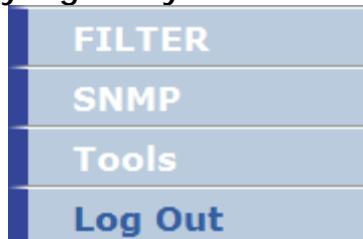


Tools	
Command Ping :	
Ping:	IP: <input type="text"/>
Count:	3 <input type="radio"/> Disable <input checked="" type="radio"/> Enable

**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

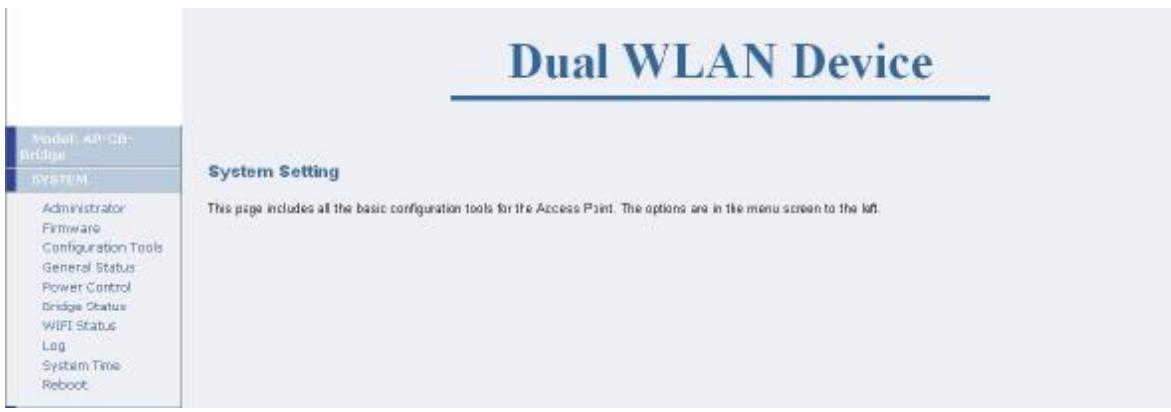
#### **▽ Tools**

- 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.

Administrator Settings

<b>Device Name</b>	<input type="text"/> ( '0~9', 'A~Z', 'a~z' or '_')
<b>Language Select</b>	Language English
<b>Model Select</b>	<input type="radio"/> OLSR_AP <input type="radio"/> AODV_AP <input type="radio"/> AP-Bridge <input checked="" type="radio"/> AP-CB-Bridge <input type="radio"/> AP-CB-ROUTE <input type="radio"/> CB-CB-ROUTE <input type="radio"/> VLAN-AP <input type="radio"/> AP_WDS_BRG <input type="radio"/> AP4_WDS_BRG
<b>Password Settings</b>	Current Password <input type="password"/> Password (3 ~ 12 Characters) <input type="password"/> Re-type Password <input type="password"/> Idle Time Out 30 (1 ~ 999 minutes)
<b>Remote Management</b>	Enable <input type="checkbox"/> ( If enabled, only the following PC can manage this AP.) IP Address <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>
<b>WIFI Loading Warning Threshold</b>	Threshold 15 (5 ~ 25 Mb/sec)

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

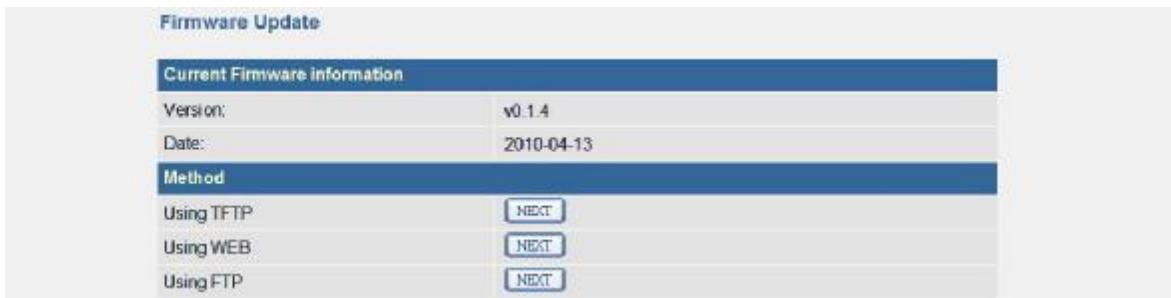
User can enable/disable the management of the Access Point from a remote host. Just tick the <Enable> check box and enter an IP address of the remote host. Then, only the host with the entered IP address can access this device.

#### † 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

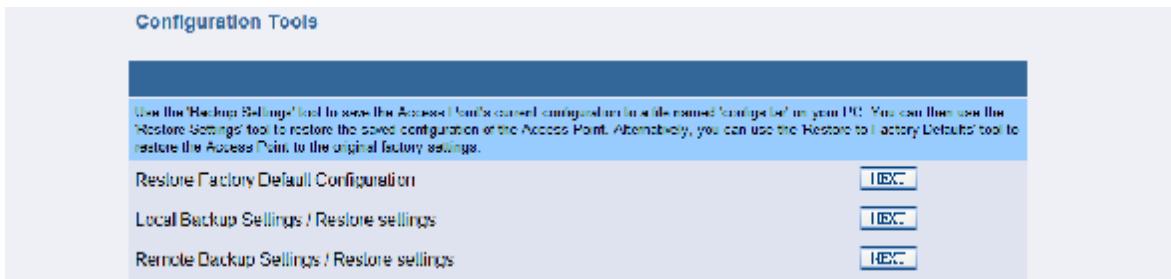
Click on <Browse> button and select the correct firmware file path and file name. Then, click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands while uploading the firmware. This is normal behavior and do not turn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

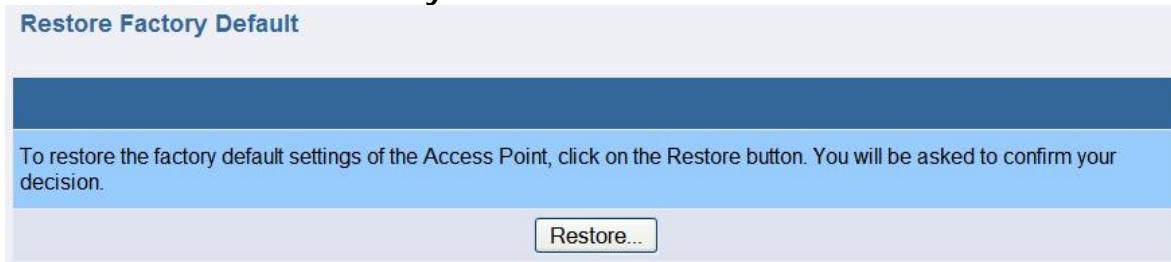
† **Restore Factory Default Configuration:**

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.

**Backup Settings**

Please press the '/Backup Settings/' button to save current configuration data to your PC.

**Restore Settings**

Enter the path and name of the backup file then press the '/Restore Settings/' button below. You will be prompted to confirm the backup restoration.

**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.

**Configuration Backup/Restore**

Server Type Select:  TFTP  FTP

TFTP or FTP Server IP:

Firmware Filename (in server):

FTP Username:

FTP Password:

**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.

Status			
<b>System Information</b>			
Current Firmware Version	v0.1.8		
Device Name	AP		
System Model	AP-CB-Bridge		
System Time	Wed Nov 3 01:53:45 2010		
<b>Power Control Status</b>			
eth0 PoE	Disabled		
<b>Bridge LAN Port</b>			
IP Address	192.168.1.1		
MAC Address	00:26:48:00:0e:df		
Mask	255.255.255.0		
<b>Station WIFI 1 Status</b>			
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			
SSID	A1_AP3	Security:	Disabled
<b>AP WIFI 2 Status</b>			
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 3-3-11

### 3.3.1.5 Power Control/Status

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

Power Control/Status	
PoE Power Control (eth0 port):	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

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:		<b>br0</b>			
Bridge STP State:		off			
<b>Bridge br0 Information</b>					
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	
aging time:	300.00				
hello timer:	0.00		tcn timer:	0.00	
<b>eth1 Port Information[0]</b>					
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	
<b>eth0 Port Information[1]</b>					
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	
<b>ath3 Port Information[2]</b>					
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	
<b>ath4 Port Information[3]</b>					
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	
<b>Bridge br0 Learned MACs</b>					
port no	mac addr	is local?	ageing timer		
1	00:15:a9:2a:be:78	no	0.04		
3	00:20:48:00:9:edf	yes	0.00		
4	00:40:c7:fb:00:f8	yes	0.00		
1	00:40:c0:00:00:22	yes	0.00		
2	00:40:cE00:00:33	yes	0.00		
<b>End of Status</b>					

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..	
<b>End of Status</b>			

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.

WIFI Status		
	ath3	ath4
<b>Interface ath3 Information</b>		
IEEE: 802.11bg	ESSID: "OW-1000/1"	Nickname: "
Mode: Managed	Frequency: 2.412 GHz	Access Point: 00:40:C7:EF:00:28
Bit Rate: 36 Mb/s	Tx-Power: 16 dBm	Sensitivity: 1/1
Retry: off	RTS thr: off	Fragment thr: off
Encryption key: off		
Power Management: off		
Link Quality: 69/70	Signal level: -24 dBm	Noise level: -93 dBm
Rx invalid mwid: 26463	Rx invalid crypt: 0	Rx invalid frag: 0
Tx excessive retries: 0	Invalid misc: 0	Missed beacon: 0
<b>Security Information</b>		
Security Mode:	Disable	
<b>Associated AP/Station</b>		
MAC Address:	00:40:C7:EF:00:28	
<b>End of Status</b>		

*Figure 3-3-15*

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

WIFI Status		
	ath3	ath4
<b>Interface ath4 Information</b>		
IEEE: 802.11bg	ESSID: "A2_AP4"	Nickname: "
Mode: Master	Frequency: 2.412 GHz	Access Point: 00:26:48:00:0EC2
Bit Rate: 0 kb/s	Tx-Power: 17 dBm	Sensitivity: 1/1
Retry: off	RTS thr: off	Fragment thr: off
Encryption key: off		
Power Management: off		
Link Quality: 0/70	Signal level: -96 dBm	Noise level: -96 dBm
Rx invalid mwid: 2229	Rx invalid crypt: 0	Rx invalid frag: 0
Tx excessive retries: 0	Invalid misc: 0	Missed beacon: 0
<b>Security Information</b>		
Security Mode:	Disable	
<b>Associated AP/Station</b>		
<b>End of Status</b>		

*Figure 3-3-16*

### 3.3.1.8 Log

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

Logs
<b>System Logs</b>
<pre> Apr 13 00:07:07 AP user.info kernel: br0: port 3 (ath3) enabled Apr 13 00:07:07 AP user.info kernel: br0: port 3 (ath3): transitioning to FORWARDING Apr 13 00:07:07 AP user.info kernel: br0: port 3 (ath3): transitioning to LEARNING state Apr 13 00:07:04 AP user.info kernel: br0: port 3 (ath3): transitioning to DESIGNATED Apr 13 00:07:04 AP user.info kernel: br0: port 3 (ath3): transitioning to RSTP mode Apr 13 00:07:04 AP user.info kernel: br0: port 3 (ath3) enabled Apr 13 00:07:01 AP user.info kernel: br0: port 3 (ath3): transitioning to DISCARDING Apr 13 00:07:01 AP user.info kernel: br0: port 3 (ath3): transitioning to DISABLED role Apr 13 00:07:01 AP user.info kernel: br0: port 3 (ath3) disabled Apr 13 00:07:01 AP user.info kernel: br0: port 3 (ath3) enabled Apr 13 00:06:06 AP user.info kernel: br0: port 3 (ath3): transitioning to FORWARDING Apr 13 00:06:05 AP user.info kernel: br0: port 3 (ath3): transitioning to LEARNING state Apr 13 00:06:04 AP user.info kernel: br0: port 3 (ath3): transitioning to DESIGNATED Apr 13 00:06:04 AP user.info kernel: br0: port 3 (ath3): transitioning to RSTP mode Apr 13 00:06:04 AP user.info kernel: br0: port 3 (ath3) enabled </pre>

*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.

The screenshot shows the 'Time Setting' configuration page. At the top, there's a 'Select Setting Type' section with two radio buttons: 'Manual Setting' (selected) and 'Synchronize with an Internet Time Server'. Below this, the 'Current System Time' is displayed as 'Wed Nov 3 02:27:13 2010'. The main configuration area is divided into two sections: 'Manual Setting' and 'Using Internet Time Server'. In the 'Manual Setting' section, there are dropdown menus for 'Year / Month / Day' (set to 2010/11/3) and 'Hour : Minute : Second' (set to 00:00:00). In the 'Using Internet Time Server' section, there are fields for 'Hours from GMT' (set to +8), 'Server IP' (set to 140.142.16.34), 'Server IP for Reference' (set to 140.142.16.34 or 129.132.2.21), and 'Time Update for Every' (set to 0 days(0 ~ 31), 0 hours(0 ~ 23), 10 minutes(0 ~ 59)).

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.

The screenshot shows the 'LAN Setting' interface with the 'Interface Info Setting' tab selected. Under 'IP Authentication', the 'Static' radio button is selected. The 'Network IP Parameters' section contains fields for IP Address (192.168.1.1), Subnet Mask (255.255.255.0), and Gateway Address (192.168.1.254). The 'Bridge STP Setting' section includes a dropdown for 'STP/RSTP' set to 'Disable'. It lists seven ports (eth0 to eth7) with their respective costs, priorities, and edge status. For example, Port eth0 has a cost of 18, priority 1, and is not an edge port. Port eth7 has a cost of 2700000, priority 9, and is not an edge port.

Port	Cost	Priority	Edge
Port eth0	18	1	no
Port eth1	19	1	no
Port eth3	2300000	5	no
Port eth4	2400000	6	no
Port eth5	2500000	7	no
Port eth6	2600000	8	no
Port eth7	2700000	9	no

Figure 3-3-20

### 3.3.3 Wireless

User can set the wireless related setting here.

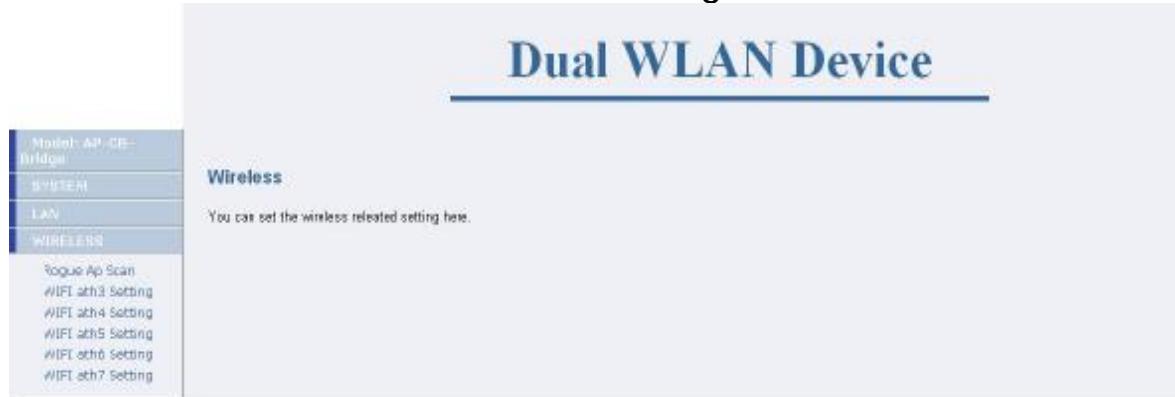


Figure 3-3-21

#### 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.

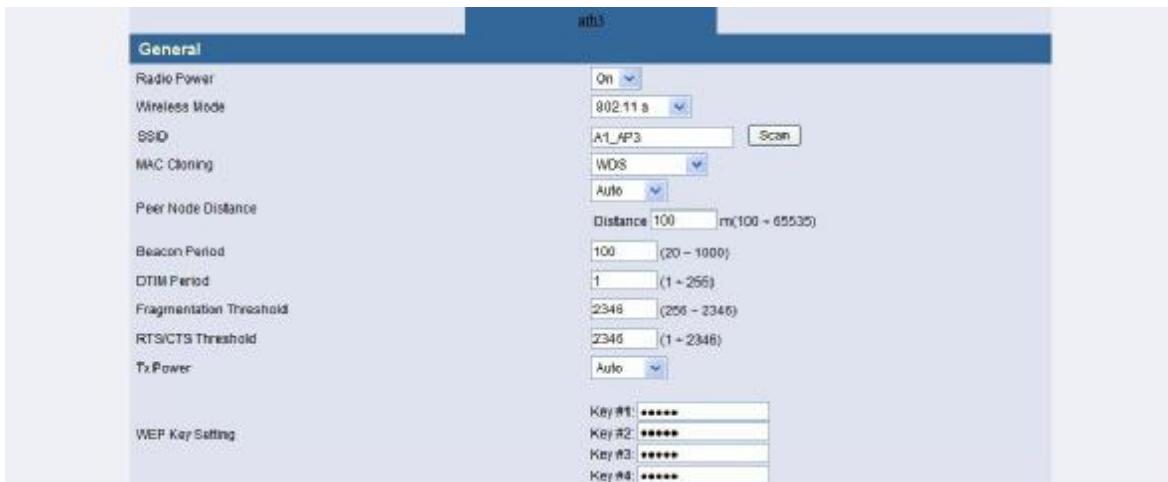
**DTIM Period:** This item contains the number of Beacon intervals between Delivery Traffic Indication Message (DTIM). Enter a number between 1 and 255 to specify.

**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.

SSID Security Mode	
Authentication	WPA-personal
WPA MODE	WPA
Share Key	123456789 (8 ~ 63 characters)
WPA Encryption	Auto

**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.

SSID Security Mode	
Authentication	WPA-enterprise
WPA MODE	WPA
Share Key	123456789 (8 ~ 63 characters)
WPA Encryption	Auto
802.1x	
Account	F3000
Password	F3000

**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.

General	
Radio Power	On
Wireless Mode	802.11 b+g
SSID	A1_AP0
SSID Hide	<input type="radio"/> On <input checked="" type="radio"/> Off
Channel	9

**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.

Setting	Value	Range
Peer Node Distance	100	m(100 ~ 65535)
Beacon Period	100	(20 ~ 1000)
DTIM Period	1	(1 ~ 255)
Fragmentation Threshold	2346	(256 ~ 2346)
RTS/CTS Threshold	2346	(1 ~ 2346)
Tx Power	Auto	
Rate	54	Mbit/s
Layer 2 Isolation	Enable	
WEP Key Setting	Key #1: ***** Key #2: ***** Key #3: ***** Key #4: *****	

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.

The screenshot shows a configuration interface titled 'SSID Security Mode'. Under 'Authentication', a dropdown menu is set to 'WEP'. Below it, there are two groups of radio buttons: 'Open' (selected) and 'Restricted'. Under 'Select Key', there are four radio buttons labeled 'KEY #1' (selected), 'KEY #2', 'KEY #3', and 'KEY #4'.

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.

The screenshot shows a configuration interface titled 'SSID Security Mode'. Under 'Authentication', a dropdown menu is set to 'WPA-personal'. Under 'WPA MODE', a dropdown menu is set to 'WPA & WPA2'. The 'Share Key' field contains '123456789' with a note '(8 ~ 63 characters)'. Under 'WPA Encryption', a dropdown menu is set to 'Auto'. Under 'Group Key Update Interval', a field contains '600' with a note '(30 ~ 65535)'.

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.

SSID Security Mode	
Authentication	WPA-enterprise <input type="button" value="▼"/>
WPA MODE	WPA <input type="button" value="▼"/>
Share Key	<input type="text" value="123456789"/> (8 ~ 63 characters)
WPA Encryption	Auto <input type="button" value="▼"/>
Group Key Update Interval	600 (30 ~ 65535)
802.1x	
Primary Radius Server	
Authenticatoin Server	192 . 168 . 1 . 80 : 1812 Shared Secret secret
Backup Radius Server (Optional)	
Authenticatoin Server	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> : <input type="text"/> Shared Secret <input type="text"/>

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.

Queue	CWmin	CWMax	AIFS	TXOP	ACM
WMM	32	(1 - 2007)	Enable		
STA Tx-Best Effort	2047	4095	2	64	Disable
STA Tx-Background	15	1023	7	1	Disable
STA Tx-Video	7	15	1	47	Disable
STA Tx-Voice	7	15	1	94	Disable

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.

MAC address filtering		
General		Filtering type: <b>Disable</b>
MAC address table		
Item	MAC address	Ex: 22-22-22-22-22-22
MAC address 1:		<input type="button" value="Delete"/>
MAC address 2:		<input type="button" value="Delete"/>
MAC address 3:		<input type="button" value="Delete"/>
MAC address 4:		<input type="button" value="Delete"/>
MAC address 5:		<input type="button" value="Delete"/>
MAC address 6:		<input type="button" value="Delete"/>
MAC address 7:		<input type="button" value="Delete"/>
MAC address 8:		<input type="button" value="Delete"/>
MAC address 9:		<input type="button" value="Delete"/>
MAC address 10:		<input type="button" value="Delete"/>
MAC address 11:		<input type="button" value="Delete"/>
MAC address 12:		<input type="button" value="Delete"/>
MAC address 13:		<input type="button" value="Delete"/>
MAC address 14:		<input type="button" value="Delete"/>
MAC address 15:		<input type="button" value="Delete"/>

**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.

SNMP Basic Settings

SNMP Agent						
<input type="radio"/> Enable	<input checked="" type="radio"/> Disable					
System Information						
Contact	<input type="text" value="Contact_Me"/>					
Location	<input type="text" value="I_am_here"/>					
V1/V2C						
Index Access Right	Community					
1	<input type="text" value="Deny"/>					
2	<input type="text" value="Deny"/>					
3	<input type="text" value="Deny"/>					
4	<input type="text" value="Deny"/>					
5	<input type="text" value="Deny"/>					
V3						
Index User ID	Security Level	Auth Type	Auth Passphrase	Privacy Protocol	Priv Passphrase	Access Right
1	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text" value=""/>	<input type="text" value="DES"/>	<input type="text" value=""/>	<input type="text" value="unused"/>
2	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text" value=""/>	<input type="text" value="DES"/>	<input type="text" value=""/>	<input type="text" value="unused"/>
3	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text" value=""/>	<input type="text" value="DES"/>	<input type="text" value=""/>	<input type="text" value="unused"/>
4	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text" value=""/>	<input type="text" value="DES"/>	<input type="text" value=""/>	<input type="text" value="unused"/>
5	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text" value=""/>	<input type="text" value="DES"/>	<input type="text" value=""/>	<input type="text" value="unused"/>

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.

SNMP VACM Settings				
Community to Security for V1/V2c				
Index	Security Name	IP Source	Community	
<input checked="" type="checkbox"/> 1	mypriv	127.0.0.1	public	
<input type="checkbox"/> 2				
<input type="checkbox"/> 3				
<input type="checkbox"/> 4				
<input type="checkbox"/> 5				

Group			
Index	Group Name	Security Model	Security Name
<input checked="" type="checkbox"/> 1	generic	v1	mypriv
<input checked="" type="checkbox"/> 2	genericusm	usm	generic
<input type="checkbox"/> 3		v1	mypriv
<input type="checkbox"/> 4		v1	mypriv
<input type="checkbox"/> 5		v1	mypriv

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'.

Index	View Name	Include	Sub Tree
<input checked="" type="checkbox"/> 1	mib2	Include	1.3.6.1.2.1
<input checked="" type="checkbox"/> 2	generic	Include	1.3.6.1.4.1.5205
<input type="checkbox"/> 3		Include	
<input type="checkbox"/> 4		Include	
<input type="checkbox"/> 5		Include	
<input type="checkbox"/> 6		Include	
<input type="checkbox"/> 7		Include	
<input type="checkbox"/> 8		Include	
<input type="checkbox"/> 9		Include	
<input type="checkbox"/> 10		Include	
<input type="checkbox"/> 11		Include	
<input type="checkbox"/> 12		Include	
<input type="checkbox"/> 13		Include	
<input type="checkbox"/> 14		Include	
<input type="checkbox"/> 15		Include	
<input type="checkbox"/> 16		Include	
<input type="checkbox"/> 17		Include	

**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.

Access	Index	Group	Security Model	Security Level	Read	Write	Notify
	<input checked="" type="checkbox"/> 1	generic	any	NoAuthNoPriv	generic	generic	generic
	<input checked="" type="checkbox"/> 2	genencusm	usm	AuthPriv	all	all	all
	<input type="checkbox"/> 3	generic	any	NoAuthNoPriv	all	all	all
	<input type="checkbox"/> 4	generic	any	NoAuthNoPriv	all	all	all
	<input type="checkbox"/> 5	generic	any	NoAuthNoPriv	all	all	all

**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.

SNMP Trap						
v1/v2c Trap						
Index	Version	IP Address : Port				Community
0	Version 1	192	.168	.1	.21	.162
1	Disable					
2	Disable					
3	Disable					
4	Disable					

v3 Trap						
Index	User	IP Address : Port				Security Level
0	genericro					NoAuthNoPriv
1	genericro					NoAuthNoPriv
2	genericro					NoAuthNoPriv
3	genericro					NoAuthNoPriv
4	genericro					NoAuthNoPriv

Figure 3-3-38

### † Trap Items

Enable/Disable which trap items to send.

Trap Items	
Cold Start	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Warm Start	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Link Up	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Link Down	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Auth Fail	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Log In	<input type="radio"/> Disable <input checked="" type="radio"/> Enable

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.

Tools
Command Ping :
Ping: IP: Count: 3 <input type="radio"/> Disable <input checked="" type="radio"/> Enable

Figure 3-3-40

### 3.3.7 Log Out

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

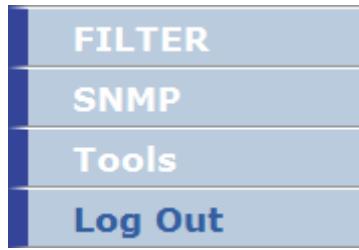


Figure 3-3-41

### 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

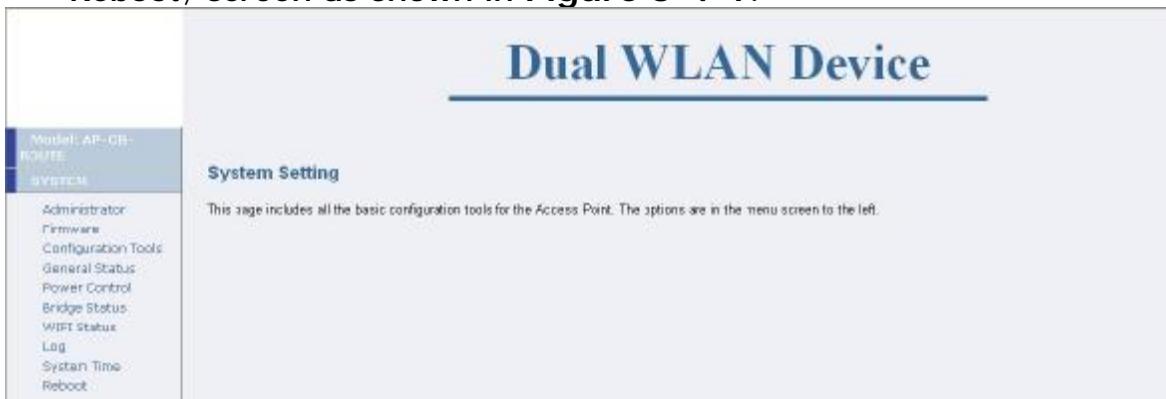
▽ Tools

- 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.



The screenshot shows the 'Administrator Settings' interface. It includes sections for Device Name, Language Select, Model Select, Password Settings, Remote Management, and WiFi Loading Warning Threshold. The Model Select section contains radio buttons for OLSR\_AP, AODV\_AP, AP-Bridge, AP-CB-Bridge, AP-CB-ROUTE, CB-CB-ROUTE, VLAN-AP, AP\_WDS\_BRG, and AP4\_WDS\_BRG. The WiFi Loading Warning Threshold section has a threshold value of 15.

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.

The screenshot shows a web-based configuration interface for a firmware update. At the top, a blue header bar contains the title 'Firmware Update'. Below this is a table with two rows. The first row is titled 'Current Firmware information' and contains two entries: 'Version: v0.1.4' and 'Date: 2010-04-13'. The second row is titled 'Method' and lists three options: 'Using TFTP', 'Using WEB', and 'Using FTP', each followed by a small blue 'NEXT' button.

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.

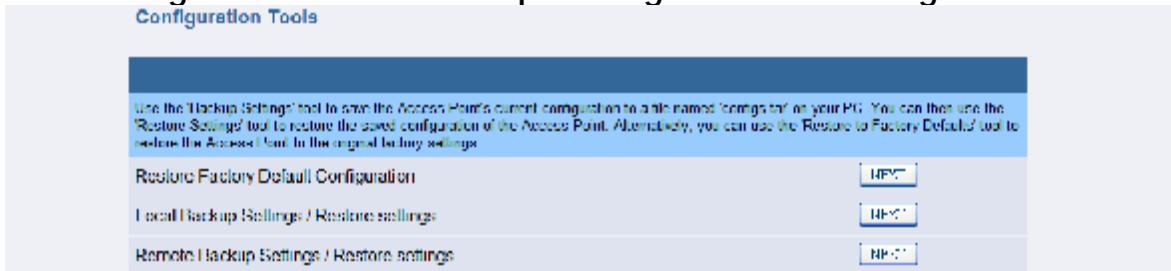


Figure 3-4-4

#### † 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.

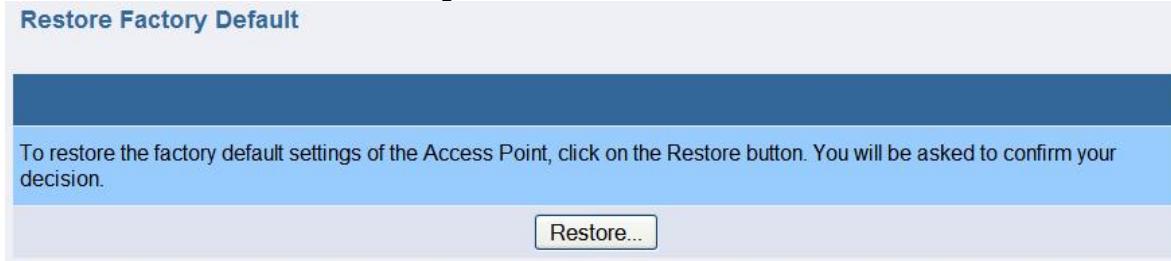


Figure 3-4-6

#### † 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.

**Backup Settings**

Please press the '/Backup Settings/' button to save current configuration data to your PC.

**Restore Settings**

Enter the path and name of the backup file then press the '/Restore Settings/' button below. You will be prompted to confirm the backup restoration.

**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'.

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.

**Configuration Backup/Restore**

Server Type Select:	<input type="radio"/> TFTP <input type="radio"/> FTP
TFTP or FTP Server IP :	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Firmware Filename (in server):	<input type="text" value="config.tar"/>
FTP Username :	<input type="text"/>
FTP Password :	<input type="text"/>
<input type="button" value="Backup To Server"/> <input type="button" value="Restore From Server"/>	

**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			
<b>System Information</b>			
Current Firmware Version	v0.1.8		
Device Name	AP		
System Model	AP-CB-ROUTE		
System Time	Wed Nov 3 00:17:44 2010		
<b>Power Control Status</b>			
eth0 PoE	Disabled		
<b>WAN Port</b>			
IP Address	192.168.23.1		
MAC Address	00:26:48:00:0e:df		
Mask	255.255.255.0		
Gateway	NA		
DHCP	Disabled		
<b>eth0 LAN Port</b>			
IP Address	192.168.0.1		
MAC Address	00:40:c0:00:00:33		
Mask	255.255.255.0		
DHCP	Disabled		
<b>eth1 LAN Port</b>			
IP Address	192.168.1.1		
MAC Address	00:40:c0:00:00:22		
Mask	255.255.255.0		
DHCP	Disabled		
<b>Station WiFi 1 Status</b>			
MODE	802.11_a		
COUNTRY	North_America_Area		
DTIM	1		
FRAG	2346		
RTS	2346		
BEACON	100		
DISTANCE	100		
<b>Interface ath0</b>			
Radio	Off		
<b>Interface ath1</b>			
Radio	Off		
<b>Interface ath2</b>			
Radio	Off		
<b>Interface ath3</b>			
IP Address	192.168.23.1		
MAC Address	00:26:48:00:0e:df		
Mask	255.255.255.0		
DHCP	Disabled		
BSSID	A1_AP1	Security:	Disabled
<b>AP WiFi 2 Status</b>			
MODE	802.11_a		
COUNTRY	North_America_Area		
CHANNEL	Auto		
DTIM	1		
FRAG	2346		
RTS	2346		
BEACON	100		
DISTANCE	100		
<b>Interface ath4</b>			
IP Address	192.168.24.1		
MAC Address	00:40:c7:f0:00:f8		
Mask	255.255.255.0		
DHCP	Disabled		
BSSID	A2_AP4	Security:	Disabled
<b>Interface ath5</b>			
Radio	Off		
<b>Interface ath6</b>			
Radio	Off		
<b>Interface ath7</b>			
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.

WIFI Status		ath3	ath4
WIFI Interfaces :			
Interface <b>ath3</b> Information			
IEEE: 802.11bg	ESSID: "OW-1000V1"	Nickname: "	
Mode: Managed	Frequency: 2.417 GHz	Access Point: 00:40:C7:EF:00:28	
Bit Rate: 36 Mbit/s	Tx-Power: 16 dBm	Sensitivity: 1/1	
Retry: off	RTS thr: off	Fragment thr: off	
Encryption key: off			
Power Management: off			
Link Quality: 69/70	Signal level: -24 dBm	Noise level: -93 dBm	
Rx invalid mwid: 26463	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	MAC Address:	00:40:C7:EF:00:28	
End of Status			

**Figure 3-4-14**

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

WIFI Status		ath3	ath4
WIFI Interfaces :			
Interface <b>ath4</b> Information			
IEEE: 802.11bg	ESSID: "A2_AP4"	Nickname: "	
Mode: Master	Frequency: 2.412 GHz	Access Point: 00:26:48:00:0E:C2	
Bit Rate: 0 kb/s	Tx-Power: 17 dBm	Sensitivity: 1/1	
Retry: off	RTS thr: off	Fragment thr: off	
Encryption key: off			
Power Management: off			
Link Quality: 0/70	Signal level: -96 dBm	Noise level: -96 dBm	
Rx invalid mwid: 2229	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	MAC Address:	00:26:48:00:0E:C2	
End of Status			

**Figure 3-4-15**

### 3.4.1.7 Log

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



The screenshot shows a window titled "Logs" with a sub-tab "System Logs". The main area contains a scrollable list of log messages. The messages are timestamped and show various system events related to the avahi-daemon, such as registering and withdrawing address records, joining and leaving mDNS multicast groups, and interface status changes. The log entries are as follows:

```
Apr 13 00:16:04 AP daemon.info avahi-daemon[2838]: Registering new address record for
Apr 13 00:16:04 AP daemon.info avahi-daemon[2838]: New relevant interface ath3.I Pv4 fo
Apr 13 00:16:04 AP daemon.info avahi-daemon[2838]: Joining mDNS multicast group on int
Apr 13 00:16:01 AP daemon.info avahi-daemon[2838]: Withdrawing address record for 192.
Apr 13 00:16:01 AP daemon.info avahi-daemon[2838]: Leaving mDNS multicast group on int
Apr 13 00:16:01 AP daemon.info avahi-daemon[2838]: Interface ath3.I Pv4 no longer reliev
Apr 13 00:15:04 AP daemon.info avahi-daemon[2838]: Registering new address record for
Apr 13 00:15:04 AP daemon.info avahi-daemon[2838]: New relevant interface ath3.I Pv4 fo
Apr 13 00:15:01 AP daemon.info avahi-daemon[2838]: Joining mDNS multicast group on int
Apr 13 00:15:01 AP daemon.info avahi-daemon[2838]: Withdrawing address record for 192.
Apr 13 00:15:01 AP daemon.info avahi-daemon[2838]: Leaving mDNS multicast group on int
Apr 13 00:15:01 AP daemon.info avahi-daemon[2838]: Interface ath3.I Pv4 no longer reliev
Apr 13 00:14:04 AP daemon.info avahi-daemon[2838]: Registering new address record for
Apr 13 00:14:04 AP daemon.info avahi-daemon[2838]: New relevant interface ath3.I Pv4 fo
Apr 13 00:14:04 AP daemon.info avahi-daemon[2838]: Joining mDNS multicast group on int
Apr 13 00:14:01 AP daemon.info avahi-daemon[2838]: Withdrawing address record for 192.
```

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

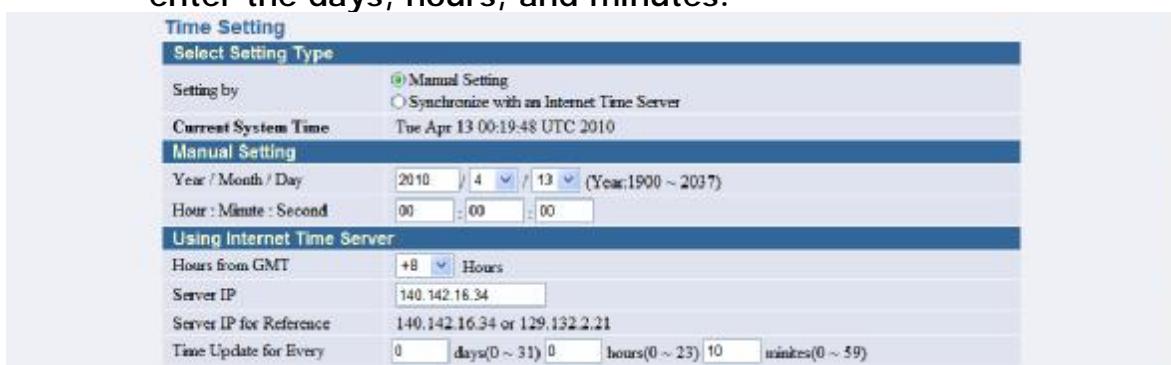
User can manually enter the Year/ Month/ Day and Hour: Minute: Second.

#### † 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.



The screenshot shows a configuration page for "Time Setting". It has a "Select Setting Type" section with two options: "Manual Setting" (selected) and "Synchronize with an Internet Time Server". Below this is a "Current System Time" field showing "Tue Apr 13 00:19:48 UTC 2010". The "Manual Setting" section includes fields for "Year / Month / Day" (set to 2010/4/13) and "Hour : Minute : Second" (set to 00:00:00). The "Using Internet Time Server" section includes fields for "Hours from GMT" (set to +8), "Server IP" (set to 140.142.16.34), and "Server IP for Reference" (set to 140.142.16.34 or 129.132.2.21). Finally, there is a "Time Update for Every" field with dropdowns for days(0 ~ 31), hours(0 ~ 23), and minutes(0 ~ 59).

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.

The screenshot shows a web-based configuration interface for 'Bandwidth Management'. At the top, there are fields for 'Upload Bandwidth' (54 Mbps) and 'Download Bandwidth' (54 Mbps), each with an 'Enable' (radio button) and 'Disable' (radio button) option. Below this is a table titled 'Bandwidth Limitation List' with one entry:

Action	Start IP Address	End IP Address	Bandwidth Limitation(Kbps)
1. <input type="checkbox"/> Up/Download	192.168.1.20	192.168.1.30	3000

Below the table is a 'Del' button. At the bottom, there is another section titled 'Add Bandwidth Limitation' with fields for 'Action' (Up/Download dropdown), 'Start IP Address' (0.0.0.0), 'End IP Address' (0.0.0.0), and 'Bandwidth Limitation(Kbps)' (200), along with an 'Add' button.

**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).

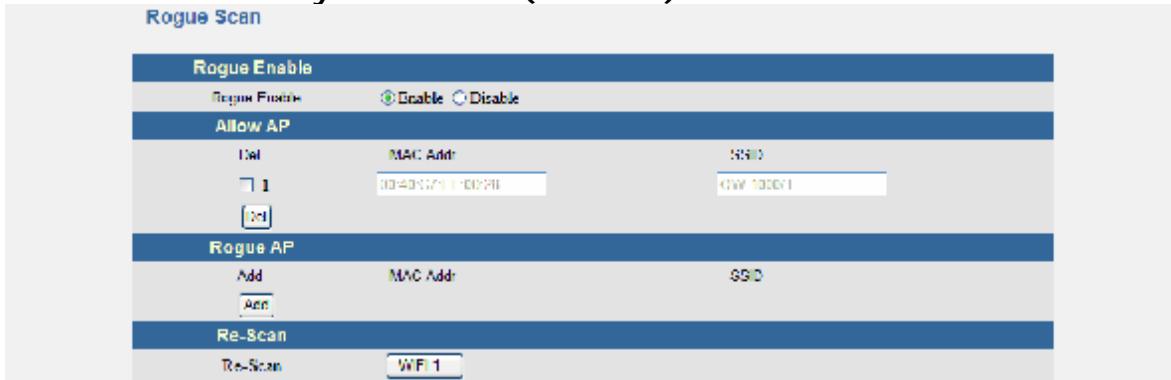


Figure 3-4-23

### 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.

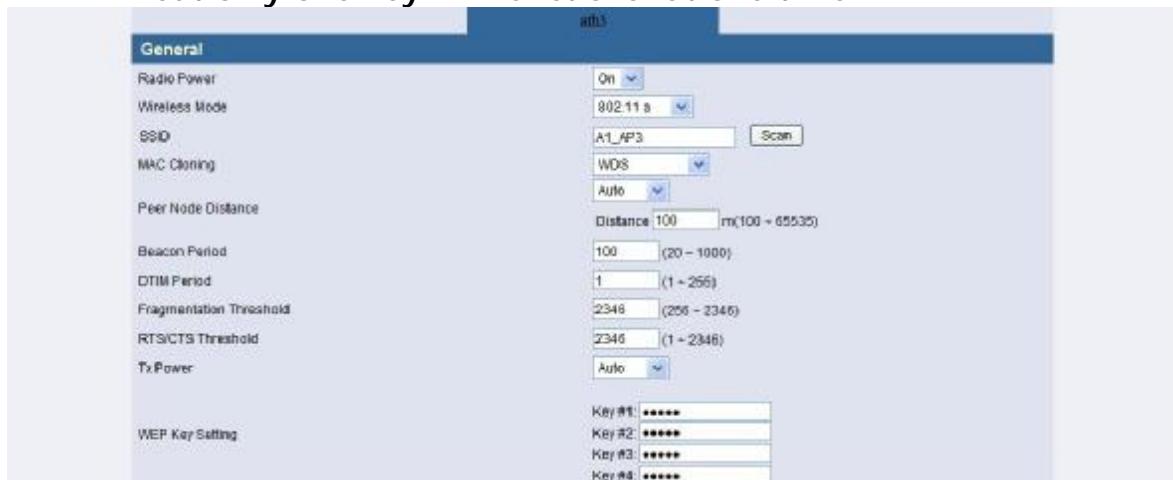


Figure 3-4-24

### † 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.

SSID Security Mode	
Authentication	WEP
WEP Encryption	<input checked="" type="radio"/> Open <input type="radio"/> Restricted
Select Key :	<input checked="" type="radio"/> KEY #1 <input type="radio"/> KEY #2 <input type="radio"/> KEY #3 <input type="radio"/> KEY #4

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.

SSID Security Mode	
Authentication	WPA-personal
WPA MODE	WPA
Share Key	123456789 (8 ~ 63 characters)
WPA Encryption	Auto

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.

SSID Security Mode	
Authentication	WPA-enterprise
WPA MODE	WPA
Share Key	123456789 (8 ~ 63 characters)
WPA Encryption	Auto
802.1x	
Account	F3000
Password	F3000

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.

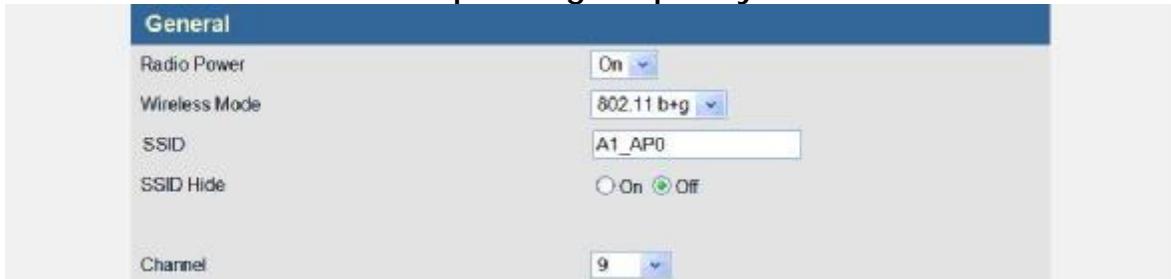


Figure 3-4-28

### † 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.

SSID Security Mode	
Authentication	WPA-personal
WPA MODE	WPA & WPA2
Share Key	123456789 (8 ~ 63 characters)
WPA Encryption	Auto
Group Key Update Interval	600 (30 ~ 65535)

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.

SSID Security Mode	
Authentication	WPA-enterprise
WPA MODE	WPA
Share Key	123456789 (8 ~ 63 characters)
WPA Encryption	Auto
Group Key Update Interval	600 (30 ~ 65535)
802.1x	
Primary Radius Server	
Authenticatoin Server	192 . 168 . 1 . 80 : 1812
Backup Radius Server (Optional)	
Authenticatoin Server	.  .  .  :
	Shared Secret

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.

**QoS Setting On AP**

	<input checked="" type="radio"/> Enable	<input type="radio"/> Disable
WMM	32 (1 ~ 2007)	
MAX Associated Station	CWmin: 2047	CWMax: 4095 AIFS: 2 (1 ~ 255) Burst: 0.0
AP Tx-Best Effort	CWmin: 15	CWMax: 1023 AIFS: 7 (1 ~ 255) Burst: 0.0
AP Tx-Background	CWmin: 7	CWMax: 7 AIFS: 1 (1 ~ 255) Burst: 1.5
AP Tx-Video	CWmin: 7	CWMax: 15 AIFS: 1 (1 ~ 255) Burst: 3.0
AP Tx-Voice	CWmin: 7	CWMax: 1023 AIFS: 2 (1 ~ 255)
STA Tx-Best Effort	TXOP: 64 (1 ~ 255)x32ms ACM: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	
STA Tx-Background	CWmin: 15	CWMax: 1023 AIFS: 7 (1 ~ 255)
STA Tx-Video	TXOP: 1 (1 ~ 255)x32ms ACM: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	
STA Tx-Voice	CWmin: 7	CWMax: 7 AIFS: 1 (1 ~ 255)
	TXOP: 47 (1 ~ 255)x32ms ACM: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	
	CWmin: 7	CWMax: 15 AIFS: 1 (1 ~ 255)
	TXOP: 94 (1 ~ 255)x32ms ACM: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	

**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.

IP Filtering		
<input checked="" type="radio"/> Disable <input type="radio"/> Enable		
Category	IP Address	Delete
IP Address 1:	<input type="text"/>	<input type="button" value="Delete"/>
IP Address 2:	<input type="text"/>	<input type="button" value="Delete"/>
IP Address 3:	<input type="text"/>	<input type="button" value="Delete"/>
IP Address 4:	<input type="text"/>	<input type="button" value="Delete"/>
IP Address 5:	<input type="text"/>	<input type="button" value="Delete"/>
IP Address 6:	<input type="text"/>	<input type="button" value="Delete"/>
IP Address 7:	<input type="text"/>	<input type="button" value="Delete"/>
IP Address 8:	<input type="text"/>	<input type="button" value="Delete"/>
IP Address 9:	<input type="text"/>	<input type="button" value="Delete"/>
IP Address 10:	<input type="text"/>	<input type="button" value="Delete"/>
IP Address 11:	<input type="text"/>	<input type="button" value="Delete"/>
IP Address 12:	<input type="text"/>	<input type="button" value="Delete"/>
IP Address 13:	<input type="text"/>	<input type="button" value="Delete"/>
IP Address 14:	<input type="text"/>	<input type="button" value="Delete"/>
IP Address 15:	<input type="text"/>	<input type="button" value="Delete"/>

**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.

MAC address filtering			
General			
Filtering type: <input type="button" value="Disable"/>			
MAC address table			
Item	MAC address	Ex: 22-22-22-22-22-22	
MAC address 1:			<input type="button" value="Delete"/>
MAC address 2:			<input type="button" value="Delete"/>
MAC address 3:			<input type="button" value="Delete"/>
MAC address 4:			<input type="button" value="Delete"/>
MAC address 5:			<input type="button" value="Delete"/>
MAC address 6:			<input type="button" value="Delete"/>
MAC address 7:			<input type="button" value="Delete"/>
MAC address 8:			<input type="button" value="Delete"/>
MAC address 9:			<input type="button" value="Delete"/>
MAC address 10:			<input type="button" value="Delete"/>
MAC address 11:			<input type="button" value="Delete"/>
MAC address 12:			<input type="button" value="Delete"/>
MAC address 13:			<input type="button" value="Delete"/>
MAC address 14:			<input type="button" value="Delete"/>
MAC address 15:			<input type="button" value="Delete"/>

**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.

SNMP Basic Settings

**SNMP Agent**

Enable  Disable  Enable

**System Information**

Contact	Contact_Me
Location	I_am_here

**V1/V2C**

Index Access Right	Community
1 Deny	
2 Deny	
3 Deny	
4 Deny	
5 Deny	

**V3**

Index User ID	Security Level	Auth Type	Auth Passphrase	Privacy Protocol	Priv Passphrase	Access Right
1	AuthPriv	MD5		DES		unused
2	AuthPriv	MD5		DES		unused
3	AuthPriv	MD5		DES		unused
4	AuthPriv	MD5		DES		unused
5	AuthPriv	MD5		DES		unused

**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.

SNMP VACM Settings				
Community to Security for V1/V2c				
Index	Security Name	IP Source	Community	
<input checked="" type="checkbox"/> 1	mypriv	127.0.0.1	public	
<input type="checkbox"/> 2				
<input type="checkbox"/> 3				
<input type="checkbox"/> 4				
<input type="checkbox"/> 5				

Group			
Index	Group Name	Security Model	Security Name
<input checked="" type="checkbox"/> 1	generic	v1	mypriv
<input checked="" type="checkbox"/> 2	genericusm	usm	generic
<input type="checkbox"/> 3		v1	mypriv
<input type="checkbox"/> 4		v1	mypriv
<input type="checkbox"/> 5		v1	mypriv

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'.

Index	View Name	Include	Sub Tree
<input checked="" type="checkbox"/> 1	mib2	Include	1.3.6.1.2.1
<input checked="" type="checkbox"/> 2	generic	Include	1.3.6.1.4.1.5205
<input type="checkbox"/> 3		Include	
<input type="checkbox"/> 4		Include	
<input type="checkbox"/> 5		Include	
<input type="checkbox"/> 6		Include	
<input type="checkbox"/> 7		Include	
<input type="checkbox"/> 8		Include	
<input type="checkbox"/> 9		Include	
<input type="checkbox"/> 10		Include	
<input type="checkbox"/> 11		Include	
<input type="checkbox"/> 12		Include	
<input type="checkbox"/> 13		Include	
<input type="checkbox"/> 14		Include	
<input type="checkbox"/> 15		Include	
<input type="checkbox"/> 16		Include	
<input type="checkbox"/> 17		Include	

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.

Access							
Index	Group	Security Model	Security Level	Read	Write	Notify	
<input checked="" type="checkbox"/> 1	generic	any	NoAuthNoPriv	generic	generic	generic	
<input checked="" type="checkbox"/> 2	genericusm	usm	AuthPriv	all	all	all	
<input type="checkbox"/> 3	generic	any	NoAuthNoPriv	all	all	all	
<input type="checkbox"/> 4	generic	any	NoAuthNoPriv	all	all	all	
<input type="checkbox"/> 5	generic	any	NoAuthNoPriv	all	all	all	

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.

SNMP Trap						
v1/v2c Trap		Index	Version	IP Address : Port		Community
0	Version 1	192	168	1	21	162
1	Disable					
2	Disable					
3	Disable					
4	Disable					

v3 Trap						
Index		User	IP Address : Port			Security Level
0	genericro					NoAuthNoPriv
1	genericro					NoAuthNoPriv
2	genericro					NoAuthNoPriv
3	genericro					NoAuthNoPriv
4	genericro					NoAuthNoPriv

Figure 3-4-40

### † Trap Items

Enable/Disable which trap items to send.

Trap Items	
Cold Start	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Warm Start	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Link Up	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Link Down	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Auth Fail	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Log In	<input type="radio"/> Disable <input checked="" type="radio"/> Enable

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.

Tools
<b>Command Ping :</b> Ping: IP: Count: 3 <input type="radio"/> Disable <input checked="" type="radio"/> Enable

Figure 3-4-42

### 3.4.8 Log Out

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

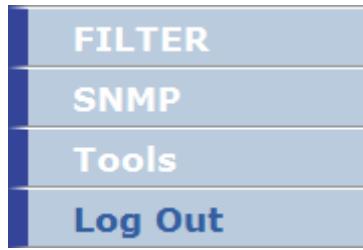


Figure 3-4-43

### 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.

The screenshot shows the 'Administrator Settings' configuration interface for an AP4\_WDS\_BRG device. It includes the following sections:

- Device Name:** A text input field for the device name, with a placeholder '(0~9, A~Z, a~z or \_.)'.
- Language Select:** A dropdown menu set to English.
- Model Select:** A section where the 'Model' is set to 'AP4\_WDS\_BRG' (radio button selected). Other options include OLSR\_AP, AODV\_AP, AP-Bridge, AP-CB-BRIDGE, AP-CB-RROUTE, CB-CB-RROUTE, VLAN-AP, and AP4\_WDS\_BRG.
- Password Settings:** Fields for Current Password, Password (6~12 Characters), and Re-type Password.
- Idle Time Out:** A numeric input field set to 999 (1~999 minutes).
- Remote Management:** A section with an 'Enable' checkbox (unchecked) and an IP Address input field.
- WIFI Loading Warning Threshold:** A section with a 'Threshold' input field set to 15 (5~25 MB/sec).

**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

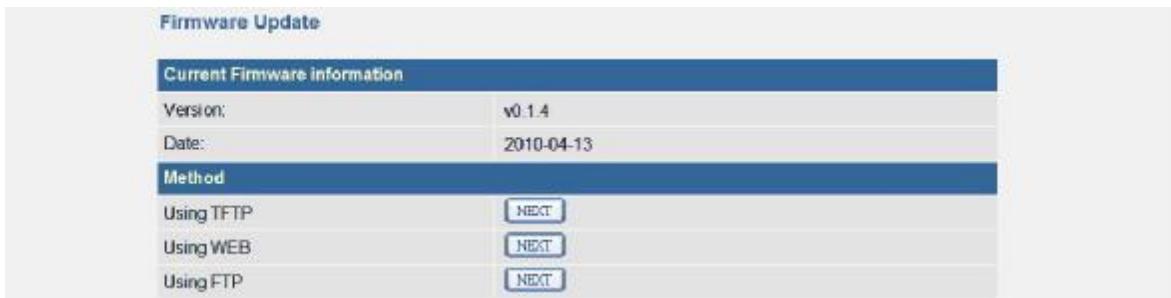
User can enable/disable the management of the Access Point from a remote host. Just click tick the <Enable> check box and enter an IP address of the remote host. Then, only the host with the entered IP address can access this device.

#### † 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

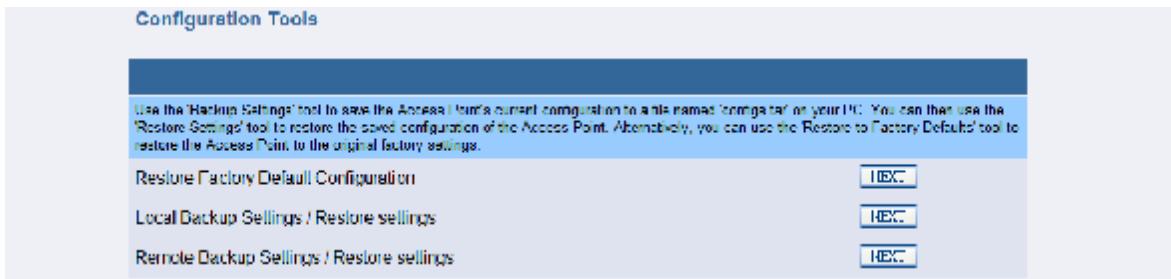
Click on <Browse> button and select the correct firmware file path and file name. Then, click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands while uploading the firmware. This is normal behavior and do not turn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

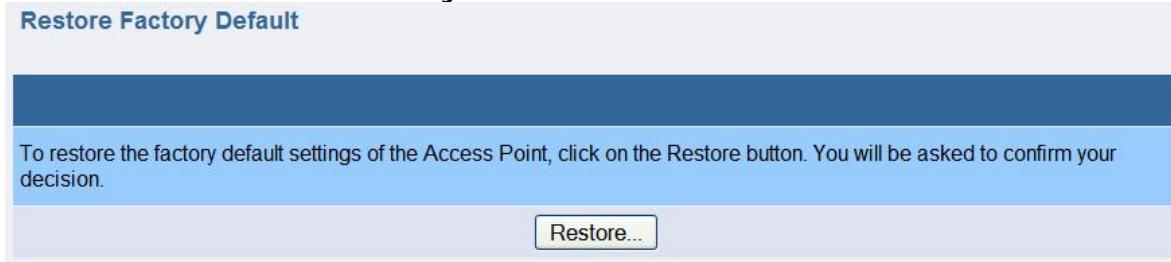
† **Restore Factory Default Configuration:**

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**

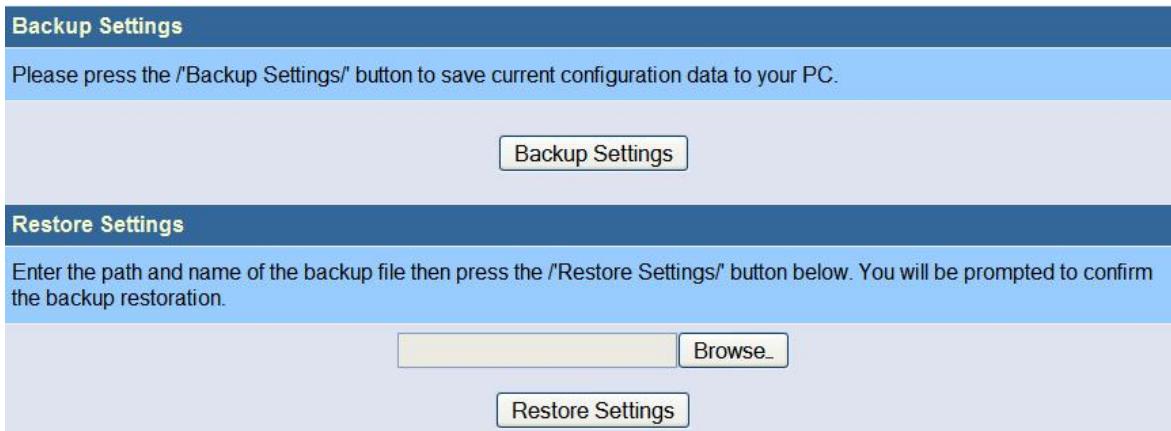
To backup or restore the configuration for this device. Click on <NEXT> button beside 'Local Backup Settings/Restore settings'.



**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				
<b>System Information</b>				
Current Firmware Version	v0.1.3			
Device Name	AP			
System Model	CB-CB-ROUTE			
System Time	Wed Nov 3 00:13:14 2010			
<b>Power Control Status</b>				
ath0 PoE	Disabled			
<b>WAN Port</b>				
IP Address	192.168.23.1			
MAC Address	00:26:48:00:0e:df			
Mask	255.255.255.0			
Gateway	NA			
DHCP	Disabled			
<b>WAN Port</b>				
IP Address	192.168.23.1			
MAC Address	00:26:48:00:0e:df			
Mask	255.255.255.0			
Gateway	NA			
DHCP	Disabled			
<b>eth0 LAN Port</b>				
IP Address	192.168.0.1			
MAC Address	00:40:cE:00:00:33			
Mask	255.255.255.0			
DHCP	Disabled			
<b>eth1 LAN Port</b>				
IP Address	192.168.1.1			
MAC Address	00:40:cE:00:00:22			
Mask	255.255.255.0			
DHCP	Disabled			
<b>Station WIFI 1 Status</b>				
MODE	802.11 a			
COUNTRY	North_America_Area			
DTIM	1			
FRAG	2346			
RTS	2346			
BEACON	100			
DISTANCE	100			
<b>Interface ath0</b>				
Radio	Off			
<b>Interface ath1</b>				
Radio	Off			
<b>Interface ath2</b>				
Radio	Off			
<b>Interface ath3</b>				
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	
<b>Station WIFI 2 Status</b>				
MODE	802.11 a			
COUNTRY	North_America_Area			
DTIM	1			
FRAG	2346			
RTS	2346			
BEACON	100			
DISTANCE	100			
<b>Interface ath4</b>				
Radio	Off			
<b>Interface ath5</b>				
Radio	Off			
<b>Interface ath6</b>				
Radio	Off			
<b>Interface ath7</b>				
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.

Time Setting	
Select Setting Type	
Setting by	<input checked="" type="radio"/> Manual Setting <input type="radio"/> Synchronize with an Internet Time Server
Current System Time	Tue Apr 13 00:44:23 UTC 2010
Manual Setting	
Year / Month / Day	2010 / 4 / 13 (Year:1900 – 2037)
Hour : Minute : Second	00 : 00 : 00
Using Internet Time Server	
Hours from GMT	+8 Hours
Server IP	140.142.16.34
Server IP for Reference	140.142.16.34 or 129.132.2.21
Time Update for Every	0 days(0 - 31) 0 hours(0 - 23) 10 minutes(0 - 59)

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.

The screenshot shows a software interface for configuring a network interface. At the top, a blue header bar says 'WAN Setting' and 'Interface ath3 Setting'. Below this, there's a section for 'IP Authentication' with radio buttons for 'Static' (selected) and 'DHCP'. Underneath is a 'Network IP Parameters' section with three rows of input fields:

	192	.	168	.	23	.	1
IP Address	192	.	168	.	23	.	1
Subnet Mask	255	.	255	.	255	.	0

Below the table, another row of input fields shows 'Gateway Address' with values 192, 168, 23, and 254.

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.

**Bandwidth Management**

Bandwidth Management			
Bandwidth Management:	<input type="radio"/> Enable <input checked="" type="radio"/> Disable		
Upload Bandwidth:	14 Mbps		
Download Bandwidth:	54 Mbps		
Bandwidth Limitation List			
Action	Start IP Address	End IP Address	Bandwidth Limitation(Kbps)
1 <input type="checkbox"/> Up/Download	192.168.1.20	192.168.1.100	0000
<a href="#">[Del]</a>			
Add Bandwidth Limitation			
Action	Start IP Address	End IP Address	Bandwidth Limitation(Kbps)
Up/Download <input type="button" value="▼"/>	0.0.0.0	0.0.0.0	200
<a href="#">[Add]</a>			

**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.

**LAN Setting**

Interface eth0 Setting	
Network IP Parameters	
IP Address	192 . 168 . 0 . 1
Subnet Mask	255 . 255 . 255 . 0
DHCP Server	Enable <input type="button" value="▼"/>
DHCP Server Parameters	
Primary DNS Address	168 . 95 . 1 . 1
Secondary DNS Address	168 . 95 . 1 . 2
IP Pool Starting Address	192 . 168 . 0 . 100
IP Pool Ending Address	192 . 168 . 0 . 200
Lease Time	48hours <input type="button" value="▼"/>

**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.

SSID Security Mode	
Authentication	<input type="button" value="WPA-personal"/>
WPA MODE	<input type="button" value="WPA"/>
Share Key	<input type="text" value="123456789"/> (8 ~ 63 characters)
WPA Encryption	<input type="button" value="Auto"/>

**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.

SSID Security Mode	
Authentication	<input type="button" value="WPA-enterprise"/>
WPA MODE	<input type="button" value="WPA"/>
Share Key	<input type="text" value="123456789"/> (8 ~ 63 characters)
WPA Encryption	<input type="button" value="Auto"/>
802.1x	
Account	<input type="text" value="F3000"/>
Password	<input type="text" value="F3000"/>

**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.

The screenshot shows a configuration interface titled "IP Filtering". At the top, there is a radio button group for "Disable" (selected) and "Enable". Below this is a table with 15 rows, each labeled "IP Address 1" through "IP Address 15". Each row has three columns: "Category" (containing the IP address), "IP Address" (a text input field), and "Delete" (a small button). The entire interface is set against a light gray background.

Category	IP Address	Delete
IP Address 1:		[Delete]
IP Address 2:		[Delete]
IP Address 3:		[Delete]
IP Address 4:		[Delete]
IP Address 5:		[Delete]
IP Address 6:		[Delete]
IP Address 7:		[Delete]
IP Address 8:		[Delete]
IP Address 9:		[Delete]
IP Address 10:		[Delete]
IP Address 11:		[Delete]
IP Address 12:		[Delete]
IP Address 13:		[Delete]
IP Address 14:		[Delete]
IP Address 15:		[Delete]

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.

MAC address filtering			
General			
Filtering type: <input type="button" value="Disable"/>			
MAC address table			
Item	MAC address	Ex: 22-22-22-22-22-22	
MAC address 1:			<input type="button" value="Delete"/>
MAC address 2:			<input type="button" value="Delete"/>
MAC address 3:			<input type="button" value="Delete"/>
MAC address 4:			<input type="button" value="Delete"/>
MAC address 5:			<input type="button" value="Delete"/>
MAC address 6:			<input type="button" value="Delete"/>
MAC address 7:			<input type="button" value="Delete"/>
MAC address 8:			<input type="button" value="Delete"/>
MAC address 9:			<input type="button" value="Delete"/>
MAC address 10:			<input type="button" value="Delete"/>
MAC address 11:			<input type="button" value="Delete"/>
MAC address 12:			<input type="button" value="Delete"/>
MAC address 13:			<input type="button" value="Delete"/>
MAC address 14:			<input type="button" value="Delete"/>
MAC address 15:			<input type="button" value="Delete"/>

**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.

SNMP Basic Settings

SNMP Agent						
<input type="radio"/> Enable	<input checked="" type="radio"/> Disable					
System Information						
Contact	<input type="text" value="Contact_Me"/>					
Location	<input type="text" value="I_am_here"/>					
V1/V2C						
Index Access Right	Community					
1	<input type="text" value="Deny"/>					
2	<input type="text" value="Deny"/>					
3	<input type="text" value="Deny"/>					
4	<input type="text" value="Deny"/>					
5	<input type="text" value="Deny"/>					
V3						
Index User ID	Security Level	Auth Type	Auth Passphrase	Privacy Protocol	Priv Passphrase	Access Right
1	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text" value=""/>	<input type="text" value="DES"/>	<input type="text" value=""/>	<input type="text" value="unused"/>
2	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text" value=""/>	<input type="text" value="DES"/>	<input type="text" value=""/>	<input type="text" value="unused"/>
3	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text" value=""/>	<input type="text" value="DES"/>	<input type="text" value=""/>	<input type="text" value="unused"/>
4	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text" value=""/>	<input type="text" value="DES"/>	<input type="text" value=""/>	<input type="text" value="unused"/>
5	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text" value=""/>	<input type="text" value="DES"/>	<input type="text" value=""/>	<input type="text" value="unused"/>

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.

SNMP VACM Settings				
Community to Security for V1/V2c				
Index	Security Name	IP Source	Community	
<input checked="" type="checkbox"/> 1	mypriv	127.0.0.1	public	
<input type="checkbox"/> 2				
<input type="checkbox"/> 3				
<input type="checkbox"/> 4				
<input type="checkbox"/> 5				

Group				
Index	Group Name	Security Model	Security Name	
<input checked="" type="checkbox"/> 1	generic	v1	mypriv	
<input checked="" type="checkbox"/> 2	genericusm	usm	generic	
<input type="checkbox"/> 3		v1	mypriv	
<input type="checkbox"/> 4		v1	mypriv	
<input type="checkbox"/> 5		v1	mypriv	

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'.

Index	ViewName	Include	Sub Tree
<input checked="" type="checkbox"/> 1	mib2	Include	1.3.6.1.2.1
<input checked="" type="checkbox"/> 2	generic	Include	1.3.6.1.4.1.5205
<input type="checkbox"/> 3		Include	
<input type="checkbox"/> 4		Include	
<input type="checkbox"/> 5		Include	
<input type="checkbox"/> 6		Include	
<input type="checkbox"/> 7		Include	
<input type="checkbox"/> 8		Include	
<input type="checkbox"/> 9		Include	
<input type="checkbox"/> 10		Include	
<input type="checkbox"/> 11		Include	
<input type="checkbox"/> 12		Include	
<input type="checkbox"/> 13		Include	
<input type="checkbox"/> 14		Include	
<input type="checkbox"/> 15		Include	
<input type="checkbox"/> 16		Include	
<input type="checkbox"/> 17		Include	

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.

Access	Index	Group	Security Model	Security Level	Read	Write	Notify
	<input checked="" type="checkbox"/> 1	generic	any	NoAuthNoPriv	generic	generic	generic
	<input checked="" type="checkbox"/> 2	genericusm	usm	AuthPriv	all	all	all
	<input type="checkbox"/> 3	generic	any	NoAuthNoPriv	all	all	all
	<input type="checkbox"/> 4	generic	any	NoAuthNoPriv	all	all	all
	<input type="checkbox"/> 5	generic	any	NoAuthNoPriv	all	all	all

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.

The screenshot shows the 'v1/v2c Trap' configuration section. It has two main tables:

- v1/v2c Trap:** This table lists trap indices from 0 to 4. Each row includes a dropdown for 'Version' (set to 'Version 1'), a dropdown for 'Trap Active' (set to 'Disable'), and columns for 'IP Address', 'Port', and 'Community'. The 'Community' column contains the value 'public' for all rows.
- v3 Trap:** This table lists trap indices from 0 to 4. Each row includes a dropdown for 'User' (set to 'genérico') and a dropdown for 'Security Level' (set to 'NoAuthNoPriv').

**Figure 3-5-34**

### † Trap Items

Enable/Disable which trap items to send.

The screenshot shows the 'Trap Items' configuration section. It lists several trap types with enable/disable checkboxes:

Trap Item	Enable
Cold Start	<input checked="" type="radio"/> Enable
Warm Start	<input checked="" type="radio"/> Enable
Link Up	<input checked="" type="radio"/> Enable
Link Down	<input checked="" type="radio"/> Enable
Auth Fail	<input checked="" type="radio"/> Enable
Log In	<input checked="" type="radio"/> Enable

**Figure 3-5-35**

### 3.5.7 Tools

#### † Command Ping

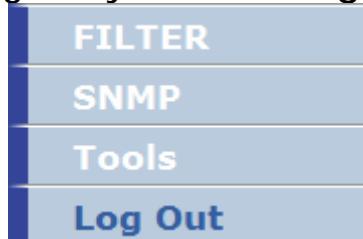
It runs ping command to test the connection capability of this device with the other Ethernet device.

The screenshot shows the 'Command Ping' configuration interface. It includes fields for 'Ping' (set to 'Ping'), 'IP' (a text input field), 'Count' (set to '3'), and 'Enable' (a radio button).

**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.

Administrator Settings

<b>Device Name</b>	<input type="text"/>	(A-Z, a-z, 0-9 or '_')
<b>Language Select</b>		
Language	English <input type="button" value="..."/>	
<b>Model Select</b>		
Model	<input type="radio"/> OLSR_AP <input type="radio"/> AODV_AP <input type="radio"/> AP-Bridge <input type="radio"/> AP-CB-Bridge <input type="radio"/> AP-CB-ROUTE <input type="radio"/> CB-CB-ROUTE <input checked="" type="radio"/> VLAN-AP <input type="radio"/> AP_WDS_BRG <input type="radio"/> AP4_WDS_BRG	
<b>Password Settings</b>		
Current Password	<input type="password"/>	
Password	<input type="password"/> (3 ~ 12 Characters)	
Re-type Password	<input type="password"/>	
Idle Time Out	30	(1 ~ 900 minutes)
<b>Remote Management</b>		
Enable	<input type="checkbox"/> (If enabled, only the following PC can manage this AP.)	
IP Address	<input type="text"/> + <input type="text"/> + <input type="text"/> + <input type="text"/>	
<b>WIFI Loading Warning Threshold</b>		
Threshold	15 (5 ~ 25 Mb/sec)	

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

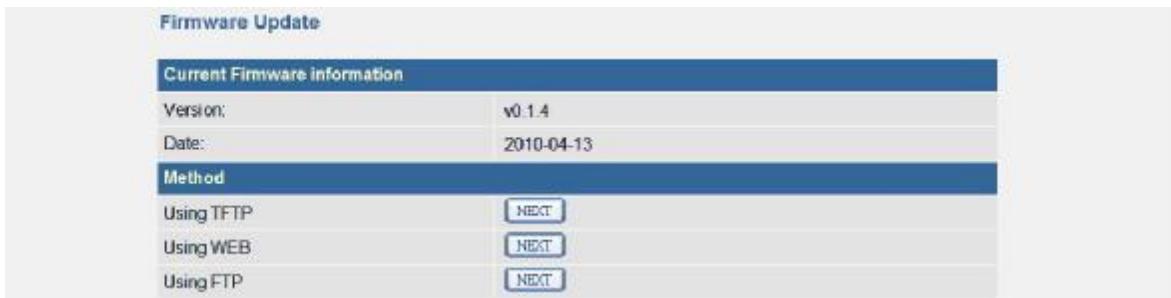
User can enable/disable the management of the Access Point from a remote host. Just tick the <Enable> check box and enter an IP address of the remote host. Then, only the host with the entered IP address can access this device.

#### † 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

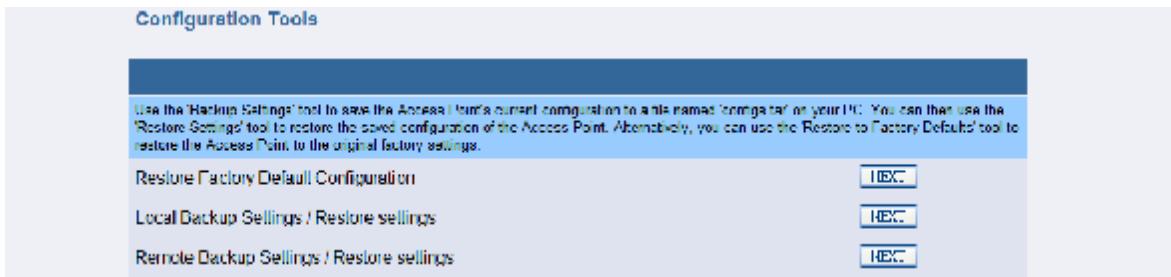
Click on <Browse> button and select the correct firmware file path and file name. Then, click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands while uploading the firmware. This is normal behavior and do not turn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

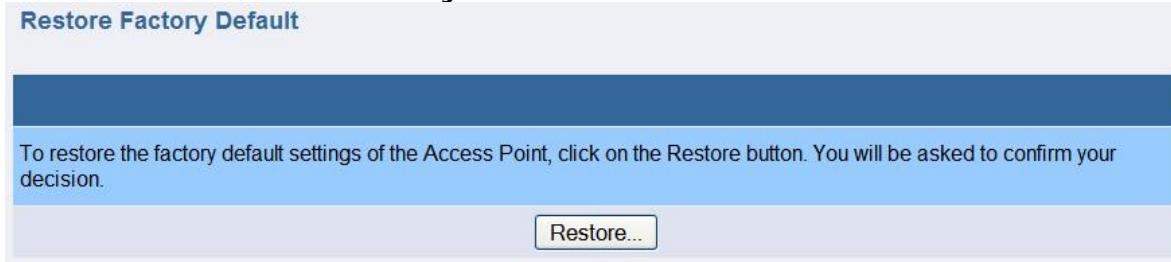
† **Restore Factory Default Configuration:**

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**

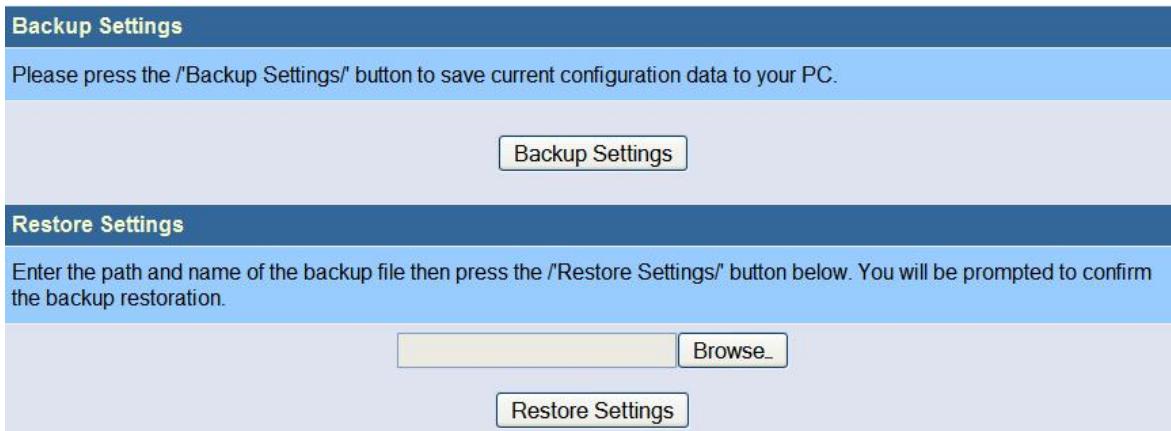
To backup or restore the configuration for this device. Click on <NEXT> button beside 'Local Backup Settings/Restore settings'.



**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.

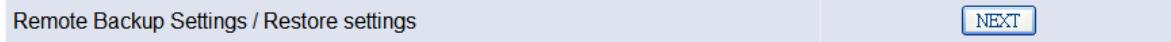


**Figure 3-6-8**

#### † 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.

Status			
<b>System Information</b>			
Current Firmware Version			v0.1.8
Device Name			AP
System Model			VLAN-AP
System Time			Wed Nov 3 01:09:12 2010
<b>Power Control Status</b>			
eth0 PoE			Disabled
<b>LAN Port of eth1</b>			
IP Address			192.168.1.1
MAC Address			00:40:cE:00:00:22
Mask			255.255.255.0
<b>AP WIFI 1 Status</b>			
MODE			802.11 a
COUNTRY			North_America_Area
CHANNEL			Auto
DTIM			1
FRAG			2346
RTS			2346
BEACON			100
DISTANCE			100
<b>Interface ath0</b>			
SSID		A1_AP0	Security:
VLAN ID		10	Disabled
<b>Interface ath1</b>			
Radio			Off
<b>Interface ath2</b>			
Radio			Off
<b>Interface ath3</b>			
Radio			Off
<b>AP WIFI 2 Status</b>			
MODE			802.11 a
COUNTRY			North_America_Area
CHANNEL			Auto
DTIM			1
FRAG			2346
RTS			2346
BEACON			100
DISTANCE			100
<b>Interface ath4</b>			
SSID		A2_AP4	Security:
VLAN ID		24	Disabled
<b>Interface ath5</b>			
Radio			Off
<b>Interface ath6</b>			
Radio			Off
<b>Interface ath7</b>			
Radio			Off

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.

<b>Power Control/Status</b>
PoE Power Control (eth0 port): <input type="radio"/> Enable <input checked="" type="radio"/> Disable

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.

WIFI Status		
WIFI Interfaces :	ath0	ath1
<b>Interface ath0 Information</b>		
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: -96 dBm	Noise level: -96 dBm
Rx invalid wcid: 979	Rx invalid crypt: 0	Rx invalid frag: 0
Tx excessive retries: 0	Invalid misc: 0	Missed beacon: 0
<b>Security Information</b>		
Security Mode:	Disable	
<b>Associated AP/Station</b>		
<b>End of Status</b>		

Figure 3-6-13

### 3.6.1.7 Log

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

Logs
System Logs
Apr 13 00:02:01 AP cron.notice crond[2844]: USER root pid 3531 cmd /web-server/www/hcm Apr 13 00:02:00 AP auth.notice root: 192.168.1.10 login Apr 13 00:01:47 AP auth.notice root: 192.168.1.10 login Apr 13 00:00:00 AP user.info : /web-server/flash-setup.sh /web-server/flash-setup.sh Apr 13 00:00:00 AP user.info : date 091300002010.00 Apr 13 00:00:00 AP user.info : Tue Apr 13 00:00:00 UTC 2010 Apr 13 00:00:05 AP user.info : Terminated Apr 13 00:00:03 AP user.info : Killed Apr 13 00:00:03 AP user.info : Terminated Apr 13 00:00:00 AP user.info kernel: br0: port 1 (eth1.24): transitioning to FORWARDING Apr 13 00:00:00 AP user.info kernel: br0: port 3 (ath0): transitioning to FORWARDING Apr 13 00:00:00 AP user.info kernel: br0: port 3 (eth1.10): transitioning to FORWARDING Apr 13 00:00:00 AP user.info kernel: br0: port 3 (ath0): transitioning to FORWARDING Apr 13 00:00:00 AP user.info kernel: br0: port 1 (eth1.24): transitioning to LEARNING Apr 13 00:00:00 AP user.info kernel: br0: port 2 (eth0.24): transitioning to DISABLED Apr 13 00:00:00 AP user.info kernel: br0: port 3 (ath0): transitioning to LEARNING sta

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.

The screenshot shows the 'Time Setting' configuration page. It includes sections for 'Select Setting Type' (Manual Setting selected), 'Current System Time' (Tue Apr 13 00:13:59 UTC 2010), and 'Manual Setting' (Year/Month/Day: 2010/4/13, Hour/Minute/Second: 00:00:00). The 'Using Internet Time Server' section shows 'Hours from GMT' as +8 Hours, 'Server IP' as 140.142.16.34, and 'Server IP for Reference' as 140.142.16.34 or 129.132.2.21. A 'Time Update for Every' field is set to 0 days(0 - 31) 0 hours(0 - 23) 10 minutes(0 - 59).

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

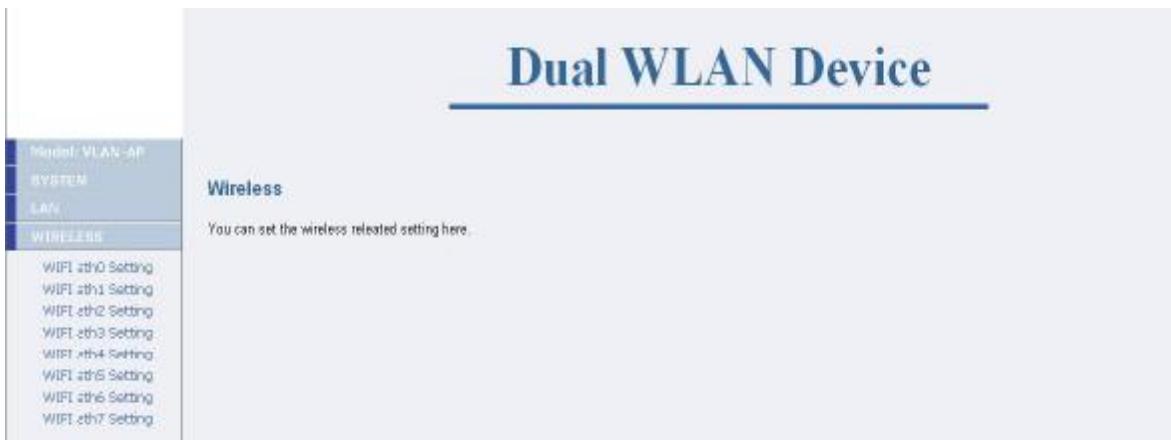
User can change the network settings of this device from LAN Configuration; it is including IP address, Subnet mask, and Gateway address.

The screenshot shows the 'LAN Setting' configuration page under 'Interface and Setting'. The 'Network IP Parameters' section displays three fields: 'IP Address' (192.168.1.1), 'Subnet Mask' (255.255.255.0), and 'Gateway Address' (192.168.1.254).

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.

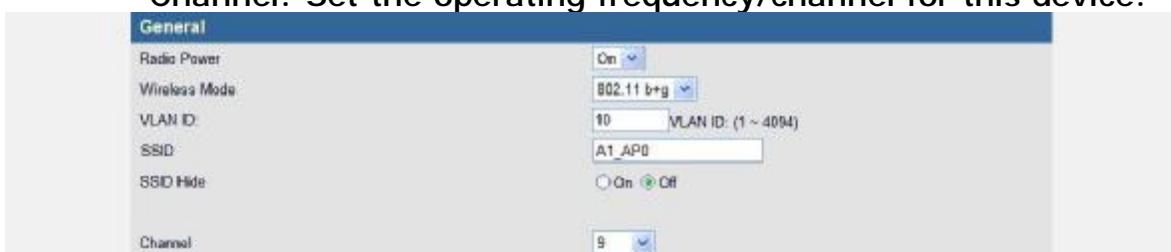
Wireless Mode: Select which wireless mode that user wants to use. The options available here are: 802.11a, 802.11b, 802.11g and 802.11b+g.

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.

The screenshot shows the 'Advanced Setting' window with the following configuration:

- Peer Node Distance: Auto, Distance: 100 m (100 ~ 65535)
- Beacon Period: 100 (20 ~ 1000)
- DTIM Period: 1 (1 ~ 255)
- Fragmentation Threshold: 2346 (256 ~ 2346)
- RTS/CTS Threshold: 2346 (1 ~ 2346)
- Tx Power: Auto
- Rate: 54 Mbit/s, Fixed
- Layer 2 Isolation: Enable
- WEP Key Setting:
  - Key #1: \*\*\*\*\*
  - Key #2: \*\*\*\*\*
  - Key #3: \*\*\*\*\*
  - Key #4: \*\*\*\*\*

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.

The screenshot shows a configuration window titled "SSID Security Mode". It includes fields for "Authentication" (set to "WPA-personal"), "WPA MODE" (set to "WPA & WPA2"), "Share Key" (containing the value "123456789" with a note "(8 ~ 63 characters)", "WPA Encryption" (set to "Auto"), and "Group Key Update Interval" (set to "600" with a note "(30 ~ 65535)").

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.

SSID Security Mode	
Authentication	WPA-enterprise
WPA MODE	WPA
Share Key	123456789 (8 ~ 63 characters)
WPA Encryption	Auto
Group Key Update Interval	600 (30 ~ 65535)
802.1x	
Primary Radius Server	
Authenticatoin Server	192 . 168 . 1 . 80 : 1812 Shared Secret secret
Backup Radius Server (Optional)	
Authenticatoin Server	.   .   . :   Shared Secret

**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.

QoS Setting On AP	
WMM	
MAX Associated Station	32 (1 ~ 2007)
AP Tx-Best Effort	CWmin: 2047 CWMax: 4095 AIFS: 2 (1 ~ 255) Burst: 0.0
AP Tx-Background	CWmin: 15 CWMax: 1023 AIFS: 7 (1 ~ 255) Burst: 0.0
AP Tx-Video	CWmin: 7 CWMax: 7 AIFS: 1 (1 ~ 255) Burst: 1.5
AP Tx-Voice	CWmin: 7 CWMax: 15 AIFS: 1 (1 ~ 255) Burst: 3.0
STA Tx-Best Effort	CWmin: 7 CWMax: 1023 AIFS: 2 (1 ~ 255) TXOP: 64 (1 ~ 255)x32ms ACM: <input checked="" type="radio"/> Enable <input type="radio"/> Disable
STA Tx-Background	CWmin: 15 CWMax: 1023 AIFS: 7 (1 ~ 255) TXOP: 1 (1 ~ 255)x32ms ACM: <input type="radio"/> Enable <input checked="" type="radio"/> Disable
STA Tx-Video	CWmin: 7 CWMax: 7 AIFS: 1 (1 ~ 255) TXOP: 47 (1 ~ 255)x32ms ACM: <input type="radio"/> Enable <input checked="" type="radio"/> Disable
STA Tx-Voice	CWmin: 7 CWMax: 15 AIFS: 1 (1 ~ 255) TXOP: 94 (1 ~ 255)x32ms ACM: <input type="radio"/> Enable <input checked="" type="radio"/> Disable

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.

MAC address filtering			
General		Filtering type:	Disable
MAC address table			
Item	MAC address	Ex: 22-22-22-22-22-22	
MAC address 1 :		<input type="button" value="Delete"/>	
MAC address 2 :		<input type="button" value="Delete"/>	
MAC address 3 :		<input type="button" value="Delete"/>	
MAC address 4 :		<input type="button" value="Delete"/>	
MAC address 5 :		<input type="button" value="Delete"/>	
MAC address 6 :		<input type="button" value="Delete"/>	
MAC address 7 :		<input type="button" value="Delete"/>	
MAC address 8 :		<input type="button" value="Delete"/>	
MAC address 9 :		<input type="button" value="Delete"/>	
MAC address 10 :		<input type="button" value="Delete"/>	
MAC address 11 :		<input type="button" value="Delete"/>	
MAC address 12 :		<input type="button" value="Delete"/>	
MAC address 13 :		<input type="button" value="Delete"/>	
MAC address 14 :		<input type="button" value="Delete"/>	
MAC address 15 :		<input type="button" value="Delete"/>	

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.

SNMP Basic Settings

SNMP Agent						
<input type="radio"/> Enable	<input checked="" type="radio"/> Disable					
System Information						
Contact	<input type="text" value="Contact_Me"/>					
Location	<input type="text" value="I_am_here"/>					
V1/V2C						
Index Access Right	Community					
1	<input type="text"/>					
2	<input type="text"/>					
3	<input type="text"/>					
4	<input type="text"/>					
5	<input type="text"/>					
V3						
Index User ID	Security Level	Auth Type	Auth Passphrase	Privacy Protocol	Priv Passphrase	Access Right
1	<input type="text"/>	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text"/>	<input type="text" value="DES"/>	<input type="text" value="unused"/>
2	<input type="text"/>	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text"/>	<input type="text" value="DES"/>	<input type="text" value="unused"/>
3	<input type="text"/>	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text"/>	<input type="text" value="DES"/>	<input type="text" value="unused"/>
4	<input type="text"/>	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text"/>	<input type="text" value="DES"/>	<input type="text" value="unused"/>
5	<input type="text"/>	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text"/>	<input type="text" value="DES"/>	<input type="text" value="unused"/>

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.

SNMP VACM Settings				
Community to Security for V1/V2c				
Index	Security Name	IP Source	Community	
<input checked="" type="checkbox"/> 1	mypriv	127.0.0.1	public	
<input type="checkbox"/> 2				
<input type="checkbox"/> 3				
<input type="checkbox"/> 4				
<input type="checkbox"/> 5				

Group			
Index	Group Name	Security Model	Security Name
<input checked="" type="checkbox"/> 1	generic	v1	mypriv
<input checked="" type="checkbox"/> 2	genericusm	USM	generic
<input type="checkbox"/> 3		v1	mypriv
<input type="checkbox"/> 4		v1	mypriv
<input type="checkbox"/> 5		v1	mypriv

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'.

Index	ViewName	Include	Sub Tree
<input checked="" type="checkbox"/> 1	mib2	Include	1.3.6.1.2.1
<input checked="" type="checkbox"/> 2	generic	Include	1.3.6.1.4.1.6205
<input type="checkbox"/> 3		Include	
<input type="checkbox"/> 4		Include	
<input type="checkbox"/> 5		Include	
<input type="checkbox"/> 6		Include	
<input type="checkbox"/> 7		Include	
<input type="checkbox"/> 8		Include	
<input type="checkbox"/> 9		Include	
<input type="checkbox"/> 10		Include	
<input type="checkbox"/> 11		Include	
<input type="checkbox"/> 12		Include	
<input type="checkbox"/> 13		Include	
<input type="checkbox"/> 14		Include	
<input type="checkbox"/> 15		Include	
<input type="checkbox"/> 16		Include	
<input type="checkbox"/> 17		Include	

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.

Access	Index	Group	Security Model	Security Level	Read	Write	Notify
	<input checked="" type="checkbox"/> 1	generic	any	NoAuthNoPriv	generic	generic	generic
	<input checked="" type="checkbox"/> 2	genericusm	usm	AuthPriv	all	all	all
	<input type="checkbox"/> 3	generic	any	NoAuthNoPriv	all	all	all
	<input type="checkbox"/> 4	generic	any	NoAuthNoPriv	all	all	all
	<input type="checkbox"/> 5	generic	any	NoAuthNoPriv	all	all	all

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.



The screenshot shows two tables for v1/v2c Trap configuration. The first table has columns for Index, Version, IP Address : Port, and Community. The second table has columns for Index, User, IP Address : Port, and Security Level. Both tables have rows for indices 0 through 4.

v1/v2c Trap				
Index	Version	IP Address : Port		Community
0	Version 1	192	168	1
1	Disable			
2	Disable			
3	Disable			
4	Disable			

v3 Trap				
Index	User	IP Address : Port		Security Level
□ 0	genericro			NoAuthNoPriv
□ 1	genericro			NoAuthNoPriv
□ 2	genericro			NoAuthNoPriv
□ 3	genericro			NoAuthNoPriv
□ 4	genericro			NoAuthNoPriv

Figure 3-6-30

#### † Trap Items

Enable/Disable which trap items to send.



The screenshot shows a table of trap items with columns for name and enable/disable status. The items listed are Cold Start, Warm Start, Link Up, Link Down, Auth Fail, and Log In.

Trap Items	Enable
Cold Start	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Warm Start	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Link Up	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Link Down	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Auth Fail	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Log In	<input type="radio"/> Disable <input checked="" type="radio"/> Enable

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.



The screenshot shows a form for Command Ping with fields for Ping, IP, Count, and enable/disable status.

Command Ping :	
Ping:	IP: [ ] Count: [3] <input type="radio"/> Disable <input checked="" type="radio"/> Enable

Figure 3-6-32

### 3.6.7 Log Out

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

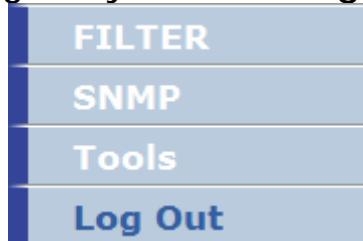


Figure 3-6-33

### **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**.

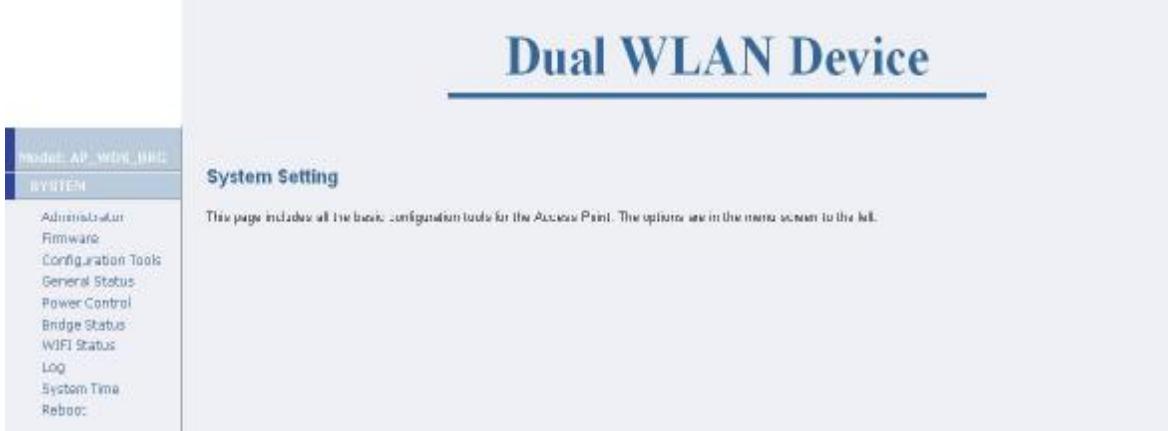


Figure 3-7-1

### 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.

The screenshot shows the 'Administrator Settings' configuration page. It includes sections for Device Name, Language Select (set to English), Model Select (with options like OLSR\_AP, ADDV\_AP, AP-Bridge, AP-CB-Bridge, AP-CB-ROUTE, CB-CB-ROUTE, VLAN4-AP, AP\_WIDS\_BRG, and AP4\_WIDS\_BRG), Password Settings (Current Password, Password, Re-type Password, Idle Time Out set to 999), Remote Management (Enable checked, IP Address input field), and WiFi Loading Warning Threshold (Threshold set to 15). The interface uses a light blue header and grey background for the form fields.

**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

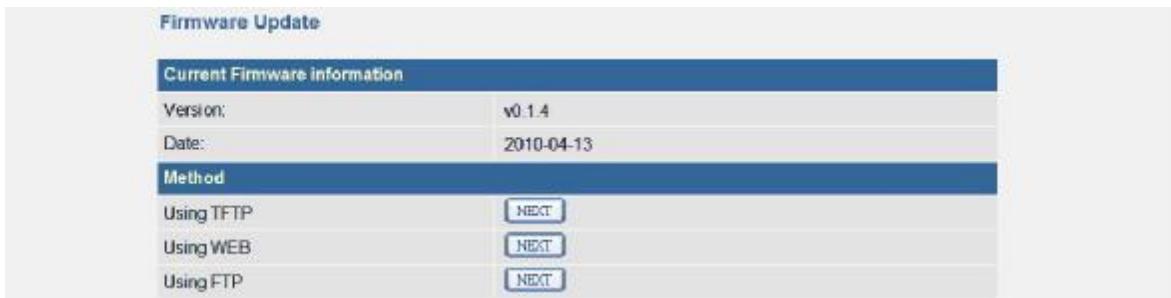
User can enable/disable the management of the Access Point from a remote host. Just tick the <Enable> check box and enter an IP address of the remote host. Then, only the host with the entered IP address can access this device.

### † 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

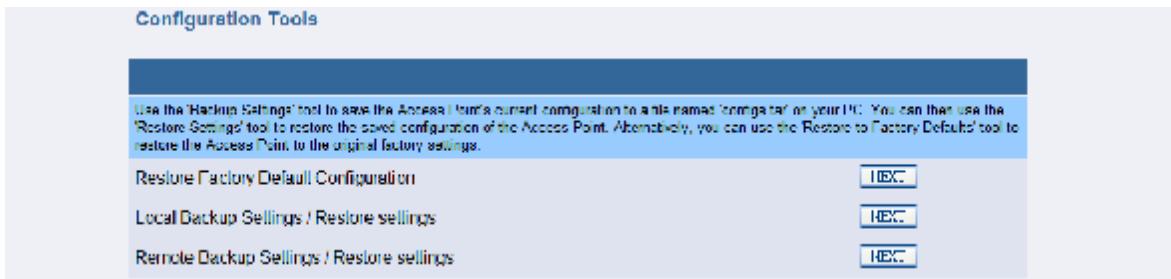
Click on <Browse> button and select the correct firmware file path and file name. Then, click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands while uploading the firmware. This is normal behavior and do not turn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

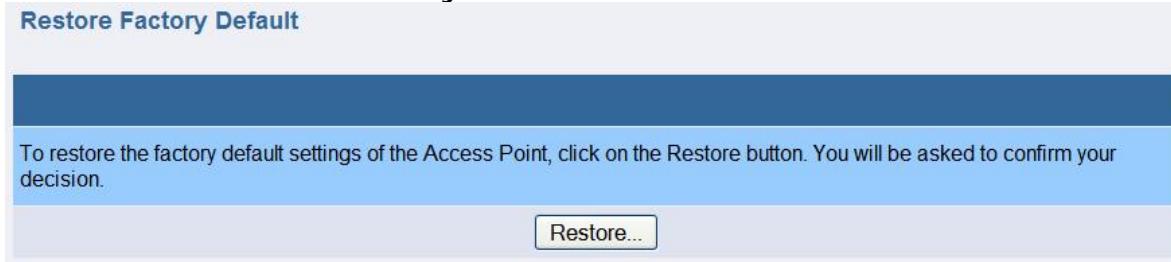
† **Restore Factory Default Configuration:**

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**

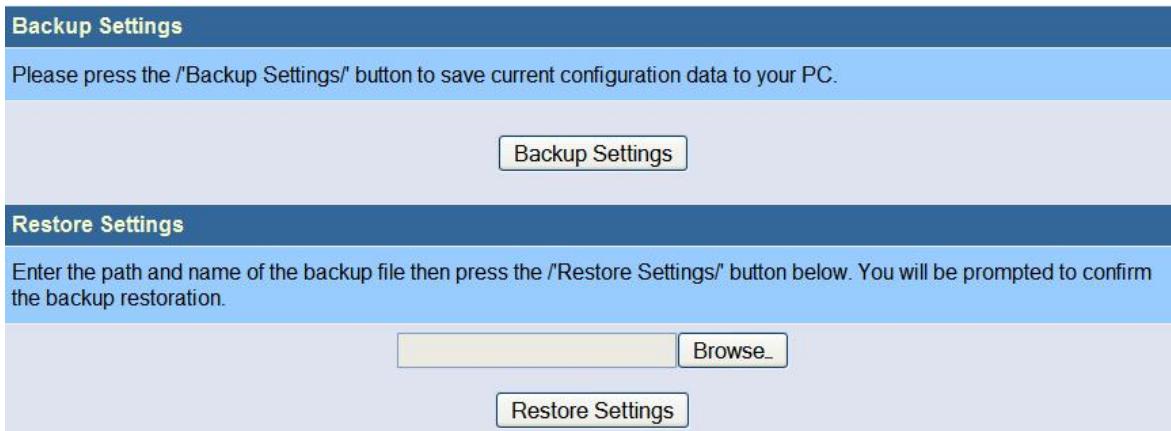
To backup or restore the configuration for this device. Click on <NEXT> button beside 'Local Backup Settings/Restore settings'.



**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.

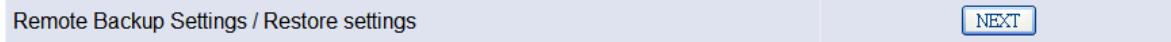


**Figure 3-7-8**

#### † 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.

Status			
<b>System Information</b>			
Current Firmware Version	v0.1.8		
Device Name	AP		
System Model	AP_WDS_BRG		
System Time	Wed Nov 3 00:40:55 2010		
<b>Power Control Status</b>			
eth0 PoE	Disabled		
<b>Bridge LAN Port</b>			
IP Address	192.168.1.1		
MAC Address	00:26:48:00:0e:df		
Mask	255.255.255.0		
<b>AP WIFI 1 Status</b>			
MODE	802.11 a		
COUNTRY	North_America_Area		
CHANNEL	Auto		
DTIM	1		
FRAG	2346		
RTS	2346		
BEACON	100		
DISTANCE	100		
<b>Interface ath0</b>			
SSID	A1_AP0	Security:	Disabled
<b>Interface ath1</b>			
Radio	Off		
<b>Interface ath2</b>			
Radio	Off		
<b>Interface ath3</b>			
Radio	Off		
<b>AP WIFI 2 Status</b>			
MODE	802.11 a		
COUNTRY	North_America_Area		
CHANNEL	Auto		
DTIM	1		
FRAG	2346		
RTS	2346		
BEACON	100		
DISTANCE	100		
<b>Interface ath4</b>			
SSID	A2_AP4	Security:	Disabled
<b>Interface ath5</b>			
Radio	Off		
<b>Interface ath6</b>			
Radio	Off		
<b>Interface ath7</b>			
Radio	Off		

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.

Power Control/Status	
PoE Power Control (eth0 port):	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

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 Information				
Bridge:	br0			
Bridge STP State:	off			
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		ten 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
administ2pmac:	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
administ2pmac:	AUTO		edge:	yes
ath0 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
administ2pmac:	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:	2813.34
designated port:	8004		forward delay timer:	2812.38
designated cost:	0		hold timer:	0.00
administ2pmac:	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:cE00:00:22	yes	0.00	
2	00:40:cE00:00:33	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.

WIFI Status		
WIFI Interfaces : ath0 ath4		
<b>Interface ath0 Information</b>		
IEEE: 802.11g	ESSID: "A1_AP0"	Nickname: ""
Mode: Master	Frequency: 2.452 GHz	Access Point: 00:26:48:00:0E:C2
Bit Rate: 0 kb/s	Tx-Power: 18 dBm	Sensitivity: 1/1
Retry: off	RTS thr: off	Fragment thr: off
Encryption key: off		
Power Management: off		
Link Quality: 0/70	Signal level: -96 dBm	Noise level: -96 dBm
Rx invalid swid: 223	Rx invalid crypt: 0	Rx invalid frag: 0
Tx excessive retries: 0	Invalid misc: 0	Missed beacon: 0
<b>Security Information</b>		
Security Mode:	Disable	
<b>Associated AP/Station</b>	No wifi Associated.	
<b>End of Status</b>		

Figure 3-7-14

### 3.7.1.8 Log

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

Logs
<b>System Logs</b>
<pre> Apr 13 00:02:01 AP cron.notice cron[2844]: USER root pid 3462 cmd /web-server/www.htm Apr 13 00:00:48 AP auth.notice root: 192.168.1.10 login Apr 13 00:00:00 AP user.info : /web-server/flash-setup.sh: /web-server/flash-setup.sh Apr 13 00:00:00 AP user.info : Date 041300002010.00 Apr 13 00:00:00 AP user.info : Tue Apr 13 00:00:00 UTC 2010 Apr 13 00:00:05 AP user.info : Terminated Apr 13 00:00:08 AP user.info : Killed Apr 13 09:09:03 AP user.info : Terminated Apr 13 00:00:00 AP user.info kernel: br0: port 1 (eth1): transitioning to FORWARDING Apr 13 00:00:00 AP user.info kernel: br0: port 2 (eth0): transitioning to FORWARDING Apr 13 00:00:06 AP user.info kernel: br0: port 3 (wlan0): transitioning to FORWARDING Apr 13 00:00:00 AP user.info kernel: br0: port 4 (eth4): transitioning to FORWARDING Apr 13 00:00:00 AP user.info kernel: br0: port 1 (wlan1): transitioning to LEARNING Apr 13 00:00:00 AP user.info kernel: br0: port 2 (eth0): transitioning to LEARNING Apr 13 00:00:00 AP user.info kernel: br0: port 3 (wlan0): transitioning to LEARNING Apr 13 00:00:00 AP user.info kernel: br0: port 4 (eth4): transitioning to LEARNING </pre>

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 functioning 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.

The screenshot shows the 'LAN Setting' interface with the 'Bridge STP Setting' tab selected. Under 'STP/RSTP', 'Disable' is chosen. The 'Bridge Priority' is set to 15. The 'Hello Time' is 2 seconds, and 'Forwarding Delay' is 15 seconds. The 'Max Age' is 20 seconds. There are 8 entries for ports wdsj0 through wdsj7, each with a 'Cost' value ranging from 18 to 2700000, a 'Priority' value (1-15), and settings for 'P to P' (auto) and 'Edge' (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.

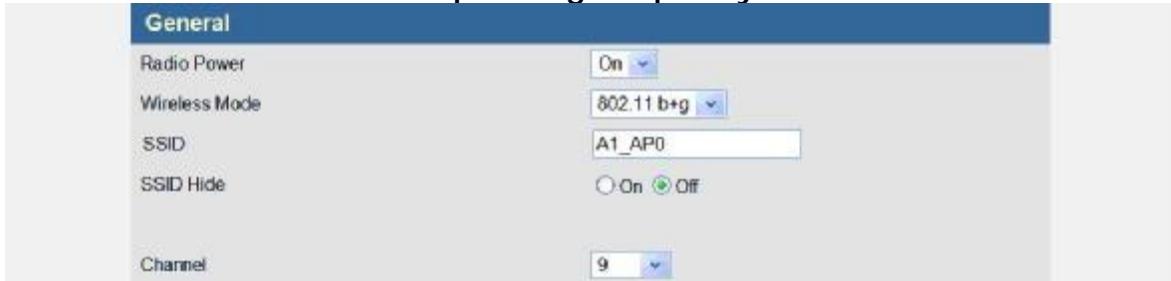


Figure 3-7-19

#### † 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.

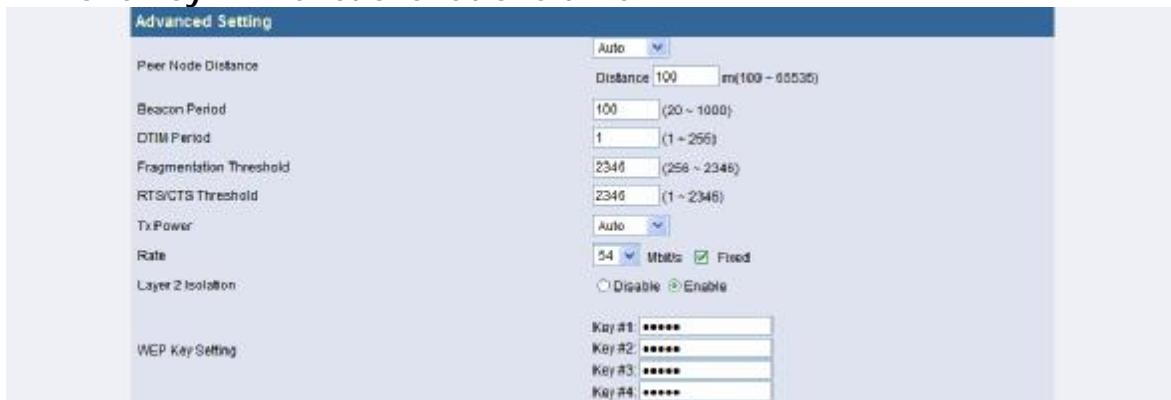


Figure 3-7-20

#### † WDS MAC Address Setting

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

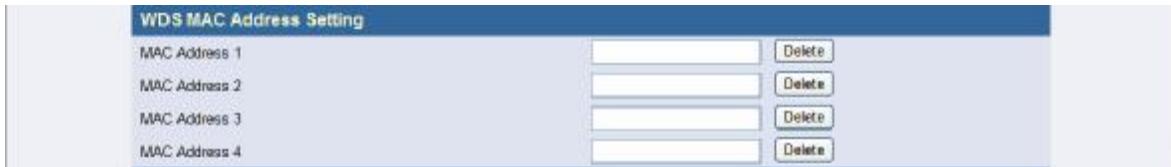


Figure 3-7-21

#### † 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.

SSID Security Mode	
Authentication	WPA-personal
WPA MODE	WPA & WPA2
Share Key	123456789 (8 ~ 63 characters)
WPA Encryption	Auto
Group Key Update Interval	600 (30 ~ 65535)

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.

SSID Security Mode	
Authentication	WPA-enterprise
WPA MODE	WPA
Share Key	123456789 (8 ~ 63 characters)
WPA Encryption	Auto
Group Key Update Interval	600 (30 ~ 65535)
802.1x	
Primary Radius Server	
Authenticatoin Server	192 . 168 . 1 . 80 : 1812
Backup Radius Server (Optional)	
Authenticatoin Server	.   .   . :
	Shared Secret

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.

**QoS Setting On AP**

	<input checked="" type="radio"/> Enable	<input type="radio"/> Disable
WMM	32 (1 ~ 2007)	
MAX Associated Station	CWmin: 2047	CWMax: 4095 AIFS: 2 (1 ~ 255) Burst: 0.0
AP Tx-Best Effort	CWmin: 15	CWMax: 1023 AIFS: 7 (1 ~ 255) Burst: 0.0
AP Tx-Background	CWmin: 7	CWMax: 7 AIFS: 1 (1 ~ 255) Burst: 1.5
AP Tx-Video	CWmin: 7	CWMax: 15 AIFS: 1 (1 ~ 255) Burst: 3.0
AP Tx-Voice	CWmin: 7	CWMax: 1023 AIFS: 2 (1 ~ 255)
STA Tx-Best Effort	TXOP: 64 (1 ~ 255)x32ms ACM: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	
STA Tx-Background	CWmin: 15	CWMax: 1023 AIFS: 7 (1 ~ 255)
STA Tx-Video	TXOP: 1 (1 ~ 255)x32ms ACM: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	
STA Tx-Voice	CWmin: 7	CWMax: 7 AIFS: 1 (1 ~ 255)
	TXOP: 47 (1 ~ 255)x32ms ACM: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	
	CWmin: 7	CWMax: 15 AIFS: 1 (1 ~ 255)
	TXOP: 94 (1 ~ 255)x32ms ACM: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	

**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.

MAC address filtering			
General			
Filtering type: <input type="button" value="Disable"/>			
MAC address table			
Item	MAC address	Ex: 22-22-22-22-22-22	
MAC address 1:			<input type="button" value="Delete"/>
MAC address 2:			<input type="button" value="Delete"/>
MAC address 3:			<input type="button" value="Delete"/>
MAC address 4:			<input type="button" value="Delete"/>
MAC address 5:			<input type="button" value="Delete"/>
MAC address 6:			<input type="button" value="Delete"/>
MAC address 7:			<input type="button" value="Delete"/>
MAC address 8:			<input type="button" value="Delete"/>
MAC address 9:			<input type="button" value="Delete"/>
MAC address 10:			<input type="button" value="Delete"/>
MAC address 11:			<input type="button" value="Delete"/>
MAC address 12:			<input type="button" value="Delete"/>
MAC address 13:			<input type="button" value="Delete"/>
MAC address 14:			<input type="button" value="Delete"/>
MAC address 15:			<input type="button" value="Delete"/>

**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.

SNMP Basic Settings

SNMP Agent						
<input type="radio"/> Enable	<input checked="" type="radio"/> Disable					
System Information						
Contact	<input type="text" value="Contact_Me"/>					
Location	<input type="text" value="I_am_here"/>					
V1/V2C						
Index Access Right	Community					
1	<input type="text" value="Deny"/>					
2	<input type="text" value="Deny"/>					
3	<input type="text" value="Deny"/>					
4	<input type="text" value="Deny"/>					
5	<input type="text" value="Deny"/>					
V3						
Index User ID	Security Level	Auth Type	Auth Passphrase	Privacy Protocol	Priv Passphrase	Access Right
1	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text" value=""/>	<input type="text" value="DES"/>	<input type="text" value=""/>	<input type="text" value="unused"/>
2	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text" value=""/>	<input type="text" value="DES"/>	<input type="text" value=""/>	<input type="text" value="unused"/>
3	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text" value=""/>	<input type="text" value="DES"/>	<input type="text" value=""/>	<input type="text" value="unused"/>
4	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text" value=""/>	<input type="text" value="DES"/>	<input type="text" value=""/>	<input type="text" value="unused"/>
5	<input type="text" value="AuthPriv"/>	<input type="text" value="MD5"/>	<input type="text" value=""/>	<input type="text" value="DES"/>	<input type="text" value=""/>	<input type="text" value="unused"/>

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.

SNMP VACM Settings				
Community to Security for V1/V2c				
Index	Security Name	IP Source	Community	
<input checked="" type="checkbox"/> 1	mypriv	127.0.0.1	public	
<input type="checkbox"/> 2				
<input type="checkbox"/> 3				
<input type="checkbox"/> 4				
<input type="checkbox"/> 5				

Group			
Index	Group Name	Security Model	Security Name
<input checked="" type="checkbox"/> 1	generic	v1	mypriv
<input checked="" type="checkbox"/> 2	genericusm	usm	generic
<input type="checkbox"/> 3		v1	mypriv
<input type="checkbox"/> 4		v1	mypriv
<input type="checkbox"/> 5		v1	mypriv

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'.

Index	View Name	Include	Sub Tree
<input checked="" type="checkbox"/> 1	mib2	Include	1.3.6.1.2.1
<input checked="" type="checkbox"/> 2	generic	Include	1.3.6.1.4.1.5205
<input type="checkbox"/> 3		Include	
<input type="checkbox"/> 4		Include	
<input type="checkbox"/> 5		Include	
<input type="checkbox"/> 6		Include	
<input type="checkbox"/> 7		Include	
<input type="checkbox"/> 8		Include	
<input type="checkbox"/> 9		Include	
<input type="checkbox"/> 10		Include	
<input type="checkbox"/> 11		Include	
<input type="checkbox"/> 12		Include	
<input type="checkbox"/> 13		Include	
<input type="checkbox"/> 14		Include	
<input type="checkbox"/> 15		Include	
<input type="checkbox"/> 16		Include	
<input type="checkbox"/> 17		Include	

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.

Access	Index	Group	Security Model	Security Level	Read	Write	Notify
	<input checked="" type="checkbox"/> 1	generic	any	NoAuthNoPriv	generic	generic	generic
	<input checked="" type="checkbox"/> 2	genericusm	usm	AuthPriv	all	all	all
	<input type="checkbox"/> 3	generic	any	NoAuthNoPriv	all	all	all
	<input type="checkbox"/> 4	generic	any	NoAuthNoPriv	all	all	all
	<input type="checkbox"/> 5	generic	any	NoAuthNoPriv	all	all	all

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.

SNMP Trap					
Trap Active <input checked="" type="radio"/> Disable <input type="radio"/> Enable					
v1/v2c Trap					
Index	Version	IP Address : Port		Community	
0	Version 1 <input type="button" value="▼"/>	192	168	1	21 : 162
1	Disable <input type="button" value="▼"/>				public
2	Disable <input type="button" value="▼"/>				
3	Disable <input type="button" value="▼"/>				
4	Disable <input type="button" value="▼"/>				

v3 Trap					
Index	User	IP Address : Port		Security Level	
<input type="checkbox"/> 0	genericro <input type="button" value="▼"/>				NoAuthNoPriv <input type="button" value="▼"/>
<input type="checkbox"/> 1	genericro <input type="button" value="▼"/>				NoAuthNoPriv <input type="button" value="▼"/>
<input type="checkbox"/> 2	genericro <input type="button" value="▼"/>				NoAuthNoPriv <input type="button" value="▼"/>
<input type="checkbox"/> 3	genericro <input type="button" value="▼"/>				NoAuthNoPriv <input type="button" value="▼"/>
<input type="checkbox"/> 4	genericro <input type="button" value="▼"/>				NoAuthNoPriv <input type="button" value="▼"/>

Figure 3-7-31

### † Trap Items

Enable/Disable which trap items to send.

Trap Items	
Cold Start	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Warm Start	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Link Up	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Link Down	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Auth Fail	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Log In	<input type="radio"/> Disable <input checked="" type="radio"/> Enable

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.

Tools					
Command Ping :					
Ping:	IP:	Count: 3	<input checked="" type="radio"/> Disable	<input type="radio"/> Enable	

Figure 3-7-33

### 3.7.7 Log Out

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

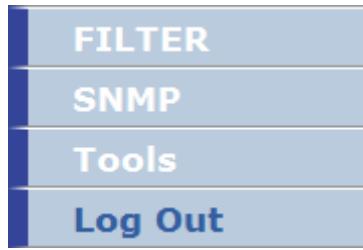


Figure 3-7-34

### 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.

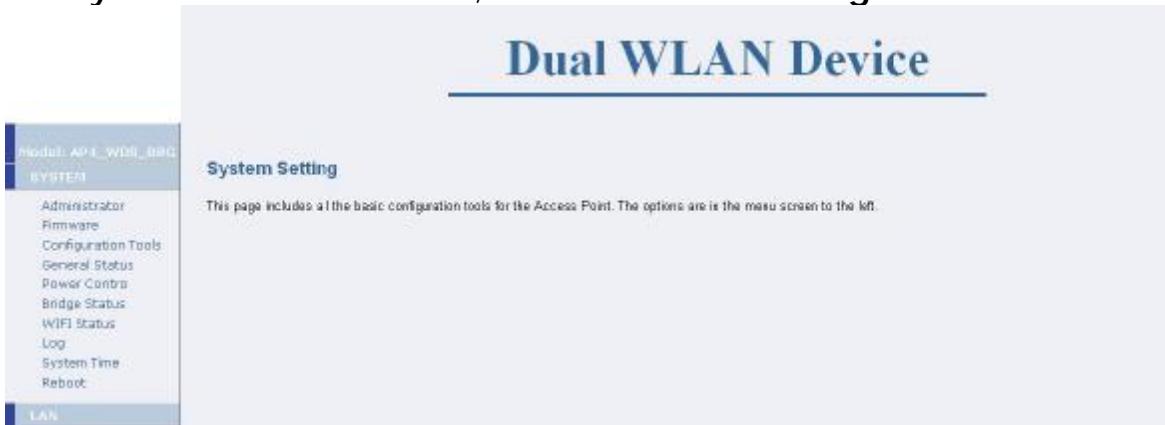


Figure 3-8-1

#### 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.

**Administrator Settings**

<b>Device Name</b>	<input type="text"/>	(A-Z, a-z, 0-9)
<b>Language Select</b>	Language	English
<b>Model Select</b>	<input type="checkbox"/> OLSR_AP <input type="checkbox"/> AODV_AP <input checked="" type="checkbox"/> AP-Bridge <input type="checkbox"/> AP-CB-Bridge <input type="checkbox"/> AP-CB-ROUTE <input type="checkbox"/> CB-CB-ROUTE <input type="checkbox"/> VLAN-AP <input type="checkbox"/> AP_WDS_BRG <input checked="" type="checkbox"/> AP4_WDS_BRG	
<b>Password Settings</b>	Current Password Password (3 ~ 12 Characters) Re-type Password Idle Time Out (1 ~ 999 minutes)	
<b>Remote Management</b>	Enable <input type="checkbox"/> (If enabled, only the following PC can manage this AP.) IP Address . . .	

**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**

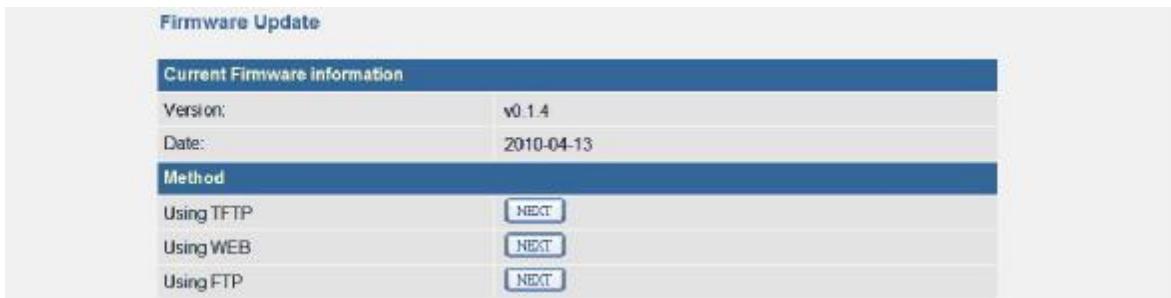
User can enable/disable the management of the Access Point from a remote host. Just tick the <Enable> check box and enter an IP address of the remote host. Then, only the host with the entered IP address can access this device.

#### † **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

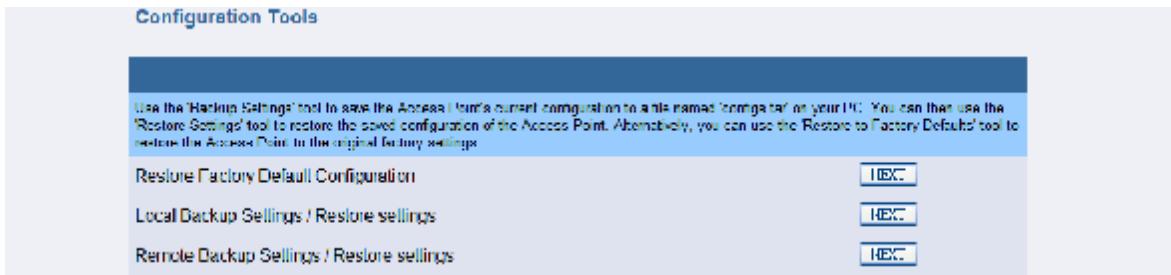
Click on <Browse> button and select the correct firmware file path and file name. Then, click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands while uploading the firmware. This is normal behavior and do not turn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

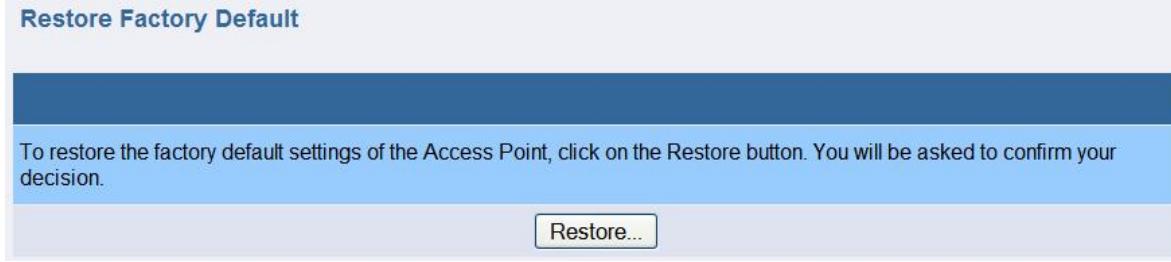
† **Restore Factory Default Configuration:**

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**

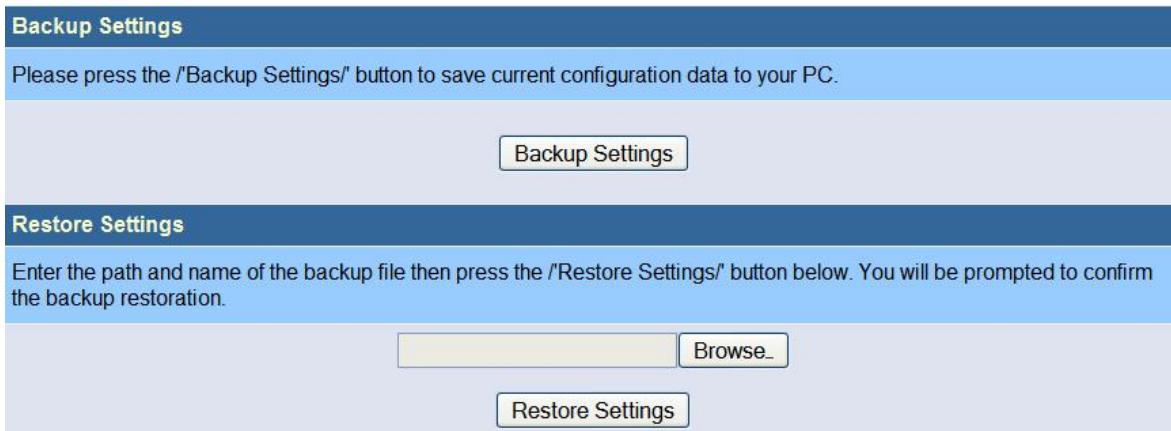
To backup or restore the configuration for this device. Click on <NEXT> button beside 'Local Backup Settings/Restore settings'.



*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

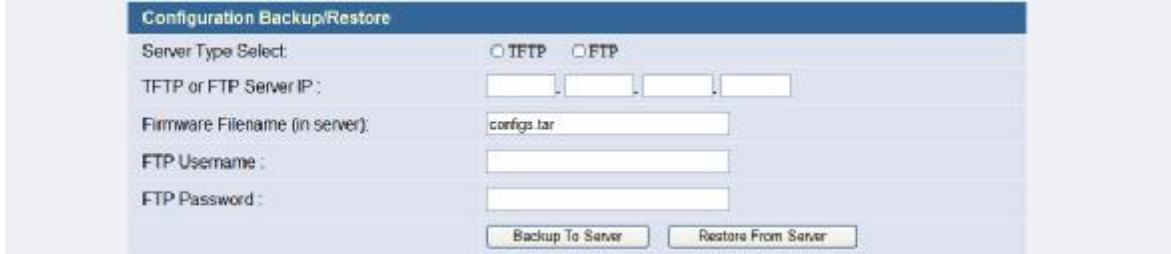
User can also backup/restore the configuration of this device remotely.

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.

Status			
<b>System Information</b>			
Current Firmware Version	v0.1.8		
Device Name	AP		
System Model	AP_WDS_BRG		
System Time	Wed Nov 3 03:24:06 2010		
<b>Power Control Status</b>			
eth0 PoE	Disabled		
<b>Bridge LAN Port</b>			
IP Address	192.168.1.1		
MAC Address	00:26:48:00:0e:df		
Mask	255.255.255.0		
<b>AP WIFI 1 Status</b>			
MODE	802.11 a		
COUNTRY	North_America_Area		
CHANNEL	Auto		
DTIM	1		
FRAG	2346		
RTS	2346		
BEACON	100		
DISTANCE	100		
<b>Interface ath0</b>			
SSID	A1_AP0	Security	Disabled
<b>Interface ath1</b>			
Radio	Off		
<b>Interface ath2</b>			
Radio	Off		
<b>Interface ath3</b>			
Radio	Off		
<b>AP WIFI 2 Status</b>			
MODE	802.11 a		
COUNTRY	North_America_Area		
CHANNEL	Auto		
DTIM	1		
FRAG	2346		
RTS	2346		
BEACON	100		
DISTANCE	100		
<b>Interface ath4</b>			
SSID	A2_AP4	Security	Disabled
<b>Interface ath5</b>			
Radio	Off		
<b>Interface ath6</b>			
Radio	Off		
<b>Interface ath7</b>			
Radio	Off		

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.

Power Control/Status
PoE Power Control (eth0 port): <input type="radio"/> Enable <input checked="" type="radio"/> Disable

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:	b:0			
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	tx 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

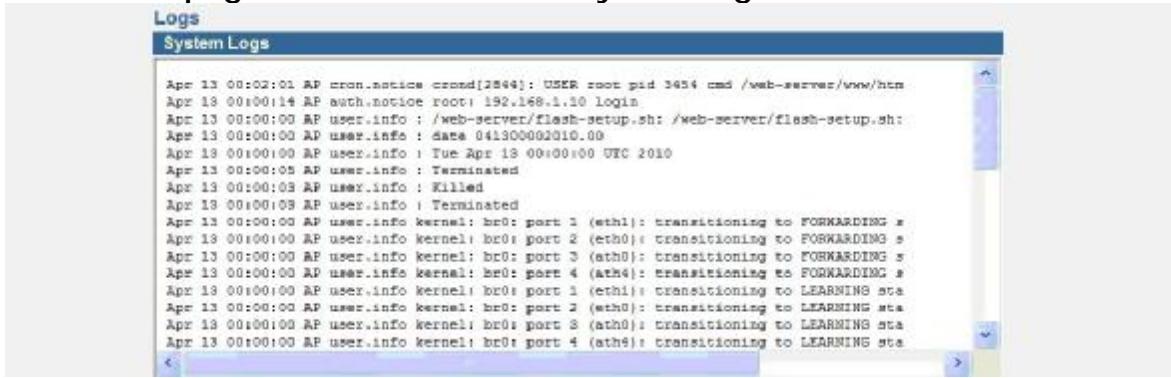
In this page user could see the WIFI information of this device, such as: Interface information, Security information, Associated AP/Station.

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 kbit/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 wcid: 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.



The screenshot shows a window titled "Logs" with a sub-tab "System Logs". The main area contains a scrollable list of log messages. Some of the visible text includes:

```
Apr 13 00:02:01 AP cron.notice cron[2844]: USER root pid 3454 cmd /web-server/www/htm  
Apr 13 00:00:14 AP auth.notice root 192.168.1.10 login  
Apr 13 00:00:00 AP user.info : /web-server/flash-setup.sh: /web-server/flash-setup.sh:  
Apr 13 00:00:00 AP user.info : date 041300002010.00  
Apr 13 00:00:00 AP user.info : Tue Apr 13 00:00:00 UTC 2010  
Apr 13 00:00:05 AP user.info : Terminated  
Apr 13 00:00:05 AP user.info : Killed  
Apr 13 00:00:08 AP user.info : Terminated  
Apr 13 00:00:08 AP user.info kernel: br0: port 1 (eth1): transitioning to FORWARDING  
Apr 13 00:00:08 AP user.info kernel: br0: port 2 (eth0): transitioning to FORWARDING  
Apr 13 00:00:08 AP user.info kernel: br0: port 3 (ath0): transitioning to FORWARDING  
Apr 13 00:00:08 AP user.info kernel: br0: port 4 (ath4): transitioning to FORWARDING  
Apr 13 00:00:08 AP user.info kernel: br0: port 1 (eth1): transitioning to LEARNING sta  
Apr 13 00:00:08 AP user.info kernel: br0: port 2 (eth0): transitioning to LEARNING sta  
Apr 13 00:00:08 AP user.info kernel: br0: port 3 (ath0): transitioning to LEARNING sta  
Apr 13 00:00:08 AP user.info kernel: br0: port 4 (ath4): transitioning to LEARNING sta
```

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

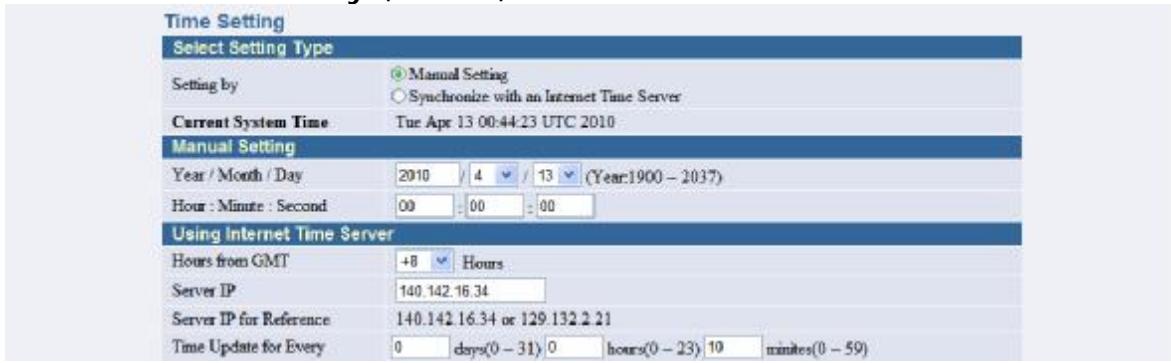
User can manually enter the Year/ Month/ Day and Hour: Minute: Second.

#### † 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.



The screenshot shows a "Time Setting" configuration page. It includes sections for "Select Setting Type", "Current System Time", "Manual Setting", and "Using Internet Time Server".

**Select Setting Type**

Setting by:  Manual Setting  Synchronize with an Internet Time Server

**Current System Time**

Tue Apr 13 00:44:23 UTC 2010

**Manual Setting**

Year / Month / Day: 2010 / 4 / 13 (Year:1900 - 2037)  
Hour : Minute : Second: 00 : 00 : 00

**Using Internet Time Server**

Hours from GMT: +8 Hours  
Server IP: 140.142.16.34  
Server IP for Reference: 140.142.16.34 or 129.132.2.21  
Time Update for Every: 0 days(0 - 31) 0 hours(0 - 23) 10 minutes(0 - 59)

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.

**LAN Setting**

**Interface eth0 Setting**

IP Authentication  Static  DHCP

**Network IP Parameters**

IP Address	192	.	168	.	1	.	1
Subnet Mask	255	.	255	.	255	.	0
Gateway Address	192	.	168	.	1	.	254

**Bridge STP Setting**

**STP/RSTP**

Bridge Priority	15	(STP 0 ~ 65535, RSTP 0 ~ 15)
Hello Time	2	(1 ~ 10)second
Forwarding Delay	15	(4 ~ 30)second
Max Age	20	(6 ~ 40)second
Port eth0	Cost: 18	(0 ~ 2*10 <sup>8</sup> ) Priority: 1 (STP 0 ~ 255, RSTP 0 ~ 15)
Port eth1	Cost: 19	(0 ~ 2*10 <sup>8</sup> ) Priority: 1 (STP 0 ~ 255, RSTP 0 ~ 15)
Port wdsj0	Cost: 2000000	(0 ~ 2*10 <sup>8</sup> ) Priority: 10 (STP 0 ~ 255, RSTP 0 ~ 15)
Port wdsj1	Cost: 2100000	(0 ~ 2*10 <sup>8</sup> ) Priority: 11 (STP 0 ~ 255, RSTP 0 ~ 15)
Port wdsj2	Cost: 2200000	(0 ~ 2*10 <sup>8</sup> ) Priority: 12 (STP 0 ~ 255, RSTP 0 ~ 15)
Port wdsj3	Cost: 2300000	(0 ~ 2*10 <sup>8</sup> ) Priority: 13 (STP 0 ~ 255, RSTP 0 ~ 15)
Port ath4	Cost: 2400000	(0 ~ 2*10 <sup>8</sup> ) Priority: 0 (STP 0 ~ 255, RSTP 0 ~ 15)
Port ath5	Cost: 2500000	(0 ~ 2*10 <sup>8</sup> ) Priority: 7 (STP 0 ~ 255, RSTP 0 ~ 15)
Port ath6	Cost: 2600000	(0 ~ 2*10 <sup>8</sup> ) Priority: 8 (STP 0 ~ 255, RSTP 0 ~ 15)
Port ath7	Cost: 2700000	(0 ~ 2*10 <sup>8</sup> ) Priority: 9 (STP 0 ~ 255, RSTP 0 ~ 15)
P to P	auto	Edge: no

Figure 3-8-18

### 3.8.3 Wireless

User can set the wireless related setting here.

**Dual WLAN Device**

**Model: AP4\_WDE\_BRD**

**SYSTEM**

**LAN**

**WIRELESS**

Wireless

You can set the wireless related setting here.

WIFI ath0 Setting  
WIFI ath4 Setting  
WIFI ath5 Setting  
WIFI ath6 Setting  
WIFI ath7 Setting

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.

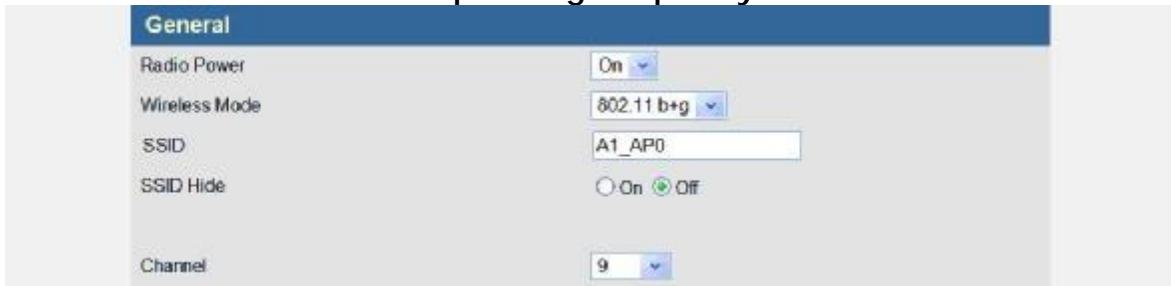


Figure 3-8-20

### † Advanced Settings

Peer Node Distance: Set the distance between this device and its 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.

**Advanced Setting**

Peer Node Distance	Auto	Distance [100] m(100 ~ 65535)
Beacon Period	100	(20 ~ 1000)
DTIM Period	1	(1 ~ 255)
Fragmentation Threshold	2346	(256 ~ 2346)
RTS/CTS Threshold	2346	(1 ~ 2346)
Tx Power	Auto	
Rate	54	Mbit/s Fixed
Layer 2 Isolation	<input type="radio"/> Disable <input checked="" type="radio"/> Enable	
WEP Key Setting	Key #1: ***** Key #2: ***** Key #3: ***** Key #4: *****	

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.

**WDS MAC Address Setting**

MAC Address 1	[ ]	Delete
MAC Address 2	[ ]	Delete
MAC Address 3	[ ]	Delete
MAC Address 4	[ ]	Delete

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.

**SSID Security Mode**

Authentication	WEP
WEP Encryption	<input checked="" type="radio"/> Open <input type="radio"/> Restricted
Select Key :	<input checked="" type="radio"/> KEY #1 <input type="radio"/> KEY #2 <input type="radio"/> KEY #3 <input type="radio"/> KEY #4

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.

SSID Security Mode	
Authentication	WPA-personal
WPA MODE	WPA & WPA2
Share Key	123456789 (8 ~ 63 characters)
WPA Encryption	Auto
Group Key Update Interval	600 (30 ~ 65535)

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.

SSID Security Mode	
Authentication	WPA-enterprise
WPA MODE	WPA
Share Key	123456789 (8 ~ 63 characters)
WPA Encryption	Auto
Group Key Update Interval	600 (30 ~ 65535)
802.1x	
Primary Radius Server	
Authenticatoin Server	192 . 168 . 1 . 80 : 1812
Backup Radius Server (Optional)	
Authenticatoin Server	. . . :  Shared Secret

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.

QoS Setting On AP						
<input checked="" type="radio"/> Enable <input type="radio"/> Disable						
WMM	32	(1 ~ 2007)	CWmin:	2047	CWMax:	4095 AIFS: 2 (1 ~ 255) Burst: 0.0
MAX Associated Station			CWmin:	15	CWMax:	1023 AIFS: 7 (1 ~ 255) Burst: 0.0
AP Tx-Best Effort			CWmin:	7	CWMax:	7 AIFS: 1 (1 ~ 255) Burst: 1.5
AP Tx-Background			CWmin:	7	CWMax:	15 AIFS: 1 (1 ~ 255) Burst: 3.0
AP Tx-Video			CWmin:	7	CWMax:	1023 AIFS: 2 (1 ~ 255)
AP Tx-Voice			TXOP:	64 (1 ~ 255)x32ms ACM:	<input type="radio"/> Enable <input checked="" type="radio"/> Disable	
STA Tx-Best Effort			CWmin:	15	CWMax:	1023 AIFS: 7 (1 ~ 255)
STA Tx-Background			TXOP:	1 (1 ~ 255)x32ms ACM:	<input type="radio"/> Enable <input checked="" type="radio"/> Disable	
STA Tx-Video			CWmin:	7	CWMax:	7 AIFS: 1 (1 ~ 255)
STA Tx-Voice			TXOP:	47 (1 ~ 255)x32ms ACM:	<input type="radio"/> Enable <input checked="" type="radio"/> Disable	
			CWmin:	7	CWMax:	15 AIFS: 1 (1 ~ 255)
			TXOP:	94 (1 ~ 255)x32ms ACM:	<input type="radio"/> Enable <input checked="" type="radio"/> Disable	

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.

General	
Radio Power	<input type="button" value="On"/>
Wireless Mode	<input type="button" value="802.11 b+g"/>
SSID	A1_AP0
SSID Hide	<input type="radio"/> On <input checked="" type="radio"/> Off
Channel	9

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.

SSID Security Mode	
Authentication	WEP
WEP Encryption	<input checked="" type="radio"/> Open <input type="radio"/> Restricted
Select Key :	KEY #1 <input checked="" type="radio"/> KEY #2 <input type="radio"/> KEY #3 <input type="radio"/> KEY #4 <input type="radio"/>

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.

SSID Security Mode	
Authentication	WPA-personal
WPA MODE	WPA & WPA2
Share Key	123456789 (8 ~ 63 characters)
WPA Encryption	Auto
Group Key Update Interval	600 (30 ~ 65535)

Figure 3-8-30

#### **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.

SSID Security Mode	
Authentication	WPA-enterprise
WPA MODE	WPA
Share Key	123456789 (8 ~ 63 characters)
WPA Encryption	Auto
Group Key Update Interval	600 (30 ~ 65535)
802.1x	
Primary Radius Server	Authenticatoin Server : 192 . 168 . 1 . 80 : 1812 Shared Secret secret
Backup Radius Server (Optional)	Authenticatoin Server : Shared Secret

**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'.

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.

Class	CWmin	CWMax	AIFS	TXOP	ACM	Enable	Disable
AP Tx-Best Effort	2047	4095	2	(1 ~ 255)	Burst: 0.0	<input type="radio"/>	<input checked="" type="radio"/>
AP Tx-Background	15	1023	7	(1 ~ 255)	Burst: 0.0	<input type="radio"/>	<input checked="" type="radio"/>
AP Tx-Video	7	7	1	(1 ~ 255)	Burst: 1.5	<input type="radio"/>	<input checked="" type="radio"/>
AP Tx-Voice	7	15	1	(1 ~ 255)	Burst: 3.0	<input type="radio"/>	<input checked="" type="radio"/>
STA Tx-Best Effort	7	1023	2	(1 ~ 255)		<input type="radio"/>	<input checked="" type="radio"/>
STA Tx-Background	15	1023	7	(1 ~ 255)		<input type="radio"/>	<input checked="" type="radio"/>
STA Tx-Video	7	7	1	(1 ~ 255)		<input type="radio"/>	<input checked="" type="radio"/>
STA Tx-Voice	47	1	1	(1 ~ 255)		<input type="radio"/>	<input checked="" type="radio"/>

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.

MAC address filtering			
General			
Filtering type: <input type="button" value="Disable"/>			
MAC address table			
Item	MAC address	Ex: 22-22-22-22-22-22	
MAC address 1:			<input type="button" value="Delete"/>
MAC address 2:			<input type="button" value="Delete"/>
MAC address 3:			<input type="button" value="Delete"/>
MAC address 4:			<input type="button" value="Delete"/>
MAC address 5:			<input type="button" value="Delete"/>
MAC address 6:			<input type="button" value="Delete"/>
MAC address 7:			<input type="button" value="Delete"/>
MAC address 8:			<input type="button" value="Delete"/>
MAC address 9:			<input type="button" value="Delete"/>
MAC address 10:			<input type="button" value="Delete"/>
MAC address 11:			<input type="button" value="Delete"/>
MAC address 12:			<input type="button" value="Delete"/>
MAC address 13:			<input type="button" value="Delete"/>
MAC address 14:			<input type="button" value="Delete"/>
MAC address 15:			<input type="button" value="Delete"/>

**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.

SNMP Basic Settings

SNMP Agent						
<input checked="" type="radio"/> Enable	<input type="radio"/> Disable					
System Information						
Contact	<input type="text" value="Contact_Me"/>					
Location	<input type="text" value="I_am_here"/>					
V1/V2C						
Index Access Right	Community					
1 Deny	<input type="text"/>					
2 Deny	<input type="text"/>					
3 Deny	<input type="text"/>					
4 Deny	<input type="text"/>					
5 Deny	<input type="text"/>					
V3						
Index User ID	Security Level	Auth Type	Auth Passphrase	Privacy Protocol	Priv Passphrase	Access Right
1	<input type="text"/>	AuthPriv	MD5	<input type="text"/>	DES	<input type="text"/> unused
2	<input type="text"/>	AuthPriv	MD5	<input type="text"/>	DES	<input type="text"/> unused
3	<input type="text"/>	AuthPriv	MD5	<input type="text"/>	DES	<input type="text"/> unused
4	<input type="text"/>	AuthPriv	MD5	<input type="text"/>	DES	<input type="text"/> unused
5	<input type="text"/>	AuthPriv	MD5	<input type="text"/>	DES	<input type="text"/> unused

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.

SNMP VACM Settings				
Community to Security for V1/V2c				
Index	Security Name	IP Source	Community	
<input checked="" type="checkbox"/> 1	mypriv	127.0.0.1	public	
<input type="checkbox"/> 2				
<input type="checkbox"/> 3				
<input type="checkbox"/> 4				
<input type="checkbox"/> 5				

Group			
Index	Group Name	Security Model	Security Name
<input checked="" type="checkbox"/> 1	generic	v1	mypriv
<input checked="" type="checkbox"/> 2	genericusm	usm	generic
<input type="checkbox"/> 3		v1	mypriv
<input type="checkbox"/> 4		v1	mypriv
<input type="checkbox"/> 5		v1	mypriv

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'.

Index	View Name	Include	Sub Tree
<input checked="" type="checkbox"/> 1	mib2	Include	1.3.6.1.2.1
<input checked="" type="checkbox"/> 2	generic	Include	1.3.6.1.4.1.5205
<input type="checkbox"/> 3		Include	
<input type="checkbox"/> 4		Include	
<input type="checkbox"/> 5		Include	
<input type="checkbox"/> 6		Include	
<input type="checkbox"/> 7		Include	
<input type="checkbox"/> 8		Include	
<input type="checkbox"/> 9		Include	
<input type="checkbox"/> 10		Include	
<input type="checkbox"/> 11		Include	
<input type="checkbox"/> 12		Include	
<input type="checkbox"/> 13		Include	
<input type="checkbox"/> 14		Include	
<input type="checkbox"/> 15		Include	
<input type="checkbox"/> 16		Include	
<input type="checkbox"/> 17		Include	

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.

Access	Index	Group	Security Model	Security Level	Read	Write	Notify
	<input checked="" type="checkbox"/> 1	generic	any	NoAuthNoPriv	generic	generic	generic
	<input checked="" type="checkbox"/> 2	genericusm	usm	AuthPriv	all	all	all
	<input type="checkbox"/> 3	generic	any	NoAuthNoPriv	all	all	all
	<input type="checkbox"/> 4	generic	any	NoAuthNoPriv	all	all	all
	<input type="checkbox"/> 5	generic	any	NoAuthNoPriv	all	all	all

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.

The screenshot shows two tables for configuring SNMP traps. The top table, titled 'v1/v2c Trap', has columns for Index, Version (dropdown), IP Address : Port (IP, Port, Port, Port, Port), and Community (text input). The bottom table, titled 'v3 Trap', has columns for Index, User (dropdown), IP Address : Port (IP, Port, Port, Port, Port), and Security Level (dropdown). Both tables have rows indexed from 0 to 4.

v1/v2c Trap			
Index	Version	IP Address : Port	Community
0	Version 1	192.168.1.21.162	public
1	Disable		
2	Disable		
3	Disable		
4	Disable		

v3 Trap			
Index	User	IP Address : Port	Security Level
0	genericro		NoAuthNoPriv
1	genericro		NoAuthNoPriv
2	genericro		NoAuthNoPriv
3	genericro		NoAuthNoPriv
4	genericro		NoAuthNoPriv

Figure 3-8-38

### † Trap Items

Enable/Disable which trap items to send.

The screenshot shows a list of trap items with enable/disable checkboxes. The items listed are Cold Start, Warm Start, Link Up, Link Down, Auth Fail, and Log In. Each item has a 'Disable' and 'Enable' radio button pair.

Trap Items	Enable
Cold Start	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Warm Start	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Link Up	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Link Down	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Auth Fail	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Log In	<input type="radio"/> Disable <input checked="" type="radio"/> Enable

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.

The screenshot shows a 'Command Ping' configuration interface. It includes fields for 'Ping' (checkbox), 'IP' (text input), 'Count' (dropdown set to 3), and 'Disable'/'Enable' (radio buttons).

Figure 3-8-40

### 3.8.7 Log Out

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

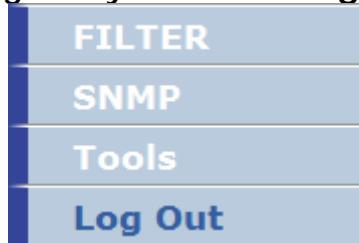


Figure 3-8-41

### **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.

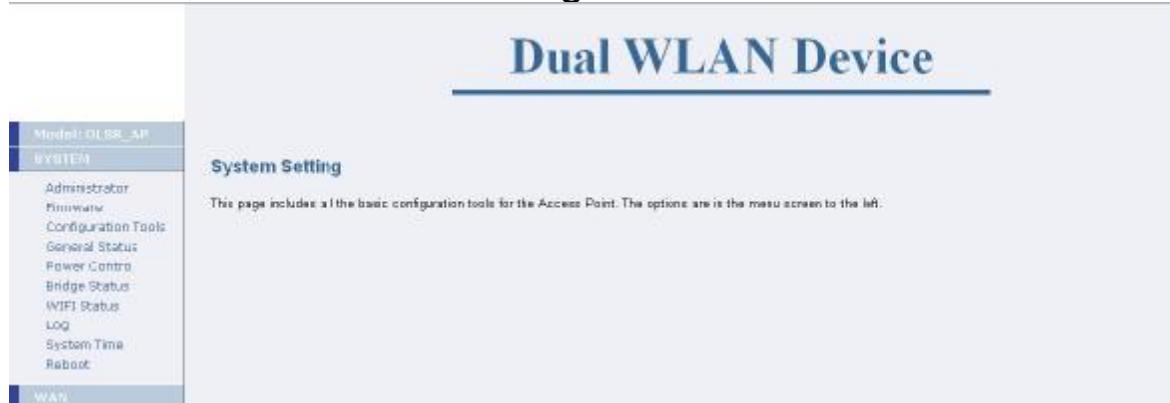


Figure 3-9-1

#### 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.

Administrator Settings

<b>Device Name</b>	<input type="text"/> ( '0~9', 'A~Z', 'a~z' or '_', '-' )
<b>Language Select</b>	
Language	English <input type="button" value="▼"/>
<b>Model Select</b>	
Model	<input checked="" type="radio"/> OLSR_AP <input type="radio"/> AODV_AP <input type="radio"/> AP-Bridge <input type="radio"/> AP-CB-Bridge <input type="radio"/> AP-CB-ROUTE <input type="radio"/> CB-CB-ROUTE <input type="radio"/> VLAN-AP <input type="radio"/> AP_WDS_BRG <input type="radio"/> AP4_WDS_BRG
<b>Password Settings</b>	
Current Password	<input type="password"/>
Password	<input type="password"/> (3 ~ 12 Characters)
Re-type Password	<input type="password"/>
Idle Time Out	30 (1 ~ 999 minutes)
<b>Remote Management</b>	
Enable	<input type="checkbox"/> ( If enabled, only the following PC can manage this AP.)
IP Address	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>
<b>WIFI Loading Warning Threshold</b>	
Threshold	15 (5 ~ 25 Mb/sec)

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

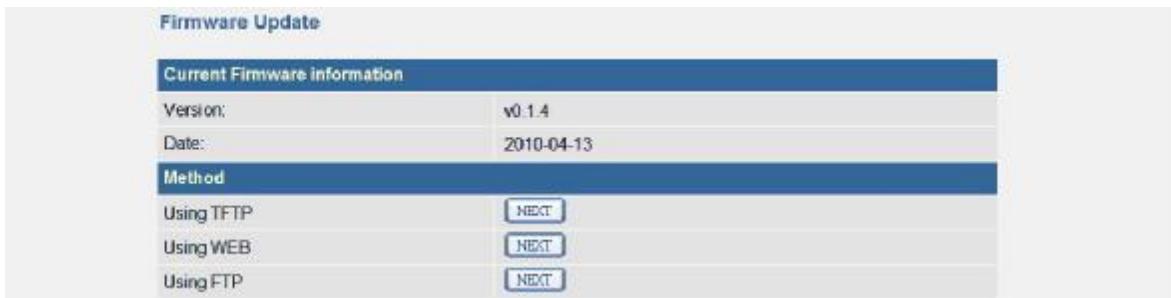
User can enable/disable the management of the Access Point from a remote host. Just tick the <Enable> check box and enter an IP address of the remote host. Then, only the host with the entered IP address can access this device.

#### † 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

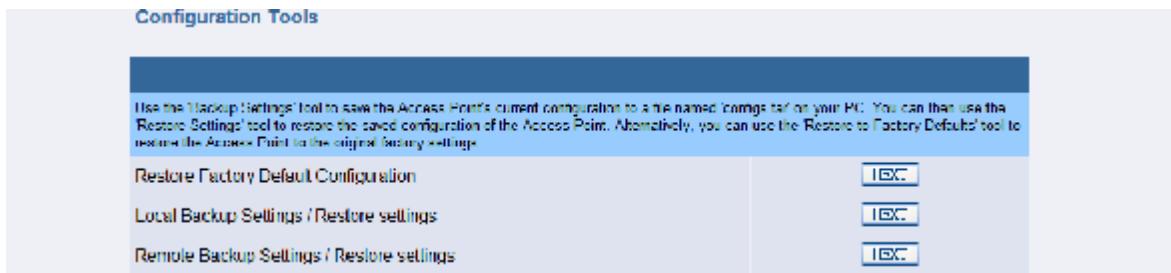
Click on <Browse> button and select the correct firmware file path and file name. Then, click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands while uploading the firmware. This is normal behavior and do not turn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

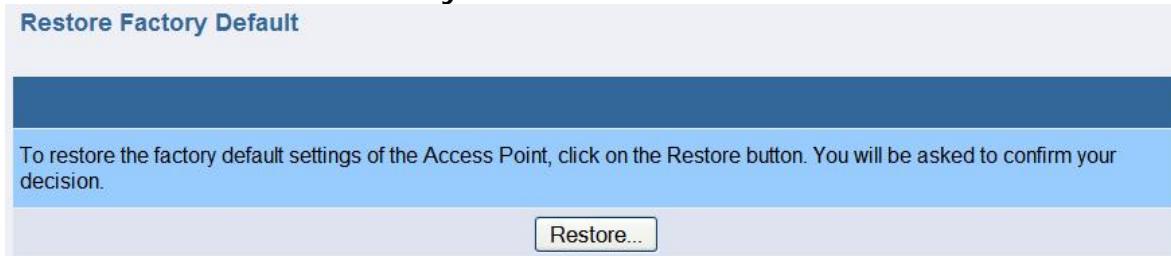
† **Restore Factory Default Configuration:**

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**

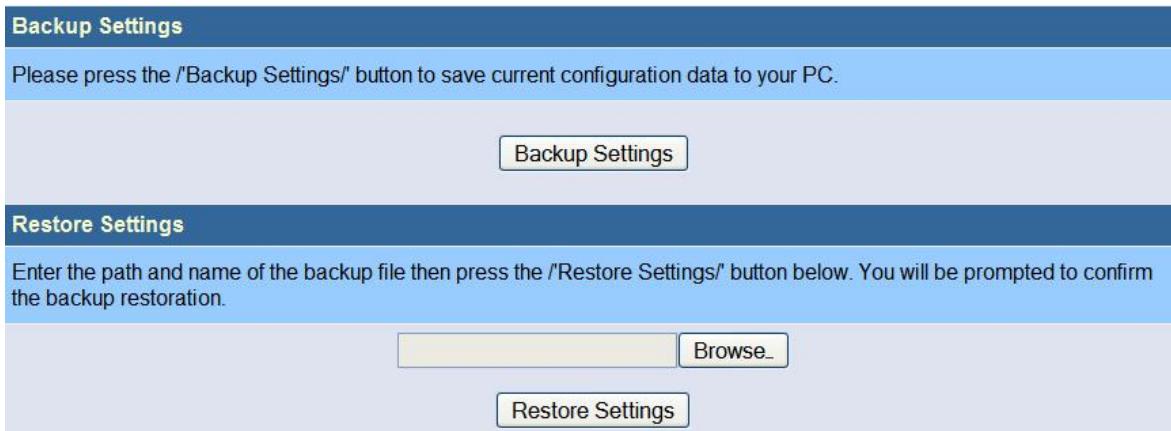
To backup or restore the configuration for this device. Click on <NEXT> button beside 'Local Backup Settings/Restore settings'.



*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

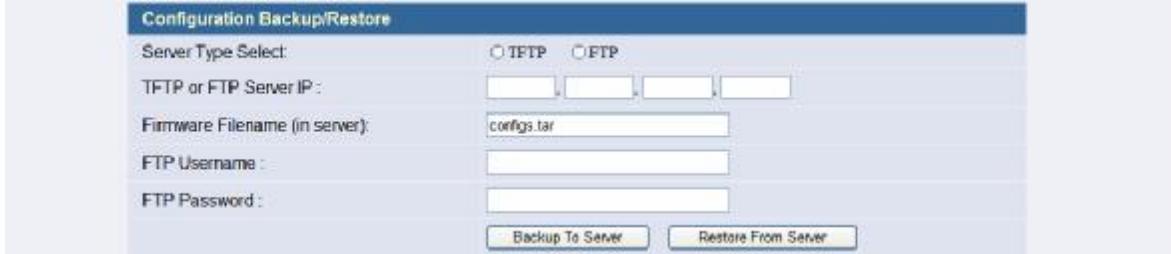
User can also backup/restore the configuration of this device remotely.

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.

Status			
<b>System Information</b>			
Current Firmware Version	v0.1.8		
Device Name	AP		
System Model	OLSR_AP		
System Time	Wed Nov 3 00:57:39 2010		
<b>Power Control Status</b>			
eth0 PoE	Disabled		
<b>WAN Port</b>			
IP Address	192.168.1.1		
MAC Address	00:40:cf:00:00:22		
Mask	255.255.255.0		
Gateway	NA		
DHCP	Disabled		
<b>OLSR Status</b>			
OLSR	Activated		
<b>eth0 LAN Port</b>			
IP Address	192.168.0.1		
MAC Address	00:40:cf:00:00:33		
Mask	255.255.255.0		
DHCP	Disabled		
<b>MESH WIFI Status</b>			
MODE	802.11 a		
COUNTRY	North_America_Area		
CHANNEL	Auto		
DTIM	1		
FRAG	2346		
RTS	2346		
BEACON	100		
DISTANCE	100		
<b>Interface ath0</b>			
IP Address	192.168.2.1		
MAC Address	00:26:48:00:0e:df		
Mask	255.255.255.0		
DHCP	Disabled		
SSID	A1_AP0	Security	Disabled
<b>AP WIFI 2 Status</b>			
MODE	802.11 a		
COUNTRY	North_America_Area		
CHANNEL	Auto		
DTIM	1		
FRAG	2346		
RTS	2346		
BEACON	100		
DISTANCE	100		
<b>Interface ath4</b>			
IP Address	192.168.24.1		
MAC Address	00:40:e7:fb:00:88		
Mask	255.255.255.0		
DHCP	Disabled		
SSID	A2_AP4	Security	Disabled

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.

Power Control/Status	
PoE Power Control (eth0 port):	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

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.

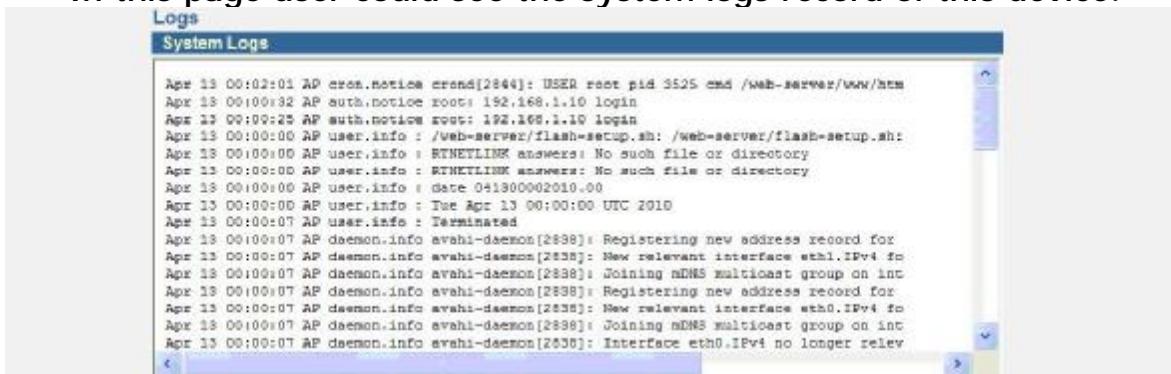


Figure 3-9-14

### 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.

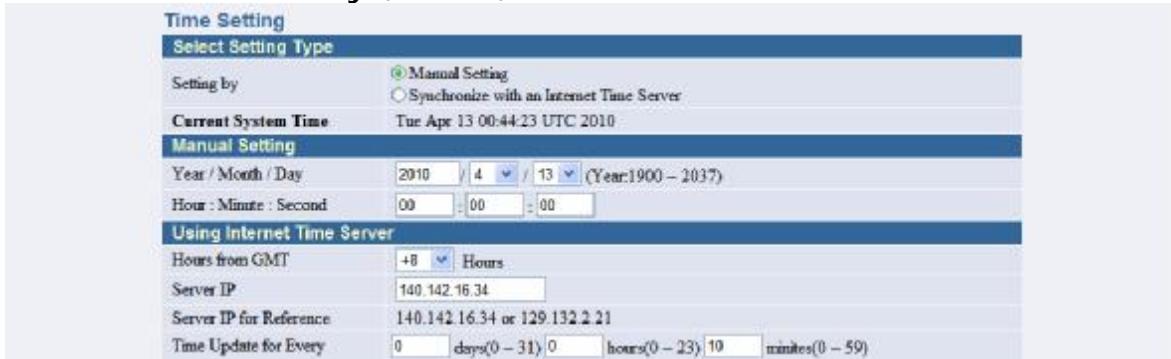


Figure 3-9-15

### 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.

The screenshot shows the 'WAN Setting' configuration page. It includes sections for 'Network IP Parameters' and 'DHCP Server Parameters'. In 'Network IP Parameters', fields are set to: IP Address (192.168.1.1), Subnet Mask (255.255.255.0), Gateway Address (192.168.1.254), and DHCP Server (Enabled). In 'DHCP Server Parameters', fields include Primary DNS Address (192.168.1.1), Secondary DNS Address (empty), IP Pool Starting Address (192.168.1.100), IP Pool Ending Address (192.168.1.200), and Lease Time (Half hour).

**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.

The screenshot shows the 'Bandwidth Management' configuration page. It includes sections for 'Bandwidth Management' settings (Enable, Upload Bandwidth 64 Mbps, Download Bandwidth 64 Mbps) and a 'Bandwidth Limitation List'. The list shows one entry: Action (Up/Download), Start IP Address (192.168.1.20), End IP Address (192.168.1.30), and Bandwidth Limitation (Kbps) (1000). Below this is an 'Add Bandwidth Limitation' form with fields for Action (Up/Download), Start IP Address (0.0.0.0), End IP Address (0.0.0.0), and Bandwidth Limitation (Kbps) (200), with an 'Add' button.

**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.

The screenshot shows a web-based configuration interface for a network card named 'Interface eth0 Setting'. The interface is titled 'LAN Setting'. There are two main sections: 'Network IP Parameters' and 'DHCP Server Parameters'. In the 'Network IP Parameters' section, the IP Address is set to 192.168.0.1, Subnet Mask is 255.255.255.0, and the DHCP Server is enabled. In the 'DHCP Server Parameters' section, the Primary DNS Address is 192.168.1.1, Secondary DNS Address is blank, IP Pool Starting Address is 192.168.0.100, IP Pool Ending Address is 192.168.0.200, and the Lease Time is set to 'Half hour'.

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.

The screenshot shows the 'LAN Setting' interface with the 'Interface ath4 Setting' tab selected. Under 'Network IP Parameters', the IP Address is set to 192.168.24.1 and Subnet Mask to 255.255.255.0. The 'DHCP Server' is enabled. Under 'DHCP Server Parameters', the Primary DNS Address is 168.95.1.1, and the IP Pool Starting Address is 192.168.24.100, ending at 192.168.24.200 with a Lease Time of half hour.

**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.

The screenshot shows the 'LAN Setting' interface with the 'Interface ath0 Setting' tab selected. Under 'Network IP Parameters', the IP Address is set to 192.168.2.1 and Subnet Mask to 255.255.255.0.

**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.

MESH Configuration		
Variables		
Pollrate: 0.500000	TC redundancy: 2	MPR coverage: 5
LQ level: 2	LQ winsize: 100	
WILLINGNESS: 7	Willingness: 7	
Interface info		
IP: 192.168.2.1	MASK: 255.255.255.0	BROADCAST: 192.168.2.255
MTU: 1500		STATUS: UP

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.

The screenshot shows the 'MESH Admin Setting' interface. It includes sections for 'Change basic settings', 'Enable local HNA entry', and 'Security'. In the 'Basic Settings' section, there are fields for TCredundancy (2), Pollrate (0.50), MPRcoverage (5), Willingness (7), LQlevel (2), LQwinsize (10), and Fisheye (checkboxes for Enable and Disable). In the 'Local HNA Entry' section, there is a checkbox for HNA Entry (checkboxes for Enable and Disable). In the 'Security' section, there is a dropdown menu for Security (options: Disable, Enable) and a field for Security Key (1234567890123456).

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  $ETX = 1 / (ILQ \times LQ)$ .

**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.

## Dual WLAN Device

MESH ROUTES					
ROUTER INFORMATION					
Description	Gateway	Cost	RTX	Interf	Type
192.168.0.3	192.168.0.3	1	334	eth0	HOST
192.168.0.1	192.168.0.1	3	4015	eth0	HOST
192.168.0.0	192.168.0.0	1	334	slip0	PSTA
192.168.0.0	192.168.0.0	2	3035	eth0	HNA

**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.  $1 / (NLQ \times LQ)$ .

#### † 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.

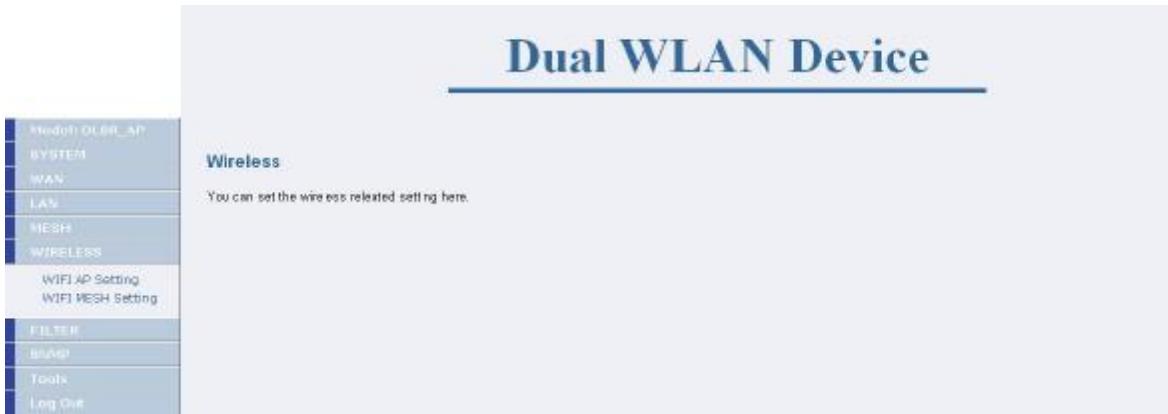
**ETX:** The ETX value for this link, calculated by  $ETX = 1 / (ILQ \times LQ)$ .

Dual WLAN Device						
LINKS						
LocalIP	NeighIP	LinkQuality	tx	txLQ	rxLQ	ETX
192.168.2.4	192.168.2.2	1.00	-	1.0	0.00	0.00
192.168.2.4	192.168.2.2	1.00	-	1.0	0.60	1.00
Neighbors						
LocalIP	Neigh	MLR	MCS	WlanStatus	Assoc_Status	
192.168.2.3	7E3	7E3	7E3	7	192.168.2.2	
192.168.2.3	7E3	7E3	7E3	7	192.168.2.2	
Diaglog screen						
Deviceline IP	Last Hop	10	ILQ	ETX		
192.168.2.4	192.168.2.2	0.50	1.00	0.50		
192.168.2.4		0.50	1.00	0.50		
192.168.2.3	7E3	0.74	1.74	0.93		
192.168.2.4		0.74	1.73	0.93		

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.

General	
Radio Power	On
Wireless Mode	802.11 b+g
SSID	A1_AP0
SSID Hide	<input type="radio"/> On <input checked="" type="radio"/> Off
Channel	9

**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**

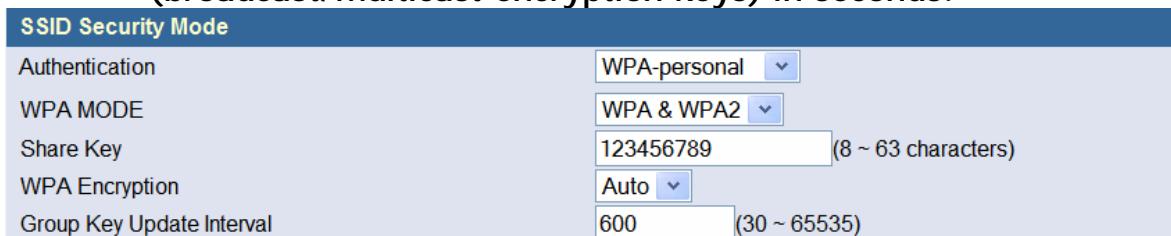
**WPA-Personal:** The method of authentication is similar to WEP, user can define a 'Pre-Shared Key', once the key is confirmed and satisfied on both the client and access point, then access is granted. The encryption method used is referred to as the Temporal Key Integrity Protocol (TKIP).

**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.

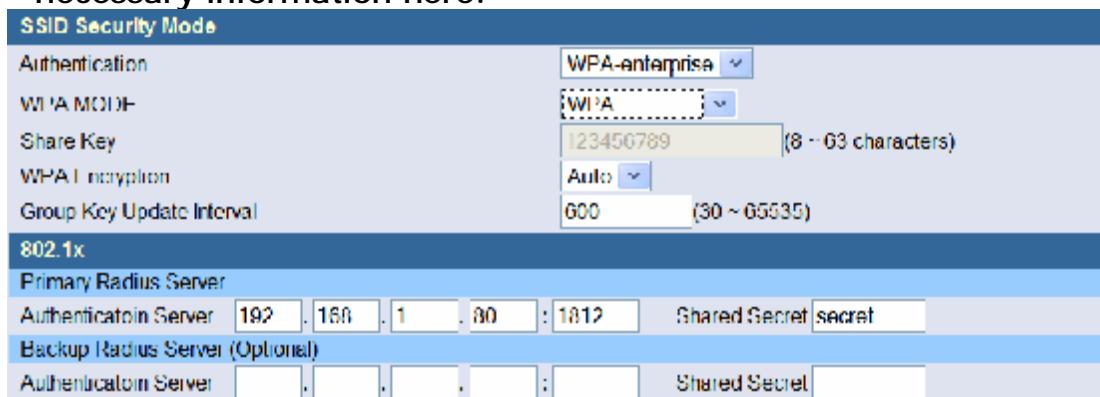
**Group Key Update Interval:** Time interval for rekeying the GTK (broadcast/multicast encryption keys) in seconds.



**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.

	CWmin	CWmax	AIFS	TXOP	ACM
WMM	32	(1 ~ 2007)	Enable		
MAX Associated Station	32	(1 ~ 2007)	Enable		
AP Tx-Best Effort	2047	4095	2	(1 ~ 255)	Burst: 0.0
AP Tx-Background	15	1023	7	(1 ~ 255)	Burst: 0.0
AP Tx-Video	7	7	1	(1 ~ 255)	Burst: 1.5
AP Tx-Voice	7	15	1	(1 ~ 255)	Burst: 3.0
STA Tx-Best Effort	7	1023	2	(1 ~ 255)	
STA Tx-Background	15	1023	7	(1 ~ 255)	
STA Tx-Video	1	(1 ~ 255)x32ms	ACM: Enable	Disable	
STA Tx-Voice	7	7	1	(1 ~ 255)	
	TXOP: 64	(1 ~ 255)x32ms	ACM: Disable		
	TXOP: 1	(1 ~ 255)x32ms	ACM: Enable	Disable	
	TXOP: 47	(1 ~ 255)x32ms	ACM: Enable	Disable	
	TXOP: 94	(1 ~ 255)x32ms	ACM: Enable	Disable	

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.

General	
Radio Power	On
Wireless Mode	802.11 b+g
SSID	A1_AP0
SSID Hide	<input type="radio"/> On <input checked="" type="radio"/> Off
Channel	9

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.

The screenshot shows the 'SSID Security Mode' configuration page. Under 'Authentication', 'WEP' is selected. Under 'WEP Encryption', 'Open' is selected. Under 'Select Key', 'KEY #1' is selected. There are also options for 'KEY #2', 'KEY #3', and 'KEY #4'.

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.

The screenshot shows the 'IP Filtering' configuration page. It has a header with 'IP Filtering' and checkboxes for 'Disable' and 'Enable'. Below is a table with columns 'Category', 'IP Address', and 'Delete'. The table lists 15 rows, each corresponding to an IP address from 'IP Address 1' to 'IP Address 15'. Each row has a text input field for the IP address and a 'Delete' button.

Category	IP Address	Delete
IP Address 1:		Delete
IP Address 2:		Delete
IP Address 3:		Delete
IP Address 4:		Delete
IP Address 5:		Delete
IP Address 6:		Delete
IP Address 7:		Delete
IP Address 8:		Delete
IP Address 9:		Delete
IP Address 10:		Delete
IP Address 11:		Delete
IP Address 12:		Delete
IP Address 13:		Delete
IP Address 14:		Delete
IP Address 15:		Delete

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.

MAC address table		
Item	MAC address	
MAC address 1:		Delete
MAC address 2:		Delete
MAC address 3:		Delete
MAC address 4:		Delete
MAC address 5:		Delete
MAC address 6:		Delete
MAC address 7:		Delete
MAC address 8:		Delete
MAC address 9:		Delete
MAC address 10:		Delete
MAC address 11:		Delete
MAC address 12:		Delete
MAC address 13:		Delete
MAC address 14:		Delete
MAC address 15:		Delete

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.

SNMP Basic Settings

SNMP Agent						
<input type="radio"/> Enable	<input checked="" type="radio"/> Disable					
System Information						
Contact	<input type="text" value="Contact_Me"/>					
Location	<input type="text" value="I_am_here"/>					
V1/V2C						
Index Access Right	Community					
1 Deny	<input type="text"/>					
2 Deny	<input type="text"/>					
3 Deny	<input type="text"/>					
4 Deny	<input type="text"/>					
5 Deny	<input type="text"/>					
V3						
Index User ID	Security Level	Auth Type	Auth Passphrase	Privacy Protocol	Priv Passphrase	Access Right
1	<input type="text"/>	AuthPriv	MD5	<input type="text"/>	DES	<input type="text"/>
2	<input type="text"/>	AuthPriv	MD5	<input type="text"/>	DES	<input type="text"/>
3	<input type="text"/>	AuthPriv	MD5	<input type="text"/>	DES	<input type="text"/>
4	<input type="text"/>	AuthPriv	MD5	<input type="text"/>	DES	<input type="text"/>
5	<input type="text"/>	AuthPriv	MD5	<input type="text"/>	DES	<input type="text"/>

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.

SNMP VACM Settings				
Community to Security for V1/V2c				
Index	Security Name	IP Source	Community	
<input checked="" type="checkbox"/> 1	mypriv	127.0.0.1	public	
<input type="checkbox"/> 2				
<input type="checkbox"/> 3				
<input type="checkbox"/> 4				
<input type="checkbox"/> 5				

Group				
Index	Group Name	Security Model	Security Name	
<input checked="" type="checkbox"/> 1	generic	v1	mypriv	
<input checked="" type="checkbox"/> 2	genericusm	usm	generic	
<input type="checkbox"/> 3		v1	mypriv	
<input type="checkbox"/> 4		v1	mypriv	
<input type="checkbox"/> 5		v1	mypriv	

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'.

Index	View Name	Include	Sub Tree
<input checked="" type="checkbox"/> 1	mib2	Include	1.3.6.1.2.1
<input checked="" type="checkbox"/> 2	generic	Include	1.3.6.1.4.1.5205
<input type="checkbox"/> 3		Include	
<input type="checkbox"/> 4		Include	
<input type="checkbox"/> 5		Include	
<input type="checkbox"/> 6		Include	
<input type="checkbox"/> 7		Include	
<input type="checkbox"/> 8		Include	
<input type="checkbox"/> 9		Include	
<input type="checkbox"/> 10		Include	
<input type="checkbox"/> 11		Include	
<input type="checkbox"/> 12		Include	
<input type="checkbox"/> 13		Include	
<input type="checkbox"/> 14		Include	
<input type="checkbox"/> 15		Include	
<input type="checkbox"/> 16		Include	
<input type="checkbox"/> 17		Include	

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.

Access	Index	Group	Security Model	Security Level	Read	Write	Notify
	<input checked="" type="checkbox"/> 1	generic	any	NoAuthNoPriv	generic	generic	generic
	<input checked="" type="checkbox"/> 2	genericusm	usm	AuthPriv	all	all	all
	<input type="checkbox"/> 3	generic	any	NoAuthNoPriv	all	all	all
	<input type="checkbox"/> 4	generic	any	NoAuthNoPriv	all	all	all
	<input type="checkbox"/> 5	generic	any	NoAuthNoPriv	all	all	all

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.



The screenshot shows the configuration of v1/v2c Trap settings. It includes a header row with 'Index', 'Version', 'IP Address', 'Port', and 'Community'. Below this are five rows of data, each with an index from 0 to 4, a dropdown for Version (set to Version 1), and input fields for IP Address (192.168.1.21), Port (162), and Community (public). The 'Trap Active' status is set to 'Enable'.

v1/v2c Trap					
Index	Version	IP Address : Port			Community
0	Version 1	192	168	1	21
1	Disable				
2	Disable				
3	Disable				
4	Disable				

v3 Trap					
Index	User	IP Address : Port			Security Level
0	genericro				NoAuthNoPriv
1	genericro				NoAuthNoPriv
2	genericro				NoAuthNoPriv
3	genericro				NoAuthNoPriv
4	genericro				NoAuthNoPriv

**Figure 3-9-42**

### † Trap Items

Enable/Disable which trap items to send.



The screenshot shows the configuration of Trap Items. It includes a header row with 'Trap Items' and six rows of data, each with an item name and an enable/disable checkbox. All items are currently set to 'Enable'.

Trap Items	
Cold Start	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Warm Start	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Link Up	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Link Down	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Auth Fail	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Log In	<input type="radio"/> Disable <input checked="" type="radio"/> Enable

**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.



The screenshot shows the configuration of the Command Ping tool. It includes a header row with 'Tools' and a row for 'Command Ping'. The 'Ping' field contains 'Ping', the 'IP' field is empty, the 'Count' field is set to 3, and the 'Enable' checkbox is checked.

Tools
Command Ping :
Ping: IP: Count: 3 <input checked="" type="radio"/> Disable <input type="radio"/> Enable

**Figure 3-9-44**

## 3.9.9 Log Out

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

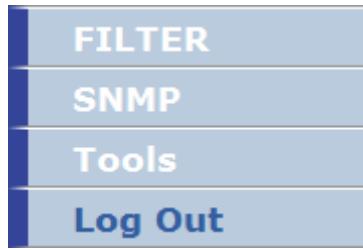


Figure 3-9-45

### 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.

**Administrator Settings**

<b>Device Name</b>	<input type="text"/>	( 1~9, 'A'~'Z', 'a'~'z' or ' ' )
<b>Language Select</b>	Language <input type="button" value="English"/>	
<b>Model Select</b>	<input type="radio"/> OUSR_AP <input checked="" type="radio"/> AODV_AP <input type="radio"/> AP-Bridge <input type="radio"/> AP-CB-Bridge <input type="radio"/> AP-CB-ROUTE <input type="radio"/> CB-CB-ROUTE <input type="radio"/> VLAN_AP <input type="radio"/> AP_WDS_BRG <input type="radio"/> AP4_WDS_BRG	
<b>Password Settings</b>	Current Password <input type="password"/> Password <input type="password"/> (3 ~ 12 Characters) Re-type Password <input type="password"/> Idle Time Out <input type="text" value="999"/> (1 ~ 999 minutes)	
<b>Remote Management</b>	Enable <input type="checkbox"/> ( If enabled, only the following PC can manage this AP. ) IP Address <input type="text"/>	

**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.

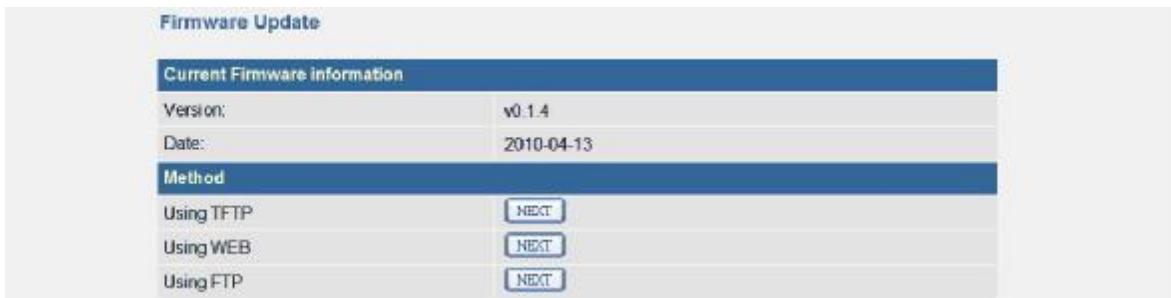


Figure 3-10-3

#### † 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

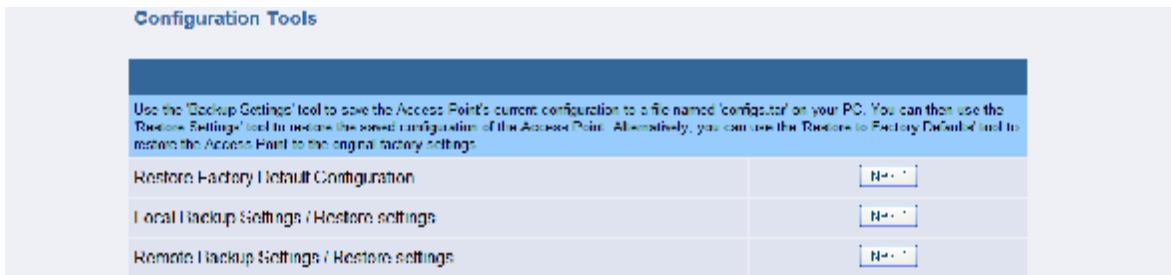
Click on <Browse> button and select the correct firmware file path and file name. Then, click on <APPLY> button to start the firmware upgrade process. At the end of the upgrade process, the Access Point may not respond to commands while uploading the firmware. This is normal behavior and do not turn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

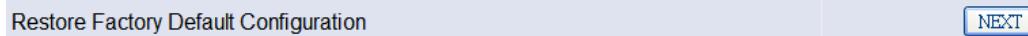
By selecting the item of Configuration Tools under System, the screen will show in Figure 3-10-4. This page includes three selections: Restore Factory Default Configuration, Local Backup settings/Restore settings and Remote Backup Settings/Restore settings.



**Figure 3-10-4**

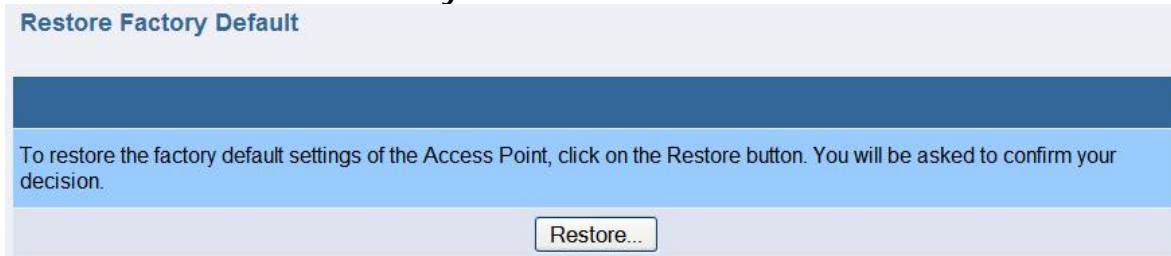
† **Restore Factory Default Configuration:**

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**

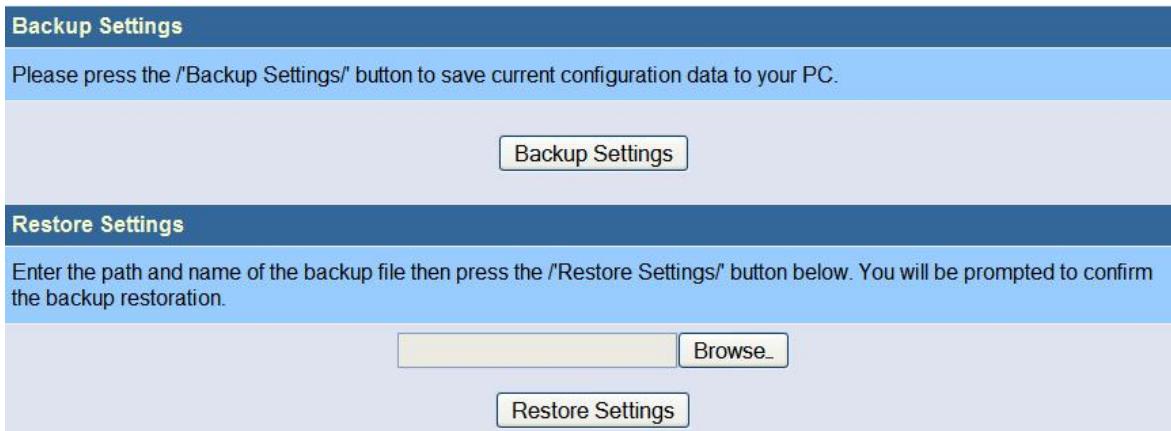
To backup or restore the configuration for this device. Click on <NEXT> button beside 'Local Backup Settings/Restore settings'.



**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.

Status			
<b>System Information</b>			
Current Firmware Version	v0.1.8		
Device Name	AP		
System Model	AODV_AP		
System Time	Wed Nov 3 01:16:31 2010		
<b>Power Control Status</b>			
eth0 PoE	Disabled		
<b>WAN Port</b>			
IP Address	192.168.1.1		
MAC Address	00:40:cF00:00:22		
Mask	255.255.255.0		
Gateway	NA		
<b>AODV Status</b>			
AODV	Actived		
<b>eth0 LAN Port</b>			
IP Address	192.168.0.1		
MAC Address	00:40:cF00:00:33		
Mask	255.255.255.0		
<b>MESH WIFI Status</b>			
MODE	802.11 a		
COUNTRY	North_America_Area		
CHANNEL	Auto		
DTIM	1		
FRAG	2346		
RTS	2346		
BEACON	100		
DISTANCE	100		
<b>Interface ath0</b>			
IP Address	192.168.2.1		
MAC Address	00:26:48:00:0e:df		
Mask	255.255.255.0		
SSID	A1_AP0	Security:	Disabled
<b>AP WIFI 2 Status</b>			
MODE	802.11 a		
COUNTRY	North_America_Area		
CHANNEL	Auto		
DTIM	1		
FRAG	2346		
RTS	2346		
BEACON	100		
DISTANCE	100		
<b>Interface ath4</b>			
IP Address	192.168.24.1		
MAC Address	00:40:c7:fb:00:b8		
Mask	255.255.255.0		
SSID	A2_AP4	Security:	Disabled

*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.

Power Control/Status	
PoE Power Control (eth0 port):	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

*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.

WIFI Status	
WIFI Interfaces :	ath0 ath4
Interface ath0 Information	
IEEE: 802.11bg	ESSID: 'A1_AP0'
Mode: Master	Frequency: 2.452 GHz
Bit Rate: 0 kb/s	Tx-Power: 16 dBm
Retry: off	RTS thr: off
Encryption key: off	Nickname: ''
Power Management: off	Access Point: 00:40:C7:FB:00:F8
Link Quality: 0/70	Sensitivity: 1/1
Rx invalid wcid: 1613	Fragment thr: off
Tx excessive retries: 0	Signal level: -97 dBm
	Rx invalid crypt: 0
	Invalid misc: 0
	Noise level: -97 dBm
	Rx invalid frag: 0
	Missed beacon: 0
Security Information	
Security Mode:	Disable
Associated AP/Station	
End of Status	

Figure 3-10-13

### 3.10.1.7 Log

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

Logs
System Logs
Apr 13 00:02:01 AP cron.notice crond[2844]: USER root pid 3688 cmd /web-server/www/htm Apr 13 00:01:09 AP auth.notice root: 192.168.1.10 login Apr 13 00:00:00 AP user.info : /web-server/flash-setup.sh /web-server/flash-setup.sh: Apr 13 00:00:00 AP user.info : RINETLINK answers: No such file or directory Apr 13 00:00:00 AP user.info : RINETLINK answers: No such file or directory Apr 13 00:00:00 AP user.info : date 041300002010.00 Apr 13 00:00:00 AP user.info : Tue Apr 13 00:00:00 UTC 2010 Apr 13 00:00:06 AP user.info : Terminated Apr 13 00:00:03 AP daemon.notice modvd: main: In wait on reboot for 3000 milliseconds. Apr 13 00:00:03 AP daemon.notice modvd: modv_socket_init: Receive buffer size set to 2 Apr 13 00:00:03 AP daemon.notice modvd: modv_socket_init: RAW send socket buffer size Apr 13 00:00:03 AP user.info : DEBUG=0 Apr 13 00:00:03 AP user.info : DEBUG... Apr 13 00:00:03 AP user.info : Killed Apr 13 00:00:03 AP user.info : Terminated Apr 13 00:00:00 AP user.info : date 041300002010.00

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.

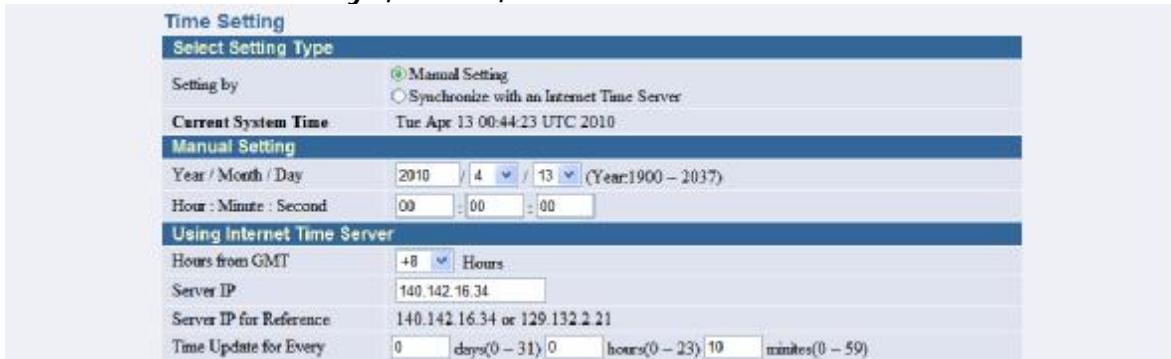


Figure 3-10-15

### 3.10.1.9 Reboot

User can perform reboot function in case of the device is not functioning 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.

The screenshot shows the 'WAN Setting' configuration page. It includes sections for 'Network IP Parameters' and 'DHCP Server Parameters'. In 'Network IP Parameters', fields are set to: IP Address (192.168.1.1), Subnet Mask (255.255.255.0), Gateway Address (192.168.1.254), and DHCP Server (Enabled). In 'DHCP Server Parameters', fields are set to: Primary DNS Address (192.168.1.1), Secondary DNS Address (empty), IP Pool Starting Address (192.168.1.100), IP Pool Ending Address (192.168.1.200), and Lease Time (Half hour).

**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.

The screenshot shows the 'Bandwidth Management' configuration page. It includes a 'Bandwidth Management' section with options for 'Enable' (radio button selected), 'Upload Bandwidth' (54 Mbps), and 'Download Bandwidth' (54 Mbps). Below is a 'Bandwidth Limitation List' table:

Action	Start IP Address	End IP Address	Bandwidth Limitation(Kbps)
Up/Download	192.168.1.20	192.168.1.30	1000

Below the table is an 'Add Bandwidth Limitation' form:

Action	Start IP Address	End IP Address	Bandwidth Limitation(Kbps)
Up/Download	0.0.0.0	0.0.0.0	200

**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.

The screenshot shows a software interface titled 'LAN Setting' for the 'Interface eth0 Setting'. It has two main sections: 'Network IP Parameters' and 'DHCP Server Parameters'. In the 'Network IP Parameters' section, the IP Address is set to 192.168.0.1, and the Subnet Mask is 255.255.255.0. The 'DHCP Server' option is set to 'Enable'. In the 'DHCP Server Parameters' section, the Primary DNS Address is 168.95.1.1. The IP Pool Starting Address is 192.168.0.1, and the IP Pool Ending Address is 192.168.0.100. The Lease Time is set to 'Half hour'.

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.

The screenshot shows the 'LAN Setting' interface under 'Interface ath4 Setting'. It includes sections for 'Network IP Parameters' and 'DHCP Server'. In 'Network IP Parameters', the IP Address is set to 192.168.24.1, Subnet Mask to 255.255.255.0, and the DHCP Server is enabled. In the 'DHCP Server Parameters' section, the Primary DNS Address is 168.95.1.1, and the IP Pool Starting Address and Ending Address are both set to 192.168.24.100.

**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.

The screenshot shows the 'LAN Setting' interface under 'Interface ath0 Setting'. It includes a 'Network IP Parameters' section where the IP Address is set to 192.168.2.1 and the Subnet Mask to 255.255.255.0. At the bottom right are 'HELP' and 'APPLY' buttons.

**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.

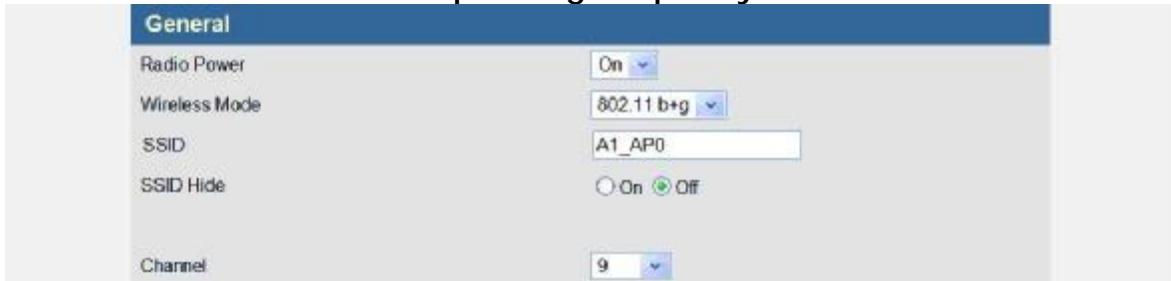


Figure 3-10-22

### † 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.

Advanced Setting	
Peer Node Distance	Auto Distance: 100 m(100 ~ 65535)
Beacon Period	100 (20 ~ 1000)
DTIM Period	1 (1 ~ 255)
Fragmentation Threshold	2346 (256 ~ 2346)
RTS/CTS Threshold	2346 (1 ~ 2346)
Tx Power	Auto
Rate	54 Mbit/s Fixed
Layer 2 Isolation	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
WEP Key Setting	Key #1: ***** Key #2: ***** Key #3: ***** Key #4: *****

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.

SSID Security Mode	
Authentication	WEP
WEP Encryption	<input checked="" type="radio"/> Open <input type="radio"/> Restricted
Select Key	<input checked="" type="radio"/> KEY #1 <input type="radio"/> KEY #2 <input type="radio"/> <input type="radio"/> KEY #3 <input type="radio"/> KEY #4

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.

SSID Security Mode	
Authentication	WPA-personal
WPA MODE	WPA & WPA2
Share Key	123456789 (8 ~ 63 characters)
WPA Encryption	Auto
Group Key Update Interval	600 (30 ~ 65535)

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.

SSID Security Mode	
Authentication	WPA-enterprise
WPA MODE	WPA
Share Key	123456789 (8 ~ 63 characters)
WPA Encryption	Auto
Group Key Update Interval	600 (30 ~ 65535)
802.1x	
Primary Radius Server	
Authenticatoin Server	192 . 168 . 1 . 80 : 1812
Backup Radius Server (Optional)	
Authenticatoin Server	.   .   .   :   Shared Secret

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.

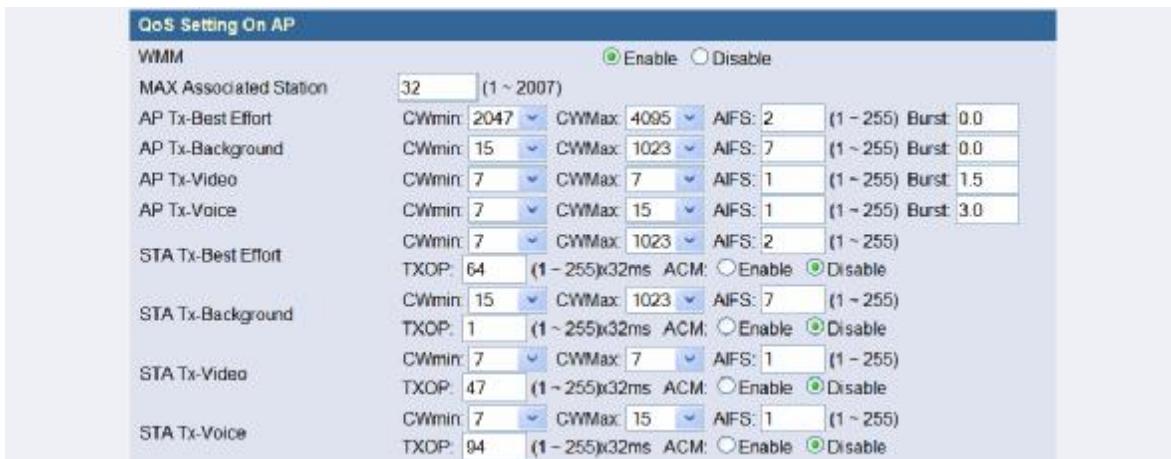


Figure 3-10-27

### 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.

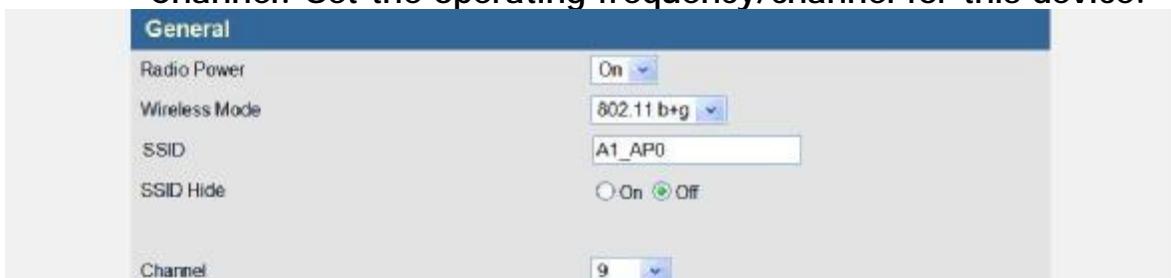


Figure 3-10-28

#### † 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.

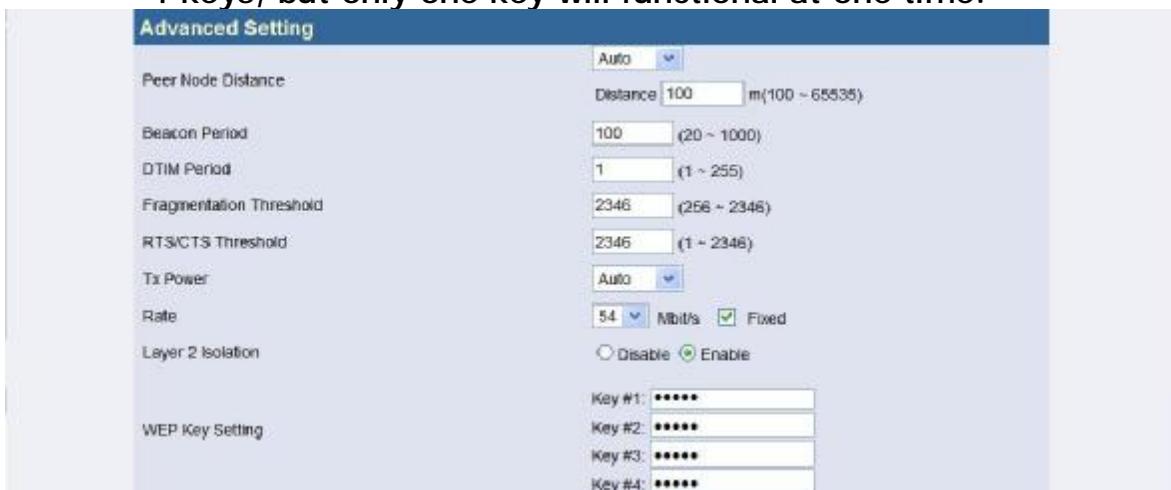


Figure 3-10-29

### † 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.

The screenshot shows the 'SSID Security Mode' configuration page. Under 'Authentication', 'WEP' is selected. Under 'WEP Encryption', 'Open' is checked. Under 'Select Key', 'KEY #1' is checked. There are also options for 'KEY #2', 'KEY #3', and 'KEY #4'.

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.

The screenshot shows the 'IP Filtering' configuration page. At the top, there is a checkbox for 'Disable' and another for 'Enable'. Below is a table with 15 rows, each labeled 'IP Address 1' through 'IP Address 15'. Each row has a text input field for the IP address and a 'Delete' button to its right.

Category	IP Address	Delete
IP Address 1:		[Delete]
IP Address 2:		[Delete]
IP Address 3:		[Delete]
IP Address 4:		[Delete]
IP Address 5:		[Delete]
IP Address 6:		[Delete]
IP Address 7:		[Delete]
IP Address 8:		[Delete]
IP Address 9:		[Delete]
IP Address 10:		[Delete]
IP Address 11:		[Delete]
IP Address 12:		[Delete]
IP Address 13:		[Delete]
IP Address 14:		[Delete]
IP Address 15:		[Delete]

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.

MAC address filtering			
General		Filtering type:	Disable
MAC address table			
Item	MAC address	Ex: 22-22-22-22-22-22	
MAC address 1:		<input type="button" value="Delete"/>	
MAC address 2:		<input type="button" value="Delete"/>	
MAC address 3:		<input type="button" value="Delete"/>	
MAC address 4:		<input type="button" value="Delete"/>	
MAC address 5:		<input type="button" value="Delete"/>	
MAC address 6:		<input type="button" value="Delete"/>	
MAC address 7:		<input type="button" value="Delete"/>	
MAC address 8:		<input type="button" value="Delete"/>	
MAC address 9:		<input type="button" value="Delete"/>	
MAC address 10:		<input type="button" value="Delete"/>	
MAC address 11:		<input type="button" value="Delete"/>	
MAC address 12:		<input type="button" value="Delete"/>	
MAC address 13:		<input type="button" value="Delete"/>	
MAC address 14:		<input type="button" value="Delete"/>	
MAC address 15:		<input type="button" value="Delete"/>	

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.

SNMP Basic Settings

SNMP Agent						
<input type="radio"/> Enable	<input checked="" type="radio"/> Disable					
System Information						
Contact	<input type="text" value="Contact_Me"/>					
Location	<input type="text" value="I_am_here"/>					
V1/V2C						
Index Access Right	Community					
1 Deny	<input type="text"/>					
2 Deny	<input type="text"/>					
3 Deny	<input type="text"/>					
4 Deny	<input type="text"/>					
5 Deny	<input type="text"/>					
V3						
Index User ID	Security Level	Auth Type	Auth Passphrase	Privacy Protocol	Priv Passphrase	Access Right
1	<input type="text"/>	AuthPriv	MD5	<input type="text"/>	DES	<input type="text"/> unused
2	<input type="text"/>	AuthPriv	MD5	<input type="text"/>	DES	<input type="text"/> unused
3	<input type="text"/>	AuthPriv	MD5	<input type="text"/>	DES	<input type="text"/> unused
4	<input type="text"/>	AuthPriv	MD5	<input type="text"/>	DES	<input type="text"/> unused
5	<input type="text"/>	AuthPriv	MD5	<input type="text"/>	DES	<input type="text"/> unused

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.

SNMP VACM Settings				
Community to Security for V1/V2c				
Index	Security Name	IP Source	Community	
<input checked="" type="checkbox"/> 1	mypriv	127.0.0.1	public	
<input type="checkbox"/> 2				
<input type="checkbox"/> 3				
<input type="checkbox"/> 4				
<input type="checkbox"/> 5				

Group				
Index	Group Name	Security Model	Security Name	
<input checked="" type="checkbox"/> 1	generic	v1	mypriv	
<input checked="" type="checkbox"/> 2	genericusm	USM	generic	
<input type="checkbox"/> 3		v1	mypriv	
<input type="checkbox"/> 4		v1	mypriv	
<input type="checkbox"/> 5		v1	mypriv	

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'.

Index	View Name	Include	Sub Tree
<input checked="" type="checkbox"/> 1	mib2	Include	1.3.6.1.2.1
<input checked="" type="checkbox"/> 2	generic	Include	1.3.6.1.4.1.6205
<input type="checkbox"/> 3		Include	
<input type="checkbox"/> 4		Include	
<input type="checkbox"/> 5		Include	
<input type="checkbox"/> 6		Include	
<input type="checkbox"/> 7		Include	
<input type="checkbox"/> 8		Include	
<input type="checkbox"/> 9		Include	
<input type="checkbox"/> 10		Include	
<input type="checkbox"/> 11		Include	
<input type="checkbox"/> 12		Include	
<input type="checkbox"/> 13		Include	
<input type="checkbox"/> 14		Include	
<input type="checkbox"/> 15		Include	
<input type="checkbox"/> 16		Include	
<input type="checkbox"/> 17		Include	

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.

Access	Index	Group	Security Model	Security Level	Read	Write	Notify
	<input checked="" type="checkbox"/> 1	generic	any	NoAuthNoPriv	generic	generic	generic
	<input checked="" type="checkbox"/> 2	genericusm	usm	AuthPriv	all	all	all
	<input type="checkbox"/> 3	generic	any	NoAuthNoPriv	all	all	all
	<input type="checkbox"/> 4	generic	any	NoAuthNoPriv	all	all	all
	<input type="checkbox"/> 5	generic	any	NoAuthNoPriv	all	all	all

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.

SNMP Trap					
Trap Active	<input checked="" type="radio"/> Disable <input type="radio"/> Enable				
v1/v2c Trap					
Index	Version	IP Address : Port			Community
0	Version 1	192	168	1	21
1	Disable				162
2	Disable				
3	Disable				
4	Disable				

v3 Trap					
Index	User	IP Address : Port			Security Level
0	genericro				NoAuthNoPriv
1	genericro				NoAuthNoPriv
2	genericro				NoAuthNoPriv
3	genericro				NoAuthNoPriv
4	genericro				NoAuthNoPriv

**Figure 3-10-37**

#### † Trap Items

Enable/Disable which trap items to send.

Trap Items	
Cold Start	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Warm Start	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Link Up	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Link Down	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Auth Fail	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Log In	<input type="radio"/> Disable <input checked="" type="radio"/> Enable

**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.

Tools				
Command Ping :				
Ping:	IP:	Count: 3	<input checked="" type="radio"/> Disable	<input type="radio"/> Enable

**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.