

Wireless LAN Access Point

AWL-500

User Manual

Version 1.0
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Notice I

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Notice II

FCC Warning

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.

Note:

The AWL-500 has been tested and found to comply with the limits for a Class B digital device and a low power transmitter, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. 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 particular installation.

Warning to user for application

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the antenna and your body.

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Chapter 1 Introduction

Thank you for choosing BenQ Wireless LAN Access Point AWL-500. The AWL500 Wireless LAN Access Point can be used with relevant BENQ wireless networking devices such as the BENQ AWL100 Wireless LAN PC Card and BENQ AWL300 Wireless LAN USB Adapter, which would allow the users to access an office LAN wirelessly, or share an xDSL/cable modem. The AWL500 could accommodate up to 32 network users a time and this high performance device is also extremely simple to install.



Chapter 2 Hardware Installation

This chapter describes initial setup of the Access Point.

2-1 Product Kit

Before installation, make sure that you have the following items:

- ◆ AWL500 Wireless LAN Access Point
- ◆ Software CD containing user manual and utility
- ◆ Quick Start Guide
- ◆ RJ-45 cable
- ◆ Power adapter
- ◆ Metal stand
- ◆ Screw pack
- ◆ Warranty card

2-2 System Requirements

Before using your AWL500, please check that you have the following required items:

- ◆ Broadband access device (ADSL/cable modem) or Office LAN
- ◆ UTP Cat-5 cable for linking ADSL/cable modem/LAN and the AWL500
- ◆ Wireless LAN PC card (AWL100) or USB adapter (AWL300)
- ◆ Web browser (Internet Explorer 5.0 or higher, or Netscape Navigator 4.5 or higher)

2-3 Mechanical Description

Top panel of the Access Point

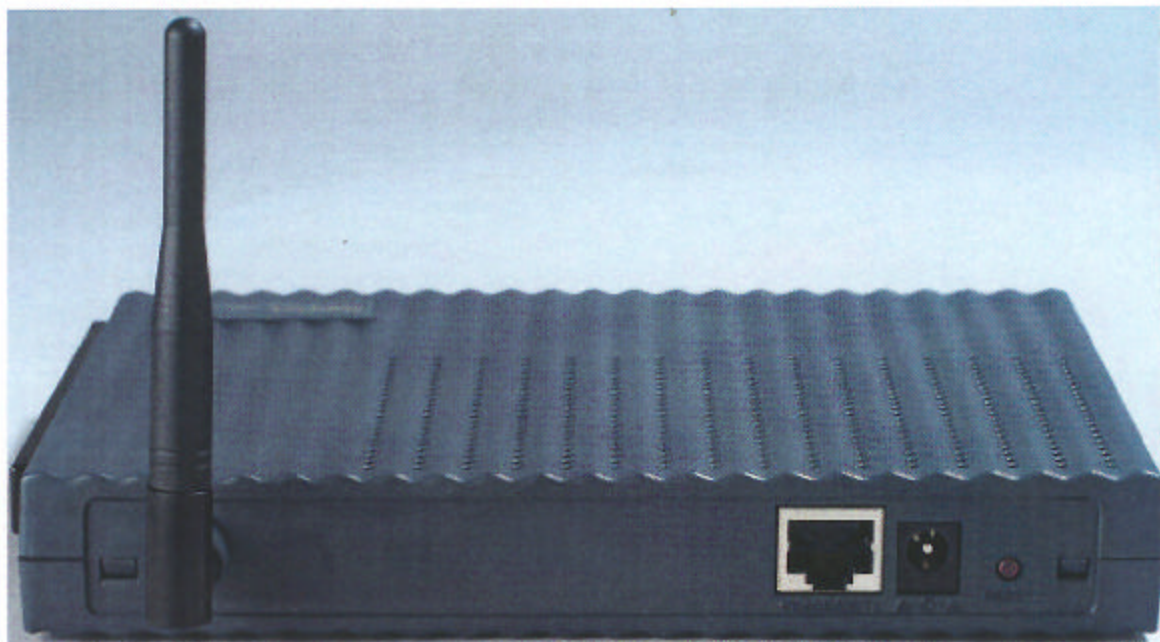
The following table provides an overview of each LED activity:



LED Definition	Activity	Description
PWR	Continuous Green	Power enabled
WLAN	Flashing Green	Off: No wireless activity
		Flashing: Wireless RX/TX activity
LAN	Flashing Green	Off: No Ethernet traffic activity
		Flashing: Wired LAN traffic activity



Back panel of the Access Point:



Back Panel	Description
Reset button	Designed to reset the AWL500 after a system failure or crash. When pressed, the AWL500 will reset.
PWR/DC jack	Where power is input to AWL500 through the power adapter supplied with it. Please do not plug other power adapters into this jack.
LAN port	Where the AWL500 can be connected to ADSL/cable modem/Ethernet LAN via an RJ-45 cable.
Antenna	Where the radio signal carrying network data is transmitted.

NOTE

Power Socket

The power adapter plugs into the socket labeled "POWER".

10/100Mbps Ethernet Ports

The Wireless LAN Access Point supports auto-detect, 10/100M MDI Ethernet port. To connect the Access Point to a hub, use a straight-through UTP cable; to connect the Access Point to a computer/station, use a crossover UTP cable.

2-4 Hardware Installation

■ **Connect the Ethernet Cable**

The 11Mbps Wireless LAN Access Point supports 10/100M Ethernet connection. Attach your UTP Ethernet cable to the RJ-45 connector on the Access Point. Then connect the other end of the RJ-45 cable to a hub or a station. Please be sure to use the MDI port to connect the Access Point to a hub. Otherwise, please use the MDI-X port to connect the Access Point to a computer/station.

■ **Plug the Power Cable**

Plug the power adapter to the power socket on the Access Point, and plug the other end of the power into an electrical outlet.

NOTE

ONLY use the power adapter supplied with the Access Point. Otherwise, the product may be damaged.

Chapter 3 Configuring the Access Point

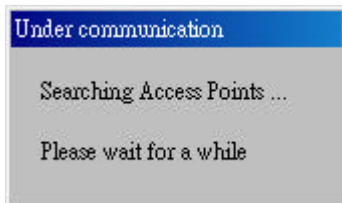
The 11Mbps Wireless LAN Access Point is shipped with default parameters, which will be suitable for the typical **infrastructure wireless LAN**. Just simply install the Access Point, power it on, and it is now ready to work. Nevertheless, you can still adjust configuration settings depending on how you would like to manage your wireless network. The 11Mbps Wireless Access Point allows its user to configure via the browse TCP/IP (HTTP).

3-1 Using the Access Point Search Tool

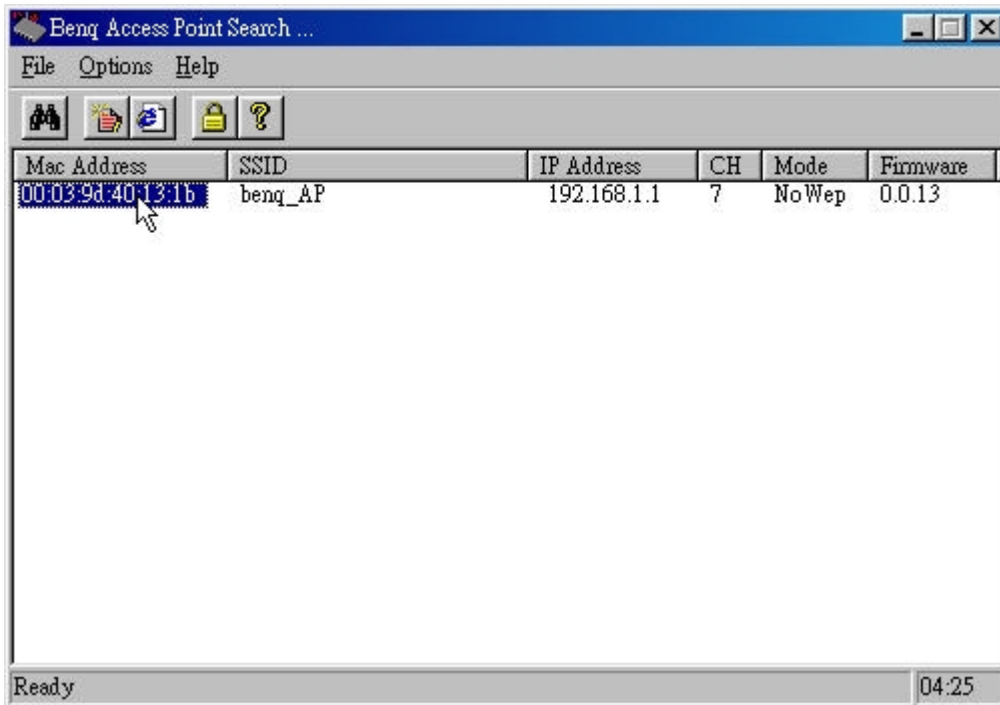
The Access Point Search tool is useful for first time configuration and forgot Access Point IP. The following steps will guide you through the installations of the Access Point Search utility.

After finishing hardware installation, put the supplied Software CD into the CD-ROM drive of your PC, and locate the “**device_search.exe**” file in the AWL500 directory. Double-click its icon with the left button of your mouse to execute the file. Then follow the steps below:

- I. After double-clicking on the icon, a small window will appear showing the status in searching for Access Points.



- II. After searching for a few seconds, information on the result of the search will be shown in a window.

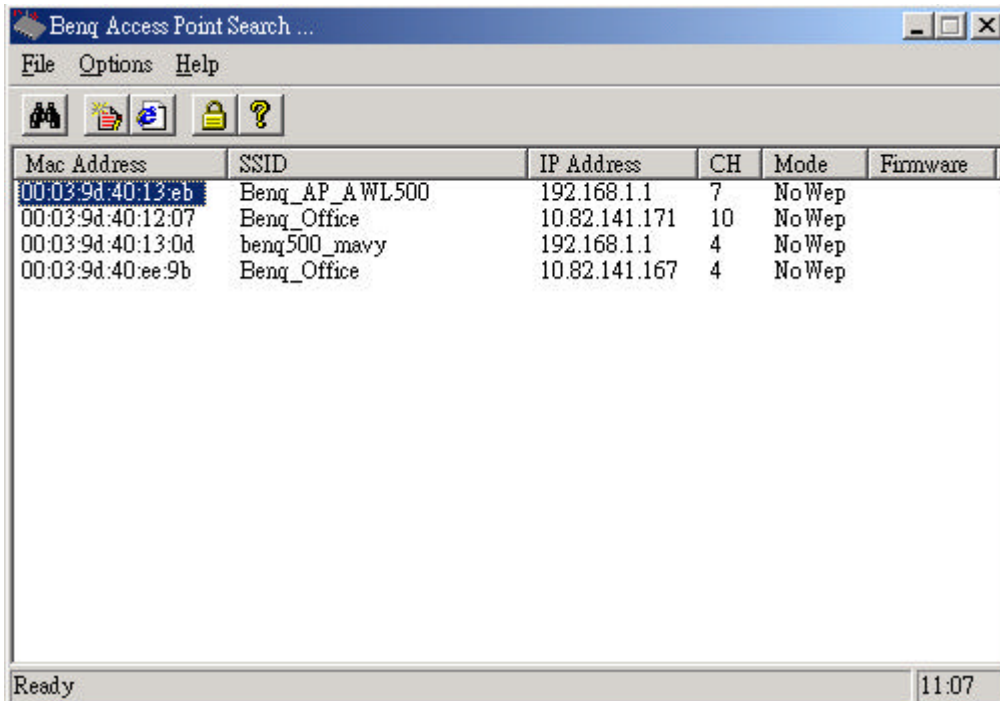


- III. When the Access Point is found within the network, a configuration window will appear. You will see the basic information of the Access Point, such as MAC Address SSID IP Channel WEP Mode and Firmware Version.

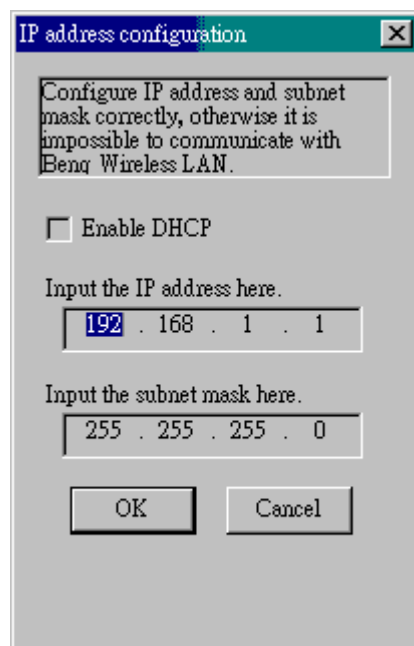
ITEM	Description
MAC Address	It is a hardware identification number on the network Access Point
SSID	SSID is a unique ID on the network Access Point
IP Address	Current Access Point IP Address
CH	<i>Access Point channel id</i>
Mode	<i>Access Point WEP Mode</i>
Firmware Version	Displays the firmware version that is equipped with your hardware

Change IP Address

1. When both Access Point and host are not on the same subnet, you can choose it and change IP Address .



2. Configure IP address to the Access Point. You may either give a fixed IP address to your Wireless Access Point, or choose DHCP client with the Enable DHCP item selected. It will obtain the IP address automatically from your DHCP server.

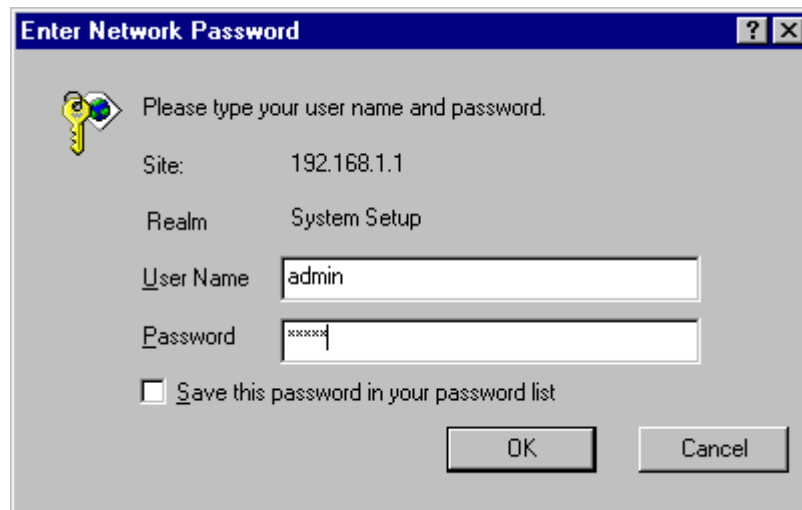


3. When both Access Point and host on the same subnet, please select IE icon , into Web Management.

3-2 Using the Web Management

The Wireless Access Point has a build-in web management server. The built-in Web Management provides you with user-friendly web pages to manage your Wireless Access Points. Using web browser connected to the Wireless Access Point (e.g. **<http://192.168.1.1>**) will allow you to monitor and configure the Wireless Access Point. The Access Point Search Tool described in the previous section may help you to find out the IP address of the Wireless Access Point if you forget its IP.

1. Open your web browser.
2. Enter the IP address of your Wireless Access Point in the Address field (e.g. <http://192.168.1.1>). You will have access to the **Wireless Access Point Web Pages** of the Wireless Access Point.



3. Enter the password to login onto the Wireless Access Point. Both the default id and password are **admin**. The main page will show up.

Quick Installation Wizard
[Information](#)
[Statistics](#)
[Channel Info](#)
[Associated Table](#)
Advanced Setting
[Security Setup](#)
[Access Control Setup](#)
Admin Password
[Save Setting](#)
[Reboot System](#)
[Update Firmware](#)
[Load Default Setting](#)

Quick Installation Wizard

- Firmware Version:**
Firmware Version: 0.0.10
- IP Parameters:**
Mode: ☐ DHCP ☒ Fixed IP
IP Address:
Netmask:
- IEEE802.11 Parameters:**
ESS ID:
Channel:
RTS Threshold:
Frag Threshold:
Basic Rates: ☒ 1-2(Mbps) ☐ 1-2-5.5-11(Mbps)
TX Rates: ☐ 1-2(Mbps) ☒ 1-2-5.5-11(Mbps)
Preamble Type: ☐ Short Preamble ☒ Long Preamble

Apply

The Wireless Access Point main page contains eight items for you to manage your Wireless Access Point.

Quick Installation Wizard

This tool displays the Firmware Version of this Wireless Access Point. And you may adjust the settings on the Wireless Access Point such as DHCP, Fixed IP, IP Address, Netmask, ESSID, Channel, RTS Threshold, Fragment Threshold, Basic Rates, TX Rates and Preamble Type.

Quick Installation Wizard

- Information
 - Statistics
 - Channel Info
 - Associated Table
- Advanced Setting
 - Security Setup
 - Access Control Setup
- Admin Password
- Save Setting
- Reboot System
- Update Firmware
- Load Default Setting

Quick Installation Wizard

- Firmware Version:

Firmware Version: 0.0.10
- IP Parameters:

Mode: ☐ DHCP ☒ Fixed IP
IP Address:
Netmask:
- IEEE802.11 Parameters:

ESS ID:
Channel:
RTS Threshold:
Frag Threshold:
Basic Rates: ☒ 1-2(MBps) ☐ 1-2-5.5-11(MBps)
TX Rates: ☐ 1-2(MBps) ☒ 1-2-5.5-11(MBps)
Preamble Type: ☐ Short Preamble ☒ Long Preamble

Apply

ESSID: The ESSID is a unique ID given to the Access Point. Wireless clients associating to the Access Point must have the same ESSID. The ESSID can have up to 32 characters.

Channel: You may select any of the available channels as an operational channel for your Access Point.

RTS Threshold: RTS Threshold is a mechanism implemented to prevent the “Hidden Node” problem. “Hidden Node” is a situation occurred when two stations are within range of the same Access Point, but are not within range of each other. Therefore, they are hidden nodes to each other. When a hidden station starts data transmission with the Access Point, it might not notice that the other station is already using the wireless media. When these two stations send data at the same time, they might collide when arriving simultaneously at the Access Point. The collision will most certainly result in a loss of messages for both stations. Thus, the RTS Threshold mechanism will provide the solution to prevent data collisions. When the RTS is activated, the station and its Access Point will use a Request to Send/Clear to send protocol (RTS/CTS). The station will send an RTS to the Access Point, informing that it is going to transmit the data. Upon receipt, the Access Point will respond with a CTS message to all station within its

range to notify all other stations to defer transmission. It will also confirm to the requesting station that the Access Point has reserved the channel for transmission.

Fragmentation Threshold: Fragmentation mechanism is used for improving the efficiency when there is high traffic within the wireless network. If you transmit large files in a wireless network, you can enable the Fragmentation Threshold and specify the packet size. The mechanism will split the packet into the packet size you set.

Rate Set: By default, the unit adaptively selects the highest possible rate for transmission. In case of obstacles or interference, the system will step down. Select the Basic Rates to be used among the following options: 1 - 2 (Mbps), 1 - 2 - 5.5 - 11 (Mbps). Select the TX Rate set among the following options, (1 - 2 - 5.5 - 11 Mbps) or (1 - 2 Mbps).

Preamble Type (Short/Long): Preamble is the first sub field of PPDU, which is the appropriate frame format for transmission to PHY (Physical layer). There are two options, Short Preamble and Long Preamble.

Information

Statistics

This item displays the Ethernet and wireless network traffic:


AWL 500 Access Point

Quick Installation Wizard

Information

- Statistics
- Channel Info
- Associated Table

Advanced Setting

- Security Setup
- Access Control Setup

Admin Password

Save Setting

Reboot System

Update Firmware

Load Default Setting

AWL500 Access Point Running Status Monitor

Wireless Receive		Wireless Transmit	
Unicast Packets	59	Unicast Packets	16
Unicast Bytes	5371	Unicast Bytes	1568
Multicast Packets	15	Multicast Packets	908
Multicast Bytes	682	Multicast Bytes	126482

Ethernet Receive		Ethernet Transmit	
Packets	15052	Packets	227
Total Bytes	9522300	Total Bytes	91925

Stop Start

Channel Info

This item displays the channel information of the Wireless Access Point.


AWL 500 Access Point

Quick Installation Wizard

Information

- Statistics
- Channel Info**
- Associated Table

Advanced Setting

- Security Setup
- Access Control Setup

Admin Password

Save Setting

Reboot System

Update Firmware

Load Default Setting

AWL500 Access Point Channel Information

Pressing Refresh button will cause temporary disconnection with all associated stations.

Channel Number	Average Signal Level (%)	Peak Signal Level (%)
1	47	80
2	42	66
3	47	76
4	47	66
5	42	71
6	57	71
7	61	90
8	80	95
9	38	38
10	42	47
11	66	90
12	47	66
13	52	76
14	0	0

Refresh

Associated Table

This is a list of all the stations that have ever associated. This table provides information to track how many stations have ever associated with the Access Point.

**AWL 500 Access Point**

Quick Installation Wizard

[Information](#)

[Statistics](#)[Channel Info](#)[Associated Table](#)

Advanced Setting

[Security Setup](#)[Access Control Setup](#)

Admin Password

[Save Setting](#)[Reboot System](#)[Update Firmware](#)[Load Default Setting](#)

AWL500 Access Point - Associated Table

This is a list of all the stations that are associated.

Association Number	MAC
1	00:03:9d:00:01:30

Refresh

Advanced Setting

Security Setup

To prevent unauthorized wireless stations from accessing data transmitted over the network, the 11Mbps Wireless LAN Access Point offers WEP (Wired Equivalency Privacy). You can set up 4 encryption keys to encrypt your data.

The screenshot shows the BenQ AWL 500 Access Point web interface. The top header is purple with the BenQ logo and 'AWL 500 Access Point'. On the left is a navigation menu with links: Quick Installation Wizard, Information, Statistics, Channel Info, Associated Table, Advanced Setting, Security Setup (highlighted), Access Control Setup, Admin Password, Save Setting, Reboot System, Update Firmware, and Load Default Setting. The main content area is titled 'Security Setup' and contains two sections: 'WEP Encryption' and 'Authentication Type'. In the 'WEP Encryption' section, 'Choose Encryption' has three radio buttons: 'Disable (no encryption)', 'WEP64 (Key is 5 hex byte. Ex: 1122334455)' (which is selected), and 'WEP128 (Key is 13 hex byte. Ex: 112233445566778899aabbccdd)'. Below this, 'Use Key' has four radio buttons: 'Key 1' (selected), 'Key 2', 'Key 3', and 'Key 4', each followed by a text input field. The 'Authentication Type' section has three radio buttons: 'Open System' (selected), 'Shared Key', and 'Both'. At the bottom right of the form is an 'Apply' button.

The 11Mbps Wireless Access Point allows you to create 4 data encryption keys to secure your data from being eavesdropped by unauthorized wireless user. To activate and set the WEP keys, please do the following:

- From the WEP encryption item, list three options:
 - Disable** – Allows wireless adapters to communicate with Wireless Access Points without any data encryption.
 - WEP64** – Requires wireless stations to use data encryption with 64 bit algorithm when communicating with the Wireless Access Point.
 - WEP128** - Allows wireless clients to communicate with the Wireless Access Point with data 128 Bit encryption algorithms.

- When WEP64 is selected, enter 10 digit hexadecimal values in the range of “A-F”, “a-f” and “0-9”, (e.g. 1234567890).
- When WEP128 is selected, enter 26 digit hexadecimal values in the range of “A-F”, “a-f” and “0-9” (e.g. 11223344556677889900aabbdd).

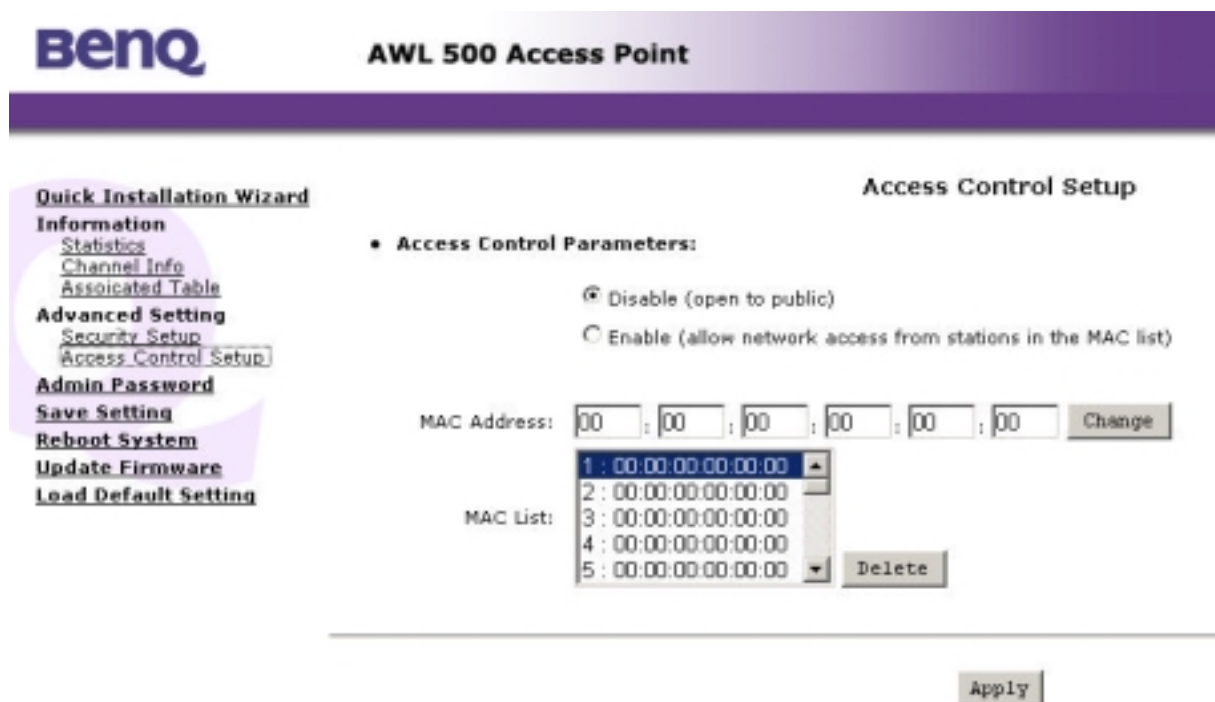
Enter the 4 WEP keys in the Key 1, Key 2, Key 3 and Key 4 entry field.
Select one WEP key as an active key before enabling use of encryption

NOTE

The WEP key must be set up exactly the same on the Wireless Access Points as they are on the wireless client stations. If you use Key 1 on the Wireless LAN Access Point, the same value must be assigned to Key 1 for all client stations.

Access Control

The Access Control Table enables you to restrict wireless stations accessing the Wireless Access Points by identifying the MAC address of the wireless devices.



The screenshot shows the BenQ AWL 500 Access Point web interface. The top navigation bar includes the BenQ logo and the title "AWL 500 Access Point". The left sidebar contains a "Quick Installation Wizard" menu with links to Information, Statistics, Channel Info, Associated Table, Advanced Setting, Security Setup, Access Control Setup, Admin Password, Save Setting, Reboot System, Update Firmware, and Load Default Setting. The main content area is titled "Access Control Setup" and contains the following elements:

- Access Control Parameters:**
 - ☒ Disable (open to public)
 - ☐ Enable (allow network access from stations in the MAC list)
- MAC Address:** A field with six boxes containing "00", "00", "00", "00", "00", and "00", followed by a "Change" button.
- MAC List:** A list box containing five entries, each starting with a number followed by a colon and a MAC address (e.g., "1 : 00:00:00:00:00:00"). A "Delete" button is located to the right of the list.
- Apply:** A button at the bottom right of the page.

Use the following buttons to manage the Access Control Table:

Enable – allow network access from stations in the list

Change – to change and add the entries in the table if you enter the incorrect MAC address

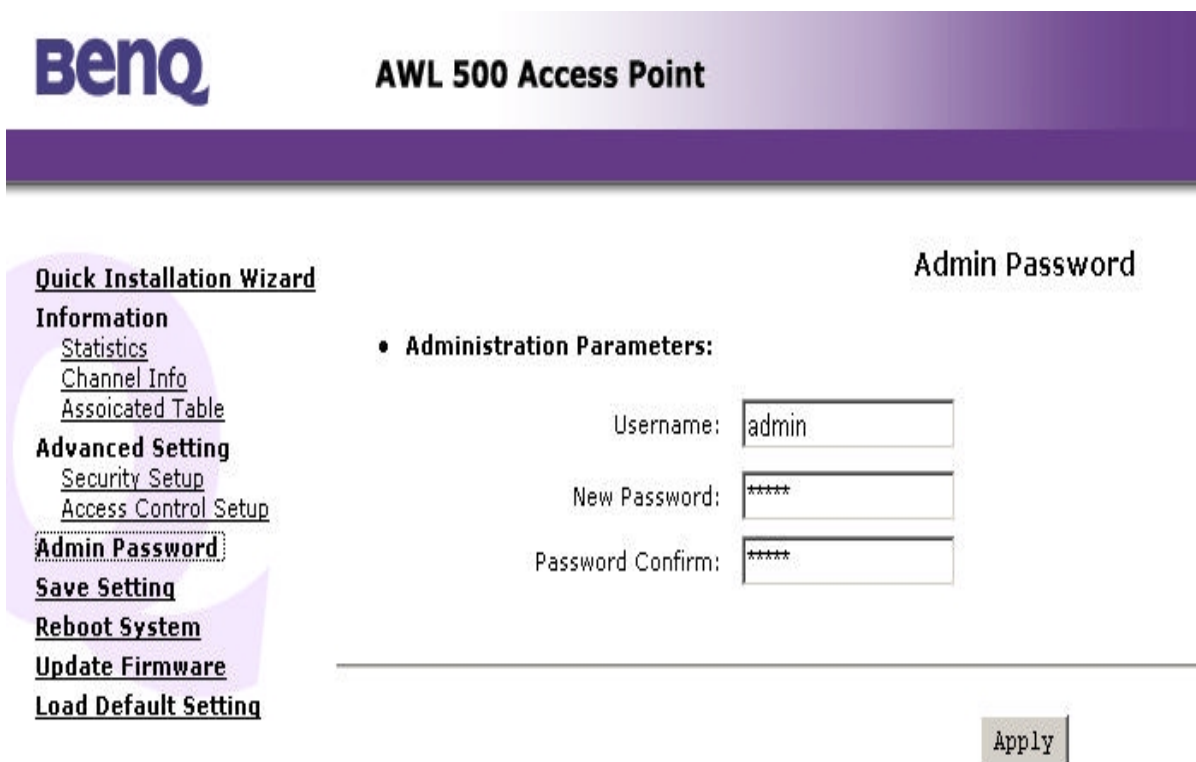
Delete – to remove MAC addresses one at a time

NOTE

Be sure to press “**Apply**” bottom after modifying the configuration before leave this page or “**Save Setting**”

Admin Password

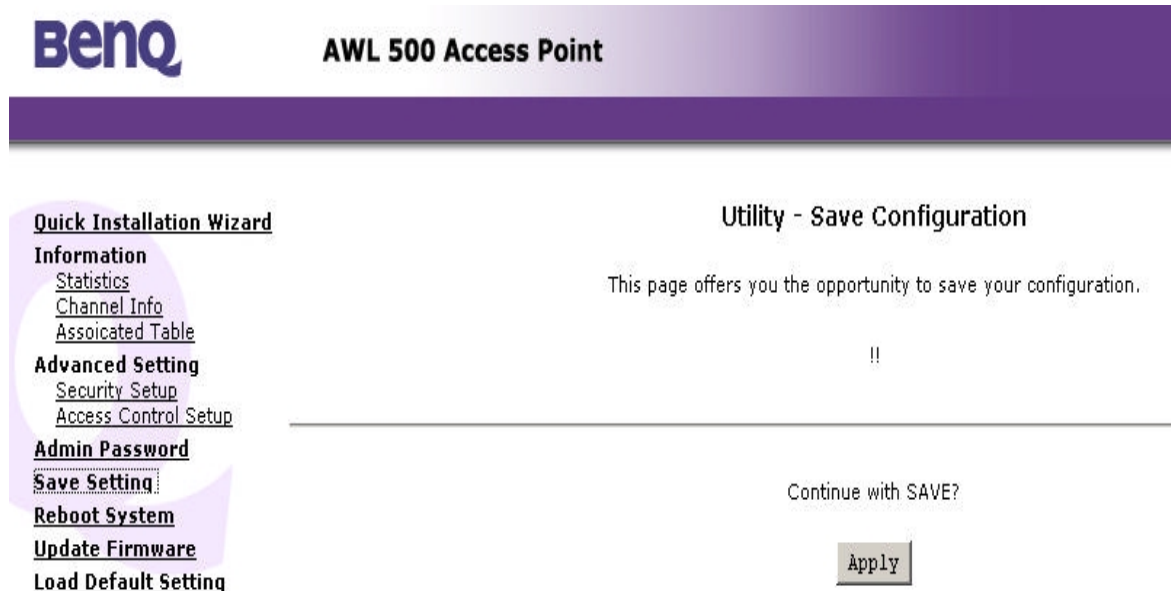
You may change the default password by entering the new password. Enter the new password in the **Confirm Change** field to make the new setting take affect.



The screenshot shows the BenQ AWL 500 Access Point configuration interface. The top header includes the BenQ logo and the title "AWL 500 Access Point". The main content area is titled "Admin Password". On the left, there is a sidebar menu with the following options: "Quick Installation Wizard", "Information" (with sub-items: Statistics, Channel Info, Associated Table), "Advanced Setting" (with sub-items: Security Setup, Access Control Setup), "Admin Password" (which is highlighted with a dashed border), "Save Setting", "Reboot System", "Update Firmware", and "Load Default Setting". The main configuration area is titled "Administration Parameters:" and contains three input fields: "Username:" with the value "admin", "New Password:" with the value "*****", and "Password Confirm:" with the value "*****". At the bottom right of the configuration area, there is an "Apply" button.

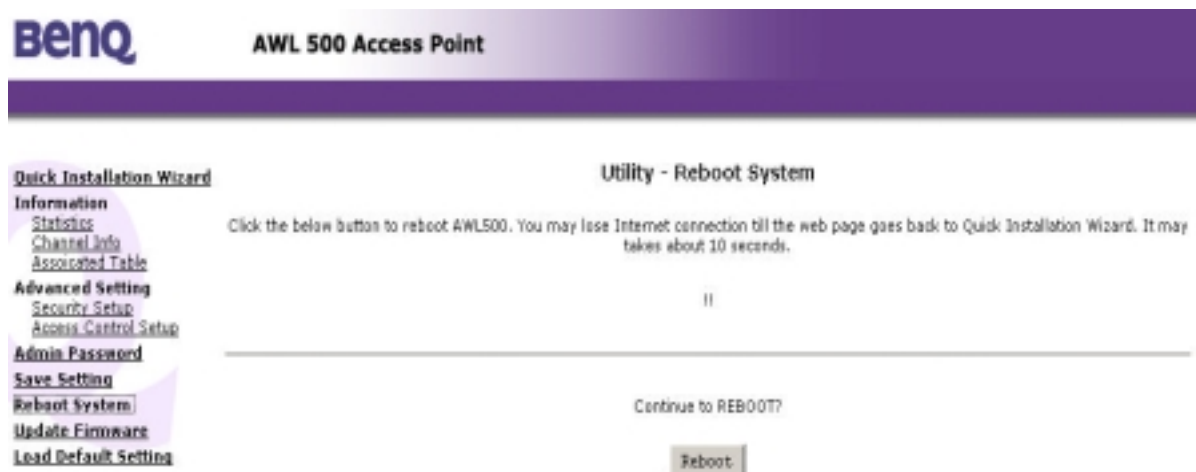
Save Setting

This function offers you the opportunity to save your current configuration.



Reboot System

This function offers you the opportunity to restart your Access Point.

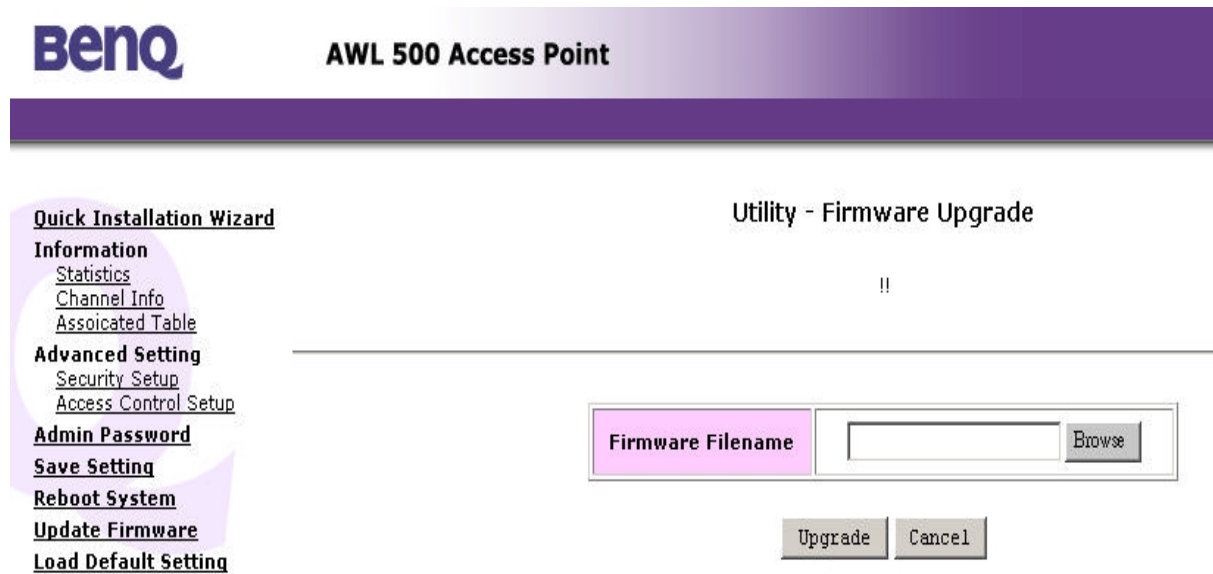


ALL settings will not take effect until “Save Setting” and “Reboot System” performed.

NOTE

Firmware Upgrade

Here, you can upload the newest firmware of the Wireless Access Point. You may either enter the file name in the entry field or browse the file by clicking the **Browse** button.



The screenshot shows the BenQ AWL 500 Access Point utility interface. At the top, the BenQ logo and 'AWL 500 Access Point' are displayed. The main title is 'Utility - Firmware Upgrade'. On the left, a sidebar lists navigation options: Quick Installation Wizard, Information (with sub-items: Statistics, Channel Info, Associated Table), Advanced Setting (with sub-items: Security Setup, Access Control Setup), Admin Password, Save Setting, Reboot System, Update Firmware, and Load Default Setting. The main area contains a 'Firmware Filename' label next to a text input field and a 'Browse' button. Below this are 'Upgrade' and 'Cancel' buttons. A '!!' warning icon is visible above the input field.

BenQ **AWL 500 Access Point**

Utility - Firmware Upgrade

!!

Quick Installation Wizard

Information

- Statistics
- Channel Info
- Associated Table

Advanced Setting

- Security Setup
- Access Control Setup

Admin Password

Save Setting

Reboot System

Update Firmware

Load Default Setting

Firmware Filename **Browse**

Upgrade **Cancel**

Load Default Setting

This function offers you the opportunity to load your default setting.

**AWL 500 Access Point**

Quick Installation Wizard

Information
[Statistics](#)
[Channel Info](#)
[Associated Table](#)

Advanced Setting
[Security Setup](#)
[Access Control Setup](#)

Admin Password

Save Setting

Reboot System

Update Firmware

Load Default Setting

Utility - Load Default Configuration

This page offers you the opportunity to load your default configuration.

!!

Continue with LOAD DEFAULT?

Apply

Chapter 4 Troubleshooting

If you have trouble using the 11Mbps Wireless LAN Access Point, the user could perform primary troubleshooting with the LED activity on your Access Point. The following is “LED Error Table” is provided to assist you in diagnosing and to solve operational problems.

PWR	WLAN	LAN	Description/Action
Continuous Green	Flash Green	Flash Green	Normal operation where flickering indicates interface activity. ■ No action required.
	Flash Green	Off	Normal operation that indicates there is no LAN activity. ■ No action required.
Off	Off	Off	Power failure. ■ Check the power cord. ■ Check the power supply.
Continuous Green	Off	Off	Invalid loader firmware or the micro-controller is dead. ■ Return the unit to the vendor for support.
	-	-	Invalid Access Point firmware. ■ Upgrade the firmware via the utility or console mode.
	Blink Green	-	Wireless LAN initialization failure ■ Check whether the wireless module has been properly installed.
	-	Blink Green	Ethernet initialization failure ■ Return the device to the vendor for support.