

# **802.11b**

# **WLAN Access Point**

*User Manual*

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## **Statement of Conditions**

We may make improvements or changes in the product described in this documentation at any time. The information regarding to the product in this manual are subject to change without notice.

We assumes no responsibility for errors contained herein or for direct, indirect, special, incidental, or consequential damages with the furnishing, performance, or use of this manual or equipment supplied with it, even if the suppliers have been advised of the possibility of such damages.

## **Electronic Emission Notices**

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.

(2) This device must accept any interference received, including interference that may cause undesired operation.

## **FCC INFORMATION**

The Federal Communication Commission Radio Frequency Interference Statement includes the following paragraph:

The 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 instruction, may cause harmful interference to radio communication. However, there is no grantee that interference will not occur in a particular installation. If this equipment dose cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

--Reorient or relocate the receiving antenna.

--Increase the separation between the equipment and receiver.

--Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

--Consult the dealer or an experienced radio/TV technician for help.

The equipment is for home or office use.

## **IMPORTANT NOTE**

FCC RF Radiation Exposure Statement: 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 20cm between the antenna and your body and must not be co-located or operating in conjunction with any other antenna or transmitter.

**Caution:** *Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*

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# Introduction

The 802.11b WLAN Access Point card aims to assist you in easily building a communicable connection between your wired LAN and one or more Wireless Local Area Networks. It's easy to install and operate. To let you enjoy the most advantages of this product, please read this manual carefully.

## 1.1 Features

- 802.11b Wi-Fi compliant
- Quick and easy to install
- Works with any device that has an Ethernet port
- LED indicators show unit operating status
- FCC Certified for use with YDI amplifiers and outdoor antennas with the Diamond WLAN Card
- Web-based configuration screen of Access Point enables fast and easy setup
- Supports RTS threshold control for better throughput
- Wireless data encryption with 64 and 128 bits encryption for security
- One-year warranty

## 1.2 Specifications

<b>Data Rates Supported</b>	1, 2, 5.5, and 11 Mbps
<b>Network Standard</b>	IEEE 802.11b
<b>Uplink</b>	10BaseT Ethernet
<b>Frequency Band</b>	2.4 to 2.497 GHz (subject to local regulations)
<b>Network Architecture Types</b>	Infrastructure

<b>Wireless Medium</b>	Direct Sequence Spread Spectrum (DSSS)
<b>Media Access Protocol</b>	Carrier sense multiple access with collision avoidance (CSMA/CA)
<b>Modulation</b>	DBPSK @ 1 Mbps; DQPSK @ 2 Mbps; CCK @ 5.5 and 11 Mbps
<b>Operating Channels</b>	(US/FCC: 1-11, Europe/ETSI: 1-13)
<b>Non-overlapping Channels</b>	Three
<b>Receive Sensitivity</b>	1 Mbps: -94 dBm 2 Mbps: -91 dBm 5.5 Mbps: -87 dBm 11 Mbps: -83 dBm
<b>Available Transmit Power Settings</b>	99 mW
<b>Range</b> <b>(typical @ 99-mW transmit power setting, including 1.95 dBi diversity dipole antenna)</b>	Indoor: 165 ft (50 m) @ 11 Mbps 350 ft (107 m) @ 1 Mbps Outdoor: 800 ft (244 m) @ 11 Mbps 2000 ft (610 m) @ 1 Mbps
<b>EMC Certification</b>	FCC 47CFR15 subpart C (15.247) and Class B device ETSI 300-328/301-489-17 (General EMC requirement for RF equipment)
<b>Antenna</b>	Two soldered dipole antennas
<b>Encryption Key Length</b>	64-bit, 128-bit

<b>Security</b>	IEEE 802.11 WEP (Wired Equivalent Privacy)
<b>Filter</b>	MAC Address Filtering
<b>Status Indicators</b>	Three indicators on the top panel provide status of POWER  Wireless LAN
<b>Automatic Configuration Support</b>	DHCP client
<b>Remote Configuration Support</b>	HTTP, TFTP
<b>Dimensions</b>	6.30 in. (16 cm) wide x 4.72 in. (12 cm) deep x 1.45 in. (3.7 cm) high
<b>Weight</b>	12.3 oz (350g)
<b>Environmental</b>	Operating temperature: 0 to 40 (32 to 104 )  Storage temperature: -20 to 70 (-4 to 158 )  Humidity: 10 to 90% (non-condensing)
<b>Input Power Requirements</b>	DC 5V 2A
<b>Warranty</b>	One year

### 1.3 Product Kit

The Access Point Kit contains the following items:

- ✓ One 802.11b WLAN Access Point
- ✓ One Power Adapter
- ✓ One Quick Installation Guide
- ✓ One User Manual
- ✓ One RJ45 Ethernet Straight LAN cable



**Note:** If any item listed above is damaged or missing, please contact your dealer immediately.

## 1.4 System Requirements

To accomplish a successful operation of your 802.11b WLAN Access Point, we suggest the following items are required:

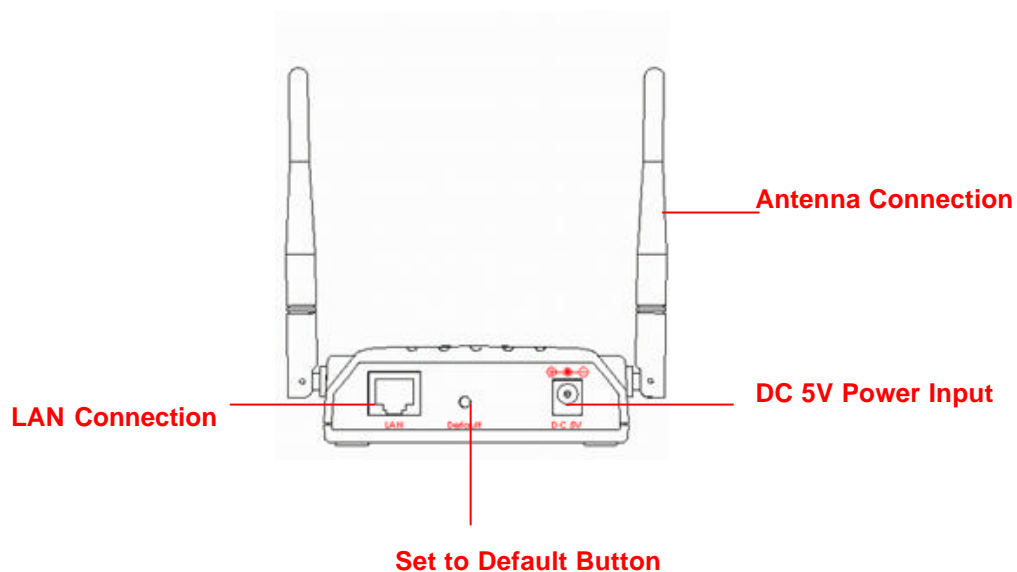
- ✓ One or more PCs (desktop or notebook) with Ethernet interface.
- ✓ TCP/IP protocol must be installed on all PCs.
- ✓ Network cables. Use standard 10/100BaseT network (UTP) cables with RJ45 connectors.
- ✓ To use the Wireless Access Point, all wireless devices must be compliant with the IEEE 802.11b specifications.
- ✓ Microsoft Internet Explorer 5.0 or later or Netscape Navigator 4.7 or later.

## Getting to Know 802.11b WLAN Access Point

This section is consisted of three parts. You will learn the guise of the hardware, including the ports and LEDs, and the installation of Access Point.

### 2.1 Ports

The 802.11b WLAN Access Point's Ports are on the rear panel of the device. Please see the following picture – the rear view of the Access Point to learn more details about your device.



**Antenna Connection** Install the dipole antenna directly into the reversed SMA connector of AP. After the Access Point begins to work, you may adjust the angle of the antenna or reposition your Access Point to obtain a better performance.

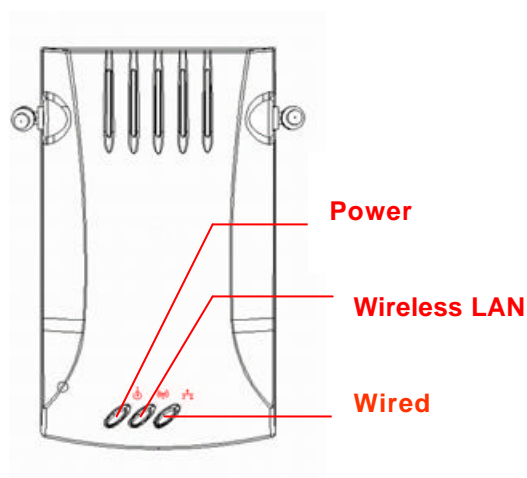
**LAN Connection** Use RJ-45 Ethernet straight LAN cable to connect your PC, hub/switch or broadband router/modem to this port.

**DC 5V Power Input** Use the power adapter which is only supplied with your Access Point.

**Set to Default Button** When you press this button, the Access Point will reboot and reset current settings to factory default settings.

## 2.2 LEDs

The 802.11b WLAN Access Point includes three types of LED indicators. Please check the following picture – the front view of the Access Point and table to obtain the information on the LED indicators on your Access Point.



LED	Status	Function
Power	On	Power on.
	Off	No power.

LED	Status	Function
Wireless LAN	Blinking	Blinking: Wireless LAN is transmitting.
	On	On: Wireless LAN connection is active.
	Off	Off: Wireless LAN connection is not active.
Wired	Blinking	Blinking: Wired LAN is transmitting.
	On	On: Wired LAN is active.
	Off	Off: Wired LAN is not active.

## 2.3 Installation

### Preparation for Installation

Before you actually install your 802.11b WLAN Access Point, please ensure that all the items listed in “1.4 System Requirements” are prepared, and then choose the place with the consideration of power outlet and network connection to install the Access Point.

To avoid causing any damage to the Access Point hardware device, please do not power up the device before you start to connect it to the port on your PC.

Also notice that a full installation of your Access Point includes not only the hardware installation but also the network configuration on your PC. Check the following section -“Hardware Installation” and the next chapter - “Configuring Windows for IP Networking” to obtain complete details.

### Hardware Installation

Follow the procedures below to fully install your Access Point hardware device:

1. Select a suitable place on the network to install the Access Point. Ensure the Access Point and the DSL/cable modem are powered off. For best wireless reception and performance, the Access Point should be positioned in a central location with minimum obstructions between the Access Point and the PCs.
2. Connect one end of Ethernet cable to Access Point and the other to switch or hub, and then the Access Point will be connected to the 10/100 Network.

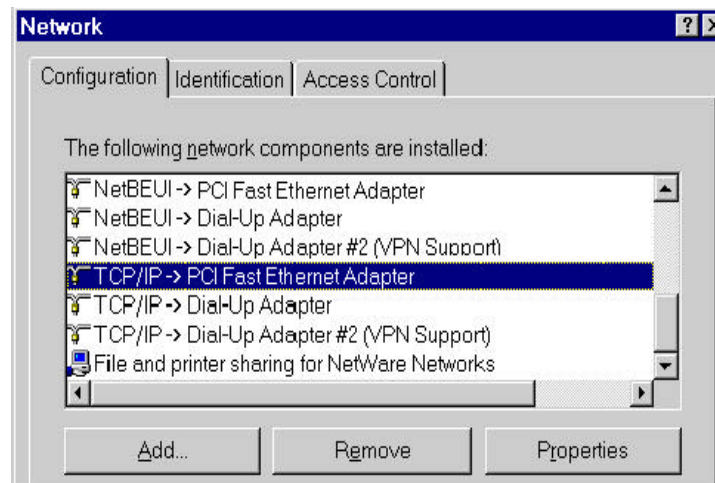
3. Connect the power adapter to the power socket on your Access Point.
4. Last but not the least, check the LEDs on the Access Point to confirm if the status is okay.
5. Now the hardware installation is complete, and you may proceed to the next chapter –“ Configuring Windows for IP Networking” for instruction on setting up network configurations.

## Configuring Windows for IP Networking

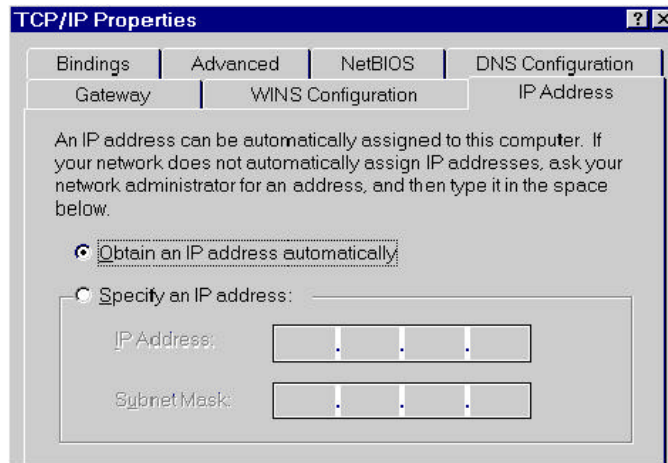
To establish a communication between your PCs and the 802.11b WLAN Access Point, you will need an IP address for your computer first. This section helps you configure the network settings for your operating system. Please follow the procedures below to complete the settings:

### If you are using Windows 98/Me:

1. Click **Start** on the taskbar and choose **Control Panel** from the submenu of **Settings**.
2. Select **Network** to open the **Network** dialog box, and then under the **Configuration** tab, select the **TCP/IP** protocol for your network card.



3. Click **Properties** to open the **TCP/IP Properties** dialog box.
4. Click the **IP Address** tab and choose **Specify an IP address**. Type **192.168.1.200** in the **IP Address** area and **255.255.255.0** in the **Subnet Mask** area. To ensure the system is now using the IP address you specify, restart your computer to check later.

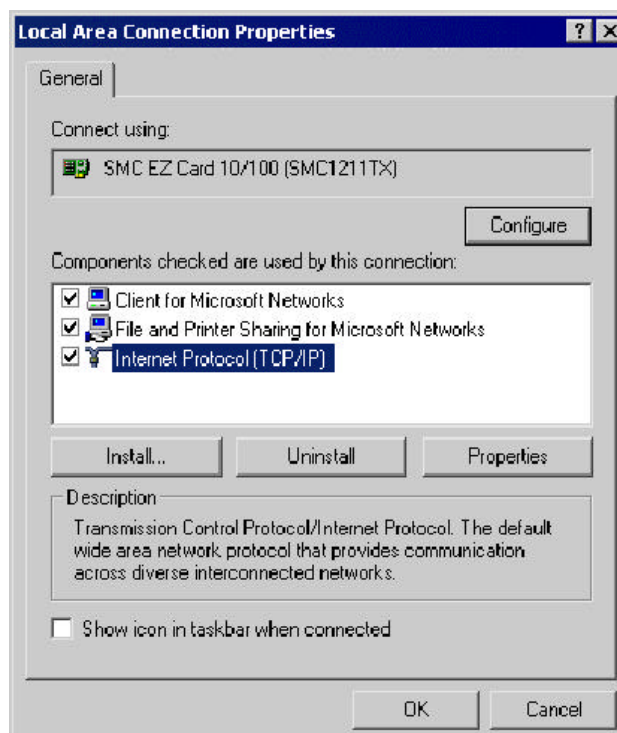


*Note: The IP address must be 192.168.1.x. The value of X should be ranged from 1 to 254 and is never used by other PCs.*

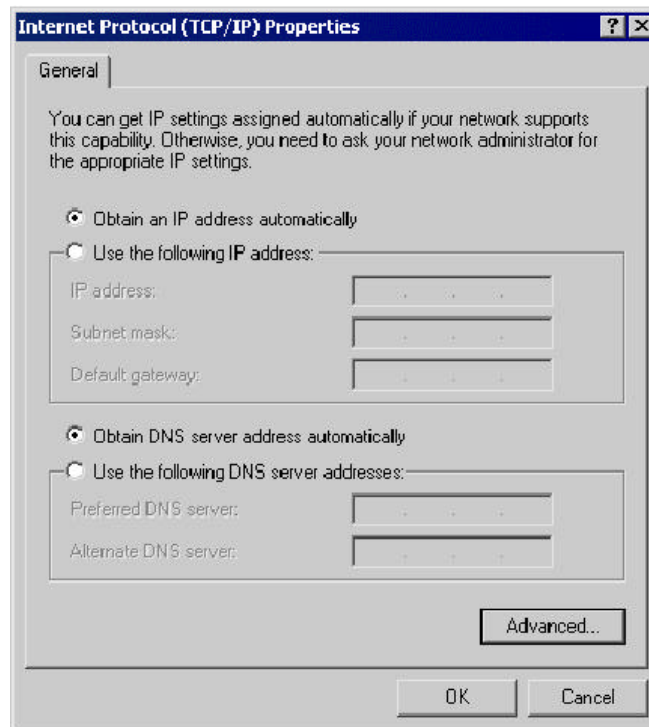
5. Click **OK**, and then restart the system.

### If you are using Windows 2000:

1. Click **Start** on the taskbar and choose **Network and Dial-up Connection** from the submenu of **Settings**.
2. Double-click the **Local Area Connection** open the **Local Area Connection Properties** box.



3. Select the **Internet Protocol (TCP/IP)** for your network card, and then click **Properties** to open the **Internet Protocol (TCP/IP) Properties** dialog box.
4. Under the **General** tab, choose **Use the following IP address**, and then enter **192.168.1.200** in the **IP Address** area and **255.255.255.0** in the **Subnet Mask** area.

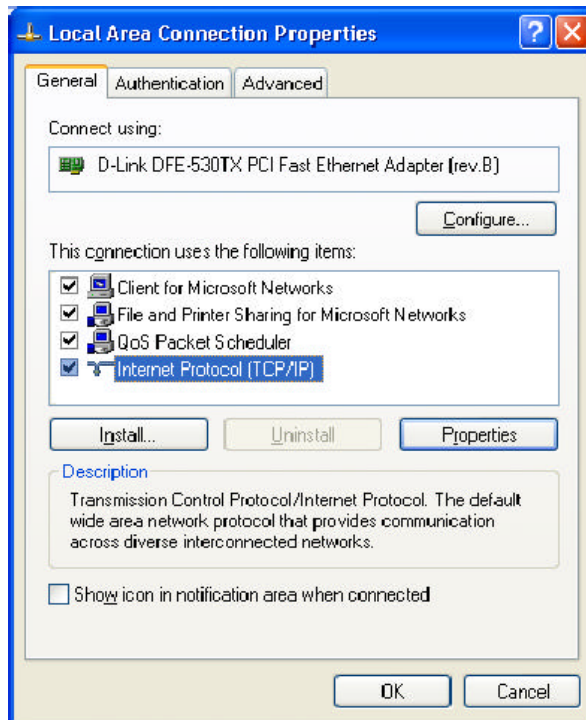


*Note: The IP address must be 192.168.1.x. The value of X should be ranged from 1 to 254 and is never used by other PCs.*

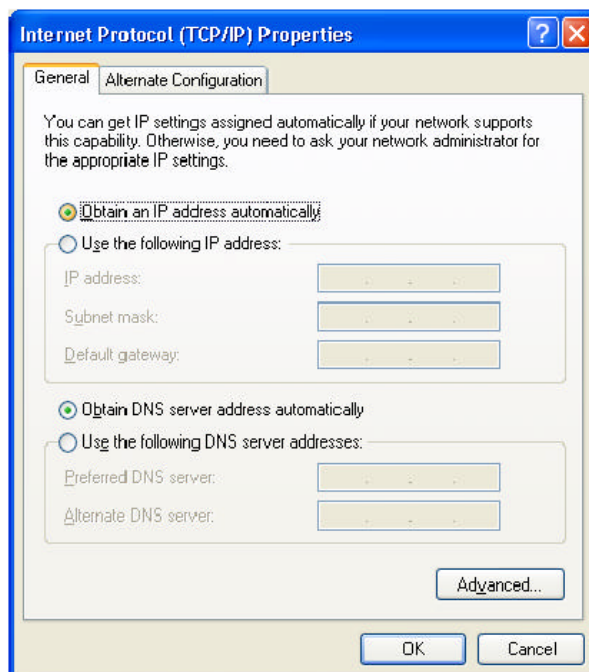
5. Click **OK**, and then restart the system.

### **If you are using Windows XP:**

1. Click **Start** on the taskbar and choose **Network** from the submenu of **Control Panel**.
2. Right-click the **Local Area Connection** icon and then choose **Properties** from the menu. You should see the **Local Area Connection Properties** dialog box shown below.



3. Select the **Internet Protocol (TCP/IP)** for your network card, and then click **Properties**.
4. In the opened dialog box, choose **Use the following IP address** under the **General** tab, enter **192.168.1.200** in the **IP Address** area and **255.255.255.0** in the **Subnet Mask** area.



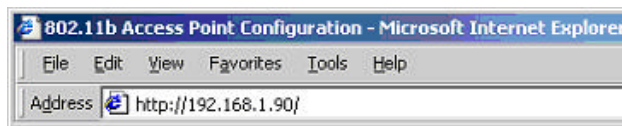
*Note: The IP address must be 192.168.1.x. The value of X should be ranged from 1 to 254 and is never used by other PCs.*

5. Click **OK**, and then restart the system.

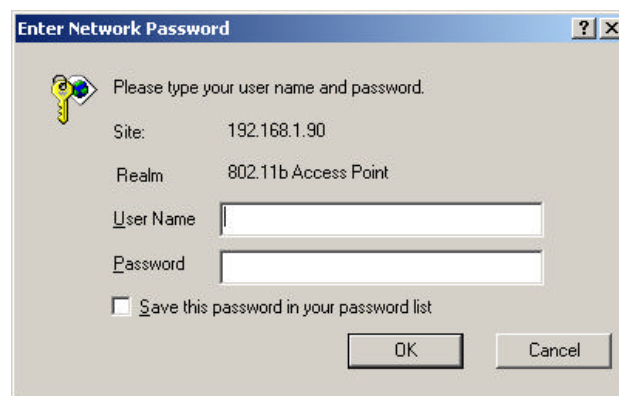
## Utilizing the WLAN Access Point

### Overview of the Interface

The 802.11b Access Point's Web-based Configuration utility presents a user-friendly interface, so that you can easily execute the program by following the on-screen explanations. Type [HTTP://192.168.1.90](http://192.168.1.90/) in the **Address** box after opening your Web browser.



Then press **Enter** on your keyboard, you will see the **Enter Network Password** dialog box appear like the picture below shows.



The default **User Name** and **Password** is **nil**. Leave **User Name** and **Password** field blank and then click **OK**.

*Note: You may set a new password by clicking the **Admin** tab after you enter the **802.11b Access Point Configuration** Web page.*

Later, you will see eight tabs in the main interface of **Access Point Configuration**, including **Info**, **Assoc**, **Configuration**, **MAC Filter**, **Advanced**, **Encryption**, **Admin**, and **Help**, and each of them provides different settings. Check the section below for more information on them.



## The Info Tab

Click this tab to display simple information on the selected Access Point, including **Firmware revision**, **Mac address of AP**, and **Current IP address**.

The screenshot shows the 'Access Point' web interface. At the top left is the logo. To the right are navigation buttons: Info (selected), Assoc, Configuration, MAC Filter, Advanced, Encryption, Admin, and Help. Below the navigation is a header for the 'INFORMATION' tab with the text 'Basic information about this access point.' The main content area has a blue background and lists the following information:

Firmware revision:	1.4.0.021129
MAC address of AP:	0050C2152DF2
Current IP address:	192.168.1.90

### Firmware revision

Here displays the present version of the Access Point's firmware.

### MAC address of AP

The **MAC** (Media Access Control) **address of AP** is the number of your computer's unique hardware - your NIC (Network interface card). It is consisted of 12-digit hexadecimal numbers (48 bits in length) to identify your computer's physical address on the LAN.

### Current IP address

In this field, enter the IP address to assign to the access point. Notice that the address should be on the same subnet as the device to which you connect the access point.

## The Assoc Tab

On the **Associations** tab, all the wireless clients currently associating with your AP are listed here

The screenshot shows the 'Access Point' web interface with the 'Assoc' tab selected. The 'ASSOCIATIONS' section is active, displaying the text: 'This is a list of all the stations that are associated, along with the amount of time since packets were transferred to or from each station. If a station is idle for too long, it is removed from this list.' Below this text is a table with two columns: 'MAC address' and 'Time idle (minutes)'. At the bottom of the interface is a button labeled 'Enable Filtering'.

### MAC address

Here displays the MAC addresses of all the associated wireless clients.

### Time idle

When any client is idle, this field will display the idle time of it.

### Enable Filtering

Click to activate the function of filtering.

## The Configuration Tab

This tab offers basics settings of your wireless network. When you are done, click **Save** and then **Reboot** to activate the new configurations.

**Access Point**

Info Assoc Configuration MAC Filter  
Advanced Encryption Admin Help

**Configuration**

On this page you can configure the basic 802.11b access point settings. Any new settings will not take effect until the access point is rebooted..

Access point name:

Network name:

Channel:  (US/FCC: 1-11, Europe/ETSI: 1-13, Japan/MKK: 1-14)

Tx rate (Mbits/s):

Preamble type:

Long = Universal Compatibility (e.g., ORINOCO cards)  
Short = Highest Performance (5.2 to 5.5 Mbps)

Save Cancel

### Access Point Name

Set your Access Point alias name in this box.

### Network Name

Decide what your network name will be named here, therefore, the client stations can freely roam over the Access Point as long as they know the **Network Name**, the identifier of your WLAN. **Network Name** is also known as **SSID**, which stands for Service Set Identifier. Any client has to indicate the **SSID** of the intended Access Point to start accessing.

### Channel

Set the channel number to be used from the list provided. Note that the available channels differ from country to country.

### Tx rate (Mbits/s)

This option indicates the transmission rate at which clients of the AP transfer the data packet.

Specify the rate according to the speed of your wireless network from the list.

### Preamble type

Define the **Preamble type** as **Long** or **Short**. The **Short** preamble option presents a better throughput performance; however, this depends upon the supportiveness of your wireless LAN card.

## The MAC Filter Tab

This tab helps you to allow or oppose the access of certain computers by recognizing their MAC Addresses.

The screenshot shows the 'MAC Address Filtering' configuration page. At the top left is the 'Access Point' logo. A navigation bar contains buttons for 'Info', 'Assoc', 'Configuration', 'MAC Filter', 'Advanced', 'Encryption', 'Admin', and 'Help'. The main heading is 'MAC Address Filtering'. Below the heading is a text box: 'On this page you can enable MAC address filtering. If enabled, only the MAC addresses entered into the boxes below are allowed to associate to this AP. Note that you can cut and paste the addresses from the Associations Web page into the MAC address boxes. These changes are effective immediately..'. Below this is a section with a blue background containing the following options:

- Enable filtering:
- MAC address 1:
- MAC address 2:
- MAC address 3:
- MAC address 4:
- MAC address 5:
- MAC address 6:
- MAC address 7:
- MAC address 8:
- MAC address 9:
- MAC address 10:
- MAC address 11:
- MAC address 12:
- MAC address 13:
- MAC address 14:
- MAC address 15:
- MAC address 16:

At the bottom right of the form are 'Save' and 'Cancel' buttons.

In the **MAC Address Filtering** area, tick on the **Enable filtering** option to filter the access. Then edit the list below in the **MAC address 1-16** fields by entering the MAC Addresses that you consent the access. When done, click the **Save** button and then the **Reboot** button to complete the settings.

## The Advanced Tab

To specify more advanced settings for your WLAN network, click this tab to open the **Advanced Configuration** page. However, before you start making any new configuration here, please check your other systems, since any changes to these settings may influence the effectiveness of some relative network performance. Therefore, leave these settings as default status unless there's any special demand.

Access Point	
	Info Assoc Configuration MAC Filter Advanced Encryption Admin Help
<b>Advanced Configuration</b>	On this page you can configure the advanced 802.11b access point settings. Any new settings will not take effect until the access point is rebooted..
Maximum associated stations:	<input type="text" value="200"/> (1-200)
Fragmentation threshold:	<input type="text" value="2346"/> (1-3000)
RTS threshold:	<input type="text" value="2432"/> (1-3000)
Beacon period:	<input type="text" value="100"/> (milliseconds,1-1000)
DTIM interval:	<input type="text" value="1"/> (number of beacons per DTIM,1-100)
	Save Cancel

### Maximum associated stations

Define the maximum number of the associated stations regarding the load balance.

### Fragmentation threshold

Specify the size at which data packets will be fragmented.

### RTS threshold

Set the minimum packet size that requires a **RTS** (Request to Send) to be transmitted. In other words, packets that are smaller than this threshold could be transfer directly to the WLAN.

### Beacon period

Set a value here to define the duration between beacon packets.

### DTIM interval

Set a value in the **DTIM** (Delivery Traffic Indication Message) **interval** box to define how often the beacon contains a delivery traffic indication message.

When done, click **Save** and **Reboot** to complete.

## The Encryption Tab

The **Encryption** tab offers you various options to maintain the secure management in a wireless LAN environment. See the explanations below for more details, and before making an activation of any new settings, click **Save** and then **Reboot**.

The screenshot shows the 'Access Point' configuration interface with the 'Encryption' tab selected. The interface is divided into two main sections: 'AP Visibility' and 'WEP Configuration'. The 'AP Visibility' section has a 'Visibility status' with radio buttons for 'Visible' and 'Invisible', where 'Invisible' is selected. The 'WEP Configuration' section includes a 'WEP enabled' checkbox (checked), a 'WEP key lengths' dropdown menu (set to '64 bit'), four 'WEP key' input fields (the first contains 'zxzc'), a 'WEP key to use' dropdown menu (set to 'Key 2'), a 'Deny unencrypted data' checkbox (checked), and an 'Authentication' section with radio buttons for 'Open', 'Shared Key' (selected), and 'Both'. At the bottom right, there are 'Save' and 'Cancel' buttons.

### Visibility status

This option determines your **AP Visibility** to be **Visible** or **Invisible**.

In the **WEP (Wired Equivalent Privacy) Configuration** area, you are allowed to put more advanced settings to establish a data privacy mechanism.

### WEP enabled

Tick on the box to enable all the WEP configurations below.

### WEP key lengths

Two key lengths are offered: **64 bits** and **128 bits** in the pull-down list.

### WEP Key 1, 2, 3, 4

Edit the texts in the blank fields as the encryption codes, and these codes/keys shall be identical between the stations and the Access Point only.

## WEP key to use

Indicate which WEP key you intend to apply to activate the WEP encryption. Make sure that each point on the wireless network shares the same keys.

## Deny unencrypted data

Enable this function to deny any request that is not encrypted.

## Authentication

Three **Authentication** types are provided: **Open**, **Shared Key**, and **Both**. The **Open** option allows any station in the WLAN to associate with the Access Point and receive and transmit data. The **Shared Key** allows only the stations that use identified keys to associate with the Access Point. While choosing **Both**, any station can associate with the Access Point either with or without encryption keys.

## The Admin Tab

Once you click on the **Administration** tab, you may assign a new name, password, TCP/IP network settings, etc. for your Access Point.

The screenshot shows the 'Administration' tab of an Access Point configuration page. At the top left is the 'Access Point' logo. A navigation bar contains buttons for 'Info', 'Assoc', 'Configuration', 'MAC Filter', 'Advanced', 'Encryption', 'Admin', and 'Help'. The 'Admin' button is highlighted. The main content area is divided into sections: 'Administration' (with a description of password and reboot options), 'IP Address Setting' (with fields for IP Address Mode, IP address, Subnet mask, Gateway, and a checkbox for 'Allow upgrade uploads'), and 'Commands' (with 'Reboot' and 'Reset' buttons). 'Save' and 'Cancel' buttons are located at the bottom right of the IP Address Setting section.

	<a href="#">Info</a> <a href="#">Assoc</a> <a href="#">Configuration</a> <a href="#">MAC Filter</a> <a href="#">Advanced</a> <a href="#">Encryption</a> <a href="#">Admin</a> <a href="#">Help</a>
<b>Administration</b>	On this page you can change the password, reboot the access point, or reset all settings to their factory defaults. If you have changed any settings it is necessary to reboot the access point for the new settings to take effect..
User name:	<input type="text"/>
Password:	<input type="password"/> <input type="password"/> (Re-enter for confirmation)
<b>IP Address Setting</b>	IP Address Mode: <input checked="" type="radio"/> Static <input type="radio"/> DHCP IP address: <input type="text" value="192.168.1.90"/> Subnet mask: <input type="text" value="255.255.255.0"/> Gateway: <input type="text" value="192.168.1.1"/> Allow upgrade uploads: <input checked="" type="checkbox"/> (Leave this off during normal operation)
<b>Commands</b>	Reboot access point: <input type="button" value="Reboot"/> Reset to factory defaults: <input type="button" value="Reset"/>
	<input type="button" value="Save"/> <input type="button" value="Cancel"/>

## User Name

Enter any name you want to use in the blank field.

## **Password**

Enter the new password in the upper blank field. And re-enter it again in the blank field below to make a confirmation.

In the **IP Address Setting** area, you can verify the current IP settings. Remember to click **Save** and **Reboot** after you finish off.

## **IP Address Mode**

Define your **IP Address Mode** as **Static** or **DHCP**.

## **IP address**

Verify your IP address here if there's a need.

## **Subnet mask**

Specify the subnet mask you want to assign for the AP here.

## **Gateway**

Enter the gateway IP you want to assign for the AP here if it is required.

## **Allow upgrade uploads**

Enable this option to allow the upgrading of firmware.

The **Commands** area offers two options for you to change the device's system settings.

## **Reboot access point**

Click **Reboot** to let the AP be rebooted immediately and confirm all the changes.

## **Reset to factory defaults**

Click **Reset** to remove all the current settings and go back to the factory defaults.

## **The Help Tab**

Click to look for more details regarding this program.