

# **11Mbps Wireless LAN** **Access Point**

**User's Manual**

Rev 1.0

### **FCC Warning**

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

### **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.

### **CE Marking Warning**

This is a Class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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# **1.Introduction**

Congratulations on your purchase of this 11Mbps Wireless LAN Access Point. This product is designed specifically for your 11Mbps wireless LAN environment needs. It is easy to configure and operate even for non-technical users. Instructions for installing and configuring this product are included in this manual. Before you install and use this product, please read the manual carefully so you may take full advantage of its functions.

## **The Wireless LAN Access Point Features**

### **LAN Features**

- **DHCP Server Support** – Dynamic Host Configuration Protocol provide a dynamic IP address to PCs upon request. The Access Point can act as a DHCP server to provide multiple wireless users to get their IP address automatically

### **Wireless Features**

- **Standard Compliant** – The Access Point complies with IEEE802.11b standard, and it is interoperable with IEEE802.11b-Compliant Equipment
- **High speed Wireless Connection** – Support up to 11Mbps wireless data rate
- **Data Rate Auto Fall-Back** - Provides 11, 5.5, 1 and 1Mbps wireless data rate shifting dynamically to guarantee availability and reliability of wireless connections
- **Roaming** – Provides seamless roaming within IEEE802.11b wireless LAN infrastructure

### **Configuration & Management**

- **Easy to Setup** - Use your WEB browser from anywhere on the wired or wireless LAN to configure the Access Point

### **Security**

- **Configuring Protection** – Provides password protection to prevent unauthorized users from changing the configuration
- **Wireless LAN Security** - Provide 64-bit & 128-bit Wired Equivalent Privacy encryption to protect the wireless data transmissions.

### **Package Contents**

- One 11Mbps wireless LAN access point

## *11Mbps Wireless LNA Access Point User's Manual*

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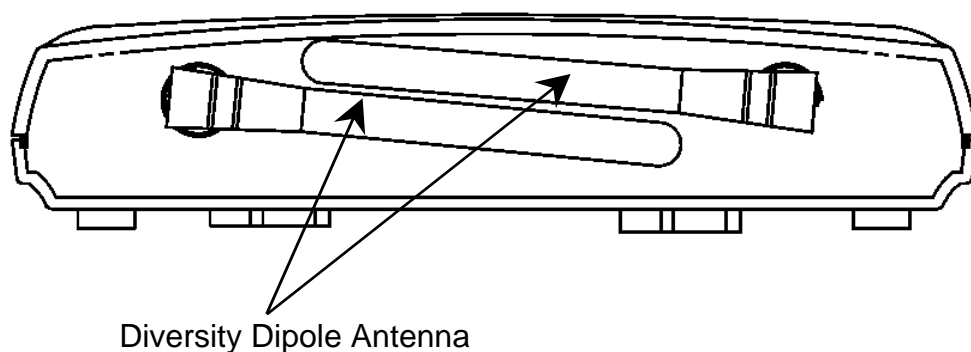
- One installation CD-ROM (AP Manager & User's Manual Included)
- One power adapter
- One quick installation guide

If any of the above items are damaged or missing, please contact your dealer immediately.

## **2. Hardware Installation**

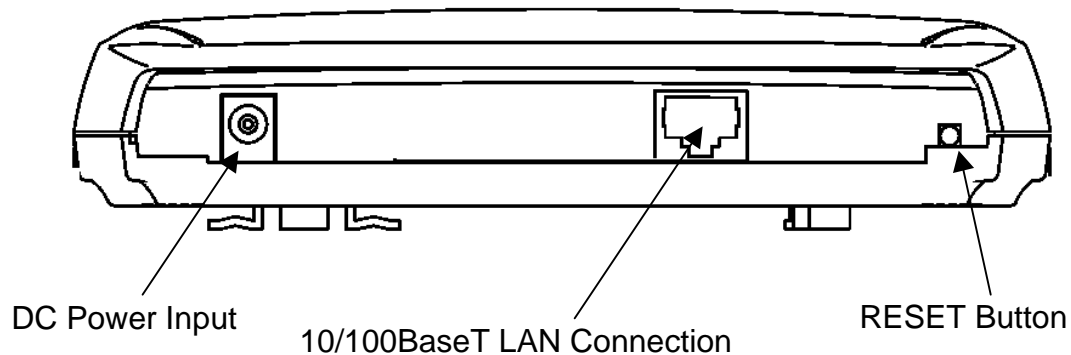
### ***Physical Details***

#### **Rear Panel**



#### **Front Panel**

The front panel features one 10/100Mbps Ethernet ports. The LAN port is used to connect to your computers or other network devices.



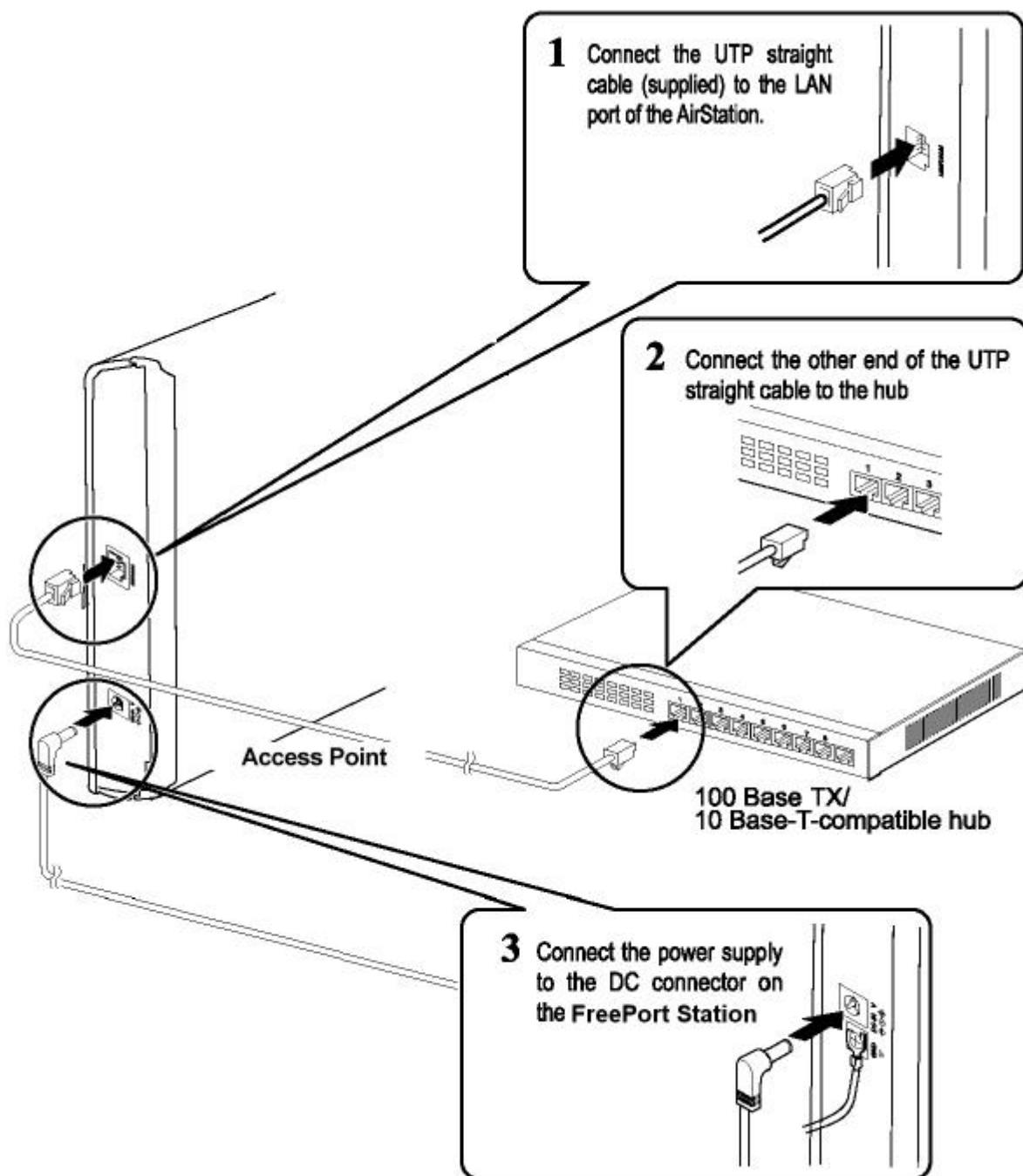
- DC Power Input**            Only use the power adapter supplied with the Access Point
- 10/100BaseT LAN Connection**    Use standard Ethernet cable (RJ-45 connector) to connect your PC, Hub, Switch or Router to this port.
- RESET Button**            The Access Point will re-boot while press the button.

### Top Panel LED Indications

<b>LED</b>	<b>Color</b>	<b>Status</b>	<b>Description</b>
<b>DIAG</b>	Green	ON	Diagnostic finished, the Access Point is ready
		Blinking	While powering on, the Access Point start executing self-diagnostic
<b>Ethernet</b>	Green	ON	The LAN port is linked
		Blinking	The LAN port is sending or receiving data
<b>Wireless</b>	Green	OFF	No wireless connection
		Blinking	Sending or Receiving data via wireless
<b>Power</b>	Green	ON	The Access Point power on
		OFF	The Access Point power off

## **Installation**

Connection to the AP, hub, and Power supply is shown below.  
Be sure to use the supplied AC adapter power supply.

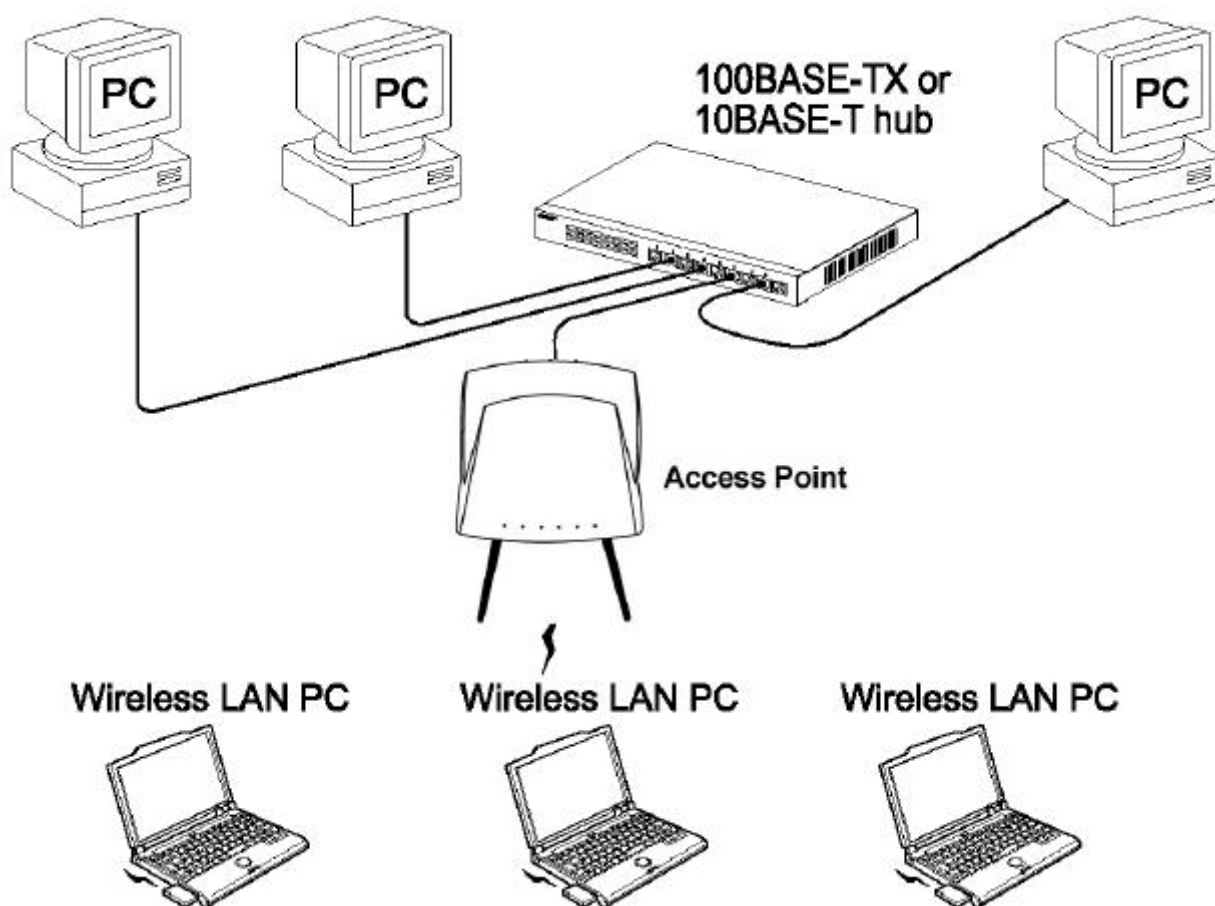




## **Connecting the AP to your Network**

For optimal performance, usually the center of your wireless network is the best place for your AP, with line of sight to all of your mobile stations. Try to place it in a position which can best cover your wireless network and is away from any potential source of interference. And normally, the higher you place the AP, the better the performance will be.

The following picture describes how to use the AP when communicating between a wireless LAN and a wired LAN.

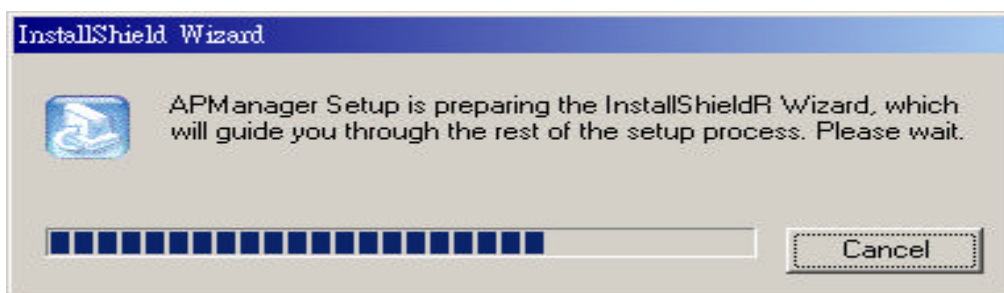


## **3. AP Manager Installation**

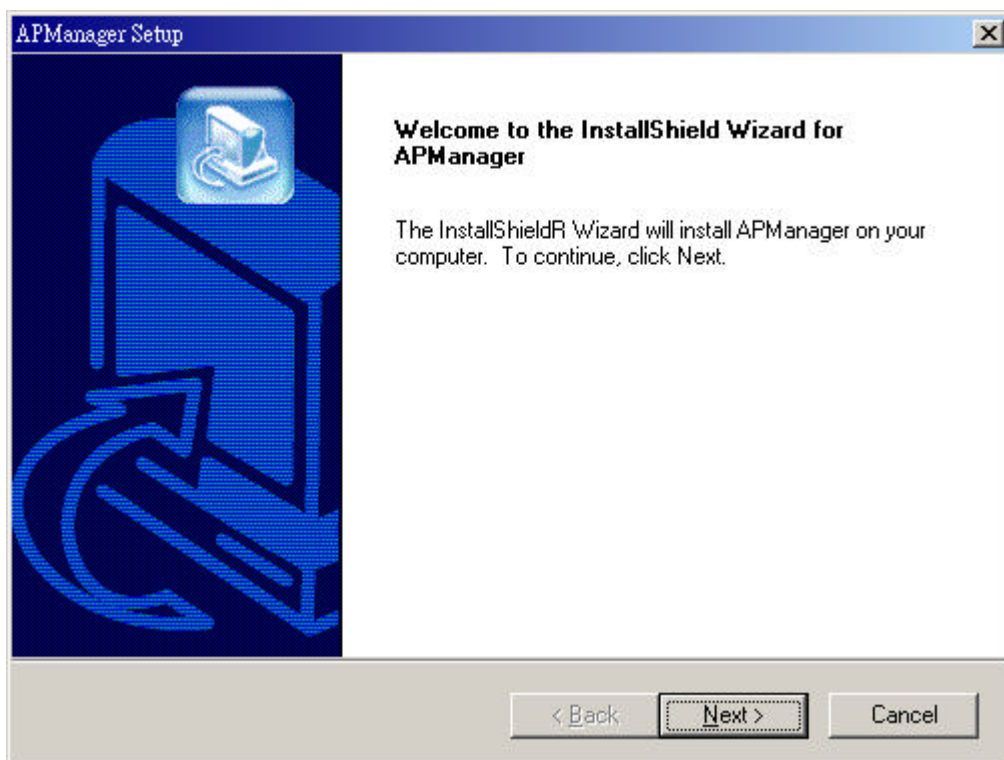
### **Install the AP Manager to your PC**

The AP Manager is provided to allow you further customization of the AP through LAN port or wireless interface. This section describes procedures for installing the AP Manager to your PC.

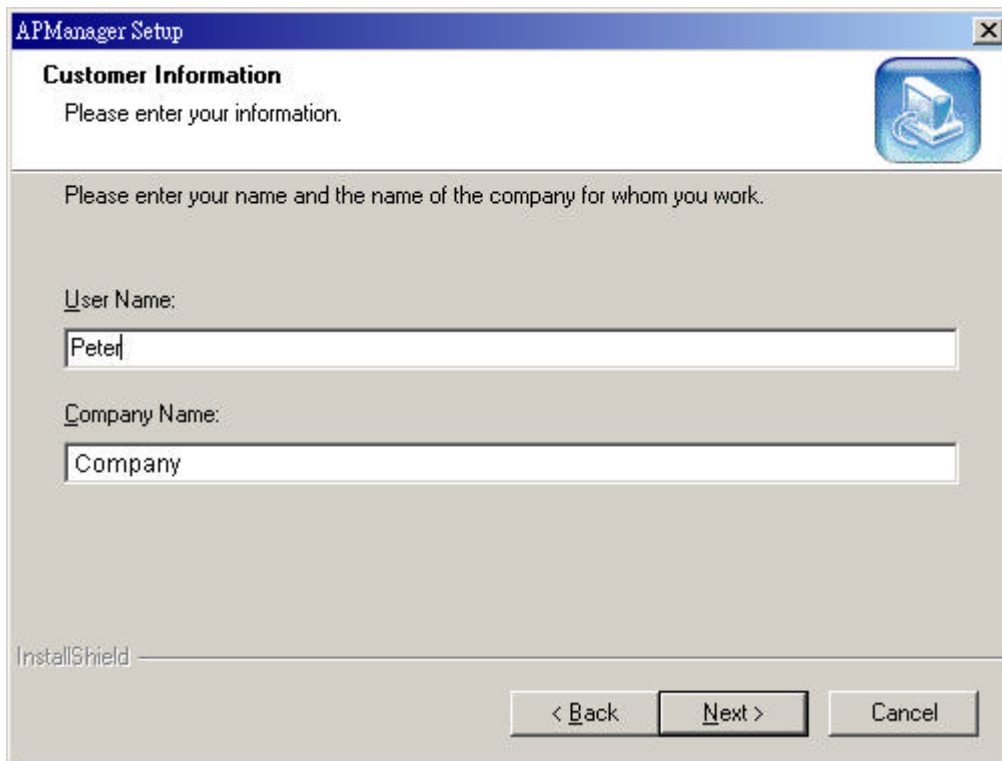
**Step 1:** Insert the installation CD-ROM into the CD-ROM drive. Run SETUP.EXE program on the CD-ROM. The following window will be shown automatically.



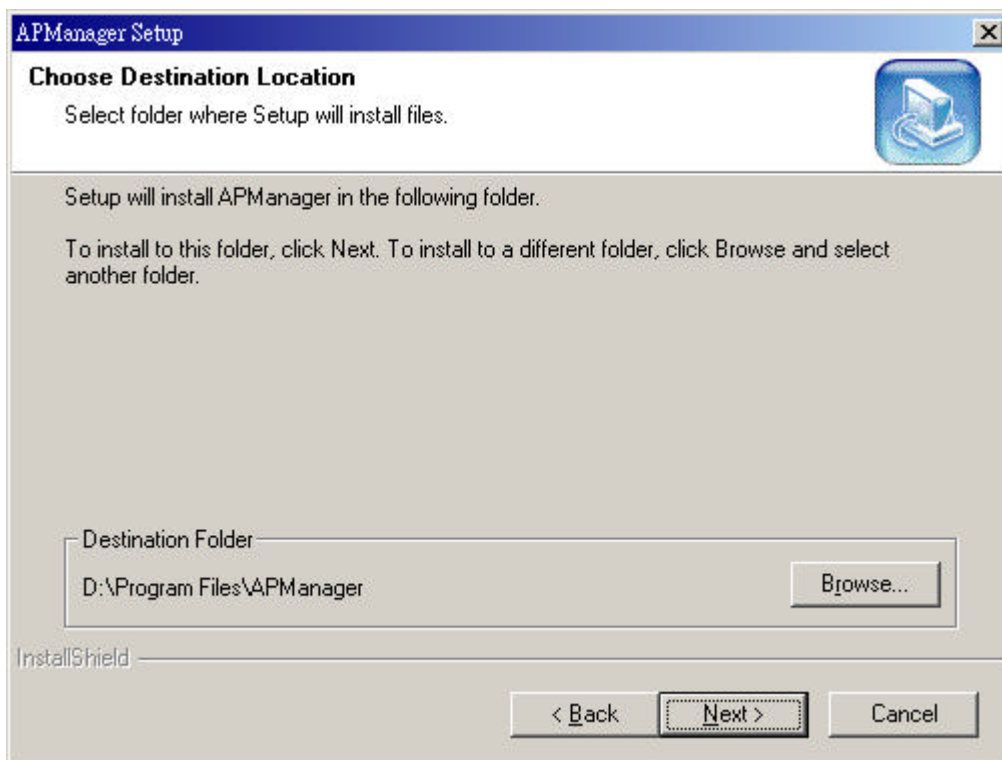
**Step 2:** After InstallShield Wizard preparation finished, the following window will be shown.



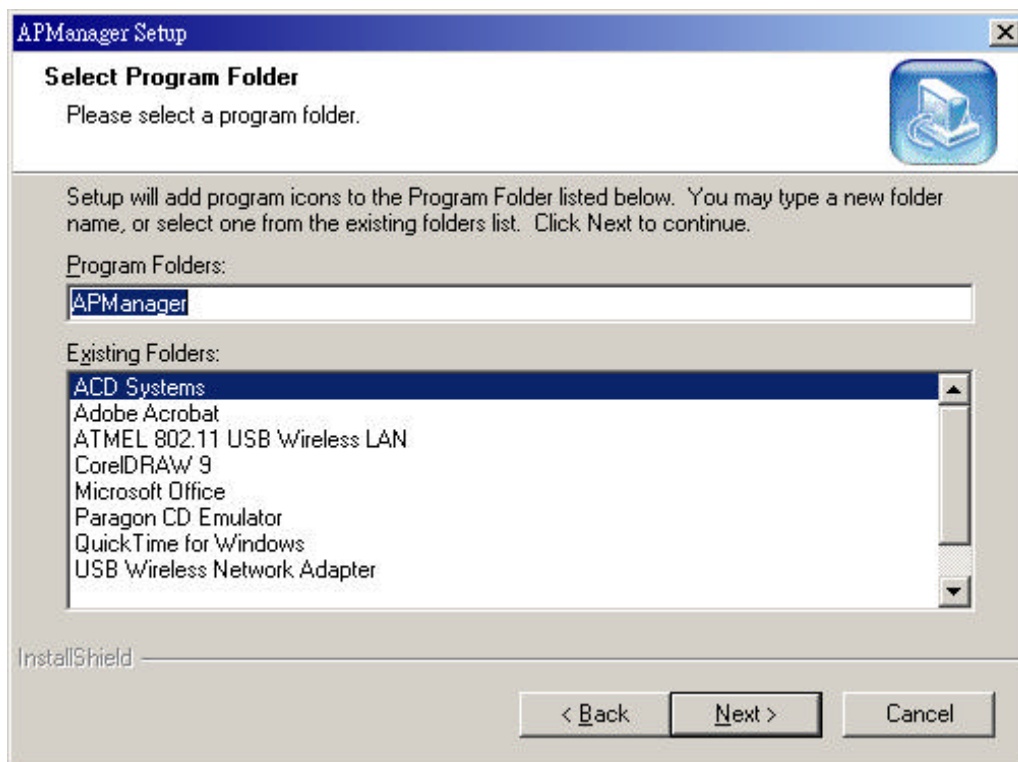
**Step 3:** Click the **Next** button to continue.



**Step 4:** Keyin your User Name and Company Name, and **click Next** button to continue.



**Step 5:** The screen will show you the default destination chosen by the utility. If you want to install the manager in another location, **click** the **Browse** button and select an alternate destination. **Click** the **Next** button, when you are ready to continue. The setup program will then begin to install the programs into the destination folder.



**Step 6:** The screen will show you the Program Folder that the utility will use. If you should want to put the utility in another Program Folder, double-click an Existing Folder or, if you don't want to run this out of a Program Folder, delete the Program Folder name. Then, click the Next button to continue.



**Step 7:** The Ap Manager has been installed now. Select “Yes, I want to restart my computer now” and then **click** the **Finish** button to restart your computer and complete installation.

To remove AP Manager, click the **Start** button, and select **Programs, APManager,** and **Uninstall,** and then follow the instruction on screen.

## **4. Configuring the AP with the AP Manager**

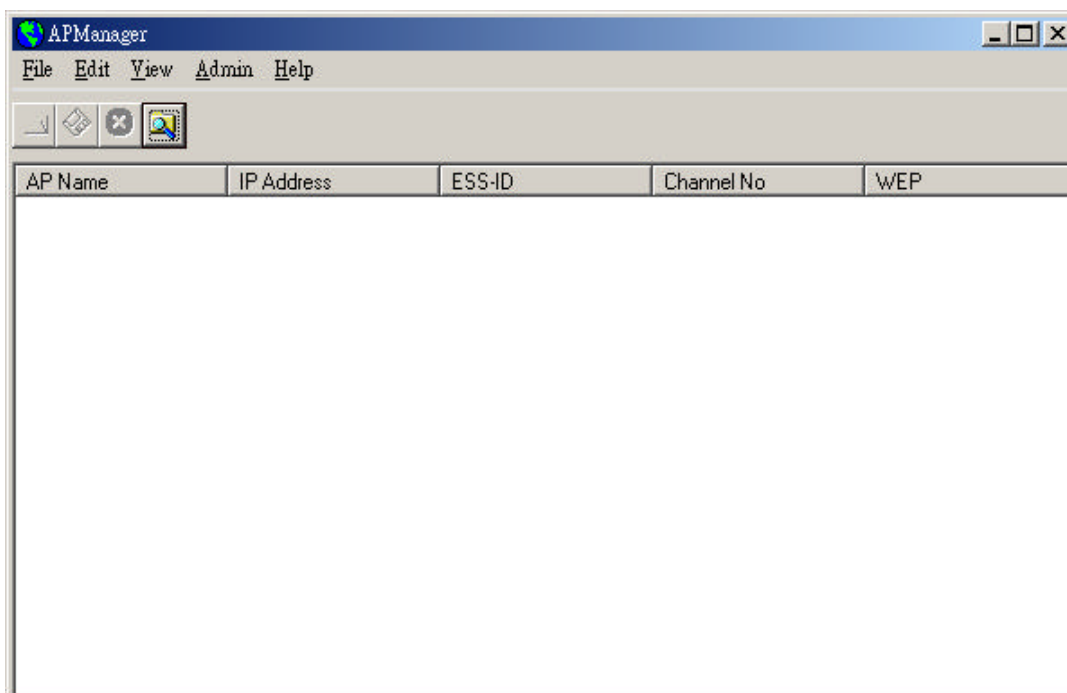
### **Startup and Login**

Follow procedures below to startup AP Manager and find the Access Point.

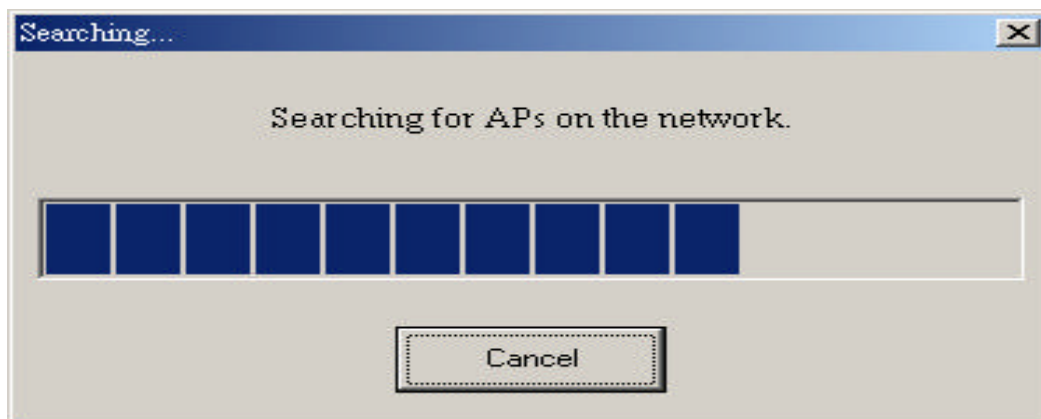
- 1.** Refer to " **AP Manager Installation**" to install the AP Manager.
- 2.** Click **Start** and select **Programs, AP Manager** and then **APManager**. Or, just double-click the **APManager** icon on your desktop screen.



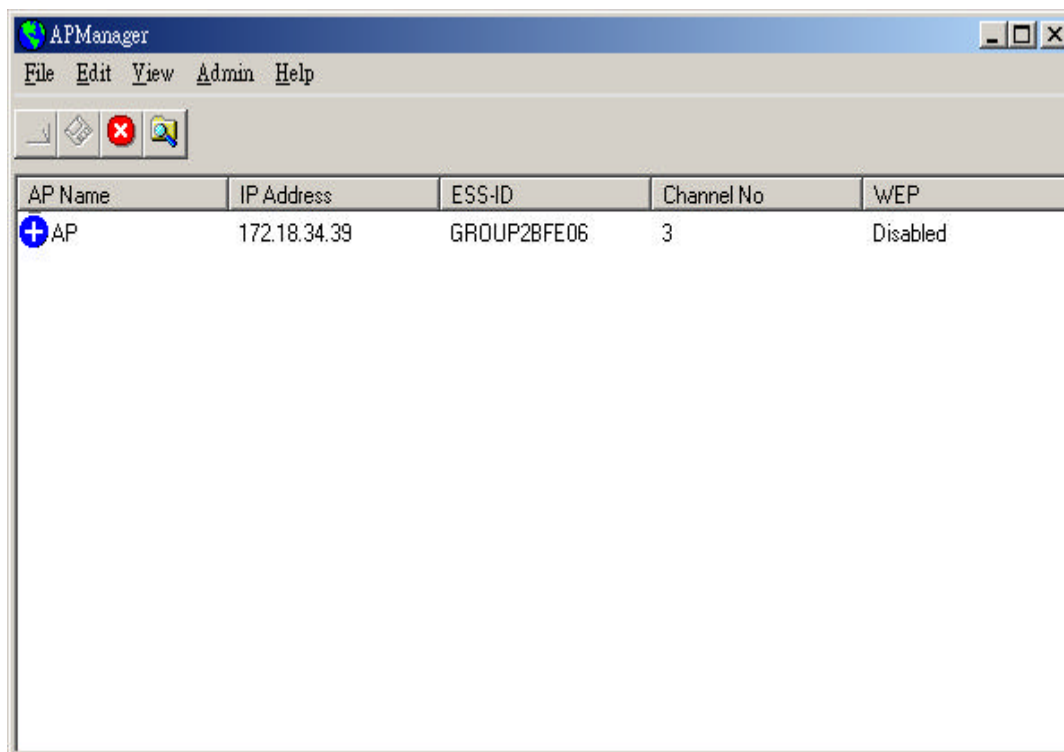
- 3.** The AP Manager starts up.



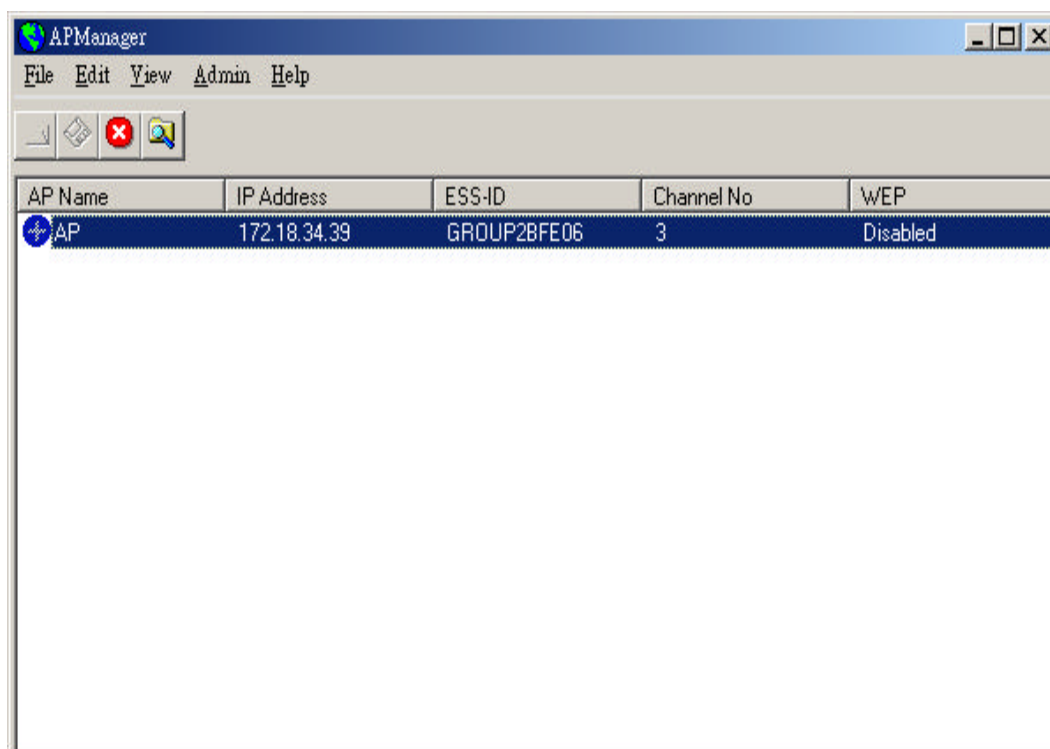
4. Click the **Search** button  to find Access Point.



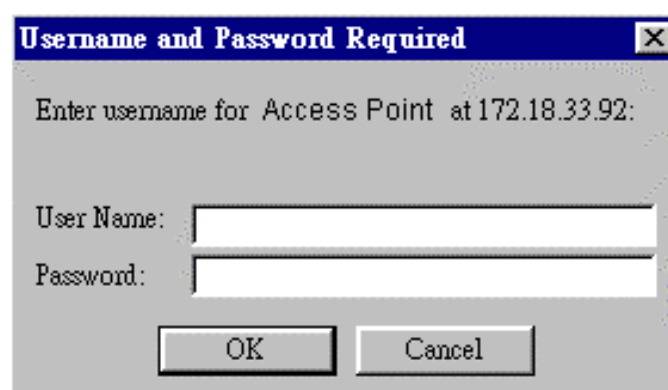
5. The computer starts searching for the Access Point.



**6.** The Access Point appears in the list. Double-click on the searched Access Point.



**7.** Key in your User Name (default is "root") and Password (default no password) and then click **OK** button to continue.





**8.** The **General Setup** screen of AP Manager will be shown.

General Setup	
Set general options. Using password is recommended	
AP Name	<input type="text" value="AP"/>
Change Password	<input type="button" value="No"/>
New Password	<input type="text"/>
Confirmation	<input type="text"/>
<input type="button" value="Reset AP"/> <input type="button" value="Restore Default"/> <input type="button" value="Download"/>	
<input type="button" value="Save"/>	

## **The General Setup Tab**

The screenshot shows the 'General Setup' tab in a web-based configuration interface. At the top, there are four tabs: 'General Setup', 'AP Setup', 'DHCP Client', and 'DHCP Server'. The 'General Setup' tab is active. Below the tabs, there is a header 'General Setup' and a sub-header 'Set general options. Using password is recommended'. The main area contains several fields: 'AP Name' with a text input field containing 'AP'; 'Change Password' with a dropdown menu set to 'Yes'; 'New Password' with a text input field containing '\*\*\*\*\*'; and 'Confirmation' with a text input field containing '\*\*\*\*\*'. At the bottom, there are three buttons: 'Reset AP', 'Restore Default', and 'Download', and a 'Save' button centered below them.

The General Setup tab will display the AP name, and enable you change the AP name and password. If AP name or password had been changed, you need to **click Save** button to store new settings.

### **Reset AP**

The function of this button is same as the hardware **RESET Button** on the front panel of Access Point. Click this button will re-boot Access Point.

### **Restore Default**

Click this button to restore the Access Point default settings. Any setting you may have made through the AP Manager will be lost if this button is clicked.

### **Download**

This button is used for firmware upgrade capability. If you click the download button to upgrade firmware, the Access Point will reboot automatically after download process.

## The AP Setup Tab

General Setup		AP Setup	DHCP Client	DHCP Server
<b>AP Setup</b>		Set up AP options. Remember to reset the AP after you make any changes.		
AP SSID	GROUP2BFE06			
AP Channel	3			
AP Basic Rate Set	All			
Enable WEP	No			
Encryption Level	64-bit			
WEP Mode	Mandatory			
Authentication Type	Open System			
Default Key	1			
Key0	1234567890			
Key1	1234567890			
Key2	1234567890			
Key3	1234567890			
Save				

The AP Setup tab allow you to set the wireless configuration items and WEP encryption. If any item had been changed, you need to click **Save** button to store new settings and then **click Reset AP** button on **General Setup** tab to make new settings effect.

### AP SSID

SSID is used to identify the wireless LAN. To communicate, all Wireless stations **MUST** use the same SSID. The SSID is case sensitive. Default SSID is **GROUPxxxxxx**, where xxxxxx are six hexadecimal digits.

### AP Channel

Select the appropriate radio channel from the list provided. The permissible number of channels depends on the Regulatory Domain. (The factory setting is **Channel 3**)

### **AP Basic Rate Set**

The basic data transfer rate should be set depending on the speed of your wireless network. If **ALL** had been chosen, the data rate will up to 11Mbps. And auto fallback will be supported.

### **Enable WEP**

Enable or disable WEP function. If **NO** (default), data is **NOT** encrypted before being transmitted.

### **Encryption Level**

Select 64-bit or 128-bit WEP encryption.

### **WEP Mode**

Mandatory or Optional.

### **Authentication Type**

Select the appropriate value - "Open System" or "Shared Key". Check your Wireless card's documentation to see what method to use. Some Wireless cards do not support both methods.

### **Default Key**

Select the key you wish to be the default. The default WEP key is 1. Transmitted data is **ALWAYS** encrypted using the Default Key; the other Keys are for decryption only.

### **Key0, 1, 2, 3**

This table is used when encrypting and decrypting data. All stations, including this Access Point, always transmit data encrypted using their default key. The key number (0, 1, 2, 3) is also transmitted. The receiving station will use the key number (0, 1, 2, 3) to determine which key value to use for decryption. If the key value does not match the transmitting station, decryption will fail.

## **The DHCP Client Tab**

The screenshot shows a web interface for configuring the DHCP Client. At the top, there are four tabs: "General Setup", "AP Setup", "DHCP Client", and "DHCP Server". The "DHCP Client" tab is selected. Below the tabs, there is a section titled "DHCP Client" with a description: "Enable/Disable DHCP client. If DHCP Client is disabled, static IP and netmask must be given." Below this, there are three input fields: "Enable DHCP Client" with a dropdown menu set to "Yes", "Static IP Address" with a text box containing "10.0.0.1", and "Network Mask" with a text box containing "255.0.0.0". At the bottom right of the form is a "Save" button.

The DHCP Client tab allow you to enable/disable DHCP client. If any item had been changed, you need to **click Save** button to store new settings.

### **Enable DHCP Client**

Enable the Access Point to act as a DHCP client. This is the default setting of the AP.

### **Static IP Address**

If the Access Point act as a DHCP client, and it has a static IP address, fill the address on this field. The default static IP address is 10.0.0.1

### **Network Mask**

The Network Mask (Subnet Mask) for the IP Address. The default Network Mask is 255.0.0.0

## **The DHCP Server Tab**

General Setup AP Setup DHCP Client DHCP Server

**DHCP Server** Enable/Disable DHCP server of AP.

Enable DHCP Server No

Network 10.0.0.0

Netmask 255.0.0.0

Gateway 10.0.0.254

Primary DNS Server 10.0.0.2

Secondary DNS Server 10.0.0.3

IP Address Range 10.0.0.1 10.0.0.253

Save

The DHCP Server tab allow you to enable/disable DHCP server. If any item had been changed, you need to **click Save** button to store new settings.

### **Enable DHCP Server**

Enable the Access Point to act as a DHCP server. The default value is NO.

### **Network**

The default Network address is 10.0.0.0

### **Netmask**

The Network Mask (Subnet Mask) for the IP Address. The default network mask is 255.0.0.0

### **Gateway**

The IP Address of router on the LAN segment to which this device is attached. The default Gateway address is 10.0.0.254

### **Primary DNS Server**

Primary DNS Server address. The default primary DNS server is 10.0.0.2

### **Secondary DNS Server**

Secondary DNS Server address. The default Secondary DNS server is 10.0.0.3

### **IP Address Range**

Whenever there is a request, the DHCP server will automatically allocate an unused IP address from the *IP address Range* to the requesting computer. You must specify the starting and ending address of the IP address Range. The default IP address range is from 10.0.0.1 to 10.0.0.253

## **5. FAQ & Troubleshooting**

### **Overview**

This chapter provides solutions to problems usually encountered during the installation and operation of the Wireless Network Access Point. Please refer to the following description to solve your problems. If you can't find an answer here, please contact your dealer for further advice.

#### **Q:My PC can't locate the Wireless Access Point. How to check the problem ?**

A:First, please check your PC is set to Infrastructure Mode. Then please make sure the wireless channel used matches the wireless channel on Access Point and the SSID on your PC are same as that of the Wireless Access Point. Because both your PC and the Wireless Access Point must have the same setting for WEP, if WEP is enabled, the key tables must match. Besides that, to see if radio interference is causing a problem, see if connection is possible when close to the Wireless Access Point. Remember that the connection range can be as little as 100 feet in poor environment.

#### **Q:The Wireless connection speed is very slow. How to improve the problem?**

A:The wireless system will connect at the highest possible speed, depending on the distance and the environment. To obtain the highest possible connection speed, you try to adjust the Access Point location and orientation. But if you find the interference is the problem, changing to another channel may show a marked improvement.

#### **Q:Can the Wireless Network Access Point act as my DHCP Server?**

A:No. The Access Point is nothing more than a wireless hub, and as such, cannot be configured to handle DHCP capabilities.

#### **Q:Can I run an application from a remote computer over the wireless network?**

A:This will depend on whether or not the application is designed to be used over a network. Consult the application's user guide to determine if it supports operation over a network.

#### **Q:Can I play computer games with other members of the cordless network?**

A:Yes, as long as the game supports multiple players over a LAN (local area network). Refer to the game's user guide for more information.

#### **Q:What is the IEEE 802.11b standard?**

A:The IEEE 802.11b Wireless LAN standards subcommittee, which is formulating a standard



for the industry. The objective is to enable wireless LAN hardware from different manufacturers to communicate.

### **Q:What's Ad-hoc?**

A:An Ad-hoc wireless LAN is a group of computers, each with a WLAN adapter, connected as an independent wireless LAN. Ad hoc wireless LAN is applicable at a departmental scale for a branch or SOHO operation.

### **Q:What is Infrastructure?**

A:An integrated wireless and wired LAN is called an Infrastructure configuration. Infrastructure is applicable to enterprise scale for wireless access to central database, or wireless application for mobile workers.

### **Q:What is Roaming?**

A:Roaming is the ability of a portable computer user to communicate continuously while moving freely throughout an area greater than that covered by a single Wireless Network Access Point. Before using the roaming function, the workstation must make sure that it is the same channel number with the Wireless Network Access Point of dedicated coverage area.

### **Q:What is Spread Spectrum?**

A:Spread Spectrum technology is a wideband radio frequency technique developed by the military for use in reliable, secure, mission-critical communications systems. It is designed to trade off bandwidth efficiency for reliability, integrity, and security. In the other words, more bandwidth is consumed than in the case of narrowband transmission, but the trade off produces a signal that is, in effect, louder and thus easier to detect, provided that the receiver knows the parameters of the spread-spectrum signal being broadcast. If a receiver is not turned to the right frequency, a spread-spectrum signal looks like background noise. There are two main alternatives, Direct Sequence Spread Spectrum (DSSS) and Frequency Hopping Spread Spectrum (FHSS).

### **Q:What is WEP?**

A:WEP is Wired Equivalent Privacy, a data privacy mechanism based on a 40 bit shared key algorithm, as described in the IEEE 802.11 standard.

## **6. Glossary**

This section explains the glossary of terms used in this manual that are required to configure the network.

### **Wireless Channel**

If there is more than one Wireless LAN network with different ESS-ID on the same floor, and they are communicating with each other, the baud rate may be slowed, due to the same radio frequency being used. If this happens, you can still communicate regardless of other LAN networks by using to use different frequencies (wireless channels).

Note: If they are communications using the wireless LAN, be sure to set all the Units the same wireless channel.

### **DHCP Server**

When configuring the network TCP/IP, be sure to set the IP address in each personal computer and other devices. When there is a DHCP server on the network, you can assign IP addresses automatically to the personal computers and the Access Point on the network. If there is Windows 2000, Windows NT, dial-up router, or other device with built-in DHCP server function on the network, the DHCP server function may start to operate. For the Windows NT server and dial-up router, or other DHCP server function, refer to the Windows 2000, Windows NT, or dial-up router manual, or consult the manufacturer. There should be no DHCP server problems for Windows 98/95 personal computers only on the network.

### **ESS-ID**

This ID is used to prevent cross-communication during communication between the Access Point and personal computers within the wireless LAN. The Wireless LAN personal computers that have the same ESS-ID as the Access Point can communicate with the Access Point. (ESS-ID is disabled when wireless LAN personal computers are communicating each other.) The ESS-ID is case sensitive. You can enter a maximum of 32 alphanumeric characters, and the underbar "\_".

### **LAN (Local Area Network)**

Read as one word. A LAN is a network in a comparatively small area, such as campus or within a single building. The LAN baud rate varies from 10 Mbps to 100 Mbps.

### **MAC Address (Media Access Control Address)**

The MAC address is a physical address specific to each network card. The MAC address is

configured from a total of six bytes as follows: A vendor code comprising the lead three bytes and a 3-byte user code. The vendor code is managed and assigned by IEEE. The user code is managed using a unique (unduplicated) number from the network card manufacturer. That is, the MAC address is assigned as a physical address unique throughout the world. In an Ethernet LAN, the MAC address is used as a base to create a frame for sending and receiving.

### **TCP/IP (Transmission Control Protocol/Internet Protocol)**

TCP/IP is a protocol equivalent to the network and transport levels of the OSI reference model, and it is defined using RFC. Consequently, different terminals can communicate with each other using TCP/IP.

- Normally, TCP/IP includes the application protocols TELNET and FTP.
- TCP/IP is the standard internet protocol.

### **WEP (Encryption)**

By setting an encryption key in the Access Point, you can prevent wireless packets from being decrypted externally.

When connecting to the Access Point with the encryption key you must enter the encryption key from the AP Manager.

### **Firmware**

Firmware is the name given to the software (programs) built into hardware such as the router, modem, and terminal adapter. This software is built into the hardware, so it can be said to be in-between hardware and software.

### **Protocol**

Protocols are the procedures and regulations for sending and receiving data between the network terminals. For example, if two computers are communicating, you can send the correct information according to the regulations by formatting all required information. The protocol such as which terminal sends first, what type of message, what type of message the receiving terminal should send in reply, the data format, and responses to communications errors are same of examples.

### **Roaming Function**

If using the roaming function and moving from one room to another room, you can switch the Access Point automatically. With the roaming function, you can easily move from the office to the conference room while maintaining access to the network.



### **Ethernet LAN and Wireless LAN**

The following terms are used in this manual to clarify the distinction between the wired 10/100 base LAN, and the wireless LAN.

Ethernet LAN: LAN connected using cables

Wireless LAN: LAN that uses wireless communications

The above terms are used for explanatory in this manual and they are not used generally.

## **7. Product Specifications**

This chapter describes the specifications of the product and the LAN port connector.

### **Specifications**

#### **Wireless LAN Interface**

##### **Standards**

IEEE 802.11b Compliant

##### **Antenna**

Built-in Diversity Dipole Antenna

##### **Frequency Range**

2.4 GHz ( Industrial Scientific Medical Band )

DSSS - Direct Sequence Spread Spectrum

##### **Data Transmission Rate**

11Mbps / 5.5Mbps / 2Mbps / 1Mbps Auto Fall-Back

##### **Access Mode**

Infrastructure mode

##### **Data Security**

Provides both 64-bit & 128-bit WEP Encryption

##### **Channels**

11Channels (US, Canada)

13 Channels (Europe)

#### **Wired LAN Interface**

##### **Standards**

IEEE 802.3u 100Base-TX Compliant

### **Data Transmission Rate**

10Mbps / 100Mbps Auto-sensing

### **Transmission Mode**

Half-duplex / Full-duplex Auto-negotiation for both 10Mbps and 100Mbps

### **Media Supported**

Category 3,4,5 for 10Base-T

Category 5 for 100Base-TX

### **Operating Distance**

100M Max. hub-to-node distance

### **Operating Environment**

Operating Temperature: 0°C to 40°C degree

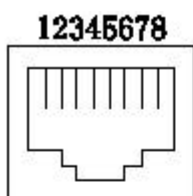
Storage Temperature: -25°C to 70°C degree

Humidity 10% to 90% non-condensing

## **LAN Port Connector Specifications**

The RJ-45 8-pole connector, specified ISO / IEC8877:1992.

### **MDI Signal Assignment**



Pin No.	MDI Signal	Signal Function
1	TD+	Sending Data (+)
2	TD-	Sending Data (-)
3	RD+	Receiving Data (+)
4	(Not used)	Not used
5	(Not used)	Not used
6	RD-	Receiving Data (-)
7	(Not used)	Not used
8	(Not used)	Not used