

ZyAIR G-220

802.11g Wireless USB Adapter

User's Guide

Version 2.0

September 2004



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The device complies with Part 15 of FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operations.

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 commercial 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.

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

Notice 1

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

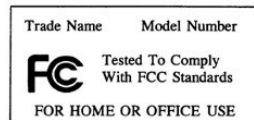
This product has been designed for the WLAN 2.4 GHz network throughout the EC region and Switzerland, with restrictions in France.

Caution

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

Certifications

Refer to the product page at www.zyxel.com.



¹ Refer to the *Quick Installation Guide* for model specific FCC statement(s) and the procedure to view the product's certification(s).

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- Warranty Information.
- Date you received your product.
- Brief description of the problem and the steps you took to solve it.

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² “+” is the (prefix) number you enter to make an international telephone call.

ZyAIR G-220 User's Guide

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FINLAND	support@zyxel.fi	+358-9-4780-8411	www.zyxel.fi	ZyXEL Communications Oy Malminkaari 10 00700 Helsinki Finland

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Preface

Congratulations on the purchase of your new ZyAIR!

About This User's Guide

This manual provides information about the ZyXEL Wireless LAN Utility.

Syntax Conventions

- “Type” or “Enter” means for you to type one or more characters. “Select” or “Choose” means for you to use one of the predefined choices.
- Mouse action sequences are denoted using a comma. For example, “click the Apple icon, **Control Panels** and then **Modem**” means first click the Apple icon, then point your mouse pointer to **Control Panels** and then click **Modem**.
- Window and command choices are in **Bold Times New Roman** font. Predefined field choices are in **Bold Arial** font.
- The ZyXEL ZyAIR G-220 802.11g Wireless USB Adapter is referred to as the ZyAIR in this guide.
- The ZyXEL Wireless LAN Utility may be referred to as the ZyXEL WLAN Utility or, simply, as the ZyXEL Utility in this guide.










Related Documentation

- Support Disk
Refer to the included CD for support documents and device drivers.
- Quick Installation Guide
Our Quick Installation Guide is designed to help you get your ZyAIR up and running right away. It contains a detailed easy-to-follow connection diagram and information on installing your ZyAIR.
- ZyXEL Glossary and Web Site
Please refer to www.zyxel.com for an online glossary of networking terms and additional support documentation.

User Guide Feedback

Help us help you. E-mail all User's Guide-related comments, questions or suggestions for improvement to techwriters@zyxel.com.tw or send regular mail to The Technical Writing Team, ZyXEL Communications Corp., 6 Innovation Road II, Science-Based Industrial Park, Hsinchu, 300, Taiwan. Thank you.

Graphics Icons Key

 Wireless Access Point	 Computer	 Notebook computer
 Server	 Modem	 Wireless Signal
 Telephone	 Switch	 Router

Chapter 1

Getting Started

This chapter introduces the ZyAIR and prepares you to use the ZyXEL Utility.

1.1 About Your ZyAIR

The ZyAIR is an IEEE 802.11g compliant wireless LAN adapter. With the ZyAIR, you can enjoy the wireless mobility within the coverage area.

The following lists the main features of your ZyAIR.

- Your ZyAIR can communicate with other IEEE 802.11b/g compliant wireless devices.
- Automatic rate selection.
- Offers 64-bit, 128-bit and 256-bit WEP (Wired Equivalent Privacy) data encryption for network security.
- Proprietary SoftAP feature turns your ZyAIR into an access point (AP).
- Low CPU utilization allowing more computer system resources for other programs.
- A built-in antenna
- Driver support for Windows XP/2000/Me/98 SE

1.2 ZyAIR Hardware and Utility Installation

Follow the instructions in the *Quick Installation Guide* to install the ZyXEL Utility and make hardware connections.

1.3 Ways to Configure the ZyAIR

To configure your ZyAIR, use one of the following applications:

In Windows XP:

- ZyXEL Utility
- Zero Configuration
- Funk Odyssey Client

In Windows 98 SE/Me/2000

- ZyXEL Utility
- Funk Odyssey Client

DO NOT use the Windows XP configuration tool or the Funk Odyssey Client and the ZyXEL Utility at the same time.

It is recommended you use the ZyXEL Utility to configure your ZyAIR.

The bundled Funk Odyssey Client only works for your ZyAIR. Do NOT use the Funk Odyssey Client to configure non-ZyXEL WLAN adapters.

Refer to the *User's Guide* of your Funk Odyssey Client for details on how to uninstall (or remove) it.

1.4 Disable Windows XP Wireless LAN Configuration Tool

Windows XP includes a configuration tool for wireless devices.

Follow the steps below to disable the configuration tool in Windows XP after you install the ZyXEL Utility. The screen varies depending on the version of Windows XP service pack.

- Step 1.** Double-click the network icon for wireless connections in the system tray. If the icon is not present, proceed to *Step 2*. Otherwise skip to *Step 5*.



Figure 1-1 Windows XP: System Tray Icon

- Step 2.** If the icon for the wireless network connection is not in the system tray, click **Start, Control Panel** and double-click **Network Connections**.

- Step 3.** Double-click on the icon for wireless network connection to display a status window as shown next.



Figure 1-2 Windows XP: Wireless Network Connection Status

- Step 4.** Click **Properties** and click the **Wireless Networks** tab. Then skip to *Step 6*.

Step 5. When a **Wireless Network Connection** window displays, click **Advanced...**

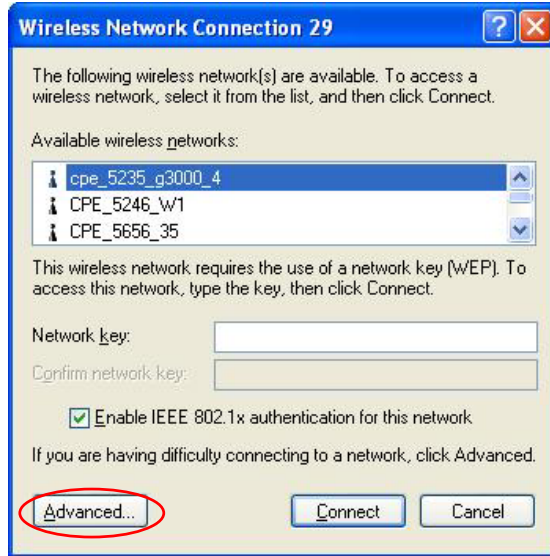


Figure 1-3 Windows XP: Connect to Wireless Network

Step 6. In the **Wireless Network Connection Properties** window, make sure the **Use Windows to configure my wireless network settings** check box is *not* selected. Click **OK**.

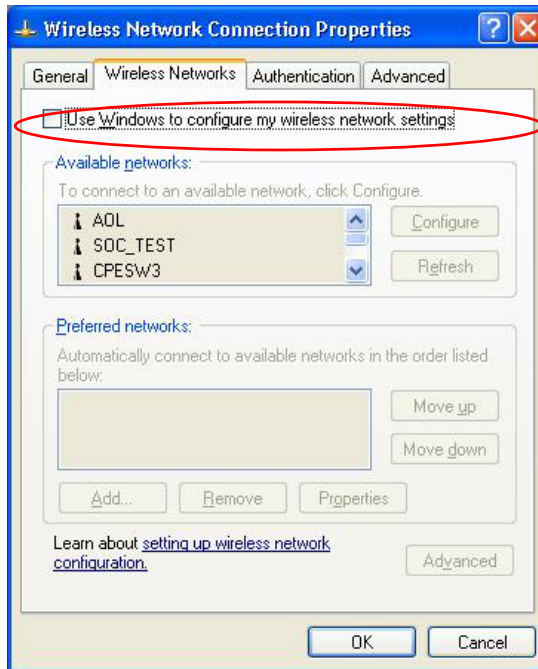


Figure 1-4 Windows XP: Wireless Network Connection Properties

1.5 Accessing the ZyXEL Utility

After you install and start the ZyXEL Utility, an icon for the ZyXEL Utility appears in the system tray.

When the ZyXEL Utility system tray icon displays, the ZyAIR is installed properly.



Figure 1-5 ZyXEL Utility: System Tray Icon

The color of the ZyXEL Utility system tray icon indicates the status of the ZyAIR. Refer to the following table for details.

Table 1-1 ZyXEL Utility: System Tray Icon

COLOR	DESCRIPTION
Red	The ZyAIR is operating in wireless station mode but is not connected to a wireless network.
Green	The ZyAIR is operating in wireless station mode and connected to a wireless network.
Pale Blue	The ZyAIR is operating in access point mode.

Double click on the ZyXEL Wireless LAN Utility icon in the system tray to open the ZyXEL Utility. The ZyXEL Utility screens are similar in all Microsoft Windows versions. Screens for Windows XP are shown.

Click the  icon (located in the top right corner) to display the on-line help window.

1.6 ZyAIR Modes

You can set your ZyAIR to operate in either wireless station or access point (AP) modes.

In wireless station mode, your ZyAIR must connect to a peer wireless station or an AP to take part in your wireless network.

In access point mode, your ZyAIR functions as an access point. This allows you to set up your wireless network without using a dedicated AP device. Up to 16 wireless stations can associate to the ZyAIR to form a wireless network. Refer to *Section 4.1* for more information.

1.6.1 Change ZyAIR Modes

To change between the modes, select either the **Station Mode** or **AP Mode** option in the **ZyXEL Utility** screen.

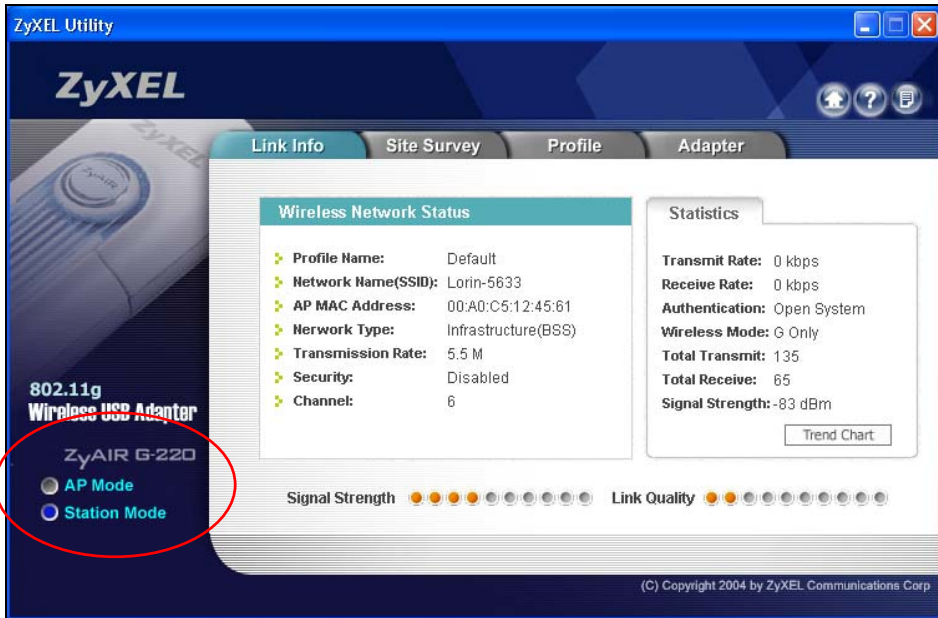


Figure 1-6 ZyXEL Utility

Wait for about five seconds for the ZyXEL Utility to complete the mode change. The current mode is indicated by the color of the radio button.

When you use the Windows XP configuration tool and the ZyXEL Utility to configure the ZyAIR at the same time, the ZyAIR automatically operates in station mode and doesn't allow any configuration change.

Chapter 2

Wireless LAN Network

This chapter provides background information on wireless LAN network.

2.1 Overview

This section describes the wireless LAN network terms and applications.

2.1.1 SSID

The SSID (Service Set Identity) is a unique name shared among all wireless devices in a wireless network. Wireless devices must have the same SSID to communicate with each other.

2.1.2 Channel

A radio frequency used by a wireless device is called a channel.

2.1.3 Transmission Rate (Tx Rate)

The ZyAIR provides various transmission (data) rate options for you to select. Options include **Fully Auto**, **1 Mbps**, **2 Mbps**, **5.5 Mbps**, **11 Mbps**, **6 Mbps**, **9 Mbps**, **12 Mbps**, **18 Mbps**, **24 Mbps**, **36 Mbps**, **48 Mbps**, and **54 Mbps**. In most networking scenarios, the factory default **Fully Auto** setting proves the most efficient. This setting allows your ZyAIR to operate at the maximum transmission (data) rate. When the communication quality drops below a certain level, the ZyAIR automatically switches to a lower transmission (data) rate. Transmission at lower data speeds is usually more reliable. However, when the communication quality improves again, the ZyAIR gradually increases the transmission (data) rate again until it reaches the highest available transmission rate.

You can select any of the above options. If you wish to balance speed versus reliability, select **54 Mbps** in a networking environment where you are certain that all wireless devices can communicate at the highest transmission (data) rate. **1 Mbps** or **2 Mbps** are used often in networking environments where the range of the wireless connection is more important than speed.

With USB1.1, the ZyAIR can only transmit at up to 11Mbps.

2.1.4 Wireless Network Application

Wireless LAN works in either of the two modes: ad-hoc and infrastructure.

To connect to a wired network within a coverage area using Access Points (APs), set the ZyAIR operation mode to **Infrastructure (BSS)**. An AP acts as a bridge between the wireless stations and the wired

network. In case you do not wish to connect to a wired network, but prefer to set up a small independent wireless workgroup without an AP, use the **Ad-hoc (IBSS)** (Independent Basic Service Set) mode.

Ad-Hoc (IBSS)

Ad-hoc mode does not require an AP or a wired network. Two or more wireless stations communicate directly to each other. An ad-hoc network may sometimes be referred to as an Independent Basic Service Set (IBSS).

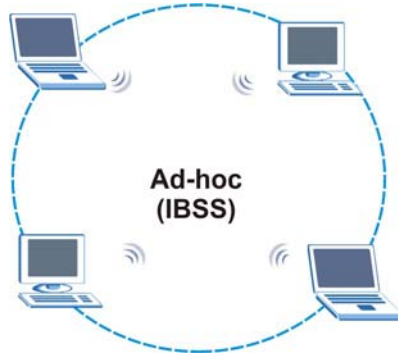


Figure 2-1 IBSS Example

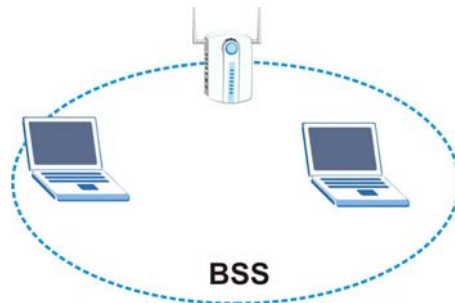


Figure 2-2 BSS Example

A series of overlapping BSS and a network medium, such as an Ethernet forms an Extended Service Set (ESS) or infrastructure network. All communication is done through the AP, which relays data packets to other wireless stations or devices connected to the wired network. Wireless stations can then access resource, such as the printer, on the wired network.

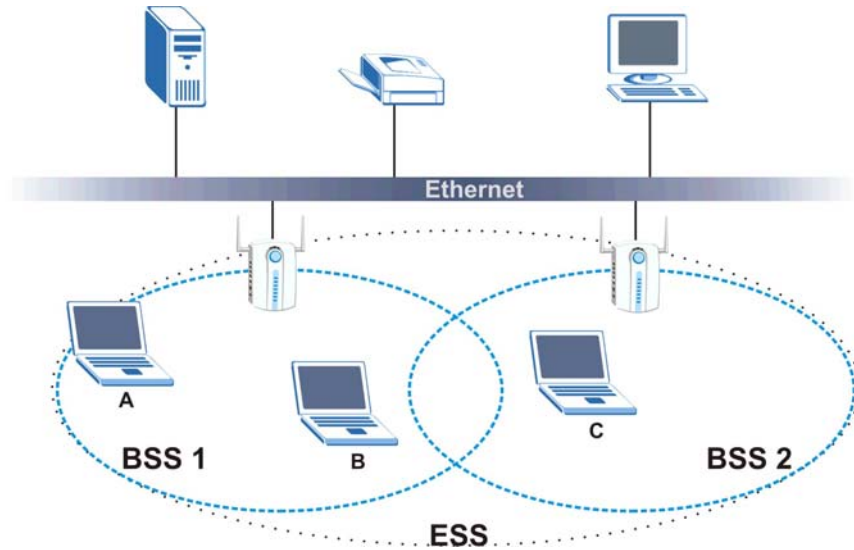


Figure 2-3 Infrastructure Network Example

Access Point Mode

The following figure depicts a network example in which you set the ZyAIR in access point mode.

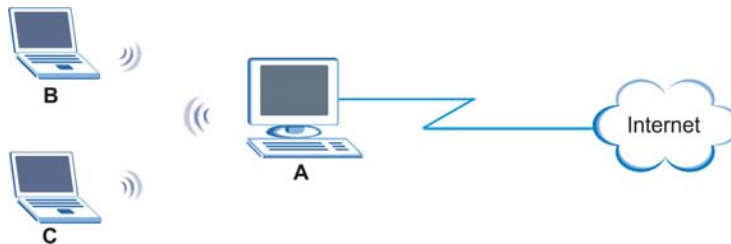


Figure 2-4 ZyAIR as an Access Point Example

In the example, the ZyAIR is installed on computer A and set to operate in access point mode. Computer A shares Internet connection to the wireless LAN, so wireless stations B and C can access the Internet.

2.1.5 Roaming

In an infrastructure network, wireless stations are able to switch from one BSS to another as they move between the coverage areas. During this period, the wireless stations maintain uninterrupted connection to the network. This is roaming. As the wireless station moves from place to place, it is responsible for choosing the most appropriate AP depending on the signal strength, network utilization or other factors.

The following figure depicts a roaming example. When wireless station **B** moves to position **X**, the ZyAIR in wireless station **B** automatically switches the channel to the one used by access point **2** in order to stay connected to the network.

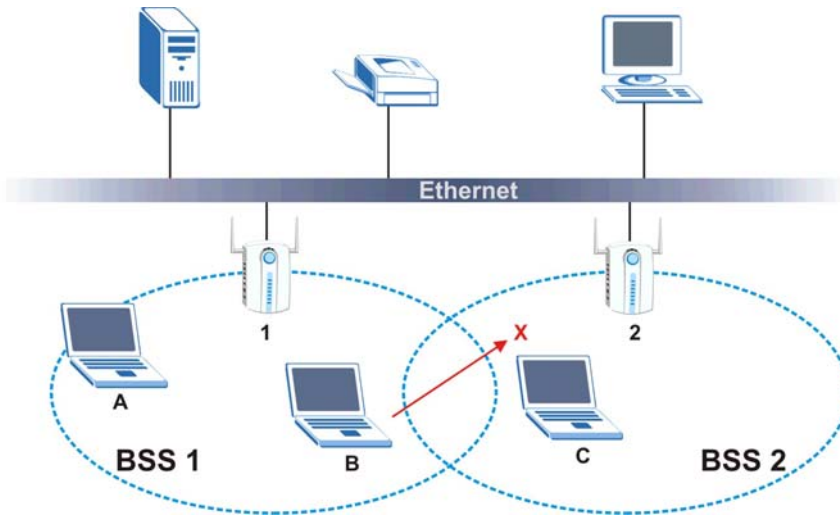


Figure 2-5 Roaming Example

2.2 Wireless LAN Security

Wireless LAN security is vital to your network to protect wireless communications.

Configure the wireless LAN security using the **Configuration** or the **Profile Security Settings** screen. If you do not enable any wireless security on your ZyAIR, the ZyAIR's wireless communications are accessible to any wireless networking device that is in the coverage area.

2.2.1 Data Encryption with WEP

WEP (Wired Equivalent Privacy) encryption scrambles all data packets transmitted between the ZyAIR and the AP or other wireless stations to keep network communications private. Both the wireless stations and the access points must use the same WEP key for data encryption and decryption.

There are two ways to create WEP keys in your ZyAIR.

- Automatic WEP key generation based on a “password phrase” called a passphrase. The passphrase is case sensitive. You must use the same passphrase for all WLAN adapters with this feature in the same WLAN.

For WLAN adapters without the passphrase feature, you can still take advantage of this feature by writing down the four automatically generated WEP keys from the **Security Settings** screen of the ZyXEL Utility and entering them manually as the WEP keys in the other WLAN adapter(s).

- Enter the WEP keys manually.

Your ZyAIR allows you to configure up to four 64-bit, 128-bit or 256-bit WEP keys and only one key is used as the default key at any one time.

2.3 Fragmentation Threshold

A **Fragmentation Threshold** is the maximum data fragment size (between 256 and 2432 bytes) that can be sent in the wireless network before the ZyAIR will fragment the packet into smaller data frames.

A large **Fragmentation Threshold** is recommended for networks not prone to interference while you should set a smaller threshold for busy networks or networks that are prone to interference.

If the **Fragmentation Threshold** value is smaller than the **RTS/CTS Threshold** value (see previously) you set then the RTS (Request To Send)/CTS (Clear to Send) handshake will never occur as data frames will be fragmented before they reach **RTS/CTS Threshold** size.

2.4 RTS/CTS Threshold

A hidden node occurs when two stations are within range of the same access point, but are not within range of each other. The following figure illustrates a hidden node. Both stations are within range of the access point (AP) or wireless gateway, but out-of-range of each other, so they cannot “hear” each other, that is they do not know if the channel is currently being used. Therefore, they are considered hidden from each other.

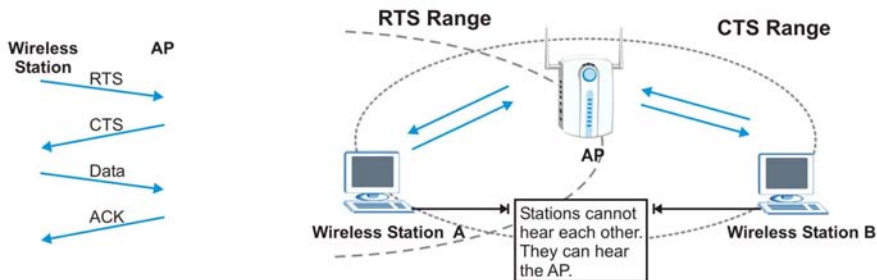


Figure 2-6 RTS Threshold

When station **A** sends data to the AP, it might not know that the station **B** is already using the channel. If these two stations send data at the same time, collisions may occur when both sets of data arrive at the AP at the same time, resulting in a loss of messages for both stations.

RTS/CTS Threshold is designed to prevent collisions due to hidden nodes. An **RTS/CTS Threshold** defines the biggest size data frame you can send before an RTS (Request To Send)/CTS (Clear to Send) handshake is invoked.

When a data frame exceeds the **RTS/CTS Threshold** value you set (between 0 to 2432 bytes), the station that wants to transmit this frame must first send an RTS (Request To Send) message to the AP for

permission to send it. The AP then responds with a CTS (Clear to Send) message to all other stations within its range to notify them to defer their transmission. It also reserves and confirms with the requesting station the time frame for the requested transmission.

Stations can send frames smaller than the specified **RTS/CTS Threshold** directly to the AP without the RTS (Request To Send)/CTS (Clear to Send) handshake.

You should only configure **RTS/CTS Threshold** if the possibility of hidden nodes exists on your network and the “cost” of resending large frames is more than the extra network overhead involved in the RTS (Request To Send)/CTS (Clear to Send) handshake.

If the **RTS/CTS Threshold** value is greater than the **Fragmentation Threshold** value (see next), then the RTS (Request To Send)/CTS (Clear to Send) handshake will never occur as data frames will be fragmented before they reach **RTS/CTS Threshold** size.

Enabling the RTS Threshold causes redundant network overhead that could negatively affect the throughput performance.

2.5 Authentication Type

The IEEE 802.11b standard describes a simple authentication method between the wireless stations and AP. Three authentication modes are defined: **Auto**, **Open System** and **Shared Key**.

Open System mode is implemented for ease-of-use and when security is not an issue. The wireless station and the AP do *not* share a secret key. Thus the wireless stations can associate with any AP and listen to any data transmitted plaintext.

Shared Key mode involves a shared secret key to authenticate the wireless station to the AP. This requires you to enable the WEP encryption and specify a WEP key on both the wireless station and the AP.

Auto authentication mode allows the ZyAIR to switch between the open and shared key authentication modes automatically. Use the auto mode if you do not know the authentication mode of the other wireless stations.

2.6 Preamble Type

A preamble is used to synchronize the transmission timing in your wireless network. There are two preamble modes: **Long Preamble** and **Short Preamble**.

Short preamble takes less time to process and minimizes overhead, so it should be used in a good wireless network environment when all wireless stations support it.

Select **Long Preamble** if you have a ‘noisy’ network or are unsure of what preamble mode the access point or the other wireless stations support as all IEEE 802.11b compliant wireless adapters must support long preamble. However, not all wireless adapters support short preamble. Use long preamble if you are unsure what preamble mode the wireless adapters support, to ensure interpretability between the ZyAIR and the access point/wireless stations and to provide more reliable communication in ‘noisy’ networks.

Select **Auto** to have the ZyAIR automatically use short preamble when all access point/wireless stations support it, otherwise the ZyAIR uses long preamble.

The ZyAIR and the access point/wireless stations **MUST** use the same preamble mode in order to communicate.

Chapter 3

Wireless Station Mode Configuration

This chapter shows you how to configure your ZyAIR in wireless station mode.

3.1 Introduction

To set your ZyAIR as a wireless station, refer to *Section 1.6.1*.

3.2 The Link Info Screen

When the ZyXEL Utility starts, the **Link Info** screen displays, showing the current configuration and connection status of your ZyAIR.

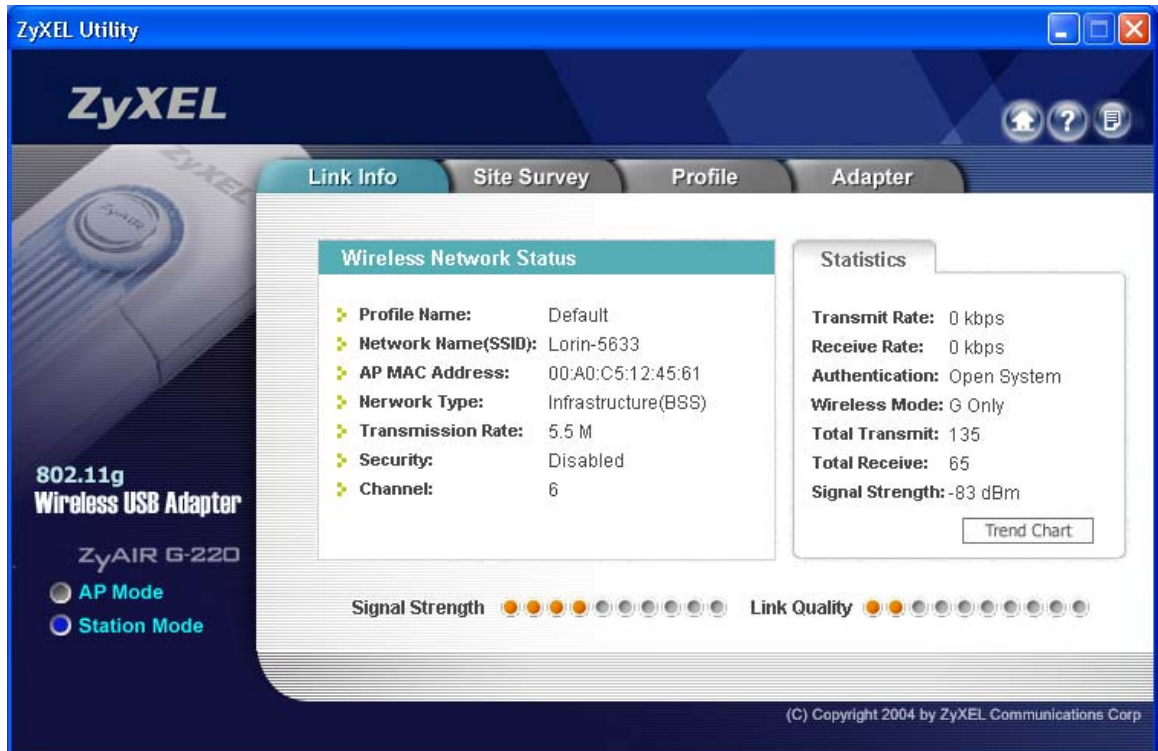


Figure 3-1 Station Mode: Link Info

The following table describes the labels in this screen.

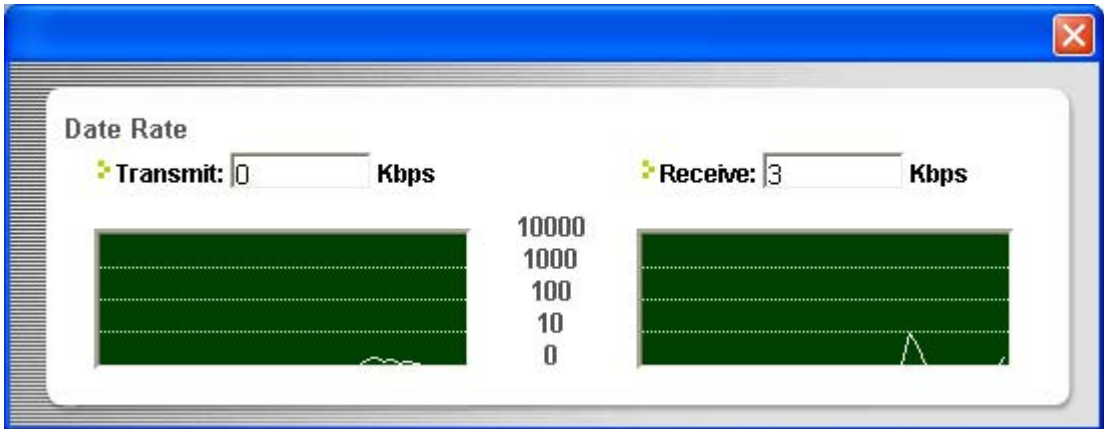
Table 3-1 Station Mode: Link Info

LABEL	DESCRIPTION
AP Mode Station Mode	Use the radio button to set the ZyAIR to operate in wireless station mode or operate in access point mode. Refer to <i>Section 1.6</i> for more information.
Wireless Network Status	
Profile Name	This is the name of the profile you are currently using.
Network Name (SSID)	The SSID identifies the Service Set to which a wireless station is associated. This field displays the name of the wireless device to which the ZyAIR is associated.
AP MAC Address	This field displays the MAC address of the wireless device to which the ZyAIR is associated.
Network Type	This field displays the network type (Infrastructure(BSS) or Ad Hoc) of the wireless network.
Transmission Rate	This field displays the current transmission rate of the ZyAIR in megabits per second (Mbps).
Security	This field displays whether WEP data encryption is activated (WEP) or inactive (Disabled).
Channel	This field displays the radio channel the ZyAIR is currently using.
Statistics	
Transmit Rate	This field displays the current data transmission rate in kilobits per second (Kbps).
Receive Rate	This field displays the current data receiving rate in kilobits per second (Kbps).
Authentication	This field displays the authentication method of the ZyAIR.
Wireless Mode	This field indicates the wireless standard (802.11b or 802.11g) of the wireless device. This field displays G Only , B Only or Mixed Mode .
Total Transmit	This field displays the total number of data frames transmitted.
Total Receive	This field displays the total number of data frames received.
Signal Strength	This field displays the signal strength of the ZyAIR.
Trend Chart	Click this button to display the real-time statistics of the data rate in kilobits per second (Kbps).
Signal Strength	The status bar shows the strength of the signal.

Table 3-1 Station Mode: Link Info

LABEL	DESCRIPTION
Link Quality	The status bar shows the quality of the signal.

3.2.1 Trend Chart

**Figure 3-2 Station Mode: Link Info: Trend Chart**

The following table describes the labels in this screen.

Table 3-2 Station Mode: Link Info: Trend Chart

LABEL	DESCRIPTION
Transmit	This field displays the current data transmission rate in kilobits per second (Kbps).
Receive	This field displays the current data receiving rate in kilobits per second (Kbps).

3.3 The Site Survey Screen

Use the **Site Survey** screen to scan for and connect to a wireless network automatically.

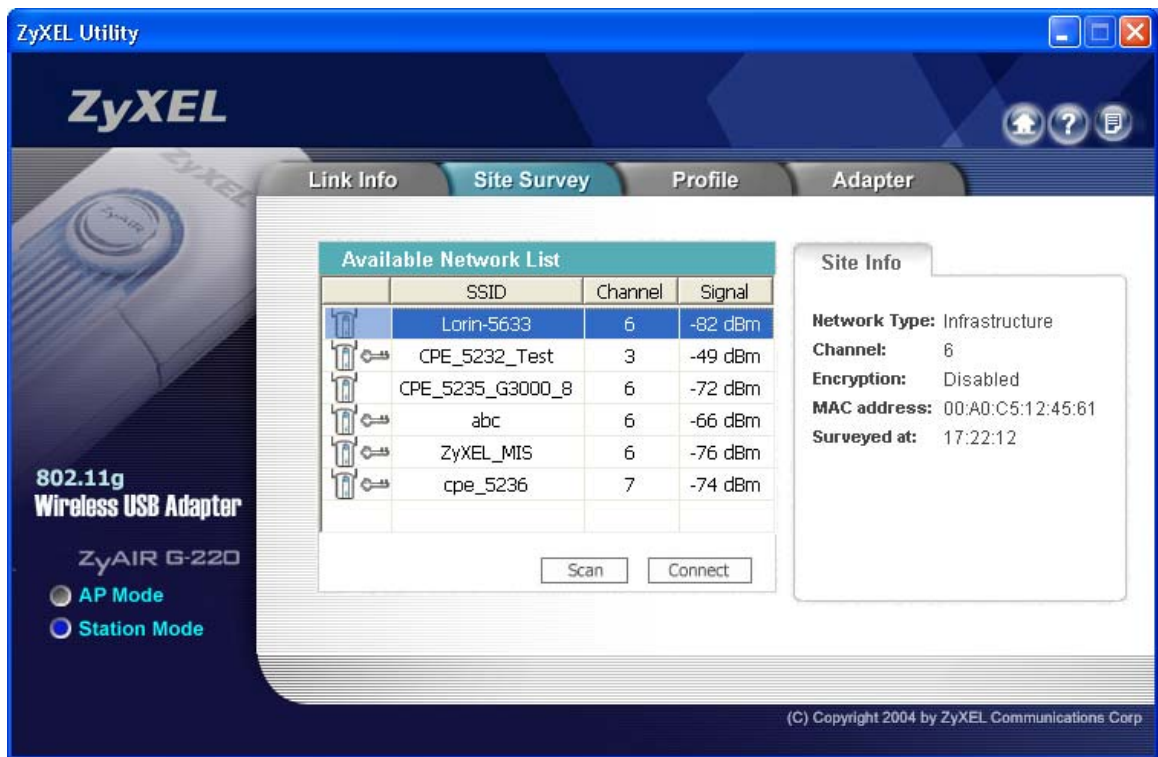










Figure 3-3 Station Mode: Site Survey

The following table describes the labels in this screen.

Table 3-3 Station Mode: Site Survey

LABEL	DESCRIPTION
Available Network List	Click a column heading to sort the entries.

Table 3-3 Station Mode: Site Survey

LABEL	DESCRIPTION
 ,   or 	<p> denotes that the wireless device is in infrastructure mode and the wireless security is activated.</p> <p> denotes that the wireless device is in infrastructure mode but the wireless security is deactivated.</p> <p> denotes that the wireless device is in Ad-Hoc mode and the wireless security is activated.</p> <p> denotes that the wireless device is in Ad-Hoc mode but the wireless security is deactivated.</p>
SSID	This field displays the SSID (Service Set Identifier) of each wireless device.
Channel	This field displays the channel number used by each wireless device.
Signal	This field displays the signal strength of each wireless device.
Scan	Click Scan to search for available wireless devices within transmission range.
Connect	Click Connect to associate to the selected wireless device.
Site Info Click an entry in the Available Network List table to display the information of the selected wireless device.	
Network Type	This field displays the network type (Infrastructure or Ad Hoc) of the wireless device.
Channel	This field displays the channel number used by each wireless device.
Encryption	This field shows whether data encryption is activated (WEP , WPA-PSK or WPA) or inactive (Disable).
MAC address	This field displays the MAC address of the wireless device.
Surveyed at	This field displays the time when the wireless device is scanned.

3.3.1 Connecting to a Network

Follow the steps below to connect to a network using the **Site Survey** screen.

- Step 1.** Click **Scan** to search for all available wireless networks within range.
- Step 2.** To join a network, click an entry in the table to select a wireless network and then click **Connect**.
- Step 3.** If the WEP encryption is activated for the selected wireless network, the **Security Settings** screen displays. You must set the related fields in the **Security Settings** screen to the same

security settings as the associated wireless device. Refer to *Section 3.3.2* for more information. Otherwise click the close (✖) button and connect to another wireless network without WEP encryption.

- Step 4.** Verify that you have successfully connected to the selected network and check the network information in the **Link Info** screen.

3.3.2 Security Settings

When you configure the ZyAIR to connect to a network with WEP encryption activated and the security settings are disabled on the ZyAIR, the screen displays as follows.

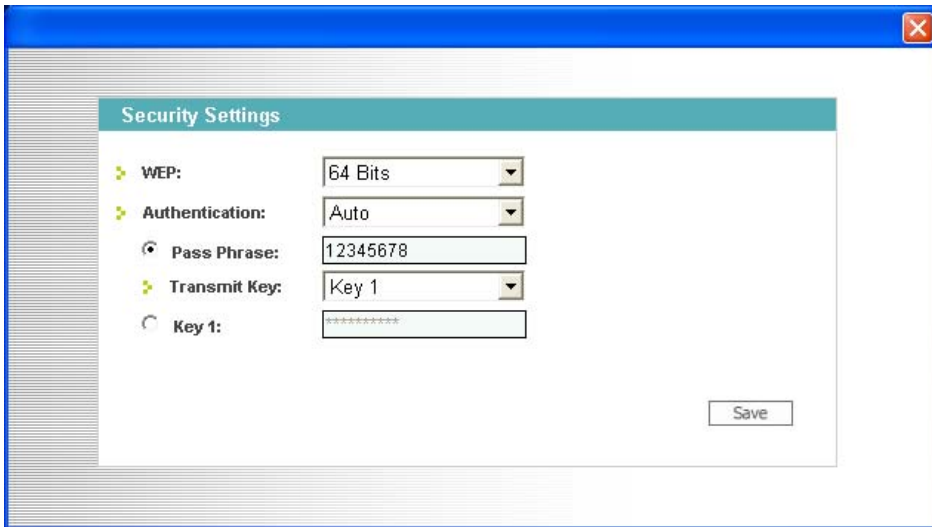


Figure 3-4 Station Mode: Site Survey: Security Settings

The following table describes the labels in this screen.


Table 3-4 Station Mode: Site Survey: Security Settings

LABEL	DESCRIPTION
Security Settings	
WEP	Select 64 Bits , 128 Bits or 256 Bits to activate WEP encryption and then fill in the related fields. Select Disable to deactivate WEP encryption.
Authentication	Select an authentication method. Choices are Auto , Shared Key and Open System . Refer to <i>Section 2.5</i> for more information.

Table 3-4 Station Mode: Site Survey: Security Settings

LABEL	DESCRIPTION
Pass Phrase	<p>When you select the radio button, enter the passphrase. As you enter the passphrase, the ZyAIR automatically generates four different WEP keys and displays it in the key field below.</p> <p>Refer to <i>Section 2.2.1</i> for more information.</p>
Transmit Key	<p>Select a default WEP key to use for data encryption. The key displays in the field below.</p>
Key x (where x is a number between 1 and 4)	<p>Select this option if you want to manually enter the WEP keys.</p> <p>Enter the WEP key in the field provided.</p> <p>If you select 64 Bits in the WEP field.</p> <ul style="list-style-type: none"> ♦ Enter either 10 hexadecimal digits in the range of “A-F”, “a-f” and “0-9” (for example, 11AA22BB33) for HEX key type <p>or</p> <ul style="list-style-type: none"> ♦ Enter 5 ASCII characters (case sensitive) ranging from “a-z”, “A-Z” and “0-9” (for example, MyKey) for ASCII key type. <p>If you select 128 Bits in the WEP field,</p> <ul style="list-style-type: none"> ♦ Enter either 26 hexadecimal digits in the range of “A-F”, “a-f” and “0-9” (for example, 00112233445566778899AABBCC) for HEX key type <p>or</p> <ul style="list-style-type: none"> ♦ Enter 13 ASCII characters (case sensitive) ranging from “a-z”, “A-Z” and “0-9” (for example, MyKey12345678) for ASCII key type. <p>If you select 256 Bits in the WEP field,</p> <ul style="list-style-type: none"> ♦ Enter either 58 hexadecimal digits in the range of “A-F”, “a-f” and “0-9” (for example, 0000111122223333444455556666777788889999AAAABBBBCCCC000011) for HEX key type <p>or</p> <ul style="list-style-type: none"> ♦ Enter 29 ASCII characters (case sensitive) ranging from “a-z”, “A-Z” and “0-9” (for example, MyKey111122223333444455556678) for ASCII key type. <div style="border: 1px solid black; padding: 5px; text-align: center; margin-top: 10px;"> <p>The values for the WEP keys must be set up exactly the same on all wireless devices in the same wireless LAN.</p> <p>ASCII WEP keys are case sensitive.</p> </div>

Table 3-4 Station Mode: Site Survey: Security Settings

LABEL	DESCRIPTION
Save	Click Save to save the changes back to ZyAIR. Otherwise, click the close () button to discard changes and go back to the Lin Info screen.

3.4 The Profile Screen

Click the **Profile** tab in the ZyXEL Utility program to display the **Profile** screen as shown next.

The profile function allows you to save the wireless network settings in this screen, or use one of the pre-configured network profiles.

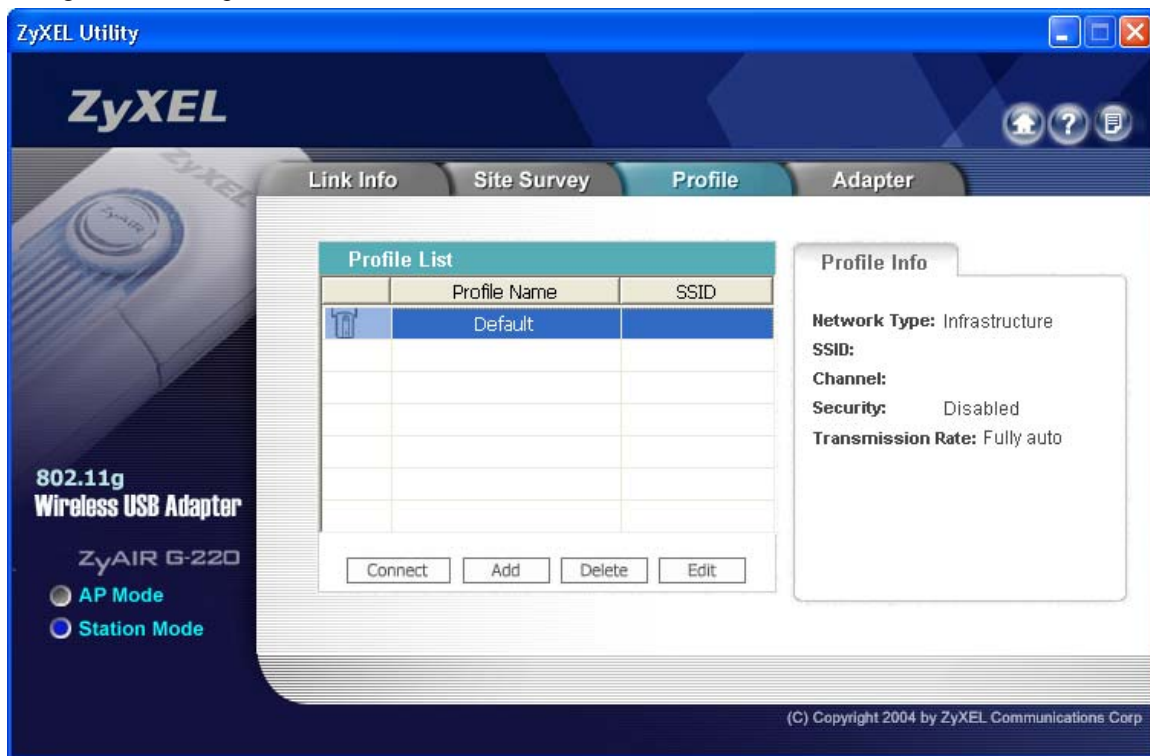
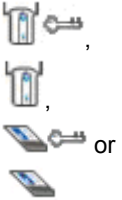






Figure 3-5 Station Mode: Profile

The following table describes the labels in this screen.

Table 3-5 Station Mode: Profile

LABEL	DESCRIPTION
Profile List Click a column heading to sort the entries.	
	<p> denotes that the wireless device is in infrastructure mode and the wireless security is activated.</p> <p> denotes that the wireless device is in infrastructure mode but the wireless security is deactivated.</p> <p> denotes that the wireless device is in Ad-Hoc mode and the wireless security is activated.</p> <p> denotes that the wireless device is in Ad-Hoc mode but the wireless security is deactivated.</p>
Profile Name	This is the name of the pre-configured profile.
SSID	This is the SSID of the wireless network to which the selected profile associate.
Connect	To use a previously saved network profile, select a pre-configured profile name in the table and click Connect .
Add	To add a new profile into the table, click Add .
Delete	To delete an existing wireless network configuration, select a profile in the table and click Delete .
Edit	To edit an existing wireless network configuration, select a profile in the table and click Edit .
Profile Info The following fields display detail information of the selected profile in the Profile List table.	
Network Type	This field displays the network type (Infrastructure or Ad Hoc) of the profile.
SSID	This field displays the SSID (Service Set Identifier) of the profile.
Channel	This field displays the channel number used by the profile.
Security	This field shows whether WEP data encryption is activated (Enabled) or inactive (Disabled).
Transmission Rate	This field displays the transmission speed of the selected profile in megabits per second (Mbps).

3.4.1 Adding a New Profile

Follow the steps below to add a new profile.

Step 1. Click **Add** in the **Profile** screen. An **Add New Profile** screen displays as shown next. Click **Next** to continue.

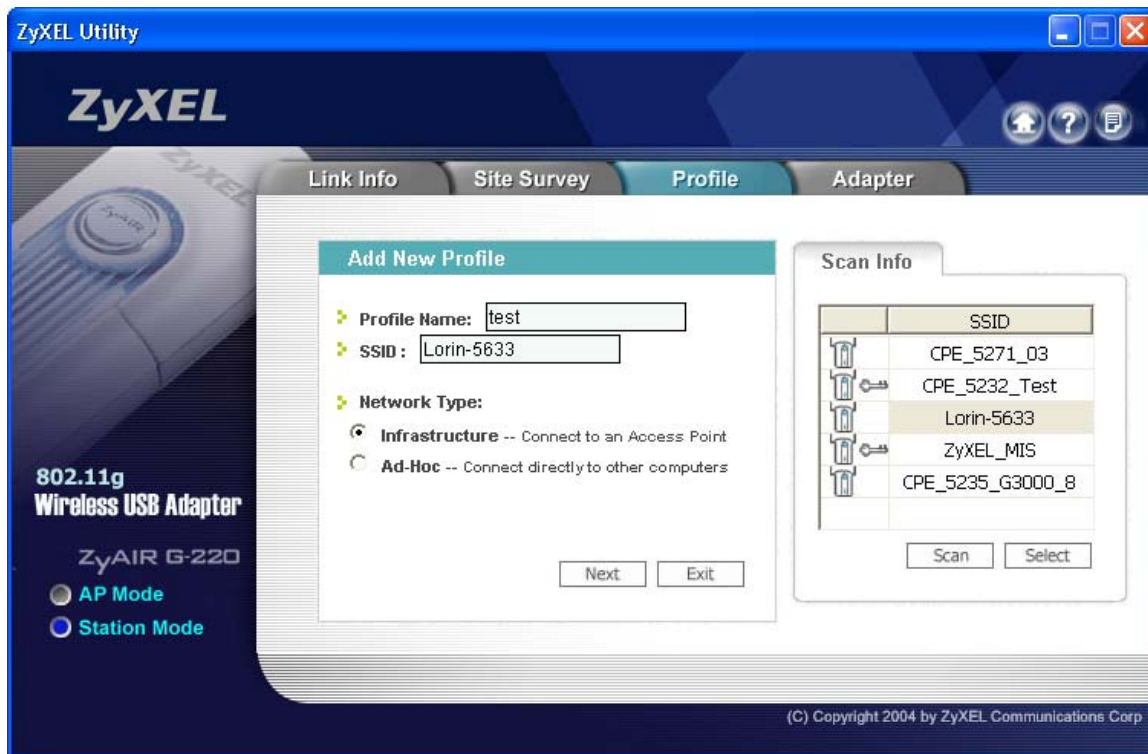


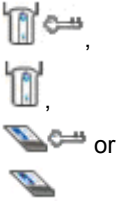




Figure 3-6 Station Mode: Profile: Add New Profile

The following table describes the labels in this screen.

Table 3-6 Station Mode: Profile: Add New Profile

LABEL	DESCRIPTION
Add New Profile	
Profile Name	Enter a descriptive name in this field.

Table 3-6 Station Mode: Profile: Add New Profile

LABEL	DESCRIPTION
SSID	Select an available wireless device in the Scan Info table and click Select , or enter the SSID of the wireless device to which you want to associate in this field manually. Otherwise, leave this field blank to have the ZyAIR associate to or roam between any infrastructure wireless networks.
Network Type	Select the Infrastructure radio button to associate to an AP. Select the Ad-Hoc radio button to associate to a peer computer.
Next	Click Next to go to the next screen.
Exit	Click Exit to go back to the previous screen without saving.
Scan Info This table displays the information of the available wireless networks within the transmission range.	
	 denotes that the wireless device is in infrastructure mode and the wireless security is activated.  denotes that the wireless device is in infrastructure mode but the wireless security is deactivated.  denotes that the wireless device is in Ad-Hoc mode and the wireless security is activated.  denotes that the wireless device is in Ad-Hoc mode but the wireless security is deactivated.
SSID	This field displays the SSID (Service Set Identifier) of each wireless device.
Scan	Click Scan to search for available wireless devices within transmission range.
Select	Select an available wireless device in the table and click Select to add it to this profile. Whenever you activate this profile, the ZyAIR associates to the selected wireless network only.

Step 2. If you select the **Ad-Hoc** network type in the previous screen, a screen displays as follows. Select a channel number and wireless LAN mode and click **Next** to continue.

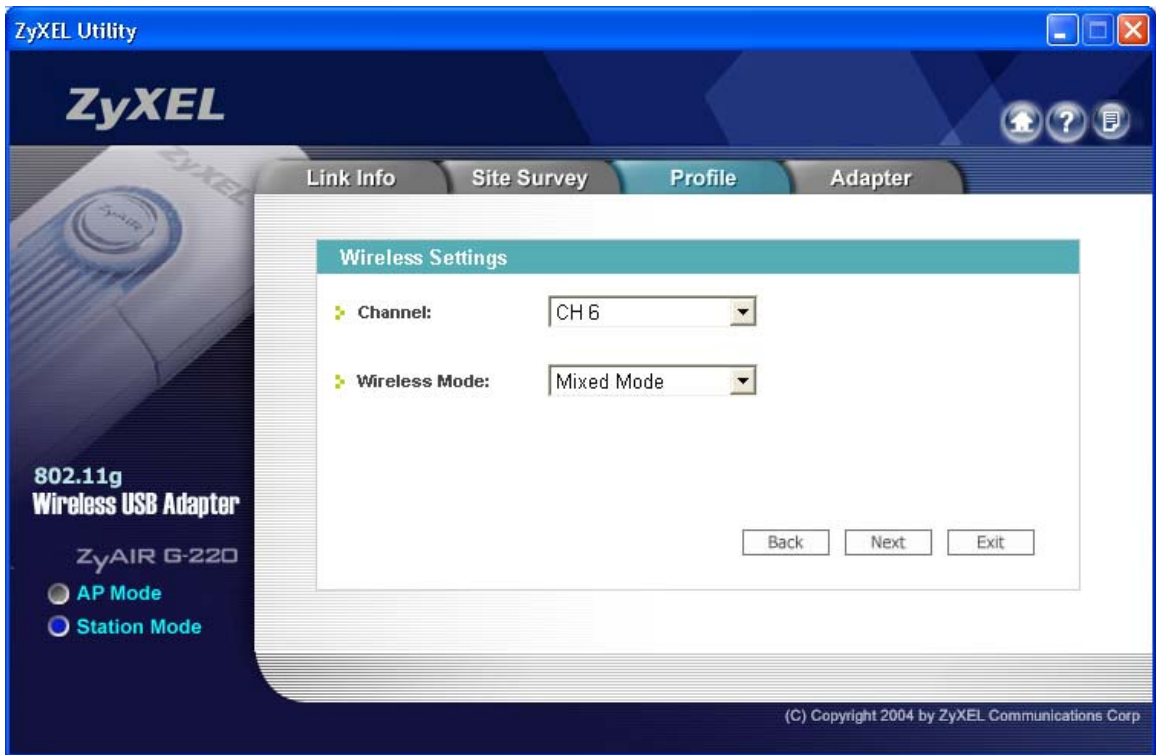


Figure 3-7 Station Mode: Profile: Select a Channel

The following table describes the labels in this screen.

Table 3-7 Station Mode: Profile: Select a Channel

LABEL	DESCRIPTION
Wireless Settings	
Channel	Select a channel number from the drop-down list box. To associate to an ad-hoc network, you must use the same channel as the peer computer.
Wireless Mode	Select Mixed Mode to have the ZyAIR connect to either an IEEE 802.11g or IEEE 802.11b wireless device. Select G-Only to have the ZyAIR connect to an IEEE 802.11g wireless device only and vice versa. Select B-Only to have the ZyAIR connect to an IEEE 802.11g wireless device only and vice versa.

- Step 3.** Select **WEP** from the drop-down list box to enable WEP encryption. Otherwise, select **Disabled** to allow the ZyAIR to communicate with the access points or other peer wireless computers without any data encryption and skip to *Step 5*.

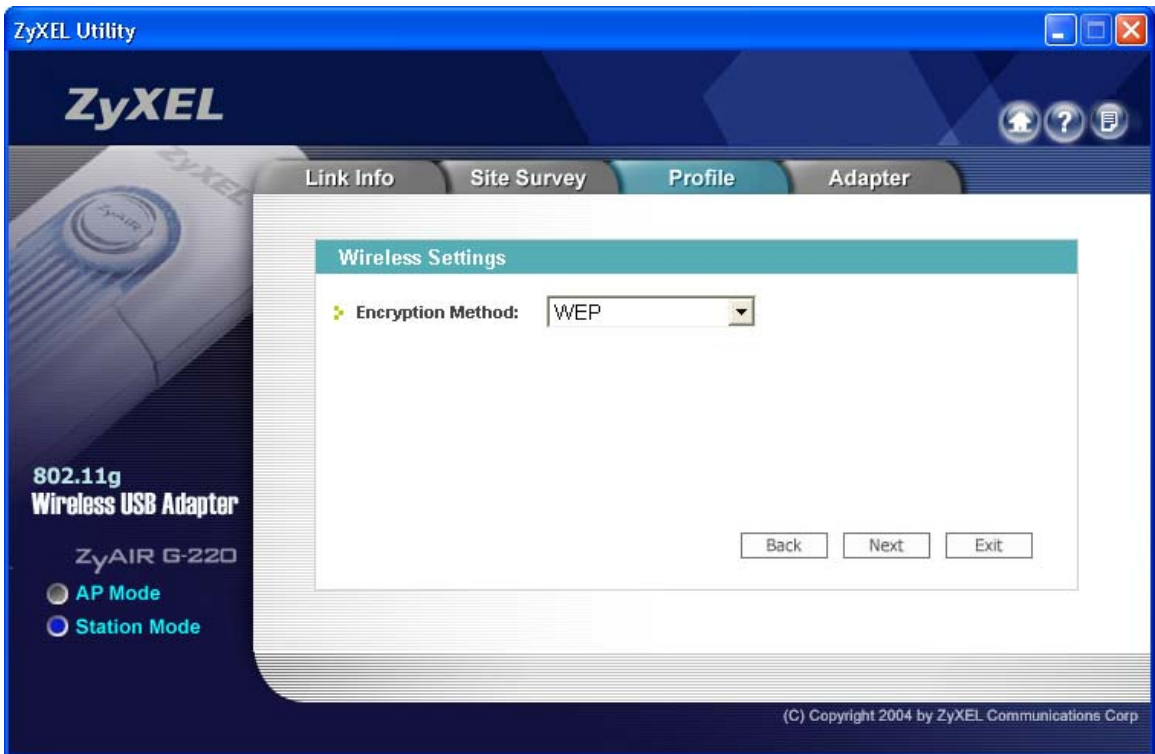


Figure 3-8 Station Mode: Profile: Wireless Settings

- Step 4.** The WEP keys are used to encrypt data before transmitting. The values for the keys must be set up exactly the same on the APs or other peer wireless computers as they are on the ZyAIR. Refer to *Section 3.3.1* for detailed information on setting up the WEP key.

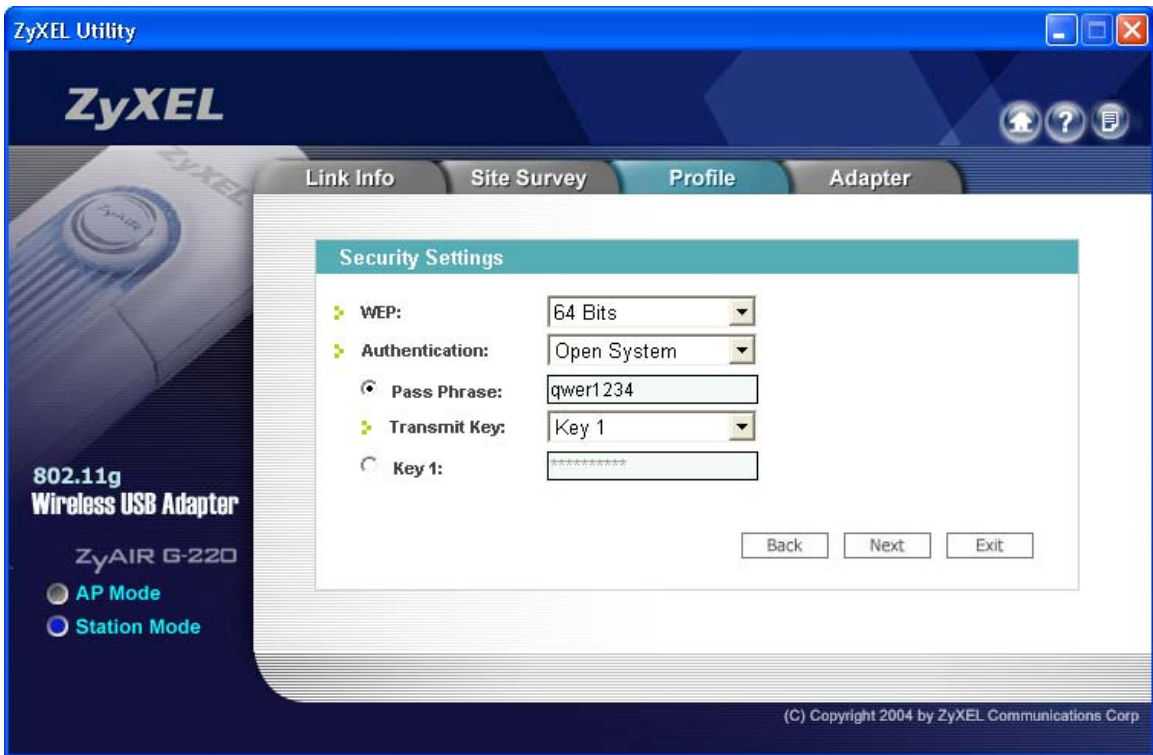


Figure 3-9 Station Mode: Profile: Security Settings

Step 5. This read-only screen shows a summary of the new profile settings. Verify that the settings are correct. Click **Save** to save and go to the next screen. Click **Back** to return to the previous screen. Otherwise, click **Exit** to go back to the **Profile** screen without saving.

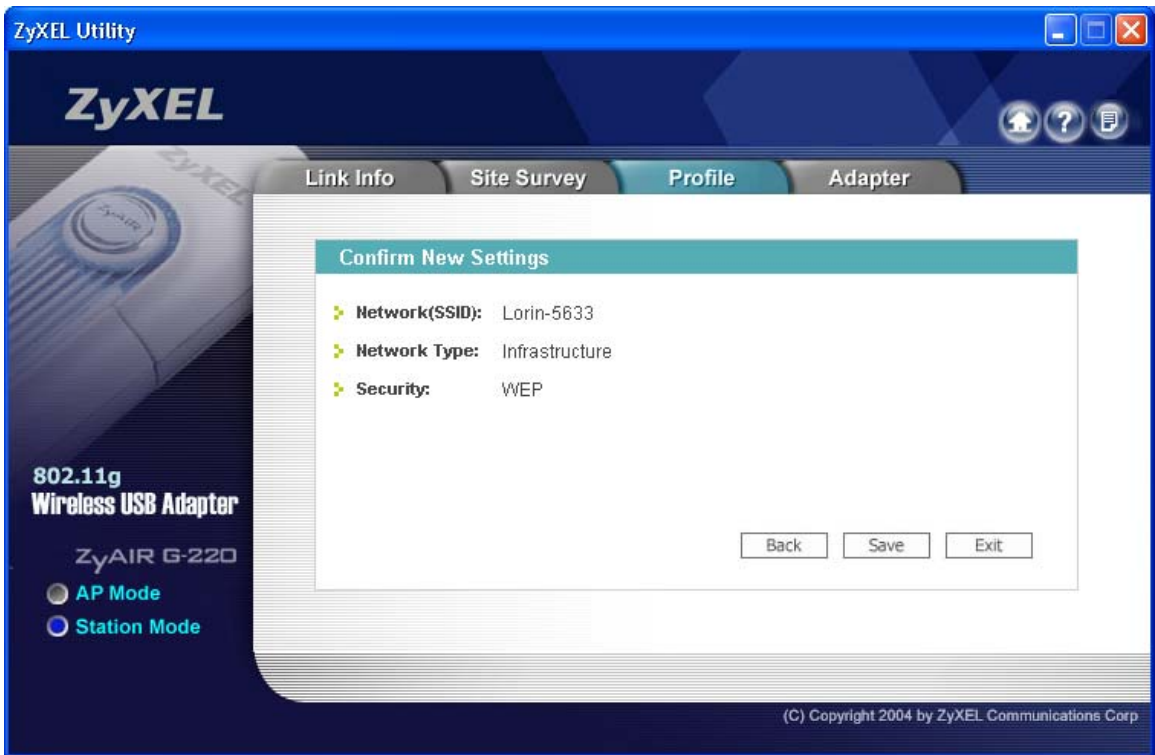


Figure 3-10 Station Mode: Profile: Confirm New Settings

Step 6. To use this network profile, click the **Activate Now** button. Otherwise, click the **Activate Later** button.

Once you activate a profile, the ZyXEL Utility will use that profile the next time it is started.

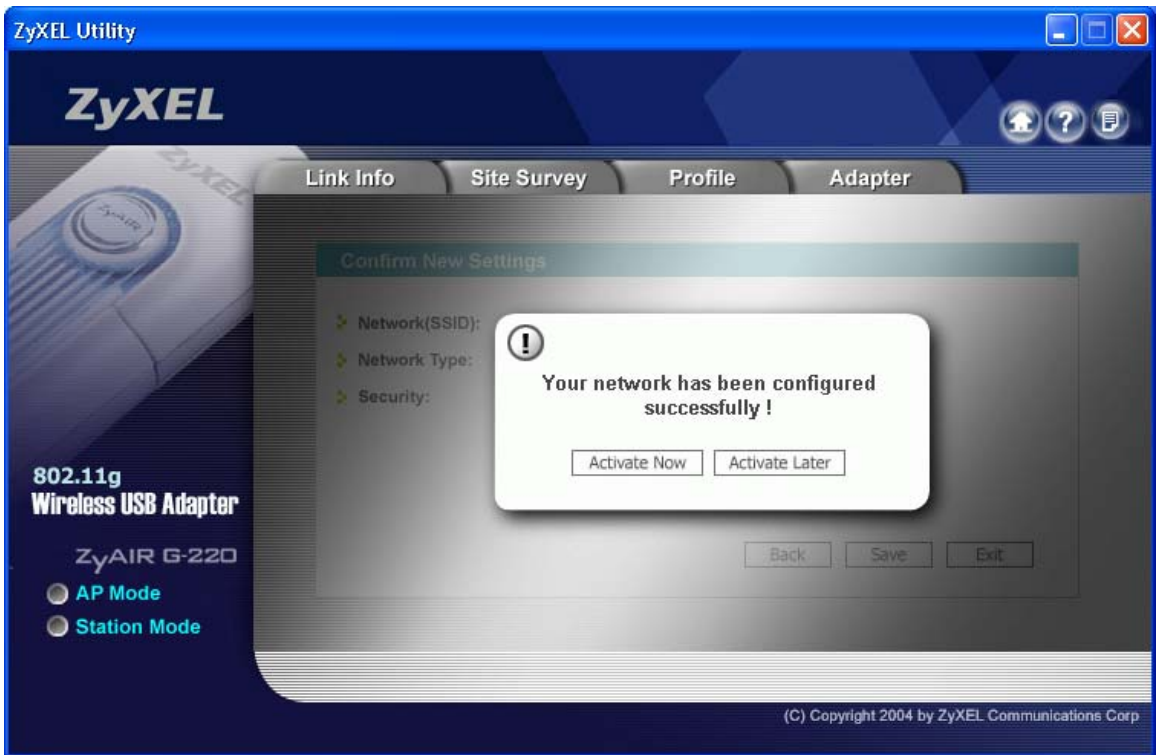


Figure 3-11 Station Mode: Profile: Activate the Profile

3.5 The Adapter Screen

To set the advanced features on the ZyAIR, click the **Adapter** tab.

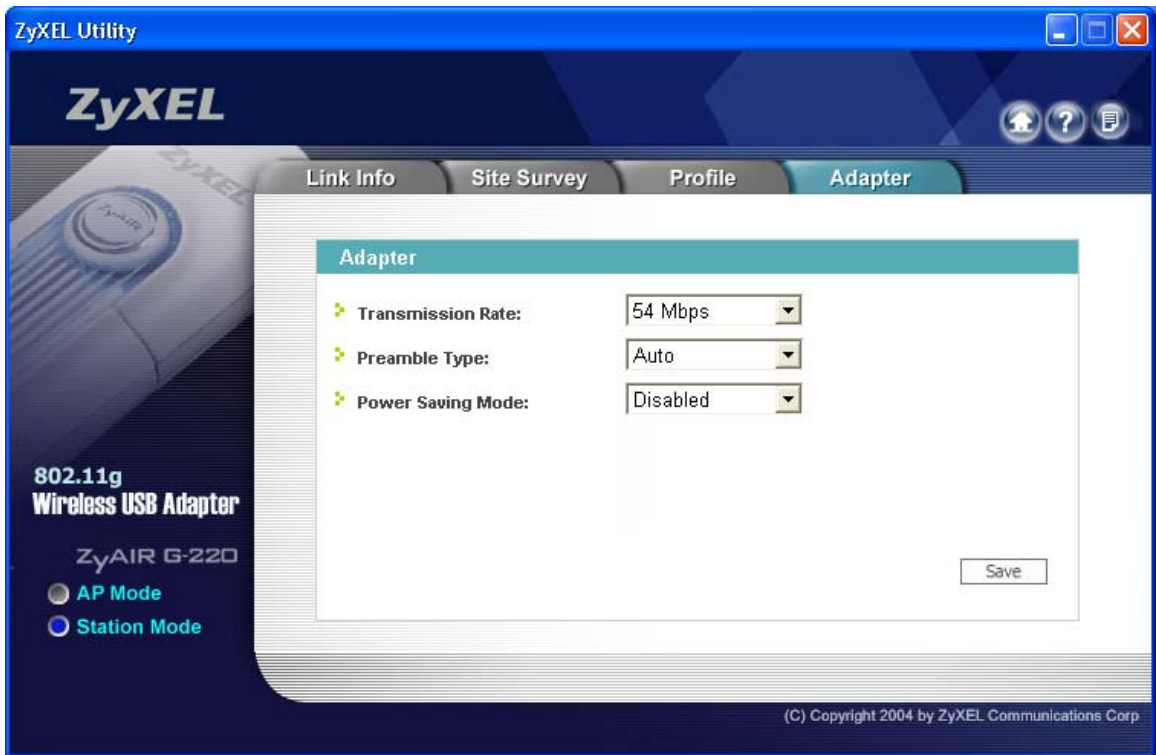


Figure 3-12 Station Mode: Adapter

The following table describes the labels in this screen.

Table 3-8 Station Mode: Adapter

LABEL	DESCRIPTION
Adapter	
Transmission Rate	Select a transmission speed from the drop-down list box. Choose from Fully Auto (default), 1 Mbps , 2 Mbps , 5.5 Mbps , 11 Mbps , 6 Mbps , 9 Mbps , 12 Mbps , 18 Mbps , 24 Mbps , 36 Mbps , 48 Mbps , and 54 Mbps .
Preamble Type	Select a preamble type. Choices are Long Preamble , Short Preamble and Auto . The default setting is Auto . Refer to <i>Section 2.6</i> for more information.

Table 3-8 Station Mode: Adapter

LABEL	DESCRIPTION
Power Saving Mode	Select Enabled to save power (especially for notebook computers). This forces the ZyAIR to go to sleep mode when it is not transmitting data. When you select Disabled , the ZyAIR will never go to sleep mode.
Save	Click Save to save the changes back to ZyAIR and return to the Link Info screen.

Chapter 4

Access Point Mode Configuration

This chapter shows you how to configure your ZyAIR in access point mode.

4.1 Introduction

To set your ZyAIR as an Access Point (AP), refer to *Section 1.6.1*.

In access point mode, your ZyAIR functions as an access point. This allows you to set up your wireless networks without using a dedicated AP device. Up to 16 wireless stations can associate to the ZyAIR.

4.1.1 Additional Setup Requirements

To bridge your wired and wireless network using the ZyAIR, the following requirements must be met:

1. The ZyAIR must be installed on a computer connected to the wired network.
2. Either configure network sharing (refer to the appendix for an example) or bridge the two interfaces (wireless and wired) on the computer.
3. Set the wireless station's IP address to be in the same subnet as the computer in which the ZyAIR is installed. Refer to the *Setting Up Your Computer's IP Address* appendix.

4.2 The Link Info Screen

Select the **AP Mode** radio button and wait for about five seconds to display the screen as shown.

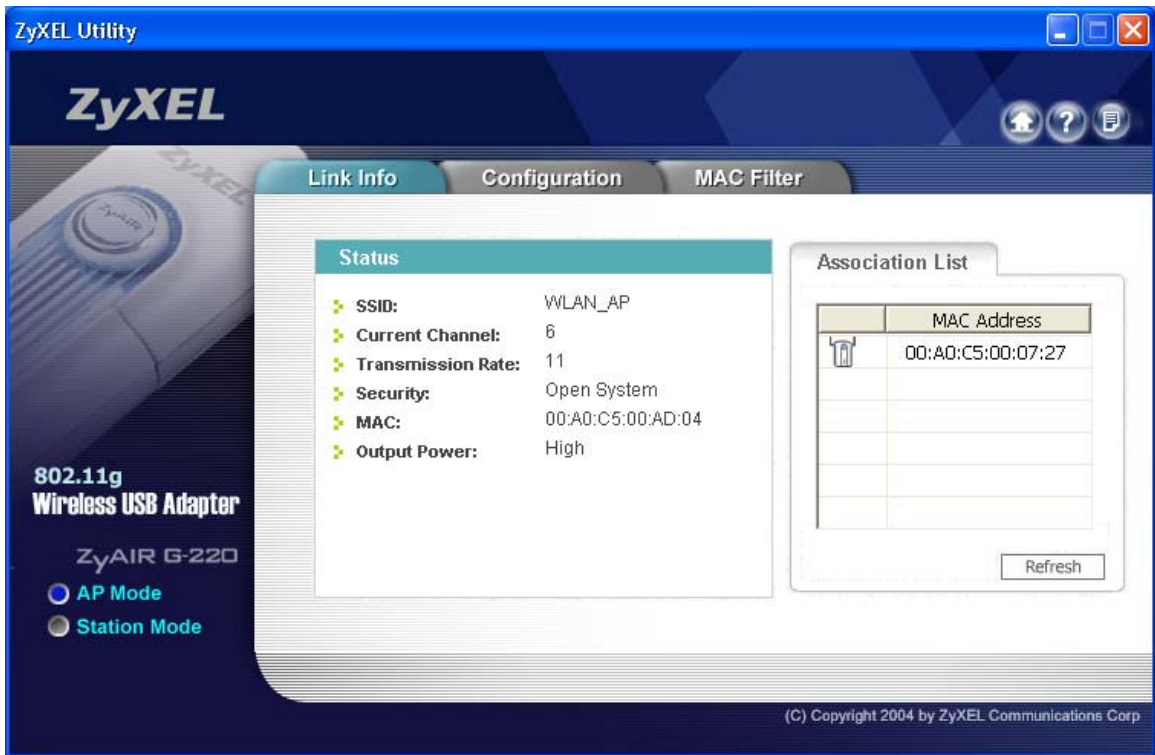






Figure 4-1 Access Point Mode: Link Info

The following table describes the labels in this screen.

Table 4-1 Access Point Mode: Link Info

LABEL	DESCRIPTION
Status	
SSID	This field displays the name that identifies your ZyAIR in the wireless LAN network.
Current Channel	This field displays the radio channel the ZyAIR is currently using.
Security	This field displays the authentication type of the ZyAIR.
MAC	This field displays the MAC address of the ZyAIR.
Output Power	This field shows the strength of the ZyAIR's antenna gain or transmission power.
Association List	

Table 4-1 Access Point Mode: Link Info

LABEL	DESCRIPTION
 or 	 denotes that the wireless device is in infrastructure mode and the wireless security is activated.  denotes that the wireless device is in infrastructure mode but the wireless security is deactivated.
MAC Address	This field displays the MAC addresses of up to 16 wireless stations that are currently connected to the ZyAIR.
Refresh	Click Refresh to update this screen.

4.3 The Configuration Screen

Click **Configuration** in the ZyXEL Utility screen to display the screen as shown.

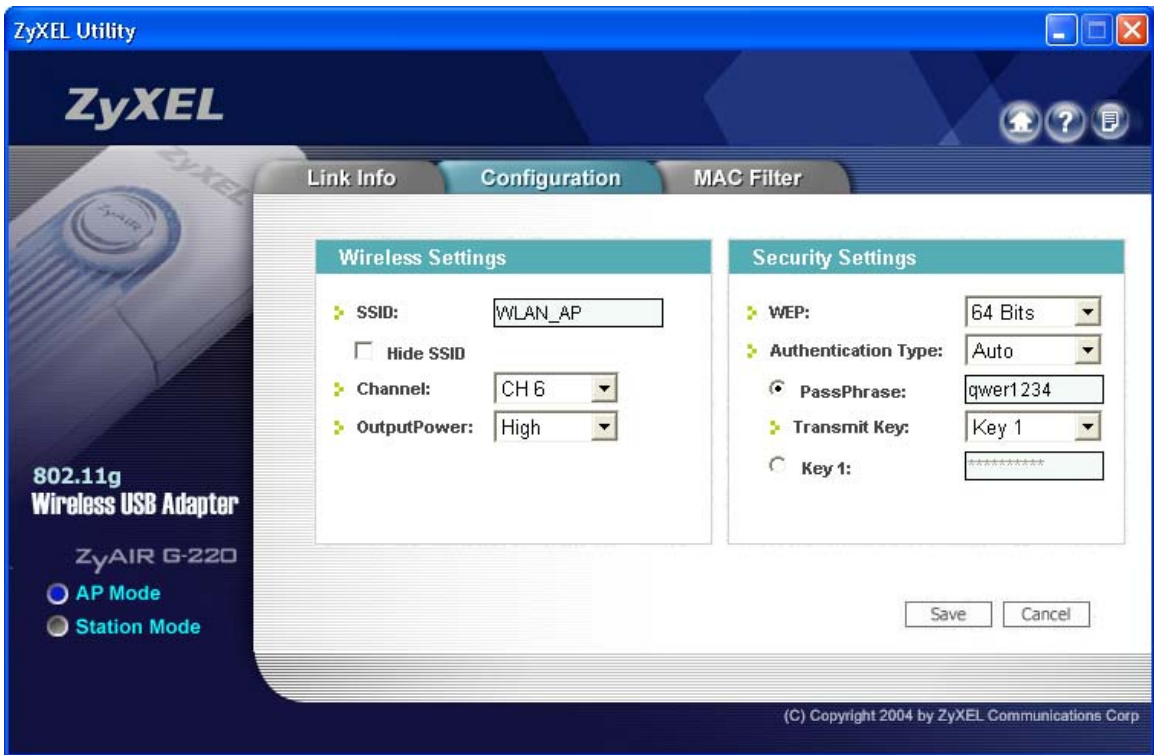


Figure 4-2 Access Point Mode: Configuration

The following table describes the labels in this screen.

Table 4-2 Access Point Mode: Configuration

LABEL	DESCRIPTION
Wireless Settings	
SSID	The SSID identifies the Service Set to which a wireless station is associated. Wireless stations associating to the access point (the ZyAIR) must have the same SSID. Enter a descriptive name (up to 32 printable 7-bit ASCII characters) for the wireless LAN.
Hide SSID	Select this check box to hide the SSID in the outgoing beacon frame so a station cannot obtain the SSID through passive scanning using a site survey tool.
Channel	Set the operating frequency/channel depending on your geographical region.

Table 4-2 Access Point Mode: Configuration

LABEL	DESCRIPTION
OutputPower	<p>Set this field if you need to conserve power consumption (especially for notebook computers). This control changes the strength of the ZyAIR's antenna gain or transmission power. Antenna gain, measured in dBm (decibel relative units compared to milliwatts), is the increase in coverage. Higher antenna gain improves the range of the signal for better communications.</p> <p>Select High to set the ZyAIR's antenna to transmit at 17-dBm.</p> <p>Select Medium-High to set the ZyAIR's antenna to transmit at 15-dBm.</p> <p>Select Medium-Low to set the ZyAIR's antenna to transmit at 13-dBm.</p> <p>Select Low to set the ZyAIR's antenna to transmit at 11-dBm. This allows for the least power consumption.</p>
Security Settings	
WEP	<p>Select 64 Bits, 128 Bits or 256 Bits to activate WEP encryption and then fill in the related fields.</p> <p>Select Disable to deactivate the WEP encryption.</p>
Authentication Type	<p>Select an authentication method. Choices are Auto, Shared Key and Open System.</p> <p>Refer to <i>Section 2.5</i> for more information.</p>
Pass Phrase	<p>When you select the radio button, enter the passphrase. As you enter the passphrase, the ZyAIR automatically generates four different WEP key and displays it in the key field below.</p> <p>Refer to <i>Section 2.2.1</i> for more information.</p>
Transmit Key	<p>Select a default WEP key to use for data encryption. The key displays in the field below.</p>

Table 4-2 Access Point Mode: Configuration

LABEL	DESCRIPTION
Key x (where x is a number between 1 and 4)	<p>Select this option if you want to manually enter the WEP keys. Enter the WEP key in the field provided.</p> <p>If you select 64 Bits in the WEP field.</p> <ul style="list-style-type: none"> ◆ Enter either 10 hexadecimal digits in the range of “A-F”, “a-f” and “0-9” (for example, 11AA22BB33) for HEX key type <p>or</p> <ul style="list-style-type: none"> ◆ Enter 5 ASCII characters (case sensitive) ranging from “a-z”, “A-Z” and “0-9” (for example, MyKey) for ASCII key type. <p>If you select 128 Bits in the WEP field,</p> <ul style="list-style-type: none"> ◆ Enter either 26 hexadecimal digits in the range of “A-F”, “a-f” and “0-9” (for example, 00112233445566778899AABBCC) for HEX key type <p>or</p> <ul style="list-style-type: none"> ◆ Enter 13 ASCII characters (case sensitive) ranging from “a-z”, “A-Z” and “0-9” (for example, MyKey12345678) for ASCII key type. <p>If you select 256 Bits in the WEP field,</p> <ul style="list-style-type: none"> ◆ Enter either 58 hexadecimal digits in the range of “A-F”, “a-f” and “0-9” (for example, 0000111122223333444455556666777788889999AAAABBBBCCCC000011) for HEX key type <p>or</p> <ul style="list-style-type: none"> ◆ Enter 29 ASCII characters (case sensitive) ranging from “a-z”, “A-Z” and “0-9” (for example, MyKey111122223333444455556678) for ASCII key type. <div style="border: 1px solid black; background-color: #e0e0e0; padding: 5px; text-align: center;"> <p>The values for the WEP keys must be set up exactly the same on all wireless devices in the same wireless LAN.</p> <p>ASCII WEP keys are case sensitive.</p> </div>
Save	Click Save to save changes.
Cancel	Click Cancel to discard changes.

4.4 The MAC Filter Screen

The **MAC Filter** screen allows you to configure the ZyAIR to give exclusive access to (Accept) devices or exclude devices from (Reject) connecting to the ZyAIR. Every Ethernet device has a unique MAC (Media Access Control) address. The MAC address is assigned at the factory and consists of six pairs of

hexadecimal characters, for example, 00:A0:C5:00:00:02. You need to know the MAC address of the device(s) to configure this screen.

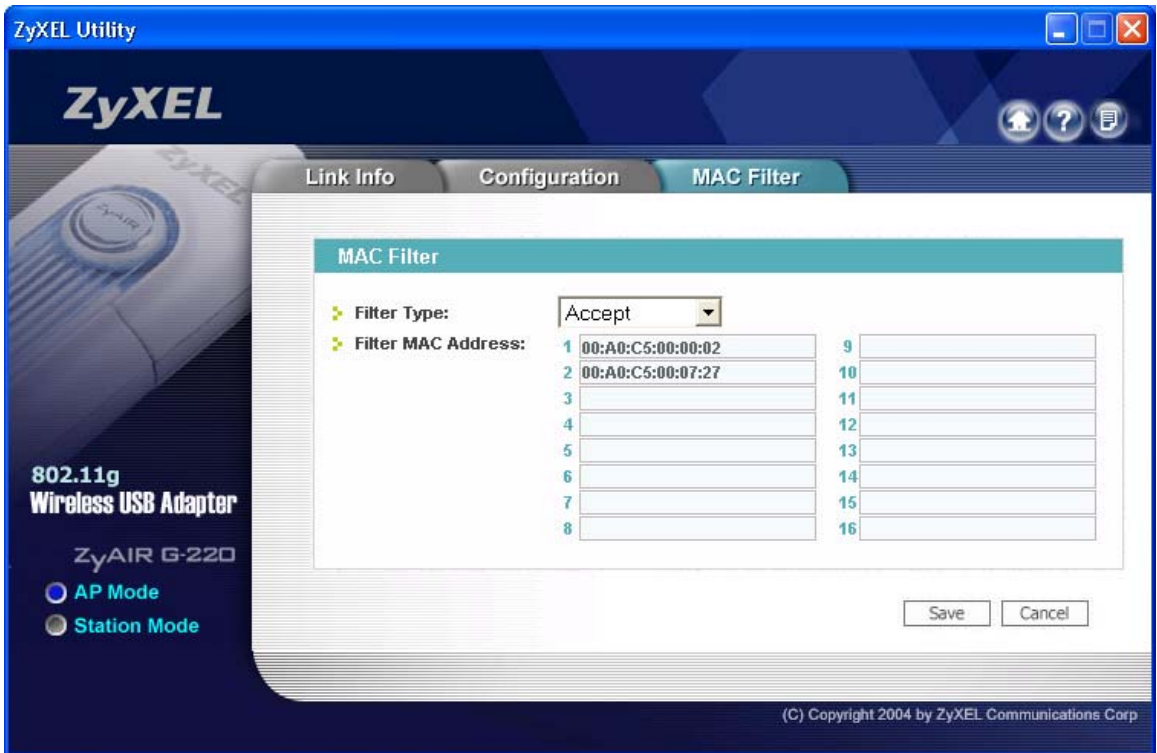


Figure 4-3 Access Point Mode: MAC Filter

The following table describes the labels in this screen.

Table 4-3 Access Point Mode: MAC Filter

LABEL	DESCRIPTION
Filter Type	Define the filter action for the list of MAC addresses in the MAC address filter table. Select Disable to deactivate the MAC filter feature. Select Reject to block access to the ZyAIR, MAC addresses not listed will be allowed to access the ZyAIR. Select Accept to permit access to the ZyAIR, MAC addresses not listed will be denied access to the ZyAIR.
Filter MAC Address	

Table 4-3 Access Point Mode: MAC Filter

LABEL	DESCRIPTION
1-16	<p>Specify the MAC address(es) of the wireless station(s) that is allowed or denied association to the ZyAIR.</p> <p>Enter six pairs of hexadecimal digits (separated by colons) in the range of "A-F", "a-f" and "0-9" (for example, 00:A0:C5:00:00:02).</p> <p>If you enter an invalid MAC address, once you click Save to save the values, a warning screen will be displayed.</p>
Save	Click Save to save the changes back to the ZyAIR.
Cancel	Click Cancel to discard changes.

Chapter 5

Maintenance

This chapter describes how to uninstall or upgrade the ZyXEL Utility.

5.1 The About Screen


The **About** screen displays related version numbers of the ZyAIR. To display the screen as shown next, click the about () button.



Figure 5-1 About

The following table describes the read-only fields in this screen.

Table 5-1 About

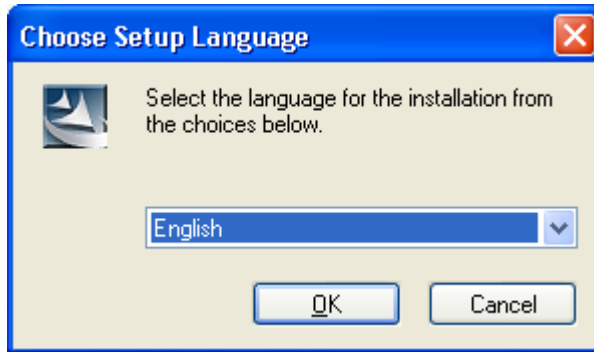
LABEL	DESCRIPTION
Driver Version	This field displays the version number of the ZyAIR driver.
Utility Version	This field displays the version number of the ZyXEL Utility.

5.2 Uninstalling the ZyXEL Utility

Follow the steps below to remove (or uninstall) the ZyXEL Utility from your computer.

Step 1. Click **Start, Programs, ZyAIR G-220 Utility, Uninstall ZyAIR G-220 Utility**.

Step 2. Click **OK** to continue.



Step 3. When prompted, click **OK** to remove the driver and the utility software.

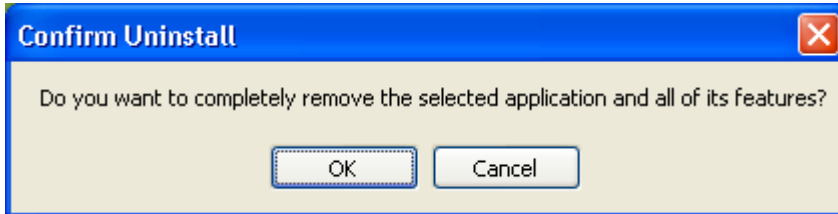


Figure 5-2 Confirm Uninstall

Step 4. Restart your computer if prompted. Click **Finish** to complete uninstalling the software.

5.3 Upgrading the ZyXEL Utility

Before you uninstall the ZyXEL Utility, take note of the current network configuration.

To perform the upgrade, follow the steps below.

Step 1. Download the latest version of the utility from the ZyXEL web site and save the file on your computer.

Step 2. Follow the steps in *Section 5.2* to remove the current ZyXEL Utility from your computer.

Step 3. Restart your computer when prompted.

Step 4. After restarting, refer to the procedure in the *Quick Installation Guide* to install the new utility.

Step 5. Check the version numbers in the **About** screen to make sure the new utility is installed properly.

Chapter 6

Troubleshooting

This chapter covers potential problems and the possible remedies. After each problem description, some instructions are provided to help you to diagnose and to solve the problem.

6.1 Problems Starting the ZyXEL Utility Program

Table 6-1 Troubleshooting Starting ZyXEL Utility Program

Cannot start the ZyXEL Wireless LAN Utility	Make sure the ZyAIR is properly inserted and the LED(s) is on. Refer to the <i>Quick Installation Guide</i> for the LED descriptions.
	Use the Device Manager to check for possible hardware conflicts. Click Start, Settings, Control Panel, System, Hardware and Device Manager . Verify the status of the ZyAIR under Network Adapter . (Steps may vary depending on the version of Windows).
	Install the ZyAIR in another computer. If the error persists, you may have a hardware problem. In this case, you should contact your local vendor.
Cannot change to Access Point mode	If you use the Windows XP configuration tool and the ZyXEL Utility to configure the ZyAIR at the same time, the ZyAIR automatically operates in wireless station mode. You need to disable the Windows XP configuration tool to change between the modes using the ZyXEL Utility (refer to the <i>Section 1.4</i> for more information).

6.2 Problem Connecting to an Access Point

Table 6-2 Troubleshooting Access Point Connection Problem

PROBLEM	CORRECTIVE ACTION
When using the Windows XP configuration tool, cannot scan for or connect to any access points.	The ZyAIR might still be operating in access point mode. This results when you set the ZyAIR to operate in access point mode using the ZyXEL Utility, close the ZyXEL Utility and then use the Windows XP configuration tool. Before you use the Windows XP configuration tool, make sure you set the ZyAIR to operate in station mode before you close and exit the ZyXEL Utility.

6.3 Problem with the Link Status

Table 6-3 Troubleshooting Link Quality

PROBLEM	CORRECTIVE ACTION
The link quality and/or signal strength is poor all the time.	<p>Search and connect to another AP with a better link quality using the Site Survey screen.</p> <p>Move your computer closer to the AP or the peer computer(s) within the transmission range.</p> <p>There may be too much radio interference (for example microwave or another AP using the same channel) around your wireless network. Relocate or reduce the radio interference.</p>

6.4 Problems Communicating With Other Computers

Table 6-4 Troubleshooting Communication Problems

PROBLEM	CORRECTIVE ACTION
In wireless station mode, the computer with the ZyAIR installed cannot communicate with the other computer(s).	
A. Infrastructure	<p>Make sure that the AP and the associated computers are turned on and working properly.</p> <p>Make sure the ZyAIR computer and the associated AP use the same SSID.</p> <p>Change the AP and the associated wireless clients to use another radio channel if interference is high.</p> <p>Make sure that the computer and the AP share the same security option and key. Verify the settings in the Profile Security Settings screen.</p>
B. Ad-Hoc (IBSS)	<p>Verify that the peer computer(s) is turned on.</p> <p>Make sure the ZyAIR computer and the peer computer(s) are using the same SS ID and channel.</p> <p>Make sure that the computer and the peer computer(s) share the same security option and key.</p> <p>Change the wireless clients to use another radio channel if interference is high.</p>

Table 6-4 Troubleshooting Communication Problems

PROBLEM	CORRECTIVE ACTION
In access point mode, the wireless station(s) cannot associate to the ZyAIR.	Verify that the computer with the ZyAIR installed is turned on. Make sure the wireless station(s) uses the same SSID as the ZyAIR. Make sure the wireless station(s) uses the same security option and/or WEP keys. Verify that the wireless station(s) is not blocked in the MAC Filter screen.

Appendix A

Product Specifications

PHYSICAL SPECIFICATIONS	
Product Name	ZyAIR G-220 802.11g Wireless USB Adapter
Interface	USB Ver. 2.0 compatible
Standards	IEEE 802.11b IEEE 802.11g
Network Architectures	Infrastructure Ad-Hoc
Operating Frequencies	2.412-2.484GHz
Operating Channels	IEEE 802.11b: 11 Channels (North America) IEEE 802.11g: 11 Channels (North America) IEEE 802.11b: 13 Channels (Europe) IEEE 802.11g: 13 Channels (Europe)
Data Rate	IEEE 802.11b: 11, 5.5, 2, 1Mbps IEEE 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps
Modulation	IEEE 802.11g: Orthogonal Frequency Division Multiplexing (64QAM, 16QAM, QPSK and BPSK) IEEE 802.11b: PBCC, Direct Sequence Spread Spectrum (CCK, DQPSK, DBPSK).
Security	64/128/256-bit WEP
Operating Temperature	0 ~ 50 degrees Centigrade
Storage Temperature	-30 ~ 60 degrees Centigrade
Operating Humidity	20 ~ 95% (non-condensing)
Storage Humidity	20 ~ 95% (non-condensing)
Power Consumption	IEEE 802.11g: TX: 450mA RX: 345mA IEEE 802.11b: TX: 450mA RX: 345mA
Voltage	5V
Weight	25.8 g

Dimension	(W) 95 mm × (D) 30 mm × (H) 16 mm
------------------	-----------------------------------

RADIO SPECIFICATIONS	
Media Access Protocol	IEEE 802.11
Frequency	2.4 ~ 2.484GHz (Industrial Scientific Medical Band)
Channels	1~11 Channels (USA, Canada) 1~13 Channels (Europe)
Data Rate	802.11g (OFDM): 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps
Modulation	802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps (OFDM) 802.11b: 11, 5.5 Mbps (CCK), 2 Mbps (DQPSK), 1 Mbps (DBPSK)
Output Power	17 dBm (typical) at 11Mbps CCK, QPSK, BPSK 15 dBm (typical) at 54Mbps OFDM
RX Sensitivity	802.11g (OFDM): 54 Mbps: < -72 dBm 802.11b (CCK): 11 Mbps: < -85 dBm

SOFTWARE SPECIFICATIONS	
Device Drivers	Microsoft Windows 98(SE), Windows 2000, Windows XP, Windows ME
Roaming	802.11b/g compliant
WEP	Supports 64-bit, 128-bit and 256-bit encryption

ENVIRONMENTAL SPECIFICATIONS	
Temperature	Operating: 0° ~ 50° C Storage: -30° ~ 60° C
Relative Humidity	20% to 95% (non-condensing)

Appendix B

Setting up Your Computer's IP Address

All computers must have a 10M or 100M Ethernet adapter card and TCP/IP installed.

Windows 95/98/Me/NT/2000/XP, Macintosh OS 7 and later operating systems and all versions of UNIX/LINUX include the software components you need to install and use TCP/IP on your computer. Windows 3.1 requires the purchase of a third-party TCP/IP application package.

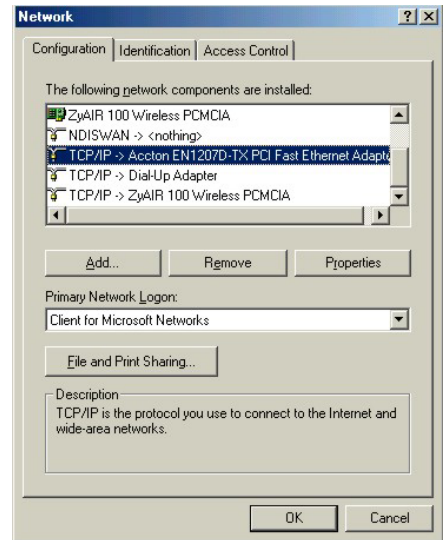
TCP/IP should already be installed on computers using Windows NT/2000/XP, Macintosh OS 7 and later operating systems.

After the appropriate TCP/IP components are installed, configure the TCP/IP settings in order to "communicate" with your network.

If you manually assign IP information instead of using dynamic assignment, make sure that your computers have IP addresses that place them in the same subnet as the ZyAIR.

Windows 95/98/Me

Click **Start**, **Settings**, **Control Panel** and double-click the **Network** icon to open the **Network** window.



The **Network** window **Configuration** tab displays a list of installed components. You need a network adapter, the TCP/IP protocol and Client for Microsoft Networks.

If you need the adapter:

- a. In the **Network** window, click **Add**.

- b. Select **Adapter** and then click **Add**.
- c. Select the manufacturer and model of your network adapter and then click **OK**.

If you need TCP/IP:

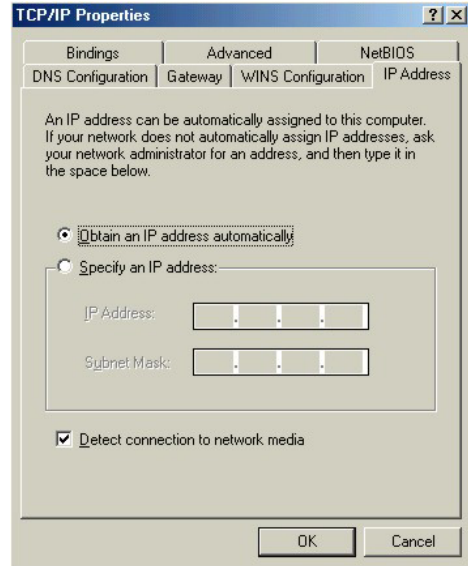
- a. In the **Network** window, click **Add**.
- b. Select **Protocol** and then click **Add**.
- c. Select **Microsoft** from the list of **manufacturers**.
- d. Select **TCP/IP** from the list of network protocols and then click **OK**.

If you need Client for Microsoft Networks:

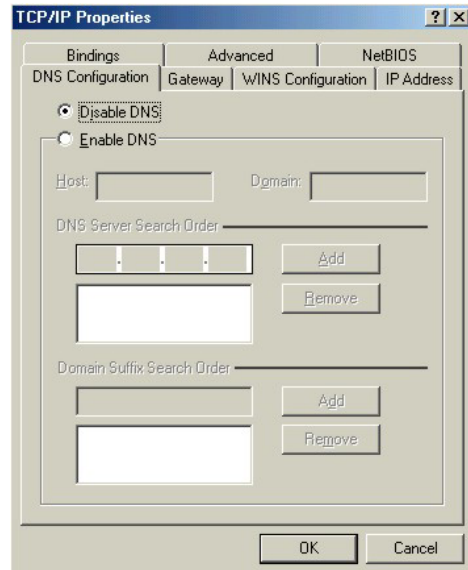
- a. Click **Add**.
- b. Select **Client** and then click **Add**.
- c. Select **Microsoft** from the list of manufacturers.
- d. Select **Client for Microsoft Networks** from the list of network clients and then click **OK**.
- e. Restart your computer so the changes you made take effect.

In the **Network** window **Configuration** tab, select your network adapter's TCP/IP entry and click **Properties**.

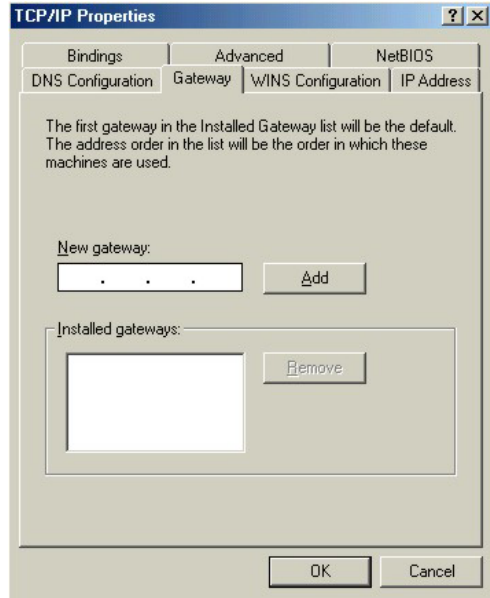
1. Click the **IP Address** tab.
 - If your IP address is dynamic, select **Obtain an IP address automatically**.
 - If you have a static IP address, select **Specify an IP address** and type your information into the **IP Address** and **Subnet Mask** fields.



2. Click the **DNS Configuration** tab.
 - If you do not know your DNS information, select **Disable DNS**.
 - If you know your DNS information, select **Enable DNS** and type the information in the fields below (you may not need to fill them all in).



3. Click the **Gateway** tab.
 - If you do not know your gateway's IP address, remove previously installed gateways.
 - If you have a gateway IP address, type it in the **New gateway field** and click **Add**.



4. Click **OK** to save and close the **TCP/IP Properties** window.
5. Click **OK** to close the **Network** window. Insert the Windows CD if prompted.
6. Restart your computer when prompted.

Verifying Your Computer's IP Address

1. Click **Start** and then **Run**.
2. In the **Run** window, type "winipcfg" and then click **OK** to open the **IP Configuration** window.
3. Select your network adapter. You should see your computer's IP address, subnet mask and default gateway.

Windows 2000/NT/XP

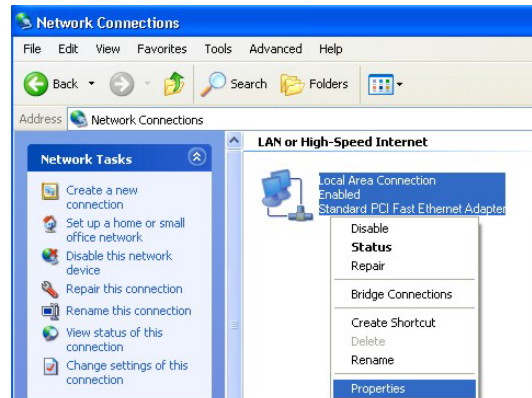
1. For Windows XP, click **start, Control Panel**. In Windows 2000/NT, click **Start, Settings, Control Panel**.



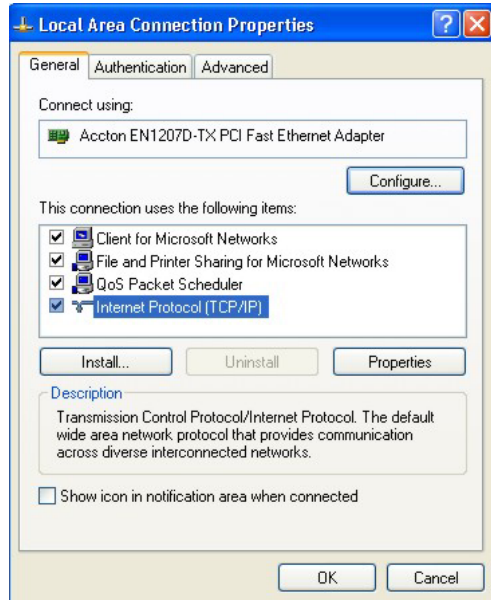
2. For Windows XP, click **Network Connections**. For Windows 2000/NT, click **Network and Dial-up Connections**.



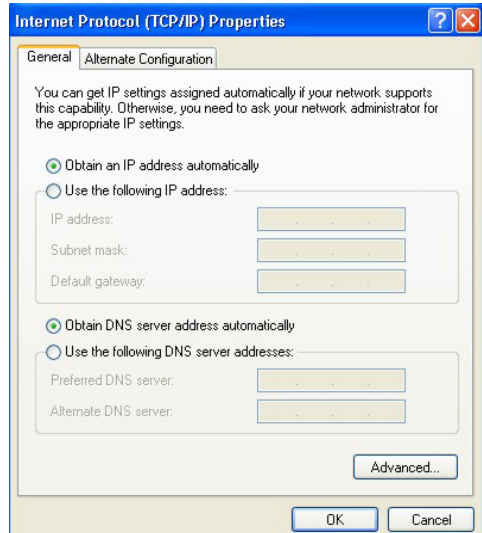
3. Right-click **Local Area Connection** and then click **Properties**.



4. Select **Internet Protocol (TCP/IP)** (under the **General** tab in Win XP) and click **Properties**.



5. The **Internet Protocol TCP/IP Properties** window opens (the **General** tab in Windows XP).
 - If you have a dynamic IP address click **Obtain an IP address automatically**.
 - If you have a static IP address click **Use the following IP Address** and fill in the **IP address**, **Subnet mask**, and **Default gateway** fields. Click **Advanced**.



6. -If you do not know your gateway's IP address, remove any previously installed gateways in the **IP Settings** tab and click **OK**.

Do one or more of the following if you want to configure additional IP addresses:

-In the **IP Settings** tab, in IP addresses, click **Add**.

-In **TCP/IP Address**, type an IP address in **IP address** and a subnet mask in **Subnet mask**, and then click **Add**.

-Repeat the above two steps for each IP address you want to add.

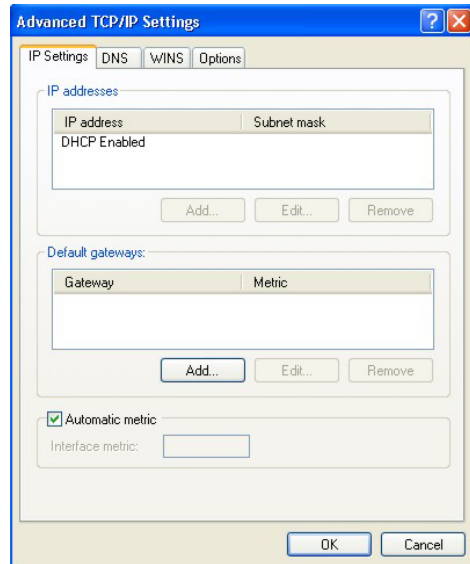
-Configure additional default gateways in the **IP Settings** tab by clicking **Add** in **Default gateways**.

-In **TCP/IP Gateway Address**, type the IP address of the default gateway in **Gateway**. To manually configure a default metric (the number of transmission hops), clear the **Automatic metric** check box and type a metric in **Metric**.

-Click **Add**.

-Repeat the previous three steps for each default gateway you want to add.

-Click **OK** when finished.

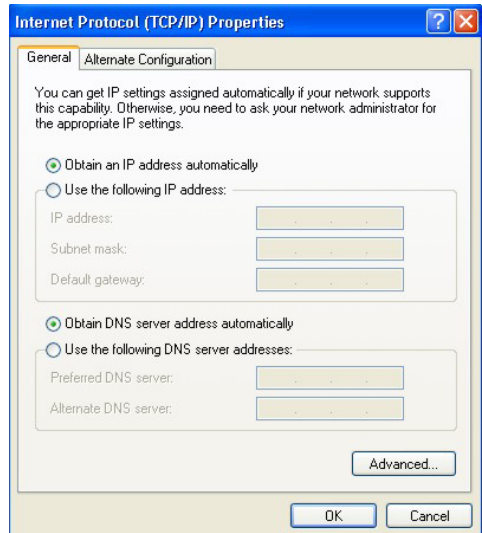


7. In the **Internet Protocol TCP/IP Properties** window (the **General** tab in Windows XP):

-Click **Obtain DNS server address automatically** if you do not know your DNS server IP address(es).

-If you know your DNS server IP address(es), click **Use the following DNS server addresses**, and type them in the **Preferred DNS server** and **Alternate DNS server** fields.

If you have previously configured DNS servers, click **Advanced** and then the **DNS** tab to order them.



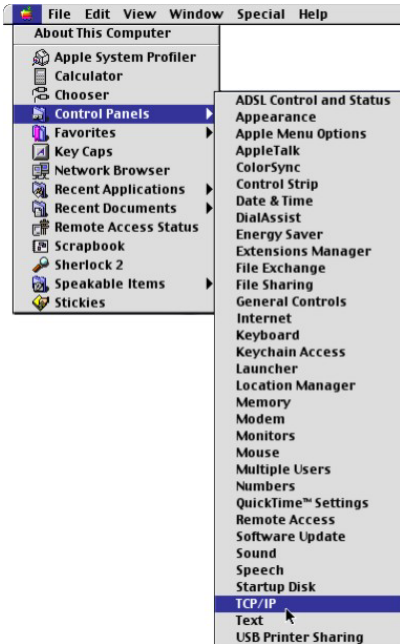
8. Click **OK** to close the **Internet Protocol (TCP/IP) Properties** window.
9. Click **OK** to close the **Local Area Connection Properties** window.
10. Restart your computer (if prompted).

Verifying Your Computer's IP Address

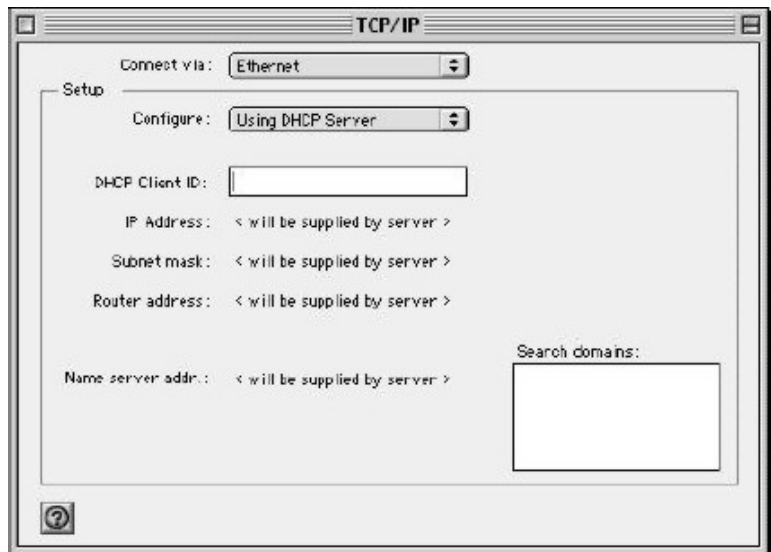
1. Click **Start, All Programs, Accessories** and then **Command Prompt**.
2. In the **Command Prompt** window, type "ipconfig" and then press [ENTER]. You can also open **Network Connections**, right-click a network connection, click **Status** and then click the **Support** tab.

Macintosh OS 8/9

1. Click the **Apple** menu, **Control Panel** and double-click **TCP/IP** to open the **TCP/IP Control Panel**.



2. Select **Ethernet** from the **Connect via** list.



3. For dynamically assigned settings, select **Using DHCP Server** from the **Configure:** list.

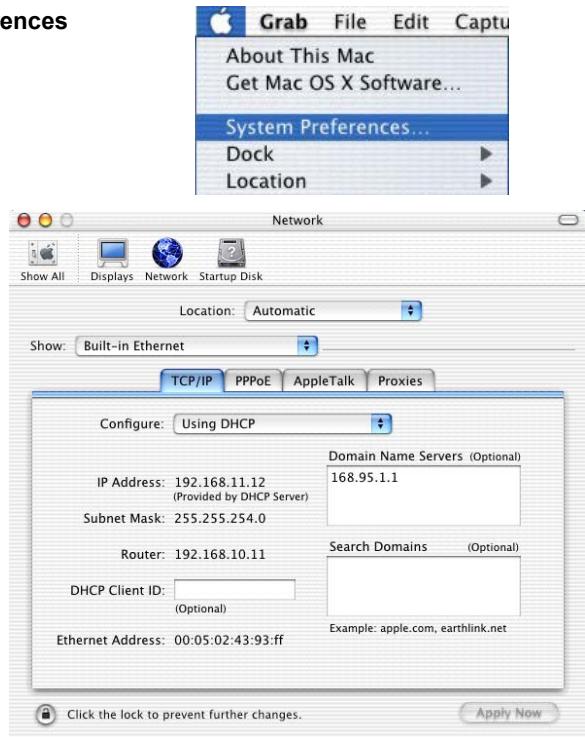
4. For statically assigned settings, do the following:
 - From the **Configure** box, select **Manually**.
 - Type your IP address in the **IP Address** box.
 - Type your subnet mask in the **Subnet mask** box.
 - Type the IP address of your ZyAIR in the **Router address** box.
5. Close the **TCP/IP Control Panel**.
6. Click **Save** if prompted, to save changes to your configuration.
7. Restart your computer (if prompted).

Verifying Your Computer's IP Address

Check your TCP/IP properties in the **TCP/IP Control Panel** window.

Macintosh OS X

1. Click the **Apple** menu, and click **System Preferences** to open the **System Preferences** window.
2. Click **Network** in the icon bar.
 - Select **Automatic** from the **Location** list.
 - Select **Built-in Ethernet** from the **Show** list.
 - Click the **TCP/IP** tab.



3. For dynamically assigned settings, select **Using DHCP** from the **Configure** list.
4. For statically assigned settings, do the following:
 - From the **Configure** box, select **Manually**.
 - Type your IP address in the **IP Address** box.
 - Type your subnet mask in the **Subnet mask** box.
 - Type the IP address of your ZyAIR in the **Router address** box.
5. Click **Apply Now** and close the window.
6. Restart your computer (if prompted).

Verifying Your Computer's IP Address

Check your TCP/IP properties in the **Network** window.

Appendix C

Access Point Mode Setup Example

This example uses the network sharing feature in Windows 2000 to bridge the wired and wireless network when you set the ZyAIR in access point (AP) mode.

Refer to *Section 4.1.1* for setup methods and requirements.

Steps may vary depending on your Windows version. You may need to install additional software in Windows 98/Me.

Configuring the Computer on Which You Install the ZyAIR

Step 1. Refer to *Section 1.6.1* to set the ZyAIR to operate in AP mode.

Step 2. Click **Start, Settings, Network and Dial-up Connections** (or click **Start, Settings, Control Panel** and double-click **Network and Dial-up Connections**).

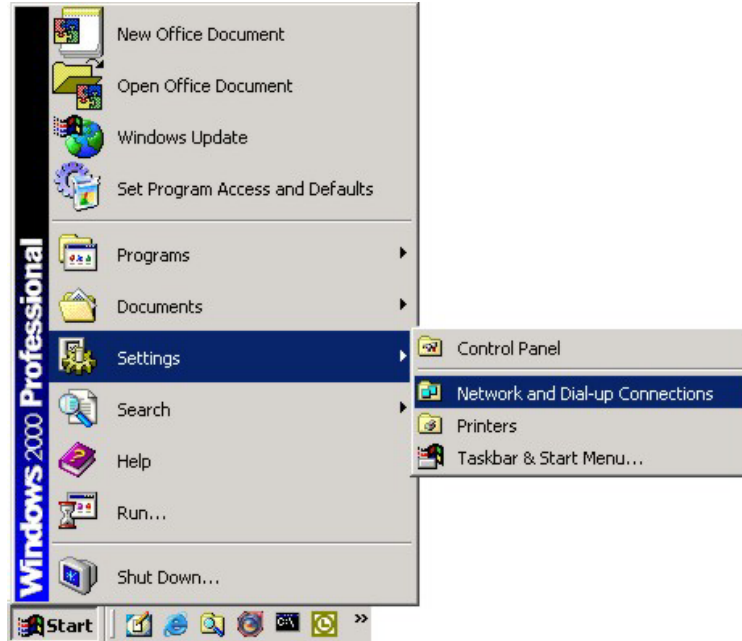


Diagram 1 Windows 2000: Start

Step 3. Right-click on the icon for your wired Ethernet adapter and click **Properties**.

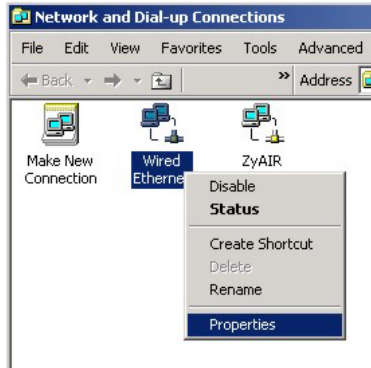


Diagram 2 Windows 2000: Network and Dial-up Connections

- Step 4.** A Properties screen displays. Click the **Sharing** tab and select **Enable Internet Connection Sharing for this connection**. Click **OK**.

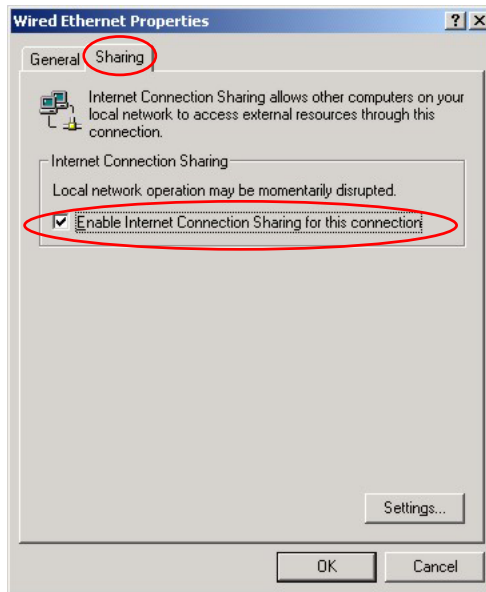


Diagram 3 Windows 2000: Network Properties

- Step 5.** A notice screen displays. Click **Yes**.

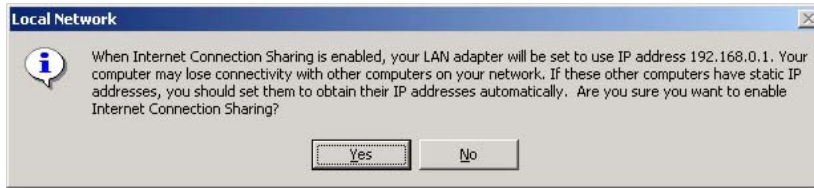


Diagram 4 Windows 2000: Local Network

Configuring the Wireless Station Computer

Refer to the *Setting Up Your Computer's IP Address* appendix to set up the wireless station computer(s) IP address.

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