

ZyAIR 200

Wireless LAN USB Adapter

User's Guide

Version 1.0.3

March, 2002

ZyXEL

TOTAL INTERNET ACCESS SOLUTION

Copyright

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Federal Communications Commission(FCC) Interference Statement

This 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.

If this equipment does cause harmful interference to radio/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 the 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.

Information for Canadian Users

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operation and safety requirements. The Industry Canada does not guarantee that the equipment will operate to a user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly. The customer should be aware that the compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

For their own protection, users should ensure that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution

Users should not attempt to make such connections themselves, but should contact the appropriate electrical inspection authority, or electrician, as appropriate.

Note

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the radio interference regulations of Industry Canada.

ZyXEL Limited Warranty

ZyXEL warrants to the original end user (purchaser) that this product is free from any defects in materials or workmanship for a period of up to two years from the date of purchase. During the warranty period and upon proof of purchase, should the product have indications of failure due to faulty workmanship and/or materials, ZyXEL will, at its discretion, repair or replace the defective products or components without charge for either parts or labor and to whatever extent it shall deem necessary to restore the product or components to proper operating condition. Any replacement will consist of a new or re-manufactured functionally equivalent product of equal value and will be solely at the discretion of ZyXEL. This warranty shall not apply if the product is modified, misused, tampered with, damaged by an act of God, or subjected to abnormal working conditions.

Note

Repair or replacement, as provided under this warranty, is the exclusive remedy of the purchaser. This warranty is in lieu of all other warranties, express or implied, including any implied warranty of merchantability or fitness for a particular use or purpose. ZyXEL shall in no event be held liable for indirect or consequential damages of any kind of character to the purchaser.

To obtain the services of this warranty, contact ZyXEL's Service Center; refer to the separate Warranty Card for your Return Material Authorization number (RMA). Products must be returned Postage Prepaid. It is recommended that the unit be insured when shipped. Any returned products without proof of purchase or those with an out-dated warranty will be repaired or replaced (at the discretion of ZyXEL) and the customer will be billed for parts and labor. All repaired or replaced products will be shipped by ZyXEL to the corresponding return address, Postage Paid (USA and territories only). If the customer desires some other return destination beyond the U.S. borders, the customer shall bear the cost of the return shipment. This warranty gives you specific legal rights and you may also have other rights that vary from state to state.



Online Registration

Do not forget to register your Prestige (fast, easy online registration at www.zyxel.com for free future product updates and information.

Customer Support

Please have the following information ready when you contact customer support.

- Product model and serial number.
- Warranty Information.
- Date that you received your device.
- Brief description of the problem and the steps you took to solve it.

METHOD LOCATION	E MAIL SUPPORT/SALES	TELEPHONE/FAX	WEB SITE/ FTP SITE	REGULAR MAIL
WORLDWIDE	support@zyxel.com.tw sales@zyxel.com.tw	+886-3-578-3942 +886-3-578-2439	www.zyxel.com www.europe.zyxel.com ftp.europe.zyxel.com	ZyXEL Communications Corp., 6 Innovation Road II, Science- Based Industrial Park, HsinChu, Taiwan 300, R.O.C.
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Preface

About Your ZyAIR 200

Congratulations on your purchase of the ZyAIR 200 Wireless LAN USB Adapter.



Online Registration

Do not forget to register your ZyAIR 200 (fast, easy online registration at www.zyxel.com) for free future product updates and information.

With a built-in Access Point and powerful routing features of the Prestige series models, you can place a wireless Prestige anywhere on a local network and create a wireless infrastructure for real-time database access, file sharing, email, printer sharing, and fast Internet access. A mobile investment saves your office construction costs, maintenance, and scalability because it's easy to add nodes. A mobile office can dramatically increase the office efficiency. The ZyAIR 200 is designed for:

- ❑ Home offices and small businesses with cable, DSL and wireless modem.
- ❑ Wireless LAN connectivity: allows you to work anywhere in the coverage area.
- ❑ Multiple office/department connections via access devices.
- ❑ E-commerce/EDI applications.

Your ZyAIR 200 is easy to install and configure.

About This User's Guide

This user's guide is designed to guide you through the hardware and software installation of your ZyAIR 200 for its various applications.

Regardless of your particular application, it is important that you follow the steps outlined in **Chapters 2** and **3**. You can then refer to the appropriate chapters of the user's guide, depending on your application.

Related Documentation

➤ Supporting Disk

More detailed information and examples can be found in our included disk (as well as on the zyxel.com web site). This disk contains information on configuring your ZyAIR 200, Application Notes and Troubleshooting.

➤ Quick Start Guide

Our Quick Start Guide is designed to help you get up and running right away. It contains a detailed easy-to-follow setup steps, default settings, handy checklists and information on setting up your network using the ZyAIR 200 utility.

- Glossary
Please refer to www.zyxel.com for an online glossary of networking terms.
- ZyXEL Web Site
The ZyXEL download library at www.zyxel.com contains additional support documentation.

Syntax Conventions

- “Type” means for you to type one or more characters and press the carriage return. “Select” or “Choose” means for you to select one predefined choices.
- Command and arrow keys are enclosed in square brackets. [ENTER] means the Enter, or carriage return key; [ESC] means the Escape key and [SPACE BAR] means the Space Bar.
- For brevity’s sake, we will use “e.g.,” as a shorthand for “for instance”, and “i.e.,” for “that is” or “in other words” throughout this manual.
- The ZyAIR 200 Wireless LAN USB Adapter may be referred to as the ZyAIR 200 or the ZyAIR in this user’s guide.

Chapter 1

Getting to Know Your ZyAIR 200

This chapter introduces the main features and applications of the ZyAIR 200.

1.1 Introduction

The ZyAIR 200 is an 11 Mbps IEEE 802.11(b) Wireless LAN USB Adapter and that has a standard USB interface integrated with wireless LAN technology. Its 11 Mbps data rate gives equivalent Ethernet speed to access corporate networks or the Internet in a wireless environment. The ZyAIR 200 gives you the mobile contenance to communicate with any 802.11 and 802.11b-compliant product, allowing you to stay connected anywhere within a coverage area.

1.2 Features of the ZyAIR 200

The following are the essential features of the ZyAIR 200.

- Supports Data Rate of 1, 2, 5.5 and 11 Mbps
- Ranges up to 800 feet in an open environment
- Supports Point-to-Point and Point-to-Multi-point Access
- Seamless connectivity to wired Ethernet and computer Network LAN
- Helps to Augment Existing Networks Quickly and Easily
- Direct Sequence Spread Spectrum (DSSS) technology provides robust, interference-resistant and secure wireless connections
- Wireless connectivity minus the cost of cabling
- Supports, Windows 98/ME/2000/XP
- Supports Plug and Play
- Supports high security WEP encryption (64-bit and 128-bit)
- Ease of installation
- Flexibility and mobility to locate or move networked computers

1.3 Applications

The ZyAIR offers fast, reliable and cost-effective solutions for wireless networks. They include:

- Remote Access to Corporate Network Information
For email, file transfer and terminal emulation access.
- Difficult to Wire Environments
For use in historical or old buildings, asbestos installations and open areas where wiring is impossible to deploy.
- Frequently Changing Environments
For retailers, manufacturers and those who frequently rearrange the workplace or change location.
- Temporary LANs for Special Projects or During Peak Time
For trade shows, exhibitions and construction sites where a temporary network is required. For retailers, airline and shipping companies who need additional workstations during peak periods. For auditors requiring workgroups at customer sites.
- Access to Database for Mobile Users
Doctors, nurses, retailers who need to access their databases on the move in a hospital, retail store, office or campus.
- SOHO (Small Office and Home Office) Users
SOHO users who need easy and quick installation of a small computer network.
- High Security Connection
Flexible, secure and quick installations.

Chapter 2

Hardware Installation

This chapter shows you how to install the hardware.

2.1 System Requirements

- USB port
- Windows 98/ME/2000/XP Operating System.
- 500 Kbytes free hard disk space (minimum) for driver and utility program installation.

2.2 Installing the ZyAIR 200

Follow the procedure shown next to install the ZyAIR 200. Please also see the **Appendices** for important safety instructions.

- Step 1.** Locate available USB port on your computer or USB hub that is connected to your computer.
- Step 2.** With the ZyAIR 200 adapter's USB cable, connect to USB port.
- Step 3.** Go to the next chapter for more instructions on installing the driver.

Chapter 3

Software Installation

This chapter shows you how to install the ZyAIR 200 driver for Windows® 98/ME/2000/XP Operating Systems.

3.1 Windows 98/ME Setup

- Step 1.** Connect the ZyAIR 200 to a USB port to your computer. Windows will auto-detect the ZyAIR 200 and Windows Wizard will display a **New Hardware Found** screen. Click **Next**



- Step 2.** Select **Search for the best driver for your device (Recommended)** and then click **Next**.



Step 3. Insert the Support CD-ROM into the CD-ROM drive and specify the location of the driver, then click **Next**.



Step 4. Click **Next** to continue.



Step 5. Click **Finish**.



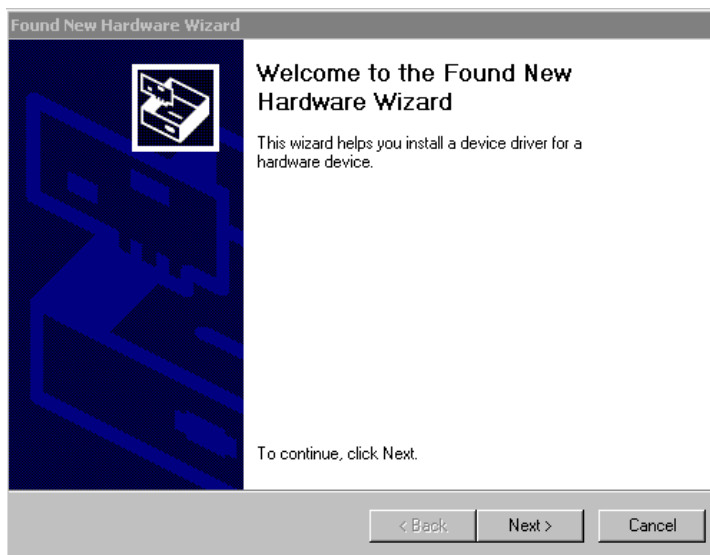
Step 6. Click **Yes** to restart your computer.



Step 7. Click **Start**, then **Control Panel**, **System** and then the **Device Manager** tab. Double-click **Network Adapters**. If no error icon appears, then your ZyAIR 200 has been successfully installed. Locate the ZyAIR 200 icon. If you see an error message, then refer to the **Troubleshooting** section.

3.2 Windows 2000 Setup

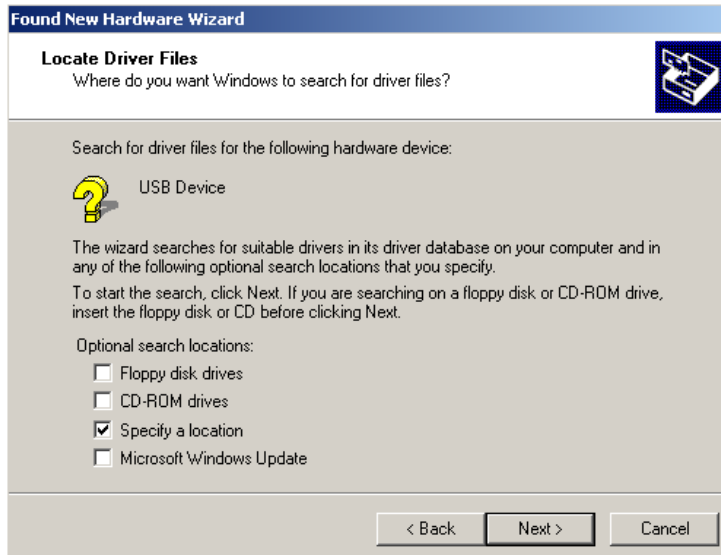
Step 1. Connect the ZyAIR 200 to a USB port to your computer. Windows will auto-detect the ZyAIR 200 and displays **Found New Hardware** dialog box .



Step 2. Select **Search for a suitable driver for my device(recommended)** and click **Next**.



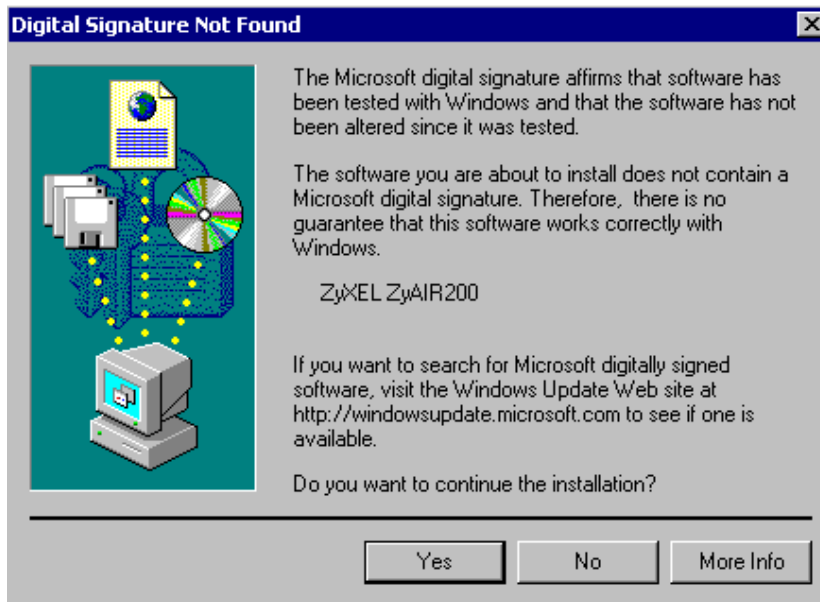
Step 3. Insert the Support CD-ROM to the appropriate drive and click **Next**.



Step 4. Windows will find a USB driver. Click **Next**.

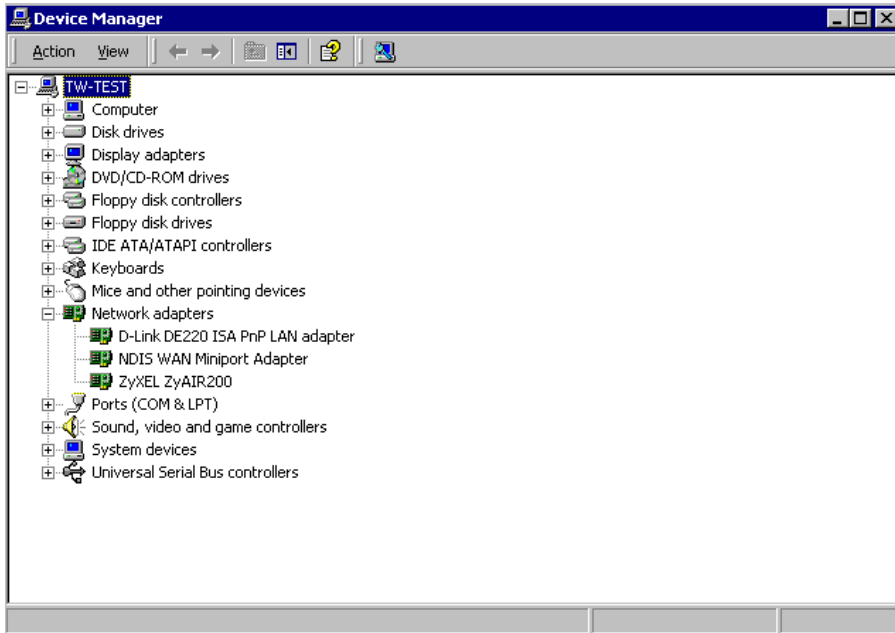


Step 5. IF you encounter the following warning scree, click **Yes** to continue.



Step 6. Click **Finish** and **Yes** to restart your computer.

Step 7. Click **Start, Control Panel, Systems** and then click **Device Manager**. Click **Network Adapter**. Locate the ZyAIR 200 icon. If no error icon appears, your ZyAIR 200 is working.

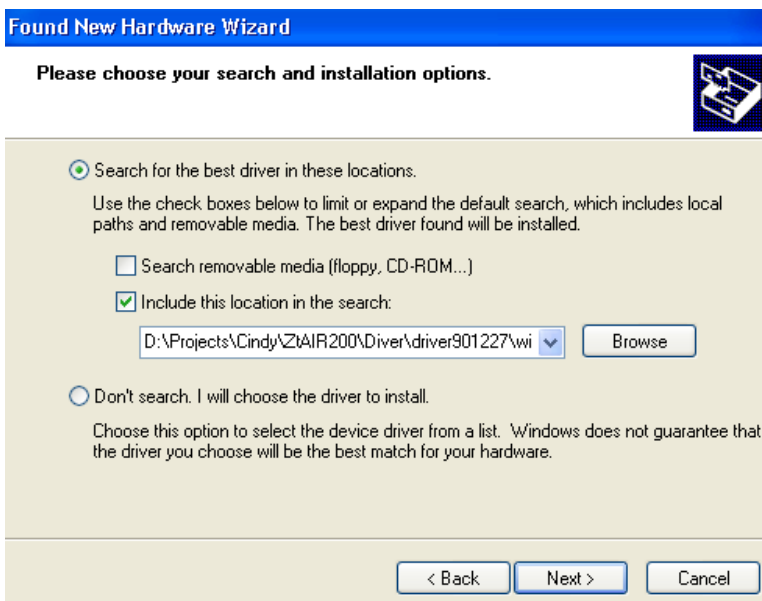


3.3 Windows XP Setup

Step 1. Connect the ZyAIR 200 to a USB port to your computer. Windows XP will auto-detect the ZyAIR 200 and displays the **Found New Hardware Wizard** dialogue. Select **Install from a list or specific (Advanced)** and click **Next**.



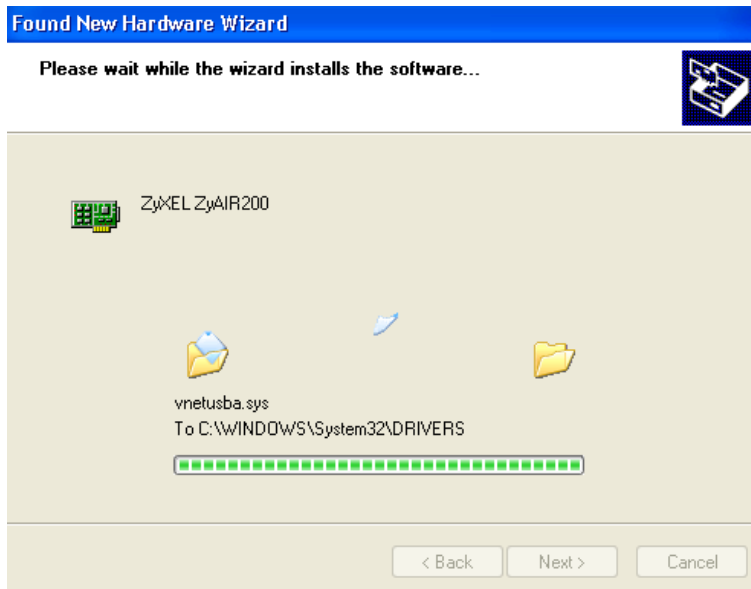
Step 2. Insert the Support CD-ROM into CD-ROM drive. Specify the location of the driver. Click **Next**.



Step 3. If you encounter the following warning screen, click **Continue Anyway** .

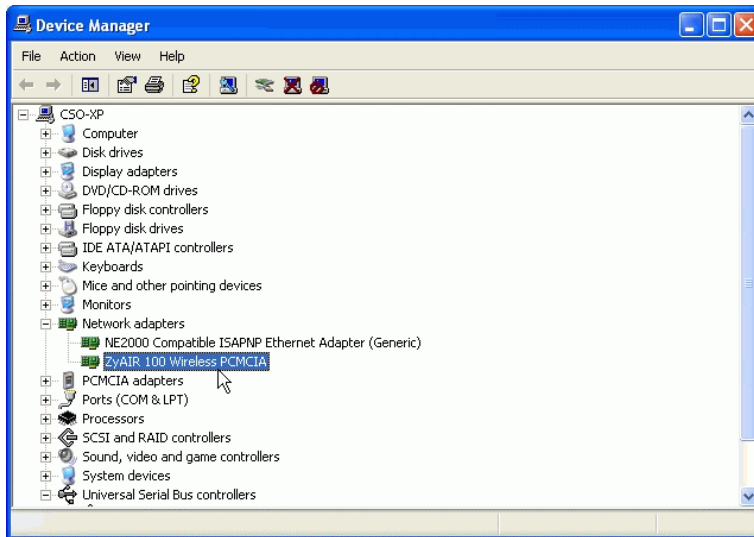


Step 4. Windows will find the ZyAIR 200 driver and copy corresponding files onto your computer. Click **Next**.



Step 5. Click **Finish**.

Step 6. Click **Start, Control Panel, Performance and Maintenance (in category view), System, Hardware, Device Manager**. Locate the ZyAIR 200 icon. Click **Network Adapters**. If no error icon appears, your ZyAIR 200 is working.



3.4 Software Installation Complete

Well Done! You have successfully installed and set up your ZyAIR 200 to operate on your computer.

Chapter 4

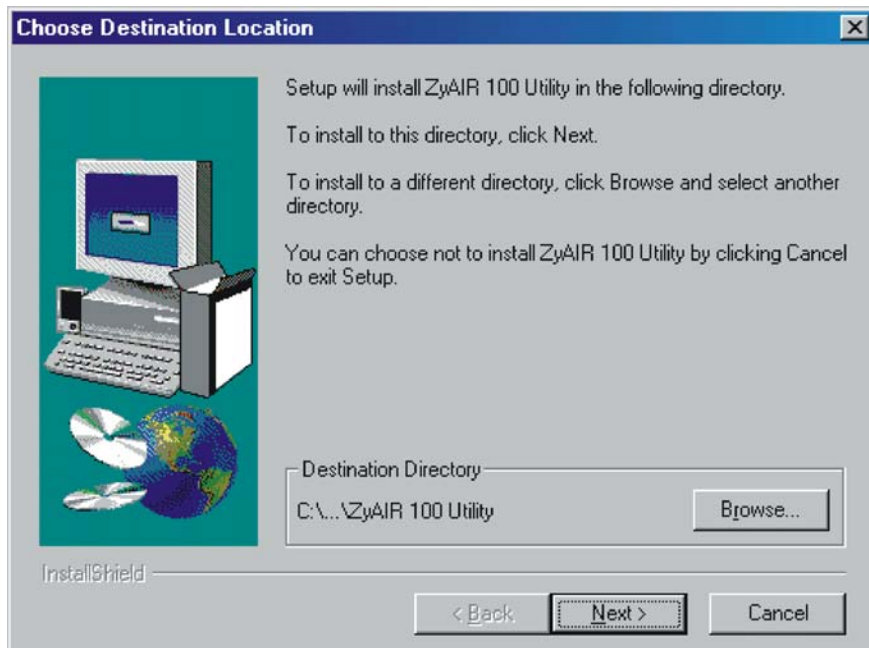
Utility Setup and Configuration

This chapter shows you how to install utility for ZyAIR 200.

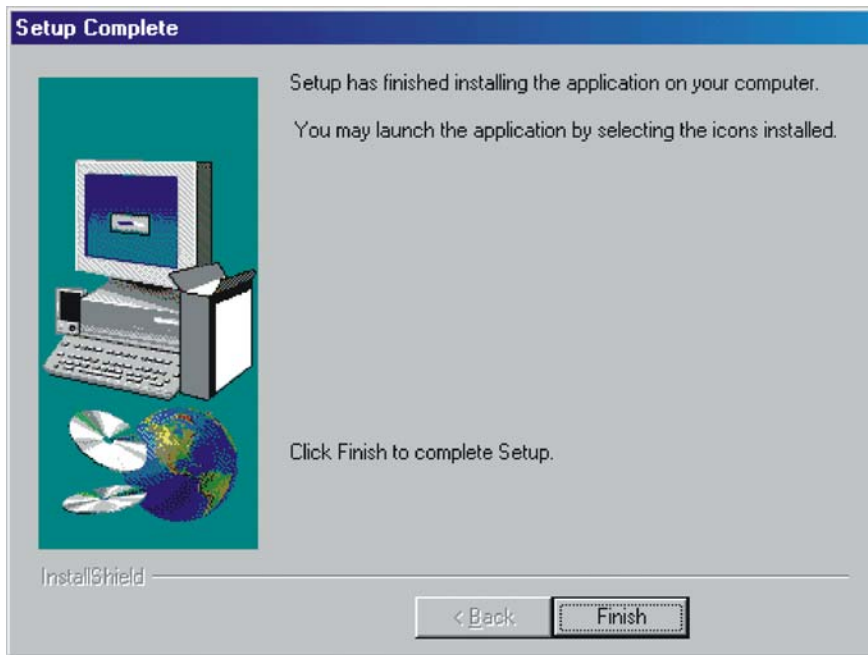
4.1 Utility Setup

Screen shots will vary depending on your version of Windows.

- Step 1.** Insert the Support CD-ROM into your CD-ROM drive and run the **setup.exe** file. Follow the on-screen instructions.



- Step 2.** Click **Finish** to complete the utility installation.



Step 3. Proceed to the next section to configure your ZyAIR 200.

4.2 Utility Configuration

Your ZyAIR 200 is Plug-and-Play and its default settings can be set for a typical infrastructure wireless LAN. Simply install the ZyAIR 200 onto your computer and it is ready for use. In special circumstances however, you may need to change configuration settings depending on how you want to manage your wireless network. The **ZyAIR 200 Utility** enables you to make configuration changes and perform user-level diagnostics.

Step 1. To run the utility for the first time, click **Start** and then **Programs**. Run the **ZyAIR 200 Utility**. The icon for the ZyAIR 200 appears in the system tray.

Step 2. The utility window will display as shown next.

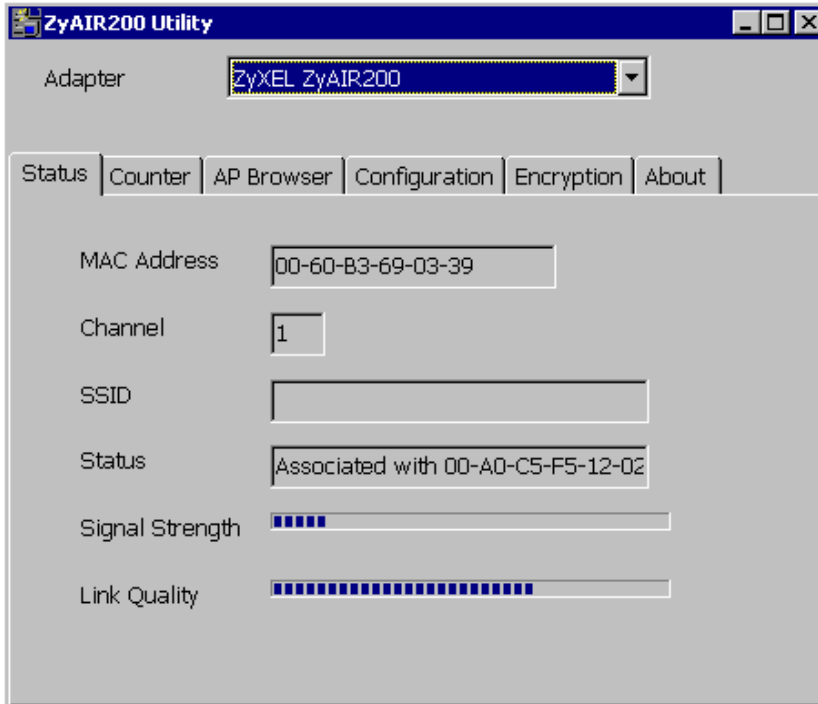


Figure 4-1 Utility – Status

4.2.1 Utility Screen

Configure and monitor your ZyAIR 200 using the following utilities: **Status, Counter, AP Browser, Configuration, Encryption and About.**

4.2.2 Status

The **Status** window displays the current state of your ZyAIR 200.

Table 4-1 Utility -Status Screen Menu Fields

FIELD	DESCRIPTION
MAC Address	Unique hardware identification number found on the bottom of your ZyAIR 200

FIELD	DESCRIPTION
Channel	Displays the current channel that your ZyAIR 200 is using.
SSID	Shows the SSID of the Access Point your ZyAIR 200 is associated with.
Status	Displays the MAC address of the Access Point your ZyAIR 200 is associated with
Signal Strength	This bar graph displays the signal strength as reported by the radio, averaged over all frames that are received from the Access Point
Link Quality	Monitors the quality of the data transmission between your ZyAIR 200 and an Access Point.

4.2.3 Counter

Statistical information on instantaneous wireless receive and transmit throughput in bytes per second is displayed.

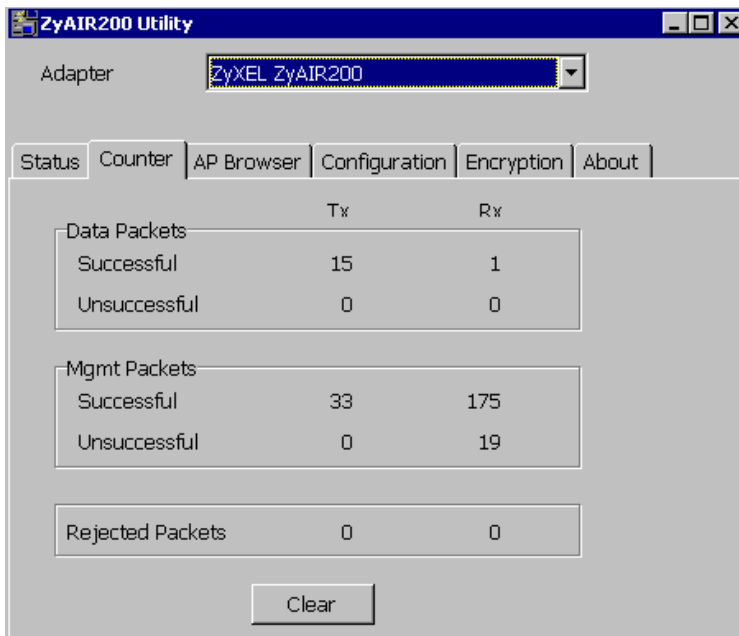


Figure 4-2 Utility – Counter

4.2.4 AP Browser

The following table explains the status/statistical information found in the **Access Point Browser** screen. Double-click on an Access Point to join.

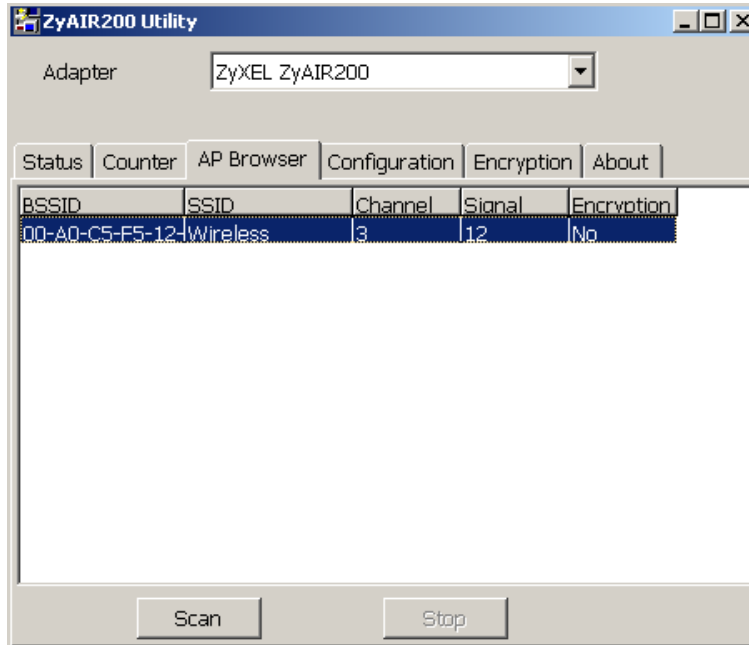


Figure 4-3 Utility – AP Browser

The following table explains the status/statistical information found in the **Access Point Browser** screen.

Table 4-2 Utility – Access Point Browser Screen Menu Fields

ITEM	DESCRIPTION
SS_ID	The SS ID (Service Set ID or MAC address) of the Access Point.
BSS_ID	The BSS ID (Basic Service Set ID) of the Access Point.
Channel	The operating channel of the respective Access Point.
Capability	When communicating with any Access Point, it will display BSS . This means that the Access Point is in the Infrastructure mode. When the device is in Ad-hoc mode, no information appears in this column.

ITEM	DESCRIPTION
Signal	The signal level is in the range of 27 to 154 . A high number indicates a strong signal. This information is for technician's use only.
Noise	This measures the actual amount of noise within your area. There may be situations where you are close to your Access Point but your signal is low. This may indicate a high noise level. This information is for technician's use only.
Rates	The data rates that ZyAIR 100 supports.

4.2.5 Configuration

The Configuration menu allows you to view and modify the current configurations of your ZyAIR 200 easily and quickly. The configuration settings include: **SS ID, Network Type, Tx(Transmission) Rate, Preamble Type, RTS/CTS Threshold, and Fragmentation Threshold.**

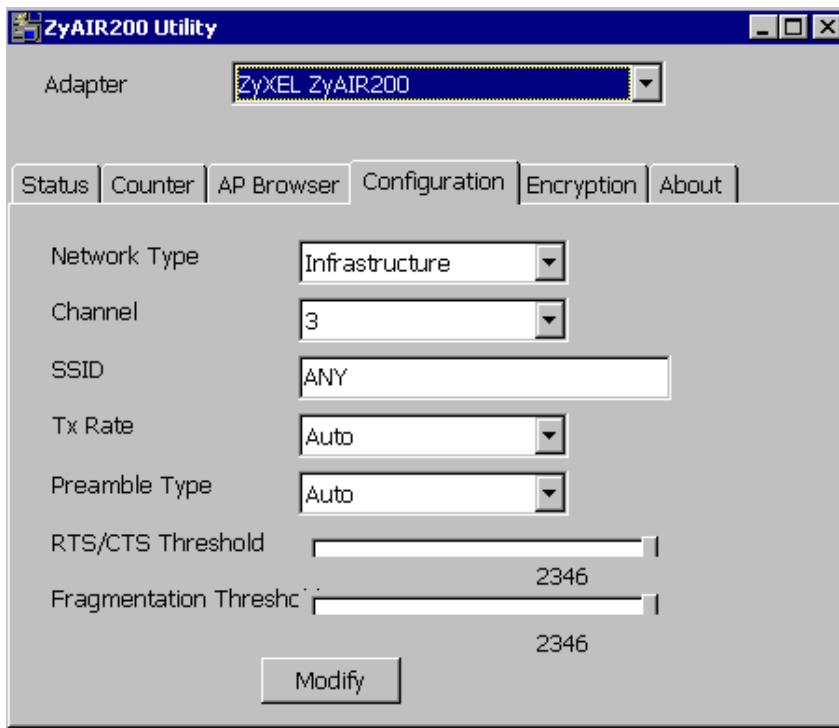


Figure 4-4 Utility – Configuration

Network Type

To connect your wireless station to a local network infrastructure, set the station operation mode to **Infrastructure (with Access Point)** as default setting). In case you do not wish to connect to a network infrastructure, but prefer to set up a small wireless workgroup, you can enable the **Ad-hoc (without Access Point)**. When the Ad-hoc mode is selected, be sure to set your wireless stations with the same channel.

ZyAIR 200 works with any IEEE 802.11 and 802.11(b)-compliant Access Points.

Channel

Channel allows you to choose the radio channels depending on your geographical area. When your **Network Type** is set to **Ad-Hoc** mode, be sure to select your wireless computer with the **same** channel.

SSID

The SSID is a unique ID given to the Access Point. Wireless clients associating to any Access Point must have the same SSID. Select **SSID** and enter a specific SSID (Access Point) you desire to connect with. Alternatively, you may enter **ANY** (default setting). This allows your wireless adapter to automatically associate to any Access Point that gives the fastest response. It is recommended that you select the **SSID** option. This will prevent your computer from accidentally connecting to a different wireless network.

Tx(Transmission) Rate

ZyAIR 200 provides various transmission (data) rate options for you to select. **Transmission Rate** options include **Fully Auto**, **Fixed 1 Mb/s**, **Fixed 2 Mb/s**, **Auto Select 1M or 2M**, **Fixed 5.5Mb/s** and **Fixed 11Mb/s**. In most networking scenarios, you will see that the factory default **Fully Auto** will prove the most efficient. This setting allows your ZyAIR 200 to operate at the maximum transmission (data) rate. When the communication quality drops below a certain level, ZyAIR 200 will automatically switch to a lower transmission (data) rate. Transmission at lower data speeds are usually more reliable. However, when the communication quality improves again, ZyAIR 200 will gradually increase the transmission (data) rate again until it reaches the highest available transmission rate.

If you wish to balance speed versus reliability, you can select any of the above options. **Fixed 11Mb/s** or **Fixed 5.5Mb/s** is used in a networking environment where you are certain that all wireless devices can communicate at the highest transmission (data) rate. **Fixed 1Mb/s**, **Fixed 2Mb/s**, **Auto Select 1M or 2M** are used often in networking environments where the range of the wireless connection is more important than speed.

Preamble Type

This field allows two different selections: **Long** and **Short**. The default setting is set to Long. **Long** – The mandatory supported “Long preamble as well as header” as specified in IEEE802.11 that allows interoperation with the current 1Mbit/sec and 2Mbit/sec DSSS specification.

Short – The optional “Short preamble and header” is intended for applications where maximum throughput is desired and interoperability with legacy and non-short preamble capable equipment is not a consideration.

RTS Threshold

The **RTS Threshold** prevents the **Hidden Node** problem. **Hidden Node** is a situation in which two stations are within range of the same Access Point, but are not within range of each other. The following figure illustrates an example of the **Hidden Node** problem. Both stations (STA) are within range of the Access Point, however, they cannot hear each other. Therefore, they are considered hidden nodes from each other. When a station starts data transmission with the Access Point, it might not notice that the other station is already using the wireless medium. When these two stations send data at the same time, they might collide when arriving simultaneously at the Access Point. The collision will most certainly result in a loss of messages for both stations.

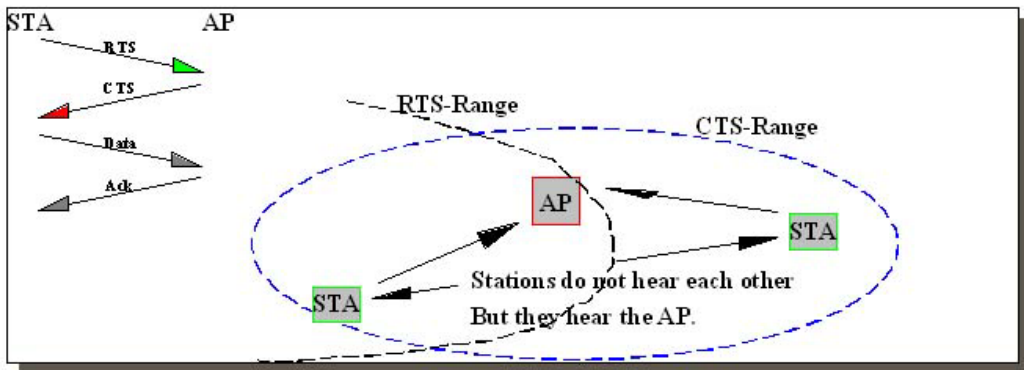


Figure 4-5 RTS Threshold

Thus, the **RTS Threshold** mechanism provides a solution to prevent data collisions. When you enable **RTS Threshold** on a possible **hidden station**, this station and its Access Point will use a Request to Send/Clear to Send protocol (RTS/CTS). The station will send an RTS to the Access Point, informing that it is going to transmit the data. Upon receipt, the Access Point will respond with a CTS message to all stations within its range to notify all other stations to defer transmission. It will also confirm with the requesting station that the Access Point has reserved it for the time frame of the requested transmission.

Normally, the **Disable** option (default) is selected when you are not concerned with the **Hidden Node** problem. When the **Hidden Node** problem becomes an issue, please select **Enable** and specify the packet size. The RTS function will be activated if the packet size exceeds the value you set. It is highly recommended that you set the value ranging from **0** to **2432**.

Enabling the RTS Threshold causes redundant network overhead that could negatively affect the throughput performance instead of providing a remedy.

Fragmentation Threshold

Fragmentation improves the efficiency when high traffic flows along in the wireless network. If your ZyAIR 200 often transmits large files in the wireless network, you can enable the **Fragmentation Threshold** by clicking **Enable** in **Advanced Configuration** window and the function will split the packet. The value can be set from **256** to **2432**. **Frag Threshold** is set to **Disable** by default.

4.2.6 Encryption

To prevent unauthorized wireless stations from accessing data transmitted over the network, your ZyAIR 200 offers highly secure data encryption, known as WEP (Wired Equivalent Privacy). If you require high security in transmission, please go to the **Encryption** tab and set the following values. You can identify up to 4 different encryption keys and select one of them to encrypt your transmission data.

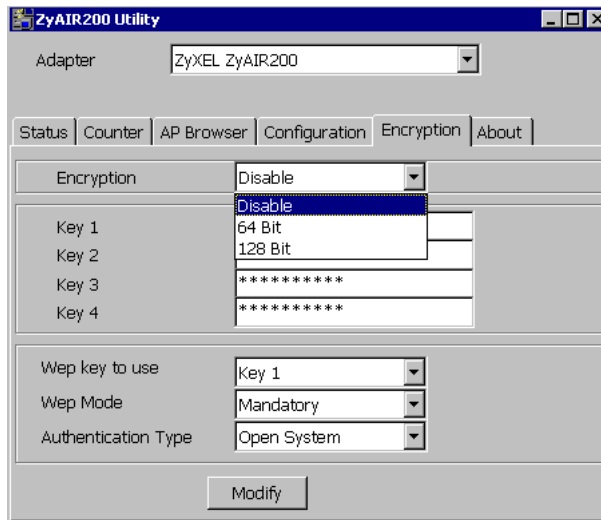


Figure 4-6 Utility - Encryption

You can select the following three options from the **Encryption** pull down menu.

Disable – Allows wireless adapters communicate with Access Points without any data encryption.

64 Bit – Requires wireless stations to use data encryption with 64 Bit algorithm when communicating with the Access Point.

128 Bit – Allows wireless clients to communicate with the Access Point with data 128 Bit encryption algorithm.

For 64bit encryption you may choose:

- **Alphanumeric: 5 characters** (case sensitive) ranging from “a-z”, “A-Z” and “0-9” (e.g. MyKey)
- **Hexadecimal: 10 hexadecimal digits** in the range of “A-F”, “a-f” and “0-9”, preceded by the characters “0x” (for example 0x11AA22BB33)

For 128bit encryption you may choose:

- **Alphanumeric: 13 characters** (case sensitive) ranging from “a-z”, “A-Z” and “0-9” (e.g. MyKey12345678)
- **Hexadecimal: 26 hexadecimal digits** in the range of “A-F”, “a-f” and “0-9”, preceded by the characters “0x” (for example 0x00112233445566778899AABBCC).

After entering the WEP keys in the key field, select one key as an active key, click **Modify** and to make the setting take effect.

To allow encrypted data communications, you must set the same encryption key values on all wireless stations and/or Access Points. For example, if you use Key 1 on your ZyAIR 200 and the value is (e.g., MyCar), the same value must be assigned to Key 1 for all other client stations. The values you enter on the Encryption dialog box will only be visible the first time you enter the keys. After closing this dialog box, all Key values will be displayed as “xxxxxxxxxxxx” every time the tab is displayed again.

4.2.7 About

Use **About** to display the driver, firmware and application version of your ZyAIR 200.

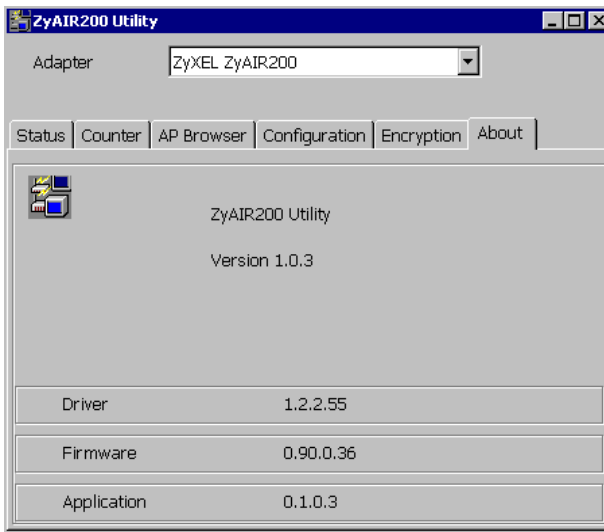


Figure 4-7 Utility – About

Chapter 5

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.

Problems During Driver Installation

Table 5-1 Troubleshooting the Installation of Your ZyAIR 200

PROB EM	CORRECTIVE ACTION
Windows does not auto-detect the ZyAIR 200	Restart your computer. Do a manual scan of your computer hardware. In Windows 2000, click Start, Settings, Control Panel, System, Hardware, Hardware Wizard . In Windows XP, click Start, Control Panel, Performance and Maintenance, System, Hardware, Device Manager . Then Right-click on your computer name and select Scan for Hardware Changes . Make sure the USB interface card is properly installed and fully functional and the USB port is enabled in the motherboard BIOS. Return your card to vendor for maintenance.

Problems With the Utility Configuration

Table 5-2 Troubleshooting the Configuration

Problem	Corrective Action
Problems encountered with the utility configuration.	<p>Click on the Status tab to check whether the Signal Strength or the Link Quality is high.</p> <p>Ensure that you have set the correct IP address for the ZyAIR 200. Use the Ping command to ping the unit itself.</p> <p>Netbeui must be installed properly and functional. Double-click Network Neighborhood on your Windows desktop. You should see your computer name.</p>

Problems With Access Point Settings

Table 5-3 Troubleshooting the Settings for the Access Point

PROBLEM	CORRECTIVE ACTION
Problems with Access Point settings.	<p>Make sure that the Access Point is on and that all the LEDs are working properly.</p> <p>Click Rescan in AP Browser window to display all available access points. If your current Access Point is not shown, then your Access Point might not be connected to the network.</p>

Problems Communicating With the Computer

Table 5-4 Troubleshooting Communication Problems

PROBLEM	CORRECTIVE ACTION
<p>The ZyAIR 200 client cannot communicate with the other computer in the Ethernet when the Infrastructure mode is configured.</p>	<p>Make sure that the Access Point and associated computer are on.</p> <p>Use the AP Browser utility to verify operating Access Points have high Signal. Change the Access Point and all the stations within the BSS to another radio channel if Signal is low.</p> <p>Make sure that the computer and Access Point share the same security option.</p>
<p>AP Browser utility shows all channel signals are low</p>	<p>Move your computer closer to the Access Point within the transmission range.</p> <p>There is too much radio interference (for example microwave oven) around your wireless network. Relocate or reduce the radio interference.</p>

Appendix A

Network Configuration

The ZyAIR 200 supports the same network configuration options of Legacy Ethernet LANs as defined by the IEEE 802 standard. The ZyAIR 200 can be configured as:

- Ad-hoc for departmental or SOHO LANs.
- Infrastructure for enterprise LANs.
- LAN-interconnection for point-to-point link as a campus backbone.

Ad-hoc Wireless LAN Topology

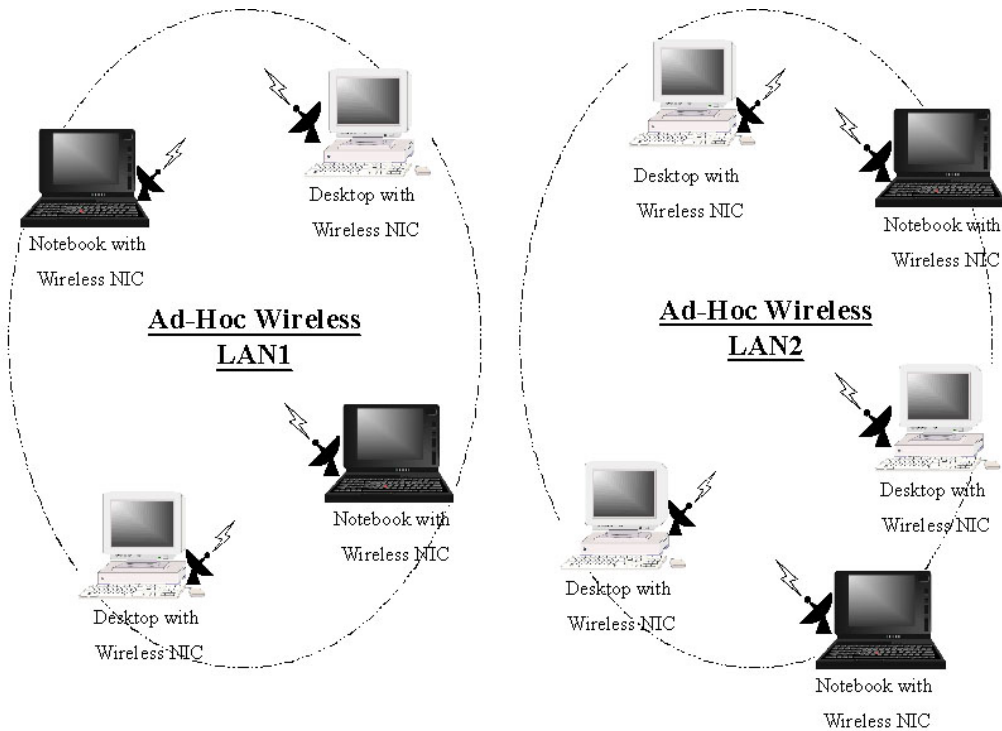


Diagram 1 Ad-hoc Wireless LAN Example

An Ad-hoc wireless LAN is a group of computers, each equipped with one wireless adapter, and connected as an independent wireless LAN. Computers in a specific Ad-hoc wireless LAN must be configured on the same radio channel. An Ad-hoc wireless LAN is available at a departmental scale for a branch or SOHO operation.

Wireless LAN Topology Infrastructure

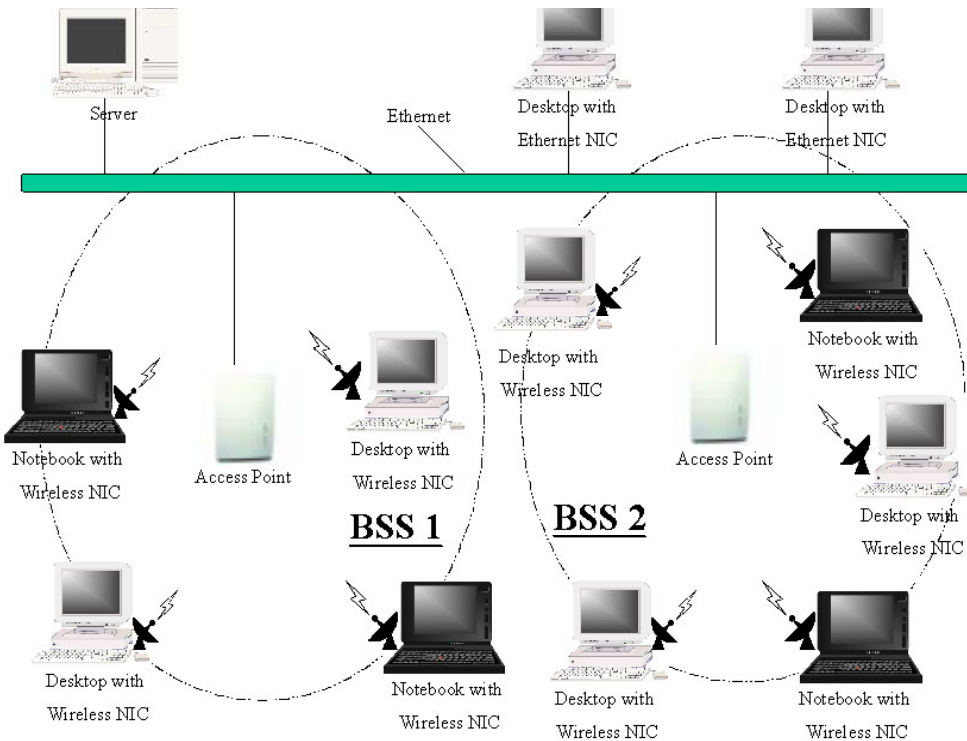
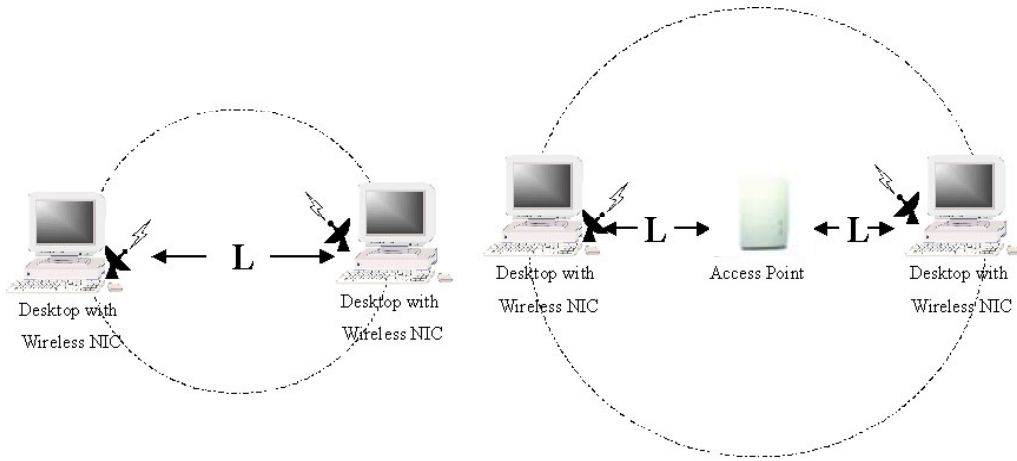


Diagram 2 Wireless LAN Infrastructure Example

The ZyAIR 200 provides access to a wired LAN for wireless computers. An integrated wireless and wired LAN is called an Infrastructure configuration. A group of wireless LAN computer users and an Access Point constitute a Basic Service Set (BSS). Each wireless-equipped computer in this BSS can talk to any computer in the wired LAN infrastructure via the Access Point.

Infrastructure configuration will extend the accessibility of a wireless station to the wired LAN. Multiple Access Points will allow roaming and it will increase the transmission range. The Access Point is also able to forward data within its BSS. The effective transmission range in an Infrastructure LAN is doubled.



Ad-Hoc

Infrastructure

Diagram 3 Effective Transmission Range Example

Appendix B

Hardware Specifications

Diagram 4 ZyAIR 200 Specifications

PRODUCT	FEATURES
Operating Channels	11 for North America, 14 for Japan, 13 for Europe (ETSI), 2 for Spain, 4 for France
Operating Frequency	2.412 ~ 2.462 GHz (North America) 2.412 ~ 2.484 GHz (Japan) 2.412 ~ 2.472 GHz (Europe ETSI) 2.457 ~ 2.462 GHz (Spain) 2.457 ~ 2.472 GHz (France)
Range	11 Mbps: 460 feet = 140m (in an open environment) 5.5 Mbps: 656 feet = 200m 2 Mbps: 885 feet = 270m 1 Mbps: 1311 feet = 400m
RF Technology	Direct Sequence Spread Spectrum
Modulation	CCK (11 Mbps, 5.5 Mbps), DQPSK (2 Mbps), DBPSK (1 Mbps)
Voltage	3.3V and 5V DC
Power Consumption	Tx power consumption: < 350mA Rx power consumption: < 250mA
Output Power	13 dBm
Sensitivity	@PER < 0.08 11 Mbps < -83 dBm 5.5 Mbps < -86 dBm 2 Mbps < -89 dBm 1 Mbps < -91 dBm
Data Rate	1, 2, 5.5, 11 Mbps
Media Access Protocol	CSMA/CA, 802.11-compliant
Supported O/S	Windows 98/ME/2000/XP

Appendix C

Important Safety Instructions

The following safety instructions apply to the ZyAIR 200:

1. Be sure to read and follow all warning notices and instructions.
2. Do not service the product by yourself. Refer all servicing to qualified service personnel.
3. Generally, when installed after the final configuration, the product must comply with the applicable safety standards and regulatory requirements of the country in which it is installed. If necessary, consult the appropriate regulatory agencies and inspection authorities to ensure compliance.
4. A rare condition can create a voltage potential between the earth grounds of two or more buildings. If products installed in separate building are interconnected, the voltage potential can cause a hazardous condition. Consult a qualified electrical consultant to determine whether or not this phenomenon exists and if necessary, implement corrective action before interconnecting the products. If the equipment is to be used with telecommunications circuit, take the following precautions:
 - Never install telephone wiring during a lightning storm.
 - Never install telephone jacks in wet location unless the jack is specially designed for wet location.
 - Never touch non-insulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
 - Use caution when installing or modifying telephone lines (other than a cordless telephone) during an electrical storm. There is a remote risk of electric shock from lightning
5. In order to limit Radio Frequency (RF) exposure, the following rules should be applied:
 - Install the antenna in a location where a distance of 20 cm from the antenna may be maintained.
 - While installing the antenna in the location, please do not turn on the power of wireless card.
 - While the device is working (transmitting or receiving), please do not touch or move the antenna.
 - Do not operate a portable transmitter near unshielded blasting caps or in an explosive environment unless it is a type especially qualified for such use.
6. For Laptop (notebook) computer users, in order to comply with the FCC RF exposure limits, it is recommended when using a laptop with a wireless LAN adapter card that the card's integrated antenna should not be positioned closer than 5 cm (2 inches) from your body or nearby persons for extended periods of time while it is transmitting (or operating). If the antenna is positioned less than 5 cm (2 inches) from the user, it is recommended that the user limit exposure time.

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