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Introduction

The Linksys Wireless Ethernet Workgroup Bridge

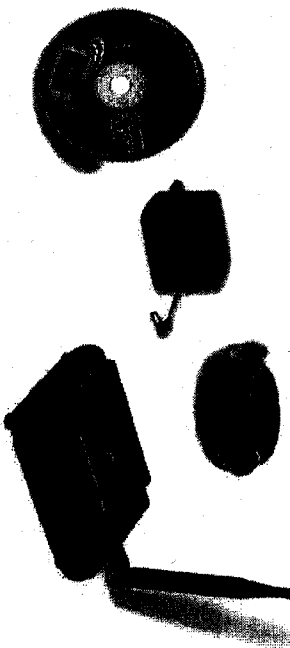
Tailor-made for the home or small office network, the Instant Wireless Wireless Ethernet Workgroup Bridge extends wireless connectivity to any Ethernet-ready network device, such as a printer, scanner, desktop or notebook PC. The Wireless Ethernet Workgroup Bridge simply and efficiently transmits data between 10Base-T/100Base-TX and your wireless LAN.

The Wireless Ethernet Workgroup Bridge gives you the freedom to place any standard network resource virtually anywhere in your office. A high-powered, built-in antenna means that you're covered at distances of up to 300 meters or more.

Based on signal strength, it dynamically shifts between 11, 5.5, 2, and 1Mbps network speeds for maximum availability and reliability of connection. So you've got the flexibility and performance you need from your wireless LAN.

Features

- An All-in-One Wireless Solution for Any Ethernet-Ready Network Device
- Interoperable with IEEE 802.11b (DSSS) 2.4GHz-Compliant Equipment
- No Additional Drivers Are Needed
- Up to 11 Mbps High-Speed Transfer Rate
- Dynamically Shifts between 11, 5.5, 2, and 1Mbps for Maximum Adaptability
- Low Interference and High Susceptibility Guarantee Reliable Performance
- Assurance of Constant Connection via Direct Sequence Spread Spectrum (DSSS)
- Conveniently Eliminates Cables and Network Wires Used by Network Devices
- Equipped with One Standard 10Base-T/100Base-TX Interface for Connection with Any Ethernet-Ready Networked Resource
- Capable of up to 128-Bit WEP Encryption
- Easy and Quick Setup
- Free Technical Support—24 Hours a Day, 7 Days a Week for North America Only
- 1-Year Limited Warranty



Package Contents

- One Instant Wireless™ Wireless Ethernet Workgroup Bridge
- One External Antenna
- One Power Adapter
- One UTP Category 5 Cable
- One Setup CD-ROM with User Guide
- Quick Installation and Registration Card (not shown)

Getting to Know the Ethernet Workgroup Bridge

The Wireless Ethernet Workgroup Bridge's Ports



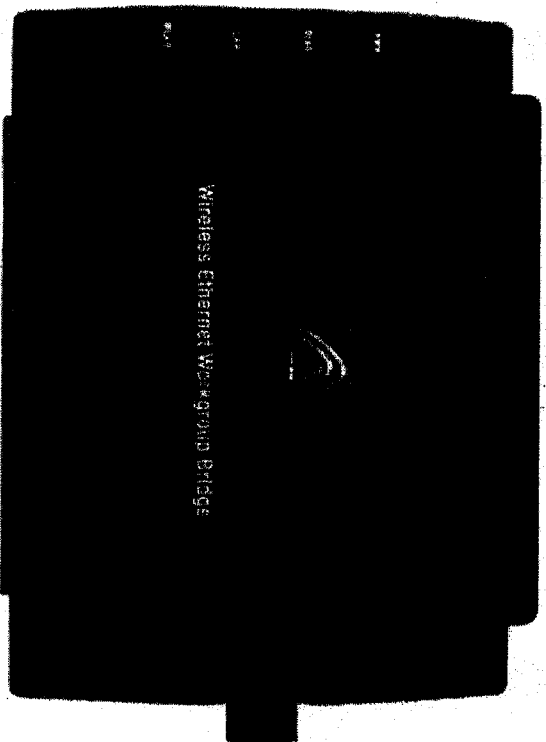
Reset The Reset button resets the Workgroup Bridge to its factory default settings.

X-|| The X-|| selection switches offers a choice between two settings. Use the X setting if you are connecting the Workgroup Bridge to a network card or other Ethernet device. Use the || setting if you are connecting the Workgroup Bridge to a hub or switch.

LAN Port The LAN Port is where you will connect your crossover or straight cable.

DC Adapter Jack The DC Adapter Jack is where you will connect your power.

The Wireless Ethernet Workgroup Bridge's Front Panel LEDs



PWR
Green. The PWR LED will light up when the Workgroup Bridge is powered on.

DIAG
Green. The DIAG LED will light up when there is a connection error. Re-establish the connection to eliminate the error.

LAN
Green. The LAN LED will be lit steadily when the Workgroup Bridge is connected to the LAN. The LED will blink when there is LAN traffic.

WLAN
Green. The WLAN LED indicates the status of the link. The WLAN LED will be lit steadily when the Workgroup Bridge is connected to the WLAN. The LED will blink when there is WLAN traffic.

Planning Your Wireless Network

Network Topology

A wireless LAN is exactly like a regular LAN, except that each network device in the LAN uses an Wireless Ethernet Workgroup Bridge to connect to the network using no wires. Computers in a wireless LAN must be configured to share the same radio channel.

The Wireless Ethernet Workgroup Bridge provides LAN access for wireless network devices. An integrated wireless and wired LAN is called an Infrastructure configuration. A group of Wireless Ethernet Workgroup Bridge users and an access point compose a Basic Service Set (BSS). Each PC equipped with an Wireless Ethernet Workgroup Bridge in a BSS can talk to any computer in a wired LAN infrastructure via the Workgroup Bridge.

An infrastructure configuration extends the accessibility of an Wireless Ethernet Workgroup Bridge to a wired LAN, and doubles the effective wireless transmission range for two Wireless Ethernet Workgroup Bridge PCs. Since the access point is able to forward data within its BSS, the effective transmission range in an infrastructure LAN is doubled.

The use of a unique ID in a Basic Service Set is essential.

The Wireless LAN Infrastructure configuration is appropriate for enterprise-scale wireless access to a central database, or as a wireless application for mobile users.

Roaming

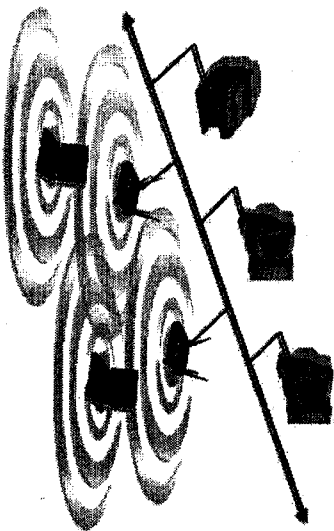
Infrastructure mode also supports roaming capabilities for mobile users. More than one BSS can be configured as an Extended Service Set (ESS). This continuous network allows users to roam freely within an ESS. All Wireless Ethernet Workgroup Bridge PCs within one Extended Service Set must be configured with the same SSID.

Selecting a feasible radio channel and optimum access point position is recommended. Proper access point positioning combined with a clear radio signal will greatly enhance performance.

Ad-Hoc versus Infrastructure Mode

Unlike wired networks, wireless networks have two different modes in which they may be set up: **Infrastructure** and **Ad-Hoc**. Choosing between these two modes depends on whether or not the wireless network needs to share data or peripherals with a wired network or not.

If the computers on the wireless network need to be accessible by a wired network or need to share a peripheral, such as a printer, with the wired network computers, the wireless network should be set up in the **Infrastructure** mode. The basis of Infrastructure mode centers around an **access point**, which serves as the main point of communications in a wireless network. Access points transmit data to PCs equipped with wireless network card, which can roam within a certain radial range of the access point. Multiple access points can be arranged to work in succession to extend the roaming range, and can be set up to communicate with your Ethernet hardware as well.



If the wireless network is relatively small and needs to share resources only with the other computers on the wireless network, then the **Ad-Hoc** mode can be used. Ad-Hoc mode allows computers equipped with wireless transmitters and receivers to communicate directly with each other, eliminating the need for an access point. The drawback of this mode is in the fact that, in Ad-Hoc mode, wireless-equipped computers are not able to communicate with computers on



a wired network. And, of course, communication between the wireless-equipped computers is limited by the distance and interference directly between them.

Connecting the Wireless Ethernet Workgroup Bridge

1. Plug a crossover or straight cable into the RJ-45 jack on the back panel of the Workgroup bridge.



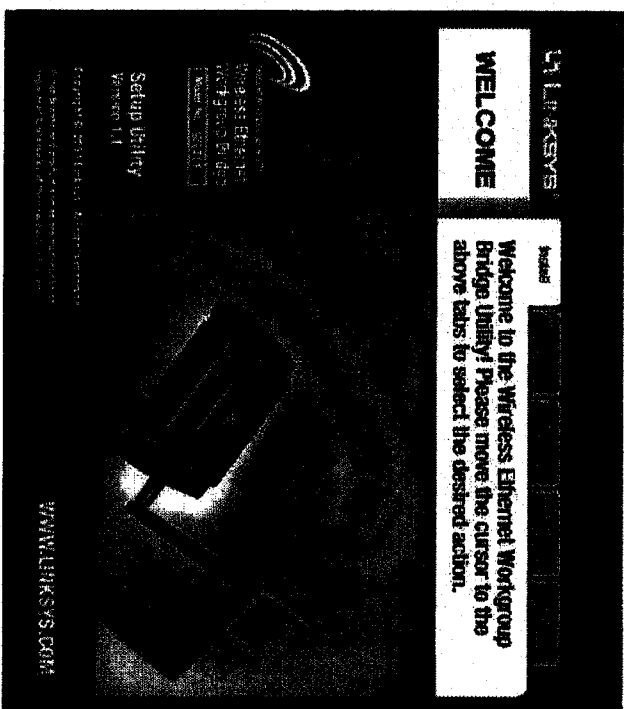
2. The X-|| selection switch offers a choice between two settings. Slide the X-|| selection switch to the X position if you are connecting the Workgroup Bridge to a network switch or other Ethernet device. Slide the X-|| selection switch to the || position if you are connecting the Workgroup Bridge to a hub or switch.
3. Plug the other end of the crossover or straight cable into the RJ-45 jack on the PC you wish to use to configure the Workgroup Bridge.
4. Plug the supplied AC power cable into the jack on the back panel of the Workgroup Bridge. Then plug the other end into a power outlet.
5. Proceed to the next section, "Installing the Wireless Ethernet Workgroup Bridge."
6. After configuration, unplug the crossover or straight cable from the PC, and plug it into the RJ-45 jack on the Ethernet-ready network device you wish to add to the WLAN.

The installation is complete.

Installing the Wireless Ethernet Workgroup Bridge

The configuration of the Wireless Ethernet Workgroup Bridge requires use of a PC and web browser.

Insert the Setup CD-ROM into your CD-ROM drive. The Setup Utility should run automatically, and the screen below should appear. If it does not, click the Start button and choose Run. In the field that appears, enter D:\setup.exe (where "D" is the letter of your CD-ROM drive).

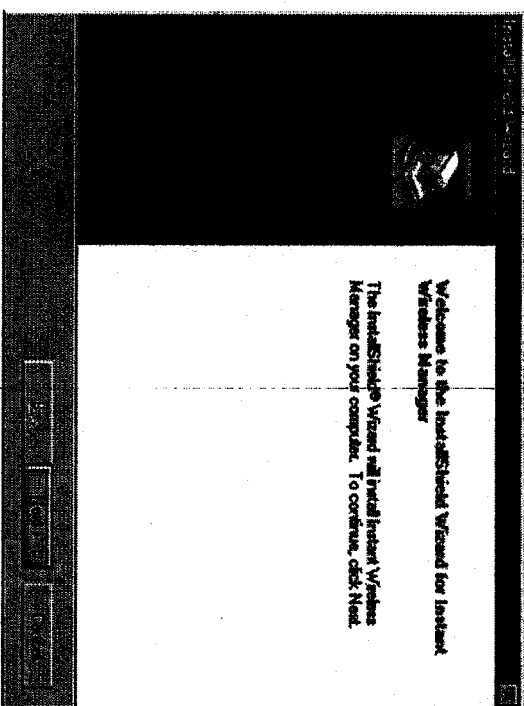


The Setup Utility is comprised of five tabs that initiate different actions.

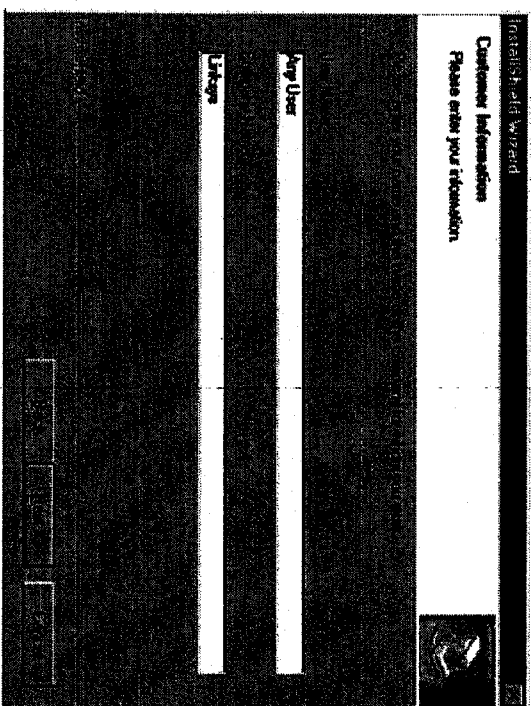
- **Install tab** - Begins the software installation process.
- **Uninstall tab** - Allows you to uninstall the Workgroup Bridge.
- **User Guide tab** - Opens Adobe Acrobat Reader to display a PDF file of the User Guide.
- **Contact Us tab** - Opens your default web browser to visit the Linksys website.
- **Exit tab** - Enables you to exit the Setup Utility.

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1. To install your Wireless Ethernet Workgroup Bridge, click on the **Install** tab.

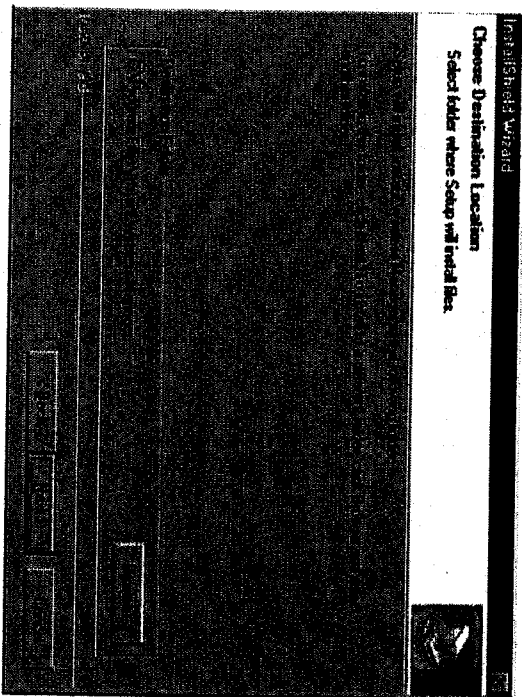


2. When you see the following screen, click the **Next** button to continue.
3. Enter your **User Name** and **Company Name**. Then click the **Next** button to continue.

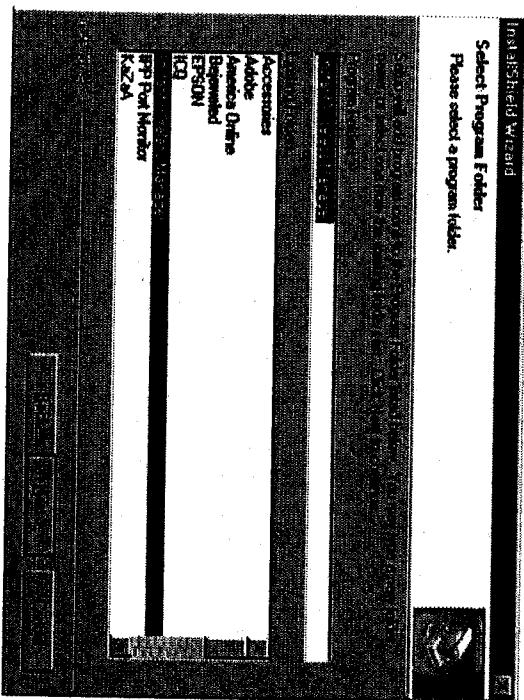


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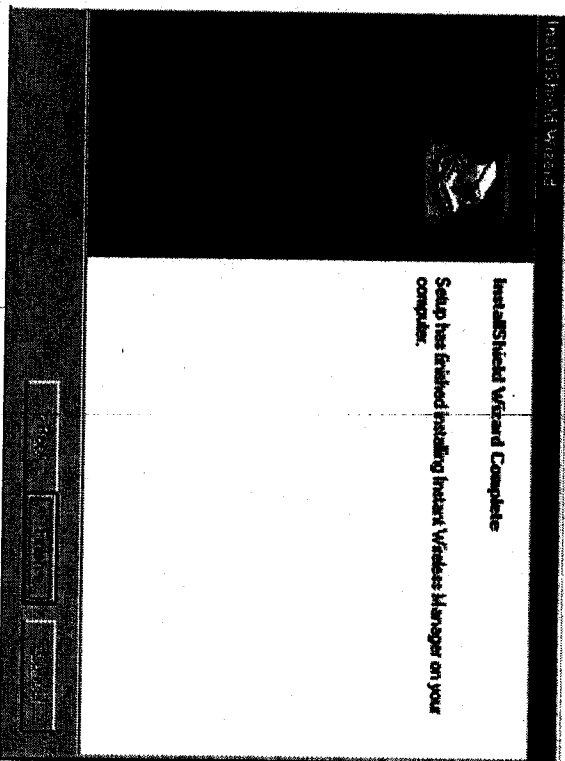
4. The InstallShield Wizard will automatically choose a folder where Setup will install the utility files. Click **Browse** if you want to choose a different folder. Click the **Next** button to continue.



5. The InstallShield Wizard will automatically choose a folder where Setup will install the program icons. If you want to create a new folder, type the new folder's name in the **Program Folders:** field. Click the **Next** button to continue.



6. The InstallShield Wizard has successfully installed the Instant Wireless Manager. Click the **Finish** button.

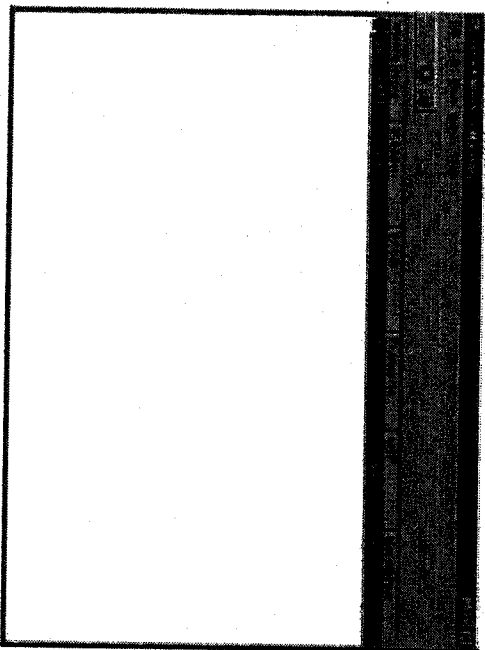


You have now completed installation of the Instant Wireless Manager. Please continue to the next page for information about the Instant Wireless Manager and Instant Wireless Configuration Utility.

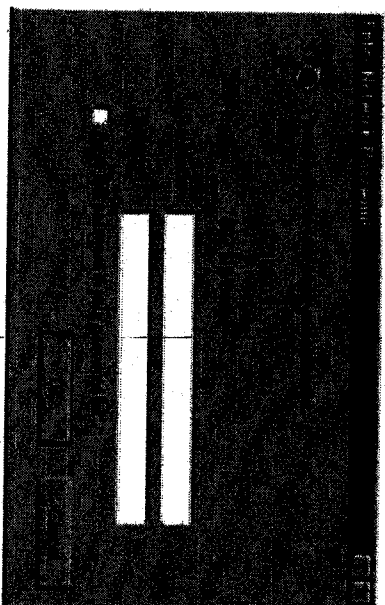
Using the Instant Wireless Configuration Utility

Starting the Utility

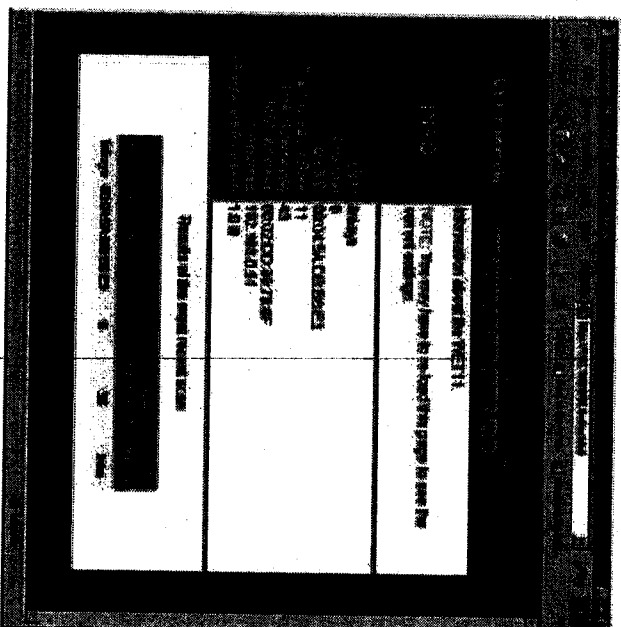
1. The Instant Wireless Configuration Utility enables you to conveniently configure your LAN connection. It must be accessed from the Instant Wireless Manager. On the desktop of the PC connected to the Workgroup Bridge, double-click the **Instant Wireless Manager** icon. The Instant Wireless Manager will automatically search for wireless devices on the LAN.
2. When the Instant Wireless Manager finds an Workgroup Bridge, its information is displayed. In the list window, double-click the name of the Workgroup Bridge you wish to configure. Then your default web browser will automatically open.



3. You will see the following screen. Type in your **User Name and Password**. The first time you access the Instant Wireless Configuration Utility, leave the User Name field blank, and enter the default Password, **admin**. Click **OK**. Note: Make sure you enter the default password in lowercase letters.



4. The INFO screen of the Workgroup Bridge's Instant Wireless Configuration Utility will appear.



Configuring the Wireless Ethernet Workgroup Bridge

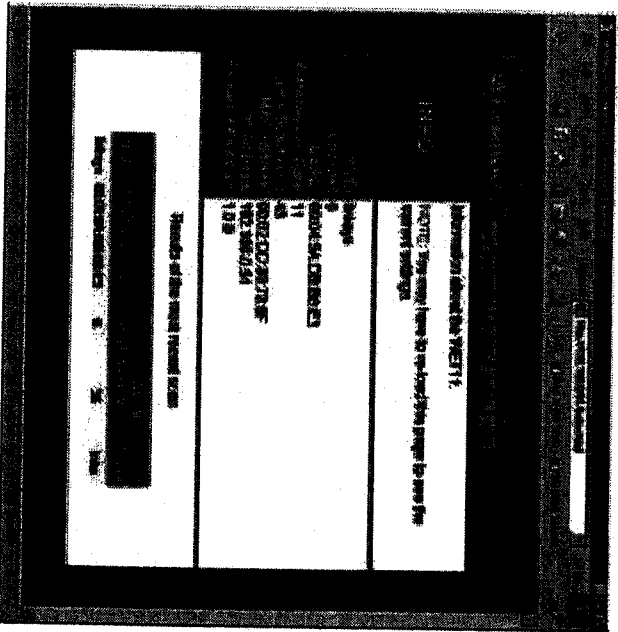
The Instant Wireless Configuration Utility provides five screens for configuring the settings for the Workgroup Bridge. When you have finished the configuration, unplug the crossover or straight cable from the PC, and plug it into the RJ-45 jack on the Ethernet-ready network device you wish to add to the WLAN.

The Configuration Utility is comprised of five tabs that allows you to configure different settings:

- **Info tab** - Displays the Workgroup Bridge's current settings.
- **Wireless tab** - Use this tab to configure the wireless settings.
- **IP Addr tab** - Enables you to configure the IP address settings.
- **Admin tab** - Use this tab to change the password, reboot the Workgroup Bridge, or reset all settings to factory defaults.
- **Help tab** - Provides explanations of various configuration settings, as well as contact information for Linksys.

INFO TAB

The INFO tab displays the Workgroup Bridge's current status and settings.



Wireless Ethernet Workgroup Bridge

- **SSID** - Displays the wireless network's current SSID. If it displays "non-spec," then the Workgroup Bridge is not connected to any wireless network.
- **Channel** - Displays the Workgroup Bridge's current channel number.
- **BSSID** - Displays the wireless network's current BSSID. For infrastructure mode, the BSSID is the MAC address of the access point to which the Workgroup Bridge is connected.
- **Transmission Rate** - Displays the transmission rate of the current connection.
- **Link Quality (%)** - When the Workgroup Bridge is connected to a wired LAN, the percentage of connection integrity is displayed. (Not available when using an ad-hoc or peer-to-peer connection.)
- **MAC Address** - Displays the Workgroup Bridge's MAC address.
- **IP Address** - Displays the Workgroup Bridge's IP address.
- **Firmware Revision** - Displays the version number of the Workgroup Bridge's firmware.

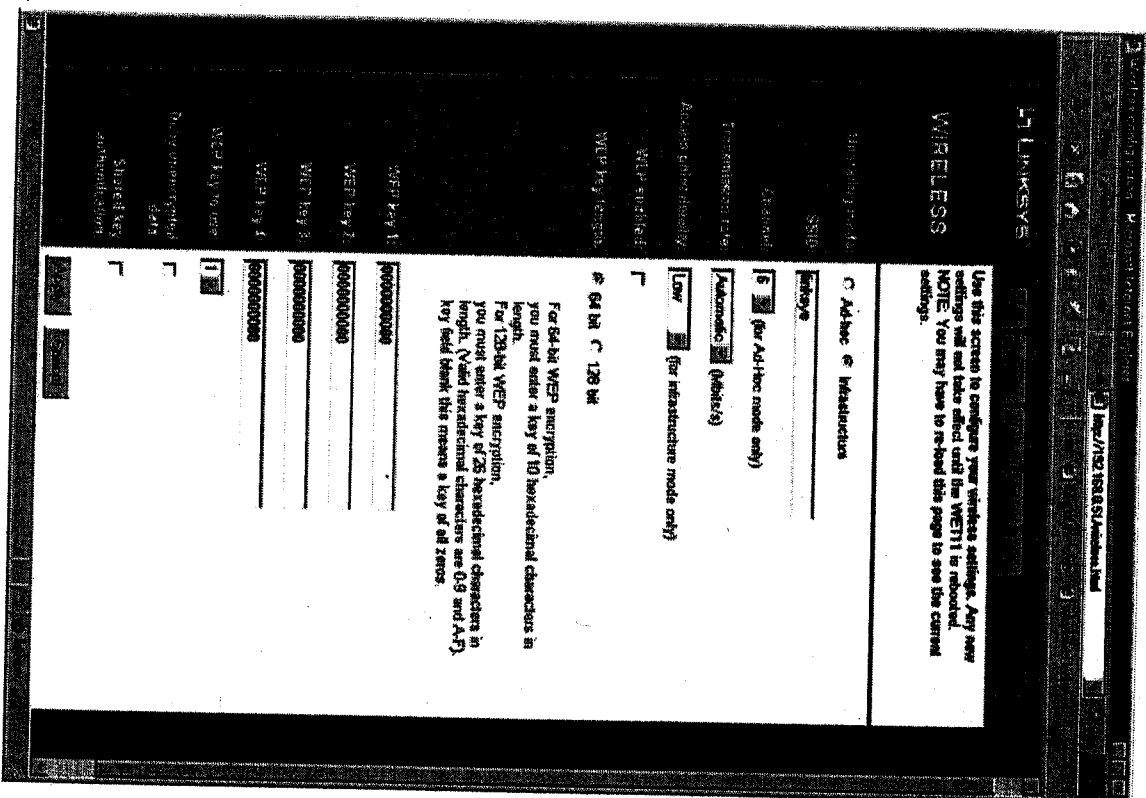
The "Results of the most recent scan" section displays information about all devices detected by the Workgroup Bridge.

- **SSID** - Displays the current SSID of a network device.
- **MAC Address** - Displays the wireless MAC address of a network device.
- **Channel** - Displays the current channel number of a network device.
- **Signal Strength (%)** - Displays the total available amount of signal measured above the noise. (Not available when using an ad-hoc or peer-to-peer connection.)
- **Mode** - Displays the operating mode of a network device.



WIRELESS TAB

The Wireless tab allows you to configure your wireless settings. Any new settings will not take effect until the Workgroup Bridge is rebooted. (To reboot the Workgroup Bridge, go to the Admin tab and click the Reboot button.)



Wireless Ethernet Workgroup Bridge

- **Operating mode** - Select the LAN mode, either Ad-hoc or Infrastructure.
 - **SSID** - Displays the current Service Set Identification. The default SSID is linksys.
 - **Channel** - Enables you to select a transmission channel. It is valid only when the Workgroup Bridge is operating in Ad-hoc mode. All points on the network must be set to the same channel.
 - **Transmission rate** - Displays a list of transfer rates (Megabits per second): 1, 2, 1 or 2, 5.5, 11, or Automatic. The default setting, **Automatic**, allows the Workgroup Bridge to automatically adjust the transfer speed for optimal performance and the longest operating range.
 - **Access point density** (for infrastructure mode only) - Enables you to specify how many access points are near the Workgroup Bridge. Use this setting to reduce channel overlap and interference.
 Low: 1-2 nearby access points
 Medium: 3-4 nearby access points
 High: 5 or more nearby access points
- When the Workgroup Bridge is connected in an infrastructure network environment, a list of nearby access points is displayed at the bottom of the Info screen.
- **WEP enabled** - Allows you to enable or disable Wired Equivalent Privacy (WEP) for encryption. You must check this box to enable WEP encryption.
 - **WEP key length** - Once WEP enabled is checked, choose 64- or 128-bit WEP encryption here. Some access points do not support 128-bit encryption.
 - **WEP keys 1-4** - Enables you to create an encryption scheme for wireless LAN transmissions. Manually enter a set of values for each key. 128-bit encryption requires more system resources than 64-bit encryption. Use 64-bit encryption for better performance.
- If you are using 64-bit WEP encryption, then each key must consist of exactly 10 hexadecimal characters in length.
 If you are using 128-bit WEP encryption, then each key must consist of exactly 26 hexadecimal characters in length.
- Valid hexadecimal characters are 0-9 and A-F. A WEP key field that is left

Instant Wireless™ Series

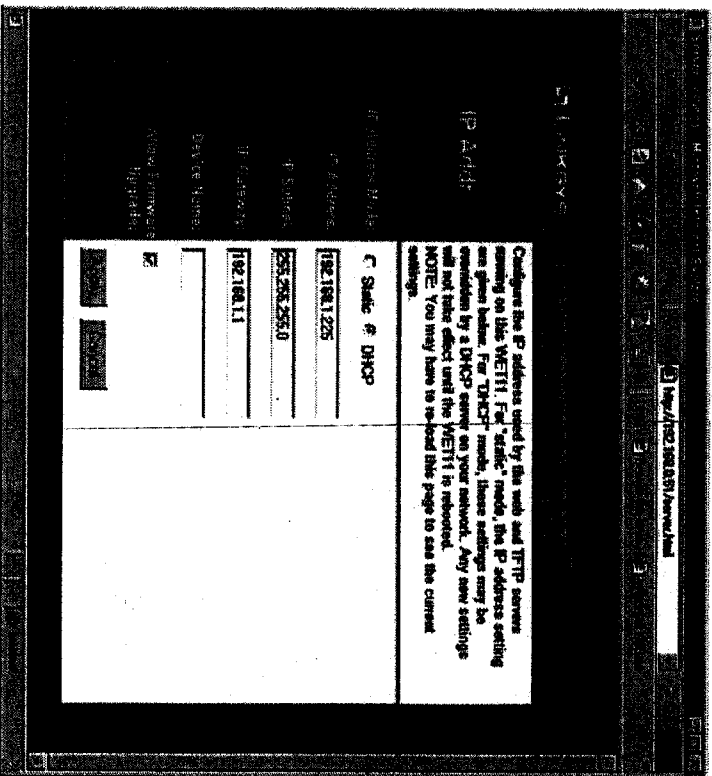
- **WEP key to use** - Sets which WEP key (1-4) to use when sending data. Make sure the receiver is using the same key.
- **Deny unencrypted data** - When this box is checked, the Workgroup Bridge ignores unencrypted data transmissions.
- **Shared key authentication** - Two authentication modes are available. When the box is checked, shared key authentication is enabled. You must set a WEP key to exchange data. When the box is unchecked, there is public access to this Workgroup Bridge.



Wireless Ethernet Workgroup Bridge

IP ADDR TAB

The IP Addr tab is used to configure the IP address used by the web and TFTP servers running on the Workgroup Bridge. For "static" mode, the IP address settings are given below. For "DHCP" mode, these settings will be overridden by a DHCP server on your network. Any new settings will not take effect until the Workgroup Bridge is rebooted. (To reboot the Workgroup Bridge, go to the Admin tab and click the Reboot button.)



- **IP Address Mode** - Enables you to select the IP address mode: Static or DHCP (Dynamic Host Configuration Protocol). DHCP mode enables the DHCP server on your network to override the current IP address settings.
- **IP Address** - Sets the Workgroup Bridge's IP address.
- **IP Subnet** - Sets the Workgroup Bridge's subnet setting.

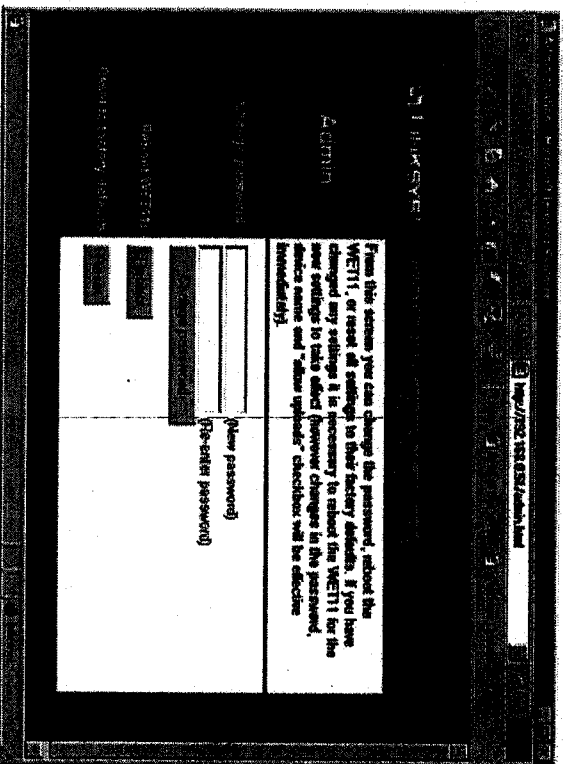
- **IP Gateway** - Sets the Workgroup Bridge's IP gateway setting.

ADMIN TAB

- **Device Name** - Sets the Workgroup Bridge's name. The default name is Linksys WET11.

The Admin tab allows you to change the password, reboot the Workgroup Bridge, or reset all settings to their factory defaults. If you have changed any settings, it is necessary to reboot the Workgroup Bridge for the new settings to take effect. (To reboot the Workgroup Bridge, click the **Reboot** button on the Admin tab.) Any changes in these three settings: password, device name, and enabling uploads, however, are effective immediately.

- **Allow Firmware Upgrade** - When the box is checked, the Workgroup Bridge accepts firmware upgrades.

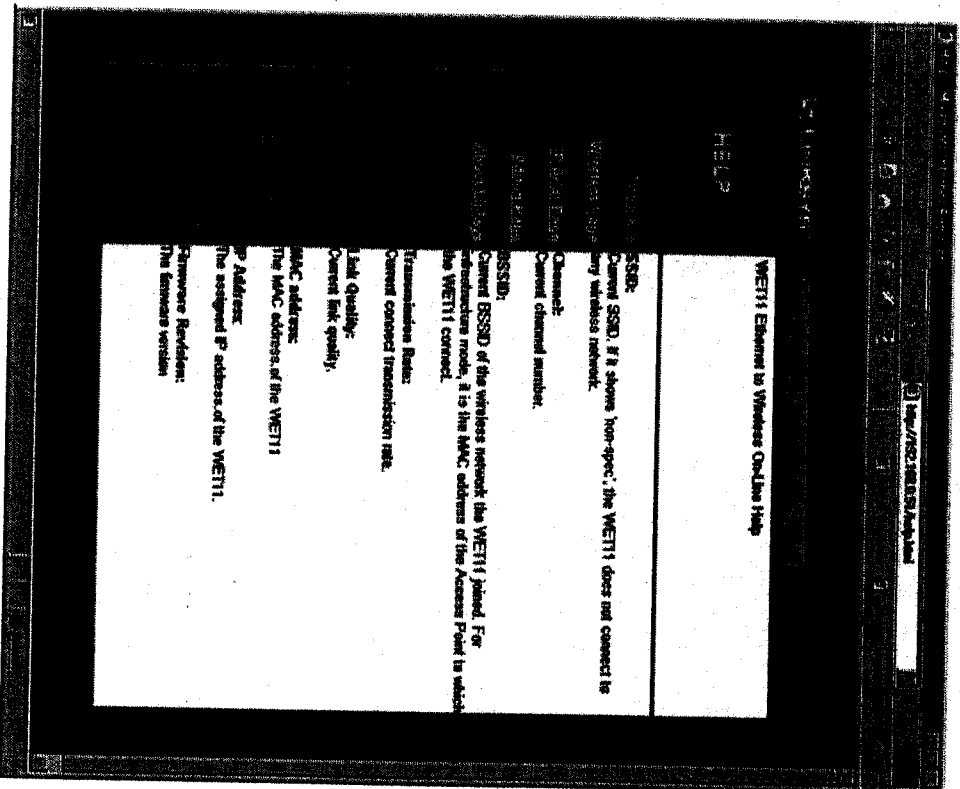


- **Change password** - Set or change the network password required to access the utility. The default password is **admin**.
- **Reboot WET11** - After you have made changes through any of the tabs, click this button to enable the new settings.
- **Reset to factory defaults** - Resets all configuration settings to their default values.



HELP TAB

The Help tab offers additional explanations about the terms used on each tab of the Instant Wireless Configuration Utility, plus contact information for additional assistance.



Troubleshooting

Common Problems and Solutions

This section provides possible solutions to problems regarding the installation and operation of the Wireless Ethernet Workgroup Bridge. If you can't find an answer here, check the Linksys website at www.linksys.com.

1. **I can't connect to the access point.**

Open the Instant Wireless Configuration Utility. Click on the **Wireless** tab and perform the following steps:

 - Verify that the operating mode is set to **Infrastructure** mode.
 - Make sure that the SSID is the same as the SSID of the access point.
 - Make sure that all of the WEP settings are the same as the WEP settings of the access point.
2. **I don't know how to change the Workgroup Bridge's IP address.**

You have two ways to change the Workgroup Bridge's IP address.

 - Open the Instant Wireless Configuration Utility. Click on the **IP Addr** tab and change the IP address there.
 - If you are unable to access the Configuration Utility, then use the Instant Wireless Manager. Click **Admin** and then **Set IP Address**. Select **Set IP** and type in the Workgroup Bridge's new IP address. Click **OK**.

If you encounter problems, then power the Workgroup Bridge off and on again, or push the Reset button. Then try to change the IP address again.
3. **The Workgroup Bridge-enabled PC won't communicate with a wireless-enabled PC or printer.**

Perform the following steps:

 - Check that the wireless-enabled PC or printer is on the same wireless network as the PC using the Workgroup Bridge.
 - Make sure that the SSID and operating mode are the same for all devices connected to the same wireless network.
 - If the wireless LAN settings are okay, make sure that all the devices are on the same IP network.
4. **The Instant Wireless Configuration Utility doesn't detect the Workgroup Bridge.**

Make sure that the Ethernet cable is properly connected and that the LAN LED is lit. If the LED is not lit, change the position of the selection switch on the Workgroup Bridge's rear panel to the correct cable, either crossover or straight.

5. **The Instant Wireless Configuration Utility won't open.**
Make sure that you have a LAN card installed on the PC so you can use the Instant Wireless Manager.

6. **The Instant Wireless Configuration Utility does not recognize my User Name and Password.**

The User Name and Password are case-sensitive. Make sure you are using the correct case(s) when entering the User Name and Password.

The default user name is **linksys**, and the default password is **admin**. If you forget your User Name or Password, you can push the Workgroup Bridge's Reset button. This will set the User Name and Password to the default settings. However, all other Workgroup Bridge settings will be reset to the factory defaults as well.

Frequently Asked Questions

What is the Microsoft digital signature?

Drivers that pass Microsoft Windows 2000 certification receive a digital signature file from Microsoft. The Wireless Ethernet Workgroup Bridge does not have such a digital signature; however, it is fully compatible with Windows 2000.

Can I run an application from a remote computer over the wireless network?

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

Can I play multiplayer games with other users of the wireless network?

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

What is the IEEE 802.11b standard?

The IEEE 802.11b Wireless LAN standards subcommittee is formulating a standard for the industry. The objective is to enable wireless LAN hardware from different manufacturers to communicate.

Wireless Ethernet Workgroup Bridge

What IEEE 802.11b features are supported?

The product supports the following IEEE 802.11 functions:

- CSMA/CA plus Acknowledge protocol
- Multi-Channel Roaming
- Automatic Rate Selection
- RTS/CTS feature
- Fragmentation
- Power Management

What is Ad-hoc?

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

What is Infrastructure?

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

What is Roaming?

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

To achieve true seamless connectivity, the wireless LAN must incorporate a number of different functions. Each node and Wireless Network Access Point, for example, must always acknowledge receipt of each message. Each node must maintain contact with the wireless network even when not actually transmitting data. Achieving these functions simultaneously requires a dynamic RF networking technology that links Wireless Network Access Points and nodes. In such a system, the user's end node undertakes a search for the best possible access to the system. First, it evaluates such factors as signal strength and quality, as well as the message load currently being carried by each Wireless Network Access Point and the distance of each Wireless Network Access Point to the wired backbone. Based on that information, the node next selects the right Wireless Network Access Point and registers its address. Communications between end node and host computer can then be transmitted up and down the backbone.

As the user moves on, the end node's RF transmitter regularly checks the system to determine whether it is in touch with the original Wireless Network Access Point or whether it should seek a new one. When a node no longer receives acknowledgment from its original Wireless Network Access Point, it undertakes a new search. Upon finding a new Wireless Network Access Point, it then re-registers, and the communication process continues.

What is BSS ID?

A specific Ad-hoc LAN is called a Basic Service Set (BSS). Computers in a BSS must be configured with the same BSS ID.

What is ESSID?

An Infrastructure configuration could also support roaming capability for mobile workers. More than one BSS can be configured as an Extended Service Set (ESS). Users within an ESS could roam freely between BSSs while maintaining a continuous connection to the wireless network stations and Wireless Network Access Points.

What is ISM band?

The FCC and their counterparts outside of the U.S. have set aside bandwidth for unlicensed use in the ISM (Industrial, Scientific and Medical) band. Spectrum in the vicinity of 2.4 GHz, in particular, is being made available worldwide. This presents a truly revolutionary opportunity to place convenient high speed wireless capabilities in the hands of users around the globe.

What is Spread Spectrum?

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

What is DSSS? What is FHSS? And what are their differences?

Frequency Hopping Spread Spectrum (FHSS) uses a narrowband carrier that changes frequency in a pattern that is known to both transmitter and receiver. Properly synchronized, the net effect is to maintain a single logical channel. To an unintended receiver, FHSS appears to be short-duration impulse noise. Direct Sequence Spread Spectrum (DSSS) generates a redundant bit pattern for each bit to be transmitted. This bit pattern is called a chip (or chipping code). The longer the chip, the greater the probability that the original data can be recovered. Even if one or more bits in the chip are damaged during transmission, statistical techniques embedded in the radio can recover the original data without the need for retransmission. To an unintended receiver, DSSS appears as low power wideband noise and is rejected (ignored) by most narrowband receivers.

Would the information be intercepted while transmitting on air?

WLAN features two-fold protection in security. On the hardware side, as with Direct Sequence Spread Spectrum technology, it has the inherent security feature of scrambling. On the software side, the WLAN series offers the encryption function (WEP) to enhance security and access control. Users can set it up depending upon their needs.

Can Instant Wireless products support file and printer sharing?

Instant Wireless products perform the same function as LAN products. Therefore, Instant Wireless products can work with NetWare, Windows NT/2000, or other LAN operating systems to support printer or file sharing.

What is WEP?

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

Glossary

Ad-hoc Network - An ad-hoc network is a wireless network or other small network in which some of the network devices are part of the network only for the duration of a communications session, while others stay in close proximity to the rest of the network.

Default Gateway - The router used to forward all traffic that is not addressed to a station within the local subnet.

DHCP (Dynamic Host Configuration Protocol) - A protocol that lets network administrators centrally manage and automate the assignment of Internet Protocol (IP) addresses in an organization's network. Using the Internet's set of protocol (TCP/IP), each machine that can connect to the Internet needs a unique IP address. When an organization sets up its computer users with a connection to the Internet, an IP address must be assigned to each machine. Without DHCP, the IP address must be entered manually at each computer and, if computers move to another location in another part of the network, a new IP address must be entered. DHCP lets a network administrator supervise and distribute IP addresses from a central point and automatically sends a new IP address when a computer is plugged into a different place in the network.

DHCP uses the concept of a "lease" or amount of time that a given IP address will be valid for a computer. The lease time can vary depending on how long a user is likely to require the Internet connection at a particular location. It's especially useful in education and other environments where users change frequently. Using very short leases, DHCP can dynamically reconfigure networks in which there are more computers than there are available IP addresses.

DHCP supports static addresses for computers containing Web servers that need a permanent IP address.

DNS - The Domain Name System (DNS) is the way that Internet domain names are located and translated into Internet Protocol (IP) addresses. A domain name is a meaningful and easy-to-remember "handle" for an Internet address.

DSSS - Also known as "Direct Sequence Spread Spectrum," this is a variety of radio transmission methods that continuously change frequencies or signal patterns. Direct Sequence Spread Spectrum (DSSS), which is used in CDMA, multiplies the data bits by a very fast, pseudo-random bit pattern (PN sequence) that "spreads" the data into a large coded stream that takes the full bandwidth of the channel.

Dynamic IP Address - An IP address that is automatically assigned to a client station in a TCP/IP network, typically by a DHCP server. Network devices that serve multiple users, such as servers and printers, are usually assigned static IP addresses.

ESS - More than one BSS in a network.

FHSS - Also known as "Frequency Hopping Spread Spectrum." Frequency Hopping Spread Spectrum (FHSS) continuously changes the center frequency of a conventional carrier several times per second according to a pseudo-random set of channels, while chirp spread spectrum changes the carrier frequency. Because a fixed frequency is not used, illegal monitoring of spread spectrum signals is extremely difficult, if not downright impossible depending on the particular method.

Firmware - Programming that is inserted into programmable read-only memory, thus becoming a permanent part of a computing device.

IEEE - The Institute of Electrical and Electronics Engineers. The IEEE describes itself as "the world's largest technical professional society—promoting the development and application of electrotechnology and allied sciences for the benefit of humanity; the advancement of the profession, and the well-being of our members."

The IEEE fosters the development of standards that often become national and international standards. The organization publishes a number of journals, has many local chapters, and has several large societies in special areas, such as the IEEE Computer Society.

Infrastructure - An infrastructure network is a wireless network or other small network in which the wireless network devices are made a part of the network through an Access Point that connects them to the rest of the network.

IP Address - In the most widely installed level of the Internet Protocol (Internet Protocol) today, an IP address is a 32-binary digit number that identifies each sender or receiver of information that is sent in packets across the Internet. When you request an HTML page or send e-mail, the Internet Protocol part of TCP/IP includes your IP address in the message (actually, in each of the packets if more than one is required) and sends it to the IP address that is obtained by looking up the domain name in the Uniform Resource Locator you requested or in the e-mail address you're sending a note to. At the other end, the recipient can see the IP address of the Web page requester or the e-mail sender and can respond by sending another message using the IP address received.

IPCONFIG - A utility that provides for querying, defining and managing IP addresses within a network. A commonly used utility, under Windows NT and 2000, for configuring networks with static IP addresses.

ISP - An ISP (Internet service provider) is a company that provides individuals and companies access to the Internet and other related services such as website building and virtual hosting.

LAN - A local area network (LAN) is a group of computers and associated devices that share a common communications line and typically share the resources of a single processor or server within a small geographic area (for example, within an office building).

MAC Address - The MAC (Media Access Control) address is a unique number assigned by the manufacturer to any Ethernet networking device, such as a network adapter, that allows the network to identify it at the hardware level.

mIRC - mIRC runs under Windows and provides a graphical interface for logging onto IRC servers and listing, joining, and leaving channels.

Network Mask - also known as the "Subnet Mask."

PCMCIA - The PCMCIA (Personal Computer Memory Card International Association) is an industry group organized in 1989 to promote standards for a credit card-size memory or I/O device that would fit into a personal computer, usually a notebook or laptop computer.

Ping (Packet Internet Groper) - An Internet utility used to determine whether a particular IP address is online. It is used to test and debug a network by sending out a packet and waiting for a response.

RJ-45 - A connector similar to a telephone connector that holds up to eight wires, used for connecting Ethernet devices.

Roaming - The ability to use a wireless device and be able to move from one access point's range to another without losing the connection.

Static IP Address - A permanent IP address that is assigned to a node in a TCP/IP network.

Subnet Mask - The method used for splitting IP networks into a series of subgroups, or subnets. The mask is a binary pattern that is matched up with the IP address to turn part of the host ID address field into a field for subnets.

TCP (Transmission Control Protocol) - A method (protocol) used along with the Internet Protocol (Internet Protocol) to send data in the form of message units between computers over the Internet. While IP takes care of handling the actual delivery of the data, TCP takes care of keeping track of the individual units of data (called packets) that a message is divided into for efficient routing through the Internet.

TCP/IP - Transmission Control Protocol/Internet Protocol (TCP/IP) is the basic communication language or protocol of the Internet. It can also be used as a communications protocol in a private network (either an intranet or an extranet). When you are set up with direct access to the Internet, your computer is provided with a copy of the TCP/IP program just as every other computer that you may send messages to or get information from also has a copy of TCP/IP.

UDP (User Datagram Protocol) - A communications method (protocol) that offers a limited amount of service when messages are exchanged between computers in a network that uses the Internet Protocol (IP). UDP is an alternative to the Transmission Control Protocol (TCP) and together with IP, is sometimes referred to as UDP/IP. Like the Transmission Control Protocol, UDP uses the Internet Protocol to actually get a data unit (called a datagram) from one computer to another. Unlike TCP, however, UDP does not provide the service of dividing a message into packets (datagrams) and reassembling it at the other end. Specifically, UDP doesn't provide sequencing of the packets that the data arrives in. This means that the application program that uses UDP must be able to make sure that the entire message has arrived and is in the right order. Network applications that want to save processing time because they have very small data units to exchange (and therefore very little message reassembling to do) may prefer UDP to TCP.

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UTP - Unshielded twisted pair is the most common kind of copper telephone wiring. Twisted pair is the ordinary copper wire that connects home and many business computers to the telephone company. To reduce crosstalk or electromagnetic induction between pairs of wires, two insulated copper wires are twisted around each other. Each signal on twisted pair requires both wires. Since some telephone sets or desktop locations require multiple connections, twisted pair is sometimes installed in two or more pairs, all within a single cable.

WEP (Wired Equivalent Privacy) - A data privacy mechanism based on a 64-bit shared key algorithm, as described in the IEEE 802.11 standard.

WINIPCFG - Configuration utility based on the Win32 API for querying, defining, and managing IP addresses within a network. A commonly used utility, under Windows 95, 98, and Millennium, for configuring networks with static IP addresses.

FEDERAL COMMUNICATIONS COMMISSION INTERFERENCE STATEMENT

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

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

CAUTION:

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

FCC RF Radiation Exposure Statement

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