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You can read the recommendations in the user guide, the technical guide or the installation guide for LINKSYS WAP11. You'll find the answers to all your questions on the LINKSYS WAP11 in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

User manual LINKSYS WAP11  
User guide LINKSYS WAP11  
Operating instructions LINKSYS WAP11  
Instructions for use LINKSYS WAP11  
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Instant Wireless™ Series

## Wireless Network Access Point



Use this guide to install: WAP11

User Guide

 LINKSYS®



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**Manual abstract:**

@@@If the product proves defective during this warranty period, call Linksys Customer Support in order to obtain a Return Authorization Number. BE SURE TO HAVE YOUR PROOF OF PURCHASE AND A BARCODE FROM THE PRODUCT'S PACKAGING ON HAND WHEN CALLING. RETURN REQUESTS CANNOT BE PROCESSED WITHOUT PROOF OF PURCHASE. When returning a product, mark the Return Authorization Number clearly on the outside of the package and include your original proof of purchase. All customers located outside of the United States of America and Canada shall be held responsible for shipping and handling charges. IN NO EVENT SHALL LINKSYS' LIABILITY EXCEED THE PRICE PAID FOR THE PRODUCT FROM DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THE PRODUCT, ITS ACCOMPANYING SOFTWARE, OR ITS DOCUMENTATION. LINKSYS DOES NOT OFFER REFUNDS FOR ANY PRODUCT. Linksys makes no warranty or representation, expressed, implied, or statutory, with respect to its products or the contents or use of this documentation and all accompanying software, and specifically disclaims its quality, performance, merchantability, or fitness for any particular purpose. Linksys reserves the right to revise or update its products, software, or documentation without obligation to notify any individual or entity. Please direct all inquiries to: Linksys P. O. Box 18558, Irvine, CA 92623. FCC STATEMENT This product has been tested and complies with the specifications 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 according to 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 is found 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 or devices Connect the equipment to an outlet other than the receiver's Consult a dealer or an experienced radio/TV technician for assistance FCC Radiation Exposure Statement This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body. UG-WAP11-011005E JL Instant Wireless™ Series Wireless Network Access Point Table of Contents Introduction The Instant Wireless™ Wireless Network Access Point Features Package Contents System Requirements Planning Your Wireless Network Network Topology Roaming Getting to Know the Wireless Network Access Point The Wireless Access Point's Rear Panel The Wireless Access Point's Front Panel Connecting and Setting Up the Wireless Network Access Point Installing the USB Drivers for the Wireless Network Access Point Installing the Driver Software for Windows 98 Installing the Driver Software for Windows Millennium Installing the Driver Software for Windows 2000 Configuring the Wireless Network Access Point Installing the Configuration Utility The USB Configuration Utility Configuring the Wireless Network Access Point with the USB Configuration Utility The Access Point's SNMP Configuration Utility Creating a Temporary IP Address Configuring the Wireless Network Access Point with the Access Point's SNMP Configuration Utility Troubleshooting Common Problems and Solutions Frequently Asked Questions Glossary Specifications Environmental Warranty Information Contact Information 1 1 2 2 3 3 4 4 6 7 8 8 10 11 14 14 18 18 31 31 32 47 47 47 51 56 57 58 59 Introduction The Instant Wireless™ Wireless Network Access Point Don't be bound by cabling restrictions any longer! The Instant Wireless™ Network Access Point from Linksys delivers the freedom to configure your network your way. Utilization of state-of-the-art wireless technology gives you the ability to set up workstations in ways you never thought possible; no cables to install means fewer expenses and fewer hassles.

The Instant Wireless™ Network Access Point's high-powered antennae offer a range of operation of up to 457 meters, providing seamless roaming throughout your LAN infrastructure. Advanced user authentication ensures a high level of security for wireless networking, while easy-to-use Windows-based diagnostics and statistic tools ensure that you'll always be in control. Best of all, the Instant Wireless Network Access Point features easy installation--just plug it in and you're ready to go! When all these features come together in one compact, lightweight, and power-efficient unit, you have the ultimate in flexible networking--the Linksys Instant Wireless™ Network Access Point. Features · Highly Efficient Dipole Antennae Provide Extensive Range of Operation · Enjoy Your Wireless Office Beyond the Range of Ethernet Networking · Auto Fall-Back Data Rate for Long-Distance Communication and Noisy Environments · High-Speed Data Transfer Rate Up to 11 Mbps · Interoperable with IEEE 802.11b (DSSS) 2.4GHz-Compliant Equipment · Features Roaming, Best Access Point Selection, Load Balancing, and Network Traffic Filtering · Extensive Operating Range Supports 150m (Indoors) and 500m (Outdoors) · 64-Bit Wired Equivalent Privacy · Free Software Driver Upgrades · Compatible with Virtually All Major Operating Systems · Free Technical Support--24 Hours a Day, 7 Days a Week for North America Only · 1-Year Limited Warranty 1 Instant Wireless™ Series Wireless Network Access Point Planning Your Wireless Network Network Topology A wireless LAN is a group of computers, each equipped with one Instant Wireless™ Series Adapter. Computers in a wireless LAN must be configured to share the same radio channel. The Instant Wireless™ Series Adapter provides access to a wired LAN for wireless workstations. An integrated wireless and wired LAN is called an Infrastructure configuration. A group of Instant Wireless™ Series Adapter users and an Instant Wireless™ Network Access Point compose a Basic Service Set (BSS).

Each Instant Wireless™ Series Adapter PC in a BSS can talk to any computer in a wired LAN infrastructure via the Instant Wireless™ Network Access Point. Package Contents . . . . . One Instant Wireless™ Network Access Point One AC Power Adapter One Setup CD-ROM One User Guide One Quick Installation and Registration Card (not shown) Two Detachable Antennae One USB Cable An infrastructure configuration extends the accessibility of an Instant Wireless™ Series Adapter PC to a wired LAN, and doubles the effective wireless transmission range for two Instant Wireless™ Series Adapter PCs.



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Since the Wireless Network 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 BSS is essential. All Instant Wireless™ Series Adapter PCs configured without roaming options in an independent BSS must be configured with a BSS ID used in the BSS. The wireless LAN Infrastructure configuration is appropriate for enterprisescale 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 Instant Wireless™ Series Adapter PCs within one ESS must be configured with the same ESS ID and use the same radio channel.

Before enabling an ESS with roaming capability, choosing a feasible radio channel and optimum Wireless Network Access Point position is recommended. Proper Wireless Network Access Point positioning combined with a clear radio signal will greatly enhance performance. 3 System Requirements · A PC with USB Support or Ethernet Connection · Windows 95, 98, Millennium, NT version 4.0, or 2000 Professional · 500 kbytes of free disk space for utility and driver installation · A 10 Mbps Category 3 or Better network RJ-45 connection Linux/Unix Users: Though these operating systems are not supported by Linksys, the Wireless Access Point should work in these environments. The WAP11 can be configured under these operating systems using SNMP.

A configurable Management Information Base file (MIB) named AT76C510.MIB can be found on the Setup Utility CD. This file is for Linux/Unix users only, and is not necessary for any Windows installation. 2 Instant Wireless™ Series Wireless Network Access Point Your Access Point comes with a USB cable that has two different types of connectors. Type A, the master connector, is shaped like a rectangle and plugs into your PC's USB port.

Type B, the slave connector, resembles a square and connects to the USB port on the rear panel of your Wireless Network Access Point. Getting to Know the Wireless Network Access Point The Wireless Access Point's Rear Panel The ADSL Modem Router's Rear Panel Your Access Point's ports, where network cables are connected, are located on the rear panel of your Access Point. USB Compatibility with Your PC To use the USB port on the Wireless Network Access Point, you must have Windows 98, 2000, or Millennium installed on your PC. USB is not supported in a Windows 95 or NT environment. Also, your PC must have a USB port installed and enabled. Some PCs may have a disabled USB port. If your port doesn't seem to be working, there may be jumpers on the motherboard or a menu option in the BIOS to enable a PC's USB port. Other motherboards have USB interfaces, but no ports. You can install your own USB port and attach it to your PC's motherboard using hardware purchased at retail computer stores. See your PC's User Guide for instructions.

The Wireless Network Access Point's Ports Dipole Antenna Connectors These two round connections are where the antennae are connected to the Access Point. This LAN (Local Area Network) port connects to Ethernet network devices, such as a hub, switch, or router. The Power port is where you will connect the power adapter. Be sure to connect the power cord to the power adapter before plugging it in. LAN Power USB Type A USB Type B Configuration Port The Configuration Port is a USB port (Type Bslave) which connects to a USB-ready PC in order to configure the Access Point's settings. To work with USB ports, your PC must be running Windows 98, 2000, or Millennium. Note: The Configuration Port does not connect your Access Point to your PC (or any other device) for networking purposes. Its only function is to allow you to configure your Access Point's settings. Once the Access Point is configured, you may remove the USB cable connecting the Access Point to your PC. There is no USB Support on PCs running Windows 95 or Windows NT.

4 5 Instant Wireless™ Series T The Wireless Access Point's Front Panel he ADSL Modem + Router's LEDs Wireless Network Access Point Connecting and Setting Up the Wireless Network Access Point 1. Locate an optimum location for the Wireless Network Access Point. The best place for your Wireless Network Access Point is usually at the center of your wireless network, with line of sight to all of your mobile stations. 2. Fix the direction of the antenna. Try to place it in a position which can best cover your wireless network. Normally, the higher you place the antenna, the better the performance will be. The antenna's position enhances the receiving sensitivity. 3. Connect a standard UTP cable to the Wireless Network Access Point. Then, connect the other end of the Ethernet cable to a switch or hub. The Wireless Network Access Point will then be connected to your 10/100 Network. 4. Connect the uitable driver... and click the Next button. This will search for the Windows 2000 driver. 4. Continue to the Configuring the Wireless Network Access Point section for software installation now.

10 11 Instant Wireless™ Series 3. Under "Optional Search Locations," select Specify a location and click the Next button. Wireless Network Access Point 5. Windows will now install the driver files. Click the Finish button when completed. 4. You will be prompted to enter a path; type "D:\WAP11\usbdrv" (where D: is the letter of your CD-ROM drive) and click OK. Windows will now search for the driver. After Windows has acknowledged finding the driver, click the Next button. 6.

Continue to the Configuring the Wireless Network Access Point section for software installation. 12 13 Instant Wireless™ Series Wireless Network Access Point 1. The following screen should appear. Configuring the Wireless Network Access Point The Wireless Network Access Point can be configured one of two ways, through the USB Utility or the Access Point SNMP Configuration Utility. USB Utility The USB Utility can be used when configuring the Wireless Network Access Point through a USB connection and is compatible with Windows 98, Millennium, and 2000.

Access Point SNMP Configuration Utility The Access Point SNMP Configuration Utility can be used when configuring the Wireless Network Access Point through an Ethernet connection and is compatible with all Windows Operating Systems. You may also configure the Access Point through its wireless connections. Click on the WAP11 product button in the column on the left to select it. Note: In order for all other wireless devices to communicate with the Wireless Network Access Point, those devices must be operating in the Infrastructure Mode. If any wireless devices are configured in the Ad Hoc Mode, they will not be recognized by the Access Point.



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*Linux/Unix Users: Since the Configuration Utility is written for Windows users, you will have to configure the Wireless Access Point using SNMP. A configurable MIB file (AT76C510.MIB) can be found on the Setup Utility CD. Remember, Linksys does not support Linux or Unix as an operating system. This file is for Linux/Unix users only, and is not necessary for any Windows installation. Installing the Configuration Utility Insert the Setup Utility CD into your CD-ROM Drive. The Setup Utility should run automatically and the screen shown on the top of the next page should appear. If it does not, click the Start button and choose Run. In the box that appears, enter D:\setup.exe (where "D" is the letter of your CD-ROM drive).*

*14 2. When this screen appears, click on the Install tab to start the setup. Note: This useful menu screen can be accessed at any time, simply by inserting the Setup Utility CD into your CD-ROM drive. From this menu, software can be uninstalled, and you may view online documentation and contact information. Your AP will still work after uninstalling the Utility. 15 Instant Wireless™ Series 3. When the Welcome screen appears, click Next to continue. Wireless Network Access Point 5. The Choose Destination Location screen will show you the default destination chosen by the utility. It is recommended that you leave the default destination, but if you want to install this in another location, click the Browse button and select an alternate destination.*

*When you are ready to continue, click the Next button. 4. Read the terms of the License Agreement, and if you agree, click Yes; otherwise, click No to cancel the configuration process. 6. The Configuration Utility has now been installed.*

*Select Yes to restart your PC and then click Finish. 16 17 Instant Wireless™ Series Wireless Network Access Point The USB Configuration Utility The USB Configuration Utility is provided to allow you further customization of the Wireless Network Access Point and your wireless network through your USB port. Configuring the Wireless Network Access Point with the USB Configuration Utility THE STATUS TAB The Status tab displays the Wireless Network Access Point's current status. From this tab, you can view the status information along with reconnecting to the Wireless Network Access Point and restoring its default settings. · Working Status.*

*@@Regulatory Domain. @@Firmware Version. @@MAC Address. This displays the MAC Address of your current WAP11. Mode. This displays the mode your WAP11 is currently configured for: Access Point, Access Point Client, or Wireless Bridge. ESSID. The unique name shared among all points in your wireless network is displayed here. Channel. The wireless channel shared by all of the points in your wireless network is displayed here.*

*· · WEP. If you have not enabled WEP encryption, this will read Disabled. @@Reconnect. If the USB connection to the Access Point is disconnected, you can reconnect the USB cable and click the Reconnect button. This will retrieve the most recently saved configuration from the Access Point so you will be ready to use the USB Configuration Utility again. Restore Defaults. @@If this button is clicked, any setting you may have made through the USB Utility will be lost. · · · · Click the Apply button to store the information. A new dialog box will appear. Click the Yes button to accept the changes.*

*If you have not already clicked the Apply button, the Close button will close the USB Utility without saving any changes. Click the Help button for assistance. 18 19 Instant Wireless™ Series THE BASIC SETTING TAB Wireless Network Access Point THE ADVANCED TAB The Access Point automatically detects the settings to your wireless network. @@ · ESSID. @@The ESSID must be identical for all points in the wireless network.*

*@@Make sure this setting for all points in the wireless network are the same. Verify that you're using the correct ESSID and click the Apply button to set it. Channel. @@All points in your wireless network must use the same channel in order to function correctly. Verify that the correct channel is selected and click the Apply button to set it.*

*A new dialog box will appear. Click the Yes button to accept the changes. Access Point Name. You may assign any name to your Access Point. Unique, memorable names are helpful, especially if you are employing multiple Access Points on the same network. Before making any changes to the Advanced tab, please check your wireless settings on other systems, as these changes will alter the effectiveness of the Wireless Network Access Point. In most cases, these settings do not need to be changed. · Fragmentation Threshold. This value indicates how much of the Access Point's resources are devoted to recovering packet errors. The value should remain at its default setting of 2,346.*

*If you have decreased this value and experience high packet error rates, you can increase it again, but it will likely decrease overall network performance. Only minor modifications of this value are recommended. RTS Threshold. This value should remain at its default setting of 2,346. Should you encounter*

*inconsistent data flow, only minor modifications are recommended. · · · 20 21 Instant Wireless™ Series · Authentication Type. You may choose between Open System, Shared Key, and Both. The Authentication Type default is set to Open System, in which the sender and the recipient do NOT share a secret key. Each party generates its own key-pair and asks the receiver to accept the randomly generated key. Once accepted, this key is used for a short time only. Then a new key is generated and agreed upon. Shared Key is when both the sender and the recipient share a secret key. Preamble Type. The preamble defines the length of the CRC block for communication between the Access Point and the roaming Network Card. (High network traffic areas should use the shorter preamble type.*

*) Select the appropriate preamble type and click the Apply button to set it. Basic Rates. The basic transfer rates should be set depending on the speed of your wireless network. Set the correct basic rate for your wireless network and click the Apply button to set it. Antenna Diversity. These two settings determine whether either or both antennae will be used to transmit or receive. The default setting, Both, means that the antennae are set to both Transmit and Receive; this is the recommended setting. The WAP11 will auto-detect which antenna to use based on signal strength. Auto Rate Fall Back setting should be checked to make your wireless network flexible for roaming wireless devices. As wireless devices move away from the Wireless Network Access Point, the transfer rate will automatically fall back to the most optimum rate allowed. Wireless Network Access Point THE MODE TAB · · · The WAP11 offers three modes of operation: Access Point, Access Point Client, and Wireless Bridge.*



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· Access Point - The Operational Mode is set to Access Point by default. This connects your wireless PCs to a wired network. In most cases, no change is necessary. · 22 23 Instant Wireless™ Series · Access Point Client A WAP11 set to Access Point Client mode is able to talk to one main WAP11 and wireless clients within its range.

This mode allows your WAP11 to act as a client of a main WAP11. A LAN attached to your WAP11 client can then be wirelessly bridged to the main WAP11. Enter the required MAC address of the main WAP11. Wireless Bridge - If you are trying to make a wireless connection between two or more wired networks, select Wireless Bridge. There are two options: Point to Point and Point to MultiPoint. Point to Point This mode connects two physically separated LAN segments by using two WAP11 units. Wireless Network Access Point To configure a Point to Point bridged environment: 1. 2. Click Point to Point. Set the MAC Address of the Access Point in LAN 1 to look for the MAC Address of the Access Point in LAN 2.

Set the MAC address of the Access Point in LAN 2 to look for the MAC Address of the Access Point in LAN 1. On the Operational Mode tab, enter the Remote MAC Address of the remote Access Point. The remote Access Point also needs to be set up as a Wireless Bridge. 3. 4.

Note: All devices on each LAN must be connected through a hub or switch. Note: In Wireless Bridge mode, the WAP11 can ONLY be accessed by another wireless bridge. In order for your other wireless devices to access the WAP11, you must reset it to Access Point mode. The two modes are mutually exclusive. Point to MultiPoint This mode allows you to construct a network that has multiple WAP11 units bridging wirelessly.

· 24 25 Instant Wireless™ Series To configure a Point to MultiPoint bridged environment: 1. Click Point to MultiPoint for the WAP11 used in LAN 1. No MAC Address binding is needed. Set the Access Points in LAN 2 and LAN 3 to Point to Point, and have them look for the MAC Address of the Access Point in LAN 1. Wireless Network Access Point THE IP SETTING TAB 2. Only one of the Access Points must be in Point to MultiPoint mode. For all other bridged Access Points, select the Point to Point option, and enter the Remote MAC Address of the Access Point set to Point to MultiPoint. Click the Apply button to store the information. A new dialog box will appear. Click the Yes button to accept the changes.

The IP settings for the Wireless Network Access Point are made from this tab. · IP Address. This IP address must be unique to your network. We suggest you use the default IP address of 192.168.1.250. As this is a private IP address, there is no need to purchase a separate IP address from your service provider. Verify the address and click the Apply button to save changes. IP Mask.

Your Access Point's Subnet Mask must be the same as your Ethernet network. Verify this is correct and click the Apply button to set it. DHCP Setting. Check the box next to DHCP Enable to allow it to obtain a dynamic IP address from a DHCP server. You may also choose how the WAP11 dynamically obtains an IP address--either Wireless or Ethernet.

IP Filtering. For security, click the check box to enable IP filtering, which allows IP packets only through the Access Point. Gateway. This setting only appears when the DHCP client is enabled; it indicates the status of the gateway and is not user-adjustable. . . . Note: Configuring the IP address here allows you to use the SNMP Configuration Utility software.

It is not necessary to make any changes to the IP address if you are not planning on using the SNMP Configuration Utility. 26 27 Instant Wireless™ Series THE SECURITY TAB Wireless Network Access Point · WEP Key Setting. This setting is the configuration key used in accessing the wireless network via WEP encryption. To generate an encryption key: 1. Type exactly the same case sensitive Passphrase in the PassPhrase field. For security purposes, please create your own Passphrase. 2. Click the Done button to create the encryption keys. The Passphrase generates four unique keys. 3.

Make sure that the Default Key is the same for each point on the wireless network. 4. Click the Apply button to store the information. 5. Click the Yes button to accept the changes in the dialog box that appears. · Password Setting. This option allows you to choose Read/Write and/or Read Only. It is recommended that you change both to maximize security. For both options, type in a password and confirm it. WEP (Wired Equivalent Privacy) is a data privacy mechanism based on a 40 bit shared key algorithm, as described in the IEEE 802.

11b standard. In order to utilize WEP encryption, all points in your wireless network must have WEP enabled and be set to the same Key Setting. For easier configuration, it is strongly recommended that you use the Passphrase feature. · WEP (Disable/64-bit WEP/128-bit WEP). In order to utilize WEP encryption, select the WEP setting from the pull-down menu.

If you do not wish do utilize WEP encryption, make sure Disable is selected. This specific WEP encryption is unique to Linksys and may conflict with other vendors' WEP encryption. Passphrase. This is the code used when a point on the wireless network wishes to log on to the network. It is a text string with a maximum of 32 alphanumeric characters.

The WEP Key Settings are based upon the Passphrase determined by you. Type that here. This passphrase may not work with non-Linksys products due to possible incompatibility with other vendors' passphrase generators. · Authorization Table Enable. This setting can be enabled here, but any setting changes must be made through the SNMP Utility. It is recommended that this setting be enabled using the SNMP Utility. Note: For security, it is recommended that you make up your own passphrase (i.e. "Home"). You must use the same passphrase or WEP key settings for all wireless computers in order for the wireless network to function properly.

28 29 Instant Wireless™ Series THE INFO TAB Wireless Network Access Point The Access Point's SNMP Configuration Utility The Access Point SNMP Configuration Utility is provided to allow you further customization of the Wireless Network Access Point and your wireless network through your Ethernet or wireless connection. It is strongly recommended that you use your wireless connection to use the SNMP Configuration Utility. Linux/Unix Users: Though these operating systems are not supported by Linksys, the Wireless Access Point should work in these environments. The WAP11 can be configured under these operating systems using SNMP. A configurable Management Information Base file (MIB) named AT76C510.MIB can be found on the Setup Utility CD. This file is for Linux/Unix users only, and is not necessary for any Windows installation. Creating a Temporary IP Address If you wish to use the SNMP Configuration Utility to configure the Access Point, you must assign a temporary IP address to your computer.



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You may need to assign the PC a temporary IP address to gain access to the Access Point. 1.

This can be done at Start, Settings, Control Panel, then Network. 2. Click the network adapter associated with the TCP/IP and click Properties. 3. Note your current settings in order to restore your TCP/IP configuration.

4. Select Specify an IP address and enter the following values: IP - 192.168.1.50, Subnet Mask- 255.

255.255.0 5. Click OK and click OK again in the Network window. 6. Restart the computer when asked. Make sure that you enter an IP address for the Access Point in order to access it at a later time. Once you have completed the IP Address Configuration, you can set the PC back to its previous settings. For example, to "Obtain an IP Address automatically." The Info tab displays general information about Linksys and the USB Utility.

The USB Utility's copyright date and version number are listed as well as the Utility's firmware version. At the bottom of the screen, you will find a button that will access Linksys' web page (once your Internet connection is properly set up), the email address for technical support, and the phone number to call for technical support. Note: Once your Access Point is installed and configured, the USB cable may be removed. 30 31 Instant Wireless™ Series To restore your TCP/IP configuration, follow the steps below: 1. Follow steps 1 and 2 in the instructions above. 2. Select either Specify an IP address or Obtain IP address automatically and enter the original values you noted earlier. 3. Click OK and click OK again in the Network window. 4.

Restart your computer. Configuring the Wireless Network Access Point with the Access Point's SNMP Configuration Utility If you wish to run the SNMP Configuration Utility, click Start, Programs, WAP11 Configuration Utility, and WAP11 SNMP. When you first start the Access Point SNMP Configuration Utility, a screen will appear asking you to enter the Wireless Network Access Point's IP Address. Enter the IP Address--192.168.

1.250 is the default setting--and Password--public is the default password--and then click the OK button to continue. (As this is a private IP address, you do not need to purchase an additional IP Address from your service provider.) Wireless Network Access Point THE STATUS TAB The Status tab displays the Wireless Network Access Point's current status. From this tab, you can view the status information along with reconnecting to the Wireless Network Access Point and restoring its default settings.

· DEFAULT SETTINGS Default IP Address: 192.168.1.250 Default SubNet Mask: 255.255.255.0 Working Status. @@Regulatory Domain. @@Firmware Version. @@It also shows the Access Point's assigned name.

MAC Address. This displays the MAC Address of your current WAP11. ESSID. @@@@WEP. @@@@Reset. @@Find AP. @@Reconnect. @@@@Restore Defaults. @@@@ESSID. @@The ESSID must be identical for all points in the network.

@@Make sure this setting for all points in the network are the same. @@Channel. @@@@Click the Apply button to store the information. A new dialog box will appear. Then click the Yes button to accept the changes.

@@@@Click the Help button for assistance. 34 35 Instant Wireless™ Series THE ADVANCED TAB Wireless Network Access Point · Authentication Type. You may choose between Open System, Shared Key, and Both. The Authentication Type default is set to Open System, in which the sender and the recipient do NOT share a secret key. Each party generates its own key-pair and asks the receiver to accept the randomly generated key.

Once accepted, this key is used for a short time only. Then a new key is generated and agreed upon. Shared Key is when both the sender and the recipient share a secret key. Preamble Type. The preamble defines the length of the CRC block for communication between the Access Point and the roaming Network Card. (High network traffic areas should use the shorter preamble type.) Select the appropriate preamble type and click the Apply button to set it. Basic Rates. The basic transfer rates should be set depending on the speed of your wireless network. Verify that you've set the correct basic rate for your wireless network before clicking the Apply button.

The Auto Rate Fall Back setting should be checked to make your wireless network flexible for roaming wireless devices. As wireless devices move away from the Access Point, the transfer rate will automatically fall back to the most optimum rate allowed. . . . Before making any changes to the Advanced tab, please check your wireless settings as these changes will alter the effectiveness of the Wireless Network Access Point. In most cases, these settings do not need to be changed. · Fragmentation Threshold Value. The value should remain at its default setting of 2,346. If you have decreased this value and experience high packet error rates, you can increase it again, but it will likely decrease overall network performance. Only minor modifications of this value are recommended. RTS Threshold Value. This value should remain at its default setting of 2,346.

Should you encounter inconsistent data flow, only minor modifications are recommended. · 36 37 Instant Wireless™ Series THE MODE TAB Wireless Network Access Point · Access Point Client A WAP11 set to Access Point Client mode is able to talk to one main WAP11 and wireless clients within its range. This mode allows your WAP11 to act as a client of a main WAP11. A LAN attached to your WAP11 client can then be wirelessly bridged to the main WAP11. Enter the required MAC address of the main WAP11.

· The WAP11 offers three modes of operation: Access Point, Access Point Client, and Wireless Bridge. · A P o i n t - T h e Operational Mode is set to Access Point by default. This connects your wireless PCs to a wired network. In most cases, no change is necessary. Wireless Bridge If you are trying to make a wireless connection between two wired networks, select Wireless Bridge.

There are two options: Point to Point and Point to MultiPoint. Note: In Wireless Bridge mode, the WAP11 can ONLY be accessed by another wireless bridge. In order for your other wireless devices to access the WAP11, you must reset it to Access Point mode. The two modes are mutually exclusive. 38 39 Instant Wireless™ Series Point to Point This mode connects two physically separated LAN segments by using two WAP11 units. Wireless Network Access Point Point to MultiPoint This mode allows you to construct a network that has multiple WAP11 units bridging wirelessly. To configure a Point to Point bridged environment: 1. 2. Click Point to Point. Set the MAC Address of the Access Point in LAN 1 to look for the MAC Address of the Access Point in LAN 2.

Set the MAC address of the Access Point in LAN 2 to look for the MAC Address of the Access Point in LAN 1. On the Operational Mode tab, enter the Remote MAC Address of the remote Access Point.



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The remote Access Point also needs to be set up as a Wireless Bridge. To configure a Point to MultiPoint bridged environment: 1. Click Point to MultiPoint for the WAP11 used in LAN 1. No MAC Address binding is needed. 2. Set the Access Points in LAN 2 and LAN 3 to Point to Point, and have them look for the MAC Address of the Access Point in LAN 1. 3. 4.

Only one of the Access Points must be in Point to MultiPoint mode. For all other bridged Access Points, select the Point to Point option, and enter the Remote MAC Address of the Access Point set to Point to MultiPoint. Click the Apply button to store the information. A new dialog box will appear. Click the Yes button to accept the changes.

Note: All devices on each LAN must be connected through a hub or switch. 40 41 Instant Wireless™ Series THE IP SETTING TAB Wireless Network Access Point THE SECURITY TAB The IP settings for the Access Point are made from this tab. This is for the SNMP Configuration Utility use only. · IP Address. This IP address must be unique to your network.

We suggest you use the default IP address of 192.168.1.250. As this is a private IP address, there is no need to purchase a separate IP address from your service provider. Verify the address and click the Apply button to save changes. IP Mask. Your Access Point's Subnet Mask must be the same as your Ethernet network. Verify this is correct and click the Apply button to set it. DHCP Setting.

Check the box next to DHCP Enable to allow it to obtain a dynamic IP address from a DHCP server. You may also choose how the WAP11 dynamically obtains an IP address--either Wireless or Ethernet. IP Filtering. For security, click the check box to enable IP filtering, which allows IP packets only through the Access Point. Gateway. This setting only appears when the DHCP client is enabled; it indicates the status of the gateway and is not user-adjustable. WEP (Wired Equivalent Privacy) is a data privacy mechanism based on a 64/128-bit shared key algorithm, as described in the IEEE 802.11 standard. In order to utilize WEP encryption, all points in your wireless network must have WEP enabled and be set to the same Key Setting. · WEP (Disable/64-bit/128-bit). To use WEP encryption, select Enable. For no WEP encryption, select Disable. This specific WEP encryption is unique to Linksys and may conflict with other vendors' WEP encryption. Passphrase. This is the code used when a point on the wireless network wishes to log on to the network.

It is a text string with a maximum of 32 alphanumeric characters. The WEP Key Settings are based upon the Passphrase determined by you. Type that here.

This passphrase may not work with non-Linksys products due to possible incompatibility with other vendors' passphrase generators. WEP Key Setting. This setting is the configuration key used in accessing the wireless network via WEP encryption. To generate an encryption key: · · · · · 1. Type exactly the same case sensitive Passphrase in the PassPhrase field. For security purposes, please create your own Passphrase. 2. Click the Done button to create the encryption keys. The Passphrase generates four unique keys. 42 43 Instant Wireless™ Series 3. Verify the Default Key is the same for each point on the wireless network. · Password Setting.

Choose Read/Write and/or Read Only. It is recommended that you change both to maximize security. For both options, type in a password and confirm it. Wireless Network Access Point To create a load file, follow these steps: 1. Create a text file (e.g., MAC.TXT) using Notepad or another text editor. 2. Enter the 10 digit MAC address of each adapter that you wish to authorize communication with the Access Point. ONE PER LINE!!!!!!! 3. Save the file. Be sure to note the full path to the saved file. 4. Click the Load File button.

5. A screen will pop-up prompting you to browse for the file (e.g. MAC.TXT).

Once you have located the file, highlight it and click Open. 6. All the MAC addresses that you entered into the text file should now appear in the window. 7. Click the Download button to save these addresses in your Authorization Table. 8. Make sure the Authorization Table Enable box is checked. 9. Click the Close button. 10.

When asked to confirm your choice, click the Yes button. 11. Click the Apply button on the security tab. 12. If you ever decide to change the entries on the table, simply edit the text file and reload it using steps 4-11. If you have not already clicked the Apply button, the Close button will close the SNMP Configuration Utility without saving any changes. Click the Apply button to store the information. A new dialog box will appear. Then click the Yes button to accept the changes. Click the Help button for assistance.

Note: When WEP settings are changed, you will lose network access until WEP settings are updated on the PCs. You must reconfigure your wireless PCs to the new WEP settings. If you are configuring this wirelessly, you will lose your connection. · Authorized MAC. You may authorize who can gain network access through the Access Point by using MAC Address filtering.

Only MAC addresses in the Authorization table will be allowed to communicate with the WAP11. Click the Authorize MAC button to view the Authorized MAC Addresses screen. Add - Click the Add button to authorize more MAC addresses. Delete - Click the Delete button to remove MAC addresses. Modify - Use the Modify button to edit any MAC address.

Sort MAC - The Sort MAC button arranges the MAC addresses in numerical order. Clear All - This button removes all MAC addresses from the table. Get flash - To view the table of currently authorized MAC addresses, click the Get flash button. Authorization Table Enable - Check the box next to Authorization Table Enable to activate MAC Address filtering. 44 45 Instant Wireless™ Series THE INFO TAB Wireless Network Access Point Troubleshooting Common Problems and Solutions This chapter provides solutions to problems usually encountered during the installation and operation of the Wireless Network Access Point. Read the description below to solve your problems. If you can't find an answer here, check the Linksys website at [www.linksys.com](http://www.linksys.com). What is the purpose of antenna diversity and when should it be used? When used, how should it be set-up? The dual antennae on the Access Point are probably best explained using this example.

Take television, if you have ever had the old "rabbit ear type of antenna" and saw reflections on TV (called "ghosts"), then you moved the antenna and the reflections "went away." (Using two antennae allows us to "MOVE AWAY" from reflections that cause us to lose or have to retransmit data.) They should be used indoors as outdoor reflections are rare. As long as both antennae cover roughly the same area, this is fine. The Info tab displays general information about Linksys and the Access Point SNMP Manager.



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The SNMP Configuration Utility's copyright date and version number are listed as well as the Utility's firmware version. At the bottom of the screen, you will find a button that will access Linksys' web page (once your Internet connection is properly set up), the email address for technical support, and the phone number to call for technical support. · Stations. This shows the MAC addresses of those machines making wireless connections to the Access Point. · Statistics. This displays the connection statistics for your wireless and Ethernet connections. · TrapLog. This displays the information on any SNMP messages read by your Access Point. Frequently Asked Questions Can the Wireless Network Access Point act as my DHCP Server? No. The Access Point is nothing more than a wireless hub, and as such, cannot be configured to handle DHCP capabilities.

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. 46 47 Instant Wireless™ Series What IEEE 802.11 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. Wireless Network Access Point 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). 48 49 Instant Wireless™ Series 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.



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*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. What is a MAC Address? The Media Access Control (MAC) 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.*

*For all practical purposes, this number is usually permanent. Unlike IP addresses, which can change every time a computer logs on to the network, the MAC address of a device stays the same, making it a valuable identifier for the network. Wireless Network Access Point 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. 50 51 Instant Wireless™ Series 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 wellbeing 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.*

*Wireless Network Access Point 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 it 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.*



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*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. 53 52 Instant Wireless™ Series 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. @@@@ 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. 54 Wireless Network Access Point 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 64bit 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.*

*55 Instant Wireless™ Series Wireless Network Access Point Baseband Processor: MAC Controller: HFA 3861B or HFA 3863 MAC Atmel AT76C510 13 - 20 dBm at maximum radiation direction 1.2 Transmitter RF Output Power: Frequency Stability: 4 mW/MHz Within + 25 ppm Specifications Standards: Channels: IEEE 802.3 (10BaseT), IEEE 802.11b (Wireless) 11 Channels (US, Canada) 13 Channels (Europe) 14 Channels (Japan) One 10BaseT RJ-45 Port, One USB Port 10BaseT: UTP Category 3 or Better USB: USB Cable Indoors: Up to 30M (100 ft.) @ 11 Mbps Up to 50M (165 ft.) @ 5.5 Mbps Up to 70M (230 ft.) @ 2 Mbps Up to 91M (300 ft.) @ 1 Mbps Outdoors: Up to 152M (500 ft.) @ 11 Mbps Up to 270M (885ft.*

*) @ 5.5 Mbps Up to 396M (1300 ft.) @ 2 Mbps Up to 457M (1500 ft.) @ 1 Mbps Up to 11Mbps (Wireless), 10Mbps (Ethernet) Power, Act, Link (Wired - Link/Activity) 1.1 General Radiation Power: Ports: Cabling Type: Operating Range (Wireless): Data Modulation Type: BPSK (1/5.5Mbps) / QPSK (2/11 Mbps) CCK (5.5/11 Mbps) 1.3 Power Power Voltage: Power Consumption: Environmental Dimensions: Unit Weight: 7.31" x 6.16" x 1.88" (186mm x 154mm x 48mm) 20.5 oz. (0.58 kg) 5V, 550mA TX, 230mA RX FCC Class B, FCC Class C, CE Mark Commercial 0°C to 55°C (32°F to 131°F) 0°C to 70°C (32°F to 158°F) 0% to 70% Non-Condensing 0% to 95% Non-Condensing DC 5.0 Volt + 5%, AC Adapter AC 100V-240V 5.*

*0 Volt, 2.0A (Typical) Data Rate: LEDs: RF Specification Emission Type: RF Frequency: Direct Sequence Spread Spectrum (DSSS) Power: 2471MHz - 2497MHz - Japan Band 2400MHz - 2483.5MHz - North America, Europe, Korea and Extended Japan Band 2455MHz - 2475MHz - Spain 2446.5MHz - 2483.5MHz - France 11 Channels (US, Canada) 13 Channels (Europe, Korea) 14 Channels (Japan) Intersil PRISM II Certifications: Operating Temp.: Storage Temp.: Operating Channel: Operating Humidity: Storage Humidity: Radio Chipset: 56 57 Instant Wireless™ Series Wireless Network Access Point Warranty Information BE SURE TO HAVE YOUR PROOF OF PURCHASE AND A BARCODE FROM THE PRODUCT'S PACKAGING ON HAND WHEN CALLING. RETURN REQUESTS CANNOT BE PROCESSED WITHOUT PROOF OF PURCHASE. IN NO EVENT SHALL LINKSYS' LIABILITY EXCEED THE PRICE PAID FOR THE PRODUCT FROM DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THE PRODUCT, ITS ACCOMPANYING SOFTWARE, OR ITS DOCUMENTATION. LINKSYS DOES NOT OFFER REFUNDS FOR ANY PRODUCT. LINKSYS OFFERS CROSS SHIPMENTS, A FASTER PROCESS FOR PROCESSING AND RECEIVING YOUR REPLACEMENT. LINKSYS PAYS FOR UPS GROUND ONLY. ALL CUSTOMERS LOCATED OUTSIDE OF THE UNITED STATES OF AMERICA AND CANADA SHALL BE HELD RESPONSIBLE FOR SHIPPING AND HANDLING CHARGES. PLEASE CALL LINKSYS FOR MORE DETAILS. Contact Information For help with the installation or operation of this product, contact Linksys Customer Support at one of the phone numbers or Internet addresses below.*

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