

LINKSYS®

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2.4GHz
802.11g

Wireless-G

USB Network Adapter User Guide

WIRELESS

Model No. **WUSB54G**

CISCO SYSTEMS



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This User Guide

The User Guide to the Wireless-G USB Network Adapter has been designed to make understanding networking easier than ever. Look for the following items when reading this guide:



This checkmark means there is a note of interest and is something you should pay special attention to while using the Adapter.



This exclamation point means there is a caution or warning and is something that could damage your property or the Adapter.



This question mark provides you with a reminder about something you might need to do while using the Adapter.

In addition to these symbols, there are definitions for technical terms that are presented like this:

word: definition.

Also, each figure (diagram, screenshot, or other image) is provided with a figure number and description, like this:

Figure 0-1: Sample Figure Description

Figure numbers and descriptions can also be found in the “List of Figures” section in the “Table of Contents”.

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Chapter 1: Introduction

Welcome

Thank you for choosing the Wireless-G USB Network Adapter. With this Adapter, your wireless networking experience will be faster and easier than ever.

Connect your USB-equipped desktop or notebook computer to a wireless network at incredible speeds with the Linksys Wireless-G USB Network Adapter. By incorporating two fast technologies—USB 2.0 and Wireless-G (802.11g)—the Adapter delivers data rates up to 54Mbps (5 times as fast as 802.11b), without the trouble of opening up the case of your desktop computer.

To install, simply plug the Adapter into any available USB port. (It's compatible with both USB 1.1 and 2.0 ports, but 2.0 will yield the fastest speeds.) It gets its power through the USB connection, so no power cord is necessary. The included Setup Wizard walks you through configuring the Adapter to your wireless network settings, step by step. The Wireless-G USB Network Adapter is also compatible with the Wireless-B (802.11b) network standard, with data rates up to 11Mbps. And your wireless communications can be protected by 128-bit encryption, so your data stays safe.

The Wireless-G USB Network Adapter's high-gain antenna lets you put your computer almost anywhere in the building, without the cost and hassle of running cables. Now you don't have to drill holes in your walls and climb through the attic or cellar to get connected to the network. Once you're connected, you can keep in touch with your e-mail, access the Internet, use instant messaging to chat with friends, and share files and other resources such as printers and hard disk storage space with other computers on the network.

Use the instructions in this Guide to help you install and use the Wireless-G USB Network Adapter. These instructions should be all you need to get the most out of the Adapter.

network: a series of computers or devices connected for the purpose of data sharing, storage, and/or transmission between users.

adapter: a device that adds network functionality to your PC.

802.11b: an IEEE wireless networking standard that specifies a maximum data transfer rate of 11Mbps and an operating frequency of 2.4GHz.

802.11g: an IEEE wireless networking standard that specifies a maximum data transfer rate of 54Mbps and an operating frequency of 2.4GHz.

What's in this Guide?

This user guide covers the steps for setting up and using the Wireless-G USB Network Adapter.

- **Chapter 1: Introduction**
This chapter describes the Adapter's applications and this User Guide.
- **Chapter 2: Planning Your Wireless Network**
This chapter discusses a few of the basics about wireless networking.
- **Chapter 3: Getting to Know the Wireless-G USB Network Adapter**
This chapter describes the physical features of the Adapter.
- **Chapter 4: Setting up the Wireless-G USB Network Adapter**
This chapter instructs you on how to run the Adapter's Setup Wizard and configure the Adapter.
- **Chapter 5: Connecting the Wireless-G USB Network Adapter**
This chapter shows you how to connect the Adapter to your PC.
- **Chapter 6: Using the Wireless Network Monitor**
This chapter explains how to use the Adapter's Wireless Network Monitor.
- **Appendix A: Troubleshooting**
This appendix describes some potential problems and solutions, as well as frequently asked questions, regarding installation and use of the Adapter.
- **Appendix B: Wireless Security**
This appendix discusses security issues regarding wireless networking and measures you can take to help protect your wireless network.
- **Appendix C: Windows Help**
This appendix describes how you can use Windows Help for instructions about networking, such as installing the TCP/IP protocol.
- **Appendix D: Glossary**
This appendix gives a brief glossary of terms frequently used in networking.
- **Appendix E: Specifications**
This appendix provides the Adapter's technical specifications.
- **Appendix F: Warranty Information**
This appendix supplies the Adapter's warranty information.

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- **Appendix G: Regulatory Information**
This appendix supplies the Adapter's regulatory information.
- **Appendix H: Contact Information**
This appendix provides contact information for a variety of Linksys resources, including Technical Support.

Chapter 2: Planning Your Wireless Network

Network Topology

A wireless network is a group of computers, each equipped with one wireless adapter. Computers in a wireless network must be configured to share the same radio channel. Several PCs equipped with wireless cards or adapters can communicate with one another to form an ad-hoc network.

Linksys wireless adapters also provide users access to a wired network when using an access point or wireless router. An integrated wireless and wired network is called an infrastructure network. Each wireless PC in an infrastructure network can talk to any computer in a wired network infrastructure via the access point or wireless router.

An infrastructure configuration extends the accessibility of a wireless PC to a wired network, and can double the effective wireless transmission range for two wireless adapter PCs. Since an access point is able to forward data within a network, the effective transmission range in an infrastructure network can be doubled.

Roaming

Infrastructure mode also supports roaming capabilities for mobile users. Roaming means that you can move your wireless PC within your network and the access points will pick up the wireless PC's signal, provided that they both share the same channel and SSID.

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

Network Layout

Linksys wireless access points and wireless routers have been designed for use with 802.11a, 802.11b, and 802.11g products. With 802.11g products communicating with the 802.11b standard and some products incorporating both "a" and "g", products using these standards can communicate with each other.

Access points and wireless routers are compatible with 802.11a, 802.11b and 802.11g adapters, such as the PC Adapters for your laptop computers, PCI Adapters for your desktop PCs, and USB Adapters for when you want to enjoy USB connectivity. Wireless products will also communicate with the Wireless PrintServer.

topology: the physical layout of a network.

ad-hoc: a group of wireless devices communicating directly with each other (peer-to-peer) without the use of an access point.

infrastructure: a wireless network that is bridged to a wired network via an access point.

roaming: the ability to take a wireless device from one access point's range to another without losing the connection.

ssid: your wireless network's name.

Wireless-G USB Network Adapter

When you wish to connect your wired network with your wireless network, network ports on access points and wireless routers can be connected to any of Linksys's switches or routers.

With these, and many other, Linksys products, your networking options are limitless. Go to the Linksys website at www.linksys.com for more information about wireless products.

Chapter 3: Getting to Know the Wireless-G USB Network Adapter

The USB Port

The Adapter's USB port is located on the side of the Adapter. You will connect the included USB cable to this port and your PC's USB port. All power is provided through the USB connection, so a power adapter is not needed.

The LED Indicators

The Adapter's LEDs indicate the status of the Adapter's power and wireless connection.



Figure 3-2: Front Panel

Power *Green.* The Power LED lights up when the Adapter is adequately powered by the USB connection.

Link *Green.* The Link LED lights up when the Adapter has an active wireless connection. It will flash when data is transmitted.



Figure 3-1: USB Port

Chapter 4: Setting up the Wireless-G USB Network Adapter

The Wireless-G USB Network Adapter Setup Wizard will guide you through the installation procedure. The Setup Wizard will install the driver and Wireless Network Monitor, as well as configure the Adapter.



NOTE: You must run the Setup Wizard before connecting the Adapter to your computer.

Using the Setup Wizard

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

On the *Welcome* screen, you have the following choices:

Install - Click the **Install** button to begin the software installation process.

User Guide - Click the **User Guide** button to open the PDF file of this User Guide.

Exit - Click the **Exit** button to exit the Setup Wizard.

1. To install the Adapter, click the **Install** button on the *Welcome* screen.
2. After reading the License Agreement, click the **Next** button if you agree, or click the **Cancel** button to end the installation.



Figure 4-1: Setup Wizard's Welcome Screen



Figure 4-2: Setup Wizard's License Agreement

- The Setup Wizard will ask you to choose a network mode. Click the **Infrastructure Mode** radio button if you want your wireless computers to network with computers on your wired network using a wireless access point. Click the **Ad-Hoc Mode** radio button if you want multiple wireless computers to network directly with each other.

In the *SSID* field, enter the SSID of your wireless network. The SSID must be identical for all devices in the network. The default setting is **linksys** (all lowercase). Click the **Next** button.



NOTE: Network SSIDs should be unique to your network and identical for all devices within the network.

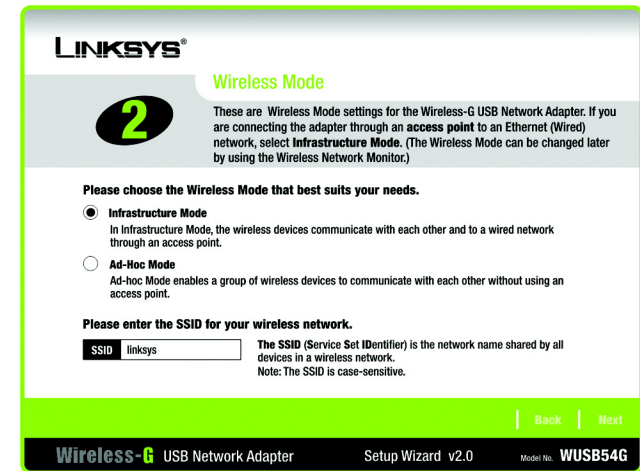


Figure 4-3: Setup Wizard's Wireless Mode Screen

- If you chose **Infrastructure Mode**, go to Step 5 now. If you chose **Ad-Hoc Mode**, select the correct operating channel for your network. Then, select the Network Mode from the drop-down menu. Click the **Next** button, and go to Step 5. Click the **Back** button to change any settings.

Channel - The channel you choose should match the channel set on the other devices in your wireless network. If you are unsure about which channel to use, select the default channel (Channel 6).

Network Mode - Select **Mixed Mode** if you want to allow Wireless-G and Wireless-B computers on the network, even though network speeds will be reduced. For maximum speed, select **G-Only Mode**; however, no Wireless-B users will be allowed on the network.

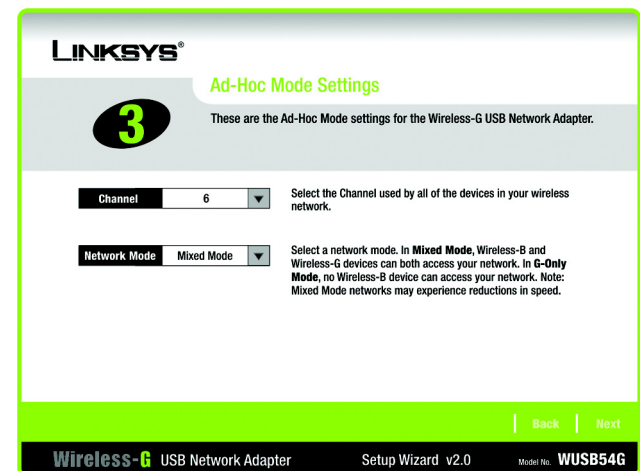


Figure 4-4: Setup Wizard's Ad-Hoc Mode Settings Screen

- Select the method of security you want to use: **WEP**, **PSK**, **PSK + RADIUS**, or **RADIUS**. WEP stands for Wired Equivalent Privacy, and PSK stands for Pre-Shared Key. RADIUS stands for Remote Authentication Dial-In User Service.



NOTE: If your network is using WPA-Personal or WPA-PSK security, then select **PSK**. If your network is using WPA-Enterprise or WPA-RADIUS security, then select **PSK + RADIUS**.

If you don't want to use encryption, select **Disabled** and then click the **Next** button to continue. Proceed to Step 7.

Click the **Next** button to continue or the **Back** button to return to the previous screen.

- Proceed to the appropriate section for your security method: WEP, PSK, PSK-RADIUS, or RADIUS.

WEP

WEP - Select **64-bit** or **128-bit** encryption from the drop-down menu, and enter a passphrase or WEP key.

Passphrase - Enter a passphrase in the *Passphrase* field, so a WEP key is automatically generated. It is case-sensitive and should not be longer than 16 alphanumeric characters. This passphrase must match the passphrase of your other wireless network devices and is compatible with Linksys wireless products only. (If you have any non-Linksys wireless products, enter the WEP key manually on those products.)

WEP Key - The WEP key you enter must match the WEP key of your wireless network. For 64-bit encryption, enter exactly 10 hexadecimal characters. For 128-bit encryption, enter exactly 26 hexadecimal characters. Valid hexadecimal characters are "0" to "9" and "A" to "F".

Advanced Users

TX Key - The default transmit key number is 1. If your network's access point or wireless router uses transmit key number 2, 3, or 4, select the appropriate number from the *TX Key* drop-down box.

Authentication - The default is set to **Auto**, so it will auto-detect for **Shared Key** or **Open System** authentication. For Shared Key authentication, both the sender and the recipient share a WEP key for authentication. For Open System authentication, the sender and the recipient do not share a WEP key for authentication. If you are not sure which authentication method to select, keep the default, **Auto**.

Click the **Next** button to continue. Click the **Back** button to return to the previous screen.

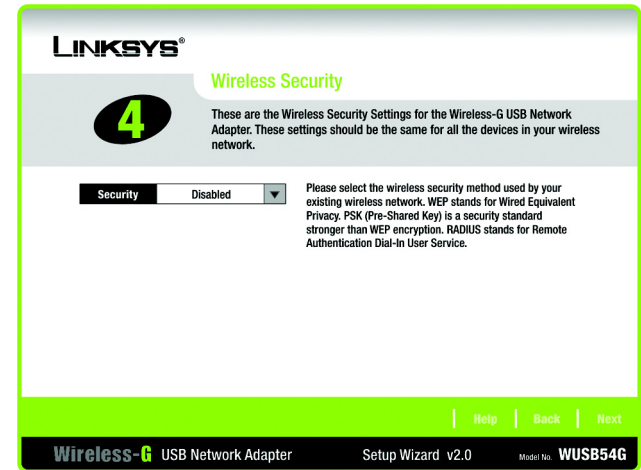


Figure 4-5: Setup Wizard's Wireless Security Screen

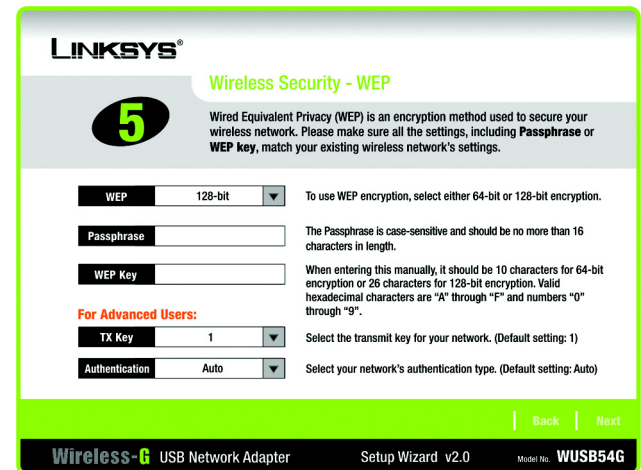


Figure 4-6: Setup Wizard's Wireless Security - WEP Screen

PSK

PSK offers two encryption methods, TKIP and AES, with dynamic encryption keys. Select the type of algorithm, **TKIP** or **AES**, for the *Encryption Type*. Then enter a Passphrase that is 8-63 characters in length.

Encryption - Select the type of algorithm you want to use, **TKIP** or **AES**, for the *Encryption Type*.

Passphrase - Enter a Passphrase, also called a Pre-Shared Key, of 8-63 characters in the *Passphrase* field. The longer and more complex your Passphrase is, the more secure your network will be.

Click the **Next** button to continue. Click the **Back** button to return to the previous screen.

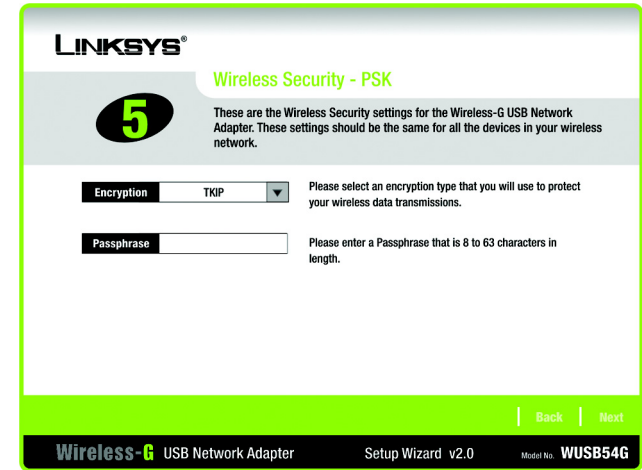


Figure 4-7: Setup Wizard's Wireless Security - PSK Using TKIP Screen

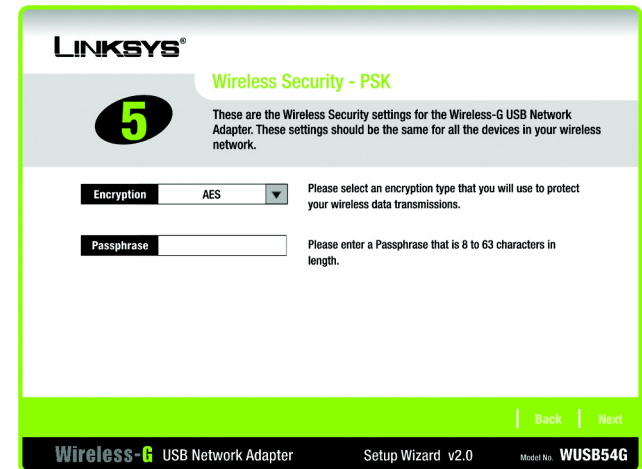


Figure 4-8: Setup Wizard's Wireless Security - PSK Using AES Screen

PSK + RADIUS

PSK + RADIUS features a Pre-Shared Key used in coordination with a RADIUS server. (This should only be used when a RADIUS server is connected to the Router.) PSK + RADIUS offers two encryption methods, TKIP and AES, with dynamic encryption keys, as well as two authentication methods, EAP-TLS and EAP-PEAP.

Authentication - Select the authentication method your network is using, **EAP-TLS** or **EAP-PEAP**.

EAP-TLS

If you selected EAP-TLS, enter the login name of your wireless network in the *Login Name* field. Enter the name of the authentication server in the *Server Name* field. From the *Certificate* drop-down menu, select the certificate you have installed to authenticate you on your wireless network. Select the type of encryption, **TKIP** or **AES**, from the *Encryption* drop-down menu.

Click the **Next** button to continue. Click the **Back** button to return to the previous screen.

EAP-PEAP

If you selected EAP-PEAP, enter the login name of your wireless network in the *Login Name* field. Enter the password of your wireless network in the *Password* field. Enter the name of the authentication server in the *Server Name* field. From the *Certificate* drop-down menu, select the certificate you have installed to authenticate you on your wireless network. Select the type of encryption, **TKIP** or **AES**, from the *Encryption* drop-down menu.

Click the **Next** button to continue. Click the **Back** button to return to the previous screen.

Figure 4-9: Setup Wizard's Wireless Security - PSK + RADIUS Using EAP-TLS Screen

Figure 4-10: Setup Wizard's Wireless Security - PSK + RADIUS Using EAP-PEAP Screen

RADIUS

RADIUS features use of a RADIUS server. (This should only be used when a RADIUS server is connected to the Router.) RADIUS offers two authentication types: EAP-TLS and EAP-PEAP.

Authentication - Select the authentication method your network is using, **EAP-TLS** or **EAP-PEAP**.

EAP-TLS

If you selected EAP-TLS, enter the login name of your wireless network in the *Login Name* field. Enter the name of the authentication server in the *Server Name* field. From the *Certificate* drop-down menu, select the certificate you have installed to authenticate you on your wireless network.

Click the **Next** button to continue. Click the **Back** button to return to the previous screen.

EAP-PEAP

If you selected EAP-PEAP, enter the login name of your wireless network in the *Login Name* field. Enter the password of your wireless network in the *Password* field. Enter the name of the authentication server in the *Server Name* field. From the *Certificate* drop-down menu, select the certificate you have installed to authenticate you on your wireless network.

Click the **Next** button to continue. Click the **Back** button to return to the previous screen.

The screenshot shows the 'Wireless Security - RADIUS' configuration screen for EAP-TLS. It features a large green number '5' in a circle. Below the title, there is a paragraph of instructions: 'These are the Wireless Security settings for the Wireless-G USB Network Adapter. Select the Authentication and Encryption settings for your network. Select the Certificate and enter the Login Name used for authentication.' The form contains four fields: 'Authentication' (a dropdown menu set to 'EAP-TLS'), 'Login Name' (a text input field), 'Server Name' (a text input field), and 'Certificate' (a dropdown menu set to 'None'). To the right of each field is a small instruction. At the bottom right, there are 'Back' and 'Next' buttons. The footer of the screen displays 'Wireless-G USB Network Adapter', 'Setup Wizard v2.0', and 'Model No. WUSB54G'.

Figure 4-11: Setup Wizard's Wireless Security - RADIUS Using EAP-TLS Screen

The screenshot shows the 'Wireless Security - RADIUS' configuration screen for EAP-PEAP. It features a large green number '5' in a circle. Below the title, there is a paragraph of instructions: 'These are the Wireless Security settings for the Wireless-G USB Network Adapter. Select the Authentication and Encryption settings for your network. Select the Certificate and enter the Login Name used for authentication.' The form contains four fields: 'Authentication' (a dropdown menu set to 'EAP-PEAP'), 'Login Name' (a text input field), 'Password' (a text input field), 'Server Name' (a text input field), and 'Certificate' (a dropdown menu set to 'None'). To the right of each field is a small instruction. At the bottom right, there are 'Back' and 'Next' buttons. The footer of the screen displays 'Wireless-G USB Network Adapter', 'Setup Wizard v2.0', and 'Model No. WUSB54G'.

Figure 4-12: Setup Wizard's Wireless Security - RADIUS Using EAP-PEAP Screen