

LINKSYS®

A Division of Cisco Systems, Inc.



2.4GHz 802.11g Wireless-G

PrintServer

User Guide



Model No. **WPS54G**



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WARNING: This product contains chemicals, including lead, known to the State of California to cause cancer, and birth defects or other reproductive harm. *Wash hands after handling.*

How to Use this User Guide

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



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



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



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

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.

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Chapter 1: Introduction

Welcome

Thank you for choosing the Linksys Wireless-G PrintServer. The PrintServer lets you connect a USB printer directly to your network, eliminating the need to dedicate a PC to print sharing chores. Using a PrintServer frees up your “print share PC” so you don’t have to leave it on all the time. It also removes the printing bottleneck, and sets your PC free to do more useful work.

The USB port is compatible with USB 1.1 printers, as well as printers that support the new high-speed USB 2.0 specification for even faster throughput.

How does the PrintServer do all of this? A print server is a device that allows multiple computers to share a printer over a network. You can connect the PrintServer directly to your network using an Ethernet network cable, or you can connect the PrintServer over Wireless-G (802.11g) at up to 54Mbps. The wireless option lets you put your printer wherever you want to, without having to run a cable. Whichever way the PrintServer is attached to your network, both your wireless and wired PCs will have access to it and its USB printer.

But what does all of this mean?

Networks are useful tools for sharing Internet access and computer resources. Multiple computers can share Internet access, so you don’t need more than one high-speed Internet connection. Using the PrintServer, you can access one printer from different computers. Plus, you can access data located on another computer’s hard drive and play multi-player video games. So, networks not only are useful in homes and offices, but also can be fun.

PCs on a wired network create a LAN, or Local Area Network. They are connected with Ethernet cables, which is why the network is called “wired”.

PCs equipped with wireless cards or adapters can communicate without cumbersome cables. By sharing the same wireless settings, within their transmission radius, they form a wireless network. This is sometimes called a WLAN, or Wireless Local Area Network. Your network router bridges wireless networks of both 802.11b and 802.11g standards and wired networks, allowing them to communicate with each other.

To guide you through the process of installing the PrintServer, run the Setup Wizard on the Setup CD-ROM (you can use the instructions in the Quick Installation or User Guide to help you). After you have installed the PrintServer, you can change its settings using its browser-based utility, which is described in this User Guide. These instructions should be all you need to get the most out of the Wireless-G PrintServer.

***mbps:** one million bits per second; a unit of measurement for data transmission*

***lan** (local area network): the computers and networking products that make up the network in your home or office*

***ethernet:** an IEEE standard network protocol that specifies how data is placed on and retrieved from a common transmission medium*

***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, an operating frequency of 2.4GHz, and backward compatibility with 802.11b devices*

***browser:** an application program that provides a way to look at and interact with all the information on the World Wide Web*

What's in this Guide?

This user guide covers the steps for setting up and using the PrintServer.

- **Chapter 1: Introduction**
This chapter describes the PrintServer's applications and this User Guide.
- **Chapter 2: Getting to Know the PrintServer**
This chapter describes the physical features of the PrintServer.
- **Chapter 3: Connecting the PrintServer**
This chapter instructs you on how to connect the PrintServer to your network.
- **Chapter 4: Configuring the PrintServer using the Setup Wizard**
This chapter instructs you on how to use the Setup Wizard to install your PrintServer.
- **Chapter 5: Windows Driver Installation**
This chapter explains how to install the Windows driver for the PrintServer.
- **Chapter 6: Configuring the PrintServer Using the Web-based Utility**
This chapter explains use the web-based utility to change the PrintServer's settings.
- **Chapter 7: Bi-Admin Management**
This chapter explains how to use the Bi-Admin Management utility, which is for advanced users only.
- **Chapter 8: Internet Printing Protocol (IPP)**
This chapter instruct you on how to use the PrintServer as an IPP server so you can run remote print jobs.
- **Appendix A: Troubleshooting**
This appendix describes some potential problems and solutions regarding use of the PrintServer.
- **Appendix B: Wireless Security**
This appendix explains the security risks in wireless networking and how you can help protect your network
- **Appendix C: About Bi-Directional Printing**
This appendix describes bi-directional printing.
- **Appendix D: Upgrading Firmware**
This appendix instructs you on how to upgrade the firmware on the PrintServer should you need to do so.

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- **Appendix E: Windows Help**
This appendix describes how you can use Windows Help for instructions about networking, such as installing the TCP/IP protocol.
- **Appendix F: Glossary**
This appendix gives a brief glossary of terms frequently used in networking.
- **Appendix G: Specifications**
This appendix provides the technical specifications for the PrintServer.
- **Appendix H: Warranty Information**
This appendix supplies the warranty information for the PrintServer.
- **Appendix I: Regulatory Information**
This appendix supplies the regulatory information regarding the PrintServer.
- **Appendix J: Contact Information**
This appendix provides contact information for a variety of Linksys resources, including Technical Support.

Chapter 2: Getting to Know the PrintServer

The Bottom Panel

The PrintServer's ports and Reset button are located on the bottom panel.



Figure 2-1: PrintServer's Bottom Panel

Power The **Power** port is where you will connect the power adapter.

Ethernet The **Ethernet** port is where you will connect the PrintServer to your wired network. (This is optional.)

USB Printer The **USB Printer** port is where you will connect the USB printer to the PrintServer.

The USB icon (right) designates a USB port. The PrintServer comes with a USB cable. One end has a rectangular connector called Type A. The other end has a square connector called Type B. The USB cable's Type A end connects to the PrintServer, and the Type B end connects to the printer.



USB Connector-Type A



USB Connector-Type B

Reset Button Use the **Reset Button** to reset the PrintServer to its factory defaults or print a test page. The instructions are provided on the right side of this page.



IMPORTANT: Resetting the PrintServer will delete all of your settings and replace them with the factory defaults. Do not reset the PrintServer if you want to retain the settings.

To reset the factory default settings

1. Unplug the PrintServer.
2. Press and hold the Reset button. While pressing the button, plug in the PrintServer.
3. If you continue pressing the button for 10 seconds, the PrintServer will be reset to factory defaults.

To generate a diagnostic print-out

1. Ensure that both the PrintServer and the printer attached to the Printer port are ON.
2. Press the Reset button, and hold it in for 2 seconds.
3. The test page, which lists the current settings, will be printed.

PostScript printers are unable to print this page. If you have a PostScript printer on the USB Printer port, the test page will not be printed.

The Front Panel

The PrintServer's LEDs are located on the front panel.

Power	Green/Orange. If the Power LED is continuously lit green, then the PrintServer is ready for use. The LED flashes green when the PrintServer is booting up, a system self-test is running, or the firmware is being upgraded. It lights up orange when there is an error.
Ethernet	Green/Orange. If the Ethernet LED is continuously lit green, the PrintServer is successfully connected to a device through the Ethernet port. The LED flashes green when the PrintServer is actively sending or receiving data from the wired network. It flashes orange when there are collisions detected on the Ethernet port.
Wireless	Green. The Wireless LED serves two purposes. If the LED is continuously lit, the PrintServer is successfully connected to the wireless network. If the LED is flashing, the PrintServer is actively sending or receiving data from the wireless network.
USB	Green/Orange. The USB LED lights up green when there is a printer connected to the USB port. The LED flashes green when the PrintServer is sending data through the USB port. It lights up orange when there is a problem with the USB printer.



Figure 2-2: PrintServer's Front Panel

Chapter 3: Connecting the PrintServer

Overview

Before starting the physical installation, note the PrintServer's default name, which starts with "LK" (for example, LK71107). The default name is shown in the *Server* field on the PrintServer's sticker, which is located on the PrintServer's back panel. During the PrintServer driver installation, this name is used to identify the PrintServer you are currently installing.

Connecting the PrintServer to Your Network

1. Use the USB cable to connect your USB printer to the PrintServer's USB Printer port. Plug the Type A connector end into the PrintServer and the Type B connector end into the printer.
2. If you are connecting the PrintServer to your wired network, then plug one end of the Ethernet network cable into the PrintServer's Ethernet port.

Then connect the other end of the cable to your router or switch. The distance between the PrintServer and the other device should not exceed 328 feet (100 meters).

3. Power on your printer.
4. Plug the power adapter into the PrintServer's Power port.

Then plug the other end into an electrical outlet.



IMPORTANT: Make sure you use the power adapter supplied with the PrintServer. Use of a different power adapter could damage the PrintServer.



NOTE: The PrintServer does not have an on/off power switch. Whenever its power adapter is plugged into a power supply, the PrintServer is powered on. The PrintServer can be powered on before, during, or after your network is powered on.

Proceed to the next section, "Placement Options."



Figure 3-1: Connect to the Ethernet Port



Figure 3-2: Connect to the USB Port



Figure 3-3: Connect to the Power Port

Placement Options

There are different ways to place the PrintServer. The first way is to place the PrintServer horizontally on a surface, so it sits on four small rubber pads. You can also use the included velcro to mount the PrintServer on a wall or underneath a shelf. To use the velcro, follow these instructions:

1. Separate the included velcro into its two sides, the hook side and the loop side. You will use the tape on the backs of the velcro sides to attach them to the PrintServer and surface you want to use.
2. For the first velcro side, peel off the cover protecting the tape, and attach it to the recessed area on the back panel of the PrintServer.
3. For the other velcro side, peel off the cover, and attach it to the location you have chosen for the PrintServer.
4. Attach the velcro sides to each other, and make sure the PrintServer is securely mounted on the wall or underneath the shelf.
5. Adjust the position of the antenna so that it is positioned as high as possible. Usually, the higher you place the antenna, the better the performance and range will be.

The physical installation of the Wireless-G PrintServer is complete. Proceed to “Chapter 4: Configuring the PrintServer Using the Setup Wizard.”



Figure 3-4: Desktop Placement

Chapter 4: Configuring the PrintServer Using the Setup Wizard

Installation

To install the PrintServer, you will use the Setup CD-ROM to run the Setup Wizard. It is highly recommended that you use a computer on the wired network to set up the PrintServer. However, if you only have a wireless network, then you can use a computer on the wireless network to set up the PrintServer.

1. Insert the Setup CD-ROM into the computer's CD-ROM drive. The Setup Wizard should run automatically. If it does not, click the **Start** button and choose **Run**. In the box that appears, enter **D:\setupWizard.exe** (if "D" is the letter of your CD-ROM drive).
2. When you see the *Welcome* screen, click **Setup Wizard** to continue. Click **Exit** to end the installation. Click **User Guide** button to view the User Guide.
3. After the Setup Wizard has found the PrintServer, the *Wireless-G PrintServer Setup* screen will appear. If this is the first time you have run the Setup Wizard, make sure that **List only new (unconfigured) Print Servers** is selected and your PrintServer is listed by its default server name. Next to the PrintServer's Server Name is its IP Address. Note the IP Address so you can use it to access the PrintServer's web-based utility, as described in "Chapter 6: Configuring the PrintServer Using the Web-based Utility."

If you have previously configured the Print Server, select **List all compatible Print Servers**. Click **Next** to continue.

Click the **Refresh** button to refresh the screen. Click **Back** to return to the previous screen.



Figure 4-1: Welcome

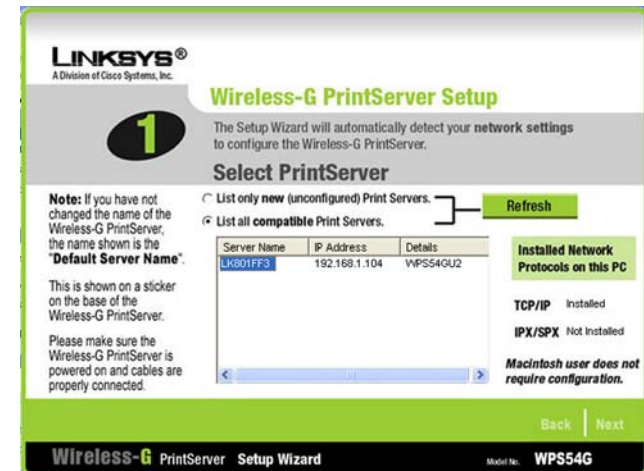


Figure 4-2: Wireless-G PrintServer Setup

ip address: the address used to identify a computer or device on a network.

- The *Basic Settings* screen will appear. If you want to change the Device Name or Domain Name, enter the Device Name and Domain Name in the respective fields.

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

- The *IP Settings* screen will appear. If your network uses a router with a DHCP setting that automatically assigns IP addresses, select **Automatically obtain an IP address (DHCP)**. If your network uses a static IP address, select **Set IP configuration manually**, and enter the IP Address, Subnet Mask, and Gateway in the fields provided.

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



Figure 4-3: Basic Settings

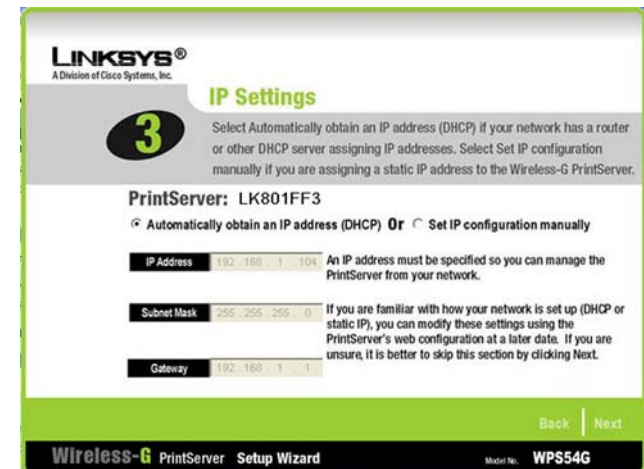


Figure 4-4: IP Settings

ip address: the address used to identify a computer or device on a network

static ip address: a fixed address assigned to a computer or device connected to a network.

ip (internet protocol): a protocol used to send data over a network

- The *Set PrintServer's Password* screen will appear. If you want to change your password, enter your current password in the *Current Password* field. Enter the new password in the *New Password* field, then enter it again in the *Verify Password* field.

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

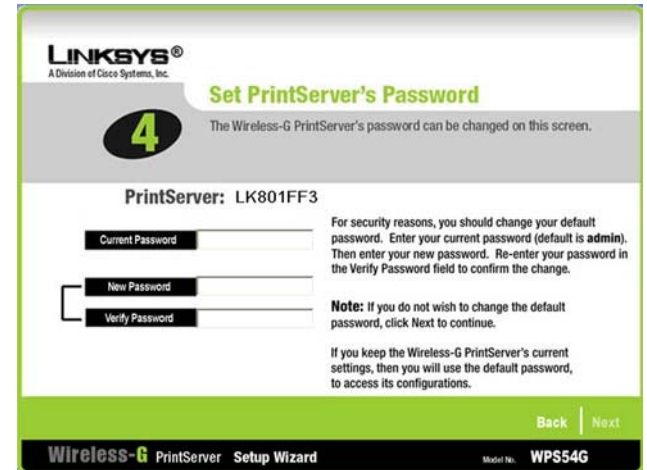


Figure 4-5: Set PrintServer's Password

- The *Wireless Settings* screen will appear. In the *SSID* field, enter your wireless network's SSID or name. This is the unique name shared by all devices in a wireless network. The SSID is case-sensitive and should have 32 characters or fewer.

Select the channel at which the network broadcasts its wireless signal (available only if you selected Ad-Hoc for the Network Type setting).

The Network Type setting shows a choice of two wireless modes. Select **Infrastructure** if you want the PrintServer to communicate using an access point or wireless router. Select **Ad-Hoc** if you want the PrintServer to communicate without using an access point or wireless router.

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

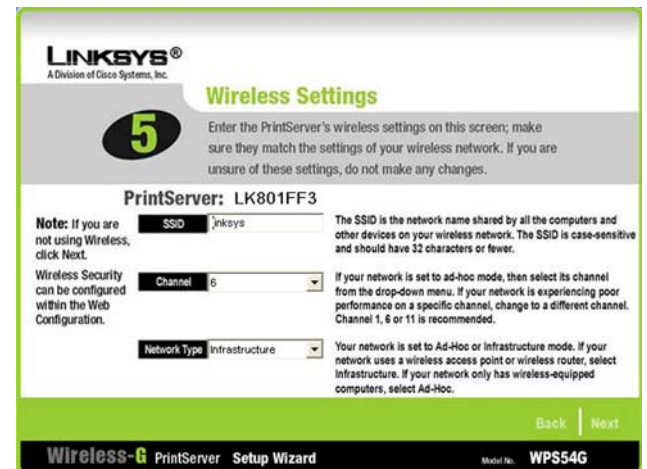


Figure 4-6: Wireless Settings

ssid: your wireless network's name.

infrastructure: configuration in which a wireless network is bridged to a wired network via an access point.

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

- The *Wireless Security Settings* screen will appear. If you want to enable WEP encryption for greater wireless security, select the level of WEP encryption, **64 Bit Keys** or **128 Bit Keys**, and then enter a Passphrase. If you use a Passphrase, a WEP key will be automatically generated after you click the Next button. The Passphrase is case-sensitive and should have 16 alphanumeric characters or fewer. It must match the passphrase of your wireless network and is compatible with Linksys wireless products only. (You will have to enter the WEP key(s) manually on any non-Linksys wireless products.)

If you want to enter the WEP key manually, then leave the *Passphrase* field blank; you will be able to enter a WEP key on the following screen. If you want to disable WEP encryption, keep the default, **Disabled**.

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



NOTE: The Wireless-G PrintServer also offers a Pre-Shared Key option for wireless security. To use this method, refer to the Wireless Tab - Security section of “Chapter 6: Configuring the PrintServer Using the Web-based Utility” for instructions.

- If you entered a Passphrase, you will see the automatically generated WEP key on the following screen. Otherwise, enter the WEP key manually in the field provided. If you are using 64-bit WEP encryption, then the key must consist of exactly 10 hexadecimal characters. If you are using 128-bit WEP encryption, then the key must consist of exactly 26 hexadecimal characters. Valid hexadecimal characters are “0”-“9” and “A”-“F”.

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

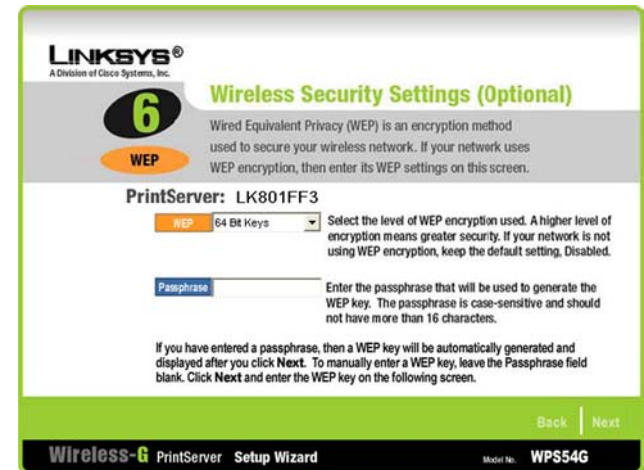


Figure 4-7: Wireless Security Settings

wep (wired equivalent privacy): a method of encrypting data transmitted on a wireless network for greater security.

passphrase: used much like a password, a passphrase simplifies the WEP encryption process by automatically generating the WEP encryption for Linksys products.

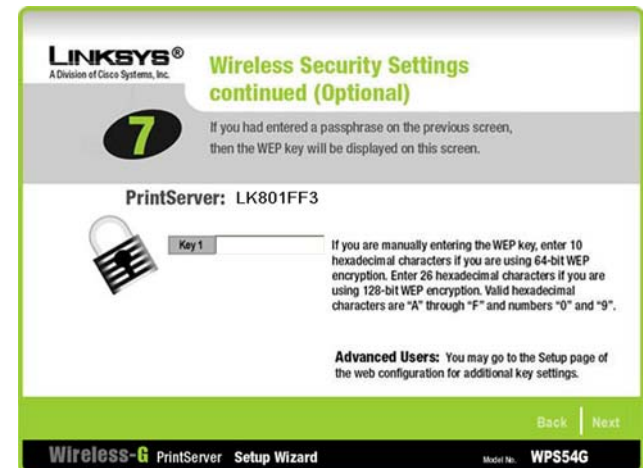


Figure 4-8: Wireless Security Settings - WEP Key

10. The *Confirmation* screen will appear. Your old and new settings will be displayed. If you want to save the new settings, click **Yes**. If you want to make a change, click **No**, and you will exit the Setup Wizard; you will have to start the Setup Wizard again.

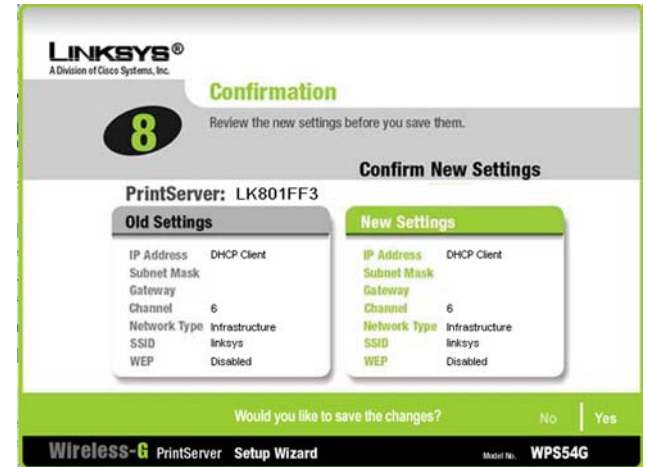


Figure 4-9: Confirmation

11. The *Congratulations* screen will appear. The setup is complete.

You will need to install the driver next. Click **User Install** at the bottom of the *Congratulations* screen, and go to “Chapter 5: Windows Driver Installation.”



Figure 4-10: Congratulations

Chapter 5: Windows Driver Installation

Overview

This section installs the PrintServer's software on your Windows 98, Me, 2000, or XP computers so they can use the PrintServer for print jobs. (The PrintServer is fully compatible with Windows 98, Me, 2000, and XP.)

At this point, you must have the following:

- the PrintServer hardware installed on your network. If not, see "Chapter 3: Connecting the PrintServer."
- TCP/IP installed on each of your computers.
- an IP address assigned to each of the computers on your network.
- an IP address assigned to the PrintServer by you or your network router. By default the PrintServer has DHCP enabled so the network router will automatically assign an IP address. If you need to manually assign an IP address, run the Setup Wizard on the Setup CD-ROM or go to "Chapter 7: Bi-Admin Management."

It is assumed that your CD-ROM drive's letter name is designated as "D". If your CD-ROM drive is named another letter, replace all instances of "D" with the appropriate letter.

If you need to install the PrintServer's driver on computers without a CD-ROM drive, you can create a setup disk by using a computer with a CD-ROM drive to copy the contents of D:\Driver\PTP onto a floppy disk.

Installation

1. Make sure you have no programs or applications running on your computer.
2. If you haven't already done so, insert the Setup CD-ROM into the computer's CD-ROM drive. The Setup CD-ROM should run automatically. If it does not, click the **Start** button and choose **Run**. In the field that appears, enter **D:\setupWizard.exe** (if "D" is the letter of your CD-ROM drive).
3. When you see the *Welcome* screen, click **User Install** to continue. Click **Exit** to end the installation.



HAVE YOU: already set up your printer? Linksys recommends that you set up your printer and install your printer's driver before you install the PrintServer's driver.



Figure 5-1: Welcome

4. The *Welcome* screen of the driver installation program will appear first. Click **Next** to continue with the driver installation, or click **Cancel** to quit the setup program and then close the open programs.



Figure 5-2: Driver Setup Welcome

5. The *Choose Destination Location* screen will appear. Choose the location where the driver's folder will be installed. To install the driver in the default location, click **Next** to continue.

If you want the folder to be installed in a different location, click the **Browse** button and select the location. Then click **Next** to continue.

You can also click **Back** to return to the previous screen or click **Cancel** to end the driver installation.

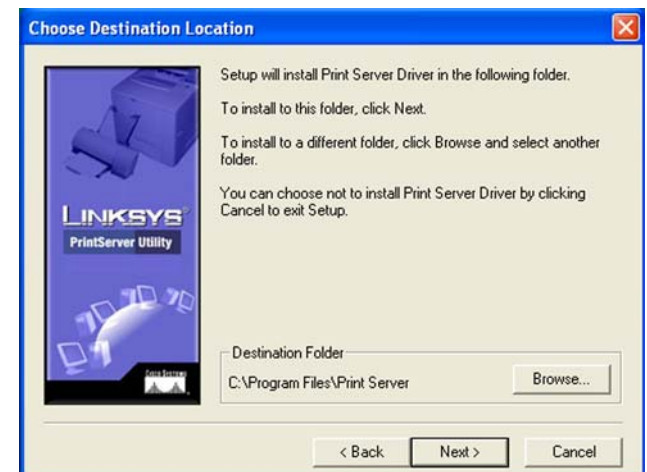


Figure 5-3: Choose Destination Location

- The *Select Program Folder* screen will appear. An icon will be added to the program folder listed. You may change the name for the program folder, if you wish. Click **Next**.

You can also click **Back** to return to the previous screen or click **Cancel** to end the driver installation.

- When the driver is installed, the *Setup Complete* screen will appear. The Print Driver must still be configured, so make sure that **Configure Print Driver now** is selected. Click **Finish** to end the driver installation and begin the driver configuration.



Figure 5-4: Select Program Folder

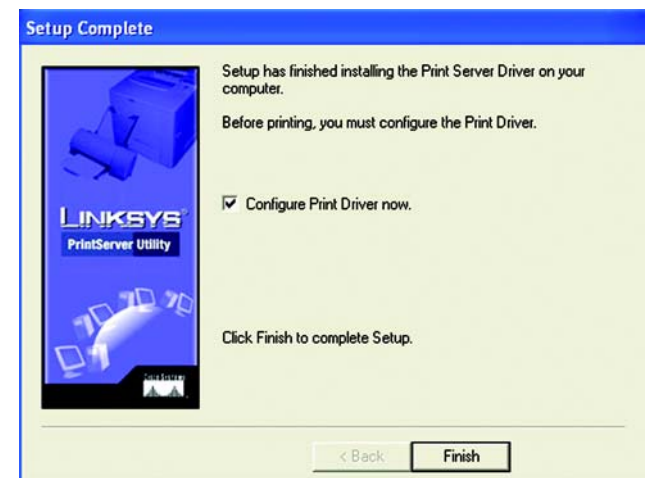


Figure 5-5: Setup Complete

Starting the Print Driver Utility

1. Click **Start, Programs, Print Server Utility**, and then **Print Driver Setup**. If the Print Driver Setup icon has been created, you can double-click it instead.
2. The *Information* screen will appear. Read the on-screen information, and then click **OK**.

3. The *Printer Port Setup* screen will appear and list the PrintServer and its ports. Select a printer port to add, and then click **Next**.

If the PrintServer or printer isn't listed, make sure that the cable connections are good and the PrintServer and printer are powered on.

4. You will be informed that the PrintServer Port has been added successfully. Click **OK**.

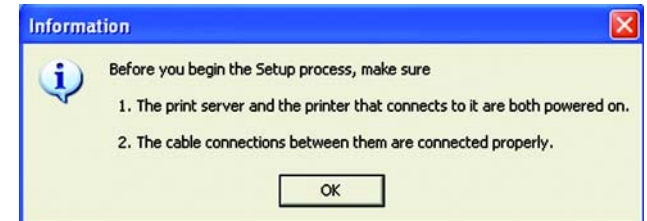


Figure 5-6: Information

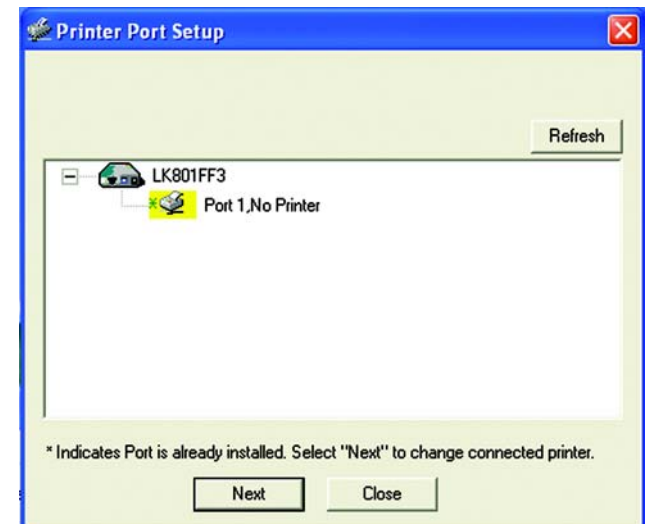


Figure 5-7: Printer Port Setup

5. The *Configure Printer Port* screen will appear. Your installed printer(s) will appear in the field. Select the printer you want, and click the **Connect** button to associate the printer with your selected printer port. To add another printer, click the **Add New Printer** button.

Click **Cancel** to cancel the setup.

6. Click **Close** to close the *Printer Port Setup* screen. Click **Refresh** to refresh the screen.

The driver installation and configuration is complete. You can now use the PrintServer.

If you would like to change the PrintServer's settings, use the PrintServer's web-based utility. For more information, refer to "Chapter 6: Configuring the PrintServer Using the Web-based Utility."

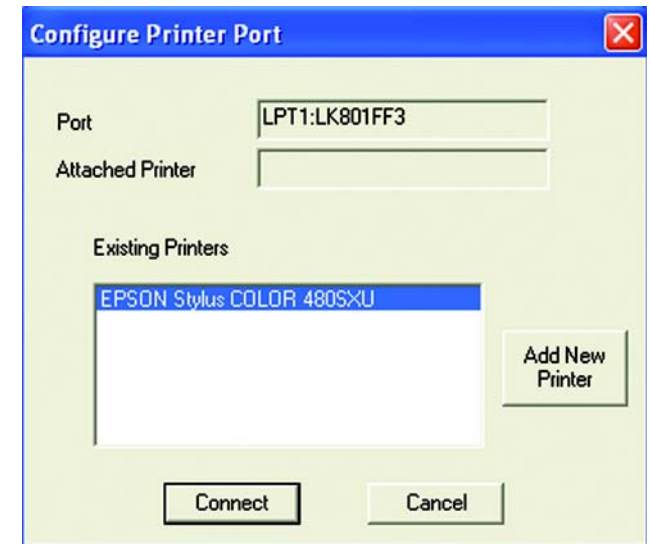


Figure 5-8: Configure Printer Port

Chapter 6: Configuring the PrintServer Using the Web-based Utility

Overview

After setting up the PrintServer with the Setup Wizard, the PrintServer will be ready for use. However, if you'd like to change its settings, use the PrintServer's web-based utility. This chapter will describe each web page of the utility and each page's key functions. The utility can be accessed via your web browser through the use of a networked computer.

There are six main tabs: Setup, Protocol, Wireless, Printer, Status, and Exit. Additional tabs will be available after you click one of the main tabs, except for the Setup tab.

To access the web-based utility, launch Internet Explorer or Netscape Navigator, and enter the PrintServer's IP address in the *Address* field. Then press **Enter**.



NOTE: Use the PrintServer's IP address that you noted when you ran the Setup Wizard. Otherwise, insert the Setup CD-ROM, and when the *Welcome* screen appears, click **Setup Wizard**. Follow the instructions until you reach the *Wireless-G PrintServer Setup* screen. Note the IP address, and then click **Back** until you reach the *Welcome* screen. Click **Exit**.

The Setup Tab

The first screen that appears is the Setup tab and allows you to change the PrintServer's general settings.

WPS54G Device Name

Enter the PrintServer's name in the field provided. The name is located on a sticker on the bottom of the PrintServer.

Password

Current Password. To change the PrintServer's password, enter the current password in the *Current Password* field.

New Password and Verify Password. Enter the new password in the *New Password* field, and then enter the new password again in the *Verify Password* field.

Protocols

The TCP/IP protocol is enabled by default.

Enable: Apple Talk or NetBEUI. Check the box(es) for AppleTalk or NetBEUI, if they are used by your network.

Click the **Save** button to apply your changes, or click **Cancel** to cancel your changes.



Figure 6-1: Setup Tab

The Protocol Tab - TCP/IP

Click the TCP/IP tab to view or change the TCP/IP values of the PrintServer.

IP Address

Obtain an IP Address Automatically. If your network router is using DHCP to assign IP addresses, select **Obtain an IP Address Automatically**. By default, **Obtain an IP Address Automatically** is enabled.

Use the Following IP Address. If you need to assign the PrintServer a fixed IP address (also known as static IP address), select **Use the Following IP Address**, and enter the appropriate values under IP Address, Subnet Mask, and Gateway. Make sure the IP Address and Subnet Mask are appropriate for your network. If you change the PrintServer's IP address, make sure you that you reconnect to the PrintServer using that new IP address. Otherwise, you will not be communicating with the PrintServer. In most cases, the Gateway IP address is the IP address of your router, and you should complete the *Gateway* field if you will use the PrintServer for Internet printing. (To find out your router's IP address, consult your router's documentation.)

Connection

Delay before reconnection attempt. Set how long you want the PrintServer to wait between attempts.

Number of reconnection attempts. Specify the number of times that the PrintServer will attempt to connect to the network.

Click the **Save** button to apply your changes, or click **Cancel** to cancel your changes.



Figure 6-2: Protocol Tab - TCP/IP

The Protocol Tab - AppleTalk

AppleTalk is a network communications protocol that allows computers to talk to each other using Ethernet. Typically only Macintoshes use AppleTalk, although other platforms can use it if they have the necessary, third-party software.

Communication

Printer Object Type. The Printer Object Type can be obtained from the manufacturer of the printer. Enter the type of printer in the field provided. For each printer connected to the PrintServer, you will choose the Communications Protocol that allows the devices on the network to communicate.

Communication Protocol. Select the type of Communication Protocol you will use, **ASCII** or **Binary** for each printer, according to the recommendation of the printer's manufacturer. For more information, refer to the printer's documentation.

Click the **Save** button to apply your changes, or click **Cancel** to cancel your changes.



Figure 6-3: Protocol Tab - AppleTalk

The Protocol Tab - NetBEUI

NetBEUI connection settings of the PrintServer are available on this tab.

Domain Name

Enter the name of the domain that you want the PrintServer associated with in the *Domain Name* field.

If you are unsure of the Domain Name, you can find it out by looking on any computer already on the network. In Windows 98, right-click **Network Neighborhood** and select **Properties**. Under the Identification tab, there will be listed that computer's name, and the Domain to which it is connected. For Windows Me, 2000, or XP, right-click **My Network Places**. In Windows Me, choose **Properties** from the menu that appears. In Windows 2000 or XP, choose **Properties** from the menu that appears. Then, right-click **Local Area Connection** and choose **Properties**. The Domain name will appear. If you want the PrintServer to be connected to that same Domain, enter that Domain name here. If no Domain name exists there, you will use the Workgroup name from that window.

Options

Response Time. You can specify the Response Time that you prefer for the PrintServer. This is the amount of time (measured in seconds) that the PrintServer will wait for a response from the network before "timing out."

Abort Print Job if Error. You also have the option to use this feature, Abort Print Job if Error. Selecting Yes here will terminate the printing if there is an error of any kind. If you select No, print jobs that have errors will be sent to the printer, but might not print properly.

Click the **Save** button to apply your changes, or click **Cancel** to cancel your changes.



Figure 6-4: Protocol Tab - NetBEUI

The Protocol Tab - SNMP

Use this screen to view or change the PrintServer's SNMP (Simple Network Management Protocol) settings.

The PrintServer supports SNMP, which allows network administrators to monitor and control the PrintServer through the use of network management platforms, such as HP OpenView.

The appropriate MIB file must be imported into your SNMP management program using the Import-Compile command. Check your program's documentation for details on this procedure. The MIB file is named Mib2p.mib and is provided in the MiB folder on the Setup CD-ROM.

General

SysContact. Enter the name of the contact person in the *SysContact* field.

SysLocation. Enter the location of the contact person in the *SysLocation* field.

Management Stations

Station No. Select the number of the management station from the *Station No.* drop-down menu (1-4). Click the **Get Data** button to display the information for the selected station.

IP Address. Enter the IP address of the management station running the SNMP program.

Community. Enter the name of the SNMP community, which is usually **public** or **private**.

Access. Select the level of access for this management station, **Not Accessible**, **Read-only**, or **Read/Write**.

Trap Receivers

Receiver No. Select the number of the trap receiver from the *Receiver No.* drop-down menu (1-4). Click the **Get Data** button to display the information for the selected trap receiver.

IP Address. Enter the IP address of the trap receiver that will be sent the trap messages or notifications.

Community. In the *Community* field, enter the name of the SNMP community, which is usually **public** or **private**.

Enable with Severity level. To designate a severity level, click the checkbox next to *Enable with Severity level*. From the following drop-down menu, select the desired level of severity, with 1 meaning least severe.

Click the **Save** button to apply your changes, or click **Cancel** to cancel your changes.

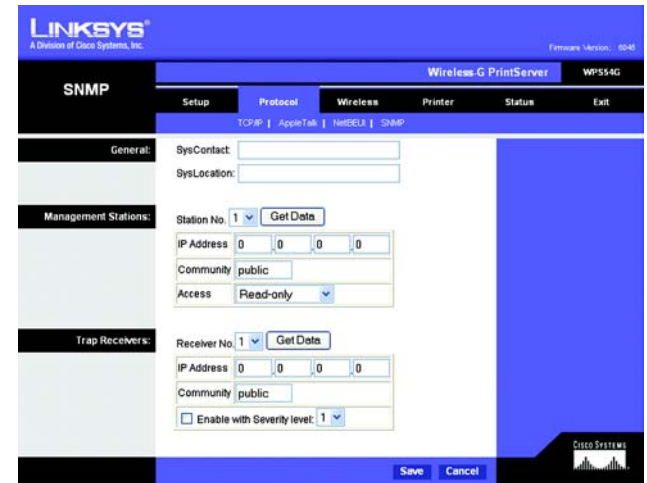


Figure 6-5: Protocol Tab - SNMP

The Wireless Tab - Basic

This screen allows you to change the PrintServer's basic wireless settings.

Configuration

Regulatory Domain and MAC Address. The PrintServer's Regulatory Domain and MAC Address are listed and cannot be changed.

SSID. In the *SSID* field, enter the name of your wireless network. This is the unique name shared by all devices in a wireless network. The SSID is case-sensitive and should have 32 characters or fewer.

Channel No. If your network is set to ad-hoc mode, select your network's channel setting from the *Channel No.* drop-down menu.

Network Type. The Network Type setting shows a choice of two wireless modes. Select **Infrastructure** if you want the PrintServer to communicate using an access point or wireless router. Select **Ad-Hoc** if you want the PrintServer to communicate without using an access point or wireless router.

Click the **Save** button to apply your changes, or click **Cancel** to cancel your changes.



Figure 6-6: Wireless Tab - Basic

The Wireless Tab - Security

Configure the security of your wireless network on this screen. There are two options available, Pre-Shared Key and Wired Equivalent Privacy, which is known as WEP. (Pre-Shared Key is a stronger security method than WEP encryption.) If you do not want to use wireless security, select **None** from the *Security Mode* drop-down menu.

Wireless Security

Pre-Shared Key

Security Mode. If you want to enable the Pre-Shared Key method, select **Pre-Shared Key**.

WPA Algorithm. This method gives you one encryption method, TKIP, with dynamic encryption keys.

WPA Shared Key. Enter a WPA Shared Key of 8-32 characters.

Click the **Save** button to apply your changes, or click **Cancel** to cancel your changes.

WEP Encryption

Security Mode. Select the level of WEP encryption you want to use, **64 Bit Keys (10 Hex chars)** or **128 Bit Keys (26 Hex chars)**.

Default Transmit Key. Select the Default Transmit Key used by your wireless network. This indicates which WEP key your network uses for WEP encryption.

Passphrase. Enter a Passphrase and click the **Generate Keys** button to automatically generate WEP Keys 1-4. The Passphrase is case-sensitive and should have no more than 16 alphanumeric characters. It must match your wireless network's passphrase and is compatible with Linksys wireless products only. (Enter the WEP key(s) manually on any non-Linksys wireless products.)

Key 1 to Key 4. To enter the WEP keys manually, leave the *Passphrase* field blank and enter your WEP key(s). For 64-bit WEP encryption, each key must have 10 hexadecimal characters, while for 128-bit WEP encryption, the key must have 26 hexadecimal characters. Valid hexadecimal characters are "0"-"9" and "A"-"F".

Authentication. Select your wireless network's authentication type. The default is **Open System**, for which the sender and the recipient do NOT use a WEP key for authentication. You can also choose **Shared Key**, for which the sender and recipient use a WEP key for authentication. If the PrintServer is set to **Auto**, then the PrintServer will automatically use the authentication being used by your wireless network.

Click the **Save** button to apply your changes, or click **Cancel** to cancel your changes.



Figure 6-7: Wireless Tab - Security (Pre-Shared Key)

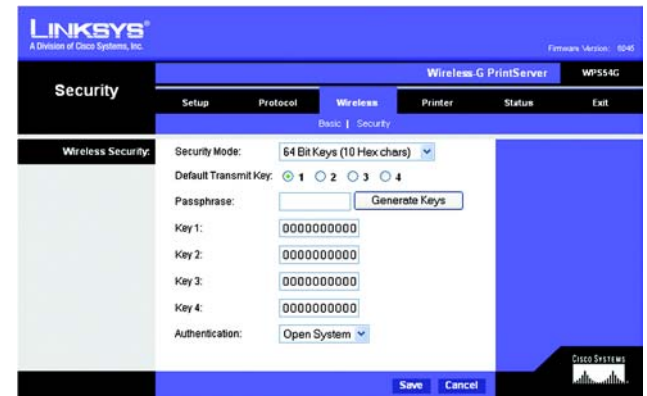


Figure 6-8: Wireless Tab - Security (WEP)

The Printer Tab - Internet Printing

Internet Printing allows you to automatically print any e-mails that are sent to a specific e-mail account on your network. This is especially useful for printing information when you are not connected to the network. You can print from any location where you can access e-mail.

Mail Server

Mail Server IP Address. Enter the address of your mail server. (This value must be a fixed IP address.)

Account Name and Password. Enter the Account Name and Account Password.

Verify Password. Enter the password again in the *Verify Password* field.

Check Mail every. Specify how often you want the PrintServer to check for e-mail to be printed.

Redirect unprintable Mail to. Specify an e-mail address to which e-mails that cannot be printed are routed; this is useful for both graphic-intensive e-mails and for troubleshooting purposes.

Printer

Printer Model. Enter the Printer Model in the field provided. You can find this in the Device Manager.

Printer Port. Choose the appropriate Printer Port from the drop-down menu: USB, the PrintServer's USB port, or **Logical Printer 1-6**. The PrintServer has six logical or virtual printer ports. For example, you can have three different configurations for your USB printer: Logical Printer 1 for landscape orientation, Logical Printer 2 for double-sided copies, and Logical Printer 3 for manual feed. Then configure the Logical Printers on the Logical Port tab, so Logical Printers 1, 2, and 3 will be mapped to the physical printer on the PrintServer's USB port.

Options

Print every E-Mail. Click this checkbox if you want to print every e-mail message.

Print Banner Page. Enabled by default, this feature tells the PrintServer to print a banner page for every print job (the banner page describes the print job). Click the checkbox to remove the checkmark and disable this feature.

Mail response when printed. Click this checkbox if you want an e-mail sent when a print job is complete.

Click the **Save** button to apply your changes, or click **Cancel** to cancel your changes.

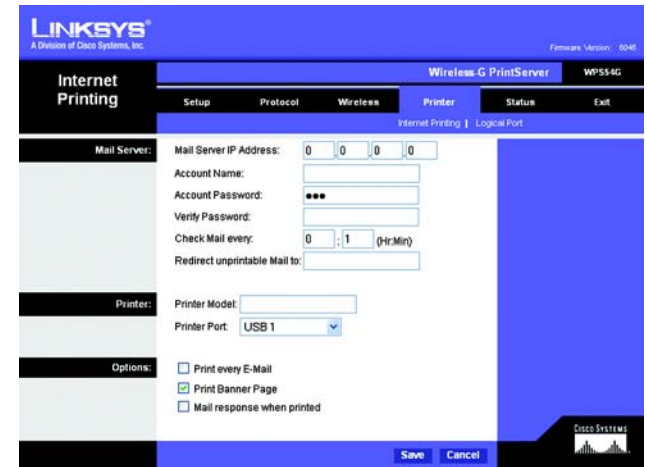


Figure 6-9: Printer - Internet Printing

The Printer Tab - Logical Port

The Logical Printers tab contains the logical printer settings of the PrintServer. Configure them for each Logical Printer.

The PrintServer has six logical or virtual printer ports. For example, you can have three different configurations for your parallel printer: Logical Printer 1 for landscape orientation, Logical Printer 2 for double-sided copies, and Logical Printer 3 for manual feed. Then you will map Logical Printers 1, 2, and 3 to the physical printer on the PrintServer's Parallel port.

Select Printer

Logical Printer No. From the *Logical Printer Port No.* drop-down menu, select the number (1-6) of the printer you wish to configure. Click the **Get Data** button to update the display with the current data for the selected logical printer.

Details

Pre-string (Hex). Enter the printer control string (in hexadecimal characters) to be sent to the printer before each print job. This string cannot exceed 30 characters.

Post String (Hex). Enter the printer control string (in hexadecimal characters) to be sent to the printer after each print job. This string cannot exceed 30 characters.

Convert LF to CR+LF. If checked, LF (line feed) characters are changed to CR+LF (carriage return + line feed).

Click the **Save** button to apply your changes, or click **Cancel** to cancel your changes.



Figure 6-10: Printer - Logical Port

The Status Tab - Device

The Device tab allows you to view information about the PrintServer.

Server Details

The PrintServer's settings and status information are displayed here. No values can be changed on this screen. This screen is for information only.

Upgrade. If you want to upgrade the PrintServer's firmware, follow these instructions:

1. Visit www.linksys.com and download the firmware upgrade file for the Wireless-G PrintServer.
2. Extract the file on your computer.
3. On the *Device* screen, click the **Upgrade** button.
4. On the *Firmware Upgrade* screen, enter the location of the extracted firmware file, or click the **Browse** button to find this file.
5. Click the **Start Upgrade** button, and follow the on-screen instructions.

On the *Device* screen, click the **Refresh** button to retrieve this information again.

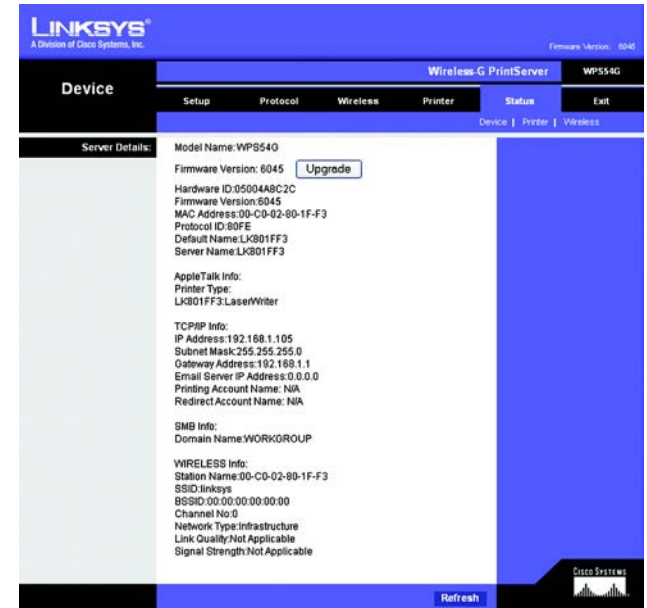


Figure 6-11: Status Tab - Device

firmware: the programming code that runs a networking device

download: to receive a file transmitted over a network

upgrade: to replace existing software or firmware with a newer version



Figure 6-12: Firmware Upgrade

The Status Tab - Printer

The Printer tab allows you to view information about the Printers. No values can be changed on this screen. This screen is for information only.

Port 1 (USB Port)

The port's status information is displayed here. No values can be changed on this screen. This screen is for information only.

Print Test Page. Click the **Print Test Page** button to print a test page on the connected printer.

Clicking the **Refresh** button causes the PrintServer to retrieve the status information again.

The Status Tab - Wireless

The Wireless tab allows you to view information about the PrintServer's wireless connection. No values can be changed on this screen. This screen is for information only.

Link Info

Settings and current transmission rate for the wireless connection are displayed here.

Throughput

The throughput information for the wireless connection is displayed here.

Clicking the **Refresh** button causes the PrintServer to retrieve information about the wireless connection again.

The Exit Tab

This tab is used exclusively for exiting the Web-based Utility.

Select the **Exit** tab, and a new screen will appear. Click the **Yes** button to exit the Utility, or click **No** to continue using the Utility.



Figure 6-13: Status Tab - Printer



Figure 6-14: Status Tab - Wireless



Figure 6-15: Exit

Chapter 7: Bi-Admin Management

Overview

If you use Windows, then you can manage the PrintServer using its web-based utility (see “Chapter 6: Configuring the PrintServer Using the Web-based Utility”) or an advanced utility program called Bi-Admin. (If you use a Macintosh or other non-Windows operating system, you can manage the PrintServer only by using its web-based utility.)

Bi-Admin is provided on the PrintServer’s Setup CD-ROM and is fully compatible with Windows 98, Me, 2000, and XP. It allows you to change the PrintServer’s internal settings, check on the unit’s status, and perform basic diagnostic tests. Note that the Bi-Admin program must be installed only on the network administrator’s computer. First, install Bi-Admin on your computer. Then, you will be able to use the management utility.

Bi-Admin Installation

1. Make sure you have no programs or applications running on your computer.
2. If you haven’t already done so, insert the Setup CD-ROM into the computer’s CD-ROM drive. The Setup CD-ROM should run automatically. If it does not, click the **Start** button and choose **Run**. In the box that appears, enter **D:\setupWizard.exe** (if “D” is the letter of your CD-ROM drive).
3. Click **Bi-Admin Install** to continue, or click **Exit** to end the installation.
4. The *Welcome* screen of the Bi-Admin Setup program will appear first. Click **Next** to continue with the Bi-Admin installation, or click **Cancel** to quit the setup program, and then close the open programs.



Figure 7-1: Welcome



Figure 7-2: Bi-Admin Setup Welcome

- The *Choose Destination Location* screen will appear. Choose the location where the B-Admin folder will be installed. To install the driver in the default location, click **Next**. If you want the folder to be installed in a different location, click the **Browse** button and select the location. Then click **Next**.

Click **Back** to return to the previous screen. Click **Cancel** to end the Bi-Admin installation.

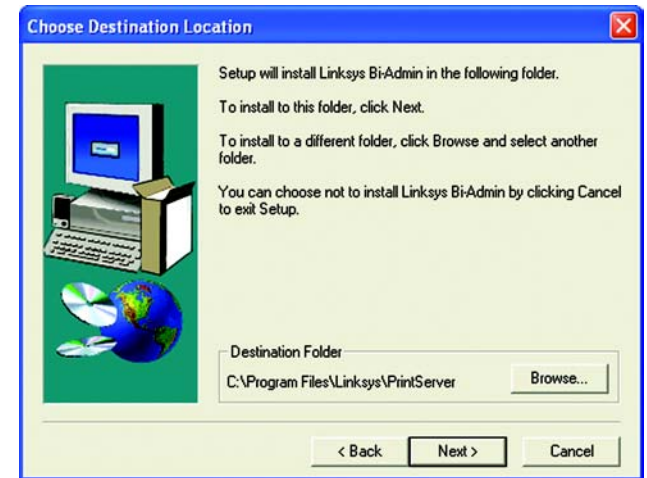


Figure 7-3: Choose Destination Location

- The *Select Program Folder* screen will appear. An icon will be added to the program folder listed. You may change the name for the program folder, if you wish. Click **Next**.

Click **Back** to return to the previous screen. Click **Cancel** to end the Bi-Admin installation.

- When the Bi-Admin is installed, the *Setup Complete* screen will appear. Click **Finish**.

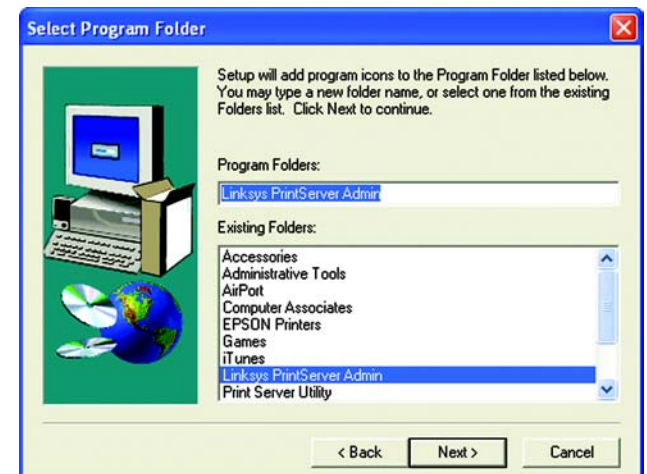


Figure 7-4: Select Program Folder

Starting the Bi-Admin Management Utility

1. To start the Bi-Admin program, click **Start, Programs, Print Server Utility**, and then **Bi-Admin Management Utility**. If the Bi-Admin Management Utility icon has been created, you can just double-click it instead. You can drag the shortcut icon onto your Desktop for easy access to the Bi-Admin Management Utility.
2. When the Bi-Admin Management Utility appears, it will ask for the Connected Protocol. Make sure the box next to *TCP/IP* is checked. Click the **OK** button.
3. The Bi-Admin Management Utility will automatically scan the network for the PrintServer.

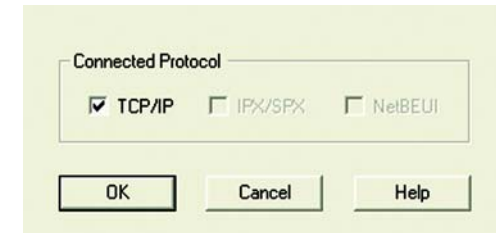


Figure 7-5: Connected Protocol

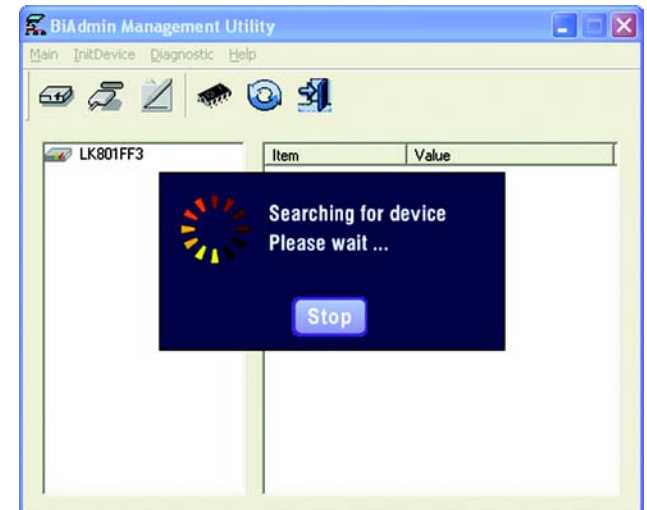


Figure 7-6: Searching for Device

The Bi-Admin Management Utility

The *Bi-Admin Management Utility* screen will appear next. Any hardware found on the network will appear on the left-hand side of the screen. The Utility can be managed from this screen. The menu and icon options will be explained in this section.

Menu Options

Main. The options are Device Status, Printer Status, Configure, Upgrade, Refresh, and Exit. These options are the same as the icons that are displayed below the menu options (viewed from left to right), and are described below:

- **Device Status.** This option allows you to view all of the device settings, optionally save the device settings to a file, or restore a previously saved file to the device.

If you click **Device Status**, the *Device Information* screen will appear. A list of the PrintServer's device settings is displayed, including Hardware ID, Firmware version, Protocol ID, Default Name, Server Name, and MAC Address. To save the information in a .txt (text) file, click the **Save to file** button.

To choose a different device that you configured, click the **Open** button. You may then browse for your file, select it, and then click **Open**. The contents of the file will display on the right-hand side of the screen. To save the file to the PrintServer, click **Restore to Device**.

Click the **Exit** button to return to the *Bi-Admin Management Utility* screen. For more information, click the **Help** button.

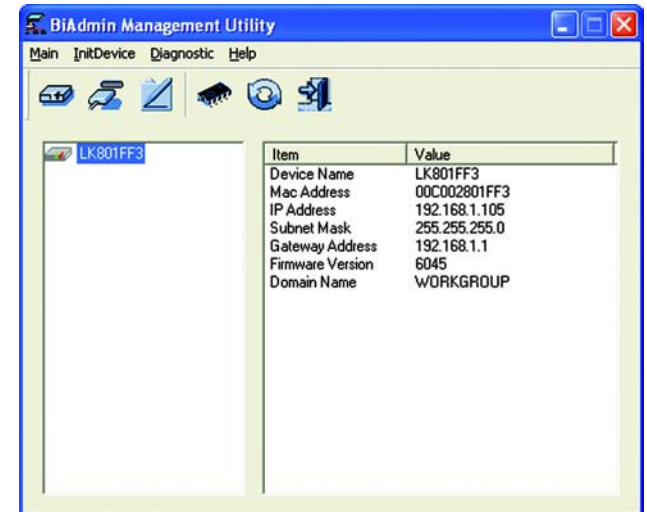


Figure 7-7: Bi-Admin Management Utility

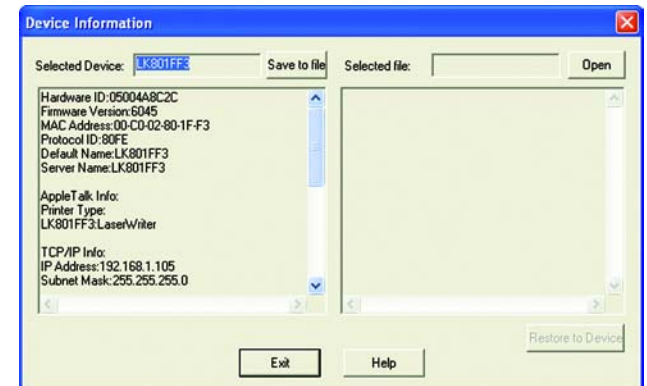


Figure 7-8: Device Information

- **Printer Status.** This option allows you to view the printer status, as well as set port and printer parameters.

If you click **Printer Status**, the *Printer Status* screen will appear. The Device Name will be displayed and the Current Selected Port will be highlighted. The status information for this port will be displayed.

Click the **Back** button to return to the *Bi-Admin Management Utility* screen. Click **Refresh** to refresh the screen. For more information, click the **Help** button.

If the printer is bi-directional and not busy, the Printer Configuration button will appear on the *Printer Status* screen. Click this button to view the printer's Environmental Variable and Variable Value items. If the items are not read-only, you can change them based on the options of your printer.

For more information, click the **Help** button.

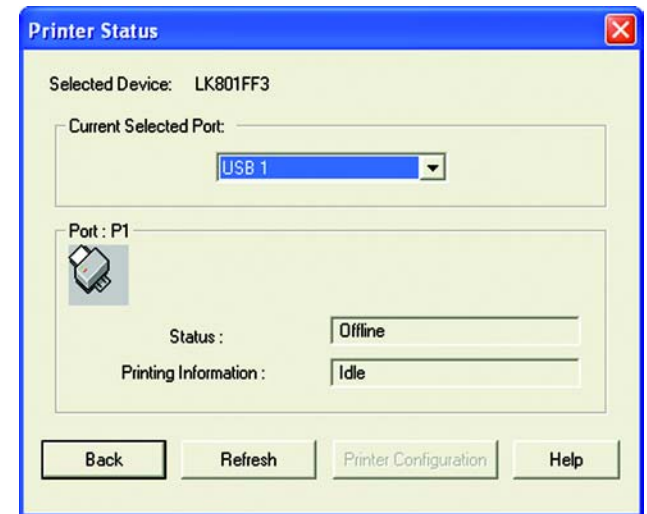


Figure 7-9: Printer Status

- **Configure.** You may configure the PrintServer with this option.

If you click **Configure**, the *Configuration* screen will appear. It displays eight tabs: System, TCP/IP, AppleTalk, NetBEUI, Internet Printing, Port, Wireless, and SNMP. The tabs will be described below.

System

- **Device Name.** Enter the Device Name in the field provided.
- **Comment.** Enter any comments in the *Comment* field.
- **Device Password.** To change the password, select **Change Device Password**, enter the new password in the *Password* field, and then re-enter the password in the *Confirm Password* field.
- **Protocol.** Select the protocol you want to use for your network: TCP/IP, AppleTalk, NetBEUI, IPX/SPX.

Click the **Get Defaults** button if you want to cancel your changes and use the default settings.

When finished making your changes on this tab, click the **OK** button to save these changes, or click the **Cancel** button to undo your changes. For more information, click the **Help** button.

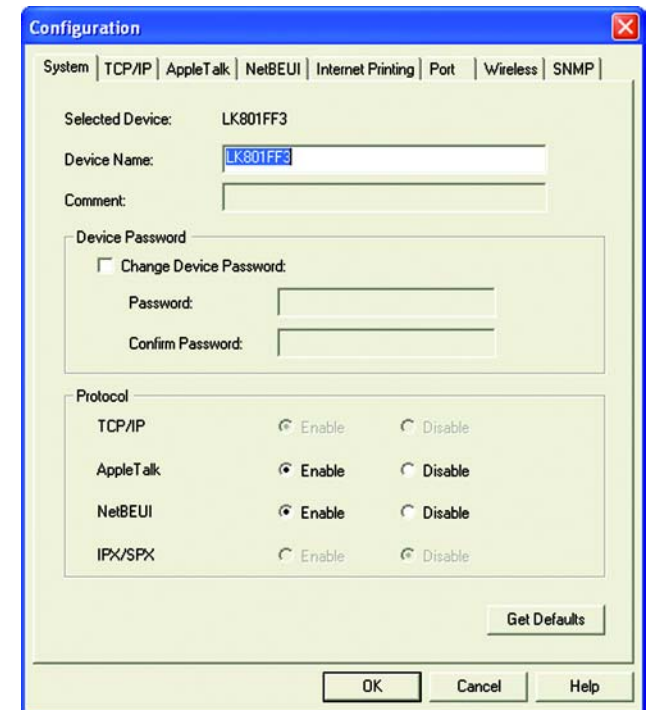


Figure 7-10: Configuration - System

TCP/IP

- **Dynamic IP Address (DHCP).** If your network router is using DHCP to assign IP addresses, select **Dynamic IP Address (DHCP)**. By default, **Dynamic IP Address (DHCP)** is enabled.
- **Fixed IP Address.** If you need to assign the PrintServer a fixed IP address (also known as static IP address), select **Fixed IP Address**, and enter the appropriate values under IP Address, Subnet Mask, and Gateway. Make sure the IP Address and Subnet Mask are appropriate for your network. If you change the PrintServer's IP address, make sure you that you reconnect to the PrintServer using that new IP address. Otherwise, you will not be communicating with the PrintServer. In most cases, the Gateway IP address is the IP address of your router, and you should complete the *Gateway* field if you will use the PrintServer for Internet printing. (To find out your router's IP address, consult your router's documentation.)
- **TCP session.** If your TCP session has ended, you can attempt a new connection. In the *Retry interval* field, enter how often you want the PrintServer to attempt a connection. In the *Retry count* field, enter the maximum number of attempts.

Click the **Get Defaults** button if you want to cancel your changes and use the default settings.

When finished making your changes on this tab, click the **OK** button to save these changes, or click the **Cancel** button to undo your changes. For more information, click the **Help** button.

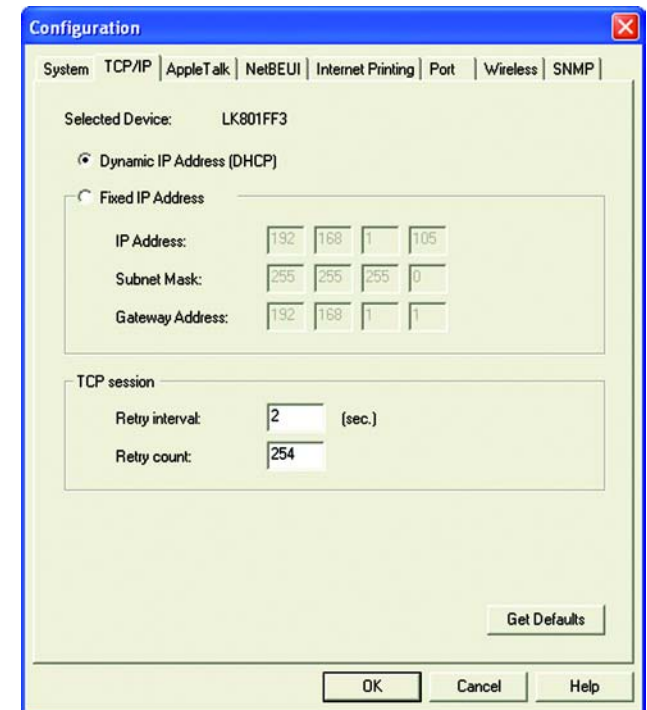


Figure 7-11: Configuration - TCP/IP

Apple Talk

- **Zone Name.** Typically only Macintoshes use AppleTalk, although other platforms can use it if they have the necessary, third-party software installed. Enter the Zone Name in the field provided.
- **Port Setting.** Select the port number from the drop-down menu. The Printer Type can be obtained from the manufacturer of the printer. Enter the type of printer in the *Printer Type* field. For each printer connected to the PrintServer, you will choose the Communications Protocol that allows the devices on the network to communicate. Select the type of Communication Protocol you will use, **ASCII** or **Binary** for each printer, according to the recommendation of the printer's manufacturer. For more information, refer to the printer's documentation.

Click the **Get Defaults** button if you want to cancel your changes and use the default settings.

When finished making your changes on this tab, click the **OK** button to save these changes, or click the **Cancel** button to undo your changes. For more information, click the **Help** button.

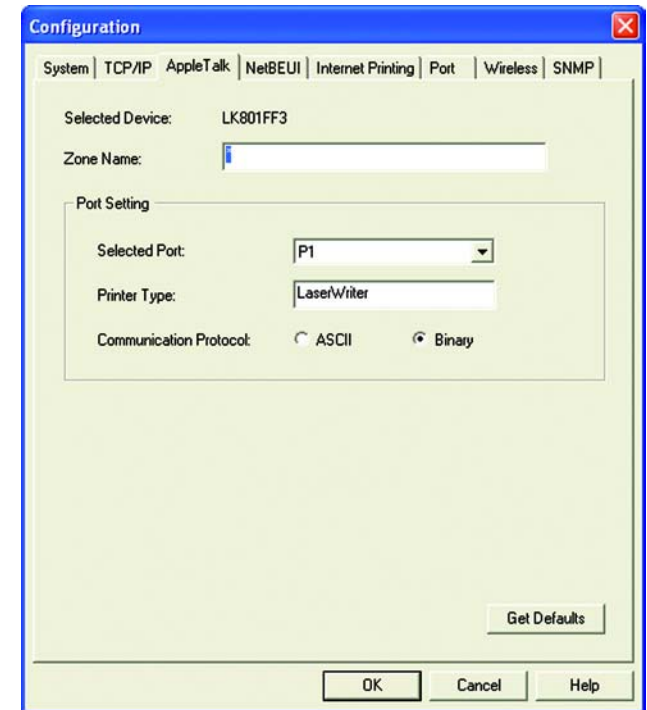


Figure 7-12: Configuration - AppleTalk

NetBEUI

- Domain Name.** Enter the name of the domain that you want the PrintServer associated with in the *Domain Name* field. If you are unsure of the Domain Name, you can find it out by looking on any computer already on the network. In Windows 98, right-click **Network Neighborhood** and select **Properties**. Under the Identification tab, there will be listed that computer's name, and the Domain to which it is connected. For Windows Me, 2000, or XP, right-click **My Network Places**. In Windows Me, choose **Properties** from the menu that appears. In Windows 2000 or XP, choose **Properties** from the menu that appears. Then, right-click **Local Area Connection** and choose **Properties**. The Domain name will appear. If you want the PrintServer to be connected to that same Domain, enter that Domain name here. If no Domain name exists there, you will use the Workgroup name from that window.
- Port Setting.** You can specify the Response Time that you prefer for the PrintServer. This is the amount of time (measured in seconds) that the PrintServer will wait for a response from the network before "timing out." You also have the option to use this feature, Abort Print Job if Error. Selecting Yes here will terminate the printing if there is an error of any kind. If you select No, print jobs that have errors will be sent to the printer, but might not print properly.

Click the **Get Defaults** button if you want to cancel your changes and use the default settings.

When finished making your changes on this tab, click the **OK** button to save these changes, or click the **Cancel** button to undo your changes. For more information, click the **Help** button.

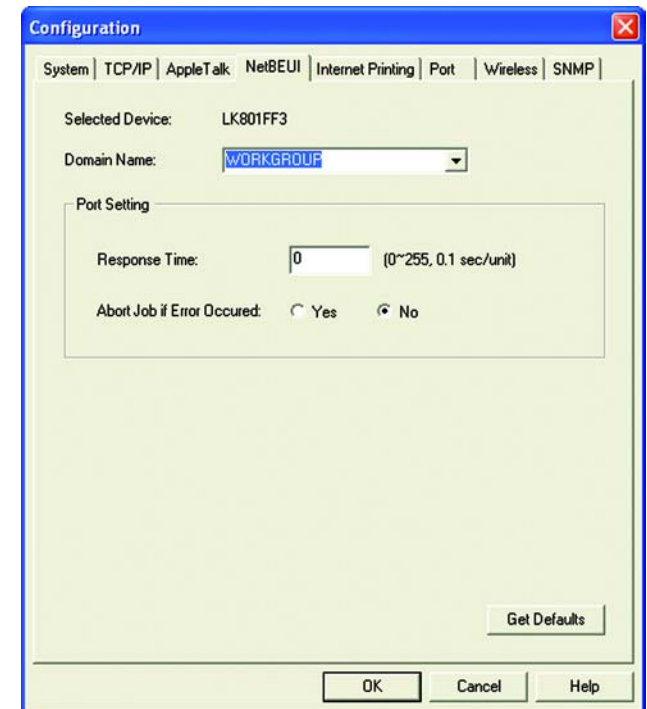


Figure 7-13: Configuration - NetBEUI

Internet Printing

- **Mail Server.** Enter the address of your mail server in the *Mail Server IP Address* fields. (This value must be a fixed IP address.) Enter the Mail Account name and Password next. Enter the password again in the *Confirm Password* field. Then, enter the time interval for the PrintServer to check for e-mail to be printed, in hours and minutes in the *Check Mail Interval* field. You may also specify an e-mail address to which mails that cannot be printed are routed; this is useful for both graphic-intensive e-mails and for troubleshooting purposes. Enter this e-mail address in the *Redirect Mail Account* field.
- **Printer.** Select the Default Printer Port from the drop-down menu. In the field provided, enter the Printer Model, which can be found through the Device Manager.
- **Options.** Place a check mark next to the options you want to enable: **Print Every Mail**, **Banner Printing** (enabled by default), or **Mail response when Printed**.

Click the **Get Defaults** button if you want to cancel your changes and use the default settings.

When finished making your changes on this tab, click the **OK** button to save these changes, or click the **Cancel** button to undo your changes. For more information, click the **Help** button.

The screenshot shows the 'Configuration' dialog box with the 'Internet Printing' tab selected. The 'Selected Device' is 'LK801FF3'. Under the 'Mail Server' section, the 'Mail Server IP Address' is set to '0.0.0.0'. The 'Mail Account' and 'Password' fields are present, along with a 'Confirm Password' field. The 'Check Mail Interval' is set to '0 : 1 (hh : mm)'. The 'Redirect Mail Account' field is empty. Under the 'Printer' section, the 'Default Printer Port' is set to 'P1' and the 'Printer Model' field is empty. Under the 'Options' section, the 'Print Every Mail' checkbox is unchecked, the 'Banner Printing' checkbox is checked, and the 'Mail Response when Printed' checkbox is unchecked. At the bottom right, there is a 'Get Defaults' button. At the bottom center, there are 'OK', 'Cancel', and 'Help' buttons.

Figure 7-14: Configuration - Internet Printing

Port

- **Physical Port.** Select the number of the Selected Physical Port from the drop-down menu. Select the Handshake Signal, **Busy Only** or **Busy & Ack**. Select the Printer Type, **High Speed** or **Low Speed**.
- **Logical Port.** Select the Selected Logical Port from the drop-down menu and then the physical port you want to map it to from the drop-down menu for *Map to Physical Port*. If you select Yes for Convert LF to LF+CR, the LF (line feed) characters are changed to LF+CR (line feed + carriage return). In the field for *Prefix of Job*, enter the printer control string (in hexadecimal characters) to be sent to the printer before each print job. This string cannot exceed 30 characters. In the field for *Suffix of Job*, enter the printer control string (in hexadecimal characters) to be sent to the printer after each print job. This string cannot exceed 30 characters.

Click the **Get Defaults** button if you want to cancel your changes and use the default settings.

When finished making your changes on this tab, click the **OK** button to save these changes, or click the **Cancel** button to undo your changes. For more information, click the **Help** button.

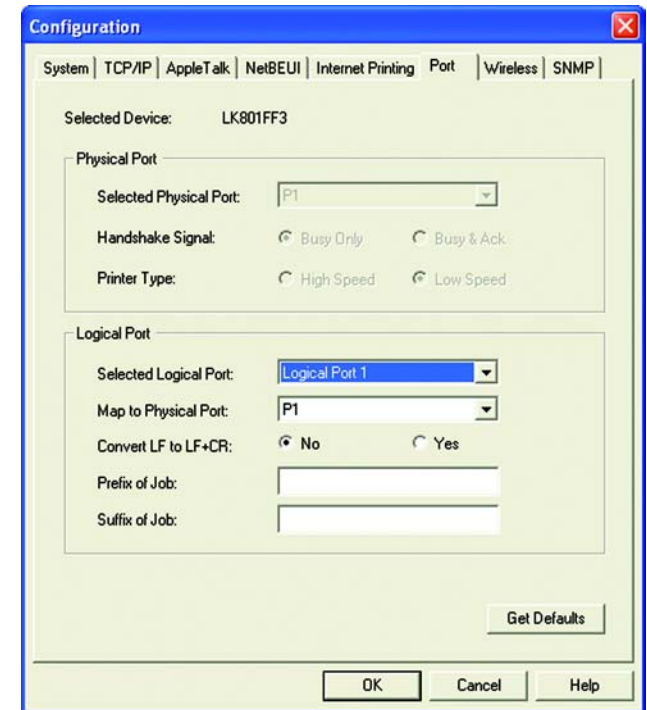


Figure 7-15: Configuration - Port

Wireless

- **SSID (Service Set Identifier).** In the *SSID* field, enter the name of your wireless network. This is the unique name shared by all devices in a wireless network. The SSID is case-sensitive and should have 32 characters or fewer.
- **Channel No.** If your network is set to ad-hoc mode, select your network's channel setting from the *Channel No.* drop-down menu.
- **Network Type.** The Network Type setting shows a choice of two wireless modes. Select **Infrastructure** if you want the PrintServer to communicate using an access point or wireless router. Select **Ad-Hoc** if you want the PrintServer to communicate without using an access point or wireless router.
- **WEP Encryption.** If you want to enable WEP encryption for greater wireless security, click the **Enable** radio button. If you want to disable WEP encryption, keep the default, **Disable**. From the *WEP Authentication* drop-down menu, select your wireless network's authentication type. The default is set to **Open System**, for which the sender and the recipient do NOT use a WEP key for authentication. You can also choose **Shared Key**, when the sender and recipient use a WEP key for authentication. This setting should match the one on your network's access point or wireless router.

In the *WEP Keys* section, select the level of WEP encryption, **64 bits** or **128-bits**. From the drop-down menu, select the Default Key used by your wireless network. This indicates which WEP key your network uses for WEP encryption. In the **Key1 (hex) to Key4 (hex)** fields, enter your network's WEP keys. If you are using 64-bit WEP encryption, then the key must consist of exactly 10 hexadecimal characters. If you are using 128-bit WEP encryption, then the key must consist of exactly 26 hexadecimal characters. Valid hexadecimal characters are "0"-"9" and "A"-"F".

Click the **Link Info** button if you want to view information about the wireless connection.

Click the **Get Defaults** button if you want to cancel your changes and use the default settings.

When finished making your changes on this tab, click the **OK** button to save these changes, or click the **Cancel** button to undo your changes. For more information, click the **Help** button.

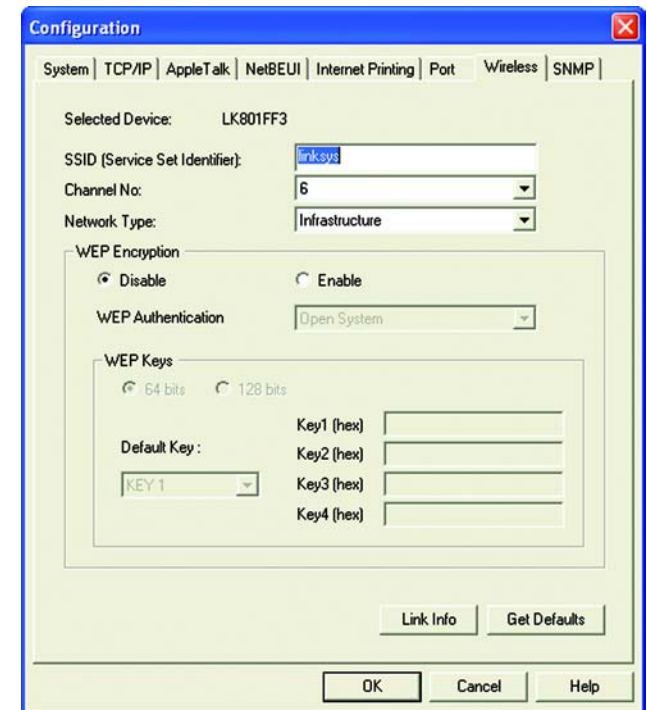


Figure 7-16: Configuration - Wireless

SNMP

- **SysContact.** Enter the name of the contact person in the *SysContact* field.
- **SysLocation.** Enter the location of the contact person in the *SysLocation* field.
- **Configuration Item.** From the *Configuration Item* box, select the number of the management station (M1-M4) or trap receiver (T1-T4). The selected item's information will be displayed below.

For management stations, you can change the station's IP address, Community String, and Access Permission level. In the *Manager IP Address* fields, enter the IP address of the management station with the SNMP program installed. In the *Community String* field, enter the name of the SNMP community, which is usually **public** or **private**. In the *Access Permission* section, select the desired level of access for this management station, **Read Only**, **Read/Write**, or **Not Accessible**.

For trap receivers, you can change the trap receiver's IP address, Community String, Trap Option, and Trap Severity level. In the *Trap Receive IP Address* fields, enter the IP address of the trap receiver that will be sent the trap messages or notifications. In the *Community String* field, enter the name of the SNMP community, which is usually **public** or **private**. For the Trap Option setting, select **Enable** or **Disable**. For the Trap Severity setting, select the desired level of severity, with 1 meaning least severe.

Click the **Get Defaults** button if you want to cancel your changes and use the default settings.

When finished making your changes on this tab, click the **OK** button to save these changes, or click the **Cancel** button to undo your changes. For more information, click the **Help** button.

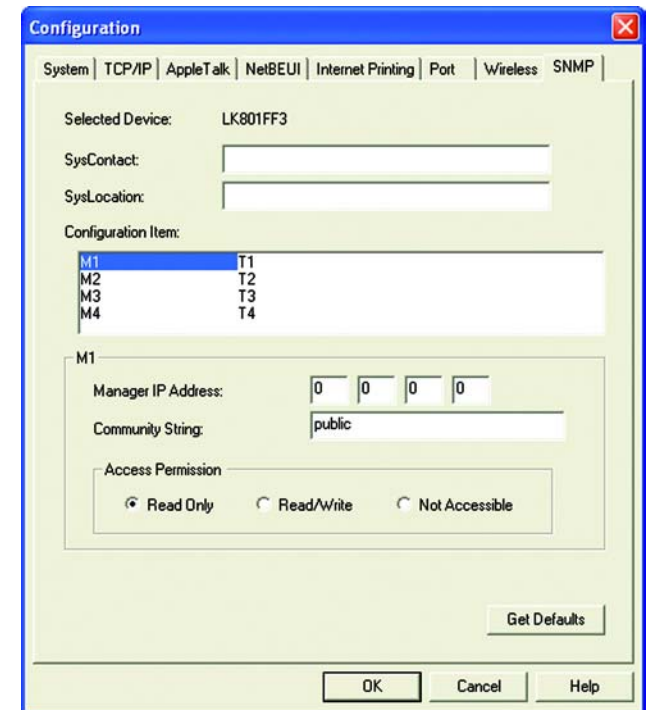


Figure 7-17: Configuration - SNMP

- **Upgrade.** You may use this option to upgrade the firmware of the PrintServer. Follow these instructions:
 1. On the *Upgrade* screen, click the **Files** button.
 2. The *Detected LAN Cards* screen will appear. Select the LAN card the PrintServer is connected to, and then click the **OK** button.
 3. Follow the on-screen instructions, and select the firmware file you want to use.
 4. View the *BIN File Information* screen, and click the **OK** button if you have selected the correct firmware file. Click the **Cancel** button to select a different firmware file.
 5. On the *Upgrade* screen, click the **Upgrade** button. Click the **Cancel** button to cancel the firmware upgrade. For more information, click the **Help** button.
- **Refresh.** This option allows you to refresh the device list after you change the name or IP address of a device. The screen does not refresh automatically.
- **Exit.** This option allows you to exit the Bi-Admin program.

InitDevice. The available options are Reset Device, Restore to Factory Default, Attached Remote, and Connected Protocol.

If you click Attached Remote, the *Add Cross Segment Printer* screen appears. To add a cross segment print server, enter its IP address in the fields provided, and click the **Set** button.

Click **Cancel** to undo any changes. For more information, click the **Help** button.

Diagnostic. Diagnostic allows you to print a test page from either of the PrintServer's ports.

Help. The two options are Help Topics and About Bi-Admin. These help files offer extensive advice and details about all of the PrintServer's functions and capabilities.



Figure 7-18: Upgrade



Figure 7-19: Detected LAN Cards



Figure 7-20: BIN File Information

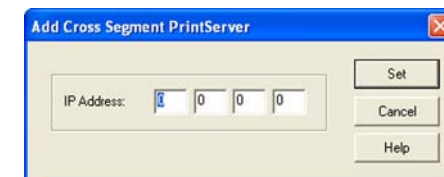


Figure 7-21: Add Cross Segment PrintServer

Chapter 8: Internet Printing Protocol (IPP)

Overview

Internet Printing Protocol (IPP) is a standards-based system that allows remote printing from a PC to any accessible printer. Normally, the printer will be attached to a computer or other device that functions as an IPP Server. For client PCs, it is necessary to install a compatible IPP Client program. The Client must also know the IP Address or URL of the IPP Server.

The PrintServer contains the necessary firmware to act as an IPP Server. No additional configuration is necessary. However, the following requirements must be met:

- The PrintServer must have a valid IP Address. For printing via the Internet, the PrintServer's IP Address must be external (allocated by your ISP), rather than an IP Address on your local LAN.
- Any Router, Gateway, or Firewall linking your LAN to the Internet must NOT block IPP. (IPP uses Port Services 631/TCP)
- You must advise clients of the correct URL or IP Address of the IPP Server. To use a URL rather than an IP Address, you need to register the domain name for the URL.
- Unless clients are using Windows 2000 or XP, you must provide your clients with the supplied IPP Client software. If it is not convenient to provide the CD-ROM, supply the setup.exe file, located in the IPP folder.

Windows IPP Client Setup

Installing using setup.exe

1. Run this program, located at d:\driver\ipp\setup.exe, to unzip the included files.
2. The IPP Setup program will then run.
3. Follow the prompts to complete the installation.

IPP Client Configuration for Windows 98, Me, 2000, and XP

1. Run the **Add IPP Port program** entry created by the installation.
2. On the *Output Select* screen, enter the IP Address or URL of the IPP Server.
3. If Internet access from your location is via a Proxy Server, check **Access IPP Server via Proxy Server**, and enter details of your Proxy Server. (This will be the same as your browser configuration.)
4. Click **Select Device Port** to view the available ports on the IPP Server, and select the appropriate port. A connection to the IPP Server will be established at this time.
5. Click **OK** to create the IPP port on your system. You will see a message confirming that the port has been created, and then you will see the *AddPort* screen.
6. Perform one of these steps.

Select an existing printer to use the new port, and click **OK**.

OR

Click the **Add New Printer** button to create a new printer that will use the IPP port. This will start the Add Printer Wizard. Follow the prompts to complete the process. Make sure that the new printer uses the IPP port.

Installation is now complete.

- To create additional IPP ports, repeat the entire procedure.
- The Proxy Server and other options are set individually for each IPP port.

Changing the IPP Port Settings

After the IPP port is created, you can reach the *Configure IPP Port* screen by performing these steps:

1. Open the **Printers** folder (**Start => Settings => Printers**).
2. Right-click **IPP Printer** and select **Properties**.
3. Click the **Port Settings** or **Configure Port** button (Details or Port tab, depending on your version of Windows).
The *Configure IPP Port* screen will appear.

There are two settings, Retry Interval and Retry Count, which can be adjusted if you have problems connecting to the IPP Server.

- The Retry Interval sets the time interval (in seconds) between connection attempts. Increase this number if you have a poor connection, or the remote server is very busy.
- The Retry Count sets how many connection attempts will be made. Increase this number if you have a poor connection, or the remote server is very busy.

IPP Client Setup for Windows XP

Windows XP has its own IPP Client, and there is no need to install the supplied IPP Client Software. To use this IPP Client with the PrintServer, follow this procedure:

1. Click the **Start** button.
2. Select **Settings** and click **Printers and Faxes**.
3. Click **Add a printer**.
4. On the *Welcome to the Add Printer Wizard* screen, click the **Next** button.
5. On the *Local or Network Printer* screen, select **A network printer, or a printer attached to another computer**, and click the **Next** button.



Figure 8-1: Windows XP - Local or Network Printer

6. On the *Specify a Printer* screen, select **Connect to a printer on the Internet or on a home or office network**, and enter the URL of the IPP Server as follows (ip_address represents the IP Address of the IPP Server, and 631 represents the port number).

Port 1 ip_address:631/ipp/P1



NOTE: These entries are case-sensitive. They must be entered as shown, with “ipp” in lowercase and P1 in uppercase.

7. If the connection can be established, and the printer on that port is online, the *Connect to Printer* dialog box will be displayed. This screen notifies you that the printer driver is not installed. Click the **OK** button.
8. Select the printer manufacturer and model to match the printer connected to the appropriate port on the IPP Server.
9. Click the **OK** button and follow the prompts to complete the Wizard.

The IPP printer is now ready for use.

IPP Client Setup for Windows 2000

Windows 2000 has its own IPP Client, and there is no need to install the supplied IPP Client Software. To use this IPP Client with the PrintServer, follow this procedure:

1. Click the **Start** button.
2. Select **Settings** and click **Printers**.
3. Double-click **Add Printer**.
4. On the *Welcome to the Add Printer Wizard* screen, click the **Next** button.
5. Select **Network Printer** and click **Next** to see the *Locate your Printer* screen.
6. Select **Connect to a printer on the Internet or on your intranet**, and enter the URL of the IPP Server as follows (ip_address represents the IP Address of the IPP Server, and 631 represents the port number).

Port 1 ip_address:631/ipp/P1



NOTE: These entries are case-sensitive. They must be entered as shown, with “ipp” in lowercase and P1 in uppercase.

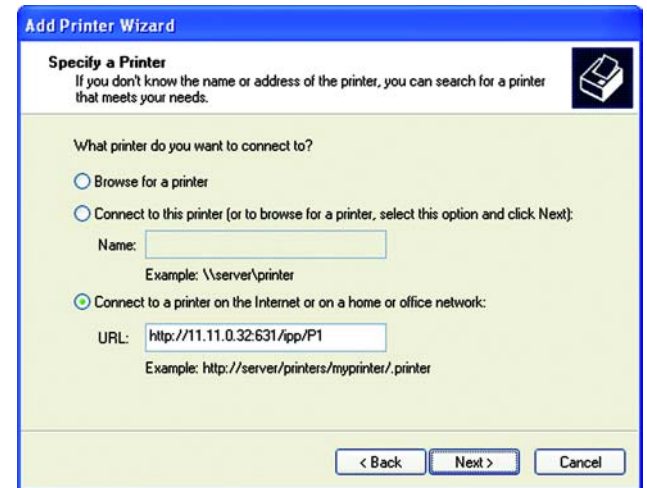


Figure 8-2: Windows XP - Specify a Printer



Figure 8-3: Windows 2000 - Locate Your Printer

Wireless-G PrintServer

7. If the connection can be established, and the printer on that port is online, the *Connect to Printer* dialog box will be displayed. This screen notifies you that the printer driver is not installed. Click the **OK** button.
8. Select the printer manufacturer and model to match the printer connected to the appropriate port on the IPP Server.
9. Click the **Next** button and follow the prompts to complete the Wizard.

The IPP printer is now ready for use.

Using IPP Printers

The IPP Printer can be selected and used like any other Windows printer. If the IPP Server is not on your network, your Internet connection needs to be active.

If you wish to check the availability of the remote IPP Server, you can use the Query IPP Printer program installed with the Add IPP Port program.

An IPP Server may be unavailable for any of the following reasons:

- It is powered off.
- A printer problem has caused the IPP Server to cease responding, and a restart (reboot) is required.
- The Server's IP Address has changed.
- The Internet connection for the IPP Server is down.
- Network congestion causes the connection attempt to time out.

If using the supplied IPP Client software, there are two settings, Retry Interval and Retry Count, which can be adjusted if you have problems connecting to the IPP Server.

See the previous section, "Changing the IPP Port Settings," for details.

Appendix A: Troubleshooting

This appendix consists of “Common Problems and Solutions”. Provided are possible solutions to problems that may occur during the installation and operation of the PrintServer. Read the descriptions below to help you solve your problems. If you can't find an answer here, check the Linksys website at www.linksys.com.

Common Problems and Solutions

1. All the LEDs on the front of the PrintServer are not lit.

Check the power adapter and the connection to the electrical outlet.

2. The PrintServer's Power LED lights up orange or flashes continuously.

Reset the PrintServer. Unplug the power adapter and plug it back in, or press the **Reset** button on the back of the PrintServer for approximately ten seconds.

3. I am using DHCP, and the PrintServer gets an IP address conflict involving the PrintServer.

If the PrintServer is left powered on when the DHCP server, which is usually the network router, is powered off, the PrintServer will retain its IP address without informing the DHCP server. Reset the PrintServer so it will obtain a new IP address. This problem may also occur if you assigned a static IP address within the range used by the DHCP server. If so, use another address NOT within the range used by the DHCP server.

4. The PrintServer's Ethernet LED is not lit.

Check your Ethernet network cable and make sure that the appropriate Ethernet or Link LED on your router or switch is lit.

5. A printer connected to the PrintServer cannot print or prints garbage.

Do the following:

- Check the cable connection between the PrintServer and printer.
- Make sure the printer driver in the application program or Windows matches the printer.
- Make sure the printer is not too long, less than 10 feet.

6. The Configuration button on the Printer Status screen in Bi-Admin is grayed out, even though my printer is bi-directional.

The button is unavailable until the printer has finished its print jobs and sits idle.

7. To start over, I need to set the PrintServer to its factory default settings.

Unplug the PrintServer's power adapter. Press the **Reset** button while you plug in the PrintServer's power adapter. Continue to hold the **Reset** button for 10 seconds and then release it. This will reset the password, wireless, and other settings on the PrintServer to the factory defaults. In other words, the PrintServer will revert to its original factory configuration.

8. I need to upgrade the firmware.

In order to upgrade the firmware with the latest features, follow these steps:

1. Go to the Linksys website at <http://www.linksys.com> and download the latest firmware for the PrintServer. Then extract the firmware file on your PC.
2. Open the PrintServer's Web-based Utility. Click **Status** and then **Device**.
3. Click the **Upgrade** button, and follow the on-screen instructions.

Appendix B: Wireless Security

Linksys wants to make wireless networking as safe and easy for you as possible. The current generation of Linksys products provide several network security features, but they require specific action on your part for implementation. So, keep the following in mind whenever you are setting up or using your wireless network.

Security Precautions

The following is a complete list of security precautions to take:

1. Change the default SSID.
2. Disable SSID Broadcast.
3. Change the default password for the Administrator account.
4. Enable MAC Address Filtering.
5. Change the SSID periodically.
6. Use the highest encryption algorithm possible. Use WPA if it is available. Please note that this may reduce your network performance.
7. Change the WEP encryption keys periodically.

To ensure network security, at least steps one through five should be followed.

Security Threats Facing Wireless Networks

Wireless networks are easy to find. Hackers know that in order to join a wireless network, wireless networking products first listen for “beacon messages”. These messages can be easily decrypted and contain much of the network’s information, such as the network’s SSID (Service Set Identifier). Here are the steps you can take:

Change the administrator’s password regularly. With every wireless networking device you use, keep in mind that network settings (SSID, WEP keys, etc.) are stored in its firmware. Your network administrator is the only person who can change network settings. If a hacker gets a hold of the administrator’s password, he, too, can change those settings. So, make it harder for a hacker to get that information. Change the administrator’s password regularly.



Note: Some of these security features are available only through the network router or access point. Refer to the router or access point’s documentation for more information.

SSID. There are several things to keep in mind about the SSID:

1. Disable Broadcast
2. Make it unique
3. Change it often

Most wireless networking devices will give you the option of broadcasting the SSID. While this option may be more convenient, it allows anyone to log into your wireless network. This includes hackers. So, don't broadcast the SSID.

Wireless networking products come with a default SSID set by the factory. (The Linksys default SSID is "linksys".) Hackers know these defaults and can check these against your network. Change your SSID to something unique and not something related to your company or the networking products you use.

Change your SSID regularly so that any hackers who have gained access to your wireless network will have to start from the beginning in trying to break in.

MAC Addresses. Enable MAC Address filtering. MAC Address filtering will allow you to provide access to only those wireless nodes with certain MAC Addresses. This makes it harder for a hacker to access your network with a random MAC Address.

WEP Encryption. Wired Equivalent Privacy (WEP) is often looked upon as a cure-all for wireless security concerns. This is overstating WEP's ability. Again, this can only provide enough security to make a hacker's job more difficult.

There are several ways that WEP can be maximized:

1. Use the highest level of encryption possible
2. Use "Shared Key" authentication
3. Change your WEP key regularly

WPA. Wi-Fi Protected Access (WPA) is the newest and best available standard in Wi-Fi security. Two modes are available: Pre-Shared Key and RADIUS. Pre-Shared Key gives you a choice of two encryption methods: TKIP (Temporal Key Integrity Protocol), which utilizes a stronger encryption method and incorporates Message Integrity Code (MIC) to provide protection against hackers, and AES (Advanced Encryption System), which utilizes a symmetric 128-Bit block data encryption. RADIUS (Remote Authentication Dial-In User Service) utilizes a RADIUS server for authentication and the use of dynamic TKIP, AES, or WEP.



Important: Always remember that each device in your wireless network **MUST** use the same encryption method and encryption key or your wireless network will not function properly.

WPA Pre-Shared Key. If you do not have a RADIUS server, select the type of algorithm, TKIP or AES, enter a password in the Pre-Shared key field of 8-64 characters, and enter a Group Key Renewal period time between 0 and 99,999 seconds, which instructs the Router or other device how often it should change the encryption keys.

WPA RADIUS. WPA used in coordination with a RADIUS server. (This should only be used when a RADIUS server is connected to the Router or other device.) First, select the type of WPA algorithm, **TKIP** or **AES**. Enter the RADIUS server's IP Address and port number, along with a key shared between the device and the server. Last, enter a Group Key Renewal period, which instructs the device how often it should change the encryption keys.

RADIUS. WEP used in coordination with a RADIUS server. (This should only be used when a RADIUS server is connected to the Router or other device.) First, enter the RADIUS server's IP Address and port number, along with a key shared between the device and the server. Then, select a WEP key and a level of WEP encryption, and either generate a WEP key through the Passphrase or enter the WEP key manually.

Implementing encryption may have a negative impact on your network's performance, but if you are transmitting sensitive data over your network, encryption should be used.

These security recommendations should help keep your mind at ease while you are enjoying the most flexible and convenient technology Linksys has to offer.

Appendix C: About Bi-Directional Printing

Normal printing only sends print signals from a PC to a printer. Bi-directional printing, also called bitronic printing, refers to a printer's ability to do just the opposite—talk back to a PC to notify it of a print job status, paper jams, etc. This two-way communication technology can be found in HP, IBM, Panasonic, and other laser or color printers where close contact between the PC and printer is key. In color printing, for example, the printer “informs” the PC of its constant status in order to mix color inks correctly for optimal quality output.

Bi-directional communication, communication from a printer to a PC, is normally handled by a combination of the printer hardware and special software on your computer. Bi-directional printers generally have highly advanced parallel interfaces. These printers often require special parallel ports in order to take full advantage of their features.

Using a bi-directional printer on a network poses unique challenges. Unlike a direct PC-to-printer connection during which a bi-directional printer can easily send its signals back to the host PC through the computer's parallel port (which is normally located only a few feet away from the printer), a networked printer faces the problem of having to route messages bound for a particular PC through a large array of hubs, switches, file servers, and computers. Unfortunately, most printers are not equipped to handle the complexities of printer-to-PC communication across a network. That does not mean that they can't be used on a network, however.

Linksys designed the PrintServers to function with both regular as well as bi-directional printers. Standard print servers cannot work with bi-directional printers, but the PrintServer features a custom design to support both parallel as well as bi-directional parallel interfaces. However, the PrintServer cannot pass messages from the printer back to the printing PC—this limitation is simply an industry standard, and not one of the PrintServer itself.

However, the PrintServer can check any printer's online and printing status on the network using the Bi-Admin management utility software packaged with the PrintServer. The status-checking feature built into the management software does not require a bi-directional printer to function. If your printer came with special bi-directional software allowing you to monitor printer status, do not use it with the PrintServer—the software is most likely not network-capable. For best results, turn off the printer's bi-directional function either by (1) removing any bi-directional printing software from your network computers, and/or (2) turning off the printer's bi-directional print feature inside of the printer's on-board menus (if it has menus). Your printer's user guide should be able to provide specific instructions for doing this.

Appendix D: Upgrading Firmware

Use the PrintServer's Web-based Utility to upgrade its firmware. Follow these instructions:

1. Visit www.linksys.com and download the firmware upgrade file for the Wireless-G PrintServer.
2. Extract the file on your computer.
3. Open the PrintServer's Web-based Utility.
4. Click the **Status** tab, and then click the **Device** tab.
5. On the *Device* screen, click the **Upgrade** button.
6. On the *Firmware Upgrade* screen, enter the location of the extracted firmware file, or click the **Browse** button to find this file.
7. Click the **Start Upgrade** button, and follow the on-screen instructions.

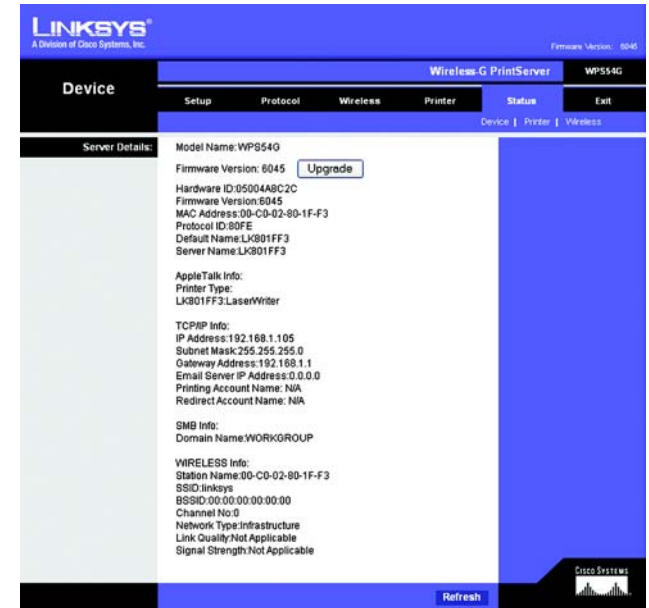


Figure D-1: Status Tab - Device



Figure D-2: Firmware Upgrade

Appendix E: Windows Help

All Linksys wireless products require Microsoft Windows. Windows is the most used operating system in the world and comes with many features that help make networking easier. These features can be accessed through Windows Help and are described in this appendix.

TCP/IP

TCP/IP is a set of instructions, or protocol, all PCs follow to communicate over a network. This is true for wireless networks as well. Your PCs will not be able to utilize wireless networking without having TCP/IP enabled. Windows Help provides complete instructions on enabling TCP/IP.

Shared Resources

If you wish to share printers, folder, or files over your network, Windows Help provides complete instructions on utilizing shared resources.

Network Neighborhood/My Network Places

Other PCs on your network will appear under Network Neighborhood or My Network Places (depending upon the version of Windows you're running). Windows Help provides complete instructions on adding PCs to your network.

Appendix F: Glossary

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

802.11g - A wireless networking standard that specifies a maximum data transfer rate of 54Mbps, an operating frequency of 2.4GHz, and backward compatibility with 802.11b devices.

Access Point - A device that allows wireless-equipped computers and other devices to communicate with a wired network. Also used to expand the range of a wireless network.

Adapter - A device that adds network functionality to your PC.

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

AES (Advanced Encryption Standard) - A security method that uses symmetric 128-bit block data encryption.

Backbone - The part of a network that connects most of the systems and networks together, and handles the most data.

Bandwidth - The transmission capacity of a given device or network.

Beacon Interval - Data transmitted on your wireless network that keeps the network synchronized.

Bit - A binary digit.

Boot - To start a device and cause it to start executing instructions.

Bridge - A device that connects different networks.

Broadband - An always-on, fast Internet connection.

Browser - An application program that provides a way to look at and interact with all the information on the World Wide Web.

Buffer - A shared or assigned memory area that is used to support and coordinate different computing and networking activities so one isn't held up by the other.

Byte - A unit of data that is usually eight bits long

Cable Modem - A device that connects a computer to the cable television network, which in turn connects to the Internet.

CSMA/CA (Carrier Sense Multiple Access/Collision Avoidance) - A method of data transfer that is used to prevent data collisions.

CTS (Clear To Send) - A signal sent by a wireless device, signifying that it is ready to receive data.

Daisy Chain - A method used to connect devices in a series, one after the other.

Database - A collection of data that is organized so that its contents can easily be accessed, managed, and updated.

DDNS (Dynamic Domain Name System) - Allows the hosting of a website, FTP server, or e-mail server with a fixed domain name (e.g., www.xyz.com) and a dynamic IP address.

Default Gateway - A device that forwards Internet traffic from your local area network.

DHCP (Dynamic Host Configuration Protocol) - A networking protocol that allows administrators to assign temporary IP addresses to network computers by "leasing" an IP address to a user for a limited amount of time, instead of assigning permanent IP addresses.

DMZ (Demilitarized Zone) - Removes the Router's firewall protection from one PC, allowing it to be "seen" from the Internet.

DNS (Domain Name Server) - The IP address of your ISP's server, which translates the names of websites into IP addresses.

Domain - A specific name for a network of computers.

Download - To receive a file transmitted over a network.

DSL (Digital Subscriber Line) - An always-on broadband connection over traditional phone lines.

DSSS (Direct-Sequence Spread-Spectrum) - Frequency transmission with a redundant bit pattern resulting in a lower probability of information being lost in transit.

DTIM (Delivery Traffic Indication Message) - A message included in data packets that can increase wireless efficiency.

Dynamic IP Address - A temporary IP address assigned by a DHCP server.

EAP (Extensible Authentication Protocol) - A general authentication protocol used to control network access. Many specific authentication methods work within this framework.

EAP-PEAP (Extensible Authentication Protocol-Protected Extensible Authentication Protocol) - A mutual authentication method that uses a combination of digital certificates and another system, such as passwords.

EAP-TLS (Extensible Authentication Protocol-Transport Layer Security) - A mutual authentication method that uses digital certificates.

Encryption - Encoding data transmitted in a network.

Ethernet - A networking protocol that specifies how data is placed on and retrieved from a common transmission medium.

Finger - A program that tells you the name associated with an e-mail address.

Firewall - A set of related programs located at a network gateway server that protects the resources of a network from users from other networks.

Firmware - The programming code that runs a networking device.

Fragmentation - Breaking a packet into smaller units when transmitting over a network medium that cannot support the original size of the packet.

FTP (File Transfer Protocol) - A protocol used to transfer files over a TCP/IP network.

Full Duplex - The ability of a networking device to receive and transmit data simultaneously.

Gateway - A device that interconnects networks with different, incompatible communications protocols.

Half Duplex - Data transmission that can occur in two directions over a single line, but only one direction at a time.

Hardware - The physical aspect of computers, telecommunications, and other information technology devices.

HTTP (HyperText Transport Protocol) - The communications protocol used to connect to servers on the World Wide Web.

Infrastructure - A wireless network that is bridged to a wired network via an access point.

IP (Internet Protocol) - A protocol used to send data over a network.

IP Address - The address used to identify a computer or device on a network.

IPCONFIG - A Windows 2000 and XP utility that displays the IP address for a particular networking device.

IPSec (Internet Protocol Security) - A VPN protocol used to implement secure exchange of packets at the IP layer.

ISM band - Radio bandwidth utilized in wireless transmissions.

ISP (Internet Service Provider) - A company that provides access to the Internet.

LAN - The computers and networking products that make up your local network.

LEAP (Lightweight Extensible Authentication Protocol) - A mutual authentication method that uses a username and password system.

MAC (Media Access Control) Address - The unique address that a manufacturer assigns to each networking device.

Mbps (MegaBits Per Second) - One million bits per second; a unit of measurement for data transmission.

mIRC - An Internet Relay Chat program that runs under Windows.

Multicasting - Sending data to a group of destinations at once.

NAT (Network Address Translation) - NAT technology translates IP addresses of a local area network to a different IP address for the Internet.

Network - A series of computers or devices connected for the purpose of data sharing, storage, and/or transmission between users.

NNTP (Network News Transfer Protocol) - The protocol used to connect to Usenet groups on the Internet.

Node - A network junction or connection point, typically a computer or work station.

OFDM (Orthogonal Frequency Division Multiplexing) - Frequency transmission that separates the data stream into a number of lower-speed data streams, which are then transmitted in parallel to prevent information from being lost in transit.

Packet - A unit of data sent over a network.

Passphrase - Used much like a password, a passphrase simplifies the WEP encryption process by automatically generating the WEP encryption keys for Linksys products.

Ping (Packet INternet Groper) - An Internet utility used to determine whether a particular IP address is online.

POP3 (Post Office Protocol 3) - A standard mail server commonly used on the Internet.

Port - The connection point on a computer or networking device used for plugging in cables or adapters.

Power over Ethernet (PoE) - A technology enabling an Ethernet network cable to deliver both data and power.

PPPoE (Point to Point Protocol over Ethernet) - A type of broadband connection that provides authentication (username and password) in addition to data transport.

PPTP (Point-to-Point Tunneling Protocol) - A VPN protocol that allows the Point to Point Protocol (PPP) to be tunneled through an IP network. This protocol is also used as a type of broadband connection in Europe.

Preamble - Part of the wireless signal that synchronizes network traffic.

RADIUS (Remote Authentication Dial-In User Service) - A protocol that uses an authentication server to control network access.

RJ-45 (Registered Jack-45) - An Ethernet connector that holds up to eight wires.

Roaming - The ability to take a wireless device from one access point's range to another without losing the connection.

Router - A networking device that connects multiple networks together.

RTS (Request To Send) - A networking method of coordinating large packets through the RTS Threshold setting.

Server - Any computer whose function in a network is to provide user access to files, printing, communications, and other services.

SMTP (Simple Mail Transfer Protocol) - The standard e-mail protocol on the Internet.

SNMP (Simple Network Management Protocol) - A widely used network monitoring and control protocol.

Software - Instructions for the computer. A series of instructions that performs a particular task is called a "program".

SOHO (Small Office/Home Office) - Market segment of professionals who work at home or in small offices.

SPI (Stateful Packet Inspection) Firewall - A technology that inspects incoming packets of information before allowing them to enter the network.

Spread Spectrum - Wideband radio frequency technique used for more reliable and secure data transmission.

SSID (Service Set Identifier) - Your wireless network's name.

Static IP Address - A fixed address assigned to a computer or device that is connected to a network.

Static Routing - Forwarding data in a network via a fixed path.

Subnet Mask - An address code that determines the size of the network.

Switch - 1. A data switch that connects computing devices to host computers, allowing a large number of devices to share a limited number of ports. 2. A device for making, breaking, or changing the connections in an electrical circuit.

TCP (Transmission Control Protocol) - A network protocol for transmitting data that requires acknowledgement from the recipient of data sent.

TCP/IP (Transmission Control Protocol/Internet Protocol) - A set of instructions PCs use to communicate over a network.

Telnet - A user command and TCP/IP protocol used for accessing remote PCs.

TFTP (Trivial File Transfer Protocol) - A version of the TCP/IP FTP protocol that has no directory or password capability.

Throughput - The amount of data moved successfully from one node to another in a given time period.

TKIP (Temporal Key Integrity Protocol) - a wireless encryption protocol that provides dynamic encryption keys for each packet transmitted.

Topology - The physical layout of a network.

TX Rate - Transmission Rate.

UDP (User Datagram Protocol) - A network protocol for transmitting data that does not require acknowledgement from the recipient of the data that is sent.

Upgrade - To replace existing software or firmware with a newer version.

Upload - To transmit a file over a network.

URL (Uniform Resource Locator) - The address of a file located on the Internet.

VPN (Virtual Private Network) - A security measure to protect data as it leaves one network and goes to another over the Internet.

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WAN (Wide Area Network)- The Internet.

WEP (Wired Equivalent Privacy) - A method of encrypting network data transmitted on a wireless network for greater security.

WINIPCFG - A Windows 98 and Me utility that displays the IP address for a particular networking device.

WLAN (Wireless Local Area Network) - A group of computers and associated devices that communicate with each other wirelessly.

WPA (Wi-Fi Protected Access) - a wireless security protocol using TKIP (Temporal Key Integrity Protocol) encryption, which can be used in conjunction with a RADIUS server.

Appendix G: Specifications

Model	WPS54G
Standards	IEEE 802.11g, IEEE 802.11b, IEEE 802.3, USB 2.0
Ports	Power, Ethernet, USB Printer
Button	Reset
Cabling Type	USB 2.0, UTP CAT5
LEDs	Power, Ethernet, Wireless, USB
Security Features	WEP, WPA-PSK
WEP Key Bits	64, 128
Dimensions (W x H x D)	5.24" x 0.98" x 2.76" (133 mm x 25 mm x 70 mm)
Unit Weight	3.80 oz. (0.11 kg)
Power	5 V DC, 2A
Certifications	FCC, CE
Operating Temp.	0°C to 40°C (32°F to 104°F)
Storage Temp.	-20°C to 70°C (-4°F to 158°F)
Operating Humidity	10% to 85%, Non-Condensing
Storage Humidity	5% to 90%, Non-Condensing

Appendix H: Warranty Information

LIMITED WARRANTY

Linksys warrants to You that, for a period of three years (the “Warranty Period”), your Linksys Product will be substantially free of defects in materials and workmanship under normal use. Your exclusive remedy and Linksys' entire liability under this warranty will be for Linksys at its option to repair or replace the Product or refund Your purchase price less any rebates. This limited warranty extends only to the original purchaser.

If the Product proves defective during the Warranty Period call Linksys Technical Support in order to obtain a Return Authorization Number, if applicable. BE SURE TO HAVE YOUR PROOF OF PURCHASE ON HAND WHEN CALLING. If You are requested to return the Product, mark the Return Authorization Number clearly on the outside of the package and include a copy of your original proof of purchase. RETURN REQUESTS CANNOT BE PROCESSED WITHOUT PROOF OF PURCHASE. You are responsible for shipping defective Products to Linksys. Linksys pays for UPS Ground shipping from Linksys back to You only. Customers located outside of the United States of America and Canada are responsible for all shipping and handling charges.

ALL IMPLIED WARRANTIES AND CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE DURATION OF THE WARRANTY PERIOD. ALL OTHER EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF NON-INFRINGEMENT, ARE DISCLAIMED. Some jurisdictions do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to You. This warranty gives You specific legal rights, and You may also have other rights which vary by jurisdiction.

This warranty does not apply if the Product (a) has been altered, except by Linksys, (b) has not been installed, operated, repaired, or maintained in accordance with instructions supplied by Linksys, or (c) has been subjected to abnormal physical or electrical stress, misuse, negligence, or accident. In addition, due to the continual development of new techniques for intruding upon and attacking networks, Linksys does not warrant that the Product will be free of vulnerability to intrusion or attack.

TO THE EXTENT NOT PROHIBITED BY LAW, IN NO EVENT WILL LINKSYS BE LIABLE FOR ANY LOST DATA, REVENUE OR PROFIT, OR FOR SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR PUNITIVE DAMAGES, REGARDLESS OF THE THEORY OF LIABILITY (INCLUDING NEGLIGENCE), ARISING OUT OF OR RELATED TO THE USE OF OR INABILITY TO USE THE PRODUCT (INCLUDING ANY SOFTWARE), EVEN IF LINKSYS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT WILL LINKSYS' LIABILITY EXCEED THE AMOUNT PAID BY YOU FOR THE PRODUCT. The foregoing limitations will apply even if any warranty or remedy provided under this Agreement fails of its essential purpose. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to You.

Please direct all inquiries to: Linksys, P.O. Box 18558, Irvine, CA 92623.

Appendix I: Regulatory Information

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.

INDUSTRY CANADA (CANADA)

This Class B digital apparatus complies with Canadian ICES-003, RSS210.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

The use of this device in a system operating either partially or completely outdoors may require the user to obtain a license for the system according to the Canadian regulations.

EC DECLARATION OF CONFORMITY (EUROPE)

Linksys declares that this product conforms to the specifications listed below, following the provisions of the European R&TTE directive 1999/5/EC:

EN 301 489-1, 301 489-17 General EMC requirements for Radio equipment.

EN 609 50 Safety

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EN 300-328-1, EN 300-328-2 Technical requirements for Radio equipment.

Caution: This equipment is intended to be used in all EU and EFTA countries. Outdoor use may be restricted to certain frequencies and/or may require a license for operation. Contact local Authority for procedure to follow.

Note: Combinations of power levels and antennas resulting in a radiated power level of above 100 mW equivalent isotropic radiated power (EIRP) are considered as not compliant with the above mentioned directive and are not allowed for use within the European community and countries that have adopted the European R&TTE directive 1999/5/EC.

For more details on legal combinations of power levels and antennas, contact Linksys Corporate Compliance.

Linksys vakuuttaa täten että dieses produkt tyypinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien näiden direktiivien muiden ehtojen mukainen.

Linksys déclare que le produit est conforme aux conditions essentielles et aux dispositions relatives à la directive 1999/5/EC.

Belgique:

Dans le cas d'une utilisation privée, à l'extérieur d'un bâtiment, au-dessus d'un espace public, aucun enregistrement n'est nécessaire pour une distance de moins de 300m. Pour une distance supérieure à 300m un enregistrement auprès de l'IBPT est requise. Pour une utilisation publique à l'extérieur de bâtiments, une licence de l'IBPT est requise. Pour les enregistrements et licences, veuillez contacter l'IBPT.

France:

2.4 GHz Bande : les canaux 10, 11, 12, 13 (2457, 2462, 2467, et 2472 MHz respectivement) sont complètement libres d'utilisation en France (en utilisation intérieur). Pour ce qui est des autres canaux, ils peuvent être soumis à autorisation selon le département. L'utilisation en extérieur est soumise à autorisation préalable et très restreint.

Vous pouvez contacter l'Autorité de Régulation des Télécommunications (<http://www.art-telecom.fr>) pour de plus amples renseignements.

SAFETY NOTICES

Caution: To reduce the risk of fire, use only No.26 AWG or larger telecommunication line cord.

Do not use this product near water, for example, in a wet basement or near a swimming pool.

Avoid using this product during an electrical storm. There may be a remote risk of electric shock from lightning.

Chapter J: Contact Information

Need to contact Linksys?

Visit us online for information on the latest products and updates to your existing products at:

<http://www.linksys.com> or
[ftp.linksys.com](ftp://ftp.linksys.com)

Can't find information about a product you want to buy on the web? Do you want to know more about networking with Linksys products? Give our advice line a call at:
Or fax your request in to:

800-546-5797 (LINKSYS)
949-823-3002

If you experience problems with any Linksys product, you can call us at:

800-326-7114
support@linksys.com

Don't wish to call? You can e-mail us at:

If any Linksys product proves defective during its warranty period, you can call the Linksys Return Merchandise Authorization department for obtaining a Return Authorization Number at:
(Details on Warranty and RMA issues can be found in the Warranty Information section in this Guide.)

949-823-3000