Instant Ethernet® Series

Ethernet 5-Port Workgroup Hub

Use this User Guide to install this Linksys product:

- **Ethernet 5-Port Workgroup Hub (EW5HUB)**

User Guide

LINKSYS®

LIMITED WARRANTY

Linksys guarantees that every EtherFast 10/100 3-Port PrintServer and EtherFast 10/100 PrintServer is free from physical defects in material and workmanship under normal use for five (5) years from the date of purchase. If the product proves defective during this **five year** warranty period, call Linksys Customer Support in order to obtain a Return Authorization number. Warranty is for repair or replacement only. Linksys does not issue any refunds. BE SURE TO HAVE YOUR PROOF OF PURCHASE AND BAR CODE ON HAND WHEN CALLING. RETURN REQUESTS CANNOT BE PROCESSED WITHOUT PROOF OF PURCHASE AND BAR CODE. When returning a product, mark the Return Authorization number clearly on the outside of the package and include your original proof of purchase and bar code.

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FCC STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used 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 device
- Connect the equipment to an outlet other than the receiver's
- Consult a dealer or an experienced radio/TV technician for assistance

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Introduction

Congratulations on your purchase of the Linksys EtherFast 10/100 PrintServer or switch + PrintServer -- the easiest way to add printers to your 10BaseT or Fast Ethernet network fast! Whether you're building a Fast Ethernet network now or later, the 10/100 PrintServer adjusts itself to either 10Mbps or 100Mbps speeds automatically.

Whether you've purchased a one-port PrintServer (PPSX1), a three-port PrintServer (EPSX3), or 10/100 Switch + PrintServer (EFSPS41) your little workhorse is ready to go to work for you right away. A stand-alone solution that doesn't require a dedicated print server PC, the PrintServer houses either one or three high speed parallel ports that can handle incoming print jobs concurrently -- put printers on your network where you need them most without having to worry about printing bottlenecks. Equipped with a Direct Memory Access (DMA) technology, a 128KB buffer, and automatic collision control, the PrintServer can handle print jobs up to 50% faster than regular print servers -- even on jobs with complex graphics and layout!

Fully compatible with regular laser, bubble jet, ink jet, and dot matrix printers, the PrintServer also supports the latest bi-directional printers from HP, Panasonic, and other manufacturers. These printers often have special features that can be utilized in a networked environment. Ready to run right out of the box with multi-protocol support for 32-bit network operating systems, the PrintServer comes with an easy-to-use software management suite that integrates seamlessly with Windows 95, Windows 98, Windows NT, and Novell NetWare -- use your applications and printer utilities in the same way you always have while giving your entire network flexible access to your printers! The PrintServer offers full support for Windows 95, Windows 98 and NT through TCP/IP, as well as Novell NetWare via IPX/SPX and TCP/IP for NetWare 5.x. Some of its other features include:

- Bi-Directional PrintServer for 10BaseT and 100Mbps Networks
- Includes Either One (PPSX1) or Three (EPSX3) Bi-Directional Parallel Ports -- Add Up to 3 Printers to Most Networks
- Supports Printing through All Printer Ports Simultaneously (3-Port)
- Runs with Most Laser, Ink Jet, Bubble Jet, Color, and Dot Matrix Parallel Printers
- Support for DHCP
- Stand-Alone Unit -- No Dedicated Print Server PC Required
- Easy-to-Use Management Tools
- NWAY Technology Automatically Detects Network Cabling Type, Speed, and Duplex
- Compatible with Both Half and Full Duplex Networks
- Runs in Either Print Server or Remote Printer Modes in NetWare
- On-Board DMA Controller Chip Supports Turbo Printing Speeds
- 256KB RAM Buffer for Faster Graphics
- 512KB Flash Memory for Future Upgrades
- Data Collision Control & Polarity Correction
- Use of VLSI Components for Reliability
- Free Technical Support & Software Upgrades
- 5 Year Limited Warranty on PrintServers (PPSX1, EPSX3)
- 1 Year Limited Warranty on Switch + PrintServer (EFSPS41)

ABOUT BI-DIRECTIONAL PRINTING

In normal printing, print signals are sent from a PC to a printer only. **Bi-directional** (also known as bi-tronic) printing refers to a printer's ability to do just the opposite--talk back to a PC in order to inform it of a print job's 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 essential. In color printing, for example, the printer will "inform" the PC of its constant status in order to mix color inks correctly for optimum output.

Bi-directional communication (communication from a printer to a PC) is normally handled by a combination of the printer's hardware and special software on the 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 special challenges. Unlike a direct PC-to-printer connection in 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 workstations. 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.

The EtherFast 10/100 PrintServers are designed to work with both regular and bi-directional printers. Unlike regular print servers that aren't compatible with bi-directional printers' parallel interface circuitry, the Linksys PrintServer has been specially manufactured to support both standard parallel as well as bi-directional parallel interfaces. However, the PrintServer cannot pass messages from the printer back to the PC where they originated – this is beyond the scope of most PrintServers, and is not a limitation of the PrintServer itself. The PrintServer can provide, however, the ability

to check any printer's online and printing status from anywhere on the network with the management software that comes with the PrintServer. This feature is built into the management software, and doesn't require a bi-directional printer in order to function. If your printer came with special bi-directional software that allows you to monitor the printer's status, do not use it with the PrintServer -- the software is probably not capable of running on a network. For best results, turn off the printer's bi-directional functionality, either by (**1**) removing any bi-directional print software from your network's workstations, 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.

ETHERNET AND FAST ETHERNET DEPLOYMENT

In recent years, Fast Ethernet has emerged as the fastest growing network topology around. Operating at an incredible 100 million bits per second (100Mbps), and sometimes referred to as **100BaseTX**, Fast Ethernet is more than fast enough to handle the latest speed-dependent applications like video, multimedia, and Internet connectivity.

Fast Ethernet is ten times faster than regular Ethernet networks. Also known as **10BaseT**, regular Ethernet networks run at a typical 10Mbps.

Unfortunately because of their speed and other technological differences, Ethernet and Fast Ethernet cannot be readily mixed together in most cases. A 10BaseT network adapter, for example, cannot be attached directly to a Fast Ethernet network. In environments where 10BaseT and Fast Ethernet need to be mixed together -- in migration scenarios, for example, where file servers are moved to 100Mbps speeds for better performance -- a **switch** can be used to connect network segments of disparate speeds together.

Fortunately, the EtherFast 10/100 PrintServer supports both 10Mbps and 100Mbps speeds right out of the box. When a network cable is plugged in, the PrintServer unit automatically determines the speed, duplex, and polarity of the arriving network packets and adjusts itself accordingly.

Like most network devices, the PrintServer unit must be connected to a 10BaseT or Fast Ethernet network via a single network cable and a hub or switch. For best results, always use a **Category 5** network cable for the PrintServer-to-hub connection. Category 5 provides the highest level of reliability and shielding against interference.

For more information about the Switching capabilities of the EtherFast 10/100 Switch + PrintServer (EFSPS41), go to page 82.

ABOUT THE PRINTSERVER'S SOFTWARE

The PrintServer is fully compatible with Windows 98, Windows 95, Windows NT 3.51, Windows NT 4.0, and Novell NetWare.

When used with Windows 98, 95 and NT, the PrintServer uses the **TCP/IP** protocol for network communication. Each computer on your network that needs PrintServer access will need to have the TCP/IP protocol installed. TCP/IP installation files are included on your original Windows 95, 98 or NT CD-ROM. For tips on installing TCP/IP, see page 47.

When operating under Novell NetWare, the PrintServer uses **IPX/SPX** for communication, which is built into the NetWare network operating system. Most workstations need only be able to log into the network in order to print after the PrintServer has been configured.

NetWare 5.x supports the use of both IPX/SPX and TCP/IP. Instructions for the setup and configuration of IPX/SPX are provided on page 42 in the NetWare 5.x section of this user guide. TCP/IP instructions are provided in the Appendix on page 47.

Please be aware that even though Linksys provides instructions for the setup of the TCP/IP protocol, these instructions are provided for reference only. Linksys will not provide technical support for the configuration and troubleshooting of the TCP/IP protocol. For full instructions about using TCP/IP, consult your operating system's user guide.

Note: Throughout the user guide, it is assumed that the CD-ROM drive on your computer is designated as letter **D**. If your CD-ROM drive is designated as a different letter, use that letter instead.

DISCLAIMER OF WHAT IS SUPPORTED

The Linksys PrintServers support more than what is advertised on the box -- such as the NetBEUI and Appletalk protocols, SNMP, Internet Mail Printing, Unix support,HP JetDirect emulation and many more. Linksys is not liable or responsible for supporting these extra features, and Linksys does not and will not provide phone or online support for these features.

In the directory Not_supp on the printserver's CD-ROM you'll find the software, drivers and the manual which will cover the installation of the unsupported options on the PrintServer. The user guides provided in the Not_supp directory (PDF or DOC) have all the information you require to setup and use these functions. You may also find some documentation on these features in the PrintServer's technical support pages on the Linksys web site at **http://www.linksys.com**

Hardware Setup

Make sure you received each of the following items. If any items are damaged or missing, contact your Linksys dealer for replacement parts.

· EtherFast 10/100 PrintServer unit (EPSX3 or PPSX1)
  or EtherFast 10/100 4-Port Switch + PrintServer (EFSPS41)
· PrintServer Setup and Utility CD-ROM
· AC Power Adapter and Power Cord
· User Guide

GETTING TO KNOW THE PRINTSERVER

The Linksys EtherFast 10/100 PrintServer is equipped with parallel ports and an RJ-45 interface port for connection to the network. The parallel ports will vary depending on which model you've purchased.

• EtherFast 10/100 3-Port PrintSever (**EPSX3**)
  2 High-Speed DMA-Equipped Parallel Printer Ports
  1 Regular Parallel Printer Port

• EtherFast 10/100 1-Port PrintServer (**PPSX1**)
  1 High-Speed DMA-Equipped Parallel Printer Port

• EtherFast 10/100 4-Port Switch + PrintServer (EFSPS41)
  1 High-Speed DMA-Equipped Parallel Printer Port
  4 Dual-Speed 10BaseT/100BaseTX RJ-45 Network Ports

If you carefully inspect your PrintServer, you will find the following components:

· a 12V DC power jack interface
· a set of DIP switches
· a small RESET button (3-Port PrintServer Only)

The DIP switches are used to define the PrintServer's speed and duplex.

The RESET button on the side of the PrintServer is used to restart the PrintServer. Pressing it is the same as turning the PrintServer off and on again (3-Port PrintServer Only).

The top or front of the PrintServer (depending on model) has Link, Status, and Error LEDs.

THE ETHERFAST 10/100 4-PORT SWITCH + PRINTSERVER

The combo switch + PrintServer model is equipped with a single parallel port and 4 RJ-45 ports. The EtherFast 10/100 4-Port Switch + PrintServer, in addition to the 10/100 auto-sensing RJ-45 ports, has a high-speed DMA-equipped parallel port.

Throughout this user guide, the setup of the PrintServer component of the Switch + PrintServer is identical to the setup of the other 10/100 PrintServers. For more information about the 4-Port switch component, please read the section about 10/100 switching that begins on page 82.

FINDING THE PRINTSERVER'S DEFAULT NAME AND NODE ADDRESS

If you look on the bottom of the PrintServer, you will find a barcode sticker with an SC number printed on it (example: SC489393). This number is the PrintServer's default PrintServer name, and you will need it in order to install the PrintServer's software drivers. Find the number now and write it down.

The PrintServer's default name is made up of the letters **SC** and then a string of 6 **hexadecimal** characters. You will see numbers between **1** and **9** and possibly letters between **A** and **E**.

To find the node address of the PrintServer, replace the 'SC' from the default name of the PrintServer with 00C002. The resulting combined number is the node address

CONFIGURING THE PRINTSERVER'S DIP SWITCHES

There are three small DIP switches on the left edge (EPSX3) or front (PPSX1) of the PrintServer. A switch is considered to be ON when it is in the down position. Set the switches according to the following descriptions:

Switch 1 turns on the PrintServer's **Auto Negotiation** mode, which allows the PrintServer to automatically detect the speed (either 10Mbps or 100Mbps), polarity, and duplex of your network's cabling. We recommend enabling this feature by turning the switch to OFF.

Switch 2 puts the PrintServer into either 10Mbps or 100Mbps mode **only**. Turn this switch OFF for 100Mbps mode, and ON for 10BaseT mode. If Auto Negotiation mode is enabled, this switch has no effect.

Switch 3 forces the switch into either **full or half duplex**. Turn this switch OFF for full duplex, and ON for half duplex. If Auto Negotiation mode is enabled, this switch has no effect.

Note: The EtherFast 10/100 4-Port Switch PrintServer does not have any DIP switches.

PLUGGING IN THE POWER

The PrintServer does not have a power switch; it will remain powered on as long as its AC power adapter is plugged in. There is no special power-up order to follow when powering up your network; the PrintServer can be powered on before, during, or after the network's power-up.

Plug the two-pronged end of the AC power adapter into a standard electrical wall socket or power strip. Plug the other end of the power cord into the PrintServer's DC power jack. The small adapter plug should fit firmly into the DC socket on the side or front of the PrintServer, depending on the model.

Be sure to use the correct AC power adapter. The wrong type can damage the PrintServer. See the Specifications section in the Appendix at the back of this guide for details.

Note: The EtherFast 10/100 4-Port Switch + PrintServer has a universal AC adapter that requires the provided power cord to be plugged into it. The other end of the power cord plugs into the wall jack.

CONNECTING TO A NETWORK

After powering on the PrintServer, connect it to a 10BaseT, 100BaseTX, or 10/100 hub or 10/100 switch with a Category 5 network cable. The cable should not exceed **328 feet** (100 meters) in length. The RJ-45 port will automatically sense the speed and duplex of the cabling, so you don't need to worry about configuring it.

Note: The PrintServer must be connected to a hub or a 10/100 switch. Do not attempt to connect it directly to a PC or other device. The EtherFast 10/100 4-Port Switch + PrintServer can accept connections to other computers and hubs since the device is also a 10/100 switch.

It is always best to connect your printserver to your highest-speed or highest-bandwidth device. It is recommended that you attach your PrintServer directly to a 10/100 Switch that offers 200Mbps of bandwidth on each port. This way, every user on your network can experience the fastest communication and the best results.

The device to which the PrintServer is attached, whether a hub or a switch, will not improve or degrade the performance of the PrintServer. A higher-bandwidth device will simply allow the networked users to access the PrintServer more quickly.

CONNECTING TO A PRINTER

Connect your printer (or printers) to one of the PrintServer's parallel (LPT) ports with an appropriate parallel printer cable.

The PrintServer's parallel (LPT) printer port(s) are 25-pin parallel male. Most parallel printers can be connected to the PrintServer using a 25-pin female-to-36-pin Centronics cable. The cable should not exceed 12 feet (3.5 meters) in length. Some printers, especially bi-directional models, may require special shielded cabling of a specific length. Consult your printer's user guide for cabling specifications.

The hardware setup is complete. Proceed to the appropriate software setup section below.

For Windows 98, 95 and NT, see page 13.

For Novell NetWare, see page 36.

HOW TO MAKE SETUP DISKETTES

If you are installing the drivers for your EtherFast 10/100 PrintServer on multiple PCs, chances are that not every PC will have a CD-ROM drive. In order to copy files onto these PCs, you must make a floppy diskette copy. Insert a blank floppy into your computer. Use Windows Explorer or the copy command in DOS to copy the contents of the folder that you need to use from the CD-ROM to the floppy.

QUICK WINDOWS SETUP FOR ADMINISTRATORS

Like most network devices, the PrintServer must be configured for your particular Windows 98, Windows 95, Windows NT 3.51, or Windows NT 4.0 environment before individual network workstations will be able to use it. In most cases, the PrintServer only needs to be configured once.

The PrintServer accepts network traffic from Windows-based workstations and file servers via the **TCP/IP** protocol. TCP/IP will need to be installed on each network workstation that needs access to the PrintServer's printers. If you haven't installed TCP/IP before, see the Appendix of this user guide for a few setup tips.

Before configuring the PrintServer, be sure to choose the IP and Gateway addresses that it will use. You will also need the SC number from the bottom of the PrintServer unit (example: SC493092). **Note**: The Gateway IP address is optional.

The PrintServer configuration for Windows consists of 4 steps that need to be performed on the LAN administrator's computer before any regular workstations are set up for printing. These steps are covered in detail on the next pages:

1. Install the TCP/IP and IPX/SPX protocols for Windows 98, 95 or Windows NT. Provided on your original Windows 98, 95 or NT installation CD-ROM, these protocols will allow the PrintServer's setup software to communicate with the PrintServer unit. Both protocols must be installed on the administrator's computer before the PrintServer can be properly configured.

2. Install and run the TCP/IP Setup Program and Redirector. Included with the PrintServer, the TCP/IP Setup program allows you to assign IP and gateway addresses to the PrintServer unit from your workstation. This program only needs to be run once by the administrator. **Note**: the Gateway Address is optional.

This step will also install the TCP/IP redirector onto the administrator's computer, which allows jobs to be redirected from the Windows environment to the PrintServer. The Redirector is only necessary in Windows peer-to-peer situations.

3. Set up the proper printer driver. Install and configure the Windows 98, 95 or NT driver for the printer that will be attached to the PrintServer. The driver may be contained on your original Windows CD-ROM, or might

have been included with your printer. After the administrator's computer is able to print to the PrintServer, one final step remains:

4. Configure your workstations. Each workstation on the network will require a TCP/IP protocol driver, a TCP/IP redirector (included with the PrintServer), and an appropriate printer driver. Step-by-step instructions for configuring each workstation can be found in the Windows 98, 95 or Windows NT sections.

Note: If you have an NT Server and you are running a client-server network, it is recommended that you set up the PrintServer on the NT server only and then setup the printer(s) as *shared* across the network. This will allow NT to queue print jobs. Refer to your NT user guide or network administrator about sharing printers and services. Otherwise, you can follow the peer-to-peer instructions in this user guide.

Administrator Setup

Before you begin, make sure that the PrintServer unit has already been installed on your 10BaseT or Fast Ethernet network.

STEP 1.
INSTALL TCP/IP AND IPX/SPX

Install the TCP/IP and IPX/SPX protocols onto your Windows 98, 95 or Windows NT workstation if you haven't already. Follow the instructions that came with 98, 95 or NT for installing or adding new protocols. If you need help, see page 47 in the Appendix for TCP/IP setup tips.

STEP 2.
INSTALL AND RUN THE TCP/IP SETUP PROGRAM

The TCP/IP Setup program is contained on the PrintServer CD-ROM Disk that came with the PrintServer. It allows you to establish communication with the PrintServer so you can assign it an IP address. Before continuing, locate the SC number on the bottom of the PrintServer unit and write it down. It will be needed to complete the TCP/IP setup. You can also create a setup diskette by copying the contents of D:\Driver\Win9xNT to a blank diskette. This is recommended if you need to install the TCP/IP Redirector (PrintServer driver) on multiple PCs. *If you do so, remember that any files referred to as being on the CD-ROM in this guide will instead be found in the **A:**\ directory on your new floppy disk.*

For **DHCP** setup, skip to the instructions for installing Bi-Admin on page 18 and the DHCP support information on page 34. When you are finished, come back to this section, but skip the rest of these TCP/IP setup instructions. Move on to **Step 3: Install the Appropriate Printer Driver**.

Follow the steps below to install and use the TCP/IP Setup program. (When you install the Setup program, the print redirector will automatically be installed onto your system at the same time).

1. Start up Windows 98, 95 or NT.

2. After Windows comes up, put the CD-ROM into your CD drive.

3. **Run** the D:\DRIVER\WIN9xNT\SETUP.EXE program on the disk.

4. When the title screen appears, click **Next**.

5. Select the directory where you want to install the software and click on the **Next** button.

6. When the Components window appears, choose to install the TCP/IP Protocol. Click on **Install TCP/IP Program** (Administrator Only) and click **Next**.

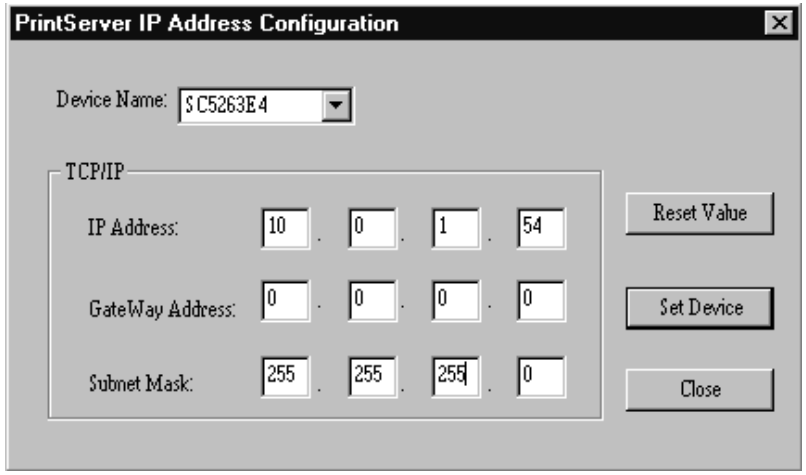
7. Enter the name of the Windows folder you want the setup program to create (or choose the default) and click **Next**.

8. Setup will copy the necessary files to your system. The files will include the TCP/IP Setup Program (which allows the assignment of an IP address from the administrator's computer), as well as the TCP/IP redirector. When finished, remove the CD-ROM from your CD drive and choose to restart your computer.

9. After your PC reboots and Windows comes up again, click on **Start**, **Programs**, **Linksys PrintServer Driver**, and **TCP/IP Setup**.

10. When the PrintServer IP Address Configuration window appears, enter the SC number from the bottom of the PrintServer unit into the Device Name box.

Enter the IP Address that should be assigned to the PrintServer, (for DHCP and dynamic addressing, see the Bi-Admin setup on page 18).



11. Enter the Gateway Address that the PrintServer will use. The Gateway Address is optional; if you don't have one, leave the values at zero.

12. Finally, enter the Subnet Mask for the network. When you're finished, click on the **Set Device** button. The IP address will be transmitted to the PrintServer where it will be stored.

13. You will be asked if you want to save the PrintServer's IP Address to the setup disk. If you are using a diskette for installation, click **Yes**. Otherwise, if you are using the CD-ROM, simply write the settings down and click **No**.

If you encounter any problems while setting up the PrintServer's TCP/IP settings, refer to the Troubleshooting section in the Appendix or the TCP/IP section of your Windows documentation.

STEP 3.
INSTALL THE APPROPRIATE PRINTER DRIVER ONTO YOUR COMPUTER

When you are finished with TCP/IP Setup Program, turn to one of the following sections to install the proper printer driver for Windows 98, 95 or NT.

for Windows 98 and 95, see step 3 on page 27.
for Windows NT 4.0, see page 30.

After the proper printer driver is installed, try printing a few documents to make sure everything is configured properly. After your computer is able to print, continue with step 4 below to configure the rest of the workstations on your network.

STEP 4.
CONFIGURE YOUR WORKSTATIONS

Proceed to the appropriate section below to configure the workstations on your network.

for Windows 98 and 95, see page 25
for Windows NT, see page 29

If you need to change the PrintServer's internal setup or configuration in the future, follow the directions in the Managing the PrintServer section below.

Managing the PrintServer

The PrintServer's management is handled by a program called Bi-Admin that can be found on the PrintServer's CD-ROM. Fully compatible with Windows 98, 95, Windows NT, and Novell NetWare, Bi-Admin 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 should only be installed onto the network administrator's computer. Also, Bi-Admin requires that the IPX/SPX Protocol be installed for initial use. You can always uninstall the protocol later if you'd like.

Bi-Admin is a Windows-based program. If you are configuring or managing the PrintServer in a NetWare DOS-only environment, you'll be using a program other than Bi-Admin to manage the PrintServer. Skip to the appropriate section that covers the setup and maintenance of the PrintServer for your particular version of NetWare.

Installing Bi-Admin

If you have already installed the Bi-Admin program, skip to step 6.

1. Insert the PrintServer's CD-ROM into your CD-ROM drive.

2. Click on **Start**, then **Run.** Type **D:\utility\biadmin\setup** in the provided window and hit **Enter**.

3. When the title screen of the setup program appears, click on the **Next** button.

4. Provide the name of the directory where the Bi-Admin program should be installed. The default directory of C:\ProgramFiles\linksys\printserver is recommended. Click **Next**.

5. Continue to follow the setup program's instructions. Setup will copy the necessary files to your system. Click on **Finish** after the setup is complete.

6. To start the Bi-Admin program, click on **Start**, **Programs**, **Linksys PrintServer Admin**, and then **PrintServer Bi-Admin**. If the **Bi-Admin** icon has been created, you can just double-click on it instead. You can drag the shortcut icon onto your desktop for easy access to the Bi-Admin program.

7. When the Bi-Admin program appears, it will automatically scan the network for available Linksys PrintServer hardware. Any hardware found on the network will appear in the Default Name, Device Name, Printer Port chart. Default Name is the SC number located on the bottom of the PrintServer unit, and it cannot be changed.

8. When the program is executed, it will ask for a password. If no password is assigned (this will be the case upon first installation) simply click **OK** . Otherwise, enter the password that you have assigned and click **OK**. You will be asked for the password every time you make any changes to the settings or protocols.

Device name is a nickname that can be given to the PrintServer to make it more user-friendly for users on the network. It can be changed with Bi-Admin at any time by clicking on **Configuration**, then **System**.

Printer Port displays the number of printer ports on the PrintServer.

Note: In some cases, the PrintServer's ERROR light may light up or flash as it accepts configuration changes you make. This is normal.

Go on the next page for instructions on **Using Bi-Admin**.

Bi-Admin Help Files

The Help files for the Bi-Admin program can be accessed by clicking on **Help** in the menu bar. These help files offer extensive advice and information about all of the PrintServer's functions and capabilities.

Using Bi-Admin

1. Obtaining Device Information

The Device Information Icon 

To access information about your printserver, either click on it in the device list window (on the right side of the Bi-Admin window) or highlight the PrintServer and click on the Device Information icon (see above). It is also possible to highlight the PrintServer and then click on Status and select Device Information... The Bi-Admin program will display the PrintServer's information in a read-only window. The following information is provided.

```
Hardware ID: 0620103428
Firmware Version: 6010
Protocol ID: 003F
Default Name: SCE02282
Server Name: RHINO
Netware Info:
  Master File Server:
  NDS Tree Name:
  NDS Tree Context:
  Print Server Mode Status:
  Remote Printer Mode Status: N/A
AppleTalk Info:
  Printer Type:
  SCE02282:LaserWriter
TCP/IP Info:
  IP Address: 192.168.1.38
  Gateway Address: 192.168.2.254
  Subnet Mask: 255.255.255.1
  Email Server IP Address: 0.0.0.0
  Printing Account Name:  N/A
  Redirect Account Name:  N/A
```

This information can be dumped to a text file. Simply click on **Save to Text** in the Device Information window and tell Bi-Admin where you would like to save the file

2. Refreshing the Device List

The Refresh Icon 

To force Bi-Admin to refresh its list of PrintServers present on the network, click on the **Refresh** button (above). Bi-Admin will scan the network for available PrintServers and update the Default Name, Device Name, Printer Port chart.

3. Checking a Printer Port's Status

Printer Status Icons 

The numbered port icons allow you to check the name, status, and printing information of the printer that is connected to the PrintServer's specific port number. A password may be required to access this information. Some printers are configurable, and you may be able to configure the printer's settings within the Printer Status window.

The EtherFast 10/100 1-Port PrintServer will only show one available parallel port icon. The EtherFast 10/100 3-Port PrintServer will show three available parallel port icons. Because Linksys PrintServers do not support serial printing, the serial port icon will remain grayed out and inaccessible.

4. Changing the IP Address

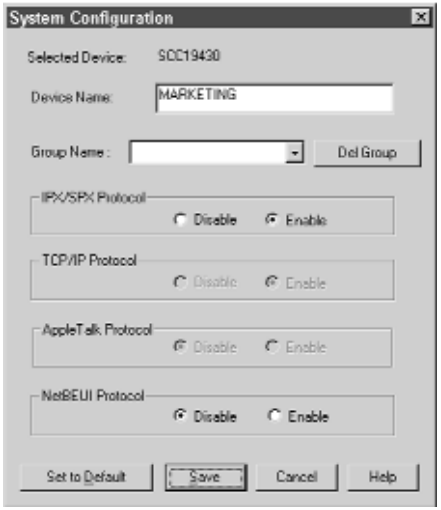
The PrintServer's IP address can be easily changed at any time. Click once on the **Device Name** of the PrintServer whose address you want to change, then click **Init Device**, followed by **Set IP Address**. The Set IP Address window will appear.

If the Default Name box is empty, enter the SC number (located on the bottom of the PrintServer unit) of the PrintServer whose IP address will be changed. Enter the new IP Address, Gateway Address (optional), and Subnet Mask for the PrintServer and click on **Set**. The new settings will be written to the PrintServer unit. For a few quick tips on TCP/IP, see the Appendix of this guide. Also, if you have a DHCP server, you can enable DHCP and leave all the IP, Gateway, and subnet values at 0 (zero). See page 34 for more information about the setup and use of DHCP

5. Changing the Device Name

The PrintServer comes with a default device name printed on the bottom of the unit, and always starting with the prefix SC (example: SC489392). The SC name is the name of the PrintServer when users on the network query it for any reason. To make the PrintServer more user-friendly, you can give it a unique **device name** to help identify the department or area where it is located (example: MARKETING).

To change the device name of the PrintServer, click once on the **Device Name** of the PrintServer you want to affect, then click on **Configuration**, followed by **System**. The System Configuration window will appear.



To include the PrintServer in a group (for administration use), use the **Group Name** option, which appears as a drop-down menu.

Enter a new device name for the PrintServer in the Device Name box. When you're finished, click on the **Save** button. The new setting will be stored in the PrintServer unit. To verify the change, click on the **Refresh** icon in the Bi-Admin menu bar. Bi-Admin will search the network for available PrintServers and report back with their device names.

6. Enabling and Disabling Protocols

If you aren't using multiple protocols simultaneously on your network, you may want to disable one or more of the PrintServer's internal protocols; this may help reduce unwanted network traffic.

Caution: Always leave at least one protocol enabled on the PrintServer. Disabling all of the protocols could simultaneously leave you without a way to communicate with the unit. Unless you require it to be disabled, leave TCP/IP alone.

To disable one of the PrintServer's protocols, click once on the **Device Name** of the PrintServer you want to change, then click on **Configuration**, followed by **System**. The System Configuration window will appear (see the picture on page 22). Each protocol is listed, along with Enable and Disable buttons. Enable or disable the protocols you want, then click on **Save** to save the changes.

7. Attaching to a Remote PrintServer

The Bi-Admin program can locate Linksys PrintServers on networks other than your own, provided your network is running TCP/IP across a WAN or other network-to-network link via a router. To attach Bi-Admin to a remote Linksys PrintServer located on a network somewhere else, click on **Init Device**, followed by **Attach**. The Add Cross Segment PrintServer window will appear. Enter the IP address of the remote unit, then click **Set**. The remote PrintServer will appear in the list of available PrintServers, allowing you to configure it.

8. Resetting the PrintServer

If the PrintServer seems to lock up for any reason, it can be reset from the Bi-Admin program. Click once on the **Device Name** of the PrintServer you want to reset, followed by **Init Device**, then **Reset Device**. The PrintServer unit will reset itself. The PrintServer can also be reset by pressing the RESET button on the left edge of the unit, (3-Port PrintServer only), or by unplugging its power cord.

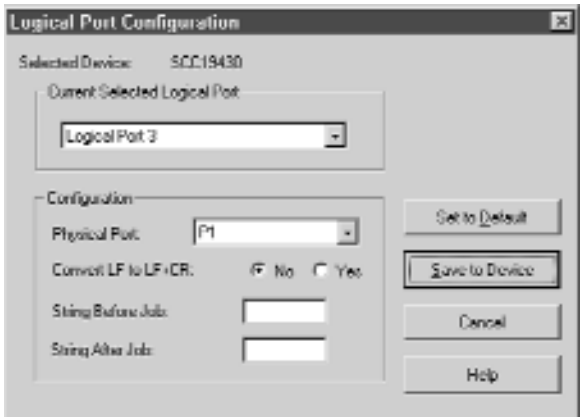
9. Restore Factory Default

If you have made irreversible changes in configuration that have rendered the PrintServer unusable, or if you simply want to start over from scratch, you can set the PrintServer back to the default mode so that the device will operate just as it did when you purchased it. Click on **Init Device**, then **Restore Factory Default**. *This will erase all of the work that you have done on the unit since purchasing it*.

9. Logical Port Configuration

The Logical Port Configuration Icon

To set or change the PrintServer's logical port settings, highlight the PrintServer that you want to change and click on the **Logical Port** icon (shown above). The **Logical Port Configuration** window will appear



Make any changes to the settings, and click on **Save to Device** when you are finished.

10. Upgrade the Firmware

The Firmware Upgrade Icon

In order to make sure that the EtherFast 10/100 PrintServer is running the most current firmware version, you should upgrade the device's ROM chip regularly. To do this, you must be able to access both the Internet and the PrintServer device from your workstation. Click on the **Upgrade Firmware** icon and follow the instructions on the screen.

11. Exit Bi-Admin

The Application Exit Icon

To exit the Bi-Admin program, click on the **Exit** icon.

Windows 98 and 95 Workstation Setup

This section explains how to set up the EtherFast 10/100 PrintServer on a Windows 98 or Windows 95 Workstation. You must establish the PrintServer's IP address before continuing with this section. To set up an IP address, see page 15.

The PrintServer is fully compatible with Windows 95and 98. Configuring a network workstation so that it can access the PrintServer on the network consists of three steps:

1. Install the TCP/IP protocol on the workstation. Included on the Windows 98 or 95 CD-ROM from Microsoft, the TCP/IP protocol allows a workstation to communicate with the PrintServer via IP.

2. Install the TCP/IP print redirector (PrintServer driver). Located on the PrintServer's CD-ROM, the redirector automatically directs print jobs from a workstation to the PrintServer on the network.

3. Install the proper printer driver. In order to properly format jobs for the printer(s) attached to the PrintServer, the workstation must have the printers' Windows printer drivers installed.

The following instructions explain how to complete each step. Before you begin, the PrintServer hardware should already be installed and configured (see page 6).

STEP 1.
INSTALL THE TCP/IP PROTOCOL FOR PRINTSERVER AND COMPUTERS

Install the TCP/IP protocol onto your PC if you haven't already. Follow the instructions that came with Windows 98 or Windows 95 for installing or adding new protocols. If you need help, see page 47 in the Appendix for TCP/IP setup tips. Please be aware that the instructions provided in the Appendix are for reference only.

Linksys will not provide technical support for the configuration and troubleshooting of the TCP/IP protocol. For full instructions about TCP/IP, consult your Windows documentation.

STEP 2.
INSTALL AND RUN THE PRINTSERVER (TCP/IP REDIRECTOR) DRIVER.

The TCP/IP Redirector driver is contained on the PrintServer's CD-ROM. It allows a workstation to route jobs across the network to the PrintServer. The Redirector is only necessary in peer-to-peer networking situations. Follow the steps below to install the redirector.

1. Start up Windows 98 or 95.

2. When Windows opens, put the CD-ROM into your CD drive.

3. Click on **Start**, then **Run**. Type the name of the program D:\DRIVERS\WIN9XNT\SETUP.EXE program on the disk.

4. When the title screen appears, click **Next**.

5. Select the directory where you want to install the software and click **Next**.

6. When the Components window appears, select **Install PrintServer Driver**, then select **Install TCP/IP**. If the workstation belongs to a normal user, choose NOT to install the TCP/IP Program. Click **Next** when you are finished.

7. Enter the name of the Windows folder you want the setup program to create and click **Next**.

Setup will copy the redirector files to your system. Before all the files have finished copying, the Configure PrintServer window will appear. Click on **Cancel** at this time. When finished, restart your computer.

STEP 3.
INSTALL THE PROPER PRINTER DRIVER

1. The last step is to install the Windows printer driver for the printer(s) attached to the PrintServer.

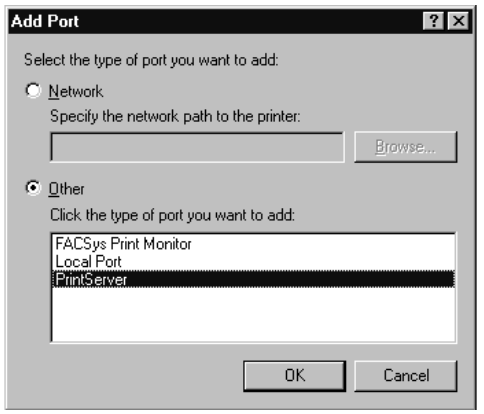
2. Click on **Start**, **Settings**, and **Printers**.

3. If no printers are already installed, proceed to install the printer driver(s) as if the printer is a "local" printer attached directly to the PC.

4. After the driver for the printer has been installed, click on **Start**, **Settings**, and **Printers**. Locate the printer you want to attach to the PrintServer (it should appear as an icon in the Printers folder) and right-click on it with your mouse.

5.Click on the **Properties** option.

6. When the Properties window appears, choose the **Details** tab. Click on the **Add Port** button. The Add Port window will appear.

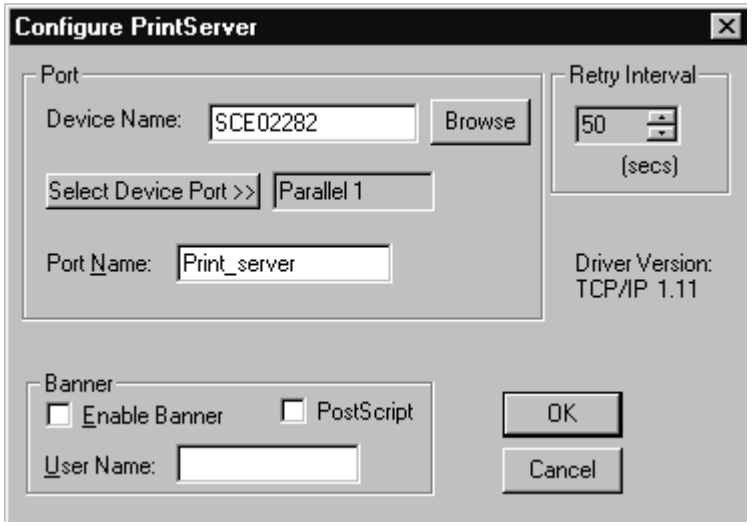


7. Select the **Other** option with your mouse, then click once on the **Print-Server** item in the list of available ports.

8. Click **OK**. The **Configure Print-Server** window appears.

9. Enter the IP address or the SC number of the PrintServer in the Device Name box. If you are not sure what the number is, click on Browse and choose from the list that appears. It may take a few seconds for the list to appear. If you have multiple PrintServers on your network, be sure to pick the correct one.

10. Click on the **Select Device Port** button.



11. Choose the parallel (LPT) port on the PrintServer where the printer you are installing is attached, (if you are using the 3-Port PrintServer). Choose a name for your printer, (i.e. Leela, Ace, etc.).

12. Set the Retry interval. Retry is how often in seconds Windows attempts to send a print job if the PrintServer is busy.

13. Enable the banner if needed. The banner automatically prints before every job to help identify users' individual jobs. If you need postscripting printing for the banner, select the **PostScript** option. Be sure to enter the workgroup or username you want to appear on the banner.

14. When you're finished, click **OK**. After you are back at the Printer Properties window, click **Apply**, then **OK**. The workstation is now attached to the PrintServer. Print as you would normal.

If you have a 3-Port PrintServer and you are using more than one printer with it or if you are using multiple PrintServers, you must add a device port for every port used on the PrintServer or for every additional PrintServer being added.

If you need to change the PrintServer's internal setup or configuration at any time, read the chapter on page 18 entitled Managing the PrintServer.

Windows NT Workstation Setup

The PrintServer is compatible with Windows NT 3.51 and 4.0. For a quick setup for Network Administrators, follow the instructions on 13. Configuring a network workstation so that it can access the PrintServer on the network consists of three steps:

1. Install the TCP/IP protocol on the workstation. Included on the Windows NT CD-ROM from Microsoft, the TCP/IP protocol allows a workstation to communicate with the PrintServer via IP.

2. Install the TCP/IP print redirector (driver). Located on the CD-ROM that accompanied the PrintServer unit, the redirector automatically directs print jobs from a workstation to the PrintServer on the network. This is only necessary in a peer-to-peer environment under Windows NT.

3. Install the proper printer driver. In order to properly format jobs for the printer(s) attached to the PrintServer, the workstation must have the printers' NT printer drivers installed.

The following instructions explain how to complete each step. Your setup will vary slightly depending on whether you are using NT 4.0 or 3.51, and the configuration of your hardware. Before you begin, the PrintServer hardware should already be installed and configured (see page 6).

STEP 1.
INSTALL THE TCP/IP PROTOCOL

Install the TCP/IP protocol onto your Windows workstation if you haven't already. Follow the instructions that came with NT for installing or adding new protocols. If you need help, see the Appendix for TCP/IP setup tips. You must establish the PrintServer's IP address before continuing with this section. To set up an IP address, see page 15.

STEP 2.
INSTALL AND RUN THE TCP/IP PRINT REDIRECTOR.

The TCP/IP Print Redirector driver is contained on the CD-ROM that came with the PrintServer. It allows a workstation to route jobs across the network to the PrintServer. Follow the steps below to install the redirector. (DHCP users refer to page 34 on how to set up the device with DHCP support)

1. Start up Windows NT 3.51 or 4.0 and login as an administrator.

2. After Windows comes up, put the CD-ROM into the CD drive.

3. **Run** the D:\DRIVERS\WIN9XNT\SETUP.EXE program on the disk.

4. When the title screen appears, click **Next**.

5. Pick the directory where you want to install the software and click **Next**.

6. When the Components window appears, select **Install PrintServer Driver**, then select **Install TCP/IP Setup Program (System Administrator Only)**. If the workstation belongs to a normal user, or if you have configured the unit using DHCP, choose NOT to install the TCP/IP Program. Click **Next** when you are finished.

7. Enter the name of the Windows folder you want the setup program to create and click **Next**. Setup will copy the redirector files to your system. Before all the files have finished copying, the Configure PrintServer window will appear.

8. Click on **Cancel** at this time. When finished, restart your computer.

If you are using Windows NT 3.51, proceed to page 32 which has important instructions specifically for NT 3.51. If you are using Windows NT 4.0, continue with Step 3 below.

STEP 3.
INSTALL THE PROPER PRINTER DRIVER IN WINDOWS NT 4.0

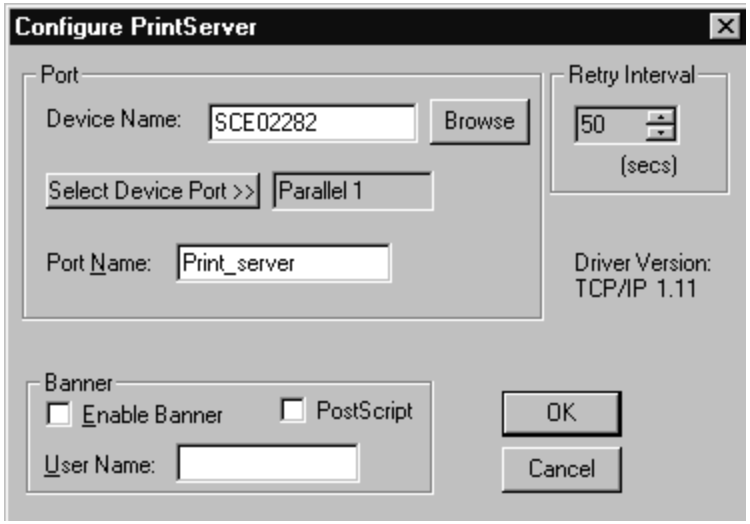
1. After your system restarts, log into the network.

2. Click on **Start**, **Settings**, **Printers**. If no printers appear, Add the driver for your printer according to the printer manufacturer's instructions. Treat the printer as though it was attached directly to the PC. After a printer driver has been set up, proceed to step 3.

3. Locate the printer in the Printers window you want to set up. Using your mouse, right-click on the printer and select the **Properties** menu item when it comes up. In the Properties window, click on the **Ports** tab.

4. Click on **Add Port**. Select **PrintServer**, then select **New Port**.

5. When the Configure PrintServer window appears, (see picture on the next page), fill out the IP address or SC number that the PrintServer will use in the Device Name box. If you are not sure what the number is, click on Browse and choose from the list that appears, (it may take a few seconds). If you have multiple PrintServers on your network, be sure to pick the correct one.



6. Set the Retry interval. Retry is how often in seconds Windows attempt to send a print job if the PrintServer is busy.

7. Click on the **Select Device Port** button. Choose the PrintServer's parallel (LPT) port where the jobs should be sent.

8. If the Name box is blank, enter a name of the new port you just created. When you're finished, click **OK**. You will end up back at the Printer Properties window. If you are setting up the PrintServer in a Client-Server environment, it is recommended that you set up the Printer Driver as sharable. If you need to know how to set up a shared resource in NT, refer to the NT user guide or your Network Administrator.

9. Otherwise, Click **Apply** then click **OK**. The setup is complete. The PrintServer is now ready to receive jobs just like any other printer.

Note: If you have a 3-Port PrintServer and you are using more than one printer with it or if you are using multiple PrintServers, you must add a device port for every port used on the PrintServer or for every additional PrintServer being added.

If you need to change the PrintServer's internal setup or configuration at any time, read the chapter on page 18 entitled Managing the PrintServer.

STEP 3.
INSTALL THE PROPER PRINTER DRIVER IN WINDOWS NT 3.51

1. After your system restarts, login as usual.

2. Locate the Windows NT Program Manager. Click on Window. Click on **Main**.

3. Double-click on the **Control Panel**, then double-click on the **Printers** icon. The Print Manager will appear.

If you don't already have a printer installed, click on **Printer**, then Create Printer, and proceed to step 4.

If you already have a printer installed, click on Window and choose the printer where print jobs should be sent. Click on **Printer**, then **Properties**. The Printer Properties window will appear.

4. Give the printer a unique name in the Printer Name box.

5. In the Driver Box, scroll down to the type of printer you're installing.

6. In the Print to box, pick the name of the PrintServer that has been installed on the network.

7. If you want the PrintServer to be shared through your file server, use your mouse to put an X in the Share this printer on the network box. This will allow anyone with access to the PrintServer through the file server's available printers (recommended).

8. Click on **Settings**. The Configure PrintServer window will appear.

9. Verify the IP Address of the PrintServer.

10. Set the Retry interval. Retry is how often in seconds Windows attempt to send a print job if the PrintServer is busy.

11. Click on the **Select Device Port** button and choose the printer port (LPT) on the print server that is attached to the printer you are setting up.

12. Enable the banner if needed. The banner automatically prints before every job to help identify users' individual jobs. If you need postscripting printing for the banner, select the PostScript option. Be sure to enter the workgroup or username you want to appear on the banner.

13. When you're finished, click **OK**. NT may ask you to supply the original Windows NT 3.51 CD-ROM.

14. After the setup is complete, you should be able to send jobs to the PrintServer just like any other printer.

Note: If you have a 3-Port PrintServer and you are using more than one printer with it or if you are using multiple PrintServers, you must add a device port for every port used on the PrintServer or for every additional PrintServer being added.

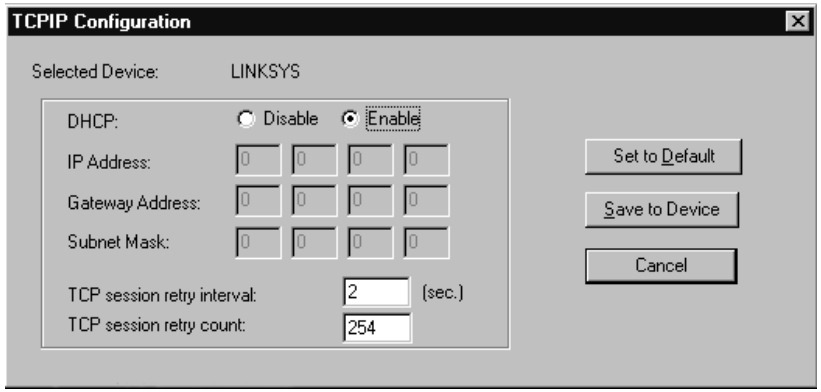
If you need to change the PrintServer's internal setup or configuration at any time, read the chapter on page 18 entitled Managing the PrintServer.

DHCP Support

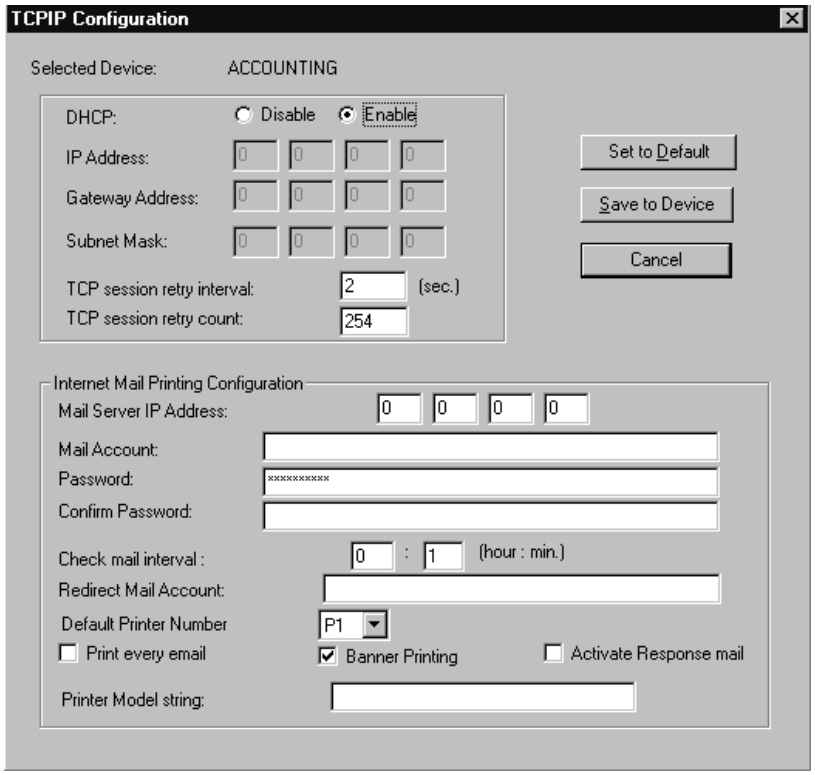
Using DHCP is only possible if you have a DHCP server and DHCP management software which allows you to take advantage of this feature. Otherwise, the PrintServer's IP address will be unknown, and connection to it will not be possible. In this case, ignore DHCP and configure the Printserver for a static IP address as described in previous sections.

To enable DHCP, you must run Bi-Admin (if you haven't installed Bi-Admin yet, refer to page 18 for installation). When Bi-Admin loads, it will scan the network for PrintServers. When it has scan the network, it will display a list of printservers and prompt you to enter the password for the highlighted PrintServer. If the highlighted PrintServer is one you are going to setup, enter the password assigned to the PrintServer (if any) and click **OK**. If no password was ever assigned, simply click **OK** without typing anything in the password field.

After you have entered the program and selected the PrintServer you are configuring, using your mouse, click on **Configuration** in the Menu and choose TCP/IP from the drop down box. The TCP/IP Configuration Window will appear. Click on the round button in front of **Enable** to enable DHCP, then click **Save to Device** (see the following pictures). You can exit the Bi-Admin program. To install the PrintServer driver (TCP/IP redirector), refer to the previous sections for install under Windows 95, 98, or NT.



Or this:



Note: To use the Internet Mail Printing Configuration features that appear, please refer to the Manual in the D:\Not_supp\Manual directory on the PrintServer's CD-ROM, Linksys will not provide phone or online technical support for this option.

Novell NetWare

The PrintServer is equipped to offer full printing services on NetWare 5.x, 4.x, and 3.x networks.

Communication with the PrintServer unit is accomplished across the TCP/IP (NetWare 5.x) and IPX/SPX protocols, which are built into the NetWare network operating system software. This section explains how to configure the PrintServer for use in a 5.x, 4.x or 3.x environment.

The PrintServer's configuration and integration into your NetWare network is accomplished with a variety of software tools. Depending on the version of NetWare you use, you might need to use programs from Novell like NWADMIN or PCONSOLE.

If you are installing the PrintServer using the IPX/SPX protocol, you will also need to use the QUICKSET program located on the PrintServer's CD-ROM during part of the setup.

The BI-ADMIN or PSCONFIG program can also be used to configure and manage the PrintServer manually with NetWare, (see the Appendix for manual setup). Complete instructions for installing and using Bi-Admin can be found in the Managing the PrintServer chapter on page 18. Instructions on how to manually setup the EtherFast 10/100 PrintServer using Bi-Admin or PSCONFIG are located in the Appendix.

If you are using a GUI, you might want to install BI-ADMIN now before attempting to set up the PrintServer for use with your file servers.

TERMINOLOGY DIFFERENCES

At times the setup instructions will refer to PrintServers and **print server devices**, as well as **print servers** and **print server resources**. These terms mean different things in NetWare terminology. The Linksys PrintServer can be installed on a Novell client-server network as either a print server or a remote printer resource. Your Novell NetWare user guides can provide you with detailed information about both types of resources.

Generally speaking, a print server is a resource on a file server or a stand-alone device that allows printing. Print jobs are handled quickly, and very little network bandwidth is required. A print server's chief disadvantage is that it takes up one of the file server's login slots when in use, reducing the number of server user licenses available by one. A remote printer, by contrast, is a resource on a file server that farms its jobs out to a physical device like the Linksys PrintServer. Although it doesn't use up any of a file server's user login slots, it is slower than a print server resource, and generates a lot more network traffic. When in doubt, choose to use the PrintServer as a print server, especially on networks where faster print job handling is required.

BEFORE YOU BEGIN

Before you begin the Novell software setup, make sure:

- The PrintServer hardware is completely installed
- Your Novell NetWare network is fully operational
- You have Administrator or Supervisor rights on the file server(s) or that you are logged on as Administrator or Supervisor
- You have access to your server's administrative utilities like NWADMIN and PCONSOLE
- You have the CD-ROM that came with the PrintServer

When you're ready to begin the installation, turn to the appropriate page to set up the PrintServer:

NetWare 5.x
IP Printing, see page 38
IPX/SPX Printing, see page 42

NetWare 4.x
Print Server mode, see page 43
Remote Printer mode, see page 44

NetWare 3.x
Print Server mode, see page 45
Remote Printer mode, see page 46

NETWARE 5.x SETUP

The following instructions will help you set up the EtherFast PrintServer to work under Novell NetWare 5.x in a pure IP environment. To keep things simple, you should assume that the following parameters exist:

Tree Name:	Novell
Organization:	TeSupp
CN:	Admin.TeSupp,
Server Name:	TECH_50
CD-ROM Drive:	D
PrintServer IP:	192.168.0.3

Of course, your settings will be different than the entries used in this user guide. Simply replace the shown parameters with your own settings throughout the setup. In order to set up the IP address, see page 15 in the Admin setup section.

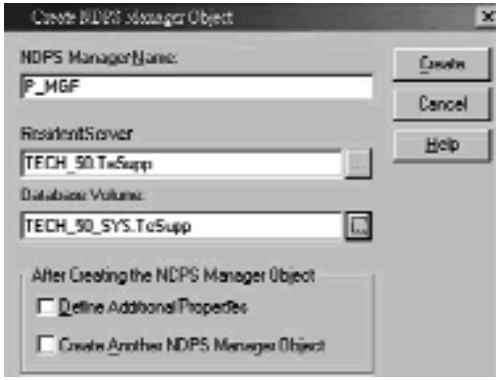
Before you can create an NDPS printer, you must first have created an **NDPS Manager** on your server. It is only necessary to do this once.

To create an NDPS Manager, go to a workstation on your network and login to a NetWare 5.x Server as Administrator. Run the NetWare Administrator application **Nwadmn32.exe** which should be located in F:\public\win32 on your network. Consult your NetWare documentation or your system administrator to learn the location of the file. When the program runs, do the following:

1. Select the container on NetWare Administrator in which you want the NDPS Manager object to reside, (e.g.: TeSupp).

2. Click on **Create** and select **Object** from the menu bar. The New Object window will appear.

3. Select NDPS Manager. The Create NDPS Manager Object window will appear.



4. Type any name that you would like into the NDPS Manager Name box at the top of the window, (e.g.: P_MGR).

5. In the Resident Server window, click on the **browse** button (···) and select the name of the server on which you would like this Manager assigned.

6. In the Database Volume window, click on the **browse** button (···) and choose where you would like to assign the NDPS Manager database, (e.g.: TECH_50_SYS.TeSupp).

7. Click on **Create**. The new NDPS Manager will appear in the main browser window.

8. Go to your NetWare Server's console and type **LOAD NDPSM**. Activate the NDPS Manager and select the NDPS Manager you have just created.

Note: To autoload the NDPS Manager every time you boot up the server, add the following line to your server's AUTOEXEC.NCF file:

```
LOAD NDPSM P_MGR.TeSupp
```

Creating a NetWare 5.x Printer

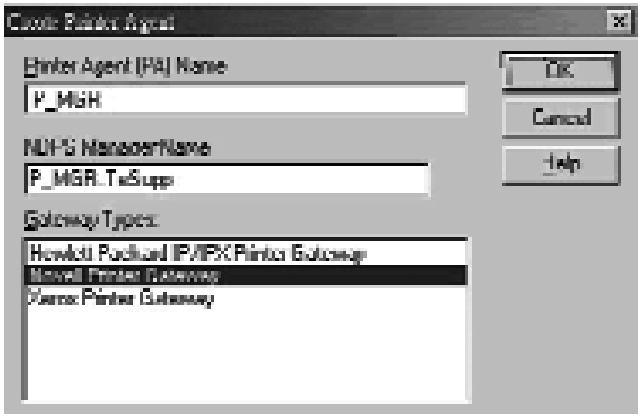
After creating an NDPS Manager, you can create NDPS printers by using NetWare Administrator. To create Public Access Printers using the NDPS Manager Object in the NetWare Administrator application, follow these steps:

1. **Run** NetWare Administrator.

2. Double-click on an **NDPS Manager**. The Manager you choose will be the one that you will be using to control the new Printer Agent. For example, you can pick the Manager that you created in the last section, P_MGR.

3. The Identification window for the selected NDPS Manager will appear. Click on the **Printer Agent List**.

4. Click on **New**. Type a name that you would like to give to your new NDPS Printer. (e.g.: S_Printer). In the Gateway Type window, select **Novell Printer Gateway**.



5. Select the available printer

6. Select **Remote** (LPR on IP) in the Connection Type.

7. Click **Next**.

Type the Host address IP that was previously assigned to the EtherFast PrintServer. In the Printer Name box, type a name for your printer (e.g.: L1).

Note: For the EtherFast 10/100 PrintServer, which has one parallel port, the logical ports are ranged from L1 to L3. For the EtherFast 10/100 3-Port PrintServer, which has three parallel ports, the logical ports are ranged from L1 to L8. On the single port model, you can use L1 and on the 3-port model you can use L1 to L3 for each port. If you require more logical ports you can make use of higher numbers. Most likely, you will not need more than 1 logical port on a single port and up to 3 logical ports on a 3 port Print server.

8. Click **Finish**.

9. Select a driver for Windows 3.1, one for Windows 95/98 and one for Windows NT 4.

10. The new Printer Agent S_Printer will now appear in the Printer Agent List window

Installing and Configuring Public Access Printers on a Workstation

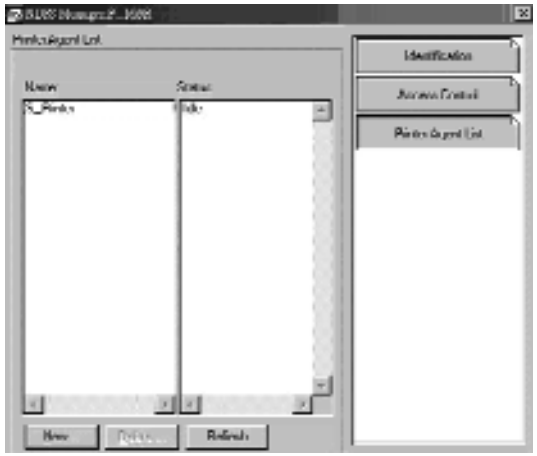
To configure your workstations to be able to print to an NDPS printer, follow these steps:

Before You Begin
Install IntranetWare Client v2.2 (or later) on each workstation that will be using NDPS. In order to install an NDPS printer on your workstation, you should use the Novell Printer Manager utility. If you're running Windows 95 or 98, then run the program called **Nwpmw32.exe**. You can find it in F:\public\win32 on your network. Consult your NetWare documentation or your system administrator to learn the location of the file. When the program runs, do the following.

1. Run the Novell Printer Manager utility on your workstation. On the Printer Manager menu bar, click on **Printer** and then select **New**.

2. Click **Add**.

3. Select the available printer and click **Install**, (e.g.: S_Printer). Click **Close**.



The printer S_Printer will appear in the main Printer Manager window and is available for print jobs.

Using the IPX/SPX

Protocol in NetWare 5.x

In order to set up the EtherFast Print Server to support NetWare using the IPX/SPX protocol for NetWare 5.x, you must use an application called QUICKSET.

Quickset.exe is located in the D:\Utility\DOS directory of the Linksys PrintServer CD-ROM

1. Login to the NDS network as **ADMIN** or as a user with Administrator privileges.

2. Go to the location (context) where you wish to create the print server object.

3. To use the NetWare Print Server mode, use the following syntax:

```
Quickset Unit_Name (/UN=P) (/Q1=W) (/Q2=X) (/Q3=Y)
```

The **Unit_Name** is the default PrintServer name that is displayed on the bar code label on the bottom of the PrintServer. The default name is in the form of SCxxxxxx (SC followed by 6 digits). The digits are in hexadecimal form, so you may see letters as well as numbers.

P is the new name of the PrintServer. If you do not specify this option, the PrintServer's name will remain as the default name.

W, **X** and **Y** are the names of the queues to be serviced by parallel ports 1, 2, and 3, respectively (Queues 2 and 3 apply only to the 3-Port PrintServer). If you do not use these options, then NDS_Q1, NDS_Q2 and NDS_Q3 are the default queue names that will be given to parallel ports 1, 2, and 3, respectively.

Here's an example:

```
Quickset SC123456 /UN=MarketingHP4L
```

This example would install the PrintServer SC123456 as a NetWare PrintServer in the current location. Its name would be "MarketingHP4L" and default names would be used for the the printer queues.

NetWare 4.x

PRINT SERVER MODE

The instructions below explain how to establish communication between the PrintServer unit and the rest of your Novell NetWare 4.x network.

There are two ways to set up the PrintServer under NetWare 4.x: automatically with QUICKSET, a small one-time program that is run from DOS with simple command-line arguments, or manually with the PrintServer's PSCONFIG or the Bi-Admin program.

AUTOMATIC SETUP

Run the QUICKSET program located under the D:\UTILITY\DOS directory of the Linksys PrintServer's CD-ROM. The program should be run from a plain MS-DOS prompt after the PrintServer's hardware has been installed.

The syntax of the program's command-line arguments are as follows:

```
Quickset Unit_Name (/UN=P) (/Q1=W) (/Q2=X) (/Q3=Y)
```

The **Unit_Name** is the default PrintServer name that is displayed on the bar code label on the bottom of the PrintServer. The default name is in the form of SCxxxxxx (SC followed by 6 digits). The digits are in hexadecimal form, so you may see letters as well as numbers.

Q1, Q2, and Q3 are the file server's print queues that will be used to handle the jobs. These queues will be automatically created on the file server when the QUICKSET command is executed. FS can be used as the name of the file server that the PrintServer should log into.
Example: /FS=ACCOUNTING

A sample use might be:

quickset SC429839 /UN=myprintserver/Q1=firstqueue/FS=ACCOUNTING

The program can be run anytime you need to change the PrintServer's settings.

NetWare 4.x

REMOTE PRINTER MODE

The instructions below explain how to configure the PrintServer for remote Printer Mode, and establish communication between it and the rest of your Novell NetWare 4.x network.

Before you begin, make sure you have already set up a Novell print server resource on a file server or elsewhere. You will need the name of the print server before you begin. See page 18 for more information about print server resources.

There are two ways to set up the PrintServer under NetWare 4.x: automatically with QUICKSET, a small one-time program that is run from DOS with simple command-line arguments, or manually with the PrintServer's PSCONFIG program or Bi-Admin (to set up the PrintServer manually, refer to Appendix page 64)

Login as **Admin** or a user with Administrator rights. **Run** the QUICKSET program located under the D:\UTILITY\DOS directory of the Linksys PrintServer's CD-ROM. The program should be run from a plain MS-DOS prompt after the PrintServer's hardware has been installed. The syntax of the program's command-line arguments are as follows (keep in mind that the command should be entered as one long command):

```
quickset SCnum R /UN=newname/Q1=Queue1/Q2=Queue2/FS=fileserver
```

SCnum is the PrintServer's default name. You will find this in the form of an SCnumber on the bottom of the PrintServer unit. Example: SC420939 Next, newname is a more user-friendly name you can give the PrintServer. Example: /UN=MARKETING

R is the name of the print server resource on the file server that the PrintServer device will log into.

Q1, Q2, and Q3 are the file server's print queues that will be used to handle the jobs. These queues will be automatically created on the file server when the QUICKSET command is executed. Example: /Q1=MYQUEUE

FS is the name of the file server that the PrintServer should log into. Example: /FS=ACCOUNTING

A sample use might be:

```
quickset SCnum pserver1/UN=marketing/Q1=myqueue/FS= ACCOUNTING
```

NetWare 3.x

PRINT SERVER MODE

The instructions below explain how to establish communication between the PrintServer unit and the rest of your Novell NetWare 3.x network in a DOS environment.

There are two ways to set up the PrintServer in DOS under NetWare 3.x: automatically with QUICKSET, a small one-time program that is run from DOS with simple command-line arguments, or manually with the PrintServer's PSCONFIG program

Run the QUICKSET program located under the D:\UTILITY\DOS directory of the Linksys PrintServer's CD-ROM. The program should be run from a plain MS-DOS prompt after the PrintServer's hardware has been installed.

The syntax of the program's command-line arguments are as follows (keep in mind that the command should be entered as one long command):

```
quickset SCnum R /UN=newname/Q1=Queue1/Q2=Queue2/FS=fileserver
```

SCnum is the PrintServer's default name. You will find this in the form of an SCnumber on the bottom of the PrintServer unit. Example: SC420939 Next, newname is a more user-friendly name you can give the PrintServer. Example: /UN=MARKETING

R is the name of the print server resource on the file server that the PrintServer device will log into.

Q1, Q2, and Q3 are the file server's print queues that will be used to handle the jobs. These queues will be automatically created on the file server when the QUICKSET command is executed. Example: /Q1=MYQUEUE

FS is the name of the file server that the PrintServer should log into. Example: /FS=ACCOUNTING

A sample use might be:

```
quickset SCnum pserver1/UN=marketing/Q1=myqueue/FS= ACCOUNTING
```

The program can be run anytime you need to change the PrintServer's settings.

NetWare 3.x

REMOTE PRINTER MODE

The instructions below explain how to configure the PrintServer for remote Printer Mode, and establish communication between it and the rest of your Novell NetWare 3.x network. PSERVER must be loaded and a PrintServer must be configured on your file server before continuing. Consult your NetWare documentation regarding the setup of PSERVER.

Before you begin, make sure you have already set up a Novell print server resource on a file server or elsewhere. You will need the name of the print server before you begin. See page 18 for more information about print server resources.

There are two ways to set up the PrintServer under NetWare 3.x: automatically with QUICKSET, a small one-time program that is run from DOS with simple command-line arguments, or manually with the PrintServer's PSCONFIG program or Bi-Admin, (to setup the printserver manually, refer to page 77 in the Appendix of this guide).

Run the QUICKSET program located under the D:\UTILITY\DOS directory of the Linksys PrintServer's CD-ROM. The program should be run from a plain MS-DOS prompt after the PrintServer's hardware has been installed. The syntax of the program's command-line arguments are as follows (keep in mind that the command should be entered as one long command):

```
quickset SCnum R /UN=newname/Q1=Queue1/Q2=Queue2/FS=fileserver
```

SCnum is the PrintServer's default name. You will find this in the form of an SCnumber on the bottom of the PrintServer unit. Example: SC420939 Next, newname is a more user-friendly name you can give the PrintServer. Example: /UN=MARKETING

R is the name of the print server resource on the file server that the PrintServer device will log into.

Q1, Q2, and Q3 are the file server's print queues that will be used to handle the jobs. These queues will be automatically created on the file server when the QUICKSET command is executed. Example: /Q1=MYQUEUE

FS is the name of the file server that the PrintServer should log into. Example: /FS=ACCOUNTING

A sample use might be:

```
quickset SCnum pserver1/UN=marketing/Q1=myqueue/FS= ACCOUNTING
```

Appendix

SETTING UP TCP/IP AND IPX/SPX IN WINDOWS

Before a workstation can communicate with the PrintServer, it must be configured with the TCP/IP protocol. If you know how to set up TCP/IP on your workstations, do so now. Otherwise, use the guidelines below to help get TCP/IP installed on all of the computers that will need PrintServer access. If you are unable to successfully install TCP/IP on one or more computers after following the directions, contact the manufacturer of your computers' network operating system for further assistance. Check with your system administrator (if you have one) for your TCP/IP settings.

The directions below provide general guidelines for coming up with IP addresses and subnet masks. Check with your system administrator to see if you need to use specific IP addresses or DHCP settings.

First, each computer on the network will require an IP address, which is a series of numbers, separated by periods, that identifies the PC on the network. To make things simple, we recommend using the following numbering scheme:

10.0.1.X

where X is a unique, arbitrarily assigned number from 1 to 255. Each computer must have its own unique X number. Note: Never use 127 or 255 for X -- these numbers are reserved by TCP/IP for other uses.

For example, if you have three computers, you could number them as follows:

10.0.1.17
10.0.1.44
10.0.1.126
In this case, 17, 44, and 126 are arbitrary numbers between 1 and 255.

Each computer will also require a subnet mask, which is a numerical "filter" that tells a computer which kinds of TCP/IP data packets to accept. If you're not sure which mask to use, we recommend the following mask:

255.255.255.0

Setting Up TCP/IP

The following instructions are provided as examples for reference **only**. For full instructions about the installation and troubleshooting of TCP/IP, please consult your Windows documentation.

TCP/IP SETUP FOR WINDOWS 98 and 95

1. Click on **Start**, **Settings**, then **Control Panel**. Double-click on the **Network** icon.

2. If the TCP/IP Protocol is listed for your network adapter, skip to step 4. Otherwise click on the **Add** button.

3. When the Component Type window appears, click on **Protocol**, followed by the **Add** button.

4. Select **Microsoft** in the Manufacturers list, then choose **TCP/IP** in the Network Protocols list. Click on **OK**.

5. When the Network window reappears, click once on **TCP/IP**, followed by the **Properties** button.

6. Click in the **Specify an IP Address** button.

7. Enter an IP Address for the workstation, along with a Subnet Mask. Click **OK**. If you do not have this information, check the previous page or consult your system administrator.

8. When the Network window reappears, click **OK**. Choose to restart your machine. TCP/IP has been successfully installed.

TCP/IP SETUP FOR WINDOWS NT 4.0

1. Click on **Start**, **Settings**, and **Control Panel**. Double-click on the **Network** icon.

2. When the Network window appears, click on the **Protocols** tab. Click on the **Add** button.

3. Find the **TCP/IP** protocol in the Select Network Protocol box. Click on it once, then click **OK**.

4. When asked if you want to use DHCP, click on **No**.

5. If asked to supply your Windows NT CD-ROM, do so. NT will copy the necessary files to your system.

6. When TCP/IP appears in the Network Protocols window, click on the Bindings tab. Windows will store your new bindings.

7. Click on the **Protocols** tab. Click once on TCP/IP.

8. Click on the **Properties** button. Select the type of network adapter you have from the Adapters box. Click on the **Specify an IP Address** button.

9. Enter the IP Address for the workstation, along with the Subnet Mask. Check with your system administrator (if you have one) for your settings.

10. Enter your Default Gateway if you have one; otherwise, leave the entry blank. **Note**: a Default Gateway is not required. Check with your system administrator

11. When you're finished, click **OK**. If NT asks about WINS, ignore it.

12. When the Network window reappears, click on **Close**. Choose to restart your computer. TCP/IP has been successfully installed.

TCP/IP SETUP FOR WINDOWS NT 3.51

1. Find and open the **Main** group in the Program Manager.

2. Double-click on the **Control Panel** icon, followed by the **Network** icon. The Network Settings window will appear.

3. Click on the **Add Software** button. The Add Software window will appear.

4. In the Network Software box, find the **TCP/IP Protocol and Related Components** item and click on it. Click on the **Continue** button.

5. When the TCP/IP Installation Options window appears, use your mouse to put an **X** in the Simple TCP/IP Services box. Click on **OK**.

6. Supply your original Windows NT CD-ROM if asked to do so. NT may copy a few files to your system.

7. When the Network window reappears, click on the **Bindings** button. When the Network Bindings window appears, click **OK**.

8. The Network Settings window will reappear. Find **TCP/IP Protocol** listed in the Installed Network Software box. Click on it once, then on the **Configure** button. The Configuration window will appear.

9. Enter the IP Address and Subnet Mask, then click **OK**. Check with your system administrator (if you have one) for your TCP/IP settings.

10. Click **OK** when the Network Settings window reappears. Restart.

Twisted-Pair Cabling

There are different grades, or categories, of twisted-pair cabling. Category 5 is the most reliable and widely compatible, and is required for Fast Ethernet.

You can buy Category 5 cabling that is pre-made, or you can cut and crimp your own. Category 5 cables can be purchased or crimped as either straight-through or crossed. A Category 5 cable has 8 thin, color-coded wires inside that run from one end of the cable to the other. Only wires 1, 2, 3, and 6 are used by Ethernet networks.

In a straight-through cable, wires 1, 2, 3, and 6 at one end of the cable are also wires 1, 2, 3, and 6 at the other end. In a crossed cable, the order of the wires change from one end to the other: wire 1 becomes 3, and 2 becomes 6.

The color code for the 4 wires should be as follows: **Wire 1**, white with an orange stripe; **Wire 2**, orange; **Wire 3**, white with a green stripe; **Wire 6**, green. The other four wires have to be connected as follows: **Wire 4**, blue; **Wire 5**, white with a blue stripe; **Wire7**, white with a brown stripe, **Wire 8**, brown.

To figure out which wire is wire number 1, hold the cable so that the end of the plastic RJ-45 tip (the part that goes into a wall jack first) is facing away from you. Flip the clip so that the copper side faces up (the springy clip will now be parallel to the floor).When looking down on the coppers, wire 1 will be on the far left.

Parallel Pin Assignments

Pin	Signal	Name	Direction
1	-	Strobe	To printer
2	+	Data Bit 0	To printer
3	+	Data Bit 1	To printer
4	+	Data Bit 2	To printer
5	+	Data Bit 3	To printer
6	+	Data Bit 4	To printer
7	+	Data Bit 5	To printer
8	+	Data Bit 6	To printer
9	+	Data Bit 7	To printer
10	-	ACK	To Server
11	+	Busy	To Server
12	+	Paper End	To Server
13	+	Select	To Server
14	-	Auto Feed	To printer
15	-	Error	To Server
16	-	Init	To printer
17	-	Select In	To printer
18-25	GND	Ground Ground	

Troubleshooting

If your PrintServer is not working correctly, follow the advice in this chapter. If you encounter printing difficulties, please refer to the Hardware section first then go to the Printing section. If, after following the advice in this chapter, the PrintServer still does not function properly, please visit http://www.linksys.com or contact Linksys Technical Support for further advice.

Hardware Problems

Problem No. 1: *All the PrintServer's LEDs are off.*
Solution No. 1: Check the power supply or power connection.

Problem No. 2: *PrintServer's status light continuously stays lit.*
Solution No. 2: Reset PrintServer by unplugging the power supply and plugging it back in.

Problem No. 3: *PrintServer status light and power light stays on continuously and do not turn off.*
Solution No. 3: Reset PrintServer by unplugging the power supply or by pushing the reset button and turning off you printer(s)

Problem No. 4: *I am using DHCP, and getting an IP Address conflict involving the PrintServer.*
Solution No. 4: If the PrintServer is left on, but the DHCP server is turned off, then the PrintServer will retain its IP Address without the DHCP Server being aware of it. Simply reset the PrintServer so it will obtain a new IP Address. This problem would also arise if you assigned a static IP Address which is within the range used by the DHCP server. If so, use another address which is NOT within the range used by the DHCP server.

Problem No. 5: *I am using WPCONFIG on Windows 95, and having problems configuring the PrintServer.*
Solution No. 5: WPCONFIG is designed for Windows 3.1 only. For Windows 95, 98/NT, you should use Bi-Admin.

Problem No. 6: *The LED on the side of the 3-Port PrintServer is not lighting up.*
Solution No. 6: Check your cabling and make sure that you also have a Link light on your hub or switch. Change the DIP switch settings on the PrintServer.

Printing Problems - General

Problem No. 1 *When using 10BaseT cabling, the PrintServer unit does not work.*
Solution No. 1 Check the Hub's link LED for the port to which the PrintServer is connected. If it is off, there is a problem in the network cable. If using 10BaseT or 100BaseTX, check the LED next to the connector. It should be on if the network connection is OK. Also check and modify the DIP switch settings on the PrintServer. Reset the PrintServer any time you change any of the DIP switches

Problem No. 2 *A printing device connected to the a PrintServer port cannot print or prints garbage.*
Solution No. 2 Check the following:
- Cable connection between PrintServer and printer.
- Printer driver in the application program or Windows matches the printer.
- Cable may be too long

Problem No. 3 *The Configuration button on the Printer Status screen in BiAdmin is grayed out, even though my printer is bi-directional.*
Solution No. 3 The button is unavailable if the printer is busy. You must wait until the printer is idle.

Printing - NetWare

Problem No. 1 *My PrintServer prints garbage.*
Solution No. 1 Follow the following steps to identify the problem:

1. Print a diagnostic file using PSCONFIG or Bi-Admin program.
   (a) Run PSCONFIG and select your **PrintServer** from the list. Then select **Print Diagnostic Report**
   (b) Select each port in turn and print a diagnostic report.
   (c) Check to see if the diagnostic report printed. If the diagnostic report printed, the problem may be caused by incorrect system configuration. Go to Step 2. If the diagnostic report printout is not okay, check your printer. If you do not find any faults while inspecting your printer, contact Linksys Tech Support.

Note: Windows only printers may not print the diagnostic page

2. Print a test text file and a test graphic file. If the text file prints correctly but the graphic file prints garbage, then specify /NT (no tabs) option for NPRINT or CAPTURE commands and print again. If both print incorrectly, go to step 3.

3. Temporarily disable the PrintServer servicing the print queue following the step-by-step instructions below:

NetWare 2.x and 3.x

(a) Run PCONSOLE, Select Print Queue Information, select the print queue that the PrintServer services, select **Current Queue Status**.
(b) Set Servers can service entries in queue to **NO**.
(c) Press **Esc** and select **Print Queue ID**. Record the queue ID.
(d) Send your test files to the print queue using normal print commands.

NetWare 4.x and 5.x bindery & NDS modes

(a) Run PCONSOLE, select Print Queues, select the print queue that your PrintServer services, select **Status**.
(b) Set Allow service by current print servers to **NO**.
(c) Press **Esc** and select **Information**, and record the queue ID.
(d) Send your test files to the print queue using normal print commands.

4. Re-route network printing to local printing.

   (a) Disconnect the printer attached to your PrintServer and connect it to LPT1 of your PC.
   (b) Change to the drive and then the directory on the file server that contains the print queue. The directory will have the name of the queue ID (e.g. \queues\Q_ID for NDS mode or system\Q_ID for Bindery mode).

5. The test files you printed in step 3 should be in the queue directory. Print these files to the local printer using the COPY command with the /b option.
   Example: copy /b test.txt LPT1

6. Compare the printouts from the PC and the PrintServer. If the printouts are the same, then the problem is NOT the PrintServer. The problem might be that an incorrect printer driver was chosen or the timeout setting in the CAPTURE command is too short. If the printouts are NOT the same, there may be a problem with the PrintServer. Contact Linksys technical support.

7. Re-enable queue service.

   (a) Disconnect the printer attached to LPT1 of your PC and connect it to your PrintServer.
   (b) For NetWare 2.x or 3.x, run PCONSOLE and Select Print Queue Information. Then select the print queue and select **Current Queue Status**. Set Servers can service entries in queue to **YES**
   For NetWare 4.x bindery and NDS modes, run PCONSOLE and select Print Queues. Then select the print queue and select **Status**. Set Allow service by current print servers to **YES**.

Problem No. 2 *My PrintServer does not appear in the Active Device List of the PSCONFIG program.*

Solution No. 2
- Ensure that the PrintServer is on the same network segment as your PC.
- Load the NetBEUI protocol on your PC, so that PSCONFIG or Bi-Admin can try connecting using NetBEUI. Once connected, check the following:
- The NetWare protocol is enabled.
- The Ethernet frame type of your PC may be different than the one with your PrintServer. Enable all Ethernet frame types.

Problem No. 3 *My PrintServer is configured as a Novell Print Server, and cannot log in to a file server.*

Solution No. 3 The following steps may solve this problem:

1. Get the PrintServer information using PSCONFIG or Bi-Admin. If the device is configured as a Novell Print Server, the information will look like the following:

   Server Name: SC110049
   NetWare Information:
   Master File Server: ICE
   Print Server Mode Status:
   Your_File_Server: Current Status
   Remote Printer Mode Status: N/A

2. Make sure the master file server name is assigned correctly.

3. Check the Current Status of Your_File_Server:

   Connected:
   No action required

   No file server:
   Assign a master file server using PSCONFIG or Bi-Admin

   Connecting to Server:
   Wait and check if the file server exists

   Password Mismatch
   Clear the NetWare password with PCONSOLE, or set the correct password for the PrintServer using PSCONFIG or Bi-Admin.

   Print Server Not Defined
   Install PrintServer again

4. Check NetWare to see if the login status of the PrintServer to the file servers is Ready. If it is not, check the error message and perform the required corrective action.

5. Check the Novell file server's name. If it is over 20 characters long, rename it using no more than 20 characters.

6. If the file server is not in the status list and the PrintServer has logged into the master file server, it means that the file server has not been serviced by the PrintServer. Check to see if the file server is in the list of File Server To Be Serviced item of PCONSOLE. If not, insert the file server name to the list.

Problem No. 4 *My PrintServer is configured as a Novell Remote Printer, and can't log in to the Novell Print Server.*

Solution No. 4 Try the following steps.

1. Get the PrintServer information as described in Problem 3.
2. Check the fields after the following.

Remote Printer Mode Status:
For each logical printer, there will be a status entry. The status will be one of the following.

Connected:
No action required

Unable to find server:
Load NetWare Print Server.

Connecting to Server:
Wait and check if the NetWare Print server is loaded

Printer not Defined
Install the PrintServer as a remote printer of a NetWare print server.

3. Check NetWare to see if the PrintServer is ready. If it is not, check the error message and perform the required corrective action.

4. Check the NetWare print server's name. If it is over 20 characters, rename the NetWare Print Server name using no more than 20 characters.

Problem No. 5 *My PrintServer cannot print the jobs sent to the print queue.*

Solution No. 5 Try the following.

1. Check if the printer attached to the PrintServer is on-line.

2. Check if your PrintServer is logged into the file server (See Problem 3).

3. Check the current status of the queue. Run PCONSOLE and select Print Queue Information. Then select the queue and select **Current Queue Status**. See if there are three YESs. If not, set them to **YES**.

4. Check if the NetWare printer number is correct.
   0 = parallel port 1 of the PrintServer.
   1 = parallel port 2 of the PrintServer.
   2 = parallel port 3 of the PrintServer

5. Check to see if the PrintServer is a static queue server to the queue. Run PCONSOLE and select Print Server Information. Then select **Print Server Configuration** and select **Queues Serviced by Printer**. Then select your desired printer and check if the queue is on the list. If its not, insert the queue into the list by pressing **Insert** key and select the queue. Then reset the PrintServer to service the new queue.

6. The total number of queues to be serviced may be over the limit of **56**. If so, reduce the number of queues.

Problem No. 6 *I used the Capture command to print a job, but the job was separated into two parts.*

Solution No. 6 The time out setting in Capture command may be too short. You should increase the timeout value of the Capture command. Use the option /TI=n of the Capture command to increase the time out value, where n is the value of timeout.

Problem No. 7 *PSCONFIG or Bi-Admin shows "No Response."*

Solution No. 7 This may be due to the following:

- The network traffic is busy now. Wait for a minute and then try it again.
- The PrintServer is not powered on. Power it on.
- The network cable is disconnected. Check the cable.
- The node address of the PrintServer may be the same as the node address of another device on the network.

Problem No. 8 *QUICKSET timed out when checking if the device had logged in to the file servers.*

Solution No. 8 This means that the PrintServer did not log in the master file server. It might be that the Ethernet frame types do not match.

1. Try to find a workstation the frame type of the PrintServer using PSCONFIG or Bi-Admin.
2. Enable the PrintServer's frame type to the frame type that the master file server uses and disable all other frame types.

Problem No. 9 *I cannot receive Notify message in NetWare 4.x environment.*

Solution No. 9 1. Make sure you are a **Notify** member of the PrintServer.
2. Run NetAdmin and set the name of the Default Server to receive notification.

Problem No. 10 *I cannot use PCONSOLE or Bi-Admin to see Printer Status or the current server status in PrintServer Information is showing Down in the NetWare 4.x environment.*

Solution No. 10 It may be that you created the print server object in NetWare 3.x environment and used PCONSOLE in NetWare 4.x to view the status. Try the following:

1. Ensure the PrintServer is ON.
2. Delete the print server object of the PrintServer.
3. Install the PrintServer again in NetWare 4.x NDS environment.

Problem No. 11 *The "String Before Job" and/or "String After Job" settings in the Logical Printers don't work properly.*

Solution No. 11
- Check the length of the control strings. No string can exceed **15** characters.
- Check that the control strings are in **HEX**.

Problem No. 12 *How do I service additional NetWare bindery file servers?*

Solution No. 12 If your PrintServer is configured as a NetWare Print Server and you want it to service more than one bindery file server, perform the following steps.

1. Login, with supervisory rights, to the other file servers you want your PrintServer to service.
2. Create queues and a print server name for your PrintServer on each file server you want to service.
3. Login, with supervisory rights, to the master file server of your PrintServer.
4. Run PCONSOLE.
5. Select **Print Server Information**, then select your PrintServer in the print server list.
6. Select **Printer Server Configuration**, then select **File Server To Be Serviced**.
7. Insert the file server names of the other file servers to be serviced by your PrintServer.
8. Reset the PrintServer.

Problem No. 13 *How do I attach to more than one NetWare Print Server*

Solution No. 13 In NetWare Remote Printer mode, if you want each port of the PrintServer to attach to a different NetWare Print Server, perform the following steps.

1. Use PCONSOLE to create and assign the required printers and queues as detailed in the Remote Printer Mode section.
2. Run PSCONFIG and select **Set to NetWare Remote Printer Mode**. Enter the correct NetWare print server names in the print server name fields, then select **Execute Setup**.

Windows Printing

Problem No. 1 *When printing from some software applications such as Power Point, it takes a long time and the print out is incorrect.*

Solution No. 1 The problem is due to the printer being configured to Start printing after the first page is spooled. To change this setting:

1. Go to **Control Panel**, **Printers** and click on your printer.
2. Then select **File**, **Properties**, **Details**.
3. When the Details screen appears, click the **Spool Settings** button.
4. When the Spool Settings dialogue box appears, choose **Start printing after last page is spooled** and click **OK**.

Problem No. 2 *While adding my printer as instructed in Windows 95 or 98, I received a message stating that Printer could not be found.*

Solution No. 2 Some printer drivers, when configured as Local Printer, will poll the printer to see if it is connected. Since the printer is networked, the printer can not be detected. To fix this, perform the following:

1. Select **Network Printer** when asked How is the printer attached to your computer?
2. Then when prompted for Network Path or Queue name enter a dummy value such as \\SCnum\P1 or P2 or P3 for LPT2 or LPT3 respectively, and select **Next**
3. The printer wizard will display a message stating the Network Printer is off-line. Continue to install the printer as normal.
4. When finished, go to **Control Panel**, **Printers** and select your printer. The printer icon will be grayed out indicating the printer is not ready.
5. Select **Properties**, **Details**. In the Print to the following port box, select **PrintServer**.
6. Click **Apply**, then **OK**, then close the properties window.
7. Select the printer and go to the File menu. Check the Work off-line option is **OFF**.
8. If the printer is connected and powered **On**, the printer icon should no longer be grayed out, and you should be able to print.

Problem No. 3 *I connected and configured a WPS (Windows Printing System) printer as described, but I can't get the print job to print.*

Solution No. 3 WPS printer drivers poll the printer before sending print data. Since the printer is networked, the printer is not found and no data is sent. The solution is to add your printer as a network printer as described in Solution 2 above. The following is a list of a few common WPS printers:

Canon LBP-430W
Epson ActionLaser 1300/W, Epson EPL-5500/W
HP LaserJet 5L, Lexmark WinWriter Series
NEC SuperScript series, Olivetti PG304
Samsung MyLaser Series
HP DeskJet CX and CS Series

Problem No. 4 *My text prints just fine, but my graphics come out looking like garbage.*

Solution No. 4 Get the latest driver for your printer from the manufac turer. then, click on **Start**, **Settings**, **Printers**. Right click on the print driver and choose **Properties**.

For windows 95 and 98 users, click on **Details**, then click on **Spool Setting** and change the setting on **Spool Data Format** (RAW). Click **OK**, then click **OK** again

NT users: after you get into the Properties windows for the printers, click on **General**. Click on **Print Processor** and choose RAW or EMF. Click on **Always Spool RAW Data Type**. Click **OK**, then click **OK** again.

Problem No. 5 *When trying to configure or change the TCP/IP settings on the PrintServer, I get an "SPX" Connect Error.*

Solution No. 5 The utilities the PrintServer uses require the IPS/SPX protocol to be installed. Also check cabling and make sure there is a link light on the hub and PrintServer. You can also restore the factory default using Bi-Admin's configuration menu.

Problem No. 6: *Some DOS based programs do not work on a Windows 95/98 peer-to-peer network.*

Solution No. 6: Some DOS application require an **LPT port** to print. You can enable the NetBEUI protocol and capture a port. You must have NetBEUI installed for you network. Follow the instructions below:

1. Run Bi-admin and select the **Configuration** menu option, then **NetBEUI**.

2. At the **Domain** prompt, enter your network workgroup name.

3. Click on **Save to Device**.

4. Open **Network Neighborhood**. You should see the PrintServer on your network. If not, press **F5** a few times to refresh the window.

5. Double-click on the **PrintServer** (i.e. sce15223 or scc15232).

6. You should see the port like **Pn**, where n is the port number, (i.e. P1) on the PrintServer.

7. Right click on the port you want to capture, (i.e. P1), and select **Capture Printer Port**.

8. A window will appear asking for a Device. Select the port you want, (i.e. LPT1, LPT2, etc.).

9. Put a check on the *Reconnect at logon* option so you can connect to the PrintServer when you reboot your computer.

10. You now need to setup your printer. Click on **Start**, then **Settings**, then **Printer**.

11. Right click on the printer that you want to setup (i.e. HP Laserjet 5L) and select Properties.

12. Click on the Details tab.

13. Change the Print to the LPT port number that you selected during step 8 of these instructions.

14. Click Apply, then OK to finish. Finally, reboot your PC.

Note: Linksys does not provide any technical support for problems with NetBEUI. Consult your Operating System's documentation if you need help.

NetWare 4.x with Windows

Print Server Mode

The instructions below explain how to establish communication between the PrintServer unit and the rest of your Novell NetWare 4.x network in a mostly Windows environment.

1. First, install and run the Bi-Admin program that is included on the PrintServer's CD-ROM. (The use of the Bi-Admin program is covered in the *Managing the PrintServer* section. Follow the steps on page 18 now to install and run Bi-Admin if you haven't already).

2. When the Bi-Admin program appears, it will automatically scan the network for available Linksys PrintServer hardware. Any hardware found on the network will appear in the Default Name, Device Name, Printer Port chart. Bi-Admin will ask for the password given to the device. Enter the password and click **OK**. If no password is assigned, just click **OK**.

3. Click once on the **Device Name** of the PrintServer you want to configure in order to highlight it.

4. Click on **Configuration**, then **NetWare**. The NetWare configuration window will appear.

5. Click on the round Print Server option button to select it, then click on the **Print Server Configuration** button. The Print Server configuration window will appear. Give the Linksys PrintServer a unique name in the Print Server Name box. Remember the name you use; you'll need it later on. (Example: MARKETING, ACCOUNTING, TARDIS, etc.)

6. Next to the NDS Tree Name box, click on the **down arrow** and pick the tree that will handle the PrintServer. If the list is blank, enter the name manually.

7. In the NDS Context box, choose the context where the PrintServer will be installed. If you don't see a context, consult your Novell NetWare user guides to establish one.

Note: Contrary to Novell NetWare Setup, the NDS context does not start with a period. The context must begin with the name of the container where the PrintServer is being installed. If the container where the PrintServer is being installed is a subcontainer, then the parent container must be listed, (separated by a '.' period).

8. Leave the Master File Server box empty.

9. Enter a number from 1 to 255 in the Polling Queue. This is how long in seconds the PrintServer will wait before polling the queue for print jobs that might be waiting.

10. If turned on, Job Notification by Connection ID will automatically notify the file server after a job is complete, allowing the administrator to use PCONSOLE or other programs to monitor users' printing.

11. Pick the frame types you want the PrintServer to support.

If you'd like to change the PrintServer's configuration password (required for changing the PrintServer's internal settings), do so by clicking on **Change Password**.

When you're finished, choose to execute and **Save To Device** the new settings, then close down the Bi-Admin program. Start up Novell NetWare's NWAdmin program. See your NetWare documentation for help if necessary.

CREATE A PRINT SERVER RESOURCE

1. Navigate through the tree on the far left until you locate the Context where the PrintServer will be installed -- this must be the same context or container you set up in step 7 above. Using your mouse, right-click on the desired Context. When the popup menu appears, click on **Create**.

2. Scroll down to **PrintServer** and double-click on it. The Create Print Server window will appear.

3. In the Print Server Name box, enter the name you gave the PrintServer in step 5 on page 64.

4. Click on the **Create** button. The newly created PrintServer should appear in the current context on the left.

CREATE A PRINTER RESOURCE

1. Using your mouse, right-click on the **Context** again.

2. When the popup menu appears, scroll down to **Printer** and double-click on it.

3. Enter a name for the printer that will be attached to the PrintServer. (Example: HP5). When you're finished, click on the **Create** button. The printer will appear in the Context.

CREATE A PRINT QUEUE RESOURCE

1. Right-click on the **Context** again. Scroll down to Print Queue and double-click on it. The Create Print Queue box will appear. Select the Directory Service Queue menu option.

2. Enter a name in the Print Queue name box. Example: SALESQUEUE

3. Next to the Print Queue Volume box, click on the dotted button. The Select Object window will appear.

4. Browse through the objects and context windows until you come to an available volume where the new print queue will be installed (the volumes will appear in the Available Objects window).

5. When the desired volume appears, double-click on it. The volume will appear in the Print Queue Volume box in the Create Print Queue window. Click on **Create**.

The currently selected Context should now contain a print server, a printer, and a queue.

ASSIGN A QUEUE TO THE PRINTER

1. Double-click on the **Printer** object in the context. The Printer window will appear. In the window, click on the **Assignments** tab, followed by the **Add** button.

2. The queue you just created will appear in the Available Objects window. Click on it, then click **OK**. The queue you created will appear in the list of print queues. Click **OK**.

CONFIGURE THE PRINTER RESOURCE

1. In the selected Context, double-click on the **printer object**, then click on the **Configuration** tab.

2. Set the Printer type to **Parallel**. Click on the **Communication** button.

3. Set the LPT value to the appropriate port on the PrintServer where the printer will be connected. Choose parallel port 1, 2, or 3 (LPT1, LPT2, or LPT3, respectively).

4. Click on the **Assignments** tab. Click on **Add**. The queue you created above will appear in the list of available queues. Double-click on it so that it appears in the print queues box. Click **OK**.

DIRECT THE PRINTER TO THE PRINT SERVER RESOURCE

1. Double-click on the **Print Server** object in the context. The Print Server window will appear. Click on **Assignments**, followed by **Add**.

2. The printer you just created will appear in Available Objects. Double-click on it. The printer will appear in the list of printers on-line.

3. Look at the bottom of the Print Server window. The Status item should say Running -- this may take a minute or two depending on the network traffic. If it doesn't, repeat all of the steps on the previous page.

4. When you're finished, click **OK**. You *may* need to reboot the computer and restart the PrintServer. The setup is complete. Follow your Novell NetWare instructions for setting up a printer on your workstation(s). The new printers and their queues will show up in Windows.

ADDING A SECOND OR THIRD PRINTER (EPSX3 only)

If you decide to add a second or third printer, repeat all of the steps from Create a Printer Resource on the previous page.

If you need to change the PrintServer's internal setup or configuration at any time, read the chapter on page 18 entitled Managing the PrintServer. If any changes are made to the PrintServer's settings, you may have to re-set up the printserver and printer objects and redo the assignments.

You will need to re-create printer resources for every printer you plan on adding to the network.

NetWare 4.x with Windows

REMOTE PRINTER MODE

The instructions below explain how to manually configure the PrintServer for Remote Printer Mode, and establish communication between it and the rest of your Novell NetWare 4.x network in a mostly Windows environment. PSERVER must be loaded and configured properly on your file server before continuing. Consult your NetWare documentation for information on how to do this.

Before you begin, make sure you have already set up a Novell print server resource on a file server or elsewhere. See page 18 for more information about print server resources.

1. Install and run the Bi-Admin program that is included on the PrintServer's Utility Disk. (The use of the Bi-Admin program is covered in the *Managing the PrintServer* section. Follow the steps on page 18 now to install and run Bi-Admin if you haven't already).

2. When the Bi-Admin program appears, it will automatically scan the network for available Linksys PrintServer hardware. Any hardware found on the network will appear in the Default Name, Device Name, Printer Port chart. Bi-Admin will ask for the password given to the device. Enter the password and click **OK**. If no password is assigned, just click **OK**.

3. Click once on the **Device Name** of the PrintServer you want to configure in order to highlight it.

4. Click on **Configuration**, then **NetWare**. The NetWare configuration window will appear.

5. Click on the round **Remote Printer** option button to select it, then click on the **Remote Printer Configuration** button. The Remote Printer configuration window will appear.

6. Give the PrintServer its own unique name. Enter a name into the Device Name box. The name you enter will refer to the PrintServer hardware itself. (Example: MARKETING, PRINTSERVER1, TARDIS, etc.)

7. In the Novell PrintServer for P1 box, enter the name of the Novell print server resource that the Linksys PrintServer hardware will log into. The print server should already be set up on a file server or elsewhere. When you're finished, click on the **Save to Device** button.

6. Run Novell's NWAdmin program. When the program comes up, find the Context tree located on the left side of the screen. Using your mouse, navigate through the available Contexts until you come to the Context where your Novell print server is set up (it should have been set up before you began the Linksys PrintServer's software setup).

CREATE A PRINT QUEUE RESOURCE

1. When you find the proper Context, right-click on it with your mouse. Click on **Create**. Scroll down to the **Print Queue** option and double-click on it. The Create Print Queue window will appear.

2. Select the Directory Service Queue menu option.

3. Enter a name in the Print Queue name box. Example: SALESQUEUE

4. Next to the Print Queue Volume box, click on the dotted button. The Select Object window will appear. Browse through the objects and context windows until you come to an available volume where the new print queue will be installed (the volumes will appear in the Available Objects window). When the desired volume appears, double-click on it. The volume will appear in the Print Queue Volume box in the Create Print Queue window. Click on **Create**.

CREATE A PRINTER RESOURCE

1. Using your mouse, right-click on the **Context** again. When the popup menu appears, scroll down to **Printer** and double-click on it.

2. Enter a name for the printer that will be attached to the PrintServer. The name you enter must be the same as the name you gave to your Novell print server when you created it on the file server or elsewhere. When you're finished, click on the **Create** button. The printer (which is actually the Novell print server resource) will appear in the Context.

The Context should now show a print server resource, a print queue, and a printer.

CONFIGURE THE PRINTER RESOURCE

1. In the selected Context, double-click on the printer object, then click on the

Configuration tab.

2. Set the Printer type to **Parallel**. Click on the **Communication** button.

3. Set the LPT value to the appropriate port on the PrintServer where the printer will be connected. Choose parallel port 1, 2, or 3 (LPT1, LPT2, or LPT3, respectively) if you have a 3-Port PrintServer.

4. Set the Interrupts value to **Polled**. Set the Connection type to **Manual Load**. Click **OK**.

5. Click on the **Assignments** tab. Click on **Add**. The queue you created above will appear in the list of available queues. Double-click on it so that it appears in the print queues box. Click **OK**.

CONFIGURE THE PRINT SERVER OBJECT

1. Double-click on the print server object in the Context.

2. Click on the **Assignments** button, followed by **Add**. The printer you created above will appear. Double-click on it. When the printer appears in the printer list box, click **OK**.

3. On your file server, take the running print server resource service down, then bring it back up. The setup is complete. Refer to your Novell documentation to see the PrintServer on the network using PSERVER or another Novell printer utility.

ADDING A SECOND OR THIRD PRINTER (for EPSX3 only)

If you've purchased a 3-Port PrintServer, and you've decided to add a second or third printer, repeat all of the steps from Create a Printer Resource on the previous page.

When you create a new printer resource, use the same printer name you used for the first printer, with an additional _P2 or _P3 at the end to designate which additional printer you're adding. If printer number one is called myprinter, for example, printer two would be called myprinter_P2, and printer three would be myprinter_P3.

If you need to change the PrintServer's internal setup or configuration at any time, read the chapter on page 18 entitled Managing the PrintServer.

NETWARE 4.x with DOS

PRINT SERVER MODE

The instructions below explain how to establish communication between the PrintServer unit and the rest of your Novell NetWare 4.x network in a DOS environment.

1. Log into your Novell NetWare network as Administrator.

2. **Run** NetWare's PCONSOLE program from DOS.

3. When the main menu appears, choose Change Context. Enter the name of the context where you want to install the PrintServer. For more information about NetWare contexts, see your Novell NetWare user guides.

CREATE QUEUES

1. Select Print Queues from the main Available Options menu. When the Print Queues box appears, press the Insert key on your keyboard. Type in the name of the queue you want to create (example: MARKETING) and press **Enter**.

2. When asked to supply the name of the volume where the queue will be installed, press **Insert**. The Object,Class browser window will appear. Use the arrow keys on your keyboard to move through the list until you find and highlight the volume you want, then press **Enter**.

Repeat for each queue you want to create. The queues will show up in the Print Queues box. When you are finished, press **Esc**.

CREATE PRINTERS

1. Select Printers from the main Available Options menu. When the Printers list appears, press **Insert** and enter the name of the printer you want to create (example: MYPRINTER). Press **Enter** when you're finished.

2. Use the arrow keys to highlight the name of the printer you just created and press **Enter**.

3. Make sure the Printer Type is set to Parallel.

4. Scroll down to Configuration and press **Enter**.

5. Make sure the Port is set to the correct PrintServer device port.

6. The location item should be set to Auto Load. When you're finished configuring the printer, press **Esc**.

ASSIGN QUEUES TO PRINTERS

1. When the Configuration menu re-appears, arrow down to the Print Queues Assigned option and press **Enter**. Press **Insert**. Select the queue where the printer will get its jobs from and press **Enter**.

2. Press **Esc**. When the Configuration menu reappears, press **Esc** to return to the Printers list box.

3. Repeat all of the steps in the Create Printers and Assign Queues sections above for each printer you want to create. When you're finished, press **Esc** until the Available Options menu re-appears.

CREATE PRINT SERVERS

1. Scroll down to Print Server and press **Enter**. When the Print Servers box appears, press **Insert**.

2. Give the print server a name and press **Enter** (example: MARKETING). The new name will appear in the Print Servers list box. Highlight the name of the new print server and press **Enter**.

ASSIGN PRINTERS TO PRINT SERVERS

1. When the Print Server Information box appears, choose Printers and press **Enter**. Press the **Insert** key. Choose the printer you just created from the Object,Class list and press **Enter**. The printer(s) will appear in the Serviced Printers box.

2. Press **Esc** to return to the Print Server Information screen, then **Esc** again to return to the Print Servers list box. Write down the name of the print server you just created. You will need it later. Also write down the Context where the print server was created; you will find it listed at the top of the screen. When finished, press **Esc** twice to exit the program.

CONFIGURE THE PRINTSERVER HARDWARE

1. Run the PSCONFIG program located in the D:\Utility\DOS directory on the Linksys PrintServer CD-ROM.

2. The program will display an Active Device list table with a list of active PrintServers on the network. Each PrintServer has a name, default name, network number, and number of available ports.

3. Select the PrintServer device you just installed and press **Enter**. A list of available options will appear. Choose **Set to NetWare PrintServer** mode from the list and press **Enter**.

4. For the Print Server Name, use the same name you used in the Create Print Servers section on the previous page.

5. For the NDS Tree Name, choose the tree where the PrintServer was installed.

6. For the NDS Context, type in the Context name you wrote down in the Assign Printers step on the previous page.

7. Leave the Master File Server box empty.

8. Enter a number from 1 to 255 in the Polling Queue. This is how long in seconds the PrintServer will wait before polling the queue for print jobs that might be waiting.

9. If turned on, Job Notification by Connection ID will automatically notify the

file server after a job is complete, allowing the administrator to use PCONSOLE or other programs to monitor users' printing.

10. Pick the frame types you want the PrintServer to support.

11. If you'd like to change the PrintServer's configuration password (required for changing the PrintServer's internal settings), do so by clicking on **Change Password**.

12. When you're finished, click on **Execute Setup** to save the PrintServer's new changes. Close down the PSCONFIG program.

The setup is complete. The PrintServer will automatically log into your file server and make itself available for use. If you run Console Monitor or other NetWare monitoring software, you will be able to verify the PrintServer's connection.

NetWare 4.x with DOS

REMOTE PRINTER MODE

The instructions below explain how to configure the PrintServer for remote Printer Mode, and establish communication between it and the rest of your Novell NetWare 4.x network in a DOS environment.

Before you begin, make sure you have already set up a Novell print server resource on a file server or elsewhere. You will need the name of the print server before you begin. See page 18 for more information about print server resources.

1. From a workstation, log into your Novell network as Administrator.

2. **Run** NetWare's PCONSOLE program from DOS.

3. Choose **Change Context** from the main menu. Enter the name of the context where you want to install the PrintServer. For more information about contexts, see your Novell NetWare documentation.

CREATE QUEUES

1. Select Print Queues from the main menu.

2. Press **Insert** on your keyboard when the Print Queues box appears.

3. Type in the name of the queue you want to create (example: MARKETING) and press **Enter**.

4. You will be asked to supply the print queue's volume where the queued jobs will be stored. Press **Insert**. The Object,Class browser window will appear.

5. Use the arrow keys to move through the various objects and classes until you find the volume you want. Highlight it and press **Enter**.

6. The queue will show up in the Print Queues list box. Repeat these steps for each queue you want to create. When you're finished, press **Esc** to return to the main menu.

CREATE & CONFIGURE PRINTERS

1. Select Printers from the main menu. When the Printers list appears, press **Insert** and enter the name of the printer you want to add. (The "printer" in this case is actually the PrintServer device).

2. Write down the name you enter -- you will need it in a moment. Press **Enter** when finished.

3. Highlight the name of the printer you just created and press **Enter** to configure it.

4. Make sure the Printer type is set to Parallel.

5. Scroll down to Configuration and press **Enter**.

6. Make sure the Port is set to the correct PrintServer device's parallel port (LPT1, 2, or 3, depending on the port that will be servicing the printer).

7. Make sure the Location is set to Auto Load. When finished, press **Esc**.

8. When the Configuration menu reappears, arrow down to the Print queues assigned option and press **Enter**.

9. Press **Insert**. Select the print queue where the printer will get its jobs from and press **Enter**. Press **Esc** when finished.

10. When the Configuration menu reappears, press **Esc** to return to the Printers list box.

ADDING A SECOND OR THIRD PRINTER (EPSX3 only)

Repeat steps 1-10 to set the configuration for each printer you create. When adding a second or third printer, you'll need to use the same printer name you used for the same printer, with an additional _P2 or _P3 added at the end to designate which printer you're adding. If printer one is called myprinter, for example, printer two would need to be called myprinter_P2, and printer three would be myprinter_P3.

ASSIGN PRINTERS TO PRINT SERVERS

1. When you're finished, press **Esc** repeatedly until the available Options main menu reappears. Scroll down to Print Servers and press **Enter**.

2. When the Print Servers menu appears, select the Novell print server resource that was already up and running when you began the installation.

3. When the Print Server Information window appears, choose the Printers option and press **Enter**.

4. When the Serviced Printers list appears, press **Insert**. Choose the printer you want to have serviced by the print server. (The "printer" is actually the PrintServer device you set up in step 1 on the previous page).

5. After selecting the desired printer, press **Enter**.

6. Press **Esc** repeatedly until you exit the program.

CONFIGURE THE PRINTSERVER HARDWARE

1. Run the PSCONFIG program located in the D:\UTILITY\DOS directory on the Linksys PrintServer CD-ROM.

2. The program will display an Active Device list table with a list of active PrintServers on the network. Each PrintServer has a name, default name, network number, and number of available ports.

3. Select the PrintServer device you just installed and press **Enter**. A list of available options will appear. Choose **Set to NetWare Remote Printer** Mode from the list and press **Enter**. Make up a Print Server name and enter it, (ie, MARKETING, TARDIS, etc.).

4. Enter the name of the existing print server resource name into Parallel Port 1. Do the same for Port 2 and Port 3 if you have an EPSX3 and you are adding printers to the PrintServer's second and third parallel ports.

5. Select the desired frame type for your network. Select the **Execute Setup**. After the program is finished, press **Esc** repeatedly until the program closes.

The setup is complete. The PrintServer will automatically log into your file server and make itself available for use. If you run your Console Monitor or other NetWare monitoring software, you will be able to verify the PrintServer's connection. Unload and reload the print server resource on the file server. When PSERVER.NLM comes up, the newly installed printers will appear.

NetWare 3.x

Print Server Mode

The instructions below explain how to establish communication between the PrintServer unit and the rest of your Novell NetWare 3.x network in a DOS environment. PSERVER must be loaded and configured properly on your file server before continuing. Consult your NetWare documentation for information on how to do this.

MANUAL SETUP

1. Run the PSCONFIG program, which can be found under the D:\UTILITY\DOS directory on the PrintServer's CD-ROM.

2. When the table of active devices appears, highlight the PrintServer device you want to configure and press **Enter**.

3. Choose Set to NetWare Print Server Mode from the Available Options menu and press **Enter**.

4. Make up a Print Server name and enter it. Write it down also -- you will need it in a moment.

5. Skip the NDS Tree Name and NDS Context entries.

6. When you reach Master File Server, press **Enter** to choose from a list of available file servers.

7. Enter a number from 1 to 255 in the Polling Queue. This is how long in seconds the PrintServer will wait before polling the queue for print jobs that might be waiting.

8. If turned on, Job Notification by Connection ID will automatically notify the file server after a job is complete, allowing the administrator to use PCONSOLE or other programs to monitor users' printing.

9. Pick the frame types you want the PrintServer to support.

10. If you'd like to change the PrintServer's configuration password (required for changing the PrintServer's internal settings), do so by clicking on **Change Password**.

11. When you're finished, click on Execute Setup to save the PrintServer's new changes. Close down the PSCONFIG program.

12. Run Novell's PCONSOLE program.

13. Choose Print Queue Information and press **Enter**.
14. A list of available print queues will appear. Press **Insert**.

15. Enter the name of the new queue you'd like to create and press **Enter**. Repeat for each new queue you'd like to make.

16. When finished, press **Esc** to return to the Available Options menu.

17. Choose Print Server Information.

18. When the Print Servers window appears, type in the name of the PrintServer you wrote down in step 4 and press **Enter**.

19. The Print Server's name will show up in the list of available print servers. Highlight it and press **Enter**.

20. Select Printer Configuration and press **Enter**.

21. A table of configured printers will appear. The first column shows the names of the configured printers; the second column shows the LPT ports on the PrintServer device. Zero refers to LPT1, 1 refers to LPT2, and 2 refers to LPT3. Press **Enter** and fill out the information.

22. Enter a name for the printer you're attaching to the PrintServer. Make one up. Example: ACE

23. Choose the Parallel or LPT port that the PrintServer should use.

24. Set Interrupts to No and leave the IRQ and Buffer entries blank.

25. Press **Esc** to exit. Your new printer will appear in the configured printers list.

26. Press **Esc** repeatedly until the program ends.

27. The setup is complete. The PrintServer will automatically log into your file server and make itself available for use. If you run your Console Monitor or other NetWare monitoring software, you will be able to verify the PrintServer's connection.

Remote Printer Mode

The instructions below explain how to configure the PrintServer for Remote Printer Mode, and establish communication between it and your Novell NetWare 3.x network.

MANUAL SETUP

1. **Run** the PSCONFIG program under the D:\UTILITY\DOS directory of the Linksys PrintServer CD-ROM.

2. When the table of active devices appears, highlight the PrintServer device

you want to configure and press **Enter**.

3. Choose Set to NetWare Remote Printer Mode from the Available Options menu and press **Enter**.

4. Make up a Print Server name and enter it. Write it down also -- you will need it in a moment.

5. Enter the name of the existing print server resource name into Parallel Port 1. Do the same for Port 2 and Port 3 if you are adding printers to the PrintServer's second and third parallel ports.

6. Select the desired frame type for your network.

7. Select the **Execute Setup**. After the program is finished, press **Esc** repeatedly until the program closes.

8. Run Novell NetWare's PCONSOLE program.

9. From the main menu, choose Print Queue information. A list of available queues will appear. Press **Insert**.

10. Type in the name of the queue you want to create and press **Enter**. Repeat for each queue you want to create. When you're finished, press **Esc** to return to the main menu. Select Print Server Information from the main menu.

11. Select the print server resource that was already up and running when you began the PrintServer's software installation.

12. The Print Server Information screen will appear. Choose the **Print Server Configuration** menu item, followed by **Printer Configuration**.

13. A table of configured printers will appear. The first column shows the names of the configured printers; the second column shows the LPT ports on the PrintServer device. Zero refers to LPT1, 1 refers to LPT2, and 2 refers to LPT3. Press **Enter** and fill out the information.

14. Enter a name for the printer you're attaching to the PrintServer. Make one up. Example: TARDIS

15. Choose the Parallel or LPT port that the PrintServer should use.

16. Set Interrupts to No and leave the IRQ and Buffer entries blank.

17. Press **Esc** to exit. Your new printer will appear in the configured printers list.

18. Press **Esc** to return to the Print Server Configuration menu.

19. Choose Queues Serviced by Printer. A list of Defined Printers will appear. Select the printer you want to configure.

20. Press **Insert**. Choose the queue you created above. When asked for a Priority, press **Enter**.

21. Press Esc. Repeat steps 11 through 17 for each printer. When finished, press Esc repeatedly until the program closes.

Unload and reload the print server resource on the file server. When PSERVER.NLM comes up, the newly installed printers will appear.

Using Windows NT 4.0 LPR Port

To use the Windows NT 4.0 LPR port as an alternative to the Linksys Redirector Port, perform the following process.

1. Install Microsoft's *Microsoft TCP/IP Printing*. To do this, click on **Start**, **Settings**, **Control Panel**, and then double-click on the **Network** icon. Click once on the **Services** tab.

2. Choose to add a service. Click on **Add** and select the *Microsoft TCP/IP Printing* option. Restart you computer.

3. Once the computer has restarted, make sure that the printer is installed as normal. Double-check your printer's documentation or user guide before continuing.

4. At the Windows NT desktop, click on **Start**, **Settings**, then **Printers**. Right click on the printer that you would like to setup.

5. Click once on the **Ports** tab. Click on **Add Port** and select the *LPR Port* option, then select *New Port*.

6. You will be prompted to provide the following information:

• Provide the IP address assigned to the printserver, (i.e. 10.0.0.1)
• Provide the port to which the printer is attached. For example, "L1"

Choose one of the following:

L1 - for 1-Port and 3-Port PrintServers. This represents LPT1.
L2 - for 3-port PrintServers only. This represents LPT2.
L3 - for 3-port PrintServers only. This represents LPT3

7. Click **OK**

8. Once you are back at the Port tab, you should see a checkmark on it with the IP address and the printer or print queue name, (e.g.: 10.0.0.1:L1)

9. The setup is complete.

Using the 10/100 4-Port Switch + PrintServer

Switching Advantages

The two main advantages of using a switch like the 10/100 4-Port Switch + PrintServer are migration and performance boosts.

100BaseTX and 10BaseT networks are not automatically compatible with each other. Because of their different speeds, their hardware is not readily interchangeable – a 10BaseT network adapter, for example, cannot be connected directly to a 100BaseTX network segment. By using a switch, 10BaseT and 100BaseTX hardware can be made to communicate with each other so you don't need to discard your slower 10Mbps network hardware as you migrate to Fast Ethernet.

As for performance, switching technology boosts any network's efficiency right away. A network without a switch is called a shared network, which means that the network's total bandwidth is equal to its speed divided by the number of users who are actively using the net. A switched network, by contrast, gives each user a full-speed pipeline that isn't shared by any other users, which causes an immediate speed and/or efficiency increase of up to 80%.

Here are some scenarios where a switch could be used:

· Speeding up a 10BaseT Network

On a 10BaseT network, you might connect users to one of the switch's 10/100 ports and the file server to the other, allowing the server to service more users faster because it enjoys its own switched pipeline into the network.

· Mixing 10BaseT with 100BaseTX

10BaseT and 100BaseTX hardware not readily compatible with each other. With a switch you can create one 10Mbps network segment for servicing users that don't need tremendous speed, and second 100Mbps segment for users who depend on graphics, video, multimedia, database, or other speedy applications.

· Adding 10Mbps Network Peripherals

In addition, since 100BaseTX is a relatively new standard, there aren't as many network peripherals available for it as there are for 10BaseT. Most network modems, print servers, sniffers, and other network peripherals are made to operate at a speed of 10Mbps, making them incompatible with 100Mbps networks unless you have a switch. A switch can add 10Mbps hardware to your network wherever you want it.

Planning Your Network

The rules that govern how switches are distributed in Fast Ethernet are slightly different from 10BaseT networking rules. Cabling specifications, distance limits, and other topology rules must be followed in order to avoid collisions or data loss.

Here are the most important rules to follow:

- 100BaseTX requires four-pair, Category 5 UTP (EIA 568, Cat 5) Cabling.
- The maximum length for a Category 5 100BaseTX cable between a workstation and a stackable or other shared bandwidth hub is **100 meters** (328 feet).
- A single or stacked 100Mbps hub is not considered a repeater in Fast Ethernet rules; a 10/100 switch is considered a repeater.
- Multiple switches can be connected together, provided you don't put the switches more than **100 meters** (328 feet) apart.
- The maximum distance from a node, hub, repeater, or switch to a switch is **100 meters** (328 feet).
- The maximum distance between 2 100Mbps Fast Ethernet hubs without a switch is **5 meters** (16.4 feet).

Connecting Nodes to the Switch

The front of the Switch has four regular RJ-45 ports and one uplink port. Each port automatically detects the speed, type, and duplex of the cabling attached to it, and can operate in either half or full duplex, giving possible speeds of 200Mbps, 100Mbps, 20Mbps, or 10Mbps.

Your switch can be connected to workstations, PCs, file servers, hubs, repeaters, bridges, or other switches. Each cable connected to the switch must be a Category 5 UTP network cable with RJ-45 tips, and should not exceed **100 meters** (328 feet) in length. Ready-to use network cables of various lengths can be purchased at most computer stores.

Connecting Workstations and PCs

Workstations and PCs should be connected to the switch with straight-through Category 5 network cabling. If connecting a computer directly to one of the switch's ports, connect one end of the cable into the switch, then plug the other end of the cable into the computer's 10Mbps or 100Mbps network adapter.

Connecting to Other Switches and Hubs

Switches, hubs, and similar devices are connected to the switch with regular Category 5 cabling via the special uplink port. This port automatically flips the Transmit (TX) and Receive (RX) signals on the wires inside of the cable. Connect one end of the cable to the switch's uplink port, then connect the other end to any standard RJ-45 port on your hub or other device.

The uplink port is "**shared**," meaning that it shares its architecture with port number 4 on the switch. If you are using the uplink port, you will lose any connection on port 4. Be sure to disconnect any cabling in port 4 before using the uplink function.

When connecting to other hubs and switches, you must use the uplink port. Linksys does not provide any technical support for connecting devices with cross-over cables.

Powering On the Switch

Plug in the 10/100 Switch + PrintServers's AC power cord. When the device is first powered up, it will put itself into a diagnostic/self-check mode and the Power LED will light up. As your network cables are connected to the switch, each port's corresponding Link, Speed (10 or 100) and Duplex (FD for Full Duplex or HD for Half Duplex) LEDs will light up. See the list of LED configurations below.

If the switch seems to experience excessive collisions, verify that your network cabling is securely crimped and installed correctly.

10/100 Switch + PrintServer LEDs

Link/ACT The LED will turn on and stay solid when an active **link** is detected on the port. The light will flicker when **activity** (transmitting and receiving data) is detected on the port.

FD/COL When the LED is on, the port is running at **Full Duplex**. The light will flicker if **collisions** are detected on the port.

100	The LED is on when the port is running at **100Mbps**, and off when the port is running at **10Mbps**

Specifications

EPSX3 and PPSX1 only

Part No.	**EPSX3**: EtherFast 3-Port 10/100 PrintServer: **PPSX1**: EtherFast 10/100 PrintServer
Standard	IEEE 802.3, IEEE 802.3u
Topology	Star
Protocol	CSMA/CD
Ports	One NWAY Auto-Sensing 10BaseT/100BaseTX Port; Three (**EPSX3**) or One (**PPSX1**) High-Speed Bi-Directional Port(s); One Female Power Jack
Buttons and Switches	Reset Button (**EPSX3** only) Three DIP switches
Max Speed	
in Full Duplex	200Mbps (for 100BaseTX) and 20Mbps (for 10BaseT)
in Half Duplex	100Mbps (for 100BaseTX) and 10Mbps (for 10BaseT)
UTP/STP Cabling	
10BaseT	Category 3 or 5
100BaseTX	Category 5
LED Indicators	Status, Link and Error
Dimensions	**EPSX3**: 9” x 5.5” x 1” **PPSX1**: 7.5” x 5.4” x 1.4”
Unit Weight	**EPSX3**: 14 oz. **PPSX1**: 1 lb.
Rating	FCC Class B, CE, UL, and CSA
Power	12VDC, 1A (max)

Specifications

for EFSPS41

Part No.	**EFSPS41**: EtherFast 3-Port 10/100 PrintServer:
Standard	IEEE 802.3, IEEE 802.3u
Toplogy	Star
Protocol	CSMA/CD
Ports	Four NWAY Auto-Sensing 10BaseT/100BaseTX Ports One High-Speed Bi-Directional Port; One Female Power Jack
Buttons and Switches	Reset Button
Max Speed	
in Full Duplex	200Mbps (for 100BaseTX) and 20Mbps (for 10BaseT)
in Half Duplex	100Mbps (for 100BaseTX) and 10Mbps (for 10BaseT)
UTP/STP Cabling	
10BaseT	Category 3 or 5
100BaseTX	Category 5
LED Indicators	Link/Activity per port, 100Mbps per port, Full Duplex (FD) and Collision per port, Data and Error (for PrintServer), Power

Dimensions	**EFSPS41**: 7.5” x 5.4” x 2.0”
Unit Weight	1 lb., 8 oz..
Rating	FCC Class B, CE, UL, and CSA

Customer Support

For help with the installation or operation of your EtherFast 10/100 PrintServer, contact Linksys Customer Support at one of the phone numbers or Internet addresses below. For an up-to-date version of this User Guide, visit the Linksys Web Site for a downloadable Adobe PDF version.

Customer Support	949-261-1288
Fax	949-261-8868
Email	support@linksys.com
Web	http://www.linksys.com
FTP Site	ftp.linksys.com

http://www.linksys.com