

NETGEAR[®]

PS100 Series Print Server



Reference Manual

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Preface

Congratulations on your purchase of the NETGEAR Model PS100 Print Server.

Since multiple protocols and operating systems are supported, these print servers provide an effective solution for networked PCs to connect to the same printer. NETGEAR Print Servers are fast and easy to set up with NETGEAR Print Server configuration software. With Microsoft Internet Explorer or Netscape web browser, you can configure the print server even easier. Please see *Chapter 3* for details on Web management.

Purpose

This guide describes in detail how to set up the Model PS100 Series Print Server. For quick installation and setup, please see the *Model PS1xx Print Server Installation Guide*. This guide provides you with further reference information.

In this guide, the Model PS1xx Print Servers are referred to collectively as the Model PS100 Print Server or just the print server. Each model is referred to specifically when features or functions are unique to that particular model.

Related Publication





Model PS1xx Print Server Installation Guide. This guide provides instructions for installing the print servers by using the NETGEAR Print Server Utility, a program developed by NETGEAR for fast and easy device configuration, and for web configuration, a built-in web server in the print server so you can use a browser to configure the print serve

Conventions

This section describes the conventions used in this guide.

Special Message Icons

This guide uses the following icons to highlight special messages:

	<ul style="list-style-type: none">• This icon is used to highlight information of importance or special interest.
	<ul style="list-style-type: none">• This icon is used to highlight information that will help you prevent equipment failure or loss of data.
	<ul style="list-style-type: none">• This icon is used to highlight material involving possibility of injury or equipment damage.
	<ul style="list-style-type: none">• This icon is used to alert you that you may incur an electrical shock by mishandling equipment.

Use of Enter, Type, and Press

This guide uses "enter," "type," and "press" to describe the following actions:

When you read "enter," type the text and press the Enter key.

When you read "type," type the text, but do not press the Enter key.

When you read "press," press only the alphanumeric or named key.

Other Conventions

This guide uses the following additional conventions:

italics Book titles and UNIX file, command, and directory names.

Initial Caps Menu titles and window and button names.

Courier Screen text, file contents and file names.

Chapter 1: Introduction

- This chapter describes the features and the components of the PS100 Print Server.
 - Section 1-1: PS111W Wireless Ready Print Server
 - Section 1-2: PS110 2-Port Print Server
 - Section 1-3: PS101 Mini Print Server

1-1 PS111W Wireless Ready Print Server Features

NETGEAR PS111W Print Server offers:

- 802.11b standard wireless ready mobile flexibility, and also supports:
 - Wired Equivalent Privacy (WEP) 40/64 or 128 bit encryption
 - Open System and Shared key authentication
 - Infrastructure, ad-hoc, and 802.11 ad-hoc communication modes
 - Up to 11 channels or 13 channels (depending on local country regulations)
- Print support - both wired and wireless simultaneously, when wireless set to ad-hoc mode
- Support for multiple protocols (TCP/IP, NetBEUI, and NetBIOS)
- Support for multiple operating systems (Windows 95 OSR2, Windows 98, Windows Me, Windows NT, Windows 2000, and Windows XP)
- Easy configuration of the device with NETGEAR Print Server software that assures fast and easy setup for Windows 95, Windows 98, Windows Me, Windows NT, Windows 2000, and Windows XP users.
- Web browser interface provides an easy way to configure the print server in a TCP/IP network
- Auto-sensing 10BASE-T/100BASE-TX Ethernet connection on the PS100 Print Server.
- One bi-directional parallel port.
- Compact size that allows the print server to be used where space is limited or to be mounted with Velcro® on the side of a printer
- Wall-mounting holes for attaching the print server to a vertical surface
- Upgradeable BIOS Flash EPROM

The LEDs that indicate the status of the server, wired, and wireless LAN are located on the front panels of the Model PS111W Print Server, as illustrated below:

Front Panel and LEDs of PS111W

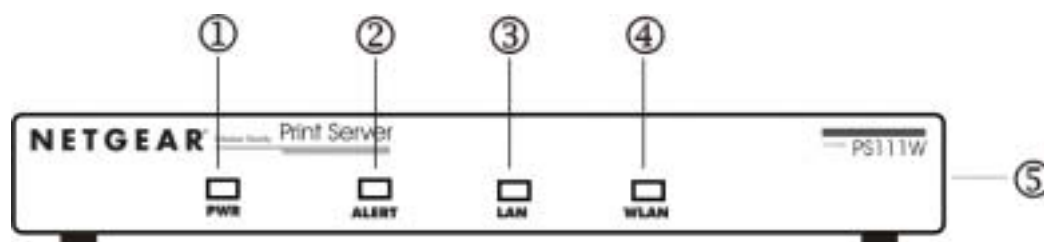


Figure 1-1 Front Panel of the Model PS111W Print Server

Key:

- 1 = PWR (power) LED
- 2 = ALERT LED
- 3 = LAN LED
- 4 = WLAN (wireless LAN) LED
- 5 = Side panel wireless PC card slot

There are 4 LEDs on the front panel of the Model PS111W Print Server. See the table below:

LED Descriptions

Label	Color	Activity	Description
PWR (power)	Green	On	Power is supplied to the print server.
Alert	Amber	Off	Operation is normal
		On	Hardware error
		Blinking	Upgrading BIOS flash ROM
LAN	Green	Off	No LAN connection
		On	Operation is normal without data transmitting or receiving from LAN
		Blinking	Operation is normal with data transmitting or receiving from LAN
WLAN	Green	Off	No wireless PC card
		On	Operation is normal without data transmitting or receiving from wireless LAN
		Blinking	Operation is normal with data transmitting or receiving from wireless LAN

Rear Panel of PS111W

The rear panel of the Model PS111W Print Server has a parallel port for printer. The Model PS111W Print Server has one 10/100BASE-T network port. The 10/100BASE-T port is an auto negotiation port that operates in 100 Mbps and in half-duplex mode when connected to a Fast Ethernet network.

If pressed for 2 seconds, the **diagnostic print and reset to factory default** button will print the current print server setup including IP address and wireless information. If pressed and held for ten seconds while powering from off to on, the **diagnostic print and reset to factory default** button will reset the print server back to factory default settings.

The Rear Panel as illustrated below, it has a power adapter receptacle that accepts a 12VDC 800mA power adapter.

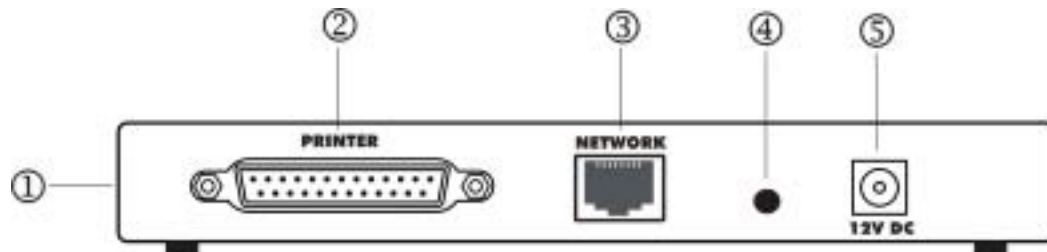


Figure 1-2 Rear Panel of the Model PS111W Print Server

Key:

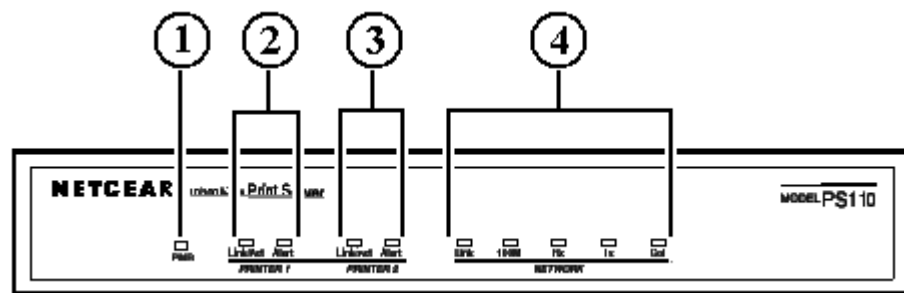
- 1 = Side panel wireless PC card slot
- 2 = PRINTER (parallel) port
- 3 = NETWORK port (10/100BASE-T connector)
- 4 = Diagnostic print and reset to factory default button
- 5 = Power adapter receptacle

1-2 PS110 2-Port Print Server Features

NETGEAR PS110 Print Servers offer:

- Support for multiple protocols (TCP/IP, NetBEUI, IPX/SPX, and AppleTalk)
- Support for multiple operating system (Windows 95 OSR2, Windows 98, Windows Me, Windows NT, Windows 2000, Windows XP, Novell NetWare, and UNIX) printing
- Support Mac OS printing with AppleTalk
- Easy configuration of the device with NETGEAR Print Server software that assures fast and easy setup for Windows 95, Windows 98, Windows Me, Window NT, Windows 2000, and Windows XP users.
- Web browser interface provides an easy way to configure the print server in a TCP/IP network
- Auto-sensing 10BASE-T/100BASE-TX Ethernet connection on the PS100 Print Server.
- Two bi-directional parallel ports on the PS110 Print Server.
- Compact size that allows the print server to be used where space is limited or to be mounted with Velcro on the side of a printer
- Extensive LED indicators for at-a-glance status
- Upgradeable BIOS Flash EPROM

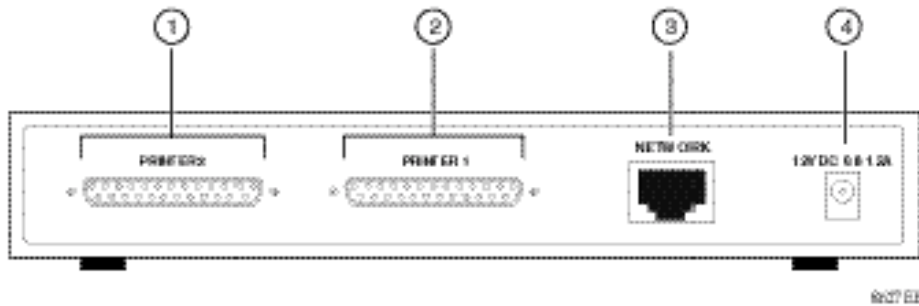
Front Panel and LEDs of PS110



Key:

- 1 = PWR (power) LED
- 2 = Printer 1 LEDs
- 3 = Printer 2 LEDs
- 4 = NETWORK LEDs

Rear Panel of PS110



Key:

- 1 = PRINTER 2 (parallel) port
- 2 = PRINTER 1 (parallel) port
- 3 = NETWORK port (10/100BASE-T connector)
- 4 = Power adapter receptacle

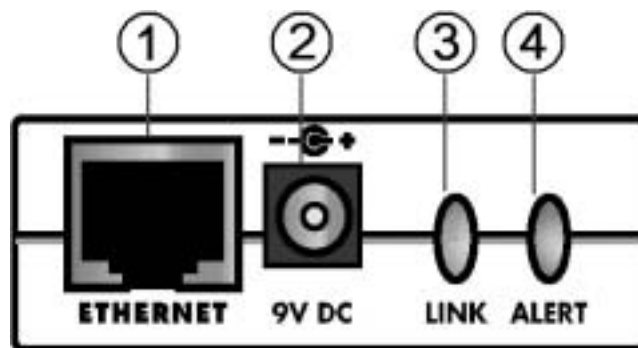
1-3 PS101 Mini Print Server Features

NETGEAR PS101 print server offers:

- Extremely compact size to fit into the back of almost any kind of the printer.
- Eliminates the need for a printer cable.
- Easy configuration of the device with NETGEAR Print Server software that assures fast and easy setup for Windows 95 OSR2, Windows 98, Windows Me, Window NT, Windows 2000, and Windows XP users.
- Web browser interface provides an easy way to configure the print server in a TCP/IP network
- 10BASE-T standard Ethernet capable to connect any 10/100 Mbps hub and switch.
- One bi-directional parallel port on the Model PS101 Print Server.
- Upgradeable BIOS Flash EPROM

Front Panel of PS101

The LEDs that indicate the status of the server and the Ethernet traffic are located on the front panel of the Model PS101 Mini Print Server. It has one 10/100 Mbps network port. The port operates in 10/100 Mbps when connected to a 10/100Mbps Ethernet network. As illustrated bellow, it has a power adapter receptacle that accepts a 9V 500mA DC power adapter.



1-1 Panel of the Model PS101 Mini Print Server

Key:

- 1 = 10/100 Mbps ETHERNET port
- 2 = Power adapter receptacle
- 3 = LINK LED
- 4 = ALERT LED

There are 2 LEDs on the panel of the Model PS101 Mini Print Server. See the table bellow:

LED Descriptions

Label	Color	Activity	Description
LINK	Green	Off	No ETHERNET connection
		On	Powered ON Operation is normal without data transmitting or receiving from ETHERNET
		Blinking	Operation is normal with data transmitting or receiving from ETHERNET
ALERT	Amber	Off	Operation is normal
		On	Hardware error
		Blinking	Upgrading BIOS flash ROM

The parallel port of the Model PS101 Mini Print Server is a standard Centronics 36 type connector for printer. The connector is as illustrated below.



Centronics 36 connector of the Model PS101 Mini Print Server

Note: Model PS101 Mini Print Server does not support printer using USB or Mini Centronics-C connectors.

CHAPTER 2: INSTALLATION

- This chapter describes the installation and setup of the NETGEAR PS100 Printer Servers.

2-1 Preparing the Site

Before you begin installing the print server, prepare the installation site. Make sure the operating environment meets the physical requirements of the print server, as described below.

2-2 Verifying Package Contents

Your package should contain the following:

- PS100 Print Server
- AC Power adapter
- PS100 Print Server Resource CD
- PS1xx Print Server Installation Guide
- Warranty & Owner Registration Card
- Customer Support Phone Card

Keep the packaging and other materials in case you need to return it for repair.

2-3 Connecting Devices to the Print Server

The Model PS101/PS110/PS111W Print Servers have one 10/100-BASE-T network port that is auto sensing and will support either 10 Mbps or 100 Mbps connections, depending on the connected device.

The network port on the all Print Server Model is configured for uplink wiring, which means you can connect the Print Server directly to an Ethernet switch or hub using a straight-through (or patch) Ethernet Cat5 (or higher) cable.



- Ethernet specifications limit the twisted pair cable (called a twisted pair segment) extended from a network port to 328 ft. (100 meters) in length.
- Centronics Parallel port limits the printer cable length to 10 ft. (3 meters).

The Model PS111W Print Server has one wireless PC card slot. It can be operated under three types of environments: LAN, wireless LAN, and both LAN and wireless LAN. Connecting the network port to an Ethernet hub/switch allows all LAN connected workstations to print using the PS111W Print Server. With a NETGEAR MA401 802.11b Wireless PC Card inserted into the PS111W, all 802.11b wireless connected workstations can print with PS111W Print Server. If a wireless Access Point is connected to the LAN, then all LAN connected workstations can also print.

You may use both an Ethernet LAN and a wireless PC Card adapter **ONLY** if the wireless clients are using Ad-Hoc Mode and there is **NO** wireless Access Point or Router. This is an unlikely configuration.

You should only insert or remove the wireless PC card with the PS111W Print Server unplugged.



To avoid damaging to the wireless PC card or the PS111W Print Server, do NOT insert or remove the PC card while the power of the Print Server is on.

2-4 Verifying Power

To complete the installation, connect the power adapter first to the power adapter receptacle on the print server rear panel and then to the power outlet on the wall. When power has been applied to the print server:

- The green PWR (power) LED on the front panel is on, if there is one.
- On the PS101 Print Server Model, the green Link LED on connected network port is on.
- On the PS110 Print Server Model, the green Link/Act LED on the connected PRINTER, PRINTER 1 or PRINTER 2 port is on.
- On the PS111W Print Server Model, the green LAN LED on connected network port is on, and, if the NETGEAR MA401 801.11b Wireless PC Card in PC card slot, the green WLAN LED is on.

Make sure the network interface cards installed in the workstations are in working condition and the software driver has been installed on the computers.

If you are re-installing a print server that has previously been in use, verify the integrity of the print server by resetting it. Turn power to the print server off and then back on. If this does not help, you can try to load the factory default setting. The procedure is: turn power to the print server off, press and hold the diagnostic and reset to factory default button while turning the power back to the print server.

There are several options to configure the print server, depending on your operating system:

1. **All operating systems:** Web management, described in Chapter 3
2. **Microsoft Windows:** Described in the *PS1xx Installation Guide* and in Chapter 4
3. **Unix/Linux:** Described in Chapter 5
4. **Netware:** Described in Chapter 6
5. **Apple Macintosh:** Described in the *PS110 Installation Guide* and in Chapter 7
6. **Advanced Windows users:** Described in Chapter 8

If you have problems and you have completed all the preceding diagnoses, contact NETGEAR Customer Support as described on page i. The best place to start is with the Frequently Asked Questions (FAQs) on www.NETGEAR.com.

Chapter 3: Web Management of Print Server

- This chapter applies to all NETGEAR Print Server models except
 - Macintosh printing with AppleTalk does not apply to PS101
 - Linux/Unix and Novell Netware printing do not apply to PS101 and PS111W
 - Wireless applies to PS111W only

The web browser interface provides an easy way to configure the print server in a TCP/IP network. You can configure your NETGEAR PS100 Print Server using any web browser such as Microsoft Internet Explorer or Netscape Navigator. NETGEAR recommends you use browser versions 5.x and above.

This chapter contains information about configuring your NETGEAR PS100 Print Server using the print server's browser interface. Please refer to the next following chapters for setting up your printing system.

3-1 Configuring Print Server for TCP/IP

Using a web browser to configure a NETGEAR Print Server requires both the print server and the workstation on to be configured for TCP/IP. This is the default for most computers sold in the last few years.

NETGEAR PS100 Print Servers are set with the factory setting to obtain an IP address automatically using DHCP. If you have a DHCP server (most broadband routers have this feature), the PS100 will get its own IP address settings for TCP/IP. However, NETGEAR recommends using a static IP address so you can configure the print server with a web browser using the same address each time.

To find the print server's IP address for PS111W, press and hold the RESET button for two seconds. The printer will print out the print server status report, which includes the IP address information. For all other models, the IP address of the print server can be found under "Device Information" in the "Control" menu of the NETGEAR Print Server Administration Program.

You may also reset the IP address of the print server using the IPSetup utility on a Windows computer. Click **Start**, Programs->NETGEAR Print Server->IPSetup.

3-2 Connecting to the Print Server

In order to configure the print server over the browser interface, your PC workstation must have a web browser program installed such as Microsoft Internet Explorer or Netscape Navigator. Free browser programs are available for Windows, Macintosh, or Unix/Linux.

1. **Start your Web Browser**
2. **In the Address box, enter http:// followed by the IP Address of the print server. For example, http://192.168.0.150 and then click Go.**
3. **You will then be prompted for the password. If no password has been set, just click OK.**
4. **Use the menu selections listed on the left of the screen to move about.**



Remember to save modifications made on any screen by clicking the **Save** button before changing to a different screen.

3-3 Browser Menu selections and Configuration Screens

This section describes the browser menu selections and corresponding configuration screens.



The menu at the left panel of the browser may vary. It depends on which NETGEAR Print Server model you have.

Server Status

The Server Status screen shows print server system data and the current settings for all of the other screens. It is read-only; no data can be input on this screen. Click the refresh button to refresh information on this screen. Use the scroll bar to scroll through the display information. Figure 3-1 shows the Server Status Screen.

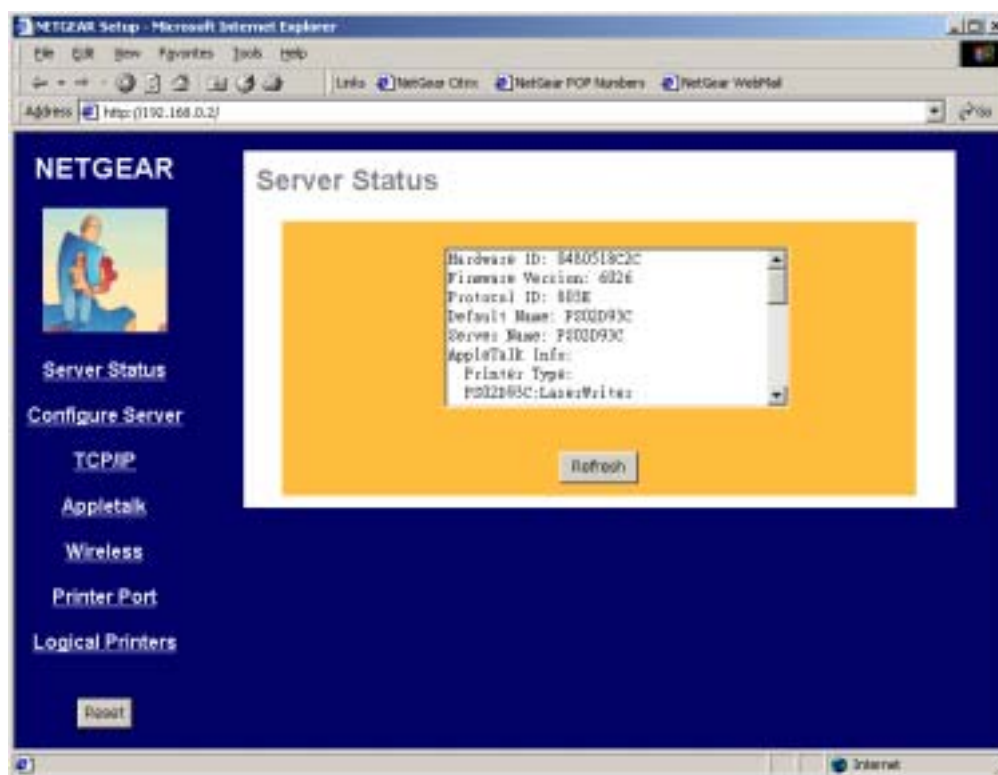


Figure 3-1 Server Status Screen

Configure Server

Clicking the Configure Server menu selection brings up the Configure Server screen. The Configure Server screen contains fields to change the print server name and to enable or disable the various network protocols supported by the print server. Figure 3-2 and following table show the Configure Server Screen and describe each of its fields.

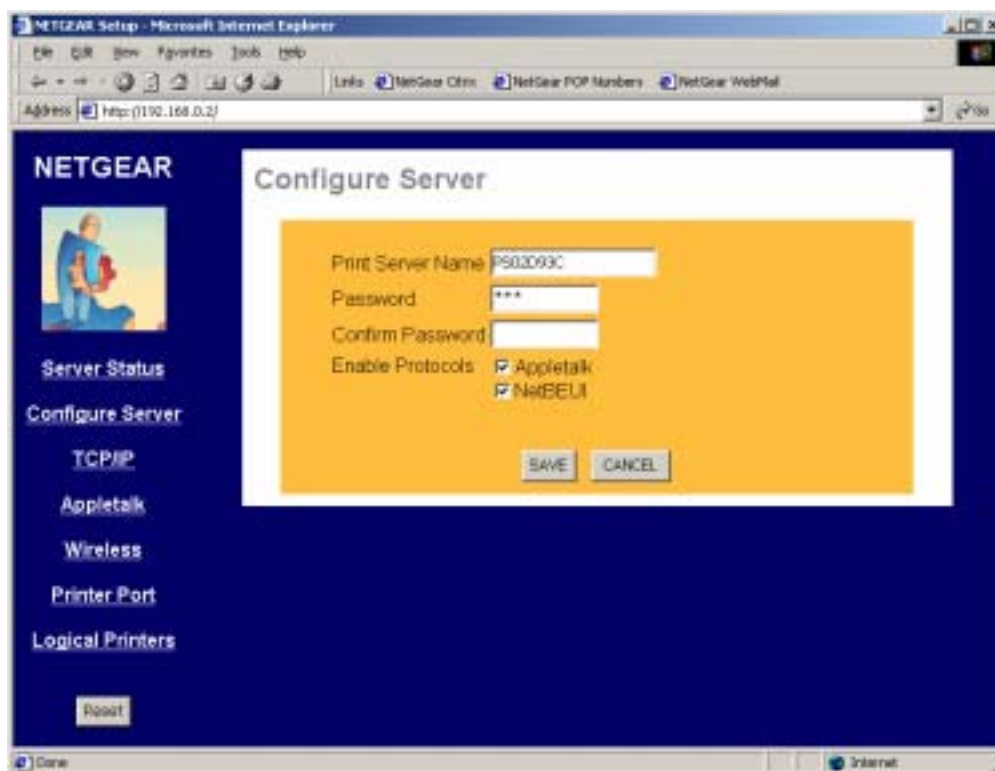


Figure 3-2 System Configuration Screen



Use key **Tab** on keyboard to move the cursor from field to field besides using the mouse.

Configure Server Fields

Print Server Name	Choose a descriptive name for the print server for identification purposes. This name is used in all protocols to identify the specific print server. There is a factory default name. For any change, NETGEAR recommends that a name be determined before configuring the client computers in any network. This name should be no more than 16 characters with at least one non-numerical letter. Spaces are not allowed, but dashes (-) and underscore marks (_) are accepted.
Password Confirm Password	Enter the device password, and again in the Confirm Password field. Once a password is entered, it is required in order to gain access and change the configuration. If you forget the password to the print server, the only way to reset it is by resetting the device to factory default through the NETGEAR Print Server Administration Program.
Enable Protocols	Check the corresponding protocols to enable them on the print server. AppleTalk is used to support AppleTalk printing from Apple computers. NetBEUI is primarily used in a small-scale Microsoft networking environment. A protocol may be disabled if it is not required for your network, but it is not required to do so.

TCP/IP

The TCP/IP configuration screen is used to configure the IP address of the print server. Figure 3-3 shows the TCP/IP configuration screen and following table lists its fields, describes the functions, and explains how to provide information in each field.

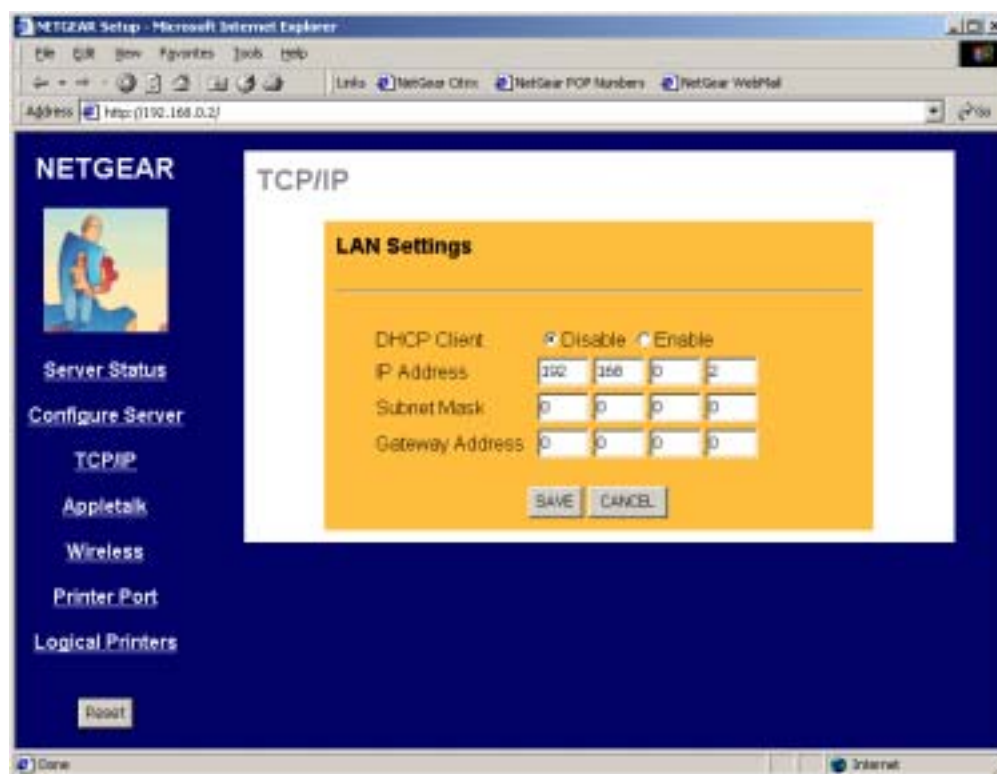


Figure 3-3 TCP/IP Configuration Screen

TCP/IP Configuration Fields

DHCP Client	This field allows you to enable or disable the print server's ability to get its IP address from a DHCP (Dynamic Host Configuration Protocol) server. When disabled, you can provide a fixed IP address in the following fields. If DHCP client is enabled, the fields that follow are not used.
IP Address	This IP address is assigned to the print server. If you have a private LAN and do not plan to connect to the TCP/IP based internet, NETGEAR recommends that you use the address from the IETF-designated private addresses (for example, 192.168.x.x or 10.x.x.x). The first 3 numbers should match the numbers in the Gateway address and the last number needs to be unique on the network.
Subnet Mask	This subnet mask defines the range of addresses that are reachable on your local LAN. For example, in a network with a NETGEAR router, the default subnet mask is usually 255.255.255.0.
Gateway Address	This is the IP address of the router on your network. For example, in a network with a NETGEAR router, the gateway address is usually 192.168.0.1.
Save Cancel Buttons	Save: After the configuration, click on 'Save' button to save the value permanently to Print Server. Cancel: No modification will be made.

AppleTalk

The NETGEAR Print Server supports AppleTalk (EtherTalk), PAP, ATP, NBP, ZIP and DDP protocols, enabling Apple computers on the network to view and use the Print Server as a regular AppleTalk printer.

The NETGEAR Print Server is enabled for AppleTalk printing by default. Further AppleTalk configuration may be configured through a web browser if the print server is configured for IP access. If the Print Server is not configured for IP access, configuration of the Printer Server for AppleTalk may be performed through the Print Server Admin program on Windows for Apple machines. Figure 3-4 shows the AppleTalk configuration screen and the following table describes its fields.



Figure 3-4 AppleTalk Configuration Screen

Apple Talk Configuration Fields

AppleTalk Zone	The AppleTalk zone that the print server will appear in. To put the print server in the default AppleTalk zone of the AppleTalk network the print server is connected to, enter a single asterisk.
Printer Type	These are text fields, used to describe the printer driver used for each port. Currently the only printer driver supported for AppleTalk is LaserWriter, so do NOT change this field.
Communication Protocol	Sets whether the port uses ASP, TBSP or BCP Communication Protocol. The default is BCP.
Save Cancel Buttons	Save: After the configuration, click on 'Save' button to save the value permanently. Cancel: No modification will be made.

Wireless

The Wireless screen provides selections for many wireless related operations. See Figure 3-5.

For wireless operation, there are two major configurations.

1. Wireless related setups.
2. Wired Equivalent Privacy (WEP) encryption.

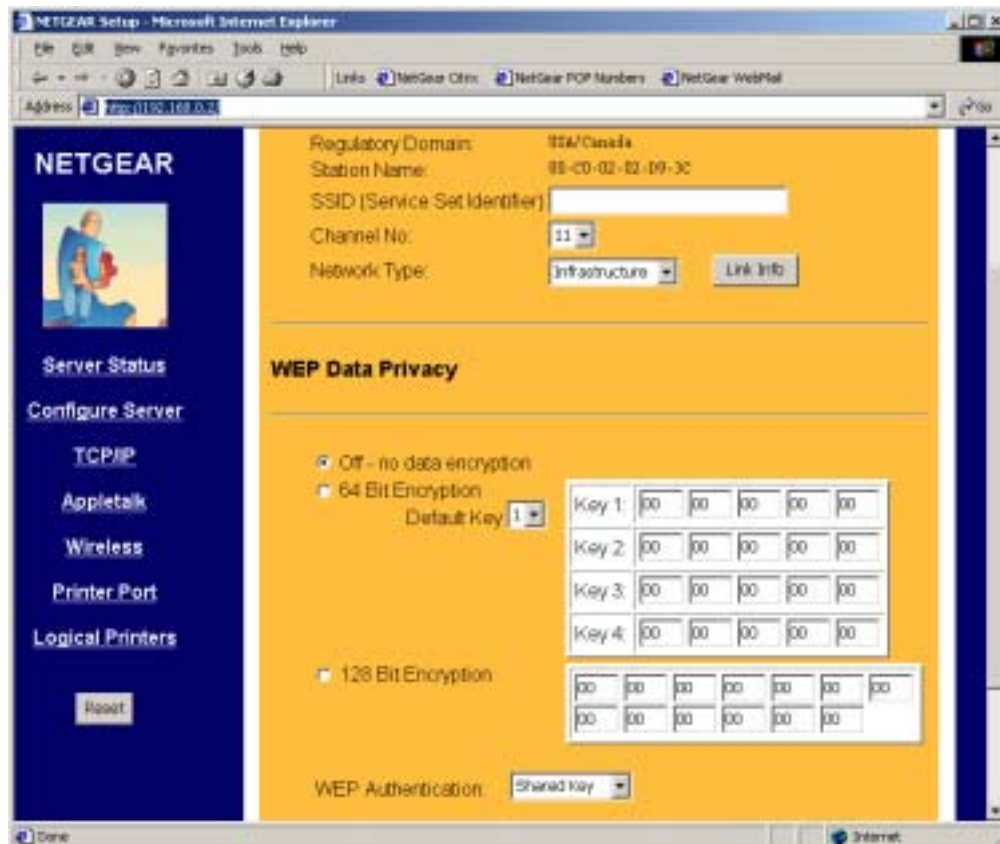


Figure 3-5 Wireless Screen

Configuration fields and buttons

Regulatory Domain	This information is set automatically by the 802.11b wireless adapter. You cannot change this field.
Station Name	The Ethernet MAC address for the 802.11b wireless. You cannot change this field.
SSID	The Service Set Identifier is the 32-character name for the wireless network. It MUST be the same on the Access Point, the Print Server and any client computers accessing the wireless network.
Channel No	<p>The Channel Number ranges from 1 to 11 for North America, and varies for other countries depending on local regulations. All wireless stations MUST use the same Channel Number.</p> <ul style="list-style-type: none"> • If using "Ad-hoc" , select the value you are using for other stations on your wireless LAN. • If using "Infrastructure" mode, you do not need to set this. The Channel Number is selected automatically to match the Channel Number used by the Access Point. • If you experience interference (shown by lost connections and/or slow data transfers) you may need to experiment with different channels to see which provides the best signal.
Network Type	<p>Select the wireless Network Type to match your wireless LAN.</p> <ul style="list-style-type: none"> • Infrastructure mode is used when each wireless station connects to the wireless Access point. This also provides access to the wired LAN and is the most common type. • 802.11 Ad-hoc mode is used when there is no wireless Access Point, and each wireless station communicates directly with other wireless stations. This is the current standard. • Ad-hoc mode is used when there is no wireless Access Point, and each wireless station communicates directly with other wireless stations. This is the older standard.

WEP Data Privacy Fields

WEP Data Privacy	<p>By default your data is NOT encrypted before being transmitted. This means it is possible for someone to eavesdrop on your network. If you are concerned about security, you should use encryption. You MUST use the same level of encryption and WEP keys on each wireless station.</p> <p>Choose the data privacy encryption from one of the three:</p> <ul style="list-style-type: none"> • Off – No data encryption • 64 Bit Encryption: medium level of encryption • 128 Bit Encryption: high level of encryption
64 Bit Encryption	<ul style="list-style-type: none"> • If selected, data is encrypted using the default key before being transmitted. The receiving station must be set to 64 Bit Encryption, and have the same Key value in the same position in its key table. Otherwise, it will not be able to decrypt the data. • Default Key - select the key you wish to be the default. Transmitted data is ALWAYS encrypted using the Default Key; the other keys are for decryption only. <p>Key 1, Key 2, Key 3, and Key 4</p> <p>This table is used when Encrypting and Decrypting data. All stations, including the Access Point, always transmit data encrypted using their default key. The key number (1, 2, 3, 4) is also transmitted. The receiving station will use the key number (1, 2, 3, 4) to determine which key value to use for decryption. If the key value does not match the transmitting station, decryption will fail.</p> <p>The easiest way to ensure there are no problems is to have every Station, including the Access Point, use the same key table (all entries identical). It does not matter which default key is used.</p> <p>Enter two hexadecimal numbers in each cell. A hexadecimal number is one of 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, a, b, c, d, e, and f, which represent the number from 0 to 15 respectively.</p>
Default Key	Choose from 1 to 4. For usage please see '64 Bit Encryption' above.
128 Bit Encryption	<p>If selected, data is encrypted using the Key before being transmitted. The receiving station must be set to use 128 Bit Encryption, and have the same Key value. Otherwise, it will not be able to decrypt the data.</p> <p>Enter two hexadecimal numbers in each cell. A hexadecimal number is one of 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, a, b, c, d, e, and f, which represent the number from 0 to 15 respectively.</p>
WEP Authentication	<p>Select the value to match other wireless devices.</p> <p>Although NETGEAR wireless adapters, Access Points and routers support both modes, some wireless adapters and Access Points do not. Check your documentation to determine the correct value to use.</p>
Save Cancel Buttons	<p>Save: After the configuration, click on 'Save' button to save the value permanently.</p> <p>Cancel: No modification will be made.</p>

Wireless Link Info

The Link Info button displays the current wireless settings. See Figure 3-6 for an example of the wireless information displayed.

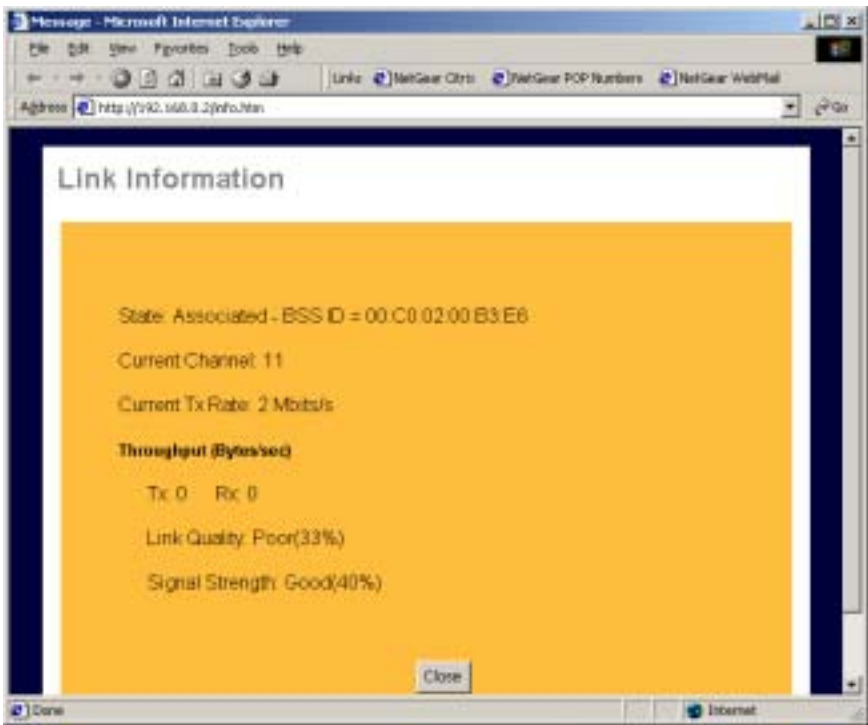



Figure 3-6 Wireless Link Information Screen

Wireless Link Info Fields

State Associated – BSS ID	The Access Point Base Station Set ID MAC address that is providing connection to the Ethernet wired network.
Current Channel	The current wireless channel. If the Network Type is Infrastructure Mode, the channel is automatically set to be the same as with the Access Point.
Current Tx Rate	The current wireless communication speed in Megabits/second (8 bits = 1 Byte)
Throughput	Tx: The current transmitting rate in bytes per second Rx: The current receiving rate in byte per second Link Quality: The quality of the link - excellent or poor and a percentage Signal Strength: The signal reception - excellent or poor and a percentage

	The information is only meaningful when there is a NETGEAR MA401 802.11b wireless PC card installed in the PS111W slot.
---	---

Printer Port

The Printer Port screen provides the status of the printer. See Figure 3-7.

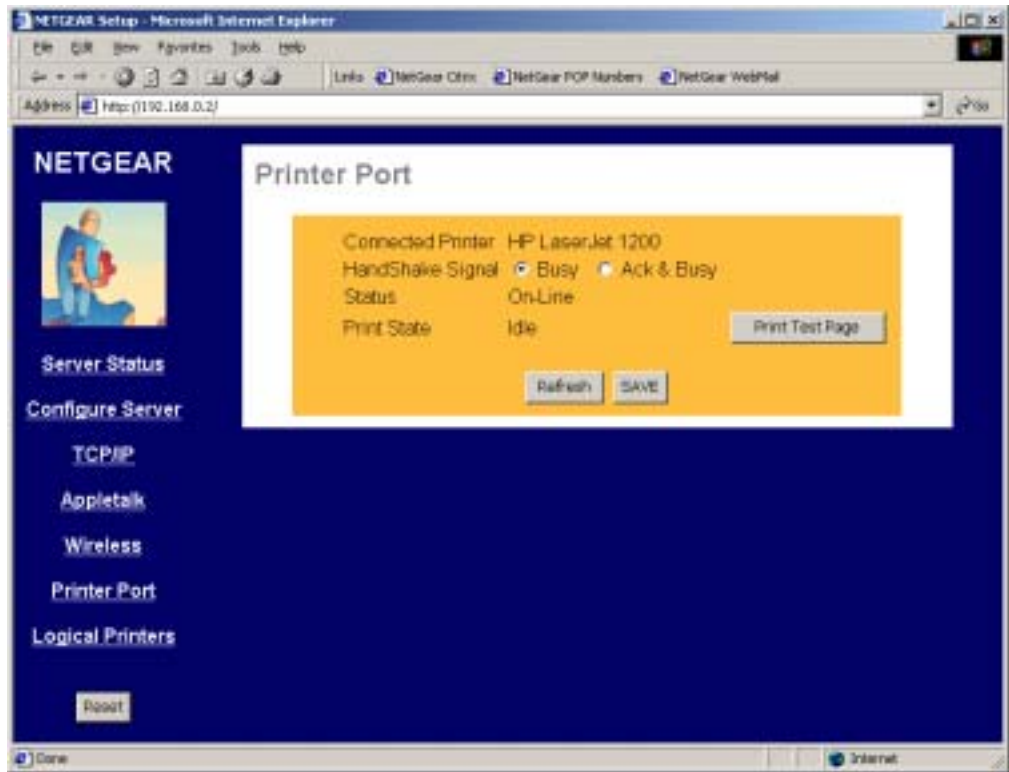


Figure 3-7 Printer Port Screen

Printer Port

Connected Printer	Shows the descriptive name for the printer.
HandShake Signal	This sets the communication parameters between the print server and the printer. The default is "Ack & Busy". Only change this to "Busy" if advised to do so by Technical Support.
Status	The current status of the printer (On-line, Off-line, Out of paper)
Print State	This will show either Idle or Printing, depending on the state of the printer.
Print Test Page	Click on this button to print the print server status page.

Logical Printer

The logical printer screen is used to map different logical printer ports to printers attached to the Print Server. A logical printer port is used to specify a set of printer control commands to be sent to a printer for every print job sent through the logical port. Generally, you do not need to use these settings. Figure 3-8 shows the logical port screen and the following table describes its fields.

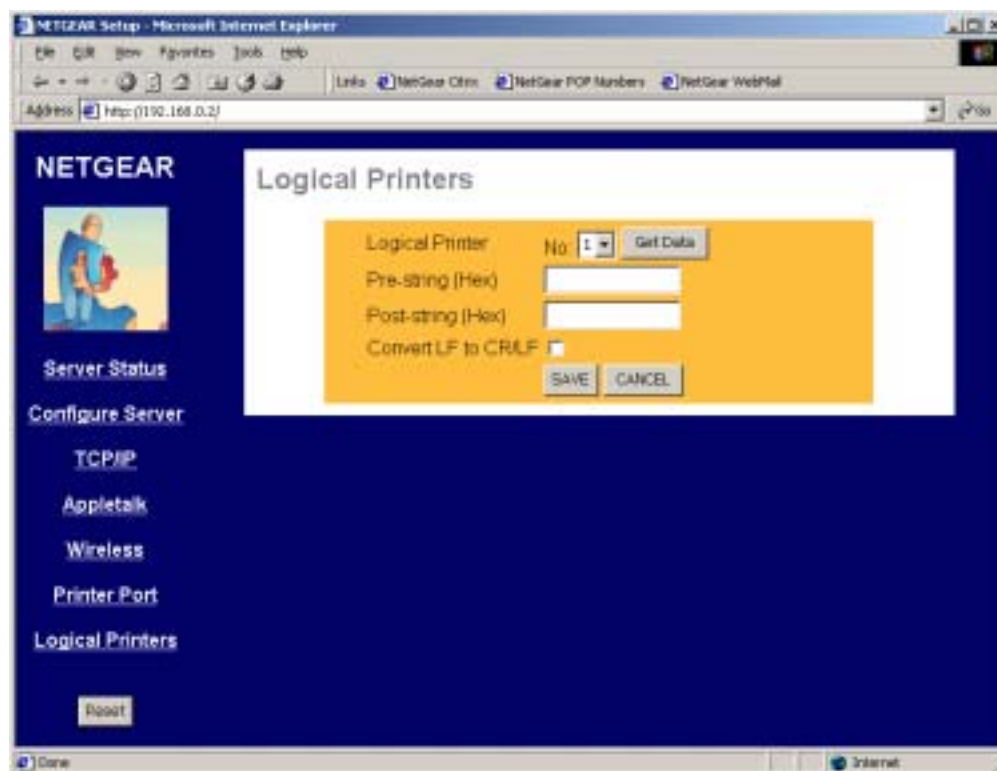


Figure 3-8 Logical Port Screen

Logical Port Fields

Logical Port	Selects the logical port to be configured. Three logical ports are available.
Get Data	Click this button to display the saved configuration parameter for the selected logical port.
Pre-String (Hex)	Provides the hexadecimal control character string to send to the printer before the first character of the job is sent to the printer. One example would be switching to landscape mode when printing to the logical port. The string is made up of the hexadecimal code of the corresponding ASCII characters, as in these examples: The PCI (Printer Command Interface) command in ASCII = [Esc]& 00, therefore enter: Hexadecimal = 1B266C304F ASCII=[Esc]& 10 Hexadecimal = 1B266C314F An ASCII to hexadecimal number conversion table is included in the appendix.
Post-String (Hex)	Provides the hexadecimal control character string to send to the printer after the last character of the job is sent to the printer. The character string must be in hexadecimal format as illustrated in the example above.
Convert LF to CR/LF	If checked, adds a carriage return (CR) every time the line feed (LF) character code is received by the print server when print data is sent to this logical printer port. Generally this should be unchecked. It may be needed for compatibility between Unix and Windows computers.
Save Cancel Buttons	Save: After the configuration, click on 'Save' button to save the value permanently. Cancel: No modification will be made.

NetWare General

The NetWare General screen provides selections for NetWare print server operation mode and Ethernet frame type selection. Depending on which NetWare print server operation mode is selected on this screen, either the NetWare Print Server or NetWare Remote Printer menu options should then be selected for mode specific configuration. Figure 8-4 and Table 8-2 show and describe the NetWare general configuration screen and its fields.

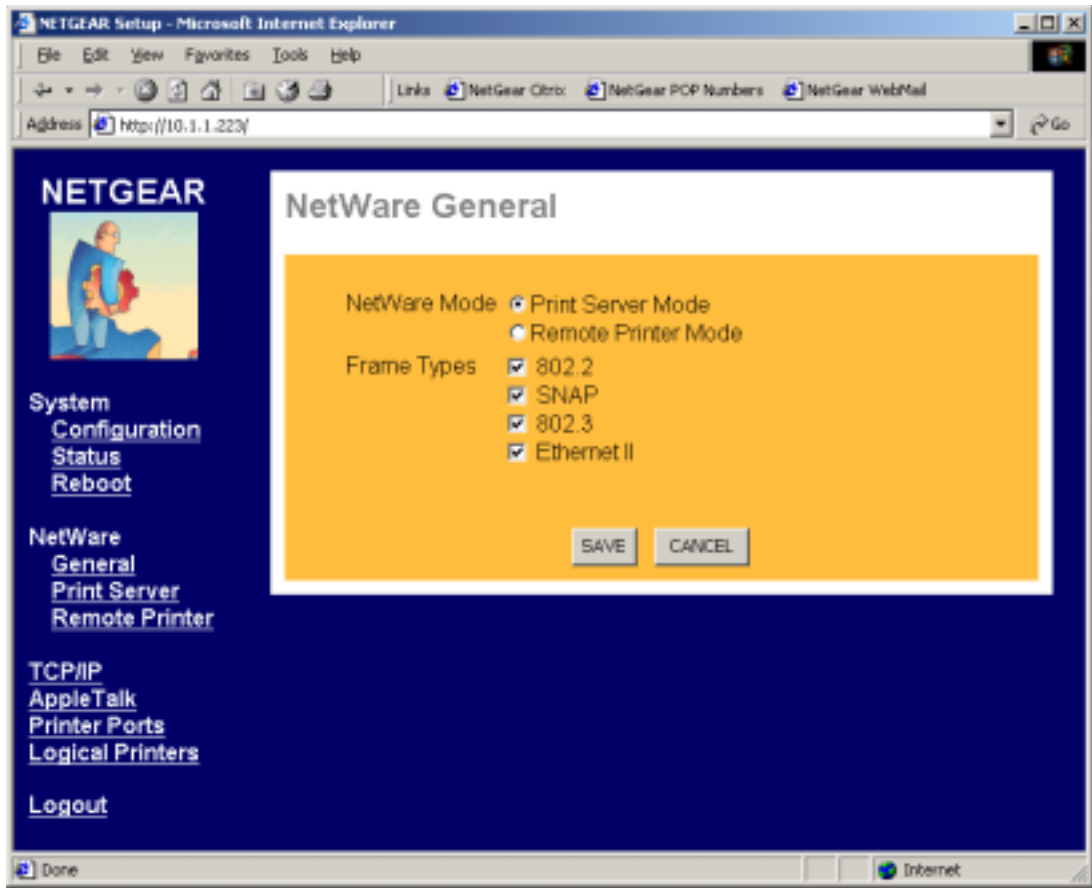


Figure 3-9 NetWare General Configuration Screen

NetWare General Configuration Fields

NetWare Mode	Select NetWare print server operation mode. The choices are NetWare Print Server Mode or NetWare Remote Printer Mode. The default is Print Server Mode.
Frame Types	Select the frame types used by your network. (Ethernet 802.2, Ethernet 802.3, Ethernet SNAP, and Ethernet II) By default, all frame types are enabled.

NetWare Print Server

Use this screen when the operating mode is set to NetWare Print Server in the NetWare General configuration screen. This screen sets the name of the NetWare Master File Server or NDS tree that the print server should service. Figure 8-5 and table 8-3 show and describe the NetWare Print Server mode configuration screen and its fields.

The screenshot shows a web browser window titled "NETGEAR Setup - Microsoft Internet Explorer". The address bar displays "http://10.1.1.223/". The main content area is titled "NetWare Print Server" and contains a yellow box with the following fields and options:

- NDS Tree Name:
- NDS Context:
- Master File Server: (Bindery Mode only)
- NetWare Password:
- Job Notification: ☐ Originating Workstation only ☒ All log-ins
- Queue Polling Interval: (1..255)

Below the fields are "SAVE" and "CANCEL" buttons. On the left side of the page, there is a sidebar with the following links:

- NETGEAR** (with a logo)
- [System Configuration](#)
- [Status](#)
- [Reboot](#)
- NetWare**
- [General](#)
- [Print Server](#) (highlighted)
- [Remote Printer](#)
- [TCP/IP](#)
- [AppleTalk](#)
- [Printer Ports](#)
- [Logical Printers](#)
- [Logout](#)

The status bar at the bottom shows "Done" and "Internet".

Figure 3-10 NetWare Print Server mode Configuration Screen

NetWare Print Server mode Configuration Fields

NDS Tree Name	For use in NetWare 4.X NetWare Directory Services (NDS) mode only. This is the NDS tree that the print server logs on. The name must not exceed 19 characters and may not contain any spaces.
NDS Context	NetWare 4.X NDS mode only. Enter the Print Server NDS context. The entry should contain the path to the context but not the context itself, and each OU (Organizational Unit) should be separated by a period (for example, department.company).
Master File Server (Bindery Mode only)	When operating in Bindery mode, the print server logs on to a file server and services the queue set up on that particular file server. Enter the name of the master file server of the print server.
NetWare Password	Use this field to configure a password to be used by the print server to log on to the NetWare server or NDS tree. When a print server object is created in the file server, the password for the print server is set to NULL (no password protection). The factory default password for the print server is also set to NULL. When changing the password, both passwords in the print server and the file server need to be modified for the two servers to communicate properly. The print server password can be changed through this popup window, but PCONSOLE or NWADMIN needs to be executed to provide the proper password setting to the file server.
Job Notification	Select how job notifications are to be received: <ul style="list-style-type: none"> • Originating Workstation only: only at the workstation where the print job originated • All log-ins: at all workstations that the originating user has logged into
Polling Queue Interval	Defines how often the print server will poll the queues to be serviced. The control unit is in seconds.

NetWare Remote Printer

Figure 8-6 and Table 8-4 show and describe the NetWare Remote Printer mode screen and its fields. The NETGEAR print server uses these parameters when its NetWare operating mode is set to Remote Printer Mode in the NetWare General configuration screen.

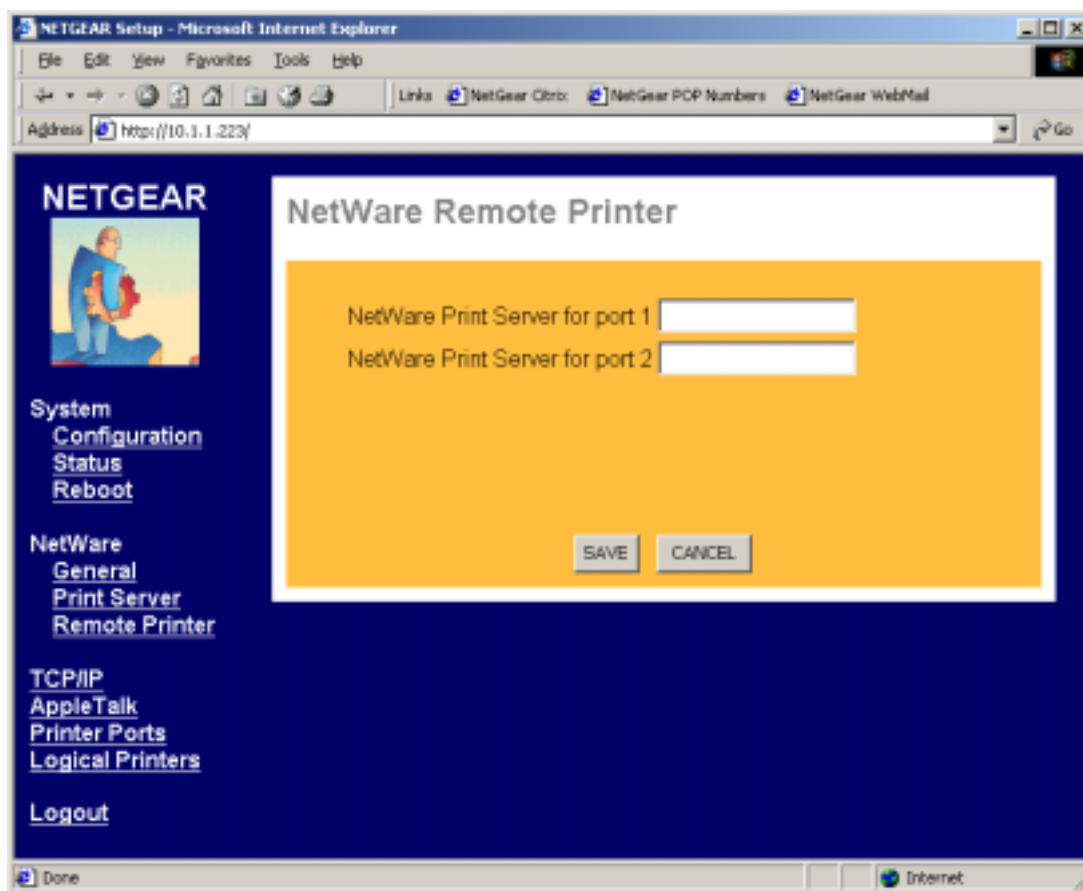


Figure 3-11 NetWare Remote Printer Mode Configuration Screen

NetWare Remote Printer Mode Configuration Fields

Novell Printer Server for P1, P2	Enter the name of the NetWare print server to service the PRINTER 1 and PRINTER 2 port of the print server.
---	---

Reset

Clicking the RESET button will reboot the print server. When you change settings for TCP/IP and Wireless, you will need to reset the print server.



If the print server is rebooted, any printing job will be disrupted.



If DHCP client is enabled, which is the default setting, after system reboots, the IP address of the unit may be changed.

Chapter 4: Microsoft Windows System Printing

This chapter describes how to configure and use the NETGEAR PS100 Print Server in a Microsoft Windows networking environment.

To configure your hardware and software for the Microsoft Windows platform, you may:

- Use a web browser, like Microsoft Internet Explorer or Netscape, to configure your NETGEAR Print Server. For the use of web browser configuration, please refer to Chapter 3.
- Install NETGEAR Print Server software on the print server administrator's computer.
- Configure the user computer to print to the NETGEAR Print Server.
- Install this Reference manual on the computer, so that you don't have to find the NETGEAR *PS100 Printer Server Resource CD*.

4-1 Printing in Windows

For the printing in your Windows system, you will need to do the following steps.

1. Hardware connection
including the physical network connection to your PC and print server, or the wireless environment. Also connect the printer with the cable to the PS100 Print Server. Please refer to *PS1xx Installation Guide* and choose a proper application setting for your environment.
2. NETGEAR Print Server software installation
will install the essential software for the configuration of the print server. By using NETGEAR Print Server Setup Wizard you can set up the print server. If you can use Web Configuration, you may not need to install the software. Please refer to Chapter 3.
3. Setup your PC to recognize the print server and write down the port name
will add a special printer port to each computer using NETGEAR Add Printer Wizard. Before installing the driver for the printer, run the NETGEAR Add Printer Wizard to add the print server port automatically. You will need the port name, so **please write down the port name** when provided to you.
4. Add a printer to your system to print.
Use NETGEAR Add Printer Driver to install the driver for your printer. Note: If you are using Windows 9x (including 95, 98, and ME), you **MUST** install this software.

4-2 NETGEAR Print Server Software Installation

NETGEAR Print Server software works for PS100 Print Servers in a Microsoft Windows networking environment.

To install and set up your network and the NETGEAR Print Server, you may use a PC with a Microsoft Windows (95, 98, NT 4.0, ME, 2000, or XP) operating system and with either the TCP/IP protocol or the NetBEUI protocol enabled.

1. Turn on the power to your PC.



Before proceeding with these instructions, be sure to assign a name to your workgroup on your PC. NETGEAR strongly recommends that you exit all Windows programs before running the Setup program. It is also necessary to install the NETGEAR Add Printer software on every PC in the network that will use the printers attached to the PS100 Print Server.

Insert the CD ROM into the CDROM drive. The program should start automatically. If not, double-click on My Computer, double-click on the CD-ROM driver and then click **setup.exe**. The first screen is shown below. Click on Next button.

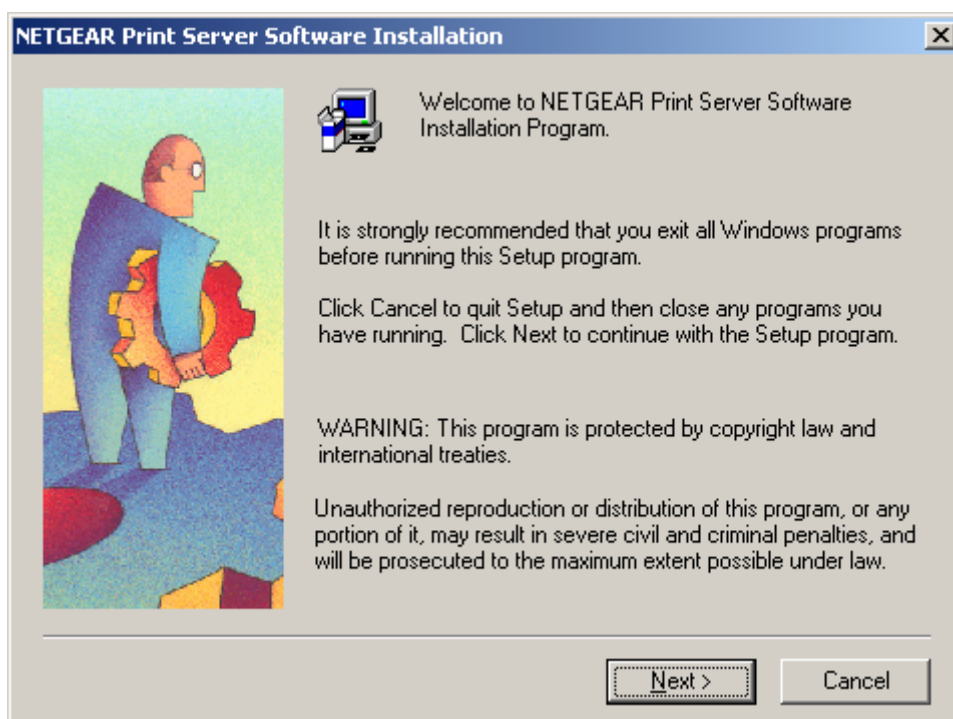


Figure 4-1 Print Server Installation

2. The second screen provides you an important message for you to read. Click on Next button.

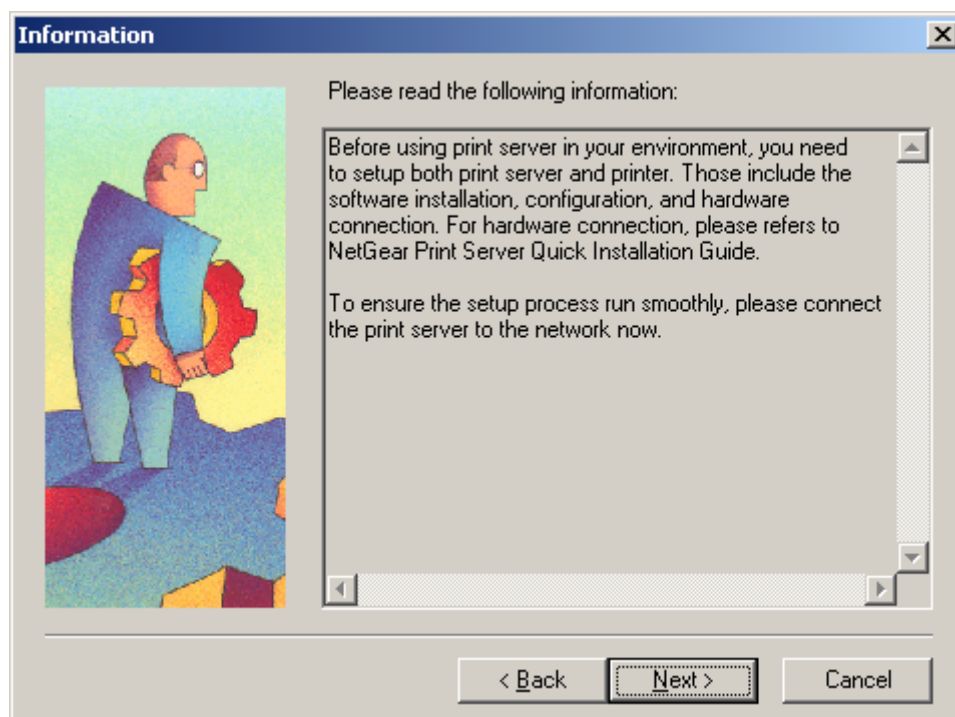


Figure 4-2 Information

3. The third screen asks you the components to install on this computer.

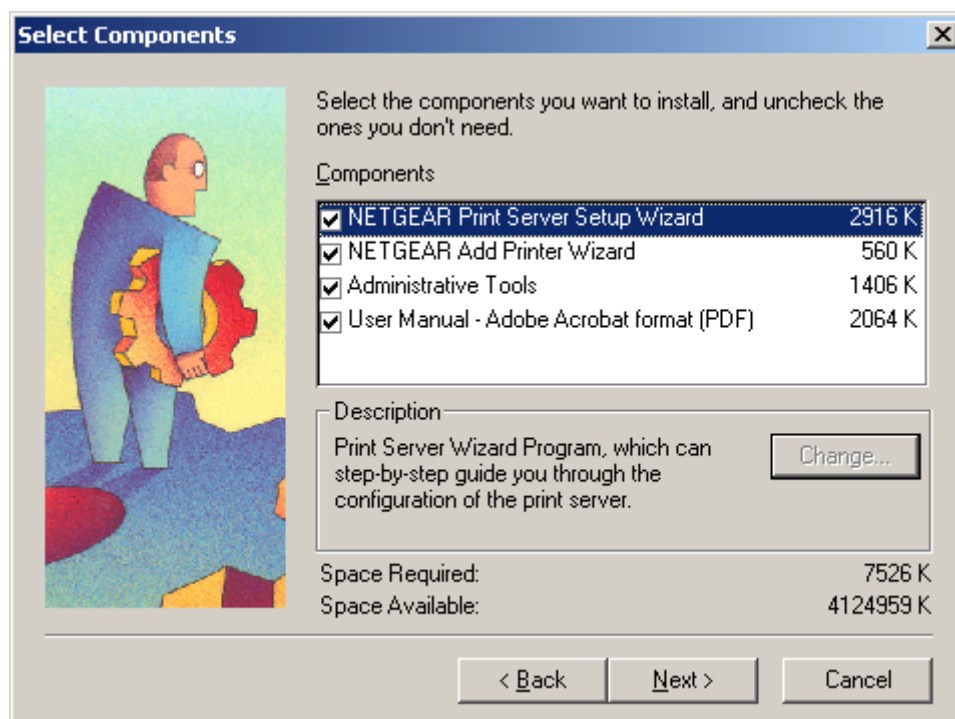


Figure 4-3 Components

- **NETGEAR Print Server Setup Wizard**
An easy-to-use wizard configurator for the print server. Install this only in the print server administrator's computer.

- **NETGEAR Add Printer Wizard**
A step-by-step guide program to configure the printer to print from your Microsoft Windows computer. You **MUST** install the NETGEAR Add Printer Wizard on each Windows computer that will print via the print server.
 - **Administrative Tools**
Advance administrative tools including NETGEAR Print Server Administration and IPSetup. Use Print Server Administration to manage the print servers on LAN. Use IPSetup to manually assign IP address for the print servers. Note that the print server default is a DHCP client. If there is a DHCP server, you do not need to set up IP address, but NETGEAR recommends using a static IP so you can use the Web configuration.
 - **User Manual – Adobe Acrobat format (PDF)**
This detailed Reference Manual. You need Adobe Acrobat Reader in the PC. You can install it from the directory *Acroread* in the CD or from www.adobe.com on the Web, if you do not have it on your computer.
4. After you make the proper selections, click on Next button. You can choose the location of the program files or accept the default.

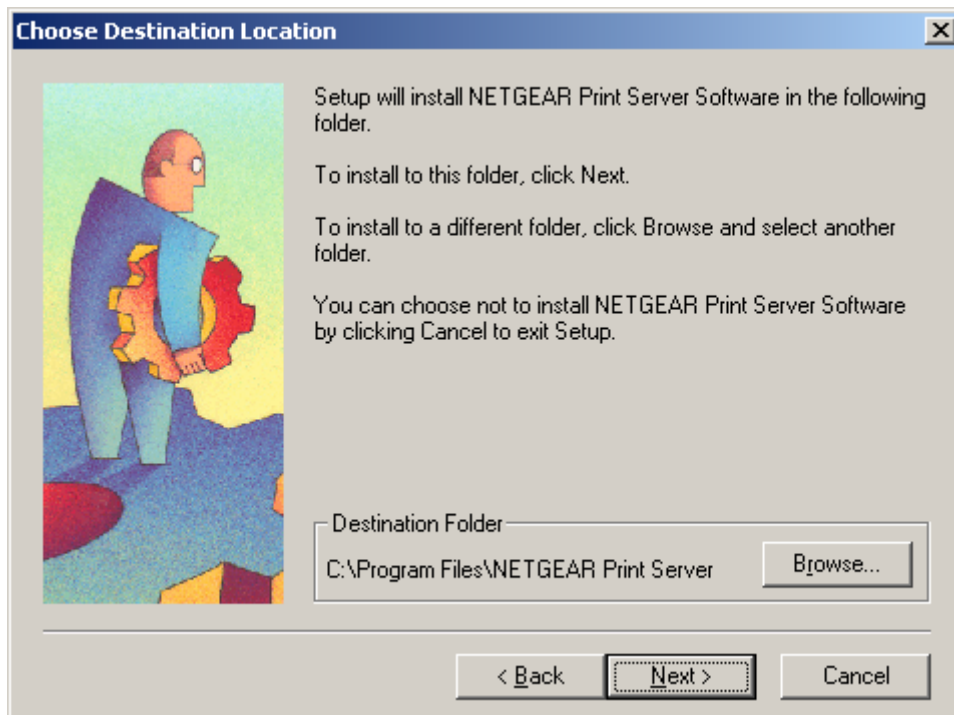


Figure 4-4 Destination Location

5. Choose a program folder name. You click on Next button to accept the default name.

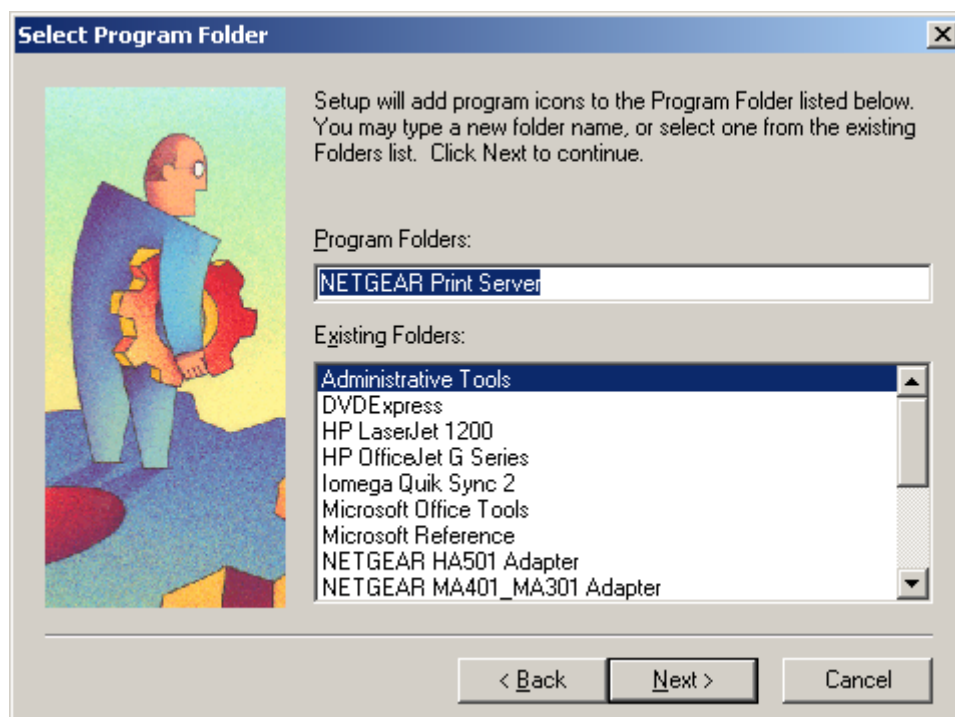


Figure 4-5 Program Folder

6. The next screen shows you the progress of the installation.

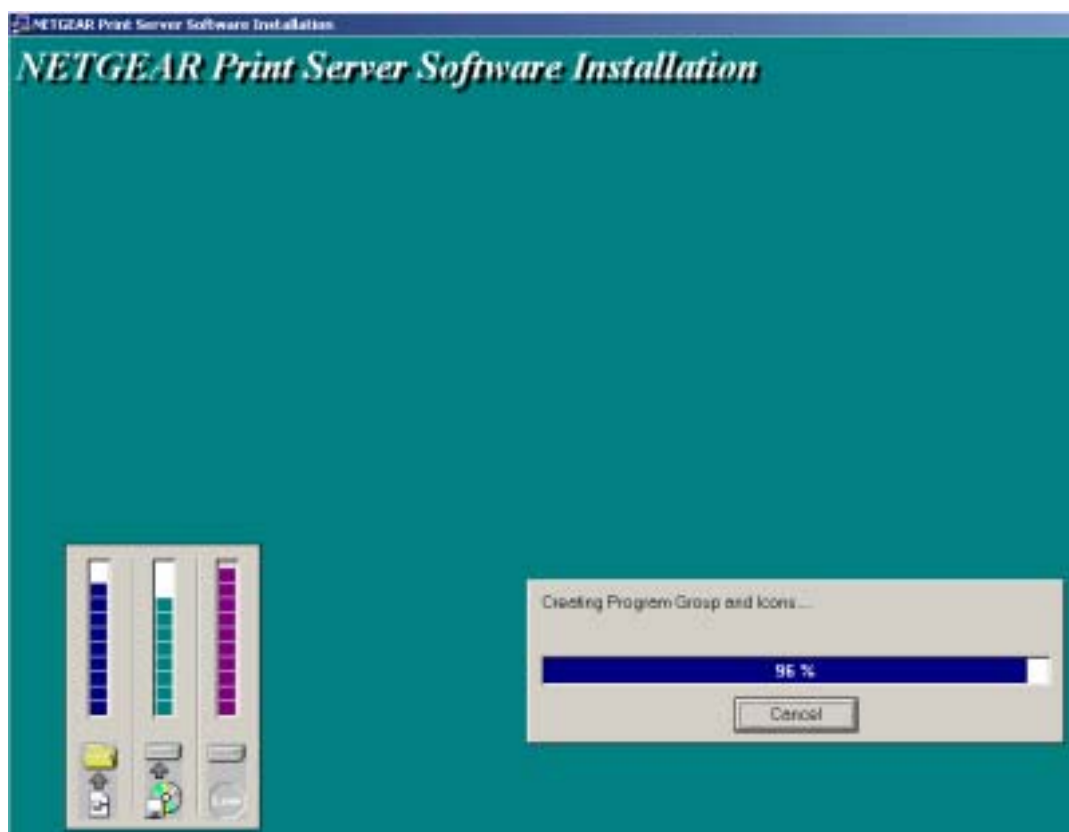


Figure 4-6

7. Before you finish the installation, you can choose to run the NETGEAR Print Server Setup Wizard and read the manual. You can uncheck either one or both of the selections and run it at a later time.

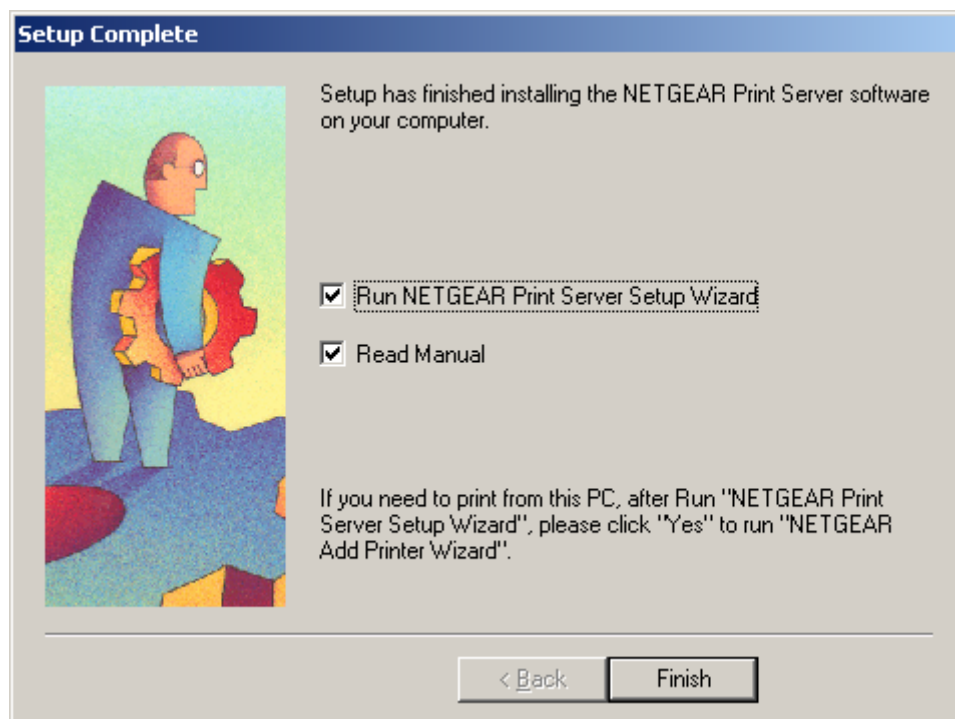


Figure 4-7 Complete Screen

8. There will be a program group created and shown as below.

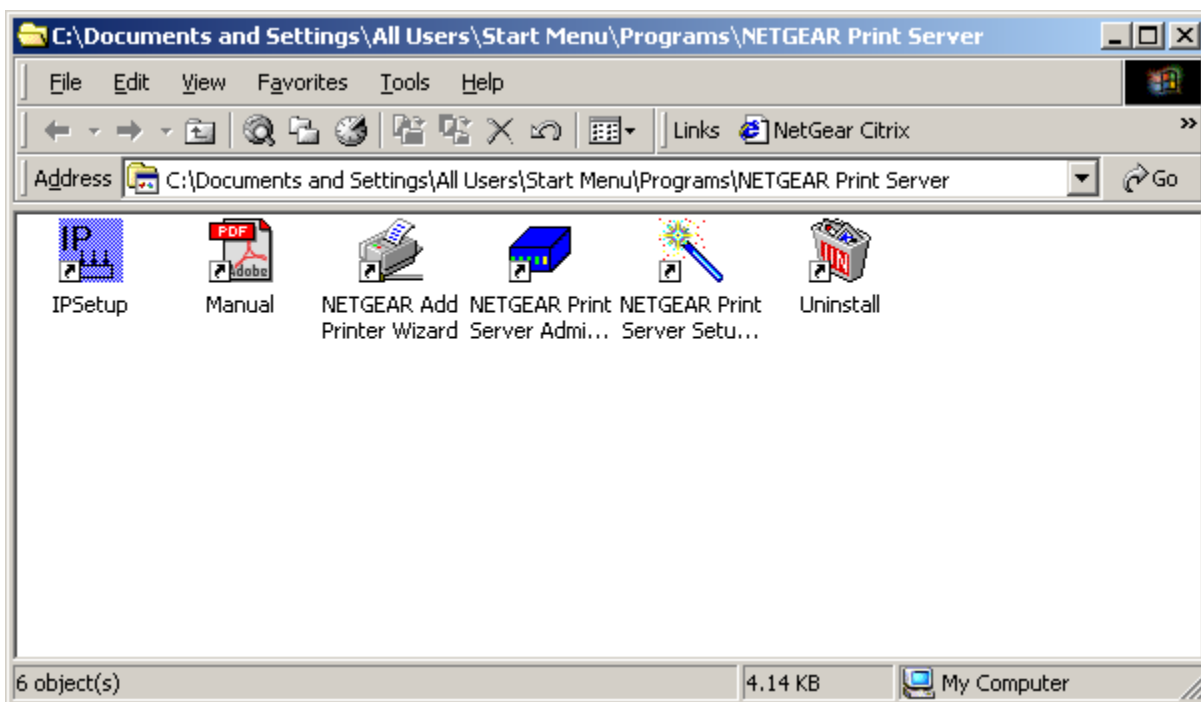


Figure 4-8 NETGEAR Print Server

You can open and access the group from your desktop as well. See Figure 4-9 in the next section.

4-3 Setting Up Your PC to Recognize the Print Server

You must set up each PC that will print to the print server. Before proceeding, verify that:

- The print cable is connected to the printer port.
- The AC adapter is plugged into the wall socket.
- The Ethernet cable is plugged into the LAN, or the wireless MA 401 PC card is installed in the PS100 Print Server.

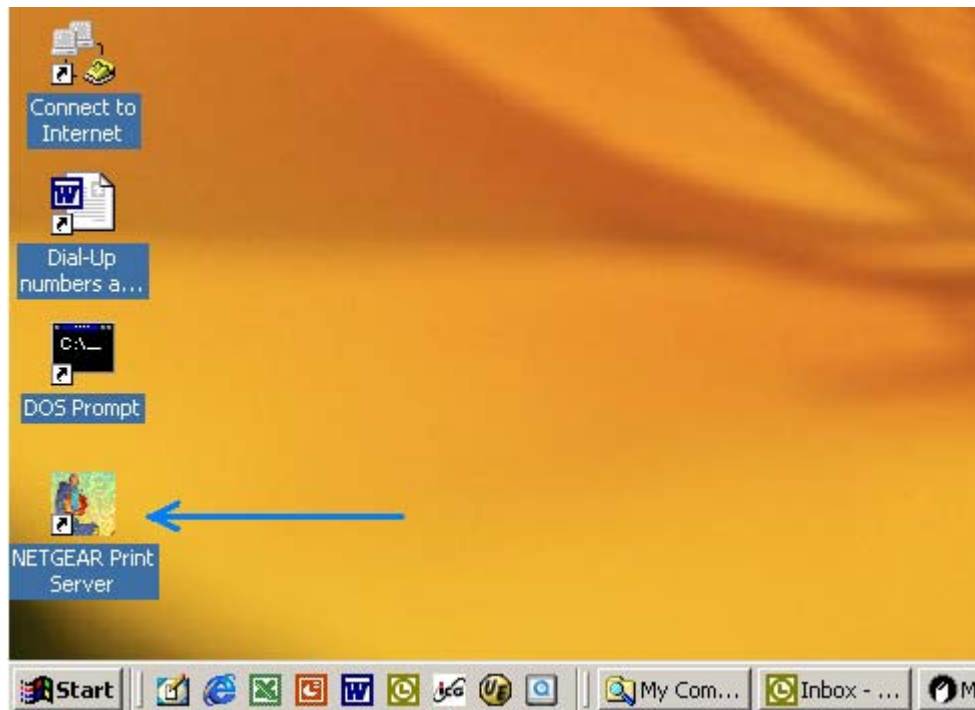


Figure 4-9 NETGEAR Print Server software Icon

To set up each PC:

1. Double-click on the desktop icon, as shown in Figure 4-9.
2. Double-click on NETGAER Print Server Setup Wizard in the NETGEAR Print Server window, Figure 4-8.

The NETGAER Print Server window opens, as illustrated below.

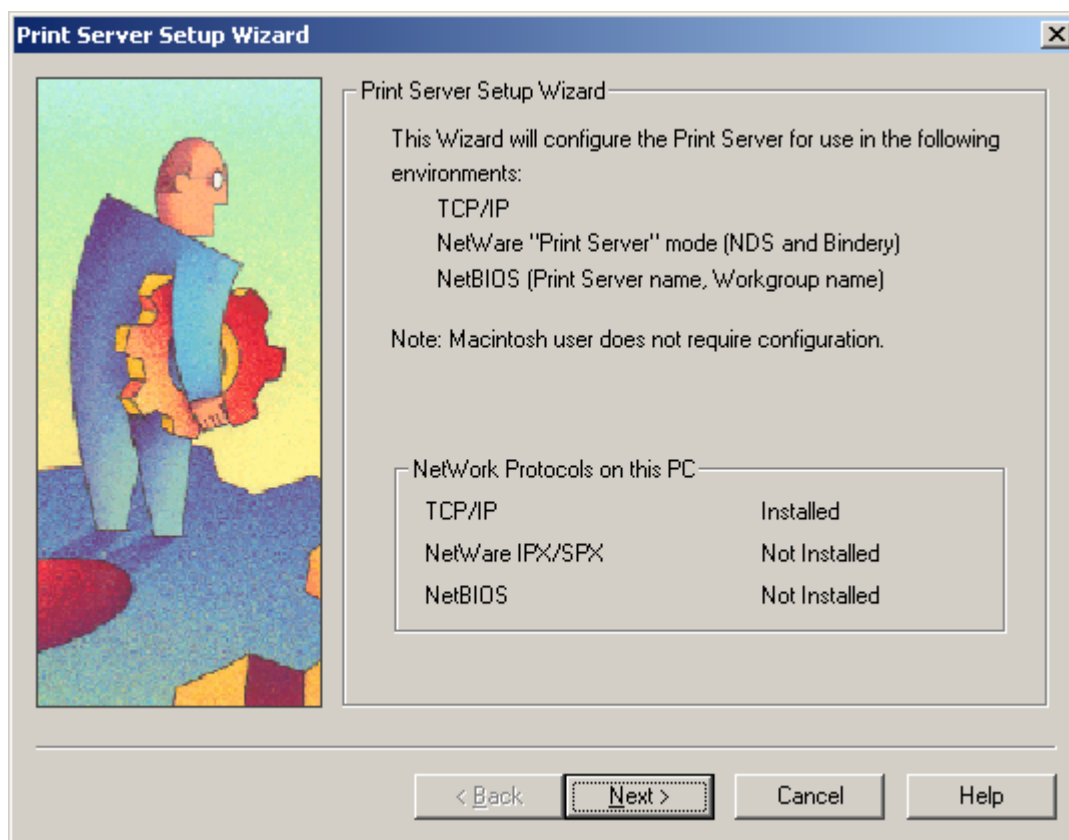


Figure 4-10 NETGEAR Print Server Setup Wizard Window

- In this window, the network protocols you have installed on the local machine will be displayed. You need TCP/IP to use web management. Most operating systems use TCP/IP as the primary networking protocol.

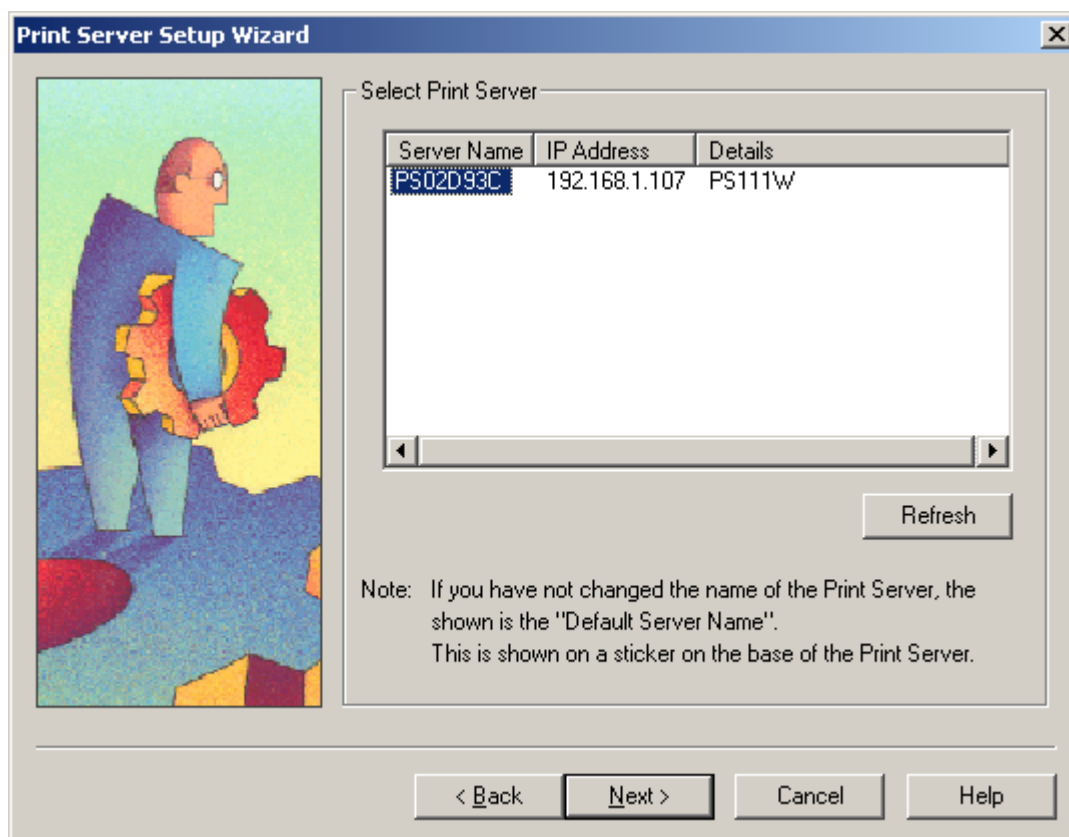
Note that the PS101 and PS111W do not support NetWare IPX/SPX environment.

Older systems, such as Microsoft Windows 3.1, may support only NetBIOS protocol (Microsoft Network).

You must have either TCP/IP or NetBIOS protocol, or both to use NETGEAR PS100 Print Server. Novell NetWare and AppleTalk are optional.

- Click on Next.

The Printer Server Setup Wizard window shows all the NETGEAR Print Servers on the LAN. Click on Refresh button to see any new print servers added while the program is running. If you still don't see the print server you wish to configure, wait a minute and click the Refresh button again.

**Figure 4-11 Select Print Server**

5. Select the PS100 Print Server and click on Next.

The Printer Server Setup Wizard window shows the current print server Name. The default name is the Device Name on the base of the unit. Change it to a unique name, or leave it without changing it. See Figure 4-12 Select Name for Print Server.

If your primary network is not NetBIOS/NetBEUI, you can leave Workgroup Name blank.

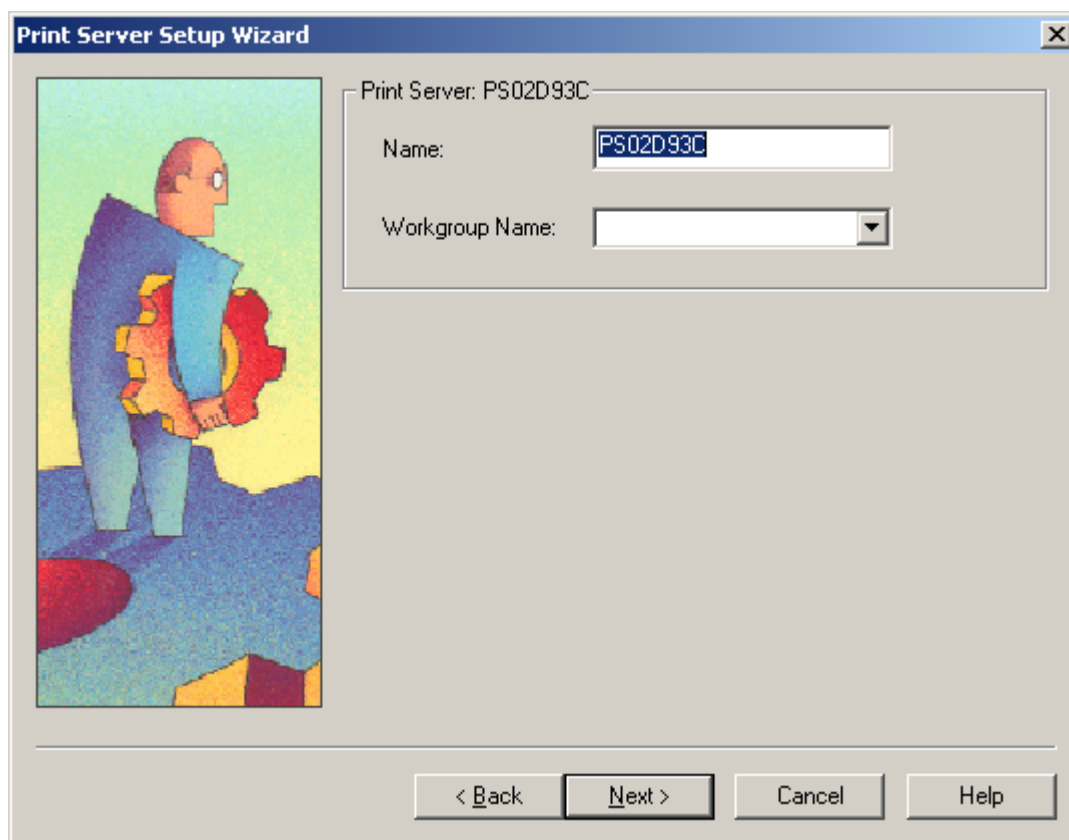


Figure 4-12 Select Name for Print Server

6. Click on Next.

The next Printer Server Setup Wizard window, Figure 4-13, shows TCP/IP setting for the print server. NETGEAR recommends using a static IP address so you can use a Web browser to configure the print server.

Dynamic IP using DHCP

You can select Obtain IP Address automatically for a dynamic IP address. When select this option, there are two ways to get an IP address dynamically. The default is to get an IP address from a DHCP server, the factory default. If you have a home gateway/router, it comes with a DHCP server. The second way, if a DHCP server is not available is to use Auto-IP to self-assign the IP address automatically.

Dynamic IP using Auto-IP

When NETGEAR PS100 Print Server does not have an IP address but is setup to obtain an IP address automatically (as a DHCP client) and there is no DHCP server, it will self-assign a unique IP address using Auto-IP. The address range is from 169.254.0.1 to 169.254.254.254 with the subnet mask 255.255.0.0. The print server can communicate and work with other IP devices using the same Auto-IP mechanism.

To display the current IP address for the print server, make sure the printer power is ON, the print cable is connected to the PS111W Print Server, and the print server power is ON, press the diagnostic button for two seconds. The printer will print out the status of the print server, as well as the IP address. (This is for model PS111W only.)

How do I use Auto-IP?

Select Obtain IP Address automatically as shown in Figure 4-13 Set up TCP/IP for Print Server to get an IP address. If you are using an Ethernet network and do not have a DHCP server (usually a router/gateway or PC

server), then Auto-IP is automatically used. Your Microsoft Windows system uses the same process – it tries DHCP first and then uses Auto-IP. To check the IP address on your computer:

Windows NT, 2000 and XP: Click on Start->Run, Enter 'command', and click OK. When the command prompt window is pops up, enter: ipconfig

Windows 95, 98 and Me: Click on Start->Run, Enter 'winipcfg', and click OK.

You may see the IP address for your system with 169.254.m.n, where m = 0-254 and n=1-254. The range is from 169.254.0.1 to 169.254.254.254 with the subnet mask 255.255.0.0. When you know the IP addresses for your system and the print server, you can test the connection from your PC to the print server. In the command prompt window, enter

ping 169.254.x.y

Where 169.254.x.y is the IP address you get from the print out of the print server. (You should replace x and y with the IP address numbers in the print out of the print server.)

Static IP

NETGEAR recommends you set up a fixed IP address for the PS100 Print Server so you use a Web browser to configure the print server.

Select **Fixed IP Address**. Enter the IP address, Subnet mask, and Default gateway to match your network. If you don't know what values you should use, you may use Suggest New Values button. This button is available only when you select Fixed IP Address.

If you are using a NETGEAR router with default settings, the following settings should work:

IP address: 192.168.0.150 (The first three numbers should match the numbers for the network router. Make sure the last 3 digits are unique on your network.)

Subnet mask: 255.255.255.0

Gateway IP address: 192.168.0.1 (the address of your router)

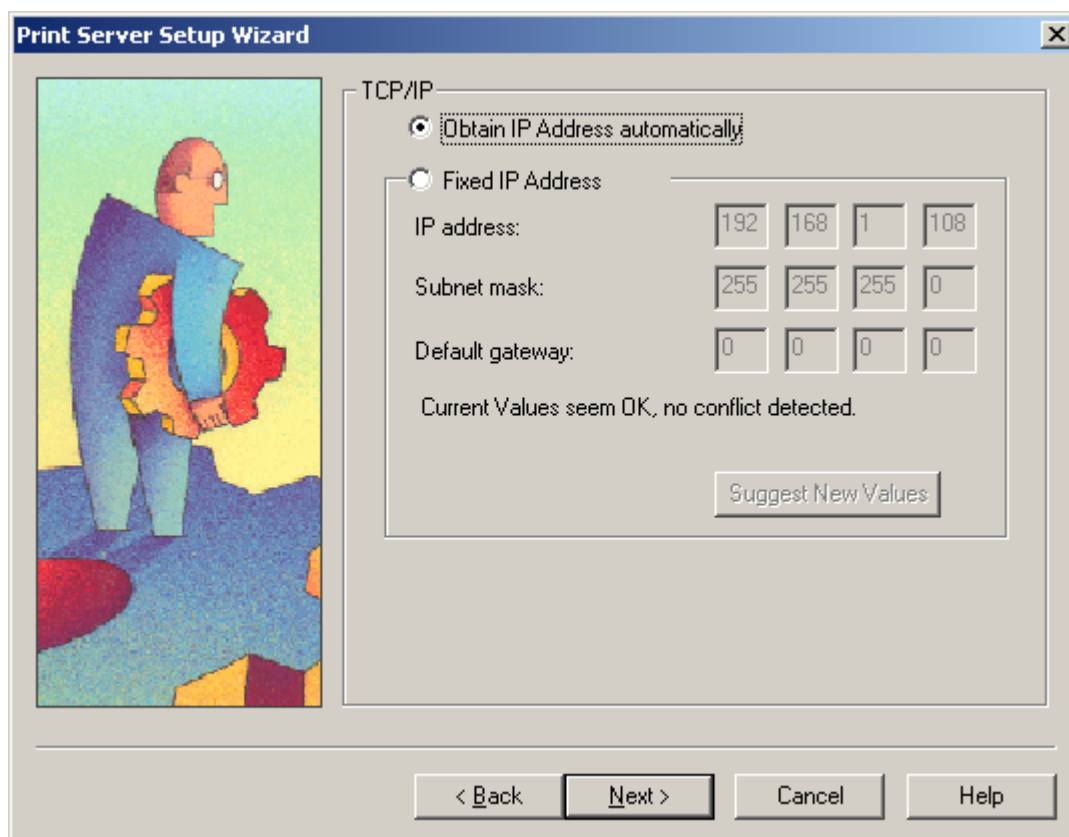


Figure 4-13 Set up TCP/IP for Print Server to get an IP address

7. Click on Next.

The next Printer Server Setup Wizard window, Figure 4-14, shows wireless settings for the print server. If there is no NETGEAR 802.11b MA401 Wireless PC card in the slot, and not planning for now, you can simply skip this step by going directly to the next step.

Wireless Configuration

The **Station Name** is not changeable. It is the Ethernet MAC address of the print server.

SSID is Service Set Identifier, which should be the same for all stations on the wireless LAN. If the Encryption is disabled and the Authentication is using Open System, this field can be empty. You should check with your Information Technology administrator, if you have one.

The **Channel Number** range depends on the regulations in your country but is generally 1 to 11 or 1 to 13. The channel number **MUST** be the same for all stations in the wireless network. When the wireless network type is in Infrastructure Mode (the most commonly used mode), the channel is selected automatically by the print server to match the Access Point. You do not need to change this setting unless you are using Ad-Hoc Mode.

Network Type **MUST** be Infrastructure Mode if you are using an Access Point or Wireless Router. Use Ad-Hoc Mode only if you are using a group of wireless clients not connected to a wired network.



If the PS111W Wireless Ready Print Server is using Infrastructure Mode with a wireless Access Point or Router, you **MUST NOT** connect the Ethernet network cable. It will disable the wireless communication.

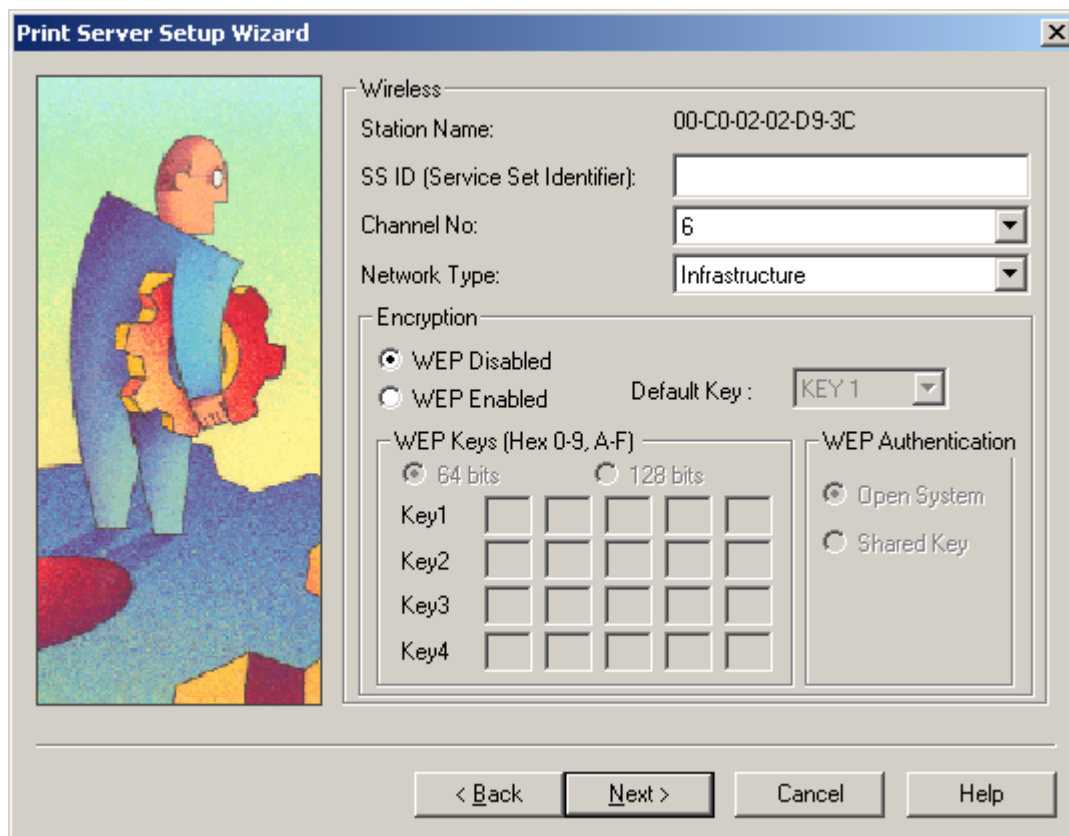
You can secure your wireless communication by using Wired Equivalent Privacy (WEP) encryption. The default is **WEP Disabled** and no encryption. By selecting **WEP Enabled**, you can enable the 64-bit or 128-bit encryption. If you choose 64-bit **WEP Keys**, you have the choice of Key 1 to Key 4 for the Default key. All the

key fields are hexadecimal from 00 to FF. You need to enter five pairs of hexadecimal values as a set for 64-bit encryption and 13 pairs for 128-bit encryption. These WEP Keys **MUST** be the same for each station on the wireless LAN.

If WEP is used, you also need to choose **WEP Authentication** method from **Open System** and **Shared Key**. (Same as page 20)



If you plan to use encryption, please make sure all the wireless stations use the same SSID, authentication, and encryption keys (64 or 128-bit). If you choose 64-bit encryption, you also need to have a default key chosen from key 1 to 4.



The image shows the 'Print Server Setup Wizard' window, specifically the 'Wireless' configuration step. On the left is a cartoon illustration of a person in a blue suit holding a large red gear. The right side contains configuration fields:

- Station Name:** 00-C0-02-02-D9-3C
- SS ID (Service Set Identifier):** [Empty text box]
- Channel No:** 6 (dropdown menu)
- Network Type:** Infrastructure (dropdown menu)
- Encryption:**
 - ☒ WEP Disabled
 - ☐ WEP Enabled
- Default Key:** KEY 1 (dropdown menu)
- WEP Keys (Hex 0-9, A-F):**
 - ☒ 64 bits
 - ☐ 128 bits
 - Key1: [5 empty hex boxes]
 - Key2: [5 empty hex boxes]
 - Key3: [5 empty hex boxes]
 - Key4: [5 empty hex boxes]
- WEP Authentication:**
 - ☒ Open System
 - ☐ Shared Key

At the bottom are buttons: < Back, Next >, Cancel, and Help.

Figure 4-14 Wireless Configuration

8. Click on Next.

Figure 4-15 Configuration Completed shows the completion of the print server configuration.

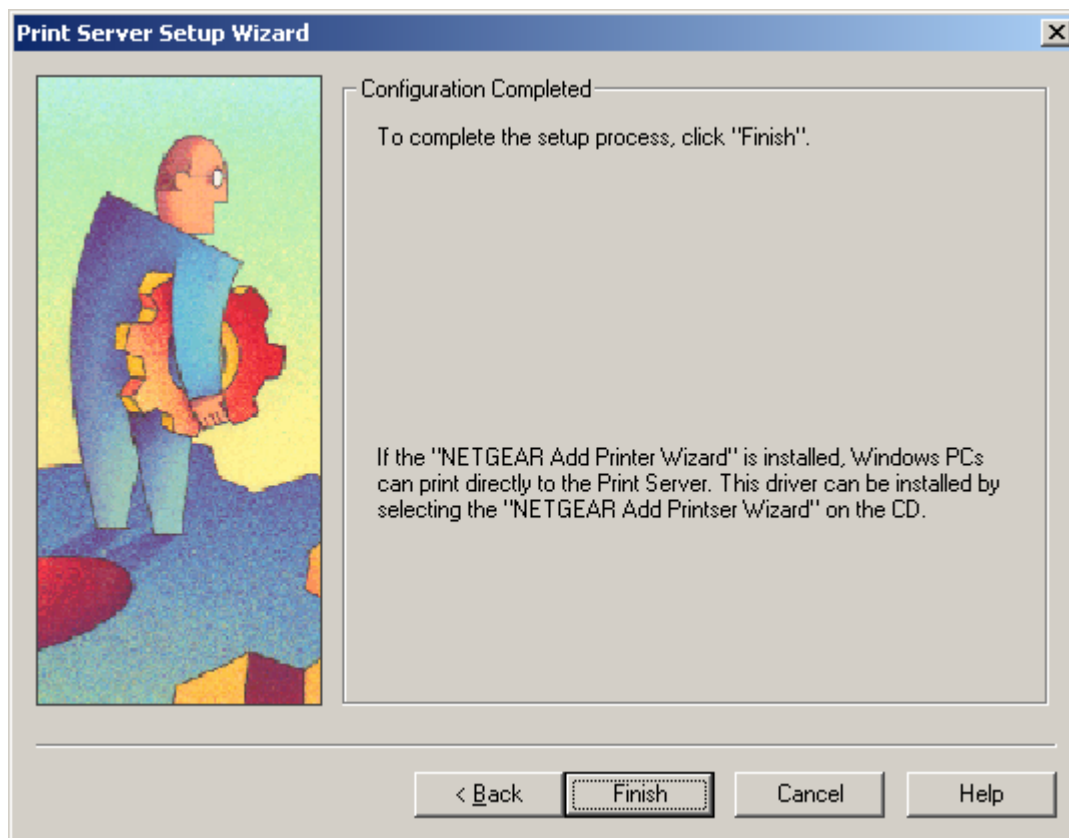


Figure 4-15 Configuration completed

9. Click on Finish.

The PS100 Print Server is ready to be used.

If you have installed NETGEAR Add Printer Wizard, you'll be able to install the printer driver and configure it now. Click No, if you don't need to add a printer to your system now. You can add a printer at a later time by opening the NETGEAR Print Server group and running NETGEAR Add Printer Wizard.

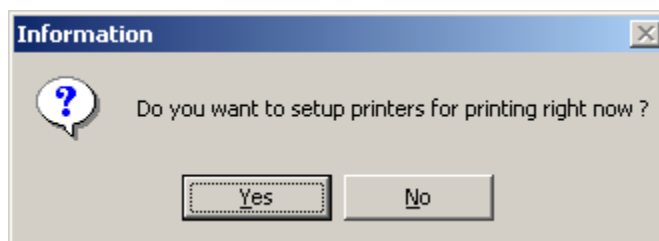


Figure 4-16 Add a Printer

Adding a Printer using the NETGEAR Add Printer Wizard

1. You can reach this setup procedure by answering Yes to the previous Figure 4-16 Information. Or if you open the NETGEAR Print Server group and run NETGEAR Add Printer Wizard.
2. Make sure that the NETGEAR Print Server and the connected printer are both powered on.
3. Make sure that the cable connections between the print server and, if not using wireless, the printer and the print server and the network are properly connected.

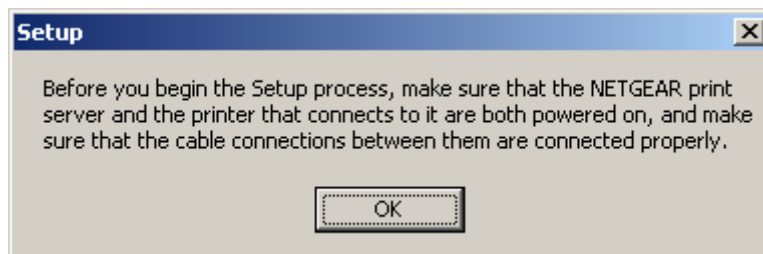


Figure 4-17 Set up printer

4. Click on OK.

The Printer Select window, as illustrated in See Figure 4-18 Printer Select Window (Add Port), opens.

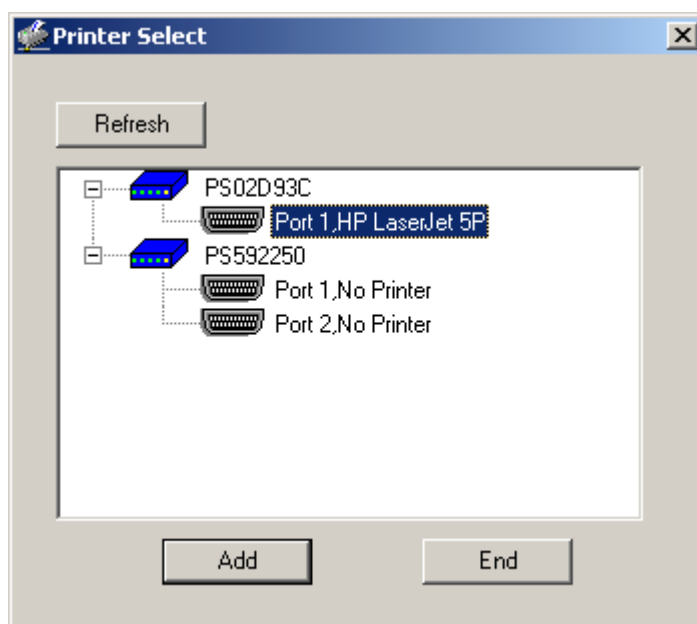


Figure 4-18 Printer Select Window (Add Port)



If the cables are not properly connected, the Printer Select dialog box will appear. If so, check the power and cable connections and click on the Refresh button, which will initiate the PC to browse again for a port.

5. Click on the printer port you want to use with the print server, and click on Add.

The ADDPORT window for Epson print connection, as illustrated in below.

ADDPORT Window (Epson Connection)

6. Click on No if you do not have an Epson Stylus Color printer attached to the port, and continue to step 7.

Or

Click on Yes if you *do* have an Epson Stylus Color printer (or plan to install one). You must disable the "Enable bidirectional support" on the Epson printer's properties screen.

To disable:

- a. **Right click on the Epson Printer's icon in the printers folder and choose "Properties".**
- b. **Click the "Ports" tab.**

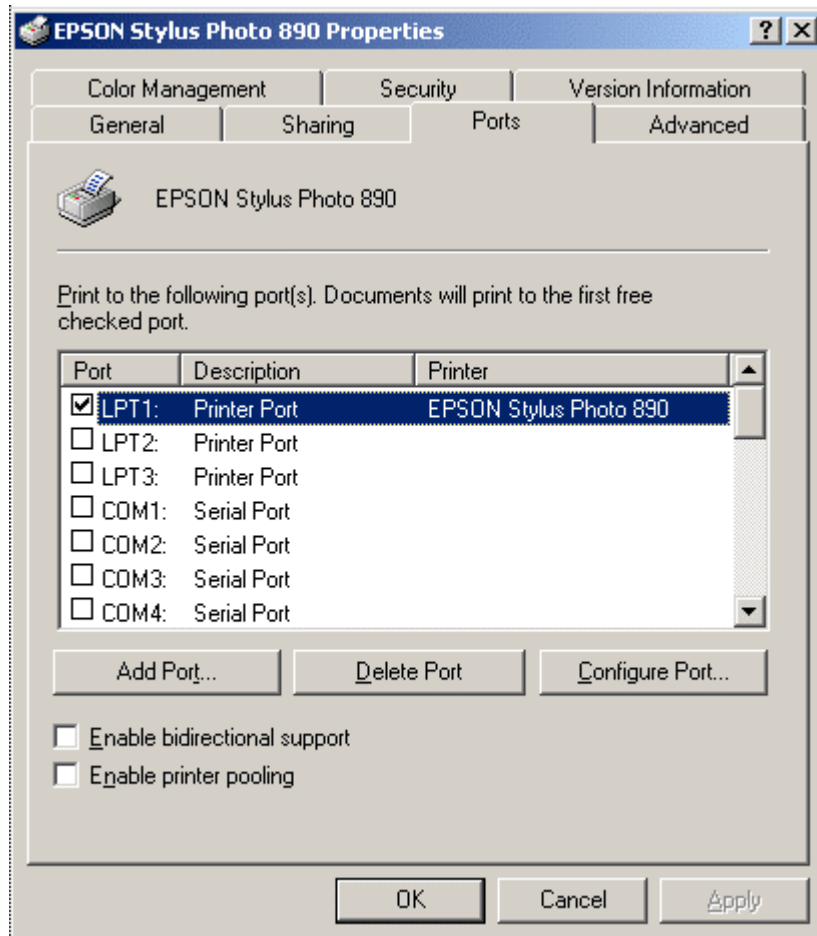


Figure 4-19 Properties Screen

- c. **Disable "Enable bidirectional support" option.**
- d. **Click on OK to exit the Properties window.**

The ADDPORT window, as illustrated in the following Figure 4-20 Add Port message, opens. This window informs you that you have successfully added the port.

ADDPOR Window

If this is not an Epson printer, skip the above procedure. The Add Port should be added successfully. See Figure 4-20 Add Port message.

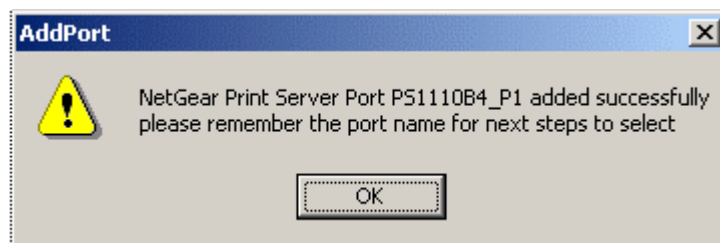


Figure 4-20 Add Port message

7. Write Down the Port Name

It is very important to remember and write down the port name. You will need this information later when prompted to select a printer port. See Figure 4-20 Add Port message. The port name, here for example, is IP_192.168.1.108_P1. You should write it down now.

Printer port name: _____

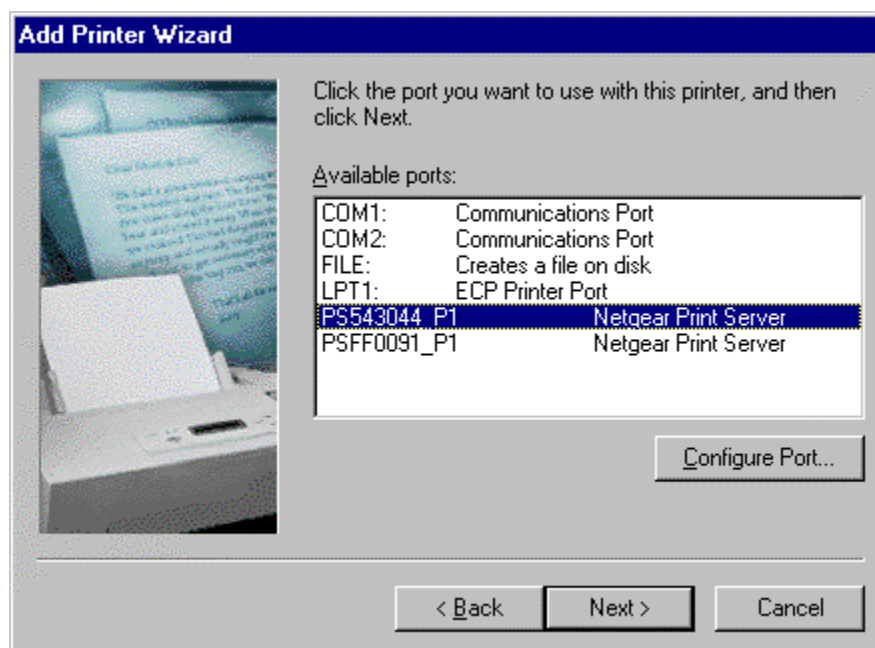
4-4 Add a printer to your system to print

1. Select Printer Port for Add Printer Wizard

After selected the printer, you need to select a printer port to print. See Figure 4-21 Select Printer Port for Add Printer Wizard.



The dialog box for selecting the printer port is different depending on your version of Windows. The dialog above in Figure 4-21a is for Windows 95, 98 and Me. See Figure 4-21b for Windows NT, 2000 and XP. They also appear in a different sequence.



**Figure 4-21a Select the Printer Port for Add Printer Wizard
Windows 95, 98 and Me**

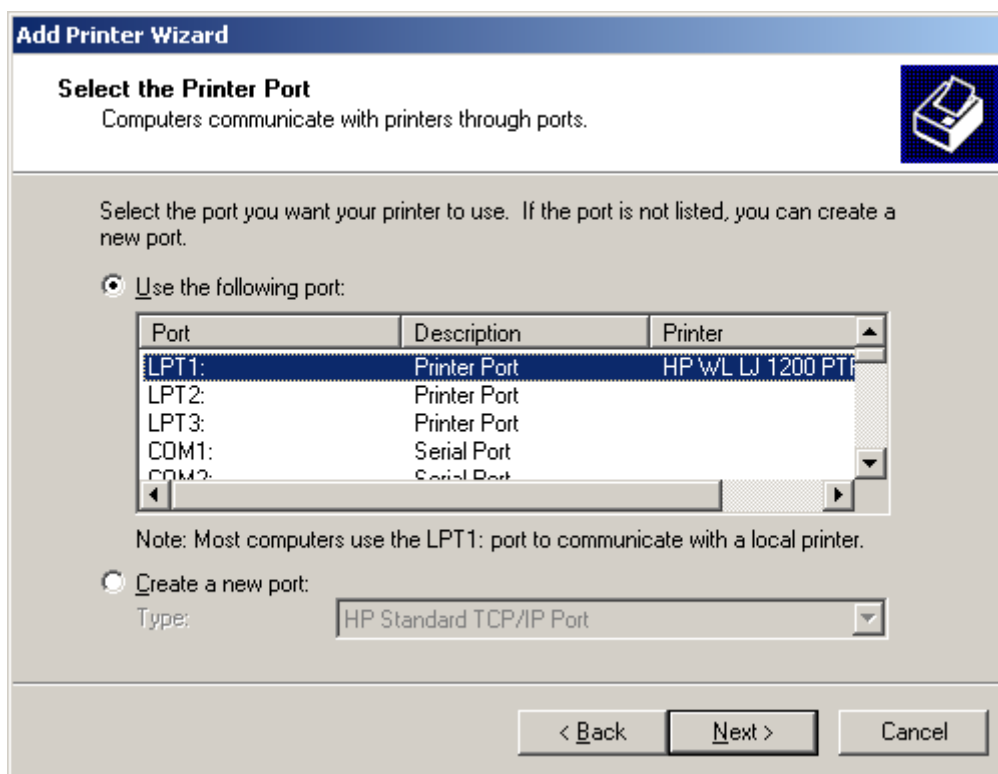


Figure 4-21b Select the Printer Port for Add Printer Wizard
Windows NT, 2000 and XP



DO NOT CLICK ON NEXT, until you really follow the steps described here. Do not select LPT1. Select the print server port name you wrote down in the last step, for example: PSFF0099_P1.

Scroll down and find the printer port name you wrote down in the previous step. For example, the printer port name here is 'IP_192.168.1.108_P1'. See Figure 4-22 Find and select the printer port. For Windows 95, and 98 users, this window will show up after Add Printer (Figure 4-23).

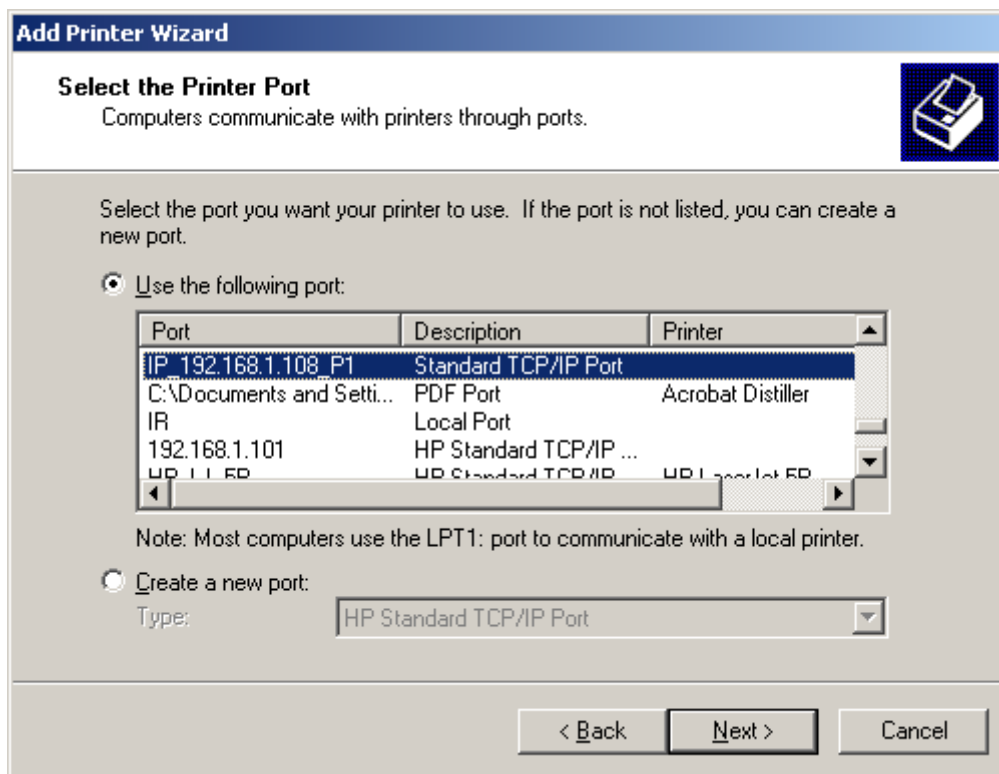
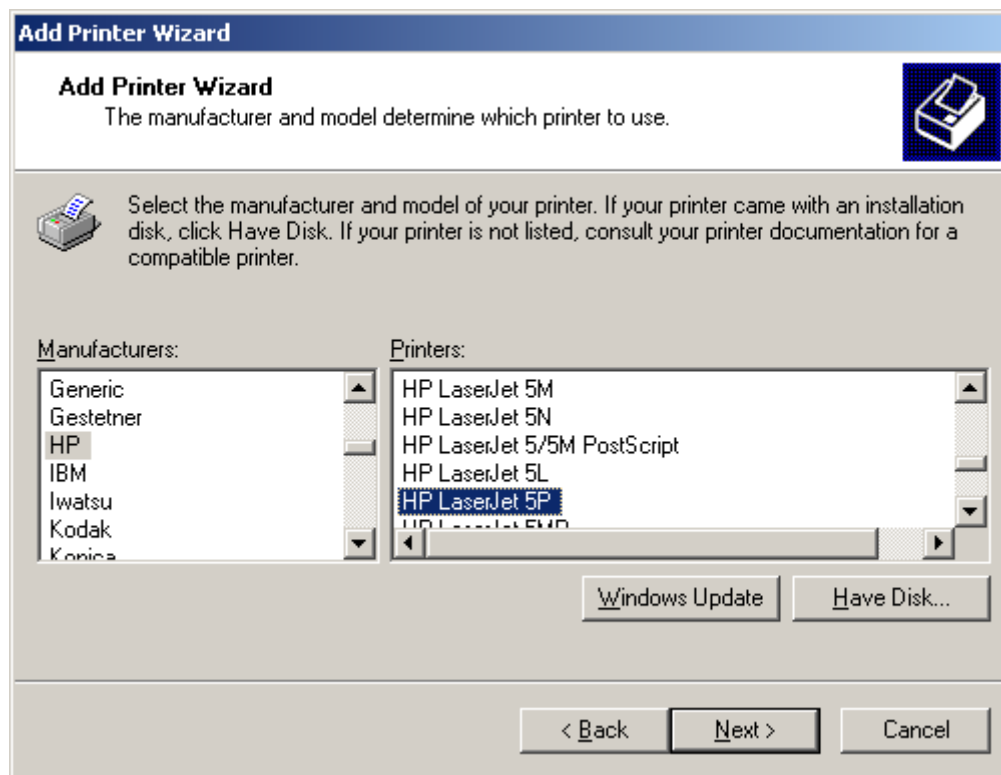


Figure 4-22 Find and select the printer port

2. Click on Next

Add Printer Wizard, Figure 4-23 Add Printer Wizard window, shows. Choose the manufacturer and the model name of the printer. If there is a CD provided with the printer, insert the CD and click on 'Have Disk...' button. Follow the instruction on screen to install the correct printer driver software.

**Figure 4-23 Add Printer Wizard**

3. Click on Next

If you have previously installed the printer driver in the system, Figure 4-24 Use Existing Driver window shows. You can choose to keep the existing driver, unless the driver is a new one and you want to replace it. If you don't see Figure 4-24, go to the next step.

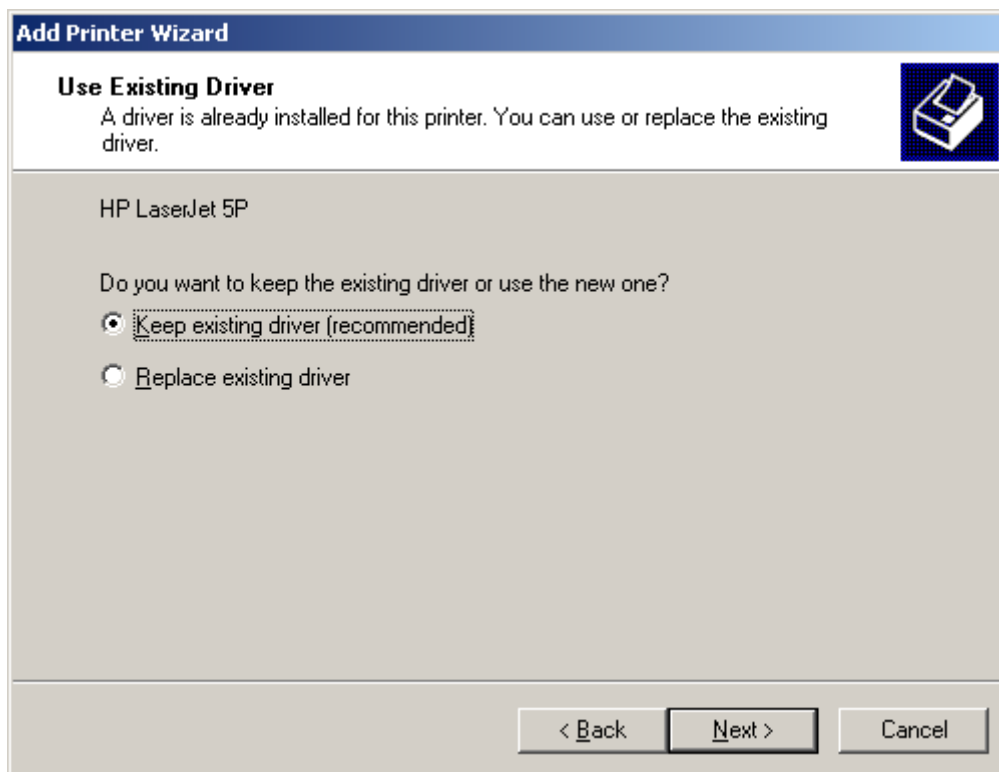


Figure 4-24 Use Existing Driver for Add Printer Wizard

4. Click on Next

Name the printer. See Figure 4-25 Name Your Printer for Add Printer Wizard. If there are more than one printer drivers installed in the system, you may answer Yes to choose this as your default printer for your Windows-based programs.

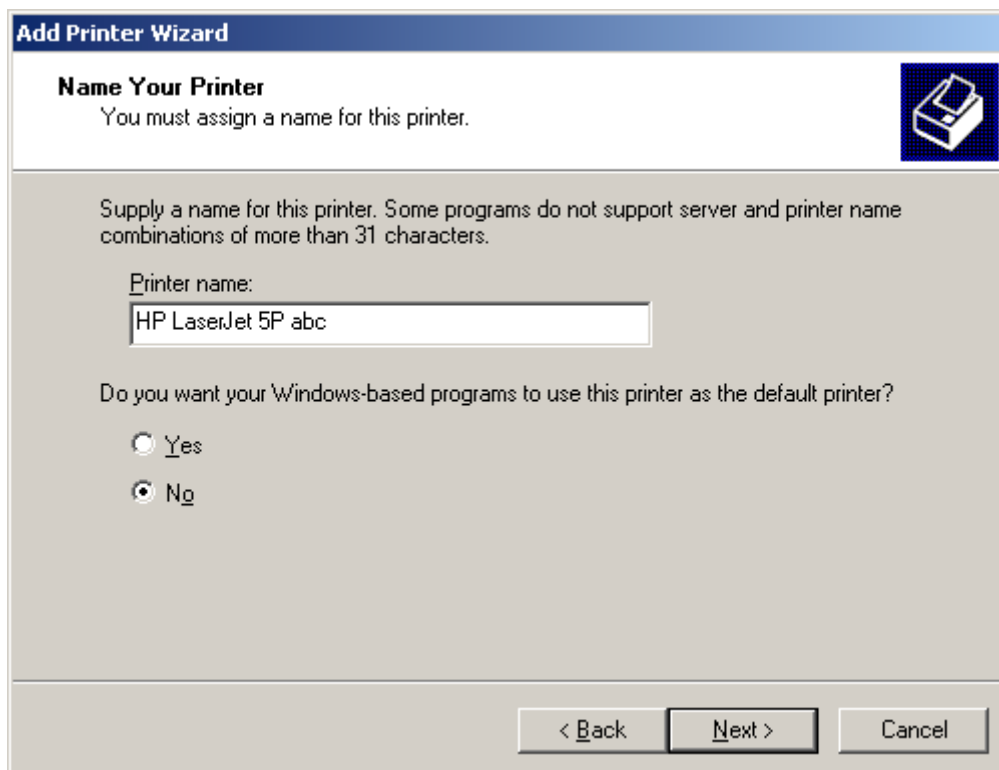


Figure 4-25 Name Your Printer for Add Printer Wizard

5. Click on Next

See Figure 4-26 Printer Sharing. The print server will do the sharing for you, so you do not need to share the printer on the local machine. Keep the default answer: **Do not share this printer.**

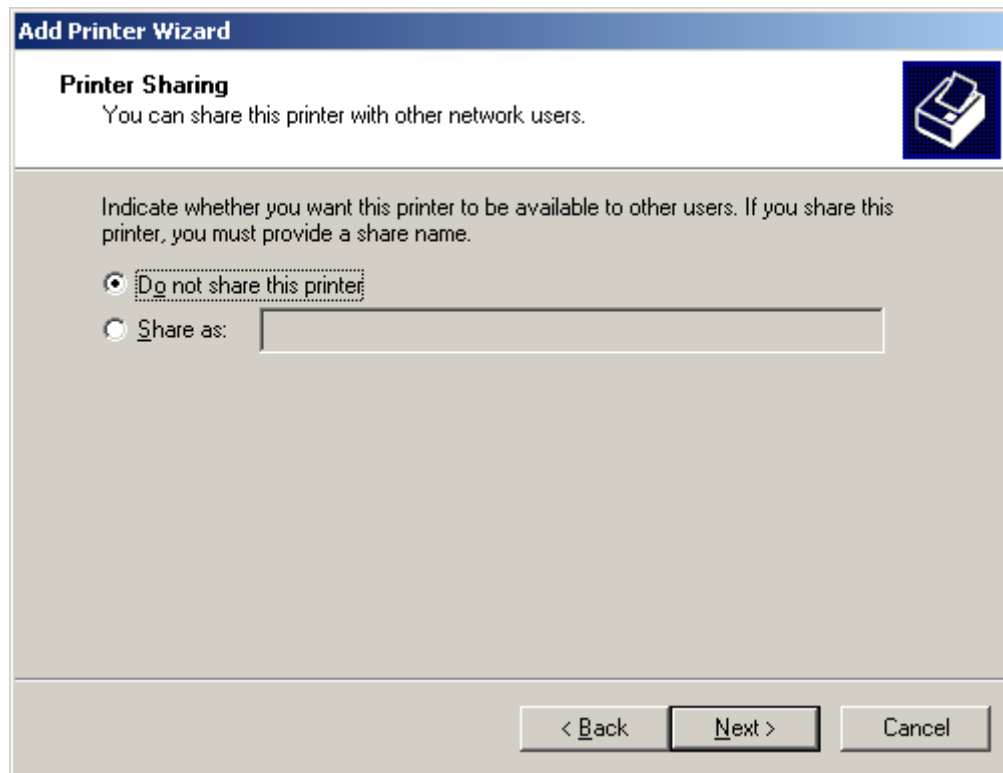


Figure 4-26 Share Printer for Add Printer Wizard

6. Click on Next

Print a test page to the printer to make sure everything is installed properly. See Figure 4-27 Print Test Page.

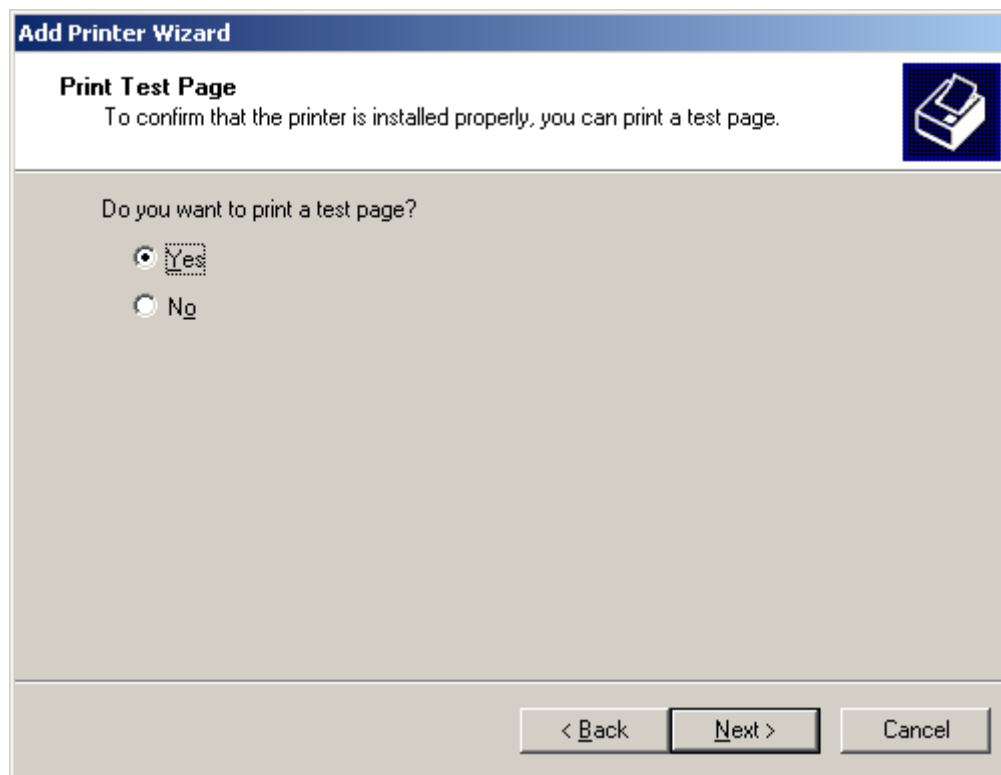


Figure 4-27 Print Test Page for Add Printer Wizard

7. Click on Next

If you answer Yes to print a test page, see Figure 4-28.

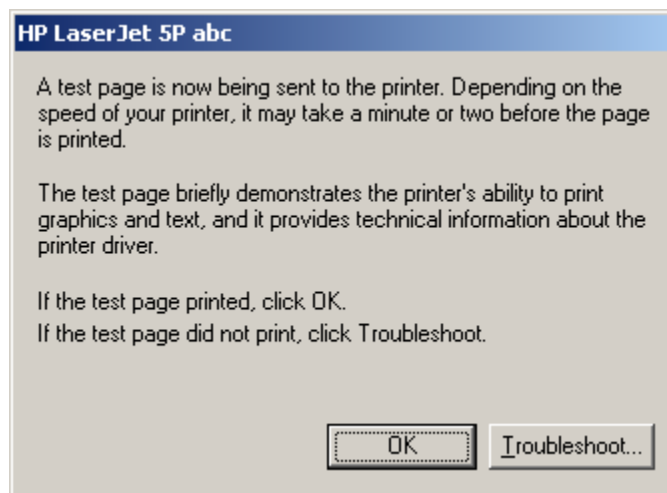


Figure 4-28 Printer print the test page

8. Click on OK

Complete the Add Printer Wizard. See Figure 4-29 Completing the Add Printer Wizard.

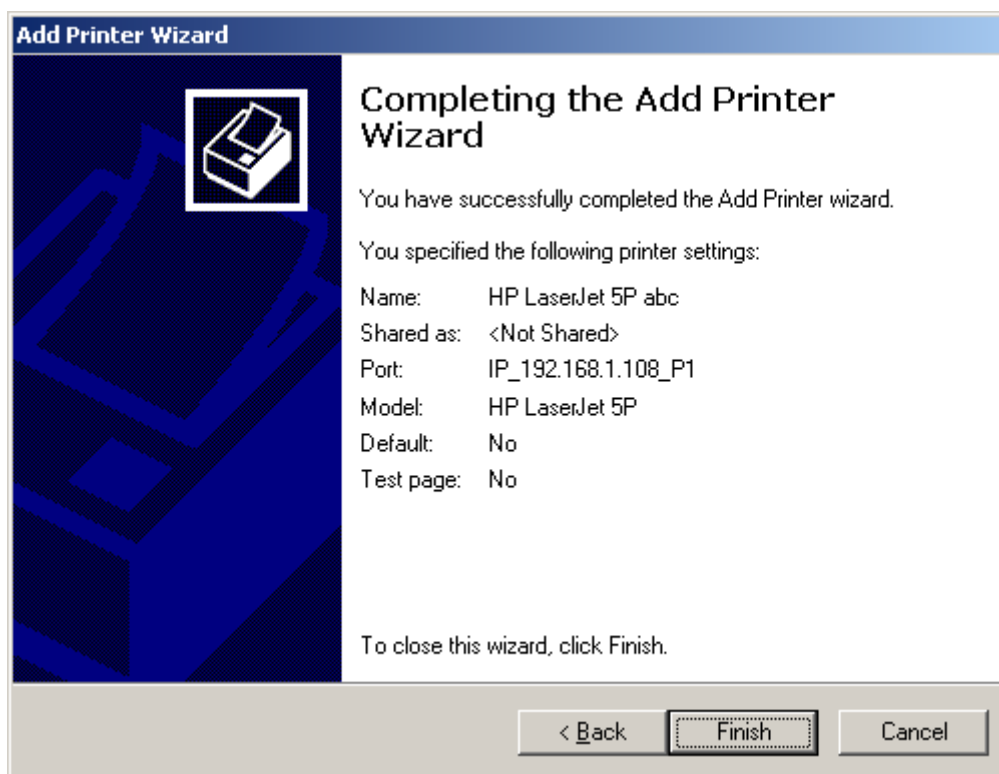


Figure 4-29 Completing the Add Printer Wizard

9. Click on Finish

Now you can print through the NETGEAR Print Server. The Figure 4-18 Printer Select Window (Add Port) window remains on the screen. Click on End to close it.

Chapter 5: UNIX/Linux Printing Using TCP/IP

This chapter explains how to configure and set up the NETGEAR PS100 Print Server and your UNIX system if you are operating in a UNIX or Linux networking environment. The print server can work with most UNIX operating systems with the TCP/IP protocol. The following protocols and printing methods are supported:

Protocols: DHCP, BOOTP, RARP, FTP, TCP, IP

Printing methods: LPD, FTP, DSI



All features described in this chapter apply to NETGEAR Print server Model PS110 only. NETGEAR does not support UNIX on the other Print Servers.

Setting up your print server and UNIX PC requires a few extra steps and some decisions that must be made before configuring both your print server and your PC. In all network environments, the print server must be configured before configuring any PCs on your network. If your network:

Includes both PCs and UNIX systems

NETGEAR highly recommends that you configure the print server from a Windows PC as outlined in the instructions in Chapter 3 Web Management, Chapter 4 Microsoft Windows System Printing or Chapter 8 Using Advanced Management Tools. The administration program software assigns an IP address to the print server by using the NetBEUI or the IPX/SPX protocol for communication. IPX address resolution is done automatically by the workstation, and no local manual configuration is necessary. Configure any UNIX system in your network with the instructions provided in this chapter. See “Setting the Print Method” to choose a printing method.

Includes only UNIX systems or if you have PCs without Windows on your network

You must configure both your print server and all your PC systems with the instructions provided in this chapter. Before you can configure the print server (which must be done first) you must assign an IP address to it. (For information about IP addresses, refer to Appendix B “Understanding IP Addresses.”) Use one of the following two methods:

Assign active IP address resolution

With temporary IP address assignment, the print server sends out broadcast packets actively searching for a server to provide the print server with an IP address. The print server sends out DHCP packets, BootP packets, and RARP packets (in this sequence) to resolve its own IP address. This broadcast mechanism is conducted only upon reset or power cycle.

Assign a temporary IP address to your print server by referring to:

“Assigning an IP Address to the Print Server Using DHCP”

“Assigning an IP Address to the Print Server Using BootP”

“Assigning an IP Address to the Print Server Using RARP”

Assign passive IP address resolution

Assign a static IP address to your print server by referring to “Assigning an IP Address to the Print Server Using ARP”.

With all four methods of IP address resolution, the print server loses the IP setting after reset or a power loss. To permanently configure the print server and save the IP address assignment in the flash EEPROM of the print server, you must use FTP. Using FTP, you can modify the CONFIG file in the print server.

After you configure the print server as described in “Configuring Your Print Server Using FTP”, choose a printing method as described in Setting the Print Method” to configure each UNIX PC in your network.

5-1 Temporary IP Address Resolution

If the IP address is left at 0.0.0.0 (the default value), a temporary IP address is assigned when the print server is powered on. DHCP, BootP, and RARP are attempted in sequence for finding an address. The newer PS100 Print Servers provide a new **Auto-IP** feature. If DHCP, BootP, and RARP cannot get an IP address, an internal IP address will be assigned automatically. The address will be in the range from 169.254.0.1 to 169.254.254.254 with subnet mask 255.255.0.0. Reset (power cycle) the print server to get an IP address.

Assigning an IP Address to the Print Server Using DHCP

Using Dynamic Host Configuration Protocol (DHCP) is possible only if you have a DHCP server with management software that allows you to take advantage of this feature. Otherwise, the IP address of the print server will be unknown, and connection to the print server is not possible. To use DHCP, turn on power to the print server; the DHCP server automatically assigns an IP address to it.

If you do not have a DHCP server and you are assigning an IP address to the print server, you can use BootP, RARP, or ARP.

Assigning an IP Address to the Print Server Using BootP

To assign an IP address using the Bootstrap Protocol (BootP):

1. Determine the physical address and the device name of the print server.

The factory default name and the physical address are shown on a sticker on the bottom of the unit. The default name on your device is PSxxxxxx.

2. Log in to the UNIX host as root.

3. Add the print server to the /etc/hosts file by adding to the file:

```
IP_Address NAME # Comment
```

Use these definitions for entering the information:

IP_Address is the IP address of your print server.

NAME is the name of your print server.

A sample entry is:

```
192.10.2.54 PS_Rm203 #Default name PS123456
```

In the example, a print server with an IP address of 192.10.2.54 is called PS_Rm203 and has a default name of PS123456.

4. Add to the Boot Table in the /etc/boottab file:

```
NAME:ht=ether:vm=rfc1024::ha=PA:ip=IP:sm=SM:gw=GW
```

Use these definitions for entering the information:

NAME is the name of your print server.

PA is the physical address of your print server.

IP is the IP address of your print server.

SM is the Subnet Mask IP address.

Refer to Appendix B “Understanding IP Addresses,” for additional information about assigning a Subnet Mask IP address.

GW is the Gateway IP address.

Refer to Appendix B “Understanding IP Addresses,” for additional information about assigning a Gateway IP address.

5. Start the BootP daemon (the usual command is BOOTPd) if the command in step 2 did not start the BootP process, and then reset the print server so that it obtains an IP address using BootP.

- 6. Compare the IP address to MAC address association to assure that an IP address has been assigned, using the ping command:**

`ping NAME`

NAME is the name of the print server. You should receive a response. If you get a timeout message, the BootP procedure has failed. You can either follow the steps again for using BootP or use one of the other methods for assigning an IP address.

- 7. Proceed to “Configuring Your Print Server Using FTP” to configure the print server, if it has not yet been configured.**

Assigning an IP Address to the Print Server Using RARP

To assign an IP address using the Reverse Address Resolution Protocol (RARP):

1. Determine the physical address and the device name of the print server.

The factory default name and the physical address are shown on a sticker on the bottom of the unit. The default name on your device is PSxxxxxx.

2. Log in to the UNIX host as root.

3. Add the print server to the /etc/hosts file by adding to the file:

```
IP_Address NAME # Comment
```

Use these definitions for entering the information:

IP_Address is the IP address of your print server.

NAME is the name of your print server.

A sample entry is:

```
192.10.2.54 PS_Rm203 #Default name PS123456
```

In the example, a print server with an IP address of 192.10.2.54 is called PS_Rm203 and has a default name of PS123456.

4. Add to the Ethernet Address table /etc/ethers:

```
00:c0:02:xx:yy:zz NAME
```

Use these definitions for entering the information:

00:c0:02:xx:yy:zz is the location of your print server.

NAME is the name of your print server.

5. Reset the print server by turning the power off and then on again.

When the print server reboots, it acquires an IP address using RARP.

6. To assure that an IP address has been assigned, check the IP address to MAC address association using the ping command:

```
ping NAME
```

NAME is the name of the print server. You should receive a response. If you get a timeout message, the RARP procedure has failed. You can either follow the steps again for using RARP or use one of the other methods for assigning an IP address.

7. Proceed to “Configuring Your Print Server Using FTP” to configure the print server, if it has not yet been configured.

Assigning an IP Address to the Print Server Using ARP

To assign an IP address using the Address Resolution Protocol (ARP):

- 1. Determine the physical address and the device name of the print server.**

The factory default name and the physical address are shown on a sticker on the bottom of the unit. The default name on your device is PSxxxxxx.

- 2. Log in to the UNIX host as root.**

- 3. Add the print server to the /etc/hosts file by adding to the file:**

```
IP_Address NAME # Comment
```

Use these definitions for entering the information:

IP_Address is the IP address of your print server.

NAME is the name of your print server.

A sample entry is:

```
192.10.2.54 PS_Rm203 #Default name PS123456
```

In the example, a print server with an IP address of 192.10.2.54 is called PS_Rm203 and has a default name of PS123456.

- 4. Compare the physical address with the IP address of the print server, using the ARP command as follows:**

```
arp -s NAME 00:c0:02:xx:yy:zz
```

Use these definitions for entering the information:

NAME is the name of your print server.

00:c0:02:xx:yy:zz is the physical address of the print server.

A sample entry is:

```
arp -s PS_Rm203 00:c0:02:12:34:56
```

- 5. To assure that an IP address has been assigned, check the IP address to MAC address association using the ping command:**

```
ping NAME
```

NAME is the name of the print server. You should receive a response, but if you get a timeout message, the ARP procedure has failed. You can either follow the steps again for using ARP or use one of the other methods for assigning an IP address.

- 6. Proceed to “Configuring Your Print Server Using FTP,” which follows.**

5-2 Configuring Your Print Server Using FTP

FTP allows a user to log on to a remote host and to manipulate files on the host. The print server can act as an FTP host. Using FTP, you can access and modify the CONFIG file in the print server. Modifying the CONFIG file changes the configuration of the print server.

The limitations of print server support when using FTP are:

- Only one FTP user can connect to the print server at a time.
- Only command line FTP programs can be used. FTP programs that attempt to browse the file system are not supported.

Configuration Example

This section provides commands to use and responses to each command when you use FTP to connect to the print server.

Example instructions are:

1. **Connect to the print server by entering the command:**

```
ftp NAME or ftp IP_Address
```

You can connect using a name instead of an IP address only if your system has been configured to recognize the name to IP address association.

2. **Enter the default name (on the base of the device) when you are prompted for the user name.**
3. **Press [Enter] when prompted for the password.**
4. **Copy the configuration file by entering the command:**

```
ftp>get CONFIG
```

5. **Quit copying the file by entering the command:**

```
ftp>quit
```

6. **Edit the CONFIG file by typing with a text editor.**

NETGEAR recommends that you edit the CONFIG file to provide a permanent IP address to the print server. The CONFIG file is shown in "CONFIG File."

7. **Copy the CONFIG file back to the print server and then reset the device by using the commands:**

```
ftp NAME  
ftp>put CONFIG  
ftp>get RESET
```

Quit by using the command:

```
ftp>quit
```

List of FTP Files and Commands Supported by the Print Server

Table FTP Files in the Directory lists the file names that appear in the directory.

FTP Files in the Directory

File Name	Purpose	Mode
CONFIG	Configuration file	Read/Write
PSINF	Device information	Read
DEFAULTC	Reset device to default configuration	Read
RESET	Reset device	Read
PASSRESET	Clear password	Read
SETIP	Save current IP address	Read

Table FTP Commands lists the case-sensitive commands that are implemented. When a command requires a parameter, the parameter is shown in *italics>*.

FTP Commands

Command	Function
dir	Lists files as shown in table FTP Files in the Directory.
get FILENAME	Retrieves a file. The only files that can be retrieved are CONFIG and PSINF.
get RESET	Resets the print server and terminates the current connection.
get PASSRESET	Clears the password.
get SETIP	Sets the current IP address as a static IP address. To avoid an address conflict, do not use this command if a DHCP server assigned the IP address to the print server.
put CONFIG	Copies the CONFIG file to the print server, overwriting the existing CONFIG file. After using this command to write a new configuration file, use the get RESET command; all LEDs should turn on and then off while the print server is resetting.
put PASSWORD	Copies the password file to the print server and gives it a new password. Passwords can be up to 19 bytes in length.
put filename Ln	Copies the filename file to the printer connected to n port and prints the file.
quit	Terminates the current FTP session.

Other FTP commands cannot be used, and they return an Invalid Command error message.

5-3 Setting the Print Method

The following three printing methods can be used in any environment:

Line Printer Daemon (LPD)

LPD is a standard print method for most UNIX systems. The benefit of this method is that it eliminates the need to install additional software on the host.

File Transfer Protocol (FTP)

FTP is also a standard print method in most UNIX systems, but it is not recommended except as a test and backup method of printing.

Direct Socket Interface (DSI)

DSI is a UNIX-based method of providing a direct connection between a host computer and a printer. The host and the print server establish a TCP connection, using a special socket number. All data sent over this connection is treated as print data and sent transparently to a logical printer defined on the print server.

Of the three choices, LPD and DSI work well with a large number of users because they both employ print queue processes. FTP does not implement a print queue; if the printer is busy, the print command may fail. The three methods are explained more fully in the following sections.

LPD Configuration and Printing

LPD is a built-in printing protocol for most UNIX systems including BSD type UNIX. It is also supported in Windows NT 3.5 or later. The following sections provide information about configuring LPD on:

- IBM AIX 4.15
- System V
- BSD

Configuring LPD on IBM AIX 4.15

Before proceeding, make sure that the print server has been assigned an IP address. To set up your AIX system for LPD printing:

1. **Type the name of your print server, adding it to the */etc/hosts.lpd* file.**
2. **Start the LPD daemon if it is not running, using the command:**

```
start src -s qdaemon
```

3. **Start the system administration tool *smith* and select **Print Spooling**.**
4. **Create the required number of queues (one for each logical printer) by selecting **Add a Print Queue, Remote (Printer attached to Remote Host)**, and then **Standard Processing**.**

Use these definitions for entering the information:

Name of queue to add

Use a single-word queue name that indicates the printer attached.

Hostname for remote server

Print server name as used in */etc/hosts.lpd*.

Name of queue on remote server

It is the logical printer number (L1 to L3 or L1 to L8) to service this queue.

Type of print spooler on remote server

Use the default value.

5. **Make sure the logical printers are configured in the print server.**

Refer to the information provided in table FTP Commands for information about configuring logical printers.

6. **Print using the command:**

```
lp -d printer_queue file_name
```

Use these definitions for entering the information:

printer_queue is one of the entries used in Name of queue to add.

file_name is the file you want to print.

Configuring LPD on System V

Before beginning LPD Setup, make sure that an IP address has been assigned to your print server and that the following statements apply:

The remote host name is the name of the print server.

The remote printer name is the print queue name for the logical printer.

Logical printers are configured on the print server itself.

You identify the service type as BSD if your UNIX system asks for the LPD type.

The LPD protocol that the print server uses meets BSD system standards.

Table Sample Commands for Using LPD on System V shows sample commands when using LPD. The definitions used in the sample commands are:

printer_name is the name of the print queue serviced by the print server.

Spooler_directory is the name of the directory used to spool the print jobs.

Sample Commands for Using LPD on System V

Action	Sample Command
Stop Print Services	/usr/lib/lpshut
Add a System Printer	/usr/lib/lpadmin -p printer_name -v /dev/null
Restart the Print Services	/usr/lib/lpsched
Enable printing to the new printer device	enable printer_name
Start accepting jobs for the new printer device	accept printer_name
Create a spooling directory	mkdir /usr/spool/Spooler_directory
Make spooling daemon the owner of this directory	chown daemon /usr/spool/Spooler_directory
Create read/write permissions	chmod 775 /usr/spool/Spooler_directory
Give permissions to LPD processes	chgrp daemon /usr/spool/Spooler_directory
Add remote printer(s). (Repeat this process for each logical printer/print queue combination that you want to create.) Sample command should be entered as one line, using a tab character where shown.	Add to the /etc/printcap file: printer_name Remote_Printer_Alias\ [Tab] :lp=:\ [Tab] :rm=PS_NAME\ [Tab] :rp=Logical_Printer_name\ [Tab] :sd=Spooler_directory\ [Tab] :mx#0 Use these definitions for entering the information: <ul style="list-style-type: none"> printer_name is the print queue name used to store jobs for the corresponding logical printer. PS_NAME is the print server name defined in /etc/hosts. Logical_Printer_name is the logical printer name on the print server (L1 to L3 or L1 to L8, depending on the print server that you are using). Spooler_directory is the directory you created.

Configuring LPD on BSD

Make sure that an IP address has been assigned to the print server and the following statements apply:

The remote host name is the name of the print server.

The remote printer name is the logical printer (L1 to L3 or L1 to L8).

You identify the service type as BSD if your UNIX system asks for the LPD type.

The LPD protocol that the print server uses meets BSD system standards.

Enter the service type as BSD if asked for the LPD type.

Table Sample Commands for Using LPD on BSD shows sample commands when using LPD. The definitions used in the sample commands are:

printer_name is the print queue serviced by the logical printer on the print server.

Spooler_dir is the name of the directory used to spool the print jobs.

Sample Commands for Using LPD on BSD

Action	Sample Command
Create a spooling directory	Mkdir /usr/spool/Spooler_dir
Set spooling daemon as owner of this directory	Chown daemon /usr/spool/Spooler_dir
Create read/write permissions	Chmod 775 /usr/spool/Spooler_dir
Give permissions to LPD processes	Chgrp daemon /usr/spool/Spooler_dir
Add remote printer(s)	See adding remote printers in table Sample Commands for Using LPD on System V
Start lpc print mechanism	lpc start printer_name

Printing Using LPD

For LPD printing instructions, refer to your UNIX manual. An example command that is used for a BSD UNIX system is:

```
lpr -P printer_name filename
```

The definitions used are:

printer_name is the name of the print queue defined on the UNIX host.

filename is the name of the file you want to print.

An example command with parameters is:

```
lpr -P Marketing /etc/hosts
```

In the above example, the /etc/hosts file is sent to the Marketing printer queue. It is then sent to the logical printer associated with this queue.

Printing Using FTP

Using FTP to print lets you send print jobs to the printers directly. Because there is no spooling, if the printer is not ready, the print job is terminated immediately. The advantage of FTP is that no host configuration is required.

To print using FTP, use the command lines:

```
#ftp Name  
ftp>put FileName Ln
```

The definitions used are:

Name is the name of the print server.

FileName is the file you want to print.

Ln is the logical printer you want to print to.

Printing Using DSI

Logical printers must be configured on the print server. Even if you are using the PS100 Print Server that normally supports up to eight logical printers, using DSI to print limits the support to three logical printers. Socket numbers are defined as listed in table Socket Number Definitions.

Socket Number Definitions

Logical Printer Number	Socket Number
1	4010
2	4020
3	4030

Chapter 6: AppleTalk Printing

This chapter contains information about configuring and using your NETGEAR PS100 Print Server in an AppleTalk networking environment.

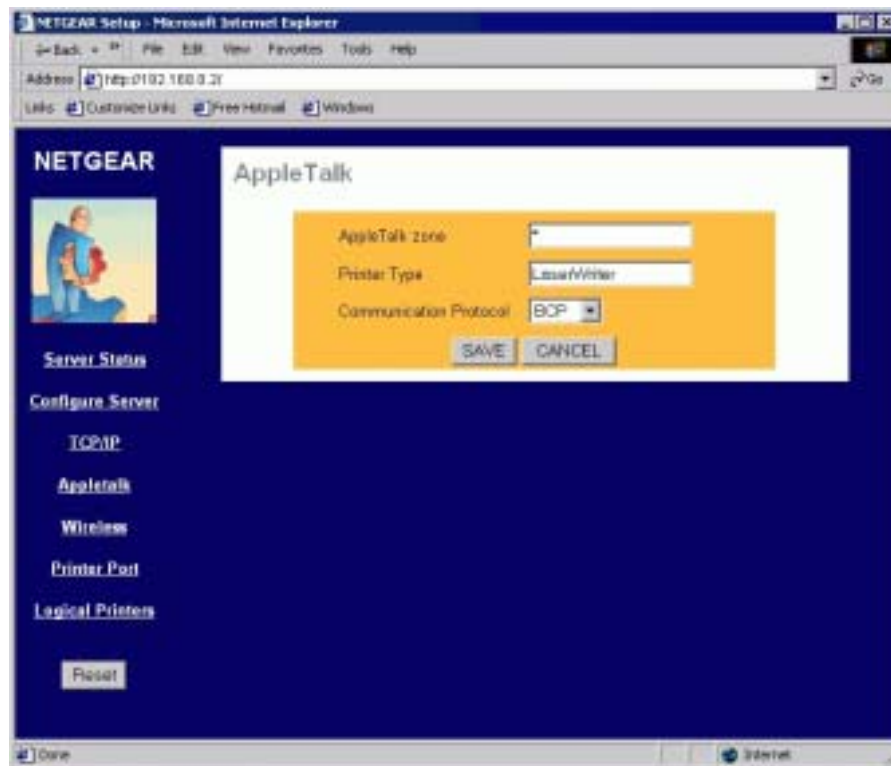
6-1 Setting up Print Server for AppleTalk

AppleTalk printing is enabled by default in NETGEAR Print Servers that support AppleTalk printing and the printers attached to the print servers are advertised in the default zone on the AppleTalk network. To disable AppleTalk printing, you may use Web configuration described in Chapter 3 or Netgear Print Server Administrative program described in Chapter 8.

Configuration will only be necessary if the name of the print server is to be changed from the default, or if you have an AppleTalk network connected by AppleTalk routers and you wish the printers attached to the print server to be advertised in a specific AppleTalk zone, or if you need to change the communication protocol used between the print server and the printer.

There are 3 different ways to configure AppleTalk on a NETGEAR PS100 Print Server:

1. The recommended approach is through the print server's browser interface in an IP networking environment. For more information, please refer to chapter 3, "Web Management for Print Server".



6-1 Browser Interface for Configuring AppleTalk

2. Through the NETGEAR Print Server Administration Program on a PC with Microsoft Windows, for more information, please refer to Chapter 8, "Using Advanced Management Tools".
3. Through the NETGEAR PSTool Utility for the Macintosh environment, described in this chapter.

6-2 Setting up Host Computer

The host Apple computer to be setup for AppleTalk printing must be running System 7 Operating System or later.

1. Install any printer driver provided by your printer manufacturer for the Mac OS®.
2. Click the Apple icon and choose **Control Panel**.
3. Click **Network**.
4. Ensure that **EtherTalk** is selected under **AppleTalk Connection**.
5. Click **Chooser**. The **Chooser** panel will open.
6. Click on either the **LaserWriter 8** icon (recommended) or the **LaserWriter 7** icon. **LaserWriter 8** makes use of the fonts installed in the printer itself, so the printing response time is quicker. **LaserWriter 7** uses the fonts installed in the computer, which increases network traffic and takes more printing time.
7. Select printers attached to the NETGEAR Print Server from the **Printer List** by clicking on the appropriate name.
8. Printers attached to the NETGEAR printer are advertised on AppleTalk networks as xxxxxx_P1, xxxxxx_P2, xxxxxx_P3, where xxxxxx is the name of the print server. e.g. if the NETGEAR Print Server is a 3 port model and the printer server name is PS543283, the printers attached to it will be advertised as PS543283_P1, PS543283_P2, PS543283_P3. The default name of the print server's name is recorded on a label on the bottom of the print server as "Device Name". This name is consisted of 8 digits and/or numbers.
9. Click on the **Close box**.

6-3 Using PSTool Utility for Macintosh™ based computer

The NETGEAR PSTool Utility is a program that runs under the Mac OS®.

This section describes how to use the NETGEAR PSTool Utility for Macintosh™ based Computers to configure AppleTalk on a NETGEAR Print Server. It is not necessary to use the NETGEAR PSTool Utility to manage AppleTalk printing if your NETGEAR Print Server can be managed via the web browser interface or if you have Windows workstations running the NETGEAR Print Server Administration program.

You first edit a NETGEAR Print Server configuration file using a text editor such as SimpleText, and then use the NETGEAR PSTool Utility to send the configuration file to the NETGEAR Print Server. The procedure is as follows:

1. Copy the following files from the Utility\Apple folder on the *Print Server Resource CD* to an appropriate folder on your Apple computer. Your Apple computer must be running Mac OS® System 7 or later.

PSTool

CONFIG. 2P if configuring a 2 port print server, or **CONFIG. 3P** if configuring a 3 port print server.

2. Use **Chooser** to select the desired Print Server.
3. Double click the CONFIG.2P or CONFIG.3P file that was copied over in step 1, and edit it. Figure 7-1 is an example of the CONFIG.3P file. DO NOT modify the first line and last line of the file, or change the number at the beginning of each line.

```
begin CMD
0001 Device Name: xxxxxxxx
3000 Apple Zone : *
3101 AP_PCOMM1: No
3102 AP_PCOMM2: No
3104 AP_PCOMM3: No
9002
```

Sample CONFIG.3P Configuration File

4. Save the file.
5. Double click the icon for **PSTool**.
6. Click the **Printer** submenu and choose **Download Postscript File**. A panel will appear with a list of files.
7. Click the CONFIG file that you edited in step 3. Then click **Download**.

6-4 PSTool Utility CONFIG File Format

The entries of the config file are listed and described in table 7.1. This example is for the 3-port model of the NETGEAR Print Server.

PSTool Utility Config File Entries

Entry in Config File	Description
begin CMD	Do not change this line.
0001 Device Name: xxxxxxx	Replace xxxxxxxx with the desired device name. The Device Name will initially be the Default Server Name. The Default Server Name is shown on a sticker on the base of the device. The Device Name can be changed, but the new name must not exceed 16 characters in length
3000 Apple Zone: *	The default value "*" allows all AppleTalk zones to access the Print Server's printers. To restrict access to a particular zone, replace the * with the desired zone name.
3101 AP_PCOMM1: No 3102 AP_PCOMM2: No 3104 AP_PCOMM3:	These settings determine whether the port uses ASP, TBCP or BCP Communication Protocol. The lines corresponds to port 1, 2 and 3 of the print server. <ul style="list-style-type: none"> The default is BCP. The computer, Print Server and printer MUST all be configured to use the SAME protocol.
9002	Do not change this line.

Note: NETGEAR does not support PS101 Print Server for an AppleTalk printing environment.

Chapter 7: Novell Netware Printing

This chapter describes how to configure and use the NETGEAR Print Server Model PS110 in the Novell NetWare environment.

7-1 Configuration Overview

This section describes the requirements and outlines the PSERVER or RPRINTER mode configuration in either a NetWare Bindery or a NetWare Directory Services (NDS) network environment.

There is a two-step process to set up the Model PS110 print server in the NetWare environment. The NetWare file server must first be configured, and then you can configure your print server.

To configure your print server for the Novell NetWare environment, you must have:

- NetWare Version 3.1x, NetWare Version 4.x, or NetWare Version 5.x
- NetWare PCONSOLE V1.21 or higher installed in your network file server
- NetWare Print Server V1.22 or higher (for remote printer mode only)
- DOS 3.3 or higher installed on all of the workstations in your network
- Network installation completed

The following two operating modes are possible in bindery (NetWare 3.x), NDS network environment (NetWare 4.x), or NDPS (NetWare 5.x):

- PSERVER mode

PSERVER mode is faster and uses fewer resources than RPRINTER mode but occupies a user login slot. The NETGEAR print server emulates a NetWare PSERVER.

- When activated, the device:
- Logs in to specified NetWare file server(s)
- Polls the specified print queues

If there are print jobs in the print queue, the print server retrieves them from the print queue.

- Sends the received network packet data to the printer

- RPRINTER mode

RPRINTER mode does not use a login slot. NETGEAR recommends that PSERVER mode be used if possible. The print server emulates a NetWare Remote Printer.

- When activated, the device:
- Connects to NetWare PSERVER
- Receives the print jobs sent by PSERVER
- Sends the received network packet data to the printer

Step 1: Configuring the NetWare File Server

NetWare server configuration can be executed through the DOS-based PCONSOLE (NetWare 3.x and NetWare 4.x), NWADMIN (NetWare 4.x), or NWADMN32 (NetWare 5.x) based on Windows. All of these programs are provided as part of NetWare. Refer to the following sections for configuring the file server using PCONSOLE. For information about NWADMIN, refer to the NetWare user's manual.

The following sections describe how to determine a device name for your print server and set up the following three printing components on a Novell NetWare server:

- Print queue
- Print server
- Print

Step 2: Configuring Your Print Server

There are two methods for configuring the print server in a NetWare environment: the NETGEAR Print Server Administration Program based on Windows, or the PSCONFIG program based on MS-DOS. Both programs are on the Model PS110 Print Server Resource CD that comes with your print server.

Additionally, you can also run the QUICKSET configuration program to configure the print server and the current Novell server in a single operation.

This chapter provides step-by-step instructions to set up the file server and the print server using PCONSOLE and PSCONFIG programs. For detailed descriptions on the various options of PSCONFIG, the NETGEAR Print Server Administration Program, and QUICKSET, refer to Chapter 8 “Using Advanced Management Tools.”

Determining a Device Name for Your Print Server

The Model PS110 print server is capable of servicing multiple protocols simultaneously. However, you must always use the same name for the print server when you are using more than one protocol. When the print server name is changed, the print operations in all protocols are affected; therefore, it is important that you decide on a permanent print server name before setting up the device. Also make sure that you decide on and assign a different name for each of the print servers on the network.

7-2 Using Your Print Server in a NetWare 3.x Network

When configuring using the PSCONFIG utility, copy all files in \DOS directory on the Model PS110 Print Server Resource CD to the hard disk of your workstation. The PSCONFIG program is in this directory.

Setting PSERVER Mode in NetWare 3.x (Bindery Mode)

To set up the NetWare file server to connect to the Model PS110 print server in the NetWare PSERVER mode, first designate a NetWare file server that your print server will log on to retrieve print jobs. Log on to the file server as SUPERVISOR or as a user with SUPERVISOR privileges. The print server can be configured to service multiple NetWare Bindery file servers as described in Chapter 8 “Using Advanced Functions”. However, one of the NetWare file servers has to be designated as the master file server, and this file server is the one that must be configured and logged on to.

To set up the NetWare file server:

1. **Execute the PCONSOLE program from the system volume of the file server.**
2. **Create queues.**

To create queues:

- a. **Select Print Queue Information in the Available Options window.**
 - b. **Press the [Ins] key to add a new queue.**
 - c. **Type in a queue name and press [Enter].**
 - d. **Repeat steps b and c until you have the number of queues you want.**
 - e. **Press [Esc] to return to the PCONSOLE Main Menu.**
3. **Add the print server.**

To inform the NetWare file server that a print server exists:

- a. **Select Print Server Information from the PCONSOLE Main Menu.**
- b. **Press [Ins] to add a new print server.**
- c. **Type the print server name.**

The factory default name for the print server is PSxxxxxx (shown on the label on the bottom of the device).

4. **Assign printers.**

To associate a NetWare printer object with each printer port of the print server:

- a. **Select the print server you added in step 3.**
- b. **Select Print Server Configuration.**

- c. **Select Printer Configuration.**
- d. **Select the printer number on the Configured Printers submenu, using the printer number mapping as shown in below “PSERVER Mode Printer Number Mapping”.**

For more information about logical ports, refer to below “Using Logical Ports”.

PSERVER Mode Printer Number Mapping	
Print Server Port	File Server Printer Number
Printer port 1	Printer number 0
Printer port 2	Printer number 1
Logical port 1	Printer number 8
Logical port 2	Printer number 9
Logical port 3	Printer number 10
Logical port 4	Printer number 11
Logical port 5	Printer number 12
Logical port 6	Printer number 13
Logical port 7	Printer number 14
Logical port 8	Printer number 15

- e. **Enter the print server name in the Name entry field.**

Leave the Type entry field with the default value of Defined elsewhere.

- f. **Press [Esc].**
- g. **Select Yes to save the changes.**
- h. **Repeat steps d, e, and f for each printer port on the print server.**
- i. **Press [Esc] to return to the Print Server Configuration menu.**

5. Associate printers with print queues.

To associate print queues with the printer(s) attached to your print server:

- a. **Select Queues Serviced by Printer from the Print Server Configuration menu.**
- b. **Select a printer you want to assign a print queue to.**
- c. **Press [Ins] when the File Server Queue Priority window opens.**
- d. **Select the print queue that you want the printer to service.**
- e. **Press [Enter] to accept the default priority level.**
- f. **Press [Esc] to return to the Defined Printers window.**
- g. **Repeat steps b through f until all printer and queue associations are configured completely.**
- h. **Press [Esc] until you exit out of the PCONSOLE program.**

6. Configure your print server.

To configure your print server:

- a. **Execute PSCONFIG while logged on to the file server.**

This program was previously copied from the print server resource CD into your hard disk.

- b. **Select the print server that you want to configure.**
- c. **Select Change Configuration.**
- d. **Select NetWare Configuration.**
- e. **Verify that PS is the Operation Mode.**

PS must be the operation mode for the print server to operate in PSERVER mode. If the operation mode is RP, the print server operates in RPRINTER mode. It can operate in only one mode at a time.

- f. **Select the Master File Server entry field to open the Select the Master File Server window.**
- g. **Select the name of the file server you just configured.**
- h. **Press [Esc] to return to the Select Configuration Item window.**
- i. **Select System Configuration if any change to the print server is necessary.**
- j. **Select Execute Change.**
- k. **Press [Enter] when asked if you are sure.**
- l. **Press [Esc] when a window opens indicating the configuration is complete.**
- m. **Press [Esc] to return to the Active Device List main menu.**

Press F2 to make sure that the new print server name is activated if it was changed.

- n. **Press [Esc] to exit out of the PSCONFIG program.**

Your print server is now set up in the NetWare networking environment. You can access the print server using NetWare commands printing to the designated queue.

Setting RPRINTER Mode in NetWare 3.x (Bindery Mode)

To set up the NetWare file server to connect to the Model PS110 print server in the NetWare RPRINTER mode, first designate a NetWare file server that your print server will log on to retrieve print jobs. Log on to the file server as SUPERVISOR or as a user with SUPERVISOR privileges. The print server can be configured to service multiple NetWare Bindery file servers as described in below “Using Advanced Functions”. However, one of the NetWare file servers has to be designated as the master file server, and this file server is the one that must be configured and logged on to.

To set up the NetWare file server:

- 1. Execute the PCONSOLE program from the system volume of the file server.**
- 2. Create queues.**

To create queues:

- a. Select Print Queue Information in the Available Options window.**
- b. Press [Ins] to add a new queue.**
- c. Type in a queue name and press [Enter].**
- d. Repeat steps b and c until you have the number of queues you want.**
- e. Press [Esc] to return to the PCONSOLE Main Menu.**

- 3. Add the print server.**

To inform the NetWare file server that a print server exists:

- a. Select Print Server Information from the PCONSOLE Main Menu.**
- b. Press [Ins] to add a new print server.**
- c. Type the print server name.**

This name is not the name of the print server. It is the print server that you will set up on the NetWare file server. At the end of the installation process, you will load PSERVER.NLM on the file server using this name.

- 4. Assign printers.**

This step should be done every time you add a new print server or when you connect a new printer to the print server.

To associate a NetWare printer object with each printer port of the print server:

- a. Select the print server you added in step 3.**
- b. Select Print Server Configuration.**
- c. Select Printer Configuration.**

- d. **Select the entry with printer number 0 on the Configured Printers submenu to open the Printer 0 Configuration window.**
- e. **Type the predetermined print server name in the Name entry field, using the convention shown below “RPRINTER Mode Printer Name Mapping”.**

When referring to the table, assume that PSxxxxxx is the predetermined name of the print server. You can provide a name different from the one presently in the print server, and then you can change the name of the device when you execute the PSCONFIG program for the RPRINTER setup.

The factory default name for the print server is PSxxxxxx as shown on the label on the bottom of the device.

RPRINTER Mode Printer Name Mapping	
Print Server Port	Printer Name in File Server
Printer port 1	PSxxxxxx
Printer port 2	PSxxxxxx_P2
Logical port 1	PSxxxxxx_L1
Logical port 2	PSxxxxxx_L2
Logical port 3	PSxxxxxx_L3
Logical port 4	PSxxxxxx_L4
Logical port 5	PSxxxxxx_L5
Logical port 6	PSxxxxxx_L6
Logical port 7	PSxxxxxx_L7
Logical port 8	PSxxxxxx_L8

- f. **Select the Type entry field to open the Printer Types window.**
 - g. **Select Remote Parallel, LPT1 in the Printer Types window and press [Enter].**
 - h. **Press [Esc].**
 - i. **Select Yes to save the changes.**
 - j. **Repeat steps d through f for each printer port on the print server.**
 - k. **Press [Esc] to return to the Print Server Configuration menu.**
5. **Associate printers with print queues.**

To associate print queues with the printer(s) attached to your print server:

- a. **Select Queues Serviced by Printer from the Print Server Configuration menu.**
- b. **Select a printer you want to assign a print queue to.**
- c. **Press [Ins] when the File Server Queue Priority window opens.**
- d. **Select the print queue that you want the printer to service.**
- e. **Press [Enter] to accept the default priority level.**
- f. **Press [Esc] to return to the Defined Printers window.**
- g. **Repeat steps b through f until all printer and queue associations are configured completely.**

- h. Press [Esc] until you exit out of the PCONSOLE program.**

6. Configure your print server.

To configure your print server:

- a. Execute PSCONFIG while logged on to the file server.**

This program was previously copied from the print server resource CD into your hard disk.

- b. Select the print server that you want to configure.**
- c. Select Change Configuration.**
- d. Select NetWare Configuration.**
- e. Verify that RP is the operation mode.**

RP must be the operation mode for the print server to operate in RPRINTER mode. If the operation mode is PS, the print server operates in PSERVER mode. It can operate only in one mode at a time.

- f. Select and enter the name of the NetWare print server in the Novell PSERVER (P1) entry field.**

This name is the NetWare print server that you entered in step 3 c.

You can also modify the Novell PSERVER field of the other printer ports if they exist.

- g. Press [Esc] to return to the Select Configuration Item window.**
- h. Select System Configuration if any change to the print server is necessary.**

If a change is necessary, select Device Name, change it to the new print server name, and exit back into the Select Configuration Item window.

- i. Select Execute Change.**
- j. Press [Enter] when asked if you are sure.**
- k. Press [Esc] when a window opens indicating that the configuration is complete.**
- l. Press [Esc] to return to the Active Device List main menu.**

Press F2 to make sure that the new print server name is activated if it was changed.

- m. Press [Esc] to exit out of the PSCONFIG program.**

7. Load the PSERVER.NLM on the NetWare file server.

If the NetWare print server to which the NETGEAR print server will be connected has been previously loaded, you must unload and reload it again. If you are unloading and reloading the PSERVER NetWare Loadable Module (NLM), start with step a. If you are loading the NLM for the first time, go to step d.

To load the NetWare PSERVER module:

- a. Go to the file server console where the PSERVER.NLM is running.**

- b. Press [Alt] + [Esc] until the print server NLM window opens.**
- c. Press [Esc] to stop the print server NLM and answer Yes.**
- d. Enter the following command when the NetWare NLM has been unloaded:**

`load pserver xxxx`

xxxx is the same NetWare print server entered in steps 3 c and 6 f.

Your print server is now set up as a remote printer in the NetWare networking environment. You can access the print server using NetWare commands printing to the designated queue or printer.

7-3 Using Your Print Server in a NetWare 4.x Network

In NetWare 3.x, all user-related information is stored in a database called the Bindery. NetWare server administration programs such as SYSCON and PCONSOLE modify information in the Bindery to manage the operation of the file server. The main disadvantage of the Bindery database is that it is limited to a single file server. Networks with a large number of servers can become difficult to manage, because each server has to be configured separately. In a large enterprise with a large number of servers, it could become extremely difficult to coordinate the administration of file servers across the entire enterprise.

Novell introduced NetWare Directory Services (NDS), which allows administration on a more global basis, in NetWare 4.x. NDS organizes objects by administrative domain, not by file server. The advantage of NDS is that the user logs on to a tree rather than a particular file server. However, to retain backward compatibility, NetWare 4.x still provides Bindery emulation to ease the transition into NDS.

To be able to configure the NetWare 4.x or IntraNetWare file server in NDS mode, the client station conducting the configuration must have Novell Client32 installed. There are different versions of Client32 software for Ms-DOS, Windows 3.1, and Windows 95. With Windows NT, the IntraNetWare software for Windows NT is necessary. Without Client32 or IntraNetWare, the file server can only be configured in Bindery mode.

Setting PSERVER Mode in a NetWare 4.x NDS Mode Network

As described at the beginning of the chapter, you should determine a unique name and permanent name for the print server prior to starting any configuration process. Also make sure that you have a unique name for each of the NETGEAR print servers on the network.

Log in to your NDS network as ADMIN or as a user with Administrator access privileges. Make a note of the NDS tree and NDS context name that appear on the screen. This information will be used later to configure the NETGEAR print server.

To configure the NDS file server to use the Model PS110 print server in PSERVER mode:

1. Execute the PCONSOLE program from the System volume of the file server.

The Available Options window opens. Make sure that the following five menu selections are in the window:

- Print Queues
- Printers
- Print Servers
- Quick Setup
- Change Context

If you do not see these five menu selections, you are not running Client32. You will have to exit PCONSOLE, log out, and log in to the NDS file server when you have Client32 installed.

2. Configure the file server using Quick Setup.

To configure the file server using Quick Setup:

a. Select Quick Setup from the Available Options window.

b. Type the predetermined print server name in the Print Server field.

This name is the one you chose earlier before starting the file server configuration. The factory default name for the print server is PSxxxxxx (shown on the label on the bottom of the device).

c. Type the printer name you want in the New Printer field.

This name is the one used to associate a NetWare printer object with each printer port of the Model PS110 print server.

d. Type the print queue name you want in the New Print Queue field.

e. Press F10 to save.

The printer number is automatically assigned by Quick Setup starting from printer number 0. It can be modified by selecting Printers from the Available Options main menu, selecting the designated printer, and changing the Printer Number in the Printer Configuration window. The print server port to printer number mapping is shown below “PSERVER Mode Printer Number Mapping”.

- f. Repeat steps a through e if you are using the Model PS110 Print Server and if you want to configure parallel port 2.**
- g. Press [Esc] to exit PCONSOLE.**

3. Configure your print server.

To configure your print server:

- a. Execute the PSCONFIG program while logged on to the file server.**
- b. Select the NETGEAR print server that you want to configure.**
- c. Select Change Configuration.**
- d. Select NetWare Configuration.**
- e. Verify that the Operation Mode is PS.**

PS must be the operation mode for the print server to operate in PSERVER mode. If the operation mode is RP, the print server operates in RPRINTER mode. It can operate in only one mode at a time.

- f. Select the NDS Tree Name entry field to open the Available Trees window.**
- g. Select the name of the tree you just configured.**

This information appears on the screen when you are logging in to the file server as ADMIN.

- h. Select the NDS Context entry field.**
- i. Select the name of the NDS context recorded earlier when logging in to the file server.**
- j. Press [Esc] to return to the Select Configuration Item window.**
- k. Select System Configuration if any changes to the print server name are necessary.**

To change the print server name, Select Device Name, change the print server to the new name, and then exit back to the Select Configuration Item window.

- l. Select Execute Change.**
- m. Press [Enter] when asked if you are sure.**
- n. Press [Esc] when a window opens indicating that the new print server name is activated, if it was changed.**
- o. Press [Esc] to exit the PSCONFIG program.**

Your print server is now set up in the NetWare networking environment. You can access the print server using NetWare commands printing to the designated queue or printer.

Setting PSERVER Mode in a NetWare 4.x Bindery Emulation Network

Besides the NDS mode, NetWare 4.x also allows file servers to provide Bindery emulation services to devices or computers that are capable of operating only in Bindery mode. In this setup example, the PS110 print server is connecting to the NetWare 4.x file server in Bindery emulation mode.

Log in to your NDS network as ADMIN or as a user with Administrator access privileges. Make a note of the attached server name that appears on the screen. This information will be used later to configure the NETGEAR print server.

To configure the file server to use the Model PS110 print server in PSERVER mode:

1. Execute the PCONSOLE program from the System volume of the file server.

The Available Options window opens. Make sure that the following five menu selections are in the window:

- Print Queues
- Printers
- Print Servers
- Quick Setup
- Change Context

If you are running Client32, you see these five menu selections in the window to indicate that you are configuring the file server in NDS mode. Press F4 to switch to Bindery mode.

If you use 16-bit client to log in to the NetWare 4.x file server, you have only four menu items in the window (Print Queues, Print Servers, Quick Setup, and Change current NetWare Server).

2. Configure the file server using Quick Setup.

To configure the file server using Quick Setup:

a. Select Quick Setup from the Available Options window.

b. Type the predetermined print server name in the Print Server field.

This name is the one you chose earlier before starting the file server configuration. The factory default name for the print server is PSxxxxxx (shown on the label on the bottom of the device).

c. Type the printer name you want in the New Printer field.

This name is used to associate a NetWare printer object with each printer port of the Model PS110 print server.

d. Type the print queue name you want in the New Print Queue field.

e. Press F10 to save.

The printer number is automatically assigned by Quick Setup starting from printer number 0. It can be modified by selecting Printers from the Available Options main menu, selecting the designated printer, and

changing the Printer Number in the Printer Configuration window. The print server port to printer number mapping is shown below “PSEVER Mode Printer Number Mapping”.

- f. Repeat steps a through e if you are using the Model PS110 Print Server and want to configure parallel port 2.**
- g. Press [Esc] to exit PCONSOLE.**

3. Configure your print server.

To configure your print server:

- a. Execute the PSCONFIG program while logged on to the file server.**
- b. Select the NETGEAR print server that you want to configure.**
- c. Select Change Configuration.**
- d. Select NetWare Configuration.**
- e. Verify that the Operation Mode is PS.**

PS must be the operation mode for the print server to operate in PSEVER mode. If the operation mode is RP, the print server operates in RPRINTER mode. It can operate only in one mode at a time.

- f. Select the Master File Server entry field to open the Select Master File Server window.**
- g. Select the name of the file server you just configured to be the master file server to your print server.**
- h. Press [Esc] to return to the Select Configuration Item window.**
- i. Select System Configuration if any changes to the print server name are necessary.**

To change the print server name, Select Device Name, change the print server to the new name, and then exit back to the Select Configuration Item window.

- j. Select Execute Change.**
- k. Press [Enter] when asked if you are sure.**
- l. Press [Esc] when a window opens indicating that the configuration is complete.**
- m. Press [Esc] to return to the Active Device List main menu.**

You can press F2 to make sure that the new print server name is activated, if it was changed.

- n. Press [Esc] to exit the PSCONFIG program.**

Your print server is now set up in the NetWare networking environment. You can access the print server using NetWare commands printing to the designated queue or printer.

Setting RPRINTER Mode in a NetWare 4.x NDS Mode Network

Make sure that you are running Client32 in the NDS mode before configuring the print server as a NetWare NDS Remote Printer.

To configure the NDS file server to use the Model PS110 print server in RPRINTER mode:

1. Execute the PCONSOLE program from the System volume of the file server.

The Available Options window opens. Make sure that the following five menu selections are in the window:

- Print Queues
- Printers
- Print Servers
- Quick Setup
- Change Context

If you do not see these five menu selections, you are not running Client32. You will have to exit PCONSOLE, log out, and log in to the NDS file server when you have Client32 installed.

2. Configure the file server using Quick Setup.

To configure the file server using Quick Setup:

a. Select Quick Setup from the Available Options window.

b. Type the predetermined print server name in the Print Server field.

This name is not the one for the NETGEAR print server. It is the print server you will set up on the NetWare file server. At the end of the installation process, you will load PSERVER.NLM on the file server using this name.

c. Type the chosen printer name in the New Printer field, using the convention shown below “RPRINTER Mode Printer Name Mapping”.

When referring to the table, assume that PSxxxxxx is the predetermined name of the print server. You can provide a name different from the one presently in the print server, and then you can change the name of the device when you execute the PSCONFIG program for the RPRINTER setup.

The factory default name for the print server is PSxxxxxx as shown on the label on the bottom of the device.

d. Type the chosen print queue name in the New Print Queue entry field.

e. Type the proper destination port in the Port entry field.

Select LPT1 and LPT2 for printer ports 1 and 2, respectively.

f. Press F10 to save.

g. Repeat steps a through e for parallel port 2, if it exists on your print server.

h. Press [Esc] to exit PCONSOLE.

3. Configure your print server.

To configure your print server:

a. Execute the PSCONFIG program while logged on to the file server.

- b. Select the NETGEAR print server that you want to configure.**
- c. Select Change Configuration.**
- d. Select NetWare Configuration.**
- e. Verify that the Operation Mode is RP.**

RP must be the operation mode for the print server to operate in RPRINTER mode. If the operation mode is PS, the print server operates in PSERVER mode. It can operate in only one mode at a time.

- f. Select and type the name of the NetWare print server in the Novell PSERVER (P1) entry field.**

You can also modify the Novell PSERVER field of the other printer ports if they exist.

- g. Press [Esc] to return to the Select Configuration Item window.**
- h. Select System Configuration if any changes to the print server name are necessary.**

To change the print server name, Select Device Name, change the print server to the new name, and then exit back to the Select Configuration Item window.

- i. Select Execute Change.**
- j. Press [Enter] when asked if you are sure.**
- k. Press [Esc] when a window opens indicating that the configuration is complete.**
- l. Press [Esc] to return to the Active Device List main menu.**

You can press F2 to make sure that the new print server name is activated, if it was changed.

- m. Press [Esc] to exit the PSCONFIG program.**

4. Load the PSERVER.NLM on the NetWare file server.

If the NetWare print server to which the NETGEAR print server will be connected has been previously loaded, you must unload and reload it again. If unloading and reloading the PSERVER NetWare Loadable Module (NLM), start with step a. If you are loading the NLM for the first time, go to step d.

To load the NetWare PSERVER module:

- a. Go to the file server console where the PSERVER.NLM is running.**
- b. Press [Alt] + [Esc] until the print server NLM window opens.**
- c. Press [Esc] to stop the print server NLM and answer Yes.**
- d. Enter the following command when the NetWare NLM has been unloaded:**

```
load pserver .XXXX.YYYY
```

xxxx is the NetWare print server selected in step 3 f.

YYYY is the NDS context information recorded when you logged in to the file server as ADMIN.

- e. Select Printer Status when the Available Options main menu opens to monitor the print server status.**

Setting PSERVER Mode in NetWare 5.x NDS Mode Network

As described at the beginning of the chapter, you should determine a unique name and permanent name for the print server prior to starting any configuration process. Also make sure that you have a unique name for each of the NETGEAR print servers on the network.

You must use Windows 95 or Windows 98 and be running Client32.

To configure the NDS file server to use the Model PS110 print server in PSERVER mode:

1. **Execute the NWADMN32 program from the system volume (for example, "F:\public\win32") on the file server.**
2. **Log in to your NDS network as ADMIN or as a user with Administrator access privileges.**

Make a note of the NDS tree and NDS context name that appear on the screen. This information is used later to configure the NETGEAR print server.

3. **Configure the file server using Quick Setup.**

To configure the file server using Quick Setup:

- a. **Select a context where you want to add the new print server object, printer object, and print queue object.**
- b. **Select Tools from the NWADMN32's menu bar.**
- c. **Select Print Services Quick Setup (Non-NDPS).**
- d. **Type your print server name in the Print Server Name field.**

(NETGEAR recommends that you use the default name of the NETGEAR Print Server, which is NETGEAR PRINT SERVER).

- e. **Type the printer name you want in the Name field (within the "Printer" section of the Quick Setup Window).**
 - f. **Select Parallel in the Type field.**
 - g. **Select Text in the Banner field.**
 - h. **Type the Queue name you want in the Name field (within the Print Queue section of the Quick Setup Window).**
 - i. **Select the NetWare File server volume in the Volume field.**
4. **Launch the Print Server Administrator Program.**

To launch the Print Server Administrator Program:

- a. **Select "Netgear Print Server Administration" from the NETGEAR Print Server for Print Server icon on your desktop.**
- b. **Select Print Server from the Active Print Server list.**

- c. Select NetWare PSERVER.**
- d. Select the Advanced icon.**
- e. Select NetWare PSERVER.**
- f. Click on Print Server Mode.**
- g. Select the NDS Tree Name (refer to step 1 on page 4-20).**
- h. Enter the Context Name (refer to step 1 on page 4-20).**
- i. Click on Save to Device.**

7-4 Using Advanced Functions

The print server is capable of servicing multiple queues from multiple file servers at one time. The print server also supports a function called logical printer that allows manipulation of print data before sending it to the printer. One typical use of the logical printer function is the conversion of line feed into carriage return and line feed for proper printing on to a line printer.

Servicing Multiple NetWare Bindery File Servers

If your print server is configured as a NetWare Print Server and you want it to service more than one Bindery file server:

1. **Log in, with supervisory rights, to each file server you want your print server to service.**
2. **Execute PCONSOLE from the System volume of each file server.**
3. **Create queues and provide the predetermined print server name for your Model PS110 print server on each Bindery file server you want the print server to service.**

These steps are outlined in “Setting PSERVER Mode in NetWare 3.x (Bindery Mode)”.

4. **Log in, with SUPERVISORY access privileges, to the file server you want to designate as the master file server for your print server.**
5. **Execute the PCONSOLE program.**
6. **Create queues and provide the print server name to the master file server.**

This procedure is the same as setting up the other Bindery file servers.

7. **Select Print Server Information from the Available Options main menu.**
8. **Select your print server in the print server list.**
9. **Select Print Server Configuration, and then select File Server To Be Serviced.**
10. **Insert the names of the other file servers to be serviced by your print server.**
11. **Press [Esc] until you exit PCONSOLE.**
12. **Execute the PSCONFIG program while you are logged in to the file server.**
13. **Select the NETGEAR print server and configure it to attach to the designated master Bindery file server.**

This step is not necessary if the print server has previously been configured.

14. **Reset your print server by turning the power off and then on again.**

You can also reset the print server by executing the PSCONFIG program, selecting the preferred print server, and then selecting Reset Device from the Available Options window.

Your print server is now ready to service more than one Bindery file server.

Attaching to More Than One NetWare Print Server

If your print server is configured as a NetWare remote printer and you want each port of your print server to attach to a different NetWare print server, perform the following procedure.

To attach each port of your print server to a different NetWare print server:

1. Use **PCONSOLE** to create and assign the required printers and queues as outlined in “Setting **RPRINTER** Mode in NetWare 3.x (Bindery Mode)” or “Setting **RPRINTER** Mode in a NetWare 4.x NDS Mode Network”.

When in NetWare **RPRINTER** mode, each printer port on the Model PS110 print server can be configured to service different NetWare print servers residing on different file servers.

2. Execute **PSCONFIG**.
3. Select the print server.
4. Select **Change Configuration**.
5. Select **NetWare Configuration**.
6. Verify that the **Operation Mode** field shows **RP** for **RPRINTER** mode.
7. Enter the correct NetWare print server names in each one of the **Novell PSERVER** fields.
8. Return to the **Select Configuration Item** window.
9. Select **Execute Change**.

Your print server is now configured in NetWare **RPRINTER** mode and ready to service multiple NetWare print servers.

Using Logical Ports

Logical ports can be used to create a "virtual" printer. For example, to create a landscape printer, you could define a logical printer as:

- Pre-string--printer control codes to switch the printer to landscape mode
- Post-string--printer control codes to reset the printer, restoring the default settings

Another example of the use of logical printers is to print UNIX-format text files properly, by converting UNIX-style LF (Line Feeds) to DOS-style LF/CR (Line Feed, Carriage Return) pairs. Each Model PS110, with two parallel ports, supports eight logical printers.

Configuring Logical Printers on the Print Server

To define pre-string, post-string, and the physical output port of a logical printer:

1. **Execute the PSCONFIG program.**
2. **Select the PS110 print server, and then select Change Configuration.**
3. **Select Logical Printer Configuration, and then set the items listed in table “Logical Printer Configuration Entries” in each of the appropriate entry fields.**

Logical Printer Configuration Entries	
Entry Field	Definition
Physical Port	Select the physical port for this logical printer (P1 to P2 for parallel ports). Logical printers are numbered L1 to L8 for the Model PS110 print server.
String Before Job	The printer control string (in hexadecimal notation) to be sent to the printer before each print job. The maximum number of ASCII characters in the control string is 15. The examples are: <ul style="list-style-type: none"> • ASCII = [Esc]&100 Hexadecimal = 1B266C304F • ASCII = [Esc]&110 Hexadecimal = 1B266C314F
String After Job	The printer control string (in hexadecimal notation) to be sent to the printer after each print job. The maximum number of ASCII characters in the control string is 15.
Convert LF to CR+LF	If On is indicated in the entry field, LF (line feed) characters are changed to CR+LF (carriage return + line feed). If Off, no conversion is done.

Configuring NetWare File Server to Connect to Logical Printers

The NetWare PCONSOLE must be used to create connections to logical ports and assign print queues to the ports. When creating logical printers, be sure to select printer numbers greater than 7 from the Configured Printer listing. When operating in a NetWare environment, all printer numbers greater than 7 are logical printers. Remember that selecting printer 8 corresponds to logical printer L1, selecting printer 9 corresponds to logical printer L2, and so on up to printer 15, which corresponds to logical printer L8.

Refer to table “RPRINTER Mode Printer Name Mapping” for printer name mapping.

For more information about using NDPS, refer to Appendix D “Using NetWare 5 NDPS.”

Chapter 8: Using Advanced Management Tools

This chapter describes in more detail the two print server management programs bundled with NETGEAR PS100 Print Servers. These programs are included on the Print Server Resource CD. The two programs described in this chapter are:

1. NETGEAR Print Server Administration Program

This software program is a print server administration program based on Windows 95, Windows 98, Windows NT, or Windows 2000. It runs on any of the four protocols that the print server supports.

2. IPSetup

This program is to the IP address of the Print Server manually from Microsoft Windows.

8-1 Configuration Using the NETGEAR Print Server Administration Program

Before you begin this section, you must first install the NETGEAR Print Server software on your PC, using the Print Server Resource CD.

To start the NetGear Administration Program:

- Click on Start
- Click on the *Programs* and select the *NETGEAR Print Server* folder
- Click on the icon for the *NETGEAR Print Server Administration* program

As illustrated below, the main screen of the NetGear print server setup utility opens and searches the network for NETGEAR print servers.



Figure 8-1 NETGEAR Print Server Administration Program

All active NETGEAR print servers are listed on the screen as shown. If there is any print server missing from the screen, you may click on the Browse button to scan the network one more time. By default, the NetGear Administration Program only browses the network with NetBEUI to minimize unnecessary packets on the network.

If you still do not see all the print servers, the print server that you are trying to configure might have the default NetBEUI protocol disabled. If the protocol is disabled, click on the Protocol button to enable

browsing with IPX/SPX and TCP/IP. Make sure that the IPX/SPX and TCP/IP protocols are also enabled and bound to the network adapter card in your Windows 95, Windows 98, Windows NT, XP, or Windows 2000 system.

Buttons

Advanced Button

Click on the Advanced button for detailed full configuration of the selected Print Server. See the later section 8-2 Advanced Print Server Configuration for more information about the *Advanced* option.

Quick Button

Click on the *Quick* button to open the Quick Setup Screen to perform a quick configuration of the print server in a Microsoft network running the NetBEUI protocol. Clicking the Quick Setup button will reveal a screen like the following.

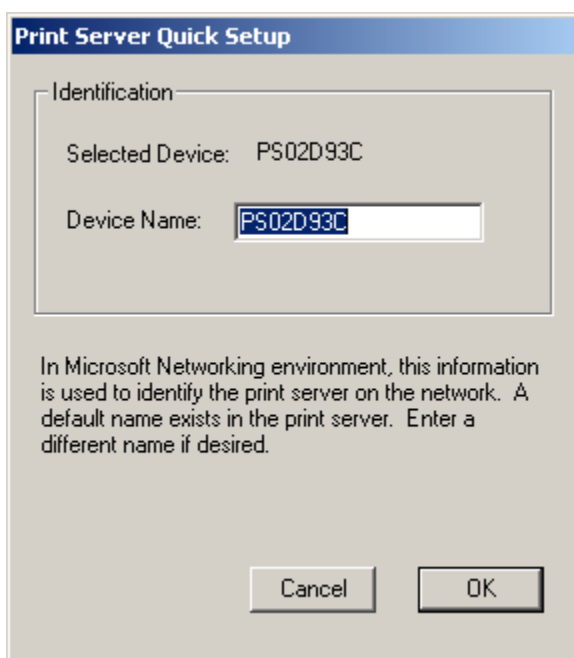


Figure 8-2 Quick Setup Screen

Enter the required *Device Name*, and click "OK". The *Device Name* is how users on the network will see this Print Server on the network.

Protocol Button

This screen allows you to disable protocols, which are not used on your network. An example screen is shown below.

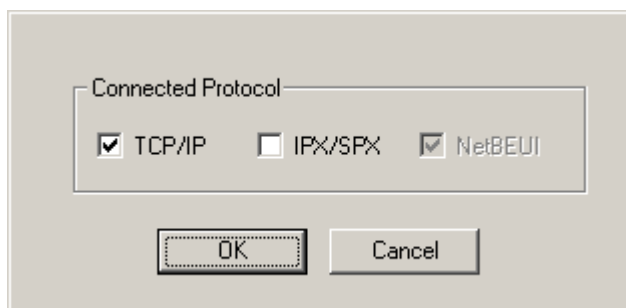


Figure 8-3 Protocol Screen

The protocol currently used for communication between your PC and the Print Server is enabled and grayed out, so it cannot be disabled.

Browse Button

Use this button to re-scan the network and update icons for any added Print Servers.

Exit Button.

The Exit button ends the NetGear setup utility.

8-2 Advanced Print Server Configuration

From the main menu, click on the Advanced button to use the advanced configuration procedure. The Advanced Print Server Configuration screen opens.

The Advanced Print Server Configuration screen contains the fields listed on tabs that can be selected in any order to customize the configuration of the print server. The following field tabs are provided by the Advanced Print Server Configuration screen:

- System
- TCP/IP
- NetBEUI
- Logical Port
- Physical Port
- Wireless

Each tab is described in the following sections.

There are two control buttons associated with every tab, and there is a "Return to Main Menu" button at the bottom of the tab. The function of each button is described in the table below.

Control Buttons on All Tabs

Field	Description
Restore to Default	This button appears on many screens. Clicking it replaces the onscreen values with the default settings. The tab settings are not saved until you click on the Save to Device button. The quickest way to set all device values to the factory default setting is to click on the Configuration selection on the menu bar and select Restore Factory Default.
Save to Device	Click this button to write any changed configuration information to the print server. If you switch to another tab without clicking on the Save to Device button, all new settings are lost.
Return to Main Menu	Click this button to return to the print server administration main menu. If you want to configure another print server, you must click on this button to return to the main menu and select another print server.

Any configuration change is lost unless you click on the Save to Device button at the bottom of the field window to send the configuration to the print server. When moving into a new field screen, all settings in the previous screen are lost. It is essential that you make a decision on the present field screen whether to abandon or save the new parameters into the print server.

The menu bars and their fields are described in the following sections.

System Tab

The System tab contains the fields to change the print server name and activate or disable the various networking protocols supported by the print server.

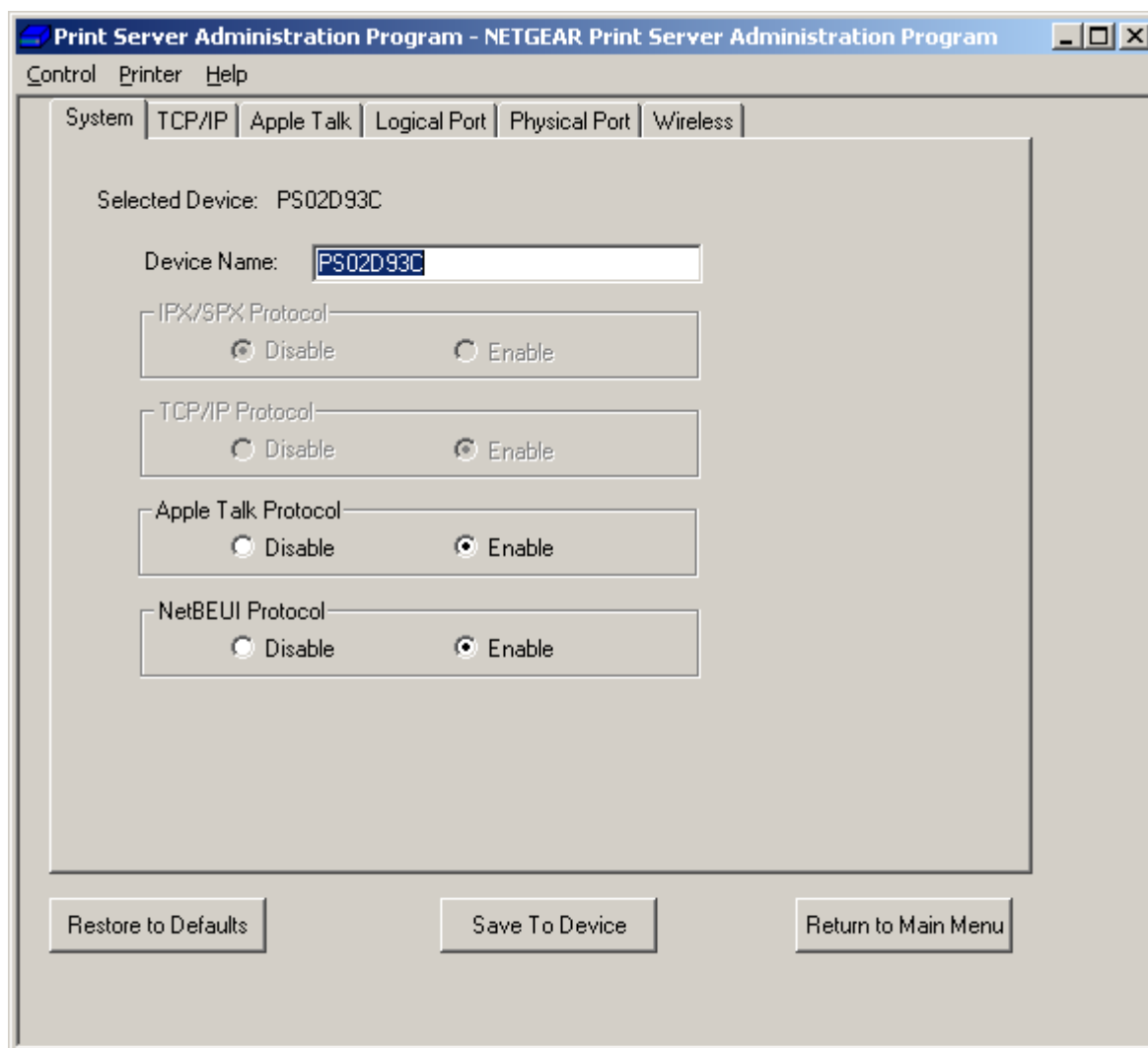


Figure 8-4 System Tab Window

System Tab Fields

Field	Description
Device Name	Choose a descriptive name for the router for identification purposes (for example, EngPrsv). This name is used in all protocols to identify the specific print server. There is a factory default name. For any change, NETGEAR recommends that a name be determined before setting the print server in any network. This name should be no more than 16 characters with at least a non numeric letter. Spaces are not allowed, but dashes (-) and underscore marks (_) are accepted.
IPX/SPX Protocol	Choose to enable or disable the IPX/SPX protocol used in the NetWare environment. This selection is always shadowed to indicate that the IPX/SPX protocol is always active and cannot be disabled.
TCP/IP Protocol	Choose to enable or disable the TCP/IP protocol. TCP/IP is used for UNIX networking and Microsoft networking. The factory default is Enable.
NetBEUI Protocol	Choose to enable or disable the NetBEUI protocol. NetBEUI is primarily used in a small-scale Microsoft networking environment.
AppleTalk Protocol	Choose to enable or disable the AppleTalk Protocol. AppleTalk is used in small networks of Apple computers. The factory default is enable.

TCP/IP Tab

This tab allows configuration for the TCP/IP network protocol. For further information about TCP/IP, refer to Chapters 3 and 4.

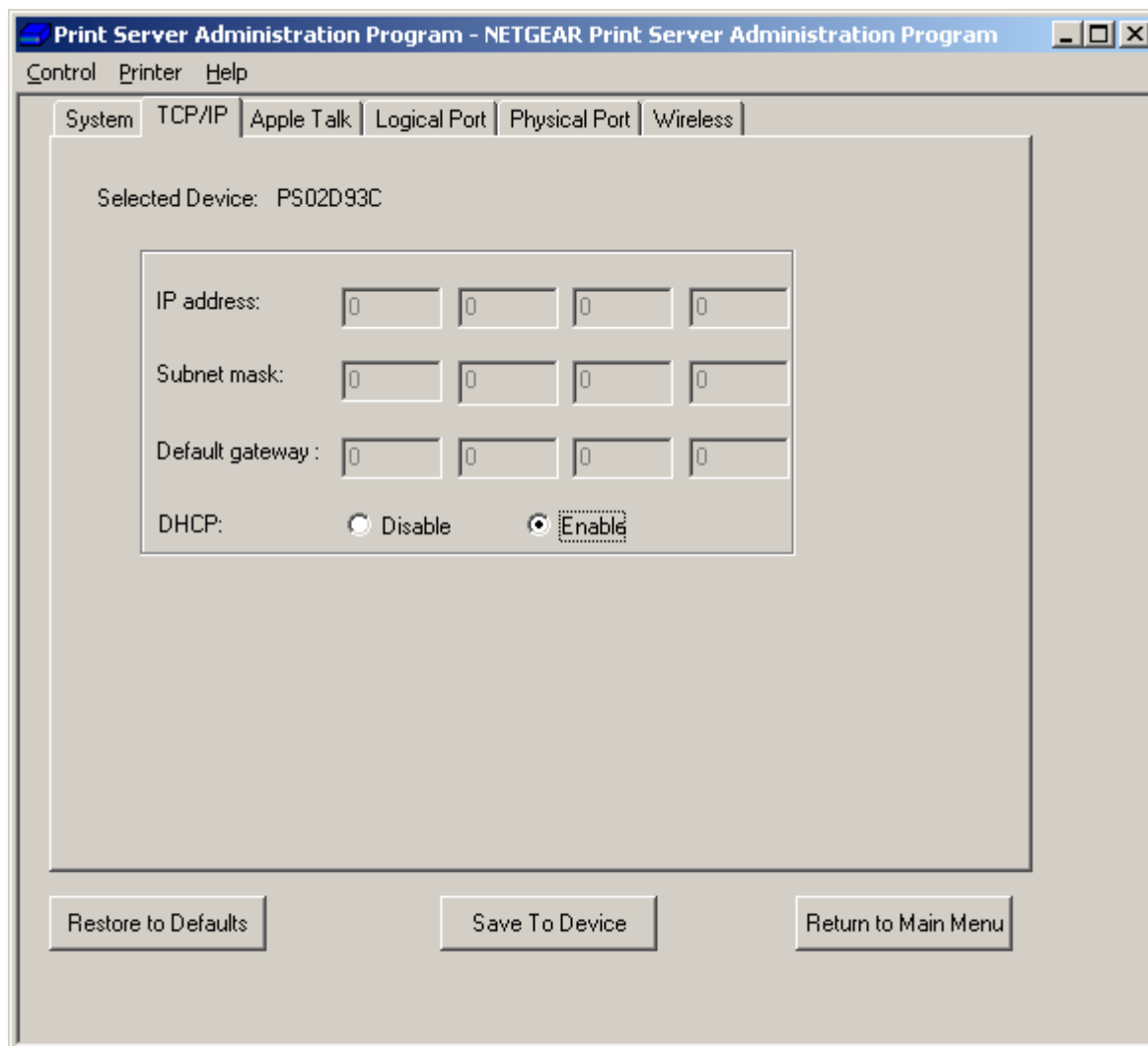


Figure 8-5 TCP/IP Tab Window

TCP/IP Tab Fields

Field	Description
DHCP	This field allows you to enable or disable the print server's ability to get its IP address from a DHCP (Dynamic Host Configuration Protocol) server. When disabled, you can provide a fixed IP address in the following fields.
IP Address	This IP address is assigned to the print server. If you have a private LAN and do not plan to connect to the TCP/IP-based internet, NETGEAR recommends that you use the address from the IETP-designated private addresses (for example, 192.168.x.x or 10.x.x.x).
Subnet Mask	This subnet mask defines the range of addresses that are reachable on your local LAN.
Gateway Address	This IP address is what the print server uses for stations with IP addresses not reachable on your local LAN.

NetWare PServer Menu Tab

The NetWare PServer menu tab sets the NetWare server (Bindery mode) or tree (NetWare Directory Services mode) that the print server should service. Figure 8-6 NetWare PServer Tab Window shows the

menu and its fields, and table NetWare PSERVER Menu Tab Fields describes the functions and explains how to provide information in each field.



This function is provided only in Print Server Model PS110.

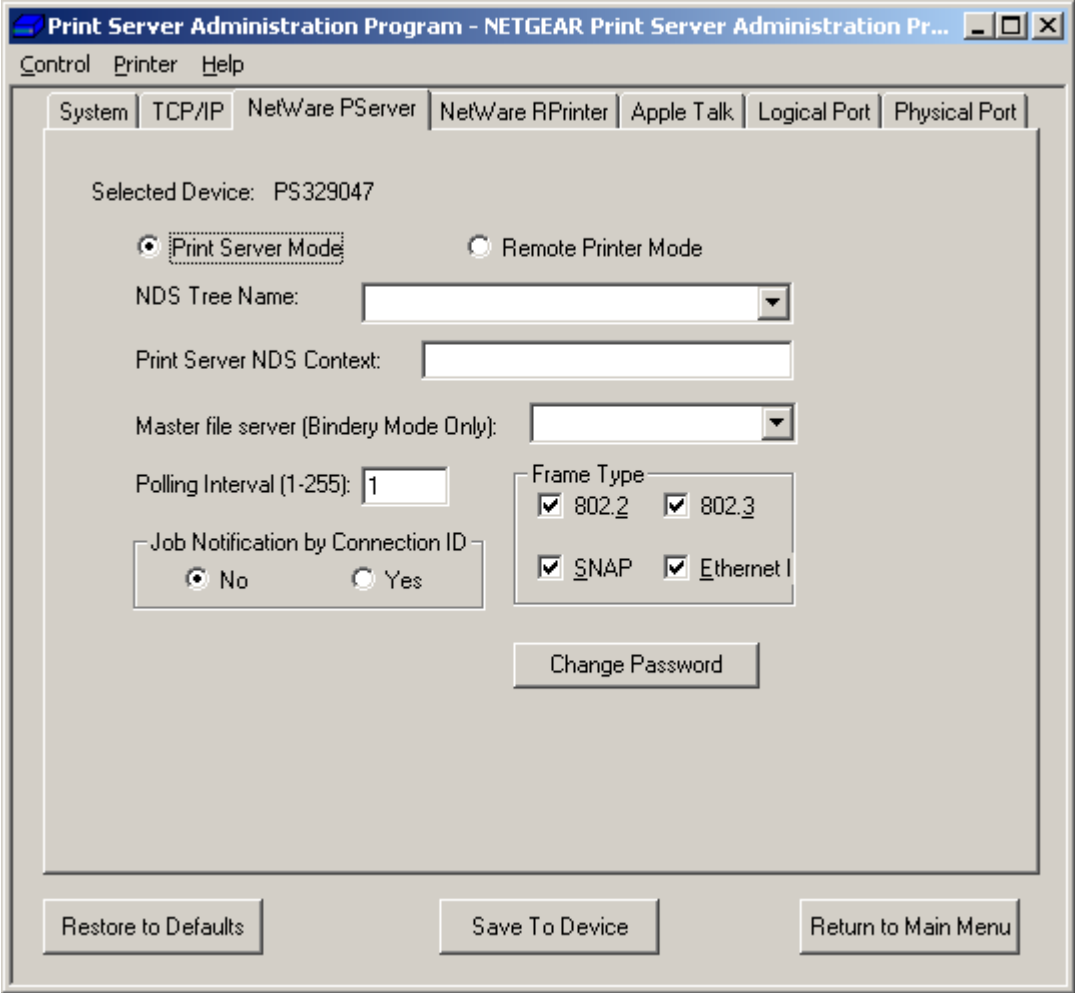


Figure 8-6 NetWare PServer Tab Window

NetWare PSERVER Menu Tab Fields	
Field	Description
Print Server Mode	Indicates if the print server is in NetWare PSERVER mode. If this button is not selected, you will not be able to modify the following PSERVER parameters.
Remote Printer Mode	When selected, the print server operates in RPRINTER mode. The print server can operate only in one of the two modes.
NDS Tree Name	For use in NetWare 4.X NetWare Directory Services (NDS) mode only. This is the NDS tree that the print server logs on. The name must not exceed 19 characters or contain any space.
Print Server NDS Context	NetWare 4.X NDS mode only. Enter the Print Server NDS Context. The entry should contain the path to the context but not the context itself, and each OU should be separated by a period (for example, department.company).

Master file server (Binary Mode Only)	When operating in Bindery mode, the print server logs on to a file server and services the queue set up on that particular file server. Enter the name of the master file server of the print server.
Polling Interval	Defines how often the print server will poll the queues to be serviced. The control unit is in seconds.
Job Notification by Connection ID	Set to Yes to receive a job notification at only the workstation where the print job originated. Set to No to receive a job notification at all workstations that you have logged on.
Frame Type	Select the frame types used by your network (Ethernet 802.2, Ethernet 802.3, Ethernet SNAP, and Ethernet II).
Change Password	Click on this button to open the password control window for the print server when operating in NetWare PSERVER mode. The print server uses this password to log on to the NetWare server or NDS tree. Click on this button to open the change password window. Type in the same password twice and click the Save to Device button to confirm the password entry. When a print server object is created in the file server, the password for the print server is set to Null (no password protection). The factory default password for the print server is also set to Null. When changing the password, both passwords in the print server and the file server need to be modified for the two servers to communicate properly. The print server password can be changed through this popup window, but PCONSOLE or NWADMIN needs to be executed to provide the proper password setting to the file server.

NetWare RPrinter Menu Tab

Figure 8-7 NetWare RPrinter Tab Window shows the menu and its fields, and table NetWare RPrinter Menu Tab Fields lists the fields of the NetWare RPrinter Menu Tab, describes the functions, and explains how to provide information in each field.



This function is provided only in Print Server Model PS110.

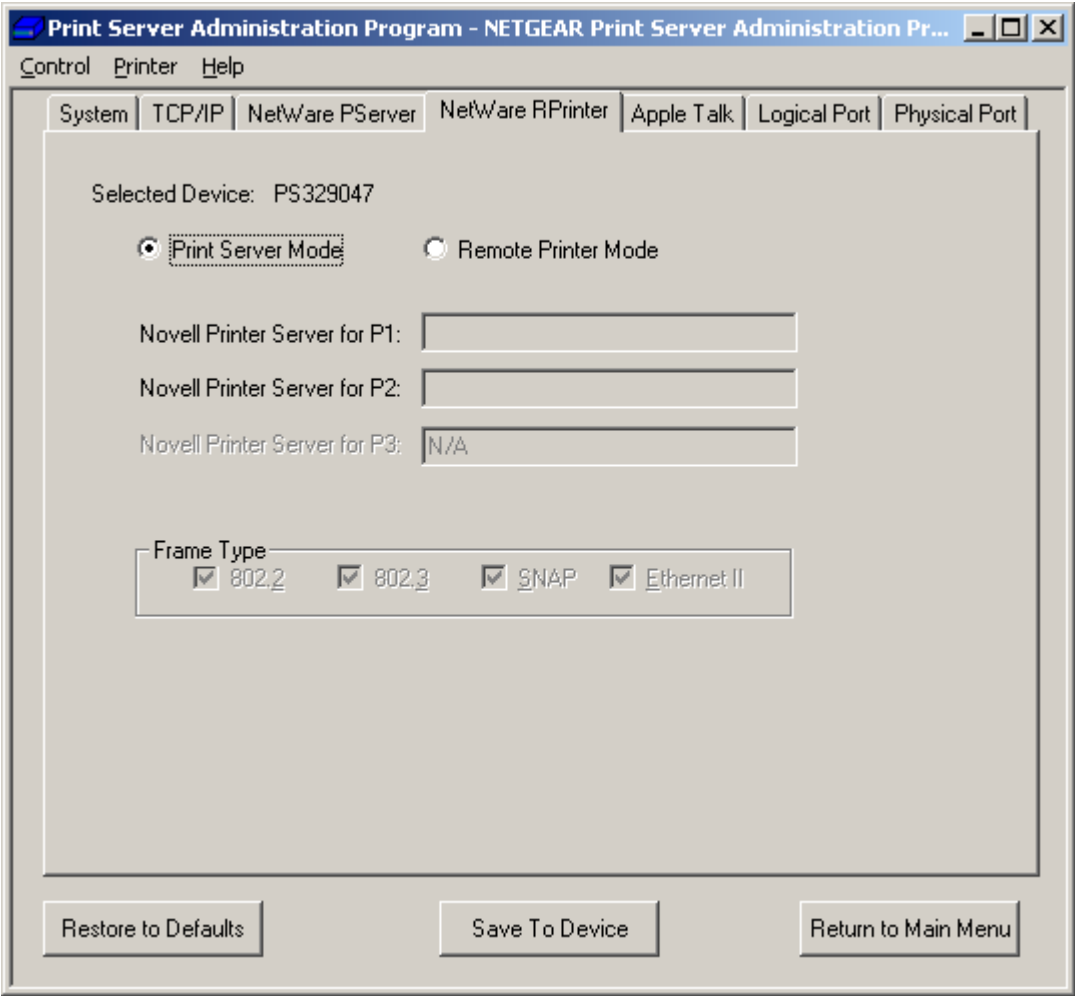


Figure 8-7 NetWare RPrinter Tab Window

NetWare RPrinter Menu Tab Fields	
Field	Description
Print Server Mode	Indicates if the print server is in NetWare PSERVER mode.
Remote Printer Mode	When selected, the print server operates in RPRINTER mode. If this button is not selected, you will not be able to modify the following RPRINTER parameters.
Novell Printer Server for P1	Enter the name of the NetWare print server to service the PRINTER 1 port of the print server.
Novell Printer Server for P2	Enter the name of the NetWare print server to service the PRINTER 2 port of the print server. If there is no PRINTER 2 port on the print server, this selection is not available and is shadowed out.
Frame Type	Select the frame types used by your network (Ethernet 802.2, Ethernet 802.3, Ethernet SNAP, and Ethernet II). By default, all four frame types are enabled.

AppleTalk Tab

The AppleTalk tab is used to configure the AppleTalk zone that the print server will appear in and the communication protocol used on the printer port. For further information about AppleTalk printing, refer to Chapter 8, "AppleTalk Printing".

AppleTalk Tab



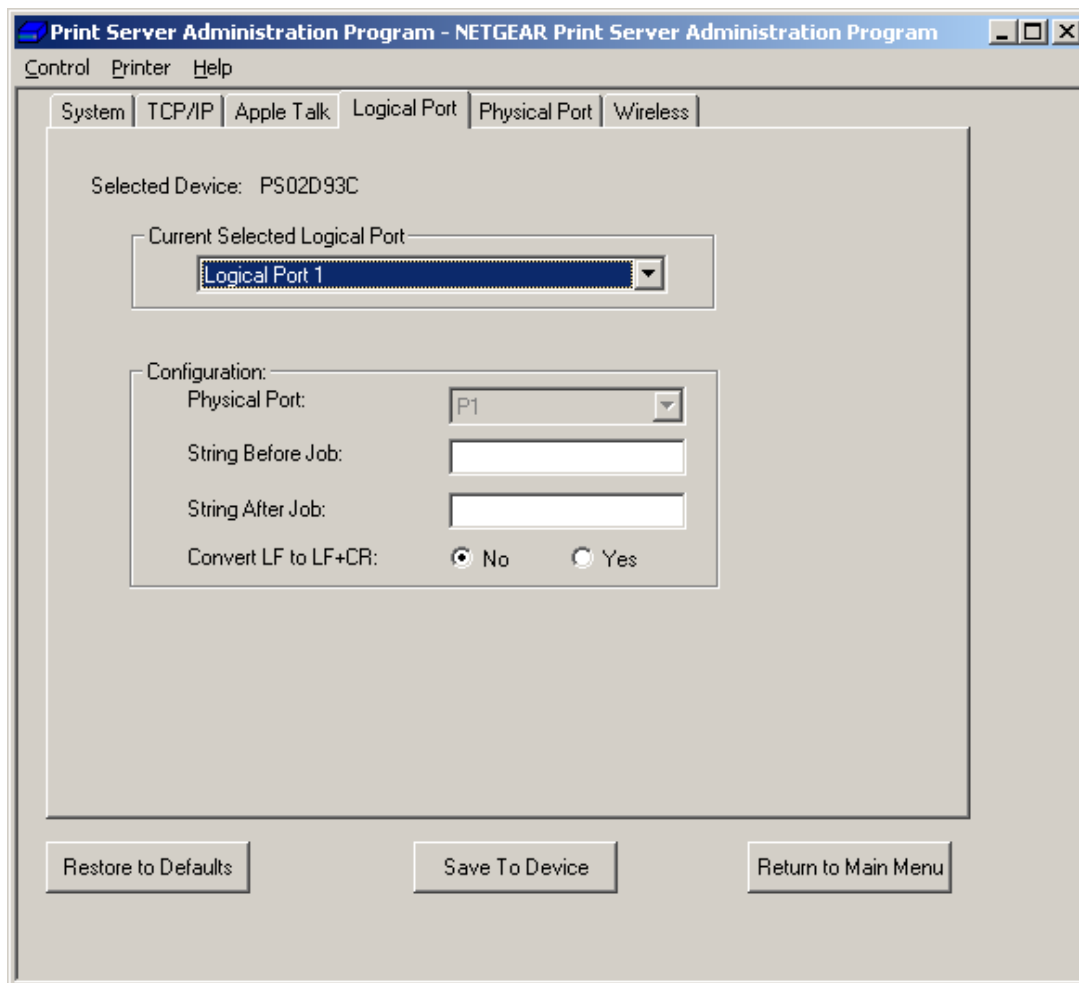
AppleTalk printing is supported in a certain models of NETGEAR Print Servers. Please refer to the specification of the model of the Print Server you have.

AppleTalk Tab Fields

Field	Description
AppleTalk Zone	The AppleTalk zone that the print server will appear in. To put the print server in the default AppleTalk zone of the AppleTalk network the print server is connected to, enter a single asterisk.
Printer Type	These are text fields, used to describe the printer driver used for each port. Currently the only printer driver supported for AppleTalk is LaserWriter.
Communication Protocol	Sets whether the port uses ASP, TBCP or BCP Communication Protocol. The default is BCP.

Logical Port Tab

Logical printers (Logical Ports) can be used under Linux or Unix. The Print Server supports 3 Logical Ports. This screen allows configuration of Logical Ports.



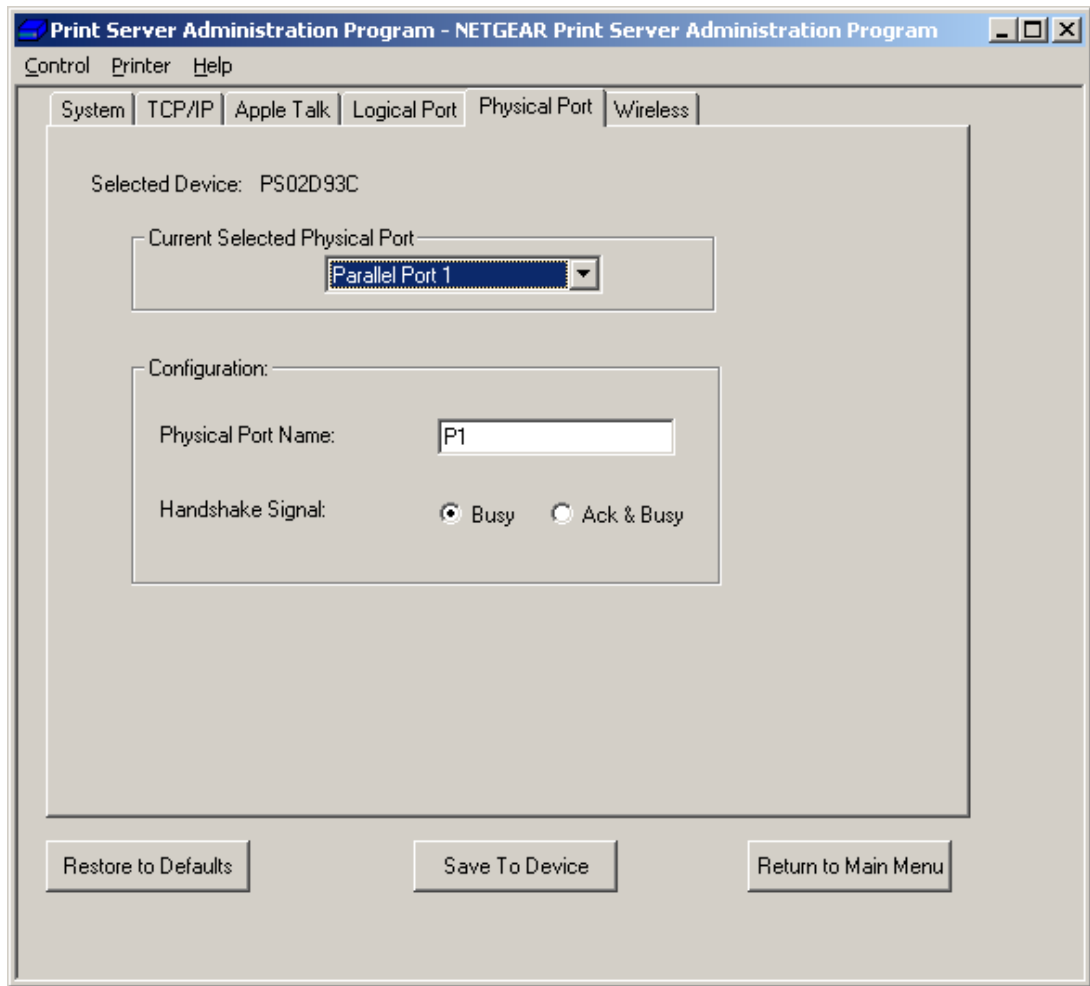
Logical Port Tab Window

Logical Port Tab Fields

Field	Description
Current Selected Logical Port	Selects the logical port to be configured. Eight logical ports are available for print servers with two printer ports; three logical ports are available for one printer port print servers.
Physical Port	Selects which physical printer port the logical port is mapped into. Converts LF to LF+CRAdd a carriage return (CR) every time the line feed (LF) character code is received by the print server when any print data is sent to this logical port.
String Before Job	Provides the control character string to send to the printer before the first character of the job is sent to the printer. One example of such an application would be switching to landscape mode when printing to the logical port. The character string must be in hexadecimal format as in these examples: <ul style="list-style-type: none"> • ASCII = [Esc]&l00 Hexadecimal = 1B266C304F • ASCII = [Esc]&l10 Hexadecimal = 1B266C314F
String After Job	Provides the control character string to send to the printer after the last character of the job is sent to the printer. The character string must be in hexadecimal format as illustrated in the String Before Job example above.

Physical Port Tab

This tab allows you to set the "Handshake Signal" used for communication between the Print Server



Physical Port

Physical Port Tab Fields

Field	Description
Current Selected Physical Port	Selects the physical port to be configured.
Physical Port Name	If required, you can change the name of the Physical Port.
Handshake Signal	The default setting is "Busy". This should only be changed to "Ack and Busy" if advised to do so by Technical Support.

Wireless Tab

This tab allows configuration of the Wireless settings for your Print Server. An example screen is shown below.



Print Server Administration Program - NETGEAR Print Server Administration Program

Control Printer Help

System TCP/IP Apple Talk Logical Port Physical Port **Wireless**

Regulatory Domain: USA/Canada
 Station Name: 02-D9-3C-3C-3C-3C
 SS ID (Service Set Identifier):
 Channel No:
 Network Type:

Encryption
☒ WEP Disabled
☐ WEP Enabled Default Key:

WEP Keys (Hex 0-9, A-F)
☒ 64 bits ☐ 128 bits

Key1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Key2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Key3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Key4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

WEP Authentication
☒ Open System
☐ Shared Key

Wireless Tab

Wireless Tab Fields

Field	Description
Regulatory Domain	It is illegal to use this device in any location outside of the regulatory domain.
Station Name	The name used to identify this Wireless station.
SSID	<ul style="list-style-type: none"> If using an ESS (Extended Service Set, with multiple access points) this ID is called an ESSID (Extended Service Set Identifier). To communicate, all Wireless stations MUST use the same SSID/ESSID. Change this value, or change the other Wireless stations, to ensure each Wireless station has the same value. The default value is "null", so the Wireless station can join any Ad-hoc group. Note! The SSID is case sensitive.
Channel No	<p>To communicate in "802.11 Ad-hoc" or "Ad hoc" mode, all Wireless stations MUST use the same Channel number.</p> <ul style="list-style-type: none"> If using "802.11 Ad-hoc" or "Ad-hoc" mode, select the value you wish to use on your Wireless LAN. If using "Infrastructure" mode, the Channel is selected automatically, to match the Channel used by the Access Point. If you experience interference (shown by lost connections and/or slow data transfers) you may need to experiment with different channels to see which is the best.
Network Type	<p>Select the correct value for your Wireless LAN.</p> <ul style="list-style-type: none"> 802.11 Ad-hoc mode is used when there is no Wireless Access Point, and each Wireless station communicates directly with other Wireless stations. This is the current standard. Ad-hoc mode is used when there is no Wireless Access Point, and each Wireless station communicates directly with other Wireless stations. This is the older standard. Infrastructure mode is used when each Wireless station connects to the Wireless Access point. This also provides access to the wired LAN.
Link Info Button	This will display information about the current wireless connection. See below for details.
WEP Disabled/ Enabled	<p>If Disabled (default), data is NOT encrypted before being transmitted.</p> <p>If Enabled, you must provide either the 64 Bit key table or the 128 Bit keys, as described below. The key is used to encrypt the data before transmission.</p>
64 Bit	<ul style="list-style-type: none"> If selected, data is encrypted, using the default key, before being transmitted. The receiving station must be set to 64 Bit Encryption, and have the same Key value in the same position in its key table. Otherwise, it will not be able to decrypt the data. Default Key - select the key you wish to be the default. Transmitted data is ALWAYS encrypted using the Default Key; the other Keys are for decryption only. <p>Key Table: This table is used when Encrypting and Decrypting data. All stations, including this Access Point, always transmit data encrypted using their default key. The key number (1, 2, 3, 4) is also transmitted. The receiving station will use the key number (1, 2, 3, 4) to determine which key value to use for decryption. If the key value does not match the transmitting station, decryption will fail.</p> <p>The easiest way to ensure there are no problems is to have every Station, including the Access Point, use the same key table (all entries identical). Then, it does not matter which key is used as the default key.</p>
128 Bit	If selected, data is encrypted using the key before being transmitted. The receiving station must be set to use 128 Bit Encryption, and have the same Key value. Otherwise, it will not be able to decrypt the data.
WEP Authentication	<p>Options are "Open System" or "Shared Key".</p> <p>Some Wireless cards and Access Points do not support both methods. Check your documentation to determine the correct value to use.</p>

Link Info Screen

The image shows a 'Wireless Link Info' dialog box with the following fields and values:

- State:** Associated - BSS ID = 00:30:AB:06:53:4D
- Current Channel:** 11
- Current Tx Rate:** 11 Mbits/s
- Throughput (Bytes/Sec)**
 - Tx:** 0
 - Rx:** 0
- Link Quality:** Excellent(100%)
- Signal Strength:** Excellent(100%)
- Close** button

Wireless Link Info

Field	Description
State	This indicates which access point is currently in use.
Current Channel	The current channel which has been used.
Current TX Rate	The current transmitting speed.
Throughput (Tx)	This will show how much data has been transmitted per second.
Throughput (Rx)	This will show how much data has been received per second.
Link Quality	This indicates the quality of the Wireless connection
Signal Strength	This indicates the strength of the Wireless signal being received.

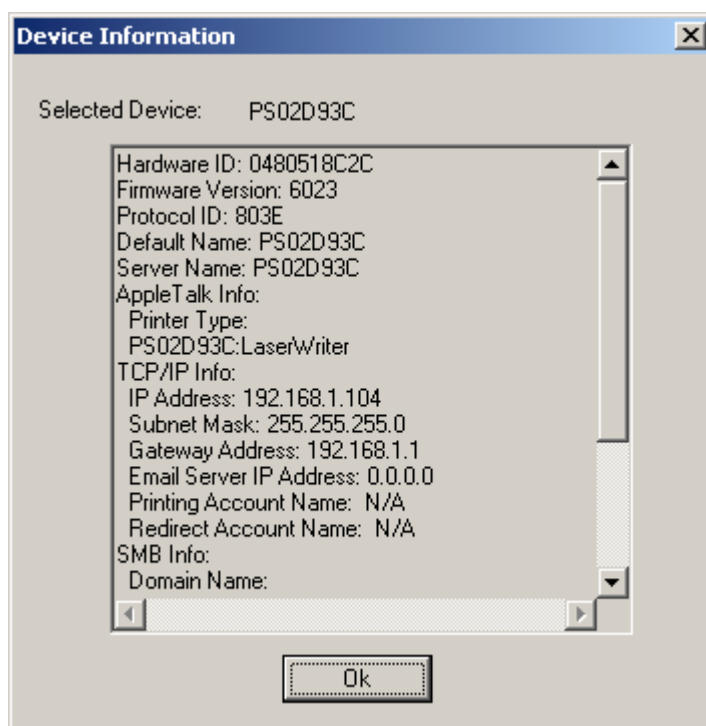
8-3 Menu Options

The NetGear Administration program contains a menu bar that provides a number of options including Control, Printer, and Help, which are outlined in the following section.

Control Menu

Control is the first item on the top menu bar is for print server control. Click on the Control selection, move the cursor down to select one of the menu selections and click again to carry out the intended action, as described below.

- **Device Information**
- Select this option to pop up a scrolling window providing a status of the various parameters on the print server that can be customized. This information includes the various NetBEUI and TCP/IP parameters.



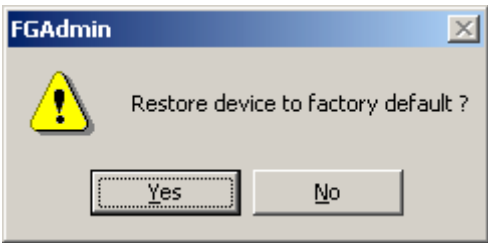
Device Information

- **Reset Device**

Issues a soft reset to reboot the print server. This process allows newly modified print server parameters to take effect.

• **Restore Default Configuration**

Changes all print server parameters to their factory default values. If only partial restoration is intended, use the tab options for the different protocols and choose "Set to Default" from that particular screen. A confirmation dialog, like the example below, will be shown.

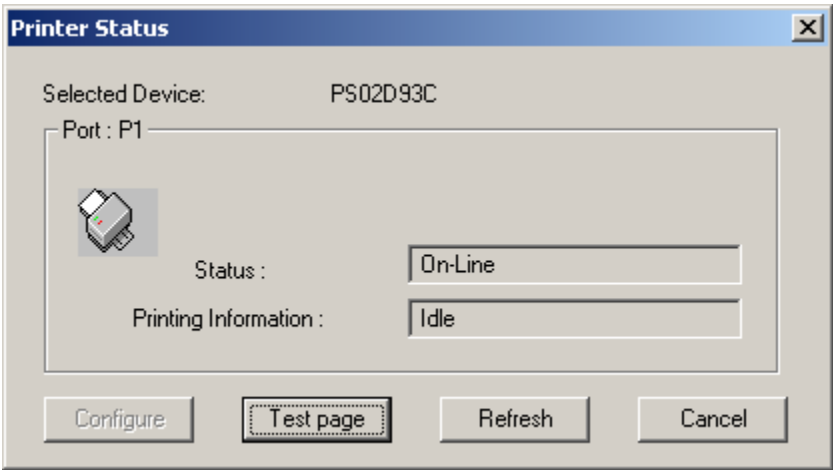


Default Configuration

- Click "Yes" to confirm setting to factory defaults, or "No" to leave the current configuration unchanged.

Printer Menu

Individual printer ports are displayed as options under the Printer Menu, and a pop-up window opens when any of the printer ports are selected, as in the example below.



Printer Status

The printer ports not existing on the print server are shadowed or grayed out.

On the popup window, you can check the connection status of the print server such as on-line, off-line, paper jam, and out-of-paper. Also on display is the printing information indicating if the print server is sending data to the printer or if the printer is idling. At the bottom of the screen are four buttons as described below.

Printer Status

Field	Description
Configure Button	<p>If the connected printer supports directional communication such as many of the new Hewlett-Packard LaserJet and DeskJet printers, you can click on this button to customize the various printing parameters of the printer. The pop-up window consists of a table with the following column headings:</p> <ul style="list-style-type: none">• Environment Variable The configuration variables available on this printer. The list of printer configuration variables vary from printer to printer.• Variable Value Displays the current setting. To change the Variable Value (if Read Only is NO) double- click the line you wish to change; then enter or select a new value.• Read Only Indicates whether or not the Environment Variable is modifiable.

Test page Button	Informs the print server to send a test page to the printer. The printout includes print server status information, which is useful when troubleshooting any printing problems.
Refresh Button	If you suspect that the printer status is not properly updated on the screen, click this button to generate packets to collect updated printer information.
Cancel Button	Close this pop-up window.

Help Menu

The Help menu has a single item - About - which will display information about the program, as shown below.



Help - About

Configuring Using IP Setup

IP Setup is a tool to let you configure the IP address for NETGEAR Print Server in Microsoft Windows environment. Please see Appendix E for IPSetup utility reference.

With IPSetup tool, you can force an IP address to a NETGEAR Print Server. It sets up the subnet mask and default gateway as well as disables the DHCP. With this tool, you can always get a known and fixed IP address.

Appendix A: Technical Specifications

This appendix provides technical specifications for the NETGEAR PS100 Print Server.

PS111W Wireless Ready Print Server Specifications

Network Protocol and Standards Compatibility

IEEE 802.3u, 100BASE-TX, Fast Ethernet
IEEE 802.3i 10BASE-T CSMA/CD
IEEE 802.11b 11Mbps maximum CSMA/CA
NetBEUI, and TCP/IP protocols

Data Rate

100 Mbps with 4B/5B encoding and MLT-3 physical interface
10 Mbps differential Manchester encoded
11Mbps wireless

Interface

10BASE-T/100BASE-TX network port (RJ-45)
Bi-Directional parallel printer port

Power Specifications for the Power Adapter

Input voltage: 100 to 240 V AC, 50 to 60 Hz, according to the power adapter
Localized plug: For North America, Japan, UK, Europe, and Australia
Output voltage: 12 V DC at 800 mA

Power Specifications for the Print Server

Power consumption: 7 W maximum
Input voltage: 12 V DC at 0.8-1.2 Amps, maximum

Physical Specifications

Width: 6.2 in. (15.8 cm)
Height: 1.0 in. (2.6 cm)
Depth: 4.0 in. (10.1 cm)
Weight: 0.9 lb (0.41 kg)

Environmental Specifications

Operating temperature: 0 ° to 40 °C (32 ° to 104 °F)
Operating humidity: 90% maximum relative humidity, noncondensing

Electromagnetic Emissions

Meets requirements of:

CE mark, residential
FCC Part 15, Class B
EN 55 022 (CISPR 22), Class B
VCCI Class B ITE
C-Tick N10947

Safety Agency Approvals, Power Adapter

Meets requirements of:

CE mark, commercial
UL listed (UL 1950)
CSA certified (CSA 22.2 #950)
TUV licensed (EN 60 950)
T-Mark

PS101 Mini Print Server Specifications

Network Protocol and Standards Compatibility

IEEE 802.3u, 100BASE-TX, Fast Ethernet
IEEE 802.3i 10BASE-T CSMA/CD
NetBEUI, and TCP/IP protocols

Data Rate

10/100 Mbps differential Manchester encoded

Interface

10BASE-T/100BASE-TX network port (RJ-45)
Bi-Directional parallel printer port

Power Specifications for the Power Adapter

Input voltage: 100 to 240 V AC, 50 to 60 Hz, according to the power adapter
Localized plug: For North America, Japan, UK, Europe, and Australia
Output voltage: 9 V DC at 500 mA

Power Specifications for the Print Server

Power consumption: 5 W maximum
Input voltage: 9 V DC at 0.5 Amps, maximum

Physical Specifications

Width 1.3 in. (6.2 cm)
Height 0.8 in. (2.0 cm)
Depth 2.3 in. (6.0 cm)
Weight 0.4 lb. (0.1 kg)

Environmental Specifications

Operating temperature: 0 ° to 40 °C (32 ° to 104 °F)
Operating humidity: 90% maximum relative humidity, noncondensing

Electromagnetic Emissions

Meets requirements of:

CE mark, commercial
FCC Part 15, Class A
EN 55 022 (CISPR 22), Class A

***Safety Agency Approvals, Power Adapter
Meets requirements of:***

CE mark, commercial

UL listed (UL 1950)

CSA certified (CSA 22.2 #950)

TUV licensed (EN 60 950)

T-Mark

PS110 2-Port Print Server Specifications

Network Protocol and Standards Compatibility

IEEE 802.3u, 100BASE-TX, Fast Ethernet

IEEE 802.3i 10BASE-T CSMA/CD

NetBEUI, IPX/SPX, AppleTalk, and TCP/IP protocols

Data Rate

100 Mbps with 4B/5B encoding and MLT-3 physical interface

10 Mbps differential Manchester encoded

Interface

10BASE-T/100BASE-TX network port (RJ-45)

2 Bi-Directional parallel printer ports

Power Specifications for the Power Adapter

Input voltage: 100 to 240 V AC, 50 to 60 Hz, according to the power adapter

Localized plug: For North America, Japan, UK, Europe, and Australia

Output voltage: 12 V DC at 1.2A

Power Specifications for the Print Server

Power consumption: 7 W maximum

Input voltage: 12 V DC at 1.2 Amps, maximum

Physical Specifications

PS110

Width: 7.4 in. (18.9 cm)

Height: 1.2 in. (3.0 cm)

Depth: 4.8 in. (12.2 cm)

Weight: 1.61 lb (0.73 kg)

Environmental Specifications

Operating temperature: 0 ° to 40 °C (32 ° to 104 °F)

Operating humidity: 90% maximum relative humidity, noncondensing

Electromagnetic Emissions

Meets requirements of:

CE mark, residential
FCC Part 15, Class B
EN 55 022 (CISPR 22), Class B
VCCI Class B ITE
C-Tick N10947

***Safety Agency Approvals, Power Adapter
Meets requirements of:***

CE mark, commercial
UL listed (UL 1950)
CSA certified (CSA 22.2 #950)
TUV licensed (EN 60 950)
T-Mark

Appendix B: Understanding IP Addresses

This appendix provides information about understanding IP addresses, which you must assign to the NETGEAR PS100 Print Server when operating in a TCP/IP environment.

IP Addresses and the Internet

Because TCP/IP networks are interconnected widely across the world, every machine on the Internet must have a unique address to make sure that transmitted data reaches the correct destination. Blocks of addresses are assigned to organizations by the Internet Assigned Numbers Authority (IANA). Individual users and small organizations may obtain their addresses either from the IANA or from an Internet service provider (ISP).

The Internet Protocol (IP) uses a 32-bit address structure. The address is usually written in dot notation (also called dotted-decimal notation), in which each group of eight bits is written in decimal form, separated by decimal points.

For example, the binary address:

```
11000011 00100010 00001100 00000111
```

is normally written as:

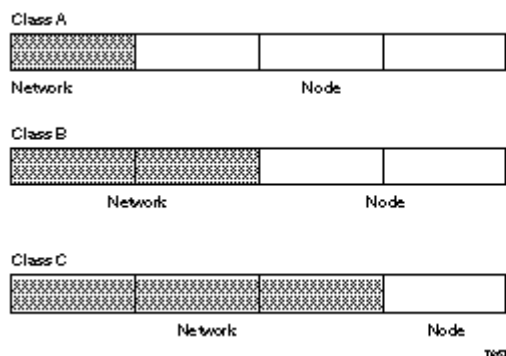
```
195.34.12.7
```

which is easier to remember and easier to enter into your computer.

In addition, the 32 bits of the address are subdivided into two parts. The first part of the address identifies the network, and the second part identifies the host node or station on the network.

The dividing point may vary depending on the address range and the application.

There are five standard classes of IP addresses. These address classes have different ways of determining the network and host sections of the address, allowing for different numbers of hosts on a network. Each address type begins with a unique bit pattern, which is used by the TCP/IP software to identify the address class. After the address class has been determined, the software can correctly identify the host section of the address. The three main address classes are illustrated below, which shows the network and host sections of the address for each address type.



Three Main Address Classes

Class A addresses can have up to 16,777,214 hosts on a single network. They use an 8-bit network number and a 24-bit node number. Class A addresses are in this range:

1.x.x.x to 126.x.x.x.

Class B addresses can have up to 65,354 hosts on a network. Class B addresses use a 16-bit network number and a 16-bit node number. Class B addresses are in this range:

128.1.x.x to 191.254.x.x.

Class C addresses can have 254 hosts on a network. Class C addresses use 24 bits for the network address and 8 bits for the node. They are in this range:

192.0.1.x to 223.255.254.x.

Class D addresses are used for multicasts (messages sent to many hosts). Class D addresses are in this range:

224.0.0.0 to 239.255.255.255.

Class E addresses are for experimental use.

This addressing structure allows IP to uniquely identify each physical network and each node on each physical network.

For each unique value of the network portion of the address, the base address of the range (host address of all zeros) is known as the network address and is not usually assigned to a host. Also, the top address of the range (host address of all ones) is not assigned but is used as the broadcast address for sending a packet simultaneously to all hosts with the same network address.

Netmask

In each of the above address classes, the size of the two parts (network address and host address) is implied by the class. This partitioning scheme can also be expressed by a netmask associated with the IP address. A netmask is a 32-bit quantity that, when logically ANDed with an IP address, yields the network address. For instance, the netmasks for Class A, B, and C addresses are 255.0.0.0, 255.255.0.0, and 255.255.255.0, respectively.

For example, the address 192.168.170.237 is a Class C IP address whose network portion is the upper 24 bits. When ANDed with the Class C netmask, as shown here, only the network portion of the address remains:

11000000 10101000 10101010 11101101 (192.168.170.237)

ANDed with:

11111111 11111111 11111111 00000000 (255.255.255.0)

Equals:

11000000 10101000 10101010 00000000 (192.168.170.0)

As a shorter alternative to dotted-decimal notation, the netmask may also be expressed in terms of the number of ones from the left. This number is appended to the IP address, following a backward slash (/), as "/n." In the example, the address could be written as 192.168.170.237/24, indicating that the netmask is 24 ones followed by 8 zeros.

Subnet Addressing

By looking at the addressing structures, you can see that even with a Class C address there are a large number of hosts per network. Such a structure is an inefficient use of addresses if each end of a routed link requires a different network number. It is unlikely that the smaller office LANs would have that many devices. You can resolve this problem by using a technique known as subnet addressing.

Subnet addressing allows us to split one IP network address into smaller multiple physical networks known as subnetworks. Some of the node numbers are used as a subnet number instead. A Class B address gives us 16 bits of node numbers translating to 64,000 nodes. Most organizations do not use 64,000 nodes, so there are free bits that can be reassigned. Subnet addressing makes use of those bits that are free, as illustrated below.



Example of Subnetting a Class B Address

A Class B address can be effectively translated into multiple Class C addresses. For example, the IP address of 172.16.0.0 is assigned, but node addresses are limited to 255 maximum, allowing 8 extra bits to use as a subnet address. The IP address of 172.16.97.235 would be interpreted as IP network address 172.16, subnet number 97, and node number 235. In addition to extending the number of addresses available, subnet addressing provides other benefits. Subnet addressing allows a network manager to construct an address scheme for the network by using different subnets for other geographical locations in the network or for other departments in the organization.

Although the preceding example uses the entire third octet for a subnet address, note that you are not restricted to octet boundaries in subnetting. To create more network numbers, you need only shift some bits from the host address to the network address. For instance, to partition a Class C network number (192.68.135.0) into two, you shift 1 bit from the host address to the network address. The new netmask (or subnet mask) is 255.255.255.128. The first subnet has network number 192.68.135.0 with hosts 192.68.135.1 to 192.68.135.126, and the second subnet has network number 192.68.135.128 with hosts 192.68.135.129 to 192.68.135.254.



- The number 192.68.135.127 is not assigned because it is the broadcast address of the first subnet. And 192.68.135.128 is not assigned because it is the network address of the second subnet.

The table below lists the additional subnet mask bits in dotted-decimal notation. To use the table, write down the original class netmask and replace the 0 value octets with the dotted-decimal value of the additional subnet bits. For instance, to partition your Class C network 204.247.203.0 with subnet mask 255.255.255.0 into 16 subnets (4 bits), the new subnet mask becomes 255.255.255.240.

Netmask Notation Translation Table for One Octet

Number of Bits	Dotted-Decimal Value
1	128
2	192
3	224
4	240
5	248
6	252
7	254
8	255

The next table displays Several common netmask values in both the dotted-decimal and the masklength formats.

Netmask Formats

Dotted-Decimal	Masklength
255.0.0.0	/8
255.255.0.0	/16
255.255.255.0	/24
255.255.255.128	/25
255.255.255.192	/26
255.255.255.224	/27
255.255.255.240	/28
255.255.255.248	/29
255.255.255.252	/30
255.255.255.254	/31
255.255.255.255	/32

NETGEAR strongly advises that all hosts on a LAN segment use the same netmask for the following reasons. So that hosts recognize local IP broadcast packets.

When a device broadcasts to its segment neighbors, it uses a destination address of the local network address with all ones for the host address. In order for this scheme to work, all devices on the segment must agree on which bits comprise the host address.

So that a local router or bridge will know which addresses are local and which are remote

Private IP Addresses

If your networks are isolated from the Internet (for example, only between your two branch offices), you can assign any IP addresses to the hosts without problems. However, the IANA has reserved the following three blocks of IP addresses specifically for private networks:

10.0.0.0 - 10.255.255.255
172.16.0.0 - 172.31.255.255
192.168.0.0 - 192.168.255.255

NETGEAR recommends that you choose your private network number from this list. NETGEAR products default to 192.168.0.xxx.

Regardless of your particular situation, do not create an arbitrary IP address; always follow the guidelines explained here. For more information about address assignment, refer to RFC 1918, *Address Allocation for Private Internets*, and RFC 2050, *Guidelines for Management of IP Address Space* .

Address Resolution Protocol

An IP address alone cannot be used to deliver data from one device to another on a LAN. In order for data to be sent from one device on the LAN to another, you must convert the IP address of the destination device to its media access control (MAC) address. Each device on an Ethernet network has a unique Ethernet MAC address, which is a 48-bit number assigned to each device by the manufacturer. The technique that associates the IP address with a MAC address is known as address resolution, and IP uses the Address Resolution Protocol (ARP) to do this.

If a device needs to send data to another station on the network and it does not already have the destination MAC address recorded, ARP is used. An ARP request is broadcast onto the network, and all stations receive and read the request. The destination IP address for the chosen station is included as part of the message so that only the station with this IP address responds to the ARP request and all other nodes discard it.

The node with the right IP address responds with its own MAC address directly to the sender, providing the transmitting station with the destination MAC address needed for it to send the data. The IP address data and MAC address data for each node are held in an ARP table, so that the next time data needs to be sent, the address can be obtained from the address information in the table.

IP Configuration by DHCP

When an IP-based local area network is installed, each workstation must be configured with an IP address. If the workstations need to access the Internet, they should also be configured with a gateway address and one or more DNS server addresses. As an alternative to manual configuration, there is a method by which each device on the network can obtain this configuration information automatically. A device on the network may act as a Dynamic Host Configuration Protocol (DHCP) server. The DHCP server stores a list or pool of IP addresses, along with other information (such as gateway and DNS addresses) that it may assign to the other devices on the network. The most of NETGEAR routers have the capacity to act as a DHCP server.

Appendix C: CONFIG File

This appendix provides information for editing a CONFIG file. CONFIG files are stored in the flash EEPROM of the NETGEAR PS100 Print Server and used for configuring the device using the FTP method. For more information about using the CONFIG file and to see an example of FTP commands, refer to the table of FTP Commands on chapter 5 Unix. Only the parameters related to TCP/IP operation of the print server are listed.

For modification of the various NetWare IPX/SPX and NetBEUI settings, NETGEAR recommends that you use the included NETGEAR Print Server Administration Program or the PSCONFIG program.

CONFIG File TCP/IP Settings

When modifying the CONFIG file, use the configuration settings outlined below.

Configuration Settings

Parameter and Command	Definition
Device Name (0001 BOX_NAME)	The default name of the print server is PSxxxxxx (PS followed by 6 numbers). You can change this, but the new name must not exceed 19 characters and must not include any spaces.
TCP/IP Protocol (0012 TCPIP_P)	Enables or disables reception or transmission of TCP/IP packets.
IP Address (4000 IP_ADDR)	This is the IP address for your print server. For more information about IP addressing, refer to "Understanding IP Addresses."
Device IP Address (4001 GATEWAY)	If your network segment has a router, enter the router address here. If there is no router, leave the address as 0.0.0.0.
Subnet Mask (4002 MASK)	If the Gateway Address is 0.0.0.0, leave the Subnet Mask at 0.0.0.0. If you have a router, enter the Subnet mask for the segment to which the print server is attached.
TCP Session Retry Interval (4010 TCP_INT)	Sets how long the print server should wait before retrying a TCP/IP connection that is lost. Allowable values are from 0 to 255 seconds, with 2 as the default.
Retry Count (4011 TCP_CNT)	Sets how many attempts for reconnection will be made. After attempting the set number, the TCP/IP session is terminated. Allowable values are from 0 to 255, with 254 as the default.
L1 Logical Printer Mapping (0100 L1_PROUT)	The physical port that this L1 logical printer maps to.
String Before Job for L1 Logical Printer (0101 L1_PREST)	The L1 logical printer control string (in hex) to be sent to the printer before each print job. Note: A printer control string is limited to 15 characters. Examples are: <ul style="list-style-type: none"> ASCII = [Esc]&l0O Hexadecimal = 1B266C304F ASCII = [Esc]&l1O Hexadecimal = 1B266C314F
String After Job (0102 L1_POSTR)	The L1 logical printer control string (in hex) to be sent to the printer after each print job. Note: A printer control string is limited to 15 characters. Examples are: <ul style="list-style-type: none"> ASCII = [Esc]&l0O Hexadecimal = 1B266C304F ASCII = [Esc]&l1O Hexadecimal = 1B266C314F
Convert LF to CR+LF (0103 L1_CHGLF)	If On, LF (line feed) characters are changed to CR+LF (carriage return + line feed). If off, no conversion is done.

Each Model PS101 and Model PS111W Print Server has one parallel port and supports three logical printers. The PS110 Print Server, with two parallel ports, supports eight logical printers. You cannot change the names. Each logical printer has four settings as shown below.

Refer to the next table for the line numbers of the logical printers in the CONFIG file.

CONFIG File Line Numbers

Logical Printer	Line Numbers
L1	0100 to 0103
L2	0120 to 0123
L3	0140 to 0143
L4	0160 to 0163
L5	0180 to 0183
L6	0200 to 0203
L7	0220 to 0223
L8	0240 to 0243

Appendix D: Using NetWare 5 NDPS

This appendix provides an overview of using the Print Server with NDPS (Novell Distributed Printing Services) under Novel NetWare 5.0.

Overview

The NETGEAR Print Server must be configured as a valid device on your TCP/IP network. To use NDPS (Novell Distributed Printing Services), the Novell server must be running Novell NetWare 5, and the PCs (clients) must be running IntranetWare Client 2.0 or later.

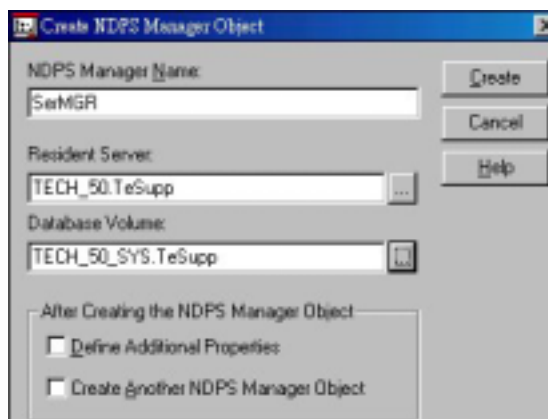
The following procedure is designed to enable Public Access Printing under NDPS. Public Access Printing allows anybody on the network to access the printer. The procedure has three parts:

- Create an NDPS Manager Object on the server.
- Create an NDPS Printer Agent on the server.
- Configure each workstation requiring access to the NDPS printers.

Creating an NDPS Manager Object

To create an NDPS manager object:

1. Log in to NetWare 5.0 Server as Admin and start the NetWare Administrator program Nwadm32.exe.
2. Select the container on NetWare Administrator where you want the NDPS Manager object to reside (for example, TeSupp).
3. Select Create - Object from the menu bar to view the New Object dialog.
4. Select NDPS Manager as the object to create. The Create NDPS Manager Object window, as illustrated in below.



Create NDPS Manager Object

Create NDPS Manager Object Window

1. Type a name in the NDPS Manager Name.

2. **Browse the Resident Server and select where you want the NDPS Manager object to be assigned.**
3. **Browse the Database Volume and select where you want the NDPS Manager database to be assigned.**
4. **Click on Create.**

The new NDPS Manager is displayed in the main browser window.

To start the NDPS Manager in future, enter the following command at the console:

```
LOAD NDPSM
```

Then select the NDPS Manager object.

To start the NDPS Manager whenever you bring up the server, add a command like the following to your server's AUTOEXEC.NCF file:

```
LOAD NDPSM SerMGR.TeSupp
```

The last item is the name of the NDPS Manager object you want to load.

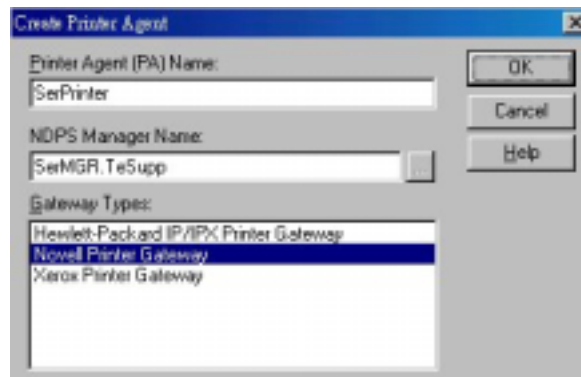
After creating an NDPS Manager, you can create NDPS printers by using NetWare Administrator, which is explained in the following section.

Creating an NDPS Printer Agent

To create Public Access Printers using the NDPS Manager Object in NetWare Administrator, follow these instructions. You will need to repeat the procedure for any other ports on the print server or for any other logical printers you want to use.

To create an NDPS printer agent:

1. **Start the NDPS Manager object you will be using to control the Printer Agent.**
2. **At the Identification page, click on the Printer Agent List.**
3. **Click on New to see the Create Printer Agent window, as illustrated below.**



Create Printer Agent

Create Printer Agent Window

1. Enter the name you want for the Printer Agent (PA) Name.

The NDPS Manager will be the NDPS Manager object you are using.

2. Select Novell Printer Gateway In the Gateway Type.

3. Click on OK, and then select the available printer.

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

5. Click on Next to view the Configure Port Handler Screen.


6. In the Host Address IP field, enter the IP address previously assigned to the Print Server device, as illustrated below.



Configure Port Handler

Configure Port Handler Window

1. In the Printer Name field, enter the Logical Port name on the Print Server (for example, L1).

	<p>For print servers with one parallel port, the logical ports are named L1, L2, and L3. For devices with two or three parallel ports, the logical ports are named L1 to L8.</p>
---	--

2. Click Finish; then select appropriate drivers for Windows 95, Windows 98, Windows NT 4, and Windows 2000.

3. The new printer agent will now appear in the Printer Agent List window.

Workstation Configuration

Before installation and configuration of the Public Access Printers on your workstation, ensure that the following statements apply:

Novell IntranetWare Client v2.2 (or later) is installed on your PC.

You have access to the Novell Printer Manager utility (Nwpmw32.exe).

Installing and Configuring the Public Access Printers

To install and configure public access printers:

- 1. Start the Novell Printer Manager utility.**
- 2. Select Printer>New from the menu, and click on Add.**
- 3. Select the required printer and click on Install.**
- 4. Click on Close.**

The printer appears in the main Printer Manager window under the Name listing and is now available for print jobs. Printer drivers are automatically downloaded from the server as required.

The printer is now in your Windows printer list and may be used by any Windows application.

Appendix E: IP Setup

This appendix provides a brief overview of IP addressing.

Overview

This appendix is intended only when the user has inadvertently disabled the DHCP protocol and/or assigned a wrong subnet IP address.

The following table describes each setting.

IP Configuration Settings

Setting	Recommended Value
Device Name	Shown on a sticker on the base of the device in the form "PSxxxxxx."
Device IP Address	192.168.0.1
Gateway IP Address	0.0.0.0
Subnet Mask	0.0.0.0

Clicking on Reset will set all values back to zero, and clicking on OK sets the data entered.

Ensure that the IP address assigned to the device is not already in use.

Following picture is the NETGEAR Print Server IP Address Configuration window.

NETGEAR Print Server IP Address Configuration

This Program allows you to assign an IP Address to a Print Server.
The "Default Name" is shown on the base of the Print Server, in the form PSxxxxxx(PS followed by 6 digits.)

Device Name:

TCP/IP

IP address:

Subnet mask:

Default gateway:

Reset

OK Cancel

NETGEAR Print Server IP Address Configuration

Appendix F: ASCII to Hexadecimal Conversion Table

Hexadecimal Value	ASCII Character
0	NUL
1	SOH
2	STX
3	ETX
4	EOT
5	ENQ
6	ACK
7	BEL
8	BS
9	HT
A	LF
B	VT
C	FF
D	CR
E	SO
F	SI
10	DLE
11	DC1
12	DC2
13	DC3
14	DC4
15	NAK
16	SYN
17	ETB
18	CAN
19	EM
1A	SUB
1B	ESC
1C	FS
1D	GS
1E	RS
1F	US
20	(SPACE)
21	!
22	"
23	#
24	\$
25	%
26	&
27	'
28	(
29)
2A	*
2B	+
2C	,
2D	-
2E	.

2F	/
30	0
31	1
32	2
33	3
34	4
35	5
36	6
37	7
38	8
39	9
3A	:
3B	;
3C	<
3D	=
3E	>
3F	?
40	@
41	A
42	B
43	C
44	D
45	E
46	F
47	G
48	H
49	I
4A	J
4B	K
4C	L
4D	M
4E	N
4F	O
50	P
51	Q
52	R
53	S
54	T
55	U
56	V
57	W
58	X
59	Y
5A	Z
5B	[
5C	\
5D]
5E	^
5F	_
60	`
61	a
62	b

63	c
64	d
65	e
66	f
67	g
68	h
69	i
6A	j
6B	k
6C	l
6D	m
6E	n
6F	o
70	p
71	q
72	r
73	s
74	t
75	u
76	v
77	w
78	x
79	y
7A	z
7B	{
7C	
7D	}
7E	~
7F	△

Statement of Conditions

In the interest of improving internal design, operational function, and/or reliability, NETGEAR reserves the right to make changes to the products described in this document without notice. NETGEAR does not assume any liability that may occur due to the use or application of the product(s) or circuit layout(s) described herein.

Certificate of the Manufacturer/Importer

It is hereby certified that the Model WG602 54 Mbps Wireless Access Point has been suppressed in accordance with the conditions set out in the BMPT- AmtsblVfg 243/1991 and Vfg 46/1992. The operation of some equipment (for example, test transmitters) in accordance with the regulations may, however, be subject to certain restrictions. Please refer to the notes in the operating instructions.

Federal Office for Telecommunications Approvals has been notified of the placing of this equipment on the market and has been granted the right to test the series for compliance with the regulations.

VCCI Statement

This equipment is in the Class B category (information equipment to be used in a residential area or an adjacent area thereto) and conforms to the standards set by the Voluntary Control Council for Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in such residential areas. When used near a radio or TV receiver, it may become the cause of radio interference. Read instructions for correct handling.

Federal Communications Commission (FCC) Compliance Notice: Radio Frequency Notice

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

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

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

Modifications made to the product, unless expressly approved by NETGEAR, Inc., could void the user's authority to operate the equipment.

Federal Communications Commission (FCC) Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20 cm (8 inches) during normal operation.

Canadian Department of Communications Radio Interference Regulations

This digital apparatus (Model MA401 Wireless PC Card) does not exceed the Class B limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Technical Support

PLEASE REFER TO THE SUPPORT INFORMATION CARD THAT SHIPPED WITH YOUR PRODUCT.

By registering your product at www.NETGEAR.com/register, we can provide you with faster expert technical support and timely notices of product and software upgrades.

NETGEAR, INC.

Support Information

Phone: 1-888-NETGEAR (For US & Canada only)

See Support Information card for other countries.

E-mail: support@NETGEAR.com

www.NETGEAR.com

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