



TRENDNET®



User's Guide

TE100-P11
TEW-P11G
H/W: V1

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Introduction

This chapter provides an overview of your Print Server's features.

Features

Congratulations on the purchase of your new Print Server. Your Print Server was designed to provide a simple and efficient network printing solution. It is packed with features, including:

- **Wireless LAN Support. (TEW-P11G only)** Wireless stations supporting the IEEE 802.11b or IEEE 802.11g standard can interoperate with the Print Server. Both LAN and WLAN users can print to the attached printer or printers.
- **Versatility.** The Print Server supports up to four protocols: TCP/IP, SMB (Service Message Block), AppleTalk (EtherTalk), and NetBEUI. It features an Ethernet interface port and operating system support includes Unix, NetWare (NDPS LPR printing), and Microsoft Windows.
- **Easy Installation.** The Print Server makes adding printers or plotters to your network simple.
- **Easy Setup.** A number of utility programs are supplied to simplify setup. For Windows 98/98/Me/NT/2000/XP/Vista users, the BiAdmin program makes it easy to configure the Print Server for a variety of network and server configurations.
- **Web-based Interface.** The Web-based interface provides an easy method of configuration in TCP/IP networks, regardless of your client platform.
- **Compact Size.** This allows the Print Server to be used even where space is limited.
- **Remote Management Tools.** A variety of software tools are provided. In most environments, both the Print Server and attached bi-directional printers can be configured remotely.
- **SNMP Support.** The Print Server can act as a SNMP agent, with its own MIB. This allows TCP/IP users to monitor, configure and troubleshoot the Print Server using their existing SNMP management tools.
- **Internet Printing Protocol (IPP) Support.** The Print Server can act as an IPP (Internet Printing Protocol) Server, allowing clients, suppliers, colleagues and others to print to your printer from anywhere on the Internet. Windows IPP Client software is also supplied.

Safety Instructions

For your own safety, and to protect your Print Server, please observe the following safety advice.

1. Unplug this device from its power source before cleaning. Use only a slightly dampened cloth for cleaning. Do not use liquid or aerosol cleaners.
2. Avoid using this product near water. Exposure to water poses an electric-shock hazard.
3. Do not place the Print Server on an unstable surface. The device may fall causing serious damage to the device.
4. This device should only be used with the power supply type specified on the marking label. If you are not sure of type of your local power supply, consult your dealer or the local power company.
5. Do not pinch, crimp or otherwise damage the power cord. If exposed to foot traffic, ensures that the cable is properly shielded and does not pose a tripping hazard.
6. If using an extension cord, makes sure the total ampere rating of the products using the cord does not exceed the extension cords ampere rating.
7. Do not attempt to service this device, as opening or removing casing may expose you to dangerous voltage points or other risks. Refer all servicing to qualified service personnel.
8. The Print Server should be serviced by qualified service personnel under the following conditions:
 - The power cord is damaged or frayed.
 - Liquid has been spilled onto the product.
 - The product has been exposed to rain or water.
 - The product does not operate normally in accordance with the operating instructions.
 - The device has been dropped or the casing has been damaged.

Packaging Contents

You should find the following items packaged with your Print Server. If any items are missing, contact your dealer immediately.

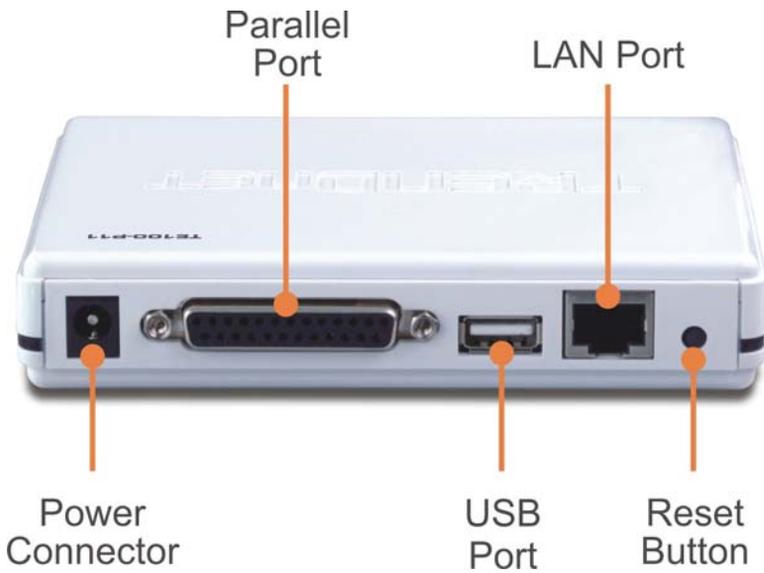
- TE100-P11 or TEW-P11G
- CD-ROM (Utility & User's Guide)
- Multi-Language Quick Installation Guide
- Power Adapter (5VDC, 2A)

Physical Details

This section has details of the LEDs and connectors. Further details are contained in *Appendix A - Specifications*.

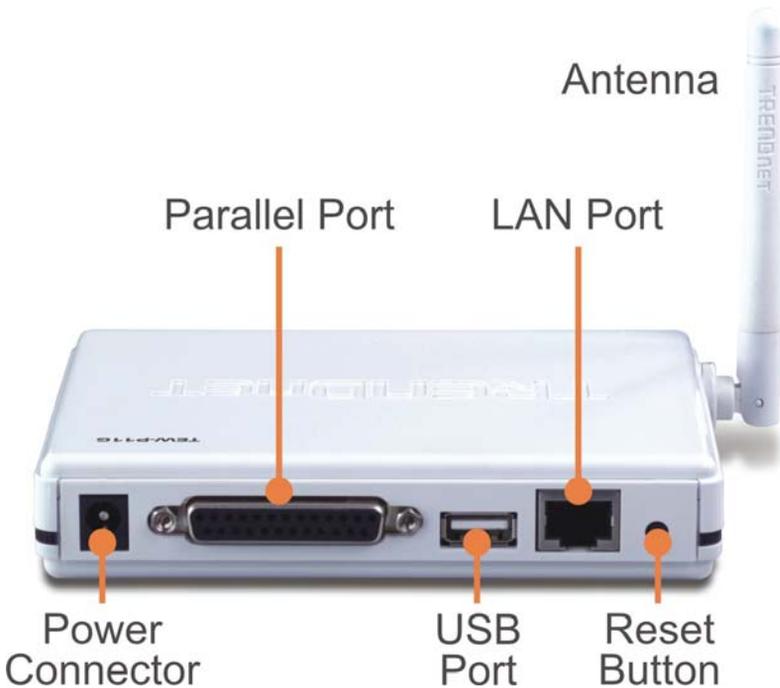
TE100-P11

- Diagnostic
- 1 x USB 2.0 Printer Port
- 1 Parallel Printer Port
- 10/100BaseT LAN connection



TEW-P11G

- Diagnostic LEDs
- 1 x USB 2.0 Printer Port
- 1 Parallel Printer Port
- IEEE 802.11b/g Wireless Station
- 10/100BaseT LAN connection



LED Indicators

There are 5 LED indicators on the rear panel. The LED indicator modes are described in the following table.

LED	Description
Power	Off - No Power. On - Normal operation
Ethernet	Off - No LAN connection. On - LAN connection is available. Flashing - Transmitting or receiving data through the LAN.
Wireless (TEW-P11G only)	Off - No Wireless connection currently exists. On - Wireless connection is available. Flashing - Transmitting or receiving data through the Wireless LAN.
Parallel	Off - No Parallel connection. On - Parallel connection is available. Flashing - Data is being transmitted via the parallel port.
USB	Off - No USB connection. On - USB connection is available. Flashing - Data is being transmitted via the USB port.

Reset Button

The Print Server is fitted with a Reset Button. The button is recessed; a pin or paper clip can be used to press it. This button has 2 functions:

- Restore the factory default settings
- Print a test page containing all current settings.

To restore the factory default settings:

1. Unplug the Power from Print Server.
2. Press and hold the reset button. While pressing the button, plug in the power back to Print Server.
3. If you continue pressing the button for 10 seconds, a diagnostic page will be printed, showing the new (default) settings.

To generate a Diagnostic print out

1. Ensure that both the Print Server and the printer attached to port 1 are ON.
2. Press the reset button, and hold it for 2 seconds.
3. The test page with current settings will be printed.

Note:

PostScript printers are unable to print this page. If you have a PostScript printer on Port 1, the test page will not be printed.

LAN Installation

This chapter describes how to install the Print Server in your Local Area Network.

Procedure

1. Preparation

- Ensure the power is OFF. Do not connect the Print Server while power is On.
- Find the *Default Server Name* for your Print Server. The *Default Server Name* is shown on the back of the unit sticker. The format is TNXXXXXX. The XXXXX indicates the last 5 digits of your MAC address. Record this name; it may be needed during configuration.

2. Connect the Printer or Printers

Connect the printer or plotter cable(s) to the appropriate port(s) on the Print Server unit.

3. Connect to your Network

Wired Network Interface

Connect the network cable to the 10/100BaseT LAN connector on the Print Server.



To use the LAN interface, the LAN cable needs to be inserted BEFORE powering ON.

Wireless Network Interface (TEW-P11G only)

Ensure your Access Point is compatible with the Print Server's default settings:

SSID Null (blank)

The Print Server will adopt the SSID used by the Access Point, unless the Access Point is configured not to broadcast its SSID.

WEP Disabled.



- In the default Wireless "Infrastructure" mode, connecting a LAN cable will disable the Wireless interface. To use both the LAN and Wireless interfaces, the Wireless mode must be changed to "Ad-hoc".
- Because the default Wireless mode is "Infrastructure", you cannot configure the Print Server via the Wireless interface unless you have an Access Point.

4. Power Up

Plug in the power adapter cable and power up. Start-up will take only a few seconds.

Use only the Power Supply unit provided with the device. Power Supply units for different models are not interchangeable.

5. Check the LEDs

- The Power LED should be ON.
- If using the LAN interface, the Ethernet LED should be ON.
If using the Wireless interface, the Wireless LED should be ON.

TE100-P11



TEW-P11G



Chapter 3

Print Server Configuration

This chapter provides an overview of the configuration process.

Overview

The Print Server is designed to support many different platforms, and the configuration required would depend upon the environment in which it is installed.

- The Print Server usually requires configuration, but if there's a DHCP server on your network, then the device is just plug-and-play. A Windows-based setup Wizard is also provided on the CD-ROM to simplify this task.
- It is required to config the print server on each computer.
See *Chapter 4- Client Configuration* for details.
- If you wish to use a queue-based printing system using **Windows NT Server/Windows 2000/Windows XP**, the Network Server must be configured as detailed in *Appendix B - Windows Server Configuration*. However, it is not necessary to use a Network Server-based queue; client PCs can print directly to the Print Server using the *Peer-to-peer Printing* installed by selecting the *User* setup type during installation procedure.

Configuration Methods

The following methods are available to perform the required Print Server configuration:

- **Windows-based Wizard** - see below for details.
- **BiAdmin** management utility program - see Chapter 5 for details.
- **Web-based setup** - see Chapter 6 for details.

Advanced Configuration and Management

The BiAdmin management utility is provided for advanced configuration and management. This program is installed by default when the *Administrator* install option is chosen. See Chapter 5 for details on using BiAdmin.

Using the Windows Setup Wizard

The Windows-based Setup Wizard is supplied on the CD-ROM, and runs on Windows 98, 98, NT4.0, ME, Windows 2000, XP and Windows Vista.

This is recommended that using this Setup Wizard to configure the Print Server and printer.

The default IP address is set as DHCP. If you do not have DHCP Server enable, the back up IP for print server is 192.168.10.40.

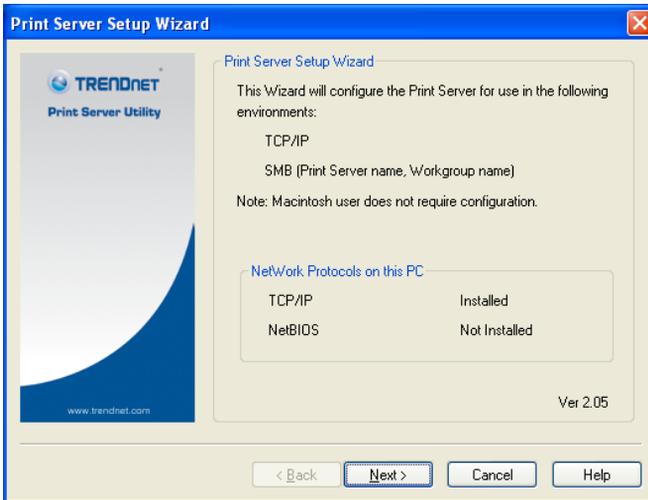
Procedure

1. Insert the supplied CD-ROM into your drive. If the setup program does not start automatically, run *Autorun.exe* in the root folder.

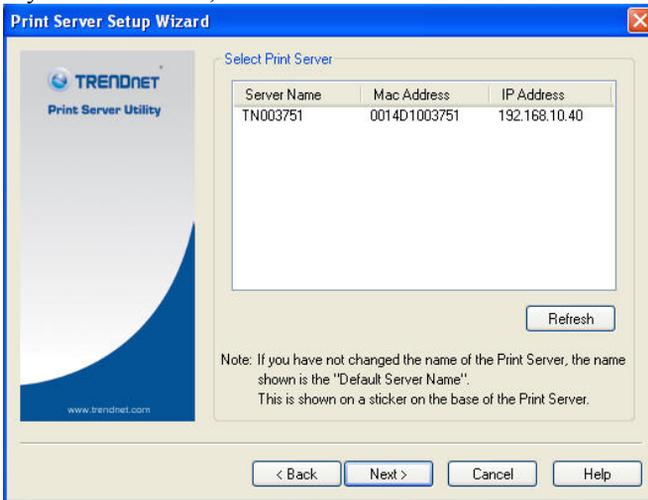
2. On the first screen, shown below, click *Install Utility* and in the sub-menu click on *Setup Wizard*.



3. Click *Next* on the main screen of the Wizard, to view a list of Print Servers on your LAN. If the Router does not have DHCP enable, it will take around 20 seconds to store the backup IP (192.168.10.40) to Print Server.

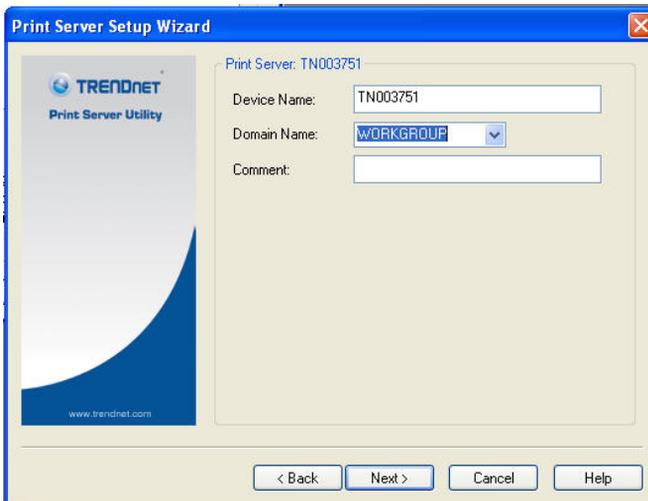


4. Select your Print Server, and then click *Next* to continue.



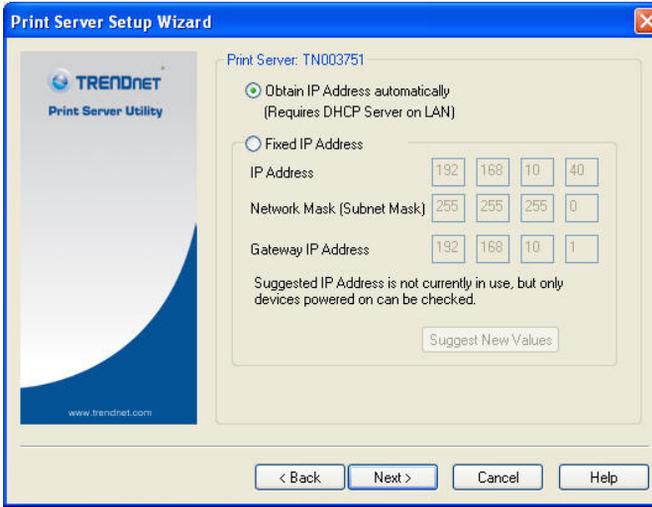
5. Enter the required data on the following screen.

- Device name: It can be changed as your desire name.
- Domain Name: Select or enter the Workgroup name for this Print Server.
- Comment: This is optional information.

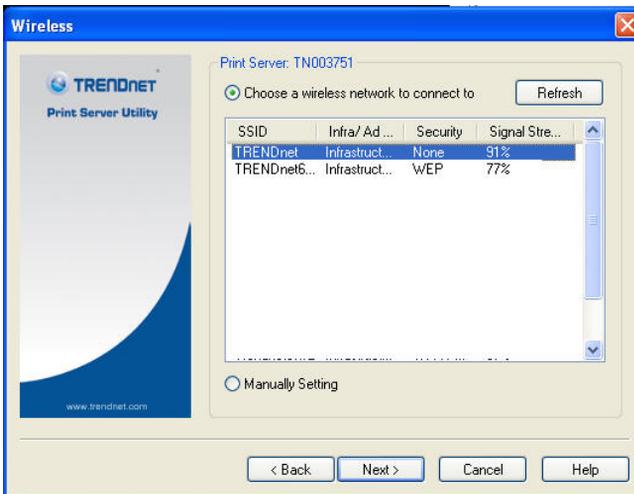


6. Click *Next* to configure the **TCP/IP Screen**:

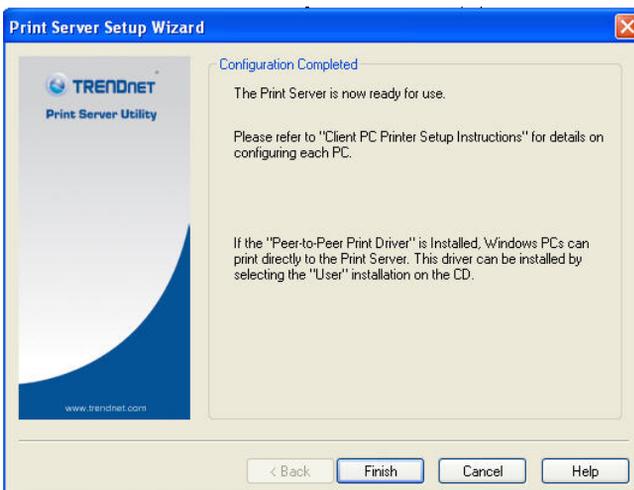
- Select *Obtain IP Address automatically* if your LAN has a DHCP Server, otherwise select *Fixed IP Address*. The default Fixed IP is set as 192.168.10.40.
- For *Fixed IP Address*, enter an unused address from the range used on your LAN, or click the *Suggest New Values* Button.
Use the same *Network Mask* and *Gateway* as PCs on your LAN.



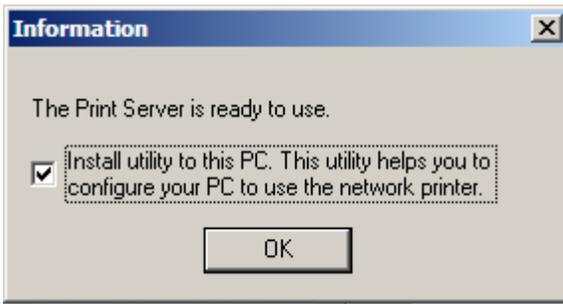
- For TEW-P11G, the settings on the Wireless Screens have to match with your other Wireless Stations. For details about each setting, refer to the following section *Wireless Configuration*.



- Click *Finish* to complete the configuration.



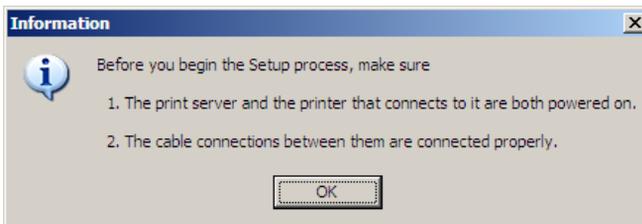
9. Select the option to help you setup the network printer into your PC.



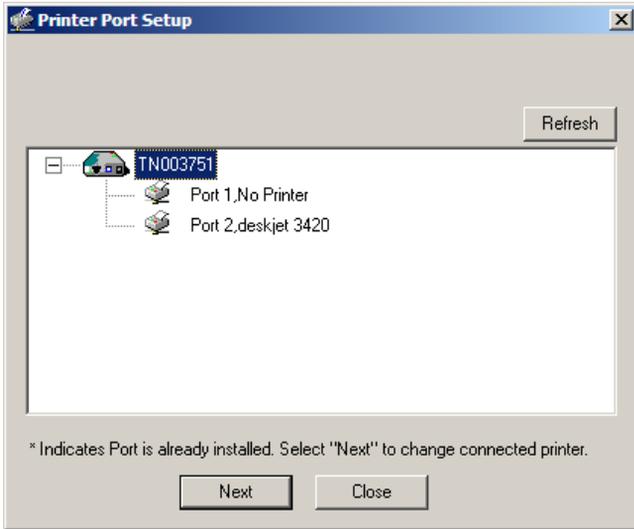
10. Select *Configure Print Driver Now*, then click *Finish*.
You can also configure later by go to *Start > Programs > TRENDnet > Print Server Utility*, Click *Printer Port Setup*.



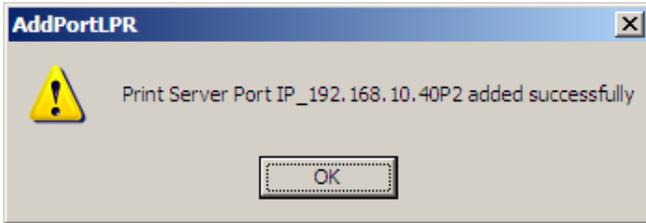
11. Make sure your print server and printer are both power on and connected properly. Then Click *Next*.



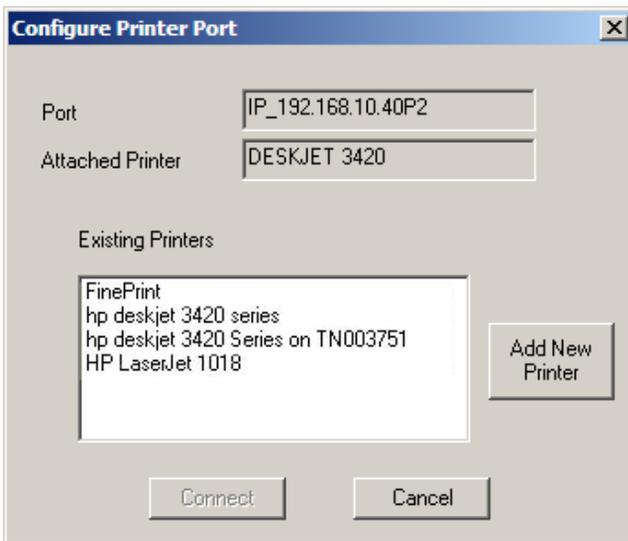
12. Select the Port number, then click *Next* to add the printer port.



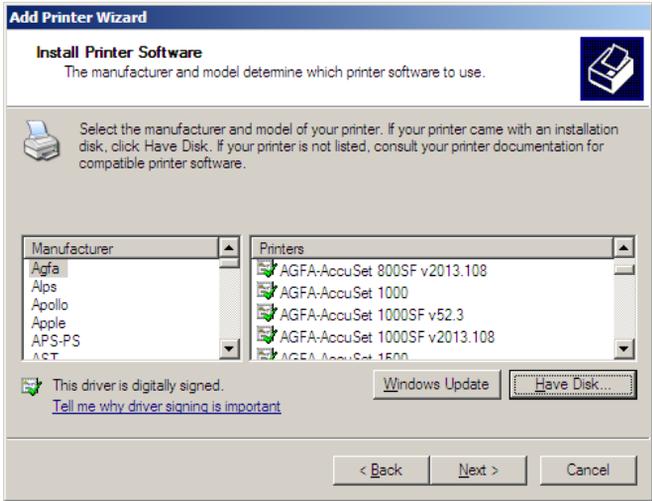
13. When blew print server port added successfully message display, click *OK*.



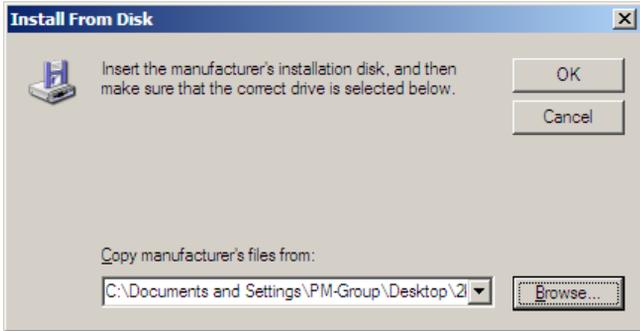
14. You can choose the printers either from the *Existing Printers* or select *Add New Printer*. This example shows you how to *Add New Printer*.



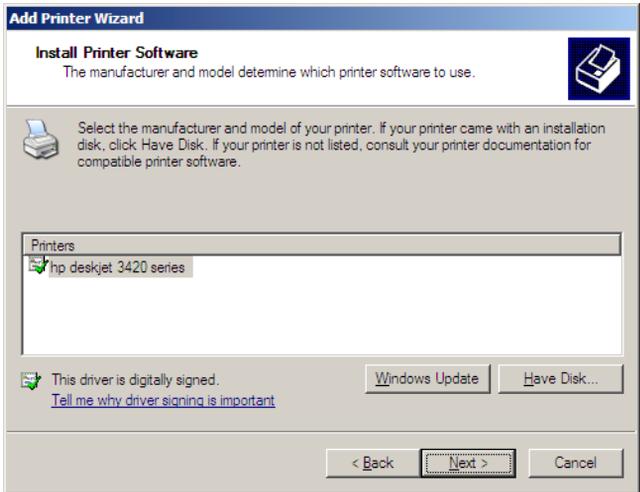
15. Install printer driver from list or click *Have Disk*. Then click *Next*.



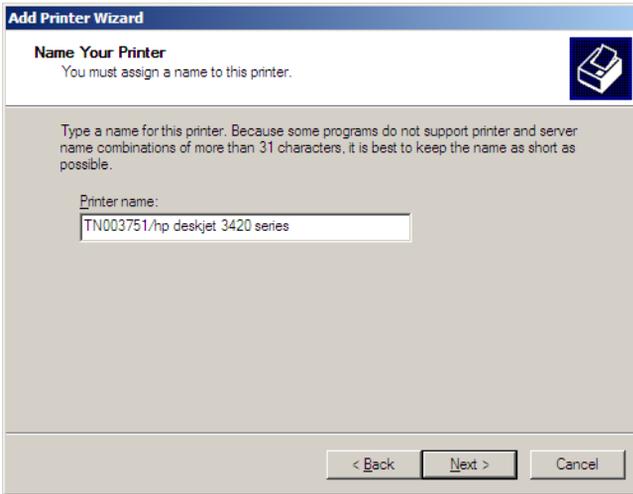
16. Browse the path, then click *OK*.



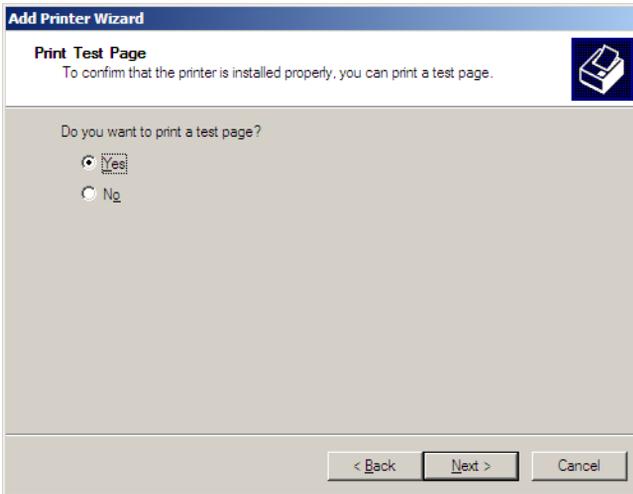
17. Click Next to install the driver.



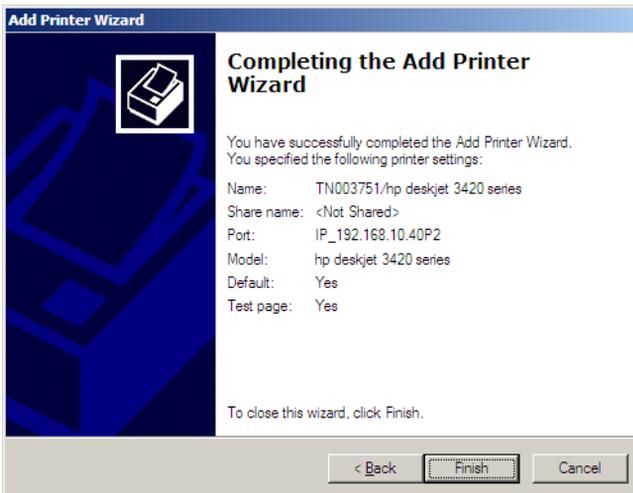
18. It is recommend to add Print Server's name in front of your printer name, then click *Next*.



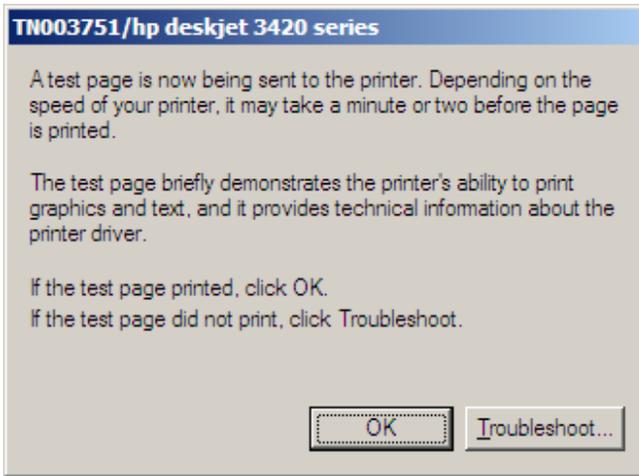
19. Click *Next* to print the test page.



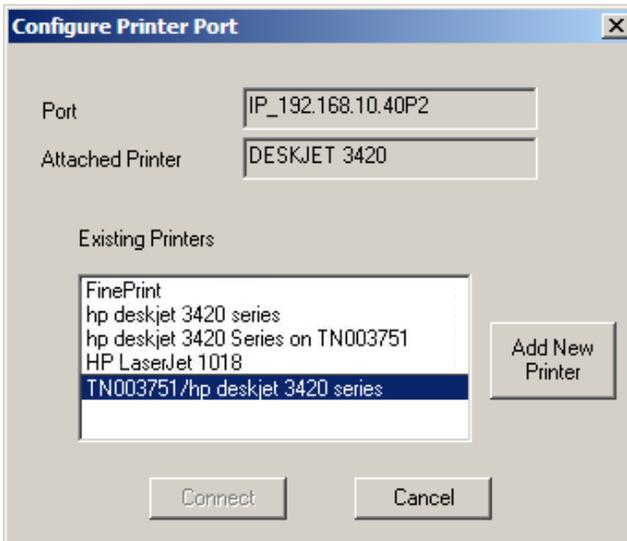
20. Click *Finish*.



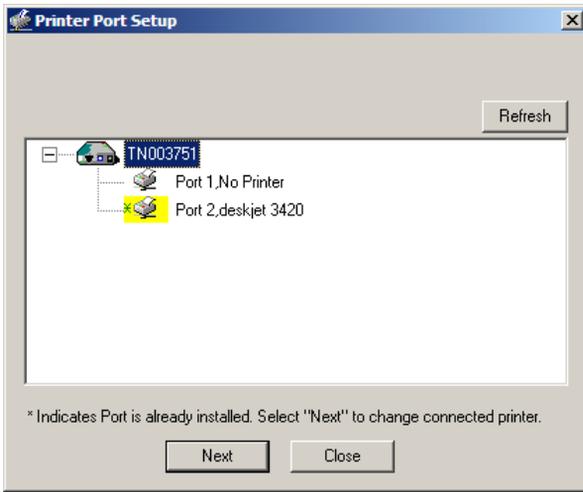
21. A test page message will display. Click *OK* if the page printed correctly.



- The *Existing Printers* list display the printer has been added successfully. Click *Cancel* to exit the Utility.



- After successful added the printer, the start mark “x” will appear right next to the port. Click Refresh if you do not see it. Click *Close* to exit the setup utility.



24. Click close to finish your Installation. Your installation is now completed.

- To install additional Printers, repeat steps 12.
- Use the **Start** menu to run this program in future. The default installation is *Start > Programs > TRENDnet > Print Server Utility > Printer Port Setup*.

Note: If the desired Print Server is not listed:

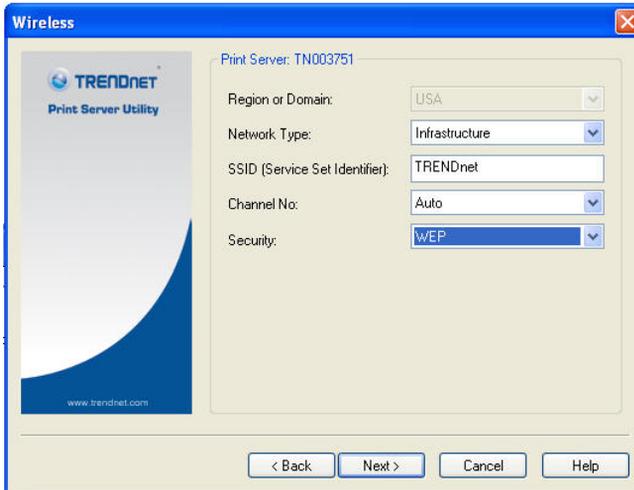
- Check all cables to the Print Server.
- Check the Print Server's LEDs:
 - The Power LED should be On in Green.
 - If using the LAN interface, the Ethernet LED should be On.
 - If using the Wireless interface, the Wireless LED should be On.
- Check that your PC and the Print Server are on the same LAN segment. (If you don't have a Router or Gateway on your LAN, you only have 1 segment.)
- Check that your PC has either the TCP/IP or NetBEUI network protocols installed. See in Chapter 4 for details.

Wireless Configuration (TEW-P11G only)

Wireless Mode

The Print Server is a Wireless station, NOT an access point. Like other Wireless stations, they have 2 modes:

- **Ad Hoc mode** - no Access Point is used, Wireless stations communicate directly with each other. This is the older standard, and requires that each Wireless station is set to use the same Channel.
- **Infrastructure (Default)** - all Wireless stations connect to the Access Point. This allows connection to both other Wireless stations and the wired LAN.



To use both the LAN and Wireless interfaces, the Wireless mode must be set to "Ad-hoc". In "Infrastructure" mode, connecting a LAN cable will disable the Wireless interface.

Required Configuration

	Ad-hoc Mode	Infrastructure Mode
SSID	If Ad Hoc mode is configured, the Print Server will join any group with the same SSID. If there's no Ad Hoc group available on the environment, the Print Server will create the group by the SSID number value it configured.	Must match the Access Point.
Channel	In <i>Ad Hoc</i> mode, the Print Server will join any group with the same Channel number.	Access Point sets the Channel used. Wireless stations automatically locate the correct channel.
Security Settings	Must match the other Wireless stations.	Must match the Access Point.

Client PC Configuration

The chapter details the client configuration required on LAN clients to use the printer or printers attached to the Print Server.

Overview

Before performing client configuration, the Print Server must be installed on your LAN, and configured as described in Chapter 3. Both the Print Server and the attached printer must be powered ON.

Printing Methods

The Print Server supports a number of printing methods:

- **Peer-to-peer Printing** means that the print jobs are stored (queued) on your PC, and sent directly to the Print Server when it is available.
- **Server-based Print Queue** means that all print jobs are stored (queued) on the Network Server (e.g. Windows NT/2000) and then sent to the Print Server. This allows the Network Administrator to modify the Print Queue. For example, an important job can be moved to the head of the queue.
- **Windows SMB** printing is a Microsoft standard for using a "Network Printer". No additional software needs to be installed on your Windows PC, and printing from MS-DOS programs is supported. However, because the Print Server cannot store files, large print jobs may cause problems.
- **AppleTalk** is also supported, and normally no configuration of the Print Server is required. See the Macintosh section of this chapter for details of client configuration.

Which printing method should I use?

- If using Windows 98, NT, ME, 2000, XP or Vista, the easiest method to use is *Peer-to-peer Printing*.
- If using Windows, and you need to print from MS-DOS programs, or you don't wish to install additional software, use SMB. However, SMB is not suitable for large, complex documents, so if you need this as well as MS-DOS printing, you should install BOTH *Peer-to-peer Printing* and SMB printing. MS-DOS programs can use the SMB printer, Windows programs should use *Peer-to-peer Printing*.
- If your LAN has Network Servers (e.g. Windows NT, Windows 2000 Server) use the method advised by your Network Administrator. The Print Server can print via a queue located on a Network server, if desired.
- **Unix** users - refer to *Appendix C*.
- **Macintosh** users - refer to the Macintosh section of this chapter.

Checking your Network Protocols (Windows 9x)

Your PC must have EITHER the TCP/IP or NetBEUI protocols installed. (All versions of Windows after Windows 98 have TCP/IP installed by default.)

- If using the *Peer-to-peer Printing*, the installation program will check this for you.
 - If using other methods, you must check manually, as follows:
1. Select the *Settings - Control Panel - Network* option on the Start Menu. You should see a screen like the one following:

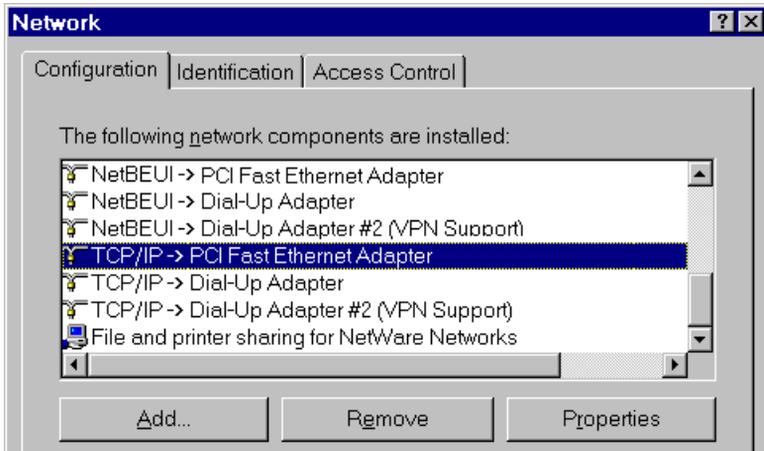


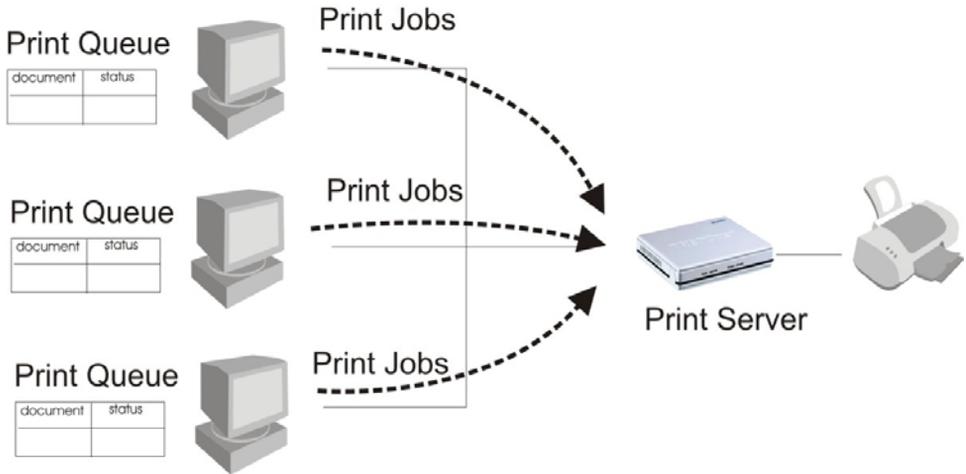
Figure 1: Network Configuration

- The top line in the list (NetBEUI -> PCI Fast Ethernet Adapter) indicates that the NetBEUI protocol is installed on this PC. Your PC will show the name of the Network card rather than "PCI Fast Ethernet Adapter".
 - The highlighted line (TCP/IP -> PCI Fast Ethernet Adapter) indicates that TCP/IP is installed. Your PC will show the name of the Network card rather than "PCI Fast Ethernet Adapter".
2. If neither line is present:
 - Install the NetBEUI protocol by selecting *Add - Protocol - Microsoft - NetBEUI - OK*. You may be prompted for your Windows CD-ROM. This protocol requires no configuration.
 - If required, you can also install TCP/IP. However, depending on your LAN environment, TCP/IP may require further configuration.
 3. If either protocol is already installed, proceed with installation.

Windows Peer-to-peer Printing

With this printing method, print jobs are stored (queued) on your PC, and then sent to the Print Server when it is available.

Peer to Peer Printing



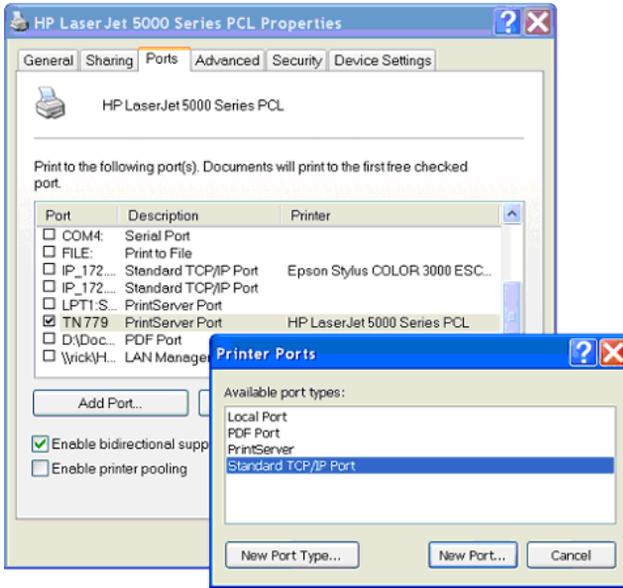
Windows 2000, XP & Vista require no additional software. You can use LPR printing method to setup your printer. If you prefer, there is another option to help you to install the printer by using Print Port Setup Utility. Please refer to *Windows 98/ME Setup* and *PTP Printer Port Setup* Section below.

For other Windows Operation System, the PTP (Peer-to-Peer) Printer Port software must be installed on each PC.

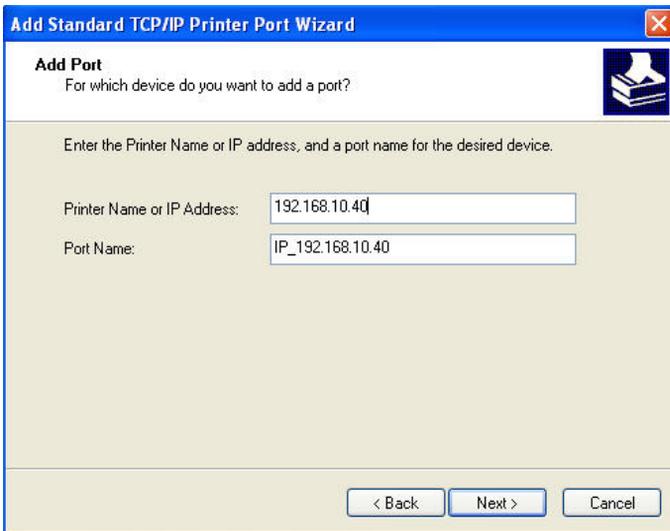
Windows 2000/XP/Vista Setup

The recommended printing method is to use LPR, as follows:

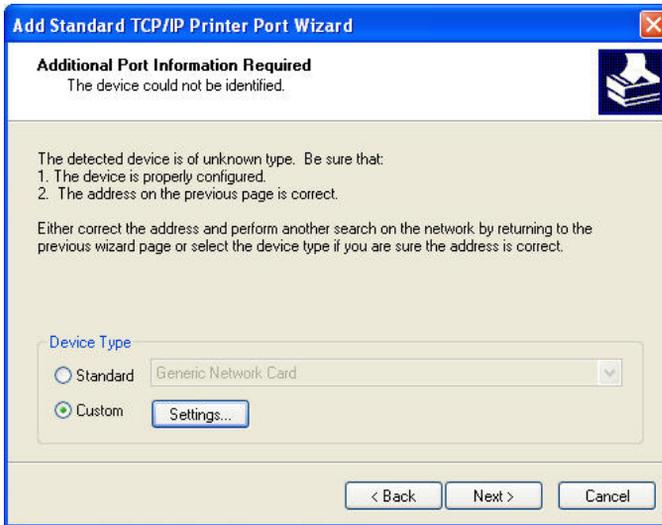
1. Open your *Printers* folder, right-click the desired printer and select *Properties*.
2. Select the *Ports* tab and click the *Add Port* button.



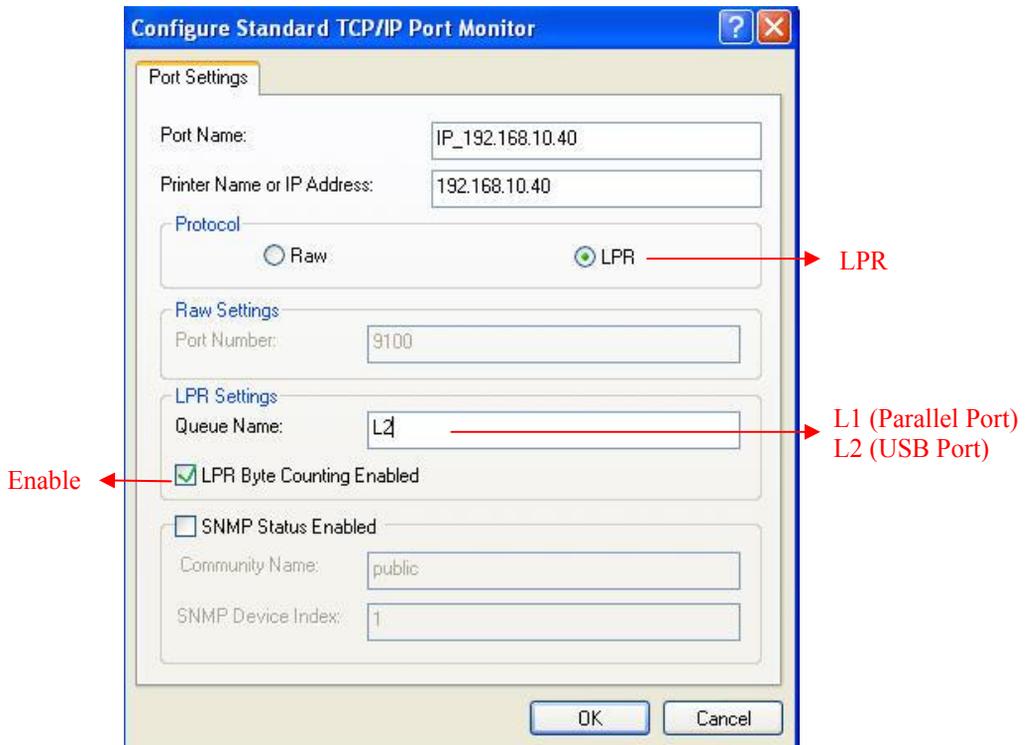
3. Choose *Standard TCP/IP Port*, then click *New Port*.



4. On the *Add Standard TCP/IP Printer Port* screen above, enter the *IP Address* of the Print Server in the *Printer Name or IP Address* field, and then click *Next*.



5. On this screen, select *Custom*, and click the *Settings* button.



6. On the *Port Settings* screen, shown above:
 - Select *LPR* in the *Protocol* section
 - Enter a *Queue name* (*L1* for Parallel Port, *L2* for USB Port)
 - Ensure the *LPR Byte Counting Enabled* setting is **Enabled**.
 - Click *OK* to confirm your changes and close this screen.
7. Follow the prompts to complete the Wizard.

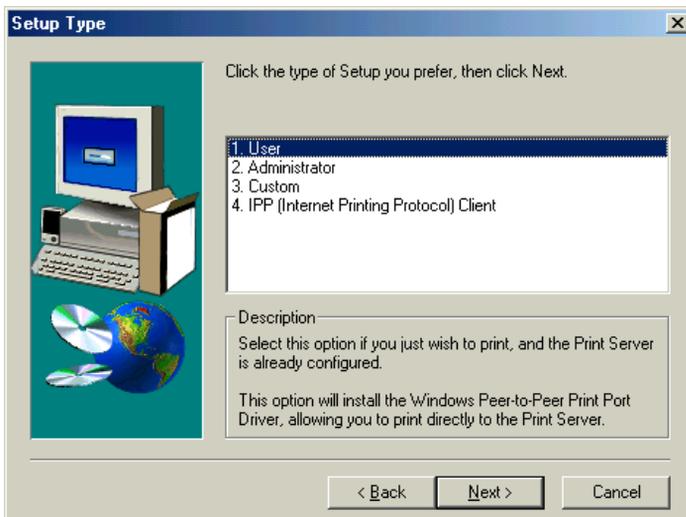
Windows 9x/ME Setup

Before performing the following procedure, the Print Server must be installed on your LAN, and configured as described in Chapter 3. Both the Print Server and the attached printer should be powered ON.

1. Insert the supplied CD-ROM into your drive. If the setup program does not start automatically, run *Autorun.exe* in the root folder.
2. On the first screen, shown below, click *Install Utility* and in the sub menu click on *Installation*.



3. Follow the prompts installation.
4. When the following screen shows, click *User* to install the Print Port Setup Utility, then click *Next*.

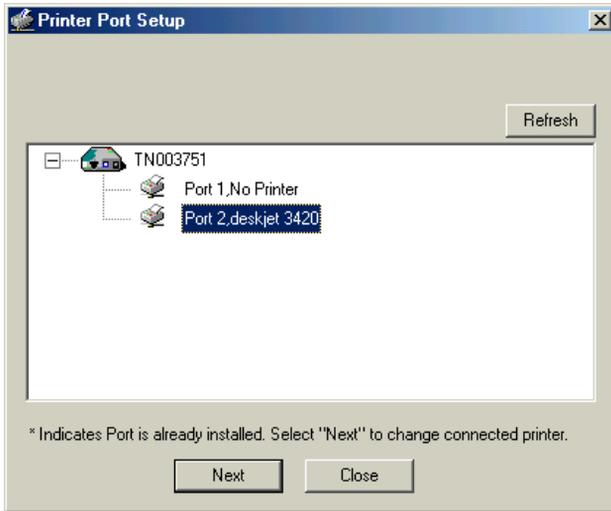


5. Follow to complete the installation (Refer to the *Windows* section of *Chapter 8 - Troubleshooting* if there is a problem with the installation.)
6. The *Print Port Setup* will run.

In future, you can use *Start > Programs > TRENDnet > Print Server Utility - Printer Port Setup* to run the program again.

PTP Printer Port Setup

1. The *Printer Port setup* program searches for Printer Servers on the network, and a screen like the following is displayed.
 - If desired, click *Refresh*.
 - The name of the attached printer will be displayed if possible. If "No printer" is displayed, check that the printer is properly connected and powered on.



If your Print Server is not listed:

- Click the "Refresh" button.
- Check that both the Print Server and the printer are properly connected, and powered on.
- Check that the Print Server has been configured. (Use the *Setup Wizard* on the CD-ROM.)
- If using TCP/IP, try installing the NetBEUI protocol. (See the earlier section *Checking your Network Protocols* for details.). Then try again.

2. Select the desired port on a Print Server, and then click *Next*. A pop-up message will inform you if the port has been created successfully.

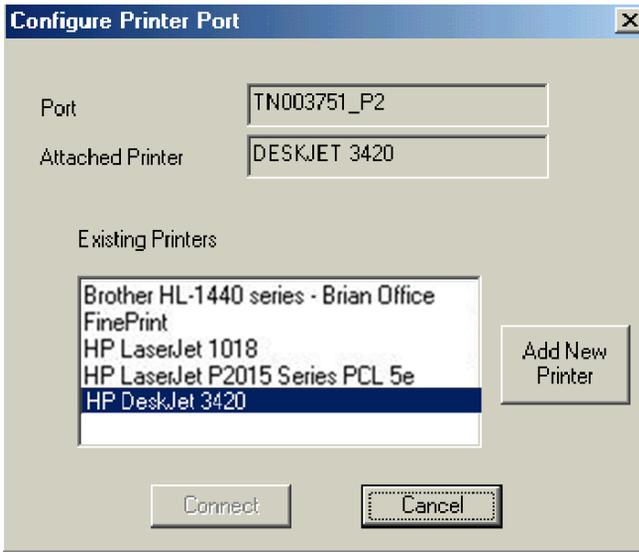




If you see the following error message, either install Internet Explorer 4 or later, or follow the procedure in the "Trouble Shooting - Windows" section of Chapter 8.

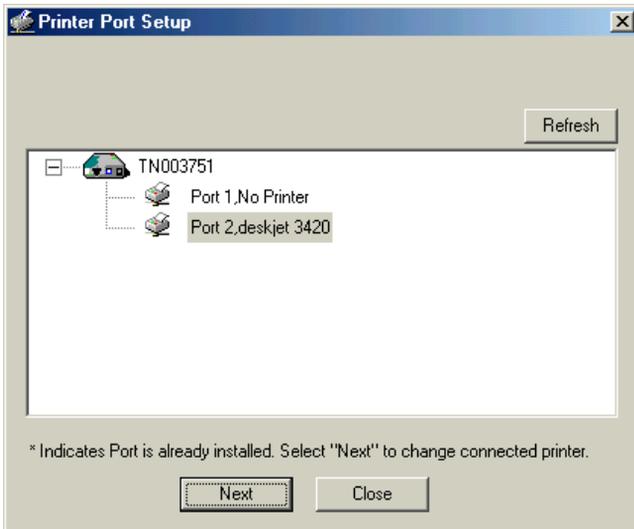


3. After the printer port created, the following screen will be displayed. Select the printer from *Existing Printers* list, then click *Connect*.

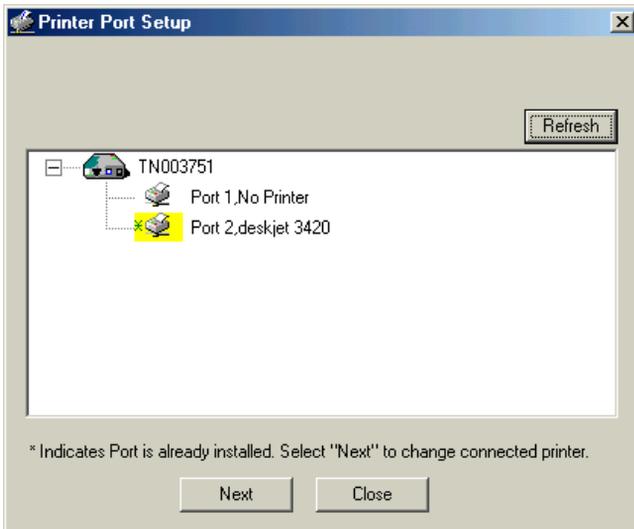


If the correct printer type is not listed, click "Add New Printer" to run the Windows *Add Printer* wizard. Step through the Wizard and install the required printer:

- Select the correct Printer Manufacturer and Model, or use the "Have Disk" option if appropriate.
 - We recommend changing the Printer name to indicate which device is on. (e.g. HP5600 on TN003751_P2)
 - If prompted about sharing the printer, do NOT enable Sharing.
 - When the Printer installation is finished, it will be listed in the *Configure Printer Port* screen above. Select it and click *Connect*.
4. The next screen will pop up.



5. Click Refresh to make sure if the printer has setup correct.



6. Click close to finish your Installation. Your installation is now completed.

- To install additional Printers, repeat steps 4.
- Use the **Start** menu to run this program in future. The default installation is *Start > Programs > TRENDnet > Print Server Utility > Printer Port Setup.*

Note:

If using the Epson Spooler Manager, this program must be disabled, as follows:

1. Run the Epson Spooler Manager.
2. Select "Queue Setup" from the menu.
3. Click "Use Print Manager for this port".
4. Click "OK" to exit.

Management

- Print jobs can be managed like any Windows printer. Open the *Printers* folder (*Start > Settings > Printers*) and double-click any printer to see the current print jobs.

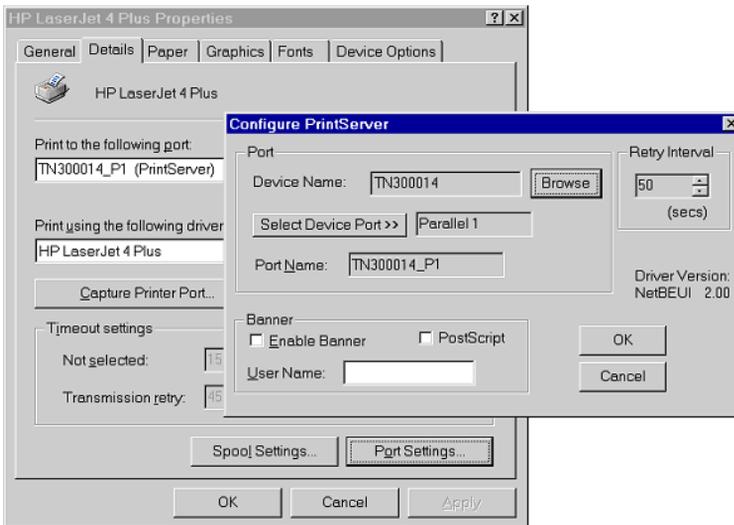
- If the printer attached to the Print Server is changed, just run this program again, and select the correct printer.
- To delete a port created by this setup program, use the Windows *Delete Port* facility:
 - Right-click any printer in the *Printers* folder, and select *Properties*.
 - Locate the *Delete Port* button. This button is on the *Details* or *Ports* tab, depending on your version of Windows.
- If the Print Server's IP Address is changed, and you can no longer print, delete the port (see procedure above) and re-install it.

Advanced Port Options

The options for the *Peer-to-peer Printing* are accessed via the *Port Settings* button.

Use *Start - Settings - Printers* to open the Printers folder, then right-click the Printer, and select *Properties*. The *Port Settings* button is on the *Details* or *Ports* tab, depending on your version of Windows.

An example screen is shown below:



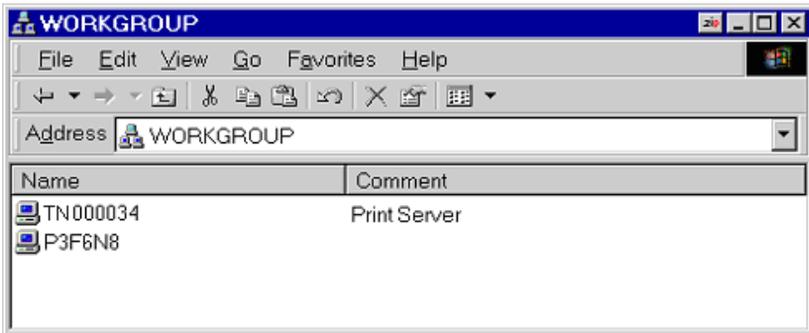
Items shown on this screen are as follows:

Port	<p>If desired, click <i>Browse</i> to select a different Print Server. If the selected device has multiple ports, the <i>Select Device Port</i> button can be used to select the port.</p> <p>The <i>Port Name</i> cannot be changed after installation. This name is shown in the Printer's <i>Properties</i>.</p>
Banner	<p>Check this option to print a banner page before each print job.</p> <ul style="list-style-type: none"> • If using a PostScript Printer, check the <i>PostScript</i> box. • The <i>User Name</i> will be printed on the banner page.
Retry Interval	<p>Sets how often Windows will poll the Print Server to establish a connection when the printer is busy. Increase this value if you get too many warning messages.</p>

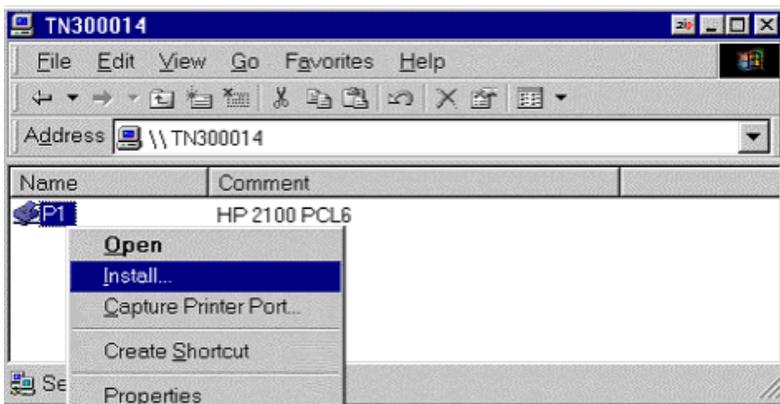
Windows SMB Printing

This method requires no additional software to be installed, but the NetBEUI or TCP/IP protocol must be installed on your PC. Use the following procedure to install the Print Server's printer as a Windows SMB network printer:

1. Double-click the *My Network Places* icon on the desktop.
2. On the *View* menu, select *Details*.
3. Locate the desired Print Server, as shown below:
 - If it is the same Workgroup as your PC, it will be listed on screen.
 - If it is in a different workgroup, double-click *Entire Network*, then double-click the appropriate Workgroup to open it.



4. Double-click the Print Server icon to view a Printer icon for each printer port. The "Comment" field may indicate what type of printer is connected to the port.
5. To install a printer, right-click the desired printer icon, and choose "Install", as shown below. This will start the *Add Printer* wizard.



6. Follow the prompts to complete the installation.
 - For information about the question "Do you print from MS-DOS programs?", see *Printing from MS-DOS Programs* below.
 - Select the Printer Manufacturer and Model to match the printer connected to this port on the Print Server, and complete the Wizard.
7. This printer will now appear in your *Printers* folder (*Start - Settings - Printers*) and can be used like any other printer. However, SMB printing is not suitable for large complex print jobs - you should use the *Peer-to-peer Printing* instead.

Windows with Server-based Print Queues

With a Server-based Print Queue, the Print Server is installed on an existing Network Server (Windows, Unix, or NetWare), rather than on your PC. If your Network Administrator uses this system, each Windows client must be set up as follows:

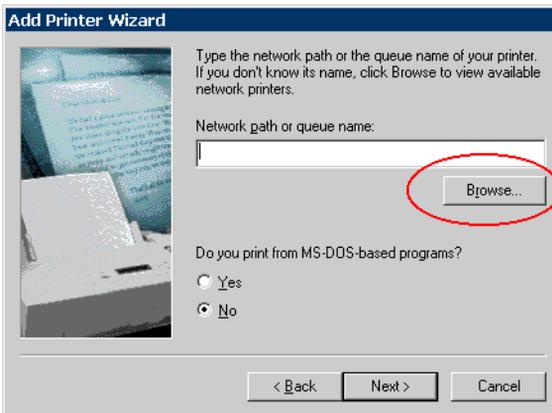
1. Open your *Printers* folder, and start the *Add Printer Wizard*.
2. When prompted, select *Network Printer*.



3. When prompted for *Network Path or Queue Name*:

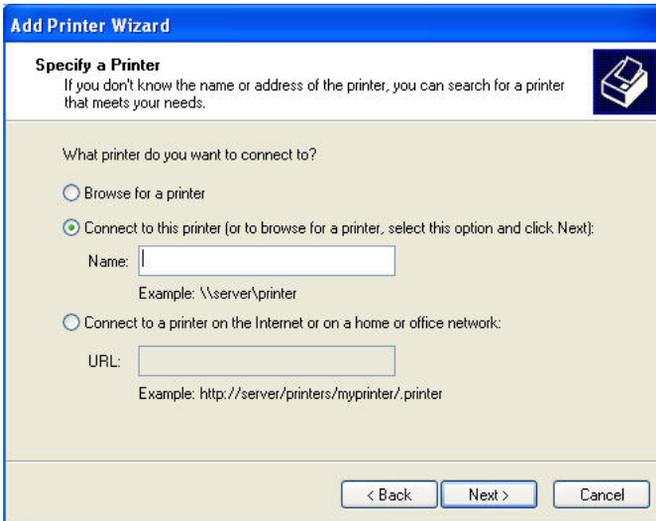
Windows 98/SE

- Click the *Browse* button, then browse the network, and locate the Server and Printer (or Print Queue) which your Network Administrator advised you to use.



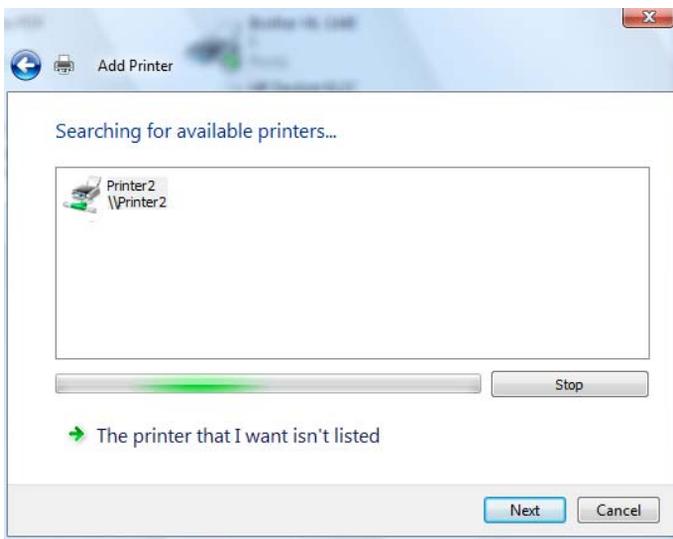
Windows 2000/XP

- On Windows 2000/XP, leave the field blank and click *Next*



Windows Vista

On Windows Vista, the Windows will search printer automatically.
Select the Printer, then click Next



4. Select the correct printer Manufacturer and Model, as advised by your Network Administrator, and click *Next*.
5. Follow the prompts to complete the Wizard.

The new printer will be listed with any other installed printers, and may be selected when printing from any Windows application.

Macintosh (AppleTalk)

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

Normally, no configuration is required.

Software Requirements

System 9.x OS or newer.

AppleTalk Setup

1. Click the apple icon and choose *Control Panel - AppleTalk*.
2. Ensure that *Ethernet* is selected under *AppleTalk Connection*.
3. Click *Chooser*. The Chooser panel will open.
4. 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.
5. Choose a PostScript printer from the list.
6. Click *Create* and it will search PPD automatically.
7. Select a printer description from the list.
8. Click *Select*.
Configuration is now complete.

Printing

Printing with the Print Server installed in an AppleTalk network is identical to normal printing. Just select *File - Print* and choose the desired printer.

Advanced Setup and Management

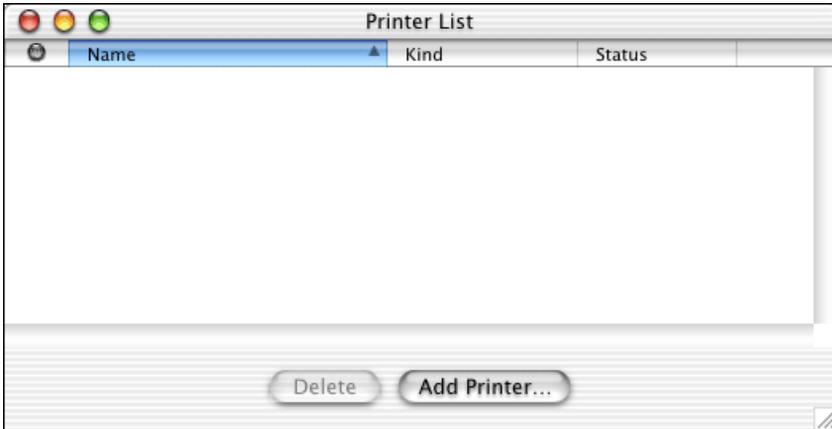
In a mixed Windows PC/Macintosh environment, you can use BiAdmin to configure the Print Server. See Chapter 5 for details on installing and using BiAdmin.

Macintosh OS X

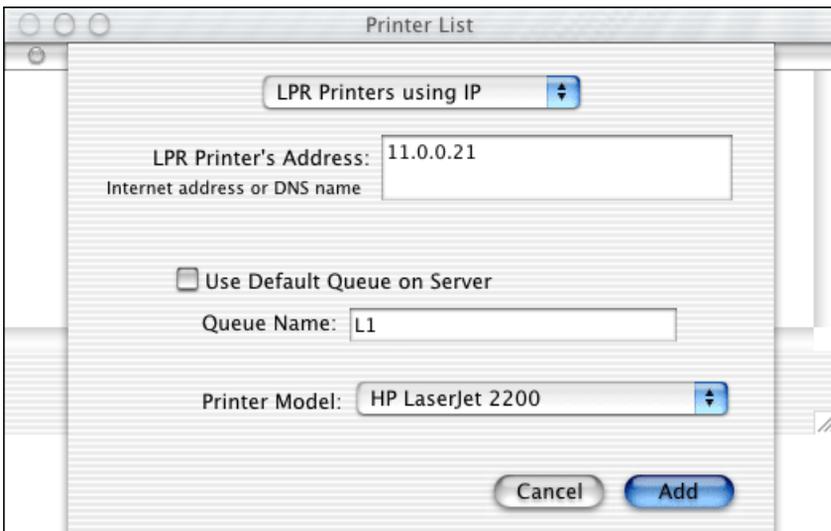
If using LPR printing, you need to ensure the Print Server has a valid IP address before configuring your Mac as follows.

LPR printing Setup

1. Select the *Printer List* icon.



2. Click the *Add Printer* button.
3. Choose *LPR Printers Using IP*.



4. Enter the IP address of the Print Server in the *LPR Printer's Address* field, and enter the *Queue Name* (L1 for Parallel port, L2 for USB port).
5. Select the *Printer Model* from the drop-down list.
6. Click *Add*.
Configuration is now complete.

BiAdmin Management Utility

This chapter describes the installation and operation of the BiAdmin Configuration & Management program.

Requirements

This program requires:

- Windows 98 or ME
- Windows NT 4.0, Windows 2000, Windows XP or Windows Vista

Additional Recommendations:

- Screen resolution of 800 * 600 or greater.

Installation

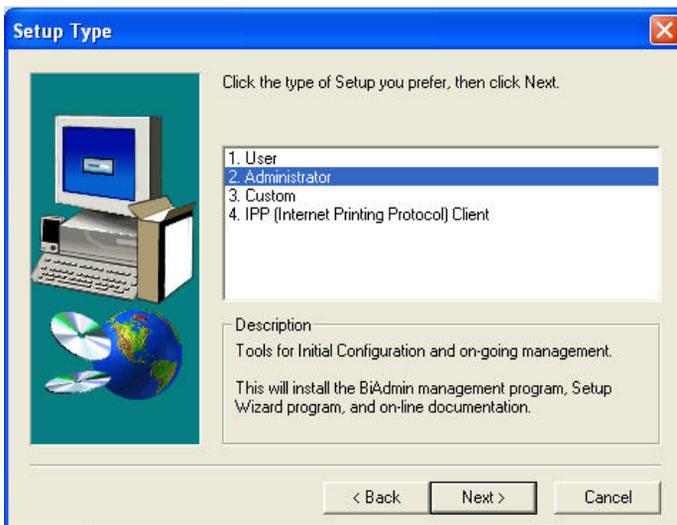
1. Insert the supplied CD-ROM into your drive. If the setup program does not start automatically, run *Autorun.exe* in the root folder.
2. On the first screen, shown below, click *Install Utility* and in the sub menu click on *Installation*.



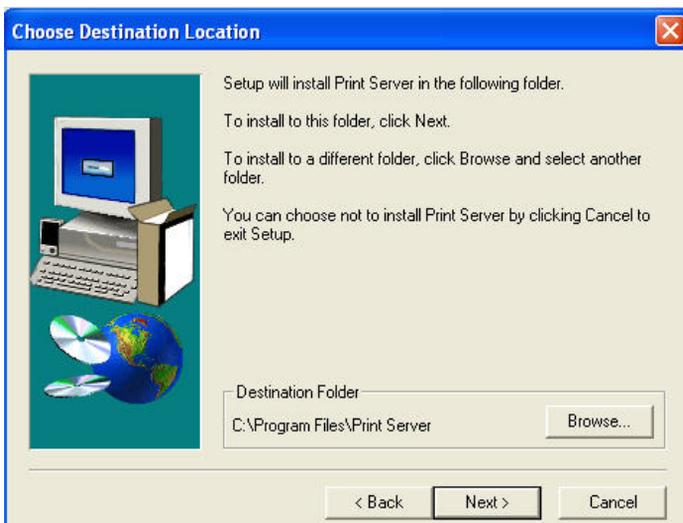
3. The Welcome screen will show up. Click *Next*.



4. Select *Administrator* to install Bi-Admin Utility, then click *Next*.



5. Click *Next* or *Browse* to different location.



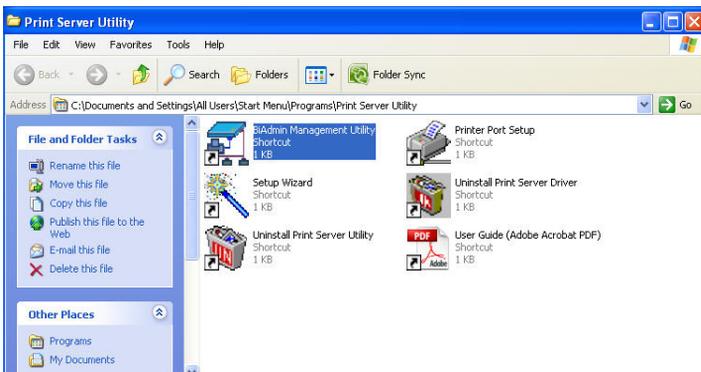
6. Click *Next*.



7. Following the screen until the following screen shows up. Select “*Enable BiAdmin Management Utility Now*”.

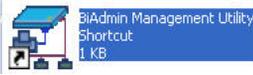


8. The Bi-Admin Utility will show up.

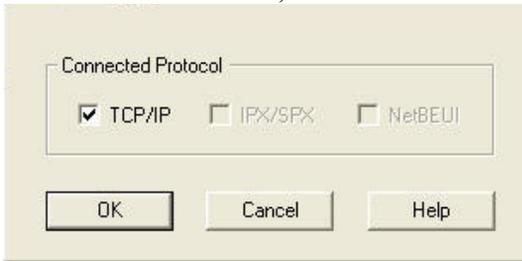


Operation

- Click BiAdmin Program icon below or Go to Start > Programs > TRENDnet > Print Server Utility, Click *BiAdmin Management Utility*

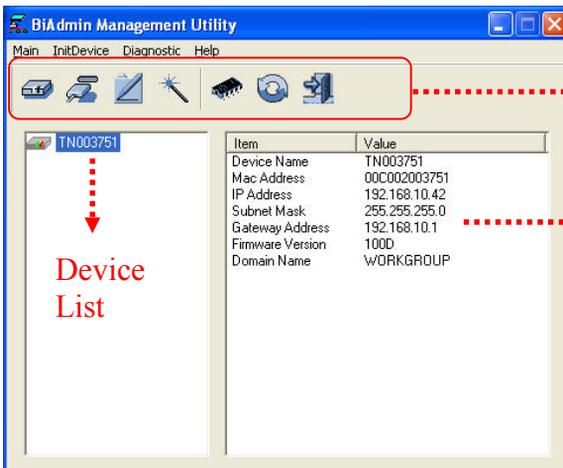


- Select the *Connected Protocol*, then click *OK*



- The BiAdmin Management Utility will search the network for all active Print Servers, and then lists them on screen, as shown by the example screen below.

BiAdmin Management Utility



Device List

The left panel displays a list of all Print Servers found on the network. When a Print Server is selected from the list, its details are displayed in the right panel.

Note: If the IP address is "Null", please click the *Refresh* icon to get the value again.

If the desired Print Server is not listed, try the following:

- Check that the device is installed and ON, then *Refresh* the list.
- If the Print Server is on another LAN segment, use the *InitDevice - Attached Remote* menu option to locate and display the Print Server.

Icons



Device Status

Menu equivalent: *Main - Device Status*



Printer Status

Menu equivalent: *Main - Printer Status*



Configuration

Menu Equivalent: *Main - Configure*



Wizard

This Print Server Wizard allows you to do the basic configuration for the selected device. The wizard is same as the Setup Wizard run from the CD-ROM, as described in Chapter 3.



Upgrade

Menu Equivalent: *Main - Upgrade*



Refresh

Menu Equivalent: *Main - Refresh*



Exit

Menu Equivalent: *Main - Exit*

BiAdmin Management Utility Menu

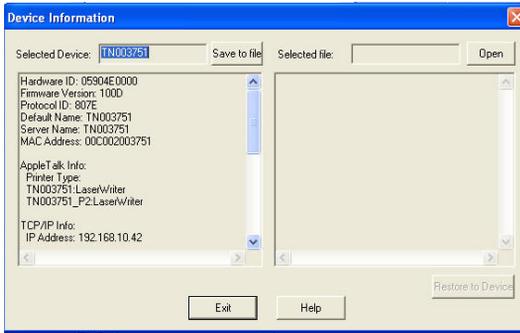
Main - Device Status



Menu equivalent: *Main - Device Status* or Click the **Icon**

All of the settings for the current device are displayed in a read-only scrollable list in the left panel.

You can use the "Save to File" and "Restore to Device" buttons on this screen to save a copy of the selected device's CONFIG file to your PC, or restore a previously saved file to the selected Print Server.



Main - Printer Status



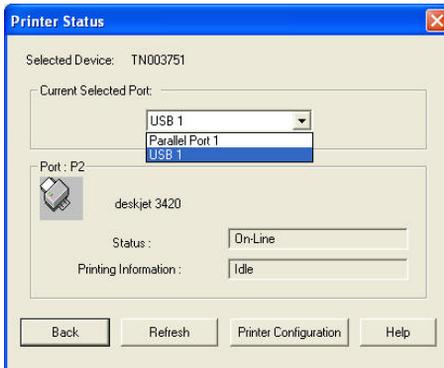
Menu equivalent: **Main - Printer Status** or Click the **Icon**

After selecting this icon, a *Detail* button will be available to show more information about the printer.

Select the desired port from the drop-down list to display the current status of the printer attached to the port. Possible states are:

- **Status** - On-line, Off-line, or Out of Paper
- **Printing Information** - Idle, Printing

If the printer is Bi-directional, and is not busy, the **Configuration** button will be available, allowing you to change the configuration of the attached printer. This button will be grayed out if the printer does not support this option, or if the printer is busy printing.

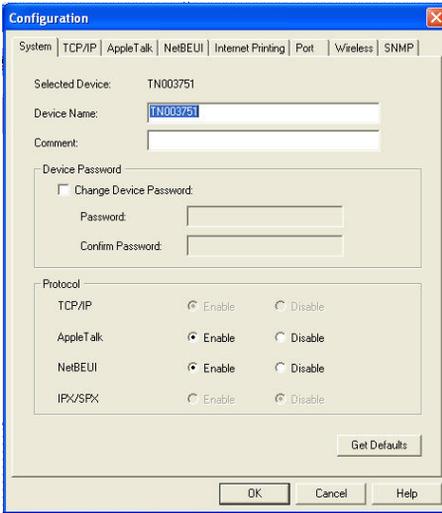


Main - Configuration



Menu Equivalent: **Main - Configure** or Click the **Icon**

This option allows you to configure the selected Print Server. Please see the following section for detail information.



Main - Upgrade



Menu Equivalent: **Main – Upgrade** or Click the **Icon**

This option allows you to upgrade the firmware for the selected Print Server. Before using this option, you need to obtain the .BIN file for the firmware upgrade, and copy it to the same directory as BiAdmin.

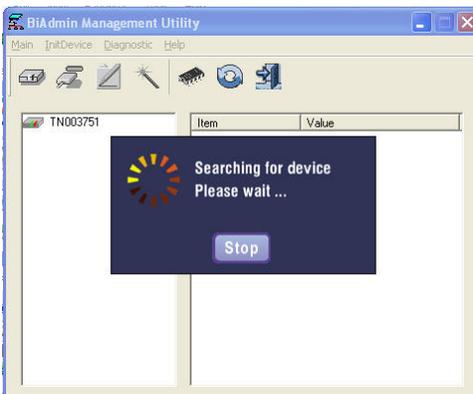


Main - Refresh



Menu Equivalent: **Main – Refresh** or Click the **Icon**

Select this icon to update the Print Server device listing after changing the name or IP Address.



Main – Exit



Menu Equivalent: **Main – Exit** or Click the **Icon**

Exit the BiAdmin program. This does not save any changes you have made; you must *Save to Device* on each screen.

InitDevice – Reset Device

This will cause the device to reboot. This should be done after making any configuration changes, or if the device stops responding after some problems.

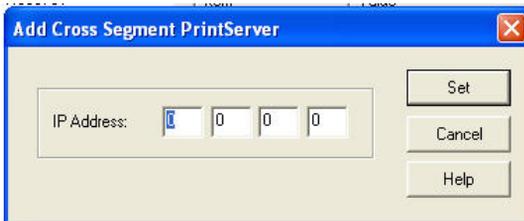
InitDevice – Restore to Factory Default

This will restore ALL device values to their factory defaults. To restore only the current screen, use the *Set to Default* button on the screen.

InitDevice – Attached Remote

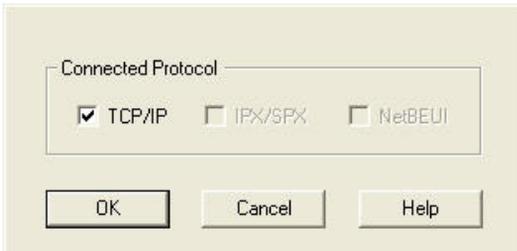
This is used to connect to a Print Server device on another LAN segment. You need to know the IP address of the remote Print Server.

If your LAN does not have a Router, you can ignore this option.



InitDevice – Connected Protocol

This option allows you to designate which LAN protocol will be used for communication between the selected device and this application. You should only select ONE protocol.



Diagnostics – Print Test Page

Use this option to print a test sheet from the selected Print Server port. The test page will include status information.

Help – Help Topics

Use this option to search the question you might have.

Help – About Bi-Admin

Use this option to check the utility version and copyright information.

Configuration

When the *Configuration* icon is clicked, or the *Configure* option on the **Main** menu is selected, a tabbed window will open. The tabs available will vary depending on the model selected. For the Print Server, the following tabs are available:

- System
- TCP/IP
- AppleTalk
- NetBEUI
- Internet Printing
- Port
- Wireless (TEW-P11G only)
- SNMP

System Tab

This screen allows you to:

- Change the name of the Print Server.
- Change the "Password" for the Print Server.
- Set the Network Protocols used the selected Print Server. (Any protocols not used on your LAN may be disabled. This may improve performance.)

The screenshot shows a 'Configuration' dialog box with a blue title bar and a close button. The 'System' tab is selected, and the 'Selected Device' is 'TN003751'. The 'Device Name' field contains 'TN003751'. The 'Comment' field is empty. Under 'Device Password', the 'Change Device Password' checkbox is unchecked, and the 'Password' and 'Confirm Password' fields are empty. Under 'Protocol', the following table shows the status of various protocols:

Protocol	Enable	Disable
TCP/IP	<input checked="" type="radio"/>	<input type="radio"/>
AppleTalk	<input checked="" type="radio"/>	<input type="radio"/>
NetBEUI	<input checked="" type="radio"/>	<input type="radio"/>
IPX/SPX	<input type="radio"/>	<input checked="" type="radio"/>

Buttons at the bottom include 'Get Defaults', 'OK', 'Cancel', and 'Help'.

TCP/IP Tab

Selecting this tab will allow configuration for the TCP/IP network protocol. The basic options are:

- **Dynamic IP Address (DHCP)** - The IP address is obtained automatically, from a DHCP Server on your network.
- **Fixed IP Address** - You must enter the IP address, Subnet Mask, and Gateway Address.
 - *IP Address* - Select an unused IP address from the address range used on your LAN.
 - *Subnet Mask* - Use the same values as PCs on your LAN (or on the same LAN segment, if you have a Router).
 - *Gateway* - Use the same values as PCs on your LAN (or on the same LAN segment, if you have a Router).

The Print Server also supports the Auto-IP function. If the Print Server is set to *Dynamic IP Address*, but there's no DHCP server found on the network, the Print Server will get an IP from the range of 169.254.1.1 ~ 169.254.254.254 automatically. In this case, even though the Print Server was initialized with an Auto-IP, it will change to DHCP whenever a DHCP server is detected.

The screenshot shows a 'Configuration' dialog box with the 'TCP/IP' tab selected. The 'Selected Device' is 'TN003751'. Under 'Dynamic IP Address (DHCP)', the 'Fixed IP Address' section is visible, showing the following values: IP Address: 192.168.10.40, Subnet Mask: 255.255.255.0, and Gateway Address: 192.168.10.1. The 'TCP session' section shows 'Retry interval: 2 (sec.)' and 'Retry count: 254'. There are 'Get Defaults', 'OK', 'Cancel', and 'Help' buttons at the bottom.

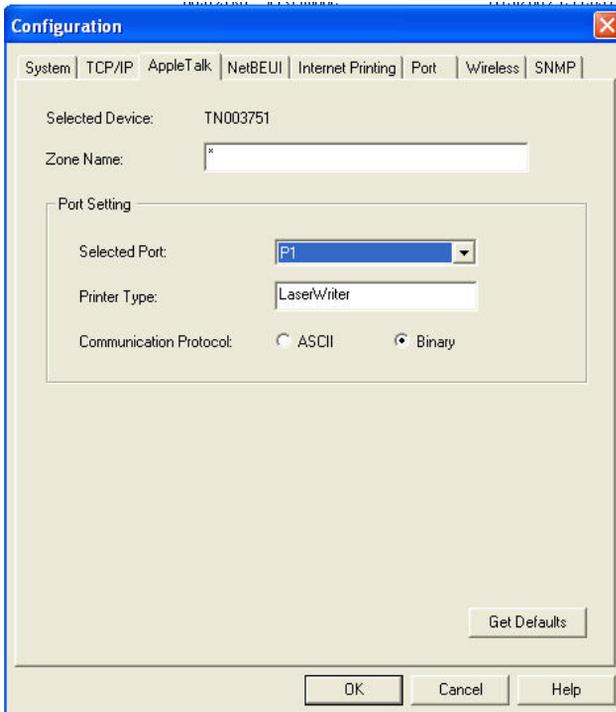
The *TCP session* parameters should only be changed if advised to do so by your Network Administrator or Print Server Technical Support.

AppleTalk Tab

Generally, no configuration of the Print Server is required for using AppleTalk.

This screen allows you to:

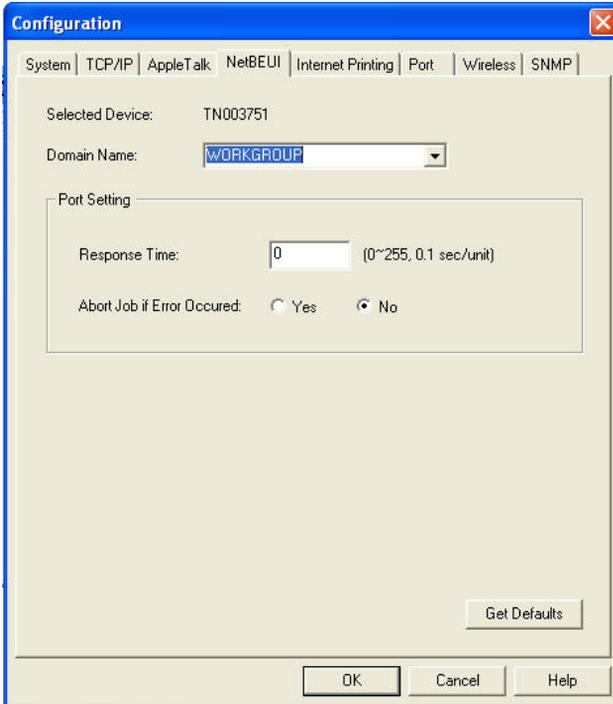
- Set the *Zone Name* field to determine which Apple systems can gain access to this printer.
- The *Printer Type* field is used to describe the printer driver used for each port.
- Set *Communication Protocol* to ASCII or Binary. This must match the setting on the Apple computer systems using the Print Server.



NetBEUI Tab

This screen allows you to:

- Choose the *Domain name* for the selected Print Server.
- Set how fast jobs are sent to the printer by using the *Response Time* field.
- Set the desired option for the *Abort Job if Error Occured* setting.
 - YES causes a print job to be terminated if a printing error occurs.
 - NO (default) will try to continue but may cause print errors.



Internet Printing Tab

The Internet Printing feature allows you to send print jobs to the Print Server using Internet E-mail.

Please see *Error! Reference source not found.* for details of using this feature.

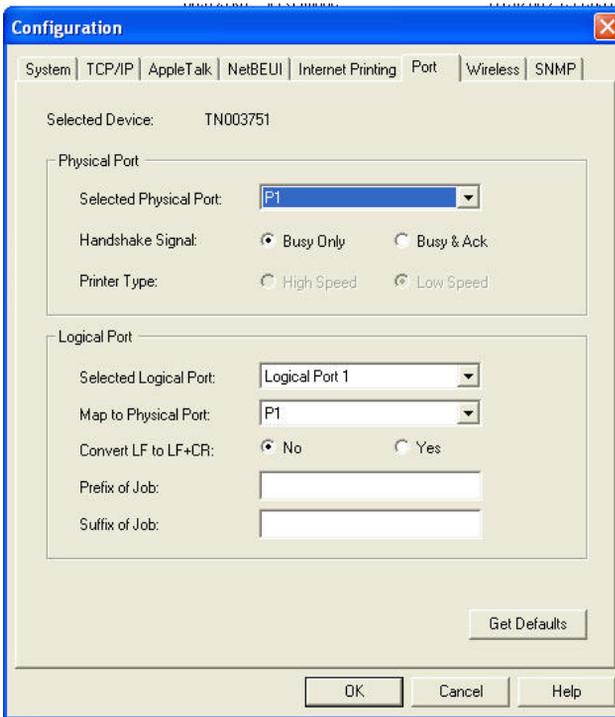
The screenshot shows a 'Configuration' dialog box with the 'Internet Printing' tab selected. The 'Selected Device' is 'TN003751'. The 'Mail Server' section includes fields for 'Mail Server IP Address' (0.0.0.0), 'Mail Account', 'Password', 'Confirm Password', 'Check Mail Interval' (0:1), and 'Redirect Mail Account'. The 'Printer' section has a 'Default Printer Port' dropdown set to 'P1' and a 'Printer Model' field. The 'Options' section has checkboxes for 'Print Every Mail' (unchecked), 'Banner Printing' (checked), and 'Mail Response when Printed' (unchecked). A 'Get Defaults' button is at the bottom right of the configuration area. At the bottom of the dialog are 'OK', 'Cancel', and 'Help' buttons.

Section	Field/Option	Value
Mail Server	Selected Device	TN003751
	Mail Server IP Address	0.0.0.0
	Mail Account	
	Password	*****
	Confirm Password	
	Check Mail Interval	0 : 1 (hh : mm)
Redirect Mail Account		
Printer	Default Printer Port	P1
	Printer Model	
Options	Print Every Mail	<input type="checkbox"/>
	Banner Printing	<input checked="" type="checkbox"/>
	Mail Response when Printed	<input type="checkbox"/>

Logical Port

Logical Ports (printers) can be used in the Unix environment. The following settings are available:

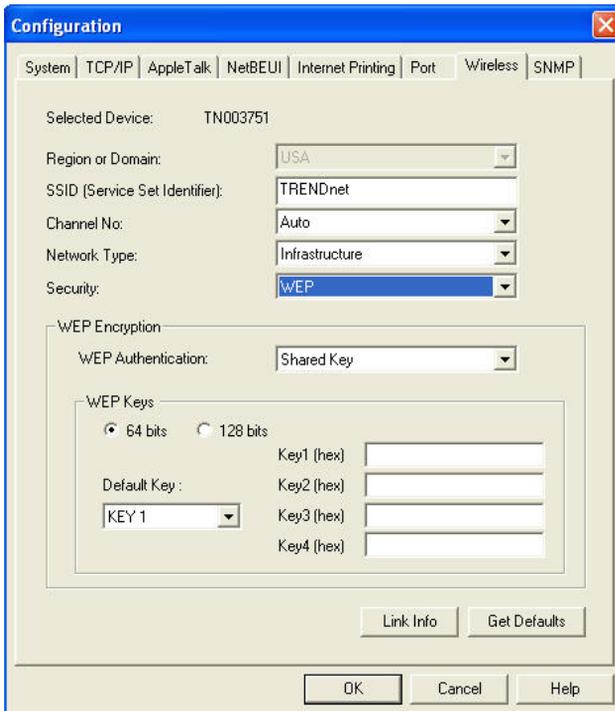
- **Selected Logical Port** - Select the Logical Printer Port you wish to configure.
- **Map to Physical Port** - Select the physical Printer Port which the Logical printer will use.
- **Convert LF to LF+CR** - If checked, LF (line feed) characters are changed to CR+LF (carriage return + line feed).
- **Prefix of Job** - The printer control string (**in hex**) to be sent to the printer before each print job. This string cannot exceed 15 characters.
- **Suffix of Job** - The printer control string (**in hex**) to be sent to the printer after each print job. This string cannot exceed 15 characters.



The *Get Defaults* button will reset all settings to their factory-default values.

Wireless Tab - WEP Encryption (TEW-P11G only)

This tab will be displayed if the selected device has the capability to serve as a Wireless Stations for your LAN.



Change the settings to suit your environment. Generally, you must match the settings of other Wireless stations. The available settings are described below.

Selected Device	This shows the name of the Print Server.
Region or Domain	Select your region from the drop-down list.
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 blank (null), so the Wireless station can join any Ad-hoc group. Note! The SSID is case sensitive.
Channel No	<p>The effect of this setting depends on the <i>Network Type</i> setting:</p> <ul style="list-style-type: none"> • In Infrastructure mode, this setting has no effect. The Channel is selected automatically, to match the Channel used by the Access Point. • In Ad hoc mode, all Wireless stations MUST use the same Channel number. <p>If you experience interference (shown by lost connections and/or slow data transfers) you may need to experiment with different channels.</p>

Network Type	<p>Select the correct value for your Wireless LAN.</p> <ul style="list-style-type: none"> • 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.
Security	<ul style="list-style-type: none"> • Disabled - no data encryption is used. • WEP - data is encrypted using the WEP standard. • WPA-PSK - data is encrypted using the WPA-PSK standard. This is a later standard than WEP, and provides much better security than WEP. • WPA2-PSK -this is a further development of WPA-PSK, and offers even greater security.
WEP Authentication	<p>Options are "Open System" or "Shared Key".</p> <p>Select the method (Open System or Shared Key) used by other Wireless Stations.</p> <p>Shared Key is more secure than Open System.</p>
64 Bits/128Bits	<p>Select "64Bits" or "128Bits" as required to match other Wireless stations on your WLAN. Stations which do not have matching settings will be unable to communicate.</p> <p>128 bit Keys are more secure than 64 bit Keys.</p>
Key Table	<p>Enter the key values to match other Wireless stations on your WLAN.</p> <p>This table is used when Encrypting and Decrypting data. All stations always transmit data encrypted using their default key (see below). 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>
Default Key	<p>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>

Wireless Tab - WPA-PSK Encryption (TEW-P11G only)

Configuration

System | TCP/IP | AppleTalk | NetBEUI | Internet Printing | Port | **Wireless** | SNMP

Selected Device: TN003751

Region or Domain: USA

SSID (Service Set Identifier): TRENDnet

Channel No.: Auto

Network Type: Infrastructure

Security: WPA-PSK

WPA Encryption

WPA Algorithm: TKIP

WPA Key: *****

Link Info Get Defaults

OK Cancel Help

WPA Algorithm	Select the method used on your LAN.
WPA Key	Enter the Keyword key value. Data is encrypted using a key derived from the network key. Other Wireless Stations must use the same network key.

Wireless Tab - WPA2-PSK Encryption (TEW-P11G only)

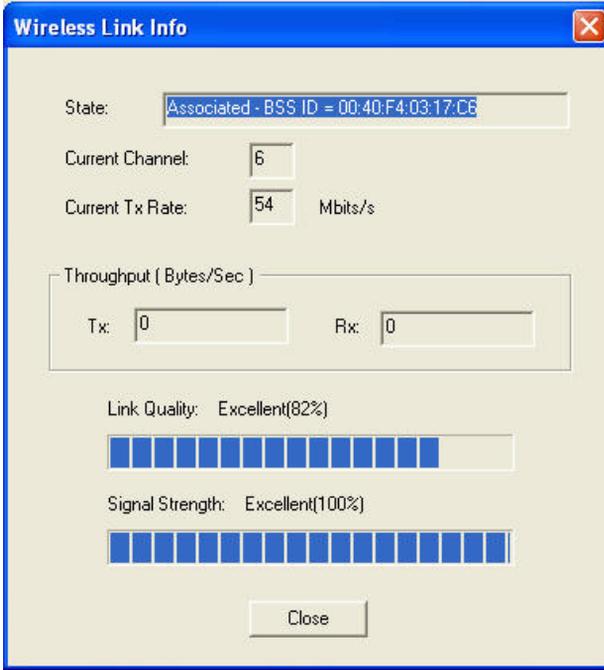
The screenshot shows a 'Configuration' dialog box with the following fields and values:

- System | TCP/IP | AppleTalk | NetBEUI | Internet Printing | Port | **Wireless** | SNMP
- Selected Device: TN003751
- Region or Domain: USA
- SSID (Service Set Identifier): TRENDeT
- Channel No.: Auto
- Network Type: Infrastructure
- Security: WPA2-PSK
- WPA Encryption:
 - WPA Algorithm: TKIP
 - WPA Key: *****
- Buttons: Link Info, Get Defaults, OK, Cancel, Help

WPA Algorithm	Select the method used on your LAN.
WPA Key	Enter the Keyword key value. Data is encrypted using a key derived from the network key. Other Wireless Stations must use the same network key.

Wireless Link Info Screen (TEW-P11G only)

After clicking the "Link Info" button on the Wireless Screen, a screen like the example below will be shown.



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.



The "Link Quality" and "Signal Strength" data is not available if using "Ad-hoc" mode.

SNMP Tab

Configuration is only required if using the Simple Network Management Protocol to administer your Print Server.

Refer to *Configuring the Print Server for SNMP* in Chapter 7 for details.

The screenshot shows a 'Configuration' dialog box with the 'SNMP' tab selected. The 'Selected Device' is 'TN003751'. There are input fields for 'SysContact' and 'SysLocation'. A table lists configuration items M1 through M4 with corresponding T1 through T4. The 'M1' section is expanded, showing 'Manager IP Address' as 0.0.0.0, 'Community String' as 'public', and 'Access Permission' set to 'Read Only'.

Configuration Item:	
M1	T1
M2	T2
M3	T3
M4	T4

M1

Manager IP Address: 0 0 0 0

Community String: public

Access Permission

Read Only Read/Write Not Accessible

Get Defaults

OK Cancel Help

Web-Based Management

This chapter explains how to use your Web Browser to configure the Print Server.

Overview

The Print Server incorporates the HTTP server. This allows you to connect to the Print Server and configure it using your Web Browser. Most browsers should work, provided they support tables and forms.

Preparation

Because it supports dynamic IP Address allocation using DHCP, BOOTP, or RARP, the Print Server ships with an IP Address of 0.0.0.0.

This is NOT a valid IP Address.

Therefore, you must do ONE of the following:

- Check your **DHCP server** (if you have one), and determine the IP Address allocated to the Print Server.
- Use the **Diagnostic Button** (if fitted) to print a report which includes the current IP address. (Press the Diagnostic Button, and hold it for 2 seconds.)
- Use the **Setup Wizard**, **BiAdmin** or another Print Server utility to allocate a valid IP Address to the Print Server.
- Add an entry to the **arp** table to associate the hardware address of the Print Server with the desired IP address, as follows:

```
arp -s IP_Address 00:c0:02:xx:xx:xx (Unix)
```

```
arp -s IP_Address 00-c0-02-xx-xx-xx (Windows)
```

Where:

IP_Address is the IP Address you wish to assign to the Print Server.

00:c0:02:xx:xx:xx is the hardware address of the Print Server.

Example (Unix):

```
arp -s 192.168.0.21 00:c0:02:12:34:56
```

Example (Windows):

```
arp -s 192.168.0.21 00-c0-02-12-34-56
```

Note: The hardware address of the Print Server is shown on a sticker on the base of the device.

Connecting to the Print Server

1. Start your Web Browser.
2. In the *Address* box, enter *HTTP://* followed by the IP Address of the Print Server.
e.g. `http://192.168.10.40`
3. You will then be prompted for the password. If no password has been set, just press ENTER.
4. Use the menu bar to move from one screen to another. Remember to save each screen before changing to a different screen.

Configuration Screens

The following configuration screens are available.

AppleTalk

AppleTalk

The zone determines which Macs have access to the printer. Communication parameters must match your Mac computers.

AppleTalk zone: AppleTalk zone *

Communication: Printer Object Type: LaserWriter

Communication Protocol: ASCII Binary

Retrieve Defaults Save Cancel

AppleTalk zone	
AppleTalk zone	This determines which Apple systems can gain access to this printer.
Communication	
Printer Object Type	This value is supplied to Macintosh clients. The default value is LaserWriter, and normally this should not be changed.
Communication Protocol	Sets whether the USB printer port uses ASCII or Binary. The default is Binary.

NetBEUI
Set the Workgroup name to match your PCs.
Other settings normally do not need to be changed.

Domain Name:

Options: Response Time (0.1 secs): (0..255)

Abort Print Job if Error: Yes
 No

Domain Name	
Domain Name	Enter the designated work group to be serviced by the Print Server. This field is not case sensitive, so names with different case will be considered to be the same name.
Options	
Response Time (0.1 secs)	Set how fast jobs are sent to the printer. The default value of zero (0) delay should be increased only if your printer cannot cope with no delays.
Abort Print Job if Error	YES terminates a print job if a printing error occurs. NO (default) will try to continue but may cause print errors. If print errors occur, try setting this value to YES.

SNMP (Simple Network Management Protocol)

SNMP

The data below is essential if using SNMP. The required MIB is on the CD-ROM. Save your data after each change.

General:

Management Stations:

Trap Receivers:

SysContact

SysLocation

Station No.

IP Address	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Community	<input type="text" value="public"/>		
Access	<input type="text" value="Read-only"/>		

Receiver No.

IP Address	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Community	<input type="text" value="public"/>		
<input type="checkbox"/> Enable with Severity level:	<input type="text" value="1"/>		

General	
SysContact	Text Field - Name of the contact person.
SysLocation	Text Field - Location of the contact person.
Management Stations	
Station No.	Select the Management station (1..4), and click the <i>Get Data</i> button to update the display for the selected item.
IP Address	Enter the IP Address of the management station, which has the SNMP program installed.
Community	This is a text field. Enter the name of the community.
Access	Select the desired level of access.
Trap Receivers	
Receiver No.	Select the Trap Receiver number (1..4), and click the <i>Get Data</i> button to update the display for the selected item.
IP Address	Enter the IP Address of the Trap Receiver, which will be sent the Trap message.
Community	This is a text field. Enter the name of the community.
Enable with Severity level	Check to enable; select the severity level. Note: Currently, all traps are level 1.

For more information about using SNMP, see *Chapter 7 - Special Features*.

TCP/IP

TCP/IP

Settings for the TCP/IP network protocol.
 Using a fixed IP Address is recommended.

IP Address:

IP Address: DHCP Client
 Fixed IP Address:

Device IP Address

Subnet Mask

Gateway Address

Connection:

Delay before reconnection attempt (secs) (0..255)

Number of reconnection attempts (0..255)

IP Address	
DHCP Client	Select this if your LAN has a DHCP Server. The Print Server will then automatically obtain an IP address from the DHCP Server.
Fixed IP Address	Select this to assign a fixed IP address to the Print Server. If selected, you must enter a in the Device IP Address, Subnet Mask, and Gateway.
Device IP Address	IP Address assigned to the Print Server. Enter an unused IP address from the address range used on your LAN.
Subnet Mask	Use the same values as PCs on your LAN (or on the same LAN segment, if you have a Router).
Gateway Address	Use the same values as PCs on your LAN (or on the same LAN segment, if you have a Router).
Connection	
Delay before reconnection attempts	Sets how long the Print Server should wait before retrying a TCP/IP connection which is lost. Allowable values are from 0 to 255 seconds, with 2 as the default.
Number of reconnection attempts	Set how many attempts at reconnection will be made. After that, the TCP/IP session will be terminated. Allowable values are from 0 to 255, with 254 as the default.

Wireless Configuration (TEW-P11G only)

There are 2 options on the menu for Wireless configuration - **Basic** and **Security**.

Wireless - Basic

The settings on this screen must match the other Wireless stations in order for communication to occur.

Wireless

SSID must match the other Wireless stations.

Configuration:

Region or Domain:

Station Name:

Network Type:

SSID:

Channel No:

Configuration	
Region or Domain	<p>Select your region from the drop-down list.</p> <p>This field displays the region of operation for which the wireless interface is intended. It may not be legal to operate the router in a region other than the region shown here. If your country or region is not listed, please check with your local government agency for more information on which channels you are allowed to use, and select a region, which allows those channels. (The channel list changes according to the selected region.)</p>
Station name	<p>This is the same as the <i>Device (Host) Name</i> on the WAN screen. On your PC, some Wireless status screens may display this name as the Access Point in use.</p>
Network Type	<p>Select the correct value for your Wireless LAN.</p> <ul style="list-style-type: none"> 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.
SSID (ESSID)	<p>To communicate, all Wireless stations MUST use the same SSID/ESSID.</p> <p>The default value is blank (null).</p> <p>Note! The SSID is case sensitive.</p>
Channel No.	<p>Select the value you wish to use on your Wireless LAN. If you experience lost connections and/or slow data transfers you may need to experiment with different channels to see which is the best.</p>

Link Info Button	Click this button will open the sub screen.
-------------------------	---

Wireless Security Screen (TEW-P11G only)

This screen is accessed by clicking the "Security" link on the *Wireless* menu. There are 4 options for Wireless security:

- **Disabled** - no data encryption is used.
- **WEP** - data is encrypted using the WEP standard.
- **WPA-PSK** - data is encrypted using the WPA-PSK standard. This is a later standard than WEP, and provides much better security than WEP.
- **WPA2-PSK** - this is a further development of WPA-PSK, and offers even greater security.

Wireless Security - WEP

If "WEP" is selected, the screen will look like the following example.

Security System	WEP The 802.11b standard. Data is encrypted before transmission, but the encryption system is not very strong.
Authentication	Normally this can be left at the default value of "Automatic." If that fails, select the appropriate value - "Open System" or "Shared Key." Check your wireless card's documentation to see what method to use.
Key Size	Select the WEP Encryption level: <ul style="list-style-type: none"> • 64-bit (sometimes called 40-bit) encryption • 128-bit encryption (sometimes called 104 bit encryption)
Keys	<ul style="list-style-type: none"> • Use the radio buttons to select the default key. • Enter the key value(s) you wish to use. Other stations must have the same key values. • Keys must be entered in Hex. Hex characters are the digits (0 ~ 9) and the letters A ~ F.
Passphrase	Enter some printable characters in the Passphrase field and click the "Generate" button to automatically configure the WEP Key(s). For 64 bit keys, four keys fields will be generated. For 128 bit keys, only the selected WEP key will be generated.

Wireless Security - WPA-PSK

If "WPA-PSK" is selected, the screen will look like the following example.

Wireless Security

WPA-PSK is not available with Ad-hoc networks.

Security System:

WPA - PSK ▾

Passphrase : 0123456789

Encryption: AES ▾

Get Defaults

Save

Cancel

Security System	WPA-PSK Like WEP, data is encrypted before transmission. WPA is more secure than WEP, and should be used if possible. WPA-PSK is the version of WPA, which does NOT require a Radius Server on your LAN.
Passphrase	Enter the Keyword key value. Data is encrypted using a key derived from the PSK. Other Wireless Stations must use the same PSK. The PSK must be from 8 to 63 characters in length.
Encryption	Select the desired option. Wireless Stations must use the same method.

Wireless Security - WPA2-PSK

If "WPA2-PSK" is selected, the screen will look like the following example.

Wireless Security

WPA-PSK is not available with Ad-hoc networks.

Security System: WPA2-PSK

Passphrase: 0123456789

Encryption: AES

Get Defaults Save Cancel

Security System	WPA2-PSK This is a further development of WPA-PSK, and offers even greater security.
Passphrase	Enter the Keyword key value. Data is encrypted using a key derived from the PSK. Other Wireless Stations must use the same PSK. The PSK must be from 8 to 63 characters in length.
Encryption	Select the desired method. Other Wireless Stations must use the same method.

Other Screens

Server Status

This screen shows 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.

Server Status	View the current status of this Server.
Server Details:	Hardware ID: 05904E0000 Firmware Version: 100D Protocol ID: 807E Default Name: TN003751 Server Name: TN003751 MAC Address: 00C002003751
	AppleTalk Info: Printer Type: TN003751:LaserWriter TN003751_P2:LaserWriter
	TCP/IP Info: IP Address: 192.168.0.199 Subnet Mask: 255.255.255.0 Gateway Address: 192.168.0.1 Email Server IP Address: 0.0.0.0 Printing Account Name: N/A Redirect Account Name: N/A
	SMB Info: Domain Name: WORKGROUP
	Wireless Info: SSID:TrendnetSky2 BSSID:00:C0:02:D4:B0:E2 Channel No:10 Network Type:Infrastructure Primary Firmware:1.0.4.4 Secondary Firmware: Link Info. Tx:0 Rx:0
	<input type="button" value="Refresh"/>

Printer Status

This screen displays the current status of each port. For each port, the following data is listed:

- **Connected Printer**- the model name of the printer connected to the port, if the printer name is known. (If the printer is not bi-directional, this information is unavailable.)
- **Status** - the current status of the printer (On-line, Off-line, Out of paper)
- **Printing Information** - this will show either *Idle* or *Printing*.

Printer Status	Check the status of the attached printer.
	Parallel Port <input type="button" value="Print Test Page"/>
	Connected Printer: P1 Status: Offline Printing Information: Idle
	USB Port <input type="button" value="Print Test Page"/>
	Connected Printer: P2 Status: Offline Printing Information: Idle
	<input type="button" value="Refresh"/>

Logical Printers

Logical Printers (ports) can be used under Unix. For each Logical Printer, the following fields are available:

Logical Printer No	Select the Logical Printer Port you wish to configure. (e.g. L1) Click the <i>Get Data</i> button to update the display with the current data for the selected logical printer.
Physical Port	Select the Printer Port which the Logical printer will use.
Pre-string (Hex)	The printer control string (in hex) to be sent to the printer before each print job. This string cannot exceed 15 characters.
Post-String (Hex)	The printer control string (in hex) to be sent to the printer after each print job. This string cannot exceed 15 characters.
Convert LF to CR/LF	If checked, LF (line feed) characters are changed to CR+LF (carriage return + line feed).

Logical Printers

Logical Printers can be used with Unix.
The names for Logical Printers are L1 to L6.

Select Printer: Logical Printer No:

Details: Physical Port:

Pre-string (Hex):

Post-string (Hex):

Convert LF to CR/LF

Internet Printers

See *Error! Reference source not found.* in Chapter 7 for details of this feature.

Special Features

This chapter covers the special features of the Print Server.

Overview

Your Print Server has three (3) special features:

- IPP (Internet Printing Protocol).
- Proprietary *Internet Mail Printing* system.
- SNMP (Simple Network Management Protocol).

Internet Printing Protocol (IPP)

IPP (Internet Printing Protocol) is a standards-based system to allow remote printing from a PC to any accessible printer. Normally, the printer will be attached to a computer or other device which functions as an **IPP Server**.

Client PCs need a compatible **IPP Client** program. Windows 2000, XP and Vista include a suitable IPP client. For other versions of Windows, a client program is supplied on the Print Server's CD-ROM.

The Client must also know the IP Address or URL or the IPP Server.

IPP Server Configuration

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

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

IPP Client Setup - Windows 98/ME

For these platforms, IPP Client software is supplied on the CD-ROM.

Also you can distribute the setup program (IPP_CLIENT.EXE) to users via E-mail.

Installing from Autorun

1. Insert the CD-ROM in your drive. If the program does not start automatically, run the autorun.exe in the root folder.
2. Click *Install Utility*, then click the submenu *Installation*
3. Click *Next* on Welcome screen
4. Click *4. IPP (Internet Printing Protocol) Client*



5. Following the screen to finish the installation.

Installing using IPP_CLIENT.EXE

1. Insert the CD-ROM into your CD-ROM drive. Click *Exit* when the Autorun screen shows up.
2. Go to *Start > Run*, Browse the Print Server's CD-ROM
3. Select the *IPP* folder, the click "*IPP Client.exe*" file, then click *OK*.
4. The IPP Setup program will then run.
5. Follow the prompts to complete the installation.

IPP Client Configuration

1. Run the "Add IPP Port" program entry created by the installation. A screen like the following will be displayed.

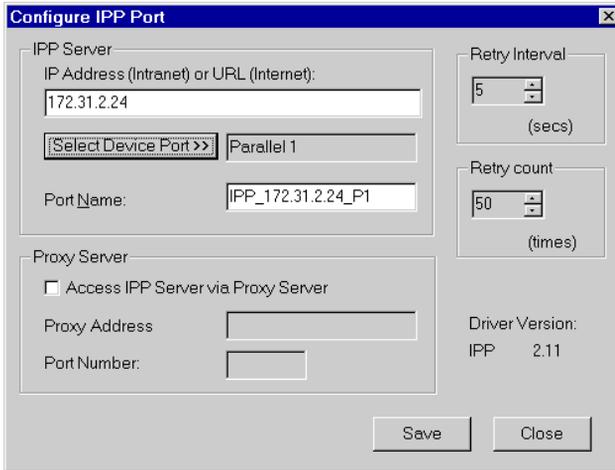


Figure 2: IPP Port

2. If Internet access from your location is via a Proxy Server, check *Access IPP Server via Proxy Server*, and enter details of your Proxy Server. (This will be the same as your Browser configuration.)
3. Enter the IP Address or URL of the IPP Server.
4. Click *Select Device Port* to view the available ports on the IPP Server, and select the appropriate port. A connection to the IPP Server will be established at this time.
5. Click *Save* to create the IPP port on your system. You will see a message confirming that the port has been created, then the following dialog:

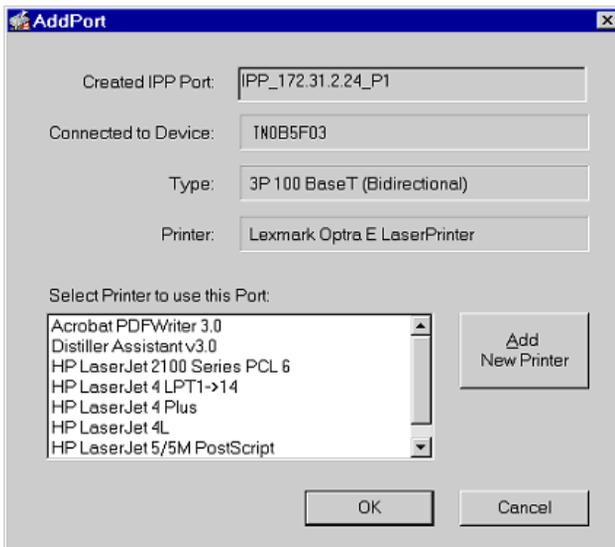


Figure 3: Select Printer for IPP Port

6. Either select an existing printer to use the new port, and click OK.
OR

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

Installation is now complete.

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

Changing the IPP Port Settings

After the IPP port is created, you can reach the screen shown in Figure 2: IPP Port using the Windows *Port Settings* button:

1. Open the Printers folder (*Start - Settings - Printers*)
2. Right-click the IPP Printer, and select *Properties*.
3. Locate and click the *Port Settings* button (*Details* or *Port* tab, depending on your version of Windows).

There are 2 settings - *Retry Interval* and *Retry Count* - which can be adjusted if you have problems connecting to the IPP Server.

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

IPP Client Setup - Windows 2000/XP

Windows 2000 and XP have their own IPP Client, and there is no need to install the supplied IPP Client Software. To use the Windows IPP Client with the Print Server, follow this procedure:

1. Start the *Add Printer* wizard.
2. Select *Network Printer*, and click "Next" to see the *Locate your Printer* screen, as shown below.

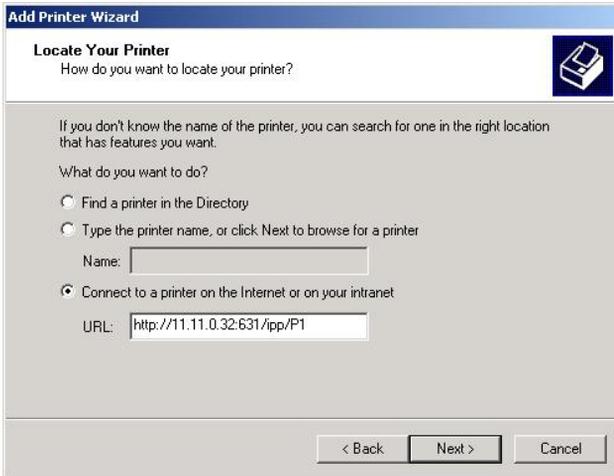


Figure 4: Windows 2000 - Locate your Printer

3. Select *Connect to a printer on the Internet or on your Intranet*, and enter the URL of the IPP Server as follows, where *ip_address* represents the IP Address of the IPP Server, and 631 is the port number.

Port 1

ip_address:631/ipp/P1



These entries are case sensitive. They must be entered as shown, with "ipp" in lower case, and P1 in UPPER case.

4. If the connection can be established, and the printer on that port is on-line, the following dialog will be displayed.



Figure 5: Windows 2000: No printer driver

5. Click "OK", and then select the printer manufacturer and model to match the printer connected to the port on the IPP Server.
6. Click "Next", and complete the Wizard.
The IPP printer is now ready for use.

IPP Client Setup - Windows Vista

For Windows Vista, do the following procedure to use the Windows IPP Client with the Printer Server. There is no need to install the additional software.

1. Select the *Add Printer*.
2. Select *Add a network, wireless or Bluetooth Printer*, and click "Next".

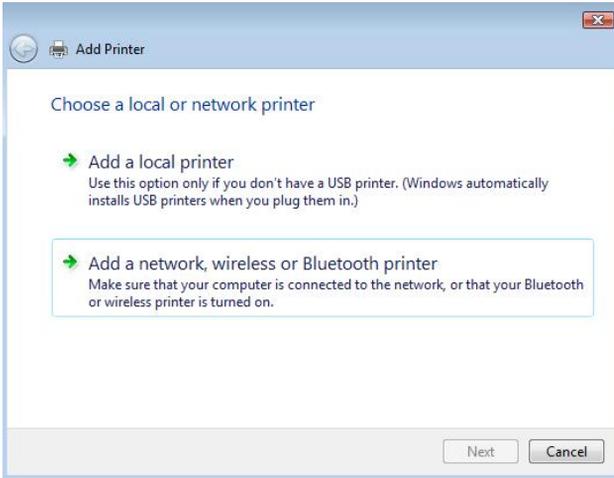


Figure 6: Windows Vista - Choose a local or network Printer

3. If the desired printer is not shown in the list, click *The printer I want isn't listed*.
4. Click *Select a shared printer by name*, and enter the URL of the IPP Server as follows, where *ip_address* represents the IP Address of the IPP Server, and 631 is the port number.

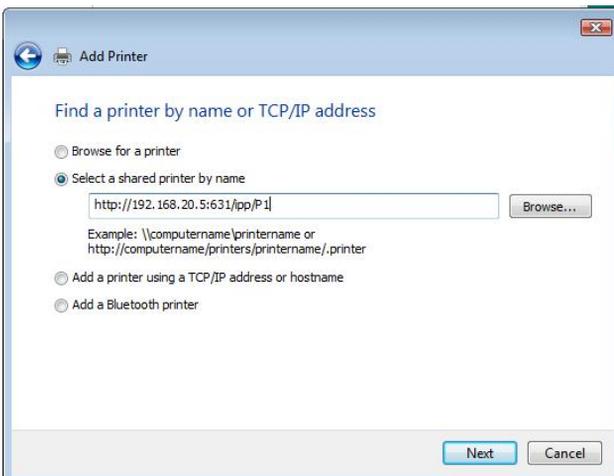


Figure 7: Find a printer by name or TCP/IP address

Port 1

ip_address : 631 / ipp / P1



These entries are case sensitive. They must be entered as shown, with "ipp" in lower case, and P1 in UPPER case.

- Click "Next". Select the printer manufacturer and model to match the printer connected to the port on the IPP Server.



- Click "OK". Step through the Wizard until finished. The IPP printer is now ready for use.

Using IPP Printers

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

If using the supplied IPP Client software, you can use the *Query IPP Printer* program installed with *Add IPP Port* to check the availability of the remote IPP Server.

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

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

If using the supplied IPP Client software, there are 2 settings - *Retry Interval* and *Retry Count* - which can be adjusted if you have problems connecting to the IPP Server.

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

Printing through the Internet

1. Create or open the document you wish to print.
2. Select the Printer connected to the InterNet Printing Port.
3. If you do not have a permanent Internet connection, establish a connection now. (**Note:** The InterNet Printing Port will NOT establish a dial-up connection, but it will send the E-Mail the next time you are connected.)

4. Print the document.
5. The InterNet Printing Port will generate an E-Mail and send it to the remote printer. The document will be encoded and sent as an attachment to the E-Mail. You will see a progress screen similar to the example below:



Figure 8 InterNet Printing Progress

6. Close the Internet connection if you opened it in Step 3.
7. If the "Notify after print job" option is set, you will receive an E-Mail when your job is printed.

SNMP

SNMP (Simple Network Management Protocol) allows network supervisors to monitor and control the Print Server using network management platforms such as HP OpenView, IBM SystemView, etc.

The appropriate MIB file must be imported into your SNMP management program using the *Import-Compile* command. Check your management program for details on this procedure. The MIB file(s) are provided in the Mib folder on the CD-ROM.

For the Print Server, the MIB file is named `Mib2p.mib`.

Configuring the Print Server for SNMP

Before using a SNMP Management station to manage the Print Server, the following settings should be assigned to it, in addition to the IP Address, Gateway Address, and Subnet Mask.

SNMP Settings

SysContact	Text Field - Name of the contact person.
SysLocation	Text Field - Location of the contact person.
Management Station IP Address(s)	Up to 4 Management Stations can be entered.
Trap Receiving IP Address(s)	Up to 4 Trap Receiving Stations can be entered.

Management Station Settings

For each Management Station, the following fields are available:

Access Permission	Options are: Read Only Read/Write Not Accessible
Community String	Leaving this blank will disable management by this station.

Trap Receiving Station Settings

For each Trap Receiving Station, the following fields are available:

Community String	Leaving this blank will disable management by this station.
Trap Enable	Use this option to Enable/Disable Trap Receiving by this station.
Trap Severity	In this version, all traps are level 1.

Troubleshooting

This chapter describes some problem which may arise, and the solutions to them.

Overview

If you encounter printing difficulties, please refer to the appropriate section. If, after following the advice in these documents, the Print Server still does not function properly, please contact your dealer for further advice.

Hardware & Connection Problems

Problem No. 1	All the Print Server's LEDs are off.
Solution No. 1	Check the power supply or power connection.
Problem No. 2	The Print Server unit cannot be found on the LAN, so configuration is not possible.
Solution No. 2	<p>If using the Wireless Interface (TEW-P11G only)</p> <ul style="list-style-type: none"> • Ensure that WEP is disabled on your other Wireless stations. • If using "Ad-hoc" mode, it is not possible for Wireless stations to connect to the Print Server, because its default mode is "Infrastructure". You must use the wired interface for initial configuration. • If using "Infrastructure" mode, ensure that your Access Point allows connection by Wireless stations with a SSID of "ANY" or null (blank). <ul style="list-style-type: none"> • The Access Point itself has a blank (null) SSID. • If there is a setting "Broadcast SSID" or "Allow SSID of ANY", this setting should be Enabled. <p>If using the Wired 10/100BaseT interface:</p> <ul style="list-style-type: none"> • Check the Hub. The link LED for the port to which the Print Server is connected should be ON. If it is Off, there is a problem in the network cable. • On the Print Server, check the Ethernet LED. If the LED is not ON, the network connection is not working. <p>Notes:</p> <ol style="list-style-type: none"> a) To use both the Wireless and LAN interfaces, the Wireless mode must be set to "Ad-hoc". b) You must Power Off the Print Server before connecting or disconnecting the LAN cable. <p>If using TCP/IP:</p> <ul style="list-style-type: none"> • Ensure that there are no routers between the Print Server and the PC used for configuration. • Ensure that the PC used for configuration has the TCP/IP network protocol installed. Test its network connection by seeing if you can

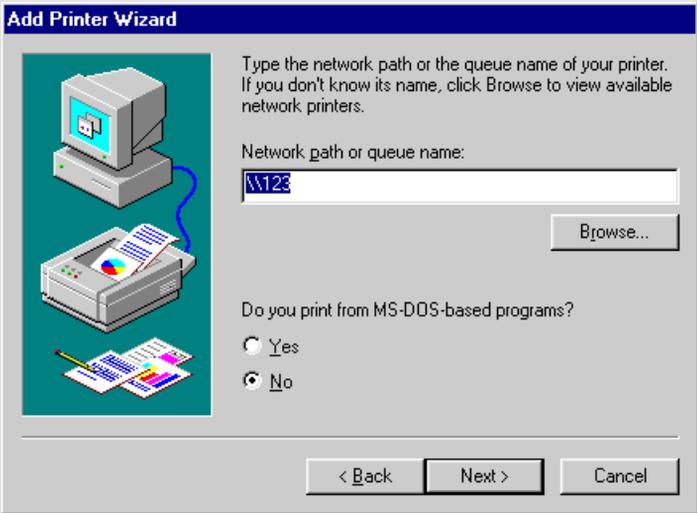
	locate other LAN devices from the PC. (e.g. Use <i>Network Neighborhood</i> and try to browser the network.)
Problem No. 3	I am using DHCP, and getting an IP Address conflict involving the Print Server.
Solution No. 3	<p>If the Print Server is left on, but the DHCP server is turned off, then the Print Server will retain its IP Address without the DHCP Server being aware of it. Simply reset the Print Server so it will obtain a new IP Address.</p> <p>This problem would also arise if you assigned static IP Address, which is within the range used by the DHCP server. If so, use another address which is NOT within the range used by the DHCP server.</p>

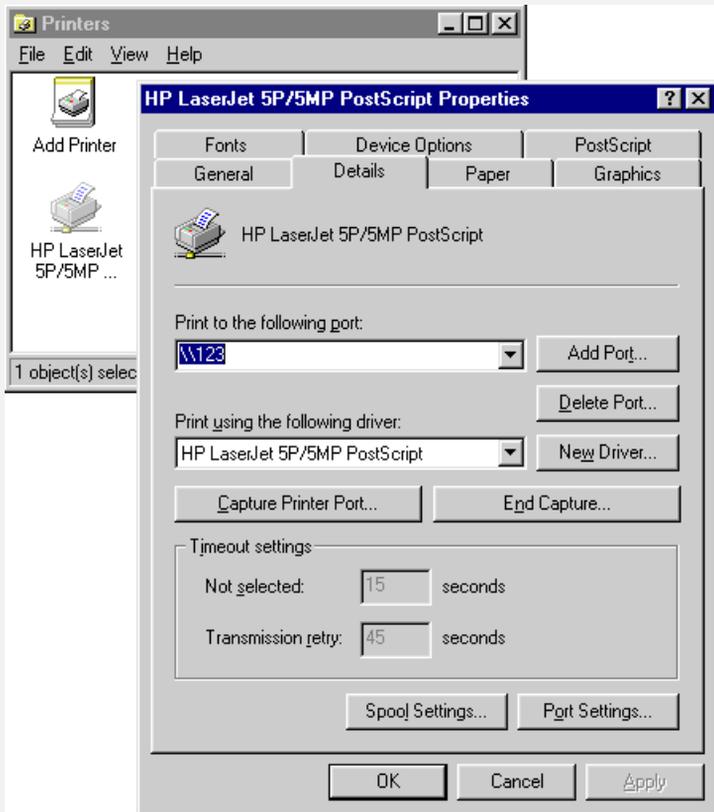
AppleTalk (Macintosh)

Problem No. 1	Why do I get an incorrect printout?
Solution No. 1	<p>Some possible reasons are:</p> <ul style="list-style-type: none"> • You may have chosen Binary encoding to print the file. Try to use ASCII encoding. • Some of the fonts, which are in your print file, may not be supported by the printer. Try selecting LaserWriter 7 instead of LaserWriter 8.
Problem No. 2	Can't find the Print Server's name in the Chooser.
Solution No. 2	<p>Try the following:</p> <ol style="list-style-type: none"> 1. Make sure that AppleTalk is on (the button next to Active is highlighted in the Chooser). 2. Make sure the printer has been on and in the READY state for a few minutes. 3. Make sure the printer has not been renamed since its last appearance in the Chooser. 4. If the printer resides on a network with multiple zones, make sure the correct zone is selected from the AppleTalk Zones box in the Chooser.
Problem No. 3	My EPS file doesn't print with the correct fonts.
Solution No. 3	This is a problem that occurs in some application programs. Try downloading the fonts contained in the EPS file before printing the saved EPS file.
Problem No. 4	I can't select the "Remaining from:" item in the print dialog box.
Solution No. 4	If you have selected the Layout value, "2 Up", or "4 Up", you cannot access the <i>Remaining from</i> item. Choose other selections.
Problem No. 5	A cover page prints either on the first or the last page of the document.
Solution No. 5	<p>Select one of these solutions:</p> <ul style="list-style-type: none"> • Turn the cover page feature off. • Insert extra page breaks in your document to avoid the cover page

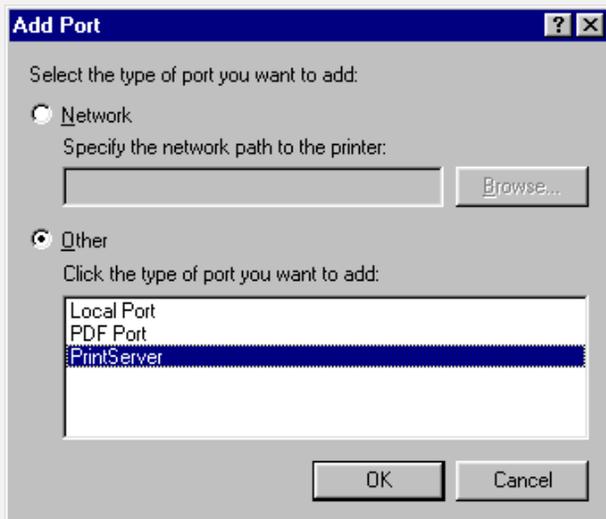
	printing on the first or last page of your document.
Problem No. 6	The colors on my printed output do not match the colors on my computer screen.
Solution No. 6	<p>When the printer receives a color file, it tries to match the printed output color to the screen color. Sometimes the printer cannot match up the colors as closely as wanted. To alleviate this problem, perform the following steps:</p> <ul style="list-style-type: none"> • Choose "Calibrated Color/Grayscale" in the <i>Print</i> pop-up menu in the <i>Print Options</i> dialog box. The printer will make adjustments to match the colors. • Check your monitor to make sure all settings (for example, brightness) are adjusted correctly.
Problem No. 7	When I send a print job, I get a PostScript Command error or no print out.
Solution No. 7	<p>Check the communication protocols. The computer, Print Server and printer must all be configured to the same communication protocol.(either Binary or ASCII).</p> <p>To configure your system:</p> <ol style="list-style-type: none"> 1. Choose which protocol you are going to use. You should check your printer; it may not give you a choice. 2. Set your printer to the correct protocol. 3. Use the computer's <i>Print</i> submenu to configure your computer to use the protocol you have chosen. 4. Configure the Print Server to use the same protocol as the printer and computer.

Windows Printing Problems

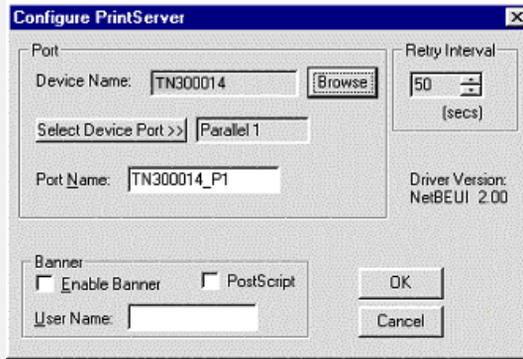
Problem No. 1	When I tried to install the Printing software for Peer-to-Peer printing, I received an error message and the installation was aborted..
Solution No. 1	<p>This may be caused by an existing installation of the printer port software. Before attempting another installation:</p> <ul style="list-style-type: none">• Remove the existing installation• Restart your PC <p>To remove an existing printer port installation:</p> <ol style="list-style-type: none">1. Open <i>Start - Settings - Control Panel - Add/Remove Programs</i>2. Look for an entry with a name like "Shared Port", "Shared Printer Port", "Print Server Driver" or "Print Server Port".3. Select this item, click "Add/Remove", and confirm the deletion.
Problem No. 2	On Windows 98, I installed the Print Port Driver for Peer-to-Peer Printing, but when I selected a port on a Print Server and clicked "Add", the printer was not installed.
Solution No. 2	<p>Try installing the Printer using the standard Windows tools, as follows:</p> <ol style="list-style-type: none">1. Start the <i>Add Printer Wizard</i>.2. Select <i>Network Printer</i> when prompted "How is the printer attached to your Computer?", and click Next.3. When prompted for the Network Path or Queue, enter a dummy value such as shown below. (Do NOT select <i>Yes</i> for "Do you print for MS-DOS programs?") <div data-bbox="375 1066 1072 1579"></div> <ol style="list-style-type: none">4. The printer wizard will display a message stating that "The Network Printer is off-line". This is OK. Continue the Add Printer Wizard until finished. If prompted about sharing the printer, do NOT enable Sharing.5. Go to the Printers folder (<i>Control Panel-Printers</i>). The printer icon will be grayed out indicating the printer is not ready.6. Right-click the Printer, and select <i>Properties</i>. Then select the <i>Details</i> tab, as shown below.



7. Click the *Add Port* button. On the resulting screen, select *Other*, then *Printer Server*, as the port to add, as shown below.



8. Click OK to see the *Print Port Configuration* screen, as shown below.



9. Click the *Browse Device* button, select the desired Print Server, and click OK.
10. Click OK to return to the Printers folders, and right-click on the Printer. Ensure that the *Work off-line* option is NOT checked.



The Printer should no longer be grayed out, and is ready for use.

Note: The screens shown above are from Windows 98. Other versions of Windows may look slightly different, but the process is identical.

Problem No. 3

I have a Windows-only printer, and when I tried to install the Peer-to-Peer Print driver on Windows 98/ME, installation failed.

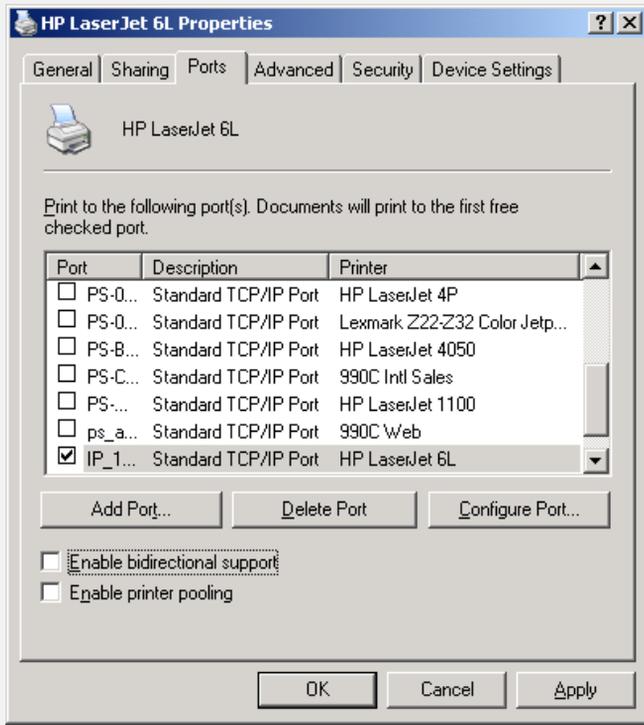
Solution No. 3

Some Windows-only printers cannot be networked. If a Windows-only printer cannot be installed using the Windows "Add New Printer" wizard, but only by using a program provided by the printer manufacturer, then it probably can't be networked.

Try the procedure described above (Solution 2). If you can't select a Printer Driver for your printer within the "Add Printer" wizard, then the printer can't be networked.

Problem No. 4 **Using Windows 2000/XP/Vista, I installed the printer using LPD as recommended, but I can't print.**

- Solution No. 4
- Check that the correct Printer driver is being used.
 - Try disabling the Bidirectional printing support, as follows:
 1. Open the *Printers* folder.
 2. Right-click on the Printer, and select *Properties*.
 3. Select the *Ports* tab.
 4. Uncheck the *Enable bidirectional support* checkbox.



Problem No. 5 **When printing from some software applications such as Power Point, it takes a long time and the print out is incorrect.**

- Solution No. 5
- The problem is due to the printer, which is being configured to **Start printing after the first page is spooled**. To change this setting:
- Go to **Control Panel - Printers** and click on your printer.
 - Then select **File - Properties - Details**.
 - When the Details screen appears, click the *Spool Settings* button.
 - When the Spool Settings dialogue box appears, choose *Start printing after last page is spooled* and click OK.

Problem No. 6 **The Configuration button on the Printer Status screen in BiAdmin is grayed out, even though my printer is bi-directional.**

Solution No. 6

The button is unavailable if the printer is busy. You must wait until the printer is idle.

Problem No. 7	My old printer cannot print or prints garbage.
Solution No. 7	<p>If the printer you used is an old model with low speed, the following steps may solve this problem:</p> <ul style="list-style-type: none"> • Open the BiAdmin Utility. • Click the <i>Printer Status</i> icon. • For the parallel port, change the Printer Type setting to <i>Low Speed</i> or set the Handshake Signal setting to <i>Ack & Busy</i>.
Problem No. 8	How Do I Print to the Print Server's printer from a MS-DOS program?
Solution No. 8	<p>Set the MS-DOS program to use LPT1 (parallel port 1) then "Capture" the output and re-direct it to the Print Server's printer.</p> <p>Windows 98/ME</p> <ol style="list-style-type: none"> 1. Select <i>Start - Settings - Printers</i> to open the Printers folder. 2. Right-click the Print Server's Printer, and select <i>Properties</i> 3. On the <i>Details</i> tab, click the <i>Capture</i> button to see the <i>Capture Printer Port</i> button, shown below. <div data-bbox="458 785 988 981" data-label="Image"> </div> <ol style="list-style-type: none"> 4. On this dialog: <ul style="list-style-type: none"> • Select the Device, normally LPT1 (parallel port 1). • Enter or select the Path to the printer: <code>\\printer_name\P1</code> Where <code>printer_name</code> is the actual name of your printer. e.g. <code>\\TN3000014\P1</code> • Check the <i>Reconnect at logon</i> checkbox. If this is not done, the capture setting will be lost when Windows is restarted. <p>Windows 2000/XP/Vista</p> <ol style="list-style-type: none"> 1. Login as Administrator. 2. Open the command prompt window. 3. Enter the following command: <pre>net use lpt1 \\printer_name\P1 /persistent:yes</pre> Where <code>printer_name</code> is the actual name of your printer. e.g. <pre>net use lpt1 \\TN3000014\P1 /persistent:yes</pre> <p>To terminate this capture, use the following command at the command prompt:</p> <pre>net use lpt1 /delete</pre>

Problem No. 1	Print Server device is not recognized.
Solution No. 1	<p>Check the following:</p> <ul style="list-style-type: none">• The network cable is OK.• There are no routers between the Print Server and the UNIX host during IP address assignment.• There are no NetWare File Servers without TCP/IP support between the Print Server and the UNIX host.• You have used the correct hardware address, as shown on a sticker on the base of the device.• Use the ping command to see if the Print Server is a valid device on the network.
Problem No. 2	The Print Server's IP address is forgotten and it needs to be installed in a new environment.
Solution No. 2	<p>Use the "Reset" button to restore the factory default settings, as described below, then configure as for a new device.</p> <ol style="list-style-type: none">1. Turn the Print Server OFF.2. Press and hold the diagnostic button. While pressing the button, switch the Print Server ON.3. If you continue pressing the button for 10 seconds, a diagnostic page will be printed, showing the new (default) settings.

Appendix A

Specifications



General Specifications

TEW-P11G	
External Power Adapter	5V DC, 2A
LEDs	5
USB 2.0 Port	1
Parallel Port	1
Ethernet Connector	10/100BaseT
FCC / CE	FCC, CE. Class B

TE100-P11	
External Power Adapter	5V DC
LEDs	4
USB 2.0 Port	1
Parallel Port	1
Ethernet Connector	10/100BaseT
FCC / CE	FCC, CE. Class B

Environmental Specifications	
Operating Temperature	0 ~ 40°C
Storage Temperature	-10 ~ 70°C
Shipping Temperature	-40 ~ 70°C
Operating Humidity	10 ~ 80%
Storage Humidity	5 ~ 90%
Shipping Humidity	5 ~ 100%

Protocol Support

Model	TCP/IP	NetBeui	AppleTalk
TEW-P11G	√	√	√
TE100-P11	√	√	√

Feature Support

Model	HTTP Setup	E-mail Printing	IPP Support	SNMP Support	AutoIP
TEW-P11G	√	√	√	√	√
TE100-P11	√	√	√	√	√

Regulatory Approvals

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used 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 of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and 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.

To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

FCC Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

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, and

- (2) This device must accept any interference received, including interference that may cause undesired operation.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Note: This equipment marketed in USA is restricted by firmware to only operate on 2.4GHz, channel 1-11.

Windows Server Configuration

Windows NT4.0 Server

If using Windows NT 4.0, Microsoft *TCP/IP Printing Support* must be installed.

- If it is already installed, add a TCP/IP Remote Printer, as described below.
- Otherwise, install TCP/IP printing support, then add a TCP/IP Remote Printer.

Adding TCP/IP Printing Support

1. Go to *Start-Settings-Control Panel-Network*.
2. Click the *Service* option and ensure that **Microsoft TCP/IP Printing** is enabled. If it is not enabled, select the *Add* option and enable it as usual.
3. If you added services in step 2, reboot the computer for the changes to take effect.

Adding a TCP/IP Remote Printer

4. Go to *Start-Settings-Printer* and invoke the *Add Printer* wizard.
5. When prompted with this printer will be managed by, select **My Computer** and click *Next*.
6. Select **Add Port...**, then select **LPR Port** and click **New Port**.
7. In the *Name of Address of server providing lpd:* Dialog box, enter the Print Server's IP address.
8. In the *Name of printer or print queue on that server* dialog box, enter the appropriate logical printer number (e.g. L1) as previously configured on the Print Server. By default, L1 is for Parallel Port, L2 is for USB Port if the Print Server has these 2 printer ports.
9. Click OK. When returned to the Printer Ports window, simply select *Close* and then install your printer driver as usual.
10. When prompted whether or not the printer will be shared, select the **Sharing** radio button.
11. In the *Shared* dialog box, enter the shared printer name. (The shared name is how other users will see this printer.) Click OK to save and exit.

Client PCs can now be configured as described in *Chapter 4 - Client Configuration*.

Windows 2000/2003 Server

1. Start the *Add Printer Wizard*, select *Network Printer*, then click *Next* to browse for the Print Server.
2. Locate and double-click the Print Server, select the desired port, and click *Next*.

A message like the following will be displayed:

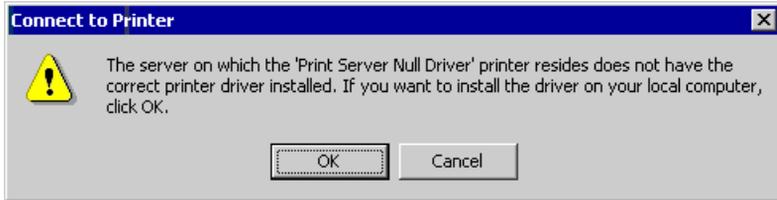


Figure 9: Windows 2000 Message



Figure 10: Windows2003 Message

3. Click "OK", and select the correct Manufacturer and Model for this printer.
4. Follow the prompts to complete the installation.
5. In the *Printers* folder, right-click the new printer, and select *Sharing*.
 - Select "Shared As:" and enter an appropriate name for this printer. Users will see this name when browsing for the printer during installation.
 - If desired, click "Additional Drivers" and install printer drivers for other versions of Windows, such as Windows 98. This will assist users during the installation process.
6. Click OK to close this Window. Configuration is now complete.

Client PCs can now be configured as described in *Chapter 4 - Client Configuration*.

Unix Systems

Overview

Your Print Server supports the LPD Unix printing method, which is supported by all common Unix systems.

You must configure both the Print Server itself and your Unix system, as described in the following sections.

Print Server IP Address Configuration

Because it supports dynamic IP Address allocation using DHCP or BOOTP, the Print Server ships with an IP Address of 0.0.0.0. This is NOT a valid IP Address.

Therefore, you must do ONE of the following:

- Check your **DHCP server** (if you have one), and determine the IP Address allocated to the Print Server.
- Configure your **BOOTP Server** (if you have one), to provide an IP address to the Print Server, then restart the Print Server.
- Use a Windows platform and run the **Setup Wizard** or **BiAdmin** utility to allocate a valid IP Address to the Print Server.
- Add an entry to the **arp** table to associate the hardware address of the Print Server with the desired IP address, as follows:

```
arp -s IP_Address 00:c0:02:xx:xx:xx
```

Where:

IP_Address is the IP Address you wish to assign to the Print Server.

00:c0:02:xx:xx:xx is the hardware address of the Print Server.

Example

```
arp -s 192.168.0.21 00:c0:02:12:34:56
```

You should then assign this IP address to the Print Server using your Web Browser, as described in *Chapter 6 - Web-based Management*.

Note:

The hardware address of the Print Server is shown on a sticker on the base of the device.

Other Print Server Configuration

The recommended method to configure the Print Server is to use the Web-based interface, as described in *Chapter 6 - Web-based Management*.

- Ensure that the TCP/IP settings are correct for your network.
- The logical printers (e.g. L1) must be configured correctly to match your system.

LPD Configuration

Configuration for the most common platforms is described below.

LPD on IBM AIX 4.15

Before proceeding, ensure that the Print Server has been assigned an IP Address. To setup your AIX system for LPD printing, perform the following steps.

1. Add the Print Server to **/etc/hosts.lpd**, using the name you assigned to the Print Server.
2. Start the LPD daemon if it is not running, using the following command:

```
start src -s qdaemon
```

3. Start the system administration tool **smit** 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)

Standard Processing

5. Use the following information:

Field	Entry
Name of queue to add	Use a single-word queue name, which indicates which printer is attached.
Hostname for remote server	Print Server name as used in /etc/hosts.lpd.
Name of queue on remote server	Logical printer number (e.g. L1) to service this queue.
Type of print spooler on remote server	Use default value. (AIX Version xxx)

6. Ensure that the logical printers are configured in the Print Server.
7. Print using the following command:

```
lp -d printer_queue file_name
```

Where

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

file_name is the file you wish to print.

LPD on System V

Before beginning LPD Setup, ensure that an IP Address has been assigned to the Print Server. Keep the following points in mind:

- 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 also need to be configured on the Print Server itself.
- If your UNIX asks for the LPD type, be sure to identify the service type as BSD. The Print Server's LPD protocol meets BSD system standards.
- In the sample commands shown, *printer_name* is the name of the Print Queue serviced by the Print Server, and *Spooler_directory* is the name of the directory, which is used to spool the print jobs.

Procedure

Action	Sample Command
Stop Print Services	<code>/usr/lib/lpshut</code>
Add a System Printer	<code>/usr/lib/lpadmin -p <i>printer_name</i> -v /dev/null</code>
Restart the Print Services	<code>/usr/lib/lpsched</code>
Enable printing to the new printer device	<code>enable <i>printer_name</i></code>
Start accepting jobs for the new printer device	<code>accept <i>printer_name</i></code>
Create a spooling directory	<code>mkdir /usr/spool/<i>Spooler_directory</i></code>
Make spooling daemon the owner of this directory	<code>chown daemon /usr/spool/<i>Spooler_directory</i></code>
Create read/write permissions	<code>chmod 775 /usr/spool/<i>Spooler_directory</i></code>
Give permissions to LPD processes.	<code>chgrp daemon /usr/spool/<i>Spooler_directory</i></code>
Add remote printer(s)	See following section

Adding Remote Printers

A remote printer is added by inserting the following line in the `/etc/printcap` file.



The entry is really one line, but can be entered as shown. Use a TAB character where shown.

```
Printer_name | Remote_Printer_Alias: \  
[TAB] :lp=: \  
[TAB] :rm=PS_NAME: \  
[TAB] :rp=Logical_Printer_name: \  
[TAB] :sd=Spooler_directory: \  
[TAB] :mx#0:
```

Where:

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. (e.g. L1)

Spooler_directory is the directory you created in Step 6.

Example:

```
Marketing|RP1_PS123456:\
[ TAB ] :lp=:\
[ TAB ] :rm=PS_Rm203:\
[ TAB ] :rp=L1:\
[ TAB ] :sd=/usr/spool/Marketing:\
[ TAB ] :mx#0:
```

Repeat this process for each Logical Printer/Print Queue combination that you wish to create.

LPD on Linux

If using the command line, the procedure is the same as for System V. (above)

On recent Linux distributions, you can use the graphical X-windows interface instead of the command line. The procedure is described below, but may vary according to your version of Linux.

1. Start your X-windows shell.
2. Select *Control Panel*, then *Printer Configuration*.
3. Select *Add*. For the printer type, select *Remote Unix (lpd) Queue*.
4. Use the following data to complete the resulting dialog.

Field	Data
Name	Enter a name for this printer
Spool Directory	<code>/var/spool/lpd/name_of_printer</code>
File Limit	0 (no limit)
Remote Host	Name or IP Address of Print Server e.g. TN300014 Note: host file entry is required to use the name instead of IP Address
Remote Queue	<code>Ln</code> Where <i>n</i> is the Logical Printer number By default, L1 is for Parallel port, and L2 is for USB port if the Print Server has these 2 ports.

5. Save this data, and exit the Printer Configuration. Configuration is now completed, and the printer is now available for use.

LPD on BSD

Before continuing, ensure that an IP Address has been assigned to the Print Server. Remember the following:

The **remote host name** is the name of the Print Server.

The **remote printer name** is the logical printer (e.g. L1) on the Print Server.

If asked for the LPD type, enter the service type as BSD.

In the sample commands shown, *printer_name* is the Print Queue serviced by the logical printer on the Print Server, and *Spooler_dir* is the name of the directory, which is used to spool the print jobs.

Procedure

Action	Sample Command
Create a spooling directory	<code>mkdir /usr/spool/Spooler_dir</code>
Set spooling daemon as owner of this directory	<code>chown daemon /usr/spool/Spooler_dir</code>
Create read/write permissions	<code>chmod 775 /usr/spool/Spooler_dir</code>
Give permissions to LPD processes	<code>chgrp daemon /usr/spool/Spooler_dir</code>
Add remote printer(s)	See below
Start lpd print mechanism	<code>lpd start printer_name</code>

Adding Remote Printers

A remote printer is added by inserting the following line in the `/etc/printcap` file.



The entry is really one line, but can be entered as shown. Use a TAB character where shown.

```
Printer_name | Remote_Printer_Alias:\
[ TAB ] :lp=:\
[ TAB ] :rm=PS_NAME:\
[ TAB ] :rp=Logical_Printer_name:\
[ TAB ] :sd=Spooler_directory:\
[ TAB ] :mx#0:
```

Where:

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. (e.g. L1)

Spooler_directory is the directory you created in Step 6.

Example:

```
Marketing|RP1_PS123456:\
[ TAB ] :lp=:\
[ TAB ] :rm=PS_Rm203:\
[ TAB ] :rp=L1:\
[ TAB ] :sd=/usr/spool/Marketing:\
[ TAB ] :mx#0:
```

Repeat this process for each Logical Printer/Print Queue combination that you wish to create.

Printing using LPD

For LPD printing instructions, refer to your UNIX manual. The following example is for a BSD system:

```
lpr -P printer_name filename
```

Where:

printer_name is the name of the Print Queue defined on the Unix host.

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

Example:

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

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

NetWare

Overview

- The Print Server must be configured as a valid device on your TCP/IP network. This printing method uses LPR over TCP/IP, not the Netware protocol.
- 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 V2.2. 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.

Creating an NDPS Manager Object

If an NDPS Manager Object already exists, skip this procedure and proceed to *Creating an NDPS Printer Agent*.

1. Login to NetWare 5.0 Server as Admin and start the NetWare Administrator program Nwadmn32.exe.
2. Select the container on NetWare Administrator where you want the NDPS Manager object to reside. (e.g. 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 shown below will appear.

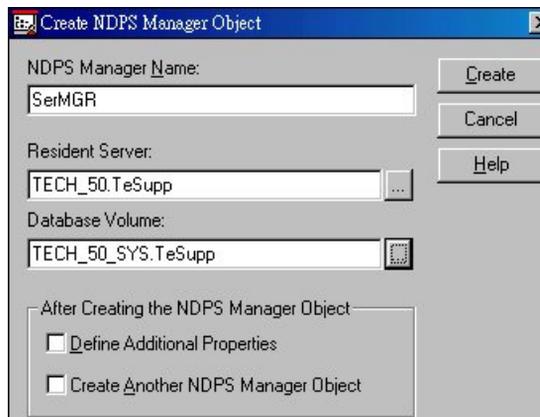


Figure 11: Create NDPS Manager Object

5. Type a name in the NDPS Manager Name.(e.g. SerMGR in Figure 1 above)
6. Browse the Resident Server and select where you want the NDPS Manager object to be assigned. (e.g. TECH_50.TeSupp in figure 1 above)
7. Browse the Database Volume and select where you want the NDPS Manager database to be assigned. (e.g. TECH_50_SYS.TeSupp in figure 1 above)
8. Click **Create**. The new NDPS Manager will appear 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 wish to load.

9. After creating an NDPS Manager, you can create NDPS printers by using NetWare Administrator, as explained below.

Creating an NDPS Printer Agent

To create Public Access Printers using the NDPS Manager Object in NetWare Administrator, follow this procedure:

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

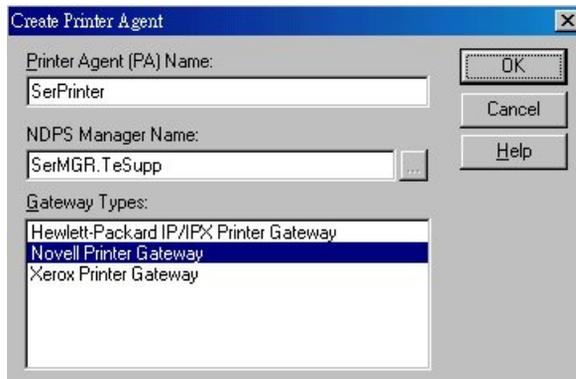


Figure 12: Create Printer Agent

4. Enter the desired name for the *Printer Agent (PA) Name*.
5. Normally, the *NDPS Manager* will be the NDPS Manger object you are using.
6. Select *Novell Printer Gateway* in the *Gateway Type*. (see figure2 above)
7. Click *OK* and then select the available printer.
8. Select *Remote (LPR on IP)* in the *Connection Type*.
9. Click *Next* to see the following *Configure Port Handler* screen.



Figure 13 Configure Port Handler

10. In the *Host address IP* field, enter the IP Address previously assigned to the Print Server device.
11. In the *Printer Name* field, enter the Logical Port name on the Print Server. (L1 for Parallel Port 1, L2 for USB port).
12. Click *Finish*, then select appropriate drivers for Windows 98 etc as required.
13. The new Printer Agent will now appear in the Printer Agent List window.

Repeat this procedure for any other ports on the Print Server, or for any other logical printers you wish to use.

Client PCs can now be configured as described in *Chapter 4 - Client Configuration*.

Network Glossary

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

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

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

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

Bit - A binary digit.

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

Broadband - An always-on, fast Internet connection.

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

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

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

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

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

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

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

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

Domain - A specific name for a network of computers.

Download - To receive a file transmitted over a network.

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

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

EAP (Extensible Authentication Protocol) - A general authentication protocol used to control network access.

Many specific authentication methods work within this framework.

Encryption - Encoding data transmitted in a network.

Ethernet - IEEE standard network protocol that specifies how data is placed on and retrieved from a common transmission medium.

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

Firmware - The programming code that runs a networking device.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Packet - A unit of data sent over a network.

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

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

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

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

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

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

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

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

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

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

Router - A networking device that connects multiple networks together.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Topology - The physical layout of a network.

TX Rate - Transmission Rate.

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

Upload - To transmit a file over a network.

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

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

WAN (Wide Area Network)- The Internet.

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

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

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

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