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Introduction

This chapter provides details of your Printer Server's features and components.

Congratulations on the purchase of your new Level One Printer Server. This device was designed to provide a simple and efficient network printing solution.

Features

- ***Versatility.*** The Level One Printer Server supports up to five protocols: NetWare, TCP/IP, SMB (Service Message Block), AppleTalk (EtherTalk), and NetBEUI. Most models feature an auto-sensing 10/100BaseT Ethernet interface port. Operating system support includes Unix, Novell, and Microsoft Windows.
- ***Easy Installation.*** The Level One Printer Server makes adding printers or plotters to your network simple. The auto-sensing feature on the LAN interface means that there is no need to set jumpers or perform software configuration to select the network speed or duplex setting.
- ***Easy Setup.*** A number of utility programs are supplied to simplify setup. For Windows 95/98/NT users, the BiAdmin program makes it easy to configure the Level One Printer Server for a variety of network and server configurations.
- ***Web-based interface.*** On models supporting 100BaseT, the Level One Printer Server incorporates a Web-based interface to provide an easy method of configuration in TCP/IP networks. When using this method, no software needs to be installed.
- ***Compact Size.*** This allows the Level One Printer Server to be used even where space is limited.
- ***Remote Management Tools.*** A variety of software tools are provided. In most environments, both the Level One Printer Server and attached bi-directional printers can be configured remotely.
- ***SNMP Support.*** The Level One Printer Server can act as a SNMP agent, with its own MIB. This allows TCP/IP users to monitor, configure and troubleshoot the Level One Printer Server using their existing SNMP management tools.

- ***JetAdmin Support.*** 100BaseT models support HP's *JetAdmin* utility. If you are already using this program, you can also use it to manage your Level One Printer Server.
- ***Internet Printing.*** Using TCP/IP, the Level One Printer Server can be configured to allow clients, suppliers, colleagues and others to print to one of your printers from anywhere on the Internet.

Year 2000 Compliance

The Level One Printer Server does not store the date, nor does it perform date calculations. When necessary, it obtains the current date from the network or client operating system. We recommend the use of network and client operating systems which are year 2000 compliant.

Safety Instructions

For your own safety, and to protect your Level One Printer 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 this device 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 local power company.
5. Do not pinch, crimp or otherwise damage the power cord. If exposed to foot traffic, ensure that the cable is properly shielded and does not pose a tripping hazard.
6. If using an extension cord, make sure the total ampere rating of the products using the cord does not exceed the extension cord's 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 device 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.

Package Contents

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

- Level One Printer Server
- Power Adapter
- One CD-ROM containing all support programs and the complete User Manual in on-line format (PDF and HTML).
- This User's Manual
- Quick Install Guide

Models

This section contains details of all Level One Printer Server models covered by this manual. Please take a few minutes to familiarize yourself with your new Level One Printer Server.

EPS-3001TU (10BaseT Direct Attach)



Figure 1: EPS-3001TU

Item	Description
1	Male Parallel Port, for direct connection to the printer.
2	Orange Error LED. See page 11 for details.
3	Green Status LED. See page 11 for details.
4	9V Power port
5	10BaseT Connector.

FPS-3001TXU (100BaseT Direct Attach)

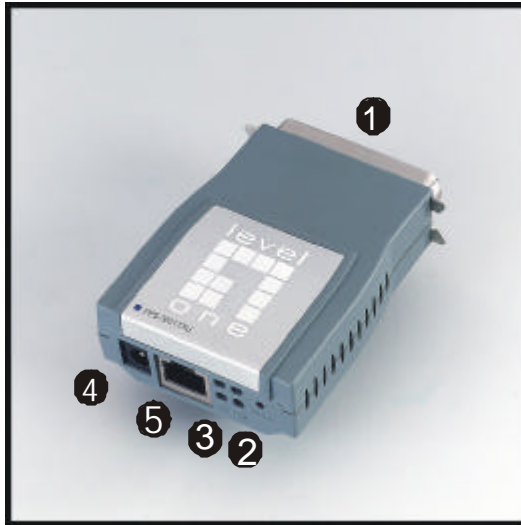


Figure 2: FPS-3001TXU

Item	Description
1	Male Parallel Port, for direct connection to the printer.
2	Orange Error LED. See page 11 for details.
3	Green Status LED. See page 11 for details.
4	5V Power port
5	10/100BaseT Connector.

The FPS-2111TXU offers support for both 10BaseT and 100BaseT environments. It features one UTP connector and one bi-directional parallel port.

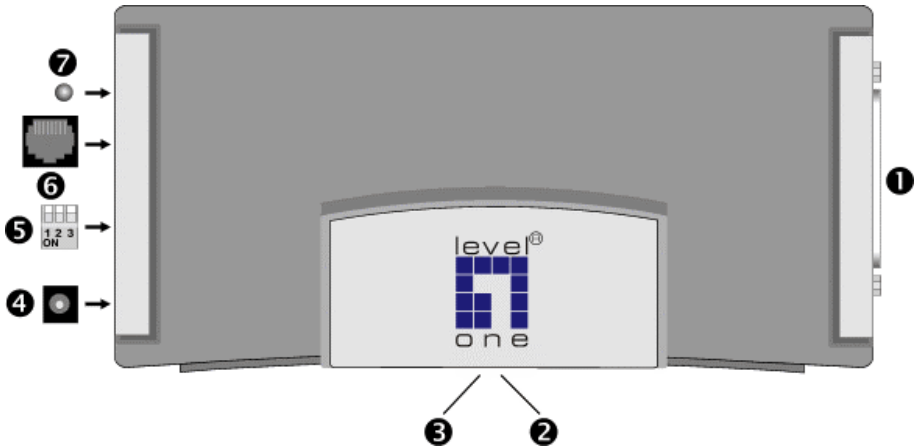
FPS-2111TXU

Figure 3 FPS-2111TXU

- 1** Parallel Port
- 2** Red Error LED. See page 11 for details.
- 3** Green Link LED See page 11 for details.
- 4** 12V Power port
- 5** 10/100BaseT Switches
See page 11 for details.
- 6** 10/100BaseT STP Connector
- 7** 10/100BaseT Link LED

FPS-2101TXU

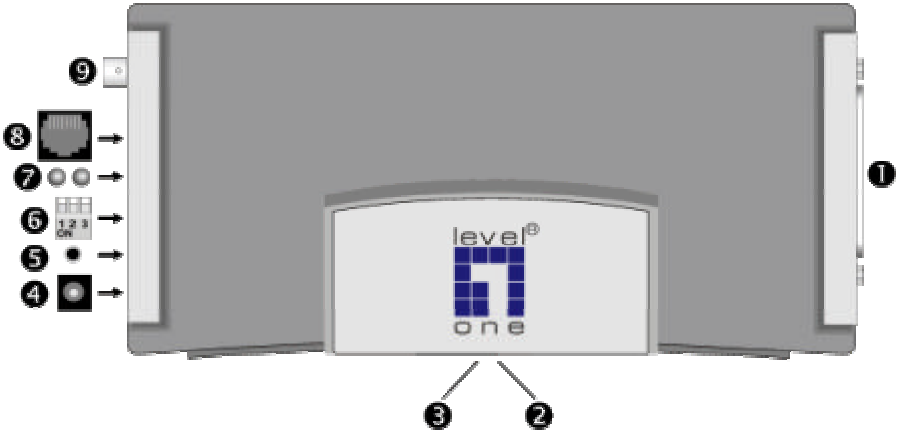


Figure 4: FPS-2101TXU

Item	Description
1	Parallel Port
2	Green Link LED. See page 11 for details.
3	Red Error LED. See page 11 for details.
4	12V Power port
5	Diagnostic push button. See page 12 for details.
6	DIP Switches. See page 11 for details.
7	10/100BaseT Link LEDs. <ul style="list-style-type: none"> • If using 100BaseT, the upper LED will light. • If using 10BaseT, the lower LED will light.
8	10/100BaseT Connector
9	10Base2 connector.

FPS-2013TXU

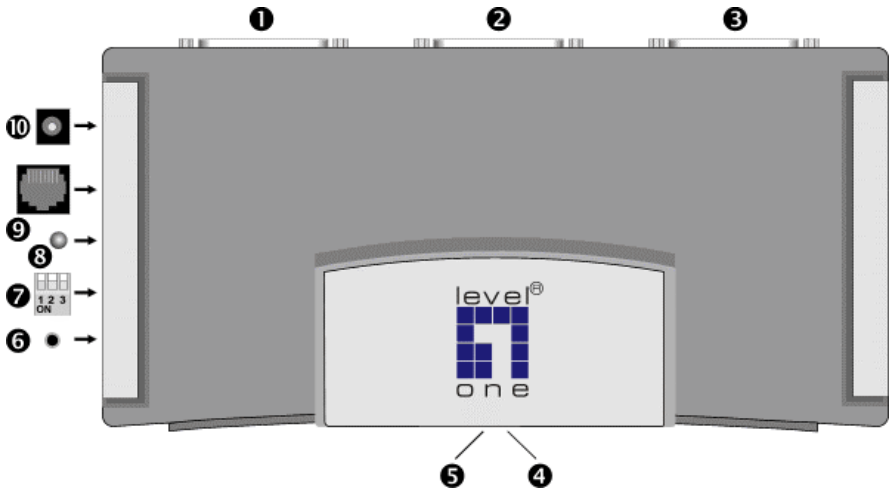


Figure 5 FPS-2013TXU

- 1** Parallel Port 1
- 2** Parallel Port 2
- 3** Parallel Port 3
- 4** Red Error LED. See page 11 for details.
- 5** Green Link LED. See page 11 for details.
- 6** Reset Button.
This will Reboot the Printer Server.
- 7** 10/100BaseT Switches.
See page 11 for details.
- 8** 10/100BaseT Link LED
- 9** 10/100BaseT Connector
- 10** 12V Power port

FPS-2003TXU

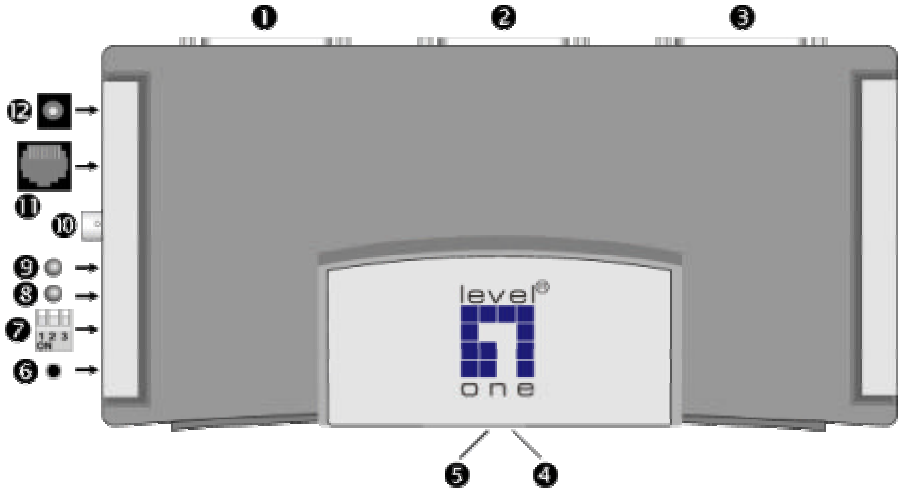


Figure 6: FPS-2003TXU

Item	Description
1	Parallel Port 1
2	Parallel Port 2
3	Parallel Port 3
4	Green Link LED. See page 11 for details.
5	Red Error LED. See page 11 for details.
6	Diagnostic push button. See page 12 for details.
7	DIP Switches. See page 11 for details.
8	100BaseT Link LED - lights if using 100BaseT.
9	10BaseT Link LED - lights if using 10BaseT.
10	10Base2 connector.
11	10/100BaseT Connector
12	12V Power Port

LED Indicators

All Level One Printer Servers are fitted with 2 LED indicators. The red LED is the Status/Error indicator. The green LED is the Power/Link indicator. The LED indicator modes are described in the following table.

Green LED	Red LED	Status Description
Solid Off	Solid Off	No power.
Solid On	Solid On	Hardware error.
Solid On	Solid Off	Normal operation.
Flashing	Off	Transmitting or receiving packets from the network.

DIP Switches - FPS-2101TXU & FPS-2003TXU

The DIP switches are used to set the LAN connection. Operation is as follows.

SW1	SW2	SW3	Description
UP	UP	UP	Auto select LAN connection (Default)
UP	UP	Down	Use BNC connector
Down	Down	Down	10BaseT - Half Duplex
Down	Down	UP	10BaseT - Full Duplex
Down	UP	Down	100BaseT - Half Duplex
Down	UP	UP	100BaseT - Full Duplex

The other possibilities are reserved, and should not be used.

DIP Switches - FPS-2111TXU & FPS-2013TXU

The DIP switches are used to set the LAN connection. Operation is as follows.

SW1	SW2	SW3	Description
UP	-	-	Auto select LAN connection (Default) Switches 2 and 3 have no effect.
Down	Down	Down	10BaseT - Half Duplex

Down	Down	UP	10BaseT - Full Duplex
Down	UP	Down	100BaseT - Half Duplex
Down	UP	UP	100BaseT - Full Duplex

The other possibilities are reserved, and should not be used.

Diagnostic Push Button

Models FPS-2101TXU and FPS-2003TXU are fitted with a "Diagnostic Push Button".

This button is used to restore the factory default settings, or to print a test page. The test page will contain all the current settings, and will be output to the printer attached to port 1.

To restore the factory default settings:

1. Turn the Printer Server OFF.
2. Press and hold the diagnostic button. While pressing the button, switch the Printer Server ON.
3. If you continue pressing the button for 10 seconds, a diagnostic page will be printed, showing the new settings.

To generate a Diagnostic print out

1. Ensure that both the Printer Server and the printer attached to port 1 are ON.
2. Press the diagnostic button, and hold it in for 2 seconds.
3. The test page, containing the 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

2

This chapter describes how to install the Level One Printer Server in your Local Area Network.

Procedure

1. Find the Default Printer Server Name

- The *Default Server Name* is shown on a sticker on the base of the device. It consists of 8 letters and/or digits.
- Record this name, it will be needed during configuration.



During configuration you will be able to change the device name. The new name MUST NOT contain any spaces or blanks

2. Connect the Printer(s)

- Models EPS-3001TU and FPS-3001TXU are connected directly to the printer. No printer cable is required.
- For other models, connect the printer or plotter cable(s) to the appropriate port(s). Parallel port cables should be less than 3 meters long.



Leave the Level One Printer Server powered OFF while connecting it to the Printer(s) and the LAN.

3. Connect the Network Cable

- Connect the Level One Printer Server to your LAN. For 10/100BaseT interfaces, the Level One Printer Server will automatically detect the correct speed.
- If your Printer Server has 2 LAN connections, only ONE (1) can be used. The Level One Printer Server will automatically detect which connection is used.

4. Power Up and Check

- Plug in the power adapter cable.
- If using 10/100BaseT on models FPS-2101TXU or FPS-2003TXU, check the LAN connection LEDs next to the 10/100BaseT connector. If neither the 10BaseT nor the 100BaseT LED lights when the Printer Server is powered up, auto-negotiation has failed. In this case, set the DIP switches as described in the document for your model.
- If using 10/100BaseT on models FPS-2111TXU or FPS-2013TXU, check the LAN connection LED next to the 10/100BaseT connector. If this LED does not light when the Printer Server is powered up, auto-negotiation has failed. In this case, set the DIP switches as described in the document for your model.



Use only the Power Supply unit provided with the Level One Printer Server.

Configuration

This chapter provides an overview of the configuration process.

Required Configuration

The Level One Printer Server is designed to support many different platforms, and the configuration required will depend upon the environment in which it is installed. Depending upon the situation, any of the following may require configuration:

- Level One Printer Server itself.
- LAN Server.
- Client PCs on the LAN.

For each supported platform, detailed instructions are contained in the appropriate chapter in this document.

Configuration Methods & Utilities

Many different methods and utilities can be used to configure the Level One Printer Server.

BiAdmin

The recommended method for configuring the Level One Printer Server is to use the supplied **BiAdmin** utility program. If using NetWare, this program can be used to configure the NetWare Server as well as the Level One Printer Server.

For details about installing and using **BiAdmin**, refer to *Chapter 4 - BiAdmin Utility Program*. BiAdmin requires Window 95/98 or Windows NT4.0 or later.

Web-based Interface

Most Browsers will work with the Web-based interface, provided on all models supporting 100BaseT. See *Chapter 7 - TCP/IP* for details.

Other Methods

The methods listed below can also be used. For more details, refer to the full user manual supplied on the CD-ROM.

Method	Platform	Details
FTP	All TCP/IP networks	Using this method, the configuration file is downloaded from the Printer Server, edited, then sent back.
JetAdmin (HP)	Windows 95/98/NT	100BaseT models support this program.
PSConfig	DOS (IPX/SPX)	Menu-based DOS program for NetWare users.
Telnet	All TCP/IP networks	Telnet can be used only to monitor the printers attached to the Level One Printer Server.
WebAdmin	Windows NT Server (TCP/IP) Web Browser	WebAdmin is installed on the NT Server, and then accessed using a Web Browser.
WPConfig	Windows 3.1 (IPX/SPX)	Not all Level One Printer Server features are available.

BiAdmin Utility Program

4

This chapter cover the installation and operation of the BiAdmin utility.

Requirements

This program requires:

- Windows 95 or Windows 98
- Windows NT 3.51, Windows NT 4.0

Additional Recommendations:

- Screen resolution of 800 * 600 or greater.
- If using Novell NetWare, installation of Novell's *Client 32 for Windows* is strongly recommended. This will greatly enhance the ability to BiAdmin to work with NetWare servers.
- BiAdmin includes extensive context-sensitive help. Please refer to these help screens as necessary.

Installation

1. Run the SETUP program in the PS\Utility\Biadmin\disk1 directory on the CD-ROM.
2. Follow the on-screen prompts to complete the installation.

Main Screen

Start the program by using the icon created by the setup program.

When run, the program searches the network for all active Level One Printer Servers, then lists them on screen, as shown by the example screen below.

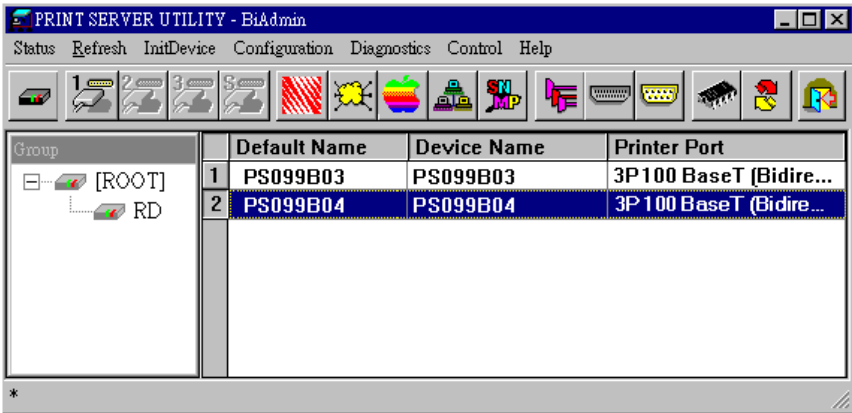


Figure 7: BiAdmin Main Screen

Groups

On the left side of the screen is a column for *Groups*. Each Level One Printer Server may be placed in a group, using the *Configuration-System Configuration-Groups* menu option.

- If a group is selected, only Level One Printer Servers in that group will be listed on the right side of the screen.
- By default, all Level One Printer Servers will appear in the [ROOT] group.
- A Level One Printer Server can only be a member of one (1) group, and will always be a member of a group
- Use the *Configuration-System Configuration-Groups* menu option to select a group for the current Level One Printer Server.
- To create a new Group and add the current Level One Printer Server to it, just enter a group name in the dialog. (See example screen below.)

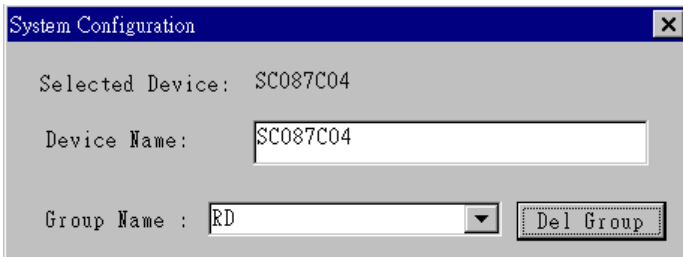


Figure 8: System Configuration – Groups

Device List

On the right side of the screen is a list of all Level One Printer Servers found on the network. For each device, the following data is shown:

- **Default Name.** The *Default Server Name* is shown on a sticker on the base of the device.
- **Device Name.** If you have not changed the name, this will be the same as the *Default Server Name*.
- **Port information.** The number and type of ports is shown in the right column.

Unlisted Devices

If the desired device is not listed, try the following:

- Check that the device is installed and ON, then *Refresh* the list.
- Use the *InitDevice – Find* menu option to search for the Level One Printer Server. You need to know the *Default Name* of the Level One Printer Server. The *Default Server Name* is shown on a sticker on the base of the device.
- If the Level One Printer Server is on another LAN segment, use the *InitDevice – Attach Remote* menu option to locate and display the Level One Printer Server.
- For networks using ONLY TCP/IP, Level One Printer Servers without an IP Address will not appear.

Use the *InitDevice – Set IP Address* menu option to assign an IP Address, then *Refresh* the list. You need to know the *Default Server Name* of the unlisted device in order to assign an IP Address. The *Default Server Name* is shown on a sticker on the base of the device.

Icons

Once a Level One Printer Server has been selected, the Icons become active.



The icons provide status information as well as access to the selected Level One Printer Server settings. If an icon is grayed out, that option or protocol is unavailable.

The icons are arranged in 3 groups:

- **Status** (left)



Use these to check the status of the selected Level One Printer Server, and the printer ports on the Level One Printer Server.

- **Configuration** (middle)



Use these to configure the selected Level One Printer Server.

- **Actions** (right)



These allow you to upgrade the firmware, refresh the list of Level One Printer Servers, view help for each of the other icons, or exit the program.

Status Icons

The following icons are located on the left side of the screen.



Device Information

Menu equivalent: *Status - Backup/Restore Device Information*

This screen is reached by the Device Information Icon or the Status - Backup/Restore Device Information menu option.

All of the settings for the current device are displayed in a read-only scrollable list in the left panel. The right panel will be blank unless a configuration file is loaded.

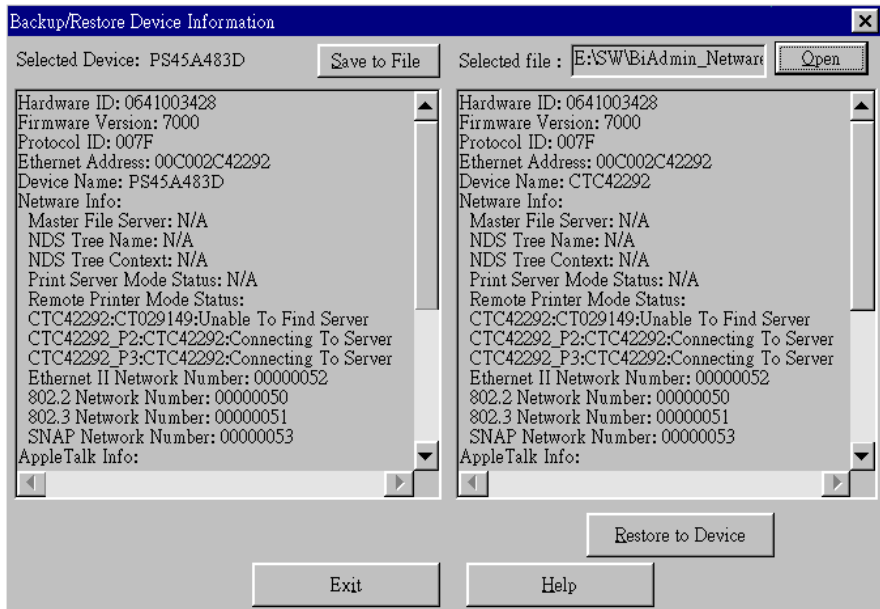


Figure 9 : Backup/Restore Device Information

Items listed are as follows:

- **Hardware ID** – use by the manufacturer to identify this particular unit.
- **Firmware version** – version of the embedded software. Technical support may ask for this information.
- **Protocol ID**. Technical support may ask for this information. It indicates what protocols are supported by the installed firmware.

- **Default Name** –The *Default Server Name*, as shown on a sticker on the base of the device. It consists of 8 characters (letters and digits).
- **Server Name** – current name. If you have not changed the device name, this will be the same as the Default Name.
- **LAN Protocol Settings** - the settings for each of the supported protocols will also be listed.

Backup/Restore Configuration Data

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 Level One Printer Server.

- When the "Open" button is used to open a previously-saved file, its contents are viewable in the right panel.
- If the "Hardware Id" matches, the *Restore to Device* button will become active.
- When a "Restore to Device" operation is performed, the Level One Printer Server will reboot, and this program will re-scan the network to ensure the Level One Printer Server is correctly displayed in the Device List.



Port Status

Menu equivalent: *Status - Port Status*

There are 4 icons - one for each parallel port, and one for the serial port. **Non-existent ports are grayed out.** Selecting an icon will result in a screen like the following example.

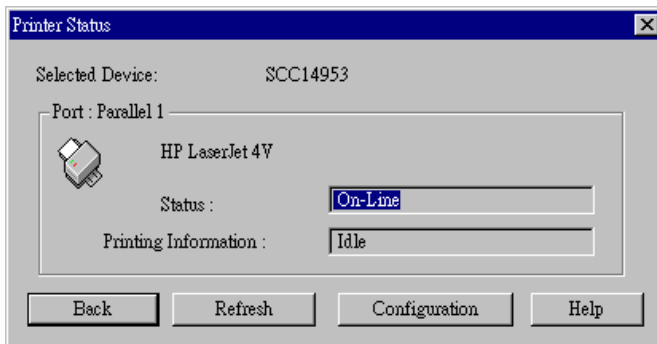
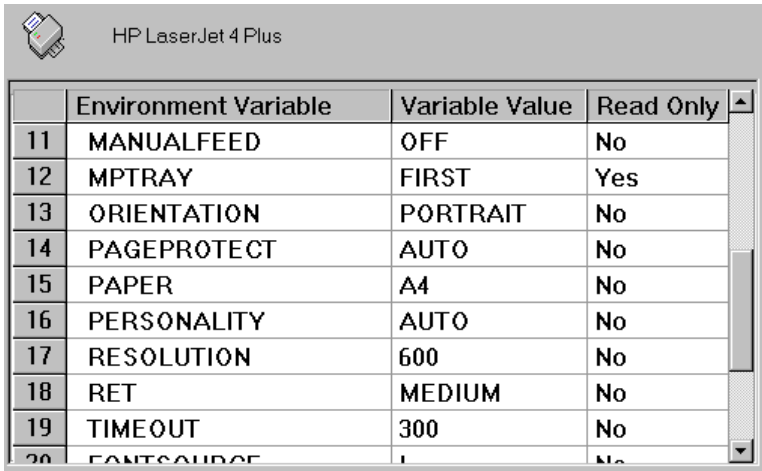


Figure 10: Printer Status

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.

If available, clicking the *Configuration* button in the *Printer Status* window will reveal a window like the following example.



The screenshot shows a window titled "HP LaserJet 4 Plus" with a printer icon. It contains a table with the following data:

	Environment Variable	Variable Value	Read Only
11	MANUALFEED	OFF	No
12	MPTRAY	FIRST	Yes
13	ORIENTATION	PORTRAIT	No
14	PAGEPROTECT	AUTO	No
15	PAPER	A4	No
16	PERSONALITY	AUTO	No
17	RESOLUTION	600	No
18	RET	MEDIUM	No
19	TIMEOUT	300	No
20	FONTSOURCE		No

Figure 11: Printer Configuration

Environment Variable	This list of printer configuration variables will vary from printer to printer.
Variable Value	Displays the current setting. To change the Variable Value (if <i>Read Only</i> is NO) double click the line you wish to change, then enter or select a new value.
Read Only	Indicates whether or not the environment variable is adjustable.

Configuration Icons

To configure a Level One Printer Server, click on it once with your mouse to highlight it. The program will ask for password confirmation. If no password is assigned, click **OK**. Otherwise, enter the password and click **OK**.

Once a Level One Printer Server is selected, the Icons (or the equivalent menu selection) explained on the following pages can be used to select configuration options.



If an Icon is grayed out, that setting or option is unavailable on the selected device.

Common Control Buttons

Most configuration screens contain the following buttons.

- **Set to Default** – Replace the on-screen values with the default values. These are NOT saved until you click the *Save to Device* button.
To set ALL device values to the default, use the menu option *InitDevice - Restore Factory Default*.
- **Save to Device** – Save the values shown on screen to the selected Level One Printer Server. You should then use the *InitDevice* menu option to *Reset* the device to ensure the changes take effect. If you have changed the name or IP Address of the Level One Printer Server, you should also *Refresh* the device list.
- **Help** – Display context sensitive help.
- **Cancel** – Discard any changes not already saved, and close the Window.



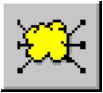
NetWare

Menu equivalent: *Configuration – NetWare*

Select this icon to configure the Level One Printer Server for use with Novell NetWare servers. You need to be logged into the NetWare servers with ADMIN rights.

The screens you will see, and the operations which can be performed, depend on whether or not you have *Novell NetWare Client 32* installed.

- If *Novell NetWare Client 32* is installed on your PC, BiAdmin allows you to configure both the Level One Printer Server and the NetWare server from within BiAdmin.
- If this *Novell NetWare Client 32* is NOT installed, you can configure only the Level One Printer Server itself, not the NetWare server.
- For more information, refer to *Chapter 6 - NetWare*.



TCP/IP Configuration

Menu equivalent: *Configuration - TCP/IP*

Selecting this icon will allow configuration for both TCP/IP and Internet Printing. The top section of the screen will be like the example below. Note that, depending on the Level One Printer Server firmware version, there may or may not be checkboxes for *DHCP*, *Bootp*, and *Rarp*.

Selected Device: PS888888

Dynamic IP Address

DHCP

Fixed IP Address

IP Address: [][][][]

Gateway Address: [][][][]

Subnet Mask: [][][][]

TCP session retry interval: [2] (sec.)

TCP session retry count: [254]

Set to Default

Save to Device

Cancel

Help

Figure 12: TCP/IP Configuration

Enter TCP/IP Configuration data on the top half of this screen. For details of the required data, see *Chapter 7 - TCP/IP*.

If your Printer Server model supports Internet Printing, the bottom section of the screen allows configuration for Internet Printing. An example screen is shown below. For details of the required data, refer to *Chapter 11 - Special Features*.

Internet Mail Printing Configuration

Mail Server IP Address: [203] [70] [212] [200]

Mail Account: [PrintServer]

Password: [*****]

Confirm Password: []

Check mail interval: [0] : [1] (hour : min.)

Redirect Mail Account: [PostMaster]

Default Printer Number: [L1]

Print every email

Banner Printing

Activate Response mail

Printer Model string: [HP LaserJet 4 Plus]

Figure 13: Internet Printing Configuration



AppleTalk Configuration

Menu equivalent: *Configuration - AppleTalk*

Selecting this icon will cause the following screen to appear.

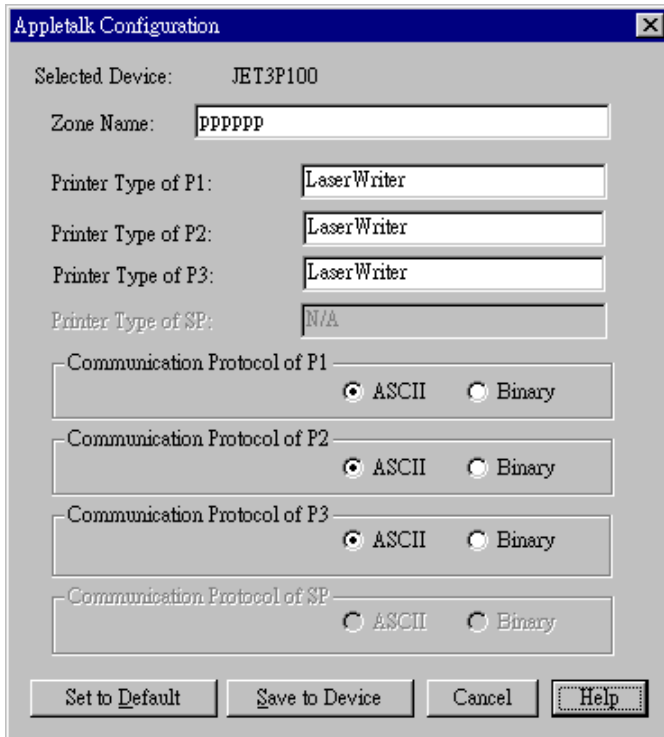


Figure 14: AppleTalk Configuration

Refer to *Chapter 5 - AppleTalk* for details of these settings.



NetBEUI Configuration

Menu equivalent: *Configuration - NetBEUI*

Selecting this icon leads to the following screen. Normally, there should be no need to adjust these settings.

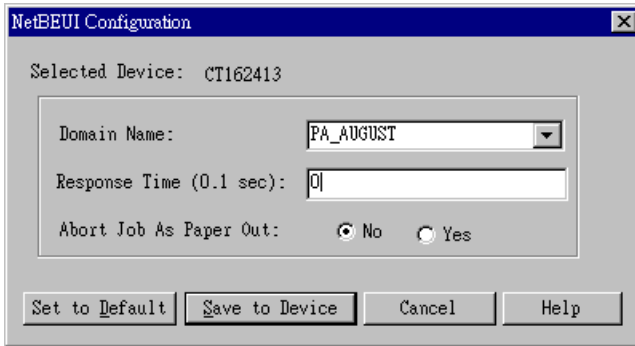


Figure 15: NetBEUI Configuration

NetBEUI Settings

Domain name	Enter the designated work group to be serviced by the Level One Printer Server. Using only UPPER CASE is recommended, because the Level One Printer Server is not case sensitive, and will ignore case.
Response Time	Sets how fast jobs are sent to the printer. The default value of zero (0) should be increased only if your printer cannot cope with no delay.
Abort Job As Paper Out	YES will terminate the current print job when a printing error is encountered. NO (default) will try to continue but may cause print errors. If errors occur, try setting this value to YES.



SNMP Configuration

Menu equivalent: *Configuration - SNMP*

After clicking this icon, the screen will look like the following.

SNMP Configuration

Selected Device: JET3P100

SysContact : Jeff Bridges

SysLocation : R305

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

Set to Default Save to Device Cancel Help

Figure 16: SNMP Configuration

Note that the bottom part of the screen will change if a **Trap** (T1..T4) is selected. In that case, the bottom part of the screen will look like the following.

T1

Trap Receive IP Address : 0 0 0 0

Community String : public

Trap Option

Enable Disable

Trap Severity

1 2 3

Figure 17: SNMP Trap Configuration

Refer to *Chapter 11- Special Features* for details of these settings.



Logical Port Configuration

Menu equivalent: *Configuration - Logical Port*

Logical port (printers) can be used in the NetWare and TCP/IP environments. Refer to *Chapter 6 - NetWare* or *Chapter 7 - TCP/IP* for details.



Physical Port Configuration

Menu equivalent: *Configuration - Physical Port*

After selecting this icon, you will see the following screen.

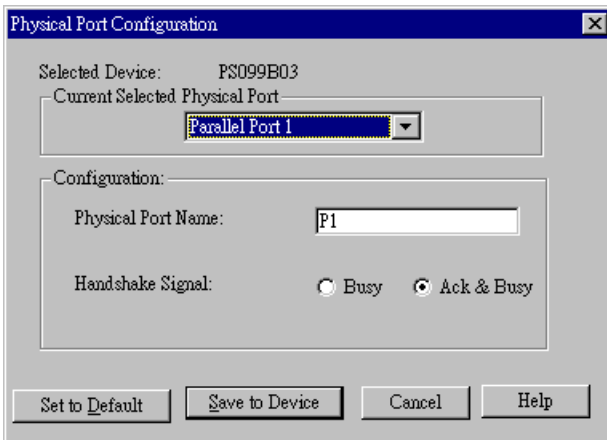


Figure 18: Physical Port

Current Selected Physical Port	Select the desired port.
Physical Port Name	If desired, enter a name for this port.
Handshake Signal	Select <i>Busy</i> or <i>Ack & Busy</i> . (Acknowledge and Busy). The default is <i>Ack & Busy</i> . This should only be changed if advised to do so by technical support staff.

Action Icons

The following icons are located on the right side of the screen.



Upgrade

Menu Equivalent: *InitDevice - Upgrade*

This option permits upgrading the firmware for the selected Printer 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. Then follow this procedure:

1. From the Main Screen, click the *Upgrade* icon or select the *InitDevice - Upgrade* menu option.
3. From the list on the **Upgrade** screen (see example below), select the Level One Printer Server you wish to upgrade.

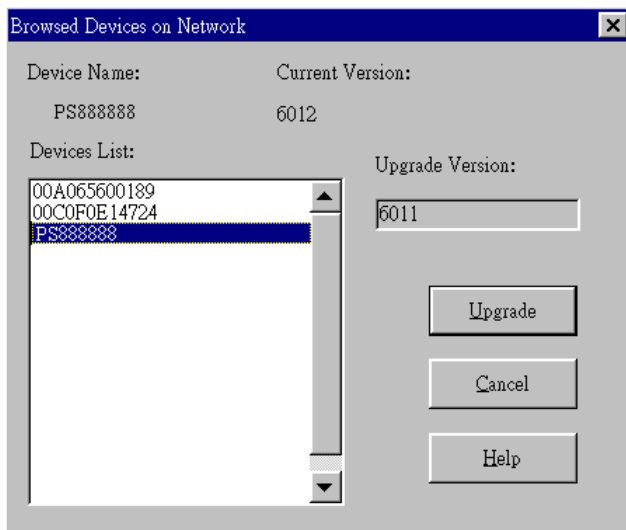


Figure 19: Firmware Upgrade Screen

4. If a matching upgrade file is available, the *Upgrade* button becomes available. Click this button to start the upgrade process.
5. Follow the instructions on screen to complete the upgrade.
6. The Level One Printer Server will Reset (reboot) after the operation is complete.



Refresh

Menu Equivalent: **None**

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



Exit

Menu Equivalent: *Help – Exit*

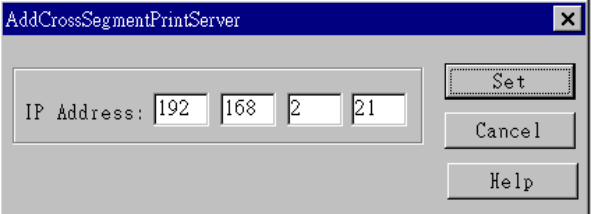
Exit the BiAdmin program. This does not save any changes you have made; you must *Save to Device* on each screen.

Menu Options

Status Menu

Device Info	Same as <i>Device</i> button. Displays configuration & status information about the selected Printer Server.
Port	Same as <i>Port Status</i> buttons. Select the desired port, to view a screen similar to Figure 10: Printer Status.

InitDevice Menu

Attach Remote	<p>This is used to connect to a Level One Printer Server device on another LAN segment. You will see the screen below.</p>  <p style="text-align: center;">Figure 20: Attach Remote</p> <p>Enter the IP address of the remote device.</p>
Connected Protocol	This option allows you to set which LAN protocol will be used for communication between the selected device and this program. You should select ONE protocol only.
Find	Use this option to locate a Level One Printer Server on the LAN. Simply enter the <i>Default Name</i> of the Level One Printer Server you wish to locate. The <i>Default Server Name</i> is shown on a sticker on the base of the device.

Reset Device	Reboot the Printer Server. This should be done after making any configuration changes, or if the device stops responding.
Restore Factory Default	This will restore ALL device values to their factory defaults. To restore only the current screen, use the screen's <i>Set to Default</i> button.
Set IP Address	<p>For TCP/IP networks only:</p> <ul style="list-style-type: none"> • If a Level One Printer Server does not appear on the main screen, use this option to set a Device IP Address, Gateway IP Address, and Network Mask to the Level One Printer Server. • This should only be necessary if your LAN is using ONLY the TCP/IP protocol. In other cases, BiAdmin will use IPX/SPX to locate the Level One Printer Server even if it doesn't have a valid IP Address. • To locate the Level One Printer Server, enter the <i>Default Name</i>. The <i>Default Server Name</i> is shown on a sticker on the base. • Enter the required IP Address, Network Mask, and Gateway IP Address. • After saving the data to the device, refresh the listing. The Level One Printer Server should then appear in the device list on the main screen.
Upgrade	Upgrade the firmware in a Level One Printer Server. See Upgrade Icon for details.

Configuration Menu

System

Selecting this option will reveal the following screen.

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

- Selected Device:** SC087C04
- Device Name:** SC087C04
- Group Name:** RD (with a dropdown arrow and a 'Del Group' button)
- IPX/SPX Protocol:** Disable Enable
- TCP/IP Protocol:** Disable Enable
- AppleTalk Protocol:** Disable Enable
- NetBEUI Protocol:** Disable Enable
- Buttons:** Set to Default, Save, Cancel, Help

Figure 21: Configuration Screen

Device Name	Enter a new name for the selected Printer Server if you wish.
Group Name	Enter the group name for this device. If no group name is entered, the Printer Server will be in the "Root" group.
Protocols	Any protocols not used on your LAN may be disabled.



By default, all protocols are enabled. This allows operation in any environment, but degrades performance.

The **Configuration Menu** also contains selections for each protocol. These have the same effect as the corresponding Icon.

Diagnostics menu

Print Test Page

Use this option to print a test sheet from the selected Level One Printer Server port. The test print out will include status information.
--

Control Menu

Abort Mail Print Job

This option allows you to cancel a print job which has been received though the Internet Printing feature, and is currently printing.

This can be used to terminate a print job which is not printing correctly.
--

AppleTalk

5

This chapter details using the Level One Printer Server in the AppleTalk environment.

The Level One Printer Server supports AppleTalk (EtherTalk), PAP, ATP, NBP, ZIP and DDP protocols, enabling Macintosh computers on the network to view and use the Level One Printer Server as a regular AppleTalk printer. Configuring and printing in the EtherTalk environment operates completely as usual.

The *PSTool* program has been provided specifically for the Macintosh environment, to allow easy configuration of your Level One Printer Server. However, it is not necessary to install and use this program for basic operation.

Software Requirements

System 7.x OS or newer.

AppleTalk Setup

1. Click the apple icon and choose Control Panel.
2. Click Network.
3. Ensure that *EtherTalk* is selected under *AppleTalk Connection*.
4. Click *Chooser*. The Chooser panel will open.
5. 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.
6. Select a Level One Printer Server from the printer list by clicking on the appropriate name. The Level One Printer Server's name is recorded on a label on the bottom of the Level One Printer Server as "Server Name". This name consists of 8 digits and/or numbers.
7. Click on the *Close* box.
Configuration is now complete.

Printing

Printing with the Level One Printer Server installed in an AppleTalk network is identical to normal printing.

For example, select a document that you want to print and then select *File - Print*. Chose the desired printer.

Advanced Setup and Management

This section describes the configuration changes which can be made to your Level One Printer Server device.

Changing the Device Configuration

Windows Software

In a mixed Windows PC/Macintosh environment, you can use the BiAdmin utility program to configure the Level One Printer Server.

For details on installing and using BiAdmin, refer to *Chapter 4 - BiAdmin*.

Macintosh Software

In AppleTalk, you can use **SimpleText** to edit the Level One Printer Server's CONFIG file and the supplied **PSTool** program to send it to the Level One Printer Server. The procedure is as follows:

1. Copy the following files from the \PS\Utility\Apple folder on the CD-ROM to an appropriate folder on your hard disk.
 - PSTool
 - CONFIG file (e.g. config.3p)
2. Use **Chooser** to select the desired Level One Printer Server.
3. Double click the CONFIG file, and edit it. The contents of the file will vary depending on your model, but will look something like the example below.

```

begin CMD
0001 Device Name: xxxxxxxx
3000 Apple Zone : *
3001 Printer Type (P1): LaserWriter
3002 Printer Type (P2) LaserWriter
3004 Printer Type (P3) LaserWriter
3101 AP_PCOMM1: No
3102 AP_PCOMM2: No
3104 AP_PCOMM4: No
9002

```

The appropriate values for each line are described in the following section.



Do NOT modify the following lines:
begin CMD
9002:

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

AppleTalk Settings

When editing the CONFIG file, only the *parameter* should be changed. The *parameter* is the last part of the line, after the colon (:). Ensure that you use only valid *parameters*.

0001 Device Name: xxxxxxxx

The *Device Name* will initially be the *Default Server Name*. The *Default Server Name* is shown on a sticker on the base of the device. The *Device Name* can be changed, but the new name MUST NOT exceed 19 characters in length.

3000 Apple Zone: *

The default value “*” allows all AppleTalk zones to access the Level One Printer Server’s printers. To restrict access to a particular zone, enter the zone name here.

3001 Printer Type (P1): LaserWriter

3002 Printer Type (P2): LaserWriter

3004 Printer Type (P3): LaserWriter

These are text fields, used to describe the printer driver used for each port. P1, P2, P3 refer to parallel ports 1 to 3 respectively. The name can be up to 19 characters long.

3101 AP_PCOMM1: No

3102 AP_PCOMM2: No

3104 AP_PCOMM4: No

These settings determine whether the port uses ASCII or Binary Communication Protocol. Enter NO for ASCII or YES for Binary. The lines refer to the following ports.

3101 AP_PCOMM1:	Parallel Port 1
3102 AP_PCOMM2:	Parallel Port 2
3104 AP_PCOMM4:	Parallel Port 3

In choosing which Protocol to use, consider the following points.

- Binary communication is twice as fast as ASCII
- ASCII communication is more reliable
- The computer, Level One Printer Server and printer **MUST** all be configured to use the **SAME** protocol. Check your printer manual for details of printer configuration, and use the *Print* menu to configure your computer, so that they use the same settings as the Level One Printer Server.

This chapter describes using your Level One Printer Server in the NetWare environment.

Overview

This section describes how the Level One Printer Server functions in the Novell NetWare environment.

The Level One Printer Server fully supports both Bindery and NDS Novell systems, and be configured as either a NetWare *Printer Server* or NetWare *Remote Printer*.

Novell Distributed Printing Services (NDPS) using TCP/IP under NetWare 5 is also supported. See page 62 for details.

Logical Printers (Ports)

Logical Printers can be used to create a “Virtual” printer. Single port models support 3 logical printers, while multi-port models support 8 logical printers.

The Logical Printers are named L1, L2, and L3; or L1 to L8 on multi-port models. The names can not be changed.

Configuring NetWare

PCONSOLE or NWAdmin must be used to create new (logical) printers and assign print queues to the printers. When creating logical printers, NetWare Printer 8 corresponds to Logical printer L1 on the Level One Printer Server, printer 9 to Logical printer L2, and so on up to printer 15 (logical printer L8).

Configuring the Level One Printer Server

The Level One Printer Server requires the following data, if logical printers are going to be used.

Physical Port	Select the parallel port (P1 to P3) for this Logical Printer
String Before Job	The printer control string (in Hex) to be sent to the printer before each print job.
String After Job	The printer control string (in Hex) to be sent to the printer after each print job.

Convert LF to CR+LF	If ON, LF (line feed) characters are changed to CR+LF (carriage return + line feed). If OFF, no conversion is done.
----------------------------	---

Configuration Methods

To support the widest possible range of users, the Level One Printer Server is supplied with the utilities listed in the following table.

Note that this document covers only BiAdmin with Novell's Client 32 software installed on your PC. For more details about the other methods, refer to the full User Manual on the CD-ROM.

- BiAdmin** If possible, you should use the supplied BiAdmin utility for configuration. BiAdmin is a powerful, user-friendly program which runs under Windows 95/98/NT.
- See *Chapter 4 - BiAdmin Utility* for details on installing this program, and general instructions on usage.
- BiAdmin works best if you have Novell NetWare Client 32 for Windows installed.
- Quickset** QUICKSET is a DOS-based command-line program. It will configure the Level One Printer Server and the current Novell server in a single operation. However, it provides few options.
- PSConfig** PSConfig is a DOS-based, menu-driven program. It uses the IPX/SPX protocol to connect to the Level One Printer Server, so your PC must load the IPX/SPX drivers before PSConfig can be used.
- PSConfig can only configure the Level One Printer Server itself. You must use the NetWare's PCONSOLE or NWAdmin to configure the NetWare server.

Using BiAdmin with Client 32

With NetWare Client 32 installed on your PC, BiAdmin's NetWare capabilities are enhanced. As well as configuring the Level One Printer Server, you can configure the NetWare Server or Servers.

Preparation

1. Ensure that you are logged into the NetWare server(s) you wish to use. You need to have ADMIN rights so you have permission to create printer objects and queues.
2. Start BiAdmin.
3. Select a Level One Printer Server from the list.
4. Select the NetWare icon.
5. From the resulting screen, shown below, select the operating mode to match your NetWare server, and click *Configure*. The following sections describe the screens for each of these selections.

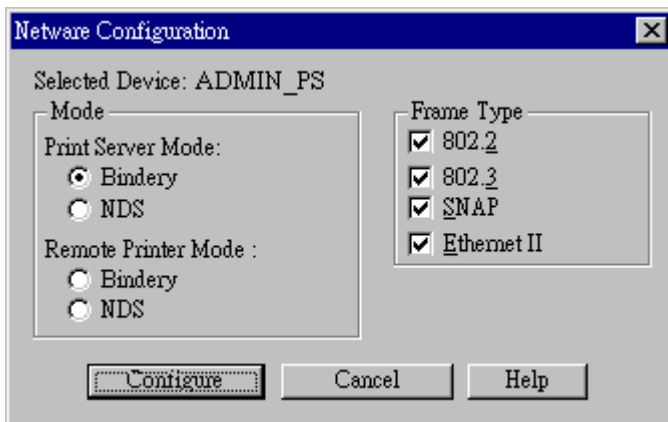


Figure 22: NetWare Mode

Print Server Mode – Bindery

If *Bindery Print Server Mode* is selected, the following screen will appear:

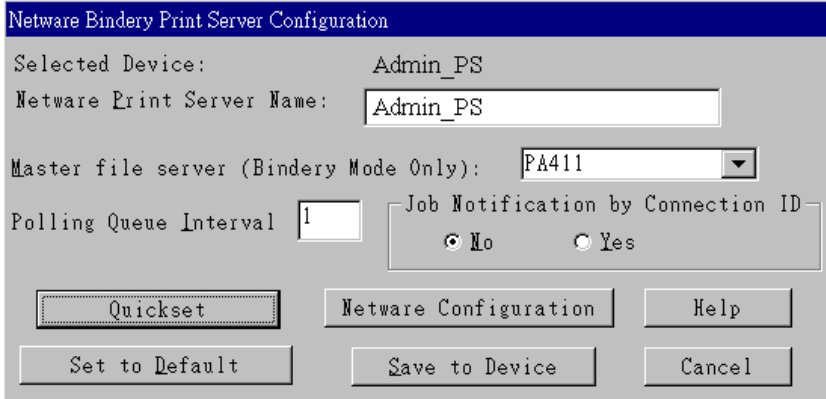


Figure 23: Bindery Print Server Mode

Data	
Print Server Name	Change the name of the selected Level One Printer Server if you wish. (This field is also on the <i>Configuration-System</i> menu.)
Master File Server	Name of the Level One Printer Server’s master file server (NetWare server). Select from the drop-down list.
Polling Queue Interval	Defines how often the Level One Printer Server will poll the queues to be serviced. The default is 1 second.
Job Notification by Connection ID	Set to <i>Yes</i> to receive a job notification at only the workstation where the print job originated, <i>No</i> to receive a job notification at all workstations that you have logged on.
Buttons	
Quickset	This option will configure the NetWare server using default values. See below for details.

NetWare Configuration	Use this to configure the NetWare server. See below for details. See the following section for details
Help	View context-sensitive help.
Set to Default	Replace the on-screen values with the default values. These are NOT saved until you click <i>Save to Device</i> . (No changes are made to the NetWare server.)
Save to Device	Save any changes you have made to the Level One Printer Server
Cancel	Ignore any changes made since the last <i>Save</i> operation; close the window.

Quickset Button (Bindery)

The *Quickset* button on the previous screen will configure the NetWare server using default values derived from the default name, as shown on the following example.

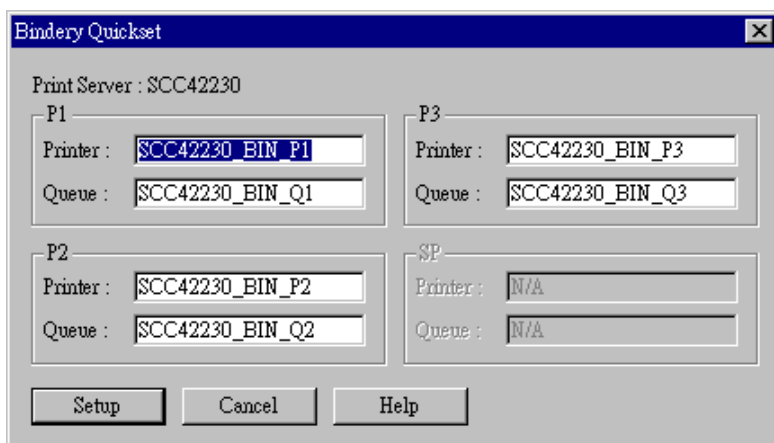


Figure 24: Bindery Quickset

This screen displays the name the selected Level One Printer Server, and the following information for each port:

Printer – the NetWare printer object which will be created on the current server.

Queue – the NetWare queue associated with the Printer Object. This queue will be serviced by the current Level One Printer Server, with print jobs being sent to the port shown.

Change the default values if you wish, then click *Setup* to create these objects on the NetWare server.

NetWare Configuration Button (Bindery)

Clicking the *NetWare Configuration* button will reveal one of the following screens, depending on the number of servers:

If you have multiple File Servers:

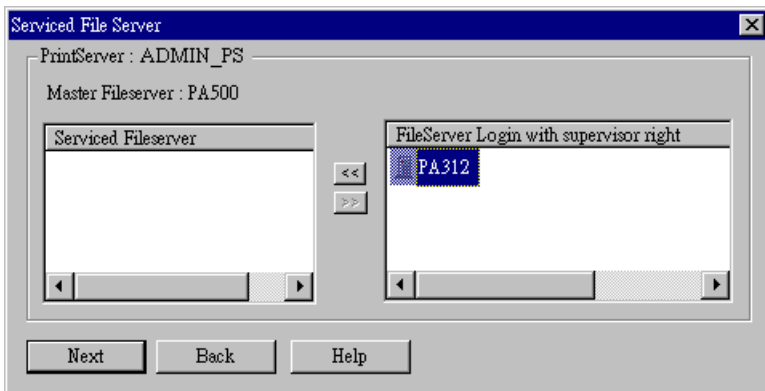


Figure 25: Assigning Additional File Servers

- This screen allows you to set the Level One Printer Server to service additional file servers. Normally, the Level One Printer Server will service only the *Master File Server*.
- The right column lists any available servers. Note that to be available, you must be logged into the Server with Supervisor rights.
- Use the “<<” and “>>” buttons to move file servers to and from the *Serviced Fileserver* list on the left.
- When completed, click *Next*. This will create a NetWare Print Server object on the *Serviced Fileserver* if it does not yet exist. The NetWare Print Server will have the same name as the NetWare Print Server on the *Master File Server*.
- After clicking *Next*, you will see the screen below.

If you have a single File Server:

Clicking the *NetWare Configuration* button will reveal the following screen:



Figure 26: Configure NetWare Server (Bindery PS mode)

- The NetWare Print Server name is shown at the top of the screen. If more than 1 NetWare server is used, this name is the same on every NetWare server.
- The options available are :

File Server This drop-down list will be operational only if you have assigned more than 1 file server to be serviced by the Level One Printer Server.

Printer Create Printer Objects, assign Print Queues, and assign users to Print Queues (Required). See the following section for details.

Operator Assign Operators to the NetWare Print Server object. (Optional) These operators will then have permission to manage the NetWare Print Server object. The screen is identical to *Figure 30: Assign Operator to Queue (Bindery)*.

User Assign Users to the NetWare Print Server object. (Optional) These users will then be able to view the status of the NetWare Print Server object. The screen is identical to *Figure 29: Assign Users to Queue (Bindery)*.

Password Change the login password used by the Level One Printer Server when it connects to the NetWare server. By default, there is no password. See *Password* for details.

"Printer" Button

1. After selecting the *Printer* button on the screen above, the NetWare printer objects (1 for each port on the Level One Printer Server) will be created if they do not yet exist.
2. The next screen (shown below) allows you to select the desired port on the Level One Printer Server. This also selects the printer object. You can NOT change the printer object associated with the port.

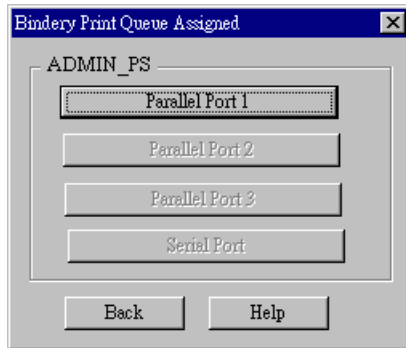


Figure 27: Select Printer Port (Bindery)

3. After selecting the desired port, you will see a screen like the following example, which allows you to assign printer queues to the printer object.

Assigning Printer Queues (Required)

This screen will be displayed when a port button is clicked on the previous screen.

Use this screen to assign queue(s) to the printer object associated with the selected port.

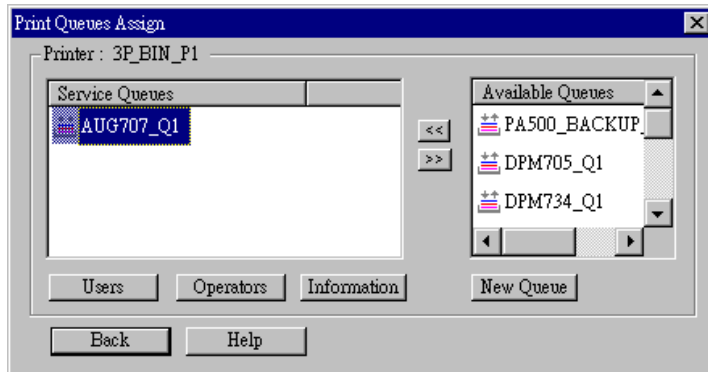


Figure 28: Assign Queues (Bindery)

This screen displays the name of the NetWare Printer on the top of the screen.

Queues serviced by this NetWare printer are listed on the left, and other queues on the right.

- Create a new queue by clicking *New Queue*. Enter the name in the dialog.
- Assign an existing queue by selecting a queue on the right, and clicking the “<<” button.
- Stop servicing a queue by selecting it from the list on the left, and clicking the “>>” button.
- When a Queue on the left is selected, the *Users*, *Operators*, and *Information* buttons become available.

To Assign Users to Queues (Required)

Select the queue, then click *Users* on the screen above to see the following screen. The current queue name is shown on the top of the screen.

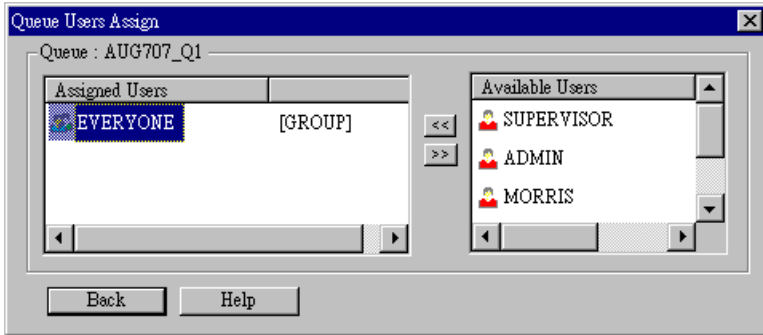


Figure 29: Assign Users to Queue (Bindery)

- Assign a user or group by selecting them on the right, and clicking the “<<” button.
- Remove an assignment by selecting the user or group from the list on the left, and clicking the “>>” button.

To assign operators to Queues (Optional)

Select *Operators* from *Figure 28: Assign Queues* to view the following screen.

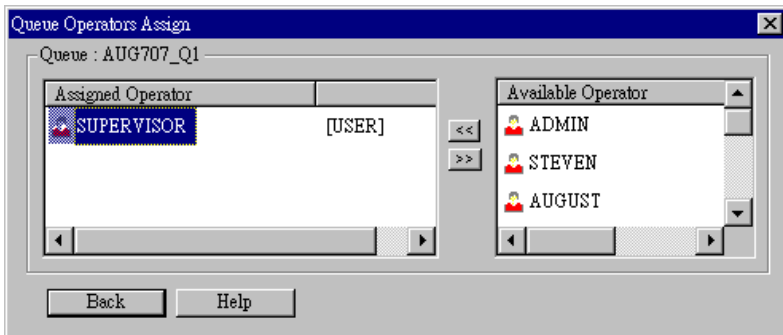


Figure 30: Assign Operator to Queue (Bindery)

- Assign an operator by selecting them on the right, and clicking the “<<” button.
- Remove an assignment by selecting the operator from the list on the left, and clicking the “>>” button.

Password

Clicking the **Password** button on the screen shown in *Figure 26: Configure NetWare Server (Bindery PS mode)* allows you to simultaneously change the NetWare password for the *Master File Server*, and the NetWare login password stored in the Level One Printer Server. (The Level One Printer Server must be able to login to the NetWare server.)

You will see a screen like the example below.

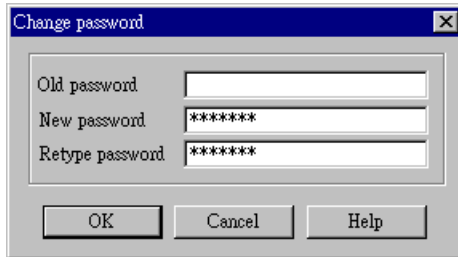


Figure 31: NetWare Password (Bindery PS Mode)

- Enter the old (NetWare) password, and enter the new password in both fields provided.
- If the printer object has been created by BiAdmin, the *Old Password* will be blank. In that case, leave this field empty.
- The new password will be saved both on the NetWare server and the Level One Printer Server.

Print Server Mode – NDS

If *Print Server – NDS Mode* was chosen, the following screen will appear.

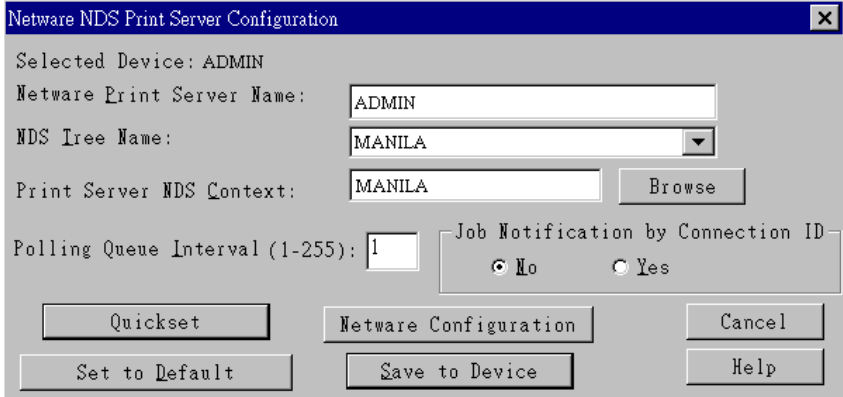


Figure 32:NDS Print Server Mode

Data	
Print Server Name	Change the name of the selected Level One Printer Server if you wish. (This field is also on the <i>Configuration-System</i> menu.)
NDS Tree Name	Select the File Server's NDS tree name (root name)
Print Server NDS Context	Select <i>Browse</i> to view the NDS tree and select the appropriate Context.
Polling Queue Interval	Defines how often the Level One Printer Server will poll the queues to be serviced.
Job Notification by Connection ID	Set to <i>Yes</i> to receive a job notification at only the workstation where the print job originated, <i>No</i> to receive a job notification at all workstations that you have logged on.
Buttons	
NetWare Configuration	Use this to configure the NetWare server. See the following section for details.

Quickset	This option will configure the NetWare server using default values. See below for details.
Help	View context-sensitive help.
Set to Default	Replace the on-screen values with the default values. These are NOT saved until you click <i>Save to Device</i> . (No changes are made to the NetWare server.)
Save to Device	Save any changes you have made to the Level One Printer Server
Cancel	Ignore any changes made since the last <i>Save</i> operation; close the window.

Quickset Button (NDS)

The *Quickset* button on the screen above will configure the NetWare server with default values based on the default name of the Level One Printer Server.

You will see a screen like the following example.

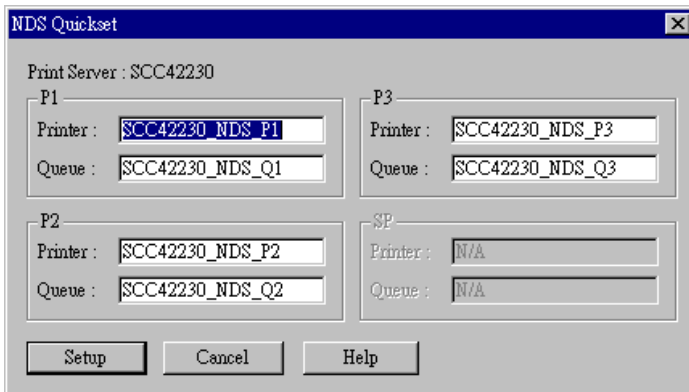


Figure 33: NDS Quickset

Change the default values if you wish, then click *Setup* to create these objects on the NetWare server.

The configuration data will be saved to the NetWare server and the Level One Printer Server.

NetWare Configuration Button (NDS)

Clicking this button will reveal the following screen.

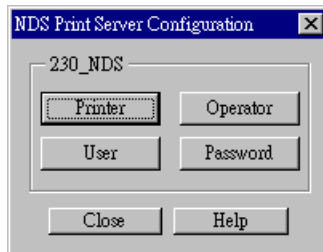


Figure 34: NetWare Configuration (NDS PS mode)

The NetWare Print Server name is shown at the top of the screen.

The options available are :

- **Printer** – Create Printer Objects, assign Printer Queues, and assign users to Queues (Required). See the following section for details.
- **Operator** – Assign Operators to the NetWare Print Server object. (Optional) These operators will then have permission to manage the NetWare Print Server object. The screen is identical to *Figure 38: Assign Operators to Queue (NDS PS mode)*.
Note: Operator assignment has no effect on the Level One Printer Server. This facility is provided only for the convenience of NetWare administrators.
- **User** – Assign Users to the NetWare Print Server object. (Optional) These users will then be able to view the status of the NetWare Print Server object. This is optional; printing requires only that users be assigned to queues, not to the NetWare Print Server. The screen for assigning users to a NetWare Print Server is identical to *Figure 37: Assign Users to Queue (NDS PS mode)*.
- **Password** – Change the login password used by the Level One Printer Server when it connects to the NetWare server. By default, there is no password. See *Password (NDS)* for details.

Printer button

1. After selecting **Printer** above, the NetWare printer objects (1 for each port on the Level One Printer Server) will be created if they do not yet exist.
2. The next screen (shown below) allows you to select the desired port on the Level One Printer Server. This also selects the printer object. You can NOT change the printer object associated with the port.

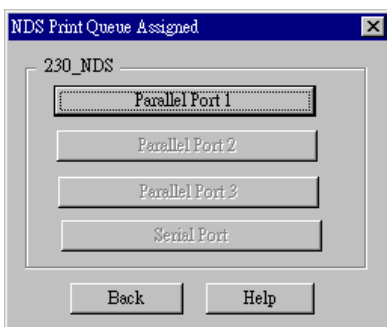


Figure 35: Select Printer Port (NDS)

- After clicking on the button for the desired port, you will see a screen like the following example. Use this screen to assign queue(s) to the printer object associated with the selected port.

Assigning Printer Queues (Required)

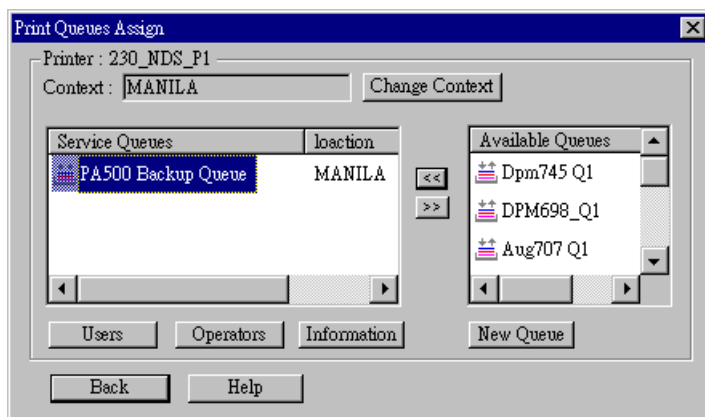


Figure 36: Assign Queues (NDS PS mode)

This screen displays the current NetWare Printer Object at the top of the screen.

Queues serviced by the current Printer Object are listed on the left, and other queues (in the current context) on the right.

- Use the *Change Context* button to change the current context. The *Available Queues* list on the right will then change to show the queues available in that context.

- Create a new queue by clicking *New Queue*. Enter the new name, and select the desired context.
- Assign an existing queue by selecting a queue on the right, and clicking the “<<” button.
- Stop servicing a queue by selecting it from the list on the left, and clicking the “>>” button.
- When a Queue on the left is selected, the *Users*, *Operators*, and *Information* buttons become available.

To Assign Users to Queues (Required)

Select on queue on the screen above, then click *Users* to see the following screen.

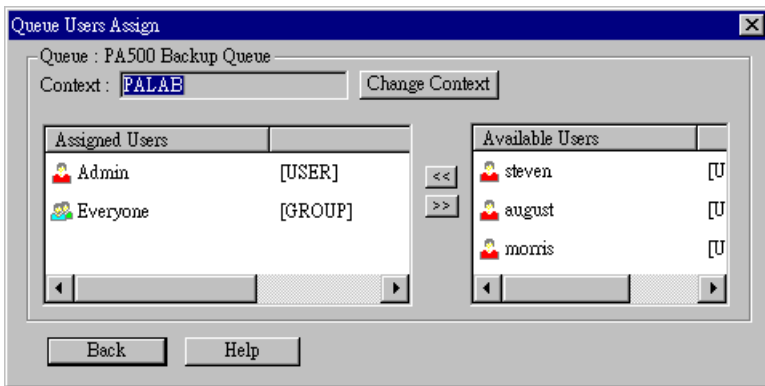


Figure 37: Assign Users to Queue (NDS PS mode)

The screen allows you to assign users to the current queue. The current queue is displayed on the top of the screen.

- Use the *Change Context* button to change the current context. The *Available Users* list on the right will then change to show the users available in that context.
- Assign a user or group by selecting them on the right, and clicking the “<<” button.
- Remove an assignment by selecting the user or group from the list on the left, and clicking the “>>” button.

Note: If you select *User* from *Figure 34: NetWare Configuration (NDS PS mode)*, you will see a similar screen, which allows you to assign users to the Printer Object, rather than the Printer Queue.

To assign operators to the Print Queue (Optional)

To assign Operators to the selected queue, select *Operators* from *Figure 36: Assign Queues (NDS PS mode)*. This step is optional; operator assignment has no effect on operation of the Level One Printer Server.

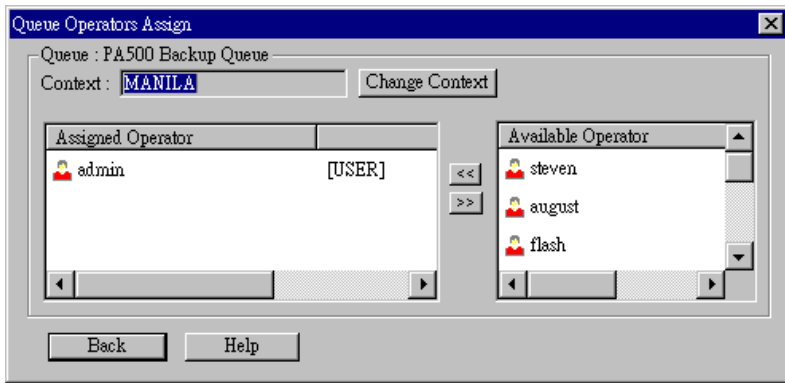


Figure 38: Assign Operators to Queue (NDS PS mode)

The current Queue and Context are displayed at the top of the screen.

- Use the *Change Context* button to change the current context. The *Available Operators* list on the right will then change to show the queues available in that context.
- Assign an operator by selecting them on the right, and clicking the “<<” button.
- Remove an assignment by selecting the operator from the list on the left, and clicking the “>>” button.

Note: If you select *Operator* from *Figure 34: NetWare Configuration (NDS PS mode)*, you will see a similar screen, which allows you to assign users to the Printer Object, rather than the Printer Queue.

Password (NDS)

Clicking the **Password** button on the screen shown in *Figure 34: NetWare Configuration (NDS PS mode)* allows you to simultaneously change the NetWare password for the *Master File Server*, and the NetWare login password stored in the Level One Printer Server. (The Level One Printer Server must be able to login to the NetWare server.)

You will see a screen like the example below.

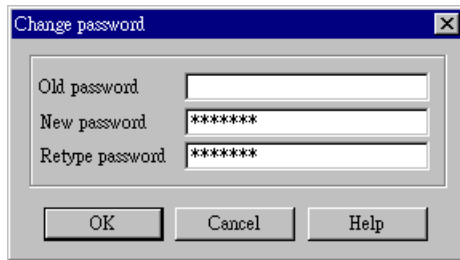


Figure 39: NetWare Password (NDS PS Mode)

- Enter the old (NetWare) password, and enter the new password in both fields provided.
- If the printer object has been created by BiAdmin, the *Old Password* will be blank. In that case, leave this field empty.
- The new password will be saved both on the NetWare server and the Level One Printer Server.

Remote Printer Mode – Bindery

If, on the original screen, *Remote Printer Mode - Bindery*, was selected, the following screen will be shown.

The screenshot shows a dialog box titled "Netware Bindery Remote Printer Configuration". It contains the following fields and values:

- Selected Device: AC_PS
- Device Name: AC_PS
- FileServer: PA411
- Novell Printer Server for P1: AC_PS
- Novell Printer Server for P2: AC_PS
- Novell Printer Server for P3: AC_PS
- Novell Printer Server for SP: N/A

At the bottom of the dialog are four buttons: "Set to Default", "Save to Device", "Cancel", and "Help".

Figure 40: Bindery Remote Printer

Data	
Device Name	Change the name of the selected Level One Printer Server if you wish. (This field is also on the <i>Configuration-System</i> menu.)
File Server	Select the NetWare File Server to service each port.
Novell Printer Server for P1 (Parallel port 1)	Select the NetWare print server to service the Level One Printer Server's parallel port 1.
Novell Printer Server for P2, P3	Select the NetWare print server to service the Level One Printer Server's parallel port 2 (P2), parallel port 3 (P3).
Buttons	
Set to Default	Replace the on-screen values with the default values. These are NOT saved until you click <i>Save to Device</i> . (No changes are made to the NetWare server.)
Save to Device	Save any changes you have made to the Level One Printer Server

Cancel	Ignore any changes made since the last <i>Save</i> operation; close the window.
Help	View context-sensitive help.

Remote Printer Mode – NDS

If, on the original screen, *Remote Printer Mode - NDS* was selected, the following screen will be shown.

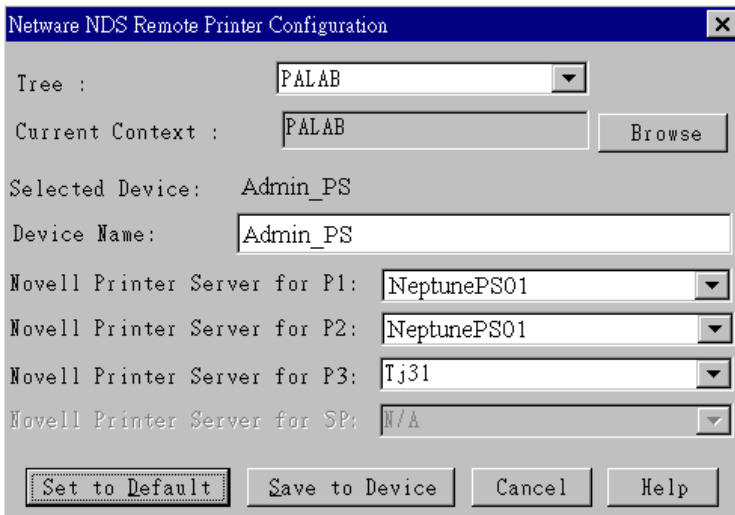


Figure 41: NDS Remote Printer

Data	
Device Name	Change the name of the selected Level One Printer Server if you wish. (This field is also on the <i>Configuration-System</i> menu.)
NDS Tree Name	Select the NDS tree
Current Context	Select <i>Browse</i> to view the NDS tree and select the appropriate Context.

Novell Printer Server for P1 (Parallel port 1)	Select the NetWare print server to service the Level One Printer Server's parallel port 1.
Novell Printer Server for P2, P3	Select the NetWare print server to service the Level One Printer Server's parallel port 2 (P2), parallel port 3 (P3).
Buttons	
Set to Default	Replace the on-screen values with the default values. These are NOT saved until you click <i>Save to Device</i> . (No changes are made to the NetWare server.)
Save to Device	Save any changes you have made to the Level One Printer Server
Cancel	Ignore any changes made since the last <i>Save</i> operation; close the window.
Help	View context-sensitive help.

NDPS (NetWare 5)

Overview

- The Level One Printer Server must first be configured as a valid device on your TCP/IP network. See *Chapter 7 - TCP/IP* for details.
- To use DNPS (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 DNPS, using TCP/IP. *Public Access Printing* allows anybody on the network to access the printer.

The procedure has 3 parts:

1. Create a NDPS Manager Object on the server.
2. Create a NDPS Printer Agent on the server.
3. Configure each workstations requiring access to the NDPS printers.

Creating an NDPS Manager Object

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.

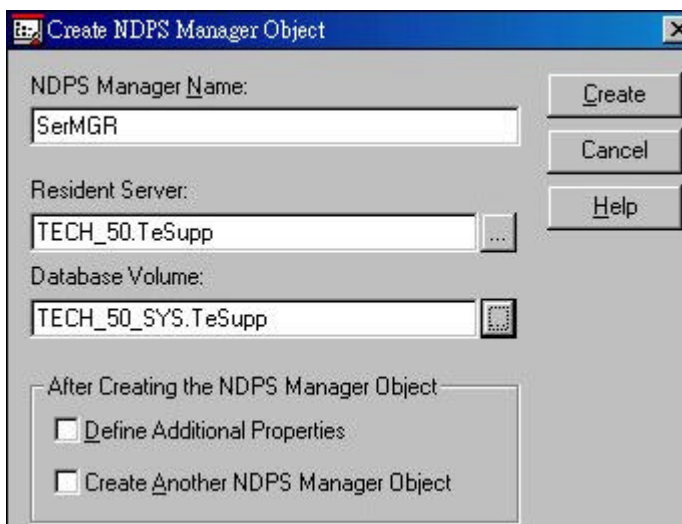


Figure 42: Create DNPS Manager Object

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 DNPS 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.

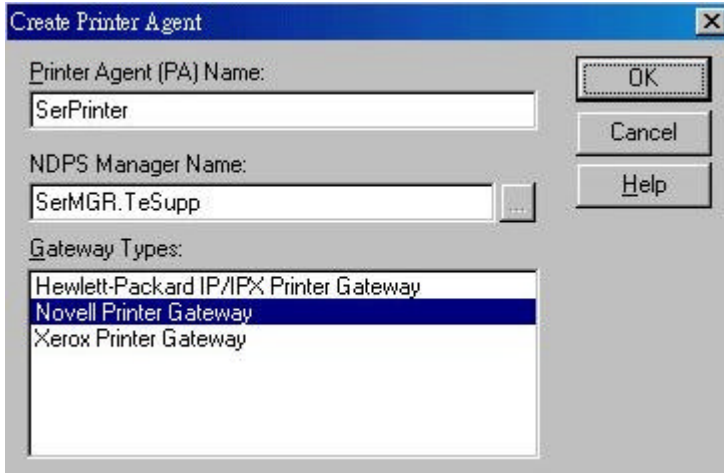


Figure 43: Create Printer Agent

4. Enter the desired name for the *Printer Agent (PA) Name*
5. Normally, the *DNPS 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.

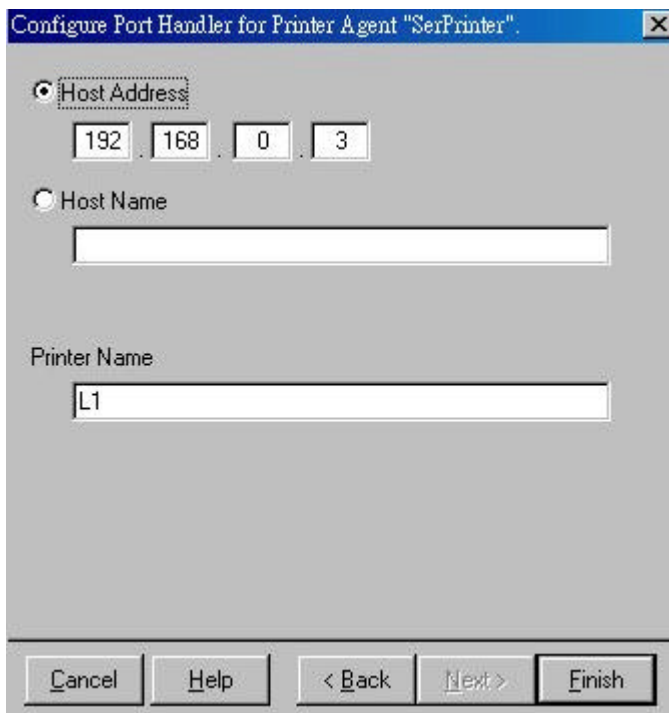


Figure 44 Configure Port Handler

10. In the *Host address IP* field, enter the IP Address previously assigned to the Level One Printer Server device.
11. In the *Printer Name* field, enter the Logical Port name on the Level One Printer Server. (e.g.: L1)
Note: For Level One Printer Servers with one parallel port, the logical ports are named L1, L2 and L3. For devices with three parallel ports, the logical ports are named L1 to L8.
12. Click *Finish*, then select appropriate drivers for Windows 3.1, Windows 95/98 and Windows NT 4.
13. The new Printer Agent will now appear in the Printer Agent List window

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

Workstation Configuration

Before attempting to install and configure Public Access Printers on your workstation, ensure that:

- Novell IntranetWare Client v2.2 (or later) is installed on your PC
- You have access to the Novell Printer Manager utility (e.g. Nwpmw32.exe)

Procedure

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

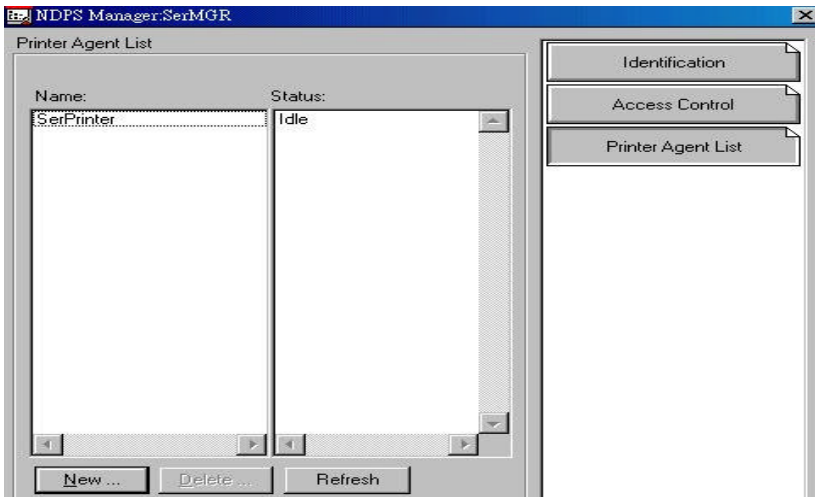


Figure 45: NDPS Manager - Client

4. The printer (e.g.: SerPrinter in the example above) appears in the main Printer Manager window in the *Name* list, and is available for print jobs. Printer drivers are automatically downloaded from the server as required.
5. The printer will appear in your Windows printer list, and may be used from by any Windows application.

TCP/IP

7

This chapter covers configuration of the Level One Printer Server in a TCP/IP environment.

Overview

- The following procedure can NOT be used with model EPS-3001TU. For this model, the **BiAdmin** utility program should be used for configuration. See *Chapter 4* for details on installing and using BiAdmin.
- If using TCP/IP in a Peer-to-peer printing environment, refer to *Chapter 10 - Windows Peer-to-peer*.
- This chapter covers configuration of the Level One Printer Server only. For host configuration, refer to *Chapter 8 - Unix* or *Chapter 9 - Windows NT Server*.

Web Browser Configuration

100BaseT Printer Server models incorporate a HTTP server. This allows you to connect to the Level One Printer 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 Level One Printer 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 **DCHP server** (if you have one), and determine the IP Address allocated to the Level One Printer Server.
- Use **BiAdmin** or another Level One Printer Server utility to allocate a valid IP Address to the Level One Printer Server.
- Add an entry to the **arp** table to associate the hardware address of the Level One Printer 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 Level One Printer Server

00:c0:02:xx:xx:xx is the hardware address of the Level One Printer 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
```



The **Default Server Name** and the **Hardware Address** of the Level One Printer Server are shown on a sticker on the base of the device.

Connecting to the Level One Printer Server

1. Start your Web Browser
2. In the *Address* box, enter *HTTP://* followed by the IP Address of the Level One Printer Server.
e.g.

```
http://192.168.0.21
```
3. You will then be prompted for the password. If no password has been set, just press ENTER.
4. Use the top menu bar to move about. Remember to save each screen before changing to a different screen.

TCP/IP Configuration

Selecting *TCP/IP* will display the screen below.

Appletalk	NetBeui	NetWare	SNMP	TCP/IP
Configure Server	Server Status	Printer Ports	Logical Printers	Internet Printing

TCP/IP

LAN Settings

Device IP Address	192	168	0	1
Router IP Address	0	0	0	0
Network Mask	255	255	255	0

TCP/IP Reconnection Settings

Delay before reconnection attempt (secs)	2	(0..255)
Number of reconnection attempts	254	(0..255)

Figure 46: TCP/IP Screen

Data - TCP/IP Screen

IP Address	<p>The Level One Printer Server is able to obtain an IP Address dynamically, using DHCP, Bootp, or rarp. Normally, it will check these methods in sequence, but each method can be individually disabled using BiAdmin. (See Chapter 4). For more details on using Bootp or rarp, refer to <i>Chapter 8 - Unix</i>.</p> <ul style="list-style-type: none"> To use a dynamic IP Address leave the IP Address here at 0.0.0.0. To use a fixed (static) IP Address, enter an unused IP Address from the IP Address range used your LAN (or LAN segment, if routers are installed).
Router (Gateway) IP Address	<p>If your network segment has a router, enter the router address here. If there is no router, leave the address as 0.0.0.0.</p>

Network Mask	If the Router is 0.0.0.0, the Network Mask should also be left at 0.0.0.0. If you have a router, enter the Network mask (Subnet mask) for the segment to which the Level One Printer Server is attached.
Delay before reconnection attempts	Sets how long the Level One Printer 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	Sets 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.

Logical Printer Configuration

Logical Printers can be used to create a “Virtual” printer. For example, to create a Landscape printer, you could define a Logical Printer as follows:

- Pre-string** Printer Control codes to switch the printer to Landscape mode
- Post-string** Printer Control codes to reset the printer, restoring the default settings.

Another logical printer could be used to print Unix-format text files for a DOS printer, by converting Unix-style LF (Line Feeds) to DOS-style LF/CR (Line Feed, Carriage Return) pairs.

The Level One Printer Server supports 8 Logical Printers. The names (L1..L8) cannot be changed. Each Logical Printer has 4 settings as shown below.

Logical Printer Setup Data

Physical Port	Level One Printer Server parallel port (P1 to P3) to which the printer is attached.
String Before Job	The printer control string (in hex) to be sent to the printer before each print job.
String After Job	The printer control string (in hex) to be sent to the printer after each print job.

Convert LF to CR+LF	If ON, LF (line feed) characters are changed to CR+LF (carriage return + line feed). If OFF, no conversion is done.
----------------------------	---

*Note!*

The maximum size of printer control strings is 15 characters, and they must be entered in HEX.

Other Screens

Other screens which may be useful in a TCP/IP environment:

- **Configure Server** - Change the Level One Printer Server name, password, and disable network protocols not used on your LAN.
- **SNMP** (Simple Network Management Protocol) - Configure the Level One Printer Server for use with SNMP Programs. *See Chapter 11- Special Features* for details.
- **Server Status** - Check the current settings of the Level One Printer Server.
- **Printer Port** - Check the status of the printers attached to the Level One Printer Server.

Telnet

Telnet can be used to monitor the status of the printers attached to the Level One Printer Server.

Operation

Establish a connection to the Level One Printer Server, by starting your Telnet program and providing the IP Address of the Level One Printer Server. (No port number is required.)

e.g. `telnet 192.168.0.21`

The Printer Server will respond with "Welcome to Print Server". From the resulting prompt, 3 commands are possible:

- **Help**: Show brief help
- **Monitor**: show printer status
- **Exit**: leave telnet

The Monitor command will show the status of the printer on each port., as shown below. The display is updated once per second.

```
(P1)STATE: Idle
TYPE: Parallel
PRINTER STATUS: Out Of Paper

(P2)STATE: Printing
TYPE: Parallel
PRINTER STATUS: On-Line
BYTES SERVICED:      75264
OCCUPIED BY: LPD

(P3)STATE: Idle
TYPE: Parallel
PRINTER STATUS: Idle
```

This chapter describes using your Level One Printer Server in the Unix environment.

Overview

Software Requirements

- TCP/IP protocol, FTP (Optional: - BOOTP, Rarp, Telnet)
- LPD printing system (for LPD printing)
- C Compiler (for PSfilter proprietary printing system only).

IP Address Configuration

The Printer Server must be provided with a IP Address so that it will be a valid device on the LAN. This can be done using either *Static* or *Dynamic* IP Address configuration.

Procedure

1. Login to the UNIX host as root.
2. Connect to the Level One Printer Server and configure it with your Web browser, as explained in *Chapter 7 - TCP/IP*. Note the following points:
 - If using static IP Addresses, you will need to add an entry to your arp table, as described in Chapter 7.
 - If using bootp or rarp, the Unix host must be configured as explained in the following section, before you can connect to it.
3. Add an entry for the Level One Printer Server to the /etc/hosts file. This will allow you to address the Level One Printer Server by name, rather than by IP Address. The line in the hosts file looks like the following:

```
IP_Address NAME # comment
```

Where:

IP_Address is the IP address for the Printer Server. This address **must match** the address stored in the device.

NAME is the Printer Server's name. This **must match** the name stored in the device.

comment. Add the Default Server Name as a comment. The Default Server Name is shown on a sticker on the base of the device.

Example:

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

In the example above, PS123456 is assigned the IP address 192.10.2.54 and the name “PS_Rm203”.

4. Check the IP Address using the **ping** command:

```
ping NAME
```

You should receive a response. If you get a *Timeout* message, the above procedure has failed.

Using BOOTP

If using bootp, no arp table entry is necessary, but the following configuration is required:

1. Add the following entry to the Boot Table `/etc/bootptab`

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

Where

NAME is the Level One Printer Server’s name

PA is the hardware address of the Level One Printer Server

IP is the Level One Printer Server’s IP Address

SM is the Subnet Mask

GW is the Gateway IP Address

2. If it is not running, start the bootp daemon (the usual command is `bootpd`) and reset the Printer Server. It will then acquire an IP Address using bootp.

Using RARP

If using rarp, no arp table entry is necessary, but the following configuration is required:

1. If the rarp daemon is not running, start it with the command:

```
rarpd -a
```

2. Add a line to the Ethernet Address table `/etc/ethers`

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

Where

00:c0:02:xx:yy:zz is the hardware address of the Level One Printer Server

NAME is the name of the Level One Printer Server.

3. Reset the Level One Printer Server. When it reboots, it should acquire an IP Address from rarp.

Printing Methods – Overview

There are 4 printing methods to choose from. All are explained in the following sections. Select whichever is the most convenient in your environment.

LPD

LPD is a standard print method for most UNIX systems. Using this method eliminates the need to install additional host software. However, in many cases the LPD protocol sends out the data file before the control file. The Printer Server will print the data file immediately, ignoring any print options set in the control file. To solve this problem, use PSfilter instead.

Direct Socket Interface

The Direct Socket Interface (DSI) is a Unix-based method of providing a “direct” connection between a host computer and a printer. The host and the Printer Server establish a TCP connection, using a special socket number. All data sent over this connection is treated as print data, and sent transparently to a logical printer defined on the Printer Server.

PSfilter

Psfilter is a proprietary print method provided with the Level One Printer Server as “C” source code. The benefit of this method is that it provides many print options such as banner print, copies, and so on. For details, see page 81.

FTP (File Transfer Protocol)

FTP is also a standard print method in most UNIX systems, but it is NOT recommended except as a test and back-up method of printing, because it does not use a print queue.

LPD Printing Configuration

LPD is a built-in printing protocol for most UNIX systems, and is also supported in Windows NT 3.5 or later.

LPD on IBM AIX 4.15

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

1. Add the Level One Printer Server to **/etc/hosts.lpd**, using the name you assigned to the Level One Printer 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:

Name of queue to add	Use a single-word queue name which indicates which printer is attached.
Hostname for remote server	Level One Printer Server name as used in /etc/hosts.lpd.
Name of queue on remote server	Logical printer number (L1..L8) 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 Level One Printer Server. Refer to *Chapter 7 - TCP/IP* for details.
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 Level One Printer Server. Keep the following points in mind:

- The **remote host name** is the name of the Level One Printer Server.
- The **remote printer name** is the print queue name for the Logical Printer. Logical printers also need to be configured on the Level One Printer Server itself. (See).
- If your UNIX asks for the LPD type, be sure to identify the service type as BSD. The Level One Printer 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 Level One Printer Server, and *Spooler_directory* is the name of the directory 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 Level One Printer Server name defined in `/etc/hosts`

Logical_Printer_name is the logical printer name on the Level One Printer Server (L1..L3 or L1..L8, depending on your model)

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 BSD

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

- The **remote host name** is the name of the Level One Printer Server.
- The **remote printer name** is the logical printer (L1..L3, or L1..L8) on the Level One Printer 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 Level One Printer Server, and *Spooler_dir* is the name of the directory used to spool the print jobs.

Procedure

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

Adding Remote Printers

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



Note!

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 Printer Server name defined in `/etc/hosts`

Logical_Printer_name is the logical printer name on the Printer Server (L1..L3 or L1..L8)

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.

Other Printing Methods

Your Printer Server supports 2 other printing methods:

- DSI (Direct Socket Interface)
- PSfilter (Proprietary print method)

Printing Using DSI

Logical printers must be configured on the Level One Printer Server as explained in *Chapter 7 - TCP/IP* (DSI supports only 3 Logical Printers).

Socket numbers are defined as follows:

Logical Printer No.	Socket No.
1	4010
2	4020
3	4030

Printing Using PSfilter

PSfilter is a proprietary print method provided with the Printer Server as “C” source code. It provides many print options. To use PSfilter, a C compiler and Socket Library must exist on the host so that `psfilter.c` can be compiled to an executable file.

The PSfilter program is shipped in source code as `psfilter.c`. Detailed instructions for installing, configuring, and using PSfilter are provided in the following files. These files, along with `PSfilter.c`, are stored on the CD-ROM in the following directories:

- PS\driver\lpti\lpsource (text format)
- PS\driver\lpti\tar (tar format)

Operating System	Filename
SCO UNIX System V Release 3	SCO.TXT
HP UXIX on HP workstation	HP.TXT
Sun 5.x on Sun SPARC workstation	SUN5.TXT
Sun 4.x on Sun SPARC workstation	SUN4.TXT
AT&T UNIX SV Release 4	SVR4.TXT

DEC/OSF1	DECOSF1.TXT
IBM AIX	AIX.TXT
UNIXWare	UNIXWARE.TXT



If your system is not listed above, do not attempt to use the PSfilter method of printing.

Windows NT Server (TCP/IP)

This chapter explains how to configure and use your Printer Server in the Windows NT Server TCP/IP environment.

Software Requirements

- Windows NT3.51 or later
- TCP/IP network protocol
- TCP/IP remote printing system (provided with Windows NT; configuration is described in this document).

Level One Printer Server Configuration

Note: The Printer Server should be configured FIRST.

Refer to *Chapter 7 - TCP/IP* for details on configuring the Level One Printer Server. It must have a valid IP Address.

Note that if you have a DHCP server, the Printer Server is assigned an IP Address of 0.0.0.0. It will then obtain an IP Address from the DHCP server. But using DHCP is only feasible if you have DHCP management software which allows you to take advantage of this feature. Otherwise, the Printer Server's IP Address will be unknown, and connection to it will be impossible. In this case, configure the Printer Server for a static IP Address.

Windows NT Host Configuration

This section covers configuration of a Windows NT host. The Level One Printer Server should be configured first. For Windows NT configuration in a Peer-to-Peer environment, see *Chapter 10 - Windows Peer-to-Peer*.

Host File Entry (Optional)

If you wish to refer to the newly-installed Level One Printer Server by its name, rather than by its IP Address, you must add an entry for it to the hosts file

```
\SYSTEM32\DRIVERS\ETC\HOSTS
```

The entry consists of the following line:

```
xxx.xxx.xxx.xxx Name
```

Where **xxx.xxx.xxx.xxx** is the IP Address you assigned to the Printer Server and **Name** is the Printer Server's name. This should match the name stored in the Printer Server itself. If you have not changed the name, use the *Default Server Name* shown on a sticker on the base of the device.

You can check that this has worked using the **ping** command, as follows:

```
ping Name
```

Where *Name* is the value used in the host file.

You should receive a response. If you get a *Timeout* message, there is a problem. If you repeat the command using the *IP Address* instead of *Name*, and get a response, then the problem is the entry in the host file.

Preparing for TCP/IP Printing

To create a TCP/IP remote printer, Microsoft *TCP/IP Printing Support* must be installed. If it is already installed, proceed to ***Adding a TCP/IP Remote Printer***. Otherwise, the procedure to install TCP/IP printing support is as follows.

Windows NT 3.51

1. Start the *Network* option in Control Panel. When the Network Settings dialog box appears, click the *Add Software* button to display the *Add Network Software* dialog box.
2. Select *TCP/IP Protocol And Related Components* in the Network Software list box, and then click the *Continue* button.
3. In the *Windows NT TCP/IP Installation Options* dialog box, check the *TCP/IP Network Printing Support* option.
4. Click the *OK* button. Windows NT Setup will display a message asking for the full path to the Windows NT distribution files. Provide the appropriate location and click the *Continue* button. All necessary files will be copied to your hard disk.
5. If you did not check the *Enable Automatic DHCP Configuration* option in the *Windows NT TCP/IP Installation Options* dialog box, you must complete all the required TCP/IP configuration procedures manually.
6. After you finish configuring TCP/IP, the *Network Settings* dialog box will reappear, click the *Close* button and then restart your computer for the changes to take effect.

Windows NT 4.0

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 affect.

Adding a TCP/IP Remote Printer

Windows 3.51

1. From the *Printer* menu in **Print Manager**, select *Create Printer*
2. In the resulting dialog box, enter data as follows:

Printer Name	Enter a name (up to 32 characters). This name appears in the title bar of the printer window.
Driver	Select the appropriate driver for the attached printer.
Description	Enter a printer description for other network users to reference.
Print To	Select <i>Other</i> .

3. A *Print Destinations* dialog box will appear after selecting *Other*. In the *Available Print Monitor* list, select *LPR Port*, then *OK*.
4. An *Add LPR compatible printer* window will appear. Enter data in the fields as follows:

Name Or Address Of Host Providing LPD	Enter the IP address of the Level One Printer Server
Name Of Printer On That Machine	Enter the appropriate logical printer number (L1..L8)

5. When the *Create Printer* dialog box reappears, check the *Share This Printer On The Network* option.
6. In the *Share Name* box, **Print Manager** creates a MS-DOS compatible resource name, which you can change if you wish. In the *Location* box, you can enter information concerning the printer location. Network users will see this information when browsing to find this printer.
7. Complete any other configuration information in the *Create Printer* dialog box.

Windows NT 4.0

1. Go to *Start-Settings-Printer* and invoke the *Add Printer* wizard.
2. When prompted with *This printer will be managed by*, select **My Computer** and click Next.
3. Select **Add Port...**, then select **LPR Port** and click **New Port**.
4. In the *Name of Address of server providing lpd:* dialog box, enter the Level One Printer Server's IP address.
5. In the *Name of printer or print queue on that server* dialog box, enter the appropriate logical printer number (L1..L8) as previously configured on the Level One Printer Server.
6. Click *OK*. When returned to the *Printer Ports* window, select *Close* and then install your printer driver as usual.
7. When prompted whether or not the printer will be shared, select the **Sharing** radio button
8. In the *Shared* dialog box, enter the shared printer name. The shared name is how other users will see this printer.

Printing with Windows NT

Windows Applications

The Level One Printer Server's printers will appear as *Network Printers* to users on the LAN.

- To install the printer on each PC, use the *Add Printer* wizard. Select *Network Printer* when prompted, and then select the appropriate destination.
- To print a file from an application, select the remote printer as the destination, and print the file as usual.

Command Line

To print a file from the command prompt, type:

```
lpr -S NT_Host -P printer_name file_name
```

Where:

NT_Host is the name of the NT host on which the remote printer is configured.

printer_name is the name assigned to the remote printer

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

To check the print status, type:

```
lpq -S NT_Host -P printer_name
```

Windows

Peer-to-Peer

This chapter describes operation in a Windows Peer-to-Peer Networking environment.

Overview

In a peer-to-peer environment, each PC communicates directly with the Level One Printer Server. This requires that the supplied **Printer Port Device Driver** software be installed and configured on **each** PC.

The Level One Printer Server supports both NetBEUI and TCP/IP. Both protocols can be used simultaneously.

The following Windows versions are supported:

- Windows 95/98 or later.
- Windows NT 3.51 or 4.0 or later.

Printer Server Configuration

- For NetBEUI, no configuration is required.
- If **any** PC will use TCP/IP, follow the procedure below.

Device Configuration - TCP/IP

When you install the **Printer Port Device Driver** software and select *TCP/IP* as the protocol, you can install a program called SETBOX. This program can be used to assign the above IP Addresses to the Level One Printer Server, as follows:

1. Run the **SETUP** program in the **PS\Driver\ptp_95nt** folder on the CD-ROM.
2. At the *Select Protocol* window, select the *TCP/IP* protocol.
3. At the *Select Components* screen, install **ONLY** the SETBOX utility. (Do **NOT** install the Device Driver until the Level One Printer Server is configured.)
4. Run the SETBOX program.

5. Enter the *Default Name* for the Level One Printer Server. The *Default Server Name* is shown on a sticker on the base of the device, and consists of 8 letters and/or digits.
6. Enter and save the IP Addresses shown in the following table. This is required to ensure the Level One Printer Server is a valid device on your LAN.
7. If you wish to print from this PC, install and configure the Device Driver by using the procedure for your operating system, as described in the following sections.



This procedure only needs to be done ONCE.
When installing on other PCs, do NOT install SETBOX.

Device IP Address	Assign a unique IP Address to the Level One Printer Server. The address must be from the same address range as PCs on your LAN. The address range recommended for a private LAN is from 192.168.0.1 to 192.168.0.254
Gateway IP Address	Use the same <i>Gateway Address</i> as your PC. If you don't have a gateway or Router, this can be left at 0.0.0.0
Subnet Mask	Use the same <i>Subnet Mask</i> as your PC. If you use the <i>IP Address</i> range 192.168.0.1 to 192.168.0.254, the correct <i>Subnet Mask</i> is 255.255.255.0.



You can start the WINIPCFG program from the *Run* dialog to check the IP Address, Gateway Address, and Subnet Mask on your PC.

Setup for Windows 95/98/NT

Software installation must be carried out on every PC requiring access to the printer or printers attached to the Level One Printer Server.

Before proceeding, check the following:

- Printer Server is installed and ON.
- Printer(s) connected to the Printer Server, and on-line.
- LAN is operational and using the TCP/IP protocol.

The setup program will do the following:

- Create the following icons: Readme and UnInstall.
- Add the driver, prtserv.dll, to the Windows\System or Windows\System32 directory
- Add the Uninstall program to the Windows directory.
- Add Uninstall information files and the Readme file to the installation directory.

Installation Procedure

1. Run the **SETUP** program in the Driver\ptp_95nt folder on the CD-ROM.
2. At the *Select Protocol* window, select *TCP/IP* or *NetBEUI* protocol, whichever is installed on your PC.
3. If TCP/IP is selected, the *Select Components* screen will present 2 options:
 - Install Device Driver
 - Install SETBOX Program

Select **Device Driver**. This needs to be installed on all workstations.

4. The *Configure Print Server* window will appear. An example screen is shown below.

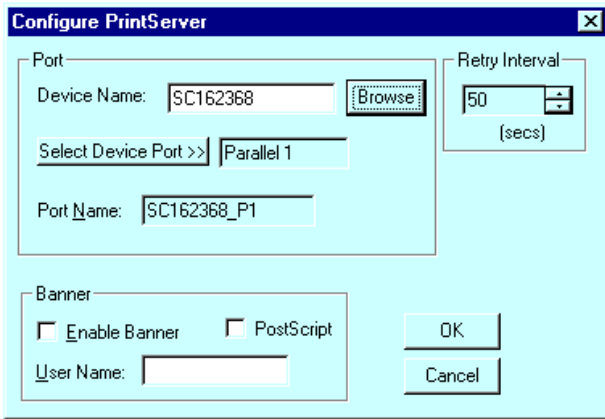


Figure 47: Configure Print Server

Device Name	Click <i>Browse</i> and select the correct Printer Server. The name shown will be the <i>Default Server Name</i> . The <i>Default Server Name</i> is shown on a sticker on the base of the device. The <i>Device Name</i> can be changed if you wish, but it is only visible when configuring the device.
Select Device Port	Select the Level One Printer Server port that the printer is connected to. For the first port, select Parallel port 1.
Port Name	Each port must have a unique name (8 alpha-numeric characters); this name is shown in the Printer’s properties. The name should indicate the port used (e.g. Par_1).
Enable Banner	Select this option to enable a banner page, to identify the owner of each print job.
PostScript	If using a PostScript Printer, check this box.
User Name	The name to be printed on the banner page, if used.
Retry Interval	Sets how often Windows will check the Printer Server when the printer is busy. Increase this value if you get too many warning messages.

5. Click "OK" when the data above is correct. You will be prompted “Do you wish to use this port for your default printer?”.
 - If your existing default printer is the correct type, click “Yes”.
 - Otherwise, click “No”, and use the following procedure to associate a Windows printer with the newly-installed port.

Configure the Printer to use this new port:

1. Go to *Start-Settings-Printers*. Invoke the *Add Printer Wizard*.
2. For Windows 95/98, select the **Local printer** option. For Windows NT, when prompted for which computer will manage the printer, select **My computer**.
3. Choose the Printer which is attached to the first port on the Level One Printer Server.
4. In the *Available Ports* screen (Windows 95/98) or *Select Port* screen (Windows NT), select the *PrintServer* port as the port to use. In Windows NT, ensure that **ONLY** this port is checked.

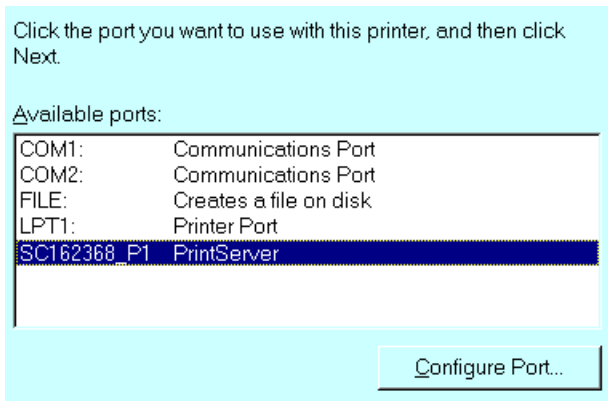


Figure 48: Available Ports (Win 95)

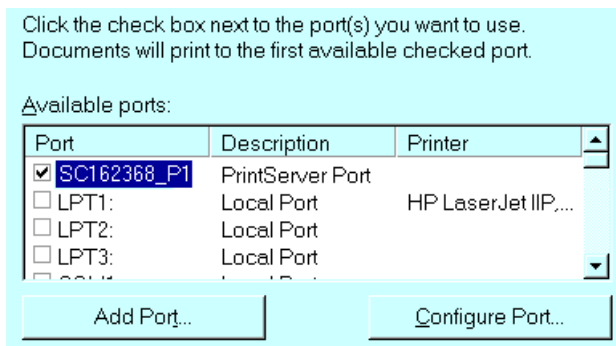


Figure 49: Select Port (NT 4.0)

Note: If you click the **Configure Port** button, you will see the *Configure Print Server* screen again.

5. Follow the on-screen instructions to finish adding a printer as normal. In Windows NT, do NOT enable sharing on this printer.
6. Installation is now complete.
You can now print using this printer.

Installing Additional Ports

If your Printer Server has multiple ports, a Windows printer must be installed for each port in order to use the attached printer. The procedure is as follows:

1. Select *Start - Settings - Printers* and click on the printer just added. Then select *File-Properties*. The *Properties* screen will appear.
2. On Windows 95/98, select the **Details** tab and locate the *Add Port* button, as shown on the screen below:

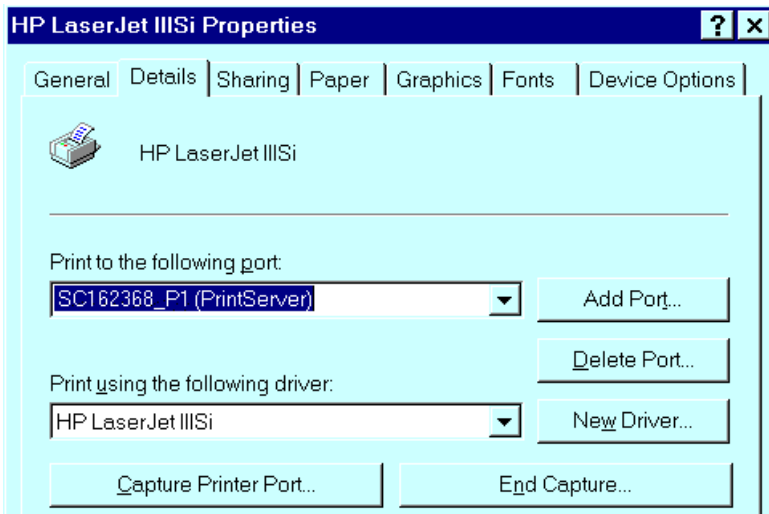


Figure 50 Printer Details (Windows 95/98)

2. On Windows NT, locate the *Add Port* button on the *Ports* tab as shown below.

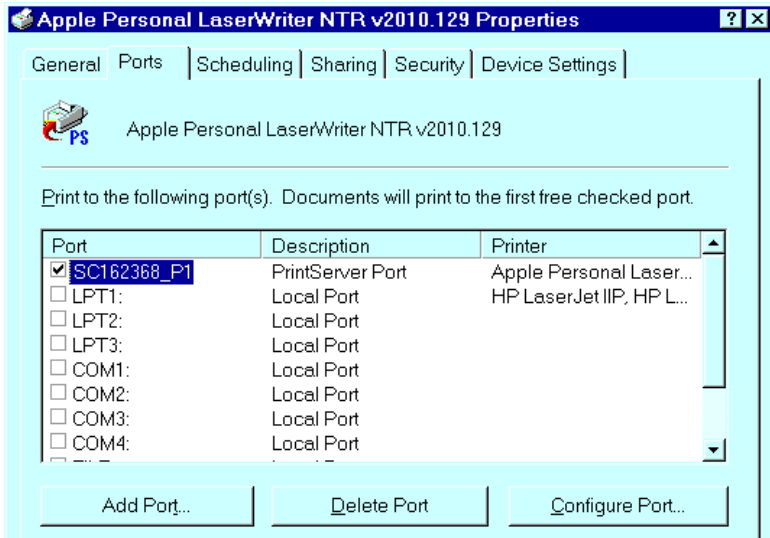


Figure 51: Ports Tab (NT 4.0)

3. Select **Add Port**. On Windows 95/98, you will see the following **Add Port** screen:

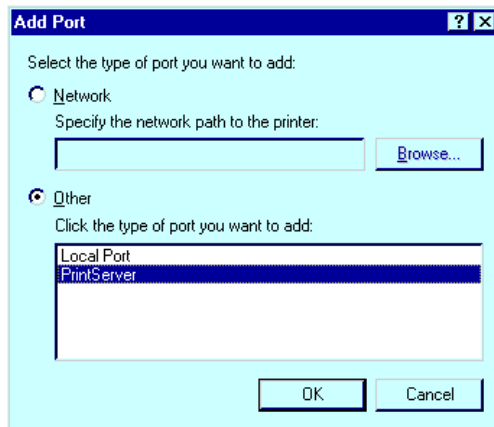


Figure 52 Add Port (Windows 95)

Select **Other** as the type of port you want to add and select the **PrintServer** port. Then click **OK** and the **Configure PrintServer** window will appear.

4. Enter the configuration information as for the first port. Ensure that you select a different PrintServer port each time, and assign a unique name to that port (e.g. PmServ_2 for parallel port 2).

5. Repeat steps 3 and 4 to add the 3rd port, if required.
6. Use the *Add Printer* wizard to install the correct printer for each port.
 - Ensure that you select the port to which the printer is connected, as shown in the following example.
 - For Windows NT, ensure that **ONLY** the correct PrintServer port is selected.

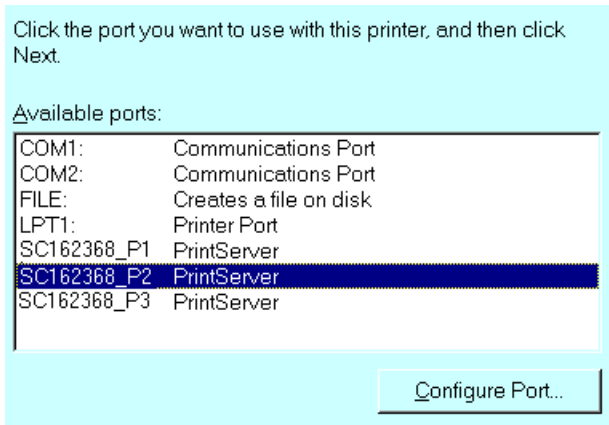


Figure 53 Select Port (Windows 95/98)

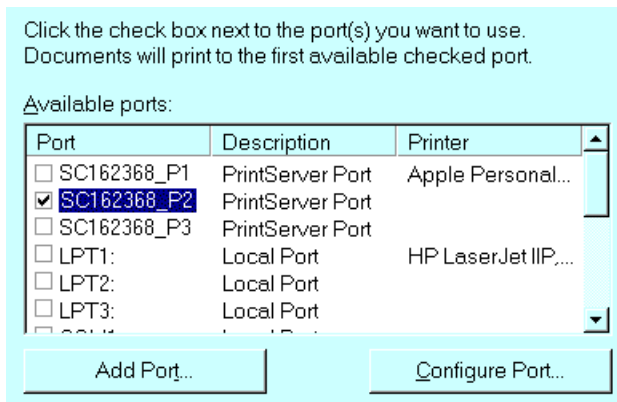


Figure 54: Port Selection (Windows NT 4.0)

7. Configuration is now complete.
You can now print using the printers attached to the Level One Printer Server.

Special Features



This chapter covers the special features of the Level One Printer Server.

When using the TCP/IP protocol, the Level One Printer Server supports 2 special features:

- Internet Printing
- SNMP

Internet Printing

Overview

The Internet Printing System allows users (employees, colleagues, suppliers, customers...) to print data to your printer across the Internet.

Users send the Internet Level One Printer Server an E Mail, with the print job normally sent as an attachment to the E Mail.

The Level One Printer Server will retrieve the E Mail and print it, using the printer attached to port 1.

System Requirements

Mail Server

- **Accessibility.** The Mail Server must be accessible by the intended clients or users. Normally, this means a permanent connection to the Internet.
- **Protocols.** The Mail Server must support the POP3 and SMTP protocols. The Internet Printing System uses these protocols and the most common E Mail formatting standards:
 - MIME (Multipurpose Internet Mail Extensions)
 - Base64 Encoding (for mail attachments)

Internet Printer Server

- **TCIP/IP Protocol.** The LAN must use the TCP/IP protocol.
- **Mail Server Access.** The Level One Printer Server must be able to access the Mail Server using a single IP address.
- **Mail Account.** The Level One Printer Server must have a Mail Account. Users print by sending an E Mail to this mail account.

User (Client) Requirements

- **Internet Connection.** Either through a LAN, or dial-up.
- **E Mail address.** This is used to notify the user that their print job has been done, or if there any problems.
- **Printer Driver.** Users must have a printer driver which matches the printer connected to the remote Internet Printer Server.
- **Print Capture Software.** To print more than plain text, users require InterNet Printing Port software to capture the print job and convert it into an E Mail attachment.

The InterNet Printing Port software is available for the following operating systems:

- Microsoft Windows 95/98
- Microsoft Windows NT 3.51 or later.

Internet Mail Printing Configuration

The Level One Printer Server must be configured with the data in the following table. This can be done with either the supplied **BiAdmin** utility program (see Chapter 4) or your Web Browser (see Chapter 7).

Mail Server IP Address	The IP Address of the E Mail Server used by the Level One Printer Server.
Mail Account	The name of the E Mail Account used by the Level One Printer Server.
Mail Account Password	Enter the password for the above Mail Account here.
Check Mail Interval	Sets how often to check for mail. Values range from 0 to 65,535 minutes, with 0 meaning a continuous connection and 1 as the default.
Print Banner	If YES (default), a banner page is printed to identify the owner of the print job.
Redirect Mail Account	Jobs which can not be printed will be sent to this account. If blank, unprintable jobs will be discarded.
Default Printer Number	Printer number for all Internet print jobs. Only one port can be selected. Users on the LAN can also use this port.
Print every E-Mail	If ON, then all E Mail received is printed. Otherwise, only E Mail from the InterNet Printing Port will be printed.
Activate Response Mail	If YES, all print jobs receive an E mail response. If NO, only users who set this option in their InterNet Printing Port software receive an E Mail
Printer Model ID String	This text field identifies the printer used for Internet printing. This value is sent to remote users upon request.

User Software

The software provided for remote users (InterNet Printing Port) should be installed by everyone intending to use Internet printing. Otherwise, remote users can print correctly only if:

- They send an E Mail directly to the Level One Printer Server Mail Account, using their normal E Mail application.
- The E Mail contains plain text only.
- The Internet Level One Printer Server is configured with *Print every E Mail ON*.

Installation of the InterNet Printing Port software will create a new printer port. After attaching the correct printer to this port, users can print to the Internet Printer using any Windows application.

Installation - User Software

1. Run the InterNet Printing Port installation program SETUP.EXE, in the PS\Driver\IPD folder on the CD-ROM.
2. Default values for the installation are:
 - **Directory** - C:\Program Files\Internet_Printer
 - **Start Menu folder** - InterNet Printing Port Driver
3. You will then see the *Configure Port* screen, as shown in the following screenshot.

InterNet Printing Port Driver Configuration (ver 1.0)

Port Name :

Remote Printer

E-mail address

Your E-mail information

Mail Server Name or IP Address

Your Internet E-mail address (e.g. username@company.com)

Retry Interval: Sec.

Reply Notification E-mail

Figure 55 InterNet Printer Port

4. The following data must be provided.

Port Name	Enter a descriptive name (e.g. "WAN") for the new printer port.
Remote Printer E-mail Address	The E Mail address for the Internet printer. Your print jobs will be sent to this E Mail address.
Mail Server Name or IP Address	This is the name or IP Address of your Mail Server. If you are on a LAN, ask the LAN Administrator. If using a dial-up connection, use the data provided by your ISP.
Your Internet E-mail Address	The normal address that people use to send you E-mail.

Retry Interval (Seconds)	If unable to connect to the E Mail server, retry after this time period (1 to 255 seconds, 30 is usually OK).
Reply Notification Mail	Check to receive an E Mail when your print job has been processed.

5. On completion, a new printer port will have been created.

Using the new Port

The Windows Control Panel is used to connect the correct printer to the InterNet Printing Port. In Windows 95/98/NT, the procedure is:

1. Select the Printer which matches the remote printer, then choose *Properties*, as shown in the example below.

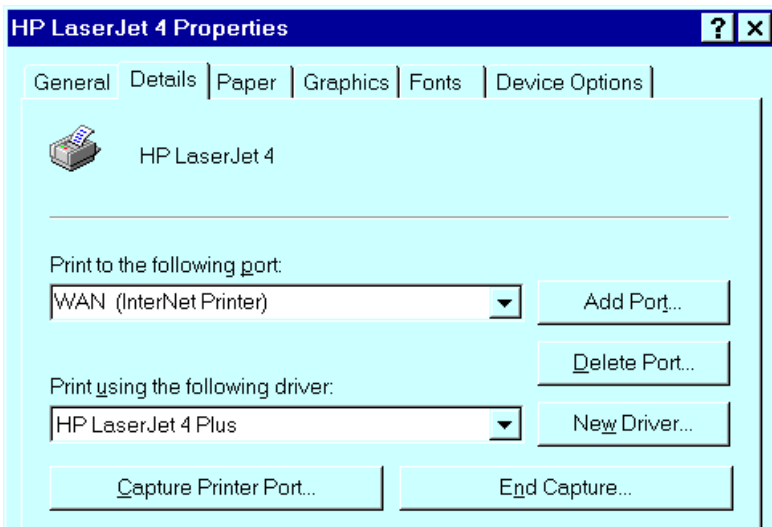


Figure 56 InterNet Printer Properties

2. Select the new port - WAN (InterNet Printer) in the example - as the port for this printer.
 - If you do not have the correct printer driver, or you wish to create another printer using an existing driver, use the Windows *Add Printer* facility.

- Using the Windows *Port Settings* or *Configure Port* facility will reveal the same *Configure Port* screen shown in *Figure 55 InterNet Printer Port* on page 101.
- If you wish to print to multiple Internet Printers, use the Windows *Add Port* facility to add a new InterNet Printer port. Ensure that the correct data is entered in each port, and that each port has a unique name.

Checking the Printer Driver

To make sure that the correct printer driver for the remote printer is installed on your system, you can use the InterNet Printing Port to send an E Mail to the Internet Printer. The procedure is as follows:

1. Connect your default printer to the InterNet Printing Port.
2. Check that “Reply Notification Mail” in the InterNet Printing Port is ON.
3. From Notepad or another text editor, print a short message (e.g. “This is a test print”) to the Internet Printer.

You will receive a reply E Mail containing the “Printer ID” which will identify the printer attached to the Level One Printer Server. If this does not match the printer driver you are using, install the correct printer driver.

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:

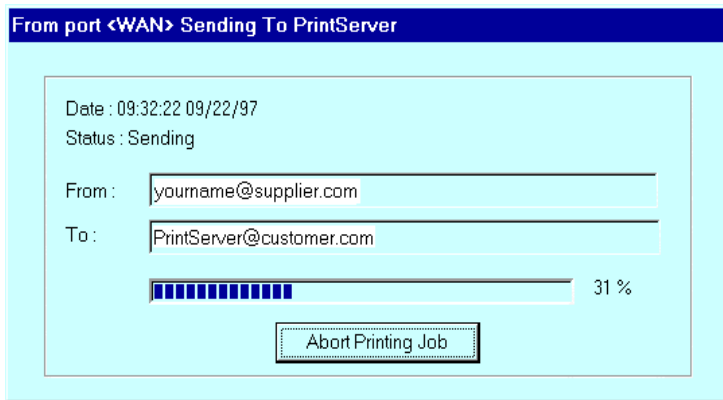


Figure 57 InterNet Printing Progress

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.

Canceling a Print Job

Users cannot cancel a Print Job once it has been sent, but Print Jobs can be canceled at the Level One Printer Server. In **BiAdmin**, the *Control - Abort Mail Print Job* menu option can be used to cancel a print job which has already started printing.

SNMP

The Level One Printer Server supports SNMP (Simple Network Management Protocol).

The Level One Printer Server's SNMP support allows network supervisors to monitor and control the Level One Printer Server using network management platforms such as HP OpenView, IBM SystemView, etc. This is accomplished through the SNMP **agent** and the SNMP **MIB**.

The **agent** (device software) responds to standard SNMP commands and reports device configuration and conditions. When a change in condition occurs, the SNMP agent will send a message (a **Trap**) to the associated management station.

The Level One Printer Server's **SNMP MIB** is a collection of objects that are monitored and controlled using SNMP's *get* and *set* commands. 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 files are provided in the \PS\MIB folder on the CD-ROM.

Use the *Import - Compile* command of your SNMP program to import the Mib file for your model.

Configuring the Printer Server for SNMP

Before using a SNMP Management station to manage the Level One Printer Server, the following settings should be assigned to it, in addition to standard TCP/IP settings covered in *Chapter 7 - TCP/IP*.

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. Levels 2 and 3 will be implemented in future versions.

Troubleshooting

12

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

Overview

If you encounter printing difficulties, please refer to the *Hardware* section first, then the *Printing* section, then the section for your specific situation.

If, after following the advice in these documents, the Level One Printer Server still does not function properly, please contact your dealer for further advice.

Hardware Problems

Problem No. 1	All the Level One Printer Server's LEDs are off.
Solution No. 1	Check the power supply or power connection.
Problem No. 2	Level One Printer Server's status light continuously stays lit.
Solution No. 2	Reset Level One Printer Server by unplugging the power supply and plugging it back in.
Problem No. 3	Level One Printer Server status light and power light stays on continuously and do not turn off.
Solution No. 3	Reset Level One Printer Server by unplugging the power supply or by pushing the reset push button.
Problem No. 4	I am using DHCP, and getting an IP Address conflict involving the Level One Printer Server.
Solution No. 4	<p>If the Level One Printer Server is left on, but the DHCP server is turned off, then the Level One Printer Server will retain its IP Address without the DHCP Server being aware of it. Simply reset the Level One Printer Server so it will obtain a new IP Address.</p> <p>This problem would also arise if you assigned a static IP Address which is within the range used by the DHCP server.</p>

	If so, use another address which is NOT within the range used by the DHCP server.
Problem No. 5	I am using WPConfig on Windows 95, and having problems configuring the Level One Printer Server.
Solution No. 5	WPConfig is designed for Windows 3.1 only. For Windows 95/NT, you should use BiAdmin.

Printing - General

Problem No. 1	When using 10BaseT cabling, the Level One Printer Server unit does not work.
Solution No. 1	Check the Hub's link LED for the port to which the Level One Printer Server is connected. If it is off, there is a problem in the network cable. If using 10BaseT or 100BaseT, check the LED next to the connector. It should be on if the network connection is OK.
Problem No. 2	A printing device connected to the a Level One Printer Server port cannot print or prints garbage.
Solution No. 2	Check the following: <ul style="list-style-type: none">• Cable connection between Level One Printer Server and printer.• Printer driver in the application program or Windows matches the printer.
Problem No. 3	The <i>Configuration</i> button on the <i>Printer Status</i> screen in BiAdmin is grayed out, even though my printer in bi-directional.
Solution No. 3	The button is unavailable if the printer is busy. You must wait until the printer is idle.

AppleTalk

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 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 Printer 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 document didn't print to the right printer.
Solution No. 3	<p>Check the following:</p> <ul style="list-style-type: none"> • Another Printer Server with the same name may have received your print job. Use the PSTOOL to reconfigure your Printer Server name and ensure all Printer Servers have unique names. • Make sure your application output encode is set to ASCII. If not, change it to ASCII.
Problem No. 4	My file doesn't print with the correct fonts.
Solution No. 4	Try using the LaserWriter 7 printer driver.
Problem No. 5	My EPS file doesn't print with the correct fonts.
Solution No. 5	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. 6	I can't select the "Remaining from:" item in the print dialog box.
Solution No. 6	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. 7	A cover page prints either on the first or the last page of the document.
Solution No. 7	Select one of these solutions: <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.• Install the Apple LaserWriter 7 driver. You are having trouble printing with the Apple LaserWriter 8 driver.
Problem No. 8	Why do I have trouble printing with the LaserWriter 8?
Solution No. 8	Your application software may not be compatible with the LaserWriter 8 driver or your system may not meet the requirements of the LaserWriter 8 driver. Use the Apple LaserWriter 7 driver instead.
Problem No. 9	How come the colors on my printed output do not match the colors on my computer screen?
Solution No. 9	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: <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. 10	The blue color I chose on my computer screen is printing out purple.
Solution No. 10	Choose Calibrated Color/Grayscale in the Print pop-up menu in the Print Options dialog box.
Problem No. 11	When I send a print job, I get a PostScript Command error or no print out.
Solution No. 11	<p>Check the communication protocols. The computer, Printer 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 Printer Server to use the same protocol as the printer and computer.

NetWare

Problem No. 1

My Printer Server prints garbage.

Solution No. 1

Follow the following steps to identify the problem:

1. Print a diagnostic file using PSConfig program.
 - (a) Run PSConfig and select your Printer Server from the list. Then select *Print Diagnostic Report*
 - (b) Select each port in turn and print a diagnostic report.
 - (c) Check to see if the diagnostic report printed OK. If the diagnostic report printed OK, the problem may be caused by incorrect system configuration. Go to Step 2. If the diagnostic report printout is not OK, check your printer. If your printer is OK, call your dealer.
2. Print a test text file and a test graphic file. If the text file prints correctly but the graphic file prints garbage, then specify /NT (no tabs) option for NPRINT or CAPTURE commands and print again. If both print incorrectly, go to step 3.
3. Temporarily disable the Printer Server servicing the print queue by following the instructions below:

NetWare 2.x and 3.x

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

NetWare 4.x bindery and NDS modes

- (a) Run PCONSOLE, select *Print Queues*, select the print queue that your Printer Server services, select *Status*.
- (b) Set *Allow service by current print servers* to NO.
- (c) Press Esc and select *Information*, and record its queue ID.

- (d) Send your test files to the print queue using normal print commands.
4. Re-route network printing to local printing.
 - (a) Disconnect the printer attached to your Printer Server and connect it to LPT1 of your PC.
 - (b) Change to the drive and then the directory on the file server that contains the print queue. The directory will have the name of the queue ID (e.g. \queues\Q_ID for NDS mode or system\Q_ID for Bindery mode).
 5. The test files you printed in step 2 should be in the queue directory. Print these files to the local printer using the COPY command with the /b option.
Example:
copy /b test.txt LPT1
 6. Compare the printouts from the PC and the Printer Server.
 - If the printouts are the same, then the problem is NOT the Printer Server. The problem might be that an incorrect printer driver was chosen or the timeout setting in the CAPTURE command is too short.
 - If the printouts are NOT the same, there may be a problem with the Printer Server. Call your dealer.
 7. Re-enable queue service.
 - Disconnect the printer attached to LPT1 of your PC and connect it to your Printer Server.
 - For NetWare 2.x or 3.x, run PCONSOLE and Select *Print Queue Information*. Then select the Printer Server's print queue and select *Current Queue Status*. Set *Servers can service entries in queue* to YES
 - For NetWare 4.x bindery and NDS modes, run PCONSOLE and select *Print Queues*. Then select the print queue and select *Status*. Set *Allow service by current print servers* to YES.

Problem No. 2	My Printer Server does not appear in the Active Device List of the PSConfig program.
Solution No. 2	<ul style="list-style-type: none">• Ensure that the Printer Server is on the same network segment as your PC.• Load the NetBEUI protocol on your PC, so that PSConfig can try connecting using NetBEUI. Once connected, check the following:<ul style="list-style-type: none">• The NetWare protocol is enabled.• The Ethernet frame type of your PC may be different than the one with your Printer Server. Enable all Ethernet frame types.
Problem No. 3	My Printer Server is configured as a Novell Print Server, and cannot log in to a file server.
Solution No. 3	<p>The following steps may solve this problem:</p> <ol style="list-style-type: none">1. Get the Printer Server information using PSConfig. If the device is configured as a Novell Print Server, the information will look like the following: Server Name: PS110049 NetWare Information: Master File Server: ICE Print Server Mode Status: Your_File_Server: Current Status Remote Printer Mode Status: N/A2. Make sure the master file server name is assigned correctly.3. Check the Current Status of Your_File_Server:<ul style="list-style-type: none">• Connected: No action required• No file server: Assign a master file server using PSConfig• Connecting to Server: Wait and check if the file server exists• Password Mismatch: Clear the NetWare password with PCONSOLE, or set the correct password for the Printer Server using WPCConfig or BiAdmin.

	<ul style="list-style-type: none"> • Print Server Not Defined: Install Printer Server again <ol style="list-style-type: none"> 4. Check NetWare to see if the login status of the Print Server to the file servers is <i>Ready</i>. If it is not, check the error message and perform the required corrective action. 5. Check the Novell file server's name. If it is over 20 characters long,. Rename it using no more than 20 characters. 6. If the file server is not in the status list and the Printer Server has logged into the master file server, it means that the file server has not been serviced by the Printer Server. Check to see if the file server is in the list of "File Servers To Be Serviced" item of PCONSOLE. If not, insert the file server name to the list.
<p>Problem No. 4</p>	<p>My Printer Server is configured as a Novell Remote Printer, and can't log in to the Novell Print Server.</p>
<p>Solution No. 4</p>	<p>Try the following steps:</p> <ol style="list-style-type: none"> 1. Get the Printer Server information as described in Problem 3 above. 2. Check the fields after the <i>Remote Printer Mode Status:</i> For each logical printer, there will be a status entry. The status will be one of the following. <ul style="list-style-type: none"> • Connected: No action required • Unable to find server: Load NetWare Print Server. • Connecting to Server: Wait and check if the NetWare Print server is loaded • Printer not Defined: Install the Printer Server as a remote printer of a NetWare print server. 3. Check NetWare to see if the Print Server is ready. If it is not, check the error message and perform the required corrective action. 4. Check the NetWare print server's name. If it is over 20 characters, rename the NetWare Print Server name using no more than 20 characters.

Problem No. 5	My Printer Server cannot print the jobs sent to the print queue.
Solution No. 5	<p>Try the following.</p> <ol style="list-style-type: none">1. Check if the printer attached to the Printer Server is on-line.2. Check if your Printer Server is logged into the file server (See Problem 3)3. Check the current status of the queue. Run PCONSOLE and select <i>Print Queue Information</i>. Then select the queue and select <i>Current Queue Status</i>. See if there are three "YES"s. If not, set them to YES.4. Check if the NetWare printer number is correct. 0 = parallel port 1 of the Printer Server. 1 = parallel port 2 of the Printer Server. 2 = parallel port 35. Check if the Printer Server is a static queue server to the queue. Run PCONSOLE and select <i>Print Server Information</i>. Then select <i>Print Server Configuration</i> and select <i>Queues Serviced by Printer</i>. Select your desired printer and check if the queue is on the list. If its not, insert the queue into the list by pressing the [Insert] key and select the queue. Then reset the Printer Server to service the new queue.6. The total number of queues to be serviced may be over the limit of 56. If so, reduce the number of queues.
Problem No. 6	I used the Capture command to print a job, but the job was separated into two parts.
Solution No. 6	<p>The time out setting in the Capture command may be too short. You should increase the timeout value of the Capture command. Use the option /TI=n of the Capture command to increase the time out value, where n is the value of timeout.</p>
Problem No. 7	PSConfig shows "No Response."

<p>Solution No. 7</p>	<p>This may be due to the following</p> <ul style="list-style-type: none"> • The network traffic is busy now. Wait for a minute and then try it again. • The Printer Server is not powered on. Power it on. • The network cable is disconnected. Check the cable. • The node address of the Printer Server may be the same as the node address of another device on the network.
<p>Problem No. 8</p>	<p>QUICKSET timed out when checking if the device had logged in to the file servers.</p>
<p>Solution No. 8</p>	<p>This means that the Printer Server did not log in the master file server. It might be that the Ethernet frame types do not match.</p> <ol style="list-style-type: none"> 1. Try to find a workstation that use the same frame type as the Printer Server so that PSConfig can see the device. Or load the NetBEUI protocol on your PC and use WPCongig to connect to the device. 2. Enable the Printer Server's frame type to the frame type that the master file server uses and disable all other frame types.
<p>Problem No. 9</p>	<p>I cannot receive Notify message in NetWare 4.x environment.</p>
<p>Solution No. 9</p>	<ul style="list-style-type: none"> • Make sure you are a Notify member of the Print Server. • Run NetAdmin and set the name of the Default Server to receive notification.
<p>Problem No. 10</p>	<p>I cannot use PCONSOLE to see Printer Status or the current server status in Print Server Information is showing <i>Down</i> in the NetWare 4.x environment.</p>
<p>Solution No. 10</p>	<p>It may be that you created the print server object in NetWare 3.x environment and used PCONSOLE in NetWare 4.x to view the status. Try the following:</p> <ul style="list-style-type: none"> • Ensure the Printer Server is ON. • Delete the print server object of the Printer Server.

	<ul style="list-style-type: none">• Install the Printer Server again in NetWare 4.x NDS environment.
Problem No. 11	The “String Before Job” and/or “String After Job” settings in the Logical Printers don’t work properly.
Solution No. 11	<ul style="list-style-type: none">• Check the length of the control strings. No string can exceed 15 characters.• Check that the control strings are in HEX.

TCP/IP (Unix & Windows NT)

Problem No. 1	Printer Server device is not recognized.
Solution No. 1	<p>Check the following:</p> <ul style="list-style-type: none">• There are no routers between the Printer Server and the UNIX host during IP address assignment.• There are no NetWare File Servers that do not have TCP/IP support between the Printer Server and the UNIX host.• The network cable to be used by Printer Server is intact. Connect the cable to another network device and test it.• 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 Printer Server is a valid device on the network.
Problem No. 2	The standard interface program on SUN 5.2 cannot be used with Psfilter.
Solution No. 2	Use dumb_int.sh which is the interface program shipped with Printer Server.
Problem No. 3	When the interface program detects that the printer device is not a printer, a printer error message appears on the screen.
Solution No. 3	Mark out all stty commands in the interface script.

Problem No. 4	The .psopts file format is not accepted by BSD UNIX.
Solution No. 4	If the prefix or and suffix string must contain control words or are too long, use headfile or tailfile instead of prefix string or suffix string.
Problem No. 5	The Printer Server's IP address is forgotten and it needs to be installed in a new environment.
Solution No. 5	<p>Follow the steps below to set the Printer Server back to the factory default configuration.</p> <ol style="list-style-type: none"> 1. Enter the command: <pre>arp -s yyy.yyy.yyy.yyy 00:c0:02:xx:xx:xx</pre> <p>Where: yyy.yyy.yyy.yyy is the new IP address assigned to the Printer Server 00:c0:02:xx:xx:xx is the hardware address, as shown on a sticker on the base of the Printer Server.</p> <p>Note: Windows NT uses "-" instead of ":" in the hardware address.</p> 2. Enter the commands: <pre>ftp yyy.yyy.yyy.yyy ftp>get DEFAULTC ftp>quit</pre> <p>This will reset the configuration to the factory defaults (including setting the IP address back to 0.0.0.0).</p> 3. Reconfigure as for a new device.
Problem No. 6	Printing by FTP, I receive an error message: <i>Invalid print queue</i> <i>Print queue not ready</i>
Solution No. 6	<ul style="list-style-type: none"> • Check that the printer is ready • Check that Logical printer(s) are defined on the Printer Server. With FTP, you can print ONLY to a logical printer. • Reset the Printer Server
Problem No. 7	I can't print using LPD.

Solution No. 7	Try printing with FTP. If this works, the problem is the LPD daemon on your UNIX host. Reconfigure the remote printer and the LPD daemon. Check the following points. <ul style="list-style-type: none">• The remote host name is the name of the Printer Server.• The remote printer name is the logical printer name on the Printer Server (e.g. L1).• If your UNIX asks for the LPD type, be sure to identify the service type as BSD.
Problem No. 8	I can't print using PSfilter,
Solution No. 8	Run PSfilter directly with the command: <pre>PSfilter -D P_name -v <file_name&</pre> Where: P_name is the Printer Server's name file_name is the file you wish to print. If this fails, check for an error log file (e.g. PSErrLog XXXXX) in the /tmp directory. If there is not an error log file, recompile PSfilter. Also, check the Troubleshooting section of the Psfilter .TXT file for your system.
Problem No. 9	The "String Before Job" and/or "String After Job" settings in the Logical Printers don't work properly
Solution No. 9	<ul style="list-style-type: none">• Check the length of the control strings. No string can exceed 15 characters.• Check that the control strings are in HEX.

Windows Peer-to-peer

Problem No. 1	When printing from some software applications such as Power Point, it takes a long time and the print out is incorrect.
Solution No. 1	<p>The problem is due to the printer being configured to Start printing after the first page is spooled. To change this setting:</p> <ul style="list-style-type: none">• Go to <i>Control Panel - Printers</i> and click on your printer.• Then select <i>File - Properties - Details</i>.• When the Details screen appears, click the <i>Spool Settings</i> button.• When the Spool Settings dialogue box appears, choose <i>Start printing after last page is spooled</i> and click OK.
Problem No. 2	While adding my printer as instructed in Windows 95, I received a message stating that Printer could not be found.
Solution No. 2	<p>Some printer drivers, when configured as <i>Local Printer</i>, will poll the printer to see if it is connected. Since the printer is networked, the printer can not be detected. To fix this, perform the following:</p> <ul style="list-style-type: none">• Select <i>Network printer</i> when asked “How is the printer attached to your computer?”• Then when prompted for “Network Path or Queue name” enter a dummy value such as \\123 and select <i>Next</i>.• The printer wizard will display a message stating that “The Network Printer is off-line”. Continue to install the printer as normal.• When finished, go to <i>Control Panel-Printers</i> and select your printer. The printer icon will be grayed out indicating the printer is not ready.• Select <i>Properties - Details</i>. In the <i>Print to the following port</i> box, select <i>Print Server (PrintServer)</i>.

	<ul style="list-style-type: none">• Click <i>Apply</i>, then <i>OK</i>, then close the <i>Properties</i> window.• Select the printer and go to the <i>File</i> menu. Check the <i>Work off-line</i> option is OFF.• If the printer is connected and powered On, the printer icon should no longer be grayed out, and you should be able to print.
Problem No. 3	I connected and configured a WPS (Windows Printing System) printer as described, but I can't get the print job to print.
Solution No. 3	<p>WPS printer drivers poll the printer before sending print data. Since the printer is networked, the printer is not found and no data is sent. The solution is to add your printer as a network printer as described in Solution 2 above. The following is a list of a few common WPS printers:</p> <ul style="list-style-type: none">• Canon LBP-430W• Epson ActionLaser 1300/W, Epson EPL-5500/W• HP LaserJet 5L• Lexmark WinWriter Series• NEC SuperScript series• Olivetti PG304• Samsung MyLaser Series

Internet Printing

Problem No. 1	I don't know my Mail Server's IP Address.
Solution No. 1	<p>Use the PING command to connect to the Mail Server by name.</p> <p>Example</p> <pre>ping ms.hinet.net</pre> <p>The reply will say:</p> <pre>Reply from xxx.xxx.xxx.xxx</pre> <p>where xxx.xxx.xxx.xxx is the IP Address of the Mail Server.</p>

Problem No. 2	Plain text E Mails are not printed.
Solution No. 2	Text E Mail messages are printed only if the Printer Server is configured with <i>Print every E Mail</i> ON.
Problem No. 3	Plain text E Mails print OK., but if I include an attachment, I get an E Mail reply “Wrong Encoding Method”.
Solution No. 3	The Internet Printer system supports only Base64 encoding. Using the Internet Printing Port driver will ensure a correctly encoded attachment..
Problem No. 4	A print job is printing garbage.
Solution No. 4	Users must use the correct printer driver. The print job can be canceled using the <i>Control - Abort Mail Print Job</i> menu option in the BiAdmin program.
Problem No. 5	Two print jobs are printing on the same page.
Solution No. 5	Change the port used for Internet Printing from a physical port to a Logical Port (Printer). Configure the Logical Printer so that the <i>String after Job</i> contains a FF (Form Feed, decimal 12 or 0C in Hex). See the section on <i>Logical Printers</i> in the Unix or NT Server sections for details of Logical Printers.
Problem No. 6	The Print job seemed to go through OK, but it was never received.
Solution No. 6	Check the E Mail address. If you use more than one Internet Printer with the same printer driver, ensure that you use the correct port each time you print.
Problem No. 7	Only the banner page was printed.
Solution No. 7	<p>This could be caused by using the wrong encoding method. Ask the user to use the InterNet Printing Port.</p> <p>Also, some printer drivers, when configured as Local Printer, will poll the printer to see if it is connected. Since the printer is networked, the printer can not be detected. To fix this, perform the following:</p> <ul style="list-style-type: none"> • Select <i>Network printer</i> when asked “How is the printer attached to your computer?”

- Then when prompted for “Network Path or Queue name” enter a dummy value such as \\123 and select Next
- The printer wizard will display a message stating that “The Network Printer is off-line”. Continue to install the printer as normal.
- When finished, go to *Control Panel-Printers* and select your printer. The printer icon will be grayed out indicating the printer is not ready.
- Select ***Properties - Details***.
In the *Print to the following port* box, select Print Server (PrintServer).
- Click *Apply*, then *OK*, then close the *Properties* window.
- Select the printer and go to the ***File*** menu. Check the *Work off-line* option is OFF.

If the printer is connected and powered On, the printer icon should no longer be grayed out, and you should be able to print.

Problem No. 8

The Banner page is not correct; the first row has disappeared.

Solution No. 8

This may be caused by the previous print job not sending a form feed after finishing printing.

Try sending print jobs to a logical printer, which is defined with a Post String of FF (Form Feed - 0C in Hex).

To do this, define the Logical Printer, and set the port used for Internet Printing to this Logical Printer.

Specifications

13

Direct Attach Models

EPS-3001TU	
Power Consumption	3w max.
External Power Adapter	9V DC
LEDs	2
Parallel Port	1 Male DB-36 connector
Ethernet cables	10Base-T

FCC Statement

This equipment generates, uses, and can radiate radio frequency energy. It 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 domestic environment.

Operation is subject to the following two conditions:

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

CE Marking Warning

This is a Class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FPS-3001TXU	
Power Consumption	3w max.
External Power Adapter	5V DC
LEDs	2
Parallel Port	1 Male DB-36 connector
Ethernet cables	10/100Base-T

FCC Statement

This equipment generates, uses, and can radiate radio frequency energy. It has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment.

Operation is subject to the following two conditions:

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

CE Marking Warning

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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%

Parallel Port Pin Assignments		
Pin	Signal Name	Source
1	-Strobe	H
2	+Data 1	Bi-Di*
3	+Data 2	Bi-Di*
4	+Data 3	Bi-Di*
5	+Data 4	Bi-Di*
6	+Data 5	Bi-Di*
7	+Data 6	Bi-Di*
8	+Data 7	Bi-Di*
9	+Data 8	Bi-Di*
10	- ACK	P
11	+ Busy	P
12	+ Paper Error	P
13	+ Select	P
14	- Auto Feed	H
15	Not Defined	
16	Logic GND	
17	Chassis GND	
18	Peripheral Logic High	P
19-30	GND	
31	-Init	H
32	-Fault	P
33-35	Not Defined	
36	-SelectIn	H

* Data signals will be driven by some but not all peripheral devices.

Other Models

FPS-2111TXU	
Power Consumption	5w max.
External Power Adapter	12V DC
LEDs	3
Parallel Port	1 Centronic female DB-25 connector
Ethernet cables	10BASE-T, 100BASE-T
FPS-2101TXU	
Power Consumption	10w max.
External Power Adapter	12V DC
LEDs	4
Parallel Port	1 Centronic female DB-25 connector, ECP compatible
Ethernet connectors	10Base2, 10Base-T/100Base-T
FPS-2013TXU	
Power Consumption	5w max.
External Power Adapter	12V DC
LEDs	3
Parallel Port	Three Centronic female DB-25 connectors
Ethernet cables	10BaseT, 100BaseT
FPS-2003TXU	
Power Consumption	20w max
External Power Adapter	12V DC
LEDs	4
Parallel Port	3 Centronic female DB-25 connector, ECP compatible
Ethernet connector	10Base2, 10Base-T/100Base-T

FCC Statement

This equipment generates, uses, and can radiate radio frequency energy. It 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 domestic environment.

Operation is subject to the following two conditions:

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

CE Marking Warning

This is a Class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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%

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

Level One Printer Server Family Product List:

Specifications	Product Name		Level One	Level One	Level One	Level One	Level One	Level One	Level One
			FPS-3001TXU	FPS-3001TXU	FPS-2111TXU	FPS-2101TXU	FPS-2013TXU	FPS-2003TXU	
Protocol	IPX/SPX		ü	ü	ü	ü	ü	ü	ü
	TCP/IP		ü	ü	ü	ü	ü	ü	ü
	PTP over TCP/IP		ü	ü	ü	ü	ü	ü	ü
	PTP over NetBEUI		ü	ü	ü	ü	ü	ü	ü
Protocol	Apple EtherTalk		ü	ü	ü	ü	ü	ü	ü
	SMB over NetBEUI		ü	ü	ü	ü	ü	ü	ü
Network Environment	Win95/98		ü	ü	ü	ü	ü	ü	ü
	Windows for Workgroup		ü	ü	ü	ü	ü	ü	ü
	Win NT		ü	ü	ü	ü	ü	ü	ü
	MAC		ü	ü	ü	ü	ü	ü	ü
Network Environment	UNIX		ü	ü	ü	ü	ü	ü	ü
	NetWare NDS & Bindery		ü	ü	ü	ü	ü	ü	ü
Network Interface	Ethernet	10 Base2 (BNC)	ü	ü	ü	ü	ü	ü	ü
	Fast Ethernet	10 Base-T (STP) 100 Base-T (STP)	ü	ü	ü	ü	ü	ü	ü
Network Speed	10Mb/Sec.		ü	ü	ü	ü	ü	ü	ü
	100Mb/Sec.		ü	ü	ü	ü	ü	ü	ü
Frame Type	Ethernet II		ü	ü	ü	ü	ü	ü	ü
	IEEE802.3/IEEE 802.2 SNAP		ü	ü	ü	ü	ü	ü	ü
Management	Web Admin Management		ü	ü	ü	ü	ü	ü	ü
	BIAdmin Management		ü	ü	ü	ü	ü	ü	ü
	NWAdmin Management		ü	ü	ü	ü	ü	ü	ü
	HP's JetAdmin		ü	ü	ü	ü	ü	ü	ü
Management	SNMP Management		ü	ü	ü	ü	ü	ü	ü
	Internet Printing (proprietary)		ü	ü	ü	ü	ü	ü	ü
Special Feature	IPP (Internet Printing Protocol)		ü	ü	ü	ü	ü	ü	ü
	Bidirectional Printing	IEEE 1284 ECP Mode	ü	ü	ü	ü	ü	ü	ü *
Printing Throughput (Bytes/sec)			200K	650K	200 K	650K	200K	650K	
	Logical Printer(s)		3	3	3	3	8	8	
Printer Port(s)	Parallel Port(s)		1 (36pin)	1 (36pin)	1 (25pin)	1 (25pin)	3 (25pin)	3 (25pin)	
	Serial Port(s)		0	0	0	0	0	0	
Memory	Flash ROM		512KB	1MB	512KB	2MB	512KB	2MB	
	RAM		256KB	1MB	256KB	1MB	256KB	4MB	
Dimensions (L*W*H,mm)		59.7*57*20	80.3*57*24.3	124*94*33	124*94*33	230*131.5*25.2	230*131.5*25.2		

*IPP is scheduled to be released in the second quarter of 2000.