OKI
PRINTING SOLUTIONS

B4400/B4600   Network Manual

B4400/B4600

PREFACE

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INTRODUCTION

This machine has a fast 100BASE-TX/10BASE-T network interface. This guide explains its functionality.

Although the Network Interface is integral in some machines and is added as a Network Interface Card (NIC) in others, access for interconnection and producing self-diagnostic test and configuration printouts is provided in both cases via an interface panel at the rear of the printer.

This network interface card supports IEEE802.2, IEEE802.3, Ethernet-II and SNAP and can detect those frame types automatically.

Also, the interface card supports major protocols such as TCP/IP, IPX/SPX (NetWare), EtherTalk and NetBEUI.

This section details the Network Interface specification and several software utilities.

For multiple emulation printers, change the emulation in the Printer Menu settings to Auto or PS before printing the self-diagnostic test and settings.

Specification

ITEM	SPECIFICATION
Frame types	IEEE 802.2
	IEEE 802.3
	Ethernet-II, SNAP, AUTO
Network interface	100BASE-TX
	10BASE-T
Network protocols	TCP/IP
	Network layerARP, RARP, IP, ICMP
	Session layerTCP, UDP
	Application layerLPR, FTP, TELNET, HTTP, IPP, BOOTP, DHCP, SNMP, DNS, SMTP, POP3, SLP
	IPX/SPX (NetWare)
	Remote printer mode (up to eight file servers and 32 queues)
	Print server mode over IPX/SPX (up to eight print servers)
	Encrypted password supported in print server mode
	SNMP
	EtherTalk
	ELAP, AARP, DDP, AEP, NBP, ZIP, RTMP, ATP, PAP
	NetBEUI
	SMB, NetBIOS, WINS
Functions	Self-diagnostic test printing
	Banner supported
	Monitoring/configure by Web browser
	Printer status notification by E-Mail

SELF-DIAGNOSTIC TEST

With the printer power switched on, press the push-button located on the network interface panel (at the rear of the printer) for more than three seconds and release. The self-diagnostic test results and configuration settings are printed.

On the first page of the Network Information that is printed out, under the heading General Information the MAC Address is given. For example:

```
MAC Address   00808784E3F1
```

From this information:

the Ethernet address is: 00:80:87:84:E3:F1

CONFIGURATION UTILITY

AVAILABLE UTILITIES

You can configure the Network Interface by using one of the following methods:

UTILITY	FEATURES	SYSTEM REQUIREMENTS
Quick Setup	Configure the Network Interface easily and simply without installing any software packages into your system. You can set the following: Enable/disable TCP/IP, NetWare, EtherTalk, NetBEUI protocols. > Set IP address, Subnet Mask and Gateway for TCP/IP manually or by using DHCP. > Set NetWare Mode and create Queue/Print Server/Printer objects. > Zone name and Port name for EtherTalk.	Windows95/98/Me/NT4.0/2000/XP (TCP/IP protocol or IPX/SPX protocol should be installed). To create a NetWare queue, NetWare Client 32 or IntranetWare Client should be installed in your system.
AdminManager	Configure the Network Interface in detail.	Windows95/98/Me/NT4.0/2000/XP (TCP/IP protocol or IPX/SPX protocol should be installed). To create a NetWare queue, NetWare Client 32 or IntranetWare Client should be installed in your system.
Web browser	Configure the Network Interface and printer by using a Web browser such as Microsoft Internet browser or Netscape Navigator.	Microsoft Internet Explorer Version 5.5 and higher or Netscape Navigator Version 6.0 and higher. Operating system that supports Web browser.
TELNET	Configure the Network Interface using TELNET.	Third-party vendor developed TELNET client package. A TELNET Application is standard in Windows/UNIX/Linux.
SNMP	The printer and network card can be controlled using third-party vendor developed SNMP application.	Third-party vendor developed SNMP application.

USING QUICK SETUP

The Quick Setup utility allows you to configure the Network Interface easily and simply without installing any software packages.

You can configure the following:

> Enable/disable TCP/IP, NetWare, EtherTalk, NetBEUI protocols.

> Set IP address, Subnet Mask and Gateway for TCP/IP manually or by using DHCP.

> Set NetWare mode and create Queue/Print Server/Printer objects.

> Zone name and Port name for EtherTalk.

Configuration requires a PC with Windows 95/98/Me, Windows 2000 Advanced Server/Professional or Windows NT Server 4.0/Work-station 4.0, Windows XP running TCP/IP or IPX/SPX (NetWare).

This utility can only be used on a PC that can be connected to the network with TCP/IP or IPX/ SPX.

This utility must be used on a PC that is located in the same segment as the printer. To create a NetWare queue, NetWare Client 32 or IntranetWare Client should be installed in your system.

The following explanation uses Windows 98 as an example.

1. Insert the Software CD-ROM into the CD-ROM drive. The Setup Utility starts automatically. If it does not start, double-click *setup. exe* in the Windows folder on the CD-ROM.

2. Select [Network Utilities]

3. Select [Install Network Card Setup].

4. Select the appropriate language.

5. Select [OKI Device Quick Setup].

6. Follow the on-screen instructions.

> The NetWare Client 32 or IntranetWare Client should be installed on the PC used for the creation of network queues. Installation enables the user to create network queues and perform other functions.

7.   If the settings are correct, click [Execute]. The new settings are transmitted to the network card but the network card is still operating with pre-transmission settings.

8.   Click [Finish] to validate the new settings. Depending on the model, the printer may have to be switched off and on again.

USING ADMINMANAGER

AdminManager is a powerful Microsoft Windows-based utility to configure all of the Network Interface functions easily and intuitively by using a graphical user interface.

Configuration requires a PC with Windows 95/98/Me, Windows 2000 Advanced Server/Professional or Windows NT Server 4.0/Work-station 4.0, Windows XP running TCP/IP or IPX/SPX (NetWare).

This utility can only be used on a PC that can be connected to the network with TCP/IP or IPX/ SPX and must be used on a PC that is located in the same segment as the printer.

To create a NetWare queue, NetWare Client 32 or IntranetWare Client should be installed on your system.

The following explanation uses Windows 98 as an example.

INSTALLATION

1.   Insert the Network Software CD-ROM into the CD-ROM drive. The Setup Utility starts automatically. If it does not start, double-click *autorun.exe* in the Windows folder on the CD-ROM.

2.   Select [Network Utilities].

3.   Select [Network Card Setup].

4.   Select the appropriate language.

5.   Select [OKI Device Standard Setup].

6.   Follow the on-screen instructions. If you want to install AdminManager on your local drive, select [Install and Execute]. Otherwise, select [Execute from CD-ROM].

7.   To run AdminManager, check [Yes] for [Do you wish to execute AdminManager?] and click [Finish]. Otherwise, check [No] and click [Finish]].

INTERFACE

Select [Start]-[Programs]-[Setup Utility]-[Admin Manager].

FILE MENU

In the [File] menu, the following item can be selected:

ITEM	FUNCTION
Search	Search printers in your network and list all printers that have the Network interfaces installed.

STATUS MENU

In the [Status] menu, the following items can be selected:

ITEM	FUNCTION
Printer Status	Current printer status is displayed:
System Status	Displays current Network Interface configuration. Configuration data can be saved as log file.
List of Configuration Items	Displays current Network Interface configuration. Configuration data can be saved as log file.

Setup Menu

In this menu, the following items can be selected:

| ITEM	FUNCTION
Setup by HTTP	Launch the default browser in your environment to access the selected printer's web page.
Setup by TELNET	Launch TELNET application in your environment to access the selected printer's TELNET port.
	Note: The TELNET application is not included as part of the Network Interface package. Install the TELNET package on your system. For further information, see your Windows manual.
Create NetWare Queue	Create a NetWare queue.
Delete NetWare Object	Delete NetWare object.
Reset	Reset the selected network interface card.
Test Print	Print self-diagnostic test pages.
IP Address Setup	Set static IP address of network interface card manually.

DEVICE SETUP

Device Setup allows you to configure the Network Interface. Type the root password (default value is the last 6 characters of the MAC address) to configure. Remember that the root password is case sensitive and if the MAC address contains any alpha characters, type them as upper case. Device Setup contains details for the following selectable tabs:

> General

> TCP/IP

> NetWare

> EtherTalk

> NetBEUI

> SNMP

> Maintenance

The following section explains each tab's functionality. Depending on your printer, some items in the following explanation may not be displayed.
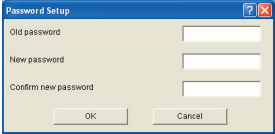
General Tab

This allows you to set or change the root password used for Admin Manager, TELNET and FTP.
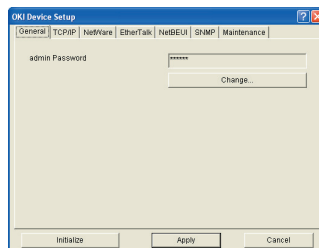
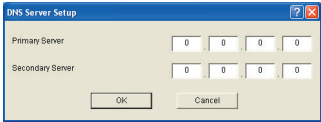| LOCATION	COMMENTS
Change root password	You can set/change the root password for AdminManager, TELNET and FTP.

TCP/IP Tab

This allows you to configure TCP/IP related items.

LOCATION	COMMENTS
Use TCP/IP Protocol	Set TCP/IP protocol as enabled/disabled.
Use DHCP/BOOTP	Check this item if IP address, subnet mask, default gateway and IP addresses for DNS primary server and secondary servers are retrieved from the DHCP or BOOTP server. Otherwise, uncheck.
Use RARP	Check this item if IP address is retrieved from the RARP server. Otherwise, uncheck.
IP Address	Set the IP address of the selected network interface card.
Subnet Mask	Set the subnet mask of the selected network interface card.
Default Gateway	Set the default gateway of the selected network interface card.
DNS Server. . .	Set IP addresses for DNS primary and secondary servers.

WINS Server ...	Configure items related to the WINS Server.	
	In this dialogue box, the following items can be configured:	
	Primary Server	Set WINS Primary server.
	Secondary Server	Set WINS Secondary server.
	Scope ID	Set a Scope ID.
Network PnP Setup ...	Configure items related to Network PnP.	
	In this dialogue box, the following items can be configured>	
	Use Network PnP	Set notifying users with using UPnP supported OS of the printer, enabled or disabled
	Device Name	Set the device name for Network PnP

Netware Tab

This is where you can configure NetWare related items.

LOCATION	COMMENTS
Use NetWare Protocol	Set NetWare protocol as enabled/disabled.
Use IPX Protocol / Use TCP/IP Protocol	Set protocol to use.
Print Server Name	Set Print Server name.
Frame Type	Set primary NetWare frame type.
Operation Mode	Set NetWare mode.
Check box besides Bindery Setup	Check if you want to use the Bindery mode and Bindery Setup button becomes available. If it is unchecked, the button is greyed out.
Bindery Setup	Configure items related to Bindery mode.
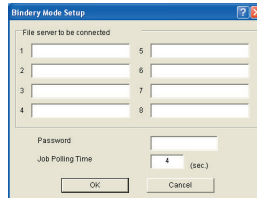
In this dialogue box, the following items can be configured.

Available File Server and Selected File Server.	Select file servers to connect. Up to eight file- servers can be selected. Select a server from Available file server list and click >> button. The server is copied to Selected file server box.
Password.	Set password for Print Server.
Job Polling Time.	Set print job polling interval in seconds.
NDS Setup	Set NDS tree and context where Print Server was created.
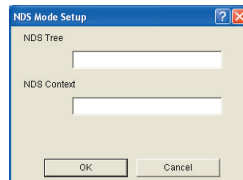
LOCATION	COMMENTS

RPRINTER Setup   Available if you select RPRINTER mode in Operation Mode.
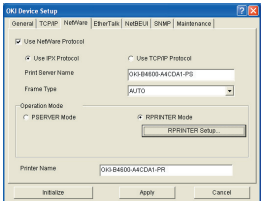
By selecting the [RPRINTER] button, this is displayed:
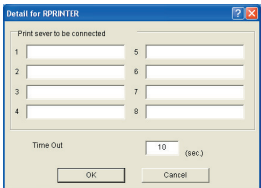
NDS or Bindery   Show the Available print server tree in NDS mode or Bindery mode.

Available print server and Selected print server   Select file servers to connect. Up to eight file servers can be selected. Select a server from Available file server list and click >> button. The server is copied to Selected file server box.

Time Out   Set duration from the last data's arrival to freeing of the port in seconds.

Printer Name   Set the NetWare printer object name.

EtherTalk Tab

This allows you to configure EtherTalk related items
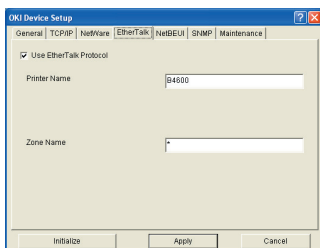
LOCATION	COMMENTS
Use EtherTalk Protocol	Set EtherTalk protocol to enabled/disabled.
Printer Name	Set EtherTalk Printer object name.
Zone Name	Set the zone name to which the Network Interface belongs.

NetBEUI Tab

This allows you to configure NetBEUI related items.

LOCATION	COMMENTS
Use NetBEUI Protocol	Set NetBEUI protocol to enabled/disabled.
Short Printer Name	Set a short printer name for the Network Interface.
Workgroup	Set a work group name to which the Network Interface belongs.
Comment	Set the comments for the Network Interface.

SNMP Tab

This allows you to configure SNMP related items.
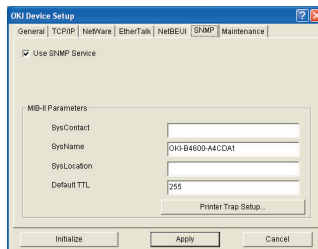
LOCATION	COMMENTS
SysContact	Set SysContact (printer manager) name.
SysName	Set SysName (printer model name).
SysLocation	Set SysLocation (the location where the printer is installed).
Default TTL	Set TTL (Time To Live) value.

Printer Trap Setup . . .   By selecting the button, the following dialogue box is displayed:
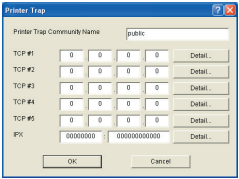
In the dialogue box, the following items can be configured:

Printer Trap Community Name	This community name is assigned to outgoing printer status traps such as off-line, paper out, etc.
TCP#1-5	Set the IP address to which a Trap packet will be sent. You can set up to five IP addresses.
Detail . . .	By selecting the button, the following dialogue box is displayed:

In the dialogue box, the following items can be configured:

Trap Enable	Set sending a Trap packet, enabled or disabled, for each destination.
Printer Reboot	Set sending a Trap packet, enabled or disabled, when the printer is rebooted.
Receive Illegal	Set sending a Trap packet, enabled or disabled, when the printer receives an illegal Trap packet.
On-line	Set sending a Trap, enabled or disabled, when the printer turns to ON-LINE.

LOCATION	COMMENTS		
Printer Trap Setup . .	Detail . . .	Off-line	Set sending a Trap, enabled or disabled, when the printer turns to OFF-LINE.
		Paper Out	Set sending a Trap, enabled or disabled, when paper is out.
		Paper Jam	Set sending a Trap, enabled or disabled, when a paper jam occurs.
		Cover Open	Set sending a Trap, enabled or disabled, when the printer cover opens.
		Printer Error	Set sending a Trap, enabled or disabled, when any errors occur.
	IPX	Set node address and network address to which a Trap packet will be sent.	
	Detail . . .	By selecting the button, the following dialogue box is displayed:	
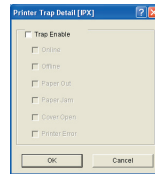
In the dialogue box, the following items can be configured:

		Trap Enable	Set sending a Trap packet, enabled or disabled, for each destination.
		Printer Reboot	Set sending a Trap packet, enabled or disabled, when the printer is rebooted.
		Receive Illegal	Set sending a Trap packet, enabled or disabled, when the printer receives an illegal Trap packet.

LOCATION		COMMENTS	
Printer Trap Setup . .	Detail . . .	On-line	Set sending a Trap, enabled or disabled, when the printer turns to ON-LINE.
		Off-line	Set sending a Trap, enabled or disabled, when the printer turns to OFF-LINE.
		Paper Out	Set sending a Trap, enabled or disabled, when paper is out.
		Paper Jam	Set sending a Trap, enabled or disabled, when a paper jam occurs.
		Cover Open	Set sending a Trap, enabled or disabled, when the printer cover opens.
		Printer Error	Set sending a Trap, enabled or disabled, when any errors occur.

IP Address Setup

If you only use TCP/IP and the Network Interface has not yet been configured, occasionally it may not be displayed on AdminManager. You can configure the IP address of the Network Interface by this function.

1. Select [IP Address Setup] from the [Setup] menu.

2. Set [Ethernet Address] and [IP Address] and select [OK].
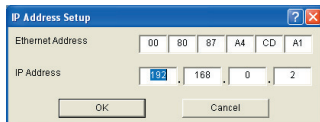
> The Ethernet Address (MAC address) is displayed during the self-diagnostic test.

3. AdminManager asks whether you want to initialise the network interface card or not. Select [Yes]. Even if you select [No] here, the IP address that you set can be used after turning the printer OFF and ON. The requirement to turn your printer OFF and ON is dependent on the network interface card.

OPTION MENU

In the [Option] menu, the following item can be selected:

Use TCP/IP Protocol   If this item is selected, AdminManager uses TCP/IP protocol to search/configure network interface cards.

Use IPX/SPX Protocol   If this item is selected, AdminManager uses IPX/SPX protocol to search/configure network interface cards.

Environment Setup   TCP/IP Tab   Set broadcast addresses that are used to search network interfaces using the TCP/IP protocol. If [Use TCP/IP protocol] is unchecked, the search will not be carried out using TCP/IP.
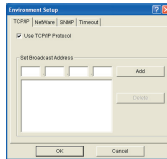
NetWare Tab   Set network addresses that are used to search network interfaces via NetWare protocol. If there any many NetWare file servers on your network, specify the network address to which the network card belongs. If [Use NetWare protocol] is unchecked, the search will not be carried out using NetWare, but if [Auto Search] is selected, AdminManager will search all networks that AdminManager can detect.
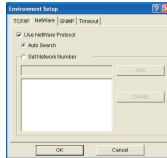
TimeOut Tab   [Search Every]: Set response waiting time from a network card in seconds.

[Time Out]: Set time out between AdminManager and the network interface card in seconds.

[Retry]: Set how many times the retry will be carried out between AdminManager and the network interface card.
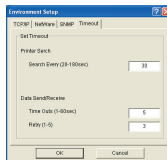
HELP MENU

In the [Help] menu, [About] is available as well as revision information for AdminManager.

USING A WEB BROWSER

If the Network Interface is connected to the network using TCP/IP, its settings and the printer menu settings can be configured using a Web browser, such as Microsoft Internet Explorer Version 5.5 and higher, or Netscape Navigator version 6.0 and higher. No guarantees are offered for other browsers. Refer to the relevant manuals for details of how to launch and use the browser.

The network addresses used in this manual are shown as examples only. Network addresses used in your installation must be generated from your own network. To apply configuration changes using a Web browser, you will be prompted for a username and password. The username is [root] and the default password is the last six characters of the MAC address.

1. Configure the IP Address, Subnet Mask and Gateway for the network card. Launch the Web browser, enter the IP Address of the network interface card in [Address (Location/Position)] and press the [Enter] key. The Printer Status screen is displayed.

2. Select a tab and items to be changed in the left frame. You need to log in as "root" to be able to configure all items. Non-root users cannot configure all items.

3. To ensure correct operation, follow the procedure below for the appropriate network browser.

    Microsoft Internet Explorer

    a. Select [Internet Options] in the [Tools] menu.

    b. Click on the [General] tab and click [Settings] in [Temporary Internet files].

    c. Check browser version. For example, version 6.0 [Check for newer versions of stored pages].

    Netscape Navigator

    a. Select [Settings] in the [Edit] menu

    b. Click [Cache] in [Details].

    c. Select [Once per session] in [Document in cache is compared to document on network].

d.   If you change the window size of the browser immediately after changing the configuration, the [Security information] may be displayed. Uncheck [Display this message next time] in the dialogue.

After making changes, click [Submit].

The root password can be changed to allow you to configure the Network Interface and printer by using a Web browser/TELNET/AdminManager. The default password is the last six characters of the MAC address (any alpha characters must be in upper case). To change the root password, select "Password Configuration" in the Maintenance tab and follow the on-screen instructions.

USING TELNET

The Network Interface can be configured using TELNET. TELNET requires the Network Interface to have a valid IP address configured. If the NIC already has an IP address configured, skip steps one to three below.

> > Note: Please ensure a valid IP address for you network environment is used. Use of an incorrect IP address can cause serious problems on your network.

The following explanation uses Sun Solaris 2.4 as an example. The method of configuring commands may differ between workstations. Refer to the workstation's manual.

1.   Login as [root].

If you do not have Superuser rights, the network manager should run the configuration.

2.   Set a temporary IP Address on the NIC using the ARP command.

Example: for IP address 192.168.20.127 and network card address 00:80:87:01:00:D2

```
# arp -s 192.168.20.127 00:80:87:01:00:D2 temp
```

The Ethernet address (MAC address) is displayed during the self-diagnostic test. A temporary address does not need to be set if an IP address has already been set.

3.   Use the PING command to confirm the connection with the network card.

Example: for IP address 192.168.20.127

ping 192.168.20.127

If there is no reply, there is a problem with the configuration of the IP address (the IP address has been already set manually or dynamically), or with the network. Reset the network interface card settings to default and try to set temporary IP address. If you still have the problem after resetting the network interface card, consult the network manager.

4.   Login to the network card using TELNET.

Example: for IP address 192.168.20.127

```
$ telnet 192.168.20.127
```

Trying 192.168.20.127

Connected to 192.168.20.127

Escape character is `^]'.

EthernetBoard Network Interface Ver P2.03 TELNET server.

login: root

`root' user needs password to login.

password:

User `root' logged in.

No. Message Value (level.1)

```
 1: Setup TCP/IP
 2: Setup SNMP
 3: Setup NetWare
 4: Setup EtherTalk
 5: Setup NetBEUI
 6: Setup printer trap
 7: Setup SMTP (E-Mail)
 9: Maintenance
10: Setup printer port
11: Display status
12: IP Filtering Setup
97: Network Reset
98: Set default (Network)
99: Exit setup
```

Please select (1-99)?

5.   Enter the number of the items to be changed and the details
         screen for that item is displayed. The menu has a hierarchical
         structure as follows.

Telnet hierarchical structure.

LEVEL1	LEVEL2	LEVEL3
1: Setup TCP/IP	1: TCP/IP protocol	—
	2: IP address	—
	3: Subnet Mask	—
	4: Default Gateway	—
	5: RARP protocol	—
	6: DHCP/BOOTP protocol	—
	7: Auto IP Address	—
	8: DNS server(Pri.)	—
	9: DNS server(Sec.)	—
	10: Root password	—
	11: Auto Discovery	1: Network PnP
		2: Rendezvous
		3: Printer Name
		99: Back to prior menu
	99: Back to prior menu	—
2: Setup SNMP	1: SysContact	—
	2: SysName	—
	3: SysLocation	—
	99: Back to prior menu	—

LEVEL1	LEVEL2	LEVEL3
3: Setup NetWare	1: NetWare protocol	—
	2: Protocol	—
	3: Frame Type	—
	4: Printer Name	—
	5: NetWare Mode	—
	6: Setup PSERVER (IP)	1: NDS Tree
		2: NDS Context
		3: Print Server Name
		4: Password
		5: Job Polling Time
		99: Back to prior menu
	7: Setup PSERVER (IPX)	1: NDS Tree
		2: NDS Context
		3: Print Server Name
		4: Password
		5: Job Polling Time
		6: Bindery mode
		7: File Server 1 ~ 14: File Server 8
		99: Back to prior menu
	8: Setup RPRINTER (IPX)	1: Print Server 1 ~ 8: Print Server 8
		9: Job Timeout
		99: Back to prior menu
	99: Back to prior menu	
4: Setup EtherTalk	1: EtherTalk protocol	—
	2: Printer Name	—
	3: Zone name	—
	99: Back to prior menu	—
5: Setup NetBEUI	1: NetBEUI Protocol	—
	2: Computer name	—
	3: Workgroup name	—
	4: Comment	—
	5: Setup WINS	1: WINS Server (Pri.)
		2: WINS Server (sec.)
		3: Scope ID
		99: back to prior menu
	99: Back to prior menu	—

LEVEL1	LEVEL2	LEVEL3
6: Setup printer trap	1: Prn-Trap Community	—
	2: Setup TCP#1 trap ~ 6: Setup TCP#5 trap	1: TCP#1~5 Trap Enable
		2: Printer Reboot Trap
		3: Receive Illegal Trap
		4: Online Trap
		5: Offline Trap
		6: Paper Out Trap
		7: Paper Jam Trap
		8: Cover Open Trap
		9: Printer Error Trap
		10: TCP#1~5 Trap Address
		99: Back to prior menu
	7: Setup IPX Trap	1: IPX Trap Enable
		2: Printer Reboot Trap
		3: Receive Illegal Trap
		4: Online Trap
		5: Offline Trap
		6: Paper Out Trap
		7: Paper Jam Trap
		8: Cover Open Trap
		9: Printer Error Trap
		10: IPX Trap Address
		11: IPX Trap Net
		99: Back to prior menu
	99: Back to prior menu	

LEVEL1	LEVEL2	LEVEL3
7: Setup SMTP(E-Mail)	1: SMTP Transmit	—
	3: SMTP server name	—
	4: SMTP port number	—
	5: E-Mail address	—
	6: Reply-to address	—
	7: Event to address 1 ~ 11: Event to address 5	1: To Address 1-5
		2: Re-send Interval
		3: Off-Line
		4: Consumable Message
		5: Toner Low/Out
		6: Paper Low/Out
		7: Paper Jam
		8: Cover Open
		9: Stacker Error
		10: Mass Storage Error
		11: Recoverable Error
		12: Service Call Req.
		99: Back to prior menu
	12: Signature line 1 ~ 15: Signature line 4	—
	99: Back to prior menu	—
9: Maintenance	1: FTP Service	—
	2: Telnet Service	—
	3: Web Service	—
	4: SNMP Service	—
	5: LAN Scale	—
	6: Default TTL	—
	99: Back to prior menu	—
10: Setup printer port	1: BOJ String	—
	2: EOJ String	—
	3: BOJ String(KANJI)	—
	4: EOJ String(KANJI)	—
	5: Printer Type	—
	6: TAB Size (char.)	—
	7: Page Width (char.)	—
	8: Page Length(line)	—
	9: FTP/LPR Banner	—
	99: Back to prior menu	—

LEVEL1	LEVEL2	LEVEL3
11: Display status	1: prn1	—
	2: Network	—
	99: Back to prior menu	—
12: IP Filtering Setup	1: IP Filtering	
	2: IP Address range 1 ~ 11: IP Address range 10	1: Start Address
		2: End Address
		3: Printing
		4: Configuration
		99: Back to prior menu
	12: Admin IP Address	
	99: Back to prior menu	
97: Network Reset	—	—
98: Set default (Network)	—	—
99: Exit setup	—	—

5. When configuration is complete, select [Exit Setup] to save your change. To exit without saving your modification, select [Quit].

6. Turn the printer off and on again.

The network card continues to use pre-transmission settings until the printer is turned off and back on again.

Using SNMP

The printer and network card can be managed via a standard SNMP management station. The network card supports SNMPv1, MIB-II and Private MIB. In order for the Network Interface to be managed correctly from an SNMP management station, the Private MIB needs to be added to that management station. Please refer to the SNMP manager documentation for information on how to do this.

The Private MIB file can be found in the MIB folder on the Network Software CD- ROM. Please refer to the readme file in the MIB folder for further information.

The printers trap address can be set in five places using TCP/IP and in one place with IPX.

Printer trap settings can be made with TELNET and a Web browser.

Management utility

PrintSuperVision

PrintSuperVision is a web-based application for managing printing devices connected to a network. It consists of two parts:

A web application based on Microsoft web server (Internet Information Server, IIS or Personal WEB Server, PWS), that provides the user interface.

A monitoring program (PrintSuperVisor) that runs all the time, collecting data and saving it in a database for statistical reports and sending E-Mail alerts based on the saved configuration.

PrintSuperVision's main functions are:

> Maintaining the list of printing devices and organising them in logical groups.

> Initially discovering and configuring printers connected to the network.

> Locating printers visually on maps.

> Monitoring devices over time and saving data for statistical reports.

> Sending email alerts when events occur that affect the functionality of printers.

> Statistical reports about usage of printers.

> Tracking maintenance data related to printers.

> Integrating with on-line web support.

Windows

The main PrintSuperVision application can be installed in any of the following Windows systems.

OPERATING SYSTEM	SERVICE PACK	OPTION PACK	IIS/PWS
Windows NT 4.0 Workstation	6.0	4.0	PWS (Personal Web Server) available in NT 4.0 Option Pack
Windows NT 4.0 Server	5.0	4.0	IIS (Internet Information Server) 1.0
Windows XP Home/ Professional	—	—	IIS installed as an option. Available in the Windows XP CD
Windows 2000 Professional	1.0	—	Internet Service Manager included in the OS
Windows 2000 Server/ Advanced Server	1.0	—	Internet Service Manager included in the OS
Windows 98	—	—	PWD (Included in Windows 98 by default)
			PWS available in NT 4.0 Option Pack in Microsoft Web site
Windows 98 SE	—	—	PWD (Included in Windows 98 by default. PWS available in NT 4.0 Option Pack in Microsoft Web site

Supported Browsers

The browsers supported are:

Internet Explorer (IE) 4.01 and above.

Netscape Navigator 4.0 and above.

Opera 5.12 and above.

The PrintSuperVision application can be accessed from any Windows, Macintosh, Unix, and Linux desktop that supports any of the above-mentioned browsers.

While all the above browsers are supported, PrintSuperVision works best when used with Internet Explorer. When using the Netscape browser, do not select the option [Images off]. The hyperlinks may not work properly. Some versions of Netscape browser do not display the frames properly, and the [Back] button may not work correctly.

While the printer properties are displayed in PrintSuperVision, only a few of the printer settings can be set. For setting any other printer settings, a hyperlink to the printer's web page is provided in PrintSuperVision.

INSTALLATION

To install the Print SuperVision utility

WindowsXP/2000/NT4.0 requires administrator privileges.

1. Insert the Network Software CD-ROM into the CD-ROM drive. The Setup Utility starts automatically. If it does not start, double-click *setup.exe* on the CD-ROM.

2. Select [Software Utilities].

3. Select [Install PrintSuperVision].

4. Follow the on-screen instructions. In the [Edit Data] screen, you can specify a port number for PrintSuperVision (default 80).

5. When installation ends, the [Setup complete] screen is displayed. Click [Finish].

6. Now you should select [Start]-[Programs]-[PrintSuperVision]-[PrintSuperVision] or double-click the [PrintSuperVision] icon on the desktop for the PrintSuperVision server.

7. For PrintSuperVision client, access [*http://[the server IP address or host name]/PrintSuperVision*] from the Web browser. If you change the port number you should add [:[port number]] such as [*http://192.168.20.127/PrintSuperVision:8080*].

8. PrintSuperVision has an on-line help facility.

UNINSTALLATION

To uninstall PrintSuperVision, either select [Start]-[Programs]-[PrintSuperVision]-[Uninstall PrintSuperVision], or from [Control Panel], select [Add/Remove Programs], select [PrintSuperVision] from the index window and click [Add/Remove]. When the uninstallation is completed, close [Add/Remove Programs].

In some cases, an empty directory may be left behind. Delete the directory manually.

PRINTING UTILITY

LPR

The LPR Utility is a utility that allows printing data to printers connected to the network via TCP/IP. This utility is for use with Windows XP, Windows 2000, Windows Me, Windows 98, Windows 95 and Window NT4.0.

The utility is for those printers which support TCP/IP and redirects printing data to the lpr port of the specified IP address.

System Requirement

Windows XP/2000/Me/98/95/NT4.0 with TCP/IP.

TO INSTALL THE LPR UTILITY

The LPR utility requires that the TCP/IP protocol should be installed into your Windows system. To install the TCP/IP protocol into your Windows system consult your Windows manual.

Windows XP/2000/NT4.0 requires administrator privileges.

1. Set up the printer driver by designating the output destination to [Local Printer (LPT1:)]. For information on setting up your printer driver, see the printer user manual.

2. Insert the Network Software CD-ROM into the CD-ROM drive. The Setup Utility starts automatically. If it does not start, double-click *setup.exe* on the CD-ROM.

3. Select [Software Utilities].

4. Select [Install LPR].

5. Follow the on-screen instructions.

6. Click [Next] when the [Welcome] screen is displayed.

7. Verify [Destination Folder] and [Spool Folder] and click [Next].

8. Check [Register in Startup] if you want automatic startup as Windows boots up. Check [Launch as minimized] if you want to startup in the Icon state and click [Next].

9. Verify the program folder name and click [Next]. The installation starts.

10. When the installation ends, the [Setup complete] screen is displayed. Check [Yes, I want to launch LPR Utility now] and click [Finish]. Check [Yes, I want to view the ReadMe File] if you want to read [Readme]. The LPR utility starts.

11. Select [Add Printer] on the [Remote Print] menu.

12. Select [Printer] to accept the printer that has been added in the step 1.

13. Enter an IP address at [IP Address] and click [OK]. A printer is added to the main window.

Refer to the On-line Help for information on how to use the utility.

UNINSTALLATION

1. Stop the LPR Utility.

2. Select [Start]-[Program]-[]-[LPR Utility]-[Uninstall LPR Utility] ([Start]-[All Programs]-[]-[LPR Utility]-[Uninstall LPR Utility] on WindowsXP).

3. Click [Yes] when the [Confirm File Deletion] dialogue is displayed. Deletion of the LPR utility starts.

4. When the deletion has finished, the [Uninstall Complete] screen is displayed. Click [OK].

If a file that has been added after installation exists in the folder to install the LPR utility or the folder to spool, you cannot delete the folder. Delete any unwanted files before running [Uninstall LPR Utility].

MICROSOFT WINDOWS

OVERVIEW

This chapter provides guidelines on how to print over the network from various Microsoft Windows platforms. There are numerous ways of printing from Windows and the exact set-up will vary depending upon your environment. There are also numerous versions of Windows, which can be configured as either a client, server or both.

Although there are many variants of Windows, the principles of network printing are the same. Microsoft provides on-line help with all of their operating systems and this is a good reference point for the exact details of each configuration option within Windows.

The network printer supports the following protocols that can be used in conjunction with the Windows operating system:

> TCP/IP

> IPX (Novell NetWare)

> NetBEUI

Installation of TCP/IP Protocol

There are a number of options available when printing using TCP/IP for Windows. The following table lists the options:

WINDOWS VERSION	METHOD
Win 95/98/Me	LPR Utility
NT 4.0	LPR Utility
	Microsoft LPR[1]
Windows 2000/ Windows XP	LPR Utility
	Microsoft LPR[1]
	Port 9100[1]
	IPP[1]

[1] These functions are built into Windows and are displayed as options when using the Add Printer Wizard.

Although there are some differences in configuration options between the various Windows platforms, the procedure for printing using TCP/IP is the same.

1. Ensure that the TCP/IP protocol has been installed in Windows. This can be confirmed by checking the network settings from within the Control Panel. If TCP/IP has not been installed refer to the section below Installation of TCP/IP protocol.

2. If not already configured, a suitable IP address, Subnet Mask and Gateway address should be configured. Please refer to the on-line help if necessary. It is vital that the IP address entered is unique and valid. Entering an incorrect IP address may cause severe network problems. Please check the address with the network administrator.

3. If your network environment uses domain names, DNS should be enabled and configured on your system. However, this step is not essential to enable network printing.

4. Restart the operating system.

WINDOWS 95/98/ME

1.   Click the [Start] button, select [Settings] and then click on [Control Panel].

2.   In the [Control Panel] double-click on the [Network] icon.

3.   In the [Network] dialogue box click the [Configuration Panel].

4.   If the [Client for Microsoft Networks] is not listed, click the [Add] button.

5.   In the [Select Network Component Type] dialogue box, select [Protocol] then click the [Add] button.

6.   In the [Select Network Protocol] dialogue box, select [Microsoft] from the list of manufacturers, then select [TCP/IP] from the list of network protocols, then click [OK].

7.   The Windows installation CD-ROM may be required. Follow the remaining dialogue box prompts.

WINDOWS NT 4.0

1.   Click the [Start] button, select [Settings] and then click on [Control Panel].

2.   Double-click the [Network] icon.

3.   In the Network dialogue box, click the [Protocols] tab.

4.   If the [TCP/IP Protocol] is not listed, click the [Add] button.

5.   In the [Select Network Protocol] dialogue box, select [TCP/IP Protocol] and click [OK].

6.   The Windows NT installation CD-ROM may be required. Follow the remaining dialogue box prompts.

Windows 2000

1. Click the [Start] button, select [Settings] and then click on [Network and Dial-up Connections].

2. Double-click the [Local Area Connection] icon. In the [Local Area Connection Status] dialogue box, click the [Properties] button.

3. If the TCP/IP protocol is not listed, in the [Local Area Connection Properties] dialogue box, click the [Install] button.

4. In the [Select Network Component Type] dialogue box, select [Protocol] and click the [Add] button.

5. In the [Select Network Protocol] dialogue box, select [TCP/IP Protocol] and click the [OK] button.

6. Click the [Close] button in the [Local Area Connection Properties] dialogue box.

7. Click the [Close] button in the [Local Area Connection Status] dialogue box.

Windows XP

1. Click the [Start] button and select [Control Panel].

2. Select [Network and Internet Connection] and [Network Connection].

3. Double-click [Local Area Connection] and click [Properties] in the [Location Area Connection Status] dialogue box.

4. If the [Internet Protocol (TCP/IP)] is not listed, click [Install..] button.

5. In the [Select Network Component Type] dialogue box, select [Protocol] then click the [Add] button.

6. In the [Select Network Protocol] dialogue box, select [Internet Protocol (TCP/IP)] then click [OK].

7. The Windows XP installation CD-ROM may be required. Follow the remaining dialogue box prompts.

Once the protocol has been installed and configured in Windows, the next step is to configure the TCP/IP parameters in the network printer.

NETWORK PRINTER IP ADDRESS CONFIGURATION

Use the Standard Set-up Utility to configure the IP Address, Subnet Mask and Gateway.

1. Connect the printer to the network and turn on.

2. Place the Network Software Utilities disk in the CD-ROM drive. The set-up utility starts automatically. If the set-up utility does not start, double-click on *setup.exe* in the Windows folder of the CD-ROM.

3. Select [Network Card Set-up].

4. Select [Network Card Quick Set-up].

5. Select the appropriate language.

6. Click [Next] at Welcome screen.

7. If you agree to the User Licence Agreement, click [Next].

8. Select the appropriate network card, using the Ethernet address to identify it, and click [Next].

The Ethernet address of the printer can be found on the self-diagnostic printout, which can be printed by pressing the push-button on the network card panel for three seconds and then releasing it.

Do you use the TCP/IP protocol?

When using *lpr* in UNIX and other TCP/IP environments, please select [Yes]. To use in a TCP/IP environment, an IP address should be assigned to the Ethernet board.

If [Yes] has been selected and TCP/IP is the only working protocol and the IP address has not already been assigned, you can either obtain an IP address automatically or assign an IP address.

When [Obtain an IP address automatically] is selected, the device IP address will be automatically assigned by the DHCP server. In an environment without a DHCP server, please assign the IP address manually.

If you are assigning an IP address, you need to enter:

> An IP address

> Submit mask

> Gateway address.

9. Click [Next].

Do you use the NetWare protocol?

Consult your network manager to ensure that the NetWare file server is properly installed and working on the network. Make sure that NetWare Client32 or IntranetWare Client is installed on your computer.

10. On selecting [Yes] you will be asked if [You set-up the queue from the Wizard]?

Do you use the EtherTalk protocol?

EtherTalk is the required protocol for printing data from the Macintosh environment.

Do you use the NetBEUI protocol?

Using NetBEUI makes it easy to manage your machine and print within the network environment of Windows.

11. Confirm your configuration. If everything is correct, select [Execute] to apply the configuration. Set-up has now been completed. Select [Finish].

Now that both Windows and the printer have been configured to use TCP/IP, the next step is to configure Windows to print to the network printer.

WINDOWS 95/98/ME

When printing using TCP/IP the *LPR* utility is the only option to use. The following procedure should be used.

When installing the driver, ensure it is installed as a local printer and not a network printer. Ensure the appropriate printer driver has been installed in Windows.

Install the *LPR* utility as described on page 44 of this manual and add the printer installed earlier.

WINDOWS NT 4.0

With Windows NT 4.0, you have two options for printing using TCP/IP. They are:

> LPR

> Microsoft LPR

In order to use Microsoft LPR, it must first be installed into your operating system.

NT 4.0 requires administrator privileges.

LPR

Please follow the procedure described in the Windows 95/98/Me section on page 44.

Microsoft LPR

To install this port, the following needs to be carried out.

1. Select [Start], [Settings], [Control Panel] and then select [Printers].

2. Select [Add Printer] Wizard.

3. Select [My Computer] and then [Next].

4. Select [Add Port].

5. Select [LPR Port] and then [OK].

6. In [Name or address of server providing lpd] type the host name or IP address of the host for the printer you are adding.

7. In [Name of printer or print queue on that server] type the logical printer name "lp" and then click [OK].

8. Follow the instructions on the screen to finish installing the LPR-compatible printer.

If the LPR port is not available, install the Microsoft TCP/IP Printing Service.

Insert the printer driver for Windows NT4.0.

1. Select [Start], [Settings], [Control Panel] and then double-click the [Network] icon.

2. In the Network dialogue box, click the [Services] tab.

3. If the [Microsoft TCP/IP Printing] is not listed, click the [Add] button.

4. In the [Select Network Service] dialogue box, select [Microsoft TCP/IP Printing] and click [OK].

5. The Windows NT installation CD-ROM may be required. Follow the remaining dialogue box prompts.

WINDOWS 2000

Windows 2000 requires administrator privileges.

With Windows 2000, there are four options for printing using TCP/IP.

>   LPR

>   Microsoft LPR

>   Port 9100

>   IPP

In order to use Microsoft LPR, it must first be installed on your system.

LPR

Please follow the procedure described in the Windows 95/98/Me section on page 44.

Microsoft LPR

To install this port, the following needs to be carried out:

1. Select [Start], [Settings], [Control Panel and Printers].

2. Open the [Printers] folder.

3. Double-click [Add Printer] and then select [Next].

4. Select [Local Printer], clear the [Automatically detect my printer] check box, and then select [Next].

5. Select [Create a new port] and then [LPR Port].

6. Select [Next] and then provide the following information:

   In [Name or address of server providing LPD] enter the host name or Internet Protocol (IP) address of the host for the printer you are adding.

   In [Name of printer or print queue on that server] type "lp".

   Follow the instructions on the screen to finish installing the TCP/IP printer.

Port 9100

1. Select [Start], [Settings], [Control Panel].

2. Open the [Printers] folder.

3. Double-click [Add Printer] and then select [Next].

4. Select [Local Printer], clear the [Automatically detect my printer] check box and then click [Next].

5. Select [Create a New Port] and select [Standard TCP/IP Port].

6. Select [Next].

7. The [Welcome to the Add Standard TCP/IP Printer Port Wizard] will appear.

8. Select [Next] and provide the following information. Enter [Printer name] or IP address, for example: *192.168.1.31*. If the above IP address is entered, the Port Name will default to *IP_192.168.1.31*.

9. Select [Next]. Additional port information will be required.

10. Under [Device Type], select [Custom] then [Settings].

11. Ensure [Protocol] is set to [Raw].

12. Ensure [Port Number] is 9100 and [SNMP Status Enabled] is deselected.

13. Select [OK].

14. Select [Follow the instructions on the screen to finish installing the printer.]

IPP

1. Select [Start], [Settings], [Control Panel and Printers].

2. Open the [Printers Folder].

3. Double-click [Add Printer] and then select [Next].

4. Select [Network Printer].

5. Select [Next].

6. Type printer URL in text box labelled [Connect to a printer in the Internet or your Intranet], e.g. *http://192.168.1.31/ipp/ip*].

7. Select [Next].

8. Install printer driver.

Windows XP

 Windows XP requires administrator privileges.

With Windows XP, there are four options for printing using TCP/IP.

> LPR

> Microsoft LPR

> Port 9100

> IPP

In order to use Microsoft LPR, it must first be installed on your system.

LPR

Please follow the procedure described in the Windows 95/98/Me section on page 44.

Microsoft LPR

To install this port, the following needs to be carried out:

1. Select [Start], [Settings], [Control Panel]. and [Printers and Other Hardware].

2. Select [Printers and Faxes].

3. Click [Add Printer] and then select [Next].

4. Select [Local printer attached to this computer], clear the [Automatically detect and install my Plug and Play printer] check box, and then select [Next].

5. Select [Create a New Port] and [Type Standard TCP/IP Port].

6. Select [Next].

7. The [Welcome to the Add Standard TCP/IP Printer Port Wizard] will appear.

8. Select [Next] and provide the following information. Enter [Printer name or IP address], for example: *192.168.1.31*. If the above IP address is entered, the Port Name will default to *IP_192.168.1.31*.

9. Select [Next]. [Additional Port Information Required] is displayed.

10. Under [Device Type], select [Custom] then [Settings].

11. Ensure [Protocol] is set to [LPR].

12. Ensure [Queue Name] is "lp" and [SNMP Status Enabled] is deselected.

13. Select [OK].

14. Follow the instructions on the screen to finish installing the printer.

Port 9100

1. Select [Start], [Settings], [Control Panel]. and [Printers and Other Hardware].

2. Select [Printers and Faxes].

3. Click [Add Printer] and then select [Next].

4. Select [Local printer attached to this computer], clear the [Automatically detect and install my Plug and Play printer] check box, and then select [Next].

5. Select [Create a New Port] and select [Type Standard TCP/IP Port].

6. Select [Next].

7. The [Welcome to the Add Standard TCP/IP Printer Port Wizard] will appear.

8. Select [Next] and provide the following information. Enter [Printer name or IP address], for example: *192.168.1.31*. If the above IP address is entered, the Port Name will default to *IP_192.168.1.31*.

9. Select [Next]. [Additional Port Information Required] is displayed.

10. Under [Device Type], select [Custom] then [Settings].

11. Ensure [Protocol] is set to [Raw].

12. Ensure [Port Number] is 9100 and [SNMP Status Enabled] is deselected.

13. Select [OK].

14. Follow the instructions on the screen to finish installing the printer.

IPP

1. Select [Start], [Settings], [Control Panel]. and [Printers and Other Hardware].

2. Select [Printers and Faxes].

3. Click [Add Printer] and then select [Next].

4. Select [A network printer, or a printer attached to another computer].

5. Select [Next].

6. Select [Connect to a printer on the Internet or on a home or office network] and type printer URL in text box, e.g. *http://192.168.1.31/ipp/ip.*

7. Select [Next].

8. Install printer driver

Novell Netware IPX

IPX is used with Novell NetWare. The Network interface supports Novell 3, 4, 5 and 6, and allows print jobs to be directed to the appropriate Novell print queue. Please refer to the relevant section of this manual for additional information.

NetBEUI Protocol

NetBEUI is a protocol that was designed for use on small workgroups or LANs. Within Windows, NetBEUI is used for file and printer sharing between computers. It provides a simple method of printing but the protocol does have limitations and is not as robust as TCP/IP or IPX. Typically it is employed in small or home networks.

Network Printer Settings

There are three configurable items under NetBEUI within the printer. These can be configured using the standard set-up utility described in the "Configuration" chapter.

COMPUTER NAME:	NAME ASSIGNED TO THE PRINTER
Workgroup:	PrintServer[1]
Comment:	User definable description

[1] Although the workgroup name can be changed, it is recommended that it remains as PrintServer.

Although there are some differences in configuration options between the various Windows platforms, the procedure for printing using NetBEUI is the same.

Please ensure the NetBEUI protocol has been installed in Windows. This can be confirmed by checking the network settings. If NetBEUI has not been installed please refer to the section below.

The relevant Windows installation CD-ROM may be required and you should follow the on-screen dialogue box prompts.

Windows 95/98/Me

1. Select [Start], [Settings], and [Control Panel].

2. In the Control Panel, double-click on the [Network icon].

3. In the Network dialogue box select [Configuration Panel].

4. If [Client for Microsoft Networks] is not listed, click the [Add] button.

5. In the [Select Network Component Type] dialogue box, select [Protocol] and click the [Add] button.

6. In the [Select Network Protocol] dialogue box, select [Microsoft] from the list of manufacturers and select [NetBEUI] from the list of [Network Protocols] and then click [OK].

7. The Windows installation CD-ROM may be required. Follow the remaining dialogue box prompts.

WINDOWS NT 4.0

1. Click the [Start] button, select [Settings] and then [Control Panel].

2. Double-click the [Network] icon.

3. In the [Network] dialogue box, click the [Protocols] tab.

4. If the [NetBEUI Protocol] is not listed, click the [Add] button.

5. In the [Select Network Protocol] dialogue box, select [NetBEUI Protocol] and click [OK].

WINDOWS 2000

1. Click the [Start] button, select [Settings] and then click on [Network and Dial-up Connections].

2. Double-click the [Local Area Connection] icon. In the [Local Area Connection Status] dialogue box, click the [Properties] button.

3. In the [Local Area Connection Properties] dialogue box, if the [NetBEUI Protocol] is not listed, click the [Install] button.

4. In the [Select Network Component Type] dialogue box, select [Protocol] and click the [Add...] button.

5. In the [Select Network Protocol] dialogue box, select [NetBEUI Protocol] and click the [OK] button.

6. Click the [Close] button in the [Local Area Connection Properties] dialogue box.

7. Click the [Close] button in the [Local Area Connection Status] dialogue box.

WINDOWS XP

Although you can install the NetBEUI protocol into Windows XP, it is not supported. You should be able to use NetBEUI on LAN connections although you will not be able to use this on a Remote Access Service Connections.

1.   In the [Start] menu, select [Settings] then [Control Panel].

2.   Double-click on [Network Connections].

3.   Right-click the adapter you wish to add NetBEUI to and then click [Properties].

4.   On the [General] tab, select [Install].

5.   Select [Protocol] and then [Add].

6.   Select [Have Disk] and insert your Windows XP CD-ROM, open the *Valueadd\msft\net\netbeui* folder, click the *Netnbf.inf* file and then click [Open]. Now the printer has been configured and NetBEUI has been installed, you can configure Windows to print over the network.

PRINTER DRIVER CONFIGURATION

In the following example, the printer has been configured as follows:

COMPUTER NAME:	OL07DB85
Workgroup:	PrintServer
Comment:	EthernetBoard Network interface

1.   Set up the printer driver as the default local printer.

2.   In the [Start] menu, select [Settings] then [Printers].

3.   Select the relevant printer driver, then [Properties].

4.   Click on the [Details] tab in the printer driver.

5.   Select [Add Port]. Select [Network] and click [Browse].

6.   Double-click [Entire Network], [PrintServer] and [*OL07DB85*].

7.   Select [*Prn1*] and click OK.

8.   Check that [Network] is selected and click [OK].

9.   Select [Apply] and [OK] to close [Properties].

> Printing can be carried out using the application software.

> The Master Browser function manages machine information from the same Workgroup, and replies to summary requests from other workgroups.

> The Master Browser function operates only if the Workgroup name is PrintServer.

> The Master Browser function can only manage this network card. If the PrintServer name is put into another Workgroup, the network card will not be able to find it on the network.

> A maximum of eight Ethernets can be managed by the Master Browser function.

> Printing cannot be carried out and an error message appears when jobs from other users (including other protocols) are being printed.

NOVELL NETWARE

OVERVIEW

The Network Interface supports the Novell NetWare environment.

It is necessary to have NetWare Administrator or Supervisor rights to change the configuration. This guide is for NetWare administrators. It should be read in conjunction with the relevant Novell NetWare manual. The latest Novell service packs and Novell client versions should be installed.

SUPPORTED VERSIONS AND MODES

NetWare 3.11 +	Bindery
NetWare 4.1+	Bindery and NDS
NetWare 5+	Bindery, NDS and NDPS
NetWare 6	Bindery, NDS, NDPS and iPrint

In NDS, the printer can be configured to work in either print server mode or remote printer mode.

REMOTE PRINTER MODE

Remote Printer Mode requires a connection to be made to a workstation running Pserver. Print jobs are received from the file server via the NetWare print server. The network interface card emulates the workstation on which the NetWare Rprinter operates. Remote Printer Mode adds additional traffic to the network and is slower than Print Server Mode but does not require any additional licences.

PRINT SERVER MODE (RECOMMENDED)

In Print Server Mode, the file server is logged in and the printer queue is repeatedly polled to determine whether a print job exists. The NetWare print server or workstation where Pserver runs is emulated. This enables high speed printing without applying a load to the network. Print Server Mode requires a single user NetWare licence.

Printing the Network Interface Card Configuration Sheet

The printer's configuration page reports information that is required for NetWare configuration. To print a configuration page, while the printer is switched on, depress the push-button on the Network Interface Card for three seconds and then release.

The information that you require is the printer's Ethernet address. The first six characters of the Ethernet address are the same for all Network Interfaces. The last six characters of the Ethernet address are unique to each card.

This is all the information that is required to setup the Network Interface for NetWare.

SETUP UTILITIES

Use *NWAdmin32* or the *Pconsole* utility to create and setup NetWare printer objects. Please refer to Novell documentation for instructions on how to achieve this.

Use the Network Card Setup Utility (*AdminManager*) or other printer manager software, (Web browser, etc.) to configure the network interface card. For instructions please refer to the Configuration Utility section and online help.

iPRINT

iPrint is included in NetWare 6 and is Novell's next generation of printing software. It is Novell's implementation of IPP (Internet Printing Protocol). iPrint allows users to install, manage and print to printers through Web browsers regardless of where the printer is physically located or whether they know the printer's network address. iPrint runs on top of Novell Distributed Print Services (NDPS) and provides the following functionality:

>   Global access to printers.

>   Customizable view of any print environment.

>   Flexible print deployment configurations.

>   Secure printing.

The Network Interface does not require any custom configuration for iPrint. To enable and configure the iPrint service on your network, please refer to your Novell NetWare 6 documentation.

UNIX

OVERVIEW

The Network Interface supports many protocols such as LPD, FTP, TELNET, SNMP and IPP, and works within the UNIX environment.

To use the network card within the UNIX environment, the following steps are required:

CONFIGURATION

Network Interface card setting

The first step in installing the network card under UNIX is to set up the IP address, Subnet Mask and Gateway. This section explains one way to set them up from a UNIX workstation.

> *The network addresses used in this manual are shown as examples only. Network addresses used in your installation must be generated for your own network.*

> *Login as [root] to change the configuration of the Network Interface.*

> *If an incorrect IP address, Subnet Mask or Gateway is entered, the network may go down or other damage may occur. Check the address with your network manager.*

The following explanation uses Sun Solaris 2.8 (Solaris 8) as an example. The actual commands may differ between versions of UNIX, so refer to the workstation manuals for more information.

1. Log in as [root] to the workstation

> If you do not have superuser rights, the network manager should conduct the configuration.

2. Set the IP address. See the section of "IP Address Setup".

3. Login to the network interface card using TELNET.

```
Example: Logging in to IP address
192.168.20.127
#telnet 192.168.20.127
Trying 192.168.20.127
Connected to 192.168.20.127
Escape character is `^]'.
EthernetBoard nnnnnnnnn Ver P2.03 TELNET server
login: root
`root' user needs password to login.
password: <CR>
User `root' logged in.
No. Message Value (level.1)
-------------------------------------------
 1 : Setup TCP/ IP
 2 : Setup SNMP
 3 : Setup NetWare
 4 : Setup EtherTalk
 5 : Setup NetBEUI
 6 : Setup printer trap
 7 : Setup SMTP (E-mail)
 9 : Maintenance
10 : Setup printer port
11 : Display status
12 : IP Filtering Setup
97 : Network Reset
98 : Set default (Network)
99 : Exit setup
Please select (1- 99)?
```

4. Type **1** and press the [Enter] key. Perform the following settings:

```
Please select (1- 99)? 1

No. Message Value (level.2)
-------------------------------------------
 1 : TCP/ IP protocol     : ENABLE
 2 : IP address           : 192.168.20.127
 3 : Subnet Mask          : 255.255.255.0
 4 : Default Gateway      : 192.168.20.1
 5 : RARP protocol        : DISABLE
 6 : DHCP/ BOOTP protocol : DISABLE
 7 : Auto IP Address      : DISABLE
 8 : DNS Server (Pri.)    : 0.0.0.0
 9 : DNS Server (Sec.)    : 0.0.0.0
10 : root password        : "******"
11 : Auto Discovery Setup
99 : Back to prior menu
Please select (1- 99)?
```

5. Logout from the network interface card. Turn the printer off and on again to validate the settings.

This section explains how to configure a printer for major UNIX operating systems.

Sun OS 4.x.x (BSD) configuration

The following explanation uses Sun OS 4.1.3 and a nnnnn printer as examples. The absolute path of commands and the configuration method may differ between OS versions, so refer to the workstation manuals for more information.

If an incorrect IP Address, Subnet Mask or Gateway is entered, the network may go down or other damage may occur. Check the address with the network manager and confirm that the IP address of the printer has been set.

1.   Login as [root] to the workstation.

If you do not have Superuser rights, the network manager should conduct the configuration.

2.   Register the IP address of the network card and the host name in the */etc/hosts* file.

Example: for IP address 192.168.20.127 and host name nnnnn

```
192.168.20.127 nnnnn
```

3.   Use the **ping** command to confirm connection with the network card.

Example: for host name nnnnn

```
# ping nnnnn
```

4. Register the printer in the */etc/printcap* file.

Example: for host name nnnnn, to create a queue called nnnnn_lp

```
nnnnn _ lp: \
:lp=:rm=nnnnn:rp=lp:\
:sd=/usr/spool/nnnnn _ lp:\
:lf=/usr/spool/nnnnn _ lp/nnnnn _ lp _ errs:
```

Where:

`nnnnn _ lp`	The name of the printer queue
`lp:`	The name of the device used to connect to the printer. Does not need to be specified for a remote machine.
`rm:`	The name of the host of the remote printer. This should be the same as the name added to the */etc/hosts* file.
`rp:`	The name of the printer on the remote printer. It should be `lp`.
`sd:`	The spool directory. Give the absolute path.
`lf:`	The error log file. Give the absolute path.

5. Create the spool directory and error log file.

Example: for spool Directory nnnnn_lp and Error Log file nnnnn_lp_errs

```
# mkdir /usr/spool/nnnnn _ lp

# touch /usr/spool/nnnnn _ lp/nnnnn _ lp _ errs

# chown -R daemon /usr/spool/nnnnn _ lp

# chgrp -R # daemon /usr/spool/nnnnn _ lp
```

6. Check that **lpd** (printer daemon) is activated.

```
# ps aux | grep lpd
```

7. If **lpd** is not running, you can start it by logging in as superuser and executing

```
# /usr/lib/lpd &
```

Sun Solaris 2.x configuration

Admintool is normally used to register remote printers on Open Windows. However, it cannot be used here, as the data recipient and queue have the same name. The procedure below must be used for registering a remote printer.

If Solaris 2.x is connected to the remote printer for a long period according to the system specifications, errors and forced disconnection may occur. Therefore, if paper tearing, off-line and other errors result in waiting time, printing may have to be aborted.

if an incorrect IP address is entered, the network may go down or other damage may occur. Configure after consulting the network manager.

The following explanation uses Sun Solaris 2.8 (known as Solaris 8) and a nnnnn printer as examples. The absolute path and method of configuring commands may differ in other versions of the OS. Refer to the workstation manual for more details.

1.   Confirm that the IP address of the printer has been set.

2.   Login as [root] to the workstation. If you do not have superuser rights, the network manager should conduct the configuration.

3.   Register the IP address of the network card and the host name in */etc/hosts* file.

Example: for IP Address 192.168.20.127 and host name nnnnn

```
192.168.20.127   nnnnn
```

4.   Use the **ping** command to confirm connection with the network card.

Example: for host name nnnnn

```
# ping nnnnn
```

5.   Register the network card as a remote printer server.

Example: for host name nnnnn

a.   Stop the print scheduler.

```
# usr/sbin/lpshut
```

b.   Create the printer queue.

```
# /usr/sbin/lpadmin -p nnnnn _ lp  -v /dev/null \

m netstandard -o dest=nnnnn:lp

-o protocol=bsd
```

c.   Set the queue to accept PostScript print jobs.

```
# /usr/sbin/lpadmin -p nnnnn _ lp -I postscript
```

d.   Start the print scheduler.

```
# /usr/sbin/lpsched
```

e.   Activate the print queue.

```
# /usr/sbin/accept nnnnn _ lp
```

f.   Enable the print queue3

```
# /bin/enable nnnnn _ lp
```

To customise output, for example to add additional commands at the start of each print job, you can edit a copy of the **netstandard** model file then add it using the **lpadmin** command.

Example: for printer nnnnn_lp, with model file called nnnnn_model

```
# /usr/sbin/lpshut

# /usr/sbin/lpadmin -p nnnnn _ lp -m nnnnn _ model

# /usr/sbin/lpsched
```

HP-UX 10.x configuration

If an incorrect IP Address, Subnet Mask or Gateway is entered, the network may go down or other damage may occur. Check the address with the network manager.

The following example uses HP-UX10.20 and a nnnnn printer as examples. The absolute path and method of configuring commands may differ in other versions of the OS. Refer to the workstation manual for more details.

1. Confirm that the IP address of the printer has been set. See network interface card IP address configuration for more information.

2. Login as [root] to the workstation. If you do not have superuser rights, the network manager should conduct the configuration.

3. Register the IP Address of the network card and the host name in the */etc/hosts* file.

Example: for IP Address 192.168.20.127 and host name nnnnn

```
192.168.20.127 nnnnn
```

4. Use the **ping** command to confirm connection with the network card.

Example: for host name nnnnn

```
# ping nnnnn
```

5. If remote spooling is not already enabled on the HP-UX machine, carry out the following configuration.

    a. Stop the printer spooler.

    ```
    # /usr/sbin/lpshut
    ```

    b. Add the following line to the */etc/inetd.conf* file and register the remote spooler.

    ```
    printer stream tcp nowait root /usr/sbin/
    rlpdameon -I
    ```

    c. Restart *inetd*

    ```
    # /etc/inetd -c
    ```

6. Register the remote printer.

Example: setting up a queue called nnnnn_lp to print to host nnnnn

d. Register the remote printer.

```
# /usr/sbin/lpadmin -pnnnnn _ lp -v /dev/null
-mrmodel \-ormnnnnn -orplp -ocmrcmodel
-osmrsmodel -ob3
```

e. Activate the print queue.

```
# /usr/sbin/accept nnnnn _ lp
```

f. Enable the print queue.

```
# /bin/enable nnnnn _ lp
```

g. Enable the printer spooler.

```
# /usr/sbin/lpsched
```

To customise output, for example, to add additional commands at the start of each print job, you can edit a copy of the */usr/spool/lp/model/rmodel* model file then add it using the *lpadmin* command.

Example: for printer nnnnn_lp, with model file called nnnnn_model

```
# /usr/sbin/lpshut
# /usr/sbin/lpadmin -pnnnnn _ lp -mnnnnn _ model
# /usr/sbin/lpsched
```

AIX 4.1.5 configuration

The following explanation uses AIX4.1.5 and a nnnnn printer as examples. The absolute path of commands and the method of configuring may differ with the OS version. Refer to the workstation's manual. If an incorrect IP address is entered, the network may go down or other damage may occur. Configure after consulting the network manager.

1.   Log in as [root]. If you do not have superuser rights, the network manager should conduct the configuration.

2.   Register the IP address and the host name in the *to/etc/hosts* file.

Example: for IP Address 192.168.29.127 and host name nnnnn

```
192.168.20.127 nnnnn
```

3.   Use the **ping** command to confirm connection with the network card.

Example: for host name nnnnn

```
# ping nnnnn
```

4.   Register the host that was previously registered as the print server.

Example: for the nnnnn registered as the print server

a.   Add the print server.

```
# ruser -a -p nnnnn
```

b.   Activate the remote printer daemon.

```
# startsrc -s lpd
# mkitab `lpd:2:once:startsrc -s lpd'
```

5.   Add the print queue using the smit command.

a.   Activate the *smit* command and convert to the item [Add print queue].

```
# smit mkrque
```

b.   Select [remote] (the printer connected to the remote host) from [Type of connection].

c.   Select [Standard procedure] from Type of remote print.

d. Carry out the following settings in [Add a standard remote print queue]. If the configuration differs from below, configure according to environment.

Example: for direct output port lp with print queue nnnnn_lp and print server nnnnn

```
Queue to be added "nnnnn _ lp"
Host name of the
remote server "nnnnn"
Queue name of the
remote server "lp"
Type of print spooler
of the remote server "BSD"
Description of printer name
of the remote server "Optional comment"
```

LPD Printing

Line Printer Daemon (LPD) is the most common protocol for printing with TCP/IP to a network printer. Refer to the workstation's manual for details of *lpr* and *lp* commands. The following explanation in this section uses the printing of print file *test.prn* with printer name *nnnnn_lp* as an example.

Logical printers

The Network Interface includes three logical printers.

> *lp* must be used for printing a file created using the printer driver.

> *sjis* must be used for printing a text file of Shift JIS Kanji code.

> *euc* must be used for the printing a text file of the EUC Kanji code.

LOGICAL PRINTER	PRINTER FUNCTION
lp	For direct output
sjis	For Shift JIS Kanji converted output
euc	For EUC Kanji converted output

> *sjis and euc function only as PostScript printers.*

BSD-based UNIX

Print using the *lpr* command.

```
# lpr -Pnnnnn _ lp test.prn
```

If the *lprm* command is used, the print job is cancelled.

Example: To delete a print job (Job ID 123) on the nnnnn_lp

```
# lprm -Pnnnnn _ lp 123
```

Verify the printer status using the *lpq* command.

> *The result of lpq may not be displayed correctly depending on UNIX operating system specification.*

> *While the short format of lpq is a UNIX compatible format, the long format is unique to the Network Interface.*

Example of the short format: `# lpq -Pnnnnn _ lp`

Example of the long format: `# lpq -l -Pnnnnn _ lp`

System V-based UNIX

Print using the *lp* command.

lp -d nnnnn_lp test.prn

Delete a print job using cancel command.

Example: To delete a print job (Job ID 456) in the nnnnn_lp

```
# cancel nnnnn _ lp  -456
```

Verify the printer status using the *lpstat* command.

```
# lpstat -pnnnnn _ lp
```

> *The result of lpstat may not be displayed correctly depending on UNIX operating system specification (e.g. Solaris 2.x).*

FTP printing

FTP (File Transfer Protocol) is used for transferring a file with TCP/IP. If the print data is sent to a logical printer via FTP, it is printed.

Refer to the workstation's manual for details of the ftp command. The following explanation uses print file test.prn with printer name nnnnn_lp as an example.

Logical directories

The Network Interface includes three logical directories.

lp must be used for printing a file created using the printer driver.

sjis must be used for printing a text file of Shift JIS Kanji code.

euc must be used for the printing a text file of the EUC Kanji code.

LOGICAL DIRECTORY	PRINTER FUNCTION
lp	For direct output
sjis	For Shift JIS Kanji converted output
euc	For EUC Kanji converted output

> *jis and euc function only as PostScript printers.*

> *You can not send data to the root directory.*

1. Login to the network interface card.

When printing with *ftp*, use any values for name and password. However, if the user name is [root], the password set under TELNET or the utility is required. See the appropriate section for details.

Example: Logging in with host name nnnnn (or IP address 192.168.20.127).

```
# ftp nnnnn (or ftp 192.168.20.127
Connected to nnnnn
220 EthernetBoard nnnnnnnnn Ver P2.03
FTP Server
Name (nnnnn:<none>) : root
331 Password required.
Password:<CR>
230 User Logged in
ftp>
```

The network card logical directory structure is hierarchical. Move to the logical directory; it is not possible to output print data to the root directory.

2. Move to the preferable logical directory using the *cd* command.

Example: moving to the lp directory and confirming the current directory.

```
ftp> cd /lp
250 Command OK.
ftp> pwd
257 "/lp" is current directory
ftp>
```

3. Configure the transfer mode

There are two types of transfer mode: BINARY mode, in which the file content is output as it is and ASCII mode, which converts the LF code to the CR+LF code. If a binary file converted by the printer driver is transferred, the transfer mode has to be BINARY mode.

Example: changing transfer mode to binary mode and verifying the current mode

```
ftp> type binary
200 Type set to I.
ftp> type
Using binary mode to transfer files.
ftp>
```

4. Transfer the print data to the network card using the *put* command. Two methods of file transfer using the *put* command are available.

Example: transferring print data test.prn

```
ftp> put test.prn
```

*Example: transferring print data specified by absolute path/*users/test/test.prn

```
ftp> put /users/test/test.prn /lp
```

5. Logout from the network card using the *quit* command

```
ftp> quit
```

Three states can be verified using the quote command *stat*: the IP address, login user name and transfer mode. In addition, printer status can be verified by specifying the directory after the *stat (lp, sjis, euc)*.

Example: displaying network card status

```
ftp> quote stat
211-FTP server status:
Connected to: 192.168.20.10.000.00
User logged in: root
Transfer type: BINARY
Data connection: Closed.
211 End of status.
ftp>
```

Example: displaying the network card status (directory name: lp)

```
ftp> quote stat /lp
211-FTP directory status:
Ready
211 End of status
ftp>
```

APPLE MACINTOSH

OVERVIEW

The Network Interface supports the Apple Macintosh AppleTalk environment. This guide is for administrators and it should be read in conjunction with the relevant Macintosh manual. The latest Macintosh service packs should be installed.

SUPPORTED VERSIONS

All Macintosh operating systems from OS 8.1 are supported.

Printing the Network Interface Card Configuration Sheet

The printer's configuration page reports information that is required for Macintosh configuration. To print a configuration page, while the printer is switched on, depress the Network Interface's push-button for three seconds and then release.

The first six characters of the Ethernet address are the same for all Network Interface network cards. The last six characters of the Ethernet address are unique to each card.

This is all the information that is required to setup the Network Interface for Macintosh.

SETUP UTILITIES
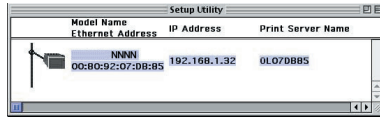
Use the Network Card Setup Utility (Macintosh) to assign an IP address and configure the network interface card. For instructions please refer to the Configuration Utility section and on-line help.

CONFIGURATION

There are three items that need to be configured for EtherTalk.

1.   Use EtherTalk Protocol

Please check the Use EtherTalk Protocol checkbox.

2.   Printer Name

Give the Printer Name as you would like it to appear in the Chooser

3.   Zone Name

If your network uses Zones, please enter the Zone Name here, otherwise leave as is.
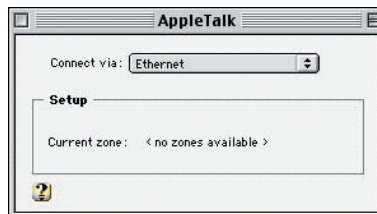
APPLETALK CONFIGURATION

To enable network printing from the Macintosh, you must configure AppleTalk to connect via Ethernet.

1. From the Apple menu select [Control Panels - AppleTalk].

2. From the AppleTalk configuration page select [Connect via: Ethernet].

3. In Setup Current Zone, if used, make sure that your zone information is correct.

4. Close the AppleTalk configuration page and save changes to current configuration when prompted.

5. Configuration is now complete and you are ready to install your printer driver. Please enter your driver CD, run the installer and follow the on-screen instructions.

MACINTOSH OS X

The Network Interface is also supported in the Macintosh OS X environment.

Run the installer on the driver CD to install the printer's PPD file.

In OS X you need to make sure that AppleTalk is turned on in order to connect to an AppleTalk printer.

1. To switch AppleTalk on, open [System Preferences], click [Network] then click [AppleTalk].

2. Check the [Make AppleTalk Active] check box and if your network uses AppleTalk Zones, enter the appropriate zone information and click [Apply Now].

In Mac OS X you use the Print Centre to select network printers, not the Chooser.
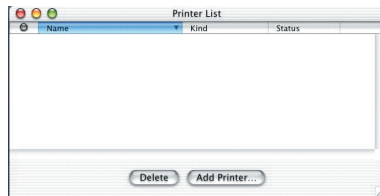
Before you can use a printer it must appear in the printer list in Print Centre.

3. Click on [Add Printer], make sure that the connection method is LPR and assign its IP address.

4. Either assign a queue name or check to use the default queue on server checkbox.

5. Under Printer Model select from the list the PPD file that you installed earlier for the printer and click [Add].

These are all the steps that are necessary to setup the Network Interface for network printing in Macintosh OS X.

Troubleshooting

The network addresses used in this manual are shown for example only. Network addresses used in your installation must be generated from your own network.

Self-diagnostic test

Printer does not print.

Ensure the printer emulation is set to **PS** or **Automatic**.

NG *is printed in the Self-diagnostic test.*

Flash ROM Check registers NG.

If the machine has been fitted with a Network Interface *Card* (NIC), confirm that it is installed correctly and turn the printer off and on again.

Initialize the NIC.

TCP/IP

Printer cannot find the network interface card.

Turn the printer off and on again.

Confirm the network interface is enabled on the printer.

Check there is a response to the **ping** command.

Check the network cable is correctly connected.

Change the cable and try again.

Run the Self-diagnostic test.

Check the IP Address, Subnet Mask and Gateway are correct.

Check that the TCP/IP protocol is set to **Enable**.

Reset the network interface card to factory default settings.

If DHCP, BOOTP and RARP are not used, ensure they have been set to **Disable**.

Cannot print with lpr and ftp.

Turn the printer off and on again.

Check there is a response to the **ping** command.

Check the network cable is correctly connected.

Change the cable and try again.

Check the host name and IP address are configured in the workstation.

Check the printer port name is configured in the workstation.

There are three port names: **lp**, **euc** and **sjis**. Use **lp** by default as **euc** and **sjis** are specific to PostScript printers.

Incorrect User name on the banner page.

If printing with *lpr*, the User name printed is **unknown** and the Filename printed is the Spool file name.

If printing with FTP, the User name printed is the User name entered during FTP login and the File name printed is the Transmitted file name. If the Print Directory name is indicated in the **put** command, the File name is not printed. The Printer name printed is the Logical Directory name.

NETWARE

Printer cannot find the network interface card.

Turn the printer off and on again.

Confirm the network interface is enabled on the printer.

Check the network cable is correctly connected.

Change the cable and try again.

If the standard configuration utility is used, check the NetWare network number in the environment settings.

If the NetWare protocol is disabled, set it to **Enable**.

Reset the network interface card to factory default settings.

The network interface is identified by the setup utility but not by the NetWare server.

Start up the NetWare server and check the Network Interface configuration.

Check the NSAP packet on the NetWare server is not set to **Disable**.

Remote Server mode

Check the correct print server is operating on the file server.

Check the Print Server name operating on the File Server and the Print Server name set in the Network Interface are the same.

Check the Printer name displayed in the Print Server monitor of the File Server and the NetWare Port name set in the Network Interface are the same. If there are multiple network interface cards, configure the NetWare Port names to be different.

Print Server mode

Check the File Server name set in the Network Interface and on the File Server are the same.

Check the Printer name set in the File Server and the NetWare Port name set in the Network Interface are the same. If there are multiple Network Interfaces, configure the NetWare Port names to be different.

Check the NetWare login password is correct.

Check the Machine name is the same as the Print Server name set in the File Server.

Printer does not print.

Check the network cable is correctly connected.

Change the cable and try again.

Turn the printer off and on again.

Check the Network Interface is connected to the File Server.

Check the printer driver has been mapped to the correct netware queue.

PostScript error occurs if a Banner Page is printed.

A PostScript Banner page cannot be printed in NetWare 3.12 Remote Printer mode. If a PostScript printer is used and a Banner Page is printed, **PostScript error** is displayed. Turn the banner output **Off** in the client's printer settings.

ETHERTALK

Not identified by the Chooser and the Setup Utility.

Turn the printer off and on again.

Check the network cable is correctly connected.

Change the cable and try again.

If the network resides in a Zone, check the correct Zone name is selected in the Chooser.

Check the Zone name in the utility related to the Network Interface is the same as the Zone name set in Network Interface.

Check AppleTalk, which is displayed at the right bottom of the Chooser, is set to **Enable**. (In some OS versions Network is used instead of AppleTalk.)

Check **Ethernet** is selected in AppleTalk. (In some OS versions Network is used instead of AppleTalk.)

Check the print driver is selected in the Chooser.

Check the EtherTalk protocol is set to **Enable**.

Print the Network Interface settings and confirm that the EtherTalk Port name is not blank.

NᴇᴛBEUI

The network interface card is not identified.

Turn the printer off and on again.

Check the network cable is correctly connected.

Change the cable and try again.

Check **Microsoft network client** and **NetBEUI** have been added to the network section of the control panel.

Check the NetBEUI protocol is set to **Enable**.

Check the factory setting of the workgroup name is **PrintServer** and the computer name is ML+ the last six characters of the MAC address.

Check the computer name of the Network Interface is different from the computer name on the network.

Error writing to Prn1.

Check the printer is online.

If there is an error message indicating the paper has run out, add more paper and cancel the error.

Check whether another user is printing. Print after the other user has finished.

GLOSSARY

NIC	Network Interface Card
NDS	Novell Directory Service
NDPS	Novell Distributed Print Services
iPrint	Internet Print
IPP	Internet Printing Protocol

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