

MPS/LPS Installation Guide

**For the MPS100, LPS1-T and LPS1-2
Micro Print Servers**

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WARNING

This product has been designed to comply with the limits for a Class A digital device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against such interference when operating in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with this guide, may cause harmful interference to radio communications.

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Cet appareil doit se soumettre avec la section 15 des statuts et règlements de FCC. Le fonctionnement est subjecté aux conditions suivantes:

- (1) Cet appareil ne doit pas causer une interférence malfaisante.
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1: Introduction

The Lantronix Micro Print Servers (MPS100, LPS1-T and LPS1-2 models) are multi-protocol print servers that provide shared network access to printers for a variety of network protocols and operating systems. The MPS supports the TCP/IP, IPX (NetWare), Local Area Transport (LAT), AppleTalk, and LAN Manager protocols. The LPS supports TCP/IP, NetWare, and LAT. Both types of servers can queue multiple pending jobs and service those jobs in the order in which they are received from hosts.

The MPS100 can auto-negotiate between 10BASE-T and 100BASE-T media connected to its RJ45 port. The features, installation process, and configuration procedures are the same. The LPS provides a twisted pair (10BASE-T) or BNC (10BASE-2) connector for network connections.

Note: *In this manual, all MPS and LPS servers will be referred to as “the MPS” unless a distinction needs to be made between models.*

1.1 How to Use This Manual

This guide is structured as follows:

- ◆ Chapter 2, *Installation* explains how to physically install the MPS.
- ◆ Chapter 3, *Getting Started* explains the minimum configuration needed.
- ◆ Chapters 4 through 8 cover protocol-specific setup needed to install print queues and otherwise use the MPS.
 - Chapter 4, *TCP/IP Configuration*
 - Chapter 5, *NetWare Configuration*
 - Chapter 6, *LAT Configuration*
 - Chapter 7, *AppleTalk Configuration*
 - Chapter 8, *DLC Configuration for LAN Manager*
- ◆ Appendices A through F provide supplementary information.
 - Appendix A, *Contact Information*
 - Appendix B, *Troubleshooting*
 - Appendix C, *Pinouts*
 - Appendix D, *Updating Software*
 - Appendix E, *Specifications*

- Appendix F, *Frequently-used Commands*

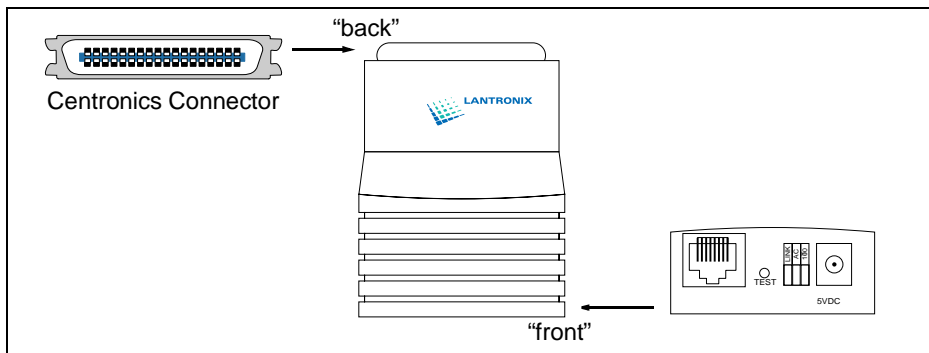
Read chapters 2 through 4 in order, then proceed to the protocol-specific chapter that relates to your network. Refer to Appendix F as needed. The *Print Server Reference Manual*, located on the CD-ROM and web site, provides additional information about configuring and using your MPS.

2: Installation

This chapter describes the various MPS models and shows how to install them into a basic network situation.

2.1 MPS/LPS Product Description

The front panel of the MPS100 has a Test button, 3 LEDs, a power connector, and an RJ45 connector for 100BASE-T. The rear panel has a Centronics connector. The front



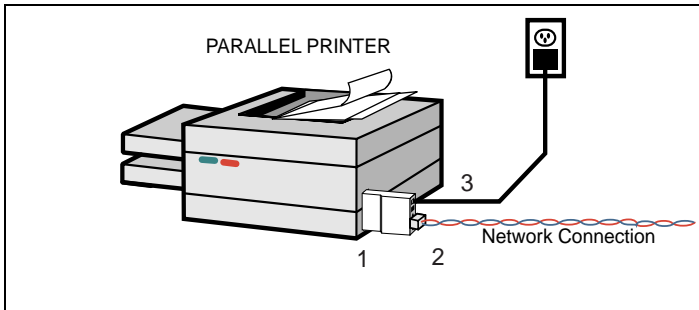
panel of the LPS has a Test button, 2 LED's, a power connector, and a 10BASE-T network connector for the LPS1-T or a 10BASE-2 BNC connector for the LPS1-2. The rear panel also has a Centronics connector.

The **LINK** LED is solid green when there is a valid Ethernet network connection. The **ACT** (Activity) LED flashes green or red when the MPS is in use. The **100** (100 MBit) LED (MPS100 only) is solid green when a 100BASE-T network is connected.

The Test button serves two functions. When pressed briefly, it prints a test page. When pressed for five seconds while plugging in the power cable, it returns the MPS to its factory default configuration.

2.2 Installing the MPS

The following diagram shows a properly-installed MPS:



To install the MPS, complete the following steps in order. Refer to the numbers in the figure for help.

- 1 Connect the MPS Centronics connector directly to your printer's connector.
- 2 Connect an Ethernet cable to your MPS's RJ45 or BNC connector.
- 3 Attach one end of the power cable to the MPS; plug the other end into an electrical outlet. Power will come on automatically.
- 4 Allow 45 seconds for the MPS to fully boot.
 - It will run through a set of power-up diagnostics for approximately 12 seconds. The 4 LEDs will show varying patterns corresponding to the test being run.
 - It will try to obtain configuration information via DHCP, BOOTP, and RARP. This step could last approximately 15 seconds if no hosts answer the requests. The OK LED will blink approximately 3 times per second, and the NETWORK LED will blink occasionally as network requests are transmitted.
 - It will determine if the code in its Flash is valid. If so, it will load the code and begin normal execution. If not, the MPS will have to download software. See *Appendix D* for more information.

- 5** Allow 45 seconds for the unit to fully boot. The LINK LED will be lit if there is a valid network connection. The ACT LED gives information about what the MPS is doing; for example, when code is being downloaded as the unit boots, the LED will blink green quickly. If you have connected a 100BASE-T cable (MPS100 only), The Link and 100MBit LEDs should both be solid green. If not, check your network connection.
- 6** Print a Test page by pressing the Test/Reset button.

Note: *If the Power LED does not light or the Test page does not print, refer to Appendix B.*

3: Getting Started

It is important to consider the following points before logging into and configuring the MPS:

- ◆ You must configure the MPS IP address before any TCP/IP functionality is available. (See *Setting the IP Address* on page 4-1) You cannot use the ThinWeb Manager until you have configured an IP address.
- ◆ Changing any server, service, or port setting requires privileged user status. The default privileged password is **system**.
- ◆ The login password is required for remote console logins. The default login password is **access**.

Note: *If you would like to change either the privileged or login password, either use EZWebCon or refer to the Print Server Reference Manual located on the CD-ROM.*

3.1 Configuration Methods

3.1.1 EZWebCon

The EZWebCon configuration software is the recommended way to configure the MPS. EZWebCon's graphical user interface guides first time users through the initial configuration process and allows experienced users to update any configurable parameters.

EZWebCon requires a Java Virtual Machine (JVM) on the client. Lantronix provides JVM installers for Solaris and 32-bit Windows users, as well as source code and instructions for compiling it for other systems.

The EZWebCon software is located on the distribution CD-ROM. All instructions for installing EZWebCon are provided in the README file. For assistance once EZWebCon is running, refer to the EZWebCon on-line help.

Note: *EZWebCon is also available from the Lantronix website and FTP server. See Appendix D for more information.*

3.1.2 Incoming Logins

You can log in via EZWebCon to configure the MPS. you can also use incoming LAT and TCP/IP logins.

Incoming Telnet is only possible if your MPS has an IP address configured. Incoming Telnet is enabled by default to allow TCP/IP connections. To change this setting, use the **Define Server Incoming** command described in the *Command Reference* chapter of the *Print Server Reference Manual* located on the CD-ROM.

Incoming logins do not prompt for a login password, so you may wish to disable them for security reasons. If it is undesirable to disable incoming logins, the MPS can be configured to prompt for a password with the **Define Server Incoming Password Enabled** command.

3.2 Services

With few exceptions, you must create a service before you can configure print queues on the MPS. A service is a resource accessible to network hosts. A Lantronix service is also known as a **remote printer** name or **remote queue** name on many operating systems.

The following default services are available once the MPS100, LPS1-T, or LPS1-2 has booted:

Table 3-1: Default Services

MPS100	LPS1-T & LPS1-2	Function
MPS_XXXXXX_TEXT	LPS_XXXXXX_TEXT	Used for text print jobs
MPS_XXXXXX_PCL	LPS_XXXXXX_PCL	Used for binary print jobs, such as plotter or PCL files
MPS_XXXXXX_PS	LPS_XXXXXX_PS	Used for Post-Script print jobs

The default service names are based on the server name; therefore the server name must be no more than 13 characters. If you change the server name, the service names will change as well. For example, changing the server name from MPS_XXXXXX to BIOLAB will change the service names to BIOLAB_TEXTS1 and so on.

The default serial port services have the TCP/IP, NetWare, LAN Manager, and AppleTalk protocols enabled. Parallel port services have TCP/IP, NetWare, and LAN Manager enabled. LAT is disabled by default on all services provided by the MPS because many network managers object to the frequent LAT service announcements. AppleTalk is disabled on parallel port services because AppleTalk requires Bitronics mode, which is disabled by default.

If you need to modify a default service, see the *Server Configuration* chapter of the *Print Server Reference Manual* located on the CD-ROM.

4: TCP/IP Configuration

The EZWebCon configuration software is the easiest way to configure the MPS. The following sections cover IP address configuration and print configuration methods for TCP/IP hosts.

4.1 Setting the IP Address

The MPS IP address must be configured before any TCP/IP functionality is available. Use one of the following methods to set the IP address: EZWebCon; a directed Ping packet; a BOOTP, DHCP, or RARP reply; or commands entered via the command line interface.

4.1.1 Using EZWebCon

Use the following steps to assign an IP address using the EZWebCon Expert Shell.

- 1 From the **Action** menu, select **Assign IP Address**.
- 2 Enter or change the IP-related settings:
 - A** For **Ethernet Address**, enter the number that appears on the bottom label of your MPS.
 - B** For **IP Address**, enter the desired IP address to use for this MPS.
 - C** For **Subnet Mask**, change the values provided only if you wish to use a mask other than the default. The default value should be correct in most cases.
 - D** For **Loadhost**, enter the IP address of the loadhost where you intend to store your operating code and SDK files (if used).
- 3 Click **OK**.
- 4 Reboot the MPS. EZWebCon will let you know whether the configuration was successful.

Note: *If you have an older version of EZWebCon, refer to the Readme that was included with it.*

4.1.2 Using a Directed Ping Packet

The ARP/ping method is available under UNIX and Windows-based systems. If the MPS has no IP address, it will set its address from the first directed IP packet it receives.

On a **UNIX** host, create an entry in the host's ARP table and substitute the intended IP address and the hardware address of the MPS, then ping the MPS. This process typically requires superuser privileges.

Figure 4-1: ARP and Ping on UNIX

```
# arp -s 192.0.1.228 00-80-a3-xx-xx-xx
% ping 192.0.1.228
```

In order for the ARP command to work on **Windows**, the ARP table on the PC must have at least one IP address defined other than its own. If the ARP table is empty, the command will return an error message. Type ARP -A at the DOS command prompt to verify that there is at least one entry in the ARP table.

Figure 4-2: ARP and Ping on Windows

```
C:\ ARP -S 192.0.1.228 00-80-A3-XX-XX-XX
C:\ PING 192.0.1.228
```

Note: *There should be replies from the IP address if the ARP command worked.*

When the MPS receives the ping packet, it will notice that its IP address is not set and will send out broadcasts to see if another node is using the specified address. If no duplicate is found, the MPS will use the IP address and will respond to the ping packet.

The MPS will not save the learned IP address permanently; this procedure is intended as a temporary measure to enable EZWebCon to communicate with the MPS, or allow an administrator to Telnet into the MPS. Once logged in, the administrator can enter the **Change IPaddress** command to make the address permanent.

Figure 4-3: Configuring Permanent IP Address

```
% telnet 192.0.1.228

Trying 192.0.1.228

Lantronix MPSx Version n.n/n (yyymmdd)
Type Help at the 'Local_>' prompt for assistance.

Enter Username> gopher
Local> SET PRIVILEGED
Password> system (not echoed)
Local>> DEFINE SERVER IPADDRESS 192.0.1.228
```

Any host wishing to access the MPS will have to be told the MPS's IP address. This is typically configured in the unix file **/etc/hosts** or via a nameserver. Refer to the host's documentation for additional information.

4.1.3 Using a BOOTP, DHCP, or RARP Reply

At boot time a host-based DHCP, BOOTP, or RARP server can respond to an MPS request for an available IP address. For information about configuring the DHCP, BOOTP, or RARP server, see your host documentation.

4.1.4 Using the Command Line Interface

- 1 Connect to the serial port (Port_1) using a console terminal or a terminal emulation program, and press **Return**. The serial port settings are 9600 baud, 8 bits, 1 stop bit, no parity.
- 2 Become the privileged user.

Figure 4-4: Becoming the Privileged User

```
Local> SET PRIVILEGED
Password> system (not echoed)
Local>>
```

- 3 Enter the new IP address.

Figure 4-5: Configuring the IP Address

```
Local>> define server ipaddress 192.0.1.201
```

4.2 LPR Printing

The MPS provides two major methods of printing via TCP/IP: Berkeley remote LPR and RTEL host software.

Two parameters **must** be configured for LPR printing:

- 1 The IP address or host name of the MPS.
- 2 The remote output queue (the name of the service on the MPS).

In addition, there are a few important things to note about LPR printing:

- ◆ Windows for Workgroups, Windows 95, and Windows 98 do not support LPR directly; however, Lantronix has provided a peer-to-peer printing solution on the distribution CD-ROM.
- ◆ Because of the way the LPR protocol is typically implemented on the host, the processing options and banner page are sent after the job data itself. The MPS will print a banner page at the end of a job, and cannot support most of the LPR options. If it is necessary to have the banner page at the beginning of the printout, install and use the RTEL software. If banners are not needed, they can be disabled.

- ◆ The MPS cannot print multiple copies of the print job when using the “-#n” lpr option.
- ◆ If two print queues on the host refer to two services on the same MPS, they must use separate spooling directories.
- ◆ No special purpose input or output filters can be used when printing via LPR. If this functionality is necessary, use the named pipe interface program in the RTEL print queue configuration software.

4.2.1 LPR on Windows NT 3.5.1 (and later)

This section assumes that TCP/IP, Simple TCP/IP, and Microsoft TCP/IP printing have been installed on the Windows NT host.

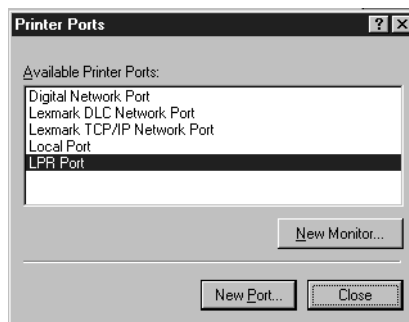
- 1 In the Control Panel, double-click the **Printers** icon.
- 2 Double-click the **Add Printer** icon.
- 3 In the window that appears, choose **My computer** and click **Next**.



- 4 Select the **Add Port** button and click **Next**.

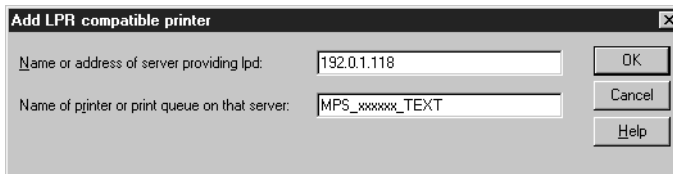


- 5 Select **LPR Port**.



Note: *If LPR Port is not an option, open the Network Control Panel and add "Microsoft TCP/IP Printing" to the List of services.*

- 6 Enter the name or IP address of your MPS on the first line, and enter the name of your MPS print service on the second line.

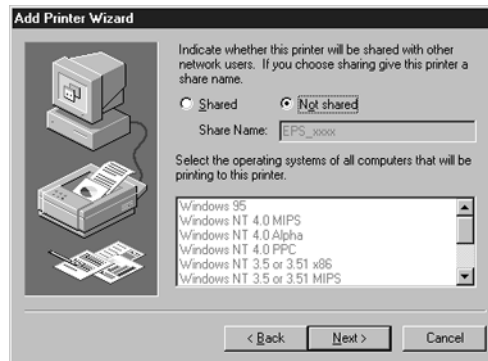


7 Select the manufacturer and printer type.



8 Enter the queue name.

9 If applicable, choose **Shared** and select the type of operating system that the printer will be working with. (First confirm that the print queue is working.)



- 10 Test the printer by choosing **Yes** and clicking **Finish**.



4.2.2 LPR on Windows 95/98

To enable LPR printing on Windows 95/98, you must download and install the *LPR for Windows 95/98* application from the Lantronix CD included with the product.

- 1 From the Distribution CD, install Lantronix LPR.
- 2 Follow the directions in the readme file to configure LPR on your PC.

4.2.3 LPR on UNIX Hosts

The Berkeley remote printing system is supported on many machines, and is simple to configure. This section describes how to configure LPR print queues on generic UNIX hosts such as SUN hosts. There are slight variations in LPR configuration for AIX, HP, and SCO hosts, as will be explained in the following sections.

- 1 Install a print queue on your host by adding the MPS name and IP address to the */etc/hosts* file:

Figure 4-6: Adding */etc/hosts* Entry

```
xxx.xxx.xxx.xxx    MPS_xxxxxxx
```

- 2 Add the host print queue to the */etc/printcap* file. The punctuation shown in Figure 4-7 is required, and no extra spaces should be added.

Figure 4-7: Adding */etc/printcap* Entry

```
mps_prt|Printer on LAB MPS:\
:rm=MPS_xxxxxxx:\
:rp=MPS_xxxxxxx_TEXT:\
:sd=/usr/spool/lpd/mps_prt:
```

This will create a host queue named `mps_prt`. The `rm` parameter is the name of the MPS in the host's address file, the `rp` parameter is the name of the service as it exists on the MPS, and the `sd` parameter specifies the name of a directory used to hold temporary spooling files.

- 3 Create a world-writable spooling directory using the **mkdir** command.

Figure 4-8: Creating Spooling Directory

```
# mkdir /usr/spool/lpd/mps_prt
# chmod 777 /usr/spool/lpd/mps_prt
```

- 4 If desired, use the **mx** option to allow unlimited size files to be printed and the **sh** option to prevent header pages from being generated. See the host's documentation or man pages for more information on the format of the printcap file and how to create the spool directory.
- 5 Print to the queue using normal `lpr` commands:

Figure 4-9: Printing to Queue

```
% lpr -Pmps_prt /etc/hosts
```

4.2.4 LPR on AIX Hosts

The System Management Interface Tool (SMIT) allows you to enable LPD printing and create print queues. LPR has only been tested on AIX versions 3.2 and higher.

To create a print queue:

- 1 At the host prompt, type **smit**.
- 2 Choose **Print Spooling**.
- 3 Choose **Manage Print Server** and **Start the Print Server Subsystem (lpd daemon)**.
- 4 In the **Start the Print Server Subsystem** dialog box, type **both** in the first field.
- 5 The message "The lpd subsystem has been started" will appear. Click **Done**.

To add a print queue:

- 1 From the main window, choose **Print Spooling**.
- 2 Choose **Manage Print Server** and **Manage Print Queues**.
- 3 Choose **Add a print queue**.
- 4 From the dialog box that appears, choose **remote**.

- 5 From the next dialog box, choose **Remote Printing**.
 - 6 The **Add a Standard Remote Print Queue** dialog box will appear. Enter the following information.
 - The name of the print queue,
 - The name of the MPS unit,
 - The name of the MPS service,
 - The type of print spooler on the remote server, and
 - A description of the printer on the remote server.
 - 7 A dialog box will appear: “Added print queue **mpps_prt**”. Click **Done**.
- Note:** *If you are unable to use SMIT, see the Print Server Reference Manual on the CD-ROM for UNIX commands used to set up print queues.*
- 8 Print to the queue using normal lp syntax.

Figure 4-10: Printing to Queue

```
% lp -dmpps_prt filename
```

4.2.5 LPR on HP Hosts

The System Administration Manager (SAM) allows you to create print queues.

- Note:** *If you are unable to use SAM, the Print Server Reference Manual located on the CD-ROM describes UNIX commands that can be used to set up print queues.*
- Note:** *Printer names on HP hosts are limited to 13 characters. The MPS text service name will be too long, so you will have to rename the MPS.*

To create a print queue:

- 1 At the HP prompt, type **sam**.
- 2 From the main application window, choose **Printers and Plotters**.
- 3 In the **Printers and Plotters** window, choose **Printers/Plotters**.
- 4 In the pull-down menu, select **Remote Printer/Plotter** from the **Actions** menu.
- 5 The **Add Remote Printer** window will appear. SAM will prompt you for:
 - The printer name (the name of the print queue),
 - The remote system name (the MPS name),
 - The remote printer name (the MPS service),

- The remote cancel model, and
- The remote status model.

4.2.6 LPR on SCO UNIX Hosts

LPR is supported in SCO V3.2 release 4 with TCP/IP Version 1.2 and greater.

To configure a print queue using LPR, issue the **mkdev rlp** command. This will install the Berkeley remote printing files and executable programs.

Note: *The **mkdev rlp** command should only be issued once, or serious problems will occur. If this happens, contact SCO technical support.*

You can print to this queue using normal lp syntax once the remote printer is set up. To create a remote printer:

- 1 Issue the **rlpconf** command.
- 2 Answer the questions that follow.

Figure 4-11: Configuring Remote Printer

```
Remote Printing Configuration
Enter information for remote printers or local printers accepting remote
printing requests
Please enter the printer name (q to quit): backupprinter
Is printer backupprinter a remote printer or a local printer? (r/l) r
Please enter the name of the remote host that backupprinter is attached
to: MPS_XXXXXX
The backupprinter is connected to host MPS_XXXXXX.
Is this correct? (y/n) y
Would you like this to be the sys.default printer? (y/n) y
Make sure your hostname appears in MPS_PRT's /etc/hosts.equiv or /
etc/hosts:lpd file.
Make sure backupprinter appears in /etc/printcap (in BSD format).
Make sure backupprinter has a spool directory on MPS_PRT.
Putting the printer in printer description file and creating spool direc-
tory... done
Updating LP information... done
```

In the example, the printer name is your MPS service name, and the remote host name is the name of your MPS as it is listed in your hosts file.

During initial configuration, the queue name must be the same as the remote printer name. However, you may change the queue name later by manually editing the printcap file.

4.2.7 RTEL Functionality

If the LPR method of printing is not adequate for an application (for example, if you need banners before jobs, or more flexibility), configure the Lantronix-supplied RTEL software on the host. After installing the software configuring the connections to the MPS, you can use normal UNIX print commands and queue utilities such as **lpc** and **lpstat**.

Note: *RTEL binaries are provided for many systems. Source code is also provided for use on non-supported systems.*

To print to the MPS using special formatting or using third-party software packages, you may have to create **print pipes** on the host. The RTEL software provides this functionality by providing a UNIX named-pipe interface.

To recreate the RTEL source files:

- 1 Copy the file **RTEL_SRC.TAR** in binary mode from the distribution CD-ROM to the UNIX host.
- 2 Untar the archive.
- 3 See the README files in the created directories that describe the contents of the RTEL distribution and man pages that describe the actual software functionality.

4.3 Unix Host Troubleshooting

Table 4-1: TCP Troubleshooting

Area to Check	Explanation
The MPS IP address and name are entered in the host file	Telnet to the MPS using the name in the host file and verify that the MPS name is resolvable and that the MPS is reachable via the network.
Jobs that appear in the host queue reach the MPS	From within the LPC administrative utility, enter these commands to clear and reset the host queue: abort <i>queue</i> clear <i>queue</i> enable <i>queue</i> start <i>queue</i>

5: NetWare Configuration

The EZWebCon configuration software is the easiest way to configure the MPS. The following sections cover print configuration methods for NetWare hosts.

Note: *The MPS needs an IP address before you can use EZWebCon. See Setting the IP Address on page 4-1 for instructions.*

This chapter explains creating NDS print queues with NetWare Administrator and with the PCONSOLE Quick Setup option. To create NDS print queues, you must be running NetWare version 4.x with NDS capabilities.

If you are running NetWare versions 2.x, 3.x, or version 4.x with bindery emulation, you may configure bindery print queues using QINST (bindery only) or PCONSOLE. For more information, see the *NetWare* chapter of the *Print Server Reference Manual* located on the CD-ROM.

5.1 NDPS Printing

Lantronix Terminal and Print Servers support Novell's NDPS for printing using the Novell NDPS Gateway. For instruction on setting up NDPS, refer to your Novell documentation. Lantronix also provides information on setting up NDPS in our FAQs on our support web site (<http://www.lantronix.com/support/>).

5.2 NDS Print Queues

5.2.1 Obtain an NDS License

If you wish to create NDS print queues, you must read and complete an NDS registration form via one of the following methods:

- ◆ Using a forms-capable Internet browser, navigate to the Lantronix World Wide Web site (www.lantronix.com), go to the Technical Support section, and find the **Novell NDS Registration** link.
- ◆ Send email to support@lantronix.com. You will receive a blank registration form that can be completed and returned to Lantronix.
- ◆ If you don't have Internet access, contact a Lantronix technical support representative for assistance. Contact information is provided in *Appendix A*.

5.2.2 Configure your MPS

- 1 License NDS on your MPS using the string obtained from Lantronix.

Figure 5-1: Licensing NDS

```
Local>> DEFINE PROTOCOL NETWARE DSLICENSE licensestring
```

- 2 Define the directory service tree in which the MPS is located.

Figure 5-2: Defining Directory Service Tree

```
Local>> DEFINE PROTOCOL NETWARE DSTREE foodco
```

Note: *For an explanation of the structure of the NetWare Directory Service tree, see your host documentation.*

- 3 Define the directory service context in which the MPS is located.

Figure 5-3: Defining Directory Service Context

```
Local>> DEFINE PROTOCOL NETWARE DSCONTEXT ou=kiwi.ou=exotic.o=fruit
```

- 4 Enter the **List Protocol NetWare Access** command to ensure that at least one of the file servers in the directory service tree is in the access list.
- 5 If desired file server is not in the access list, add it.

Figure 5-4: Defining Access List

```
Local>> DEFINE PROTOCOL NETWARE ACCESS fileserver
```

- 6 Reboot the MPS.

Figure 5-5: Rebooting

```
Local>> INITIALIZE DELAY 0
```

5.3 NetWare Administrator Quick Setup Print Queues

The NetWare Administrator management utility allows you to manage network resources, such as queue-based print services, in a tree structure. You can either use the Quick Setup option or individually create printing-related objects.

Note: *NetWare Administrator can be used for both NDS and bindery print queues.*

To create a print queue with the Quick Setup option:

- 1 Start the NetWare Administrator.
- 2 In the **Directory Tree** windows, select the context in which to install the printer.
- 3 From the Menu Bar, select **Tools: Print Services Quick Setup**.
- 4 In the **Print Server Name** field, enter the name of your MPS (viewable by entering the **Show Server** command at the Local> prompt).
- 5 In the **Printer Name** field, enter the name of the desired print **service** configured on your MPS. For example, MPS_XXXXXX_TEXT.
- 6 In the **Print Queue Name** field, enter the name of the print queue to create. The name should be meaningful to you; it will not affect MPS configuration.
- 7 Click **Create**.
- 8 Reboot the MPS.

5.4 PCONSOLE Print Queues

- 1 Log in as Admin on the file server you will be changing.
- 2 At the prompt, type **PCONSOLE** to start the utility.

For example, if your file server is mapped to the F: drive, you would use the **F:** prompt.

- 3 From the main menu, choose **Quick Set-Up**.
- 4 When prompted by PCONSOLE, enter the information with which to configure the print queue.
 - The print server name (MPS_XXXXXX),
 - The new printer name (service name, such as MPS_XXXXXX_TEXT),
 - The new print queue name, and
 - The print queue volume (the name of the file server from which the printer receives print requests).

The remaining fields can be left in their default settings.

- 5 Press the **F10** key to save the print queue information.
- 6 Reboot the MPS.

5.5 NetWare Host Troubleshooting

Table 5-1: NetWare Host Troubleshooting (Bindery Mode)

Area to Check	Explanation
The print server names in PCONSOLE match the MPS name and its service name	Use PCONSOLE to check.
The MPS NetWare access table	Use the Show Protocols NetWare Access command. Scanning too many file servers can cause a delay between jobs. Configure the access list to only scan for jobs on the file servers of interest.

Table 5-2: NetWare Host Troubleshooting (NDS)

Area to Check	Explanation
The MPS NetWare access table	Use the Show Protocols NetWare Access command. By default, only local file servers are scanned for queues.
The MPS login password and the queue password on the file server	The passwords must match or the MPS will not be able to log into the file servers to scan for jobs.
The MPS has successfully attached to the queue	Type NETSTAT at the Local> prompt. This will display information about file servers, printers, and queues that the MPS has found. If a queue is in JobPoll, the MPS has successfully attached to the queue.
The DSTree, DSContext, and DSLicense	Type Show Protocol NetWare NDS . This command shows the tree and the context that you have configured, a failure code, and an NDS error code for each server. DSTree is the directory service tree on which the MPS is located. DSContext is the context where the MPS is located; it must match the context on the file server (The DSContext must be of the following form: ou=fruit.o=exotic). DSLicensed should be yes .
Printer and queue changes have propagated through the NDS tree	It may take a few minutes for the changes to propagate. If the MPS doesn't attach, reboot the MPS.

Table 5-3: NDS Errors from the File Server

Code	Meaning	Remedy
0xffffda7	Object could not be found in the given context	Check the MPS server name, DScontext, and DStree to ensure the printer server is set up correctly with PCONSOLE.
0xffffda5	Requested attribute could not be found	Use PCONSOLE to ensure that the MPS has associated printers and the printers have associated queues.
0xffffd69	DS Database is locked	An administrator is probably updating the database. Wait a few minutes and issue the Set Protocol NetWare Reset command.
0xffffd63	Invalid password	The password for the print server object under PCONSOLE must match the MPS login password. If the login password on the MPS is left as the default (access), there should be no password for the print server object.
0xffffd54	Secure NCP violation	Turn down the NCP packet signature level so that it is not required.

Table 5-4: NDS Printing Errors

Bit	Meaning	Remedy
1	Server out of memory	Turn the MPS off, wait a few seconds, and turn it back on. Disable unused protocols and/or remove file servers without print queues from the NetWare access list.
2, 3	Unexpected response from file server	Report the problem to Lantronix Technical Support.
4	No printers found for the MPS	Ensure that there are printers for the MPS, and the printer names match the service names on the MPS.
5	No printer queue found	Ensure that the printers have associated queues.
6	Login failed	Ensure there is a print server object configured with the same name as the MPS.
7	Authentication failed	Ensure the MPS login password is the same as the print server object password. If the MPS is using the default password (access), there should be no print server object password.
8	Server cannot attach to queue	Check the NDS partitions, replicas, and volumes to ensure the file server where the queue lives has the correct information.

6: LAT Configuration

The EZWebCon configuration software is the easiest way to configure the MPS. The following sections cover print configuration methods for LAT hosts.

Note: *The MPS needs an IP address before you can use EZWebCon. See Setting the IP Address on page 4-1 for instructions.*

LAT print queues can be created by printing to a port or printing to a service. Printing directly to a port requires no MPS configuration.

Note: *Printing directly to a port is the easiest method for printing to the MPS. If you would like instructions for printing to a service, see the Print Server Reference Manual located on the CD-ROM.*

6.1 Printing Directly to a Port

- 1 Create a LAT application port that references the MPS port.

Figure 6-1: Creating LAT Application Port

```
$ RUN SYS$SYSTEM:LATCP
LATCP> CREATE PORT LTAnnn/APPLICATION
LATCP> SET PORT LTAnnn/NODE=MPS_XXXXXX/PORT=Port_n
LATCP> EXIT
```

- 2 Create and start a print queue that uses the LAT application port.

Figure 6-2: Creating and Starting Print Queue

```
$ INITIALIZE/QUEUE/START/ON=LTAnnn:/PROCESSOR=LATSYM
/RETAIN=ERROR queue_name
```

- 3 Add the commands to the SYS\$MANAGER:LAT\$STARTUP.COM file so the required LAT devices will be recreated after each host reboot.

Note: *LAT terminal device characteristics may have to be changed to correctly print certain files. See your VMS documentation for more information.*

- 4 Print to the queue.

Figure 6-3: Printing to Queue

```
$ PRINT/QUEUE=queue_name filename.txt
```

6.2 LAT Host Troubleshooting

By default, the LAT error message codes on the host are not translated into text error messages. If a LAT job fails and appears in the queue with an eight-digit hex result code, the code can be translated by issuing the following commands:

Figure 6-4: Translating LAT Error Codes

```
$ SHOW QUEUE/FULL/ALL queue_name
(note the error code nnnnnnnn)
$ SET MESSAGE SYS$MESSAGE:NETWRKMSG.EXE
$ EXIT %Xnnnnnnnn
```

Table 6-1: Troubleshooting LAT Configurations Using a Port

Area to check	Explanation
The specified node name matches the MPS node name	Use the Show Server command to verify.
The specified port name matches the port's name	Use the List Port 1 command to verify.

7: AppleTalk Configuration

The EZWebCon configuration software is the easiest way to configure the MPS. The following sections cover print configuration methods for AppleTalk hosts.

Note: *The MPS needs an IP address before you can use EZWebCon. See Setting the IP Address on page 4-1 for instructions.*

Note: *Macintoshes that do not support EtherTalk will need either an Ethernet card or a LocalTalk-to-EtherTalk router to use the MPS.*

Note: *The LPS1-T and LPS1-2 do not support AppleTalk Protocol.*

7.1 Bitronics

Printing from a Macintosh is only possible with a PostScript printer and bi-directional communication between the MPS and that printer. The MPS supports the Bitronics interface, an extension to the standard Centronics interface. Printers that support Bitronics allow bi-directional communication. To enable Bitronics on an MPS port, use the **Define Port 1 Bitronics Enabled** command.

Note: *MacOS 8.1 can also print via LPD. See the Print Server Reference Manual located on the CD-ROM and web site for configuration instructions.*

7.2 Macintosh Services

Before attempting to print from a Macintosh, ensure that AppleTalk and PostScript are both enabled on at least one service. Once a PostScript AppleTalk service is configured, the service will appear in the Chooser as a LaserWriter in the same zone as the MPS. Select the service in the Chooser and complete the appropriate setup options. Then close the Chooser window and print a test page of text to the Macintosh service.

7.3 AppleTalk Zones

If there is a router on the network, the MPS will appear in the default zone specified by the router. To change the default zone use the **Define Protocol AppleTalk Zone** command.

If the MPS is attached to a network without an AppleTalk router, all AppleTalk devices (including the MPS) will appear in the default zone in the Chooser.

Note: *If no router is present on the network, the MPS will not accept AppleTalk print jobs for 60 seconds after booting.*

7.4 AppleTalk Host Troubleshooting

Table 7-1: AppleTalk Host Troubleshooting

Area to Check	Explanation
The printer is available to be selected in the Chooser	Make sure the printer is in the right zone.
Bidirectional communication	Lock the printer in PostScript mode and issue the Test Service PostScript Count n command. This sends a job to the printer and waits for the response.

8: DLC Configuration for LAN Manager

The EZWebCon configuration software is the easiest way to configure the MPS. This chapter explains DLC/Digital Network Port configuration for Windows NT 4.x hosts.

Note: *The Server needs an IP address before you can use EZWebCon. See Setting the IP Address on page 4-1 for instructions.*

Printing using an LPD client is the preferred method for sending print jobs to the MPS. Windows 95 does not support DLC printing (see *Chapter 4* for more information).

8.1 DLC Configuration

8.1.1 MPS Configuration

To use the DLC protocol, you must have one service with the DLC characteristic enabled. The DLC characteristic may be associated with only one service on a given MPS.

Figure 8-1: Enabling DLC

```
Local>> DEFINE SERVICE MPS_XXXXXX_TEXT DLC  
ENABLED
```

8.1.2 Host Configuration

To send print jobs from a Windows NT host to the MPS, add the MPS as a Windows NT printer.

- 1 Double-click the **Printers** icon in the Control Panel.
- 2 Double-click the **Add Printer** icon.
- 3 In the window that appears, select **My Computer** and click **Next**.
- 4 Select the **Add Port** button.
- 5 Select **Hewlett-Packard Network Port** and click **New Port**.

If Hewlett-Packard port is not one of the available options, you must install DLC printing from your Windows NT system disks. DLC is not installed by default.

- 6 Enter the MPS hardware address. It is printed on the MPS bottom label.

- 7** Select **Job-based**.
- 8** Select the manufacturer and printer type.
- 9** Enter the queue name.
- 10** If applicable, choose **Shared** and select the operating system the printer will be working with. (First confirm that the print queue is working.)
- 11** Test the printer.

A: Contact Information

If you are experiencing an error that is not listed in Appendix B: or if you are unable to fix the error, contact your dealer or Lantronix Technical Support at 800-422-7044 (US) or 949-453-3990. Technical Support is also available via Internet email at support@lantronix.com.

A.1 Problem Report Procedure

When you report a problem, please provide the following information:

- ◆ Your name, and your company name, address, and phone number
- ◆ Lantronix MPS model number
- ◆ Lantronix MPS serial number
- ◆ Software version (use the **Show Server** command to display)
- ◆ Network configuration, including the information from a **Netstat** command
- ◆ Description of the problem
- ◆ Debug report (stack dump), if applicable
- ◆ Status of the unit when the problem occurred (please try to include information on user and network activity at the time of the problem)

A.2 Full Contact Information

Address: 15353 Barranca Parkway, Irvine, CA 92618 USA

Phone: 949/453-3990

Fax: 949/453-3995

World Wide Web: <http://www.lantronix.com>

North American Direct Sales: 800/422-7055

North American Reseller Sales: 800/422-7015

North American Sales Fax: 949/450-7232

Internet: sales@lantronix.com

International Sales: 949/450-7227

International Sales Fax: 949/450-7231

Internet: intsales@lantronix.com

Technical Support: 800/422-7044 or 949/453-3990

Technical Support Fax: 949/450-7226

Internet: support@lantronix.com

B: Troubleshooting

This Appendix discusses how to diagnose and fix errors quickly yourself without having to contact a dealer or Lantronix. It will help to connect a terminal to the serial port while diagnosing an error to view any summary messages that are displayed.

When troubleshooting, always ensure that the physical connections (power cable, network cable, and serial cable) are secure. If you have trouble with wireless networking, it may help to connect the MPS to a wired Ethernet network to verify that it is working properly and to check the wireless settings.

Note: *Some unexplained errors may be caused by duplicate IP addresses on the network. Make sure that your MPS IP address is unique.*

B.1 Power-up Troubleshooting

There are several possible error situations if the LEDs do not flash.

Table B-1: Error Messages

Message	Diagnosis/Remedy
Power-up diagnostic failure (hardware failure)	Note which LED is blinking and its color, then contact your dealer or Lantronix Technical Support.
The MPS boots but does not try to load the Flash ROM code	Press the Test/Reset button. A brief description of the problem will be queued to the parallel port and printed.
Network Error: The ACT LED will blink yellow 2-3 times per second	A. Make sure the Ethernet network cable is properly connected and reboot the MPS. B. If option A fails to resolve the problem, reload Flash ROM. Refer to Appendix D.

Problem situations and error messages are listed in Table B-2. If you cannot find an explanation for your problem, try to match it to one of the other errors. If you cannot remedy the problem, contact your dealer or Lantronix Technical Support.

Table B-2: Power-up Problems and Error Messages

Problem/Message	Error	Remedy
The MPS is connected to a power source, but there is no LED activity.	The unit or its power supply is damaged.	Contact your dealer or Lantronix Technical Support for a replacement.
The MPS is unable to complete power-up diagnostics.	This generally indicates a hardware fault. One of the LEDs will be solid red for three seconds, followed by one second of another color.	Note the blinking LED and its color, then contact your dealer or Lantronix Technical Support. The MPS will not be operational until the fault is fixed.
The MPS completes its power-up and boot procedures, but there's no noticeable serial activity.	There is a problem with the serial connection or the set-up of the serial device.	Check the terminal setup and the physical connections, including the cable pinouts (see Appendix C). Try another serial device or cable, or cycle power on the MPS.
	A rapidly-blinking OK LED may signal boot failure.	Reboot the unit. When the MPS is running normally, the OK LED blinks every two seconds.

Table B-2: Power-up Problems and Error Messages, cont.

Problem/Message	Error	Remedy
The terminal shows a Boot> prompt rather than a Local> prompt.	The MPS is not connected properly to the Ethernet.	Ensure that the MPS is firmly connected to a functional and properly-terminated network node.
	The MPS Ethernet address is invalid.	The MPS Ethernet address is located on the bottom of the unit. Use the Change Hardware command to set the correct address, then reboot.
	Init Noboot command was entered.	See <i>Entering Commands at the Boot Prompt</i> on page B-6.
The MPS passes power-up diagnostics, but attempts to download new Flash ROM code from a network host.	If the OK LED blinks rapidly, the Flash ROM code may be corrupt.	Reboot the unit. If you get the same message, you will need to reload Flash ROM. See <i>Reloading Software on page D-2</i> .
	If you did not request a TFTP boot, the flash ROM code is corrupt. The unit will remain in boot mode.	

B.2 DHCP Troubleshooting

Table B-3: DHCP Troubleshooting

Area to Check	Explanation
DHCP is enabled on the MPS	Use the Set Server DHCP Enabled command. If you manually enter an IP address, DHCP is automatically disabled.
Make sure the DHCP server is operational.	Check to see that the DHCP server is on and is functioning correctly.
The MPS gets its IP address from the DHCP server	Refer to the DHCP Manager on your DHCP server for information about addresses in use. If the DHCP server doesn't list your MPS IP address, there may be a problem.

B.3 BOOTP Troubleshooting

If the BOOTP request is failing and you have configured your host to respond to the request, check these areas:

Table B-4: BOOTP Troubleshooting

Area to Check	Explanation
BOOTP is in your system's <code>/etc/services</code> file	BOOTP must be an uncommented line in <code>/etc/services</code> .
The MPS is in the loadhost's <code>/etc/hosts</code> file	The MPS must be in this file for the host to answer a BOOTP or TFTP request.
The download file is in the correct directory and is world-readable	The download file must be in the correct directory and world-readable. Specify the complete pathname for the download file in the BOOTP configuration file, or add a default pathname to the download filename.
The MPS and host are in the same IP network	Some hosts will not allow BOOTP replies across IP networks. Either use a host running a different operating system or put the MPS in the same IP network as the host.

B.4 RARP Troubleshooting

Table B-5: RARP Troubleshooting

Area to Check	Explanation
The MPS name and hardware address in the host's <code>/etc/ethers</code> file	The MPS name and hardware address must be in this file for the host to answer a RARP request.
The MPS name and IP address in the <code>/etc/hosts</code> file	The MPS name and IP address must be in this file for the host to answer a RARP request.
The operating system	Many operating systems do not start a RARP server at boot time. Check the host's RARPD documentation for details, or use the <code>ps</code> command to see if there is a RARPD process running.

B.5 Printing Problems

Table B-6: General Printing Problems

Area to Check	Explanation
Physical connections	To test a non-PostScript printer, use the Test Port MPS Count 100 command. This command will send 100 lines of test data out the parallel port so you can see if the printer is receiving data.
Service characteristics	Use the Show Service Local Characteristics command from the <code>MPS Local></code> prompt to see if the desired service is available and to verify that the appropriate protocols are enabled on the service.
The IP address	The IP address must be unique on the network. Many problems can occur when there are duplicate IP addresses.
Queue Status and Port counters	Use the Monitor Queue command to ensure queue entries appear in the job list. Use the Monitor Port 1 Counters command to verify that the counter is incrementing with each job. If it is not, verify the connection between the MPS and the printer.

B.5.1 PostScript Problems

PostScript printers will silently abort jobs if they detect an error.

Table B-7: PostScript Troubleshooting

Area to Check	Explanation
The MPS is communicating with the printer	To test a PostScript printer, use the Test Port 1 PostScript Count 2 command. This command will send 2 pages of PostScript data out the parallel port. Watch the indicators on the printer to verify that the MPS is communicating with the printer. If the printer is capable of bidirectional communication, use the Test Service MPS_XXXXXX_PS PostScript Count 5 command. This will transfer data both to and from the printer. Autoselection must be disabled and the printer must be configured as a PostScript printer for this test to succeed.
The printer is configured to use 8-bit characters	If special characters or bitmaps are not printing correctly, the printer may be incorrectly configured to use 7-bit characters.

Table B-7: PostScript Troubleshooting, cont.

Area to Check	Explanation
Service Characteristics	Issue the Show Service Characteristics command. If the service rating is zero, the parallel port is in use. Verify that the PostScript characteristic and appropriate protocols have been enabled on the service.
Port Counters	If PostScript jobs appear to print but nothing comes out of the printer, verify the amount of data sent from the host. Issue the appropriate print command from the host system. After the job has completed, use the Show Port 1 Counters command. The bytes output value should be approximately 171 bytes greater than the size of the file on the host system. These numbers are only approximate, but will show that data is flowing to the printer.

B.5.2 Bitmap Graphics

If files that contain embedded bitmap graphics do not print correctly, it is probably because the bitmaps are being sent as actual binary data and binary data cannot be printed via serial or parallel interfaces.

Most major application packages have provisions to print using either **binary postscript** (for printers connected to the network via LocalTalk) or **hex postscript** (for printers connected to the network via a serial port or parallel port). If your application does not have this provision, ask the application vendor for an upgrade version or “patch” that will add the hex postscript function.

B.6 Entering Commands at the Boot Prompt

If the Boot> prompt appears on the serial console instead of the Local> prompt, one of two things may be wrong. Either the MPS does not have enough information to boot, or the network or flash boot has failed. If pressing the **Return** key does not display a prompt, press any other key. The Boot> prompt should appear.

If the MPS does not have enough information to boot, or the network or flash boot has failed, it will print a message to the console and wait ten seconds for serial port activity. If it detects serial port activity, it will continue booting provided the flash is good. However, if the user presses a key during that time period, the MPS will display the Boot> prompt.

Note: *If you see the message “Will attempt another download in x minutes,” press any key for the Boot> prompt.*

A series of commands called Boot Configuration Program (BCP) commands can be entered at the Boot> prompt to configure the MPS. These commands are a subset of the entire MPS command set. For example, a typical TCP/IP configuration might use the following commands:

Figure B-1: BCP Command Examples

```

Boot> Set IPADDRESS 192.0.1.229
Boot> Set SOFTWARE /tftpboot/MPS.SYS
Boot> Set LOADHOST 192.0.1.188
Boot> Set SECONDARY 192.0.1.22
Boot> FLASH
% Initialization begins in 5 seconds.....

```

These commands set the Server's address, the software loadfile, and the loadhost's IP address (as well as that of a backup loadhost). The server then reboots using the **Flash** command and will attempt to load the file MPS.SYS from the host at 192.0.1.188.

Flush NVR

This command is used to restore the MPS's non-volatile RAM to its factory default settings. It will reset everything that is configurable on the server, including the unit's IP address.

Flash

This command will force the MPS to download new operational code and reload it into Flash ROM. This is necessary when a new version of software is released and you wish to upgrade your unit. If the server cannot download the file, the code in Flash ROM will still be usable.

Help

Displays a one-page summary of available commands and what they do.

Init 451

Reboots the MPS after it has been configured. If the MPS can find and load the specified software loadfile, it will restart itself with full functionality. If the loadfile is not found, the server will attempt to reload continuously. If there is an error, or if the console's **Return** key is pressed, the MPS will re-enter the Boot Configuration Program.

Set BOOTP {Enabled, Disabled}

Enables or disables the sending of BOOTP queries during the boot sequence. It is enabled by default.

Set DHCP {Enabled, Disabled}

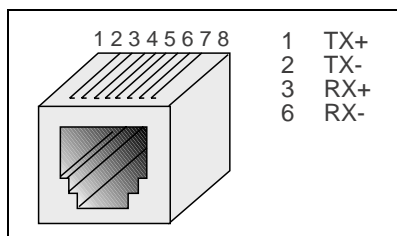
Enables or disables the sending of DHCP queries during the boot sequence. It is enabled by default.

Set Hardware xx-xx-xx	<p>Specifies the last three numbers of the server's Ethernet address. The first three numbers will be supplied automatically.</p> <p>The Ethernet address should have been set at the factory. Setting an incorrect address could cause serious network problems.</p>
Set IPAddress ip_address	<p>Specifies this server's IP address. Uses the standard numeric format.</p>
Set Loadhost ip_address	<p>Specifies the host to attempt to load the file from. The IP address should be in standard numeric format (no text names are allowed).</p>
Set RARP {Enabled, Disabled}	<p>Enables or disables the sending of RARP queries during the boot sequence. It is enabled by default.</p>
Set Secondary ip_address	<p>Specifies a backup loadhost. The IP address should be in standard numeric format (no text names are allowed). The backup loadhost will be queried if the primary host cannot load the server.</p>
Set Software filename	<p>Specifies the name of the file to load. The MPS will automatically add .SYS to the filename you specify. Note that all protocols must have a filename specified (either the default or set by the user). For more information, see <i>Appendix D</i>.</p> <p>TCP/IP users must use the Software option to specify the loadhost, the loadfile, and their own network address.</p> <p>TFTP users can specify a complete path name (up to 31 characters) if the file is located in a directory other than the default. The case of the filename must match that of the filename loaded onto the host computer.</p>
Show Server	<p>Use this command when issuing other commands to view the current MPS setup.</p>

C: Pinouts

C.1 Ethernet Connector

Figure C-1: RJ45 Ethernet Connector



C.2 Parallel Connectors

Lantronix uses standard Centronics parallel connectors.

For optimum performance of your MPS, Lantronix recommends the use of high quality parallel cables. Choose one of the following:

- ◆ A Lantronix parallel port cable, part number #500-011 (6 feet).
- ◆ Any other brand of **IEEE Std. 1284-1994** compliant cable. Compliant cables can easily be identified by the permanent label “IEEE Std. 1284-1994 compliant” printed on the cable.

Note: *Non-compliant cables have the same type of connectors but different electrical characteristics.*

D: Updating Software

D.1 Obtaining Software

Current software files (MPS.SYS for MPS100, LPS.SYS for LPS1-T and LPS1-2) are available on the distribution CD. You can obtain software updates and release notes for the MPS from the Lantronix World Wide Web site (www.lantronix.com), or by using anonymous FTP through the Internet ([ftp.lantronix.com](ftp://ftp.lantronix.com)).

D.1.1 Via the Web

The latest version of MPS.SYS can be downloaded from the Lantronix Web site. At the time of this writing, the exact location of the files on the re-designed site was unknown.

Note: *As a result of Netscape Navigator's configuration, it may try to open the file as an ASCII text file. To avoid this, hold down the shift key when choosing the software file.*

D.1.2 Via FTP

The MPS software resides on the Lantronix FTP server ([ftp.lantronix.com](ftp://ftp.lantronix.com)). Most of these files are binary data, so the binary option must be used to transfer the files. All released files are in the **pub** directory. Always download the README file in the pub directory before downloading anything else; it contains a list of available software files.

To log into the FTP server, enter a username of **anonymous** and enter your full email address as the password. The following text will be displayed:

Figure D-1: Sample FTP Login

```
230-Welcome to the Lantronix FTP Server.
230-
230-IMPORTANT: Please get the README file before proceeding.
230-IMPORTANT: Set BINARY mode before transferring executables.
220-
230-Direct questions to support@lantronix.com or 800-422-7044 (US)
or 949-453-3990
230-
230 Guest login ok, access restrictions apply.
Remote system type is [your type will be displayed here].
ftp>
```

D.2 Reloading Software

The MPS stores software in Flash ROM to control the initialization process, operation, and command processing. The contents of Flash ROM can be updated by downloading a new version of the operational software via NetWare, TCP/IP, or MOP. Regardless of which protocol is used to update Flash ROM, the following points are important:

- ◆ The Flash ROM software file name, **MPS.SYS**, should not be changed.
- ◆ The download file should be world-readable on the host.
- ◆ There is a sixteen character length limit for the path name.
- ◆ There is a twelve character limit for the filename.
- ◆ Define commands must be used because Set configurations are cleared when the MPS boots. Use the **List Server Boot** command to check settings before rebooting.

Note: *It is important to check MPS settings before using the Initialize Reload command to ensure that you are reloading the correct software file.*

D.2.1 Reloading Sequence

If DHCP, BOOTP, or RARP is enabled on the MPS, the MPS will request assistance from a DHCP, BOOTP, or RARP server before starting the download attempts. The MPS will then try TFTP, NetWare, and MOP booting (in that order) provided that it has enough information to try each download method.

Downloading and rewriting the Flash ROM will take approximately two minutes from the time the **Initialize** command is issued. If the download file cannot be found or accessed, the MPS can be rebooted with the code still in Flash ROM. The OK/ACT LED will blink quickly while the MPS is booting (and reloading code) and then slowly when it returns to normal operation.

Note: *If you experience problems reloading Flash ROM, refer to Troubleshooting Flash ROM Updates on page D-4.*

D.2.1.1 TCP/IP

Before the MPS downloads the new software, it will send DHCP, BOOTP, and/or RARP queries (all are enabled by default). Next, the MPS will attempt to download the MPS.SYS file using TFTP (Trivial File Transfer Protocol).

Note: *EZWebCon can also be used to reload software.*

If a host provides DHCP, BOOTP, or RARP support, it can be used to set the MPS IP address (all methods) and loadhost information (BOOTP and RARP only).

Some BOOTP and TFTP implementations require a specific directory for the MPS.SYS file. See your host's documentation for instructions.

To manually configure the MPS IP parameters for software reload, use the following commands.

Figure D-2: Configuring TCP/IP Reload

```
Local> SET PRIVILEGED
Password> SYSTEM (not echoed)
Local>> DEFINE SERVER IPADDRESS nnn.nnn.nnn.nnn
Local>> DEFINE SERVER SOFTWARE "/tftpboot/MPS.SYS"
Local>> DEFINE SERVER LOADHOST nnn.nnn.nnn.nnn
Local>> LIST SERVER BOOT
Local>> INITIALIZE RELOAD
```

Note: *For instructions on how to log into the MPS to enter these commands, see the Getting Started chapter.*

The path and filename are case-sensitive and must be enclosed in quotation marks. When attempting to boot across an IP router, you must configure the router to proxy-ARP for the MPS, or use the bootgateway feature. For more information, see **Set/Define Bootgateway** in the *Commands* chapter of the *Print Server Reference Manual* located on the CD-ROM.

D.2.1.2 NetWare

The MPS.SYS file should be placed in the login directory on the NetWare file server. The MPS cannot actually log into the file server (since it knows no username/password); it can only access files in the login directory itself. On the MPS, specify the file server name, filename, and path.

Figure D-3: Configuring NetWare Reload

```
Local> SET PRIVILEGED
Password> SYSTEM (not echoed)
Local>> DEFINE SERVER NETWARE LOADHOST fileserver
Local>> DEFINE SERVER SOFTWARE SYS:\LOGIN\MPS.SYS
Local>> INITIALIZE RELOAD
```

D.2.1.3 MOP

The MPS.SYS filename is the only parameter that the MPS needs to reload via MOP. Make sure the service characteristic is enabled on the host's Ethernet circuit, copy the MPS.SYS file to the MOM\$LOAD directory, and reload the MPS using the **Initialize Reload** command. Be sure to use binary mode for the file transfer.

D.3 Troubleshooting Flash ROM Updates

Many of the problems that occur when updating the Flash ROM can be solved by completing the following steps:

Table D-1: Flash ROM Troubleshooting

Protocol	Area to Check
NetWare	Ensure the file is in the login directory. Since the MPS cannot actually log into the file server, it has very limited access to the server directories.
TFTP	Check the file and directory permissions. Ensure the loadhost name and address are specified correctly and that their case matches that of the filenames on the host system. Ensure the file and pathnames are enclosed in quotes to preserve case. Ensure that TFTP is enabled on the host; several major UNIX vendors ship their systems with TFTP disabled by default.
MOP	The Ethernet circuit must have the service characteristic enabled. Ensure that the MOM\$LOAD search path includes the directory containing the MPS.SYS file.

E: Specifications

E.1 Power Information

E.1.1 Power Requirements

Voltage:	<i>MPS100:</i> 95-250 V AC, 3-wire single phase, autoranging <i>LPS1-T and LPS 1-2:</i> 110 V AC US, 220 V AC International
Frequency:	47-63 Hz
Operating Current:	<i>MPS100:</i> 800 mA (maximum) @ 5V Reg. DC <i>LPS1-T and LPS1-2:</i> 700 mA (maximum) @ 6V
Power Consumption:	<i>MPS100:</i> 25 Watts <i>LPS1-T and LPS1-2:</i> 4.2 Watts
Fuse Rating	1.6A, 250 Volts

E.1.2 Power Supply Cord

Cord type:	3 conductors, 1.0 mm ² minimum conductor size (approximately 18 AWG)
Rated for:	250 Volts AC, 10 Amps
Length:	3.0 meters

E.2 Environmental Limitations

E.2.1 Temperature

Operating range:	5° to 50° C (41° to 122° F)
-------------------------	-----------------------------

Storage range: -40° to 66° C (-40° to 151° F)

Max temp. change/hr: 20° C (36° F)

Rapid temperature changes may affect operation. Therefore, do not operate the MPS near heating or cooling devices, large windows, or doors that open to the outdoors.

E.2.2 Altitude

Operating maximum: 2.4 km (8,000 ft)

Storage maximum: 9.1 km (30,000 ft)

If operating the MPS above 2.4 km (8000 ft.), decrease the operating temperature rating by 1° F for each 1000 ft.

E.2.3 Relative Humidity

Operating range: 10% to 90% noncondensing, 40% to 60% recommended

Storage range: 10% to 90% noncondensing

F: Frequently-used Commands

This appendix lists some of the most frequently-used commands of the Micro Print Server command set. More information about the command set, including additional options, can be found in the *Print Server Reference Manual* located on the CD-ROM.

F.1 Conventions

Please note the following before continuing:

- ◆ Commands are divided into Server (general), Port, and Protocol sections. Within each section, commands are listed alphabetically.
- ◆ Commands may require privileged user status. Enter **Set Privileged**, then enter the privileged password when prompted.
- ◆ When you enter a Define (or Purge) command, you must reboot the MPS for the command to take effect. Alternately, you can issue several Set commands and then a Save command to make the Set commands take effect without rebooting.
- ◆ When the abbreviated syntax “**{EN/DIS}**” is shown, you must choose either **Enabled** or **Disabled** to complete the command.

F.2 Server Commands

Table F-1: Frequently-used Server Commands

Command	Option(s)	Description
CONNECT option	servicename	Makes a connection to a LAT service.
	LOCAL num	Makes a connection to the specified local port.
	RLOGIN host	Makes an Rlogin connection to the specified host (text name or numeric IP address).
	TCP host	Makes a raw TCP connection to the specified host (text name or numeric IP address).
	TELNET host	Makes a Telnet connection to the specified host (text name or numeric IP address).
DEFINE SERVER BOOTP {EN/DIS}		Enables or disables querying for a BOOTP host at system boot time.
DEFINE SERVER DHCP {EN/DIS}		Enables or disables querying for a DHCP host at system boot time.
DEFINE SERVER GATEWAY ipaddr		Specifies the host to be used as a TCP/IP gateway to forward packets between networks. Enter an IP address.
DEFINE SERVER INCOMING option	BOTH	Enables incoming LAT and Telnet connections.
	LAT	Enables only incoming LAT connections.
	NONE	Disables incoming connections.
	TELNET	Enables only incoming Telnet connections.
	PASSWORD	Causes the MPS to prompt for a password for all incoming connections.
	NOPASSWORD	Allows connections to be established without prompting for a password.
DEFINE SERVER IPADDRESS ipaddr		Sets the MPS's network IP address.
DEFINE SERVER LOADHOST ipaddr		Specifies the TCP/IP host from which the MPS requests its run-time code.
DEFINE SERVER LOGIN PASSWORD		Sets a new password that will be required before incoming logins are accepted. You will be prompted for the new password (up to 6 alphanumeric characters, case-insensitive).
DEFINE SERVER NAME "newname"		Specifies a new name for the MPS. Names are restricted in length; generally a name of 11 or fewer characters is permissible.

Table F-1: Frequently-used Server Commands, cont.

Command	Option(s)	Description
DEFINE SERVER NETWARE LOADHOST server		Specifies the NetWare host from which the MPS requests its run-time code. Enter a file server name of up to 11 characters.
DEFINE SERVER PRIVILEGED PASSWORD		Sets a new password that will be required for privileged user status. You will be prompted for the new password (up to 6 alphanumeric characters, case-insensitive).
DEFINE SERVER RARP {EN/DIS}		Enables or disables querying for a RARP host at system boot time.
DEFINE SERVER SOFTWARE "filename"		Specifies the name or path (TCP) of the software download file. The filename can be up to 11 characters, and the pathname can be up to 26. The MPS will add a ".SYS" extension.
DEFINE SERVER SUBNET MASK ipmask		Specifies the subnet mask to be used for the MPS. The ipmask must be in n.n.n.n format.
HELP option	<nothing>	Displays a list of top-level (general) Help topics.
	<keyword>	Displays information about the keyword(s) entered. Multiple keywords must be specified in the order they occur in a command.
DEFINE SERVICE "name" PORT num		Creates a new service and associates it with the specified port.
DEFINE SERVICE "name" option	APPLETALK {EN/DIS}	Toggles whether the named service can be used to service networks running the specified protocol. RTEL applies to TCP/IP networks.
	LANMAN {EN/DIS}	
	LAT {EN/DIS}	
	NETWARE {EN/DIS}	
	RTEL {EN/DIS}	

Table F-1: Frequently-used Server Commands, cont.

Command	Option(s)	Description
DEFINE SERVICE “name” option	DLC {EN/DIS}	Specifies which service will handle print requests from DLC hosts. DLC can be enabled on one service per MPS.
	BANNER {EN/DIS}	When Enabled, causes the MPS to print a banner page before jobs.
	BINARY {EN/DIS}	When Enabled, the MPS will not process data passed through the service. This characteristic should be enabled when printing PCL data.
	EOJ string	Causes the MPS to send an end-of-job string to the attached device after every job. Enter an end string or the word none .
	FORMFEED {EN/DIS}	When Enabled, causes the MPS to append a formfeed to the end of LPR print jobs.
	POSTSCRIPT {EN/DIS}	When Enabled, causes the MPS to assume the attached device is a PostScript device and act accordingly.
	PS CONVERT {EN/DIS}	When Enabled, causes the MPS to place a PostScript wrapper around each job.
	SOJ string	Causes the MPS to send a start-of-job string to the attached device before every job. Enter a start string or the word none .
DEFINE SERVICE “name” option	TCP PORT string	Specifies a raw TCP listener socket for the service. Enter a socket number (4000 to 4999) or the word none .
	TELNET PORT string	Specifies a TCP listener socket for the service. Unlike TCP port, this option performs Telnet IAC interpretation on the data stream. Enter a socket number (4000 to 4999) or the word none .
INITIALIZE option	DELAY num	Schedules a reboot after num minutes. Enter a value from 0 to 120.
	CANCEL	Cancels an impending initialization.
	FACTORY	Reboots the MPS to its factory default settings.
	NOBOOT	Forces the MPS to stop in Boot Configuration Mode rather than fully rebooting.
	RELOAD	Forces the MPS to download new operational code and reprogram its flash-ROM.

Table F-1: Frequently-used Server Commands, cont.

Command	Option(s)	Description
LOGOUT option	<nothing>	Logs out the current port (the port that issued the command).
	PORT num	Logs out the specified port.
PURGE SERVICE option	LOCAL	Removes the definitions of all local services.
	“service”	Removes the definition of the specified service.
SET PRIVILEGED		Enters privileged mode, provided the user enters the proper privileged password when prompted.
{SHOW/MONITOR} QUEUE		Displays the status of MPS queues once (Show) or continually every three seconds (Monitor).
{SHOW/MONITOR} SERVER	<nothing>	Displays MPS information once (Show) or continually every three seconds (Monitor).
	COUNTERS	Displays characteristics related to the various counters kept by the MPS.
{SHOW/MONITOR} SERVICE option	<nothing>	Displays characteristics about all configured services once (Show) or continually every three seconds (Monitor).
	“service”	Displays only characteristics related to the named service.
ZERO COUNTERS option	ALL	Zeroes all port, node, and server counters.
	PORT num	Zeroes port counters for the specified port.

F.3 Port Commands

Table F-2: Port Commands

Command	Option(s)	Description
DEFINE PORT 1 ACCESS option	DYNAMIC	The port can initiate and receive connection requests.
	LOCAL	The port can initiate connection requests, and local logins are permitted.
	NONE	The port is unusable.
	REMOTE	The port can receive host-initiated connection requests.

Table F-2: Port Commands, cont.

Command	Option(s)	Description
DEFINE PORT 1 BITRONICS {EN/DIS}		When Enabled, ensures bidirectional functioning of the parallel port. The attached printer must also support Bitronics mode.
DEFINE PORT 1 CHARACTER	size	Toggles the port between 7-bit and 8-bit characters (the default). Enter either 7 or 8 .
DEFINE PORT 1 DSRLOGOUT {EN/DIS}		When Enabled, the port will be logged out automatically whenever DSR is deasserted.
DEFINE PORT 1 DTRWAIT {EN/DIS}		When Enabled, the MPS will not assert DTR on the port when it is idle (no user logins or connections).
DEFINE PORT 1 FLOW option	CTS	Specifies CTS/RTS (hardware) flow control.
	{EN/DIS}	Activates or deactivates the currently-configured flow-control method.
	NONE	Removes the current flow control settings.
	XON	Specifies XON/XOFF (software) flow control.
DEFINE PORT 1 NAME	"newname"	Enter a name of up to 16 alphanumeric characters for the specified port.
DEFINE PORT 1 PARITY option	parity	Enter even , odd , mark , or space . Specifying mark or space will change the character size to 7 bits.
	NONE	Specifies that no parity will be used (the default).
DEFINE PORT 1 SPEED	baudnum	Sets the port's baud rate. Acceptable baudnum values range from 300 to /230000 (MPS)baud.
{SHOW/MONITOR} PORT 1		Displays the port's configuration characteristics once (Show) or continually every three seconds (Monitor). Counters and Status keywords can be added.
TEST PORT 1 option	COUNT rows	Sends an ASCII data stream to the port for the specified number of rows and/or columns.
	WIDTH cols	
	POSTSCRIPT	Sends a PostScript test page to the port.

F.4 Protocol Commands

In the following table, **PROTO** is an abbreviation for the optional keyword **PROTOCOL**.

Table F-3: Protocol Commands

Command	Option(s)	Description
DEFINE PROTO APPLETALK option	{EN/DIS}	Enables or Disables the AppleTalk protocol for the MPS.
	ZONE newzone	Places the MPS in a zone other than the default.
DEFINE PROTO IP option	{EN/DIS}	Enables or Disables the TCP/IP protocol for the MPSMPS.
	GATEWAY ipaddr	See DEFINE SERVER GATEWAY ipaddr.
	IPADDRESS ipaddr	See DEFINE SERVER IPADDRESS ipaddr.
	LOADHOST ipaddr	See DEFINE SERVER LOADHOST ipaddr.
	NAMESERVER ipaddr	Specifies the IP address of the host that will resolve text host names into their numeric equivalents for TCP/IP connection attempts.
DEFINE PROTO LANMAN option	{EN/DIS}	Enables or Disables the LAN Manager protocol for the MPS.
DEFINE PROTO LAT option	{EN/DIS}	Enables or Disables the LAT protocol for the MPS.
	LICENSE string	Enables LAT on multi-port MPS's. Enter the license string obtained from Lantronix.
DEFINE PROTO NETWARE option	{EN/DIS}	Enables or Disables the NetWare (IPX) protocol for the MPS.
	DSCONTEXT string	Configures the NetWare Directory Services context in which the MPS is located. For more information about NDS contexts, see your NDS documentation.
	DSLICENSE string	Configures the NetWare Directory Services license needed to enable NDS on your MPS. Enter the license string obtained from Lantronix.
	DSTREE string	Configures the NetWare Directory Services tree in which the MPS is located. For more information about NDS trees, see your NDS documentation.

Table F-3: Protocol Commands, cont.

Command	Option(s)	Description
DEFINE PROTO NETWARE ENCAPSULATION option {EN/DIS}	NATIVE	Configures the MPS to use the “native mode” frame format.
	ETHER_II	Configures the MPS to use Ethernet v2 frame format.
	802_2	Configures the MPS to use 802.2 frame format with NetWare SAPs.
	SNAP	Configures the MPS to use 802.2 frame format with SNAP SAPs.
DEFINE PROTO NETWARE LOADHOST server		See DEFINE SERVER NETWARE LOADHOST server.
PURGE IPSECURITY option	ALL	Removes the entire IP security table.
	ipaddress	Removes entries from the IP security table that are related to the specified IP address.
PURGE PROTO NET- WARE ACCESS option	ALL	Removes all entries from the NetWare access list.
	server	Removes entries from the NetWare access list that are related to the specified file server.
{SHOW/MONITOR} PROTO protocolname		Displays operating characteristics of the specified protocol.

Warranty Statement

Lantronix warrants for a period of FIVE years from the date of shipment that each MPS100, LPS1-T and LPS1-2 Micro Print Server supplied shall be free from defects in material and workmanship. During this period, if the customer experiences difficulties with a product and is unable to resolve the problem by phone with Lantronix Technical Support, a Return Material Authorization (RMA) will be issued. Following receipt of a RMA number, the customer is responsible for returning the product to Lantronix, freight prepaid. Lantronix, upon verification of warranty will, at its option, repair or replace the product in question, and return it to the customer freight prepaid. No services are handled at the customer's site under this warranty.

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Declaration of Conformity

(according to ISO/IEC Guide 22 and EN 45014)

Manufacturer's Name: Lantronix

Declares that the product:

Manufacturer's Address: 15353 Barranca Parkway, Irvine, CA 92618 USA

Product Name: Micro Print Server

Model Name/Number: MPS100, LPS1-T and LPS1-2

Conforms to the following standards:

Safety: EN 60950:1988 + A1, A2

EMC: (all models)
EN 55022:1988 class A
EN 50082-1:1992
(LPS1-T and LPS1-2 only)
IEC 801-2:1991/prEN55024-2:1992-4kV CD, 8kV AD
IEC 801-3:1992/prEN55024-3:1991-3V/m
IEC 801-4:1988/prEN55024-4:1992-0.5kV Signal
Lines, 1kV Power Lines
IEC 801-5:1993/prEN55024-5:1992-1kV Common
Mode, 0.5kV Differential Mode, 1kV Network
Cable

Supplementary Information: *The product complies with the requirements of the Low Voltage Directive 72/23/EEC and the EMC Directive 89/336/EEC.*

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.*

Manufacturer's Contact: Director of Quality Assurance Lantronix 15353 Barranca Parkway Irvine, CA 92618 USA
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