TW100-P1W1
NWay Internet/Print
Multiple Server
User's Guide

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Printed In Taiwan

RECYCLABLE

Wichtige Sicherheitshinweise

1. Bitte lesen Sie sich diese Hinweise sorgfältig durch.
2. Heben Sie diese Anleitung für den spätern Gebrauch auf.
3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Vervenden Sie keine Flüssig- oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.
4. Um eine Beschädigung des Gerätes zu vermeiden sollten Sie nur Zubehörteile verwenden, die vom Hersteller zugelassen sind.
5. Das Gerät is vor Feuchtigkeit zu schützen.
6. Bei der Aufstellung des Gerätes ist auf sichern Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen. Verwenden Sie nur sichere Standorte und beachten Sie die Aufstellhinweise des Herstellers.
7. Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor Überhitzung schützt. Sorgen Sie dafür, daß diese Öffnungen nicht abgedeckt werden.
8. Beachten Sie beim Anschluß an das Stromnetz die Anschlußwerte.
9. Die Netzanschlußsteckdose muß aus Gründen der elektrischen Sicherheit einen Schutzleiterkontakt haben.
10. Verlegen Sie die Netzanschlußleitung so, daß niemand darüber fallen kann. Es sollete auch nichts auf der Leitung abgestellt werden.
11. Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.
12. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.
13. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. Elektrischen Schlag auslösen.
14. Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von authorisiertem Servicepersonal geöffnet werden.
15. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:
    - a– Netzkabel oder Netzstecker sint beschädigt.
    - b– Flüssigkeit ist in das Gerät eingedrungen.
    - c– Das Gerät war Feuchtigkeit ausgesetzt.
    - d– Wenn das Gerät nicht der Bedienungsanleitung ensprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.
    - e– Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.
    - f– Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.

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17. Wenden Sie sich mit allen Fragen die Service und Repartur betreffen an Ihren Servicepartner. Somit stellen Sie die Betriebssicherheit des Gerätes sicher.

Quick Installation

This section takes you through a step-by-step minimum installation and setup procedure for the internet/print multiple server. Please refer to the main text of this manual for detailed information about the setup and operation of this device.

Getting Started

Step 1: Unpack the device. Make certain no components have been lost or damaged. A packing list is provided on page 7.

Step 2: Choose an installation site on a flat, level surface or wall near the modem or ISDN/TA you plan to use for internet connections or near the network line you plan to use for a LAN connection, and near the printer you would like to share through the server. Note that the internet/print multiple server can be hung on a wall using the wall mounting equipment included with the product.

Making Connections

Step 3: Connect the internet/print multiple server to your LAN using a Category 3, 4 or 5, twisted-pair cable and the device's single RJ-45 LAN port. This connection should be made to an Ethernet or Fast Ethernet switch or hub. (The RJ-45 port looks like a phone jack.)

Step 4: Connect the internet/print multiple server to the printer using the LPT port and a parallel cable. See Chapter 5 for information on how to setup the print server variables and see the *IS Admin User's Guide* for information on shared print services.

Step 5: Connect the internet/print multiple server to a modem or ISDN/TA using the device's serial port (COM). (Note that your modem or ISDN/TA should already be connected and setup according to the instructions included with it.)

Step 6: Plug the power adapter into the device and into an outlet.

Configuring

Step 7: Before your can use your internet/print multiple server, IP addresses on your LAN's PCs must be set so that they are compatible with the internet/print multiple server's settings. The internet/print multiple server comes with the default local IP address: **192.168.100.1** and the default subnet mask setting: **255.255.255.0**. Computer stations on your LAN that will use the internet/print multiple server for internet access must modify their IP settings to 192.168.100.xxx (where xxx is a number between 2 and 255). All stations must also modify their subnet mask settings to match the internet/print multiple server subnet mask setting, and set their default gateway to the local IP address (in this case the default address listed above) used by the internet/print multiple server. If you want to use a different IP address range, see "Setting IP Addresses" on page 16.

Step 8: The internet/print multiple server can be configured and operated via Telnet or a web browser once PC IP addresses have been properly set. (Note that some device settings can be manipulated using the IS Admin program included with the device.) Start your Telnet or browser software and enter the IP address of the internet/print multiple server (either the default IP listed above or the new address you assigned using IS Admin). This should bring up the internet/print multiple server start menu. See the next series of steps for information about variables that must be set for the device to work properly.

Key Variables

Step 9: **ISP Account -> Phone Number,** when you signed-up for an account with your ISP (internet service provider), you should have been given an access phone number that your modem will dial. Look under the "WAN Port Variables" menu for this variable and enter the phone number provider by your ISP.

Step 10: **ISP Account -> User ID,** your ISP should also have assigned a User ID (aka, a username) that you will use for logging-in. Also under "WAN Port Variables," enter this user ID exactly as it was provided to you.

Step 11: **ISP Account -> Password,** finally, to complete the ISP login process, the internet/print multiple server must provide the password associated with the user ID assigned by your ISP. Enter it.

You have now completed the basic steps necessary to install, configure, and begin using the internet/print multiple server. Note that, with respect to steps 9-11, it may be necessary for you to use a "Login Script" instead. If you enter the information required in those three variables correctly and still have trouble logging-in, see the "Login Script" section on page 23 to create a login script.

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this user's guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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TABLE OF CONTENTS

ABOUT THIS GUIDE

This guide explains how to install and use the NWay port internet/print multiple server.

Audience

This manual assumes basic familiarity with LANs, the internet, and ISPs. It has, however, been designed for basic-level users.

Overview of the User's Guide

? ? Chapter 1, *Introduction*. Provides information on the internet/print multiple server and internet server technology.

? ? Chapter 2, *Installation*. Helps you unpack, understand and install the device.

? ? Chapter 3, *System Setup*. Explains how to set necessary options on the internet/print multiple server.

? ? Chapter 4, *Configuration Variables*. Explains all available variables on the internet/print multiple server and what options exist for configuration and use.

? ? Chapter 5, *Print Server Function*. Describes how to use the device as a print server.

? ? Appendix A, *Troubleshooting*. Provides direction and assistance for locating the source of problems and solving them.

? ? Appendix B, *Specifications*. Lists the device's specifications.

? ? Appendix C, *AT Commands*. Lists the basic and extended AT command sets.

? ? Appendix D, *Port Pinouts*. Provides pinout data for the device's ports.

? ? Appendix E, *Glossary*. Provides the meaning for some networking terms used in this manual.

1

INTRODUCTION

This chapter introduces the internet/print multiple server, as well as some of the technology that underlies it.

Product Description

The internet/print multiple server is designed to provide a single-point access to the internet for multiple, networked PCs. One of the primary features of the internet/print multiple server is that it provides multi-user access to the internet through a single user account and one connection. More simply put, an internet/print multiple server takes a single internet connection that without it could only be used by one person and allows it to be used by multiple stations on the same network simultaneously.

The internet/print multiple server also supports local network print server operations.

Product Features

The list below highlights the features and specifications of the internet/print multiple server.

? ? Compatible with the IEEE 802.3 10BASE-T Ethernet and 802.3u 100BASE-TX Fast Ethernet industry standards for interoperability with other Ethernet/Fast Ethernet network devices.

? ? Internet protocol support for: PPP, PAP/CHAP, NAT, TCP/IP, DHCP, ARP, ICMP, SMTP, POP3, FTP, Telnet, and HTTP.

? ? Support for device configuration via Telnet, web browser, or IS Admin program (included).

? ? NWay TP port for LAN connection.

? ? Ethernet connections support Category 3 or better twisted-pair cables.

? ? Fast Ethernet connections support both shielded twisted pair and Category 5 unshielded twisted-pair cables.

? ? 56K (maximum) modem speed support

? ? 128K (maximum) ISDN/TA speed support

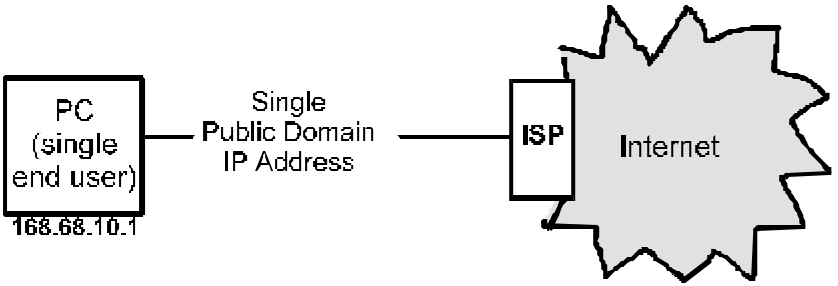
? ? Internet Features include: Dial-On-Demand, NAT internet access, DHCP server, and virtual server.

? ? Print Server support includes the following print server protocols: TCP/IP, NetBEUI, and AppleTalk.

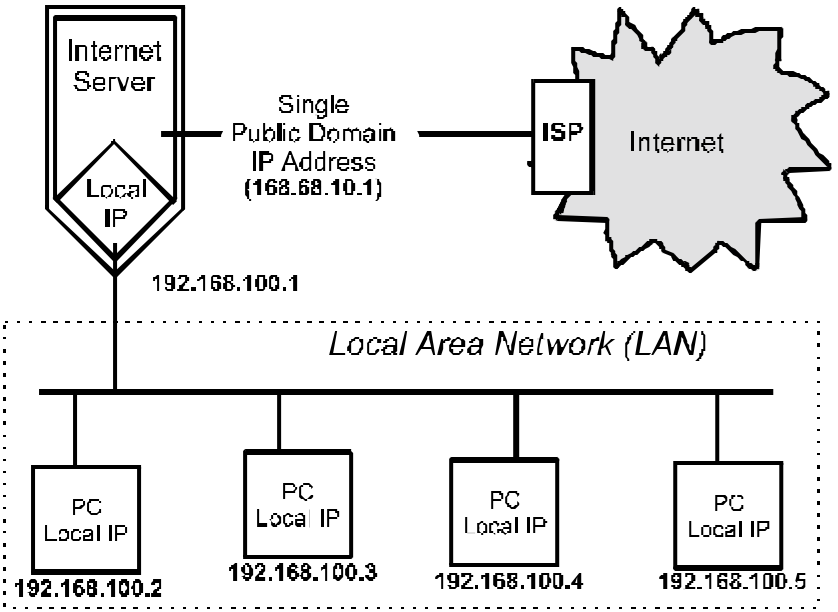
? ? Flash memory for easy firmware upgrades.

Internet Server Technology

The concept behind internet/print multiple servers is to provide a single, shared access point for multiple users. Without an internet/print multiple server, each end point (i.e., PC or workstation) on a LAN must have it's own public domain IP address.



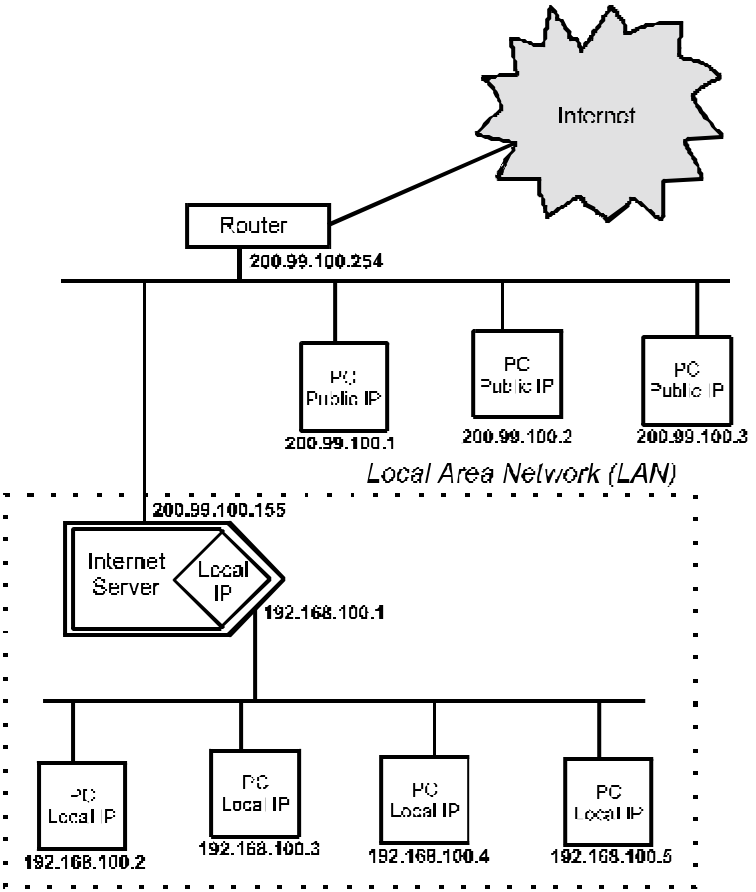
Using an internet/print multiple server allows a single public IP address to be shared by multiple local end points simultaneously.



Since the same range of local IP addresses can be used at as many multiple locations as necessary, available IP addresses can increase.

Also, it is only necessary for a company to pay for a single internet access account even though many people will be able to use it.

An internet/print multiple server can also be used to expand a LAN by providing a means to create localized "sub-groups" in a LAN-to-LAN configuration. The internet/print multiple server acts as a sin-



gle public IP address access point for the sub-group LAN. The sub-group LAN can then use local IP addresses from the available

ranges. The effect of this is to expand the number of stations that can use IP addresses assigned to the LAN.

2

INSTALLATION

This chapter provides information on the unpacking and initial installation of your internet/print multiple server.

Unpacking

Open the shipping carton of your internet/print multiple server and carefully unpack the contents. The carton should contain the following items:

? ? One internet/print multiple server device

? ? One AC power adapter, suitable for your area's electrical power connections

? ? One 3.5" diskette with IS Admin software

? ? IS Admin *User's Guide*

? ? Wall mount hardware

? ? This *User's Guide*

? ? One lpr software diskette

? ? One lpr *User's Guide*

Inspect the device and all accompanying items. If any item is damaged or missing, report the problem to your dealer immediately.

Desktop / Shelf Installation

The unit has rubber feet attached to the bottom to cushion it. Allow enough ventilation space between the device and the objects around it. Choose a sturdy, level surface in a ventilated area that is dust free and away from heat vents, warm air exhaust from other devices and direct sunlight. Avoid proximity to large electric motors or other electromagnetic equipment.

Observe the following guidelines when choosing an installation location:

?? Air temperature should range from 32? to 122? F (0? to 50? C).

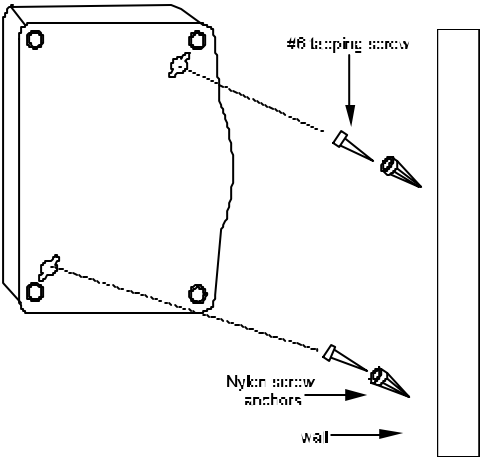
?? Humidity should be less than 90%, non-condensing.

?? Site should not exceed the electromagnetic field (RFC) standards for IEC 801-3, Level 2 (3V/M) field strength.

For a detailed list of the product's technical specifications, refer to Appendix B, *Specifications*.

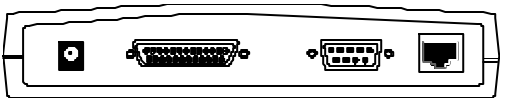
Wall Installation

The product can be installed on a wall. When installing, you need to attach two tapping screws and two screw anchors to the bottom of the device. Wall mount supplies are included.



Installing the Internet/Print Multiple Server on a Wall

Port Description



Rear Panel

Serial – WAN

The serial port is used for a WAN connection either to a modem or an ISDN terminal adapter. The serial port is a standard male 9-pin RS-232 connector.

Parallel – Printer

The parallel port is used for connecting to a printer for sharing to the LAN. This port is a standard female 25-pin parallel connector.

RJ-45 – LAN

The internet/print multiple server has a single, NWay RJ-45 LAN port. This port is 10Mbps and 100Mbps capable (auto-detect, auto-configure) and designed for use in an Ethernet or Fast Ethernet LAN via a network hub. The port has standard RJ-45 pinouts.

LED Description

The internet/print multiple server has a small LED array for indicating current port and transmission status. The power/transmit (Pw/Tx) and connect/receive (Link/Rx) LEDs only relate to activity on the LAN port. All other LED indicators display information about their related ports as labeled.

Pw/Tx

The Pw/Tx (power/transmit) LED lights when power is supplied to the device and flashes when the LAN port transmits data.

Link/Rx

The Link/Rx (link/receive) indicator will light up when a good connection is made at the LAN port with an operating and compatible Ethernet or Fast Ethernet device. This indicator flashes when the LAN port receives data from the network.

COM

The COM port LED provides an indication of the operating status of the WAN port. When the WAN port is transmitting data, the COM port will light. If no data is being transmitted, the COM LED will be off.

LPT

The LPT port LED lights to indicate when data is being sent to the network printer it is connected to. If no data is being transmitted, the LPT LED will be off.

Normal LED Flash Pattern

Immediately after power-up, all four of the LEDs should display steady green for several seconds. Then the COM LED and LPT LED should flash simultaneously three times. This sequence of flashes should be followed by first the COM LED flashing once and then LPT LED flashing once, repeated three times in succession. If as problem with the device is detected during this time, the LED flashes will display an error pattern (see Appendix A: *Troubleshooting* for more information on POST error indications). If no errors are detected, the internet/print multiple server will begin operating normally.

Connecting to the Local Network

The internet/print multiple server includes one RJ-45 NWay LAN port. To connect the device to your LAN, use a standard Category 3, 4, 5 UTP, or STP twisted-pair cable to link the device to an Ethernet or Fast Ethernet hub or switch.

Cable length limits must conform to Ethernet and Fast Ethernet wiring rules. Ethernet cable segments can be a maximum of 100 meters. Fast Ethernet wiring rules also limit the maximum length of cabling segments to 100 meters.

Once the internet/print multiple server is physically connected to a local network and you have used the IS Admin software included to assign an IP address to the device (or simply reconfigured your PC's IP address, subnet mask and gateway to match the default settings of the internet/print multiple server), you may configure other parameter variables from your network station using Telnet or a web browser.

Connecting to the Internet

The internet/print multiple server must be connected to the internet (this is also known as a "Wide Area Network or 'WAN'" connection) using the COM serial port. The COM port can either be connected to the serial port of a modem (or fax/modem), or to an ISDN terminal adapter. The faster the WAN connection is, the faster access will be and the more users will be able to get on the internet simultaneously.

Connect the COM port of the internet/print multiple server to a modem or ISDN terminal adapter using a standard serial cable.

Connecting Power

Power is supplied to the internet/print multiple server through an AC power adapter. Check the technical specifications section for information about the AC power input voltage.

Since the internet/print multiple server does not include a power switch, plugging its power adapter into a power outlet will immediately power it on.

3

SYSTEM SETUP

Before it can be used, the internet/print multiple server has some variables that need to be properly set. This chapter describes how to change default IP settings and then how to use Telnet or a web browser to manipulate the internet/print multiple server. A description of the minimum setup required to operate is also provided. A full listing of all variables on the internet/print multiple server is provided in Chapter 4. Note that the variables and their options are the same regardless of whether you are using Telnet or a web browser although they are displayed in different formats.

Usage Note: Throughout this user's guide, we refer to "your ISP." An ISP is a company that provides internet services, normally for a fee, and usually via modems connected over telephone lines. From the ISP's point of view, the internet/print multiple server is a single user (with a single username and password). The purpose of the server is to allow you to get access as a single user for multiple actual users.

Setting IP Addresses

The internet/print multiple server comes with a default IP address and subnet mask assigned. If you would prefer not to use the internet/print multiple server's default IP address, it will be necessary for you to change that address using the IS Admin program included with the device. Regardless, it will be necessary for you to configure one PC with an IP address and subnet mask that are compatible with the settings of the internet/print multiple server. (Note that your PC's IP address, subnet mask, and IP gateway must be hand set; The IS Admin program does not include this function.)

Once the server and a management PC have compatible IP address and subnet mask settings, and are connected through the LAN, either an in-band Telnet session or a web browser can be used to set the device's configurable variables and view its current operating status.

Default Addressing

The internet/print multiple server comes with a preset default IP address setting of 192.168.100.1. In order to configure the internet/print multiple server, you must set at least one computer on your LAN to an IP address in the same subnet (192.168.xxx.xxx).

Configuring LAN IP Addresses

Before you can use Telnet or a browser to configure the internet/print multiple server, it is necessary for you to change your PC's IP address to the same subnet as the LAN IP used by the server. Each operating system and network software suite will have a different procedure/application for setting the system IP.

Under TCP/IP (many Windows 3.1 and 3.11 users), the system IP and subnet mask are configured under "Setup" in the TCP manager. In Windows 95, users must go to the Control Panel and Network settings; Under Network settings, you must modify the TCP/IP properties for the IP address, subnet mask, and default gateway. The IP address should be on the same subnet as the local address assigned to the internet/print multiple server, the subnet mask setting should be the same as the internet/print multiple server, and the default gateway setting should be the local IP address assigned to the internet/print multiple server.

Since the principle behind internet/print multiple server technology is the use of local IP addresses that are never seen or used on public systems, you must use IP addresses from the ranges below. The following three IP address blocks have been set aside by internet regulatory authorities specifically for local-only use:

10.0.0.0 – 10.255.255.255

172.16.0.0 – 172.31.255.255

192.168.0.0 – 192.168.255.255

All local stations using the server to access the internet must have an IP address within these three ranges, as well as an IP address on the same subnet as the internet/print multiple server.

Important: *If the server's IP address is 10.10.1.150, all local stations must have an IP address as: 10.10.1.xxx, the subnet mask setting must be the same, and the default gateway of each station needs to be set to the local IP address assigned to the internet/print multiple server.*

We recommend that you make a note of each device's IP address for reference during troubleshooting or when adding new stations or devices.

Using In-Band Telnet to Configure the Server

Once your PC is configured with an IP address on the same subnet as the server, start your Telnet program and enter the IP address assigned to the server when you are prompted for a host address.

You should immediately see the internet/print multiple server Telnet Interface console greeting screen.

Enter the password to access the device parameters. There is no default password. Once you have access, use the menu item numbers to set the variables which are described later in this chapter.

Note: When using Telnet to modify device parameters, saving those parameters immediately ends the Telnet session.

Using a Browser to Configure the Server

Once your PC is configured with an IP address on the same subnet as the server, start your browser program and enter the "http://" pre-

fix, followed by the IP address assigned to the server, in the address window.

You should immediately see the internet/print multiple server web browser interface menu. Note that the internet/print multiple server IP can be bookmarked for future access so that it doesn't need to be entered each time.

The browser interface uses frames, so it is best if you use a frames-capable browser program. Also, we advise you to temporarily suspend the use of proxies – if you are using them – while accessing the internet/print multiple server as proxy settings may interfere with browser access to local devices.

If you use a non-frames browser, when you receive the initial internet/print multiple server screen, you should see the main navigation menu rather than the navigation menu and the system status screen. The functions are the same, only the appearance will be different.

After you have access to the browser interface, use the menu options in the left-hand frame to choose the variables you want to view, set or modify. Some variables have limited options that must be selected from a pull-down list.

Minimum Configuration

Regardless of how you intend to use the internet/print multiple server, you will need to consider and set some basic system variables. This section is concerned with describing only those variables that are critical to proper functioning of the internet/print multiple server.

The following variables need to be configured for the internet/print multiple server to operate correctly (the first is a System variable, the others are WAN port variables):

DNS IP Address

Domain Name Service (DNS) servers are used on the internet to maintain information about which Uniform Resource Locator (URL) name relates to which internet IP address. For example, the URL: WWW.CNN.COM, is a pseudonym for the IP address: 207.25.71.25. DNS entries allow users to access resources using URLs instead of IPs.

Options: Any internet DNS server IP address available through the WAN connection. This address should be provided by your ISP. (Note that without a DNS server IP, internet sites will only be available using IP addresses and will not be available using URLs.)

Default Value: 0.0.0.0

Must Be User Modified? Yes.

Description: A Domain Name Service (DNS) server address is used to translate URLs into their corresponding IP addresses.

ISP Account -> Phone Number

In order for the internet/print multiple server to control the modem to dial the phone, you must enter the dial-up phone number for your ISP. If you need to dial an area code in order to call the number, it must be included in this variable. If you must dial "#", 0, 9 or some other number in order to get an outside phone connection, that information must be included in how this variable is configured.

Options: For dial-up connections, the local ISP phone number, complete without spaces, hyphens or other punctuation (commas may be used to indicate a pause). The maximum length is 20 characters.

Example: Your ISP phone number is a local call to 916-5555 and you must dial 0 in order to get an outside line from the office where you want to use the internet/print multiple server. You would enter 0,,9165555 in the "ISP Account -> Phone Number" variable. The two commas instruct the modem to pause between dialing the 0 and dialing the rest of the number. This pause is necessary if there is normally a moment or two between dialing 0 and getting an outside dial tone.

Default Value: (none)

Must Be User Modified? Yes.

Description: The phone number entered in this variable is the number the internet/print multiple server will dial to establish its internet (WAN) connection.

Note: If the ISP phone line is busy, the internet/print multiple server will automatically redial. Three successive redial attempts will be made.

ISP Account -> User ID

Just as the internet/print multiple server needs to know what phone number to dial to access your ISP, it also needs to know what username to login under. This variable is the username the ISP has assigned to you or your company.

Options: Needed for dial-up connections. The ISP assigned user ID name exactly as provided (i.e., all letters capitalized where necessary, underscores and other punctuation included). The maximum length is 16 characters.

Default Value: (none)

Must Be User Modified? Yes.

Description: This variable is the user ID that will be provided to the ISP once the modem connection is established.

Notes: It may not be possible with some ISPs to use this variable to allow the internet/print multiple server to automatically login. In that case, it will be necessary to use the Login Script as described below.

ISP Account -> Password

The password is the final step in the ISP dial-up login process. As with the username, this password should have been assigned to you by your ISP when you registered for the service.

Options: For dial-up connections, the ISP user access password exactly as provided (i.e., all letters capitalized where necessary, underscores and other punctuation included). The maximum length is 16 characters.

Default Value: (none)

Must Be User Modified? Yes.

Description: This variable is the user password that will be provided to the ISP once the modem connection is established and the username has been accepted.

Notes: It may not be possible with some ISPs to use this variable to allow the internet/print multiple server to auto-

matically login. In that case, it will be necessary to use the Login Script as described below.

Login Script

The login script allows you to list prompts generated by the ISP each time a user dials-up and then provide the right responses so that the internet/print multiple server can login. The login script should be used when the Username and Password variables above don't work with your ISP or if your ISP's login procedure includes additional prompts (for example, a transmission protocol choice).

Options: For each line item, a prompt string and a keyin string must be provided. The prompt string is the text displayed by the ISP requesting that something be entered. The keyin string is what should be entered. Prompt strings can be up to 25 characters long including punctuation. Keyin strings can be up to 20 characters long including punctuation (a maximum of 8 separate line entries).

Example: If your ISP asks you to input a user ID, password, and to choose from a list of available communications protocols each time you dial-up, your login script would look like something like this:

No.	Prompt	Keyin
1	Username	Andy
2	Password	abcd
3	Choice -->	2

With each prompt being the text of the prompt provided by the ISP, and each keyin being the exact data you would enter.

Default Value: (none)

Must Be User Modified? No (unless your ISP login procedure requires you to use a login script).

Description: A login script is used to provide login prompt responses when required by the ISP login procedures. Each line item in the script table should correspond with a prompt that the ISP makes once the modem connection is established. The prompt string information entered in the table should include an indication of what data is being asked for at each step in the login process. Reply string data should be provided exactly as it would be if it were hand entered.

Operation

To access the internet, do the following at each station that will use the internet/print multiple server for internet access:

1. Make sure that TCP/IP settings are configured properly. IP parameters that must be set:

   ?? **IP Address –** must be a unique IP address chosen from the three reserved IP ranges set aside for local network only use. See "Setting IP Addresses" earlier in this chapter.

   ?? **Default Gateway –** should be set to the IP address assigned to the internet/print multiple server's LAN interface.

   ?? **DNS (Domain Name Service) –** an IP address provided by your ISP.

2. Activate your browser and use normally.

4

CONFIGURATION VARIABLES

This chapter provides information about all of the configuration settings available on the internet/print multiple server. Information about the range of values, default setting, and purpose for each variable is given. Sections and variable order correspond with the menu listings presented by the internet/print multiple server Telnet console program. Note that those variables which must be user configured are further detailed in Chapter 3.

System Variables

Server Name

Options: An fifteen-character string of letters and numbers.

Default Value: IS-xxxxxx (where "xxxxxx" is the last six digits of the device's MAC address).

Description: The server name is used to identify the internet/print multiple server on network management lists of active devices.

Local LAN -> IP Address

The Local LAN IP Address variable defines the unique IP address that your network will use to identify the internet/print multiple server.

Options: Any IP address from within the local-only ranges (10.0.0.0.– 10.255.255.255 ; 172.16.0.0 – 172.31.255.255 ; 192.168.0.0 – 192.168.255.255).

Default Value: 192.168.100.1

Must Be User Modified? No.

Description: The IP address assigned to the internet/print multiple server must be consistent with the addresses to be used by other devices on the network. That is, if the internet/print multiple server address is 192.168.100.1, all other addresses assigned to local network devices must start with 192.168.100 and have a final number between 2 and 255.

Local LAN -> Subnet Mask

This variable defines the subnet level the internet/print multiple server will share with other devices on the network.

Options: Any subnet address which identifies a subnet level.

Default Value: 255.255.255.0

Must Be User Modified? No.

Description: The subnet mask is used to identify subgroups on a LAN. A subgroup is a set of network nodes that can receive broadcast messages (i.e., messages not requiring a specific IP).

DNS IP Address

Domain Name Service (DNS) servers are used on the internet to maintain information about which Uniform Resource Locator (URL) name relates to which internet IP address. For example, the URL: WWW.CNN.COM, is a pseudonym for the IP address: 207.25.71.25. DNS entries allow users to access resources using URLs instead of IPs.

Options: Any internet DNS server IP address available through the WAN connection. This address should be provided by your ISP. (Note that without a DNS server IP, internet sites will only be available using IP addresses and will not be available using URLs.)

Default Value: 0.0.0.0

Must Be User Modified? Yes.

Description: A Domain Name Service (DNS) server address is used to translate URLs into their corresponding IP addresses.

Maximum Idle Time

This variable allows you to set an idle time after which the internet/print multiple server will automatically disconnect the WAN connection. Setting an idle time lets you keep from staying logged-in to your ISP when no one is using the internet.

Options: A time duration from 3 to 65535 minutes.

Default Value: 30 minutes

Must Be User Modified? No.

Description: The system will automatically disconnect the WAN link if the port is inactive for the time set.

Operation Mode

Options (sub-menus):

? ? **Mode:** LAN-to-WAN / LAN-to-LAN; Default is LAN-to-WAN operation.

? ? **LAN-to-LAN Internet Server -> Global IP Address:** Internet/print multiple server's address for the router segment when used in LAN-to-LAN mode only.

? ? **LAN-to-LAN Internet Server -> Subnet Mask:** (as subnet mask above)

? ? **LAN-to-LAN Internet Server -> Default Gateway:** Router's IP Address.

Default Value: Mode = LAN-to-WAN

Description: This option only needs to be changed if the internet/print multiple server isn't going to be used to connect directly to an ISP. Enabling LAN-to-LAN mode automatically disables the LAN-to-WAN and Server Address Mapping functions.

LAN-to-LAN mode should be used when you need to expand your LAN but have limited IP addresses available and internet access is provided via a router.

Note: *In LAN-to-LAN mode, you cannot let users outside of the LAN have access to services (e.g., Telnet, FTP, or web servers).*

Change Password

Options: An eight-character string of letters and numbers. Case sensitive.

Default Value: (none – no password)

Must Be User Modified? No (but it is highly recommend to protect your internet/print multiple server's settings).

Description: Prevents unauthorized access to the device.

WAN Port Variables

Line Type

Options: Disable, Dialup, Lease Line.

Default Value: Dialup

Description: The WAN port must be configured for use as either a dial-up connection or a leased-line connection.

Baud Rate

Options: 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800 bps.

Default Value: 115200 bps

Description: The setting of this variable sets the maximum bits per second data transmission rate on the line. Generally, the rate should be set equal to or greater than the maximum

possible transmission rate of the device (e.g., the modem) connected to the WAN port.

ISP Account -> Phone Number

Options: For dial-up connections, the local ISP phone number, complete without spaces, hyphens or other punctuation (commas may be used to indicate a pause). The maximum length is 20 characters.

Default Value: (none)

Description: The phone number entered in this variable is the number the internet/print multiple server will dial to establish its internet (WAN) connection.

Note: If the ISP phone line is busy, the internet/print multiple server will automatically redial. Three successive redial attempts will be made.

ISP Account -> User ID

Options: For dial-up connections, the ISP assigned user ID name exactly as provided (i.e., all letters capitalized where necessary, underscores and other punctuation included). The maximum length is 16 characters.

Default Value: (none)

Description: This variable is the user ID that will be provided to the ISP once the modem connection is established.

ISP Account -> Password

Options: For dial-up connections, the ISP user access password exactly as provided (i.e., all letters capitalized where necessary, underscores and other punctuation included). The maximum length is 16 characters.

Default Value: (none)

Description: This variable is the user password that will be provided to the ISP once the modem connection is established and the username has been accepted.

ISP Account -> IP Address

Options: The IP address the ISP has assigned to this account.

Default Value: 0.0.0.0

Description: Dial-up connections should use address 0.0.0.0 if the IP will be dynamically assigned at each connection. Otherwise, enter the IP address assigned by your ISP.

Modem AT Command

Options (sub-variables):

? ? **Initial String:** <AT &F> (default)

? ? **Dial Prefix String:** <ATDT> (default)

? ? **Hangup String:** <~~~+++~~~ATH0> (default)

Description: Modem AT commands are used to configure and operate the modem when it is necessary to control settings

such as the speaker volume, line modulation, or handshaking protocol.

Note: See your modem user's guide for information about initial string settings and other modem commands.

Note that the initial string modem command must set the following:

1. Fixed baud rate (i.e., serial data rate adjustment disabled).
2. Data Carrier Detect (DCD) to follow carrier signal status.
3. Data Set Ready (DSR) to on while the modem is on.
4. Data Terminal Ready (DTR) to off to hang-up.
5. Enable RTS/CTS flow control.

Login Script

Options: For each line item, a prompt string and a keyin string must be provided. The prompt string is the text displayed by the ISP requesting that something be entered. The keyin string is what should be entered. Prompt strings can be up to 25 characters long including punctuation. Keyin strings can be up to 20 characters long including punctuation (a maximum of 8 separate line entries).

Example: If your ISP asks you to input a user ID, password, and to choose from a list of available communications protocols each time you dial-up, your login script would look like something like this:

No.	Prompt	Keyin
1	Username	Andy
2	Password	abcd
3	Choice -->	2

With each prompt being the text of the prompt provided by the ISP, and each keyin being the exact data you would enter.

Default Value: (none)

Description: A login script is used to provide login prompt responses when required by the ISP login procedures. Each line item in the script table should correspond with a prompt that the ISP makes once the modem connection is established. The prompt string information entered in the table should include an indication of what data is being asked for at each step in the login process. Reply string data should be provided exactly as it would be if it were hand entered.

Print Server Variables

The variables listed here are those available for print server control. Refer to Chapter 5 for more information about setting-up and using the print server functions of the internet/print multiple server.

Parallel Port -> Port Name

Options: A string of letters and numbers up to 32 characters long.

Default Value: IS-xxxxxx-P1 (where “xxxxxx” is the last six digits of the device's MAC address).

Description: An identifying label for the print server port.

Important: If the port will be used for Windows NT 4.0 clients, the port name cannot exceed 12 characters. If the port will be used for LAN manager clients, the port name cannot exceed eight characters.

Parallel Port -> Speed

Options: High/Low.

Default Value: High

Description: The parallel port speed setting controls the rate (in general) at which print job data will be transmitted to the printer. Most newer printers can accept high speed data transmission; If your printer loses characters, then you may need to choose low speed mode.

Parallel Port -> PJL Printer

Options: Yes/No.

Default Value: No

Description: If the printer being used is compatible with the HP PJL (Printer Job Language) protocol, enabling this variable will allow the printer to provide information to the internet/print multiple server about the printer model, status, and other details.

NetBEUI -> Workgroup Name

Options: A string of letters and numbers up to 15 characters long.

Default Value: WORKGROUP

Must Be User Modified? No (unless you want the print server to be assigned to another network group).

Description: Each Microsoft Networking workstation or server has a workgroup name. Workgroup names determine what servers and resources will appear by default in lists of accessible resources. You should assign to the print server the same workgroup name as the users who will be accessing it most often.

NetBEUI -> Maximum Connected Stations

Options: A number between 16 and 100.

Default Value: 32

Description: The NetBEUI protocol allows you to limit the number of connections to a shared printer to prevent queue overloads.

AppleTalk -> Printer Type

Options: A string of letters and numbers up to 32 characters long.

Default Value: LaserWriter

Must Be User Modified? No (unless your printer is not a postscript printer).

Description: The AppleTalk protocol requires that the type of printer being used be identified. Most postscript printers should use the "Laserwriter" type.

AppleTalk -> Postscript Level

Options: Level 1, Level 2

Default Value: Level 2

Description: The AppleTalk print protocol requires that shared postscript printers be identified as to whether they are Level 1 or Level 2 postscript.

AppleTalk -> Font Group

Options: No font, All fonts, Standard 35, Standard 13

Default Value: Standard 35

Description: The AppleTalk print protocol requires that shared postscript printers be identified as to what font group is supported by the printer. Most postscript printers support Standard 35 (Adobe 35N font set). The option, "No font" will force Macintoshes to load fonts to the printer, and the option, "All fonts" will prevent Macintoshes from loading any fonts to the printer.

DHCP Server Variables

The Dynamic Host Configuration Protocol (DHCP) allows servers and devices like the internet/print multiple server to dynamically assign IP addresses to network devices. Dynamic IP assignment alleviates the need for the network administrator to maintain and monitor IP address assignments and simplifies IP use because IP address are automatically and dynamically assigned when a station powers-on. DHCP is factory defaulted to OFF.

Important Note: *If you use DHCP to set your local IP addresses, the software IP settings of all stations on the network will need to be manually configured to 0.0.0.0., or, as in the case of Windows 95 users, the "Obtain an IP address automatically" option under TCP/IP will have to be selected.*

Enable

Options: Yes/No

Default Value: No

Description: This variable is the "on/off" switch for using a DHCP server. DHCP (Dynamic Host Configuration Protocol) allows IP addresses to be dynamically assigned. Rather than assigning a specific local IP address to each station, the internet/print multiple server will assign IPs to each station dynamically if the DHCP server function is enabled.

IP Address Range -> Start

The range of IP addresses available to the internet/print multiple server for DHCP allocation is set using two variables. This is the first.

Options: Any IP address within the three reserved IP ranges. The IP chosen must correlate with the End of the range.

Default Value: 192.168.100.101

Must Be User Modified? No.

Description: This variable indicates the beginning of the range of IP addresses available for DHCP use in assigning IPs. It is paired with the next variable to create an address range.

IP Address Range -> End

This is the second of the DHCP IP address range variables.

Options: Any IP address within the three reserved IP ranges. The IP address used must correlate with the IP set in the Beginning range variable.

Default Value: 192.168.100.150

Description: This variable indicates the end of the range of IP addresses available for DHCP use in assigning IPs. It is paired with the previous variable to create an address range.

IP Lease Time

Options: An amount of time, measured in minutes, from 5 to 65535.

Default Value: 1440 (24 hours)

Description: Dynamically assigned addresses can be periodically "refreshed" by a DHCP server. The IP Lease Time variable allows you to set that time limit. If a time is entered in this variable, each dynamically assigned address will be recycled at the end of the lease time.

IP Reserve Table

Options: Local IP Address, MAC Address (a maximum of 16 separate line entries).

Default Value: (none)

Description: The IP reserve table specifies ownership of particular IP addresses by particular stations or servers (identified by MAC address) so that those IP addresses will not be used by other devices on the LAN under any circumstances. (Note that devices listed in the Server Address Variables table should have their IP addresses listed here if DHCP is going to be used so that their IP addresses don't get assigned to other network stations.)

Server Address Variables

The Server Address Configuration table allows you to setup local servers, for example an FTP or web site, and provide non-local access to them through the internet/print multiple server. Entries in the table associate a port number with the local IP of a particular LAN server so that users not on the LAN can access that server.

The internet/print multiple server supports virtual internet servers so that your single-point ISP internet access can be used to provide

externally-accessible servers for FTP and HTTP. "Virtual Servers" in this context are "virtual" because they don't have their own public domain IP addresses in the typical internet fashion. Rather, their local IP address, with an access port number, is listed in a table inside the internet/print multiple server. The port number provides the internet/print multiple server with the reference to correctly route data requests.

Note that in LAN-to-LAN mode, this function is disabled and no LAN devices can be accessed from the internet.

? ? No.

Item number used for entry editing. Maximum of 16 entries.

? ? Local IP Address

The LAN IP address for the server entered. Any resource which will be shared to the internet through the server should have a dedicated IP address.

? ? Protocol

The type of server protocol being used: TCP or UDP

? ? Port Number

The server port number assigned to provide outside connections (from 1 to 65535).

A Server Address Variable table example:

No	Local IP Address	Protocol	Port Number
1	192.168.100.11	TCP	23
2	192.168.100.50	TCP	21

3 192.168.100.101 TCP 80

Note: The port numbers in the above example are those commonly used for Telnet, FTP, and web servers respectively, but the port number should correspond to that assigned when the server is setup.

System Monitoring

The internet/print multiple server provides a display function which shows the current setting and operational status of all of its functions. In display mode, it is only possible to view the status of variables and functions, it is not possible to modify or control them.

Displaying Information

? ?Monitor WAN Port Link

Provides a display of the current WAN port link status (i.e., whether or not the WAN port is connected).

? ?Display Configuration

Displays all configuration data for the device (addresses, ports, links, etcetera). Configuration data is a readout of the variables that are user-set as described in this chapter.

? ?DHCP Server Status

Displays a table of DHCP servers with the following information: IP Address, MAC Address, and Lease Time.

? ?**User Connection Status**

Displays a table of current user connections with the following data: Source IP, Destination IP, Protocol, Path, and Idle. Each user connected to the internet through the server will be listed.

? ?**Print Server Status**

Displays current print server statistics and information on any jobs currently printing or spooled including their size.

Tools

Each of the management items listed below allows you to 'force' some action. Each of them prompt for confirmation before executing.

? ?**Dial Up** – Dial the ISP phone access for one or the other WAN port using the configuration stored under the WAN port control.

? ?**Hang Up** – Send the phone disconnect command string to the modem immediately to end the current session.

? ?**Reset** – Return the internet/print multiple server's settings to their state prior to changes made this session and restart the device.

? ?**Factory Reset** – Return the internet/print multiple server's settings to their original factory values and restart the device. Note that this will wipe out all information about how the variables are currently set.

Navigation Controls

Each of the functions below may be available in various locations and each is either a configuration control or a navigation control.

? ?**Save Configuration** – Stores the current settings into the system firmware. Activation is followed by a prompt for confirmation.

Note: When using Telnet to modify device parameters, saving the configuration immediately ends the Telnet session.

? ?**Quit** – Quits the current function or the entire management system. Activation is followed by a prompt for confirmation.

? ?**Return to Main Menu** – Returns the management console to the first menu screen.

? ?**Return to <Previous> Menu –** Takes you up one menu level (generally to the menu immediately preceding the current menu).

5

PRINT SERVER FUNCTION

This chapter explains how to use the internet/print multiple server as a network print server.

Print Server Features

Print servers improve network printing services in three ways:

? ? They pick up the workload of managing print file traffic to connected printers. This provides workload relief to file servers, and allows the file servers' full capacity to be used for file access or other direct services to network users.

? ? The internet/print multiple server's IEEE 1284 compliant, high-speed, bi-directional parallel printer port can transmit to high-speed laser printers much faster than a PC's parallel printer port. A high-speed laser printer can thus be used at its full capacity.

? ? Because the internet/print multiple server is very portable and inexpensive compared to a PC-based print server, the printer

can be stationed at the location of maximum convenience to users.

The internet/print multiple server's print server functionality offers extraordinary flexibility, operating with most major network operating systems and protocols:

? ?**TCP/IP**

UNIX lpr/lpd (HP-UX, SunOS, Solaris, SCO, UnixWare, IBM AIX); Windows NT

? ?**NetBEUI**

Windows NT, Windows 95/98, Windows for Workgroups, Microsoft LAN Manager, IBM LAN Server

? ?**AppleTalk**

MacOS EtherTalk

The print server configuration, features, and operation can all be controlled using the same Telnet or browser interface as the WAN port and other aspects of the internet/print multiple server (see the previous chapter).

Connecting for Print Service

To connect your printer to the internet/print multiple server, you should use the standard parallel cable that comes with the printer. If you need to purchase a new parallel cable, be certain that the connectors on both ends of the cable are the right type and that the total cable length does not exceed 12 feet (approximately 4 meters).

Follow these steps for a trouble-free print-server connection.

1. Confirm proper operation of the printer to be connected to the internet/print multiple server.

2. When you have confirmed proper operation of the printer, switch its power off.

3. Confirm that your network is operating normally.

4. Connect the internet/print multiple server to the network (through the RJ-45 port on the print server's rear panel).

5. While the printer is power off, install a printer cable to connect its parallel port to the printer port of the internet/print multiple server.

6. Switch printer power on.

7. Plug the AC power adapter's output plug into the power input socket on the rear panel of the internet/print multiple server.

8. Plug the AC power adapter into an electric service outlet. This will supply power to the internet/print multiple server. (The server has no power switch.)

Print Server Configuration

Print server configuration and operation is controlled through the same Telnet console or browser interface as the WAN port and other features of the internet/print multiple server. Chapter 4 explains each operational section of the interface and its variables. Refer to the section on print server configuration for details. The following variables and controls are provided for operating and managing the print server port of the internet/print multiple server:

1. Parallel Port -> Port Name

2. Parallel Port -> Speed
3. Parallel Port -> PJL Printer
4. NetBEUI -> Workgroup Name
5. NetBEUI -> Maximum Connected Stations
6. AppleTalk -> Printer Type
7. AppleTalk -> Postscript Level
8. AppleTalk -> Font Group

A

TROUBLESHOOTING

System POST

When the unit is powered on, the system first runs a Power-On Self Test (POST) as a check of system components. Errors encountered during the POST are indicated by different flashing front panel LED combinations.

Note: *The LEDs flash as a normal part of the system initialization. The error flash codes listed in the table below will be constant and thus unlike the brief LED indications at initial power-on.*

LED POST Error Indication Table

	COM STATE	LPT STATE	ERROR INDICATED
0	slow flashing	slow flashing	Need to reload firmware
1	on	on	DRAM Error

2	1 long 2 short	off	Timer INT Error
3	1 long 3 short	off	Flash Protected
4	1 long 4 short	off	Flash ID Error
5	1 long 5 short	off	Flash Erase / Program Error
6	1 long 6 short	off	LAN Controller Error
7	1 long 7 short	off	LAN Memory Error
8	1 long 8 short	off	IO Controller Error
9	1 long 9 short	off	LPT Error
10	fast flashing	on	EEPROM Error
11	1 long 11 short	off	LAN IO Base Error

Device Installation Problems

WAN

IP ADDRESSES: If you have trouble connecting with or contacting your ISP, double-check the IP address setting of the internet/print multiple server. Particularly if your ISP is not using DHCP to dynamically assign IP addresses, make certain that you are using the right IP for the login you have set.

ACCESS PASSWORD: It is possible that you mis-entered your ISP login password. Use the Telnet or browser configuration program to re-enter the login password.

Print Server

UNSUPPORTED PROTOCOL: The internet/print multiple server supports the TCP/IP, NetBEUI, and AppleTalk print protocols. If your network is using some other print protocol (NetWare IPX/SPX for example), you will have printing problems. Most platforms should allow you to reconfigure and use a supported protocol.

LAN

IP ADDRESSES: If stations on your network have trouble connecting with the internet, double check their IP address settings. Particularly if you are not using the internet/print multiple server's DHCP server function, make certain that you are using only IP addresses from the three reserved ranges and that each PC's IP address is within the same subnet as the internet/print multiple server LAN IP.

Station Configuration Problems

SUSPEND BROWSER PROXIES: When using a browser to configure the internet/print multiple server, we recommend that you suspend use of proxies until after you have completed the configuration. If you are using a proxy server on a different subnet, your browser will have difficulty contacting the internet/print multiple server.

IP ADDRESSES: The PC you are using must have an IP address on the same subnet as the internet/print multiple server in order to contact it.

Operating Problems

ISP LOGIN PROCEDURES – LOGIN SCRIPT: It may be necessary for you to create login script entries in order to complete your login procedure. Some ISPs prompt for a communications protocol choice or other data after a successful modem connection. Refer to Chapter 4 for more information.

MODEM COMMANDS: It may be necessary for you to reconfigure the initial modem commands due to operational differences in your modem. Refer to Appendix C of this *User's Guide* and the documentation provided with your modem for more information. In particular, check the setting of the initial string for discrepancies with your modem's operational features.

ISP DETAILS: Double check all ISP login information (i.e., username, password, phone number) for accuracy.

OUTSIDE LINE ACCESS DIALING: If it is necessary for you to dial a special number in order to dial a phone number outside of your office, that dialing information will need to be included in the phone number information provided to the internet/print multiple server. See Chapters 3 and 4 for more information.

NUMBER OF USERS: While the internet/print multiple server can handle any number of users, it is recommended that no more than 50 attempt to access the internet through the device simultaneously. Note that the more people who access the internet through the internet/print multiple server the slower response times will be for all.

B

SPECIFICATIONS

General

Standards: IEEE 802.3 10BASE-T Ethernet repeater, IEEE 802.3u 100BASE-TX Fast Ethernet repeater (Class II); ANSI X3T9.5 Twisted-Pair Transceiver; IEEE 1284 bi-directional parallel interface

Protocol: CSMA/CD

Network Data Transfer Rate: NWay – Fast Ethernet, 100Mbps; Or Ethernet, 10Mbps

Ports: One RJ-45 NWay LAN port; One RS-232 serial WAN port; and One 25-pin standard parallel printer port

Network Media: Ethernet: Category 3 or better UTP cable, 100m maximum; Fast Ethernet: UTP Cat 5 or STP, 100-ohm twisted-pair 100m maximum.

Status LEDs: Pw/Tx (power on/transmit); Link/Rx (connect o.k./receive); LPT and COM.

Environmental and Physical

Power Supply:	12VDC/500mA (external)
Dimensions:	164 x 118.2 x 30 mm (W x L x H)
Weight:	245 grams (approximately 8.6 ounces)
Operating Temp.:	0? to 55?C
Storage Temp.:	–25? to 55?C
Humidity:	5% to 95% non-condensing
Emissions:	FCC Class A, CE, VCCI Class A, C-Tick
Safety:	UL, CSA, CE Mark, TÜV/GS

C

AT COMMANDS

The commands provided in the table below are used to control modems and are provided as a supplemental reference to documentation that should have been included with your modem or fax/modem.

Basic AT Command Set

Each command, except for "+++" and "A/", must be preceded by "AT" and executed when you press the <Enter> key.

Command	Var	Description
+++	**–**	Escape to command mode
A/	**–**	Repeat last command
A	**–**	Answer command
Bn		Protocol for 1200 bps connection
	0	V.22 mode
	1	Bell 212A mode (Default)
Dstring		Dial Command
	P	Pulse dial, must precede number string
	T	Tone dial, must precede number string

	W	Inserted between digit. Wait for dial tone for the period defined by S7 before dialing.
	,	Inserted between digit. Pause for the period defined by S8.
	!	Flash. Inserted between digit. Cause modem to go on-hook for 0.5 seconds and return to off-hook.
	;	Command append. Return to command mode after dialing to allow additional dialing command.
	S=n	Dial a stored number where n is equal to 0, 1 or 2 corresponding to the slot number.
Fn		Select Line Modulation
	0	Auto-detect mode
	1	V.21 or Bell 103
	2	Reserved
	3	V.23
	4	V.22 or Bell 212A 1200 bps line speed
	5	V.22
	6	V.32bis or V.32 4800
	7	V.32 7200
	8	V.32bis or V.32 9600
	9	V.32bis 12000
	10	V.32bis 14400
	13	V.FC 14400
	14	V.FC 16800
	15	V.FC 19200
	16	V.FC 21600
	17	V.FC 24400

	18	V.FC 24600
	19	V.FC 28800
Hn		Hook Switch
	0	Go on-hook (hang-up)
	1	Go off-hook
In		Identification Command
	0	Display the product identification code.
	1	Report pre-computed checksum.
	2	Report O.K.
	3	Report firmware revision, model and interface type.
	4	Report response programmed by an OEM.
	5	Report the country code parameter.
	6	Report modem data pump model and code version.
Ln		Speaker Volume
	0	Off
	1	Low (Default)
	2	Medium high
	3	High
Mn		Speaker Control
	0	Speaker always off
	1	Speaker on during handshaking and off while receiving carrier. (Default)
	2	Speaker on during handshaking and while receiving carrier.
	3	Speaker off during dialing and receiving carrier and turn speaker on during answering.

Nn		Automode Detection – This command interacts with the **F** command and should be thus used.
	0	Disabled
	1	Enabled (Default)
On		Return to Data Mode – after using **+++** command to switch to command mode.
	0	Return to data mode.
	1	Perform equalizer retrain sequence, then return to data mode. A retrain causes the modem to optimize for the best data transmission. This command works at speeds of 2400 bps or higher.
P		Force Pulse Dialing
Qn		Modem Responses – Determines whether the modem returns responses after typing a command.
	0	Send responses to local computer (Default)
	1	Do not send response
Sn		Select S-Register as default
Sn**?**		Display the value of S-Register n
Sn=v		Change the value of Register n to v
=v		Set default S-Register to value v
?		Display the value of the default S-Register
T		Force DTMF dialing
Vn		Response Format – Used with **Q** command.
	0	Numeric response format
	1	Word response format (Default)
Wn		Extended Response Code
	0	Report DTE speed in EC mode. (Default)
	1	Report line speed, EC protocol and DTE speed.

	2	Report DCE speed in EC mode.
Yn		Long Space Disconnect
	0	Modem does not send or respond to break signals. (Default)
	1	Modem sends break signals for 4 seconds before disconnecting.

Extended AT& Command Set

Command	Var	Description
&Bn		Data rate, terminal-to-modem
	1	DTE/DCE rate fixed at DTE setting
&Cn		Carrier Detect signal status
	0	Forced to On continuously (Default)
	1	Follows the status of remote carrier signal
&Dn		Date Terminal Ready (DTR) operations
	2	DTR off causes modem to hang up
&F		Load the default factory settings
&Hn		Data flow control, DTE/DCE
	0	Flow control disabled
	3	Hardware (RTS/CTS) flow control
	4	Software (Xon/Xoff) flow control
&Sn		Data Set Ready (DSR)

	0	DSR overridden, DSR always on

D

PORT PINOUTS

This appendix provides pinout data for the internet/print multiple server's ports.

Serial Ports

The table below shows the pinouts of the internet/print multiple server's 9-pin RS-232 serial port. Consult your modem's documentation for detailed information on how to physically connect the internet/print multiple server to it.

Pin	Signal	Function
1	DCD	Data Carrier Detected
2	RxD	Received Data
3	TxD	Transmitted Data
4	DTR	Data Terminal Ready
5	Gnd	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicator

Parallel Port

The table below lists the pinouts of the internet/print multiple server's 25-pin parallel port connector (identical to the parallel port connector used on most personal computers), and the corresponding pin numbers for the 36-pin Centronics connector used on most printers.

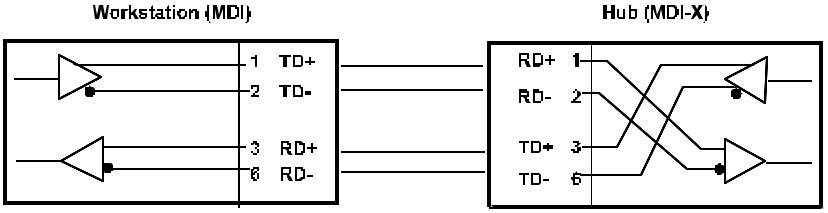
Signal names beginning with *n* are active-low signals.

25-pin	Centronics	Signal	Source
1	1	nStrobe	Host
2	2	Data 1	Bi-directional
3	3	Data 2	Bi-directional
4	4	Data 3	Bi-directional
5	5	Data 4	Bi-directional
6	6	Data 5	Bi-directional
7	7	Data 6	Bi-directional
8	8	Data 7	Bi-directional
9	9	Data 8	Bi-directional
10	10	nAck	Printer
11	11	Busy	Printer
12	12	PError	Printer
13	13	Select	Printer
14	14	nAutoFd	Host
15	32	nFault	Printer
16	31	nInit	Host
17	36	nSelectIn	Host
18-25	16, 17, 19-30	Ground	

RJ-45 Port

The RJ-45 port of the device is a LAN port designed to use standard, straight twisted-pair cabling (with different ratings at different lengths for Ethernet and Fast Ethernet).

Straight Twisted-Pair Cable Pinouts		
Contact	**MDI-X Signal**	**MDI Signal**
1	RD+ (receive)	TD+ (transmit)
2	RD- (receive)	TD- (transmit)
3	TD+ (transmit)	RD+ (receive)
4	Not used	Not used
5	Not used	Not used
6	TD- (transmit)	RD- (receive)
7	Not used	Not used
8	Not used	Not used



RJ-45 Twisted-Pair Cabling Active Pinout Configuration

E

GLOSSARY

Please note that the terms in this glossary are defined according to their usage in this document and as part of the field of computer networking. Any meaning or usage outside of these specific areas may not be included and is not necessarily implied.

#

100BASE-TX — 100Mbps Ethernet LAN communications standard set by the IEEE (in standard 802.3u); also called "Fast Ethernet."

100Mbps — 100 million bits per second; an expression of transmission speed in a network.

10BASE-T — The original Ethernet LAN communications standard set by the IEEE (in standard 802.3); a 10Mbps standard.

10Mbps — 10 million bits per second; an expression of transmission speed in a network.

A

Address — A number, set of numbers, or name which uniquely identifies a computer, network device, or network resource.

B

Bandwidth — The range of frequencies available across a communications channel; in one sense, the "size" of the communications channel.

C

Category 3, 4, 5 — Communication cabling standards referring to the quality of the transmission medium and whether or not the cable includes transmission shielding.

Collision — Simultaneous data transmission on a network medium, resulting in a garbled (and unreadable) transmission. See "CSMA/CD."

Collision Domain — A section of a network isolated from other sections by a switch, bridge, or hub that detects and resolves collisions locally so that there is less impact on the entire network.

CSMA/CD — **C**arrier **S**ense **M**ultiple **A**ccess with **C**ollision **D**etection; a network communications protocol in which each transmission source (i.e., station, server, switch, etc.) monitors the main data channel for traffic before and during transmission, postponing transmission when the data channel is in use.

D

DHCP — **D**ynamic **H**ost **C**onfiguration **P**rotocol. DHCP is a protocol that allows IP addresses to be dynamically assigned.

DNS — **D**omain **N**ame **S**ervice. DNS entries on internet DNS servers map site names (also called, "URLs") to their actual IP addresses.

E

Ethernet — A particular type of LAN described in a standard (802.3) established by the IEEE, with 10Mbps data transmission.

F

Fast Ethernet — An extension of Ethernet LAN (defined in standard 802.3u) to allow 100Mbps transmissions.

H

Hub — The central device in a star-topology LAN used to connect each station to the network.

I

IEEE — **I**nstitute of **E**lectrical and **E**lectronics **E**ngineers, an accredited professional group of scientists and engineers who help set standards for LAN communications technology.

In-band — Communications with a network device using the network medium itself. Contrast with out-of-band.

Internet Server — A device designed to provide internet access to multiple users at multiple stations but through a single access point (both a single ISP and only one public domain IP).

ISP — **I**nternet **S**ervice **P**rovider. ISPs are companies that provide internet access, often through a modem-to-modem phone line connection.

L

LAN — **L**ocal **A**rea **N**etwork, an interconnected set of computers and other devices.

Leased-Line — A phone line, usually "rented" from a phone company, which is dedicated to the sole use of the "renter." Internet access speeds are faster using a leased-line, because there is no bandwidth sharing.

LED — **L**ight **E**mitting **D**iode – an electronic device that lights up when electricity is passed through it. LEDs are commonly used for status indicators on electronic devices.

M

Mbps — Megabits per second; millions of bits per second.

T

TCP/IP — **T**ransmission **C**ontrol **P**rotocol/**I**nternet **P**rotocol; a suite of transport and network layer communications protocols.

Telnet — Terminal emulation for the TCP/IP protocol suite, used for interacting with remote computers and devices.

Twisted-pair — Wire such as is commonly used with telephones consisting of pairs of copper wire

usually terminating in an RJ-45 or RJ-11 connector.

U

UTP/STP — UTP – unshielded twisted-pair, twisted pair wire without shielding. STP – shielded twisted-pair, twisted-pair wire with shielding.

W

WAN — **W**ide **A**rea **N**etwork, an interconnected set of computers and other devices spread over a large geographic area. (Often used synonymously with "internet.") Compare, "LAN."

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