



DP-802 NWay Internet/Print Server User's Guide

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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. Verwenden Sie keine Flüssig- oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.
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9. Die Netzanschlußsteckdose muß aus Gründen der elektrischen Sicherheit einen Schutzleiterkontakt haben.
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 - b- Flüssigkeit ist in das Gerät eingedrungen.
 - c- Das Gerät war Feuchtigkeit ausgesetzt.
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 - e- Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.
 - f- Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.
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18. Zum Netzanschluß dieses Gerätes ist eine geprüfte Leitung zu verwenden. Für einen Nennstrom bis 6A und einem Gerätegewicht größer 3kg ist eine Leitung nicht leichter als H05VV-F, 3G, 0.75mm² einzusetzen.

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QUICK INSTALLATION

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

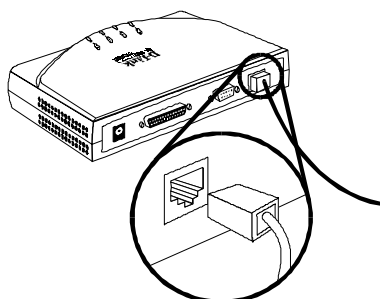
Getting Started

Step 1: Unpack the device. Make certain no components have been lost or damaged. A packing list is provided on page 11.

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 server can be hung on a wall using the wall mounting equipment included with the product.

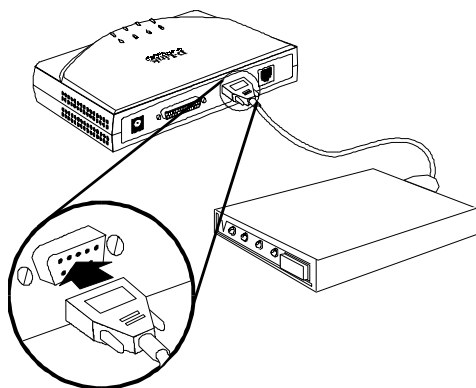
Making Connections

Step 3: Connect the internet/print 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 server to the printer using the LPT port and a parallel cable. See Chapter “Print Server Setup” for information on how to setup the print server settings and see the *IS Admin User's Guide* for information on shared print services.

Step 5: Connect the internet/print 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.

Configuration

Step 7: Before you can use your internet/print server, IP addresses on your LAN's PCs must be set so that they are compatible with the internet/print server's settings. The internet/print server comes with the default local IP address: **192.168.100.1** and the default subnet mask setting: **255.255.255.0**. Assuming that you leave these settings unchanged and assign fixed IP addresses to machines on your LAN that will access the Internet through the internet/print server, you must give those machines IP addresses in the range of 192.168.100.xxx, where xxx is a number from 2 to 255. (If you want to use a different IP address range, see "Setting IP Addresses" on page 21.) You can, alternatively, set the machines on your LAN to obtain their IP addresses automatically using DHCP to get IP addresses from the internet/print server. Whether the machines use fixed IP addresses or DHCP, they must all use the same subnet mask setting as the internet/print server, and the internet/print server's local (LAN) IP address must be set as each machine's default gateway.

Step 8: The internet/print 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 server (either the default IP listed above or the new address you assigned using IS Admin). This should bring up the internet/print server start menu. See the next series of steps for information about settings that must be set for the device to work properly.

Mandatory Settings for Internet Access

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 Settings” menu for this setting 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 Settings,” 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 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 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 settings correctly and still have trouble logging-in, see the “Login Script” section on page 29 to create a login script.

INTRODUCTION

This chapter introduces this manual, the DP-802 internet/print server, as well as some of the technology that underlies it.

About This Guide

This guide explains how to install and use the DP-802 NWay port internet/print 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 DP-802 and internet/print server technology.

- ◆ Chapter 2, *Installation*. Helps you unpack, understand and install the DP-802.
- ◆ Chapter 3, *Internet Server Setup*. Explains how to configure the settings for the internet functions on the internet/print server.
- ◆ Chapter 4, *Print Server Setup*. Explains how to configure the settings for the print server functions on the internet/print server.
- ◆ Chapter 5, *Configuration Settings*. Explains all available settings on the internet/print server and what options exist for configuration and use.
- ◆ 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.

Product Description

The DP-802 internet/print server is designed to give multiple, networked PCs access to the internet through a single account. It controls your Local Area Network (LAN) by automatically assigning IP addresses to all computers connected to it and routing traffic to and from local computers and the internet.

The DP-802 also supports local network print server operations.

Product Features

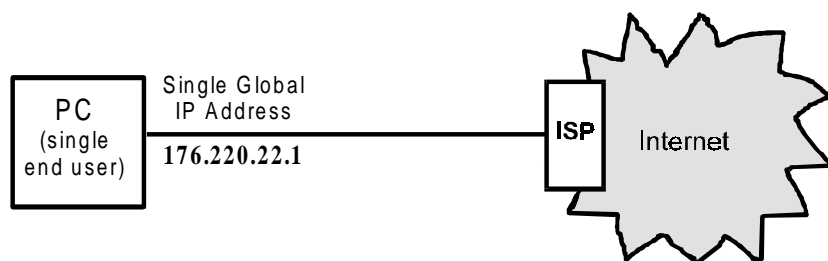
The list below highlights the features and specifications of the DP-802 internet/print server.

- ◆ 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, FTP, Telnet, and HTTP.
- ◆ Support for device configuration via Telnet, web browser, or IS Admin program (included).
- ◆ NWay RJ-45 UTP/STP 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.

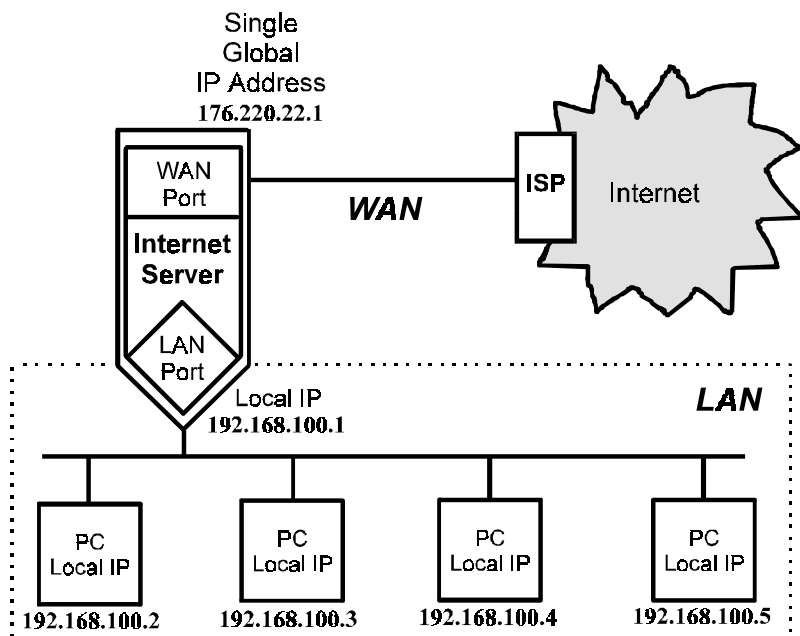
- ◆ 56K (maximum) modem speed support
- ◆ 128K (maximum) ISDN/TA speed support
- ◆ Internet features include: Dial-On-Demand, NAT internet access, DHCP server, and virtual server.
- ◆ Print Server support includes the following print server protocols: TCP/IP, NetBEUI, and AppleTalk.
- ◆ Flash memory for easy firmware upgrades.

Internet Server Technology

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



Using an internet server allows a single global IP address to be shared by multiple end nodes simultaneously.

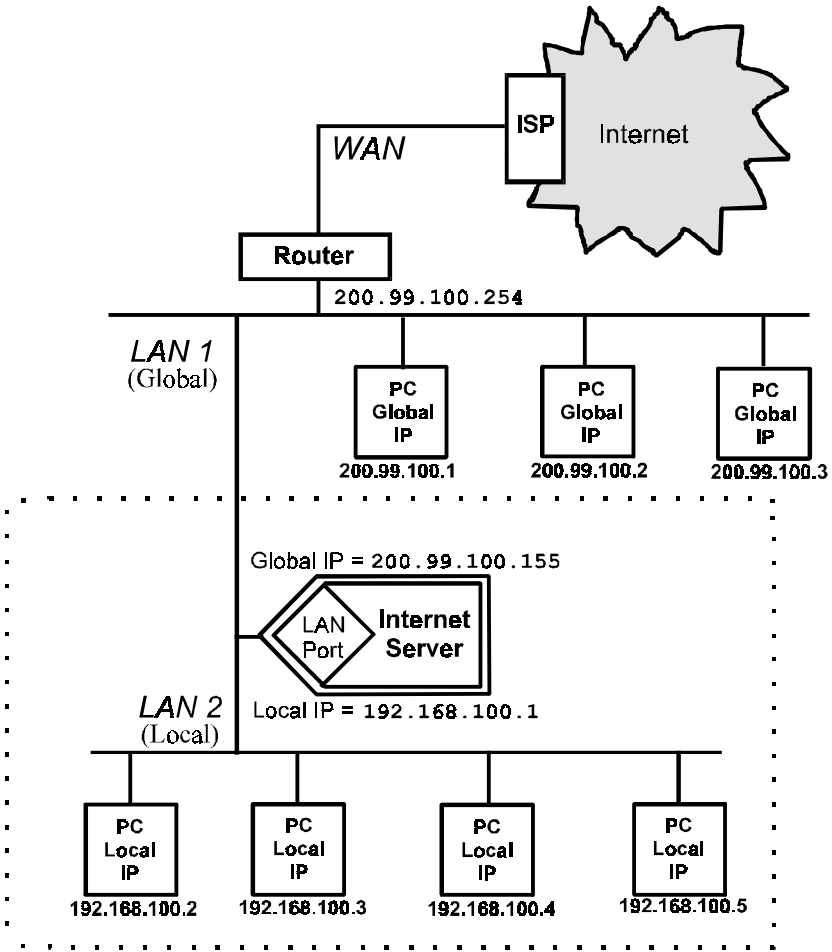


In this implementation, it is only necessary to pay for a single internet account even though many people will be able to use it.

Non-Internet Implementations

An internet server can also be used to expand a LAN by creating a localized IP “sub-group”. In this LAN-to-LAN configuration, the internet server links the two IP subgroups (as shown below). This implementation is useful when the LAN has run out of IP addresses. The internet server uses a single IP address from the first (global) LAN to establish a second (local) LAN, in much the same way it allows many users to connect to the internet through a single IP address. PC’s on the second LAN (called a local LAN since the IP addresses of computers on this LAN are managed by the internet server) can still access the internet by setting their

Gateway address to the IP address of the local LAN port of the Internet server. Please note that the WAN ports on the DP-802 are disabled when it is operating in LAN-to-LAN mode.



2

INSTALLATION

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

Unpacking

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

- ◆ One internet/print 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*
- ◆ One 3.5" diskette with IS Manager Server software
- ◆ IS Manager Server *User's Guide*
- ◆ One 3.5" diskette with IS Mail Server software
- ◆ IS Mail Server *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.

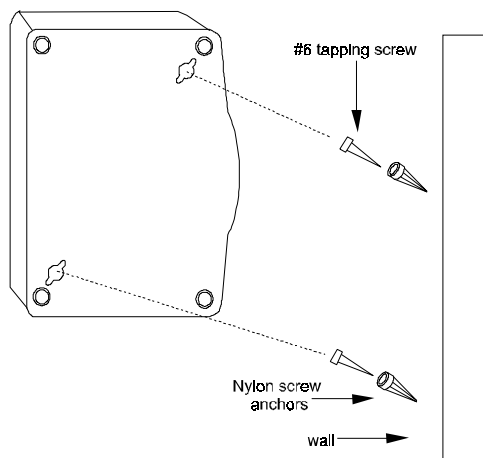
Observe the following guidelines when choosing an installation location:

- 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*.

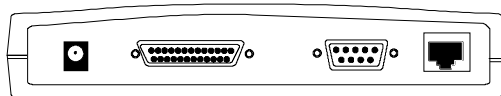
Wall Installation

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 Server on a Wall

Port Description



DP-802 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

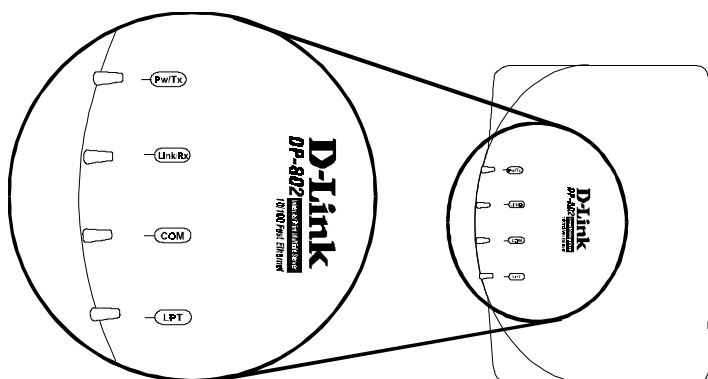
The parallel port is used for connecting to a printer for sharing to the LAN. This port is a standard female 25-pin parallel connector.

RJ-45 – LAN

The internet/print 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 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.



DP-802 Front Panel / LEDs

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 a 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 server will begin operating normally.

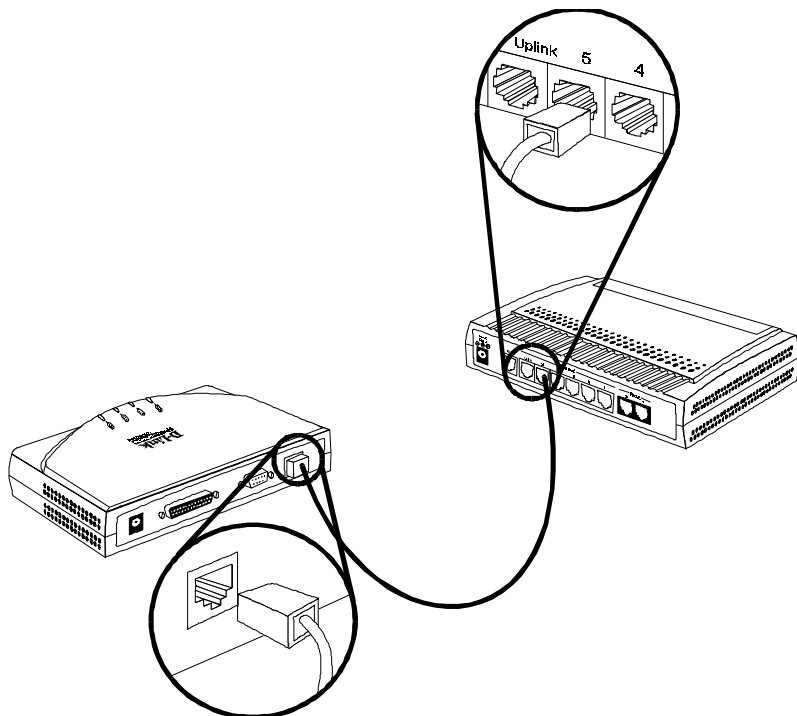
Connecting to the Local Network

The internet/print 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 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 server), you may configure other parameters from your network station using Telnet or a web browser.

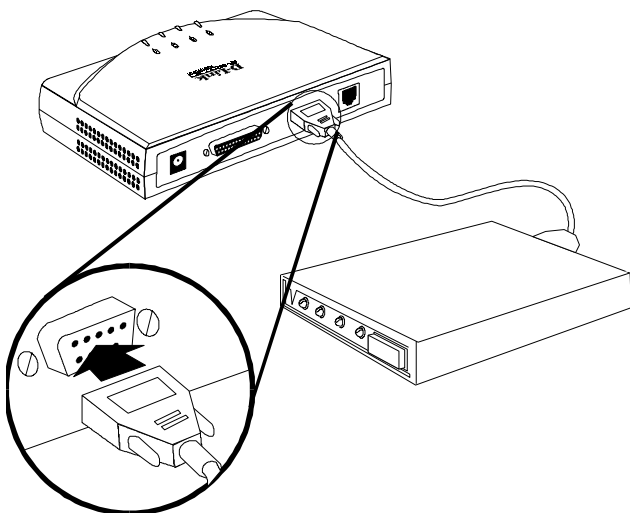


LAN Connection

Connecting to the Internet

The internet/print 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.

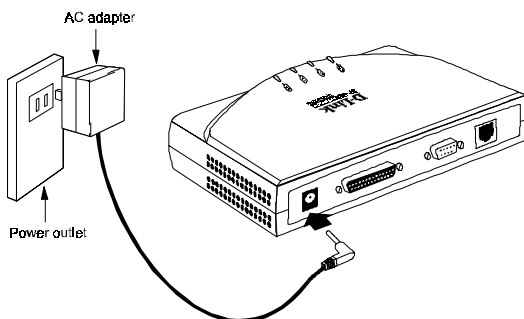
Connect the COM port of the internet/print server to a modem or ISDN terminal adapter using a standard serial cable.



Modem Connection

Connecting Power

Power is supplied to the internet/print server through an AC power adapter.



Connecting Power

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

3

INTERNET SERVER SETUP

Before it can be used, the internet/print server has some settings 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 server. A description of the minimum setup required to operate is also provided. A full listing of all settings on the internet/print server is provided in Chapter 5. Note that the settings 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 (Internet Service Provider) is a company that provides internet services for a fee, usually via modems connected over telephone lines. From the ISP's point of view, the internet server is a single user (with a single username and password).

Setting IP Addresses

The IP address settings, which include the IP address, subnet mask and gateway IP address are the first and most important settings that need to be configured. The internet server comes with a default Local LAN IP address and subnet mask assigned. If you do not have a preexisting IP network and are setting one up now, using the factory default IP address settings can greatly ease the setup process. If you already have a preexisting IP network, you should adjust the IP settings for the internet server to fit within your existing scheme. Both cases are discussed below. Before proceeding, please make sure that you have physically connected all components in the LAN, including the internet server, the hub or switch and the computers, as described in the previous chapter.

Using the Default Address

The internet server comes with a preset default IP address setting of 192.168.100.1. There are two ways to use this default IP address. The first way is to manually set the IP address, subnet mask and default gateway on each computer. Different operating systems and network software suites will have a different procedure/application for setting the system IP. In Windows 3.1 and 3.11, find the TCP manager and choose TCP/IP then "Setup". In Windows 95/98, click on the START button and choose Control Panel. In the window that opens, double-click on the Network icon. Under the Configuration tab, find or add a TCP/IP component and edit the address settings accordingly.

Default Addressing Example			
Host	IP Address	Subnet Mask	Gateway IP
Internet Server	192.168.100.1	255.255.255.0	
Computer #1	192.168.100.2	255.255.255.0	192.168.100.1
Computer #2	192.168.100.3	255.255.255.0	192.168.100.1
Computer #3	192.168.100.4	255.255.255.0	192.168.100.1

Please note that when using the default IP address as in the above example, the first three numbers in the IP address must always be the same with only the fourth number changing. This is because the first three numbers define the network IP address (all machines must belong to the same IP network), while the last number denotes the host address (each host must have a unique number). Also note that the subnet mask is the same for all machines and the default gateway address is the Local LAN IP address of the internet server.

The second way to use the default settings is to allow the internet server to automatically assign IP addresses to your computers using DHCP. To do this, simply make sure your computers' IP addresses are set to 0.0.0.0. Under Windows, choose the option 'Obtain an IP address automatically' in the TCP/IP network component described above. When your computer is restarted, it will automatically be given a valid IP address, subnet mask and gateway address by the internet server. For this option to work, the internet server's DHCP feature must be enabled, which it is by default.

Using Your Own Address Settings

If your LAN is already setup for IP networking and you wish to change the IP address of the internet server to operate within your existing IP network, simply:

1. Physically connect the internet server to your LAN and power it on.
2. Configure one computer on your network to have the IP address of 192.168.100.2 (or any unique IP address in the 192.168.100.XXX domain) and a subnet mask of 255.255.255.0. Please note the original IP settings of the computer before changing them. Restart the computer.
3. Run Telnet and connect to the internet server through its default address of 192.168.100.1.
4. When prompted for the password on the opening screen, press the <Enter> key. There is no default password.
5. In the Main Menu choose System Configuration.
6. In the System Configuration window choose Local LAN -> IP Address and type in the IP address you wish to assign to the internet server.
7. Also in the System Configuration window choose Local LAN -> Subnet Mask and enter the correct subnet mask. Hint: If left blank, the internet server will automatically assign the standard subnet mask for Class A, B or C IP addresses.
8. Press to return to the main menu.
9. Press to Save Configuration settings. The internet server will automatically save the new settings and reboot, disconnecting your telnet session. When it comes online again, the new settings will be in effect.
10. Change the IP address and subnet mask of the computer back to their original configuration. Reboot the computer.

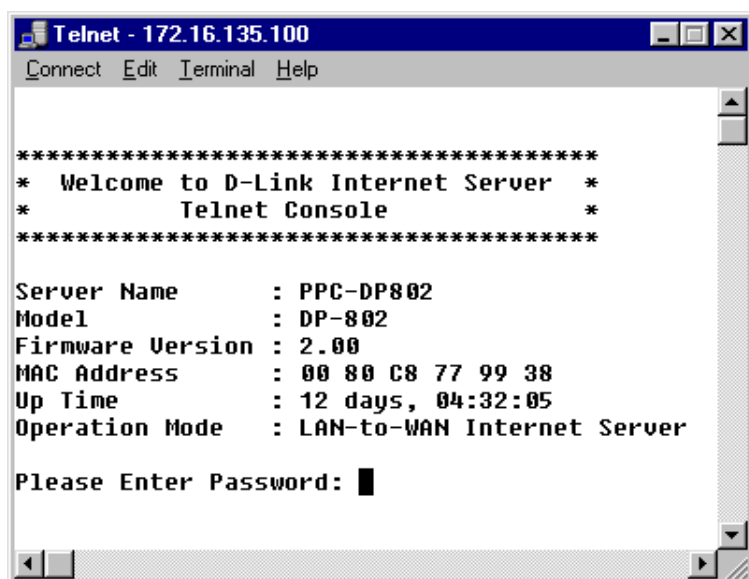
We recommend that you make a note of each device's IP address for reference during troubleshooting or when adding new stations or devices.

Using 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 server Telnet Interface console greeting screen.

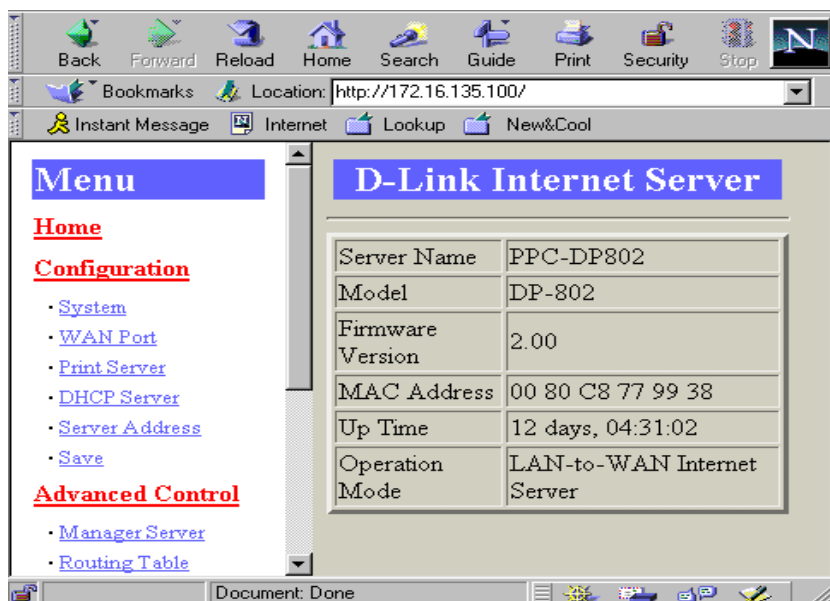


Enter the password to access the device parameters. There is no default password. Once you have access, use the menu item numbers to set the settings which are described later in this chapter.

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://" prefix, followed by the IP address assigned to the server, in the address window.



You should immediately see the internet/print server web browser interface menu. Note that the internet/print 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 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 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 settings you want to view, set or modify. Some settings have limited options that must be selected from a pull-down list.

Minimum Configuration

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

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

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 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 setting. 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 setting 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 server. You would enter 0,,9165555 in the “ISP Account -> Phone Number” setting. 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 setting is the number the internet/print server will dial to establish its internet (WAN) connection.

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

ISP Account -> User ID

Just as the internet/print server needs to know what phone number to dial to access your ISP, it also needs to know what username to login under. This setting 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 64 characters.

Default Value: (none)

Must Be User Modified? Yes.

Description: This setting 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 setting to allow the internet/print 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 32 characters.

Default Value: (none)

Must Be User Modified? Yes.

Description: This setting 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 setting to allow the internet/print server to automatically 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 server can login. The login script should be used when the Username and Password settings 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:

<u>No.</u>	<u>Prompt</u>	<u>Keyin</u>
1	Username	Stepanka
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 server for internet access:

1. Make sure that TCP/IP settings are configured properly. IP parameters that must be set include:
 - **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 server’s LAN interface.
 - **DNS (Domain Name Service)** – an IP address provided by your ISP.
2. Activate your browser and use normally.

4

PRINT SERVER SETUP

This chapter explains how to use the internet/print 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 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 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 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

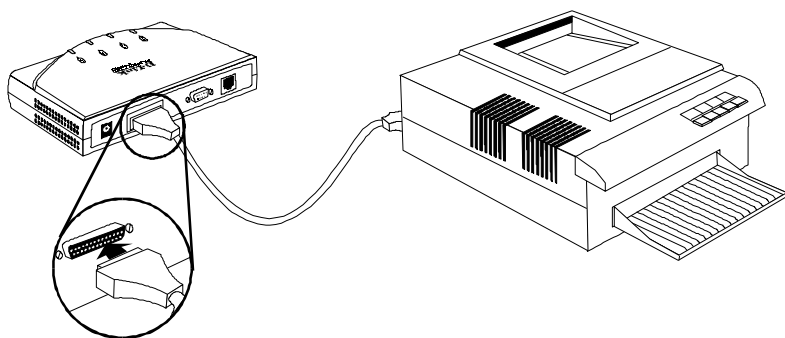
The print server configuration, features, and operation can all be controlled using the same Telnet or browser interface as the WAN port and other aspects of the internet/print server (see the next chapter).

Connecting the Print Server

To connect your printer to the internet/print 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 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 server to the network (through the RJ-45 port on the print server's rear panel).
5. While the printer is powered off, install a printer cable to connect its parallel port to the printer port of the internet/print 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 server.
8. Plug the AC power adapter into an electric service outlet. This will supply power to the internet/print server. (The server has no power switch).



Connecting a Printer

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 server. Chapter 5 explains each operational section of the interface and its settings. Refer to the section on print server configuration for details. The following settings and controls are provided for operating and managing the print server port of the internet/print server:

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

CONFIGURATION SETTINGS

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

Navigation Controls

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

- ◆ **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).

System Configuration

Server Name

Options: A 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 server on network management lists of active devices.

Local LAN -> IP Address

The Local LAN IP Address setting defines the unique IP address that your network will use to identify the internet/print 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 server must be consistent with the addresses to be used by other devices on the network. That is, if the internet/print

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 setting defines the subnet level the internet/print 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 setting allows you to set an idle time after which the internet/print 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 1 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 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 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 server's settings).

Description: Prevents unauthorized access to the device.

WAN Port Configuration

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 setting 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 setting is the number the internet/print server will dial to establish its internet (WAN) connection.

Note: *If the ISP phone line is busy, the internet/print 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 64 characters.

Default Value: (none)

Description: This setting 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 32 characters.

Default Value: (none)

Description: This setting 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 Commands

Options (sub-settings):

- ♦ **Init. 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 initialization string settings and other modem commands.

Note that the initialization 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:

<u>No.</u>	<u>Prompt</u>	<u>Keyin</u>
1	Username	Nick
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 Configuration

The settings listed here are those available for print server control. Refer to Chapter 4 for more information about setting-up and using the print server functions of the internet/print 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 -> PJI Printer

Options: Yes/No.

Default Value: No

Description: If the printer being used is compatible with the HP PJI (Printer Job Language) protocol, enabling this setting will allow the printer to provide information to the internet/print 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 Configuration

The Dynamic Host Configuration Protocol (DHCP) allows servers and devices like the internet/print 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 ON.

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 95/98 users, the "Obtain an IP address automatically" option under TCP/IP will have to be selected.*

Enable

Options: Yes/No

Default Value: Yes

Description: This setting 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 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 server for DHCP allocation is set using two settings. 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 setting indicates the beginning of the range of IP addresses available for DHCP use in assigning IPs. It is paired with the next setting to create an address range.

IP Address Range -> End

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

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

Default Value: 192.168.100.150

Description: This setting indicates the end of the range of IP addresses available for DHCP use in assigning IPs. It is paired with the previous setting 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 setting allows you to set that time limit. If a time is entered in this setting, 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 Settings 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 Configuration

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 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 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 server. The port number provides the internet/print 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 Setting 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.

Advanced Control Configuration

Manager Server IP Address

This setting is the IP address of the computer using the IS Manager Server software included with the device. The default IP address is 0.0.0.0.

Log and Filter

When set to Yes, the log and filter functions in IS Manager server software will be enabled. The internet server will create a log of all user connections and their status, viewable in the IS Manager program. The user filters also become operative, filtering connections by user, protocol and destination, as defined in the IS Manager program. Default setting is “No”.

Dial-up Schedule

The dial-up schedule settings are used to configure the internet server to dial out only at certain times. Default setting is “No”.

◆ Enable

Enables/disables the dial-out scheduling feature.

◆ Schedule Table

A table showing all the hours in all the days of the week. Choose Add to add a period of time to the table during which the internet server can dial out.

◆ **Holiday Table**

The holiday table is used to create exceptions to the schedule table. The holiday table lists all 12 months. Choose Add to add a date to the holiday table. Any dates designated in the holiday table will keep the internet server from dialing out on that day. The Holiday table is only enabled when scheduling is enabled.

◆ **Dial Up Mode**

In normal operation (when scheduling is disabled) the internet server will always dial out when it receives a data packet destined for the internet, and will hang up when the idle time condition in the System Configuration menu is met. However, when scheduling is enabled, the internet server will maintain the WAN connection according to these parameters:

- **Auto Dial** – Causes the internet server to automatically dial out when a scheduled time occurs. If the internet server is scheduled to operate between 9:00 am and 17:00 pm on Mondays, then at 9:00 am Monday morning the internet server will dial out regardless of whether it receives a packet destined for the internet. The connection to the internet will be maintained until the scheduled period elapses.
- **Dial on Demand** – Causes the internet server to dial out when it receives a packet for the internet, if the packet is received within the time allowed for dialing up in the schedule table. If a request is received to access the

internet outside of the time limits defined in the schedule table, the internet server will not dial out.

Routing Table

The static routing table allows the internet server to coexist on the same network with a router. This implementation depends on whether the router has its own WAN access to the internet.

If the router does not have a connection to the internet, then you do not need to create a new IP network or IP subnet. You simply need to add the internet server to the existing LAN and configure the router to use the Local LAN IP address of the internet server as its default gateway. In the internet server, you must add static routes into the routing table to the other IP networks or IP subnets that the router is routing between. Use the router's LAN IP address as the gateway for the static routes to the other IP networks or IP subnets that the internet server does not belong to. Doing this enables computers on the same IP network as the internet server to communicate with the computers on the other local IP networks or IP subnets.

If your router has its own connection to the internet then you must create a new IP network or IP subnet. All computers on the new IP network will use the internet server to access the internet. Computers remaining on the preexisting IP network will continue to use the router for internet access. In this configuration, the internet server can ease the burden for internet bandwidth on the router. However, for computers on the new IP network to communicate with computers on the old one, you must create a static route in the internet server's routing table. When doing this, the IP address of

the static route will be the preexisting IP address and the gateway will be the LAN port of the router.

Note: If you are creating a second IP network, do not allow the internet server to use DHCP if the router is also using DHCP, unless the router is supplying IP addresses on only one port and the internet server is not connected to that port.

Filter NetBIOS over TCP/IP

As the name states, this feature allows you to filter NetBIOS traffic when it is transmitted over TCP/IP. This can prevent NetBIOS packets, domain name queries for example, from initiating a dial-up connection.

Display Information

The internet/print 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 settings 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 settings 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.

◆ **Monitor Traffic**

This feature allows you to monitor traffic on the WAN ports(s) in kbps (kilobytes per second) and as a percentage of utilization.

◆ **Display Current Time**

Shows the current date and time as known by the internet server. Please note that the date and time values can only be received from the IS Manager Server.

◆ **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 server’s settings to their state prior to changes made this session and restart the device.
- ◆ **Factory Reset** – Return the internet/print server’s settings to their original factory values and restart the device. Note that this will wipe out all information about how the settings are currently set.
- ◆ **Adjust Time** – Choosing this option causes the internet server to contact the IS Manager Server to receive an updated time and date.

Save Configuration

This feature 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.*

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.

DP-802 LED POST Error Indication Table

	COM STATE	LPT STATE	ERROR INDICATED
0	slow flashing	slow flashing	Need to reload firm-ware
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 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 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 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 server LAN IP.

Station Configuration Problems

SUSPEND BROWSER PROXIES: When using a browser to configure the internet/print 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 server.

IP ADDRESSES: The PC you are using must have an IP address on the same subnet as the internet/print 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 5 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 server. See Chapters 3 and 5 for more information.

NUMBER OF USERS: While the internet/print 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 server the slower response times will be for all.

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



MODEM 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.
F_n	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
H_n	Hook Switch	

	0	Go on-hook (hang-up)
	1	Go off-hook
I_n	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.
L_n	Speaker Volume	
	0	Off
	1	Low (Default)
	2	Medium high
	3	High
M_n	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.
N_n	Automode Detection – This command interacts with the F command and should be thus used.	
	0	Disabled
	1	Enabled (Default)
O_n	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
&B _n		Data rate, terminal-to-modem
	1	DTE/DCE rate fixed at DTE setting
&C _n		Carrier Detect signal status
	0	Forced to On continuously (Default)
	1	Follows the status of remote carrier signal
&D _n		Date Terminal Ready (DTR) operations
	2	DTR off causes modem to hang up
&F		Load the default factory settings
&H _n		Data flow control, DTE/DCE
	0	Flow control disabled
	3	Hardware (RTS/CTS) flow control
	4	Software (Xon/Xoff) flow control
&S _n		Data Set Ready (DSR)
	0	DSR overridden, DSR always on



PORT PINOUTS

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

Serial Port

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

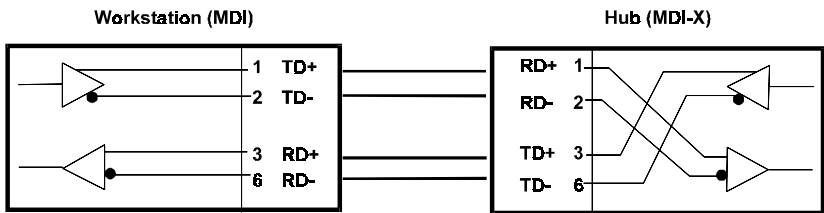
Signal names beginning with *n* are active-low signals.

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



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” or “speed” 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 as computers are turned on.

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 established by the IEEE (802.3), 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 Institute 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	Internet Service Provider. ISPs are companies that provide internet access, often through a modem-to-modem phone line connection.

L

LAN	Local Area Network, an interconnected set of computers and other devices, in an office for example.
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	Light Emitting Diode – 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 networking, consisting of pairs of copper wire usually terminating in an RJ-45 connector.

U

UTP/STP	U TP – unshielded twisted-pair, twisted pair wire without shielding. S TP – 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.”) A WAN connection might be the connection of two office buildings on different sides of the city, or a connection to the Internet, for example. Compare, “LAN.”
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D-Link® Offices

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Registration Card

Print, type or use block letters.

Your name: Mr./Ms _____
 Organization: _____ Dept. _____
 Your title at organization: _____
 Telephone: _____ Fax: _____
 Organization's full address: _____

 Country: _____
 Date of purchase (Month/Day/Year): _____

Product Model	Product Serial No.	* Product installed in type of computer (e.g., Compaq 486)	* Product installed in computer serial No.

(* Applies to adapters only)

Product was purchased from:

Reseller's name: _____
 Telephone: _____ Fax: _____
 Reseller's full address: _____

Answers to the following questions help us to support your product:

- Where and how will the product primarily be used?**
☐Home ☐Office ☐Travel ☐Company Business ☐Home Business ☐Personal Use
- How many employees work at installation site?**
☐1 employee ☐2-9 ☐10-49 ☐50-99 ☐100-499 ☐500-999 ☐1000 or more
- What network protocol(s) does your organization use ?**
☐XNS/IPX ☐TCP/IP ☐DECnet ☐Other _____
- What network operating system(s) does your organization use ?**
☐D-Link LANsmart ☐Novell NetWare ☐NetWare Lite ☐SCO Unix/Xenix ☐PC NFS ☐3Com 3+Open
☐Banyan Vines ☐DECnet Pathwork ☐Windows NT ☐Windows NTAS ☐Windows '95
☐Other _____
- What network management program does your organization use ?**
☐D-View ☐HP OpenView/Windows ☐HP OpenView/Unix ☐SunNet Manager ☐Novell NMS
☐NetView 6000 ☐Other _____
- What network medium/media does your organization use ?**
☐Fiber-optics ☐Thick coax Ethernet ☐Thin coax Ethernet ☐10BASE-T UTP/STP
☐100BASE-TX ☐100BASE-T4 ☐100VGAnyLAN ☐Other _____
- What applications are used on your network?**
☐Desktop publishing ☐Spreadsheet ☐Word processing ☐CAD/CAM
☐Database management ☐Accounting ☐Other _____
- What category best describes your company?**
☐Aerospace ☐Engineering ☐Education ☐Finance ☐Hospital ☐Legal ☐Insurance/Real Estate ☐Manufacturing
☐Retail/Chainstore/Wholesale ☐Government ☐Transportation/Utilities/Communication ☐VAR
☐System house/company ☐Other _____
- Would you recommend your D-Link product to a friend?**
☐Yes ☐No ☐Don't know yet
- Your comments on this product?**



TO:

D-Link®