DECserver 90M+

Installation Guide

Part Number: IG-DCSRV-00

April 2006

This document describes how to install and troubleshoot the DECserver 90M+.

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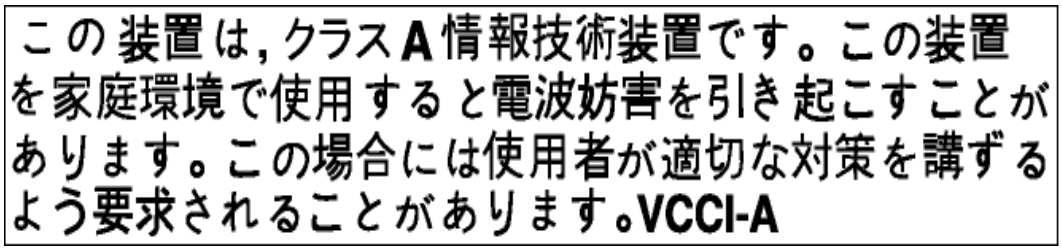

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For complete product certification information, refer to the equipment label on the back panel of the product.

Preface

Chapter 1 Overview

Chapter 2 Installation

Chapter 3 Troubleshooting

Chapter 4 Specifications

Preface

Overview

This manual describes the procedures used to install and troubleshoot the DECserver 90M+.

Purpose of This Guide

This guide describes how to install the DECserver 90M+ hardware. It also provides problem-solving information and product specifications.

Read through this guide completely to understand the features and capabilities.

Intended Audience

This guide is intended for the hardware installer. The installer is responsible for ensuring that the hardware is installed and tested.

Structure of This Guide

This guide is organized as follows:

Chapter/ Appendix	Title	Description
Preface	Preface	Describes the use and audience for this document.
Chapter 1	Overview	Provides an overview of the DECserver 90M+ features.
Chapter 2	Installation	Describes selected methods of installing the DECserver 90M+.
Chapter 3	Troubleshooting	Describes troubleshooting techniques.
Appendix A	Specifications	Lists DECserver 90M+ specifications.

For software installation information, refer to the DECserver Network Access Software Installation documentation.

Related Documentation

All related documents to help the user to install a DECserver 90M+ may be found on the Web and can be located at **http://www.digitalnetworks.net/**.

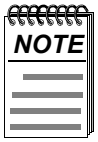
Conventions

This document uses the following conventions.

Convention	Description
Bold Type	Indicates user input.
special type	This special type indicates system output or user input.
Ctrl /X	Hold down the Control key and simultaneously press the key specified by X. The DECserver displays this key combination as ^X.
UPPERCASE	Uppercase letters in command lines indicate keywords that must be entered. You can enter keywords in either upper-case or lowercase. You can abbreviate command keywords to the smallest number of characters that distinguish the key-word to the DECserver.

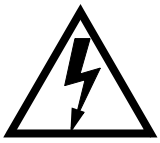
The following are used to call attention to important information throughout this document

NOTE:



Calls the reader's attention to any item of information that may be of special importance.

WARNING:



Warns against an action that could result in the presence of an electrical hazard.

CAUTION:

Contains information essential to avoid damage to the equipment.

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Chapter 1

Overview

Introduction

This chapter provides an overview of the DECserver 90M+.

In This Chapter

Information is presented in this chapter as follows:

Description

The DECserver 90M+ is a full function asynchronous device and remote access server designed to operate in multi-vendor environments. The DECserver 90M+ can be configured as a standalone/stackable device, in the MultiStack System or as a module in the DEChub 90 or MultiSwitch 900 hub backplane.

The MultiStack System supports standalone configurations.

The DEChub 90 is a multifunction Ethernet backplane that provides mounting, power, and connections for up to eight work group local area network (LAN) products.

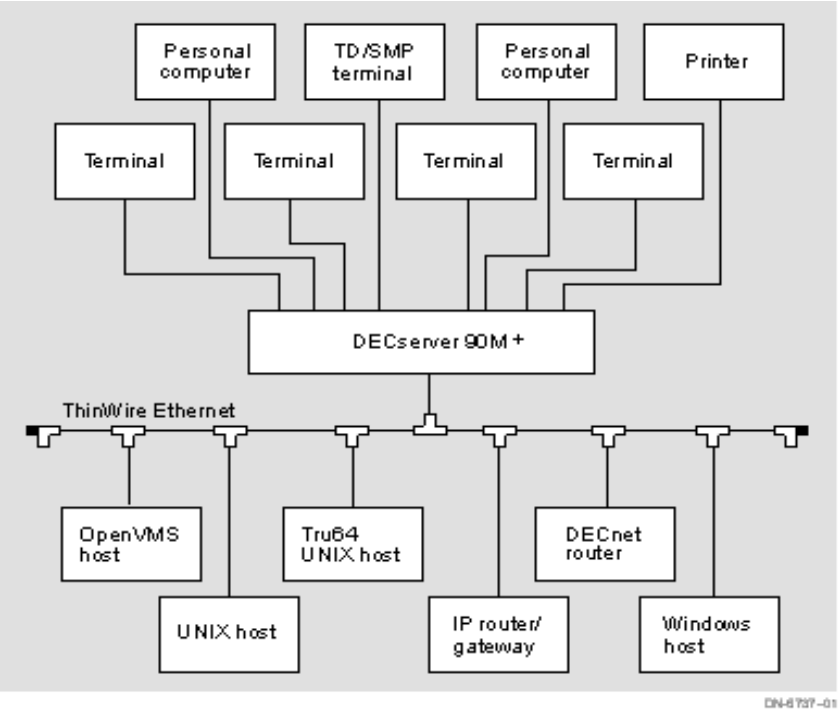
The MultiSwitch 900 System is a switching chassis that delivers multigigabit/multi-technology switch performance Designed for the wiring closet and data center configurations.

The DECserver 90M+ has the capability to:

- Downline load software using DECnet Maintenance Operation Protocol (MOP) or Access Server Loader TCP/IP Bootstrap Protocol (BOOTP/ TFTP).
- Attach to a 10BASE-T Ethernet network.
- Support eight asynchronous devices.
- Support Open DECconnect network.
- Load software from Flash RAM. (no load host is required).

Figure 1–1 shows a typical DECserver 90M+ configuration in a Ethernet LAN.

Figure 1-1: DECserver 90M+ Connection



Features

In addition to the previously mentioned capabilities, the DECserver 90M+ supports the following standard features and protocols:

- Upgradeable on-board firmware.
- Rack mountable in the MultiStack Tray System, DEChub 90 or MultiSwitch 900 Ethernet backplane
- Ready-in/ready-out or XON/XOFF flow control
- Manageable using Access Server Manager on Windows and Windows NT systems
- Manageable through remote console facility on OpenVMS, ULTRIX, or UNIX systems
- Manageable using Terminal Server Manager (TSM) software (OpenVMS only) Note: The TSM application is no longer maintained by Digital Networks.
- Kerberos-based user authentication support
- Command line recall and editing
- 3270 Terminal Emulator (TN3270) support
- Domain Name System (DNS) support
- Port characteristics
  - — 8-wire modular jack - RJ45
  - — Individual port status LEDs
  - — 6-wire DTR/DSR control signaling
- Protocols
  - — Bootstrap Protocol (BOOTP/TFTP)
  - — Compressed Serial Line Internet Protocol (CSLIP)
  - — LAT Protocol
  - — Maintenance Operation Protocol (MOP)
  - — Point-to-Point Protocol (PPP)
  - — Serial Line Internet Protocol (SLIP)
  - — Simple Network Management Protocol (SNMP)
  - — Telnet

— Terminal Device/Session Management Protocol (TD/SMP)

— Trivial File Transfer Protocol (TFTP)

— Directed Trivial File Transfer Protocol (DTFTP) with DECserver 90M+ with BootRom Version 1.0 or greater.

Figure 1–2 calls out the DECserver 90M+ controls, indicators, and connectors. Table 1–1 provides a description of these features.

Figure 1-2: DECserver 90M+ Hardware

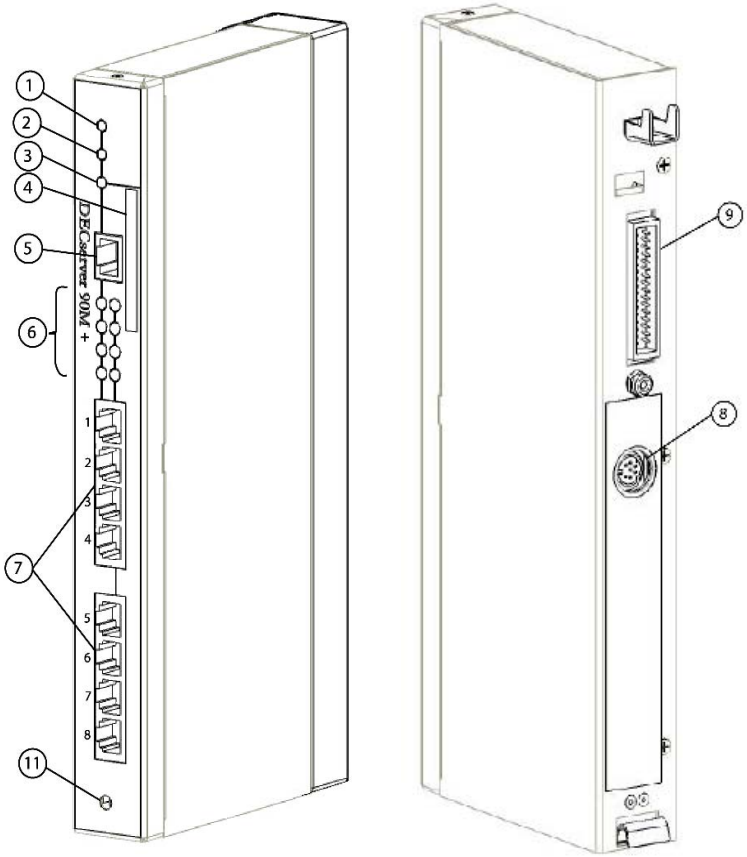


Table 1-1: Controls, Indicators, and Connectors

	Item	Description
1	Power Indicator	Turns on when +5 volts are supplied to the DECserver 90M+.
2	System OK Indicator	Turns on when the DECserver 90M+ successfully completes the ROM-based self-tests.
3	Network OK Indicator	Turns on when you connect the DECserver 90M+ to a properly terminated network. Blinks while the DECserver 90M+ loads or dumps software.
4	Ethernet Address Label	Displays the DECserver 90M+ Ethernet address.
5	10BASE-T Connector	Connects the DECserver 90M+ to the network. Not used when you install the DECserver 90M+ in a DEChub 90 or MS900 Ethernet backplane.
6	Port Activity Indicators	Consists of eight LEDs, each corresponding to a device port on the DECserver 90M+. Each port activity LED turns on when the associated port is in use. These LEDs blink when port activity is detected and continue blinking until port data transfer stops.
7	Port Connectors (RJ45)	Connects the peripheral devices to the DECserver 90M+.
8	Power Connector	Connects the power source to the standalone DECserver 90M+. Not used when you install the DECserver 90M+ in a MultiStack System, DEChub 90 or MS900 Ethernet backplane.
9	Backplane Connector	Connects the DECserver 90M+ power source and network interface to a MultiStack System, DEChub 90 or MS900 Ethernet backplane.

	Item	Description
10	Back Cover	Covers the backplane connector and mounting assembly. Present on standalone units only.
11	Reset Switch	Resets the DECserver 90M+ to the factory-default characteristics.

Features

Chapter 2

Installation

Overview

Introduction

This chapter describes how to install the DECserver 90M+ as a standalone device (on a tabletop or mounted to a wall) or added to the DEChub 90 or MS900 Ethernet backplane.

In This Chapter

Installing the DECserver 90M+ Hardware

The following sections describe how to install the DECserver 90M+ hardware as a standalone device, multistack system, or in a backplane.

Standalone Installation

Depending on your configuration, you can install the DECserver 90M+ as a tabletop device or on a wall by performing the following steps:

Wallmount Only:

1) Remove the wall mounting cover plate (refer to Figure 2–1).

a) Use a small phillips screwdriver to remove the mount cover plate.

2) Use the mounting plate as a template and position each of the #8 1-inch mounting screws (not supplied).

3) Secure the mounting screws.

4) Replace the mounting cover plate on the unit.

Tabletop and Wallmount:

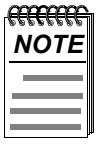
5) Connect the 10BASE-T connector to a properly configured 10BASE-T network as shown in Figure 2–2.

6) Conect Power Supply connector shown in figure 2-2.

Tray Mount:

For Multistack system installation refer to DETRX installation guide, it can be found on our Web site at **http://www.digitalnetworks.net/**

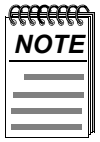
7) Verify that the power LED is on and that the DECserver 90M+ is running the self-tests.



Chapter 1 provides an illustration of the DECserver 90M+ hardware and descriptions of the LED indicators.

8) Optionally, attach a device configured with the following settings to the console port (default is port 1) using a cable terminated with an RJ45compatible plug. .

Character size	8
Flow control	XON
Parity	NONE
Stop bits	Dynamic
Input speed	9600 baud
Output speed	9600 baud



A 10 BASE-T Ethernet connection must be configured to successfully complete selftest.

9) Verify that the DECserver 90M+ successfully ran all of the self-tests.

Figure 2-1 shows how to remove the wall mount cover plate of the DECserver 90M+.

Figure 2-1: Removing the Wall Mounting Cover Plate

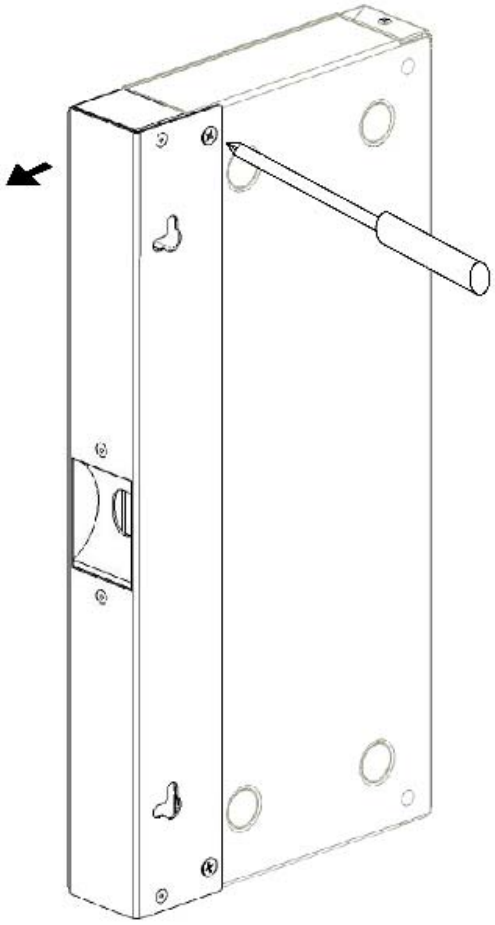


Figure 2-2 shows the standalone configuration of the 10BASE-T connection as described in Table 2-1.

Figure 2-2: Standalone Configuration – 10BASE-T Connection

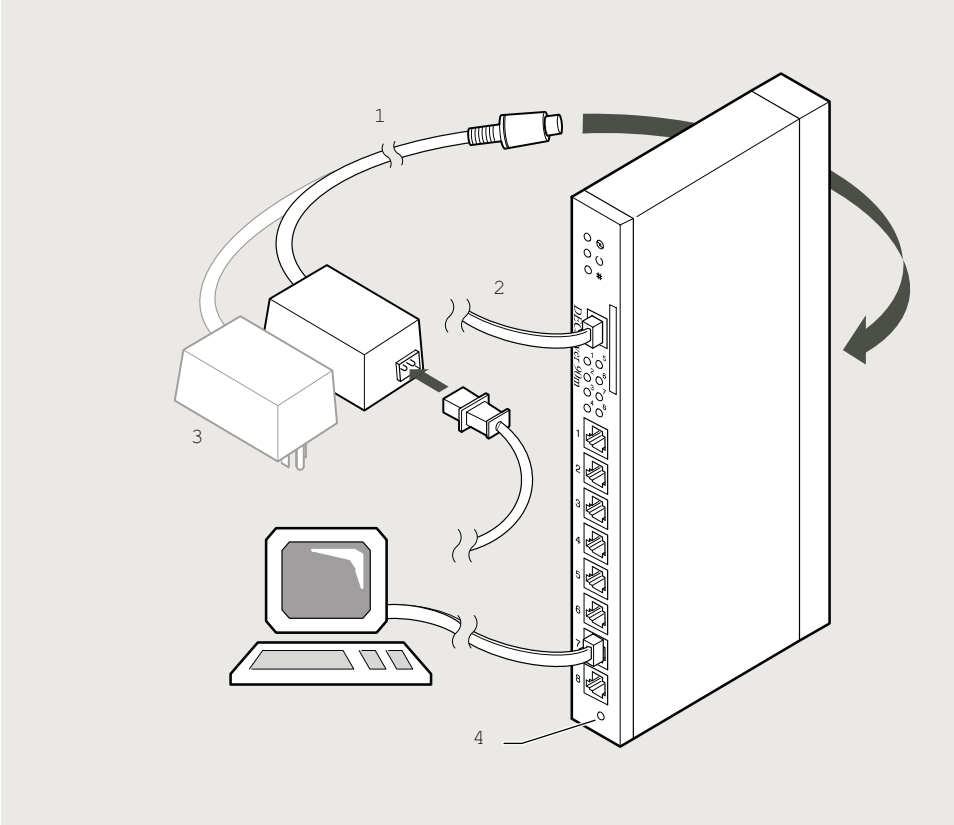


Table 2-1: Description of Standalone Configuration (10BASE-T)

Callout Number	Description
1	International Power Supply
2	RJ45 Ethernet
3	North American Power Supply
4	Reset Switch

Backplane Installation

To install the DECserver 90M+ in the DEChub 90 Ethernet backplane, perform the following steps:

1) Remove the back cover (refer to Figure 2–1).

2) Place the lower mounting tab, located on the back of the DECserver 90M+, in the appropriate mounting slot on the backplane (refer to Figure 2–3).

3) Rock the unit into place. You hear a click when the device is securely latched in place.

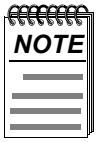
4) Make sure the power unit is secured in the backplane.

5) Verify that the power LED is on and that the DECserver 90M+ is running the self-tests.

6) Optionally, attach a device configured with the following settings to the console port (default is port 1) using a cable terminated with an RJ45 compatible plug.

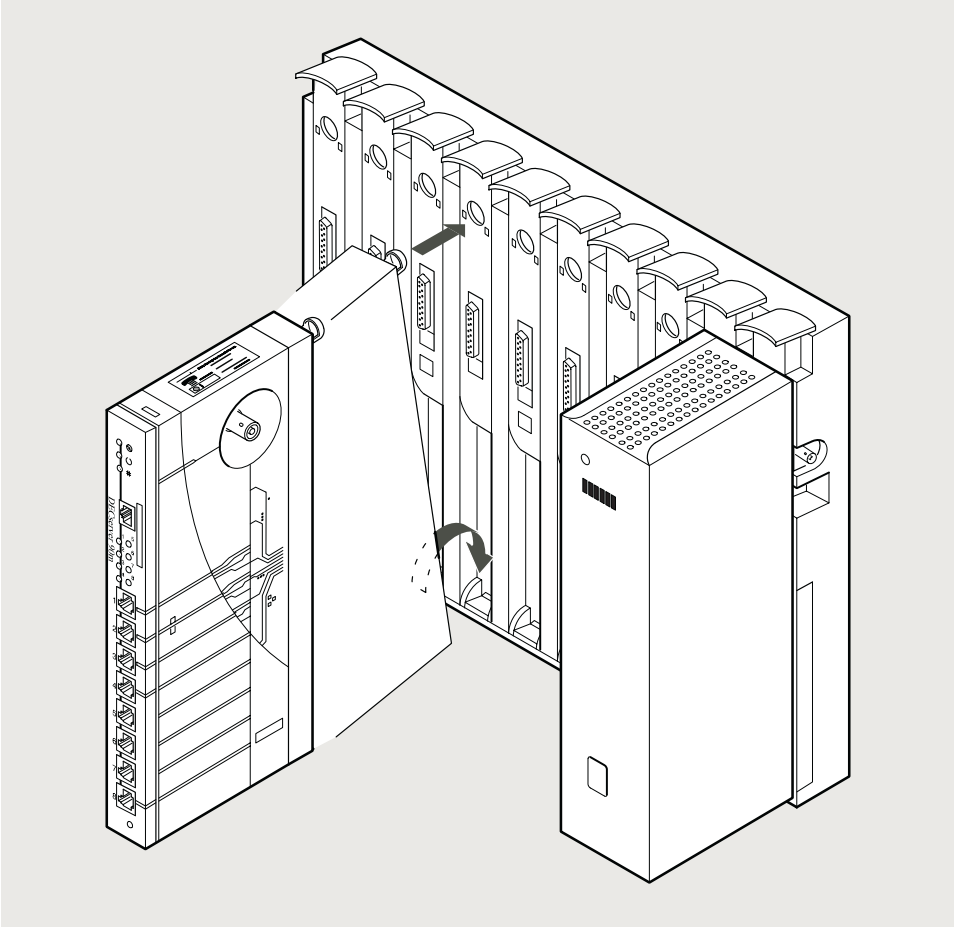
Character size	8
Flow control	XON
Parity	NONE
Stop bits	Dynamic
Input speed	9600 baud
Output speed	9600 baud

7) Verify that the DECserver 90M+ successfully ran all the self-tests.



You can install or replace (hot-swap) the DECserver 90M+ in a functioning DEChub 90.

Figure 2-3: Backplane Installation



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Running the DECserver 90M+ Self-Tests

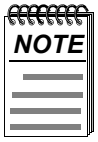
The DECserver 90M+ runs a series of self-tests when you turn on the power. It reports test status through the DECserver 90M+ Port Activity LEDs (refer to Figure 1–2).

If the DECserver 90M+ is not properly connected to an Ethernet LAN (refer to the section, Installing the DECserver 90M+ Hardware, in this chapter), the network loopback self-tests fail.

The following list describes the status of the LEDs during self-test.

- Initially, all LEDs go on briefly, then go off, leaving only the power LED on.
- The Port Activity LEDs go on one-by-one and remain on, as the DECserver 90M+ completes each segment of self-test. All eight LEDs are on once the tests have run successfully.
- After successful completion of the self-tests, the System OK LED is on and the eight port LEDs go off.

Refer to the section "On-Board Flash Memory", for the procedure to reset your module to factory default settings.



If a self-test pattern halts, an error condition has been detected (refer to Chapter 3).

Loading the DECserver Network Access Software

Before you load the software, optionally attach a terminal to the console port. The DECserver 90M+ displays status messages on the console terminal while the boot sequence is running. Status messages indicate the Ethernet address of the DECserver 90M+, the name of the load image it is looking for, and the current stage of the boot process.

Booting From Flash RAM

Once the self-tests are complete, the DECserver 90M+ checks for Flash RAM. If Flash RAM is present, the DECserver 90M+ begins the boot sequence to load the software from Flash RAM. Port Activity LED 4 goes on to indicate a Flash RAM boot sequence is in progress. A typical Flash RAM load takes about 10 seconds.

If you want to abort a boot from Flash RAM, it is only during these 10 seconds when the software is loading that you can abort the Flash RAM load by pressing the Reset-to-Factory button until Port Activity LED 4 blinks.

Booting From the Network

If you do not have Flash RAM or the correct image is not found in Flash RAM, the DECserver 90M+ proceeds to perform a network load. When you start the boot process, the Network OK LED blinks continuously and the system OK LED remains on indicating that the DECserver 90M+ is attempting to load the software from the network.

During the network boot sequence, the DECserver 90M+ searches for a load host. The DECserver 90M+ tries both MOP and BOOTP/TFTP protocols in a factory-defined order. The boot sequence includes a wait period after passing through all the boot protocols. Once the DECserver 90M+ finds a load host, it records the protocol and load host in its permanent database. The software is then downline loaded from the load host.

Port Activity LEDs 6, 7, or 8 go on to indicate which protocol the DECserver 90M+ is using to downline load the software. Port Activity LED 5 goes on to indicate that all attempts to find a load host have failed and that the DECserver 90M+ will remain in a wait state for a designated period of time before trying again. Port Activity LED 4 goes on to indicate the software is being booted from Flash RAM (refer to Table 2–3).

Table 2-2: LOAD and DUMP Protocols

Port LED	Meaning
4	Booting from Flash RAM
5	Waiting to retry
6	Ethernet BOOTP/TFTP or dump
7	ISO 8802/3 MOP load or dump
8	MOP load or dump

For more information about installing the software, refer to the appropriate DECserver Network Access Software Installation documentation.

Using Console Commands to Boot

If you program Flash RAM with a nonstandard boot image name and a load host is not available, pressing the reset-to-factory button may leave the DECserver unbootable. A nonstandard boot image name is any name other than MNENG4 for DECserver 90M+ units configured with 4 MB of Flash.

To allow booting of a nonstandard boot image name, perform the following steps:

1) 1. During the boot sequence of the DECserver 90M+ initialization process, press Ctrl/B two times consecutively.

Ctrl/B Ctrl/B

The boot process stops and the DECserver returns the following console prompt:

>>>

2) At the >>> prompt, you can enter H to invoke help.

Entering H provides minimal help text to describe the interactive boot mode commands available. Table 2–4 lists the boot mode commands and summarizes the help text that displays when you invoke H.

Table 2-3: Interactive Boot Mode Commands

This command...	Means...
B	Boot the DECserver software.
B *name*	Boot the DECserver software name.
B *media:name* .	The DECserver looks for the software name from the media (Flash RAM or the network)
B/M	Boot the maintenance software for the DECserver.
B/S	Boot the standard software for the DECserver.
B/U	Boot specified update image.
H	Provide help.
I	Initialize the DECserver.
R	Reset to the factory settings and initialize the DECserver.

You have several options when you use the B command.

- B — This command, without an argument, starts a new boot sequence to load the DECserver with an executable image using the default boot parameters.
- B *name* — This command and the argument *name* specifies a nonstandard boot image. The DECserver looks for the software *name*; first from Flash RAM, then from the network.
  - — B MNENG4 — This command instructs the DECserver to look for the MNENG4 software image first in Flash RAM, then from the network.
  - — b /tftp/serversw — This command instructs the DECserver to look for image /TFTP/SERVERSW; first in Flash RAM, then from the network. If you want lowercase letters, you have to use quotation marks. For example:

    b “/tftp/serversw”
  - — B “” — This command and the quotation marks (explicit null name) instruct the DECserver to search for any image in Flash RAM. If the DECserver is unable to find an image in Flash RAM, then it loads from the network. The network load host defines this software and is typically based on the Ethernet MAC address of the DECserver.

- B *media:name* — The media name specifies which boot media to use.
  - — FLA: — Use Flash RAM. For example:

    B FLA:MNENG4

  - — ETH: — Use the network to find a load host. For example:

    B ETH:MNENG4

  - — FLA:ETH: — Use Flash RAM first, and if that does not work, then use the network to find a load host. For example:

    B FLA:ETH:MNENG4

- B/M — This command boots the maintenance mode software for the DECserver. The network load host defines this software and is typically based on the Ethernet MAC address of the DECserver.
- B/S — This command boots the standard system software for the DECserver. The network load host defines this software and is typically based on the Ethernet MAC address of the DECserver.
- B/U — This command boots the specified update image and initiates a flash rom update. This command may be used to update either firmware or software that resides in the onboard flash. When using the B/U command the image name must be specified. You can boot update images from the network using either MOP or TFTP.
- H — This command displays the help text that describes the interactive boot mode commands.
- I— This command initializes the DECserver using the default boot parameters. All normal self-tests are performed.
- R — This command resets the factory-settings and initializes the DECserver. This command requires verification. Enter YES if you want to reset the DECserver to factory settings.

The S command is available if you desire to direct a load from a specific TFTP load host. Use this command to set up the desired characteristics before initiating and boot command.

S address Set various IP addresses for directed TFTP image loading-- the address specification is of the form aa=nnn.nnn.nnn.nnn where "aa=" is one of:

IP= the IP address of the DECserver,
GW= the IP address of the default gateway,
TFTP= the IP address of the TFTP load server.

example

>>> S IP = address

Verifying the Operation of the DECserver 90M+ Ports

To verify the operation of each port, perform the following steps:

1) Connect a terminal to the port you want to test.

2) Press the Return key two or three times to set the operating speed (autobaud) of the port.

3) Type a character on the terminal and observe each Port Activity LED for a reaction. The Port Activity LED should turn on, indicating that the corresponding port is in use. Additional characters should then cause the LED to blink.

On-Board Flash Memory

The DECserver 90M+ uses non-volatile flash memory to store the following:

- Configuration data

Non-volatile configuration settings for DECserver 90M+ hardware and software.

- Firmware (bootrom)

The firmware abstracts the hardware from the software layer and provides boot capability as well as many other low-level functions

- Software (Flash bootable copy)

The DECserver Network Access Software stored in flash to enable local booting. This is the operational sofware running in the DECserver once it has completed booting.

Reset to Factory Defaults

To reset the DECserver 90M+ to its factory-default settings, press the Reset switch and cycle the power. Keeping the Reset switch depressed until the Network OK and System OK LEDs flash rapidly. This indicates that the DECserver 90M+ has been reset to the factory settings

Factory settings may also be achieved using the Interactive Boot Mode "R" command. See section, "Using Console Commands to Boot", for more information.

Upgrading Firmware

The firmware in the DECserver 90M+ is upgradeable and from time to time Digital Networks may make new versions available. Check the Digital Networks website and your DECserver Network Access Software release notes to determine if you need an update.

Procedures for determining your current DECserver 90M+ firmware version and upgrading to new firmware are outlined in the following tables.

Procedure to determine the DECserver 90M+ Firmware Version:

Step	Action
1	Attach a terminal to the console port. (Factory Defaults: Port 1, Baud=9600, Parity=None, Databits=8, and StopBits=1) If your configuration settings have changed you console settings may be different.

2	If your DECserver is already booted and running DECserver Network Access Software skip to section B:
	A) Apply power. When self-test completes the following will be displayed on the console:
	`Local>`
	`Local -901- Initializing DECserver 90M+ 00-10-64-8E-A2-3B FW V 1.5 HW 1.0`
	`. . .`
	Proceed to Step 3.
	B.) From the DECserver Network Access Server "Local>" prompt type the following:
	`Local> show server`
	`Network Access SW V2.6 BL53 for DS90M+ ROM 1.5 Uptime: 0 00:02:42`
	`...`

3	In both of the previous examples the firmware version was shown to be V1.5.

Procedure for Upgrading your DECserver 90M+ Firmware:

Step	Action
1	Make a Bootp/TFTP, TFTP, or MOP load host available on the same lan segment as the DECserver 90M+.
2	Obtain firmware update image and place in the load area. Make sure to use the appropriate filename (ie MNBOOT.SYS for MOP Server or MNBOOT for TFTP). If you are using a BOOTP/TFTP server, such as Access Server Loader, be sure to configure it properly with the DECServer 90M+ MAC address, IP-Address, IP-Mask, Device Name and the firmware update file name.
3	Connect to console terminal of DECserver. (Factory Default: Port 1, Baud=9600, Parity=None, Databits=8, and StopBits=1) If your configuration settings have changed you console settings may be different.)
4	Apply power to the DECserver 90M+.
5	During the boot sequence of the DECserver 90M+ initialization process, press Ctrl/B two times consecutively.

Step	Action

6	If you are using a BOOTP/TFTP or MOP to load your file at the ">>>" prompt type:
	>>> **b/u filename**
	
	If you are using a TFTP server as your load host, you must provide TFTP load information using the S command. This procedure is outlined below:
	
	Specify the IP address for the 90M+ to use:
	>>> **s ip=###.###.###.###**
	Specify the IP address of the TFTP Server:
	>>> **s tftp=###.###.###.###**
	Specify your IP Gateway:
	>>> **s gw=###.###.###.###**
	Now boot the firmware update image:
	>>> **b/u filename**

7	Wait for the module to reset or reset manually after bootrom update success message is displayed.

Upgrading Software

For information on upgrading your DECserver Network Access software please refer to Network Access Server Install Guide.

Chapter 3

Troubleshooting

Overview

Introduction

This chapter provides troubleshooting information for the DECserver 90M+. This chapter also provides problem and solution information tables to help you isolate hardware, software, or network problems.

Before servicing the DECserver 90M+, you should:

1. Verify that you have properly installed the DECserver 90M+.

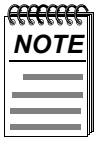
2. Note the fault condition.

3. Isolate the problem.

In This Chapter

Operating Problems

When troubleshooting self-test or boot problems, connect a terminal to the console port on the DECserver 90M+ to view error messages. Port 1 is the default console port.



For descriptions of error messages and tips on trouble-shooting DECserver 90M+ problems, refer to the Network Access Server Problem Solving Guide.

Table 3–1 lists some possible hardware, software, or network problems and suggested solutions.

Table 3-1: DECserver 90M+ Troubleshooting

Problems	Possible Causes	Action
The self-test fails, and the network LED does not go on.	The network LED port or 10BASE-T connector is not connected to a properly terminated network.	Terminate the network correctly.
	A fatal hardware error occurred	Replace the DECserver 90M+.
The port activity LEDs do not respond when characters are typed on the console keyboard.	Interface cable may be disconnected or faulty	Secure or replace the cable.
The port does not respond to the console terminal.	The port may be faulty.	Refer to the *Network Access Server Problem Solving* Guide.
	Port and terminal parameters may be set incorrectly.	Refer to the *Network Access Server Problem Solving* Guide.
The DECserver 90M+ power LED does not go on.	The power cord is disconnected from the outlet.	Connect the power cord.
	The DECserver 90M+ is not receiving +5VDC.	Check power supply connection.
	Reseat the power supply, backplane installation only.	Replace the power supply.
	The LED is bad.	Replace the DECserver 90M+.
The network LED is not on.	The network is down.	Determine the network status.
	Check network connectivity.	Run MOP loopback or MOP console carrier session tests.

Continue...

Operating Problems

Problems	Possible Causes	Action
	The Ethernet connection may be disconnected	Reconnect the Ethernet cable.
	The communication port may not be terminated.	Terminate the T-connector on the communications port.
	The 50 ohm terminator(s) to the T-connector may have disonnected.	Reconnect the terminator(s).
There is no response at the Local prompt.	Terminal connection to the console port may be broken.	Secure the console terminal cable to the console port.
The DECserver 90M+ cannot connect to a service on the LAT network.	The service is not available.	Refer to the *Network Access Server Problem Solving* Guide.
	LAT software is not installed on the host system.	Refer to the *Network Access Server Problem Solving* Guide.
	The host name is not in the local database.	Refer to the *Network Access Server Problem Solving* Guide.
	Group Codes are not enabled.	Refer to the *Network Access Server Problem Solving* Guide.
	The host is not on a local area network.	Refer to the *Network Access Server Problem Solving* Guide.
The DECserver 90M+ cannot connect to a host on the network through Telnet.	Internet and Telnet parameters are not set or are set incorrectly.	Refer to the *Network Access Server Problem Solving* Guide.
Printer does not print or prints incorrectly.	Printer port and baud rate do not match.	Reset printer and port baud rates to match.
The printer port LED does not go on.	The printer is disconnected.	Connect the printer.
The printer is not acknowledged by the printer port.	The port may be set incorrectly.	Refer to the *Network Access Server Problem Solving* Guide.

Continue...

Problems	Possible Causes	Action
	Check printer port access.	Refer to the *Network Access Server Problem Solving* Guide.
	Flow control is not set.	Refer to the *Network Access Server Problem Solving* Guide.
The power LED is on , the self-test OK LED is on, and the network LED is blinking.	The DECserver 90M+ cannot find the load image.	Ensure LOADING is enabled on the host. Reinstall the software to replace the load image.
The port activity LED does not blink when port traffic is present.	Port characteristics may be set incorrectly.	Verify settings using the SHOW PORT *n* command.

Appendix A

Specifications

Overview

Introduction

This appendix lists the specifications for the DECserver 90M+.

In This Chapter

Physical Specifications

Table A–1 lists the physical specifications for the DECserver 90M+.

Table A-1: Physical Specifications

Dimension	Value
Height	3.18 cm (1.25 in)
Width	27.31 cm (10.75 in
Depth	12.70 cm (5.0 in)
Weight	0.77 kg (1.7lb)

Environmental Specifications

The DECserver 90M+ is designed to operate in an office environment or in equipment room environments, such as telephone closets or satellite equipment rooms. The operating and shipping environments are described in Tables A–2 and A–3.

Table A-2: Operating Environment

Dimension	Value
Temperature	5 C to 50 C (41 F to 122 F)
Maximum rate of change	20 C/hr (36 F/hr) change
Relative humidity	10 % to 95 % (noncondensing)
Wet-bulb temperature	32 C (90 F) maximum
Dew point	2 C (36 F) minimum
Altitude	Sea level to 2.4 km (8000 ft)
Air flow	Convectively cooled. A minimum of 10 cm (4 in) of space must be provided on both ends of the unit for adequate air flow.

Table A-3: Shipping Environment

Item	Value
Temperature	–40 C to 66 C (–40 F to 151F)
Relative humidity	10 % to 95 % (noncondensing)
Altitude	Sea level to 4.9 km (16000 ft)

Power Specifications

Table A–4 lists the DECserver 90M+ power supply specifications and Table A–5 lists the DECserver 90M+ power specifications.

Table A-4: Power Supply

Item	Value
Voltage (North American)	104 Vac to 128 Vac (nominal 120 Vac)
Voltage (International)	208 Vac to 256 Vac (nominal 240 Vac)
Current at 120 V	0.25 amps
Current at 240 V	0.125 amps
Frequency	50 Hz to 60 Hz
Power consumption	16 W
Output voltage	5.1 Vdc
Output current	1.8 A

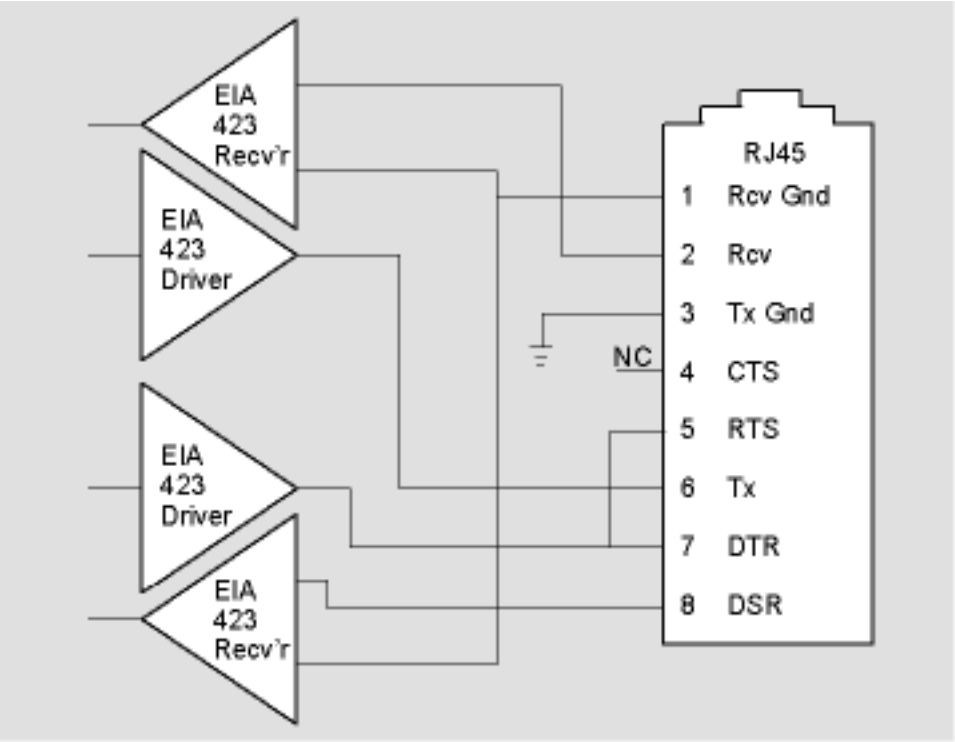
Table A-5: Decserver 90M+ Power Specifications

Item	Value
Input voltage	4.75 to 5.25 Vdc
Input current	1.2 A

DECserver 90M+ Connector Pin Out

Pin out for the DECserver 90M+ was designed for compatibility with Open DECconnect. Figure A–1 shows the circuit connections for each port.

Figure A-1: Port Circuit



Cable Connector Pin Out

This section provides wiring diagrams for the serial communication cable connectors listed in Table A–6.

Table A-6: Cable Connectors

Item	Value
BN25G or BN25E	8MP-to-8MP (modular plug) equipment cable
BN24H	8MP-to-6MMP (modified modular plug) office cable

The BN25x is a twisted-pair (four twisted pairs) cable with standard 8-pin modular plugs. Figure A–2 shows the wiring configuration for the BN25G & BN25E cable. This is the standard cable used to connect an asynchronous port on the DECserver 90M+ to an Open DECconnect wall plate. Note the BN25G is Cat 5 & BN25E is CAT 5e.

Figure A-2: BN25G & BN25E Equipment Cabling Wiring Diagram

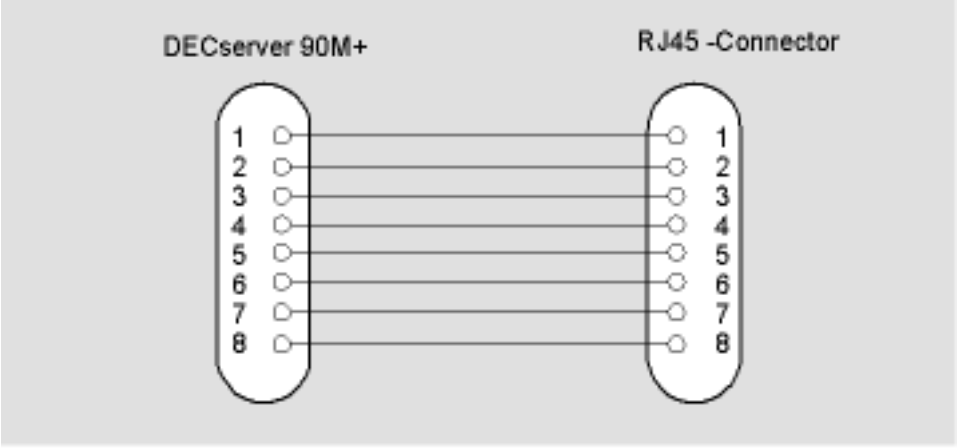


Table A-7 defines the wiring configuration for the BN25G cable.

Table A-7: BN25G Cable Wiring Configurations.

DECserver 90M+ 8-pin Modular Plug		RJ45 8-pin Modular Plug	
Pin	**Signal**	**Pin**	**Signal**
1	RXD GND	1	RXD GND
2	RXD	2	RXD
3	TXD GND	3	TXD GND
4	Not used	4	Not used
5	Not used	5	Not used
6	TXD	6	TXD
7	DTR	7	DTR
8	DSR	8	DSR

The BN24H is a twisted-pair (three twisted pairs) cable with a standard 8-pin modular plug on one end and a 6-pin modified modular plug on the other end. Use this cable to connect the DECserver 90M+ to an MMJ connector on an asynchronous device. You also use the BN24H when connecting an asynchronous device to a DECconnect wall plate.

Use an H8584-AA adapter when connecting the DECserver 90M+ to existing MMJ wiring. The adapter uses a standard 8-pin modular plug on one side and a 6-pin modified plug on the other end.

Figure A-3 shows the wiring configuration for the BN24H cable and H8584-AA adapter.

Figure A-3: BN24H Office Cable Wiring Diagram

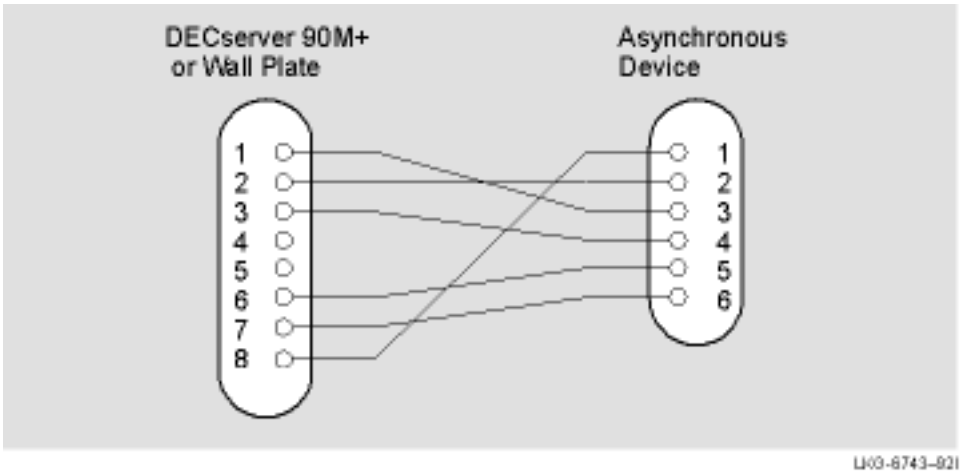


Table A-8 defines the wiring configuration for the BN24H cable.

Table A-8: Wiring Configuration for the BN24H cable

DECserver 90M+ or Wall Plate 8-pin Modular Plug		Asynchronous Device 6-pin Modular Plug	
Pin	**Signal**	**Pin**	**Signal**
1	RXD GND	3	TXD GND
2	RXD	2	TXD
3	TXD GND	4	RXD GND
4	Not used		
5	Not used		
6	TXD	5	RXD
7	DTR	6	DSR
8	DSR	1	DTR