

DECagent 90

User Information

Order Number: EK-DENMA-UI. A01

Revision/Update Information: This is a new manual.

First Edition, December 1992

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation. Digital Equipment Corporation assumes no responsibility for any errors that may appear in this document.

© Digital Equipment Corporation 1992.

All Rights Reserved.
Printed in U.S.A.

FCC NOTICE: The equipment described in this manual generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such radio frequency interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user at his own expense may be required to take measures to correct the interference.

The following are trademarks of Digital Equipment Corporation: DEC, DECbridge, DECconnect, DECmcc, DECnet, DECserver, Digital, LAT, ThinWire, VMS, VAX, and the DIGITAL logo.

Motorola is a registered trademark of Motorola, Inc.

All other trademarks and registered trademarks are the property of their respective holders.

This document was prepared using VAX DOCUMENT, Version 2.1.

Contents

About this Manual	vii
1 Overview	
Introduction	1-1
Features	1-1
Description	1-1
How the DECagent 90 Works	1-2
Power Supply	1-3
LEDs and Connectors	1-4
Client Communities for the DECagent 90	1-6
2 Installation	
Introduction	2-1
Quick Reference Installation Procedures	2-1
For a Standalone Installation	2-1
For a Backplane Installation	2-3
Standalone Installation	2-5
Select a location.	2-5
Place the DECagent 90 on a table.....	2-5
Mount the DECagent 90 on a wall.	2-5
Connect the cables.	2-7
Backplane Installation	2-8
Remove the back cover.	2-8
Mount the DECagent 90 in the backplane.	2-8
Power-Up and Reset	2-9

3 Configuration

Introduction	3-1
Configuration Rules	3-1
Segment Length	3-1
Firmware Version	3-1
Setting a Password	3-1
Setting the IP Address	3-2
Using the Front Panel Asynchronous Port	3-2
Modifying the Bootp Table	3-2
Terminal Setup	3-3

4 DECagent 90 Management

Introduction	4-1
Console Management	4-1
Using the Console Interface	4-1
Console Main Menu	4-1
Show Community	4-2
Add Community	4-4
Remove Community	4-5
Add Community Trap Addresses	4-6
Remove Community Trap Addresses	4-6
Change Community String	4-7
Change Community Size/Type	4-8
Change Default Community	4-8
Set Agent IP Address	4-9
Enable/Disable SNMP Sets	4-9
Change System Information	4-9
Change Security Configuration	4-10
Show Module	4-12
Add Module	4-13
Remove Module	4-15
Move Module	4-16
Change Module MAC Address	4-16
Connect	4-17
Loop	4-18
Show Counters	4-18
Restore Factory Settings	4-20
Reset the Agent	4-20
Exit	4-21
Upgrading the DECagent 90	4-21

Loading from a VAX Host	4-21
VAX Host Node Setup	4-21
Downline Loading the Firmware File.....	4-22
Loading from an ULTRIX Host	4-24
ULTRIX Host Node Setup	4-24
Downline Loading the Firmware File.....	4-25
Trap-PDU.....	4-26

5 Troubleshooting

Introduction	5-1
DECagent 90 Standalone Troubleshooting	5-2
DECagent 90 Backplane Configuration Troubleshooting	5-3

A Specifications and Parts

Introduction	A-1
Physical Dimensions	A-1
Environmental Specifications	A-2
Operating Environment	A-2
Shipping Environment	A-2
Electrical Specifications	A-3
Power Supply	A-3
Input Voltage	A-3
Console Connector Pin Out (RS-232/DB25)	A-4
Replacement Parts	A-4

B Console Messages

Introduction	B-1
Informational Messages	B-1
Error Messages	B-5

C MIB Groups and Communities

Introduction	C-1
MIB Groups	C-1
MIB II	C-2
Bridge Group	C-2
RS-232-Like MIB Group	C-4
Character Group	C-5
Slot Table	C-6
Communities	C-9

D Documentation and Ordering Information

Introduction	D-1
Related Documentation	D-1
Ordering Information	D-2

Index

Figures

1-1	Sample DECagent 90 Configuration	1-2
1-2	How the DECagent 90 Communicates with Modules	1-3
1-3	The DECagent 90 Module	1-4
2-1	Connecting the Cables	2-2
2-2	Backplane Installation	2-4
2-3	Removing the Back Cover	2-6
2-4	Mounting the DECagent 90 on a Wall	2-7
2-5	DECagent 90 Backplane Installation	2-9
4-1	Show Community Screen	4-4
4-2	Show Module Screen	4-13

Tables

1-1	DECagent 90 LEDs and Connectors	1-5
3-1	Terminal Setup Parameters	3-3
5-1	Troubleshooting a DECagent 90 Standalone Unit	5-2
5-2	Troubleshooting a DECagent 90 in a DEChub 90 Backplane	5-3

About this Manual

Introduction

This manual describes how to install, configure, operate, and troubleshoot the DECagent 90 module. The DECagent 90 is an Ethernet network management agent that can be used in a standalone operation or in the DEChub 90 Ethernet backplane.

Organization

This manual contains five chapters and four appendices.

- Chapter 1 provides an overview of the DECagent 90, and it describes the product's features, LEDs, and connectors.
- Chapter 2 describes how to install the DECagent 90 as a standalone unit or in a DEChub 90 backplane.
- Chapter 3 describes the configuration rules you should follow for correct operation of the DECagent 90.
- Chapter 4 describes how to operate the DECagent 90 on a network, using the console main menu options.
- Chapter 5 contains basic troubleshooting information.
- Appendix A contains system specifications and a parts list.
- Appendix B describes informational and error messages you might receive at the console.
- Appendix C provides information about management information base (MIB) groups, the slot table, and communities.
- Appendix D contains information about related documentation and ordering.

Conventions

The following conventions are used in this manual.

Convention	Meaning
Note	Contains general information.
Caution	Contains information to prevent damage to equipment or software.
<i>n</i>	A lowercase italic <i>n</i> indicates the generic use of a number. For example, 19 <i>nn</i> indicates a 4-digit number in which the last 2 digits are unknown.
❶	A number in a black circle in text refers to the corresponding number in an accompanying illustration.
<i>italic type</i>	Italic type emphasizes important information, indicates variables, and indicates complete titles of manuals.
commands	Commands are shown in uppercase or lowercase letters. For the VMS operating system, you can enter commands in either uppercase or lowercase letters. For the ULTRIX operating system, commands must be entered as indicated in the examples.
monospaced type	Text that the system displays on the screen is shown in monospaced type.
bold monospaced type	Bold monospaced type in examples indicates user input.
Return or Enter	The Return and Enter keys perform the same function.
Return	A key name enclosed in a box indicates that you press that key. In this example, you would press the Return key.
Ctrl/ <i>x</i>	Ctrl/ <i>x</i> indicates that you hold down the Ctrl key while you press another key (indicated here by <i>x</i>).

1

Overview

Introduction

This chapter provides an overview of the DECagent 90 module. It also lists the features of the DECagent 90, describes the LEDs and connectors, and provides information about community strings.

Features

The following list summarizes the features of the DECagent 90. The DECagent 90

- Can be installed as a standalone module *or* in a DEChub 90 backplane
- Needs no downline load at power-up
- Is downline loadable for firmware upgrades (MOP protocol)
- Can be directly managed through SNMP
- Stores MIB settings in battery-backed RAM
- Provides out-of-band console port
- Allows hot swap of modules

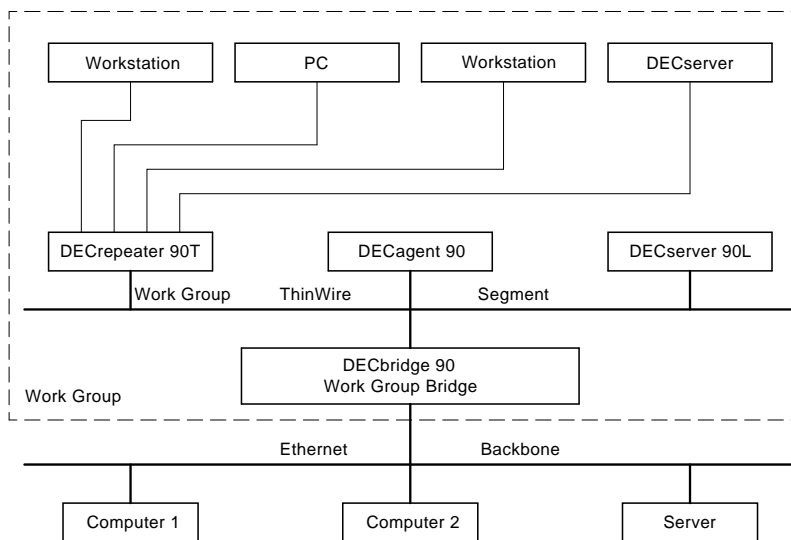
Description

The DECagent 90 is a network management agent designed for the IEEE 802.3 CSMA/CD networks. The DECagent 90 uses a Simple Network Management Protocol (SNMP) agent. The DECagent 90 has one ThinWire port and one asynchronous RS-232 port. The ThinWire port complies with the IEEE 802.3 standard for 10Base2 networks.

The DECagent 90 is a self-contained module that uses a Motorola 68000 central processing unit (CPU). The DECagent 90 can operate in a standalone configuration with a dual 5- and 12-volt power supply, or in a DEChub 90 Ethernet backplane.

Figure 1–1 shows a typical configuration of the DECagent 90 in an Ethernet local area network (LAN).

Figure 1–1 Sample DECagent 90 Configuration



LJ-01458-T10

How the DECagent 90 Works

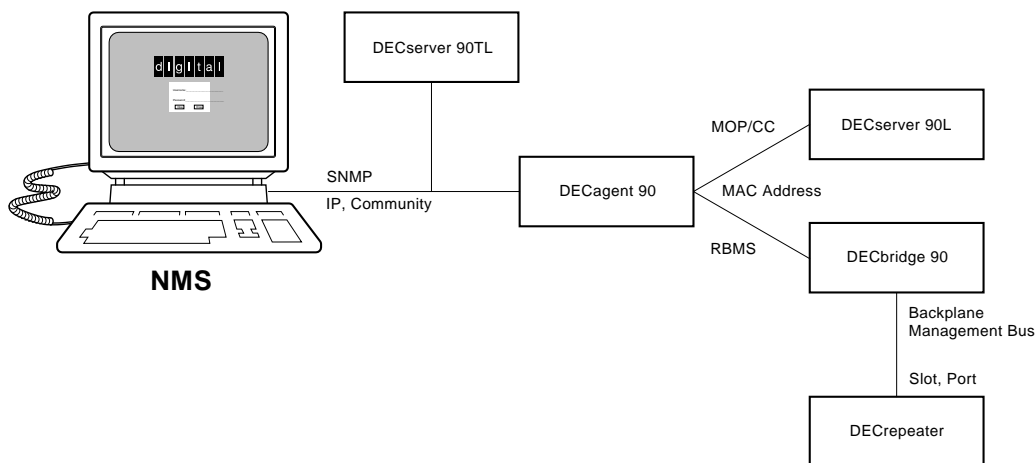
The DECagent 90 acts as a proxy agent on behalf of its client modules. This includes the DECserver 90L and the DECbridge 90. The DECrepeater 90C and DECrepeater 90T are managed by a DECbridge 90 in the hub. The DECagent 90 accepts SNMP messages on behalf of its client modules, sends an appropriate command to the queried client module, and waits for a response from the client module. When it receives a response from the client module, the DECagent 90 sends an SNMP packet to the querying Network Operations Center (NOC).

The DECagent 90 has a single IP address. It implements the protocols required for SNMP-based proxy access. The following protocols are used:

- ARP
- IP
- UDP
- SNMP
- BootP

Figure 1-2 shows how the DECagent 90 communicates with the other modules.

Figure 1-2 How the DECagent 90 Communicates with Modules



LJ-01882-T10

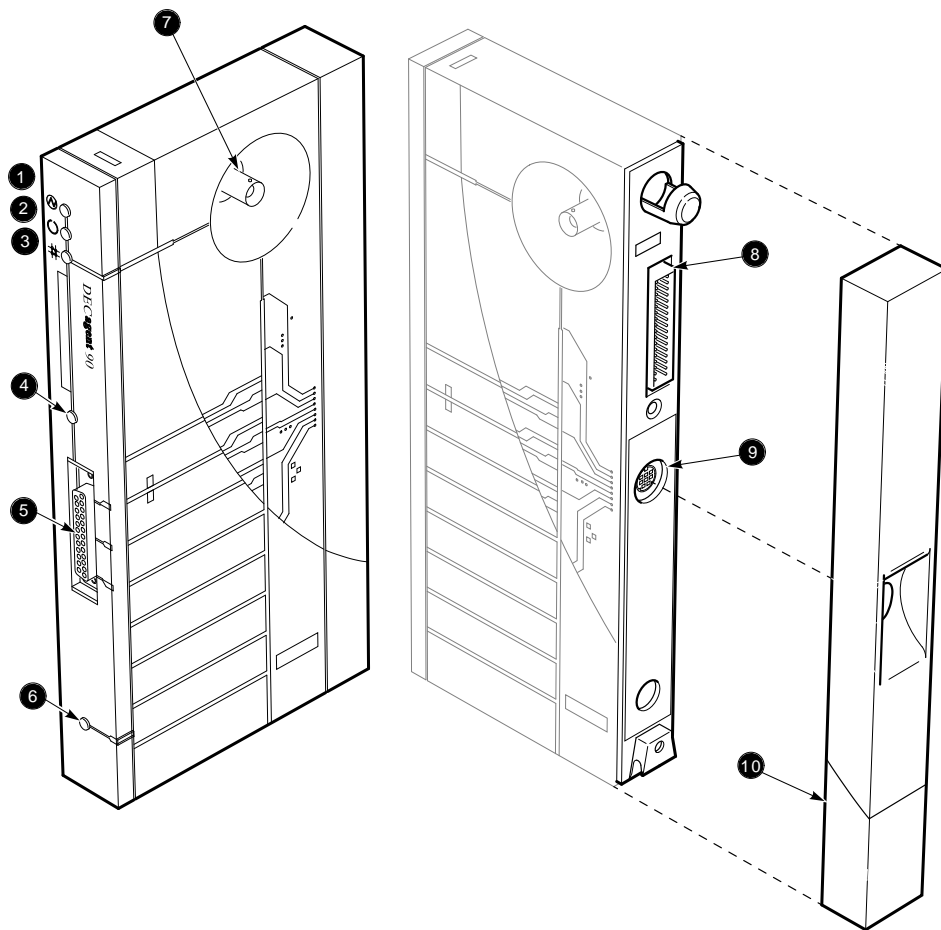
Power Supply

When operating as a standalone agent, power is supplied to the DECagent 90 with a separate power supply. This power supply is connected to the agent by a cable with a 7-pin connector. The auto-ranging power supply is modular and accommodates either a North American 120-volt or an international 240-volt wall outlet.

LEDs and Connectors





Figure 1–3 shows the DECagent 90 and Table 1–1 describes the DECagent 90 LEDs and connectors.

Figure 1–3 The DECagent 90 Module



LJ-01459-T10

Table 1–1 DECagent 90 LEDs and Connectors

①		<p>DC OK—Monitors the voltage. On: The +12.0 Vdc voltage is normal. Off: The voltage is abnormal (as when a power failure occurs).</p>
②		<p>Self-test OK indicator—Indicates self-test has passed. On: Self-test completed successfully. Off: Self-test is not complete or has failed.</p>
③		<p>Backbone port OK indicator—Monitors the network port. On: The network port is properly terminated. Off: The network port is not properly terminated. Flashing: Flashing at a 1-second interval with the asynchronous serial port status LED indicates that an IP address has not been set.</p>
④		<p>Asynchronous serial port (RS-232) status LED—Monitors network activity. This LED will also flicker with auto-baud. On: Port is operational (DSR active). Flicker: Port or network has activity. Off: Port or network is not operational. Flashing: Flashing at a 1-second interval with the backbone port OK indicator, indicates that an IP address has not been set.</p>
⑤		<p>Asynchronous serial port (RS-232) connector— Provides an interface to the DECagent 90 through a terminal or terminal emulation program.</p>
⑥		<p>Reset switch—Resets the agent back to factory settings. Nullifies the password for the DECagent 90. The agent is accessible without a password until a new password is defined.</p>
⑦		<p>Port 0 network connector (BNC)— Connects the agent to the ThinWire segment. Not used when the agent is installed in the DEChub 90 backplane.</p>
⑧		<p>Backplane connector—This provides network and power connections to the DECagent 90 when it is installed in the DEChub 90 backplane.</p>
⑨		<p>Power connector—Receives +5.0 and +12.0 volts from the DECagent 90 power supply. Not used when the agent is installed in the DEChub 90 backplane.</p>
⑩		<p>Back cover—Used with standalone units only. It covers the backplane connector and mounting assembly.</p>

Client Communities for the DECagent 90

Each client community for a DECagent 90 is identified by a unique community address string for each standalone or hub module.

Naming Community Strings

The easiest way to keep track of the modules with community address strings, is to use a similar name for the hub and community address string.

The community string name can be up to 32 characters long. There are two community strings per community, a read-only string and a read/write string. A community string consists of any printable characters and are case sensitive. Here are two examples of naming schemes:

MyHUBFloor3Room27

COMM_LAB_HUB_3

For more information about communities, refer to Appendix C.

2

Installation

Introduction

This chapter describes how to install the DECagent 90 as a standalone unit or in a DEChub 90 backplane.

The chapter provides quick reference sections which provide brief descriptions of the installation procedures. The chapter also includes detailed installation procedures.

Quick Reference Installation Procedures

This section provides an overview of the standalone and backplane installation procedures. See the Standalone Installation and Backplane Installation sections for detailed procedures.

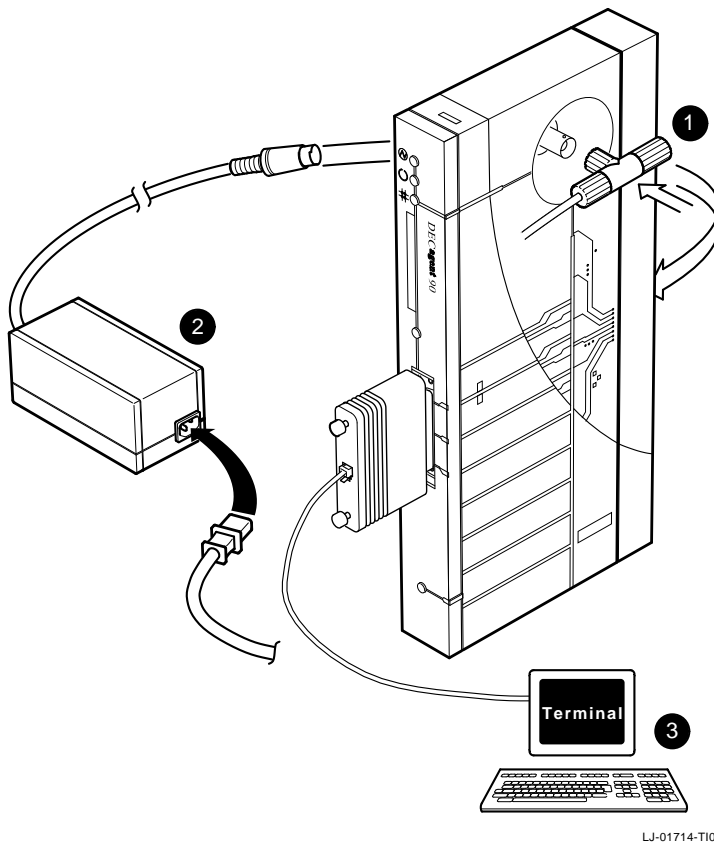
For a Standalone Installation

To install and enable the DECagent 90 as a standalone unit, you need to

1. Select a location.
2. Place the DECagent 90 on a table or mount the DECagent 90 on a wall.

3. Connect the cables (Figure 2-1).
 - a. Connect the Ethernet ThinWire T-connector to the port 0 BNC network connector. ❶
 - b. Connect the cable from the power supply (H7827-AA) to the 7-pin power connector on the DECagent 90. ❷
 - c. Connect a terminal or terminal emulator to the front panel asynchronous port. ❸This connection allows console management.

Figure 2-1 Connecting the Cables



LJ-01714-T10

4. Configure the DECagent 90 (See Chapter 3).
 - a. Set the password.
 - b. Set the IP address.
 - c. Add modules (optional).

For a Backplane Installation

This section provides an overview of the backplane installation procedure. See the Backplane Installation section for detailed instructions.

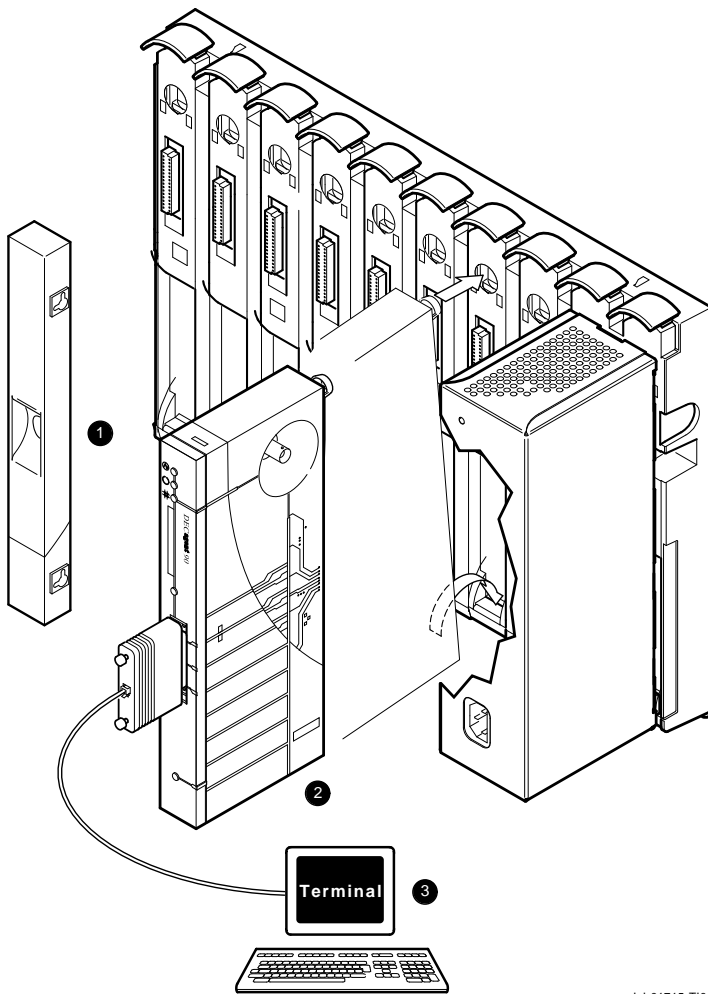
Note

Only one DECagent 90 can be installed in a DEChub 90 backplane.

To install and enable the DECagent 90 in a DEChub 90 backplane (Figure 2–2), you need to

1. Remove the back cover (if there is one). ❶
2. Install the DECagent 90 in the DEChub 90. ❷
Place the lower mounting tab on the back of the DECagent 90, into slot 7 or 8 of the backplane. Rock the DECagent 90 into place.
3. Connect a terminal or terminal emulator to the front panel asynchronous port and press the Return key several times. ❸
The console prompt appears.
4. Configure the DECagent 90 (See Chapter 3).
 - a. Set the password.
 - b. Set the IP address.
 - c. Ensure that the community is greater than 1.
 - d. Add modules (optional).

Figure 2-2 Backplane Installation



LJ-01715-T10

Standalone Installation

This section provides detailed procedures for installing a DECagent 90 as a standalone unit.

Select a location.

The DECagent 90 can be installed on a table top or mounted on a wall.

The location should be within 2 meters (6 feet) of a power outlet that supplies the correct voltage.

Place the DECagent 90 on a table.

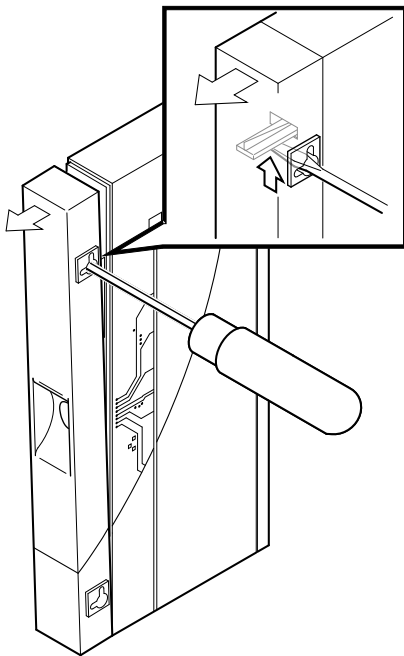
If you place the DECagent 90 on a table top, follow the environmental specifications listed in Appendix A.

Mount the DECagent 90 on a wall.

To mount the DECagent 90 on a wall, use the following procedure:

1. Remove the back cover of the DECagent 90, if there is one (Figure 2-3).
 - a. Insert a small screwdriver into the top mounting hole on the cover.
 - b. Lift up on the latch with the screwdriver, then pull the cover away and down from the top of the unit.

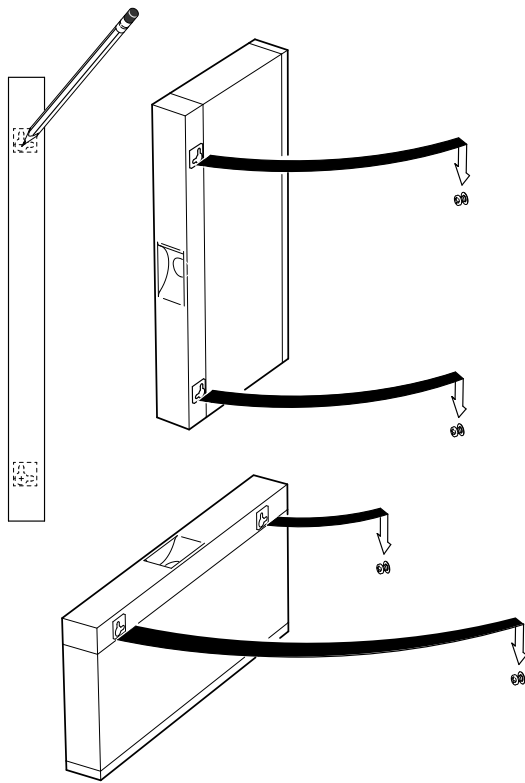
Figure 2-3 Removing the Back Cover



LJ-00320-T10

2. Use the mounting holes on the back cover to determine the placement for the mounting screws on the wall (Figure 2-4).
3. Secure the back cover to the wall using the mounting screws.
The screws should be tight enough to provide resistance if you try to remove the back cover from the wall. Do not make them so tight that the cover is distorted or cannot be removed from the wall.
4. Remove the back cover from the wall.
5. Attach the back cover to the DECagent 90.
6. Mount the DECagent 90 onto the mounting screws.

Figure 2-4 Mounting the DECagent 90 on a Wall



LJ-00701-T10

Connect the cables.

To connect the cables, use the following procedure and refer to Figure 2-1:

1. Connect the cable from the power supply to the 7-pin power connector on the DECagent 90. Align the power symbol on the dc power connector with the power symbol on the DECagent 90 and push the power connector straight in.
2. Connect the power supply cord to the modular power supply, then to the wall outlet.

All the LED indicators should turn on during initial power-up. After approximately 5 seconds, the backbone port OK indicator and the asynchronous serial port (RS-232) status LEDs turn off while the other LEDs stay on.

3. Connect the Ethernet ThinWire T-connector to the port 0 BNC network connector on the side of the module. Terminate the T-connector with a 50-ohm terminator or extend the Ethernet segment to the next device.

The port network activity LED should be on or flashing to indicate the amount of traffic on the network. The LED intensity varies with the amount of network activity.

Backplane Installation

This section provides detailed procedures for installing the DECagent 90 in a DEChub 90 Ethernet backplane.

Note

Only one DECagent 90 can be installed in a DEChub 90 backplane.

Remove the back cover.

Remove the back cover, if there is one (Figure 2-3).

1. Insert a small screwdriver into the top mounting hole located on the cover.
2. Lift up on the latch with the screwdriver, and pull the cover away and down from the top of the unit.

Mount the DECagent 90 in the backplane.

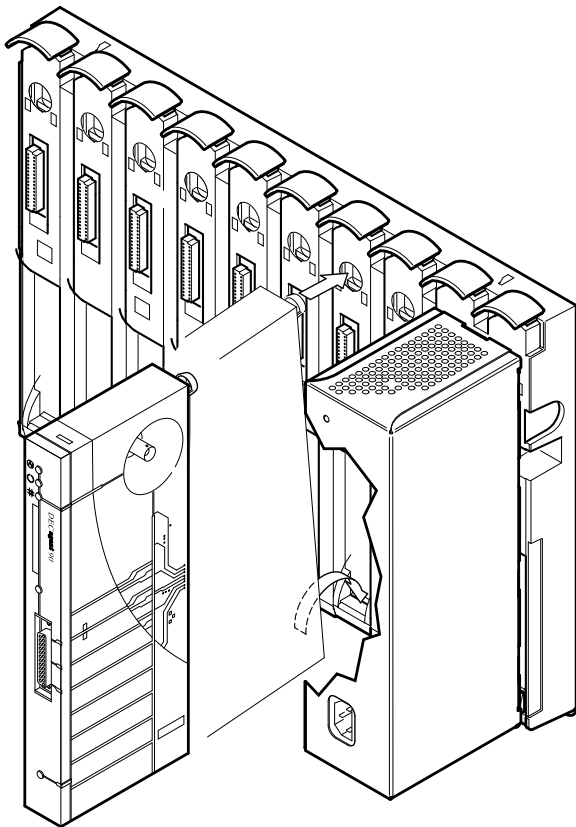
1. Install the DECagent 90 in the backplane (Figure 2-5). Place the lower mounting tab, located on the back of the DECagent 90, into slot 7 or 8 of the backplane.
2. Rock the DECagent 90 into place. You will hear a click when the DECagent 90 is secured in the slot.

Note

The DECagent 90 can be installed into or removed from the DEChub 90 Ethernet backplane while power is supplied to the backplane. (This is referred to as a hot swap.)

All LEDs on the DECagent 90 turn on either immediately or at initial power-up. After approximately 5 seconds, the network LED turns on with intensity that is proportional to the amount of network activity on the port.

Figure 2-5 DECagent 90 Backplane Installation



LJ-01460-T10

Power-Up and Reset

Upon power-up and reset, the DECagent 90 performs self-test out of ROM. The DECagent 90 then enters an operational mode if an IP address has been established. If an IP address has not been established, then the agent will attempt to obtain its IP address using the bootp protocol. Refer to Chapter 3 for more information about setting the IP address.

If a minor error occurs during power-up or reset, then the DECagent 90 enters monitor mode. While in monitor mode, error information and logs can be accessed through the RS-232 console port.

3

Configuration

Introduction

This chapter contains the configuration rules you must follow for correct operation of the DECagent 90. This chapter also contains information about setting a password, setting the IP address, and terminal setup.

Configuration Rules

For a complete list of configuration rules, see the *Open DECconnect Building Wiring Component and Application Catalog*.

DECagent 90 modules comply with both Ethernet and IEEE 802.3 standards. These standards are subject to revision; therefore, network planners should consult the standards frequently for detailed information.

Segment Length

The port 0 ThinWire segment can be as long as 185 meters. A ThinWire segment may have a total of 30 transceivers.

Firmware Version

The DECagent 90 requires that the firmware be Version 2.3 or higher.

Setting a Password

You must set a password at initial power-up and after the password reset button is pressed. The following message appears on the monitor at initial power-up and after reset:

```
The console password has not been set.  
You must enter a console password now.  
  
New password:  
Verify password:
```

A password must be a minimum of 6 characters and a maximum of 16 characters. Passwords are case sensitive.

To set a password, enter the password at the prompts and press the Return key. The password will not be echoed on the screen.

Setting the IP Address

There are two ways to set the IP address:

1. By using the front panel asynchronous port using a terminal or a terminal emulator
2. By modifying the bootp table

Using the Front Panel Asynchronous Port

To set the IP address using the front panel asynchronous port, use the following procedure:

1. Connect a terminal or terminal emulator to the port and press the Return key a few times.
The DECagent 90 will prompt you to set a password; or if a password is already set, a pound sign (#) appears.
2. Enter the password at the pound sign (#) and press the Return key.
The console main menu appears.
3. Choose the Set Agent IP Address option to set the IP address.
For more information about the Set Agent IP Address option, see Chapter 4.

Modifying the Bootp Table

To set the IP address over the network, you must have a bootp server with a bootp daemon running. Use the following procedure to set the IP address:

1. Start the bootp daemon by entering the following command:

```
bootpd &
```

2. Edit the `/etc/bootptab` file.

Add the following line to the `/etc/bootptab` file:

```
<IP Node Name> <Ethernet MAC Address> <IP Address>
```

3. Edit the `/etc/hosts` file.

Add the following line to the `/etc/hosts` file:

```
<IP Address> <Official Host Name> <Alias>
```

4. Power cycle the agent after the edits are complete and the bootpd has been started.

Terminal Setup

Table 3–1 lists the minimum terminal settings that are required to establish a connection to the DECagent 90. Ensure that the following terminal setup parameters are in effect.

Table 3–1 Terminal Setup Parameters

Parameter	Setting
Transmit speed	300 to 9600 baud
Receive speed	Receive=Transmit
Transmit flow control	XON/XOFF
Character format	8 bits, no parity
Stop bits	1
Local echo	Disable

4

DECagent 90 Management

Introduction

This chapter describes the console main menu options that you use to manage the DECagent 90 module. It also describes how to upgrade the DECagent 90.

Console Management

To manage the DECagent 90 at the console, connect a terminal, through the front asynchronous port, to the DECagent 90. At initial power-up or after the password reset button is pressed, you will need to set a password. See Chapter 3 for information about setting passwords.

Using the Console Interface

The following conventions apply when you use the console interface:

- **Return or Enter**— Press the Return or Enter key after you enter information at the console.
- **Defaults**— Default responses appear in angle brackets (<>). Press the Return or Enter key at any prompt, to select the default.
- **Messages**— Informational and error messages, which may appear at the console, are described in Appendix B.

Console Main Menu

The console main menu appears after you enter the password. The main menu contains the following options:

Sets Enabled DEChub 90 SNMP Network Management Agent V1.0
Default Community: public [1] Default Slot: 1
Name: DECagent 90 IP Address: 255.255.255.255 System Uptime: 12 09:31:22

- | | |
|-------------------------------------|--|
| [1] Show Community | [13] Show Module |
| [2] Add Community | [14] Add Module |
| [3] Remove Community | [15] Remove Module |
| [4] Add Community Trap Addresses | [16] Move Module |
| [5] Remove Community Trap Addresses | [17] Change Module MAC Address |
| [6] Change Community String | |
| [7] Change Community Size/Type | [18] Connect |
| [8] Change Default Community | [19] Loop |
| | [20] Show Counters |
| [9] Set Agent IP Address | |
| [10] Enable/Disable SNMP Sets | [21] Restore Factory Settings |
| [11] Change System Information | [22] Reset the Agent |
| [12] Change Security Configuration | [23] Exit (wait 5 sec. before restart) |

Enter your selection:

Note

For security reasons the read/write community string should be changed to something other than the default "public".

To choose a menu option, enter the option number and press the Return key. The following sections describe the console main menu options.

Show Community

Option 1, Show Community, allows you to display community information on the screen. When you choose the Show Community option, detailed community information appears:

```
Sets Enabled      DEChub 90 SNMP Network Management Agent      V1.0
Default Community: public [1]                                Default Slot: 1
Name: DECagent 90 IP Address: 255.255.255.255 System Uptime: 12 09:32:25
Show Community
```

Type: Extended DEChub 90

```
Read-Only Community String: public
Read-Write Community String: public
Trap Community String:      public
```

```
System Name:      Work Group Hub
System Location:  Network Interconnect Room
System Contact:   John Doe
```

```
Total Slots:  16      Agent Slot:  7      Trap Count:    8
Total Ports:  24      Bridge Slot:  8      Interface Number: 10
```

```
Traps: 1.1.1.1      2.2.2.2      3.3.3.3      4.4.4.4
       5.5.5.5      6.6.6.6      7.7.7.7      8.8.8.8
```

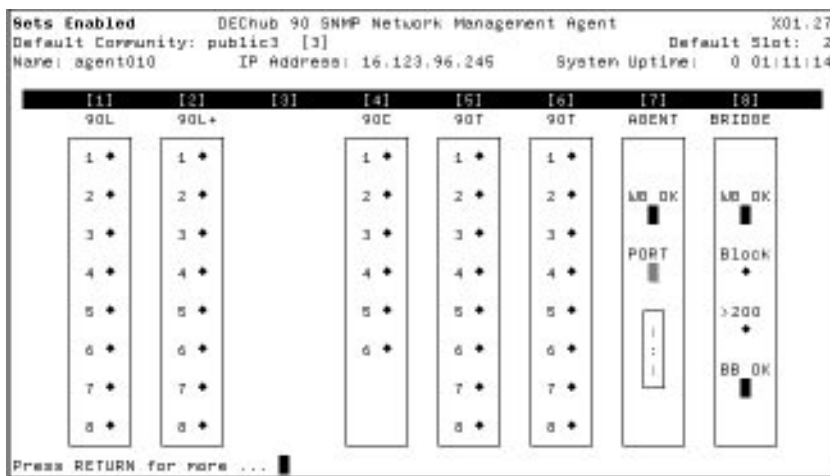
Press RETURN for more...

Press the Return key to display the second Show Community screen. The second screen contains a graphic display. For a standalone module, slot 1 appears. For a hub or extended hub, slots 1 through 8 appear. Each module is displayed in its slot in the hub.

If the community is an extended hub, then press the Return key to display a third screen. This screen contains a graphic display of slots 9 through 16.

Figure 4-1 shows a typical Show Community screen for a hub configuration.

Figure 4-1 Show Community Screen



Note

When a module is first added, it is highlighted on the screen. When the module replies to the poller, the highlighting is removed. If the module does not respond to the poller, the highlighting flashes.

After all the information is displayed, the following prompt appears:

Press RETURN to continue:

Press the Return key to return to the main menu.

Add Community

Option 2, Add Community, allows you to add a community to the agent's database. When you choose the Add Community option, the following appears:

```
Sets Enabled      DEChub 90 SNMP Network Management Agent      V1.0
Default Community: public [1]                    Default Slot: 1
Name: DECagent 90  IP Address: 255.255.255.255  System Uptime: 12 09:32:45
```

Add Community

Enter the read-only community string:
Enter the read-write community string:

- [1] Standalone
- [2] 8-slot Hub
- [3] 16-slot Hub

Enter the community type <2>:

Enter the appropriate information at the prompts and press the Return key.

Note

Each pair of community strings that you enter must be unique within the agent.

The community strings are case sensitive.

After the community strings are entered and you choose a community type, you will receive the same prompts as in the Add Module option. See the Add Module section for more information.

After each module is entered, the following prompt appears:

Add another module? <YES>

Remove Community

Option 3, Remove Community, allows you to remove a community from the agent's database. When you choose the Remove Community option, the following appears:

```
Sets Enabled      DEChub 90 SNMP Network Management Agent      V1.0
Default Community: public [1]                          Default Slot: 1
Name: DECagent 90  IP Address: 255.255.255.255  System Uptime: 12 09:42:45
```

Remove Community

Index	Community Type	Community Strings
[1]	Standalone DECagent 90	Read Only: Public Read Write: Public
[2]	Extended DEChub 90	Read Only: Public2 Read Write: Public2

Enter the community index <2>:

After you enter the community index, the following prompt appears:

Community [n] will be removed.

Are you sure?

Where *n* is the community index of the community you want to remove. Enter either Yes (Y) or No (N).

If you enter Yes, then the community will be removed. If you enter No, then the community will not be removed.

After you enter Yes or No, you will be asked if you want to remove another community.

Note

You cannot remove the community in which the DECagent 90 resides.

Add Community Trap Addresses

Option 4, Add Community Trap Addresses, allows you to add trap addresses to the community trap address table. The maximum number of entries is eight. When you choose the Add Community Trap Addresses option, the following appears:

```
Sets Enabled          DEChub 90 SNMP Network Management Agent          V1.0
Default Community: public [1]                               Default Slot: 1
Name: DECagent 90 IP Address: 255.255.255.255 System Uptime: 12 09:42:45
```

Add Community Trap Addresses:

There are no trap address set for this community.

You may enter up to 8 more trap addresses for this community.

Add trap address:

Enter the trap address using the following format:

aaa.bbb.ccc.ddd

A valid value in each field is 0 to 255 decimal.

Remove Community Trap Addresses

Option 5, Remove Community Trap Addresses, allows you to remove trap addresses from the community trap address table. When you choose this option, the following prompt appears:

Enter the trap address:

Enter the trap address using the following format:

aaa.bbb.ccc.ddd

A valid value in each field is 0 to 255 decimal.

Change Community String

Option 6, Change Community String, allows you to change the read-only and read/write community strings. When you choose this option, the following appears:

```
Sets Enabled          DEChub 90 SNMP Network Management Agent          V1.0
Default Community: public [1]                                     Default Slot: 1
Name: DECagent 90 IP Address: 255.255.255.255 System Uptime: 12 10:42:45
```

Change Community String

```
* * * * * * * * * * NOTICE * * * * * * * * * *
```

```
Pressing only the RETURN key at the prompt for the new community
string will result in that community string being set to null,
effectively disabling access via that community string.
You will not be allowed to set both community strings to null.
```

```
[1] Read-Only Community String
[2] Read-Write Community String
[3] Trap Community String
```

Enter your selection:

The following table describes the results of each selection.

If you enter ...	Then the following prompt appears ...
1	Enter the read-only community string:
2	Enter the read-write community string:
3	Enter the trap community string:

The maximum community string length is 32 characters.

Note

You may change one of the community strings to null (effectively disabling access through that community string) by pressing the Return key in response to the prompt. You cannot set both community strings to null.

Change Community Size/Type

Option 7, Change Community Size/Type, allows you to expand or shrink the size (number of slots) of an existing community. When you choose this option, the following appears:

```
Sets Enabled      DEChub 90 SNMP Network Management Agent      V1.0
Default Community: public [1]                          Default Slot: 1
Name: DECagent 90 IP Address: 255.255.255.255 System Uptime: 12 15:42:45
```

Change Community Size/Type

Index	Community Type	Community Strings
[1]	Standalone DECagent 90	Read Only: Public Read Write: Public
[2]	Extended DEChub 90	Read Only: Public2 Read Write: Public2

Enter the community index <2>:

After you select an index, the following prompt appears:

```
[1] Standalone
[2] 8-slot Hub
[3] 16-slot Hub
```

Enter the community type:

Change Default Community

Option 8, Change Default Community, allows you to change the current default community. Several main menu selections operate by default. The default community is the community that is currently active. When you choose the Change Default Community option, the following appears:

```
Sets Enabled      DEChub 90 SNMP Network Management Agent      V1.0
Default Community: public [1]                          Default Slot: 1
Name: DECagent 90 IP Address: 255.255.255.255 System Uptime: 12 16:49:45
```

Change Community Size/Type

Index	Community Type	Community Strings
[1]	Standalone DECagent 90	Read Only: Public Read Write: Public
[2]	Extended DEChub 90	Read Only: Public2 Read Write: Public2

Enter the community index <2>:

Set Agent IP Address

Option 9, Set Agent IP Address, allows you to set the IP address for the DECagent 90. When you choose this option, the following appears:

```
Sets Enabled          DEChub 90 SNMP Network Management Agent          V1.0
Default Community: public [1]                                Default Slot: 1
Name: DECagent 90 IP Address: 255.255.255.255 System Uptime: 12 17:42:45
```

Set Agent IP Address

Enter the IP address:

Enter the IP address using the following format:

aaa.bbb.ccc.ddd

A valid value in each field is 0 to 255 decimal.

To obtain the IP address from the bootp server, enter a zero (0) at this prompt. When the agent is powered-up, it will request the IP address from the bootp server.

Enable/Disable SNMP Sets

Option 10, Enable/Disable SNMP Sets, allows you to enable or disable SNMP Sets. When you choose this option, the state of the SNMP Sets is changed. For example, if the SNMP Sets are currently enabled, choosing this option will disable the SNMP Sets.

To determine the current state of SNMP Sets, check the upper-left corner of the screen. If "Sets Disabled" is flashing, then SNMP Sets are currently disabled. If SNMP Sets are enabled, "Sets Enabled" appears on the screen.

Note

The default state (factory setting) is Sets Enabled.

Change System Information

Option 11, Change System Information, allows you to set a node name for the DECagent 90 and change system information related to the MIB-II system group (sysName, sysLocation, and sysContact). The node name should be the same as the <alias> in the bootp table. When you choose this option, the following prompts appear:

Agent Node Name:
System Name:
System Location:
System Contact:

The maximum node name length is 12 characters. The system strings can be up to 80 characters in length. To leave an item unchanged, press the Return key at any prompt. The agent node name appears on the third line of the console header. The remaining system information is community-specific and can be seen by choosing the Show Community option.

Change Security Configuration

Option 12, Change Security Configuration, allows you to change the console password and configure the console timeout feature. The next two sections describe how to use this option to change the console password and configure the console timeout value.

Change Console Password

Change Console Password allows you to change the console password. Passwords will not be echoed back to the screen when they are entered. The following information and prompts appear:

```
Sets Enabled          DEChub 90 SNMP Network Management Agent          V1.0
Default Community: public [1]                                     Default Slot: 1
Name: DECagent 90 IP Address: 255.255.255.255 System Uptime: 12 09:42:45
```

Change Security Configuration

Change Console Password? <NO>

If you do not want to change the console password, then press the Return key. To change the console password, enter Yes (Y) and press the Return key. The following prompts appear:

Old Password:

Enter the current console password.

New Password:

Enter the new console password.

Verify Password:

Enter the new console password again.

The minimum password length is 6 characters. The maximum password length is 16 characters. Passwords are case sensitive.

Configuring the Console Timeout Feature

The Console Timeout feature allows you select a time, in minutes, after which, if there is no input at the console terminal, the console session is automatically terminated. If you are connected to the DECagent 90 by a modem, the telephone line is also disconnected. When you choose this option, the following prompt appears:

```
Change Console Timeout? <NO>
```

If you do not want to change the console timeout value, then press the Return key. To change the console timeout value, enter Yes (Y) and press the Return key.

If you enter Yes to change the console timeout value, then one of the following messages, indicating the current status of the console timeout feature, appears:

```
The console timeout feature is currently disabled.  
Enter a non-zero value to re-enable it.
```

- or -

```
The current console timeout value is <nn> minutes.
```

Where nn is the current timeout value (if enabled). If the console timeout feature is disabled, the console timeout value is zero (0). If the console timeout feature is currently enabled (that is, has a non-zero value), setting it to zero (0) will disable it.

Then the following prompt appears:

```
Enter the console timeout value (in minutes) <nn>:
```

Where nn is the current console timeout setting. Enter an integer value ranging from 0 through 720 decimal. This allows the console timeout to be disabled (0) or set to timeout anywhere from 1 minute to 12 hours.

Note

The console timeout feature is disabled at initial power-up (factory setting) and when you choose to reset the DECagent 90 to factory settings.

Show Module

Option 13, Show Module, graphically displays module information on the screen. The module MAC address and the following module information, if applicable, appears:

```
Name: Repeater Alpha      Polling: Disabled      Interface: 2
Slot: 2                   Password:
Port 1: Alpha Port 1 : Enabled   Port 5: Alpha Port 5 : Enabled
Port 2: Alpha Port 2 : Enabled   Port 6: Alpha Port 6 : Enabled
Port 3: Alpha Port 3 : Enabled   Port 7: Alpha Port 7 : Enabled
Port 4: Alpha Port 4 : Enabled   Port 8: Alpha Port 8 : Enabled
```

If there is more than one module in the community, the following prompt appears:

```
Enter the slot number <nn>:
```

Enter the slot number and press the Return key. The module in that slot appears on the screen and the following prompt appears:

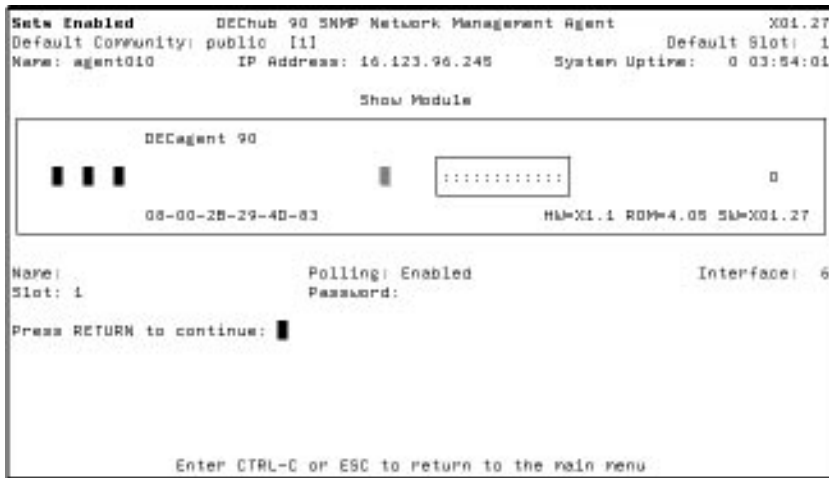
```
Show the next module? <YES>
```

If there is only one module in the community, that module is automatically displayed and the following prompt appears:

```
Press RETURN to continue:
```

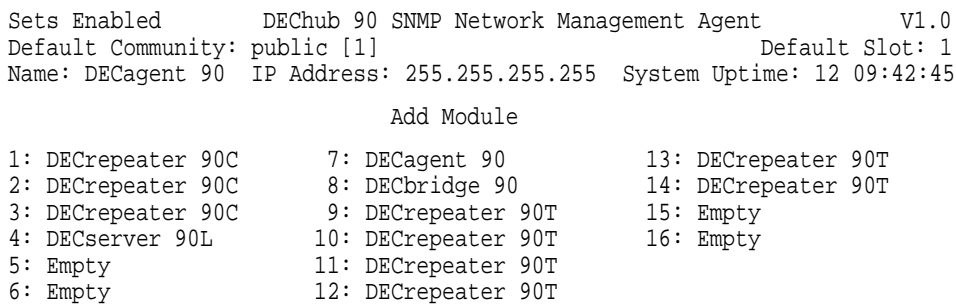
Figure 4-2 shows a typical Show Module screen.

Figure 4-2 Show Module Screen



Add Module

Option 14, Add Module, allows you to add a module to a community. The Add Module option lists all the slots in the current default community and indicates whether or not a module occupies that slot. When you choose the Add Module option, a screen similar to the following appears:



Enter the slot number <nn>:

Where nn is the first empty slot number. Enter a slot number in the range 1 through 8 for a hub and 1 through 16 for an extended hub. After you enter a slot number, the following appears on the screen:

```
[1] DECbridge 90 (Work Group Bridge)      [6] DECserver 90L
[2] DECrepeater 90T (Twisted Pair)       [7] DECserver 90L+
[3] DECrepeater 90C (Coax)              [8] DECserver 90TL
[4] DECrepeater 90A (AUI/Fiber-Optic)    [9] Empty
[5] DECrepeater 90FL (Fiber-Optic)
```

Enter the module type:

A DECbridge 90 module must reside in slot 7 or 8.

If you choose module type [1] DECbridge 90 and you select a slot number other than 7 or 8, then the following message appears:

The bridge must reside in either slot 7 or 8.

Since at least one of the slots in which the bridge may be placed is currently empty, do you wish to put the bridge there? <YES>

Enter the slot number <n>:

Where n is either 7 or 8, depending on which slot is empty. Enter either 7 or 8 to place the bridge in that slot.

Note

If only one slot is empty, you will be asked only for a module type.

If applicable, the following prompt appears:

Enter the MAC address:

The acceptable formats are as follows:

```
uu-vv-ww-xx-yy-zz
uu:vv:ww:xx:yy:zz
uuvvwwxxyyzz
```

where uu, vv, ww, xx, yy and zz are hexadecimal numbers in the range *00* through *FF*.

After you respond to all of the prompts, the module is added to the community, and the following prompt appears:

Add another module? <YES>

Remove Module

Option 15, Remove Module, allows you to remove a module from a community. The Remove Module option lists all the slots in the current default community. It indicates whether or not a module occupies that slot. When you choose the Remove Module option, the following appears:

```
Sets Enabled          DEChub 90 SNMP Network Management Agent          V1.0
Default Community: public [1]                                Default Slot: 1
Name: DECagent 90   IP Address: 255.255.255.255   System Uptime: 12 09:42:45
```

Remove Module

```
1: DECrepeater 90C      7: DECagent 90          13: DECrepeater 90T
2: DECrepeater 90C      8: DECbridge 90         14: DECrepeater 90T
3: DECrepeater 90C      9: DECrepeater 90T     15: Empty
4: DECserver 90L        10: DECrepeater 90T    16: Empty
5: Empty                11: DECrepeater 90T
6: Empty                12: DECrepeater 90T
```

Enter the slot number:

You will then be asked to verify that you want to remove the module from the slot; a prompt similar to the following appears:

```
DECrepeater 90C will be removed from slot 1.
Are you sure?
```

If you enter Yes (Y) at this prompt, then the module in that slot is removed from the community. If you enter No (N), then the module is not removed from the slot. Then, the following prompt appears:

```
Remove another module? <YES>
```

Note

If only one slot is occupied you will not be asked for a slot number, but for confirmation to remove that module.

Move Module

Option 16, Move Module, allows you to move a module within a community. The Move Module option lists all the slots in the current default community. It indicates whether or not a module occupies that slot. When you choose this option, the following appears:

```
Sets Enabled          DEChub 90 SNMP Network Management Agent          V1.0
Default Community: public [1]                                Default Slot: 1
Name: DECagent 90   IP Address: 255.255.255.255   System Uptime: 12 09:42:45
```

Remove Module

```
1: DECrepeater 90C      7: DECagent 90          13: DECrepeater 90T
2: DECrepeater 90C      8: DECbridge 90         14: DECrepeater 90T
3: DECrepeater 90C      9: DECrepeater 90T     15: Empty
4: DECserver 90L        10: DECrepeater 90T    16: Empty
5: Empty                11: DECrepeater 90T
6: Empty                12: DECrepeater 90T
```

Move from slot number:

After you enter a slot number, the following prompt appears:

```
Move to slot number:
```

After you enter a slot number, another prompt appears:

```
Move another module? <YES>:
```

Change Module MAC Address

Option 17, Change Module MAC Address, allows you to change the MAC address of a module in a community. The Change Module MAC Address option lists all the slots in the current default community. It indicates whether or not a module occupies that slot. When you choose this option, the following appears:

```
Sets Enabled          DEChub 90 SNMP Network Management Agent          V1.0
Default Community: public [1]                                Default Slot: 1
Name: DECagent 90   IP Address: 255.255.255.255   System Uptime: 12 09:42:45
```

Change Module MAC Address

```
1: DECrepeater 90C      7: DECagent 90          13: DECrepeater 90T
2: DECrepeater 90C      8: DECbridge 90         14: DECrepeater 90T
3: DECrepeater 90C      9: DECrepeater 90T     15: Empty
4: DECserver 90L        10: DECrepeater 90T    16: Empty
5: Empty                11: DECrepeater 90T
6: Empty                12: DECrepeater 90T
```

Enter the slot number:<n>

Where *n* is the first slot which contains a module whose MAC address may be changed.

After you enter the slot number, the following prompt appears:

```
Enter the MAC address <xx-xx-xx-xx-xx-xx>:
```

Where <xx-xx-xx-xx-xx-xx> is the current MAC address of the module.

The acceptable formats are as follows:

```
uu-vv-ww-xx-yy-zz
uu:vv:ww:xx:yy:zz
uuvvwwxxyyzz
```

where *uu*, *vv*, *ww*, *xx*, *yy* and *zz* are hexadecimal numbers in the range *00* through *FF*.

After you respond to the prompt, the new module MAC address is stored.

Connect

Option 18, Connect, allows you to connect to a remote device using the MOP console carrier. When you choose this option, the following appears:

```
Sets Enabled          DEChub 90 SNMP Network Management Agent          V1.0
Default Community: public [1]                                     Default Slot: 1
Name: DECagent 90  IP Address: 255.255.255.255  System Uptime: 12 09:42:45

                          Connect
```

Enter the MAC address:

To connect to a device, enter the MAC address of the device.

The acceptable formats are as follows:

```
uu-vv-ww-xx-yy-zz
uu:vv:ww:xx:yy:zz
uuvvwwxxyyzz
```

where *uu*, *vv*, *ww*, *xx*, *yy* and *zz* are hexadecimal numbers in the range *00* through *FF*.

If a connection is successfully established, you will be connected to that device. For more information about what to do after a connection is established, refer to the owner's manual for the device to which you are connected.

To disconnect the session, press Ctrl/D.

Loop

Option 19, Loop, allows you to perform connection testing to other devices on the network. When you choose this option, the following appears:

```
What type of loopback do you wish to perform?
```

- [1] ISO 802.2 XID Poll
- [2] ISO 802.2 XID Loopback
- [3] MOP V3 Loopback
- [4] MOP V4 Loopback

```
Enter the type of loopback:
```

```
Enter the MAC address:
```

Depending on the type of loopback selected, the following may appear:

```
Enter the size of the test pattern <10>:
```

The test pattern size is the number of bytes which will be used in the loopback test packet. The size can range from 1 to 1500.

For loopback types [3] and [4], the following also appears:

```
Enter the number of loops <1>:
```

Entering a number larger than 1 will result in being prompted for that number of MAC addresses through which the loopback will be performed. The first MAC address entered will be the first destination of the loop test packet. The test packet will then be sent to the next MAC address and so on, until all MAC address have been utilized. The test packet is then sent back to the originating MAC address.

Show Counters

Option 20, Show Counters, allows you to view the DECagent 90 MOP counters. When you choose this option, the following appears:

```
Enter the MAC address <xx-xx-xx-xx-xx-xx>:
```

Where <xx-xx-xx-xx-xx-xx> is the MAC address of either the DECagent 90 or the last device for which counters were requested.

The acceptable formats are as follows:

```
uu-vv-ww-xx-yy-zz  
uu:vv:ww:xx:yy:zz  
uuvvwvwxxyyzz
```

Where uu, vv, ww, xx, yy, zz are hexadecimal numbers in the range 00 through FF.

After you enter the MAC address, the following appears:

Enter the MOP version (3 or 4) <3>:

The counters will then appear on the screen, automatically updating every few seconds or so. Examples of the displays for both MOP V3 and MOP V4 counters are shown next. The <xx-xx-xx-xx-xx-xx> is the MAC address that you entered at the Enter the MAC Address prompt.

MOP V3 Counters for xx-xx-xx-xx-xx-xx

Seconds since last zeroed	x	Send failure	x
		Excessive collisions	*
Bytes received	x	Carrier check failed	*
Bytes sent	x	Short circuit	*
Frames received	x	Open circuit	*
Frames sent	x	Frame too long	*
Multicast bytes received	x	Remote failure to defer	*
Multicast frames received	x	Receive failure	x
Frames sent		Block check error	*
Initially deferred	x	Framing error	*
Single collision	x	Frame too long	*
Multiple collisions	x	System buffer unavailable	x
Unrecognized frame dest'n	x	User buffer unavailable	x
Data overrun	x		

MOP V4 Counters for xx-xx-xx-xx-xx-xx

Time since counter creation		Send failure	
ddd hh:mm:ss.ccc		Excessive collisions	x
Bytes received	x	Carrier check failed	x
Bytes sent	x	Short circuit	x
Frames received	x	Open circuit	x
Frames sent	x	Frame too long	x
Multicast bytes received	x	Remote failure to defer	x
Multicast frames received	x	Receive failure	
Frames sent		Block check error	x
Initially deferred	x	Framing error	x
Single collision	x	Frame too long	x
Multiple collisions	x	System buffer unavailable	x
Unrecognized frame dest'n	x	User buffer unavailable	x
Data overrun	x	Collision detect check fail	x

To exit the Show Counters display, press Ctrl/C or the ESC key.

Note that for MOP V3 counters, the *Send Failure* and *Receive Failure* counters are totals for that counter type. An asterisk (*) next to a failure type indicates that type is part of the total. Totals for individual failure types are not kept by MOP V3 for these counters.

Note

The DECserver 90 modules do not support MOP Version 4.

Restore Factory Settings

Option 21, Restore Factory Settings, allows you to restore factory settings. It has the same effect as when you power up the DECagent 90 and press the reset button at the same time. When you choose this option, the following warning message and prompt appears:

```
Restore Factory Settings
* * * * * WARNING WARNING WARNING WARNING WARNING * * * * *
Restoration of factory settings will destroy all the information the
DECagent 90 knows about all communities. What will remain is a community
of one, a standalone DECagent 90.
Are you sure you want to do this? <NO>
```

Caution

If you enter Yes (Y) at the prompt, all settings that you have made are destroyed, and the factory default settings are restored.

Reset the Agent

Option 22, Reset the Agent, allows you to reset the agent. When you choose this option, the following appears:

```
Reset the Agent
* * * * * WARNING WARNING WARNING WARNING WARNING * * * * *
Resetting the agent will result in a restart of the console session.
Are you sure you want to do this? <NO>
```


Exit

Option 23, Exit, allows you to exit the console. When you choose this option, the console session is terminated and the following appears:

```
Console session terminated ...
```

If you are connected to the session by a modem, then the phone line is also disconnected. After you exit, you must wait a minimum of 5 seconds before you try to re-establish a connection. Press the Return key to reconnect to the console. You must then supply the correct password to gain access to the console.

Upgrading the DECagent 90

The DECagent 90 can be upgraded in the field (on site). Operational code is stored in flash RAM and is downline loaded using the MOP protocol. A downline load host triggers the DECagent 90 to request a downline load of a specified software image. The image is initially loaded into a "landing pad" area of RAM. After the transfer is complete and the software checksum is verified, the DECagent 90 transfers the new image into flash RAM. The DECagent 90 then resets and cycles through power-up.

The upgrade procedure is non-destructive. Programmable information pertaining to the DECagent 90 and its clients is preserved.

Loading from a VAX Host

This section describes how to downline load the flash image through an Ethernet network from a VAX host.

VAX Host Node Setup

Check to see if the VAX host is set up to allow downline loads. Circuit service must be enabled.

To set up the VAX host for downline loading, use the following procedure:

1. Enter ncp by entering the following:

```
$ mcr ncp 
```

2. At the ncp prompt, enter the following:

```
ncp> sho circ qna-0 char 
```

Note

Use the appropriate Ethernet circuit. For example, sva, bna, qna, and so on.

3. To set the service to ON, enter the following commands:

Caution

When you set the service to ON, you are turning off the network! You must have system privileges and be knowledgeable in system management. If you are on a production system, we recommend that you let the system manager do this step.

```
nep> set cir qna-0 state off 
nep> set cir qna-0 service enabled 
nep> set cir qna-0 state on 
```

4. Exit out of nep and downline load the firmware file, denma.exe, into mom\$load by entering the following command:

```
$ copy denma.exe mom$load: 
```

Downline Loading the Firmware File

The downline loading is performed through the command console interface (CCI). To access CCI, use the following procedure:

1. Connect a terminal to the front panel connector of the DECagent 90.

The communication parameters should be set as follows:

- 9600 baud
 - 8 bits
 - No parity
 - 1 stop bit
2. Physically power cycle the DECagent 90. (Remove and replace the agent.)
 3. Before the self-test LED lights, and 10 seconds after power-up, press Ctrl/I on the terminal keyboard.
 4. At the CCI> prompt, enter the following command:

```
CCI> load denma.exe 
```

The following appears on the screen:

```
Attempting to locate load host
Host AA-00-04-00..... located
Requesting load from host...
Loading from load host...
Image verification in progress.
Image load completed.

Attempting crc check on image loaded.
CCI>
```

The DECagent 90 is now loaded with its firmware image. The following message appears if there was an error in the load process. Try loading again.

```
Invalid load image...
```

The following message appears if the DECagent 90 could not locate a load host:

```
DENMA -901- Initializing DECagent 90.
DENMA -953- Attempting to locate load host
[ISO8802]
DENMA -953- Attempting to locate load host
[ETHERNET]
DENMA -951- DENMA will retry operation in 4 seconds
```

This could happen for any of the following reasons:

- The load host you set up is not logically connected to the DECagent 90. Make sure that they are on the same LAN and can communicate with each other.
 - The load host is not properly set up. See the VAX Host Node Setup section.
 - The DECagent 90 is faulty. Call your Digital Services Engineer.
5. To start the module you can do one of the following:
- At CCI> console prompt, enter this command: start 200000
 - Turn the power to the module off, then turn it back on.

Loading from an ULTRIX Host

This section describes how to downline load the flash image through an Ethernet network from an ULTRIX host.

ULTRIX Host Node Setup

Check to see if the ULTRIX host is set up to allow downline loads. The mop_mom process must be running.

To set up the ULTRIX host for downline loading, use the following procedure:

1. At the # prompt, enter the following command:

```
# ps -ax |grep mop_mom 
```

The following is a typical response. If you see only the grep mop_mom then, you need to start the mop_mom process.

```
721 ? I      0:10 mop_mom      ( mop_mom process is running )
6189 p4 S    0:00 grep mop_mom
```

2. To start the grep mop_mom, enter the following command:

```
# /etc/mop_mom 
```

This will start the mop_mom process if it's available on your system. If it is not available on your system, contact your system manager.

3. Copy the firmware file, denma.exe, into the /usr/lib/mop directory, by entering the following command:

```
# cp denma.exe /usr/lib/mop 
```

Downline Loading the Firmware File

The downline loading is performed through CCI. To access CCI, use the following procedure:

1. Connect a terminal to the front panel connector of the DECagent 90.
The communication parameters should be set as follows:
 - 9600 baud
 - 8 bits
 - No parity
 - 1 stop bit
2. Physically power cycle the DECagent 90. (Remove and replace the agent.)
3. Before the self-test LED lights, and 10 seconds after power-up, press Ctrl/I on the terminal keyboard.
4. At the CCI> prompt, enter the following command:

```
CCI> load denma.exe 
```

The following appears on the terminal:

```
Attempting to locate load host
Host AA-00-04-00..... located
Requesting load from host...
Loading from load host...
Image verification in progress.
Image load completed.

Attempting crc check on image loaded.
CCI>
```

The DECagent 90 is now loaded with its firmware image. The following message appears if there was an error in the load process. Try loading again.

```
Invalid load image...
```

The following message appears if the DECagent 90 could not locate a host:

```
DENMA -901- Initializing DECagent 90.
DENMA -953- Attempting to locate load host
[ISO8802]
DENMA -953- Attempting to locate load host
[ETHERNET]
DENMA -951- DENMA will retry operation in 4 seconds
```

This could happen for any of the following reasons:

- The load host you set up is not logically connected to the DECagent 90. Make sure that they are on the same LAN and can communicate with each other.
 - The load host is not properly set up. See the ULTRIX Host Node Setup section.
 - The DECagent 90 is faulty. Call your Digital Services Engineer.
5. To start the module you can do one of the following:
- At CCI> console prompt, enter this command: start 200000
 - Turn the power to the module off, then turn it back on.

Trap-PDU

Traps are not supported in Version 1.0 of the DECagent 90.

5

Troubleshooting

Introduction

This chapter provides troubleshooting information for the DECagent 90 when used as a standalone unit or installed in a DEChub 90 backplane.

Before You Start

1. Verify the installation of the DECagent 90. Installation must meet the configuration rules given in Chapter 3.
2. Note the fault condition.
3. Isolate the problem.

Use Table 5-1 to troubleshoot a standalone DECagent 90. Use Table 5-2 to troubleshoot a DECagent 90 installed in a DEChub 90 backplane.

DECagent 90 Standalone Troubleshooting

Use Table 5–1 to troubleshoot a standalone DECagent 90.

Table 5–1 Troubleshooting a DECagent 90 Standalone Unit

If...	Then...	Do this...
All LEDs are off.	Check the ac power connection.	Check that the power supply is properly plugged into the power outlet. Check the power to the power outlet.
	Check the power supply.	Check the 7-pin connector to the power supply. If the connections are okay, replace either the power supply (for 120 V operation) or both the power supply cord and power supply (for 220 V operation).
All LEDs flicker.	The DECagent 90 is not receiving the correct voltages.	Connect the DECagent 90 to the correct power supply.
The network activity LED is off.	There is low network activity or no network activity.	Ensure that network activity is present and that the segment is properly terminated.
	If the network activity LED still fails to illuminate.	Turn the agent off and on by unplugging and replugging the power supply. Check that the network activity LED comes on momentarily.
	If the network activity LED illuminates momentarily, the network activity LED portion of testing has passed.	Replace the agent.
	If the network LED fails to illuminate.	Replace the agent.

DECagent 90 Backplane Configuration Troubleshooting

Use Table 5–2 to troubleshoot a DECagent 90 installed in a DEChub 90 backplane.

Table 5–2 Troubleshooting a DECagent 90 in a DEChub 90 Backplane

If...	Then...	Do this...
The power LED is off.	The DECagent 90 is not receiving +12 V.	Check the power LED on the DEChub 90 power supply.
	If the power LED on the DEChub 90 is off, there is a problem with the DEChub 90 power supply.	See the troubleshooting procedures in the <i>DEChub 90 Owner's Manual</i> .
	If the power LED on the DEChub 90 power supply is on, are other component power LEDs off? If other components are on, the DECagent 90 has a power problem.	Ensure that the agent is in slot 7 or 8. If the agent is in the correct slot, try re-seating the DECagent 90 in either the same slot or the other slot.
	If the power LED on the DEChub 90 power supply is on, are other component power LEDs off? If other components are off, the DEChub 90 has a power problem.	See the troubleshooting procedures in the <i>DEChub 90 Owner's Manual</i> .
	If the power LED turns on when re-seated in the same slot, the DECagent 90 was not properly seated.	Make sure that the DECagent 90 is properly seated in the slot.
	If the power LED turns on when re-seated in another slot, the problem is with the DEChub 90.	See the troubleshooting procedures in the <i>DEChub 90 Owner's Manual</i> .

(continued on next page)

Table 5–2 (Cont.) Troubleshooting a DECagent 90 in a DEChub 90 Backplane

If...	Then...	Do this...
The port 0 network activity LED is off.	If the DECagent 90 does not turn on in a known good slot, the DECagent 90 is defective.	Replace the DECagent 90.
	The DECagent 90 or any other unit in the DEChub 90 may not be connected to an active segment.	Connect a known active segment to a port (other than port 0) on any unit in the DEChub 90.
	If the DECagent 90 is connected to a known active segment and the port 0 LED is off, the DECagent 90 is defective.	Replace the DECagent 90.

A

Specifications and Parts

Introduction

This appendix provides the following specifications for the DECagent 90:

- Physical dimensions
- Environmental specifications
- Electrical specifications
- Console connector pin out

The appendix also lists the replacement parts for the DECagent 90.

Physical Dimensions

The following table lists the physical dimensions of the DECagent 90:

Dimension	Measurement
Height	3.5 cm (1.4 in)
Width	28.0 cm (11.0 in)
Depth	14.0 cm (5.5 in)
Weight	.77 kg (1.7 lb)

Environmental Specifications

The DECagent 90 is designed to operate in an office environment or equipment room environment, such as telephone closets or satellite equipment rooms. It is not intended to operate in a sealed environment.

Operating Environment

The following table provides the operating environment specifications:

Condition	Value
Temperature	5°C to 50°C (41°F to 122°F)
Maximum rate of change	20°C/hr (36°F/hr)
Relative humidity	10% to 95% (non-condensing)
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.

Shipping Environment

The following table provides the shipping environment specifications:

Condition	Value
Temperature	-40°C to 66°C (-40°F to 151°F)
Relative humidity	10% to 95% (non-condensing)
Altitude	Sea level to 4.9 km (16,000 ft)

Electrical Specifications

The standalone DECagent 90 has a separate self-contained power supply and a power cord.

Power Supply

The following table provides the power supply specifications:

Specification	Value
Voltage (domestic)	104 Vac to 128 Vac (nominal 120 Vac)
Voltage (international)	208 Vac to 256 Vac (nominal 240 Vac)
AC cord length	6 ft
Current at 120 volts	.25 A
Current at 240 volts	.125 A
Frequency	50 Hz to 60 Hz
Power consumption	9 W
Output voltage 1	5.1 Vdc
Output voltage 2	12.0 Vdc
DC cord length	8 ft
Output current	1.8 A

Input Voltage

The following table provides the input voltage specifications:

Specification	Value
Input voltages	12.0 Vdc, 4.75 to 5.25 Vdc
Input current	1.0 A

Console Connector Pin Out (RS-232/DB25)

The following table provides the console connector pin out:

Pin	Signal	Pin	Signal
1	Protective Ground	14	–
2	Transmit Data	15	–
3	Receive Data	16	–
4	Request to Send (RTS)	17	–
5	Clear to Send (CTS)	18	–
6	Data Set Ready (DSR)	19	–
7	Signal Ground (GND)	20	Data Terminal Ready (DTR)
8	Carrier Detect (CD)	21	–
9	–	22	Ring Indicator (RI)
10	–	23	–
11	–	24	–
12	–	25	–
13	–		

Replacement Parts

The following table lists the replacement parts and order numbers for the DECagent 90:

Replacement Part	Order Number
DECagent 90	DENMA-MA
Power supply, 110/220 Vac	H7827-AA
Rear cover	H0342-AA

B

Console Messages

Introduction

This appendix describes the informational and error messages that you might receive at the console.

Informational Messages

The following section lists the informational messages that might appear at the console.

Adding module to slot 'nn'.

This message appears when you are adding modules to a community and there is only one empty slot.

Changing the MAC address of the 'module type' in slot 'nn'.

This message appears when a MAC address is in the process of being changed.

Community ['nn'] added. Now adding modules ...

This message appears when a community has been added to the agent's database.

Community ['nn'] removed.

This message appears when a community has been removed from the agent's database.

Community ['nn'] will be removed.

This message appears when a community is about to be removed from the agent's database. You will be prompted to confirm the removal.

Community size changed to 'nn'.

This message appears when a community size has been successfully changed to the value indicated.

Connecting ...

This message appears when the agent is attempting to establish a MOP console carrier session to another module via the Connect option.

Console session terminated ...

This message appears when the console is being exited.

Factory settings are being restored ...

This message appears when the agent is restoring the original factory settings. The agent will automatically restart and the console session must be re-established.

If a bridge will be part of this community, adding it now will allow the auto-discovery mechanism to discover other modules in the community.

This message appears after you choose the Add Community option, to allow you to add a bridge to the community before other modules. If a bridge will be part of the community, adding it first will allow the auto-discovery mechanism to attempt to locate others modules in the hub.

'module type' added to slot 'nn'.

This message appears when a module has been added to the indicated slot in the default community.

'module type' moved from slot 'xx' to slot 'yy'.

This message appears after you choose the Move Module option, when a module has been moved to another slot. The module type and slots, whose contents have changed, appear in the message.

'module type' removed from slot 'nn' ...

This message appears when a module has been removed from the community. The module type and slot number appear in the message.

Moving the 'module type' ...

This message appears after you choose the Move Module option and there is only one module in the community. You will be prompted only for the slot where you want to move the module. The module type appears in the message.

No changes made.

This message appears when a command has been aborted by pressing either the Return or Enter key without supplying any information, or under certain circumstances when Ctrl/C or ESC is pressed.

No modules remain in this community.

This message appears after you choose the Remove Module option, when you have removed the last module from the community. You will then be asked whether or not you want to remove the community as well.

No modules were added to this community.

This message appears after you choose the Add Community option, when you enter a valid set of community strings and select a hub type, but abort using Ctrl/C or ESC, without adding any modules. Essentially, you have created an empty community.

No user input for 'nn' minutes. Console session terminated ...

This message appears when the console timeout period has expired. This occurs when there is no user input at the console terminal for the specified period of time. The console automatically disconnects itself after the timeout period has expired, and you must restart the console session by entering the console password. No data is lost when the console is disconnected this way.

Now that the former standalone 'module type' is in a hub, it must now be moved to an appropriate slot.

This message appears when you have changed the community size of a standalone agent or bridge so that it resides in a hub or extended hub. You are prompted for one of the slots to which the module can be moved.

Password changed.

This message appears when the console password is changed.

Pressing only the RETURN key at the prompt for the new community string will result in that community string being set to null, effectively disabling access via that community string. You will not be allowed to set both community strings to null.

This message appears after you choose the Change Community String option, to remind you that you cannot set both community strings to null.

Resetting the DECagent 90 will restart the console session.

This message appears after you choose the Reset the Agent option. This system allows you to abort or continue to reset the agent.

Restoration of factory settings will destroy ALL the information the DECagent 90 knows about all communities and modules. What will remain is a community of one, a standalone DECagent 90.

This message appears after you choose the Restore Factory Settings option.

Setting the DECagent 90's IP address to zero (0) will cause the DECagent 90 to be reset. Upon restart, the DECagent 90 will request its IP address from the bootp server.

This message appears when you attempt to set the agent's IP address to zero (0.0.0.0). You will be prompted to reset the agent so that the IP address can be obtained from the bootp server.

Standalone 'module type' added as community ['nn'].

This message appears when you have successfully added a standalone module as a community to the agent's database.

The agent is being reset ...

This message appears when the agent is asked to perform a reset. The agent automatically restarts and the console session must be re-established.

**The console password has not been set.
You must enter a console password now.**

This message appears at initial power-up of the module, or when the password reset switch is pressed in conjunction with module power-up. You are prompted to enter a console password which will be used as a security mechanism for access to the console menu.

**The console timeout feature is currently disabled.
Enter a non-zero value to re-enable it.**

This message appears during the Change Console Timeout option of the Change Security Configuration option to indicate that the console timeout feature is currently disabled.

The console timeout feature has been disabled.

This message appears when you have entered a console timeout value of zero (0) to disable the console timeout feature during the Change Console Timeout option of the Change Security Configuration option.

The console timeout has been set to 'nn' minutes.

This message appears when you have entered a non-zero console timeout value during the Change Console Timeout option of the Change Security Configuration option.

The current console timeout value is 'nn' minutes.

This message appears after you choose the Change Console Timeout option of the Change Security Configuration option. This message indicates the current setting of the console timeout value.

Use the 'Move Module' command to vacate the desired slot.

This message appears after you choose the Add Module option, when you have attempted to add an agent or bridge to an inappropriate slot, but one of the appropriate slots could be made available by using the Move Module option.

You may enter 1 more trap address for this community.

You may enter up to 'nn' more trap addresses for this community.

One of these messages appears after you choose the Add Community Trap Addresses option, to inform you of the number of available trap table entries.

You must use the Move Module command to move the 'module type' to an appropriate slot.

This message appears after you choose the Change Community Size/Type option when you have been prompted to move an agent or a bridge to another slot and you have pressed Ctrl/C or ESC to abort the move. You should move the module to an appropriate slot before attempting to change the community size.

Error Messages

The following section lists the error messages that might appear at the console.

**A module was found in slot 'nn'.
'nn' modules were found in slots 'xx' through 'yy'.**

One of these messages accompanies the "Unable to change community size" message issued when you choose the Change Community Size/Type option, to indicate the reason why the agent was unable to change the community size.

A 'module type' in slot 'xx' of community ['nn'] has MAC address xx-xx-xx-xx-xx-xx

This message appears when you attempt to add a module to a community and the specified MAC address is discovered in another module elsewhere in the agent's database. You should check the other module to be sure that the MAC address is correct. Duplicate MAC addresses are not allowed.

A trap address cannot be the DECagent 90's IP address.

This message appears when you attempt to add a trap address to a community that is the same as the agent's IP address. You cannot specify that traps generated by the agent be sent to the agent.

All slots to which the 'module type' could be moved are currently occupied. Movement of the 'module type' is not possible at this time.

This message appears when you have attempted to move an agent or bridge within a community and no slot is vacant.

Both community strings cannot be null. Please try again.

This message appears when you have attempted to set both community strings of a community to null.

Community ['nn'] not found. Please try again.

This message appears when you have selected a community which does not exist in the agent's database. The community index is contained in the message. You are prompted to re-enter the community index.

Community string is not unique. Please try again.

This message appears when you have specified a community string in response to the Add Community or Change Community String options, and the community string is already in use by another community.

Error adding community. Insufficient system resources.

This message appears when you have attempted to add a community, and an agent resource, such as memory, has been exhausted.

Error adding module. Insufficient system resources.

This message appears when you have attempted to add a module to a community, and an agent resource, such as memory, has been exhausted.

Error during loopback. Insufficient system resources.

This message appears when you have attempted a MOP loopback to another node, and an agent resource, such as memory, has been exhausted.

Error obtaining MOP counters. Insufficient system resources.

This message appears after you choose the Show Counters option, if system resources are not available.

Invalid agent node name. Please try again.

This message appears when an invalid agent node name has been entered. The accompanying message indicates the reason. You are prompted to re-enter a valid node name.

Invalid system name. Please try again.

This message appears when an invalid system name has been entered. The accompanying message indicates the reason. You are prompted to re-enter a valid system name.

Invalid system location. Please try again.

This message appears when an invalid system location has been entered. The accompanying message indicates the reason. You are prompted to re-enter a valid system location.

Invalid system contact. Please try again.

This message appears when an invalid system contact has been entered. The accompanying message indicates the reason. You are prompted to re-enter a valid system contact.

Invalid 'read-only/read-write' community string. Please try again.

This message appears when an invalid community string has been entered. You are prompted to re-enter a valid community string.

Invalid console password. Please try again.

This message appears when an invalid password has been entered. You are prompted to re-enter a valid password.

Invalid IP address. Please try again.

This message appears when an invalid IP address has been entered. You are prompted to re-enter a valid IP address.

Invalid MAC address. Please try again.

This message appears when an invalid MAC address has been entered. You are prompted to re-enter a valid MAC address.

Invalid trap address. Please try again.

This message appears when an invalid trap address has been entered. You are prompted to re-enter a valid trap address.

Invalid number. Range is 'xx'-'yy'. Please try again.

This message appears when an invalid number has been entered. You are prompted to re-enter a valid number in the specified range.

Module movement is not possible.

This message accompanies another message regarding the state of the current default community when you attempt to move a module within the community.

No default community selected.

This message appears after you choose the Show Community option, with the Full option, and you have not selected a default community.

No module in this community has a changeable MAC address.

This message appears after you choose the Change Module MAC Address option, and the default community does not have any modules whose MAC address can be changed.

Password retry count exceeded.

This message appears when you have attempted to change the console password and have not entered the correct password 3 times.

Password too long. Maximum password length is 16.

This message appears when the password you entered is more than 16 characters long.

Password too short. Minimum password length is 6.

This message appears when the password you entered was less than 6 characters.

Password verification failed.

This message appears when you change the console password. At the verification prompt you typed something different than what you typed at the new password prompt.

Please respond with YES or NO.

This message appears when you incorrectly respond to a YES or NO query.

Slot 'nn' is empty.

This message appears when you attempt to move or remove a module from an empty slot.

Slot 'nn' is not empty.

This prompt appears when you attempt to add or move a module to a slot that is already occupied.

String too long. Maximum string length is 'nn'.

This message appears along with the Invalid agent node name... or Invalid system... messages to indicate that the string entered was too long. Re-enter a string that is less than or equal to the specified maximum length.

**The DECagent 90's community is the only community.
You cannot remove the community in which the DECagent 90 resides.**

This message appears when you attempt to remove a community and the agent's community is the only one in the database.

The DECagent 90 resides in this standalone community. It cannot be removed.

This message appears when you attempt to remove a module from a standalone community which contains the agent.

The DECagent 90 must reside only in slot 7 or 8, 15 or 16.

This message appears when you attempt to add or move a DECagent 90 to a slot other than slot 7, 8, 15 or 16.

**The DECagent 90 resides in slot 'nn'.
It cannot be removed from the community.**

This message appears when you attempt to remove the agent from the community.

**The DECbridge 90 must reside only in slot 7 or 8.
Use the 'Move Module' command to vacate the desired slot.**

This message appears when you attempt to add or move a bridge within a hub to a slot other than slots 7 and 8.

The 'module type' does not have a MAC address.

This message appears when you attempt to change the MAC address of a module which does not have a MAC address.

The new console password is the same as the old console password.

This message appears when you attempt to set the console password to be the same as the previously stored console password.

**The read-only community string is set to null.
You cannot set the read-write community string to null also.**

**The read-write community string is set to null.
You cannot set the read-only community string to null also.**

One of these messages appears when you attempt to set to null a community string whose counterpart is null already.

The trap table for this community is full.

This message appears when you have attempted to add a trap address when the trap table is full. The trap table can hold up to 8 trap addresses.

There are no trap addresses set for this community.

This message appears when you attempt to remove a trap address from a community for which no trap addresses have been set.

This is already a community of size 'nn'.

This message appears when you attempt to set the community size to the same value as its current size.

This community has no empty slots.

This message appears when you attempt to add or move a module in a community which has no empty slots.

This community has no modules.

This message appears during several commands to indicate that the operation cannot take place because no modules are in the community.

This community has only one slot.

This message appears when you attempt to move a module which is a member of a standalone community.

Trap address 'trap address' is already in the trap table .

This message appears when you attempt to enter a duplicate trap address.

Trap address 0.0.0.0 is not valid.

This message appears when you attempt to add trap address 0.0.0.0 to the trap table.

Trap address 'xx.xx.xx.xx' not found.

This message appears when you attempt to remove a trap address which is not in the trap table of this community.

Unable to change community size.

This message appears when you attempt to reduce the community size of a community which has modules in the slots which would be eliminated by the changing of the community size. You should move those modules to lower-numbered slots, or remove those modules entirely. See the accompanying message for more information.

Unable to remove community ['nn'].

This message appears after you choose the Remove Community option, when the agent is unable to remove the community. Choose the option again. If this message appears again, contact your Digital Services representative.

Unable to remove the 'module type' from slot 'nn'.

This message appears when the agent was unable to complete the Remove Module option. Try the option again. If this message appears a second time, contact your Digital Services representative.

You cannot add another bridge to this community.

This message appears when you attempt to add a bridge to a community that already has a bridge installed.

You cannot change the MAC address of the DECagent 90.

This message appears when you attempt to change the MAC address of a DECagent 90.

You cannot remove the community in which the DECagent 90 resides.

This message appears when you attempt to remove the community in which the DECagent 90 resides.

You cannot set to null the read-write community string of a DECagent 90's community.

This message appears when you attempt to set the agent's read/write community string to null.

You must set to a non-null string the read-write community string of the DECagent 90's community before SNMP Sets can be enabled.

This message appears when you attempt to enable SNMP Sets and the agent's read/write community string is set to null.

C

MIB Groups and Communities

Introduction

This appendix provides information about the management information base (MIB) groups that are supported by the DECagent 90. It also provides information about the slot table and communities.

MIB Groups

A MIB is a collection of manageable objects for a given entity. The following standard MIBs are supported by the DECagent 90:

- MIB II
- IETF bridge group
- RS-232-like MIB group
- Character group

MIB II

MIB II, like its predecessor, the Internet-standard MIB, contains only essential elements. There is no need to allow individual objects to be optional. Rather, the objects are arranged into the following groups:

- System
- Interfaces
- Address translation (deprecated)
- IP
- ICMP
- TCP (not supported by the DECagent 90)
- UDP
- EGP (not supported by the DECagent 90)
- Transmission (not supported by the DECagent 90)
- SNMP
- IETF bridge
- Character
- RS-232-like

These groups are the basic unit of conformance. This method is as follows:

If the semantics of a group is applicable to an implementation, then it must implement all objects in that group. For example, an implementation must implement the EGP (Exterior Gateway Protocol) group if and only if it implements the EGP.

Bridge Group

Objects in this MIB {mib-2 17} are arranged into groups. Each group is organized as a set of related objects. The overall structure and assignment of objects to their groups is shown in the following list:

Bridge MIB Names

- dot1dBridge
- dot1dBase
 - BridgeAddress
 - NumPorts
 - Type
 - PortTable
 - Port
 - IfIndex
 - Circuit
 - DelayExceededDiscards
 - MtuExceededDiscards
- dot1dStp
 - ProtocolSpecification
 - Priority
 - TimeSinceTopologyChange
 - TopChanges
 - DesignatedRoot
 - RootCost
 - RootPort
 - MaxAge
 - HelloTime
 - HoldTime
 - ForwardDelay
 - BridgeMaxAge
 - BridgeHelloTime
 - BridgeForwardDelay
 - PortTable
 - Port
 - Priority
 - State
 - Enable
 - PathCost
 - DesignatedRoot
 - DesignatedCost
 - DesignatedBridge
 - DesignatedPort
 - ForwardTransitions

RS-232-Like MIB Group

The RS-232-like MIB group {mib-2 transmission} applies to interface ports, such as an RS-232 port with modem signals, that logically support the Interface MIB, Transmission MIB, or Character MIB.

The DECagent 90 supports the RS-232-like MIB for the DECserver 90L and the DECserver 90L+ modules.

The RS-232-like MIB is one of a set of MIBs designed for complementary use. The set comprises:

- Character MIB
- PPP MIB
- RS-232-like MIB
- Parallel-printer-like MIB

The RS-232-like MIB and the Parallel-printer-like MIB represent the physical layer, providing service to higher layers such as the Character MIB or PPP MIB. Further MIBs may appear above these.

The intent of the model is for the physical-level MIBs to represent the lowest level, regardless of the higher level that may be using it. In turn, separate higher level MIBs represent specific applications, such as a terminal (the Character MIB) or a network connection (the PPP MIB).

The RS-232-like MIB is mandatory for all systems that have a hardware port that supports services managed through some other MIB, such as, the Character MIB or PPP MIB.

The MIB includes multiple similar types of hardware, and as a result contains objects not applicable to all of those types. Such objects are in a separate branch of the MIB, which is required when applicable and otherwise absent.

The RS-232-like MIB includes RS-232, RS-422, RS-423, V.35, and other asynchronous or synchronous, serial physical links with a similar set of control signals.

The MIB contains objects that relate to physical layer connections. Such connections provide hardware signals (other than for basic data transfer), such as RNG and DCD. Hardware ports also have such attributes as speed and bits per character.

Usefulness of the error counters in this MIB depends on the presence of non-error character counts in higher level MIBs.

The MIB comprises one base object and four tables. The tables contain objects for all ports, asynchronous ports, and input and output control signals.

Character Group

The Character group applies to interface ports that carry a character stream, whether physical or virtual, serial or parallel, synchronous or asynchronous. The most common example of a character port is a hardware terminal port with an RS-232 interface. The DECagent 90 supports the RS-232-like MIB for the DECserver 90L and the DECserver 90L+. Another common hardware example is a parallel printer port, with a Centronics interface. The concept also includes virtual terminal ports, such as a software connection point for a remote console.

The Character MIB is one of a set of MIBs designed for complementary use. The set comprises:

- Character MIB
- PPP MIB
- RS-232-like MIB
- Parallel-printer-like MIB

The RS-232-like MIB and the Parallel-printer-like MIB represent the physical layer, providing service to higher layers such as the Character MIB or PPP MIB. Further MIBs may appear above these.

The intent of the model is for the physical-level MIBs to represent the lowest level, regardless of the higher level that may be using it. In turn, separate higher level MIBs represent specific applications, such as a terminal (the Character MIB) or a network connection (the PPP MIB).

For the most part, character ports are distinct from network interfaces (which are already covered by the Interface group). In general, they are attachment points for non-network devices. The exception is a character port that can support a network protocol, such as SLIP or PPP. This MIB treats such situations with benign neglect. A port may indicate that it is running as a network character stream device. If it does, this could imply the existence of an entry in the Interfaces table.

The Character MIB is mandatory for all systems that offer character ports. This includes, for example, terminal servers, general-purpose time-sharing hosts, and even such systems as a bridge with a (virtual) console port. It may or may not include character ports that do not support network sessions, depending on the system's needs.

Some MIBs have objects whose value identifies a MIB document. For such purposes, this document has the OBJECT IDENTIFIER value:

```
char    OBJECT IDENTIFIER ::= { mib-2 19 }
```

The Character MIB's central abstraction is a port. Physical ports have a one-to-one correspondence with hardware ports. Virtual ports are software entities analogous to physical ports, but with no hardware connector.

Each port supports one or more sessions. A session represents a virtual connection that carries characters between the port and some partner. Sessions typically operate over a stack of network protocols. A typical session, for example, uses Telnet over TCP.

The MIB comprises one base object and two tables. The tables contain objects for ports and sessions.

The MIB intentionally contains no distinction between what is often called permanent and operational or volatile data bases. For the purposes of this MIB, handling of such distinctions is implementation specific.

Slot Table

The slot table is the repository of all the information necessary for the management station to understand the topology of a hub or a community and for the DECagent 90 to access the various modules. The slot table does not, however, refer directly to the DECagent 90 data structure. The slot table refers to module-specific data structures maintained for each module.

The DEChub 90 slot table contains a row for each slot in the hub. Each row contains the following information for the module in that slot:

- Name
- Type
- ID
- Version
- Counter time
- MAC address
- Password

The following list describes the objects in the Dh90 group:

- **Dh90SlotTable**— Not accessible
A list of modules installed in the DEChub 90. The number of entries is given in dh90SlotNumber.
- **Dh90SlotIndex**—Read/write
The slot number containing the module.
- **Dh90SlotModuleID**—Read/write
The type of the module in a slot. The following defaults are used for a slot row:
 - dh90SlotIndex—Instance specified
 - dh90SlotModuleID—Value specified
 - dh90SlotModuleName—Null string
 - dh90SlotModuleVersion—Run-time value, not initialized
 - dh90SlotCounterTime—Run-time value, not initialized
 - dh90SlotIfBase—Calculated based on current community contents
 - dh90SlotIfNumber—Derived from module ID
 - dh90SlotPhysicalAddress—Defaults to null (needed for DECbridge 90 and DECserver 90L)
 - dh90SlotPortNumber—Derived from module ID
 - dh90SlotPassword—Defaults to null
 - dh90SlotNewPassword—No value
 - dh90SlotPolling—Defaults to on
 - dh90SlotPrimarySpecific—Derived from module ID
 - dh90SlotSecondarySpecific—Derived from module ID
- **Dh90SlotModuleName**—Read/write
A textual description of the module.
- **Dh90SlotModuleVersion**—Read-only
A textual description of the version level of the hardware and firmware of the module.
- **Dh90SlotCounterTime**—Read-only
Time since the counters of this module were zeroed.

- **Dh90SlotIfBase**—Read-only
An index into the ifTable for the first interface on this module. Add one to this value to reference the ifTable entry which corresponds to the second interface, and so on. If no interface is supported on the module, a value of zero is returned.
- **Dh90SlotIfNumber**—Read-only
Number of interfaces on this module.
- **Dh90SlotPhysicalAddress**—Read/write
A read/write variable for the physical address to allow devices to be added to the hub remotely. Writing this variable as part of a remote add device routine will cause the new physical address to be accessible in the ifTable.
- **Dh90SlotPortNumber**—Read-only
The number of ports on this module.
- **Dh90SlotPassword**—Write-only
Password used to enable management mode on the server.
- **Dh90SlotNewPassword**—Write-only
Setting this variable causes the agent to set a new password on the terminal server using the TSNewPassword value as the new password and TSPassword as the old password. Power on the terminal server must be cycled within a minute for the change to take effect.
- **Dh90SlotPolling**—Read/write
The current polling status of the module. If the DECagent 90 is polling this device, a get of this variable will return 'on', otherwise 'off' is returned. Setting this variable to 'off' causes the agent to stop polling the device in this slot.
- **Dh90SlotPrimarySpecific**—Read-only
A reference to the Bridge { experimental 14 } or the Character-like { experimental 19 } MIB definition. If the module realizes some other function, the object identifier nullSpecific OBJECT IDENTIFIER ::= { 0 0 } is returned.

- **Dh90SlotSecondarySpecific**—Read-only
A table of IP addresses to which this device will send traps.
- **Dh90TrapAddressTable**—Not accessible
A table of IP addresses to which this device will send traps.
- **Dh90TrapAddress**—Read/write
An IP address to which all SNMP traps generated by this device will be sent.

Communities

A community in the SNMP sense is a set of manageable attributes that are managed as a group. Normally, there is a one-community-to-one-agent relationship. The manageable attributes are usually contained within a single hardware device, or within a single enclosure in the case of hubs. The single hardware device, or the collection of devices within a hub, is treated as one community. A particular manageable entity is uniquely identified on the network by the combination of an IP address and a community string.

A community string is a sequence of ASCII characters that is checked by the SNMP agent for access control to the manageable entity. The community string can be thought of as a password. There are two strings associated with a given community: the read-only string and the read/write string. For a GET or a GET NEXT operation, the agent will accept either the read-only or the read/write string. However, for a SET operation, the agent will accept only the read/write string.

An SNMP proxy agent, such as the DECagent 90, can translate from SNMP to the native protocol understood by a non-SNMP speaking device. For proxy agents, the manageable entities are often separate and distinct hardware devices. The relationship changes to several communities per proxy agent. A particular manageable entity is still identified on the network by the combination of an IP address and a community string. Now, however, each community supported by the proxy agent has its own set of read-only and read/write strings. Each read-only string at a given IP address must be unique from all the others. Likewise, each read/write string at a given IP address must be unique from all the others. Because the proxy agent has only one IP address, the community strings are used to index the separate and distinct manageable entities supported by that agent.

For the DECagent 90, a standalone module, such as a DECserver 90L or a DECbridge 90, is treated as one community. One DEChub 90 is also treated as a single community. When two DEChub 90 hubs are connected together in a daisy-chained fashion, they are treated as one 16-slot hub from a management perspective. The 2 hubs are treated as a 1-hub community with 16 slots. The DECagent 90 can store information for up to 64 communities. Practical limits are, however, much lower, and are performance dependent. A good rule of thumb is one DECagent 90 supporting 8 single hubs (or 4 daisy-chained) containing bridges and repeaters. For DECserver 90L or 90L+ modules, a good rule of thumb is 64 devices, independent of whether or not they are in a hub.

A new community is created in the DECagent 90 by giving it a community type (standalone or DEChub 90), and the read-only and read/write community strings. The default community created for a type of DEChub 90 will have 8 slots. This can be changed to a double hub by setting the MIB object dh90NumberSlots to 16. When the DECagent 90 is first installed, SETs are enabled. They must be disabled at the console if you do not wish to allow modification through SNMP.

At least one community will always exist in a DECagent 90; that is the community of which the agent itself is a part. If the agent is to be used standalone, this community does not need to be changed. The DECagent 90 will sense when it is in a hub. When given the MAC address of a bridge in the same hub the DECagent 90 will resize, if appropriate, to a 16-slot hub. The object da90NumberSlots will change if the hub is daisy-chained and the bridge is polling.

To assist network management stations that feature autotopology or autodiscovery, the user may want to leave the agent's read-only community string as "public". New communities to be added could be given strings of public1, public2, public3, and so on. Community strings are case sensitive.

D

Documentation and Ordering Information

Introduction

This appendix lists documentation that is related to the DECagent 90. It also provides ordering information.

Related Documentation

You can order the following documents from Digital:

Document Title	Order Number
DEChub 90 Owner's Manual	EK-DEHUB-OM
Open DECconnect Building Wiring Components and Application Catalog	EB-K2407-42
DECconnect System Planning and Configuration Guide	EK-DECSY-CG
DECbridge 90 Owner's Manual	EK-DEWGB-OM
DECrepeater 90C Owner's Manual	EK-DECMR-OM
DECrepeater 90T Owner's Manual	EK-DETMR-OM
DECserver 90L Owner's Manual	EK-DSRVD-OM
DECserver 90L+ Owner's Manual	EK-DSRVG-OM
HUBwatch for DECmcc MSU User Information	EK-479AA-UI
HUBwatch for DECmcc MSU DECbridge 90 Management	EK-480AA-UI
HUBwatch for DECmcc MSU DECrepeater 90C and 90T Management	EK-482AA-UI
HUBwatch for DECmcc MSU DECserver 90L and 90L+ Management	EK-481AA-UI

Ordering Information

You can order options and documentation by mail, phone, or electronically.

Need Help?

If you need help deciding which documentation best meets your needs, please call 800-DIGITAL (800-344-4825) and press 2 for technical assistance.

Electronic Orders

To place an order through your account at the Electronic Store, dial 800-234-1998, using a modem set to 2400 or 9600 baud. You must use a VT terminal or terminal emulator set at 8 bits, no parity. If you need help, call 800-DIGITAL (800-344-4825) and ask for an Electronic Store specialist.

Telephone or Direct Mail Orders

If You Are From . . .	Call . . .	Or Write . . .
U.S.A.	DECdirect Phone: 800-DIGITAL (800-344-4825) FAX: (603) 884-5597	Digital Equipment Corporation P.O. Box CS2008 Nashua, NH 03061
Puerto Rico	Phone: (809) 781-0505 FAX: (809) 749-8377	Digital Equipment Caribbean, Inc. 3 Digital Plaza, 1st Street Suite 200 Metro Office Park San Juan, Puerto Rico 00920
Canada	Phone: 800-267-6215 FAX: (613) 592-1946	Digital Equipment of Canada Ltd. 100 Herzberg Road Kanata, Ontario, Canada K2K 2A6 Attn: DECdirect Sales
International	—	Local Digital subsidiary or approved distributor

Digital Personnel

You can order documentation by electronic mail. Contact the following organizations for instructions:

If You Need . . .	Call . . .	Contact . . .
Software documentation ¹	DTN: 241-3023 (508) 874-3023	Software Supply Business Digital Equipment Corporation 1 Digital Drive Westminster, MA 01473
Hardware documentation	DTN: 234-4325 (508) 351-4325 FAX: (508) 351-4467	Publishing & Circulation Services Digital Equipment Corporation NRO2-2/I5 444 Whitney Street Northboro, MA 01532

¹Call to request an Internal Software Order Form (EN-01740-07).

Index

A

- Addresses, 4-9
 - setting IP, 4-9
- Agent
 - managed, 1-1
 - unmanaged, 1-3
- Asynchronous serial port status, 1-5

B

- Backplane
 - DEChub 90, 1-1
- Backplane connector, 1-5
- 10Base2, 1-1
- BNC network connector, 1-5

C

- Communities, C-9
- Configuration, 3-1
- Configurations
 - installation, 2-1
- Connect, 4-17
- Connecting cables, 2-2
- Connection
 - sample, 1-2
- Connector
 - backplane, 1-5
 - network (BNC), 1-5
 - power, 1-5
- Console interface
 - using the, 4-1

- Console management, 4-1
- Console messages, B-1
 - error, B-5
 - informational, B-1
- Conventions
 - console interface, 4-1
- Counters, 4-18
 - MOP V3, 4-19
 - MOP V4, 4-19
- Cover, 1-5
- CSMA/CD, 1-1

D

- DC OK display, 1-5
- DECagent 90
 - input current, A-3
 - input voltage, A-3
- DEChub 90, 1-1
- Depth, A-1
- Description, 1-1
- Dew point, A-2
- Dimensions
 - physical, A-1
- Display
 - DC OK, 1-5
 - network activity, 1-5
 - port status, 1-5
 - self-test, 1-5
- Documentation
 - ordering, D-2
- Documents
 - related, D-1

E

Environment
 operating, A-2
Environmental
 specifications, A-2
Error messages, B-5

F

Features, 1-1
Firmware version, 3-1

H

Height, A-1
Humidity, A-2

I

IEEE 802.3, 1-1
IEEE 802.3 standards, 3-1
Installation, 2-1
 backplane, 2-3, 2-8 to 2-9
 quick reference procedures, 2-1
 standalone, 2-1, 2-5
 wall mount, 2-5 to 2-8
IP address
 setting the, 3-2

M

Management
 MOP, 4-17
 remote, 4-17
MIB, C-2
 bridge, C-2
 character, C-5
 ITEF, C-2
 RS-232-like, C-4

N

Network activity display, 1-5
Network connector (BNC), 1-5
Networks
 CSMA/CD, 1-1
 IEEE 802.3, 1-1

O

Operating
 altitude, A-2
 dew point, A-2
 environment, A-2
 relative humidity, A-2
 temperature, A-2
 temperature change, A-2
Options
 ordering, D-2

P

Passwords, 3-1
Physical dimensions, A-1
Pin out
 DB25, A-3
 RS-232, A-3
Power
 120 Vac, 1-3
 240 Vac, 1-3
Power connector, 1-5
Power supply, 1-3
 current, A-3
 frequency, A-3
 output current, A-3
 output voltage, A-3
 power consumption, A-3
 specifications, A-3
 voltage, A-3

Q

Quick reference installation procedures, 2-1

R

Relative humidity, A-2

Reset

password reset, 1-5

to factory settings, 1-5

RS-232 pin out, A-3

S

Sample connection, 1-2

Segment length, 3-1

Self-test display, 1-5

Setting

a password, 3-1

the IP address, 3-2

Settings

factory, 4-20

terminal, 3-3

Shipping

altitude, A-2

environment, A-2

relative humidity, A-2

temperature, A-2

Slot table, C-6

Specifications

environmental, A-2

power supply, A-3

Standalone

installation, 2-5 to 2-8

System upgrade, 4-21

T

Temperature, A-2

maximum rate of change, A-2

Trap-PDU, 4-26

Troubleshooting, 5-4

DECagent 90 in DEChub 90 backplane, 5-3

standalone DECagent 90, 5-2

U

Upgrading

the DECagent 90, 4-21

W

Wall mount

standalone, 2-5 to 2-8

Weight, A-1

Width, A-1

