

DECagent 90

User Information

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About This Manual

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 or 900 Ethernet hub.

Organization

This manual contains four chapters, four appendices and a glossary:

- 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, and it contains terminal setup data.
- Chapter 3 describes how to operate the DECagent 90 on a network, using the console main menu options.
- Chapter 4 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 ordering related documentation.
- Glossary contains a glossary of common terms.

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

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.

1.1 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
- Needs no downline load at power-up
- Downline upgradeable for firmware upgrades (MOP protocol)
- Can be directly managed through SNMP
- Stores MIB settings in battery-backed RAM
- Provides out-of-band console port
- Hot swappable

1.2 Description

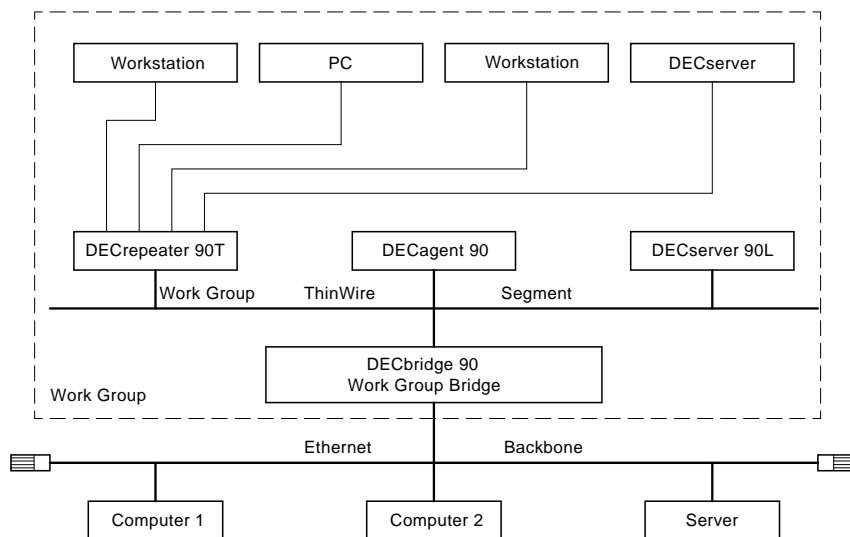
The DECagent 90 is a network management agent designed for IEEE 802.3/Ethernet CSMA/CD networks. The DECagent 90 uses the Simple Network Management Protocol (SNMP). The DECagent 90 has one ThinWire port and one console RS-232 port. The ThinWire port complies with the IEEE 802.3 standard for 10Base2 networks.

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.

The DECagent 90 is a proxy agent. A proxy agent physically resides outside of any manageable network module, such as a repeater or bridge. A proxy agent will possess an IP address that is associated with each of its client modules, so each manageable module doesn't need its own IP address, just a unique community string. The DECagent 90 translates SNMP packets for its non-SNMP client modules.

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



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1.2.1 How the DECagent 90 Works

The DECagent 90 acts as a proxy agent on behalf of its client modules. This includes, but not limited to, the DECserver 90L and the DECbridge 90. The DECrepeaters are managed by a DECbridge 90 in the hub. For proper operation, the DECagent 90 requires that the DECbridge 90 non-volatile RAM code be revision 3.0 or greater. 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 response to the querying Network Management Station (NMS).

Note

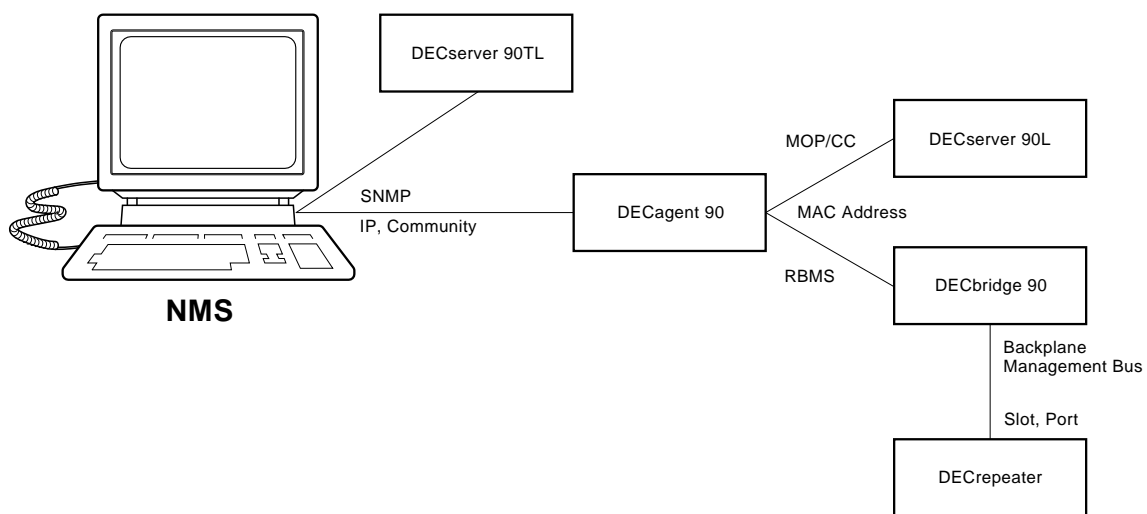
For the DECagent 90 to work properly, the DECbridge 90 firmware must be revision 3.0 or higher.

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
- ICMP

The DECagent 90 acts as a translator for the NMS. The DECagent accepts SNMP data packets from the NMS and translates them into MOP/CC for the DECserver 90L and RBMS for the DECbridge 90. DECrepeaters are managed on the DEChub management bus from the DECbridge. The DECserver 90TL is able to communicate directly with the NMS using SNMP. Figure 1-2 shows how the DECagent 90 communicates with the other modules.

Figure 1-2 How the DECagent 90 Communicates with Modules



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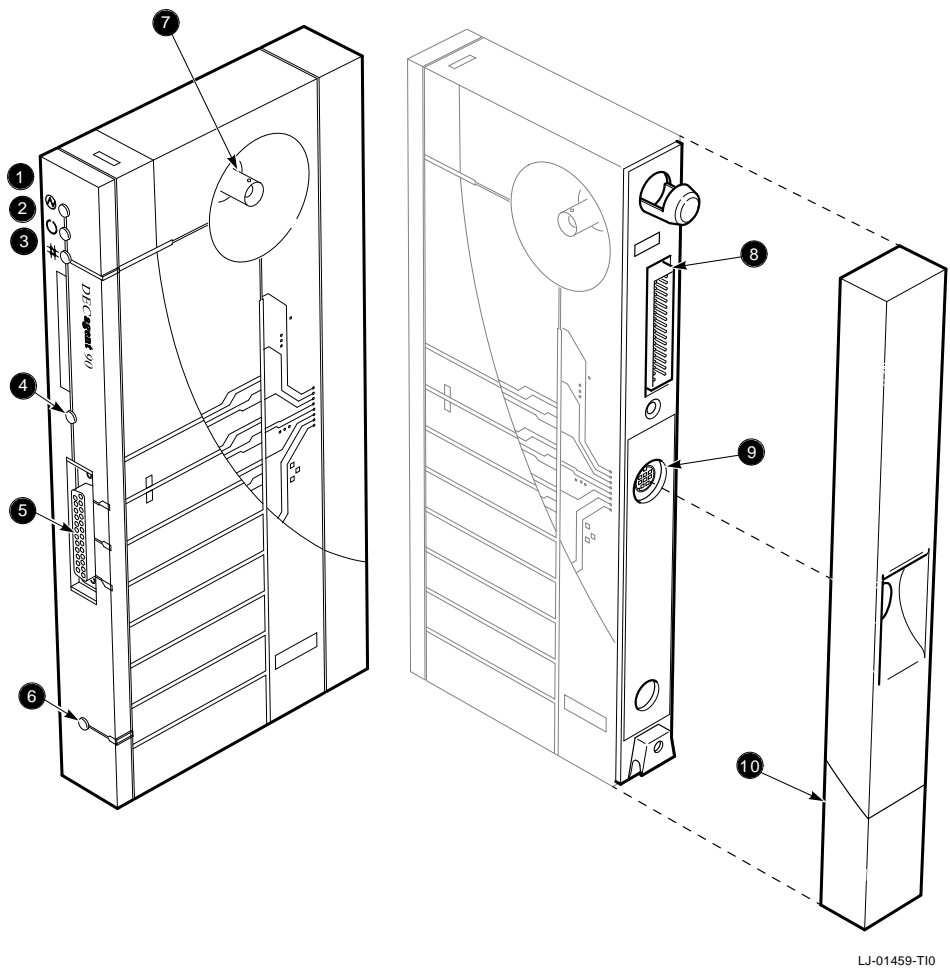
1.2.2 Power Supply

When operating as a standalone agent, power is supplied to the DECagent 90 with a separate 12 volt power supply. This power supply is connected to the DECagent 90 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 power cord. Appendix A contains additional information on the DECagent standalone power supply. Appendix D contains ordering information for the DECagent standalone power supply.

1.3 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



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Table 1–1 DECagent 90 LEDs and Connectors

1		<p>DC OK indicator—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 status. On: Self-test completed successfully. Off: Self-test is in progress. Flashing: Self-test has failed.</p>
3		<p>Network OK indicator—Monitors the network port. On: The network port is properly terminated. Off: The network port is not properly terminated. Flashing: Alternate flashing, at a 1-second interval, with the console serial port status LED indicates that an IP address has not been set.</p>
4		<p>Network Activity indicator – Monitors network activity. This LED will also flicker with auto-baud. Flicker: Port or network has activity. Off: Port or network is not operational. Flashing: Alternate flashing, at a 1-second interval, with the network port OK indicator indicates that an IP address has not been set.</p>
5		<p>Console serial port (RS-232) connector— Provides an interface to the DECagent 90 through a terminal.</p>
6		<p>Reset to factory switch—Resets the agent back to factory settings. Nullifies the password for the DECagent 90.</p>
7		<p>Network connector (BNC)— Connects the agent to the ThinWire segment. Not used when the agent is installed in the DEChub.</p>
8		<p>DEChub connector—This provides network and power connections to the DECagent 90 when it is installed in the DEChub.</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.</p>
10		<p>Back cover—Used with standalone units only. It covers the DEChub connector and mounting assembly.</p>

1.4 Client Communities

A community in the SNMP sense is a set of manageable entities that are managed as a group. Typically, there is a one-community-to-one-agent relationship. The manageable entities 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. 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.

Naming Community Strings

To keep track of the modules with community address strings, use a similar name for the hub and community 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 is case sensitive. Here are two examples of naming schemes:

```
MyHUBFloor3Room27  
COMM_LAB_HUB_3
```

DECagent 90 Communities

An SNMP proxy agent, such as the DECagent 90, translates from SNMP to the native protocols RBMS and MOP understood by its non-SNMP speaking client devices. The DECagents manageable entities are separate and distinct hardware devices. The relationship is not one agent to one community, but several communities per DECagent 90. A particular manageable entity is still identified on the network by the combination of an IP address and a community string. Each community supported by the DECagent 90 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 DECagent 90 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 is treated as one community. One DEChub 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.

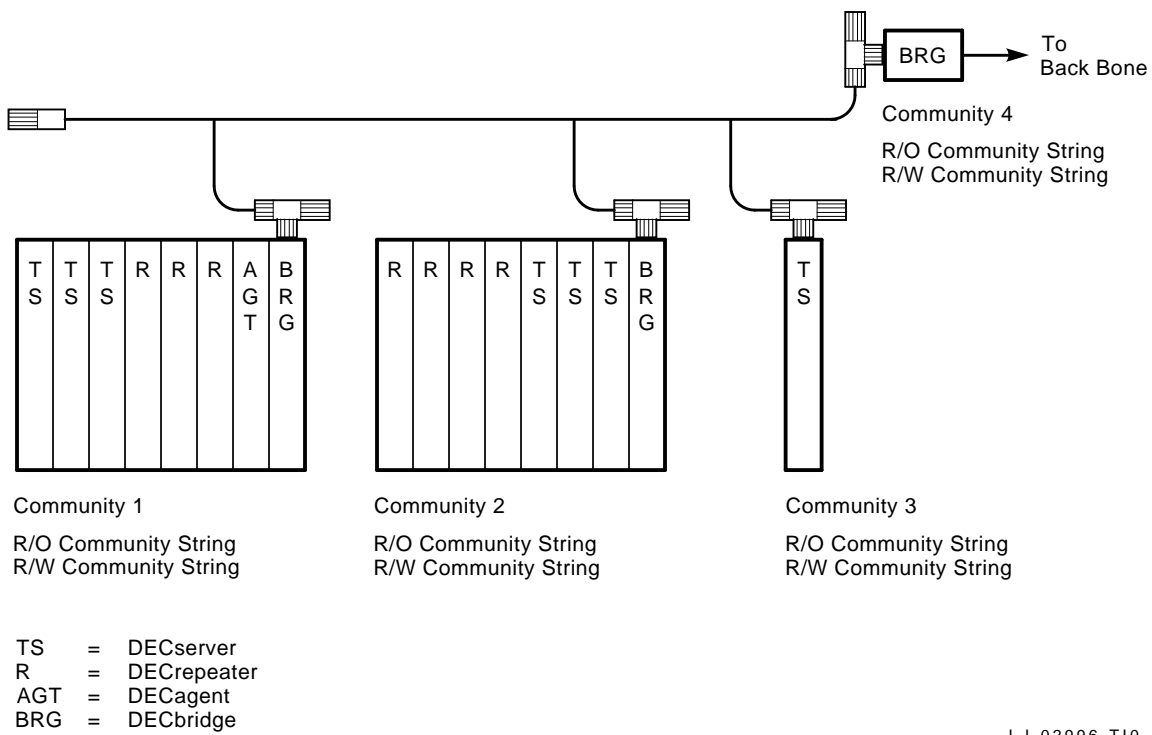
A new community is created in the DECagent 90 by giving it a community type (standalone or DEChub), and the read-only and read-write community strings. The default community created for a type of DEChub will have 8 slots. This can be changed to a double hub by setting the MIB object dh90NumberSlots to 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. The DECagent 90 will sense when it is in a hub or standalone. 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 dh90NumberSlots 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.

Figure 1-4 displays a sample DECagent 90 community.

Figure 1-4 Sample DECagent 90 Community Structure



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2

Installation

This chapter describes how to install the DECagent 90 as a standalone unit or in a DEChub. This chapter also provides the terminal settings required for console management.

It details installation procedures and provides illustrations with callouts related to the primary steps of the installation.

2.1 Terminal Setup

Table 2-1 lists the terminal settings that are required to establish a terminal session with the DECagent 90. Ensure that the following terminal setup parameters are in effect.

Table 2-1 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

2.2 Required Tools and connectors

To install a DECagent 90 you will need the following tools and connectors:

- Screwdriver
- T-Connector
- 50-ohm terminator

2.3 Standalone Installation

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

2.3.1 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.

2.3.2 Table Top Installation.

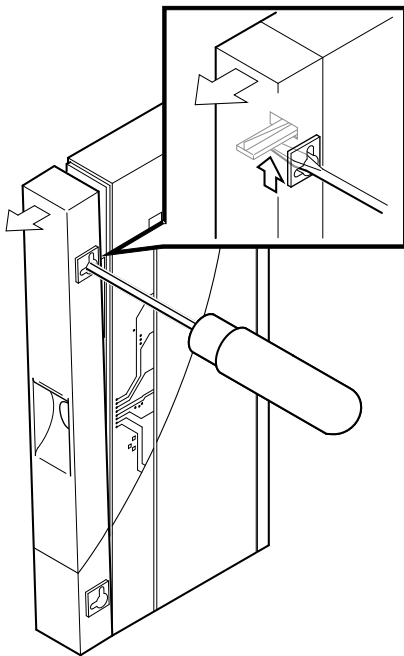
Place the DECagent 90 on a table top and connect the cables as detailed in Section 2.3.4

2.3.3 Wall Mount Installation.

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 2-1).
 - 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.

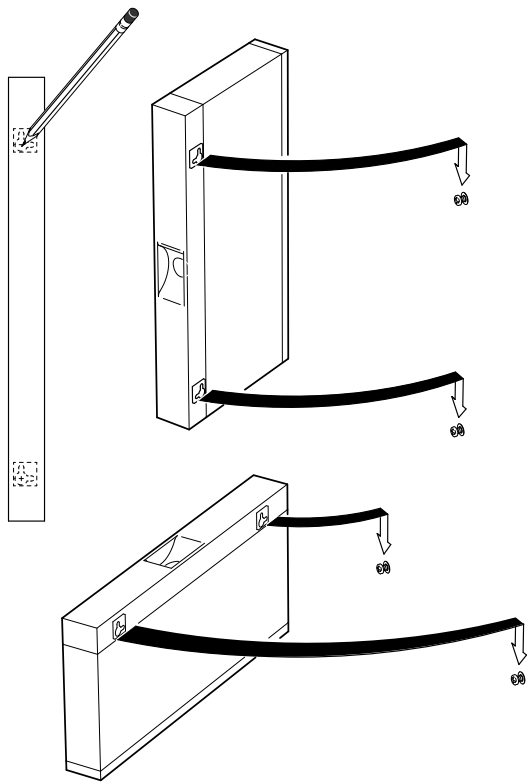
Figure 2-1 Removing the Back Cover



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2. Use the mounting holes on the back cover to determine the placement for the mounting screws on the wall (Figure 2-2).
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 2–2 Mounting the DECagent 90 on a Wall



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2.3.4 Connect The Cables.

To connect the cables, use the following procedure and refer to Figure 2–3:

1. Connect the Ethernet ThinWire T-connector to the network connector on the side of the module **1**. Terminate the T-connector with a 50-ohm terminator or extend the Ethernet segment to the next device.

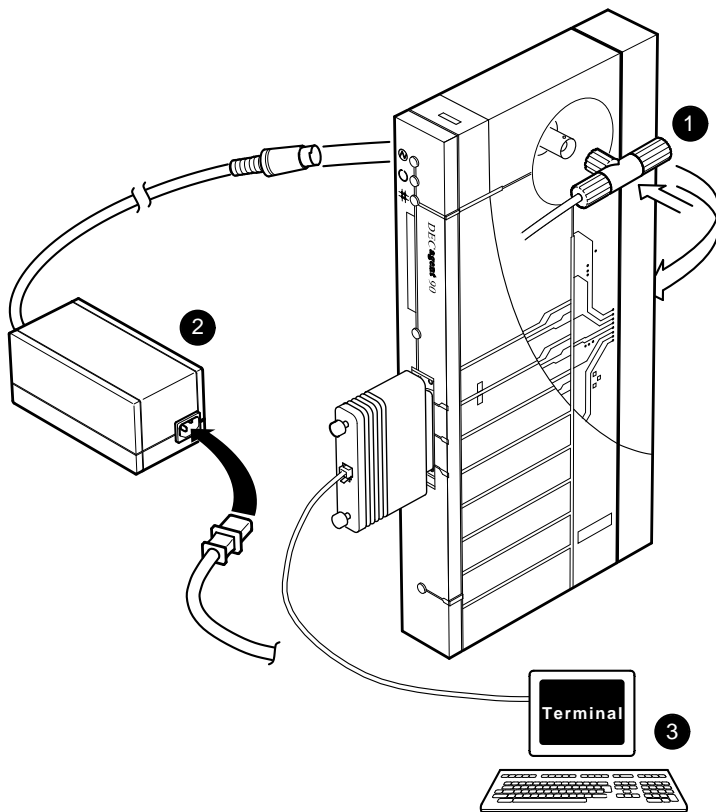
Once power is applied, the port network activity LED should be on or flashing to indicate the amount of traffic on the network. The LED intensity varies with the amount of network activity.

2. Connect the cable from the power supply **2** 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. 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 ten seconds, the network port OK indicator and the console serial port (RS-232) status LEDs turn off while the other LEDs stay on.

3. Connect a terminal **3** to the front panel port. Press `Return` a few times to activate the terminal connection. Once a connection has been established you will be prompted to enter a password. If a password has previously been established the pound (#) prompt will appear.

Figure 2-3 Connecting the Cables



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2.4 DEChub Installation

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

Note

Only one DECagent 90 can be installed in a DEChub.

2.4.1 Mount the DECagent 90 in the DEChub.

See Figure 2–4 when performing the following procedure.

1. Remove the back cover ❶. To remove the back cover insert a small screwdriver into the top mounting hole located on the cover. Lift up on the latch with the screwdriver, and pull the cover away and down from the top of the unit.
2. Install the DECagent 90 in the DEChub ❷ Place the lower mounting tab, located on the back of the DECagent 90 into a DEChub slot.

Note

When installing a DECagent 90 into a DEChub 90, slot 7 or 8 of the DEChub must be used.

3. Rock the DECagent 90 into place. You will hear a click when the DECagent 90 is secured in the slot.

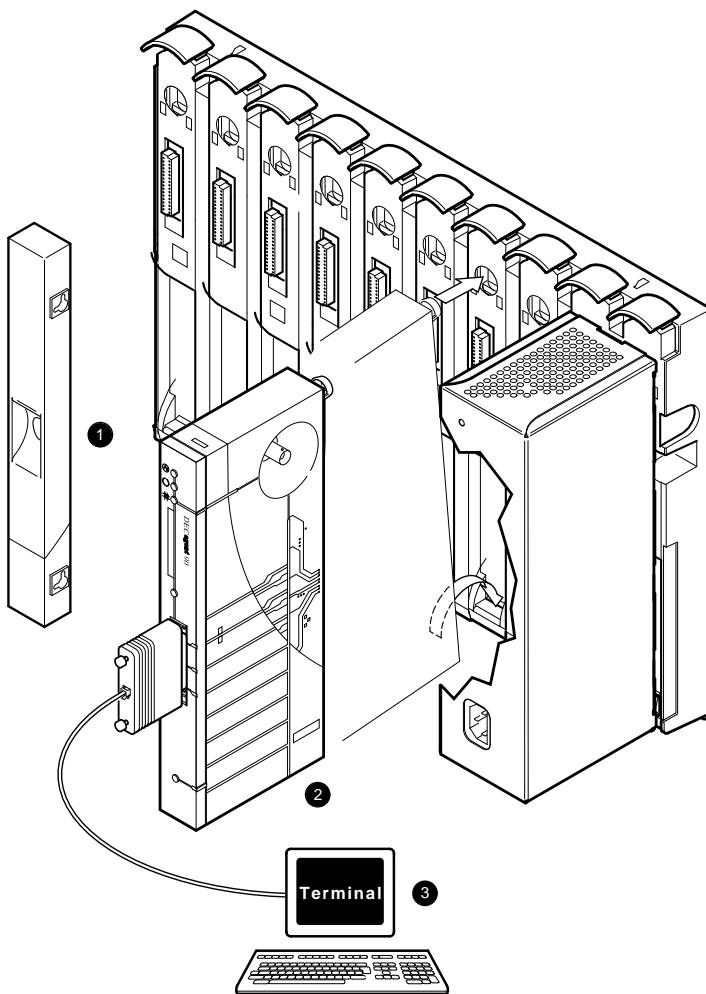
Note

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

All LEDs on the DECagent 90 turn on either immediately or at initial power-up. The self-test LED will turn off to indicate self-test is in progress. The self-test LED will turn on when self-test has completed successfully. If the self-test LED starts to flash, self-test has failed. After approximately five seconds, the network LED flashes with intensity that is proportional to the amount of network activity on the port.

4. Connect a terminal **3** to the front panel port. Press `Return` a few times to activate the terminal connection. Once a connection has been established you will be prompted to enter a password. If a password has previously been established the pound (#) prompt will appear.

Figure 2-4 DECagent 90 DEChub Installation






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2.4.2 DECagent Status LEDs

Table 2–2 contains the normal operating status of the DECagent 90 LEDs.

Table 2–2 DECagent 90 LEDs

LED	Symbol	Status
DC Ok indicator		On: The +12.0 Vdc voltage is normal.
Self-test OK indicator		On: Self-test completed successfully.
Network OK indicator		On: The network port is properly terminated.
Network Activity indicator		Flickering: Port or network has activity.

2.5 Power-Up

When you power-up the DECagent, the DECagent performs self-test. The DECagent 90 then enters an operational mode if an IP address has been established. At initial installation the DECagent 90 will not have an IP address and it will attempt to obtain its IP address using the bootp protocol. If the DECagent 90 fails to acquire its IP address through bootp, it will have to be added manually. Section 3.3 contains the necessary information to set the DECagent 90 IP address.

2.6 Reset to Factory Settings

The DECagent can be reset to factory settings in two ways. One way is to cycle the power to the DECagent 90 and then press and hold the factory reset switch for a minimum of 15 seconds. The other way is through the console interface. See option 21 in Chapter 3.

3

DECagent 90 Management

This chapter contains the following:

- Configuration rules to follow for correct operation of the DECagent 90.
- Information about setting the following:
 - A password
 - The IP address
 - Terminal setup
- The console main menu options that you use to manage the DECagent 90 and the modules in its community.

3.1 Configuration Rules

The configuration rules for the DEChub 90 are as follows:

- Only one DECagent 90 may reside in a DEChub 90.
- Only one DECbridge 90 may reside in a DEChub 90.
- The DECagent 90 and DECbridge 90 must be installed in slot 7 or 8.
- A console password must be set. Setting a password will help to prevent unauthorized access.
- An IP address must be set in the DECagent 90. Without an IP address other modules will not be able to communicate with the DECagent 90.

3.2 Console Communications

This section details how to establish a console communications session and set the password.

3.2.1 Establishing a DECagent 90 Front Panel Console Port Communication Session

To establish a DECagent 90 front panel console session, do the following:

1. Connect a terminal to the console (RS-232)port and press `[Return]` a few times.
The DECagent 90 prompts you to set a password; or if a password is already set, a pound sign (#) appears.
2. Enter the password at the # and press `[Return]`.
The console main menu appears.

3.2.2 Setting a Console Password

You must set a password at initial power-up and after a reset to factory settings has been performed. To set a console password, perform the procedure in Section 3.2.1. Once a console session is established the following message appears on the console:

```
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 prompt and press `[Return]`. The password will not be echoed on the screen. You will be prompted to verify your password.

3.3 Setting the IP Address

There are two ways to set the IP address:

1. Through the DECagent 90 front panel console port using a terminal
2. On an ULTRIX NMS by modifying the bootp table

3.3.1 Through the DECagent 90 front panel console port

Section 3.4.2.9 contains information on how to set the DECagents IP address through the console port.

3.3.2 Modifying the Bootp Table

To set the IP address over the network, you must have a bootp server with a bootp daemon running. On the ULTRIX NMS, use the following examples, as a guide, to set the IP address:

1. Start the bootp daemon, if not already running, by entering the following command:

```
bootpd &
```

2. Add a line, similar to the following, to the /etc/bootptab file:

```
agent1 1 08.00.2b.29.4d.28 16.126.99.235
```

3. Add a line, similar to the following, to the /etc/hosts file:

```
16.126.99.235 agent007.mlo.dec.com agent1
```

4. Power cycle the agent after the edits are complete and the bootpd has been started. When the DECagent 90 powers up it will request an IP address from the bootp server.

3.4 Console Management

Console management is performed through the front console port on the DECagent 90 with a terminal. Connect a terminal to the front console port and press `[Return]` a few times to activate a console session.

3.4.1 Using the Console Interface

The following conventions apply when you use the console interface:

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

3.4.2 Console Main Menu

This section contains the console main menu and an example of each option. The console main menu appears after you enter the password. The main menu contains the following options:

```
Sets Enabled          DECagent 90 SNMP Network Management Agent          V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16   IP Address: 16.123.96.255   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:

The first time the menu is displayed or after a factory reset, the following informational tip will appear at the bottom of the screen:

```
To facilitate hub management, do the following:
* Add a bridge to the community using [14] Add Module
* Connect to the bridge console using [18] Connect
* Enter the DECbridge command: SET BRIDGE HUB_MANAGEMENT ENABLE
```

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

Note

For security reasons the read-write community string of the DECagent's community should be changed to something other than the default of "public".

3.4.2.1 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      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16  IP Address: 16.123.96.255  System Uptime: 12 09:32:25
                                   Show Community
```

Type: DEChub 90-16

```
Read-Only Community String: public2
Read-Write Community String: public2
Trap Community String:
```

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

```
Total Slots: 16  Agent Slot: 7  Bridge Slot: 8  Interface Number: 6
Proxied Terminal Ports: 24  Proxied Repeater Ports: 66
```

```
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
```

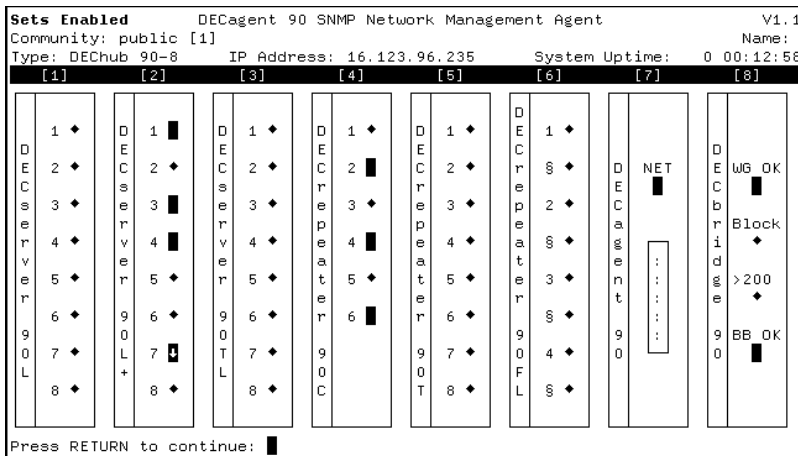
Press RETURN for more...

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

If the community is a 16-slot DEChub 90, press **Return** to display a third screen. This screen contains a graphic display of slots 9 through 16.

Figure 3-1 shows a typical Show Community screen for a hub configuration.

Figure 3-1 Show Community Screen



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Note

When a module is first added or becomes unreachable, it is highlighted on the screen. When the module responds to the periodic 20 second poller, the highlighting is removed. If the module does not respond to the poller for two or more consecutive polling cycles, the highlighting flashes. Discoverable modules which do not respond to the poller are removed from the community.









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

Press RETURN to continue:

Press **[Return]** to return to the main menu.

Table 3-1 describes the meaning of the DECrepeater 90 and DECserver 90 port LEDs as seen on the DECagent console.

Table 3-1 DECrepeater and DECserver Concole LEDs

Indicator	Agent Admin Status ¹	Module Admin Status ²	Module Oper Status ³	Comments
	*	*	*	The state of the indicator is unobtainable through the DECagent 90.
	↑	↑	↓	Port is enabled but not active.
	↑	↑	↑	Port is enabled and active.
	↓	↓	↓	Port is disabled.
	↓	↑	↑	Port is enabled and active, however the DECagent 90 desires the port to be disabled. ^{4 6}
	↓	↑	↓	The port is enabled and active, however the DECagent 90 desires the port to be disabled. ^{4 6}
	↑	↓	↑	The port is disabled, but has a properly terminated connection, however the DECagent 90 desires the port to be enabled. ^{5 7}
	↑	↓	↓	Port is disabled and inactive, However the DECagent 90 desires the port to be enabled. ^{5 7}

¹DECagent 90 Admin Status—The state in which the network manager wants the port to be in.

²Module Admin Status—The state in which the module wants the port to be in.

³Module Operational Status—The actual port state.

⁴This could be caused by the repeater having been power-cycled, which causes the port to return to it's default non-management partitioned state.

⁵This could be caused by someone partitioning the port from another management station, or through the work group bridge's MOP Console Carrier interface.

⁶If the module is arepeater and polling is enabled in the Work group bridge, within 20 seconds the DECagent 90 will try to disable the port.

⁷This particular state of the DECagent 90 will not try to enable the port.

3.4.2.2 Add Community

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

```
Sets Enabled      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16  IP Address: 16.123.96.255  System Uptime: 12 09:32:25
                                     Add Community
```

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

```
[1] Standalone
[2] 8-slot DEChub 90
[3] 16-slot DEChub 90
[4] DEChub 900
[5] Exit
```

Enter the community type:

Enter the appropriate information at the prompt and press .

Note

Each pair of community strings must be unique within the DECagent.
Community strings are case sensitive.

The following message and prompt appears:

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.

Will a bridge be a member of this community?

Respond with Yes to add a bridge to the community. Respond with No to add other modules.

If you answer Yes to the above prompt, the following reminder appears:

```
***** Please be certain that the bridge's backbone port
***** has a properly terminated network connection.
```

After you decide whether or not to add a bridge, you will receive the same prompts as in the Add Module option. See Section 3.4.2.14 for more information.

After each module is entered, the following prompt appears:

```
Add another module? <YES>
```

3.4.2.3 Remove Community

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

```
Sets Enabled      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16  IP Address: 16.123.96.255  System Uptime: 12 09:32:25
Remove Community

Index      Community Type      Community Strings
[1]        Standalone          Read Only: public
           DECagent 90         Read Write: public
[2]        DEChub 90-16       Read Only: public2
           DEChub 90-16       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 Yes or No.

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

You will then be asked if you want to remove another community.

Note

You will not be allowed to remove the community in which the DECagent resides.

3.4.2.4 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.

A trap is an SNMP packet sent to the NMS, from an agent, with notification about an extraordinary event. These events would be problems or discoveries that have occurred to the agent or its managed communities. When you choose the Add Community Trap Addresses option, the following appears:

```
Sets Enabled      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16  IP Address: 16.123.96.255  System Uptime: 12 09:32:25
                Add Community Trap Addresses
```

There are no trap addresses 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.

Note

If you wish to add a trap address that is outside of your subnet, be sure to define a default gateway address. See option 9, Set agent IP address.

If you attempt to add a trap address which is equal to the DECagent's IP address, the following warning and prompt will appear:

```
Trap address aaa.bbb.ccc.ddd is equal to the DECagent 90' IP
address.
```

```
Enter it anyway? <NO>
```

If you answer Yes, the DECagent's IP address will be added to the current community's trap address table. Note, however, that traps will not be sent to the DECagent's IP address. Respond with No to skip adding this trap address and try again.

Generic Traps

Table 3–2 contains the generic traps that are supported in V1.1 of the DECagent 90.

Table 3–2 Generic Traps

Integer	Trap Type
coldStart(0)	Agent has just powered up.
warmStart(1)	Agent has reset but not power-cycled.
authenticationFailure(4)	SNMP PDU contained an unknown community string.

Enterprise Specific Trap

Table 3–3 contains the enterprise specific traps that are supported in V1.1 of the DECagent 90.

Table 3–3 Enterprise Specific Trap

Integer	Trap Type
hubTopologyChange(4)	A NMS has added, deleted or moved a module in a community.

3.4.2.5 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.

3.4.2.6 Change Community String

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

```
Sets Enabled      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16  IP Address: 16.123.96.255  System Uptime: 12 09:32:25
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 the read-only and read-write
community strings of this community to null.
```

```
*****
```

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

Enter your selection:

If the current community is the DECagent's, the above notice will contain the following in place of the second paragraph:

```
Since the current community is the DECagent 90's, you will not be
allowed to set the read-write community string to null.
```

The following table describes the prompts for 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 with that community string, by pressing only **[Return]** in response to the prompt. You cannot set both the read-only and read-write community

strings to null. In addition, you will not be allowed to set the read-write community string of the DECagent's community to null.

3.4.2.7 Change Community Size/Type

Option 7, Change Community Size/Type, allows you to change the type of the selected community. This includes expanding or shrinking the size (number of slots) of an existing DEChub community. When you choose this option, the following appears:

```
Sets Enabled      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16  IP Address: 16.123.96.255  System Uptime: 12 09:32:25
Change Community Size/Type
```

Index	Community Type	Community Strings
[1]	Standalone DECagent 90	Read Only: public Read Write: public
[2]	DEChub 90-16	Read Only: public2 Read Write: public2

Enter the community index <2>:

After you select an index, the following menu and prompt appears.

```
[1] Standalone
[2] 8-slot DEChub 90
[3] 16-slot DEChub 90
[4] DEChub 900
[5] Exit
```

Enter the community type:

3.4.2.8 Change Default Community

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

```
Sets Enabled      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16  IP Address: 16.123.96.255  System Uptime: 12 09:32:25
Change Default Community
```

Index	Community Type	Community Strings
[1]	Standalone DECagent 90	Read Only: public Read Write: public
[2]	DEChub 90-16	Read Only: public2 Read Write: public2

Enter the community index <2>:

3.4.2.9 Set Agent IP Address

Option 9, Set Agent IP Address, allows you to set the IP address and change the default router/gateway for the DECagent. When you choose this option, the following appears:

```
Sets Enabled      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16  IP Address: 16.123.96.255  System Uptime: 12 09:32:25
                  Set Agent IP Address
```

Current IP Configuration:

```
IP Address:          16.123.96.255
Network Mask:        255.0.0.0 (Class A)
Network Broadcast Address: 16.255.255.255
Default Gateway:     0.0.0.0
```

Enter the IP address <16.123.96.255>:

Enter the IP address using the following format:

```
aaa.bbb.ccc.ddd
```

A valid value in each field is 0 to 255 decimal. Press only if you do not want to change the IP address.

Note that when you change the IP address, the Network Broadcast Address and Network Mask may change depending on the class of network the new IP address is in.

To cause the DECagent to issue a BOOTP request for its IP address, enter a zero (0) at this prompt. You will then be asked to restart the DECagent so that the BOOTP request can be issued.

If you attempt to set the DECagent's IP address to an address which is in a community trap address table, the following warning and prompt will appear:

```
IP address aaa.bbb.ccc.ddd found in the trap table of community
[n].
```

```
Enter it anyway? <NO>
```

where *n* is the index of the community in which the trap address was found.

If you answer Yes, the DECagent's IP address will be set to the desired value. Note, however, that traps will not be sent to the DECagent's IP address. Respond with No to set another IP address.

You will then be prompted to enter a default gateway, as follows:

```
Enter the default gateway:
```

Enter the default gateway address using the same format as the IP address. If you do not want to define a default gateway, press only .

3.4.2.10 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 SNMP Sets are currently enabled, choosing this option will disable them.

When SNMP sets are enabled you will be allowed to read module information and make changes to modules. When SNMP sets are not enabled you will be allowed to read module information, but you will be prohibited from making changes.

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.

3.4.2.11 Change System Information

Option 11, Change System Information, allows you to set a node name for the DECagent 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 appears:

```
Sets Enabled          DECagent 90 SNMP Network Management Agent          V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16   IP Address: 16.123.96.255   System Uptime: 12 09:32:25
                  Change System Information
```

- [1] Agent Node Name
- [2] System Name
- [3] System Location
- [4] System Contact
- [5] Exit

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 only **[Return]** at any prompt. To set a string to null, enter two double quotes (") at the prompt. The DECagent node name appears on the second line of the console header. The system information is community-specific and can be seen by choosing the Show Community option.

3.4.2.12 Change Security Configuration

Option 12, Change Security Configuration, allows you to change the console password, configure the console timeout feature, enable or disable Remote Downline Load of the DECagent software image, and enable or disable the issuing of the SNMP Authentication Failure Trap. Select your choice from the following menu. The next sections describe how to use each selection.

```
Sets Enabled      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16  IP Address: 16.123.96.255  System Uptime: 12 09:32:25
Change Security Configuration
```

- [1] Change Console Password
- [2] Change Console Timeout
- [3] Configure Remote Downline Load
- [4] Configure Authentication Failure Trap
- [5] Exit

Enter your selection:

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:

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 by a modem, the telephone line is also disconnected.

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.

The current console timeout value is *mn* minutes.

where *mn* 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) <*mn*>:

where *mn* 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 to factory settings.

Configuring Remote Downline Load

Remote Downline Load is a feature which allows the DECagent to be field-upgraded when a new version of the software image is made available. The default configuration is to allow Remote Downline Load. You may disable this feature by selecting this option, for which the following message and prompt will appear:

Remote Downline Load is currently enabled.

Disable it? <YES>

Entering Yes will disable Remote Downline Load. Enter No if you do not wish to disable it at this time.

Configuring Authentication Failure Trap

Authentication Failure Trap is a feature which causes the DECagent to issue an SNMP generic trap to a series of trap (IP) addresses on the network (see Add Community Trap Addresses). The default configuration for this feature is disabled, which means no traps will be issued when an authentication failure occurs. An SNMP authentication failure occurs when the NMS requests information about a community using a community string unknown to the agent. You may enable this feature with an affirmative response to the following message and prompt:

Authentication Failure Trap is currently disabled.

Enable it? <YES>

Note that the authentication failure trap is issued to the trap addresses defined for the community in which the DECagent resides.

3.4.2.13 Show Module

Option 13, Show Module, graphically displays module information on the screen. If there is more than one module in the community, a screen similar to the following appears:

```
Sets Enabled      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16  IP Address: 16.123.96.255  System Uptime: 12 09:32:25
                Show Module

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

Enter the slot number <nn>:

A graphical representation of the selected module's front panel appears along with some pertinent information about the module; for example:

```
Slot: 2  Interface:  0  Polling: Enabled  Name: Office 33C

  Agent Module Port Port      Agent Module Port Port
# Admin Admin Oper Name      # Admin Admin Oper Name
1  ↑      ↑      ↑      Office 1      5  ↑      ↑      ↑      Office 5
2  ↑      ↑      ↑      Office 2      6  ↑      ↑      ↑      Office 6
3  ↑      ↓      ↓      Office 3      7  ↑      ↑      ↑      Office 7
4  ↓      ↓      ↓      Office 4      8  T      ↓      ↓      Bryan's Office

Show the next module? <YES>
```

Note

The symbols (↑) and (↓) in the above display will appear as (+) and (-) respectively if your terminal does not support the DEC Technical Character Set.

For devices which have a security password, the password will appear beneath the "Slot" information above. Devices which contain their own on-board SNMP agent will have their IP address and access community string (if known) displayed on the line beneath the "Slot" information.

Press and the module in the next highest slot in the community will automatically be displayed. If there are no modules in higher slots, the display will wrap around to the module in the lowest slot number in the community.

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

Press RETURN to continue:

Figure 3-2 shows a typical Show Module screen.

The first column in the above port display shows the port number.

The second column is the port administrative (admin) status which the DECagent has stored in its database. This is the desired state of the port. This status is "enabled" (↑) by default but can be set to "disabled" (↓) by an SNMP request.

The third column is the module's admin status for that port. This status is derived from the port's operational (oper) status received when the module is polled. Repeater ports indicate whether or not they are partitioned (↓), and if partitioned give a reason for the partitioning. An operational port with no connection established will also indicate the "enabled" state (↑). An operational port with no connection will indicate the "disabled" state (↓). Terminal servers indicate whether or not a port is enabled, and also provide information about ports with active (↑) connections, inactive (↓) connections, or ports in test mode (T).

The fourth column shows the operational (oper) status of a port. This status indicates if the port has an active connection (↑) or is inactive (↓).

The fifth column shows the port name, if any.

When there is a discrepancy between the Agent Admin status and the Module Admin status, the port LED will contain an arrow (↑ or ↓) when it can be determined whether or not there is an active connection on that port. This will usually indicate that the port status has been changed by an entity other than the agent. For example, another management station, a direct connection to a device (MOP to a terminal server, enabling/disabling a repeater port from a bridge), or power-cycling a device which causes it to reset to defaults which are different from those contained in the DECagent can all be responsible for discrepancies in admin status.

Note that the DECagent attempts to rectify discrepancies with repeater ports when the DECagent thinks the port should be disabled and the port status indicates that it is enabled. The reverse is not true, however. The DECagent will not enable a port when it thinks it should be enabled and the port status indicates that it is disabled.

Figure 3-2 Show Module Screen

```

Sets Enabled      DECagent 90 SNMP Network Management Agent      V1.1
Community: public [1]                                         Name:
Type: DEChub 90-8      IP Address: 16.123.96.235      System Uptime: 0 00:22:22
                                Show Module

DECserver 90L+
██████████ ██████████ ██████████ ██████████ ██████████ ██████████ ██████████ ██████████ ██████████
08-00-2B-2D-7F-57      1      2      3      4      5      6      7      8

Slot: 2      Interface: 5      Polling: Enabled

  Agent Module Port Port      Agent Module Port Port
# Admin Admin Oper Name      # Admin Admin Oper Name
1  ↑      ↑      ↑      TERM_1      5  ↑      ↑      ↓      PR_1
2  ↑      ↑      ↓      TERM_2      6  ↑      ↑      ↓      PR_2
3  ↑      ↑      ↑      TERM_3      7  ↑      ↓      ↓      TERM_7
4  ↑      ↑      ↑      TERM_4      8  ↑      ↑      ↓      TERM_8

Show next module? <YES> █
Enter CTRL-C or ESC to return to the main menu

```

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3.4.2.14 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:

```
Sets Enabled      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16  IP Address: 16.123.96.255   System Uptime: 12 09:32:25
                  Add Module

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

Enter the slot number <nn>:

where *nn* is the first empty slot number. Enter a slot number in the range 1 through 8 for an 8-slot DEChub 90 or DEChub 900 and 1 through 16 for a 16-slot DEChub 90. After you enter a slot number, the following appears on the screen:

```
[1] DECbridge 90 (AUI/Coax)
[2] DECbridge 90FL (AUI/Fiber)
[3] DECserver 90L
[4] DECserver 90L+
[5] Exit
```

Enter the module type:

When adding modules to a community, the modules in the above list must be manually added because they are not automatically discoverable when inserted into a DEChub.

Note

The DECserver 90TL is not auto-discoverable and must be added through SNMP.

The DECbridge 90 and DECbridge 90FL modules must reside in slot 7 or 8 of a DEChub 90.

If you want to add module type [1] or [2] to a DEChub 90 and you select a slot number other than 7 or 8, then the following message appears provided either slot 7 or 8 is vacant:

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>

If you answer Yes to the prompt, you will be prompted for the slot number as follows:

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 of the required slots 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*. The MAC address is accessible from the front panel of the module to be added.

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

Add another module? <YES>

3.4.2.15 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      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16  IP Address: 16.123.96.255  System Uptime: 12 09:32:25
Remove Module

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

Enter the slot number:

You will then be asked to verify that you want to remove the module from the slot. For example, if you entered "4" at the prompt for the slot number, the following message and prompt would appear:

```
The DECserver 90L will be removed from slot 4.
Are you sure?
```

If you enter Yes at this prompt, then the module in that slot is removed from the community. If you enter No, then the module is not removed from the slot. In either case 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.

3.4.2.16 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      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16  IP Address: 16.123.96.255  System Uptime: 12 09:32:25
                    Move Module

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

Move from slot number:

After you enter the slot number of the module you wish to move, the following prompt appears:

Move to slot number:

You must enter the slot number of an empty slot. When this is complete, the module will be moved to the new slot. Finally the following appears:

Move another module? <YES>

3.4.2.17 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      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16  IP Address: 16.123.96.255  System Uptime: 12 09:32:25
                  Change Module MAC Address

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

Enter the slot number <n>:

where *n* is the first slot which contains a module whose MAC address may be changed. In the above screen, *n* would be 4.

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

Changing the MAC address of the <module type> in slot <nn>.

Enter the MAC address <uu-vv-ww-xx-yy-zz>:

where *uu-vv-ww-xx-yy-zz* 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.

3.4.2.18 Connect

Option 18, Connect, allows you to do the following:

- Connect to a remote device using the MOP console carrier
- Manage remote devices using MOP
- Manage repeaters by connecting to a bridge

When you choose option 18, the following appears:

```
Sets Enabled          DECagent 90 SNMP Network Management Agent          V1.1
Community: public2 [2]                                     Name: DEChub
Type: DEChub 90-16   IP Address: 16.123.96.255   System Uptime: 12 09:32:25
                                     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 of the device to which you are connected.

To disconnect the session, press Ctrl/D.

Note

You will only be able to connect to a device on the same LAN, since MOP is not a routed protocol.

3.4.3 Loop

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

```
Sets Enabled      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16  IP Address: 16.123.96.255  System Uptime: 12 09:32:25
                                   Loop
```

```
[1] ISO 802.2 XID Poll
[2] ISO 802.2 XID Loopback
[3] MOP V3 Loopback
[4] MOP V4 Loopback
[5] Exit
```

Enter the type of loopback:

Select the type of loopback you wish to perform and press . The following prompt then appears:

```
Enter the MAC address:
```

Enter the MAC address of a device to which you want the loopback packet to be sent. If you selected loopback type [3] or [4] above, you will be prompted to enter a series of MAC addresses, starting as follows:

```
Enter MAC address #1:
```

You can enter up to 20 MAC addresses to which the loopback packet will be sent. When you have entered all the MAC addresses you want to send the loopback packet to, press only the key in response to the MAC address prompt. To delete an entry in the table of MAC addresses that you entered during a previous Loop command (if a default appears at the prompt), enter a "0" (zero) in response to the prompt.

The following prompt will appear if you selected loopback types [1] or [2]:

```
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.

Once the loop is complete, a message will appear indicating whether or not the loop completed successfully, then the following prompt appears:

```
Same loop again? <YES>:
```

Press to perform the same loop again. Enter No followed by to return to the main menu.

3.4.3.1 Show Counters

Option 20, Show Counters, allows you to view the MOP datalink counters for a specified device. When you choose this option, the following appears:

```
Sets Enabled      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                               Name: DEChub
Type: DEChub 90-16  IP Address: 16.123.96.255  System Uptime: 12 09:32:25
                                   Show Counters
```

Enter the MAC address <uu-vv-ww-xx-yy-zz>:

where *uu-vv-ww-xx-yy-zz* is the MAC address of either the DECagent 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
uuvvwwxxyyzz
```

where *uu*, *vv*, *ww*, *xx*, *yy* and *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.

Note

MOP 4 counters are more detailed than MOP 3, but are not supported by all modules.

MOP V3 Counters for 08-00-2B-11-22-33

Seconds since last zeroed	3846	Send failure	12
		Excessive collisions	*
Bytes received	11037	Carrier check failed	
Bytes sent	3996	Short circuit	
Frames received	67	Open circuit	
Frames sent	76	Frame too long	*
Multicast bytes received	2571183	Remote failure to defer	
Multicast frames received	7043	Receive failure	5
Frames sent		Block check error	
Initially deferred	9	Framing error	*
Single collision	1	Frame too long	
Multiple collisions	0	System buffer unavailable	0
Unrecognized frame dest'n	354	User buffer unavailable	0
Data overrun	0		

MOP V4 Counters for 08-00-2B-11-22-33

Time since counter creation		Send failure	
01:04:06.000		Excessive collisions	10
Bytes received	11037	Carrier check failed	0
Bytes sent	3996	Short circuit	0
Frames received	67	Open circuit	0
Frames sent	76	Frame too long	2
Multicast bytes received	2571183	Remote failure to defer	0
Multicast frames received	7043	Receive failure	
Frames sent		Block check error	0
Initially deferred	9	Framing error	5
Single collision	1	Frame too long	0
Multiple collisions	0	System buffer unavailable	0
Unrecognized frame dest'n	354	User buffer unavailable	0
Data overrun	0	Collision detect check fail	0

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

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 Send and Receive Failure types are not kept by MOP V3 for these counters.

Note

The DECserver 90L and DECserver 90L+ modules do not support MOP Version 4.

3.4.3.2 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 and press the reset button at the same time. When you choose this option, the following warning message and prompt appears:

```
Sets Enabled      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                                     Name: DEChub
Type: DEChub 90-16   IP Address: 16.123.96.255   System Uptime: 12 09:32:25
                  Restore Factory Settings
```

```
* * * * * WARNING WARNING WARNING WARNING WARNING * * * * *
```

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.

Are you sure? <NO>

If you answer Yes, the following messages will appear:

Factory settings are being restored ...

Please wait at least 5 seconds before reconnecting to the console.

Caution

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

3.4.3.3 Reset the Agent

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

```
Sets Enabled      DECagent 90 SNMP Network Management Agent      V1.1
Community: public2 [2]                                     Name: DEChub
Type: DEChub 90-16   IP Address: 16.123.96.255   System Uptime: 12 09:32:25
Reset the Agent
```

```
* * * * * WARNING WARNING WARNING WARNING WARNING * * * * *
```

Resetting the DECagent 90 will result in a restart of the session.

Are you sure? <NO>

If you answer Yes, the following messages will appear:

The DECagent is being reset ...

Please wait at least 5 seconds before reconnecting to the session.

3.4.3.4 Exit

Option 23, Exit, allows you to exit the session. 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 telephone line is also disconnected. After you exit, you must wait a minimum of five seconds before you try to re-establish a connection. Press `[Return]` a few times to reconnect to the console. You must then supply the correct password to gain access to the console.

4

Troubleshooting

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

Before You Start

1. Verify the installation of the DECagent 90.
2. Note the fault condition.
3. Verify that the DECbridge code is revision 3.0 or higher. Use option 18, Connect, on the console main menu to verify the DECbridge 90 code revision.
4. Isolate the problem.

Use Table 4–1 to troubleshoot a standalone DECagent 90. Use Table 4–2 to troubleshoot a DECagent 90 installed in a DEChub.

4.1 DECagent 90 Standalone Troubleshooting

Use Table 4–1 to troubleshoot a standalone DECagent 90.

Table 4–1 Troubleshooting a DECagent 90 Standalone Unit

If...	Then...	Do this...
The Network OK and Network activity LEDs alternately flash	An IP address has not been set.	Set the IP address.
The Self-test LED is flashing.	The DECagent has failed self-test.	Replace the DECagent.
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.

(continued on next page)

Table 4–1 (Cont.) Troubleshooting a DECagent 90 Standalone Unit

If...	Then...	Do this...
All LEDs flicker.	<p data-bbox="467 695 740 720">Check the power supply.</p> <p data-bbox="467 867 740 947">The DECagent 90 is not receiving the correct voltages.</p>	<p data-bbox="776 695 1170 856">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).</p> <p data-bbox="776 867 1170 919">Connect the DECagent 90 to the correct power supply.</p>
The network activity LED is off.	<p data-bbox="467 961 740 1041">There is low network activity or no network activity.</p> <p data-bbox="467 1056 740 1129">If the network activity LED still fails to illuminate.</p> <p data-bbox="467 1199 740 1356">If the network activity LED illuminates momentarily, the network activity LED portion of testing has passed.</p> <p data-bbox="467 1371 740 1423">If the network LED fails to illuminate.</p>	<p data-bbox="776 961 1170 1041">Ensure that network activity is present and that the segment is properly terminated.</p> <p data-bbox="776 1056 1170 1188">Turn the agent off and on by unplugging and replugging the power supply. Check that the network activity LED comes on momentarily.</p> <p data-bbox="776 1199 1170 1224">Replace the agent.</p> <p data-bbox="776 1371 1170 1398">Replace the agent.</p>

4.2 DECagent 90 DEChub Configuration Troubleshooting

Use Table 4–2 to troubleshoot a DECagent 90 installed in a DEChub.

Table 4–2 Troubleshooting a DECagent 90 in a DEChub

If...	Then...	Do this...
The Network OK and Network activity LEDs alternately flash	An IP address has not been set.	Set the IP address.
The Self-test LED is flashing.	The DECagent has failed.	Replace the DECagent.
The power LED is off.	The DECagent 90 is not receiving +12 V. If the power LED on the DEChub is off, there is a problem with the DEChub power supply. If the power LED on the DEChub power supply is on, are other component power LEDs off? If other components are on, the DECagent 90 has a power problem. If the power LED on the DEChub power supply is on, are other component power LEDs off? If other components are off, the DEChub has a power problem. If the power LED turns on when re-seated in the same slot, the DECagent 90 was not properly seated. If the power LED turns on when re-seated in another slot, the problem is with the DEChub.	Check the power LED on the DEChub power supply. See the troubleshooting procedures in the <i>DEChub Owner's Manual</i> . 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. See the troubleshooting procedures in the <i>DEChub Owner's Manual</i> . Make sure that the DECagent 90 is properly seated in the slot. See the troubleshooting procedures in the <i>DEChub Owner's Manual</i> .

(continued on next page)

Table 4–2 (Cont.) Troubleshooting a DECagent 90 in a DEChub

If...	Then...	Do this...
The network port 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.
	Check for proper termination on the DEChub network port	Properly terminate the DEChub network port.
	If the DEChub is properly terminated and the network port LED is off, the DECagent 90 is defective.	Replace the DECagent 90.

A

Specifications and Parts

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.

A.1 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)

A.2 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.

A.2.1 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.

A.2.2 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)

A.3 Electrical Specifications

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

A.3.1 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

A.3.2 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

A.4 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	–		

A.5 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

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

B.1 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 DEChub 90. 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 the read-only and read-write community strings to null.

This message appears after you choose the Change Community String option, to remind you that you cannot set both the read-only and read-write 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 ARP for an IP address.

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, which will cause the agent to issue an ARP request to obtain its IP address.

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.

B.2 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-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. Retry the operation.

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. Retry the operation.

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. Retry the loop.

Error obtaining MOP counters. Insufficient system resources.

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

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 when you choose the Show Community command and there is no default community. Use the Change Default Community command to select a 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 move a DECagent 90 to a slot within a DEChub 90 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 DEChub 90 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

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

C.1 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

C.1.1 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.

C.1.2 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

C.1.3 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.

C.1.4 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.

C.2 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 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. 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.

D

Documentation and Ordering Information

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

D.1 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

D.2 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 terminal 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
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).

Glossary

Agent

A software system on a managed device that processes SNMP requests for management information. It uses its knowledge of the internal structure of the device to retrieve the information and return an SNMP response to the requester.

Auto Discovery

A utility that automatically finds all PING-only and SNMP-manageable devices within a specified range of IP addresses.

Bridge

A protocol-independent network device that provides for the exchange of packets between the physical networks it connects. It can divide large networks into smaller, interconnected segments. It can also serve as a tool for fault isolation.

Coaxial cable

A single conductor surrounded by insulation and a conductive shield. This shield prevents the cable from picking up or emitting electrical noise.

Community string

A community string acts as a password for SNMP messages. When a device receives an SNMP request, it checks whether the community string in the request matches that in its configuration. If the community string matches, the device responds to the request. Otherwise, it ignores the request and issues an authentication failure trap.

DARPA

See ICMP.

Device

A generic SNMP element such as an agent, bridge, repeater or server.

Device driver

A program that translates requests for the attached hardware.

Host

An end-system.

Hub

A generic term used to describe a multiport repeater.

ICMP

Internet Control Message Protocol. A large collection of connected networks, primarily in the United States, running the Internet suite of protocols. Sometimes referred to as the DARPA Internet

IEEE

A professional organization which, as a part of its services to the community, performs some pre-standardization work for OSI.

Institute of Electrical and Electronics Engineers (IEEE)

See IEEE.

Internet

A collection of local data networks connected by gateways and protocols that allow them to function as a single large network.

Internet address

IP address

Internet Control Message Protocol (ICMP)

See ICMP.

Internet Protocol (IP)

See IP.

IP address

A 32-bit quantity used to represent a point of attachment in an Internet.

IP

Internet Protocol. A network layer protocol providing best-effort delivery within the Internet suite of protocols. It is responsible for providing transparency over both the topology of the Internet and the transmission media used in each physical network.

Jabber

A term used to denote continuous transmission of corrupted or random data onto a network. This is usually caused by network interface card failures.

LAN

Local Area Network. Any one of a number of technologies providing high speed, low-latency transfer and being limited in geographic size.

Local Area Network (LAN)

See LAN.

MAC

Medium Access Control. The lower half of the Data Link Layer of the OSI model that defines access to the transmission media.

Management Information Base (MIB)

See MIB.

Medium Access Control (MAC)

See MAC.

MIB

Management Information Base. A collection of objects that can be accessed by way of a network management protocol.

MIBI

An internet standard MIB (RFC 1156)

MIBII

An internet standard MIB (RFC 1213)

Module

A board that plugs into a hub or concentrator.

NDIS

Network Driver Interface Specification. The specification for a generic LAN Manager-based device driver that is hardware-independent and protocol-independent. This was developed by Microsoft and 3Com.

Network

A collection of subnetworks connected by intermediate-systems and populated by end-systems. Also (Internet usage), a single subnetwork or a related set of subnetworks in the OSI sense.

Network administrator

A network administrator is the individual responsible for managing the network from the management station.

Network elements

The devices interconnected on the network.

Network management

A technology used to manage an Internet.

Network management station

A system responsible for managing the network.

Network map

A display showing the logical elements that compose the network.

ODI

Open Datalink Interface. Novell's media-and-protocol-independent communications specification providing a standard interface that allows transport protocols to share a network interface card without conflict.

Open Datalink Interface (ODI)

See ODI.

Open Systems Interconnection (OSI)

See OSI.

OSI

Open Systems Interconnection. An international effort to facilitate communications among computers of different manufacture and technology.

Packet

A collection of data bits and associated control information bits that is transmitted as a whole unit, the basic unit of information transfer.

PDU

Protocol Data Unit. A data object exchanged by protocol machines, usually containing both protocol control information and user data.

Ping

A program used to test IP-level connectivity from one IP address to another.

Port number

Identifies an application entity to a transport service in the Internet suite of protocols.

Protocol

A set of formats, rules and standards for network communications.

Protocol Data Unit (PDU)

See PDU.

Proxy

A term used to define software that fronts for another system. In the SNMP world, proxy agents are used to avoid implementing full protocol stacks in simple devices.

Repeater

A networking device that receives a digital signal from one cable, amplifies it, and then reconstructs the signal for transmission onto another cable. It does not filter packets or make routing decisions, but simply transfers packets from LAN to LAN.

Request for Comments (RFC)

See RFC.

RFC

Request for Comments. A document available on the Internet describing the Internet suite of protocols and related experiments.

Router

A networking device used to connect LANs by examining data addresses and choosing the most efficient path to the destination. Like a bridge, a router restricts a LAN's local traffic, only passing data on to the routed path when that data is specifically intended for it.

Simple Network Management Protocol (SNMP)

See SNMP.

Site

A network element that incorporates devices into single large groupings. For example, it may reflect a different corporate group or building in the network.

SNMP

Simple Network Management Protocol. The application protocol offering network management service in the Internet suite of protocols. It is part of the TCP/IP protocol suite and usually runs over the connectionless User Datagram Protocol (UDP).

Subnet mask

A 32-bit quantity indicating which bits in an IP address identify the physical network.

TCP

Transmission Control Protocol. The transport protocol offering a connection-oriented transport service in the Internet suite of protocols.

Token Ring

A network in which the computers are connected together in a ring. A special message called the token is passed from one machine to another around the ring and each machine can transmit only while it is holding the token.

Transmission Control Protocol (TCP)

See TCP.

UDP

User Datagram Protocol. The transport protocol offering a connectionless-mode transport service in the Internet suite of protocols.

User Datagram Protocol (UDP)

See UDP.

Variable

A pairing of an object instance name and associated value.

WAN

Wide Area Network. Any one of a number of technologies providing geographically distant transfer.

Wide Area Network (WAN)

See WAN.

X.25

A connection-oriented network facility.

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