DECswitch 900FO

Installation and Configuration

Part Number: EK-DEFBB-IN. C01

June 1996

This manual describes how to install and configure the DECswitch 900FO module.

Revision/Update Information: This is a revised manual.

FCC Notice — Class A Computing Device:
This equipment generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such radio frequency interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference; in which case, measures taken to correct the interference are at the user's expense.

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Warning!
This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Achtung!
Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

Attention!
Ceci est un produit de Classe A. Dans un environement domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées.

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Preface

Overview

Purpose of this Document

This manual describes how to install and configure the DECswitch 900FO module to operate in either a DEChub 900 MultiSwitch or as a standalone unit in a DEChub ONE or DEChub ONE-MX docking station.

Intended Audience

This manual is intended for personnel who install and configure the DECswitch 900FO module.

Organization

This manual is organized as follows:

Section	Description
Chapter 1	Provides an overview of the DECswitch 900FO module, describes its features, and lists front and back panel features.
Chapter 2	Describes how to install the DECswitch 900FO into a DEChub 900 MultiSwitch.
Chapter 3	Describes how to install the set-up port cable.
Chapter 4	Describes how to set up and configure the module in a DEChub ONE docking station.
Chapter 5	Describes how to set up and configure the module in a DEChub 900 MultiSwitch.
Chapter 6	Describes how to remove the module from a DEChub 900 MultiSwitch.
Appendix A	Describes how to diagnose and solve problems with the module.
Appendix B	Describes the calculated fiber-optic loss budget for the DECswitch 900FO.
Appendix C	Lists the operating and acoustical specifications for the module.
Appendix D	Describes network cables.
Appendix E	Describes how to access and configure RMON Groups.

Conventions

The following conventions are used in this manual:

Convention	Description
NOTE	Contains information of special importance.
Boldface type	In examples, indicates user input.
Italics	In examples, indicates a variable. In text, indicates emphasis or a book title.
`Monospaced type`	Indicates a literal example of system output.

Associated Documents

The following documents provide information relating to the module. To order any of the following documents, refer to the directions in How to Order Additional Documentation.

Title and Order Number	Description
Ethernet Switch Enterprise RMON Upgrade Configuration AA-QXWAA-TH	Provides information for installing and configuring nine RMON groups.
DEChub 900 MultiSwitch Owner's Manual EK-DH2MS-OM	Provides installation, use, security, and troubleshooting information for the DEChub 900 MultiSwitch.
DEChub ONE Installation EK-DEHU2-IN	Provides installation and operation guidelines for standalone module configuration, including mounting options and cabling.
DEChub ONE-MX Installation EK-DEF1H-IN	Provides installation and operation guidelines for standalone module configuration, including mounting options and cabling.
clearVISN Installation	Describes how to install clearVISN software. It includes a list of distribution kit contents, system requirements, pre-installation considerations, and the installation procedure.
clearVISN Product Overview	Provides an overview of clearVISN, an explanation of each clearVISN application, and descriptions of all concepts necessary to understand and use these applications efficiently.
clearVISN Configuration and Use	Provides information for starting each application, configuring them (when necessary), and general information.
Open DECconnect Applications Guide EC-G2570-42	Provides information to help plan and install networking systems based on Digital's OPEN DECconnect System and networking products.

Title and Order Number	Description
DEChub Network Modules 900-Series Switch Reference EK-SWTCH-HR	Describes the functions and features of Digital's HUB-based 900-Series switching products.
Bridge and Extended LAN Reference EK-DEBAM-HR	Describes how bridges are used to create extended local area networks (LANs). The descriptions include the use of bridges in extended LAN configurations, information on LAN interconnections, overall bridge operation, spanning tree, bridge management, and solving bridge-related problems in a network.

Correspondence

Documentation Comments

If you have comments or suggestions about this document, send them to the Network Products Business Organization.

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FAX: (508) 486-6093
E-MAIL: doc_feedback@lkg.mts.dec.com

Online Services

To locate product specific information, refer to the following online services:

BBS   To read the Bulletin Board System, set your modem to 8 bits, no parity, 1 stop bit, and dial 508-486-5766 (U.S.)

WWW   The Digital Equipment Corporation Network Products Business Home Page on the World Wide Web is at the following addresses:

North America: http://www.networks.digital.com

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Electronically (United States only)	Dial 1-800-DEC-DEMO (For assistance, call 1-800-DIGITAL)
By Mail (United States and Puerto Rico)	DIGITAL EQUIPMENT CORPORATION P.O. Box CS2008 Nashua, New Hampshire 03061 (Place prepaid orders from Puerto Rico with the local Digital subsidiary: 809-754-7575)
By Mail (Canada)	DIGITAL EQUIPMENT of CANADA LTD. 940 Belfast Road Ottawa, Ontario, Canada K1G 4C2 Attn: A&SG Business Manager
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Internally	U.S. Software Supply Business (SSB) DIGITAL EQUIPMENT CORPORATION 10 Cotton Road Nashua, New Hampshire 03063

Safety

Overview

Any warning or caution that appears in this manual is defined as follows:

WARNING	Contains information to prevent personal injury.
CAUTION	Contains information to prevent damage to equipment.
VORSICHT	Enthält Informationen, die beachtet werden müssen, um den Benutzer vor Schaden zu bewahren.
ACHTUNG	Enthält Informationen, die beachtet werden müssen, um die Geräte vor Schaden zu bewahren.
DANGER	Signale les informations destinées à prévenir les accidents corporels.
ATTENTION	Signale les informations destinées à prévenir la détérioration du matériel.
AVISO	Contiene información para evitar daños personales.
PRECAUCIÓN	Contiene información para evitar daños al equipo.

The cautions that must be observed for the hardware described in this manual are listed below in English, German, French, and Spanish.

CAUTION	This action deletes all configured settings and replaces them with factory default values. All configuration settings will be lost.
ACHTUNG	Bei diesem Vorgang werden alle Konfigurationseinstellungen gelöscht und die Werkseinstellungen wieder eingesetzt. Alle Konfigurationsdaten gehen verloren.
ATTENTION	Cette action supprime tous les paramètres de configuration et les remplace par des valeurs prédéfinies. Tous les paramètres de configuration seront perdus.
PRECAUCIÓN	Esta intervención borrará todos los parámetros de configuración y los sustituirá por valores por defecto definidos de fábrica. Se perderán todos los parámetros de configuración.

CAUTION	If power is interrupted during Stage 3 of the DLU process, the firmware image can become corrupted. Do not turn off power to the unit or perform any action that can cause the unit to lose power during Stage 3 of the DLU process.
ACHTUNG	Solite während der Phase 3 des DLU-Prozesses eine Unterbrechung der Stromversorgung eintreten, kann das Firmwareprogramm zerstört verden. Aus diesem Grunde wird dringend empfohlen, Vorkehrungen zu treffen, daß während der Durchführung dieser Phase 3 die Systemeinheit weder ausgeschaltet noch die Stromversorgung unterbrochen werden kann.
ATTENTION	L'image du microprogramme risque d'être corrumpue, en cas de coupure de courant au cours de l'étape 3 du processus DLU. Ne mettez pas l'unité hors tension et n'exécutez aucune action risquant d'entraîner une coupure d'alimentation au course de cette étape.
PRECAUCIÓN	Si se interrumpe el suministro eléctrico durante la Etapa 3 del proceso DLU, puede dañarse la imagen del firmware. No se debe apagar la unidad ni realizar ninguna operación que pueda causar una interrupción del suministro de la unidad durante la Etapa 3 del mencionado proceso.

WARNING	Some fiber optic equipment can emit laser or infrared light that can injure your eyes. Never look into an optical fiber or connector port. Always assume the cable is connected to a light source.
VORSICHT	Bestimmte Lichtleitergeräte können für die Augen gefährliches Laser- oder Infrarotlicht abstrahlen. Vermeiden Sie es daher unter allen Umständen, direkt in ein Lichtleiterkabel oder einen Lichtleiteranschluß zu schauen. Gehen Sie immer davon aus, daß Lichtleiterkabel mit einer Lichtquelle verbunden sind.
DANGER	Certains équipements à fibre optique peuvent émettre un rayonnement laser ou infra-rouge pouvant provoquer des troubles oculaires. Ne regardez jamais à l'intérieur d'une fibre optique ou d'un port de connecteur. Considérez que le câble est connecté en permanence à une source lumineuse.
AVISO	Ciertos equipos de fibras ópticas pueden emitir luz lasérica o infrarroja con riesgos de lesiones en los ojos. No se debe nunca mirar en una fibra óptica o una puerta de conexión. Siempre hay que suponer que el cable está conectado a una fuente luminosa.

Chapter 1

Product Description

Overview

Introduction

This chapter describes the features and components of the DECswitch 900FO module.

In This Chapter

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What Is the DECswitch 900FO?

The DECswitch 900FO (also referred to in this manual as the module) provides the interconnection between six 10BaseFL 10 Mb/s Ethernet LANs using ST-type connectors and a high-speed 100 Mb/s Fiber Distributed Data Interface (FDDI) network backbone.

As a self-learning IEEE 802.1d Media Access Control (MAC) switch, the module performs standard functions such as filtering and forwarding. In addition, the module performs high-speed translation of network data packets between the FDDI and Ethernet networks.

NOTE

In this manual, the term Ethernet is Digital's term for its product compatibility with the ISO 8802-3/ANSI/IEEE 802.3 standards and the Ethernet standards for Carrier Sense Multiple Access with Collision Detection (CSMA/CD) local area networks (LANs).

The DECswitch 900FO module is protocol independent. As such, it accommodates multiple protocols such as DECnet, LAT, Transmission Control Protocol/Internet Protocol (TCP/IP), or any other protocol running on FDDI and Ethernet LANs. The module includes flexible filtering options for destination and source addresses and protocols.

You can access filters through clearVISN MultiChassis Manager software or any Simple Network Management Protocol (SNMP) management software, and determine which users or groups of users can gain access to the networks. As with other switch products from Digital, you restrict access to network management by password protection.

The DECswitch 900FO standards-compliant technology (IEEE 802.1d, 802.1h, 802.1i, 802.2, 802.3, and ANSI FDDI) ensures interoperability in multivendor networks.

You can install and configure the module in a DEChub 900 MultiSwitch (also referred to in this manual as a DEChub 900) or as a standalone unit in a DEChub ONE or DEChub ONE-MX docking station (see the *DEChub ONE Installation* manual or the *DEChub ONE-MX Installation* manual).

NOTE

Throughout this manual, the term DEChub ONE refers to the DEChub ONE-MX or the DEChub ONE docking station unless otherwise specified. The DEChub ONE (DEHUA-**) does not support FDDI connectivity.

Features

Your DECswitch 900FO module includes the following features.

Hot Swap

The module's hot swap capability allows you to install or remove the module from a DEChub 900 without turning off the power.

Configuration and Management

The module offers the following configuration and management options:

- Set-up port for initial configuration of the module using a terminal or personal computer.

- Upgradeable device firmware (in nonvolatile Flash memory) using Trivial File Transfer Protocol (TFTP) with HUBloader or through the set-up port with any TFTP server.

- Configurable rate limiting of multicast packets to limit the spread of multicast and broadcast storms.

- Out-of-Band Management (OBM) over Serial Line Internet Protocol (SLIP) through the OBM connector in addition to in-band management.

- Advanced Graphical User Interface (GUI) manageability with Digital's clearVISN MultiChassis Manager application.

- Support for up to 8000 network addresses.

SNMP

The module offers the following SNMP options:

- Built-in SNMP agent support for the following protocols:
  — SNMP management (RFC 1157)
  — Management Information Base - MIB II (RFC 1213)
  — Bridge MIB (RFC 1493)
  — FDDI MIB (RFC 1512)
  — Ethernet MIB (RFC 1398)
  — Digital ELAN MIB Extensions
  — Statistics, History, Alarms and Events Groups of RMON MIB (RFC 1757)

- Support for the following SNMP traps:

  — coldstart

  — linkUp

  — linkDown

- Manageability using any generic SNMP management application that supports the MIBs listed above.

Remote MONitoring (RMON)

The DECswitch 900FO supports sophisticated Ethernet monitoring with the Remote Network Monitoring Information Base (RMON-MIB). The following RMON features and options are available:

- RMON functions are performed concurrently with the switching function.

- Multiple RMON monitors within the switch (one for each Ethernet) are accessible by multiple managers.

- Basic RMON capability at the LAN level for the following groups:

  — Statistics — Various statistics measured by the probe for the monitored Ethernet, including utilization, packet rates, broadcast and multicast rates, and error information

  — History — Capturing of periodic statistical samples for later retrieval and analysis by the manager

  — Alarms — Specification of thresholds for various monitored variables, in order to generate events

  — Events — Controls the generation and notification of events from the probe

- GUI Management with clearVISN RMON Manager/ProbeWatch

The following two features are optional upgrades. For more information about these features, refer to *Ethernet Switch Enterprise RMON Upgrade Configuration*.

- Enhanced RMON capability for the following five groups of the standard RMON MIB:

  — Host Table — statistics by specific MAC address

  — Host Top N — statistics for the top N addresses, ordered by one of their statistics

  — Traffic Matrix — traffic patterns between pairs of nodes

— Filters — a set of user-defined preconditions for packet capture or events

— Packet capture — stores packets that meet the filter criteria for later retrieval. Allows examination of individual packets or sequence of packets to help identify and isolate problems

- RMON capability for a variety of network protocols and applications

For information on how to access and use the basic RMON features, refer to Appendix E.

Virtual LANs

The VLAN capability of the module has the following features:

- Ability to segment the network into logically separate virtual LANs over the extended LAN, interconnected by switches. Moves, adds, and changes can be accomplished using the clearVISN VLAN Manager.

- Support for up to 250 VLANs in the network

- Segmentation of network bandwidth via software

- Firewalling between independent domains

- Containment of multicast and broadcast traffic within a VLAN

- Ease of network configuration and administration

- Compatibility with existing, non-VLAN-capable switches from Digital as well as other vendors, with the use of the Default VLAN

For further information on VLAN Management, refer to the *clearVISN Product Overview* manual.

Bridging

The module offers the following bridging options:

- High-speed local traffic filtering and forwarding

- Flexible filtering capabilities (source address, destination address, and protocol) for greater network control, increased security and bandwidth utilization, and reduced propagation of network problems

- Option to turn off automatic learning and manually load the address database

- Spanning tree loop detection protocol:

  — IEEE 802.1d (default)

  — Digital LB100 mode

- Ability to turn off spanning tree algorithm on individual switch ports on a per-port basis

FDDI/Ethernet

The module offers the following FDDI/Ethernet options:

- One FDDI dual attachment station (DAS) port (backplane connection) and six 802.3 10BaseFL Ethernet LAN ports (front port connections)

  — FDDI PHY port 1A/M and 1B/S connects to the DEChub 900 backplane

  — Each of the Ethernet ports is individually switchable to a DEChub 900 backplane LAN through clearVISN MultiChassis Manager management

  — Port 3 can be redirected to the DEChub 900 backplane ThinWire LAN segment via clearVISN MultiChassis Manager

  — When the module is installed into a DEChub ONE docking station, a user can redirect Port 4 to the DEChub ONE's AUI port

  — When connected to a DEChub ONE-MX docking station, each of the FDDI PHY ports (1A/M and 1B/S) is individually switchable to the corresponding PHY ports on the DEChub ONE-MX docking station

- Fragmentation of large FDDI IP packets to legal-size Ethernet packets per RFC 791 (Internet Protocol) and RFC 1191 (Path MTU Discovery)

- Translation between FDDI and IEEE 802.3/Ethernet frame formats for direct, transparent connections; translation of AppleTalk® 1 and AppleTalk 2 AARP packets; handling of raw IEEE 802.3 Novell IPX® packets

- Support for operation in either an FDDI tree or dual ring network configuration. You can switch FDDI port A to emulate an M port of a concentrator. If you perform this switch, FDDI port B is automatically switched to emulate an S port.

- Console support for enabling and disabling translation of IPX raw 802.3 packets into SNAP encapsulated packets on the FDDI LAN

Front Panel Features

The following table describes the DECswitch 900FO front panel features shown in Figure 1-1. See Appendix A for more information about LED operation.

Table 1-1: Front Panel Features

Item	Icon	Name	Description
1		Power LED	Indicates the module has power.
2		Module OK LED	**ON**: The module has passed self- test.
			OFF: The module has failed self-test.
3		Port State LEDs	Indicates the status of ports 1 to 7.
4		Network Activity LEDs	**Green**: Indicates network traffic level through front panel.
			Yellow: Indicates network traffic level through backplane or docking station.
5		FDDI port (PHY) LEDs	Indicates the status of the connection between the module and the FDDI network. The FDDI LEDs are labeled 1A/M and 1B/S.

Figure 1-1: Front Panel

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Item	Icon	Name	Description
6		Address Label	Contains the lowest of seven consecutive Media Access Control (MAC) addresses that corresponds to port 1. For example, if this module's port 1 MAC address is 08-00-2B-AB-0C-08, then the consecutive port MAC addresses are: Port 1 = 08-00-2B-AB-0C-08 Port 2 = 08-00-2B-AB-0C-09 Port 3 = 08-00-2B-AB-0C-0A Port 4 = 08-00-2B-AB-0C-0B Port 5 = 08-00-2B-AB-0C-0C Port 6 = 08-00-2B-AB-0C-0D Port 7 = 08-00-2B-AB-0C-0E
7		Port Link LEDs	Indicates the 10BaseFL connection status of the fiber-optic link to the remote device.
8		802.3/10BaseFL (fiber-optic Ethernet) Port ST-type connectors:	
		1. Fiber-optic Tx connectors	Connects fiber-optic cables to the transmit port.
		2. Fiber-optic Rx connectors	Connects fiber-optic cables to the receive port.

Back Panel Features

The following table describes the module's back panel features shown in Figure 1-2.

Table 1-2: Back Panel Features

Step	Name	Description
1	Locking tab	Locks the module into a DEChub 900 backplane or into a DEChub ONE docking station. Contains the hotswap switch lever.
2	48-pin connector	Provides network and power connections to the module when the module is installed in a DEChub 900 or DEChub ONE.
3	Grounding bolt (hex)	Provides a chassis grounding connection between the module and the DEChub 900 or the DEChub ONE.
4	Manufacturing label	Lists the module's part number, serial number, revision level, and power requirements.
5	160-pin connector	Provides network and power connections to the module when the module is installed into a DEChub 900 or a DEChub ONE docking station.
6	Mounting tab	Secures the module when it is installed into a DEChub 900 or a DEChub ONE docking station.
7	Grounding fingers	Provide additional chassis grounding between the module and a DEChub 900 or a DEChub ONE docking station.

Back Panel Features

Figure 1-2: Back Panel
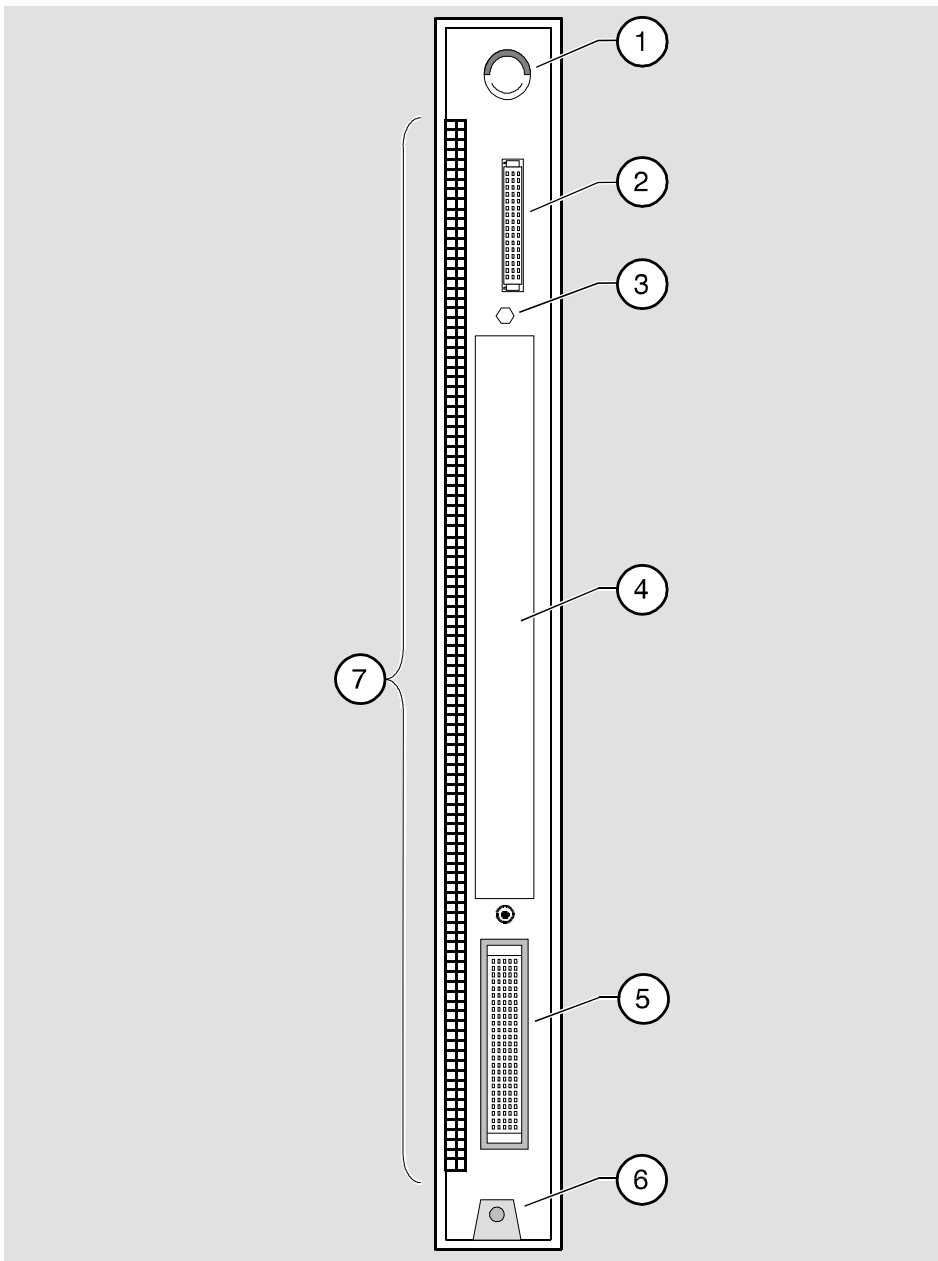
NPG-9723-95F

Chapter 2

Installing the Module

Overview

Introduction

This chapter describes how to install the DECswitch 900FO in a DEChub 900 MultiSwitch.

The DECswitch 900FO hotswap feature allows you to install the module into the DEChub 900 without turning off power. Seating the module initiates its power-up sequence if enough power is available. To install the module to a DEChub ONE or DEChub ONE-MX, refer to the *DEChub ONE* or *DEChub ONE-MX Installation Manual*.

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Installing the Module in a DEChub 900

To install the module in a DEChub 900, complete the following tasks:

Task	Description
1	Compare the power ratings.
2	Seat the module into the DEChub 900.
3	Verify initial LED operation.
4	Connect the port cables.

Task 1: Compare the Power Ratings

Compare the module's power ratings **(1)** with the values shown in the Hub Manager status display **(2)** (see Figure 2-1).

If any of the module's power requirements exceed the values shown in the status display, add another power supply (see the *DEChub 900 MultiSwitch Owner's Manual*).

The 12V power in the DEChub 900 is derived from the 15V source. Although it is listed separately in the product specifications, the 12V requirements are included in the 15V power total.

Figure 2-1: Module Power Ratings


```
                                      53.0 W
                                8.5 A    5 V          Available: 90.5 W
                                0.1 A   12 V          5V: 13.0 A, 15V: 3.5 A
                                0.7 A   15 V
```
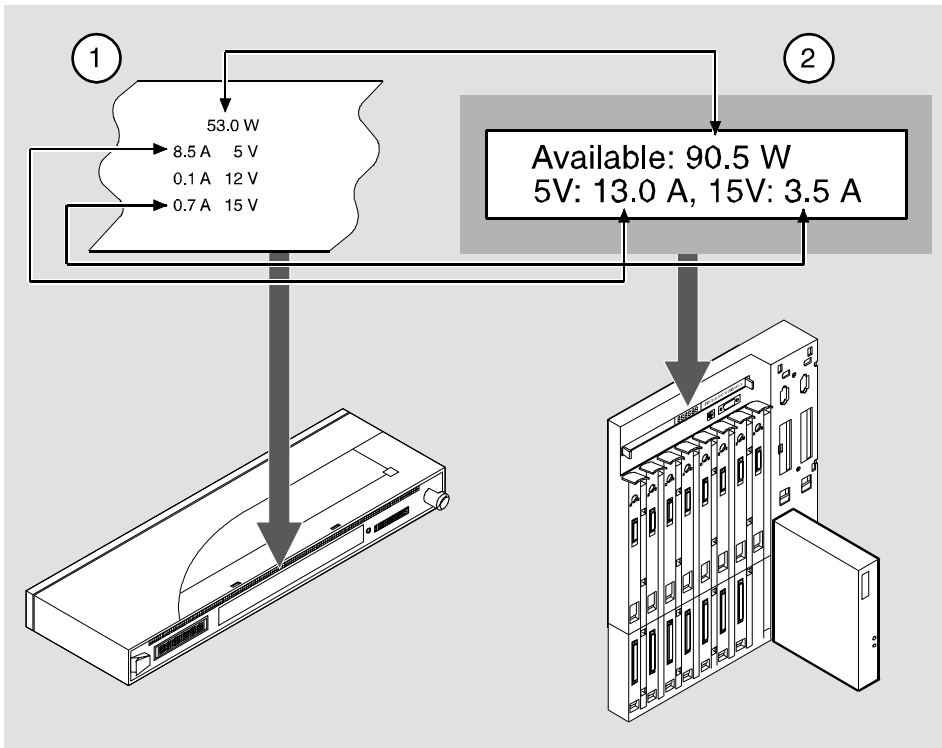
NPB-0413-96F

Task 2: Seat the Module into the DEChub 900

To seat the module, complete the following steps (refer to Figure 2-2):

Step	Action
1	Place the module's mounting tab into a mounting slot **(1)** on the DEChub 900.
2	Pull up the release lever **(2)** to its unlocked position.
3	Pivot the module on the mounting slot and align the connectors.
4	Firmly push the module onto the backplane connectors.
5	Press down on the release lever **(3)** to ensure that the module is locked.

Figure 2-2: Seating the Module
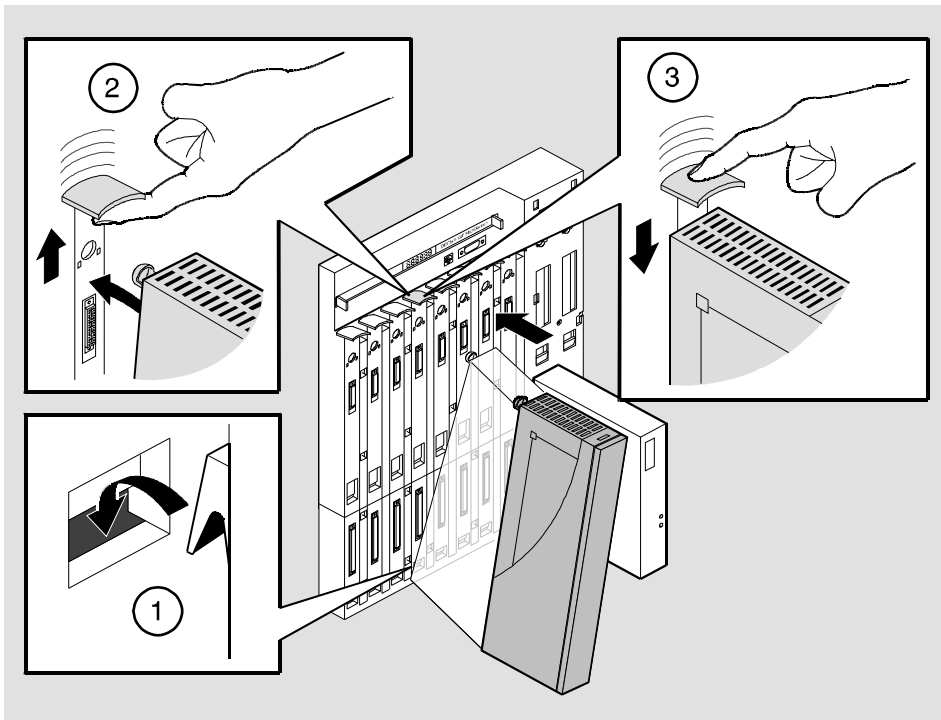
NPG-0004-95F

Task 3: Verify Initial LED Operation

Verify that the module's Power LED and the Module OK LED light within 1 minute (See Figure 1-1). The LEDs light in the following two occurrences:

Occurrence	Icon	Description
1		The Power LED lights when power is applied, then the module performs a self-test.

2		After the module completes self-test, the Module OK LED lights and remains lit. The Hub Manager status display shows:
		
		`DECswitch 900FO`
		`up`

NOTE

Refer to Appendix A, Problem Solving, if the LEDs do not operate as described.

Task 4: Connect the Port Cables

Digital recommends that you use 62.5/125-micron multimode graded index fiber-optic cable with the DECswitch 900FO. If the fiber-optic cables that you are using are not the recommended size, refer to Appendix B, Fiber-Optic Loss Budget, for more information.

All the cables should be installed, tested, and tagged at the site prior to this installation. If your site is prewired, the fiber-optic cables are labeled with information on size and attenuation characteristics.

Refer to Appendix D, Cables, for part numbers for various fiber-optic cables available from Digital. See your network manager if you are not sure which cables to connect.

NOTE

To prevent damage to the cables, avoid making sharp bends and kinks.

Figure 2-3 shows the transmit and receive cable connection.

Figure 2-3: Transmit and Receive Cables
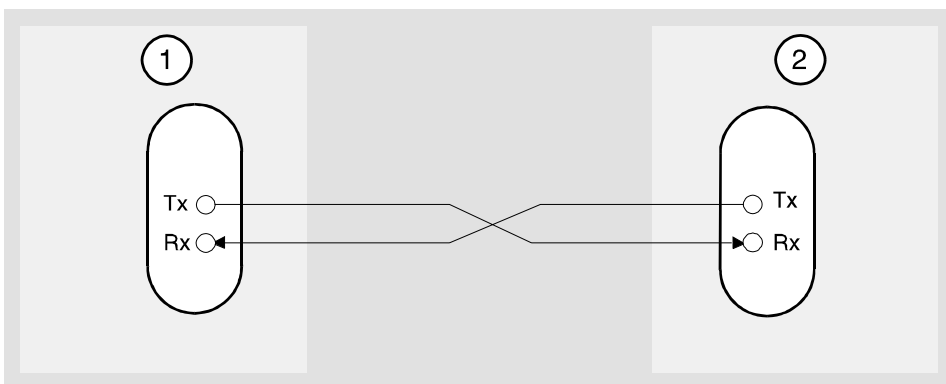
NPG-0357-95F

The following legend identifies the setup port cabling in Figure 2-3.

Item	Description
1	DECswitch 900FO
2	Remote device

Task 4: Connect the Port Cables

To connect the cables (refer to Figure 2-4), complete the following steps:

Step	Action
1	Remove any dust caps from the ST-type connectors on the ports that you are connecting.
2	Align the tab and slot **(1)** of the transmit cable plug with the slot and tab **(2)** of the transmit port connector.
3	Insert the plug, then push in the plug sleeve **(3)** and turn it clockwise, locking it into place.
4	Connect the receive cable, in the same way, to the receive port connector.
5	Connect the transmit and receive cables at the remote connecting device.

Figure 2-4: ST Cable Connection
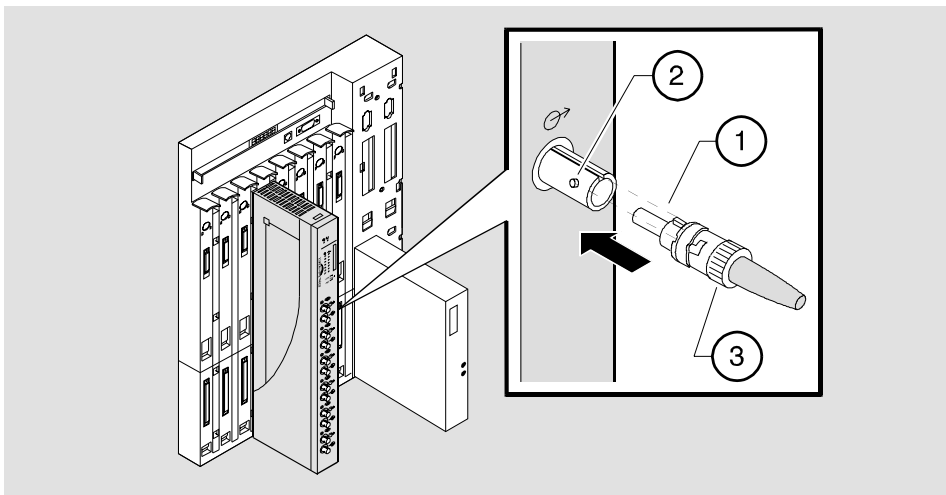
NPG-0336-95F

After all cables are installed, go to Chapter 3, Installing the Setup Port Cable.

Chapter 3

Installing the Setup Port Cable

Overview

Introduction

The setup port on the DEChub 900 or the DEChub ONE docking station allows you to access and set DECswitch 900FO parameters. This chapter describes how to access the module from either port and how to set those parameters.

In This Chapter

Signaling Standards

Signals from the DEChub 900 Hub Manager set-up port and from the DEChub ONE docking station set-up port conform to the EIA-232D signaling standard at 9600 baud. To the user, the port appears as a data terminal equipment (DTE) device.

The DEChub 900 Hub Manager set-up port is compatible with devices that use the EIA-423 signaling standard.

Setup Port Device Cabling

The setup port (Figure 3-1) on the DEChub 900 MultiSwitch or the DEChub ONE docking station can be connected to a set-up port device (a terminal or personal computer) by using the following cables and adapters:

If the set-up port device is	Use this cable	With this adapter
PC with a 9-pin D-Sub communications port	BN24H-*xx*[1]	H8571-J
Terminal with a 25-pin D-Sub connector	BN24H-*xx*[1]	H8575-A
Terminal with a 6-pin MMJ connector	BN24H-*xx*[1]	Not required

[1]*xx* indicates cable length in meters

Connecting to the Setup Port

To connect to the setup port on the module, complete the following steps:

Step	Action
1	Ensure that the transmit and receive baud rates on the setup port device are set to 9600 baud.
2	Connect the set-up port device to the setup port connector on either the DEChub 900 or the DEChub ONE docking station (see Figure 3-1).

The following legend identifies the setup port cabling in Figure 3-1.

Item	Description
1	OBM Port
2	Setup Port
3	Setup Port Device

Figure 3-1: Setup Port Cabling Components
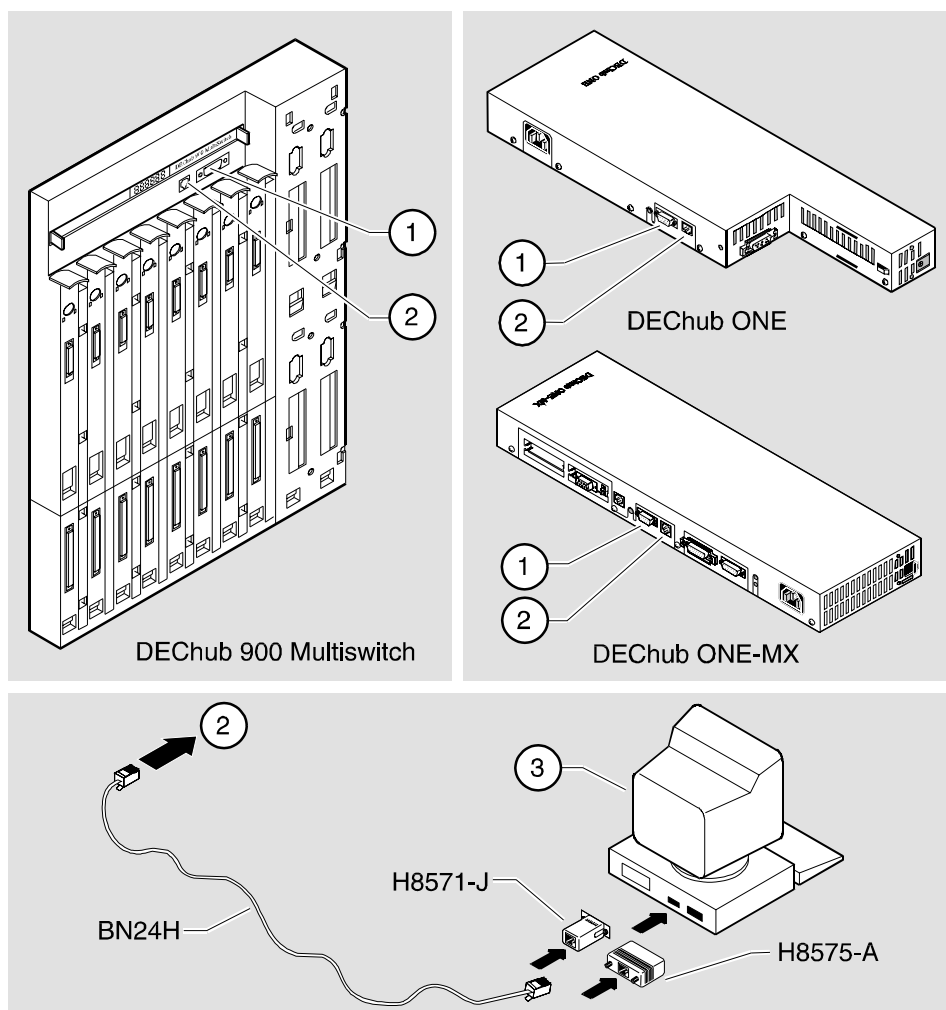
NPG-0020-95F

After all cables are connected, go to one of the following chapters:

To	Go to
Configure the module in a DEChub ONE	Chapter 4
Configure the module in a DEChub 900	Chapter 5

Chapter 4

Configuring the Module in a DEChub ONE

Overview

Introduction

This chapter describes how to configure your DECswitch 900FO when it is installed in a DEChub ONE docking station.

In This Chapter

Topic	Page
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Accessing the Set-up Port

To configure your module and make it remotely accessible, assign:

- An IP address

- A subnet mask

- A default gateway

The set-up port provides menus that allow you to access the DECswitch 900FO. These menus allow you to set up the module for basic connectivity.

This chapter provides examples of the set-up screens to help describe the set-up port and to display the options that are available. Because they are examples only, the displays can vary slightly from the actual screens on your set-up port device. Boldface type in the screen examples indicates user input.

To access the configuration menus, press <Return> on the set-up port device until the DECswitch 900FO INSTALLATION MENU appears.

Using Menus to Configure the Module

This section describes the options that are available from the DECswitch 900FO
INSTALLATION MENU when the module is installed in the DEChub ONE docking
station.

The following example shows the dialog associated with these options when the
module is configured with factory defaults.

```
 DECswitch 900FO

 ============================================================

            DECswitch 900FO INSTALLATION MENU

 [1]  Reset with Factory Defaults
 [2]  Reset with Current Settings
 [3]  Show Current Settings
 [4]  Configure IP
 [5]  Dump Error Log
 [6]  Downline Upgrade
 [7]  Configure Out-of-Band Port
 [8]  Module-Specific Options
 ============================================================

            Enter selection:  [n] <Return>
```

[1] Reset with Factory Defaults

This option initializes the module's configuration to factory default values by resetting the module's nonvolatile configuration storage parameters and restarting the module. (To keep the configured set-up, use Option 2.) Allow approximately one minute for the module to restart and complete self-test.

CAUTION

This action deletes all configured settings and replaces them with factory default values. All configuration settings will be lost.

The following example shows the dialog associated with this option:

```
                   Enter selection : 1
DECswitch 900FO
============================================================

           RESET WITH FACTORY DEFAULTS


 * * * * * * * * * * * * * * * * * * * * * * * *   *
 *         IMPORTANT!    IMPORTANT!    IMPORTANT!   *
 * * * * * * * * * * * * * * * * * * * * * * * *  * *
  This selection will delete the current configuration
  settings and reset the system with the factory default
  settings. All configuration settings will be lost.
  * * * * * * * * * * * * * * * * * * * * * * * * * *
============================================================
     Press Y to confirm [N]:  <Return>
     Press Return for Main Menu...
```

[2] Reset with Current Settings

This option resets the module but leaves the module's configured nonvolatile configuration storage parameters at their current values.

NOTE

Allow approximately 1 minute for the module to restart.

The following example shows the dialog associated with this option:

```
                     Enter selection:  2

DECswitch 900FO
==============================================================
             RESET WITH CURRENT SETTINGS

   This selection will reset your system with the current
     configuration settings.
==============================================================
            Press Y to confirm [N] :  <Return>
Press Return for Main Menu...
```

[3] Show Current Settings

This option shows the module's current settings. If the module is being configured for the first time, some fields will be blank. The FDDI port configuration will change.

The following example shows the display associated with this option.

```
                    Enter selection : 3

 DECswitch 900FO

 ===================================================================
 DECswitch 900FO, 6-Ethernet/FDDI Switch, HW=v0/2,RO=v0.4,SW=v1.6.0
 SysUpTime                    : 6 days 00:03:18     28 resets
 SNMP Read/Write Community  : shepp96
 SNMP Trap Addresses        : 16.7.88.156
 Status of Last Downline Upgrade: TFTP Read
                                 00:02:55   27 resets
                                  Transfer Complete
  Out-of-Band (OBM) Management RTS: Disabled
 BootP: Disabled
 Interface_ IP Address_  Subnet Mask_  Def.Gateway_ Other Info
 In-Band    16.20.216.91 255.255.255.0  16.21.0.1  08-00-2B-A6-0E-05
 OBM Port   16.20.66.156 255.255.255.0             Speed 38400 bps
 IPX switch is disabled.
 FDDI port configuration is Docking Station: A, B
 Port 4 using front panel Fiber port

 ===================================================================

             Press Return for Main Menu...
```

[4] Configure IP

This option provides you with IP configuration selections.

The following example shows the dialog associated with this menu:

```
                 Enter selection : 4

DECswitch 900FO
========================================================================

                  IP CONFIGURATION

          [1]  Set SNMP Read/Write Community
          [2]  Add SNMP Trap Addresses
          [3]  Delete SNMP Trap Addresses
          [4]  Set In-Band Interface IP Address
          [5]  Set Out-of-Band Interface IP Address
          [6]  Enable/Disable BootP
          [7]  Return to Main Menu


========================================================================

               Enter selection number : [n]  <Return>
```

The following pages describe the IP Configuration options:

Topic	Page
[1] Set SNMP Read/Write Community	4-8
[2] Add SNMP Trap Addresses	4-9
[3] Delete SNMP Trap Addresses	4-10
[4] Set In-Band Interface IP Address	4-11
[5] Set Out-of-Band Interface IP Address	4-12
[6] Enable/Disable BootP	4-13

[4] Configure IP

[1] Set SNMP Read/Write Community

This option prompts you to enter the module's read/write community name. The community name can be used for read/write access control.

The following example shows the dialog associated with this option:

```
                     Enter selection : 1

   DECswitch 900FO
=================================================================
              SET SMNP READ/WRITE COMMUNITY


Format: The format for a community name is a string, consisting
        of 4 to 31 printable Ascii characters, that
        describes the relationship between an SNMP agent and
        one or more SNMP managers. The string defines the
        authentication mechanism that is employed to validate
        the use of the community by the sending SNMP entity.
=================================================================

      Enter the community string [public] : shepp96<Return>

SNMP Read/Write community string set.
Press Return for IP Configuration Menu...
```

[2] Add SNMP Trap Addresses

This option prompts you to enter IP addresses to which the DECswitch 900FO module sends SNMP traps. You can enter up to eight trap addresses. If one or more SNMP trap addresses were previously configured, the screen displays those addresses.

The format of an SNMP trap address is the standard 4-octet dotted decimal notation for an IP address, where each octet of the address is represented as a decimal value, separated by a decimal point (.), for example, 16.20.54.156.

The following example shows the dialog associated with this option:

```
                   Enter selection : 2

DECswitch 900FO
========================================================================

                  ADD SNMP TRAP ADDRESSES

  Format:   The standard 4 octet dotted decimal notation in which
            each octet of the address is represented as a decimal
            value, separated by a '.' character.

                  example: 16.20.54.156


========================================================================
             Enter Trap Addresses [ ]:

Trap address added!  Enter a Trap Address [ ] :  <Return>

             Press Return for IP Configuration Menu ...
```

[4] Configure IP

[3] Delete SNMP Trap Addresses

This option prompts you to select SNMP trap addresses for deletion from the community trap address table. If one or more SNMP trap addresses were previously configured, the screen displays those trap addresses.

The following example shows the dialog associated with this option:

```
                     Enter selection : 3

DECswitch 900FO
========================================================================

                   DELETE SNMP TRAP ADDRESSES

  Format:   The standard 4 octet dotted decimal notation in which
            each octet of the address is represented as a decimal
            value, separated by a '.' character.

                 example: 16.20.40.156

========================================================================
Configured SNMP Trap Addresses: 16.20.216.81

                 Enter a Trap address [ ] :

Trap address deleted. Enter a Trap Address [ ] :

              Press Return for IP Configuration Menu ...
```

[4] Set In-Band Interface IP Address

This option prompts you to change or enter the module's in-band IP address, subnet mask, and default gateway for the in-band interface. If an IP address were previously configured, the screen displays an in-band IP address.

You do not need to configure the module with a subnet mask for SNMP communications with management stations located on the same subnet as the module.

The factory default setting is no in-band address.

The following example shows the dialog associated with this option:

```
                    Enter selection : 4

DECswitch 900FO
========================================================================

            IN-BAND INTERFACE IP ADDRESS CONFIGURATION

  Format:   The standard 4 octet dotted decimal notation in which
            each octet of the address is represented as a decimal
            value, separated by a '.' character.

                   example: 16.20.40.156

            To delete the IP address, enter 0 in the appropriate
            address field.

Interface    IP Address      Subnet Mask      Def.Gateway      Other Info
-------      --------        ---------        --------         ---------
In-Band
OBM Port                                                Speed 38400 bps
============================================================
      Enter the IP address [ ]  : 16.20.54.156   <Return>
      Enter the Subnet Mask [ ] : 255.225.0 0    <Return>
      Enter the Default Gateway [ ] : 16.21.0.1    <Return>
      Press Return for IP Configuration Menu ...
```

[4] Configure IP

[5] Set Out-of-Band Interface IP Address

This option prompts you to change or enter the IP address and subnet mask for the out-of-band interface.

This feature allows you to manage your module through the OBM port as an alternative to normal in-band management. To enable out-of-band management, you need to assign an OBM IP address and select an OBM port speed from the DECswitch 900FO Installation MENU.

The module does not need to be configured with a subnet mask for SNMP and Telnet communications with management stations located on the same subnet as the module.

The following example shows the dialog associated with this option:

```
                    Enter selection :5
DECswitch 900FO
==========================================================
      OUT-OF-BAND INTERFACE IP ADDRESS CONFIGURATION

Format: The standard 4 octet dotted decimal notation in which
each octet of the address is represented as a decimal value,
separated by a '.' character.

                  example: 16.20.40.156

To delete the address, enter 0 in the appropriate address field.
==========================================================
Interface   IP Address    Subnet Mask   Def.Gateway    Other Info
In-band   16.20.216.91   255.255.255.0 16.21.0.1   08-00-2B-A3-CD-08
OBM Port                                        Speed 38400 bps
==========================================================
Enter the IP address : 16.20.66.156 <Return>
Enter the Subnet Mask  255 255 192 0 <Return>
Press Return for IP Configuration Menu...
```

See *DEChub ONE Installation* or *DEChub ONE-MX Installation* manuals **for OBM port cabling information.**

[6] Enable/Disable BootP

This option prompts you to enable or disable the bootstrap protocol (BootP) process. BootP is a protocol that the module uses to determine its IP address automatically by communicating with the BootP server.

The factory default setting is DISABLED. If BootP is enabled, the word DISABLED shown in the following dialog is replaced with the word ENABLED.

The following example shows the dialog associated with this option:

```
                    Enter selection : 6
DECswitch 900FO
===========================================================
                 ENABLE/DISABLE BOOTP
BOOTP is the IP bootstrap protocol.  BOOTP may be used
to obtain the module's IP address, subnet mask, and default
gateway.When BOOTP is enabled and the module is not configured
with an IP address, the module will send out BOOTP requests
until it receives a response or is manually configured with an
IP address. When BOOTP is disabled, no BOOTP requests will be
sent.

The BOOTP server must be properly configured to return the
address information.
===========================================================
The BOOTP process is DISABLED
Would you like to ENABLE BOOTP Y/[N]: Y <Return>
Press Return for IP Configuration Menu...
```

[5] Dump Error Log

This option displays error log dumps for use by Digital support personnel when analyzing system faults. Up to four error log dumps can be stored, and the most recent dump is displayed first. Firmware upgrades are also recorded in the error log.

The following example shows the display associated with this option:

```
                       Enter selection : 5
DECswitch 900FO
===========================================================
                     DUMP ERROR LOG
                 CURRENT RESET COUNT: 34
===========================================================
Entry #            = 3
Entry Status       = 0 [0=valid, 1=write_error, 2=invalid,
                       3=empty, 4=crc_error]
Entry Id           = 10
Firmware Rev       = 1.0
Reset Count        = 7
Timestamp          = 0  0  1c7
Write Count        = 24
FRU Mask           = 0
Test ID            = A60
Error Data = SR=2000  PC=03034C4A  Error Code=000023C0
Registers  = D0=ECE462A1  D1=9FFF9FFD  D2=00000284 D3=EC63F2C5
             D4=9FFD9FC7  D5=00000001  D6=00000000 D7=0000FFFF
             A0=04800000  A1=0307CE50  A2=04480000 A3=00066914
Dump another entry Y/[N]? N <Return>
===========================================================
No more Error Log entries
Press Return for Main Menu ...
```

NOTE

The format for some entries in the error log may be different from those shown here.

---

[6] Downline Upgrade

This option allows you to upgrade the module's firmware in nonvolatile flash memory.

Before You Begin

You can perform the downline upgrade (DLU) in one of the following ways:

If the module has...	Then you can...
Been assigned an IP address	Use the module's in-band interface IP address.
Not been assigned an IP address	Assign an IP address to the module. Use the IP address of the OBM interface in the DEChub ONE.

Assigning an IP Address

If you need to assign an IP address to the module, complete the following steps:

Step	Action
1	Select the `Configure IP` option (option 4) from the `DECswitch 900FO INSTALLATION MENU`.
2	Select the `Set In-Band Interface IP Address` option (option 4) from the `IP Configuration` menu.
3	Enter the IP address, subnet mask, default gateway, and press Return.

The module retains the IP address at the completion of the DLU process.

Using the DLU Process

CAUTION

If power is interrupted during Stage 3 of the DLU process, the firmware image can become corrupted. Do not turn off power to the unit or perform any action that can cause the unit to lose power during Stage 3 of the DLU process.

When you select this option from the DECswitch 900FO INSTALLATION MENU, the initial set-up screen display appears. This screen identifies the option and alerts the user not to interrupt power during the downline load.

```
                        Enter selection : 6
 DECswitch 900FO
 ===================================================================

                        DOWNLINE UPGRADE

 This process upgrades the module's firmware (in nonvolatile Flash
 memory). Enter the IP address of your TFTP (Trivial File Transfer
 Protocol) load host and the image file name when prompted.


 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 *      IMPORTANT!          IMPORTANT!          IMPORTANT!   *
 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 *    If power is interrupted during the downline load, the  *
 *    firmware image can be corrupted. Do not turn off power *
 *    to the unit or perform any action that can cause the   *
 *    unit to lose power during a downline upgrade.          *
 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 ===================================================================
 Press <Return>to Continue...
```

Initializing the Process

To initiate the DLU process, complete the following steps:

Step	Action	Example
1	Press Return	**\<Return\>**
2	Enter the firmware image file name and press Return. (The TFTP load host conventions specify the format of the firmware image file name).	**DEFBB160.BIN** **\<Return\>**
	If the file is located in the default TFTP directory, enter only the filename.	**DEFBB160.BIN**
	If the file is located somewhere other than the default TFTP directory, enter the complete path name.	**/BOOT/** **DEFBB160.BIN**
3	Enter the IP address of the TFTP load host, and press Return. The screen displays the following message:	**16.20.40.156**

```
Load will be initiated over the
in-band network interface. The
device becomes nonfunctional for up
to 10 minutes during the time that
the flash load is in progress.

Press Return Key to Start Load
[Ctrl/C to abort]...
```

4	Press Return	**\<Return\>**

When you press \<Return\>, you initiate the DLU process over the LAN that is connected to the load host. The screen displays the following message:

```
DLU process started!
```

The DLU Process Stages

The DLU process consists of four stages:

Stage	Description
1	Transferring the image to the module's temporary storage buffer
2	Verifying the image
3	Writing the new image into nonvolatile flash memory
4	Resetting module and self-test

Table 4-1 explains what happens during each stage of the DLU process:

Table 4-1: DLU Process Description

Stage	Description
1	**The DLU process transports the new firmware image across the network from the TFTP load host and places it into a temporary storage buffer in the module.** This stage normally takes 1 minute to complete. However, due to variations in network configurations (load path and traffic levels), this stage can take 10 minutes or more.

The following states indicate that this stage is in progress:

- Module status – functional and manageable

- Module can respond to management requests

- LED display – normal operation

- Setup screen display –

```
DLU process started
...................
```

When the series of dots ends, the screen displays the following message:

```
Transfer complete.
```

Stage	Description
2	**The module verifies that the firmware image is correct.** This stage normally takes 10 seconds to complete.
	The following states indicate that this stage is in progress:
	• Module status – functional and manageable
	• Module can respond to management requests
	• LED display – normal operation
3	**The DLU process transfers the new image from the module's temporary storage buffer to the nonvolatile flash memory, overwriting the old image.**
	CAUTION: If power is interrupted during Stage 3 of the DLU process, the firmware image can become corrupted. Do not turn off power to the unit or perform any action that can cause the unit to lose power during Stage 3 of the DLU process.
	This stage normally takes less than 2 minutes to complete.
	The following states indicate that this stage is in progress:
	• Module status – not functional or manageable
	• Module cannot respond to management requests
	• LED display:
	— The Power LED is on.
	— The Module OK LED is on.
	— The Port State LED 4 lights green for 3 or 4 seconds.
	— The Port State LED 5 lights green for up to 2 minutes.
	— All the Port State LEDs flash alternately green and yellow for 10 seconds.

Stage	Description
4	**The module resets, runs self-test, and then begins executing the new firmware image.**
	This stage normally takes 1 minute to complete.
	The following states indicate that this stage is in progress:
	• Module status – not functional or manageable.
	• Module cannot respond to management requests.
	• LED display –
	— The Power LED is on.
	— The Module OK LED is off.
	— The Port State LEDs flash indicating various subroutines are running (standard self-test pattern).

If the Process Does not Complete

If the process does not complete as described in Stage 3, take one of the following actions:

If	Then	Because
The module loses power	Contact your Digital representative.	The firmware image is corrupted.
The Port State LEDs 4 and 5 do not light	Check that the load host is operational.	The load did not succeed.
All the Port State LEDs light yellow after Port State LED 4 or 5 lights	Retry the load procedure. If the problem persists, contact your Digital service representative.	A loading error has occurred.

When the DLU Process is Complete

When the DLU process is complete, the following events occur:

- The module exits from the DLU process.

- The module begins the execution of the new firmware image.

- The Module OK LED turns on.

- The module becomes fully operational.

Verifying the Upgrade

After the DLU process has completed, you can verify the firmware upgrade by completing the following steps:

Step	Action
1	Select `Option [3] Show Current Settings` from the `DECswitch 900FO INSTALLATION MENU`.
2	Press <Return>.
3	Verify that the correct firmware version has been loaded.

The screen displays the following text.

```
                    Enter selection : 3

DECswitch 900FO
========================================================================
DECswitch 900FO, 6-Ethernet/FDDI Switch, HW=v1/2,RO=v0.4,SW=v1.6.0
SysUpTime                              : 6days 00:03:18   28 resets
SNMP Read/Write Community              : whitney95
SNMP Trap Addresses                    : 16.7.88.156
Status of Last Downline Upgrade        : TFTP Read
                                         00:02:55  27 resets
                                         Transfer Complete
Out-of-Band Management RTS             : Disabled
BootP                                  : Disabled
Interface  IP Address   Subnet Mask    Def.Gateway    Other Info
In-Band    16.20.216.91 255.255.255.0  16.21.0.1      08-00-2B-A6-8D-C8
OBM Port   16.20.66.156 255.255.255.0                 Speed 9600 bps
IPX switch is disabled.
FDDI port configuration is Front Panel: A, B
Port 4 using front panel UTP port
========================================================================

                  Press Return for Main Menu ...
```

[7] Out-of-Band Port Configuration

[1] Set Port Speed

This option lets you select and enter the speed of your OBM port. The factory default for this option is 9600. The OBM port speed that you select must match the speed of your OBM device.

NOTE

The port speeds at both ends of the communications link must be identical.

The following example shows the dialog associated with this option:

```
              Enter selection : 1

DECswitch 900FO
=====================================================================

            SET OUT-OF-BAND (OBM) PORT SPEED

                [1] 2400 baud
                [2] 9600 baud
                [3] 38400 baud


=====================================================================

        Enter selection : [2] (9600) : [n] <RETURN>
                    OBM port speed set

            Press Return for OBM Configuration Menu...
```

[[8] Module-Specific Options

When selected, the option allows you to:

- Set FDDI port configuration

- Set Ethernet configuration

- Configure the IPX switch

- Return to Main Menu

The following example shows the dialog associated with this option:

```
          Enter selection : 8

DECswitch 900FO
================================================================
            MODULE-SPECIFIC OPTIONS
        [1] Set FDDI Configuration
        [2] Set Ethernet Configuration
        [3] Configure IPX Switch
        [4] Return to Main Menu
================================================================

        Enter selection : [n] <Return>
        Press Return for Main Menu...
```

[1] Set FDDI Configuration

This option allows you to set the FDDI port configuration.

This screen also indicates the current station configuration.

```
               Enter selection : 1

DECswitch 900FO
======================================================================

            DECswitch 900FO FDDI PORT CONFIGURATION MENU

            [1] Front Panel: A, B
            [2] Front Panel: M, S
            [3] Return to Previous Menu

Current configuration: Front Panel : A, B


======================================================================
            Enter selection : [2] <Return>

FDDI port configuration set to Front Panel: M, S

            Press Return to Continue...
```

[2] Set Ethernet Configuration

This option allows you to set the Ethernet configuration in standalone mode.

This selection allows you to toggle the connection of port 4 between the module's front panel and the docking station's AUI port. When port 4 is connected to the AUI of a DEChub ONE, note that the Network Activity LED corresponding to that port changes to yellow. The yellow color of the LED indicates that the port is now connected to the AUI port on the DEChub ONE docking station.

Port 4 can physically connect to either an AUI port or a front panel ST Fiber port. If port 4 is connected to the docking station's AUI port, then the front panel ST Fiber port 4 is not operational.

The following example shows the dialog associated with this option:

```
                    Enter selection : 2
Change Port 4 to use docking station AUI port?
Press Y to confirm [N] : Y <Return>
Press Return for Main Menu...
```

NOTE

If port 4 is already connected to the docking station AUI port, the prompt changes to Change Port 4 to use front panel ST Fiber-optic Port?

---

[3] Configure IPX Switch

This option allows you to configure the IPX switch. The Novell Internetworking Protocol eXchange (IPX) interconnects LANs to allow communication between client and server.

When the IPX switch is enabled, the DECswitch 900FO translates raw 802.3 frames to SNAP encapsulated FDDI frames with a protocol type 81-37. When disabled, IPX frames are translated without SNAP encapsulation. The current state of the IPX switch can be viewed by selecting option [3] Show Current Settings in the DECswitch 900FO INSTALLATION MENU.

If the IPX switch is disabled (factory default), the following dialog appears on the screen:

```
                     Enter selection : 3
Enable IPX Switch?
Press Y to confirm [N] : Y <Return>
Press Return to Continue...
```

If IPX switch is enabled, the screen displays the following message:

```
 Disable IPX Switch?
```

Chapter 5

Configuring the Module in a DEChub 900

Overview

Introduction

This chapter describes how to configure your DECswitch 900FO when it resides in a DEChub 900 MultiSwitch.

In this Chapter

DEChub 900 MultiSwitch INSTALLATION MENU

The following example shows the DEChub 900 MultiSwitch INSTALLATION MENU:

To access the module's set-up screen, you must choose option [9] Start Redirect Mode.

The following example shows the dialog associated with this option:

```
DEChub 900 MultiSwitch
===============================================================
        DEChub 900 MultiSwitch INSTALLATION MENU

          [1]  Reset with Factory Defaults
          [2]  Reset with Current Settings
          [3]  Show Current Settings
          [4]  Configure IP
          [5]  Dump Error Log
          [6]  Downline Upgrade
          [7]  Configure Out-of-Band Port
          [8]  Start Event Display Mode
          [9]  Start Redirect Mode


===============================================================
           Enter selection number: 9 <Return>

           Press Return for Main Menu ...
```

[9] Start Redirect Mode

The Start Redirect Mode option redirects the DEChub 900 MultiSwitch Hub Manager set-up port to the set-up port of any network module (such as the DECswitch 900FO) that is installed into the DEChub 900. This option allows you to configure or obtain status of an installed network module by accessing the specified network module's installation menu.

After you choose the Start Redirect Mode option from the DEChub 900 MultiSwitch INSTALLATION MENU, the screen prompts you for a slot number (3) as shown in the following example. After you enter the number of the slot in which the DECswitch 900FO is installed, the console is redirected to this slot.

NOTE

The slot number may change to reflect the slot number in which your module is installed.

The following example shows you how to select a slot number:

```
                    Enter selection: 9
========================================================
Enter the slot number for redirection (1-8):  3 <Return>
Console redirected to 3: DECswitch 900FO
Attempting connection [Ctrl/C to Abort]...
Connection successful!
```

If the redirection is successful, after you press <Return>, the DECswitch 900FO INSTALLATION MENU appears on your screen.

Using Menus to Configure the Module

The following screen shows the options available from the DECswitch 900FO INSTALLATION MENU when the module is operating in a DEChub 900 configuration.

When your module is installed in the DEChub 900, the slot number where the module is installed appears at the top of the menu.

```
DECswitch 900FO- slot 3
=======================================================================
            DECswitch 900FO INSTALLATION MENU

            [1] Reset with Factory Defaults
            [2] Reset with Current Settings
            [3] Show Current Settings
            [4] Configure IP ...
            [5] Dump Error Log
            [6] Downline Upgrade
            [7] Module-Specific Options...

[Ctrl/C] Return to Hub Manager Installation Menu
=======================================================================
              Enter selection:  [n]  <Return>
```

[1] Reset with Factory Defaults

This option reboots the module, causing its configured Nonvolatile Random Access Memory (NVRAM) parameters to be initialized to factory default values followed by a module reset.

If you need to reboot the module and retain the current settings, choose option [2] from the DECswitch 900FO INSTALLATION MENU. Allow approximately 1 minute for the module to reboot and complete self-test.

CAUTION

This action deletes all configured settings and replaces them with factory default values. All configuration settings will be lost.

The following example shows the dialog associated with this option:

```
                   Enter selection : 1

DECswitch 900FO - slot 3
===================================================================

                   RESET WITH FACTORY DEFAULTS

    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
    *          IMPORTANT!    IMPORTANT!    IMPORTANT!         *
    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
    * This selection will delete the current configuration    *
    * settings and reset the system with the factory default  *
    * settings. All configuration settings will be lost.      *
    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
===================================================================
                Press Y to confirm [N]:  <Return>

                Press Return for Main Menu ...
```

[2] Reset with Current Settings

This option resets the module but leaves the module's configured nonvolatile configuration storage parameters at their current values.

Allow approximately 1 minute for the module to restart.

The following example shows the dialog associated with this option:

```
                    Enter selection:  2

DECswitch 900FO - slot 3
================================================================
                RESET WITH CURRENT SETTINGS

   This selection will reset your system with the current
   configuration settings.

================================================================
             Press Y to confirm [N] :  <Return>
             Press Return for Main Menu ...
```

[3] Show Current Settings

This option shows the module's current settings. If the module is being configured for the first time, some fields are blank. The FDDI port configuration changes.

The following example shows the display associated with this option.

```
                        Enter selection : 3
DECswitch 900FO - slot 3

=====================================================================
DECswitch 900FO, 6-Ethernet/FDDI Switch, HW=v0/2,RO=v0.4,SW=v1.6.0
SysUpTime                      : 6 days 00:03:18    28 resets
SNMP Read/Write Community      : shepp96
SNMP Trap Addresses            : 16.7.88.156
Status of Last Downline Upgrade: TFTP Read
                                 00:02:55  27 resets
                                 Transfer Complete

BootP: Disabled
Interface  IP Address   Subnet Mask   Def.Gateway  Other Info
In-Band    16.20.216.91 255.255.255.0  16.21.0.1  08-00-2B-A6-0E-05
OBM Port   16.20.66.156 255.255.255.0             Active
IPX switch is disabled.
FDDI port configuration is Docking Station: A, B
Port 4 using front panel Fiber port
=====================================================================
                Press Return for Main Menu ...
```

[4] Configure IP

This option provides you with IP configuration selections.

The following example shows the dialog associated with this option:

```
                     Enter selection : 4

DECswitch 900FO - slot 3
===================================================================
                IP CONFIGURATION

          [1] Set SNMP Read/Write Community
          [2] Add SNMP Trap Addresses
          [3] Delete SNMP Trap Addresses
          [4] Set In-Band Interface IP Address
          [5] Set Out-of-Band Interface IP Address
          [6] Enable/Disable BootP
          [7] Return to Main Menu

===================================================================

          Enter selection number : [n] <Return>
```

The following pages describe the IP Configuration options:

Topic	Page
[1] Set SNMP Read/Write Community	5-9
[2] Add SNMP Trap Addresses	5-10
[3] Delete SNMP Trap Addresses	5-11
[4] Set In-Band Interface IP Address	5-12
[5] Set Out-of-Band Interface IP Address	5-13
[6] Enable/Disable BootP	5-14

[1] Set SNMP Read/Write Community

This option prompts you to enter the module's read/write community name. The community name can be used for read/write access control.

The following example shows the dialog associated with this option:

```
                    Enter selection : 1


  DECswitch 900FO - slot 3
=================================================================
                  SET SMNP READ/WRITE COMMUNITY


Format: The format for a community name is a string, consisting
        of four to 31 printable Ascii characters, that
        describes the relationship between an SNMP agent and
        one or more SNMP managers. The string defines the
        authentication mechanism that is employed to validate
        the use of the community by the sending SNMP entity.
=================================================================

Enter the community string [public] : shepp96 <Return>

SNMP Read/Write community string set.
Press Return for IP Configuration Menu ...
```

[4] Configure IP

[2] Add SNMP Trap Addresses

This option prompts you to enter IP addresses to which the DECswitch 900FO module sends SNMP traps. You can enter up to eight trap addresses. If one or more SNMP trap addresses were previously configured, the screen displays those addresses.

The format of an SNMP trap address is the standard 4-octet dotted decimal notation for an IP address, where each octet of the address is represented as a decimal value, separated by a decimal point (.), for example, 16.20.54.156.

The following example shows the dialog associated with this option:

```
                    Enter selection : 2

DECswitch 900FO - slot 3
=======================================================================
                ADD SNMP TRAP ADDRESSES

Format: The standard 4 octet dotted decimal notation in which
        each octet of the address is represented as a decimal
        value, separated by a '.' character.

               example: 16.20.54.156

=======================================================================

                    Trap address [ ]: 16.20.216.82 <Return>

Trap address added!  Enter a Trap Address [none] : <Return>

              Press Return for IP Configuration Menu ...
```

[3] Delete SNMP Trap Addresses

This option prompts you to select SNMP trap addresses for deletion from the community trap address table. If one or more SNMP trap addresses were previously configured, the screen displays those trap addresses.

The following example shows the dialog associated with this option:

```
                    Enter selection : 3

DECswitch 900FO - slot 3
========================================================================

               DELETE SNMP TRAP ADDRESSES

Format: The standard 4 octet dotted decimal notation in which
        each octet of the address is represented as a decimal
        value, separated by a '.' character.

                  example: 16.20.40.156


========================================================================

                      Trap address [ ] : 16.20.216.81 <Return>

Trap address deleted. Enter a Trap Address [none] : <Return>

              Press Return for IP Configuration Menu ...
```

[4] Set In-Band Interface IP Address

This option prompts you to change or enter the module's in-band IP address, subnet mask, and default gateway for the in-band interface. If an IP address were previously configured, the screen displays an in-band IP address.

You do not need to configure the module with a subnet mask for SNMP communications with management stations located on the same subnet as the module.

The factory default setting is no in-band address.

The following example shows the dialog associated with this option:

```
                 Enter selection : 4

DECswitch 900FO - slot 3
=======================================================================

            IN-BAND INTERFACE IP ADDRESS CONFIGURATION

Format: The standard 4 octet dotted decimal notation in which each octet
        of the address is represented as a decimal value, separated by a
        '.' character.

                         example: 16.20.40.156

        To delete the IP address, enter 0 in the appropriate address
        field.

Interface    IP Address   Subnet Mask    Def.Gatewa   Other Info
-------        --------     ---------      --------     ---------
In-Band
OBM Port                                   Active
============================================================
    Enter the IP address [ ] : 16.20.54.156 <Return>
    Enter the Subnet Mask [ ] : 255.225.0 0  <Return>
    Enter the Default Gateway [ ] : 16.21.0.2 <Return>
             Press Return for IP Configuration Menu
```

[5] Set Out-of-Band Interface IP Address

This option prompts you to change or enter the IP address and subnet mask for the out-of-band interface. The module does not need to be configured with a subnet mask for SNMP communications when management stations are on the same subnet as the module.

The format for these values is the standard 4-octet dotted decimal notation, where each octet of the address is represented as a decimal value, separated by a decimal point (.).

The OBM feature allows you to manage your module through the OBM port located on the DEChub 900. To enable out-of-band management, you need to assign an OBM IP address.

The following example shows the dialog associated with this option:

```
                        Enter selection :5

DECswitch 900FO - slot 3
=======================================================================

         OUT-OF-BAND INTERFACE IP ADDRESS CONFIGURATION

Format: The standard 4 octet dotted decimal notation in which each octet
        of the address is represented as a decimal value, separated by
        a '.' character.

                        example: 16.20.40.156

        To delete the address, enter 0 in the appropriate address field.

Interface    IP Address   Subnet Mask   Def.Gateway    Other Info
-------      --------     ---------     --------       ---------
In-band     16.20.216.91  255.255.255.0 16.21.0.1     08-00-2B-A3-CD-08
OBM Port                                Active
========================================================
Enter the IP address [16.20.66.156] : 16.20.54.155 <Return>
Enter the Subnet Mask [255.255.255.0] : 255.225.192.0 <Return>
            Press Return for IP Configuration Menu ...
```

[4] Configure IP

[6] Enable/Disable BootP

This option prompts you to enable or disable the bootstrap protocol (BootP) process. BootP is a protocol that the module uses to determine its IP address automatically by communicating with the BootP server.

The factory default setting is DISABLED. If BootP is enabled, the word DISABLED shown in the following dialog is replaced with the word ENABLED.

The following example shows the dialog associated with this option:

```
                    Enter selection : 6

DECswitch 900FO - slot 3
========================================================================

                       ENABLE / DISABLE BOOTP

  BOOTP is the IP bootstrap protocol.  BOOTP may be used
  to obtain the module's IP address, subnet mask, and default gateway.
  When BOOTP is enabled and the module is not configured with an IP
  address the module will send out BOOTP requests until it receives a
  response or is manually configured with an IP address.  When BOOTP is
  disabled, no BOOTP requests will be sent.

  The BOOTP server must be properly configured to return the address
  information.
========================================================================
The BOOTP process is DISABLED
Would you like to ENABLE BOOTP Y/[N]: Y <Return>

              Press Return for IP Configuration Menu...
```

[5] Dump Error Log

This option displays error log dumps for use by Digital support personnel when analyzing system faults. Up to four error log dumps can be stored, and the most recent dump is displayed first. Firmware upgrades are also recorded in the error log.

The following example shows the display associated with this option:

```
                   Enter selection : 5
DECswitch 900FO – slot 3
=============================================================
                    DUMP ERROR LOG
                CURRENT RESET COUNT: 34
=============================================================
Entry #            = 3
Entry Status       = 0 [0=valid, 1=write_error, 2=invalid,
                        3=empty, 4=crc_error]
Entry Id           = 10
Firmware Rev       = 1.0
Reset Count        = 7
Timestamp          = 0   0   1c7
Write Count        = 24
FRU Mask           = 0
Test ID            = A60
Error Data = SR=2000  PC=03034C4A  Error Code=000023C0
Registers  = D0=ECE462A1  D1=9FFF9FFD  D2=00000284 D3=EC63F2C5
             D4=9FFD9FC7   D5=00000001  D6=00000000 D7=0000FFFF
             A0=04800000   A1=0307CE50  A2=04480000 A3=00066914
Dump another entry Y/[N]? N <Return>
=============================================================
No more Error Log entries
Press Return for Main Menu ...
```

NOTE

The format for some entries in the error log may be different from those shown here.

---

[6] Downline Upgrade

This option allows you to upgrade the module's firmware in nonvolatile flash memory.

Before You Begin

You can perform the downline upgrade (DLU) in one of the following ways:

If the module has...	Then you can...
Been assigned an IP address	Use the module's in-band interface IP address.
Not been assigned an IP address	Use the IP address of the DEChub 900 Hub Manager.
	Note: Refer to the *DEChub 900 MultiSwitch Owner's Manual* for more information.
	Assign an IP address to the module.

Assigning an IP Address

If you need to assign an IP address to the module, complete the following steps:

Step	Action
1	Select the Configure IP option (option4) from the DECswitch 900FO INSTALLATION MENU.
2	Select the Set In-Band Interface IP Address option (option 4) from the IP Configuration menu.
3	Enter the IP address, subnet mask, default gateway, and press Return.

The module retains the IP address at the completion of the DLU process.

Using the DLU Process

CAUTION

If power is interrupted during Stage 3 of the DLU process, the firmware image can become corrupted. Do not turn off power to the unit or perform any action that can cause the unit to lose power during Stage 3 of the DLU process.

When you select this option from the DECswitch 900FO INSTALLATION MENU, the initial set-up screen display appears. This screen identifies the option and alerts the user not to interrupt power during the downline load.

```
                         Enter selection : 6
DECswitch 900FO - slot 3
=================================================================

                         DOWNLINE UPGRADE

This process upgrades the module's firmware (in nonvolatile Flash
memory). Enter the IP address of your TFTP (Trivial File Transfer
Protocol) load host and the image file name when prompted.

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*      IMPORTANT!         IMPORTANT!          IMPORTANT!   *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*    If power is interrupted during the downline load, the  *
*    firmware image can be corrupted. Do not turn off power *
*    to the unit or perform any action that can cause the   *
*    unit to lose power during a downline upgrade.          *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
=================================================================
 Press Return Key to Continue...
```

Initializing the Process

To initiate the DLU process, complete the following steps:

Step	Action	Example
1	Press Return	**\<Return\>**
2	Enter the firmware image file name and press Return. (The TFTP load host conventions specify the format of the firmware image file name).	`DEFBB160.BIN` **\<Return\>**
	If the file is located in the default TFTP directory, enter only the filename.	`DEFBB160.BIN`
	If the file is located somewhere other than the default TFTP directory, enter the complete path name.	`/BOOT/DEFBB160.BIN`
3	Enter the IP address of the TFTP load host, and press Return. The screen displays the following message:	**16.20.40.156**

```
 Load will be initiated over the
 in-band port network interface. The
 device becomes nonfunctional for up
 10 minutes during the time that
 the flash load is in progress. When
 the flash load is in progress.WHen
 load is complete the screen
 displays the message:(Module not
 responding!) This is normal.
 Press Return Key to Start Load
 [Ctrl/C to abort]...
```

4	Press Return	**\<Return\>**

When you press \<Return\>, you initiate the DLU process over the LAN that is connected to the load host. The screen displays the following message:

```
 DLU process started!
 ..............
```

The DLU Process Stages
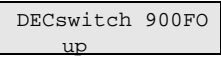
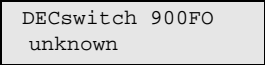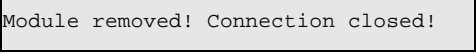The DLU process consists of four stages:

Stage	Description
1	Transferring the image to the module's temporary storage buffer
2	Verifying the image
3	Writing the new image into nonvolatile flash memory
4	Module reset and self-test

Table 5-1 explains what happens during each stage of the DLU process:

Table 5-1: DLU Process Description

Stage	Description
1	**The DLU process transports the new firmware image across the network from the TFTP load host and places it into a temporary storage buffer in the module.** This stage normally takes 1 minute to complete. However, due to variations in network configurations (load path and traffic levels), this stage can take 10 minutes or more. The following states indicate that this stage is in progress: • Module status – functional and manageable • Module can respond to management requests • LED display – normal operation • Hub Manager display – `DECswitch 900FO` `up` • Setup screen display – `DLU process started!` `................` When the series of dots ends, the screen displays the following message: `Transfer complete.`

Stage	Description

2	**The module verifies that the firmware image is correct.**
	This stage normally takes 10 seconds to complete.
	
	The following states indicate that this stage is in progress:
	
	• Module status – functional and manageable
	
	• Module can respond to management requests
	
	• LED display – normal operation
	
	• Hub Manager display –
	`DECswitch 900FO`
	`            up`

3	**The DLU process transfers the new image from the module's temporary storage buffer to the nonvolatile flash memory, overwriting the old image.**
	
	CAUTION: If power is interrupted during Stage 3 of the DLU process, the firmware image can become corrupted. Do not turn off power to the unit or perform any action that can cause the unit to lose power during Stage 3 of the DLU process.
	
	This stage normally takes less than 2 minutes to complete.
	
	The following states indicate that this stage is in progress:
	
	• Module status – not functional or manageable
	
	• Module cannot respond to management requests
	
	• LED display:
	
	— The Power LED is on.
	
	— The Module OK LED is on.
	
	— The Port State LED 4 lights green for 3 or 4 seconds.
	
	— The Port State LED 5 lights green for up to 2 minutes.
	
	— All the Port State LEDs flash alternately green and yellow for 10 seconds.
	
	• Hub Manager display –
	`DECswitch 900FO`
	`      unknown`
	
	• Setup screen display – `Module removed! Connection closed!`
	
	These messages are normal and indicate the module is not manageable.

Stage	Description
4	**The module resets, runs self-test, and then begins executing the new firmware image.**
	This stage normally takes 1 minute to complete.
	The following states indicate that this stage is in progress:
	• Module status – not functional or manageable.
	• Module cannot respond to management requests.
	• LED display –
	— The Power LED is on.
	— The Module OK LED is off.
	— The Port State LEDs flash indicating various subroutines are running (standard self-test pattern).
	• Hub Manager display – `DECswitch 900FO` `unknown`
	This message is normal and indicates the module is not manageable.

If the Process Does not Complete

If the process does not complete as described in Stage 3, take one of the following actions:

If	Then	Because
The module loses power	Contact your Digital representative.	The firmware image is corrupted.
The Port State LEDs 4 and 5 do not light	Check that the load host is operational.	The load did not succeed.
All the Port State LEDs light yellow after Port State LED 4 or 5 lights	Retry the load procedure. If the problem persists, contact your Digital service representative.	A loading error has occurred.

When the DLU Process is Complete

When the DLU process is complete, the following events occur:

- The module exits from the DLU process.

- The module begins the execution of the new firmware image.

- The Module OK LED turns on.

- The module becomes fully operational.

- The Hub Manager status display shows the following message:

```
DECswitch 900FO
up
```

Verifying the Upgrade

After the DLU process has completed, you can verify the firmware upgrade by completing the following steps:

Step	Action
1	Select Option [3] Show Current Settings from the DECswitch 900FO INSTALLATION MENU.
2	Verify that the correct firmware version has been loaded.
3	Press <Return> for the Main Menu .

The screen displays the following text.

```
                  Enter selection : 3

DECswitch 900FO - slot 3
=======================================================================
DECswitch 900FO, 6-Ethernet/FDDI Switch, HW=v1/2,RO=v0.4,SW=v1.6.0
SysUpTime                                 : 6days 00:03:18   28 resets
SNMP Read/Write Community                 : whitney95
SNMP Trap Addresses                       : 16.7.88.156
Status of Last Downline Upgrade           : TFTP Read
                                            00:02:55  27 resets
                                            Transfer Complete
Out-of-Band Management RTS                : Disabled
BootP                                     : Disabled
Interface  IP Address   Subnet Mask   Def.Gateway   Other Info
In-Band    16.20.216.91 255.255.255.0  16.21.0.1     08-00-2B-A6-8D-C8
OBM Port   16.20.66.156 255.255.255.0                Speed 9600 bps
IPX switch is disabled.
FDDI port configuration is Front Panel: A, B
Port 4 using front panel UTP port
=======================================================================
                  Press Return for Main Menu ...
```

[7] Module-Specific Options

This option provides module-specific selections when you are using the DEChub 900. When selected, the option allows you to:

- Configure IPX switch

- Run extended diagnostics

- Return to Main Menu

The following example shows the dialog associated with this option:

```
                     Enter selection : 7
DECswitch 900FO - slot 3
============================================================

                MODULE-SPECIFIC OPTIONS

           [1] Configure IPX Switch
           [2] Run Extended Diagnostics
           [3] Return to Main Menu

============================================================
Enter selection : [n]
Press Return to Continue ...
```

[1] Configure IPX Switch

This option allows you to configure the IPX switch. The Novell Internetworking Protocol eXchange (IPX) interconnects LANs to allow communication between client and server.

When the IPX switch is enabled, the DECswitch 900FO translates raw 802.3 frames to SNAP encapsulated FDDI frames with a protocol type 81-37. When disabled, IPX frames are translated without SNAP encapsulation. The current state of the IPX switch can be viewed by selecting option [3] Show Current Settings in the DECswitch 900FO INSTALLATION MENU.

If the IPX switch is disabled (factory default), the following dialog appears on the screen:

```
                    Enter selection : 1
Enable IPX Switch?
Press Y to confirm [N] : Y <Return>
Press Return for Main Menu ...
```

If the IPX switch is enabled, the screen displays the following message:

```
 Disable IPX Switch?
```

[2] Run Extended Diagnostics

This option allows you to run certain extended diagnostics tests if you suspect that the module is faulty. One of these tests is the Ethernet backplane loopback test. All other tests run as part of the normal powerup self-test.

CAUTION

This action deletes all configured settings and replaces them with factory default values. All configuration settings will be lost.

NOTE

This option facilitates fault diagnosis under certain conditions. There is normally no need to select this option.

The extended diagnostics tests disrupt operation on the DEChub backplane and on network segments connected to the switch ports. In addition, the switch will be reset to factory defaults at the end of the tests. As a result, all configuration parameters stored in Nonvolatile Random Access Memory (NVRAM) are erased. Be sure to observe the following precautions before proceeding further with the extended diagnostics test:

Step	Action
1	Record any configuration parameters, such as the module's IP address and address filters, that you would like to restore after the test.
2	Disconnect all modules other than this switch from backplane channels. Do this by physically removing the modules from the hub or using the clearVISN MultiChassis Manager LAN Interconnect view.

The following example shows the dialog associated with this option:

```
                    Enter selection : 2

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*       IMPORTANT!           IMPORTANT!           IMPORTANT!    *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
The extended diagnostics tests utilize hub backplane
LANs. These LANs may not be utilized by any other
module during the tests. Also, the switch will be
reset to factory defaults after the test. All
nonvolatile configuration parameters including the switch's IP
address will be lost. You must do the following before
running the tests:

(1) Disconnect all modules from backplane LANs (ThinWire
    LAN connections need not be removed). This may be
    done from the clearVISN LAN interconnect view
    (RECOMMENDED). Alternately, the modules (other than
    this switch) may be physically removed from the Hub.
(2) Note down any configuration parameters such as the
    switch's IP address that you would like to restore after the
    tests.

Are you ready to run the extended diagnostics tests?
Press Y to confirm. [N]: Y <Return>
```

If you do not want to run the extended diagnostics tests, press N or <Return>. If you press Y, the extended diagnostics tests are run. After a few seconds, the following message appears on the screen:

```
  Module Removed! connection closed!
  Press Return for Main Menu ...
```

The module is now reset to factory defaults. Allow approximately 1 minute for the module to reset. After successfully resetting and completing self-test, the Module OK LED lights and the Hub Manager display indicates the following information:

```
  DECswitch 900FO
  up
```

Display DEChub 900 MultiSwitch INSTALLATION MENU

Press <Return> to display the DEChub 900 MultiSwitch INSTALLATION MENU. Display the DECswitch 900FO INSTALLATION MENU as described in the section titled [9] Start Redirect Mode.

Error log entries

Select option [5] Dump Error Log in the DECswitch 900FO INSTALLATION MENU. This action dumps the most recent entry in the error log, if there are any entries.

If...	Or...	Then...
No error log entry is displayed	The Test ID field of the first entry does not have a value of B06	The module has successfully passed the extended diagnostics test.
An error log entry is displayed		Check the Test ID field in the entry.
		If the Test ID field has a value of B06, the backplane loopback test has failed. The failure may be caused by any of the following reasons:
		• A fault in this module
		• A fault in the hub backplane
		• Faults in other modules installed in the hub
		Call your Digital service representative for further assistance.

Chapter 6

Removing the Module

Overview

Introduction

This chapter describes how to remove the module from a DEChub 900 MultiSwitch. To remove the module from a standalone unit, refer to the *DEChub ONE Installation* manual.

In This Chapter:

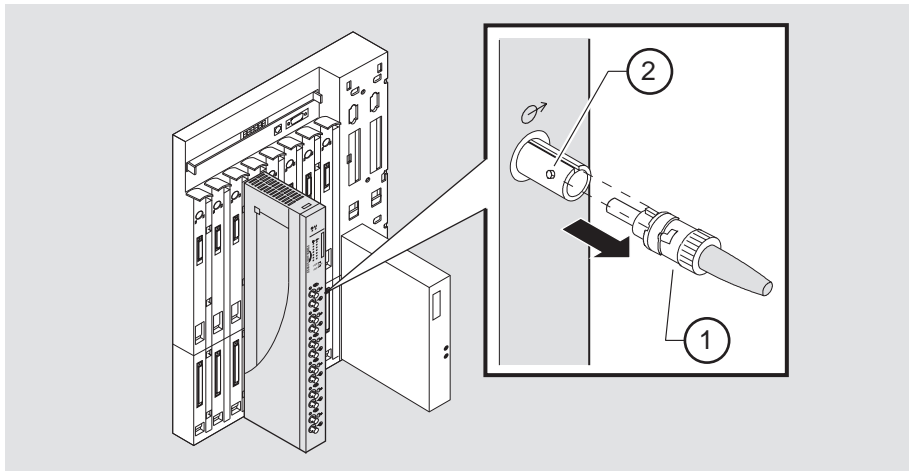| Topic	Page
Removing the Cable	6-2
Unseating the Module	6-3

Removing the Cable

To remove the cable from the module, complete the steps in the following table (see Figure 6-1):

| Step	Action
1	To disconnect the fiber-optic cable, push the plug's sleeve in (**1**) and turn it counterclockwise.
2	Pull out the cable from the module connector (**2**).

Figure 6-1: Disconnect the Cable

NPG-0338-95F

Unseating the Module

To unseat the module from the DEChub 900, complete the following steps (see Figure 6-2):

Step	Action
1	Hold the module and lift the release lever (**1**) located at the top of the DEChub 900 slot.
2	While holding up the release lever (**2**), pivot the module back on its bottom mounting tab (**3**).
3	Remove the module.

Figure 6-2: Unseat the Module
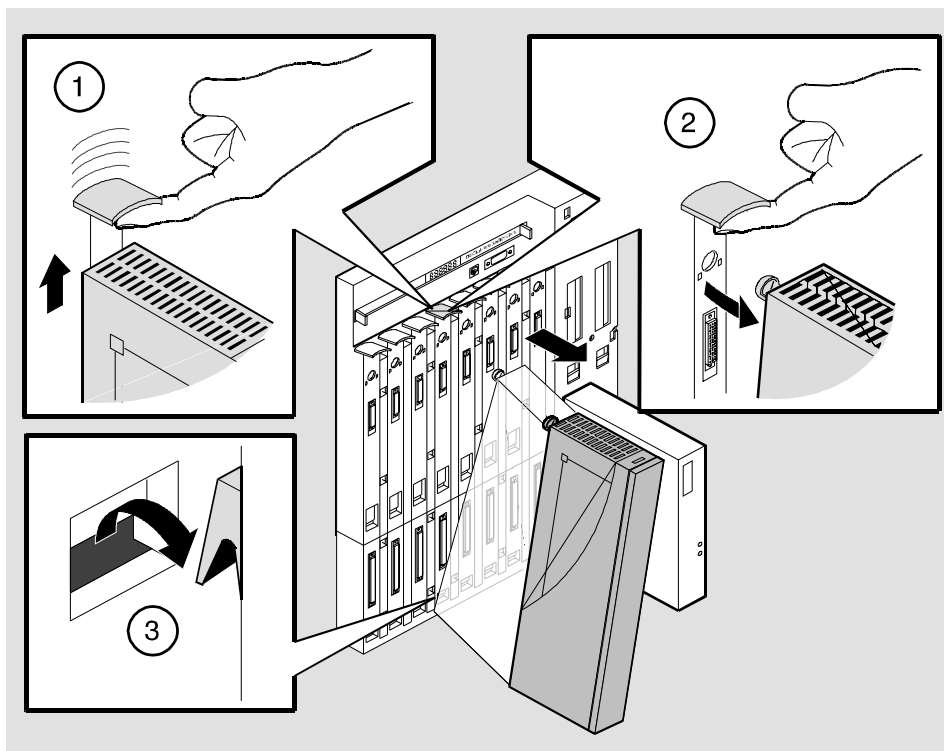
NPG-0008-95F

Appendix A

Problem Solving

Overview

Introduction

This appendix describes how to diagnose and solve problems with the module using the LED displays.

In This Appendix

LED Descriptions

The module's LEDs provide dynamic indications of the status of the module. The LEDs can be in various states (on, off, or flashing), and can change color (green or yellow) depending on the operational status of the module or the level of activity on the network.

Table A-1 shows the states that are possible for each of the module's LEDs.

Table A-1: Module LED States

LED Name	Off	On (Green)	On (Yellow)	Flashing
Power	No power to module	Module receiving power	N/A	N/A
Module OK	Self-test failed (if more than 60 seconds elapsed)	Passed self-test	N/A	Non fatal failure
Port State	Bad or no connection	Port is in the forwarding state	Port Failure	Port is in the Backup, Preforwarding or Disabled state
Network Activity	No network activity	Port connected to network through the module's front panel connector	Port connected to network via DEChub 900 backplane or DEChub ONE AUI port	Intermittent network activity
Port Link	Bad fiber-optic connection on receive port	Receive port has a good fiber-optic link that meets 802.3/10BaseFL requirements	N/A	N/A

The FDDI PHY LEDs (see Table A-2) indicate the status of the connection between the module and the FDDI network.

Table A-2: FDDI PHY LED States

	Off	On			Flashing	
LED Name	**No Color**	**Green**	**Yellow**	**Green**	**Yellow**	**Green / Yellow**
FDDI Port (PHY)	Ready to connect	Good connection	Link error rate exceeded	Disabled or broken	Illegal or unwanted connection	Standby or dual homing

Normal Powerup

When the module's power is initially turned on, the following events occur:

Event	Description
1	The module's Power LED lights as soon as power is applied to the unit.
2	The module initiates its built-in self-test. Flashing Port State LEDs and Network Activity LEDs indicate that the module is running various subroutines as part of the self-test.
3	After the successful completion of self-test (within 60 seconds after power is applied), the Module OK LED lights, and remains lit.
4	The remaining LEDs (Port State LEDs, Network Activity LEDs, Port Link LEDs, and PHY LEDs) now indicate their operational status, as described in Table A=1.

Problem Solving Using LEDs

When diagnosing a problem with the module, note that the problem is often indicated by the combined states of the module LEDs. Table A-3 lists the typical combined states of the LEDs for various error conditions that can occur during initial installation of the device, along with probable causes and corrective actions to take.

Table A-3: Problem Solving Using LEDs

Symptom	Probable Cause	Corrective Action
Power LED is off.	The module is not receiving +5Vdc.	Check the power status on the Hub Manager status display.
		If the Hub Manager status display indicates that power is available for this module, press the release lever and reseat or remove the module.
		Inspect the module's 48- or 160-pin connector for bent or broken pins. If any are bent or broken, replace the module.
		If the problem persists, either replace the module or contact your Digital service representative to correct the problem.
Module OK LED is off.	Self-test failed.	If the LED does not light within 60 seconds, lift and reseat the release lever momentarily to repeat the self-test.
		If self-test fails again, either replace the module or contact your Digital service representative to correct the problem.

Symptom	Probable Cause	Corrective Action
Module OK LED is off and Port State LED for Port 1 is blinking green (once every 8 seconds).	Module's firmware image is corrupted.	Either replace the module or contact your Digital service representative to correct the problem.
Module OK LED is flashing, but module continues to operate normally.	A nonfatal error occurred.	Turn power off and on. If the problem persists, either replace the module or contact your Digital service representative to correct the problem.
Port Link LED is off.	• Fiber-optic cable connection is BAD.	Replace or repair cable.
	• Fiber-optic cable budget exceeded.	See Appendix B, Fiber-Optic Loss Budget.
Port State LED is off.	• Connection is bad (loose or incorrect cable).	Correct the cable connection.
	• Port not connected.	None (normal operation).
Port State LED is Yellow.	Port failure.	Either replace the module or contact your Digital service representative to correct the problem.
Port State LED is flashing green.	The corresponding port is in one of the following port states: Backup, Preforwarding, or Disabled.	None (normal operation).

Appendix B
Fiber-Optic Loss Budget

Overview

Introduction

This appendix describes the calculated fiber-optic loss budget for the DECswitch 900FO.

In This Appendix

Topic	Page
Labeling	B-2
10BaseFL Loss Budget	B-3
FOIRL Compatibility	B-5
Maximum Launch Power	B-6

Labeling

Note the labeling on the fiber-optic cable that is being installed with the DECswitch 900FO. Cables are tagged according to fiber type. For example, micron fiber-optic types are:

- 50/125

- 62.5/125

- 85/125

- 100/140

The attenuation of each cable is also characterized and recorded.

10BaseFL Loss Budget

Table B-1 shows the calculated loss budget for 10BaseFL fiber-optic segments used to interconnect the DECswitch 900FO with the cable plant. These measurements account for the connectors at either end of the segment and are calculated using the transmit and receive optical power levels in decibels of optical power referenced to one milliwatt (dBm).

NOTES

1. When connecting the cables to other devices, take into account the transmit and receive optical power levels of the other devices.

2. No additional degradation is used. It is included in the vendor's specified power calculations.

Table B-1: 10BaseFL Worst-Case Loss Budget (0°C to 50°C, End of Life)

Measurement	Unit of Measure	Multimode, Graded Index Fiber Size (Microns)			
		50/125	62.5/125	85/125	100/140
Numerical aperture	NA	0.2	0.275	0.26	0.3
Minimum average transmit power ($P_{T(avg)}$)	dBm	-22.8	-19.0	-16.8	-13.5
Minimum average receive sensitivity ($P_{R(avg)}$)	dBm	-32.5	-32.5	-32.5	-32.5
10BaseFL loss budget ($P_{T(avg)}$ - $P_{R(avg)}$)	dB	9.7	13.5	15.7	19.0

FOIRL Compatibility

The IEEE 802.3 standard for fiber-optic interrepeater link (FOIRL) devices specifies a -27.0 dBm minimum peak receive power ($P_{R(avg)}$ = -30.0 dBm). This power level represents a 2.5 dB lower receive sensitivity. The worst-case loss budget for FOIRL-compliant devices should include this decrease in receive sensitivity.

The IEEE 802.3 standard specifices a maximum receive power level of -9.0 dBm peak or -12.0 dBm average for FOIRL and 10BaseFL devices, respectively.

When calculating the loss budget for fiber-optic devices, ensure that the higher output from the module, in conjunction with the increased launch power into the two largest fiber sizes (85.125 and 100/140 microns), does not overlead the receivers.

Table B-2 shows the calculated loss budget, in peak levels, for FOIRL-compliant fiber-optic segments.

NOTE

No additional degradation is used. It is included in the vendor's specified power calculations.

Table B-2: FOIRL Worst-Case Loss Budget (0^oC to 50^oC, End of Life)

Measurement	Unit of Measure	Multimode, Graded Index Fiber Size (Microns)			
		50/125	62.5/125	85/125	100/140
Minimum peak transmit power ($P_{T(peak)}$)	dBm	-19.8	-16.0	-13.8	-10.5
Minimum peak receive power ($P_{R(peak)}$)	dBm	-27.0	-27.0	-27.0	-27.0
FOIRL loss budget	dB	7.2	11.0	13.2	16.5

Maximum Launch Power

Table B-3 shows the loss budget for fiber-optic devices should include the maximum launch power amounts.

Table B-3: DECswitch 900FO Best-Case Maximum Launch Power

Measurement	Unit of Measure	Multimode, Graded Index Fiber Size (Microns)			
		50/125	62.5/125	85/125	100/140
Minimum peak transmit power	dBm	-12.8	-9.0	-6.8	-3.5
Maximum average transmit power	dBm	-15.8	-12.0	-9.8	-6.5

Additional Attenuation

When the DECswitch 900FO is connected to short lengths of 85/125-micron or 100/140-micron fiber-optic cable, the connection might require additional attenuation to prevent exceeding the -9.0 dBm peak (-12 dBm average) received power level. To make that determination, complete the following steps:

Step	Action
1	Subtract the cable's characterized attenuation value from the value listed in Table B-3.
2	If the result of this calculation is less negative than -9.0 dBm peak (-12.0 dBm average), connect the fiber-optic cable to the DECswitch 900FO and measure the actual power level at the opposite end of the cable to determine whether additional attenuation is required.

You can obtain attenuators (such as Fotec part number A-450-A) from Fotec, Inc. in Charlestown, Massachusetts, or contact other fiber-optic vendors for an equivalent part.

Appendix C

Product Specifications

Overview

Introduction

This appendix lists the operating specifications and the acoustical specifications for the DECswitch 900FO module.

In This Appendix

Topic	Page
Operating Specifications	C-2
Acoustical Specifications	C-4
Connectors	C-5

Operating Specifications

Table C-1 lists the product specifications for the module.

Table C-1: Product Specifications

Parameter	Specifications
Environment	
Operating Temperature [1]	5°C to 50°C (41°F to 122°F)
Relative Humidity	10% to 95% noncondensing
Altitude	
• Operating	Seal level to 2400 m (8,000 ft)
• Non-operating	Sea level to 4900 m (16,000 ft)
Power	53.0 W, total power
	8.5 A, 5Vdc
	0.1 A, 12Vdc[2]
	0.7 A, 15Vdc
Physical	
Height	44.45 cm (17.5 in)
Width	4.45 cm (1.75 in)
Depth	15.25 cm (6 in)[3]
	15.25 cm (6 in)[4]
Weight	1.79 kg (3.95 lb)[5]

Parameter	Specifications
Shock (Class A/B for products weighing under 100 lbs)	
10 G / 10 ms half sine pulse in three orthogonal axes	
Vibration (Class C)	
5 to 2000 Hz sine sweep @ 0.25 G limited by 0.02" (0.5mm) displacement DA* 200 to 500 Hz sine sweep @ 0.10G	
Certification	CE, CSA, FCC,TÜV, UL, VCCI

[1] For sites above 4900 m (16,000 ft), decrease the operating temperature specification by 1.8^{o}C for each 1000 m or 3.2^{o}F for each 3200 ft.

[2] The 12Vdc power in the DEChub 900 is derived from the 15Vdc power source. Although it is listed separately in the product specifications, the 12Vdc requirements are included in the 15Vdc power total.

[3] Include an additional 10.25 cm (4.0 in) when attached to a DEChub ONE docking station.

[4] Include an additional 15.12 cm (5.9 in) when attached to a DEChub ONE-MX docking station.

[5] Include 1.59 kg (3.5 lb) when attached to a DEChub ONE docking station; add 2.10 kg (4.63 lb) when attached to a DEChub ONE-MX.

Acoustical Specifications

Table C-2 lists the acoustical specifications for the module.

Table C-2: Acoustical Specifications

Declared values per ISO 9296 and ISO 7779[1]

Product	Sound Power Level L_{WAd}, B	Sound Pressure Level L_{pAm}, dBA (bystander positions)
	Idle/Operate	Idle/Operate
DECswitch 900FO DEFBB-MA	5.0	37
DECswitch 900FO & DEChub ONE DEFBB-MA + DEHUA	5.3	40
DECswitch 900FO & DEChub ONE-MX DEFBB-MA + DEF1H	5.4	40

[1] Current values for specific configurations are available from Digital Equipment representatives.
1 B = 10 dBA.

Schallemissionswerte - Werteangaben nach ISO 9296 und ISO 7779/DIN EN27779[2]

Produkt	Schalleistungspegel L_{WAd}, B	Schalldruckpegel L_{pAm}, dBA (Zuschauerpositionen)
	Leerlauf/Betrieb	**Leerlauf/Betrieb**
DEFBB	5,0	37
DEFBB and DEHUA	5,3	40
DEFBB and DEF1H	5,4	40

[2] Aktuelle Werte für spezielle Ausrüstungsstufen sind über die Digital Equipment Vertretungen erhältlich
1 B = 10 dBA.

Connectors

Table C-3 provides a list of connectors for DECswitch 900FO and the DEChub ONE and DEChub ONE-MX.

Table C-3: Connectors

Connectors	Quantity
Fiber-optic ST-type (DECswitch 900FO)	12
DEChub ONE	
• 8-pin MJ (Setup port)	1
• DB-9 (OBM)	1
• 15-pin D-Sub (AUI connector)	1
DEChub ONE MX	
• 8-pin MJ	1
• 6-pin MJ (OBR)	1
• DB-9	1
• 15-pin D-Sub	1
• Redundant power connector (D-Sub)	1

Appendix D

Cables

Overview

Introduction

This appendix describes some of the cables that are available for connecting your module to various network devices. Digital has cables that can satisfy most of your needs. Contact your Digital sales representative for additional information.

In This Appendix

Topic	Page
Multimode Cables	D-2
Port Keying	D-2
Multimode Cables with ST Connectors	D-3
Multimode Cables with MIC Connectors	D-3
Multimode Cables with SC Connectors	D-4

Multimode Cables

The following ANSI multimode cables are available from Digital Equipment Corporation:

Cable Description	Order Number
FDDI-to-2.5 mm ST-type connector cables	BN24D-*xx**

**xx* represents the cable length in meters.

The following cable lengths are available:

| Cable Length	xx Value
1 m (3.3 ft)	01
3 m (9.8 ft)	03
4.5 m (14.8 ft)	4E
10 m (32.8 ft)	10
20 m (65.6 ft)	20
30 m (98.4 ft)	30

Port Keying

Digital BN24B and BN24D cables are color key coded on the top of the duplex connector as follows:

- Red for PHY A ports

- Blue for PHY B port

- Green for PHY M ports

The receptacles and plugs are keyed as shown in Figure D-1.

Figure D-1: Receptacles and Plugs Keying MIC Connectors
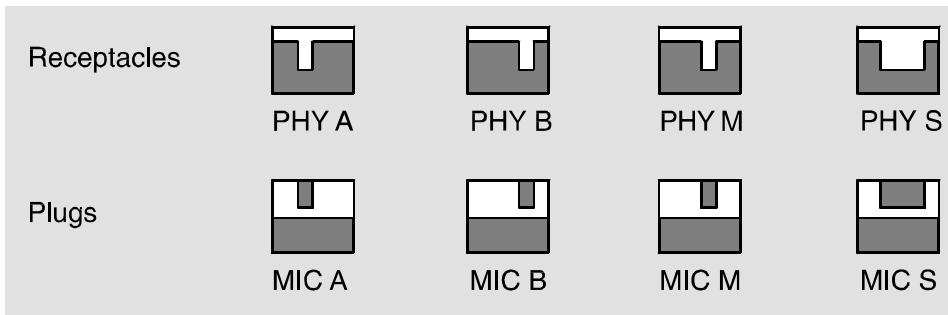
NPG-0188-95F

Multimode Cables with ST Connectors

Multimode cables with ST connectors are available from Digital Equipment Corporation. Refer to the following table for the connector type and description:

ST Cable Description	Order Number
Dual 2.5-mm Bayonet ST Multimode Cable	BN 34C -*xx*
Dual ST to SC Multimode Cable	BN 34A -*xx*
ST to FDDI (Ansi MIC) Multimode Cable	BN 24D -*xx*

Multimode Cables with MIC Connectors

Multimode cables with MIC connectors are available from Digital Equipment Corporation. Refer to the following table for the connector type and description:

Connector	Description
MIC A	Primary in/secondary out - DAS PHY A port
MIC B	Primary in/secondary out - DAS PHY B port
MIC M	Concentrator PHY M port
MIC S	SAS PHY S port

Multimode Cables with SC Connectors

Multimode cables with SC connectors are available from Digital Equipment Corporation. Refer to the following table for a description of the various connector types and order numbers:

SC Cable Description	Order Number
ST to SC	BN 34A -*xx*

Contact your Digital sales representative for additional information.

Appendix E

Accessing and Configuring RMON Groups

Overview

Introduction

This appendix describes how to access the four RMON groups and how to configure the Alarms and Events groups.

In This Appendix

Topic	Page
Why is RMON?	D-2
Groups Supported	D-3
How to Access RMON Groups	D-4

What is RMON?

RMON is a Remote Network Monitoring Management Information Base (RMON MIB). RMON gathers a wide variety of statistical information about network operation. A typical network consists of multiple network segments with one RMON agent connected to each segment. RMON gathers this information by examining each packet passed on a network segment. Segment statistics are stored in counters within the module. The counters are continuously updated and reset at powerup.

RMON also captures and stores network traffic information. RMON allows you to examine these captured packets or sequences of packets to identify and isolate network operational software or hardware problems.

RMON features are listed and described in Chapter 1.

NOTE

The online help includes management tasks and information for the RMON Manager application.

Groups Supported

The four RMON groups supported by this module are Statistics, History, Alarms, and Events. The following table defines these four groups:

This group...	Allows you to...
Statistics	Obtain an array of operational statistics including: • Packets • Octets • Broadcasts • Collisions • Dropped packets • Fragments • CRC alignment errors • Undersize/oversize packets • Multicasts • Jabbers • 64 octet packets • 65 to 127 octet packets • 128 to 255 octet packets • 256 to 511 octet packets • 512 to 1023 octet packets • 1024 to 1518 octet packets
History	Obtain a historical representation of statistics for individual ports for customized trend analysis.
Alarms	Set a wide variety of thresholds and sampling intervals on any statistic to create an alarm condition. An alarm will cause an event. You may set threshold values as: • An absolute value • A rising value • A falling value • A delta value
Events	Create entries in the monitor log and generate SNMP traps for selected events. You can initiate events by setting an alarm on any counter. The log includes a description and the time of each event.

How to Access RMON Groups

This section provides you with procedures that describe how to access the RMON Groups.

RMON Group	To Access/Use these Groups ...
Statistics and History	Use the clearVISN MultiChassis Manager (See Accessing Statistics and History)
Alarms and Events	Use any SNMP network manager (See Accessing Alarms and Events)

Accessing Statistics and History

To access the Statistics and History groups you must manage each of these groups using the clearVISN MultiChassis Manager as follows:

Step	Action
1	Run the clearVISN MultiChassis Manager.
2	Double-click on the DECswitch 900FO module. (The summary screen displays the module's summary.)
3	Click on the RMON button to display the Statistics screen.
4	Click on the HISTORY button on the Statistics screen.

For additional Statistics and History information refer to online help.

Accessing Alarms and Events

This section describes how to set up a condition to be monitored (an alarm) and an event to be generated once that condition has occurred. You use an SNMP network manager to set up conditions and events. For a more complete description of the alarmTable and eventTable, refer to RFC 1757: S. Waldbusser, "Remote Network Monitoring Management Information Base", 02/10/1995.

The event group consists of the eventTable and the logTable. The alarmTable contains configuration entries that define a variable, polling period, and threshold parameters.

If an entry is found to have crossed the threshold value, an event is generated that is processed as specified by your entries in the eventTable. Thus, the eventTable controls the generation and notification of events from the device.

The RMON Alarms and Events MIB objects and eventCommunity support up to 32 characters. MIB object eventDescription, alarmOwner, and eventOwner support up to 127 characters. The maximum number of entries that can be placed in the alarmTable is 20. For the eventTable, the maximum is 32.

Alarm and Event Table Entries

Alarm table entries can only be created for SNMP Integer MIB variables of the following types:

- INTEGER

- Counter

- Gauge

- TimeTicks

The following tables list and define the fields that make up an alarm table entry and an event table entry.

Table E-1: Alarm Table Entry Fields

Alarm Table Entry Fields	Definition
alarmIndex	An index that uniquely identifies an entry (see note below).
alarmInterval	The interval, in seconds, over which the data is sampled and compared with the rising and falling threshold.
alarmVariable	The object identifier of the particular variable to be sampled.
alarmSampleType	The method of sampling the selected variable and calculating the value to be compared against the thresholds.
alarmValue	The value of the statistic during the last sampling period (see note below).
alarmStartupAlarm	The alarm that may be sent when this entry is first set to valid.
alarmRisingThreshold	Rising (increasing) threshold for the sampled statistic.
alarmFallingThreshold	Falling (decreasing) threshold for the sampled statistic.
alarmRisingEventIndex	The index of the eventEntry that is used when a rising threshold is crossed.
alarmFallingEventIndex	The index of the eventEntry that is used when a falling threshold is crossed.
alarmOwner	The person who configured this entry and is therefore using the resources assigned to it.
alarmStatus	The status of this alarm entry.

NOTE

The alarmIndex and alarmValue objects are read-only. You cannot set these fields. The alarmIndex is implicitly specified when the entry is created. The alarmValue is made available after the current sampling period.

Table E-2: Event Table Entries

Event Table Entry Fields	Definition
eventIndex	An index that uniquely identifies an entry (see note below).
eventDescription	A comment describing this event.
eventType	The type of notification that will occur when the threshold is being reached.
eventCommunity	If an SNMP trap is to be sent, it will be sent to the SNMP community specified.
eventLastTimeSent	The value of sysUpTime at the time this event entry last generated an event. (see note below).
eventOwner	The person who configured this entry and is therefore using the resources assigned to it.
eventStatus	The status of this event entry.

NOTE

The eventIndex and eventLastTimeSent objects are read-only. You cannot set these fields. The eventIndex is implicitly specified when the entry is created. The eventLastTimeSent is made available after the current sampling period.

How Traps Work

SNMP-managed devices are able to send trap messages to network management stations. You configure the IP addresses of NMS "trap sinks" that are to receive the RMON trap messages. For additional information on traps, refer to RFC 1215: M. Rose, "A Convention for Defining Traps for use with the SNMP", 03/27/1991.

The trap IP address can be configured on all DEChub 900 modules through the device's set-up port. With the exception of the DECserver 900 products, the trap IP address can also be added via SNMP set-requests to the device's private MIB (pcomSnmpAuthTrapAddressTable).

You can specify that when an alarm condition is reached, a trap is generated and sent to the trap sinks specified. For additional information on how to specify trap generation, refer to eventType RFC 1757: S. Waldbusser, "Remote Network Monitoring Management Information Base", 02/10/1995.