DECswitch 900EF

Installation and Configuration

Part Number: EK-DEFBA-IN. D01

May 1996

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

VCCI Notice — Class 1 Computing Device:
This equipment is in the 1st Class category (information equipment to be used in commercial and/or industrial areas) and conforms to the standards set by the Voluntary Control Council for Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in commercial and/or industrial areas. Consequently, when used in a residential area or in an adjacent area thereto, radio interference may be caused to radios and TV receivers. Read the instructions for correct handling.

CE Notice — Class A Computing Device:
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 Gegenma nahmen verantwortlich ist.
Attention!
Ceci est un produit de Classe A. Dans un environment domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées.

CONTENTS

Preface

Safety

1 Product Introduction

2 Installing the Module

3 Installing the Setup Port Cable

4 Setting Up and Configuring the Module in a DEChub ONE

5 Configuring the Module in a DEChub 900

6 Removing the Module

A Problem Solving

B Connector and Pin Assignments

C Product Specifications

D Accessing and Configuring RMON Groups

Figures

Tables

Preface

Overview

About this Manual

This manual describes how to install the DECswitch 900EF in a DEChub 900 MultiSwitch. (How to install the DECswitch 900EF in the DEChub ONE docking station is described in the *DEChub ONE Installation* manual.) This manual also describes how to configure the DECswitch 900EF software to operate in either a DEChub 900 MultiSwitch or as a standalone module in a DEChub ONE docking station.

Intended Audience

This manual is intended for use by personnel who will install and configure the DECswitch 900EF module.

Organization

This manual is organized as follows:

Section	Description
1	Provides an overview of the DECswitch 900EF, describes its features, and lists front and back panel features.
2	Provides instructions for installing the module in a DEChub 900 MultiSwitch.
3	Provides instructions for installing the setup port cable.
4	Provides instructions for configuring the module in a DEChub ONE.
5	Provides instructions for configuring the module in a DEChub 900 MultiSwitch.
6	Provides instructions for removing the module from a DEChub 900 MultiSwitch.
A	Provides installation-specific troubleshooting information using the LEDs.
B	Provides connector and pin assignment information.
C	Provides product specifications.
D	Provides instructions for accessing the RMON groups.

Associated Documents

The following documents provide information relating to the module. To order any of the following documents, refer to the section titled 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 full RMON firmware upgrade that supports all nine RMON groups plus additional proprietary RMON MIBs.
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 the application efficiently.
clearVISN Configuration and Use	Provides information for starting each application, configuring then (when necessary), and general use 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). This includes the use of bridges in extended LAN configurations, information on LAN interconnections, overall bridge operation, spanning tree, and solving bridge-related problems in a network.

Conventions

Overview

This book uses the following conventions.

Convention	Description
Bold Type	Indicates user input
Monospaced Type	Indicates system output
16.20.54.156	The format of an IP address 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 (.).
Italics	In examples, indicates user input.
[ ]	Contain default responses to the installation menu prompts.
<Return>	Indicates that you press the Return Key.
Ethernet	The Digital's term for its product's compatibility with the ISO 8801-3/ANSI/IEEE 802.3 standards and the Ethernet standards for Carrier Sense Multiple Acc4ess with Collision Detection (CSMA/CD) local area networks (LANs).
08-00-2B-A3-00-00	This format represents a Media Access Control (MAC) address in examples and figures.

Correspondence

Documentation Comments

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

Attn.:	Documentation Project Manager
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
Europe:	http://www.networks.europe.digital.com
Australia:	http://www.digital.com.au/networks

How to Order Additional Documentation

To order additional documentation, use the following information.

To Order:	Contact:
By Telephone	USA (except Alaska, New Hampshire, and Hawaii):
	1-800-DIGITAL (1-800-344-4825)
	Alaska, New Hampshire, and Hawaii: 1-603-884-6660
	Canada: 1-800-267-6215
Electronically (USA. only)	Dial 1-800-DEC-DEMO (For assistance, call 1-800-DIGITAL)
By Mail (USA 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
Internationally	DIGITAL EQUIPMENT CORPORATION Attn.: A&SG Business Manager c/o local Digital subsidiary or approved distributor
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 Gerate 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.

WARNING	To prevent personal injury or equipment damage, **do not** insert telecommunications cabling into the Optical Bypass Relay connector.
VORSICHT	Um Personen oder Geräteschäden zu vermeiden, dürfen Sie das Telefonkabel **Auf Keinen Fall** am Anschluß des optischen Bypass-Relais anschließen.
DANGER	Pour éviter tout risque d'accident corporel ou de dommage matériel, **Ne Branchez Pas** de câble de télécommunication sur le connecteur de relais sélectif optique.
AVISO	Para evitar daños personales o al equipo, **No** se debe introducir cableado de telecomunicaciones en el conector óptico de relés de derivación.

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.

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.

Chapter 1

Product Introduction

Overview

Introduction

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

In this chapter

What is the DECswitch 900EF?

The DECswitch 900EF (also referred to in this manual as the module) provides the interconnection between six 10 Mb/s Ethernet LANs and a high-speed 100 Mb/s Fiber Distributed Data Interface (FDDI) network backbone. (**The DECbridge 900MX has the same functions and features as the DECswitch 900EF.**)

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, transparent translation of network data packets between the FDDI and Ethernet networks.

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

You can access filters through Simple Network Management Protocol (SNMP) management software, allowing network managers to decide 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 900EF standards-compliant technology (IEEE 802.1d, 802.1h, 802.1i, 802.2, 802.3, and ANSI FDDI) ensures interoperability in multivendor networks.

You can configure the module into the DEChub 900 MultiSwitch (also referred to in this manual as the DEChub 900) or as a standalone unit into a DEChub ONE docking station (see the *DEChub ONE-MX Installation* manual or the *DEChub ONE Installation* manual). (**Throughout this manual, the term DEChub ONE refers to the DEChub ONE-MX or the DEChub ONE docking station unless otherwise specified.**)

Features

Your DECswitch 900EF 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 of the hub.

Configuration and Management

The following configuration and management options are available:

• Setup port for initial setup 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 setup 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 as an alternative to in-band management.

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

• Advanced Graphical User Interface (GUI) manageability with Digital's MultiChassis Network Management Station (NMS) application.

• Support for up to 8000 network addresses.

Features

Bridging

The following bridging features and options are available:

- 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 following FDDI/Ethernet features and options are available:

- One FDDI dual attachment station (DAS) port and six 802.3/Ethernet LAN ports.

  — Each of the ports (including FDDI PHY ports 1A/M and 1B/S) is individually switchable to a DEChub 900 backplane LAN through MultiChassis management. Port 3 can be redirected to the DEChub 900 backplane ThinWire LAN segment via MultiChassis Manager/HUBwatch.

  — When the module is installed into a DEChub ONE docking station, a user can configure either the DEChub ONE's AUI port or the module's (front panel) port 4 as an active Ethernet interface.

  — 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 as 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. FDDI port A can be switched 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.

SNMP

The following SNMP features and options are available:

- Built-in SNMP agent support for the following MIBs:

  — SNMP management (RFC 1157)

  — Management Information Base - MIB II (RFC 1213)

  — Bridge MIB (RFC 1493)

  — FDDI MIB (RFC 1512)

  — Ethernet MIB (RFC 1398)

  — Statistics, History, Alarms and Events Groups of RMON MIB (RFC 1757)

  — Digital ELAN MIB Extensions

- Support for all nine RMON groups with the Full RMON Firmware Upgrade.

- Support for the following SNMP traps:

  — coldstart

  — linkUp

  — linkDown

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

- SNMP trap address must be set if you want the switch to send traps.

Remote MONitoring (RMON)

The DECswitch 900EF 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 and MultiChassis Manager

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

- 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 D.

Virtual LANs

The VLAN capability of the switch 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 Manager refer to the *clearVISN Product Overview* manual.

Front Panel Features

The following table describes the DECswitch 900EF front panel features shown in
Figure 1-1.

Table 1-1: Front Panel LEDs and Connectors

Item	Icon	Name	Description
1		Power LED	On = the module has power.
2		Module OK LED	On = the module passed self-test. Off = Diagnostic test or module failed.
3		Port State LEDs	Indicate the status of ports 1 to 7.
4		Network Activity LEDs	Indicate network traffic level. The color shows whether the specific port's network connection is through the front panel (green) or through the backplane or docking station (yellow).
5		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

Front Panel Features

Figure 1-1: Front Panel LEDs and Connectors
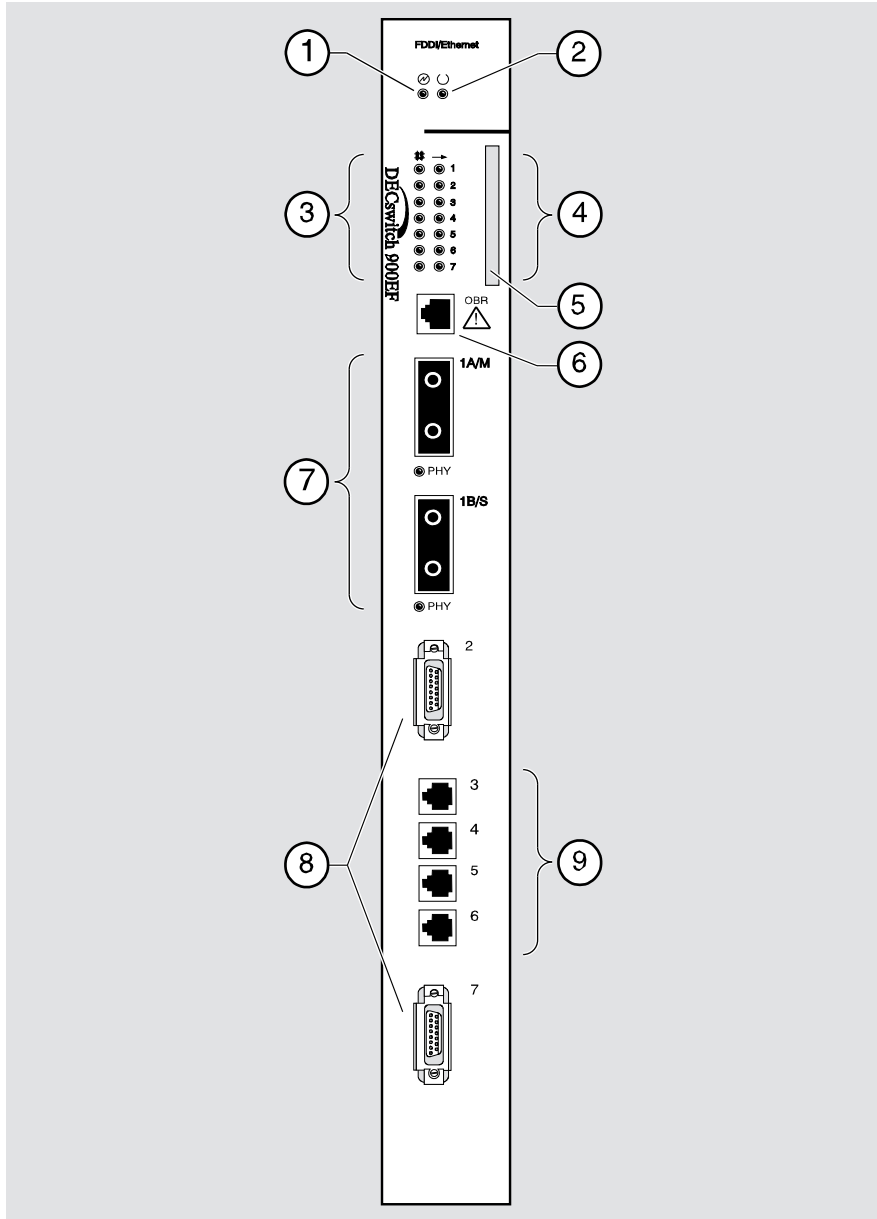
NPG-9548-95F

Table 1-2: Front Panel LEDs and Connectors

Item	Name	Description
6	Optical Bypass Relay (OBR) (6-pin MJ) connector	Allows you to connect an OBR device (not supplied) to maintain connectivity of the FDDI ring in the absence of power or during fault conditions in a station. **WARNING**: To prevent personal injury or equipment damage, do not insert telecommunications cables into the Optical Bypass Relay connector.
7	Dual attachment station (DAS) FDDI port connectors and associated PHY LEDs	One port is labeled 1A/M and the other port is labeled 1B/S. Both ports are standard FDDI MIC connectors.
8	802.3/Ethernet AUI (15-pin D-Sub) port connectors	Refer to the *OPEN DECconnect Applications Guide* for a list of AUI media adapters you can use with your module.
9	10BaseT (8-pin MJ) port connectors	Support both UTP and STP cabling. These ports are wired as straight-through connectors.

Back Panel Features

The features on the back panel (Figure 1-2) of the DECswitch 900EF are listed in Table 1-3.

Table 1-3: Back Panel Feature Descriptions

Item	Name	Description
1	Locking tab	Locks the module into a DEChub 900 backplane or into a Dechub ONE docking station. Contains the hot-swap 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 docking station.
3	Grounding bolt	Provides a chassis grounding connection between the module and the DEChub 900 or the DEChub ONE docking station.
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.

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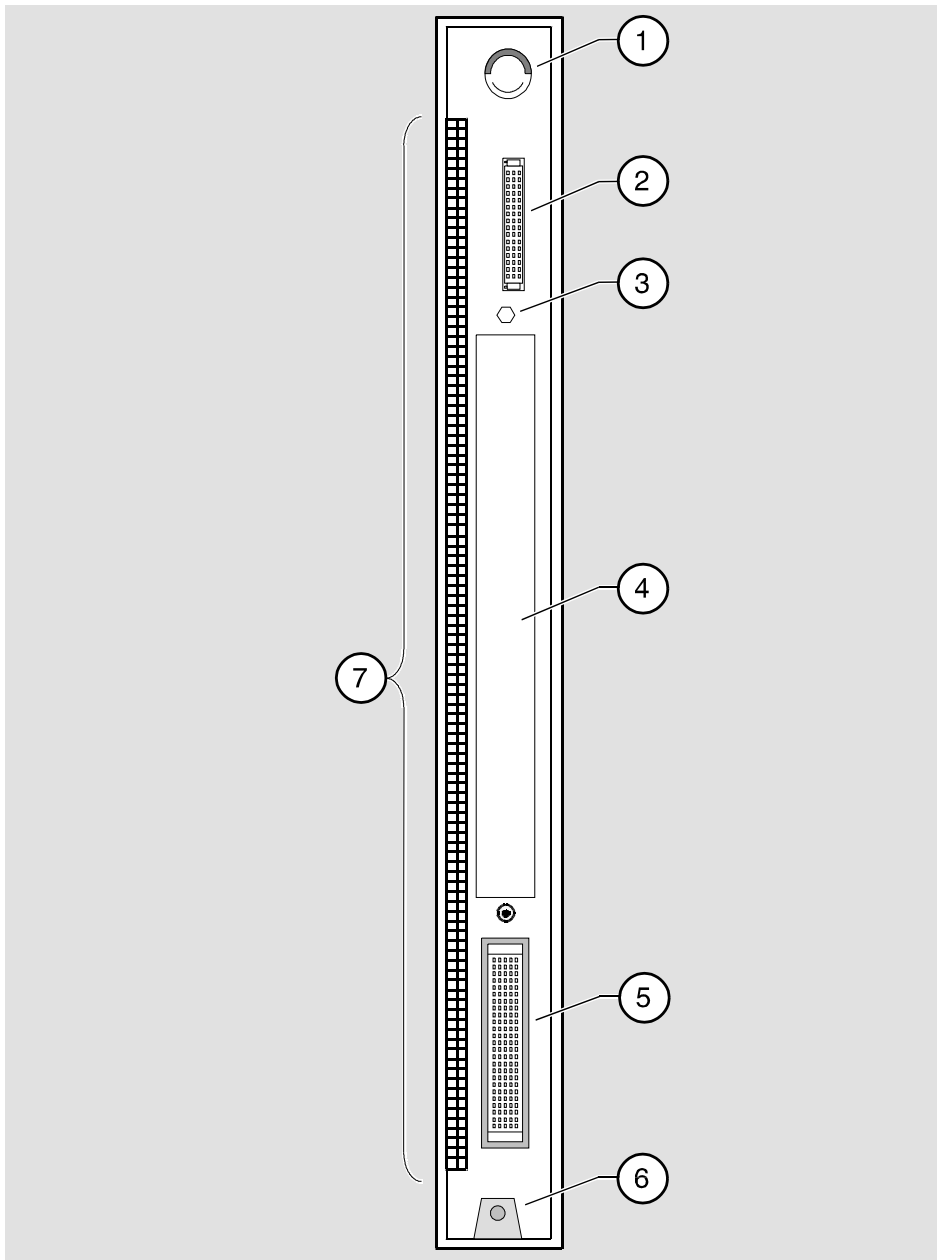
NPG-9723-95F

Chapter 2

Installing the Module

Overview

Introduction

This chapter describes how to install the DECswitch 900EF in a DEChub 900 MultiSwitch. To install a module in a DEChub ONE or DEChub ONE-MX docking station refer to the *DEChub ONE Installation* manual, the *DEChub ONE-MX Installation* manual or the *DECswitch 900ET Quick Start* card.

In this chapter

Topic	Page
Installing the Module in a DEChub 900	2-2
Task 1: Compare the Power Ratings	2-3
Task 2: Seat the Module into the DEChub 900	2-4
Task 3: Verify Initial LED Operation	2-5
Task 4: Connect the Port Cables	2-6

Installing the Module in a DEChub 900

The DECswitch 900EF hot-swap feature allows you to install the module into the DEChub 900 without turning off power. Seating the module initiates the module's powerup sequence if enough power is available.

The following table describes the tasks necessary for installing the module in a DEChub 900.

Task	Description
1	Compare the power ratings.
2	Seat the module into the DEChub 900.
3	Verify initial LED operation.
4	Connect necessary 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
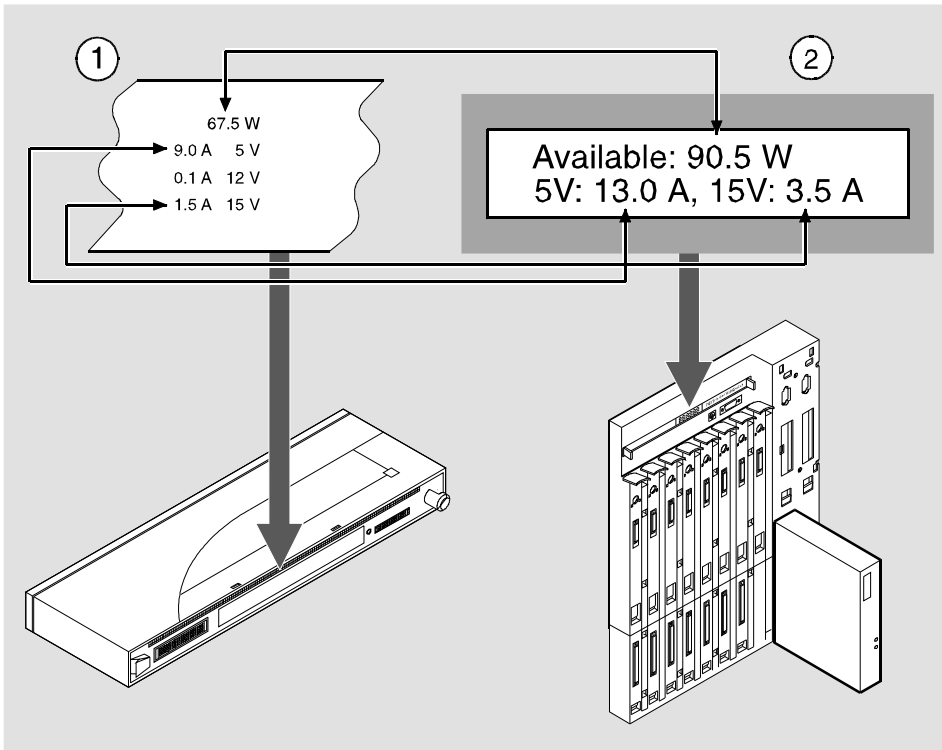
NPG-0107-95F

Task 2: Seat the Module into the DEChub 900

To seat the module, perform the following steps (see 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
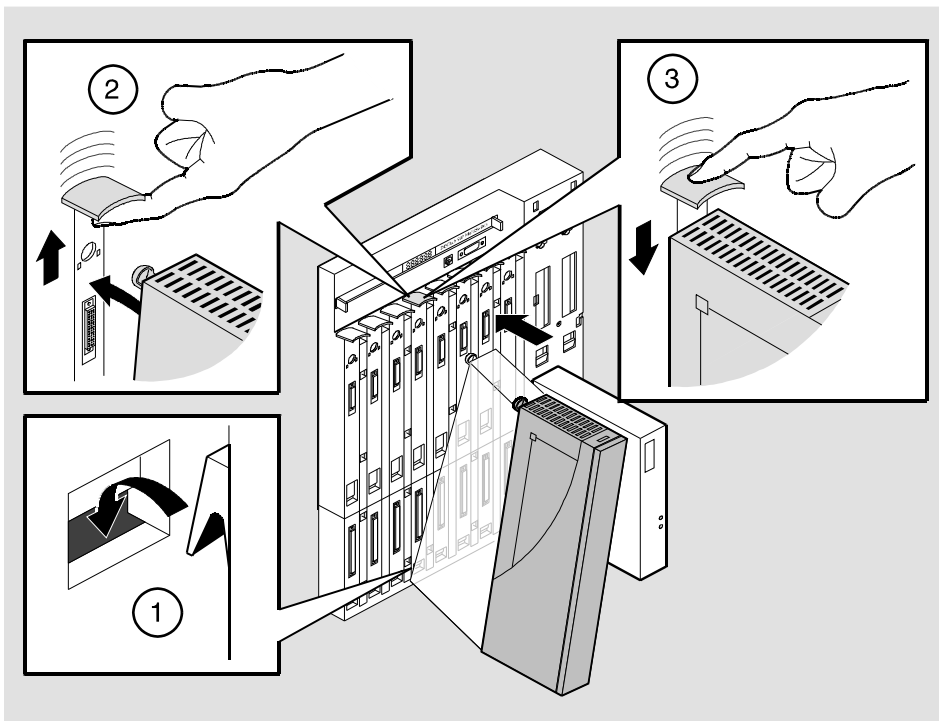
NPG-0004-95F

Task 3: Verify Initial LED Operation

Verify that the module's Power LED and the Module OK LED light within 1 minute (Figure 2-3). The LEDs light in the following two stages:

Stage	Description
1	The Power ⊘ LED lights when power is applied to the DEChub 900, then the module performs a self-test.
2	After the module completes self-test, the Module OK ◯ LED lights and remains lit. Then the Hub Manager status display shows: DECswitch 900EF up

NOTE

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

Figure 2-3: LED Location
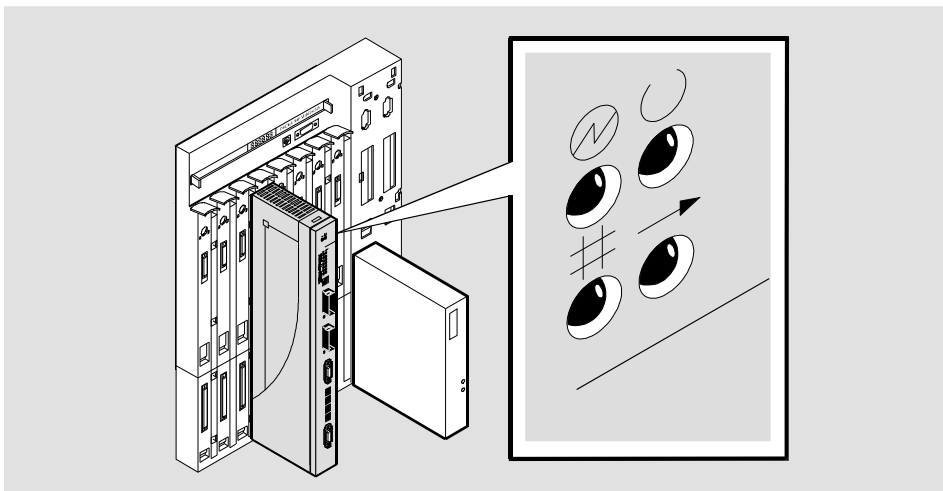
NPG-0148-95F

Task 4: Connect the Port Cables

Depending on your network configuration requirements, connect the appropriate FDDI cables, AUI Ethernet cables, and UTP/STP cables.

See your network manager if you are not sure which cables to connect.

NOTE

All cables should be installed, tested, and tagged at the site, prior to this installation.

To	Go to
Connect FDDI cables	Page 2-7
Connect AUI cables	Page 2-8
Connect UTP/STP cables	Page 2-9
Connect Optical Bypass Relay (OBR)	The installation instructions included with the OBR

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

Task 4 (Cont.): Connect the FDDI Cables

To connect the FDDI cables, complete the following steps (see Figure 2-4).

Step	Action
1	Remove the protective caps from the module's FDDI connector and from the FDDI cable plug.
2	Align the keyway (1) on the FDDI cable plug with the key on the module's FDDI connector.
3	Insert the plug into the connector (2), ensuring that the locking clips on the sides of the plug snap into the locked position.

Figure 2-4: FDDI Cables
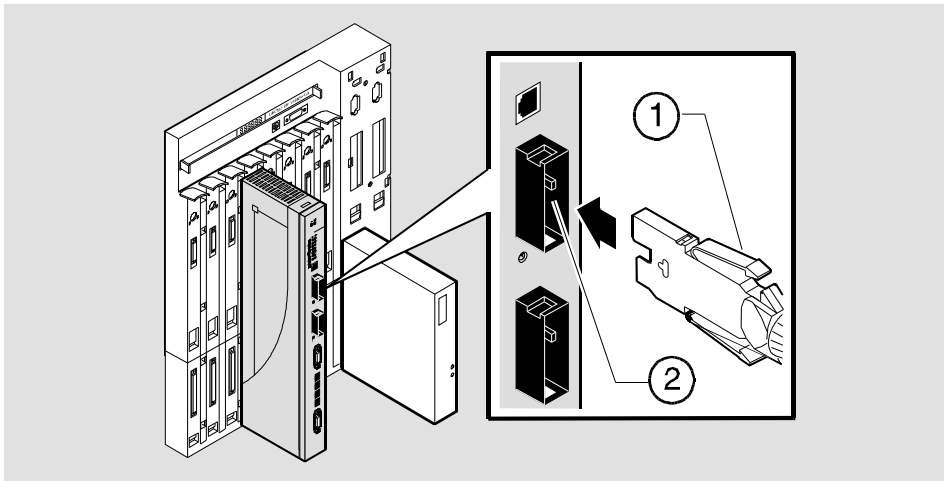
NPG-0110-95F

To disconnect the cables refer to Chapter 6.

Task 4 (Cont.): Connect the AUI Ethernet Cables

To connect the AUI Ethernet cable, complete the following steps (see Figure 2-5).

Step	Action
1	Push the module's AUI connector slide latch up (1) to the unlocked position.
2	Insert the AUI cable plug into the AUI connector.
3	Push the module's AUI connector slide latch down (2) to the locked position.

Figure 2-5: AUI Cable Connection
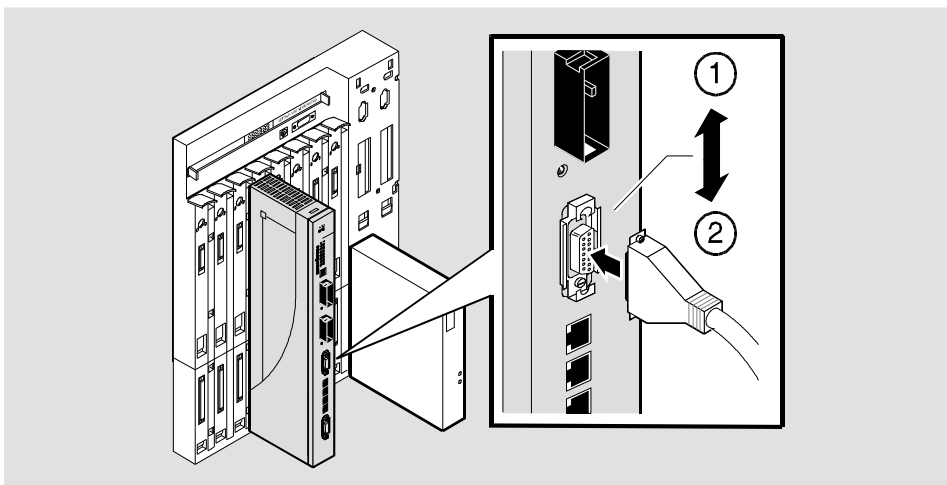
NPG-0111-95F

To disconnect the cables, refer to Chapter 6.

Task 4 (Cont.): Connecting the UTP/STP Cable

The DECswitch 900EF Router module uses straight-through 10BaseT (8-pin MJ) port connectors. Select the appropriate UTP/STP cable type (crossover or straight-through) to ensure that the module's transmit/receive signals connect correctly to the transmitter/receiver of the connected device.

Before connecting the cables to the module, note the following rules:

If the device you are connecting to the module uses	Then use
Straight-through connectors	Crossover cables
Crossover connectors	Straight-through cables

NOTES

1   The sum of crossovers must always equal an odd number.

2   Digital's straight-through cables are marked (=);
        crossover connectors (and cables) are marked (X).

If you need help determining the appropriate cable type to use, refer to Appendix B, Connector and Pin Assignments.

To connect the UTP/STP cables, complete the following steps (see Figure 2-6).

Step	Action
1	Align the release tab on the cable plug (1) with the keyway on the module's 10BaseT port connector.
2	Insert the plug into the connector (2), ensuring that the release tab snaps into the locked position.

Figure 2-6: UTP/STP Cable Connection
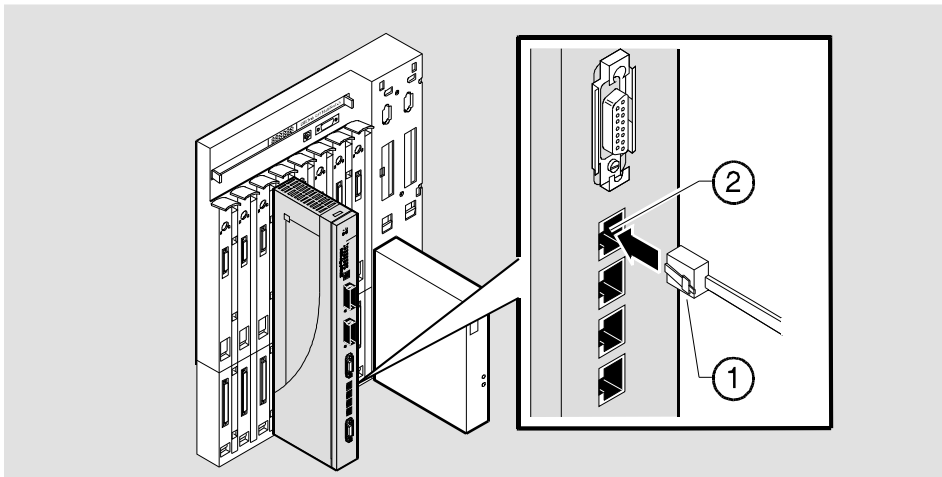
NPG-0112-95F

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

Chapter 3

Installing the Setup Port Cable

Overview

Introduction

This chapter describes how to connect the DECswitch 900EF module to the setup port on a DEChub 900 or the DEChub ONE docking station.

In this chapter

Topic	Page
Signaling Standards	3-2
Setup Port Device Cabling	3-3
Connecting to the Setup Port	3-4

Signaling Standards

Signals from the DEChub 900 Hub Manager setup port and from the DEChub ONE docking station setup 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 setup port is compatible with devices that use the EIA-423 signaling standard.

Setup Port Device Cabling

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

If the setup 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.

Legend

[1] xx indicates cable length in meters.

Connecting the Setup Port

To connect the setup port on the DECswitch 900EF 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 setup 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.

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

Figure 3-1: Device, Cable and Connector Identification
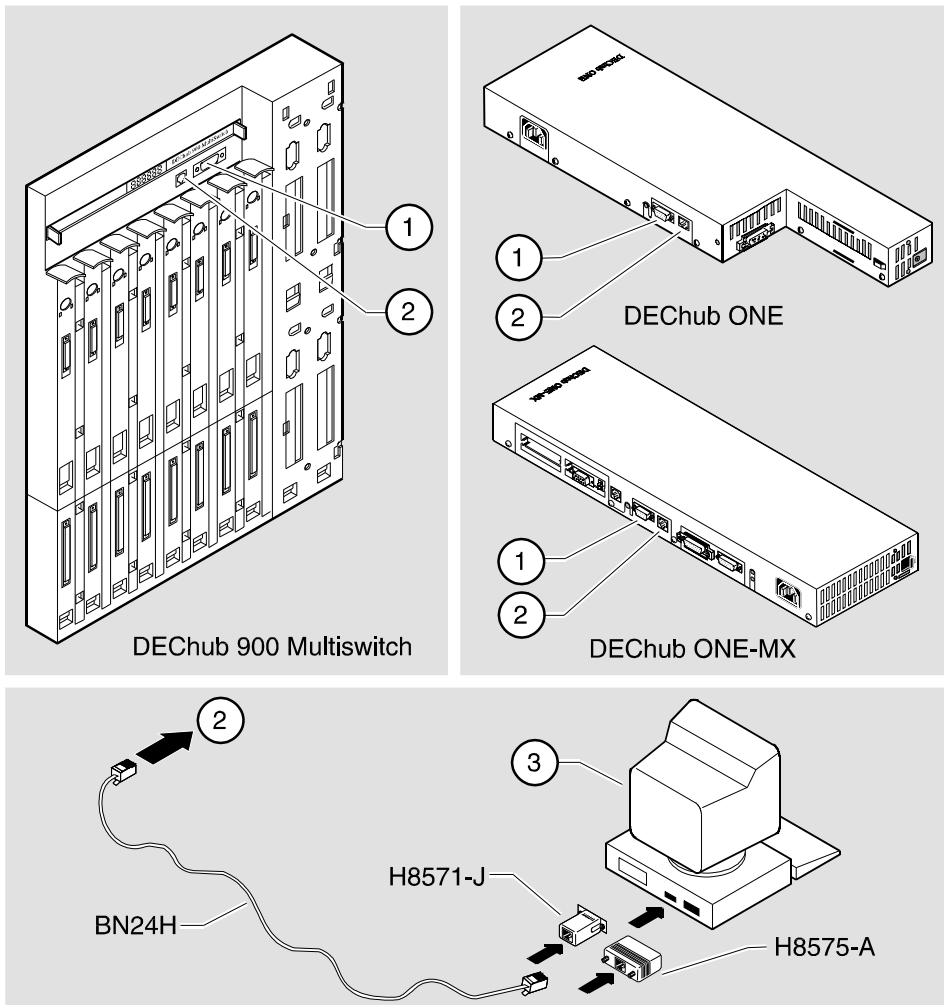
NPG-0020-95F

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

Setting Up and Configuring the Module in a DEChub ONE

Overview

Introduction

This chapter describes how to setup and configure your DECswitch 900EF when it is installed in a standalone unit DEChub ONE docking station. For DEChub ONE installation procedures refer to the *DEChub ONE Installation* manual. For DEChub ONE-MX installation procedures refer to the *DEChub ONE-MX Installation* manual

In this chapter

Accessing the Setup Port

The setup port provides menus that allow you to access the DECswitch 900EF. This setup menu allows you to minimally setup the module for basic connectivity.

Examples of the setup screen displays are provided in this chapter to aid in the description of the setup port and to display the options that are available. Because they are examples only, the displays can vary slightly from the actual screen displays on your setup port device.

The basic steps you must follow to configure your module and make it remotely accessible are to assign:

- An IP address

- A subnet mask

- A default gateway

To access the setup menus, press <Return> on the setup port device until the DECswitch 900EF INSTALLATION MENU appears.

Using Menus to Setup the Module

This section describes the options that are available from the `DECswitch 900EF INSTALLATION MENU` when the module is installed in the DEChub ONE **or DEChub ONE-MX** docking station.

```
        DECswitch 900EF
        =============================================================
            DECswitch 900EF 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 number:  [n]     <Return>
```

The installation menu options are as follows:

[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 900EF 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 900EF
========================================================================

                    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 900EF
=======================================================================
                  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 `IPX switch is disabled` will change to reflect the current IPX switch configuration.

The `FDDI port configuration is Front Panel: A, B` will change to reflect the current FDDI port configuration.

The `Port 4 using front panel UTP port` will change to reflect the current configuration of ports 1 and 4.

The following example shows the display associated with this option:

```
                  Enter selection : 3

DECswitch 900EF
==========================================================================
DECswitch 900EF, 6-Ethernet/FDDI Switch, HW=v1/2,RO=v0.4,SW=v1.60
SysUpTime                               : 6days 00:03:18   18 resets
SNMP Read/Write Community               : whitney96
SNMP Trap Addresses                     : 16.7.88.156
Status of Last Downline Upgrade         : TFTP Read
                                           00:02:55  17 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 ...
```

[4] Configure IP

This option provides you with IP configuration selections.

The following examples show this option's menus.

```
                 Enter selection : 4

DECswitch 900EF
=======================================================================

                  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.

[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 this option's dialog associated with this option.

```
                    Enter selection : 1

DECswitch 900EF
=======================================================================

                   SET SNMP READ/WRITE COMMUNITY

Format: The format for a community name is a string,
        consisting of four to thirty-one 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] : whitney96  <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 900EF 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 900EF
========================================================================

                   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 ...
```

If a trap address was already entered, the following information appears:

```
   Configured SNMP Trap Addresses:16.20.216.81
                   Trap address [ ]: 16.20.216.81    <Return>
```

[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 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 : 3

DECswitch 900EF
=======================================================================

                  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: 16.20.54.156

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

               Enter a Trap address [ ] : 16.20.216.81

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 was 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 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 factory default setting is no in-band address.

The following example shows the dialog associated with this option.

```
                    Enter selection : 4

DECswitch 900EF
=====================================================================

            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: 16.20.54.156

           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                                               Speed 9600 bps
==========================================================
   Enter the IP address [ ] : 16.20.126.24   <Return>
   Enter the Subnet Mask [ ] : 255.225.255.0    <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.

The out-of- band-management (OBM) 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 900EF Installation MENU.

The following example shows the dialog associated with this option.

```
                  Enter selection :5

DECswitch 900EF
=====================================================================

            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: 16.20.54.156

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

Interface  IP Address   Subnet Mask    Def.Gatewa   Other Info
-------    --------     ---------      --------     ---------
In-band    16.20.216.91 255.255.255.0  16.21.0.1    08-00-2B-A6-8D-C8
OBM Port                                            Speed 9600 bps
=====================================================================
            Enter the IP address [ ] : 16.20.66.156    <Return>
            Enter the Subnet Mask [ ] : 255.225.255.0   <Return>
                Press Return for IP Configuration Menu ...
```

Refer to the *DEChub ONE Installation* or *DEChub ONE-MX Installation* manual 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 900EF
=========================================================================

                      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 entries 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 900EF
=======================================================================
                         DUMP ERROR LOG
                    CURRENT RESET COUNT: 45
=======================================================================
Entry #      = 3
Entry Status = 0 [0=valid, 1=write_error,2=invalid,3=empty, 4=crc_error]
Entry Id     = 10
Firmware Rev = 1.6
Reset Count  = 8
Timestamp    =   0  0  0
Write Count  = 89
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 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 `Configure IP` (option 4) from the `DECswitch 900EF INSTALLATION MENU.`
2	Select `Set In-Band Interface IP Address` (option 4) from the `IP Configuration` menu.
3	Enter the IP address, Subnet mask and 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 900EF INSTALLATION MENU, the initial setup screen display appears. This screen identifies the option and alerts the user not to interrupt power during the downline load.

```
                     Enter selection : 6
DECswitch 900EF
=================================================================
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	a. If the file is in the default TFTP directory, enter the firmware image file name and press Return. (The TFTP load host conventions specify the format of the firmware image file name).	**DEFBA160.BIN** **\<Return\>**
	b. If the file is not in the default TFTP directory, enter the complete path name and press Return.	**/BOOT/** **DEFBA160.BIN** **\<Return\>**
3	Enter the IP address of the TFTP load host, and press Return. The screen displays the following message:	**16.20.40.156** **\<Return\>**
	```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!
```
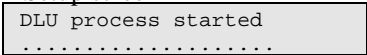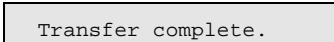
The DLU Process Stages

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	Module reset 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 – ``` 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. • 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, 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 turn on 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 screen displays the DECswitch 900EF Installation Menu.

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 900EF INSTALLATION MENU.
2	Press <Return>.
3	Verify that the correct version was loaded.

The screen displays the following text.

```
                  Enter selection : 3

DECswitch 900EF
========================================================================
DECswitch 900EF, 6-Ethernet/FDDI Switch, HW=v1/2,RO=v0.4,SW=v1.6.0
SysUpTime                              : 6days 00:03:18   18 resets
SNMP Read/Write Community              : whitney96
SNMP Trap Addresses                    : 16.7.88.156
Status of Last Downline Upgrade        : TFTP Read
                                         00:02:55  17 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

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.

The following example shows the dialog associated with this option.

```
                 Enter selection : 1

DECswitch 900EF
=====================================================================

           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, and configure the IPX switch.

The following example shows the dialog associated with this option.

```
              Enter selection : 8

DECswitch 900EF
============================================================

            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.

If your module is installed in a ...	Page
DEChub ONE-MX	4-26
DEChub ONE	4-27

FDDI Configuration in a DEChub ONE-MX

The following example shows the menu associated with this option when the module is installed in a DEChub ONE-MX.

This screen indicates the current station configuration.

```
                    Enter selection : 1

DECswitch 900EF
========================================================================
          DECswitch 900EF FDDI PORT CONFIGURATION MENU

          [1] Front Panel: A, B        Docking Station: none
          [2] Front Panel: None        Docking Station: A, B
          [3] Front Panel: B           Docking Station: A
          [4] Front Panel: A           Docking Station: B
          [5] Front Panel: M, S        Docking Station: none
          [6] Front Panel: None        Docking Station: M, S
          [7] Front Panel: S,          Docking Station: M
          [8] Front Panel: M           Docking Station: S
          [9] Return to Main Menu

Current configuration: Front Panel: A, B, Docking Station: None
========================================================================
                    Enter selection : [5] <Return>

FDDI port configuration set to Front Panel:M, S Docking Station: None

                    Press Return to Continue...
```

[1] Set FDDI Configuration (Cont.)

This option allows you to set the FDDI port configuration.

FDDI Configuration in a DEChub ONE

The following example shows the menu associated with this option when the module is installed in a DEChub ONE.

```
             Enter selection : 1

DECswitch 900EF
=====================================================================

          DECswitch 900EF 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 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 docking station, 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 UTP port. If port 4 is connected to the DEChub ONE docking station's AUI port then the front panel UTP port 4 is not operational.

The following example shows the menu associated with this option.

```
              Enter selection : 2

Change Port 4 to use Front Panel AUI port?

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

NOTE

If port 4 is already connected to the DEChub ONE docking station AUI port, the prompt changes to `Change Port 4 to use front panel UTP Port?`.

---

[3] Configure IPX Switch

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

When the IPX switch is enabled, the DECswitch 900EF 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 900EF 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 the IPX switch is enabled, the screen shows `Disable IPX Switch?`

Chapter 5

Configuring the Module in a DEChub 900

Overview

Introduction

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

In this chapter

DEChub 900 MultiSwitch Installation Menu

The following screen is an example of the DEChub 900 MultiSwitch INSTALLATION MENU.

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

```
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] Downing Upgrade
         [7] Configure Out-of-Band Port
         [8] Start Event Display Mode
         [9] Start Redirect Mode


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

          Enter selection number: 9
```

Examples of the setup screen displays are provided in this chapter to aid in the description of the setup port and to display the options that are available. Because they are examples only, the displays can vary slightly from the actual screen displays on your setup port device.

[9] Start Redirect Mode

The Start Redirect Mode option redirects the DEChub 900 MultiSwitch Hub Manager setup port to the setup port of any network module (such as the DECswitch 900EF) that is installed into the DEChub 900 MultiSwitch. Choosing this option allows you to set up or obtain the 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 DECswitch 900EF INSTALLATION MENU, the screen display prompts you for a slot number (8) as shown in the following example. After you enter the number of the slot in which the DECswitch 900EF 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 the dialog associated with this option.

```
            Enter selection number: 9

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

   Enter the slot number for redirection (1-8): 8

Console redirected to 8: DECswitch900EF

      Attempting connection [Ctrl/C to abort]...
```

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

Using Menus to Setup the Module

This section describes the options that are available from the DECswitch 900EF INSTALLATION MENU when the module is installed in the DEChub 900 MultiSwitch.

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

The following example shows the dialog associated with this option.

```
DECswitch 900EF- slot 3
=========================================================================
           DECswitch 900EF 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>
```

The installation menu options are as follows:

Topic	Page
[1] Reset with Factory Defaults	5-5
[2] Reset with Current Settings	5-6
[3] Show Current Settings	5-7
[4] Configure IP	5-8
[5] Dump Error Log	5-15
[6] Downline Upgrade	5-16
[7] Module-Specific Options	5-24

[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 900EF 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 900EF - 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 900EF - 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 will be blank.

The following example shows the display associated with this option:

```
                 Enter selection : 3

DECswitch 900EF - slot 3
==========================================================================
DECswitch 900EF, 6-Ethernet/FDDI Switch, HW=v1/2,RO=v0.4,SW=v1.6.0
SysUpTime                                 : 6days 00:03:18  18 resets
SNMP Read/Write Community                 : whitney96
SNMP Trap Addresses                       : 16.7.88.156
Status of Last Downline Upgrade           : TFTP Read
                                            00:02:55  17 resets
                                            Transfer Complete
BootP                                     : Disabled
Interface   IP Address     Subnet Mask    Def.Gatewa   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.
==========================================================================

             Press Return for Main Menu ...
```

NOTE

The IPX switch is disabled will change to reflect the current IPX switch configuration.

---

[4] Configure IP

This option provides you with IP configuration selections. The following examples show this option's menus.

```
                     Enter selection : 4

DECswitch 900EF - 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
         [5] Enable/Disable BootP
         [6] Return to Main Menu

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

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

The following pages describe the IP configuration options.

[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 this option's dialog (user response is shown in **boldface type**):

```
                 Enter selection : 1

DECswitch 900EF - slot 3


===================================================================
               SET SNMP READ/WRITE COMMUNITY

Format:The format for a community name is a string, consisting of four
to thirty-one 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] : whitney96  <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 900EF 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 900EF - 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 [ ]: 16.20.216.81 <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 900EF - 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


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

                    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 was 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 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 factory default setting is no in-band address.

The following example shows the dialog associated with this option.

```
                   Enter selection : 4

DECswitch 900EF - 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 [ ] : 16.20.216.91 <Return>
    Enter the Subnet Mask [ ] : 255.225.255 0  <Return>
    Enter the Default Gateway [ ] : 16.21.0.1 <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 out-of- band-management (OBM) 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 900EF Installation MENU`.

The following example shows the dialog associated with this option.

```
                      Enter selection :5

DECswitch 900EF - 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.Gatewa  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 <Return>
Enter the Subnet Mask [ ] : 255.225.255.0 <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 900EF - 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 900EF - slot 3
========================================================================
                          DUMP ERROR LOG
                     CURRENT RESET COUNT: 45
========================================================================
Entry #      = 3
Entry Status = 0 [0=valid, 1=write_error,2=invalid,3=empty, 4=crc_error]
Entry Id     = 10
Firmware Rev = 1.6
Reset Count  = 8
Timestamp    =   0  0  0
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?   <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.

Assigning an IP Address

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

Step	Action
1	Select `Configure IP` (option 4) from the `DECswitch 900EF INSTALLATION MENU`.
2	Select `Set In-Band Interface IP Address` (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 900EF INSTALLATION MENU, the initial setup screen display appears. This screen identifies the option and alerts the user not to interrupt power during the downline load.

```
                    Enter selection : 6
DECswitch 900EF
================================================================
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	a. If the file is in the default TFTP directory, enter the firmware image file name and press Return. (The TFTP load host conventions specify the format of the firmware image file name).	`DEFBA160.BIN` `<Return>`

	b. If the file is not in the default TFTP directory, enter the complete path name and press Return.	`/BOOT/`
		`DEFBA160.BIN`
		`<Return>`

3	Enter the IP address of the TFTP load host, and press Return. The screen displays the following message:	`16.20.40.156` `<Return>`

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

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

Step	Action	Example
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:
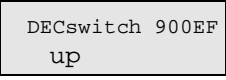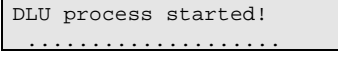
```
DLU process started!
.............
```
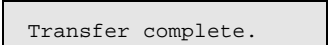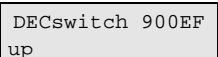
The DLU Process Stages

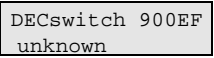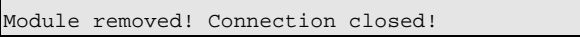The DLU process consists of four stages:

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

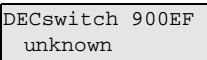Table 5-1 explains what happens during each stage of the DLU process:

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 900EF
      up
```

- Setup screen –

```
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.

- Module can respond to management requests.

- LED display – normal operation.

- Hub Manager display –
```
DECswitch 900EF
up
```

Stage	Description
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 900EF
unknown
```

- Setup screen –
```
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 900EF` `          unknown`
	This message is normal.

If the Process Does not Complete

If the process does not complete, 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 turn on 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 900EF
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 900EF INSTALLATION MENU`.
2	Press <Return>.
3	Verify that the correct version was loaded.

The screen displays the following text.

```
DECswitch 900EF
=======================================================================
DECswitch 900EF, 6-Ethernet/FDDI Switch, HW=v1/2,RO=v0.4,SW=v1.60
SysUpTime                                 : 6days 00:03:18   18 resets
SNMP Read/Write Community                 : whitney96
SNMP Trap Addresses                       : 16.7.88.156
Status of Last Downline Upgrade           : TFTP Read
                                            00:02:55  17 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 900EF - slot 3
=========================================================

              MODULE-SPECIFIC OPTIONS

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

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

          Enter selection : [n]   <Return>

          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 900EF 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 900EF 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 to Continue ...
```

If the IPX switch is enabled, the screen shows Disable IPX Switch?

[2] Run Extended Diagnostics

This option allows you to run certain diagnostics tests if you suspect that the module is faulty. The extended diagnostics test 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 test disrupts 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 test. As a result, all configuration parameters stored in nonvolatile Flash memory are erased. Please 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 MultiChassis Manager LAN Interconnect view.

[2] Run Extended Diagnostics (Cont.)

The following example shows the dialog associated with this option:

```
                    Enter selection : 2

DECswitch 900EF - slot 3
==========================================================
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*      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 MultiChassis Manager LAN interconnect view
    (RECOMMENDED). Alternately, the modules (other than
    this switch) may be physically removed from the Hub.
(2) Note down any configuration parameter such as the
    switch's IP address that you want to restore after the
     test.
==========================================================
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 test, press N or <Return>. If you press Y, the extended diagnostics test is run. After a few seconds, the following message appears on the screen:

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

[2] Run Extended Diagnostics (Cont.)

The module is now reset to factory defaults. Allow approximately one 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 900EF
up
```

Display DEChub 900 MultiSwitch INSTALLATION MENU

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

Error log entries

Select option [5] Dump Error Log in the DECswitch 900EF 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 faults:
		• A fault in this module
		• A fault in the hub backplane
		• Faults in other modules installed in the hub
		Call your service representative for further assistance.

Chapter 6

Removing the Module

Overview

Introduction

This chapter describes how to remove the DECswitch 900EF from a DEChub 900 MultiSwitch. If you need instructions on how to remove the DECswitch 900EF from a standalone module, refer to either the *DEChub ONE Installation* manual or the *DEChub ONE-MX Installation* manual.

In this chapter

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

Removing the Cables

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.

To remove cables from the module, complete the step in the following table that is appropriate for your type of cable (see Figure 6-1).

| Step	Action
1	FDDI cables, press the locking clips (1) on the cable plug, then pull out the cable.
2	AUI cables, push the connector slide latch up (2) to the unlocked position, then pull out the cable.
3	UTP/ScTP cables, press the release tab (3) on the cable plug, then pull out the cable.
4	Optical Bypass Relay (OBR) cables, refer to the removal instructions included with the OBR.

Figure 6-1: Cable Removal
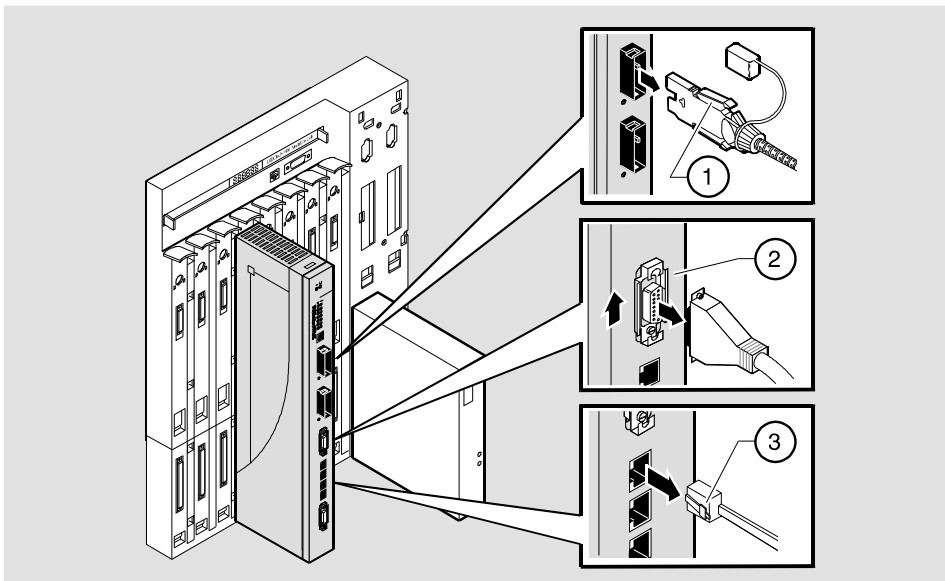
NPG-0109-95F

Unseating the Module

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

Step	Action
1	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
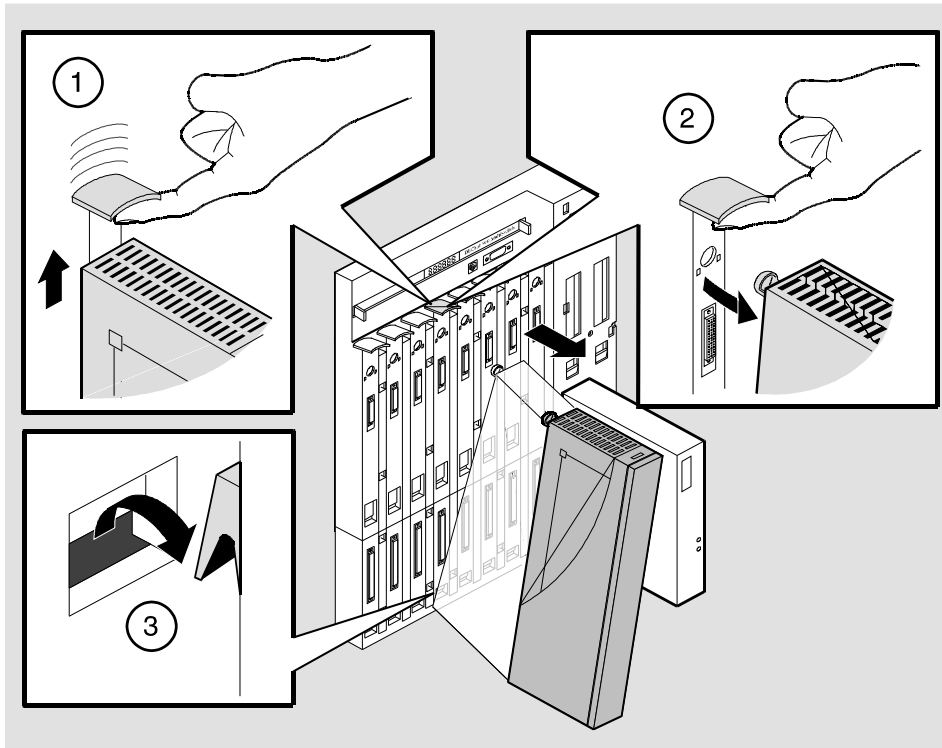
NPG-0008-95F

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 blinking), and can change color (green or yellow) depending on the operational status of the module or the level of activity on the network.

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. Blinking Ethernet Activity LEDs and Ethernet Status 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 (TR1, TR2, and Ethernet LEDs) now indicate their operational status, as described in the following table.

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

Table A-1: LED States

LED Name	Off	On (Green)	On (Yellow)	Blinking
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 Status	Bad or no connection.	Port is in the forwarding state.	Port Failure.	**Port is in the Backup, Pre-forwarding 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.

LED Descriptions

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 LEDs

LED Name	Off	On		Blinking		
	No Color	Green	Yellow	Green	Yellow	Green/ Yellow
PHY	Ready to connect	Good connec-tion	Link Error Rate exceed-ed	Dis-abled or broken	Illegal or unwant-ed con-nection	Stand-by or Dual homing

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: Typical Combined States of 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.
		If the problem persists, either replace the module or contact your service representative to correct the problem.
Module OK LED is off.	Self-test in progress.	Wait for self-test to complete.
	Self-test failed.	If the LED does not light within 60 seconds, lift the release lever momentarily to repeat the self-test.
		If self-test fails again, replace the module. If the problem persists, contact your service representative to correct the problem.
Module OK LED is off and Ethernet Activity LED for Port 1 is blinking green (once every 8 seconds).	Module's firmware image is corrupted.	Either replace the module or contact your service representative to correct the problem.
Module OK LED is blinking, but module continues to operate normally.	A non-fatal error occurred.	Power off and on. If the problem persists, either replace the module or contact your service representative to correct the problem.
Port State LED is off.	1. Connection is bad (loose, or incorrect cable).	Correct the cable connection.
	2. Port not connected.	None — normal operation.

Symptom	Probable Cause	Corrective Action
Port State LED is on yellow.	Port failure.	Either replace the module or contact your service representative to correct the problem.
Port State LED is blinking green.	The corresponding port is in one of the following port states: Backup, Preforwarding or Disabled.	None — normal operation.

Appendix B

Connector and Pin Assignments

Overview

Introduction

This appendix shows the pin assignments of the connectors, cables, and adapters that are part of, or can be used with, the module.

In this appendix

Connector Assignments

Optical Bypass Relay (6-pin MJ) Connector

The Optical Bypass Relay (OBR) feature on the module maintains FDDI dual-ring integrity if the module fails or if the power to the module is turned off. Figure B-1 shows the OBR 6-pin Modular Jack (Shielded RJ12) connector and its pin assignments. Refer to this information when selecting OBR devices.

Figure B-1: Optical Bypass Relay Connector Pin Assignments
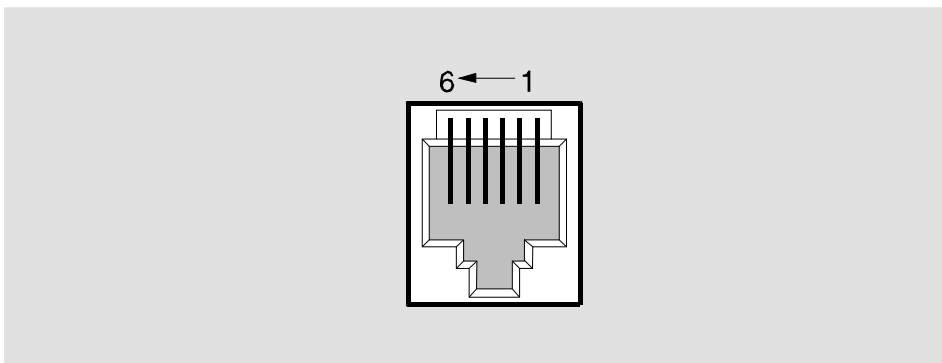
NPG-8720-95F

Table B-1: Pin Assignments

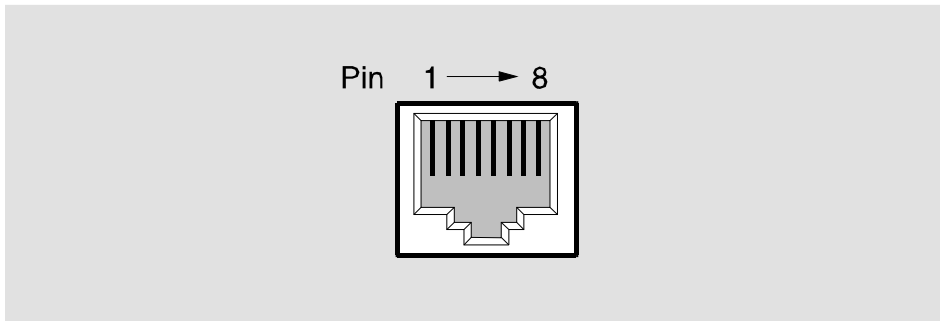| Pin	Assignment
1,2	Relay drive; +5V @ 200 mA (max.)
3,4,6	Return; grounded internally
5	Bypass present; must be externally grounded to pin 3,4, or 6

10BaseT (8-pin MJ) Port Connector

Figure B-2 shows the 8-pin MJ (straight-through) connector and its pin assignments.

Table B-2: 10BaseT (8-pin MJ) Connector Pin Assignments

Pin No.	Assignment
1	TX+
2	TX-
3	RX+
4	Unused
5	Unused
6	RX-
7	Unused
8	Unused

Figure B-2: 10BaseT (8-pin MJ) Connector

NPG-8719-95F

NOTE

All 10BaseT port connectors on the module are straight-through connections.
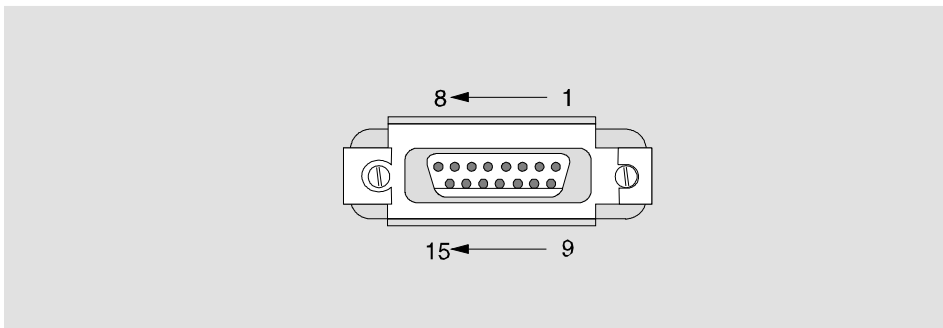
AUI (15-pin D-Sub) Port Connector

Figure B-3 shows the shielded MJ8 Twisted Pair 15-pin AUI connector and its pin assignments.

Table B-3: AUI 15-Pin Port Connector Pin Assignments

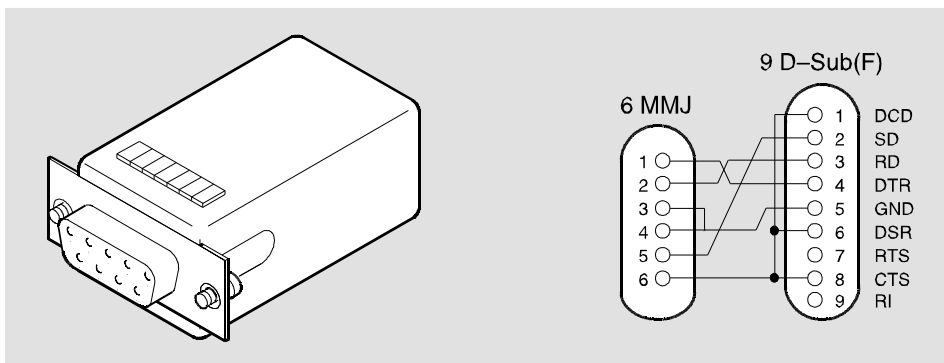| Pin No.	Assignment
1	Ground
2	CI+
3	DO+
4	Ground
5	DI+
6	Power rtn
7	NC
8	Ground
9	CI-
10	DO-
11	Ground
12	DI-
13	Power 12V
14	Ground
15	NC

Figure B-3: AUI 15-Pin Port Connector

NPG-0222-95F

H8571-J Adapter

This section shows the H8571-J adapter (6-pin MMJ to 9-pin D-Sub connector) and its pin assignments as shown in Figure B-4.
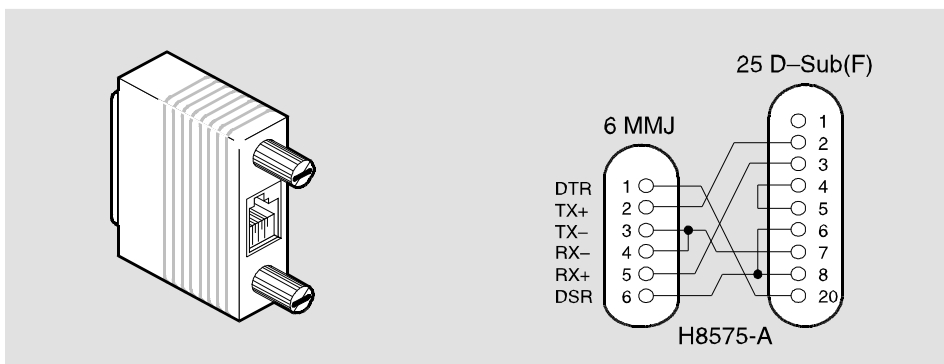
Figure B-4: H8571-J Adapter

NPG-5342-95F

H8575-A Adapter

This section shows the H8575-A adapter (6-pin MMJ connector to 25-pin D-Sub connector) and its pin assignments as shown in Figure B-5.

Figure B-5: H8575-A Adapter

NPG-8793-95F

NOTE

EOS/ESD protection devices are not shown in the illustration.

Internal and External Crossover Configurations

A crossover function must be implemented in every twisted-pair link. The crossover function (internal or external) allows the transmitter of one device to connect to the receiver of the device at the other end of the twisted-pair link.
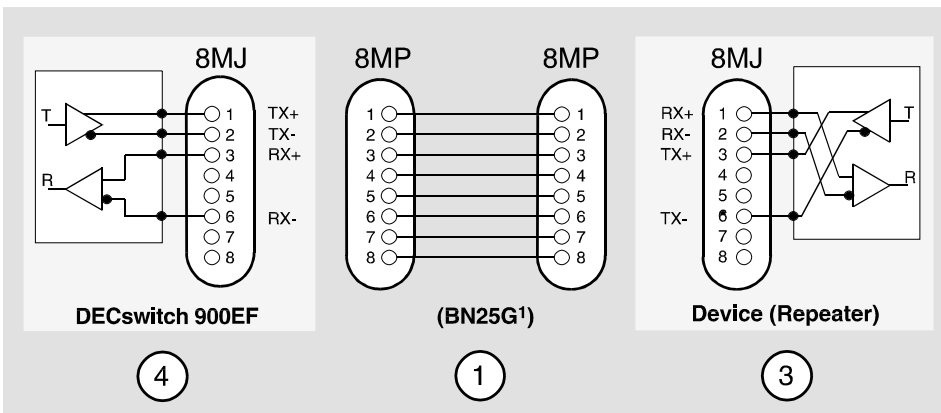
Figure B-6 shows straight-through (1) and crossover cables (2) for connecting crossover (3) and straight-through (4) types of devices. The DECswitch 900ET Router uses straight-through connectors.

Figure B-6: Crossover Configurations

External Crossover Configuration:
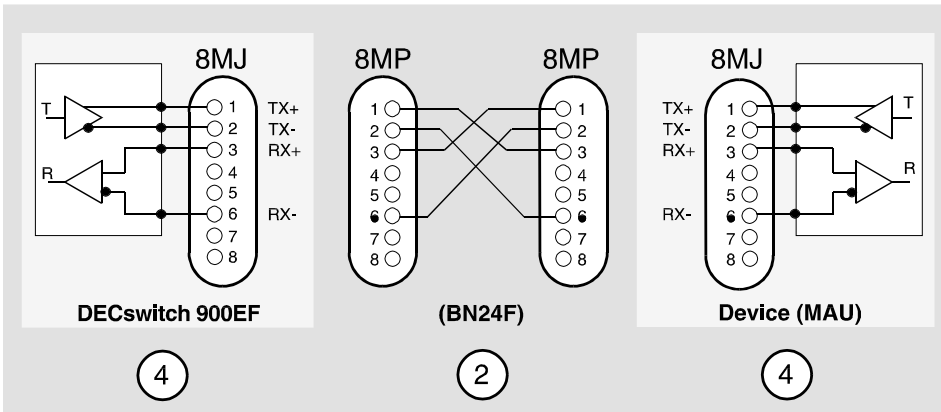
Internal Crossover Configuration:

NPB-0970e-95F

[1] If screened cabling is required, use BN26M.

Appendix C

Product Specifications

Overview

Introduction

This appendix lists the operating specifications and the acoustical specifications for the DECswitch 900EF Router.

In this appendix

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

Product Specifications

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

Table C-1: Product Specifications

Parameter	Specification
Environment	
Operating Temperature	5° C to 50° C (41 ° F to 122 ° F)
Relative Humidity	10% to 95% noncondensing
Altitude	
• Operating	Sea level to 2400 m (8,000 ft)
• Non-operating	Sea level to 4900 m (16,000 ft) **For sites above 2400 m (8,000 ft), decrease the operating temperature specification by 1.8° C for each 1000 m or 3.2°F for each 3200 ft.**

Power	67.5W @ 15V total power
	  9.0 A, 5Vdc
	  0.1 A, 12Vdc
	  1.5 A, 15Vdc
	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.

Physical	
Height	44.45 cm (17.5 in)
Width	4.45 cm (1.75 in)
Depth	15.24 cm (6 in); 25.40 cm (10.0 in) with a DEChub ONE docking station. 15.24 cm (6 in); 30.48 cm (12.0 in) with a DEChub ONE-MX docking station.
Weight	1.8 kg (4 lb) **Include an additional 1.59 kg (3.5 lb) when attached to a DEChub ONE docking station**

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 200 Hz sine sweep @ 0.25 G limited by 0.02" (0.5mm) displacement DA* 200 to 500 Hz sine sweep @ 0.10 G

Certification

CE, CSA, FCC, TÜV, UL, VCCI

Table C-2: Connector Specifications

Module Connectors

DECswitch 900EF has: one Dual Attachment Station (DAS) FDDI port multimode optics (ANSI MIC), one shielded 6-pin MJ (OBR), two 15-pin D-Sub (AUI ports), and four shielded 8-pin MJ (10BaseT ports) with straight through connectors.

DEChub ONE has: one 8-pin MJ (setup port), one DB-9 (OBM), and one 15-pin D-Sub (AUI connector)

DEChub ONE-MX has: one 8-pin MJ (setup port), one 6-pin MJ (OBR), one DB-9 (OBM), and one 15-pin D-Sub (AUI connector), and one redundant power connector (D-Sub).

Acoustical Specifications

This section shows the acoustical specifications.

Acoustics - Declared values per ISO 9296 and ISO 7779[1]

Table C-3: Acoustical Specifications

Product	Sound Power Level L$_{WAd}$, **B**	Sound Pressure Level LpAm, dBA (bystander positions)
	Idle/Operate:	Idle/Operate:
DECswitch 900EF DEFBA-MA	5.0	36
DECswitch 900EF & DEChub ONE DEFBA-MA + DEHUA	5.4	40
DECSwitch 900EF & DEChub ONE-MX DEFBA-MA + DEF1H	5.4	39

[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]

Table C-4: Aktuelle Werte für spezielle Produkt

Produkt	Schalleistungspegel L$_{WAd}$, B	Schalldruckpegel LpAm, dBA (Zuschauerpositionen)
	Leerlauf/Betrieb:	Leerlauf/Betrieb:
DECswitch 900EF DEFBA-MA	5,0	36
DECswitch 900EF & DEChub ONE DEFBA-MA + DEHUA	5,4	40
DECSwitch 900EF & DEChub ONE-MX DEFBA-MA + DEF1H	5,4	39

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

Appendix D

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.

A list of RMON features is 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
Alarms and Events	Use any SNMP network manager, as described later in this document

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 900EF 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 D-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 D-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.