

# DECconcentrator 900MX

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## Installation and Configuration

Part Number: EK-DEF6X-IN. B01

**May 1995**

This manual describes how to install and configure the DECconcentrator 900MX module.

**Revision/Update Information:** This is a revised manual.

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May 1995

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Achtung!

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

Attention!

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

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## Safety

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

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<b>WARNING</b>	Contains information to prevent personal injury.
<b>CAUTION</b>	Contains information to prevent damage to equipment.

---

<b>VORSICHT</b>	Enthält Informationen, die beachtet werden müssen, um den Benutzer vor Schaden zu bewahren.
<b>ACHTUNG</b>	Enthält Informationen, die beachtet werden müssen, um die Geräte vor Schaden zu bewahren.

---

<b>DANGER</b>	Signale les informations destinées à prévenir les accidents corporels.
<b>ATTENTION</b>	Signale les informations destinées à prévenir la détérioration du matériel.

---

<b>AVISO</b>	Contiene información para evitar daños personales.
<b>PRECAUCIÓN</b>	Contiene información para evitar daños al equipo.

---

## Safety (Cont.)

The cautions that must be observed for the hardware described in this manual are listed below in English, German, French, and Spanish. The pages on which these safety messages appear are also listed.

---

### WARNING

To prevent personal injury or equipment damage, **do not** insert telecommunications cabling into the Optical Bypass Relay connector. [Pages 3 and 76.]

### 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. [Pages 8, 9, 10 and 11.]

### 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 láserica 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.

---



## Safety (Cont.)

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### 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. [Pages 30, 32, and 36.]

### ACHTUNG

Sollte während der Phase 3 des DLU-Prozesses eine Unterbrechung der Stromversorgung eintreten, kann das Firmwareprogramm zerstört werden. 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 corrompue, 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 cours 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.

---

## Safety (Cont.)

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### WARNING

Be sure to remove the module from its power source (the DEChub 900 MultiSwitch or the DEChub ONE) before performing any ModPMD removal and replacement procedures. [Page 50.]

### VORSICHT

Achten Sie darauf, daß das Modul von seiner Energiequelle abgetrennt wurde (DEChub 900 MultiSwitch oder DEChub ONE), bevor Sie das ModPMD entfernen oder auswechseln.

### DANGER

Assurez-vous que vous avez débranché le module de sa source d'alimentation (interrupteur multiple DEChub 900 ou DEChub ONE) avant de retirer ou de remplacer le ModPMD.

### AVISO

Es preciso cerciorarse de retirar el módulo de la fuente de energía (Conmutador múltiple DEChub 900 o DEChub ONE) antes de realizar cualquier procedimiento de cambio y remplazo del ModPMD.

---

### CAUTION

Static electricity can damage modules and electronic components. Digital recommends using a grounded antistatic wrist strap and a grounded work surface when handling any modules. [Page 52.]

### ACHTUNG

Module und elektronische Komponenten können durch elektrostatische Entladungen beschädigt werden. Benutzen Sie immer eine antistatische Gelenkmanschette und eine geerdete Arbeitsunterlage, wenn Sie am offenen Gerät arbeiten.

### ATTENTION

Les charges excessives d'électricité statique peuvent endommager les modules et les composants électroniques. Digital conseille l'utilisation d'un bracelet de masse et d'un plan de travail mis à la terre lors de la manipulation des modules.

### PRECAUCIÓN

La electricidad estática puede dañar los componentes electrónicos y los módulos. Digital recomienda que se utilicen cintas de pasadores y superficies de trabajo conectadas a tierra al trabajar con cualquier módulo.

---

## Safety (Cont.)

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### WARNING

To avoid personal injury or damage to equipment, do not install the module into a DEChub 900 or DEChub ONE unless the module is completely assembled, with the enclosure, bezel, and all faceplates in place. [Page 60.]

### VORSICHT

Um den Benutzer vor Schaden zu bewahren und eine Beschädigung des Geräts zu vermeiden, muß das Modul erst vollständig mit Gehäuse, Blende und Anschlußdose montiert werden, bevor es in ein System DEChub 900 oder DEChub ONE eingebaut wird.

### DANGER

Pour éviter tout risque d'accident corporel ou de dommage à l'équipement, n'installez le module dans un DEChub 900 ou un DEChub ONE que s'il est complètement monté et que le boîtier, le couvercle et les caches ont été mis en place.

### AVISO

Para evitar daños personales o al equipo, no se debe instalar el módulo en un DEChub 900 o un DEChub ONE a menos que el módulo esté completamente ensamblado, con la carcasa, la tapa y las placas de conexión en sus respectivos lugares.

---

### CAUTION

This action deletes all configured settings and replaces them with factory default values. All configuration settings will be lost. [Page 19.]

### 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.

---



## Introduction

The DECconcentrator 900MX (also referred to in this manual as the module) is an eight-port (six front panel and two backplane) Fiber Distributed Data Interface (FDDI) concentrator that can be configured into the DEChub 900 MultiSwitch (also referred to in this manual as the DEChub 900).

The module can also serve as a standalone unit when configured with a DEChub ONE<sup>1</sup> docking station (see the *DEChub ONE Installation* manual). As standalone units, the modules can be stacked into equipment racks to allow for economical network growth and for remote access to local area networks (LANs).

The module supports three types of modular physical media dependent (ModPMD) ports: multimode fiber (MMF), single-mode fiber (SMF), and twisted-pair for FDDI (TP-FDDI). The ports can be installed in various combinations by qualified service technicians to optimize LAN usage and accessibility from a single module.

The module's front panel provides six ModPMD ports and a 6-pin MJ connector that supports an optical bypass relay (OBR). When the module is installed into a DEChub 900, you can interconnect up to eight FDDI modules via the DEChub 900 backplane, without using any of the front-panel ports. Front-panel LEDs provide module status and port-level status.

### Features

Your DECconcentrator 900MX includes the following features:

- Hot-swap capability allows you to install and remove the module without turning off power to the DEChub 900 or DEChub ONE.
- Front-panel ports are software configurable as follows:
  - Six M-ports
  - Two A-/B-ports and four M-ports
  - One A-port and five M-ports
  - Five M-ports and one B-port
  - One S-port and five M-ports

---





<sup>1</sup>Throughout this manual, the term DEChub ONE refers to the DEChub ONE or the DEChub ONE-MX docking station unless otherwise specified.

## Introduction (Cont.)

- Versatile front-panel connectivity features a modular media interface design that supports the following ModPMDs on a per-port basis:
  - Multimode fiber (MMF)
  - Single-mode fiber (SMF)
  - Twisted-pair for FDDI (TP-FDDI)
- Setup port for initial setup of the module using a terminal or personal computer.
- Built-in Simple Network Management Protocol (SNMP) network management.
- Built-in SNMP agent supports the following management information bases (MIBs):
  - MIB II, RFC 1213
  - FDDI MIB, RFC 1512
  - Digital Extended MIB V2.9, 17-May-1994
  - PCOM MIB, June 1995
- Support for SMT 7.3 Station Management (X3.229–1994)
- Manageability using any generic SNMP management application that supports the MIBs listed above.
- Out-of-band management (OBM) using SNMP over Serial Line Internet Protocol (SLIP) through the OBM connector on the DEChub 900 or DEChub ONE docking station as an alternative to normal in-band management.
- Advanced Graphical User Interface (GUI) manageability with Digital's HUBwatch Network Management Station (NMS) application.
- Upgradeable device firmware (in nonvolatile Flash memory) using Trivial File Transfer Protocol (TFTP) with HUBloader or through the setup port with any TFTP server.
- Auto self-test at powerup.
- FDDI dual-ring or tree connectivity.
- Support for an Optical Bypass Relay (OBR).
- IP Services support


# Front Panel

Of the six front panel ports, ports 1 and 6 are software selectable using HUBwatch or SNMP. The default configuration for port 1 is A-type and for port 6 is B-type. Optional configurations are: port 1 configured as either an A- or M-type port, port 6 configured as either a B-, M- or S-type port. Note that ports 2 to 5 are always M-type ports.

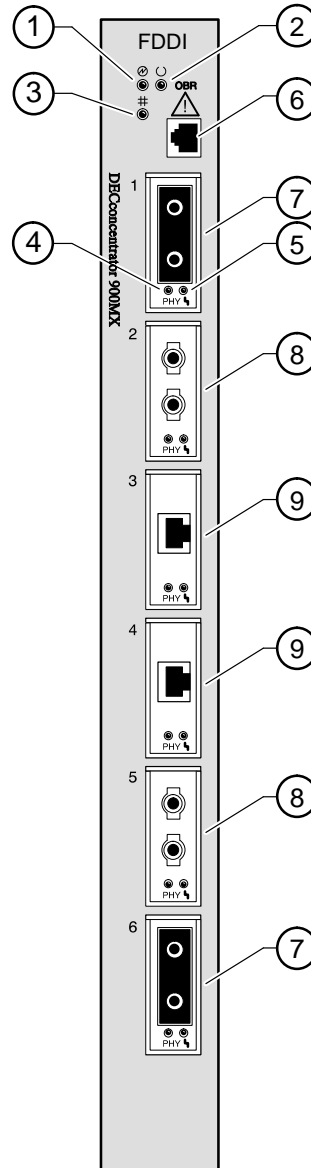
- 1) **Power**  **LED** — Lights when the module has power.
- 2) **Module OK**  **LED** — Lights when the module passes self-test. If the module fails self-test, the Module OK LED remains off.
- 3) **Network OK**  **LEDs** — Shows the status of the network connection. Lights to indicate that the FDDI Ring is operational.
- 4) **Physical Protocol Status** **PHY LED** — Lights green, yellow, or alternating green/yellow, indicating the PHY connection status.
- 5) **Port Type**  **LEDs** — Lights green (or off, no color) to indicate the ModPMD port type. The led turns on yellow to indicate a ModPMD fault condition.

**NOTE:** For more information about the module's LEDs, refer to the section titled LED Descriptions.

- 6) **Optical Bypass Relay (OBR) 6-pin MJ connector** — Allows the connection of an OBR device (not supplied) to maintain connectivity of the FDDI ring in the absence of power or during station fault conditions.

**WARNING**  To prevent personal injury or equipment damage, **do not** insert telecommunications cables into the optical bypass relay connector.

- 7) **Multimode fiber (MMF) ModPMD**
- 8) **Single-mode fiber (SMF) ModPMD**
- 9) **Twisted-pair for FDDI (TP-FDDI) ModPMD**



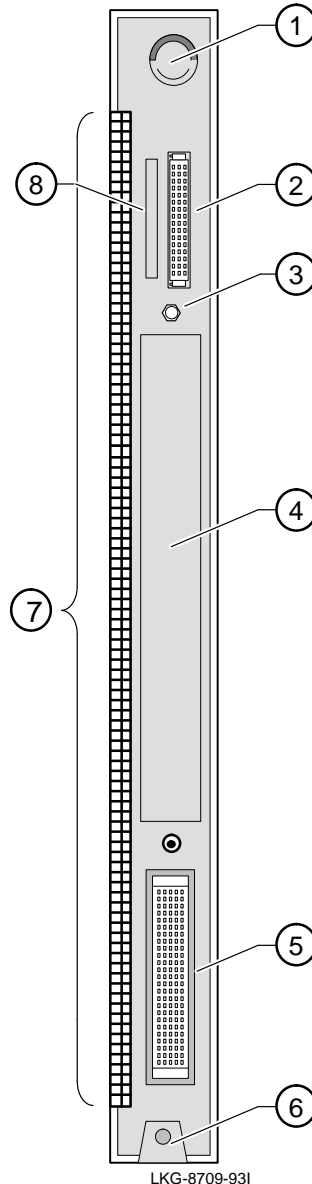
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## Back Panel

- 1) **Locking tab** — Locks the module into a DEChub 900 backplane or into a DEChub ONE docking station. It also contains the hot-swap switch lever.
- 2) **48-pin connector** — Provides network and power connections to the module when the module is installed into a DEChub 900 or DEChub ONE docking station.
- 3) **Grounding bolt** — Provides a chassis grounding connection between the module and a DEChub 900 or a 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 to the backplane when the module 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.
- 8) **Address label** — Contains the module's 48-bit MAC Hardware Address.

**NOTE:** Ensure that any or all ModPMDs are installed before installing the module into the DEChub 900. For installation instructions, refer to the section of this manual titled Replacing ModPMDs.

**NOTE:** If an OBR is to be used, ensure that it is installed before power is applied to the module.



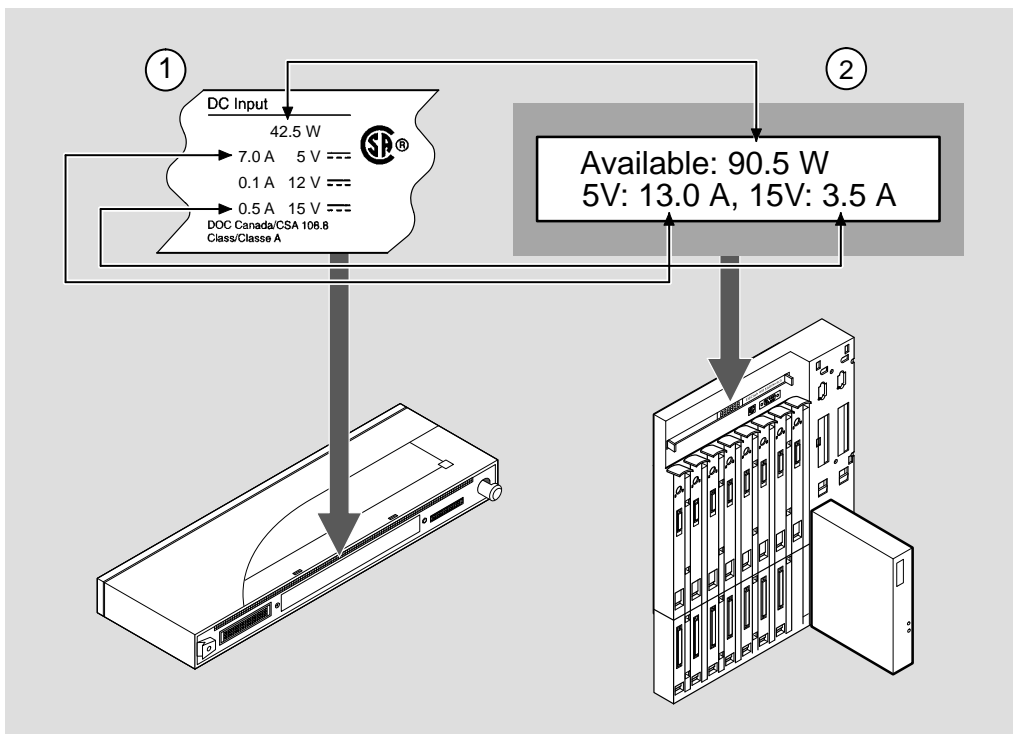


## Installing the Module

The DECconcentrator 900MX hot-swap feature allows you to install the module into the DEChub 900 or DEChub ONE docking station without turning off power. Seating the module initiates the module powerup sequence if enough power is available.

- 1 Compare your module's power ratings (1) with the values shown in the Hub Manager status display (2) as shown below.

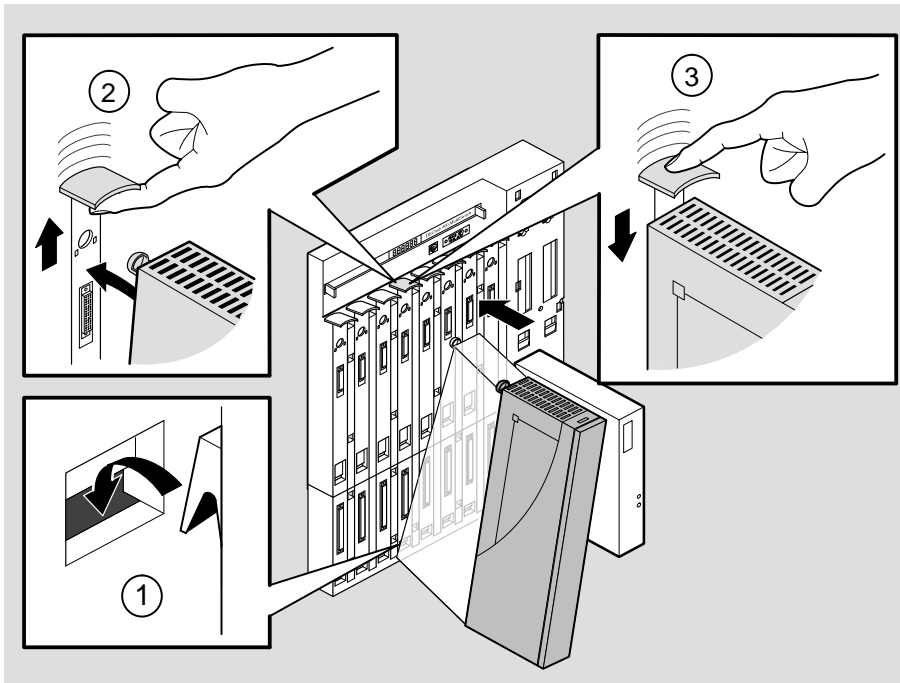
**NOTE:** The 12V power in the DEChub 900 is derived from the 15V power source. Although it is listed separately in the product specifications, the 12V requirements are included in the 15V power total.



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## Installing the Module (Cont.)



- 2** Seat the module into the DEChub 900.
  - a. Place the module's mounting tab into a mounting slot **(1)** on the DEChub 900.
  - b. Pull up on the release lever **(2)** to its unlocked position.
  - c. Pivot the module on the mounting tab and align the connectors.
  - d. Firmly push the module onto the backplane connectors.
  - e. Press down on the release lever **(3)** to ensure that it is locked.



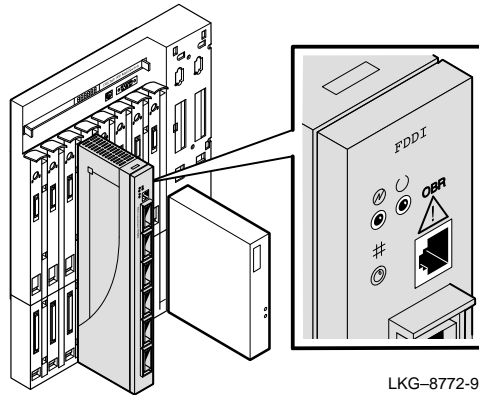
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## Installing the Module (Cont.)

**3** Verify that the module's Power  LED and the Module OK  LED light (within 1 minute).

- a. The Power  LED lights when power is applied, then the module performs a self-test.
- b. After the module completes self-test, the Module OK  LED lights and remains lit, then the Hub Manager status display shows:

```
DECconcent 900MX
up
```



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**NOTE:** If the LEDs do not operate as described, refer to the section titled Problem Solving Using the LEDs.


**4** Connect the port cables.

Connect the appropriate cables, then go to the section titled Configuring the Module. 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 connect single-mode fiber-optic (SMF) cables, go to step 5.
- To connect twisted-pair for FDDI (TP-FDDI) cables, go to step 6.
- To connect multimode fiber-optic (MMF) cables, go to step 7.

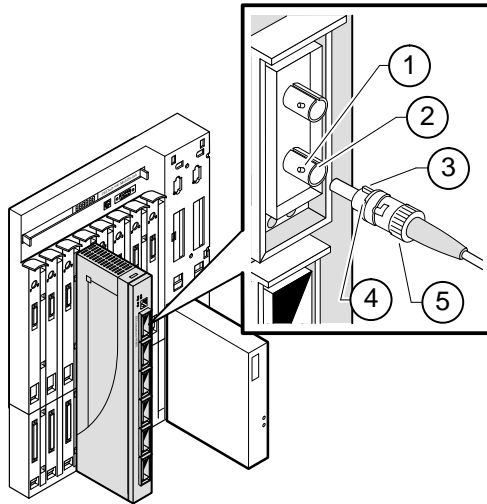
## Installing the Module (Cont.)

**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.

### 5 Connect the ST-type SMF port cables.

If you are connecting to an SMF ModPMD with ST-port connectors, complete the following steps:


- a. Remove the dustcaps from the ST-type port connectors and from the ports that you are connecting.
- b. Align the tab (3) and slot (4) of the transmit cable plug with the slot (2) and tab (1) of the transmit port connector (labeled  $\ominus$ ).
- c. Insert the plug, then push the plug's sleeve (5) in and turn it to the right, locking it in place.
- d. Connect the receive cable, in the same way, to the the receive port connector (labeled  $\oplus$ ).



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**NOTE:** To disconnect the SMF ST-type port cables, push the plug's sleeve in and turn it to the left, then disconnect the cable.

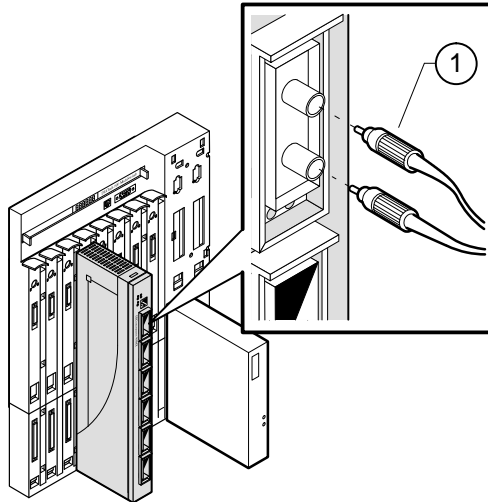
## Installing the Module (Cont.)

**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.

### 6 Connect the FC/PC-type SMF port cables.

If you are connecting to an SMF ModPMD with FC/PC-type port connectors, complete the following steps:

- a. Remove the dustcaps from the FC/PC-type port connectors and from the ports that you are connecting.
- b. Align the keys on the cable and the ModPMD port.
- c. Push the cable **(1)** into the port and screw in the ferrule.
- d. Connect the other cable, in the same way, to the other port.



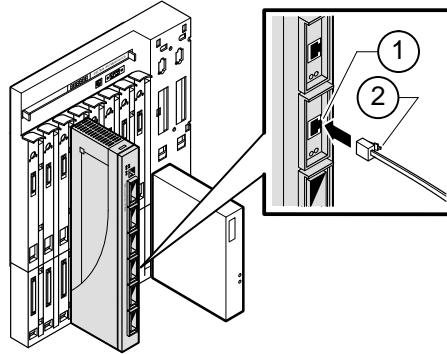
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**NOTE:** To disconnect the SMF port cables, unscrew the ferrule and pull the connector from the port. Replace the dust caps.

## Installing the Module (Cont.)


### 7 Connect the TP-FDDI port cables.

- a. Align the release tab (2) on the cable plug with the keyway (1) on the module's 8-pin MJ connector.
- b. Insert the plug into the connector, ensuring that the release tab snaps into the locked position.



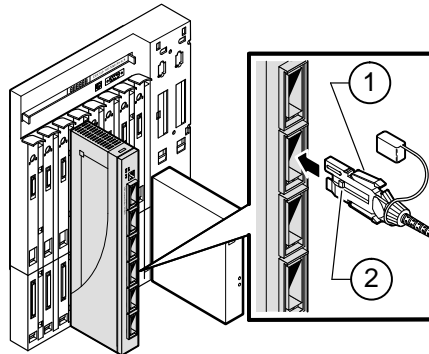
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**NOTE:** To disconnect the TP-FDDI port cable, press the release tab on the 8-pin MJ connector, then disconnect the cable.

**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.

### 8 Connect the MMF port cables.

- a. Remove the protective caps from the module's MMF port connector and from the MMF cable plug.
- b. Align the keyway (2) on the MMF cable plug with the key on the module's MMF port connector.
- c. Insert the plug into the connector, ensuring that the locking clips (1) on the sides of the plug snap into the locked position.




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**NOTE:** To disconnect the MMF port cables, press the locking clips on the cable plug, then disconnect the cable.

After all cables are installed, go to the section titled Configuring the Module.

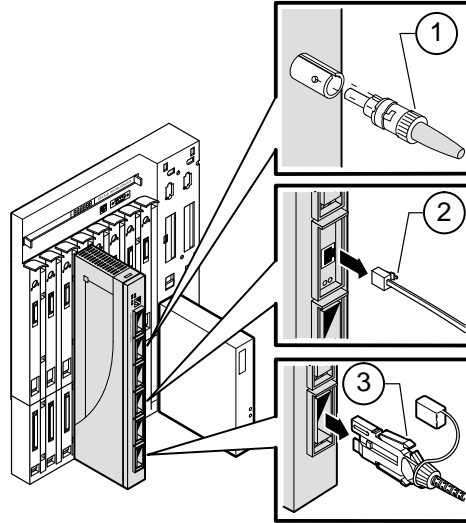
## Removing the Module

**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.

**1** **Disconnect all the cables from the module.**

To disconnect:

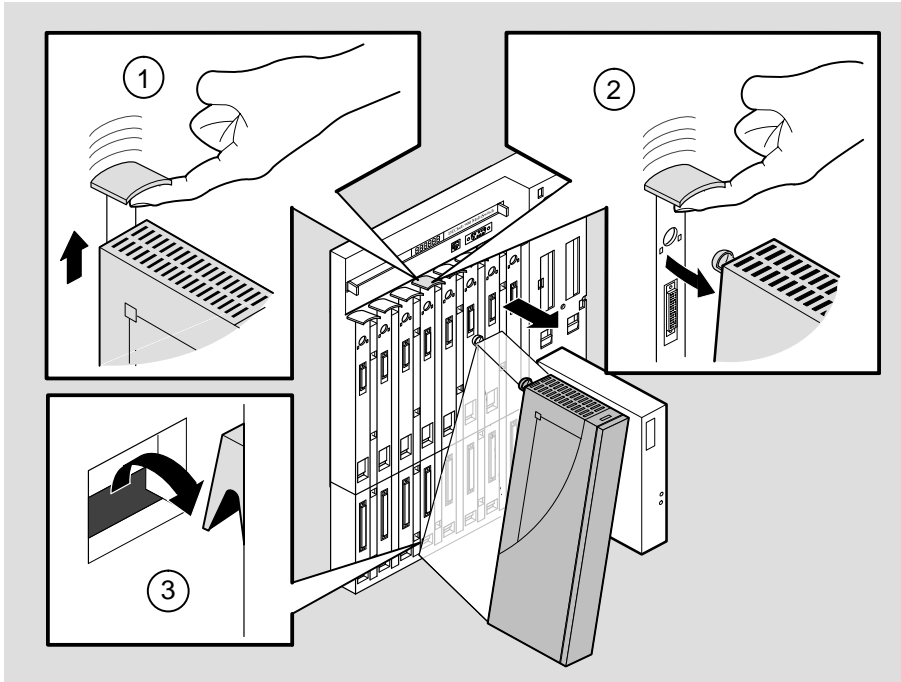
- a. SMF port cables, push the plug's sleeve **(1)** in and turn it to the left, then disconnect the cable.
- b. TP-FDDI port cables, press the release tab **(2)** on the 8-pin MJ connector, then disconnect the cable.
- c. MMF port cables, press the locking clips **(3)** on the cable plug, then disconnect the cable.



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## Removing the Module (Cont.)

- 2** Unseat the module from the DEChub 900.
  - a. Lift the release lever located on the top of the DEChub 900 slot **(1)**.
  - b. While holding up the release lever, pivot the module back on its bottom mounting tab **(2)**.
  - c. Lift the module out of the backplane **(3)**.



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## Configuring the Module

### Setup Port Description

The setup port (on the DEChub 900 MultiSwitch or the DEChub ONE) allows you to access and set DECconcentrator 900MX parameters. This section describes how to access the module from either port and how to set those parameters.

Examples of the setup screen displays are provided in this section 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. **Boldface type** in the screen display examples indicates user input.

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 (.). The following is an example of an IP address: 16 . 20 . 54 . 156

### 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.

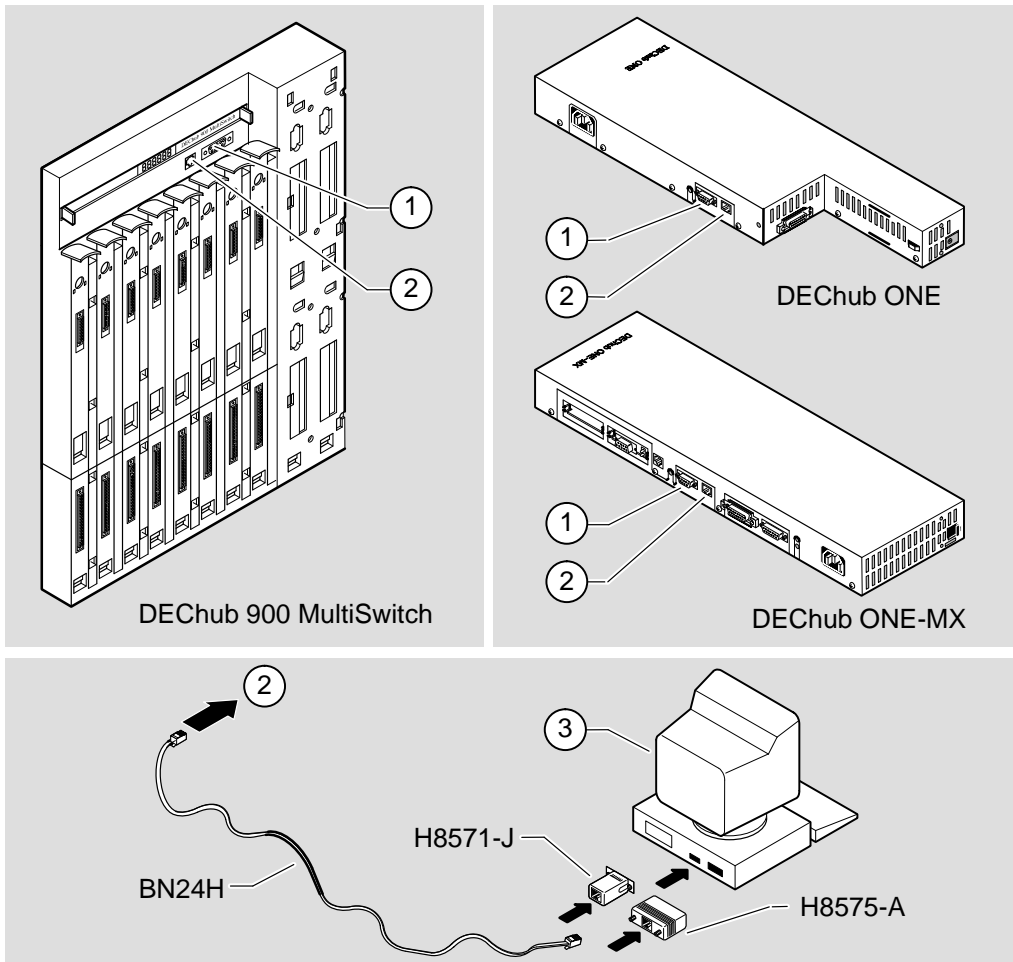
### Setup Port Device Cabling

The setup port on the DEChub 900 MultiSwitch or the DEChub ONE can be connected to a setup port device (a terminal or personal computer), using the following cables and adapters.

<b>IF the setup port device is...</b>	<b>Use this cable...</b>	<b>With this adapter...</b>
A PC with a 9-pin D-Sub communications port	BN24H-xx <sup>1</sup>	H8571-J
A terminal with a 25-pin D-Sub connector	BN24H-xx <sup>1</sup>	H8575-A
A terminal with a 6-pin MMJ connector	BN24H-xx <sup>1</sup>	Not required.

<sup>1</sup> xx indicates cable length in meters.

## Configuring the Module (Cont.)



NPG-0020-951

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

## Configuring the Module (Cont.)

### Connecting to the Setup Port

To connect to the setup port on the DECconcentrator 900MX module, complete the following steps:

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.

### Accessing the Setup Port

To access the setup port, press  on the setup port device a few times until a menu appears.

- a. If the module is connected to the setup port on the DEChub ONE docking station, the DECconcentrator 900MX INSTALLATION MENU appears. Go to the section titled DECconcentrator 900MX Installation Menu (DEChub ONE Options).
- b. If the module is connected to the Hub Manager setup port on the DEChub 900, the DEChub 900 MultiSwitch INSTALLATION MENU appears (see following example). Choose option 9, then go to the section titled Start Redirect Mode.

The following example shows the DEChub 900 MultiSwitch INSTALLATION MENU:

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

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

=====

Enter selection: 9 
```

## Configuring the Module (Cont.)

### Start Redirect Mode

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

After you choose the `Start Redirect Mode` option from the DEChub 900 MultiSwitch INSTALLATION MENU, the screen display prompts you for a slot number.

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

```
Enter selection: 9
=====
Enter the slot number for redirection (1-8): 3 
Setup port redirected to 3: DECconcen 900MX
Attempting to connect [Ctrl/C to Abort]...
Connection successful!
```

After you press , the DECconcentrator 900MX INSTALLATION MENU appears on your screen.

## Configuring the Module (Cont.)

### DECconcentrator Installation Menu (DEChub 900 Options)

This section shows the options available from the DECconcentrator 900MX Installation Menu when the module is installed in the DEChub 900 MultiSwitch.

Note that when your module is installed in the DEChub 900, the slot number where the module is installed is shown at the top of the menu.

The following example shows the DECconcentrator 900MX operating in a DEChub 900 configuration:

```
DECconcen 900MX - slot 3
=====
      DECconcentrator 900MX 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] 
```

Go to the section titled Description of Menu Items.

## Configuring the Module (Cont.)

### DECconcentrator Installation Menu (DEChub ONE Options)

This section shows the options available from the DECconcentrator 900MX Installation Menu when the module is installed standalone, in the DEChub ONE docking station.

The following example shows the DECconcentrator 900MX operating in a DEChub ONE configuration:

```
DECconcen 900MX
=====
      DECconcentrator 900MX INSTALLATION MENU

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

=====

Enter selection : [n] 
```

**NOTE:** Option 7, Out-of-Band Port Configuration, in the above menu is only available when the module is installed in a DEChub ONE.


## Configuring the Module (Cont.)

### Description of Menu Options

This section describes the menu options that are available from the DECconcentrator 900MX Installation Menu. Note that the out-of-band menu options apply to the module only when it is in standalone mode (configured in a DEChub ONE docking station).

#### [1] Reset with Factory Defaults

This option causes the module's configured 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 DECconcentrator 900MX Installation Menu.

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

**NOTE:** Allow approximately 1 minute for the module to reset and complete self-test.

The following example shows the dialog associated with this option.

```
Enter selection : 1
DECconcen 900MX - 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] : 
Press Return for Main Menu ...
```

## Configuring the Module (Cont.)

### [2] Reset with Current Settings

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

**NOTE:** Allow approximately 1 minute for the module to reset and complete self-test.

The following example shows the dialog associated with this option.

```
Enter selection : 2
DECconcen 900MX - slot 3
=====
                RESET WITH CURRENT SETTINGS
                This selection will reset your system with the
                current configuration settings.
=====
Press Y to confirm [N] : 
Press Return for Main Menu ...
```



## Configuring the Module (Cont.)

### [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 number : 3

DECconcen 900MX - slot 3
=====
DECconcen 900MX, 6-port FDDI Concentrator, HW=v1,RO=v.1.1.0,SW=T3.6.2
SysUpTime           : 6 days 01:39:11  34 resets
SNMP Read/Write Community : public
SNMP Trap Addresses  : Not Configured
Status of Last Downline Upgrade : TFTP Read
                                00:02:55  27 resets
                                Transfer Complete.
Out-of-Band Management RTS : Disabled ①
BootP                  : Disabled
Interface  IP Address  Subnet Mask  Def. Gateway  Other Info
FDDI Port                               08-00-2B-A6-0E-05
OBM Port   16.20.158.26                Active ②
=====
SNMP Port Traps           : Enabled
Quick diagnostic on PC-trace : Disabled
FDDI Port Configuration   : Front Panel: Ms Docking Station: S ③
=====
Press Return for Main Menu ...
```

Item	Description
1	This line appears only when the module is connected to a DEChub ONE docking station.
2	If the module is a DEChub ONE, the word "Active" is replaced with the current OBM port speed (for example, "Speed 38400 bps").
3	This line will change to reflect the current configuration of front panel and backplane/docking station ports.

## Configuring the Module (Cont.)

### [4] IP Configuration

This option allows you to set six IP configuration settings.

The following example shows the menu that is associated with this option.

```
DECconcen 900MX - slot 3
=====
                IP Configuration
[1] Set SNMP Read/Write Community
[2] Add SNMP Trap Addresses
[3] Delete SNMP Trap Addresses
[4] Set In-Band Interface IP Address
[5] Set Out-of-Band Interface IP Address
[6] Enable/Disable BootP
[7] Return to Main Menu
=====
Enter selection : 1 
```

The following pages describe the IP configuration options.

## Configuring the Module (Cont.)

### [4] IP Configuration (Cont.)

#### Option [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 is an example of an SNMP read/write community name: Kera89

**NOTE:** The SNMP read/write community name is case sensitive.

The following example shows the dialog associated with this option.

```
Enter selection : 1
DECconcen 900MX - slot 3
=====
          SET SNMP READ/WRITE COMMUNITY
Format: The format for a community name is a string,
        consisting of 4 to 31 printable ASCII characters,
        that describes the relationship between an SNMP
        agent and one or more SNMP managers. The string
        defines the authentication mechanism that is employed
        to validate the use of the community by the sending
        SNMP entity.
=====
Enter the community string [public] : Kera89 
          SNMP Read/Write community string set.
          Press Return for IP Configuration Menu ...
```

## Configuring the Module (Cont.)

### [4] IP Configuration (Cont.)

#### Option [2] Add SNMP Trap Addresses:

This option prompts you to enter IP addresses to which SNMP traps will be sent from the DECconcentrator 900MX.

The following example shows the dialog associated with this option.

```
Enter selection : 2
DECconcen 900MX - 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
=====
Configured SNMP Trap Addresses: 16.20.216.81
Trap address [ ] : 16.20.54.156 
Trap address added! Enter a Trap Address [none] : 
Press Return for IP Configuration Menu ...
```

If an SNMP address was previously configured, the screen displays an SNMP trap address.

## Configuring the Module (Cont.)

### [4] IP Configuration (Cont.)

#### Option [3] Delete SNMP Trap Addresses:

This option prompts you to select an SNMP trap address to be deleted from the community trap address table.

The following example shows the dialog associated with this option.

```
Enter selection : 3
DECconcen 900MX - 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 
Trap address deleted! Enter a Trap Address [] : 
Press Return for IP Configuration Menu ...
```

If an SNMP address was previously configured, the screen displays an SNMP trap address.

## Configuring the Module (Cont.)

### [4] IP Configuration (Cont.)

#### Option [4] Set In-Band Interface IP Address:

This option prompts you to enter the module's IP address, subnet mask address and default gateway address. If an address was previously configured, an in-band address will be displayed. To remove an address or mask, enter **0** at the prompt.

The factory default of this menu option is no in-band addresses.

The following example shows the dialog associated with this option:

```
Enter selection : 4
DECconcen 900MX - 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. Gateway  Other Info
FDDI Port  16.20.126.24  255.255.192.0  16.20.157.25  08-00-2B-A6-39-25
OBM Port   16.20.158.26  255.0.0.0      16.20.159.27  Speed 9600 bps
=====
Enter the IP address [16.20.126.24] : 16.20.54.155 
Enter the Subnet Mask [255.255.192.0] : 255.225.0.0 
Enter the Default Gateway [16.20.157.25] : 16.20.54.156 
Press Return for IP Configuration Menu ...
```

## Configuring the Module (Cont.)

### [4] IP Configuration (Cont.)

#### Option [5] Set Out-of-Band Interface IP Address:

**NOTE:** This selection is operational only when the module is in standalone mode (for example, when it is installed in a DEChub ONE docking station).

This option prompts you to enter the IP address, subnet mask address and default gateway address. To remove an address or mask enter **0** at the prompt

The OBM feature allows you to manage your module through the OBM port in addition 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 DECconcentrator 900MX Installation Menu.

The following example shows the dialog associated with this option:

```
Enter selection : 5
DECconcen 900MX
=====
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 IP address, enter 0 in the appropriate
address field.
=====
Interface  IP Address  Subnet Mask  Def. Gateway  Other Info
FDDI Port  16.20.126.24  255.255.192.0  16.20.157.25  08-00-2B-A6-39-25
OBM Port   16.20.158.26  255.0.0.0     16.20.159.27  Speed 9600 bps
=====
Enter the IP address [16.20.126.26] : 16.20.54.155 
Enter the Subnet Mask [255.255.192.0] : 255.225.0.0 
Press Return for IP Configuration Menu ...
```

## Configuring the Module (Cont.)

### [4] IP Configuration (Cont.)

#### Option [6] Enable/Disable BootP:

This option prompts you to enable or disable the Bootstrap Protocol (BootP) process.

The factory default of this menu option is `Disabled`. If BootP is enabled, the word `DISABLED` shown in the following dialog will be replaced with the word `ENABLED`.

If the module obtains its IP address using BootP and an SNMP trap sink has been entered, traps will be lost until the BootP response message is received by the module.

The following example shows the dialog associated with this option:

```
Enter selection : 6
DECconcen 900MX - slot 3
=====
                ENABLE/DISABLE BOOTP
BOOTP is the IP bootstrap protocol. BOOTP may be used to
obtain the modules 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] N 
Press Return for IP Configuration Menu ...
```

**NOTE:** If an IP address is entered via the setup port, BootP messages are not sent even if this option is enabled.



## Configuring the Module (Cont.)

### [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
DECconcen 900MX - slot 3
=====
                DUMP ERROR LOG
        Current Reset Count: 34
=====
Entry #      = 10
Timestamp    = 0 0
Reset Count  = 29
Firmware upgrade to: V3.0.0
Dump another entry Y/[N]? N 
=====
No more Error Log entries.

                Press Return for Main Menu ...
```

## Configuring the Module (Cont.)

### [6] Downline Upgrade

This option allows you to upgrade the module's firmware (in nonvolatile Flash memory). It prompts you to enter the load image file name and the IP address of your TFTP (Trivial File Transfer Protocol) load host.


Before initiating this option, be sure that the module that you are upgrading has been configured with an IP address (refer to option [4]). If the module is not configured with an IP address, you can still upgrade the module by selecting the *Downline Upgrade* option from the *DEChub 900 MultiSwitch INSTALLATION MENU*. Refer to the *DEChub 900 MultiSwitch Owner's Manual* for more information.

**NOTE:** The module's IP address is retained at the completion of the downline upgrade process.

The following example shows an image file name and an IP address:

dcon900mx.bin and 16.20.40.156

The format of the image file name is specified according to the conventions used by your TFTP load host.

**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.

### The Downline Upgrade (DLU) Process

The DLU process consists of four stages:



- Stage 1 — Transferring Firmware Image
- Stage 2 — Verifying Firmware Image
- Stage 3 — Writing New Firmware Image into Nonvolatile Storage
- Stage 4 — Module Reset and Self-Test

## Configuring the Module (Cont.)

### [6] Downline Upgrade (Cont.)

Table 1 describes what happens during each stage of the DLU Process.

**Table 1 DLU Process Description**




Stage	What Happens
1	<p><b>The new firmware image from the TFTP load host is transported across the network and placed into a temporary storage buffer in the module.</b></p> <p>Indications that this stage is in progress include:</p> <ul style="list-style-type: none"><li>• Module status — functional and manageable.</li><li>• Module can respond to management requests.</li><li>• LED display — normal operational.</li><li>• HUB Manager display — <code>DECconcen 900MX up</code></li></ul> <p>This stage normally completes in 1 minute, however, because of variances in network configurations (load path, bit rate, and traffic levels), this stage of the DLU process can take up to 10 minutes to complete.</p>
2	<p><b>The module verifies that the firmware image is correct after Stage 1 is complete.</b></p> <p>Indications that this stage is in progress include:</p> <ul style="list-style-type: none"><li>• Module status — functional (but not manageable).</li><li>• Module cannot respond to management requests.</li><li>• LED display — the Power  LED and the Module OK  LED remain on. All other LEDs turn off.</li><li>• HUB Manager display — <code>DECconcen 900MX unknown</code></li></ul> <p>This stage normally completes in 5 seconds.</p>

(continued on next page)

## Configuring the Module (Cont.)

### [6] Downline Upgrade (Cont.)

Table 1 (Cont.) DLU Process Description

Stage	What Happens
3	<p><b>The new firmware image is transferred from the module's temporary storage buffer to the NVRAM, overwriting the old firmware image.</b></p> <p><b>CAUTION</b>  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.</p> <p>Indications that this stage is in progress include:</p> <ul style="list-style-type: none"><li>• Module status — not functional.</li><li>• Module cannot respond to management requests.</li><li>• LED display — all LEDs (except the Power  LED) are off.</li><li>• HUB Manager display — <code>DECconcen 900MX</code> <code>unknown</code></li></ul> <p>This stage normally completes in 3 minutes.</p>
4	<p><b>The module resets, runs self-test, and then begins executing the new firmware image.</b></p> <p>Indications that this stage is in progress include:</p> <ul style="list-style-type: none"><li>• Module status — not functional.</li><li>• Module cannot respond to management requests.</li><li>• LED display — alternating off, on, and flashing (for details, refer to the section later in this discussion titled Stage 4 — Module Reset and Self-Test).</li><li>• HUB Manager display — <code>DECconcen 900MX</code> <code>unknown</code></li></ul> <p>This stage normally completes in 1 minute.</p> <p>After the successful completion of self-test, the Module OK  LED lights and the module becomes fully manageable. Note also that the HUB Manager display indicates: <code>DECconcen 900MX</code> <code>up</code></p>

## Configuring the Module (Cont.)

### [6] Downline Upgrade (Cont.)

The following section explains how to use the DLU process and details the events that occur within each of the four stages of the process.

#### Using the DLU Process

When you select this option, the initial setup screen display appears (see the following example display). This screen identifies the option and alerts users not to interrupt power during the downline load.

The following example shows the dialog associated with this option:

```
Enter selection : 6
DECconcen 900MX
=====
                DOWNLINE UPGRADE

This process upgrades the device'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 ...
```

## Configuring the Module (Cont.)

### [6] Downline Upgrade (Cont.)

When you press , the screen displays the following prompt:

```
Enter the Load Filename [ ] dcon900MX.bin 
```

After you enter the load image filename and press , the screen prompts you to enter the address of the TFTP server.

```
Enter the Load host IP Address [ ] :16.20.54.156 
```

Each network interface has its own IP address. When the firmware reads more than one IP address (therefore more than one network interface), it asks you if you want to select a different network interface to use for the load request.

If you select the default [N], the setup screen displays the following message:

```
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]...
```

When you press , the DLU process is initiated over the in-band network interface.

Go to the section titled Stage 1 — Transferring Firmware Image for a description of the DLU process, after pressing  for this selection.

If you selected [Y], the setup screen displays the following information:

Interface	Description
1	FDDI port
2	OBM port

Enter the network interface to be used [1]:

## Configuring the Module (Cont.)

### [6] Downline Upgrade (Cont.)

Then press , the setup screen displays the following message:

```
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]...
```

Pressing  for this selection initiates the DLU process.

Go to the section titled Stage 1 — Transferring Firmware Image for a description of the DLU process, after pressing  for this selection.

#### Stage 1 — Transferring Firmware Image

This stage begins when the new firmware image is transferred across the network and placed into the module's temporary storage buffer. During this stage, the module is functional and manageable.

**NOTE:** Because of variances in network configurations (load path, bit rate, and traffic levels), this stage of the DLU process can take up to 10 minutes to complete.

After you initiate the process (by pressing  at the screen prompt), the screen displays the following message:

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

The series of dots (.....) that appear on the screen indicate that the load is in progress.

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

```
Transfer complete.
```

This marks the end of the first stage of the DLU process. The DLU process continues with Stage 2, as described in the following sections.



## Configuring the Module (Cont.)

### [6] Downline Upgrade (Cont.)

#### Stage 2 — Verifying Firmware Image

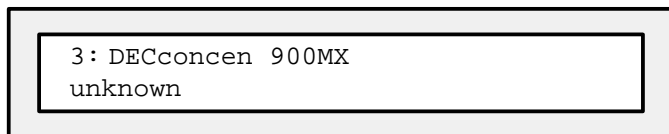
After the new firmware image is loaded into the module's temporary storage buffer, the new firmware image is checked. During this stage, the module is functional but not manageable.

The module's LEDs indicate the start of this stage, as follows:

- the module's Power  LED remains on
- the module's Module OK  LED remains on
- all other LEDs are turned off

If the module is installed into a DEChub 900, the Hub Manager status display indicates the following information:

#### Hub Manager Status Display




This is normal.

This stage takes approximately 5 seconds to complete, then Stage 3 of the DLU process begins.

#### Stage 3 — Writing New Firmware Image into Nonvolatile Storage

After the new firmware image is validated the DLU process overwrites the old firmware image, in the module's NVRAM, with the new firmware image. During this stage the module is not functional and cannot respond to management requests.


**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.



## Configuring the Module (Cont.)

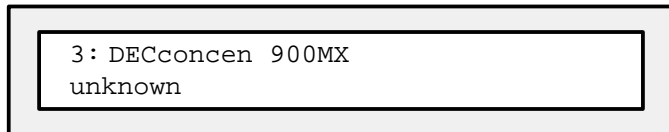
### [6] Downline Upgrade (Cont.)

The module's LEDs indicate the start of this stage, as follows:

- the module's Power  LED remains on
- all other LEDs are turned off

If the module is installed into a DEChub 900, the Hub Manager status display indicates the following information:

#### Hub Manager Status Display



This is normal.

The following message is displayed on the setup screen (note that this message does not appear if you are initiating the load process from a DEChub ONE docking station.):

```
Device not Responding! Connection closed!
```

This is normal.

This stage takes approximately 30 seconds to complete, then Stage 4 of the DLU process begins.

#### Stage 4 — Module Reset and Self-Test

This stage begins after the new firmware image is written into the module's NVRAM. The module resets, then runs self-test. After self-test completes successfully, the module exits this stage and begins the execution of the new firmware image. During this stage, the module is not functional and cannot respond to management requests.

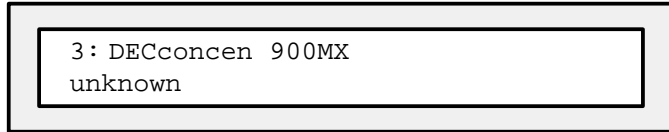
This stage proceeds as follows:

## Configuring the Module (Cont.)

### [6] Downline Upgrade (Cont.)

If the module is installed into a DEChub 900, the Hub Manager status display indicates the following:

#### Hub Manager Status Display



This is normal.

The module LEDs display the following sequence during this stage:

1. The Network OK # LED flashes intermittently to indicate that various diagnostic routines are running.
2. After approximately 40 or 50 seconds, all Port-Type  $\downarrow$  LEDs flash alternately amber to green. This sequence indicates that all port LEDs are operational.
3. After self-test completes successfully, the Module OK  $\odot$  LED turns on and the module becomes fully operational.

This stage takes approximately 1 minute to complete, then the module returns to normal operational status.

## Configuring the Module (Cont.)

### [7] Module-Specific Options

**NOTE:** This option appears as menu selection [8] when the module is installed into a DEChub ONE.

This option provides module-specific selections for the user. When selected, the option offers three selections: Enable/Disable SNMP Port Traps, Enable/Disable Quick PC-trace Recovery and FDDI Port Configuration.

**NOTE:** FDDI Port Configuration is only available when the module is installed into a DEChub ONE.

```
Enter selection : 7

DECconcen 900MX
=====
DECconcen 900TH Configuration
[1] Enable/Disable SNMP Port Traps
[2] Enable/Disable Quick PC-trace Recovery
[3] FDDI Port Configuration
[4] Return to Main Menu
=====

Enter selection : 1 
```

## Configuring the Module (Cont.)

### [7] Module-Specific Options (Cont.)

#### Option [1] Enable/Disable SNMP Port Traps:

This selection allows you to enable or disable the SNMP Port Traps.

The module can generate any one of the following SNMP traps:

- Cold Start – Cold Start traps are sent following a power up or module reset.
- Port – Port traps are sent on any fddimibPORTConnectState change. Therefore, an SNMP Port Trap is transmitted for every port following power up or a module reset because the fddimibPORTConnectState transitions into the connecting state. A second Port Trap is transmitted if the port has a valid connection and transitions into the active state.
- Link Up – A Link Up trap is transmitted when the first port trap transitions into the active state.

**NOTE:** If BootP is used by the module to obtain its IP address, the Cold Start trap, Link Up trap, and a percentage of the Port traps may be lost. The transmission of traps is delayed for three seconds following a power up or reset. If the BootP server responds within three seconds, the traps will be successfully transmitted. However, if the BootP server does not respond within three seconds, some or all of the queued up traps will be lost.

- Link Down – A Link Down trap is transmitted when the last port transitions out of the active state.
- Authentication Failure – An Authentication Failure trap is sent if an SNMP set is attempted with the incorrect read–write community.

In order to have traps successfully transmitted out of the OBM, the necessary information needs to be entered in the ipNetToMediaTable in such a way that it is retained across power failures and resets. This is accomplished by marking the entry in the table as static. ipNetToMediaTable entries that are "learned" by examining the source address of the incoming frames are dynamic entries. Dynamic entries are aged out and are not retained across power failures and resets.

## Configuring the Module (Cont.)

### [7] Module-Specific Options (Cont.)

#### Option [1] Enable/Disable SNMP Port Traps:

When an IP packet is to be sent (this includes SNMP traps), the `ipNetToMediaTable` is accessed to see if it contains the destination's IP address. If it does, the corresponding MAC address and interface are used for transmission. If the destination address is not in the `ipNetToMediaTable`, an Address Resolution Protocol (ARP) request is transmitted to obtain the MAC address to be used. If the module is in a docking station and only the OBM has been assigned an IP address, the ARP request cannot be sent. Therefore, the packet cannot be transmitted and is deleted.

There two ways to generate the necessary `ipNetToMediaTable` entry to allow the packet to be transmitted out the OBM:

- Access (for example, use ping) the module through the OBM interface from the trap sink(s). This will cause the entry to be added to the `ipNetToMediaTable` mapping the trap sink address with the OBM interface. However, since this entry was "learned", it is marked as dynamic. To change this, use an NMS and set the corresponding entry's `ipNetToMediaTable` entry to static.
- Set (using an NMS) the `ipNetToMediaTablePhysAddress` to a null length octet string. This causes the table row to be constructed with a `ipNetToMediaType` of static. The interface number for the module's OBM is 2. Therefore, to add a static entry for IP address 16.21.12.27 to the `ipNetToMediaTable`, set the object `ipNetToMediaTablePhysAddress [2.16.21.12.27]` to a null length octet string.

The following example shows the dialog associated with this option:

```
DECconcen 900MX
=====
          Enable and Disable SNMP Port Traps
          SNMP Port Traps are currently disabled.
=====

          Press Y to ENABLE the Port Traps. [N]: Y 

          SNMP Port Trap Switch Enabled.

          Press Return for main menu ...
```

## Configuring the Module (Cont.)

### [7] Module-Specific Options (Cont.)

#### Option [2] Enable/Disable Quick PC-trace Recovery:

This selection allows you to enable or disable Quick PC-trace Recovery.

As defined by the FDDI standard, a PC-trace is a method for isolating faulty hardware. All stations that are in the fault domain perform some level of hardware diagnostic tests before attempting to re-enter the FDDI ring. Normally, the module runs its full set of hardware diagnostic tests. This will take approximately one minute, but gives the highest level of assurance that a hardware failure would be found.

If only a subset of the hardware diagnostic tests is to be run following a PC-trace, enable this setup option. The reduced set of diagnostic tests completes in approximately 10 seconds. If any hardware failure is found by this reduced set of diagnostic tests, the module is reset, causing the full set of diagnostic tests to be executed. If a hardware problem is not found, the module is enabled and attempts to rejoin the ring.

The following example shows the dialog associated with this option:

```
DECconcen 900MX
=====
      Enable and Disable Quick PC-trace Recovery
      Quick PC-trace Recovery is currently disabled.
=====

Press Y to ENABLE Quick PC-trace Recovery. [N]: Y 

Quick PC-trace Recovery Enabled.

      Press Return for main menu ...
```

## Configuring the Module (Cont.)

### [7] Module Specific Options (Cont.)

#### Option [3] FDDI Port Configuration:

This option allows you to set the Station Configuration

See the section titled Network Environments for a table showing which configurations are supported in each environment.

The following example shows the menu associated with this option. This screen also indicates the current station configuration.

```
Enter selection : 3
DECconcen 900MX
=====
[1] Front Panel: A, B, Ms   Docking Station: none
[2] Front Panel: Ms        Docking Station: A, B
[3] Front Panel: B, Ms     Docking Station: A
[4] Front Panel: A, Ms     Docking Station: B
[5] Front Panel: S, Ms     Docking Station: none
[6] Front Panel: Ms        Docking Station: S, M
[7] Front Panel: S, Ms     Docking Station: M
[8] Front Panel: Ms        Docking Station: S
[9] Front Panel: A, B, Ms  Docking Station: M
[10] Return to Main Menu

Current FDDI Port configuration: Front Panel: A, B, Ms Docking
Station: none
=====

Enter selection 
```

## Configuring the Module (Cont.)

### [7] Out-of-Band Port Configuration

**NOTE:** This option is only available when the module is installed in a DEChub ONE docking station.

This option provides you with two configuration selections: Set Port Speed and enable/disable RTS.

The following example shows the dialog associated with this option.

```
DECconcen 900MX
===== :
      OUT-OF-BAND PORT CONFIGURATION

[1] Set Port Speed
[2] Enable/Disable RTS
[3] Return To Main Menu

===== :

Enter selection : 1 
```



## Configuring the Module (Cont.)

### [7] Out-of-Band Port Configuration (Cont.)

#### Option [1] Set Port Speed:

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

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

The following example shows the menu that is associated with this option.

```
Enter selection : 1

DECconcen 900MX
=====
                SET OUT-OF-BAND MANAGEMENT INTERFACE PORT SPEED
                [1] 1200 baud
                [2] 2400 baud
                [3] 4800 baud
                [4] 9600 baud
                [5] 19200 baud
                [6] 38400 baud
=====

Enter selection [4] (9600) : 4
                OBM port speed set

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

## Configuring the Module (Cont.)

### [7] Out-of-Band Port Configuration (Cont.)

#### Option [2] Enable/Disable RTS:

This option allows additional control over modem communications. When you enable this option, the RTS signal on the OBM port is active only when data, such as an SNMP trap, is being transmitted to the OBM port. When you disable this option, RTS is always active. RTS is automatically disabled upon the completion of module self-tests.

**NOTE:** The port speeds at each end of the communications link must be identical.

The factory default for this menu option is disabled.

The following example shows the dialog associated with this option.

```
Enter selection number : 2

DECconcen 900MX
=====
                ENABLE/DISABLE OUT-OF-BAND PORT RTS

Enable/Disable request to send (RTS) option allows additional
control to modem communications. When the RTS option is
disabled the RTS signal on the OBM port is asserted after
self-test is completed and left asserted. When the RTS option
is Enabled the RTS signal is asserted only when there is data
to be transmitted and deasserted after the data has been
transmitted.
=====

RTS is Disabled. Would you like to ENABLE RTS? [N]

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

## Network Environments

There are three network environments that the module can be in:

- DEChub 900 (Hub)
- DEChub ONE-MX (DEF1H)
- DEChub ONE (DEHUA)

The abbreviations (shown in parentheses) are used to indicate these environments in the table in the following section.

### Environment Configurations

When the concentrator is in a DEChub ONE-MX any one of nine different FDDI port configurations can be chosen via the setup port or HUBwatch.

When the concentrator is in a DEChub ONE only two FDDI port configurations are available via the setup port or HUBwatch.

When the concentrator is in a DEChub 900 any one of nine different FDDI port configurations can be chosen. The FDDI port configurations cannot be selected via the setup port. HUBwatch is used to put the module in the desired FDDI port configuration. The following table contains all the configurations that can be used.

Station Type	Front Panel Ports	Backplane Ports	Environment
DAC <sup>1</sup>	A, B, 4M	Not used	Hub, DEF1H, DEHUA
DAC	A, 5M	B	Hub, DEF1H
DAC	B, 5M	A	Hub, DEF1H
DAC	6M	A, B	Hub, DEF1H
DAC	A, B, 4M	M	Hub, DEF1H
SAC <sup>2</sup>	S, 5M	Not Used	Hub, DEF1H, DEHUA
SAC	S, 5M	M	Hub, DEF1H
SAC	6M	S	Hub, DEF1H
SAC	6M	S, M	Hub, DEF1H

<sup>1</sup> Dual attach concentrator

<sup>2</sup> Single attach concentrator

## Network Environments (Cont.)

### Changing Network Environments

When the module is installed in a DEChub ONE or DEChub ONE-MX, the selected FDDI port configuration is stored in NVRAM. On a reset the selected configuration is maintained. Also, if the module is moved from a docking station to another docking station of the same type, the selected configuration is maintained. This is true even if the number or type of ModPMDs in the docking stations are different.

However, if the module is moved from one environment to a different environment, the selected configuration is deleted from NVRAM and the default configuration is used. However, all other stored information is retained (for example, in-band IP address, out-of-band address). The following table contains the default configuration.

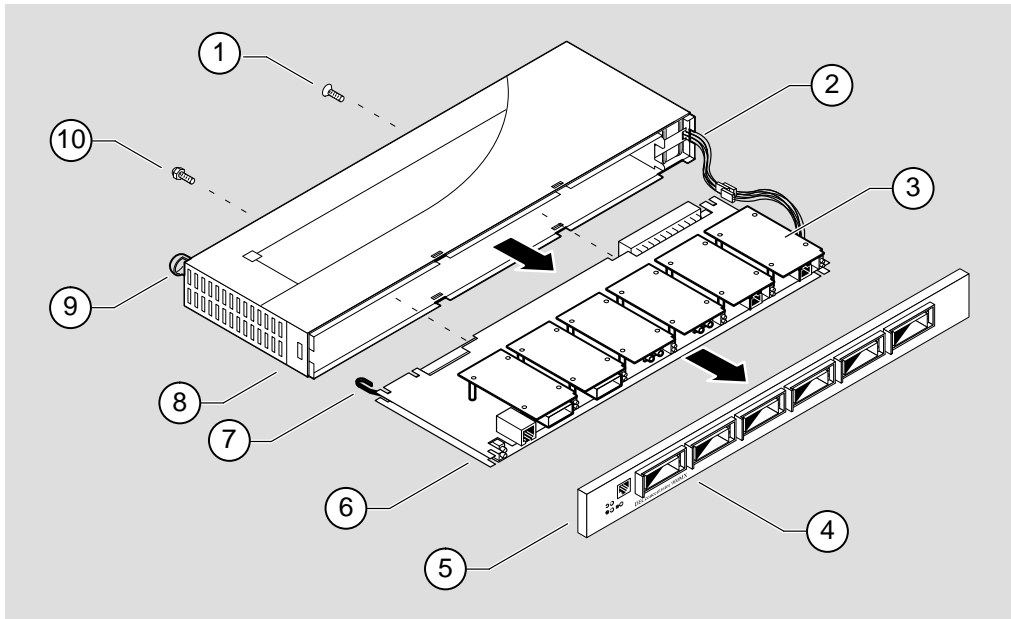
Port	Port Type
1	A
6	B
2–5	M
Backplane	Not used

## Replacing ModPMDs

This section provides removal and replacement procedures for the module's ModPMDs. The procedures are intended for qualified service personnel only.

The following topics are included in this section:

- Tools Required
- Preparing the Module
- Removing and Installing ModPMDs



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Item	Description	Item	Description
1	Phillips-head screw	6	Circuit boards
2	Fan harness	7	Hot-swap switch lever
3	ModPMD	8	Enclosure
4	ModPMD faceplate	9	Locking tab
5	Bezel	10	Hex grounding bolt

## Replacing ModPMDs (Cont.)

### Tools Required

The following tools are required:

- A flat-blade screwdriver
- A Phillips-head screwdriver
- A 5/16-inch nut driver
- An antistatic wrist strap kit (required to handle circuit boards and components)


### Preparing the Module

This procedure assumes that you are changing or reconfiguring ModPMDs on an operational module. Before you begin, you must disconnect and remove the module from its power source (the DEChub 900 or the DEChub ONE docking station), as follows:

1. Before removing the module from the DEChub 900 or DEChub ONE docking station, save or record the module's characteristics.
2. Remove the module from the DEChub 900 (refer to the section of this manual titled Removing the Module) or from the DEChub ONE docking station (refer to the *DEChub ONE Installation* manual).

### Removing and Installing ModPMDs

This section describes how to remove and install ModPMDs. After completing these procedures, verify that the module is operational by installing the module into the DEChub 900 or into the DEChub ONE docking station (refer to the *DEChub ONE Installation* manual). Note that the module's self-test is automatically initiated at powerup.

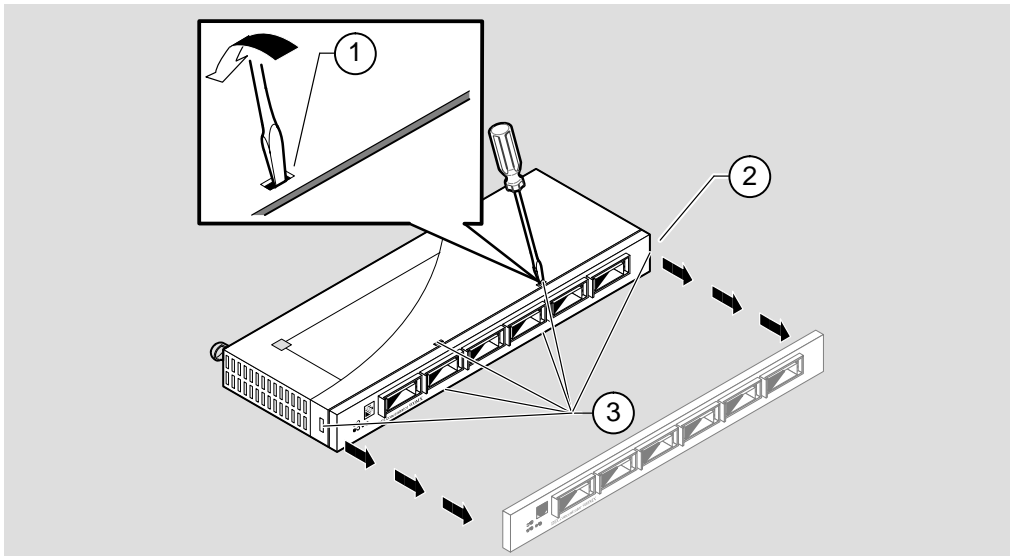
**WARNING**  Be sure to remove the module from its power source (the DEChub 900 MultiSwitch or the DEChub ONE) before performing any ModPMD removal and replacement procedures.

## Replacing ModPMDs (Cont.)

### Removing and Installing ModPMDs (Cont.)

#### 1 Remove the bezel.


- a. Place the blade of a screwdriver in each of the snaplock slots (1) and pry the snaplock in the direction of the bezel.
- b. When all six snaplocks (3) are unlocked, use your fingers to grasp one end of the bezel (2) and work the bezel loose by pulling it away from the enclosure. Pull the bezel carefully along its entire length, until it is free of the enclosure.
- c. Place the bezel aside.



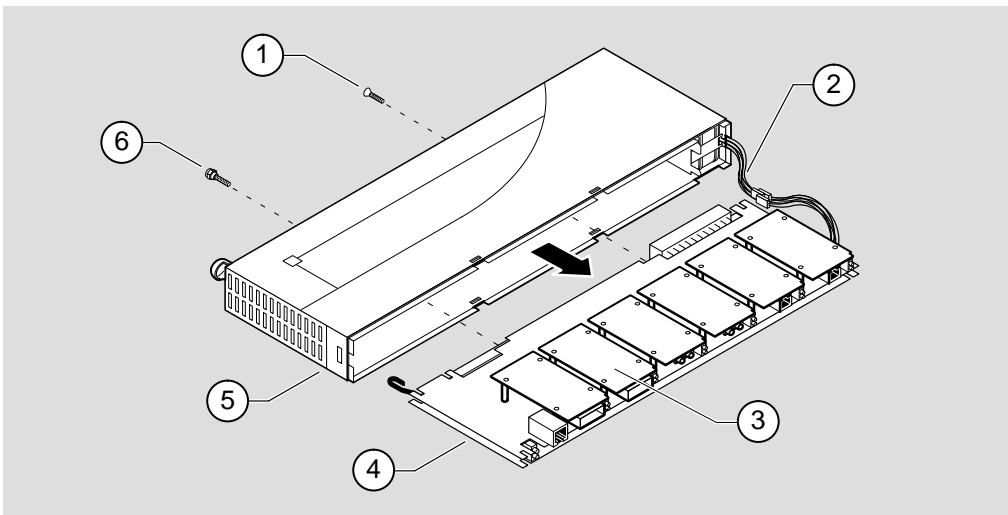
NPG-0181-95I

## Replacing ModPMDs (Cont.)

### Removing and Installing ModPMDs (Cont.)

**CAUTION**  Static electricity can damage modules and electronic components. Digital recommends using a grounded antistatic wrist strap and a grounded work surface when handling any modules.

- 2** Remove the circuit boards from the enclosure.
  - a. Attach a grounded antistatic wrist strap to your wrist.
  - b. Remove the Phillips-head screw **(1)** next to the 160-pin connector.
  - c. Remove the hex grounding bolt **(6)**.
  - d. Remove the circuit boards **(4)** from the enclosure **(5)**. The fan harness **(2)** extends to allow the circuit boards to clear the enclosure. The ModPMDs **(3)** are now accessible.



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**NOTE:** The circuit boards may or may not be populated with ModPMDs, depending on your module's configuration.



## Replacing ModPMDs (Cont.)

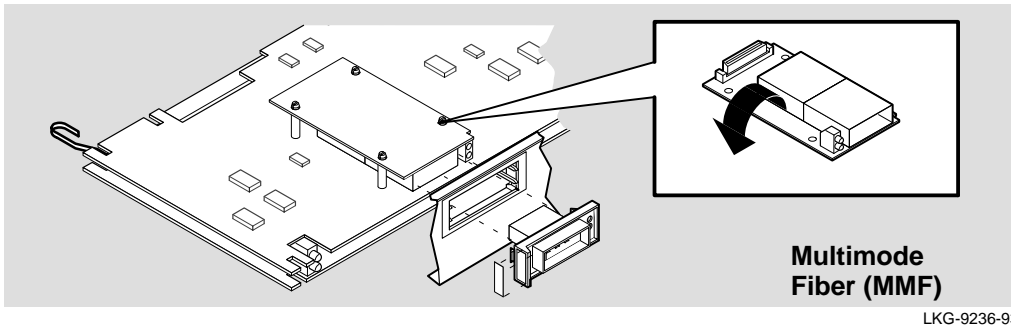
### Removing and Installing ModPMDs (Cont.)

#### 3 Verify the appropriate ModPMD to be Installed.

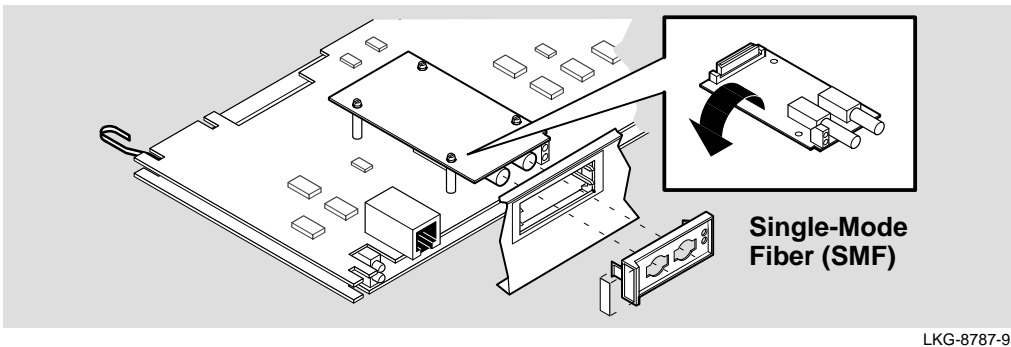
The DECconcentrator 900MX accommodates three different ModPMDs, as shown in the following three illustrations.

**NOTE:** The ModPMDs are shown component-side up for identification purposes only.

#### Multimode Fiber (MMF) ModPMD (Part Number DEFXM-AA)



#### Single-Mode Fiber (SMF) ModPMD (Part Number DEFXS-AA or DEFXS-BA)

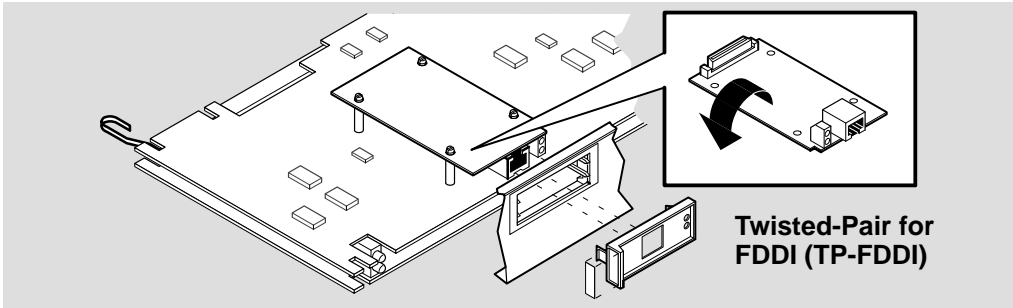


**NOTE:** Both the DEFXS-AA and DEFXS-BA Single-Mode Fiber ModPMD are supported by the DECconcentrator 900MX. However, when using the DEFXS-AA an adjacent ModPMD slot must be left vacant to accommodate the fiber coil on the DEFXS-AA.

## Replacing ModPMDs (Cont.)

### Removing and Installing ModPMDs (Cont.)

#### Twisted-Pair for FDDI (TP-FDDI) ModPMD (Part Number DEFXU-AA or DEFXU-BA)



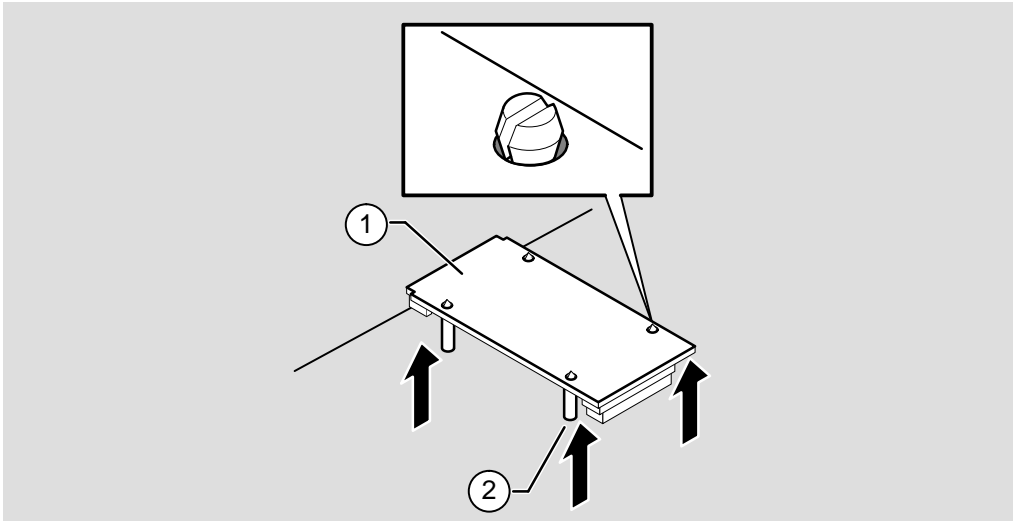
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## Replacing ModPMDs (Cont.)

### Removing and Installing ModPMDs (Cont.)

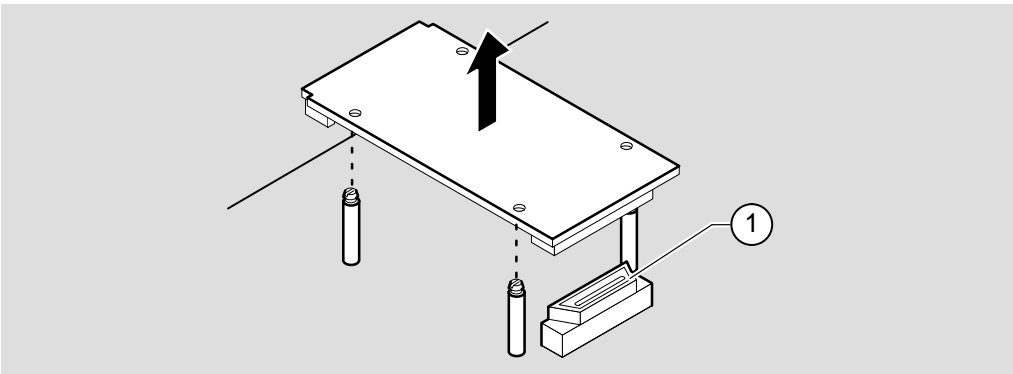
#### 4 Remove the appropriate ModPMDs.

- a. Using your fingers, push up on the corners of the ModPMD (1) until it is released from the 4 standoffs (2).



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- b. Disconnect the ModPMD from the PMD connector (1) and remove it from the 4 standoffs (2).



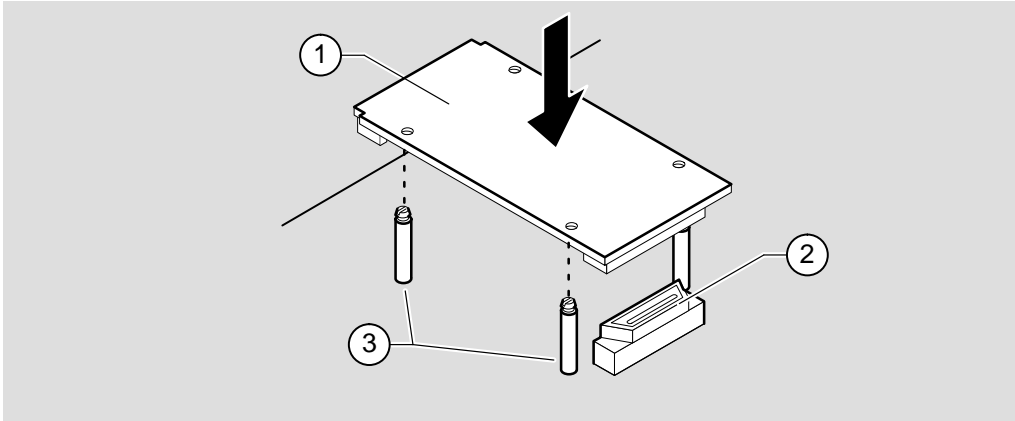
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## Replacing ModPMDs (Cont.)

### Removing and Installing ModPMDs (Cont.)

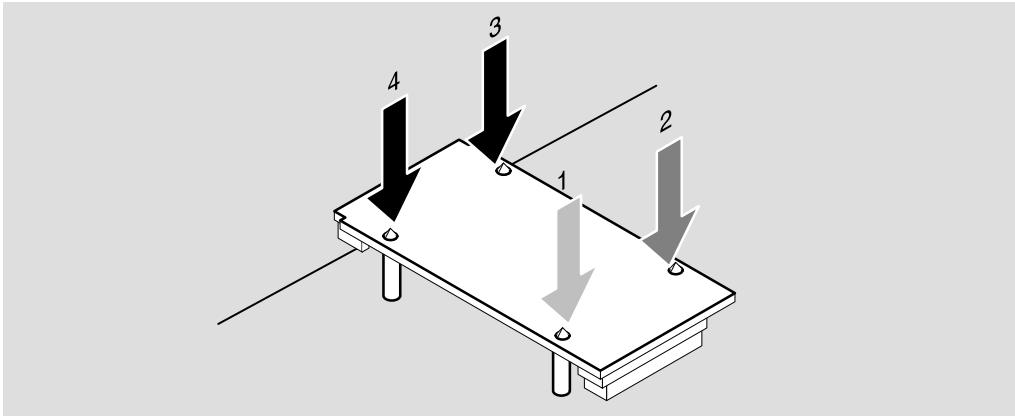
#### 5 Install the replacement ModPMD.

- a. Align the 4 holes on the replacement ModPMD (1) with the 4 standoffs (3). Ensure that the ModPMD's connector aligns properly with the PMD connector (2) on the circuit board.



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- b. Press down firmly on each corner of the ModPMD, seating one corner at a time. This action seats the connector and secures the ModPMD to the circuit board.

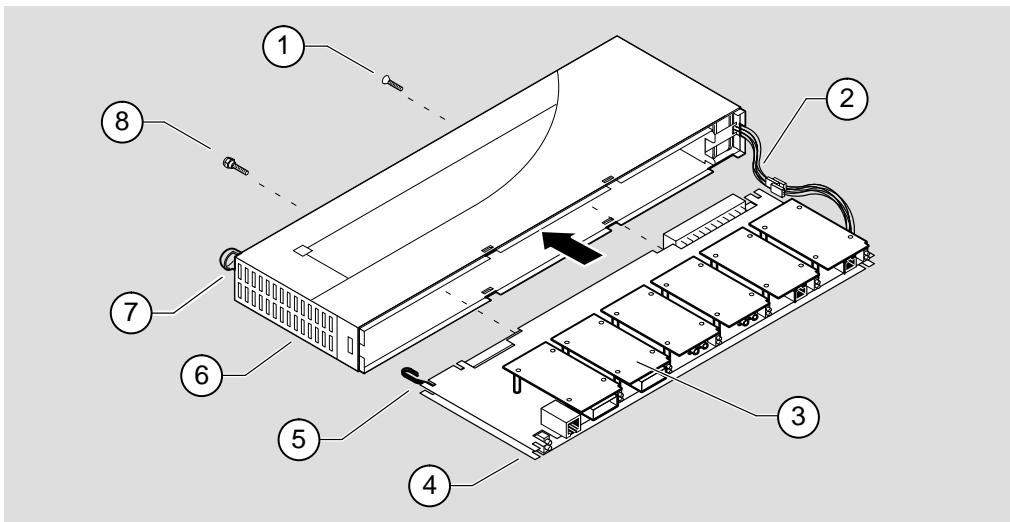


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## Replacing ModPMDs (Cont.)

### Removing and Installing ModPMDs (Cont.)

- 6** Install the circuit boards into the enclosure.
  - a. Carefully slide the circuit boards **(4)** *partially* into the enclosure **(6)**.
  - b. Using your finger, guide the hot-swap switch lever **(5)** into the locking tab enclosure **(7)** while seating the circuit boards into the enclosure. The hot-swap switch lever should not protrude from the locking tab when the circuit boards are seated correctly.
  - c. Insert and secure the Phillips-head screw **(1)**.
  - d. Insert and secure the hex grounding bolt **(8)**.
  - e. Fold the fan harness **(2)** neatly between the two main circuit boards **(4)**.



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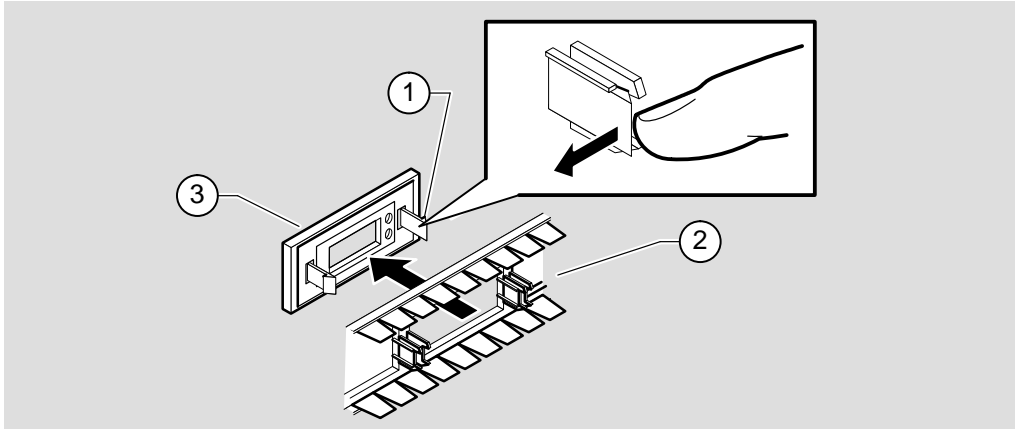
## Replacing ModPMDs (Cont.)

### Removing and Installing ModPMDs (Cont.)

#### 7 Install the bezel.

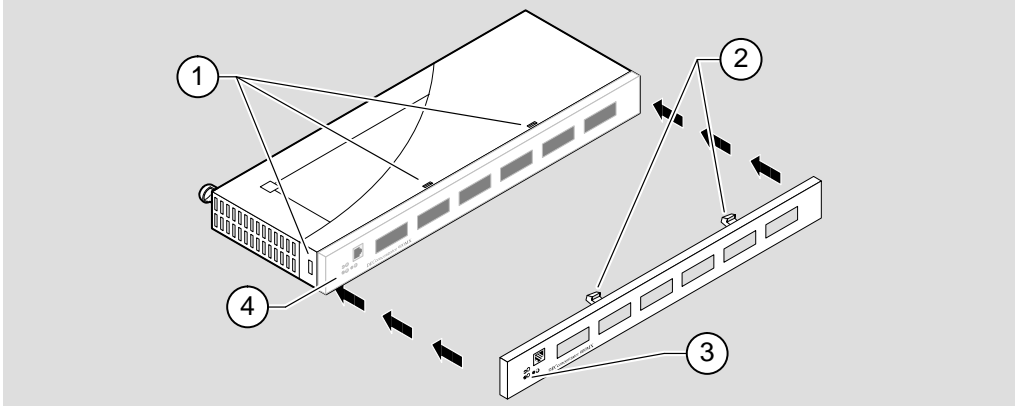
**NOTE:** All faceplates must be removed before you install the bezel.

- a. Press the faceplate's locking tab (1) and remove the faceplate (3) from the bezel (2).



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- b. Align the bezel with the enclosure so that the module LEDs (4) are aligned with the LED cutouts (3) on the bezel.
- c. Starting at one end, press the bezel into place, until all six snaplocks (2) are seated into the six enclosure slots (1).



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## Replacing ModPMDs (Cont.)

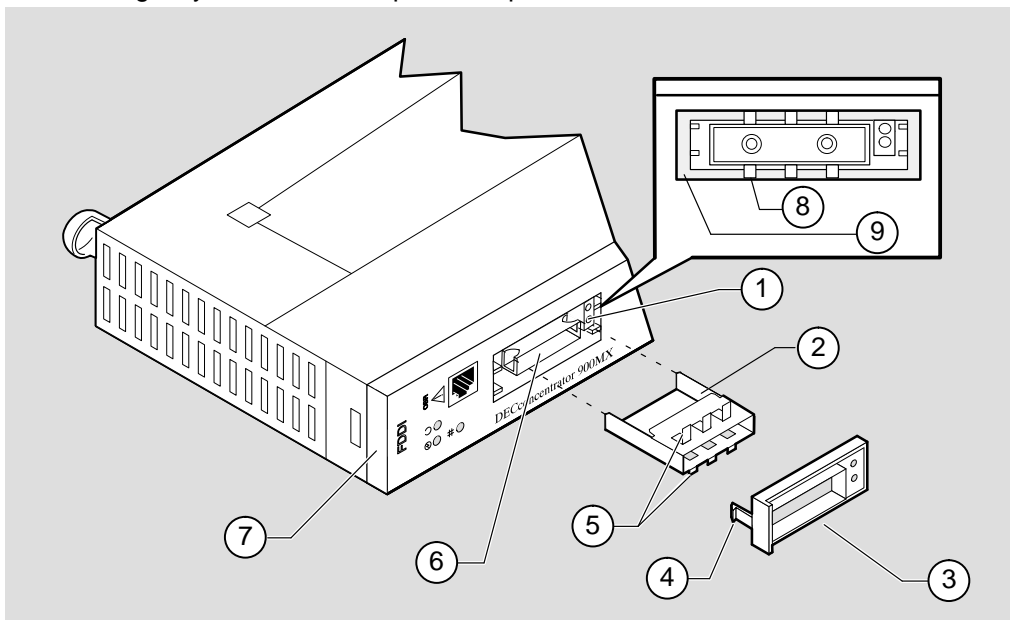
### Removing and Installing ModPMDs (Cont.)

#### 8 Install the faceplates.

If you are installing an MMF ModPMD, and the receptacle is metal, you must install a metal ESD shield (supplied).

**NOTE:** MMF ModPMDs with plastic (nonmetallic) receptacles do not require the metal ESD shield.

- a. Install the metal ESD shield (if required) as follows:
  - Align the metal ESD shield (2) with the metal MMF receptacle (6) as shown in the illustration.
  - Slide the metal ESD shield over the receptacle (6) and gently press it until the metal fingers (5) and (8) are flush against the channel on the bezel (9).
- b. Position the faceplate (3) so that the LED cutout aligns with the LEDs (1).
- c. Press the faceplate's locking tabs (4) into the slots on the bezel (7). Push gently to lock the faceplate into place on the bezel.




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## Replacing ModPMDs (Cont.)

### Removing and Installing ModPMDs (Cont.)

**NOTE:** The SMF (DEFXS-BA) ModPMD faceplate includes an ESD shield that provides a brush-like contact to the ST receptacles. This normally causes a slight drag while installing the faceplate.

#### 9 Install the module.

**WARNING**  To avoid personal injury or damage to equipment, do not install the module into a DEChub 900 or into a DEChub ONE unless the module is completely assembled with the enclosure, bezel and all faceplates in place.

- To install the module into a DEChub 900, refer to the section of this manual titled Installing the Module.
- To install the module into a DEChub ONE docking station, refer to the *DEChub ONE Installation* manual.

After the module is verified to be operational, restore any previously saved module characteristics.







## LED Descriptions

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


Table 2 shows the static states that are possible for each of the module LEDs.

**Table 2 Module LED States**

LED Name	Off	On (Green)	Flashing (Green)
<b>Power</b> 	No power to module.	Module receiving power.	N/A
<b>Module OK</b> 	Self-test failed (if more than 60 seconds elapsed).	Module passed self-test.	Nonfatal error. (e.g., Fan failure.)
<b>Network OK</b> 	FDDI Ring is not operational.	FDDI Ring is operational.	During self-test, indicates that diagnostics are running.

The ModPMD LEDs (see Table 3) indicate the status of the connection between the module and the FDDI network. Note that each of the FDDI ModPMD ports are provided with 2 LEDs: a PHY LED (Port Status), and a FRU Status  LED.

**Table 3 FDDI ModPMD LED States**






LED Name	Off	On		Flashing		
	No Color	Green	amber	Green	amber	Green / amber
<b>FRU  Status</b>	M-type	S-type	ModPMD fault	A or B	N/A	N/A
<b>PHY</b>	Ready to connect	Good connection	Link Error Rate exceeded	Management Disabled or Broken	Illegal/unwanted connection	Standby/Dual homing

## Problem Solving Using the LEDs

When diagnosing a problem with the module, note that the problem is often indicated by the *combined* states of the module LEDs. Table 4 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.

### Normal Power-up


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

1. The module's Power  LED lights immediately, then the module initiates its built-in self-test.
2. During self-test, the Module OK  LED remains off and the Network OK # LED flashes as each diagnostic test in the self-test routine runs.
3. After approximately 30 or 40 seconds, all FRU Status  LEDs flash alternately amber to green. This sequence allows visual verification that the LEDs are operational.
4. After the successful completion (i.e., no fatal errors) of self-test, the Module OK  LED lights, and remains lit.
5. The status LEDs (Network OK #, FRU Status , and PHY Status LEDs) now indicate their operational status, as described in Table 2 and 3.

### Problem Solving

Table 4 provides a list of symptoms indicated by the LED states, along with suggestions for corrective actions.




**Table 4 Problem Solving Using the 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 power is available for this module, press the release lever down and reseal or remove the module.  Inspect the module's 48- or 160-pin connector for bent, broken, or dirty pins.  If the problem persists, replace the module.

(continued on next page)

## Problem Solving Using the LEDs (Cont.)

Table 4 (Cont.) Problem Solving Using the LEDs

Symptom	Probable Cause	Corrective Action
	Faulty Power LED	Move the module to an operational hub slot. If the power LED does not light, replace module or contact your service representative.
	Faulty slot connection.	Move the module to an operational slot. If the Power LED lights, the original DEChub 900 slot may be faulty. Refer to the problem solving section in the <i>DEChub 900 MultiSwitch Owner's Manual</i> .
Module OK  LED is off.	Self-test in progress.  Self-test failed.	Wait for self-test to complete.  If the LED does not light after approximately 60 seconds, lift the release lever momentarily then press it down to repeat self-test. If self-test fails again, replace the module or contact your service representative.
Module OK  LED is flashing.	Self-test has detected a non-fatal fault. Module is not fully functional.	The non-fatal failure will be a bad ModPMD, fan or EEPROM. Check those components and replace as necessary.
FRU Status  Led is on amber.	Faulty ModPMD.	Replace the ModPMD; contact your service representative.
PHY Status LED is flashing green.	Port disabled by management.	Enable port via management.

(continued on next page)

## Problem Solving Using the LEDs (Cont.)

**Table 4 (Cont.) Problem Solving Using the LEDs**

Symptom	Probable Cause	Corrective Action
PHY Status LED is flashing amber.	Invalid connection.	<p>Use a valid connection (for example, M-to-M connections are invalid).</p> <p>Change one of the M-type connections to another type to achieve a valid connection.</p>
PHY Status LED is on steady amber, or it repeats the following cycle: on (amber) for 50 seconds, then turns to green for a brief period, then returns to steady amber.	Network problem, or the PHY port is faulty.	<p>Disconnect the port cable. If the LED turns off, the PHY port is functional. To confirm, move the cable to a different module port and observe results. If the problem shifts to the other concentrator port, replace the cable. If the cable is not the problem, troubleshoot the remote device that is connected to the original port.</p> <p>If the problem does not shift to the other concentrator port, the cable is good. Perform loopback testing on the original concentrator port. Refer to table 7, Problem Solving Using Loopback Testing, in this manual.</p> <p>If the problem persists, contact your service representative.</p>

## Loopback Testing

You can use a loopback connector to isolate and identify problems related to the module from those that are caused by the network. The loopback connector routes the module's transmitter port output directly back to its own receiver. If a problem occurs, it is isolated to that specific PHY port, simplifying the corrective action.

**NOTE:** Loopback testing does not verify the port's minimum receive levels or transmit signal specifications.

This section identifies the various loopback connectors available from Digital, provides loopback installation procedure, and describes how to interpret the ModPMD status LEDs when using the loopback connector.

The following subsections are included:

- Identifying Loopback Connectors
- Attaching Loopback Connectors
- Evaluating ModPMD LEDs During Loopback Test

### Identifying Loopback Connectors

Table 5 lists the appropriate loopback connector to select when evaluating the various types of ports:

**Table 5 Identifying Loopback Connectors**

Port Type	Vendor	Loopback Part Number
Multimode fiber (MMF) (DEFXM-AA)	Digital	12-32005-01
Single-mode fiber (SMF) (DEFXS-AA)	Digital	12-34830-01
Single-mode fiber (SMF) (DEFXS-BA)	N/A	N/A
Twisted-pair for FDDI (TP-FDDI) (DEFXU-AA and DEFXU-BA)	Amphanol	12-35619-03

## Loopback Testing (Cont.)

### Attaching Loopback Connectors

This section describes the following tasks:

- Attaching the Multimode Fiber (MMF) loopback connector
- Making and attaching the Single-mode Fiber (SMF) loopback connector
- Attaching the Twisted-pair for FDDI (TP-FDDI) loopback connector

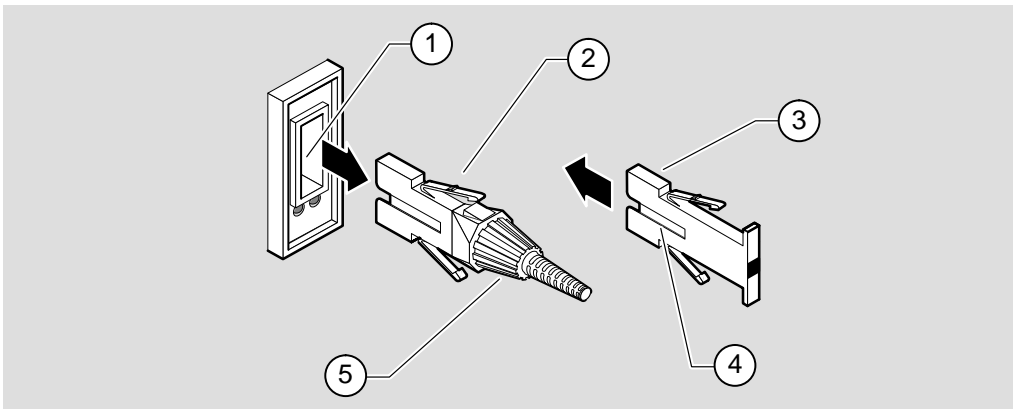
Refer to the appropriate sections to attach loopback connectors.

#### Attaching the Multimode Fiber (MMF) Loopback Connector

To attach an MMF loopback connector, complete the following steps:

**NOTE:** To avoid optical power loss, do not touch the fiber ends.

1. Press the locking clips **(2)** on the media interface connector (MIC) cable plug **(5)** (or dust cap), and remove the cable (or dust cap) from the PHY port.
2. Align the keyway **(4)** on the loopback connector **(3)** with the key on the MMF connector **(1)**.
3. Insert the plug into the connector, ensuring that the locking clips snap into the locked position.
4. Go to the section titled Evaluating ModPMD LEDs During Loopback Test.



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To remove an MMF loopback connector, press the locking clips on the MMF loopback connector, then disconnect the connector. Replace the cable or dust caps.

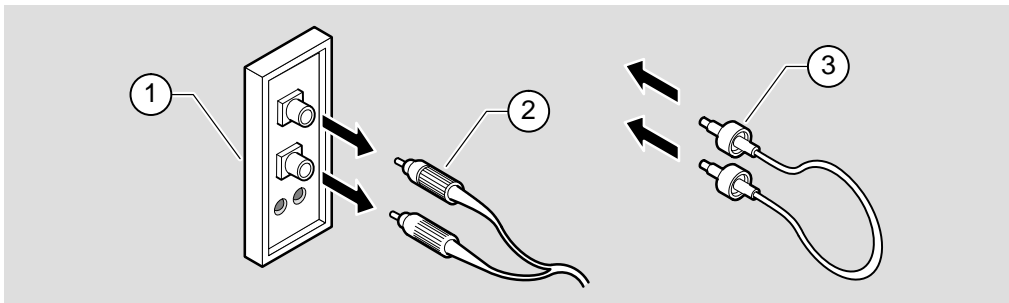
## Loopback Testing (Cont.)

### Attaching the Single-Mode Fiber (MMF) (DEFXS-AA) Loopback Connector

To attach an SMF loopback connector, complete the following steps:

**NOTE:** Ensure that the bend radius of the fiber-optic cable remains greater than 2.5 cm (1 in). To avoid optical power loss, do not touch the fiber ends.

1. Remove the cables **(2)** (or dust caps) from the PHY port's FC/PC-type connectors.
2. Insert one end of the loopback connector **(3)** into the ModPMD's **(1)** transmit port connector (labeled  $\ominus$ ), ensuring that it is seated into the connector.
3. Connect the other end of the SMF loopback plug to the SMF receive port connector (labeled  $\oplus$ ).
4. Go to the section titled Evaluating ModPMD LEDs During Loopback Test.



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To remove the SMF loopback connector, pull the plug out of the connector while twisting it slightly. Replace the cable or dust caps.

**NOTE:** DEFXS-BA ModPMDs are equipped with ST-type connectors. Earlier versions of the single-mode fiber ModPMD (DEFXS-AA) are equipped with FC/PC-type connectors.

## Loopback Testing (Cont.)

### Attaching the Single-Mode Fiber (SMF) (DEFXS-BA) Loopback Connector

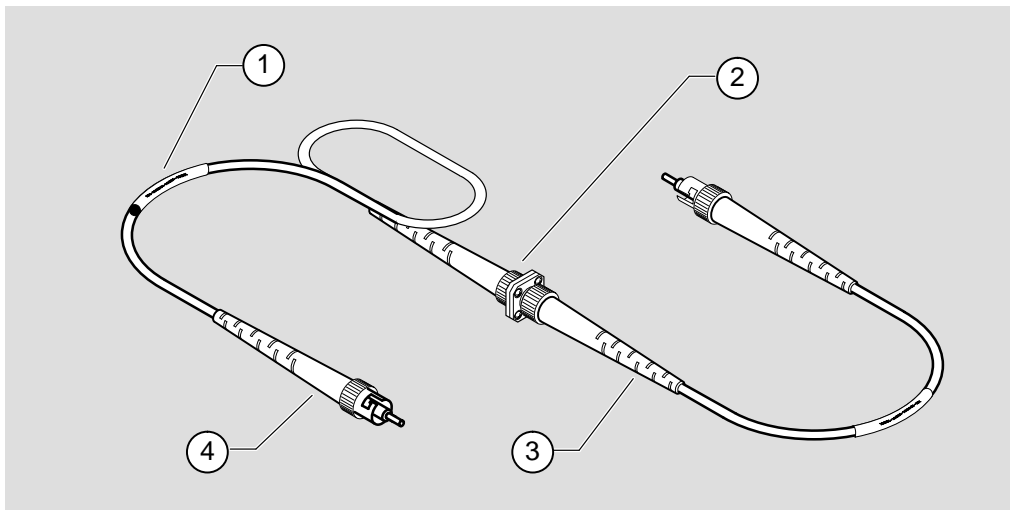
SMF loopback connectors for the DEFXS-BA ModPMD are not available from Digital as single units. To perform loopback testing, a loopback connector must be made from three discrete components, described in table 6.

**Table 6 SMF Loopback Connector Components**

Part	Vendor	Quantity
ST-to-FC Cable	Various – see page 73	2
Line-Loss Element (Attenuator)	3M Storm Products	1

### Making a SMF Loopback Connector

1. Connect the FC end of one of the cables to the line-loss element.
2. Connect the FC end of the other cable to the line-loss element.



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Item	Description	Item	Description
1	Cable identifier tag	3	FC end of cable
2	Line loss element (Attenuator)	4	ST end of cable

See the section titled Cables for vendor information.



## Loopback Testing (Cont.)

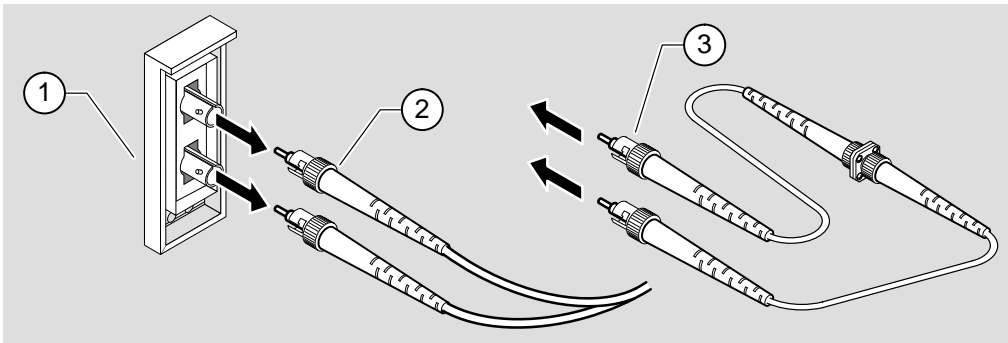
### Attaching the Single-Mode Fiber (SMF) (DEFXS-BA) Loopback Connector (Cont.)

To attach an SMF loopback connector, complete the following steps:

**NOTE:** Ensure that the bend radius of the fiber-optic cable remains greater than 2.5 cm (1 in). To avoid optical power loss, do not touch the fiber ends.

1. Remove the cables **(2)** (or dust caps) from the PHY port's ST-type connectors.
2. Insert one end of the SMF loopback connector **(3)** into the ModPMD's **(1)** transmit port connector (labeled  $\odot$ ), ensuring that it is seated into the connector and twist the connector clockwise.
3. Connect the other end of the SMF loopback connector into the SMF receive port connector (labeled  $\ominus$ ).
4. Go to the section titled Evaluating ModPMD LEDs During Loopback Test.

To remove the SMF loopback connector, twist the connector counter clockwise and pull the cable out. Replace the cable or dust caps.



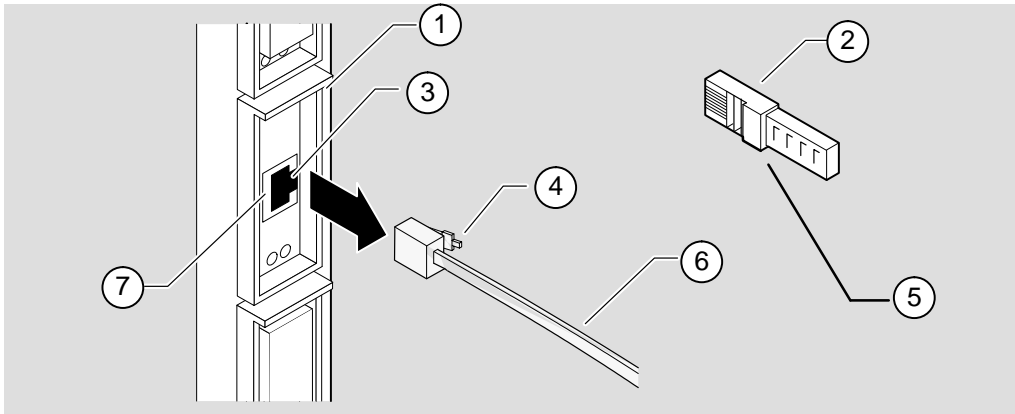
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## Loopback Testing (Cont.)

### Attaching the Twisted-Pair for FDDI (TP-FDDI) Loopback Connector

To attach a TP-FDDI loopback connector, complete the following steps:

1. Press the locking tab **(4)** on the TP-FDDI cable **(6)** plug, then disconnect the cable.
2. Align the release tab **(2)** on the loopback connector **(5)** with the keyway **(3)** on the PHY port's **(1)** 8-pin MJ connector **(7)**.
3. Insert the loopback connector plug into the PHY port's 8-pin MJ connector, ensuring that the release tab snaps into the locked position.
4. Go to the section titled Evaluating ModPMD LEDs During Loopback Test.



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To remove the TP-FDDI loopback connector, press the locking tab on the loopback connector, then remove the loopback connector. Align the locking tab with the keyway and replace the TP-FDDI cable into the PHY port's 8-pin MJ connector.

## Loopback Testing (Cont.)

### Evaluating ModPMD LEDs During Loopback Test

After attaching the loopback connector (as described in the previous sections), complete the following steps:

1. Observe and record the LED status indications on the port under test.
2. Compare the recorded findings with the symptoms described in Table 7.

**Table 7 Problem Solving During Loopback Testing**

Symptom	Probable Cause	Corrective Action
PHY Status LED is on steady green or flashing amber	Normal condition during loopback testing	Port functioning. No action required. (LED color depends on port type definition.) The media or another device may require further testing.
PHY Status LED is on amber, or off	Port failure	Replace the ModPMD on that port (refer to the section of this manual titled Replacing ModPMDs), or contact your service representative.
PHY Status LED flashing green	Port disabled by network management	Port cannot be tested while disabled, use network management to enable the port.

For more information regarding port cables, refer to the section of this manual titled Cables.

If you have followed the procedures in this section, and are still having problems with your unit, refer to the section of this manual titled Problem Solving Using the LEDs.

## Cables

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

The cables described in this section include the following types:

- Multimode
- Single-mode
- Twisted-pair for FDDI

### Multimode Cables

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

Cable Description	Order Number
FDDI MIC-to-FDDI MIC connector cables	BN24B-xx*
FDDI-to-2.5 mm ST-type connector cables	BN24D-xx*

\* xx represents the cable length in meters.

The following cable lengths are available:

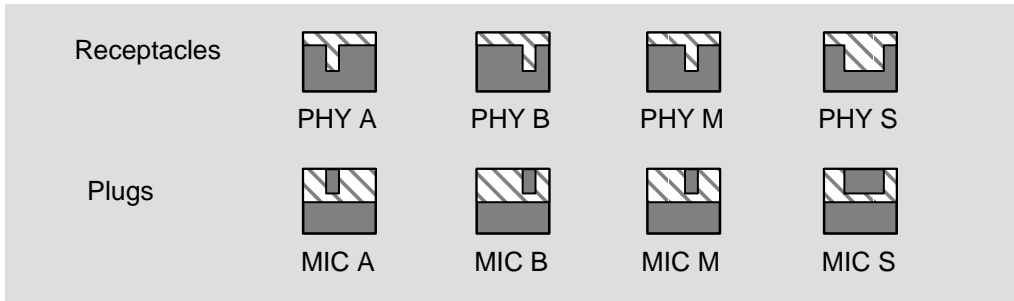
Cable Length	xx Value
1 m (3.3 ft)	01
3 m (9.8 ft)	03
4.5 m (14.8 ft)	4E
10 m (32.8 ft)	10
20 m (65.6 ft)	20
30 m (98.4 ft)	30

## Cables (Cont.)

### Port Keying

Digital BN24B and BN24D cables are color-key coded on the top of the duplex connector as follows: red for PHY A ports, blue for PHY B ports, and green for PHY M ports.

The receptacle and plugs are keyed as follows:



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Refer to the following table for a description of the various connector types:

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

## Cables (Cont.)

### Single-Mode Cables

Single-mode patch cables are available from the following vendors. You can also use equivalent parts from other vendors:

Simplex Patch Cables	Duplex Patch Cables	ST to FC Patch Cables
AMP Incorporated	Anixter Brothers	3M
AT&T <sup>1</sup>	—	Anixter Brothers
Dorran/3M	—	Computer Crafts

<sup>1</sup> AT&T also supplies a six-unit coupler.

**NOTE:** Earlier versions of the single-mode fiber ModPMDs may have FC-type connectors. Replacement ModPMDs have ST-type connectors. An FC-to-ST adapter is available from Digital, part number 12-44990-01.

When you use single-mode cable, verify the following information:

- The cableplant has a loss of between 12 decibels (dB) and 22 dB (measured at a wavelength of 1300 nm).
- The cableplant attaches to the FDDI device through ST-type connectors.
- Use fiber-optic cables that conforms to EIA/TIA 492BAAA with a cutoff wavelength of 1240 nm or less.
- Use in-line loss elements with cables of less than 12 dB of loss. Use one of the following types of in-line loss elements, as appropriate:

Cable Loss	Loss Element Rating
0 dB to 6 dB	12 dB to 16 dB
6 dB to 12 dB	6 dB to 10 dB

In-line loss elements are available from Amphenol Corporation and from Aster Corporation. You can use equivalent parts from other vendors.

Contact your Digital sales representative for additional information.

## Cables (Cont.)

### Twisted-Pair for FDDI Cables

The following Twisted-pair for FDDI (TP-FDDI) cables are available from Digital Equipment Corporation (you can also use equivalent parts from other vendors):

Cable Description	Order Number
8-pin MP to 8-pin MP office cable (crossover)	BN25H-03 (3m (9.8 ft) only)
8-pin MP to 8-pin MP Category 5 cable (straight through)	BN25G-03

The BN25H is a category 5 crossover cable used to connect the TP-FDDI ModPMD in the module directly to another FDDI device in an office environment.


When a DECconcentrator 900MX is installed in an equipment room, a BN25G straight-through cable is often used to connect the TP-FDDI ModPMD to a patch panel.

**NOTE:** Digital crossover cables are marked with the letter X.  
Digital straight-through cables are marked with the symbol =.

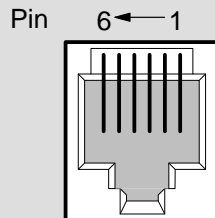
## Connector Pin Assignments

This section provides a description of the connectors used on the module.

### Optical Bypass Relay (6-Pin MJ) Connector

**WARNING**  To prevent personal injury or equipment damage, **do not** insert telecommunications cabling into the optical bypass relay connector.

The Optical Bypass Relay (OBR) feature on the module maintains FDDI dual-ring integrity if the module fails or if power to the module is turned off. When the module is installed in a DEChub ONE-MX, the OBR in the DEChub ONE-MX overrides the OBR in the module. The following illustration shows the OBR 6-pin MJ connector and its pin assignments. Refer to this information when selecting optical bypass devices.



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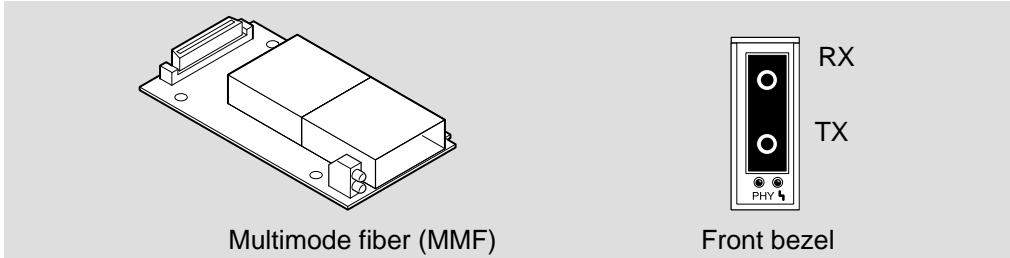
Pin	Assignment
1, 2	Relay drive; +5V @ 200mA (max.)
3, 4, 6	Return; grounded internally
5	Bypass present; must be externally grounded to pin 3, 4, or 6



## Connector Pin Assignments (Cont.)

### Multimode Fiber ModPMD

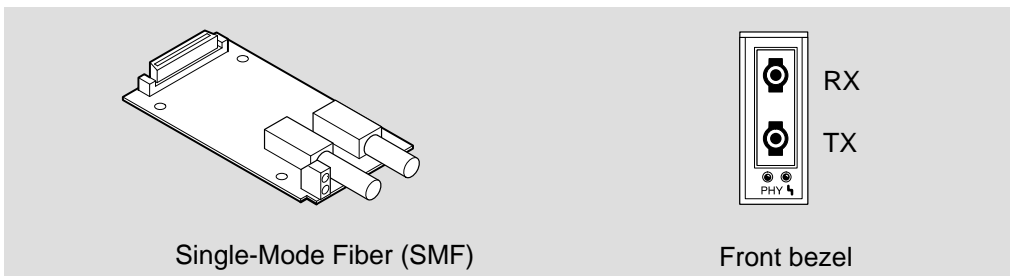
The following illustration shows the multimode fiber (MMF) ModPMD connector and its pin assignments:



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### Single-Mode Fiber ModPMD

The following illustration shows the single-mode fiber (SMF) ModPMD connector and its pin assignments:

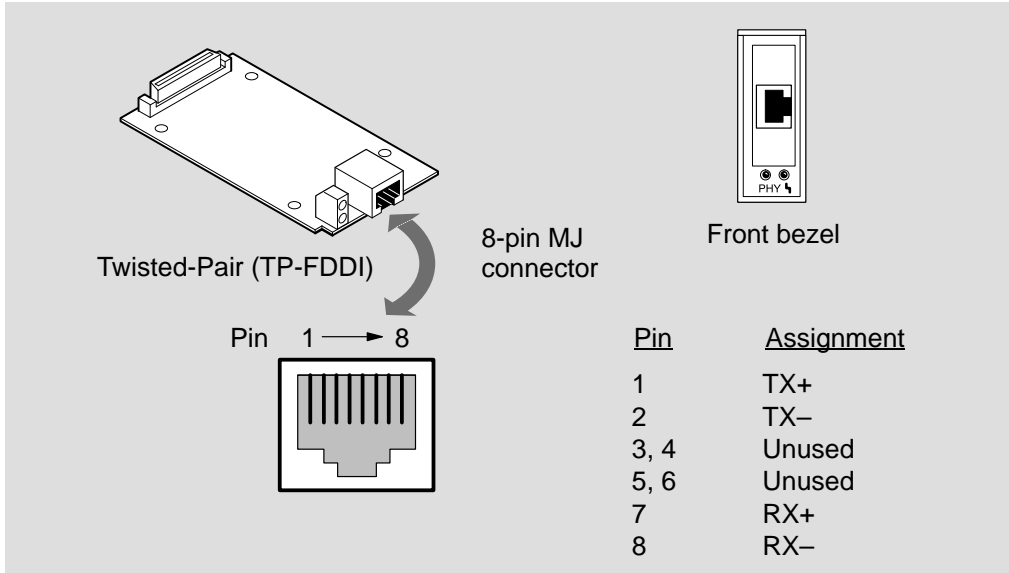


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## Connector Pin Assignments (Cont.)

### Twisted-Pair for FDDI ModPMD

The following illustration shows the twisted-pair for FDDI (TP-FDDI) ModPMD connector and its pin assignments:

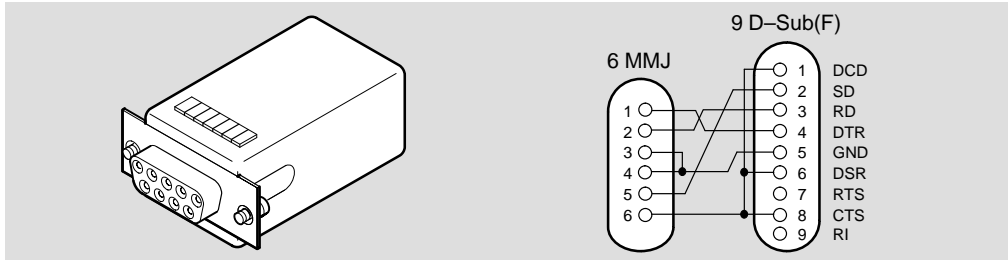


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## Connector Pin Assignments (Cont.)

### H8571-J Adapter

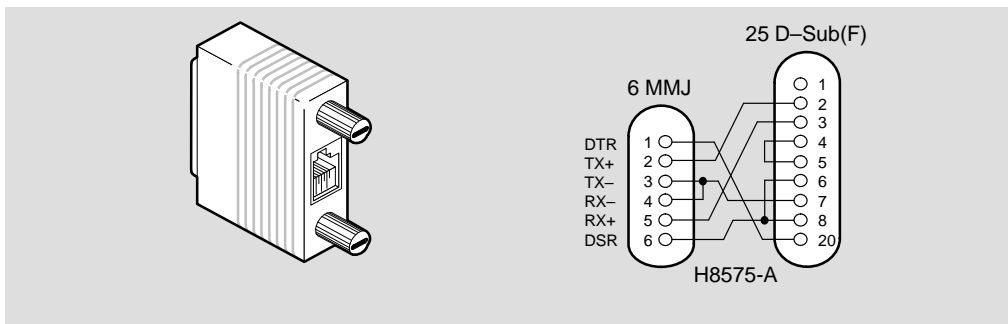
The following illustration shows the H8571-J adapter (6-pin MMJ to 9-pin D-Sub connector) and its pin assignments:



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### H8575-A Adapter

The following illustration shows the H8575-A adapter (6-pin MMJ to 25-pin D-Sub connector) and its pin assignments:



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**NOTE:** EOS/ESD protection devices are not shown in the above diagram

## Product Specifications

Operating specifications for the DECconcentrator 900MX module are provided in Table 8. The module's acoustical specifications are listed in Table 9.

**Table 8 DECconcentrator 900MX Operating Specifications**

Parameter	Specification
<b>Operating Environment</b>	
Operating Temperature <sup>1</sup>	5°C to 50°C (41°F to 122°F)
Relative Humidity	10% to 95% noncondensing
Altitude	Sea level to 4900 m (16,000 ft)
Power	42.5 W, total power 7.0 A, 5Vdc, 0.1 A, 12Vdc <sup>2</sup> 0.5 A, 15Vdc
<b>Connectors</b>	
One Shielded 6-pin MJ (OBR) connector and as many as six ModPMDs of the following types: Multimode fiber (MMF), Single-mode fiber (SMF), and Twisted-pair for FDDI (TP-FDDI).	
(DEChub ONE has one 8-pin MJ, one DB-9, and one 15-pin D-Sub AUI connector.)	
(DEChub ONE-MX has: one 8-pin MJ, one 6-pin MJ (OBR), one DB-9, one 15-pin D-Sub, one redundant power connector (D-Sub), and as many as two ModPMDs.	
<b>Physical</b>	
Height	44.45 cm (17.5 in)
Width	4.45 cm (1.75 in)
Depth	15.25 cm (6 in) <sup>3</sup>
Weight	1.8 kg (4 lb) <sup>4</sup>
<b>Certification</b>	
CE, CSA, FCC, TÜV, UL, VCCI.	

<sup>1</sup> For sites above 4900 m (16,000 ft), decrease the operating temperature specification by 1.8°C for each 1000 m or 3.2°F for each 3200 ft.

<sup>2</sup> The 12V power in the DEChub 900 is derived from the 15V power source. Although it is listed separately in the product specifications, the 12V requirements are included in the 15V power total.

<sup>3</sup> Include an additional 10.25 cm (4.0 in) when attached to a DEChub ONE; when attached to a DEChub ONE-MX, add 15.12cm (5.9 in).

<sup>4</sup> Include an additional 1.59 kg (3.5 lb) when attached to a DEChub ONE; when attached to a DEChub ONE-MX, add 2.10 kg (4.63 lb).

## Product Specifications (Cont.)

**Table 9 Acoustical Specifications**

Acoustics — Declared values per ISO 9296 and ISO 7779<sup>1</sup>

Product	Sound Power Level	Sound Pressure Level
	$L_{WA,d}$ , B	$L_{pAm}$ , dBA (bystander positions)
	<i>Idle/Operate</i>	<i>Idle/Operate</i>
DECconcentrator 900MX DEF6X	5.2	38
DECconcentrator 900MX & DEChub ONE DEF6X + DEHUA	5.4	41
DECconcentrator 900MX & DEChub ONE-MX DEF6X + DEF1H	5.4	41

Schallemissionswerte — Werteangaben nach ISO 9296 und ISO 7779/DIN EN27779<sup>2</sup>

Produkt	Schalleistungspegel	Schalldruckpegel
	$L_{WA,d}$ , B	$L_{pAm}$ , dBA (Zuschauerpositionen)
	<i>Leerlauf/Betrieb</i>	<i>Leerlauf/Betrieb</i>
DECconcentrator 900MX DEF6X	5,2	38
DECconcentrator 900MX& DEChub ONE DEF6X + DEHUA	5,4	41
DECconcentrator 900MX& DEChub ONE-MX DEF6X + DEF1H	5,4	41

<sup>1</sup> Current values for specific configurations are available from Digital Equipment Corporation representatives. 1 B = 10 dBA.

<sup>2</sup> Aktuelle Werte für spezielle Ausrüstungsstufen sind über die Digital Equipment Vertretungen erhältlich. 1 B = 10 dBA.

## Associated Documents

The following documents provide related information about the module. Ordering information is provided at the back of this manual.

<b>Title and Order Number</b>	<b>Description</b>
<i>DEChub 900 MultiSwitch Owner's Manual EK-DH2MS-OM</i>	Provides installation, use, security, and troubleshooting information for the DEChub 900 MultiSwitch.
<i>DEChub ONE Installation EK-DEHU2-IN</i>	Provides installation and operation guidelines for standalone module configuration, including mounting options and cabling.
<i>DEChub ONE-MX Installation EK-DEF1H-IN</i>	Provides installation and operation guidelines for standalone module configuration, including mounting options and cabling.
<i>HUBwatch Installation and Configuration AA-QOFXB-TE</i>	Provides information for installing and configuring HUBwatch for Open VMS V3.0 and HUBwatch for Windows V2.0.
<i>HUBwatch for Windows Use AA-Q3S3A-TE</i>	Provides network management and DEChub 900 functionality information for HUBwatch for Windows V2.0.
<i>Fiber Distributed Data Interface Media Connection Information EK-A0597-MI</i>	Provides FDDI connector, cable, and loopback connector information for ModPMDs.
<i>Open DECconnect Applications Guide EC-G2570-42</i>	Provides information to help plan and install networking systems based on Digital's OPEN DECconnect System and networking products.

## HOW TO ORDER ADDITIONAL DOCUMENTATION

### DIRECT TELEPHONE ORDERS

In Continental USA  
call 1-800-DIGITAL  
(1-800-344-4825)

In Canada  
call 1-800-267-6215

In New Hampshire,  
Alaska or Hawaii  
call 1-603-884-6660

### ELECTRONIC ORDERS (U.S. ONLY)

Dial 1-800-dec-demo with any VT100 or VT200  
compatible terminal and a 1200 baud modem.

If you need assistance, call 1-800-DIGITAL (1-800-344-4825)

### DIRECT MAIL ORDERS (U.S. and Puerto Rico\*)

DIGITAL EQUIPMENT CORPORATION  
P.O. Box CS2008  
Nashua, New Hampshire 03061

### DIRECT MAIL ORDERS (Canada)

DIGITAL EQUIPMENT OF CANADA LTD.  
940 Belfast Road  
Ottawa, Ontario, Canada K1G 4C2  
Attn: A&SG Business Manager

### INTERNATIONAL

DIGITAL EQUIPMENT CORPORATION  
A&SG Business Manager  
c/o Digital's local subsidiary  
or approved distributor

Internal orders should be placed through U.S. Software Supply Business (SSB),  
Digital Equipment Corporation, 10 Cotton Rd. Nashua, NH. 03063-1260

\*Any prepaid order from Puerto Rico must be placed  
with the Local Digital Subsidiary:  
809-754-7575





**DECconcentrator 900MX Installation and Configuration**  
**EK-DEF6X-IN. B01**

**Please return this card.**

Your comments and suggestions will help us improve the quality and usefulness of our documentation.

Did you use the manual as a reference or as a step-by-step procedure to install the device?

\_\_\_\_\_

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Were the instructions complete? \_\_\_\_\_

Were they in the proper sequence? \_\_\_\_\_

Which chapters or sections were most helpful? \_\_\_\_\_

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Did you use the appendixes? Which ones? \_\_\_\_\_

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Were some illustrations unnecessary? \_\_\_\_\_ Which ones? \_\_\_\_\_

Do you think the manual needs more illustrations? \_\_\_\_\_ Please give an example. \_\_\_\_\_

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Thank you.

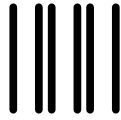
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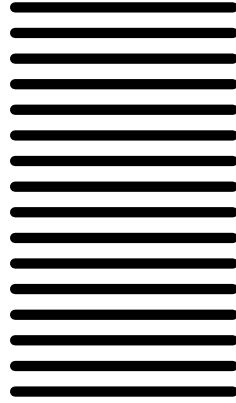
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