

DECconcentrator 900MX

Installation and Configuration

Part Number: EK-DEF6X-IN. A01

May 1994

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

Revision/Update Information: This is a new manual.

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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:

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

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 59.]

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 6, 7, 8, and 9.]

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.)

CAUTION

If power is interrupted during a downline load, 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 a downline upgrade. [Pages 25 and 30.]

ACHTUNG

Wenn die Stromversorgung während des Fernladens unterbrochen wird, besteht die Gefahr, daß die Firmwaredaten zerstört werden. Während der Durchführung der Ferninstallation der Firmware müssen Sie daher unter allen Umständen dafür Sorge tragen, daß die Stromversorgung des Geräts nicht unterbrochen werden kann.

ATTENTION

Une coupure de courant au cours de la procédure de téléchargement peut entraîner la détérioration de l'image du microprogramme. Ne mettez pas l'unité hors tension et n'exécutez une action pouvant provoquer une coupure de courant au cours de cette procédure.

PRECAUCIÓN

Si ocurre una interrupción del suministro durante la carga desde el sistema central, puede corromperse la imagen del firmware. No se debe apagar el dispositivo, ni tomar ninguna medida que pueda producir un corte de la alimentación durante una actualización por telecarga.

Safety (Cont.)

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 37.]

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 39.]

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.)

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 45.]

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.

Introduction

The DECconcentrator 900MX (also referred to in this manual as the module) is a six-port 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 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). These software-configurable ports can be field 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 for LAN connections 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 8 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:

- Built-in Simple Network Management Protocol (SNMP) network management.
- Supports Serial Line Internet Protocol (SLIP).
- Stores management information base (MIB) settings.
- Downline-upgradable firmware.
- Built-in security.
- Standalone operation with a DEChub ONE docking station.
- 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

Introduction (Cont.)

- Hot-swap capability allows you to install and remove the module without turning off power to the DEChub 900.
- Setup port for the initial setup of the module using a setup port device (a terminal or personal computer).
- Module self-test.
- Field-replaceable ModPMDs.
- Module can be connected directly to a dual ring.
- Versatile front-panel connectivity features a design that supports the following ModPMDs on a per-port basis:
 - Multimode fiber (MMF)
 - Single-mode fiber (SMF)
 - Twisted-pair for FDDI (TP-FDDI)
- Built-in SNMP agent supports the following management information bases (MIBs):
 - MIB II, RFC 1213
 - FDDI MIB, RFC 1512
 - Digital Extended MIB v2.7, 2–December–1993
 - PCOM MIB v1.0, October 1993
 - SMT7.2 Station Management MIB
- Manageability using any generic SNMP management application that supports the MIBs listed above.
- User-friendly advanced Graphical User Interface (GUI) manageability with Digital's HUBwatch Network Management Station (NMS) application.

Front Panel

Of the six FDDI 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- or M-type port. Note that ports 2 to 5 are always M-type ports.

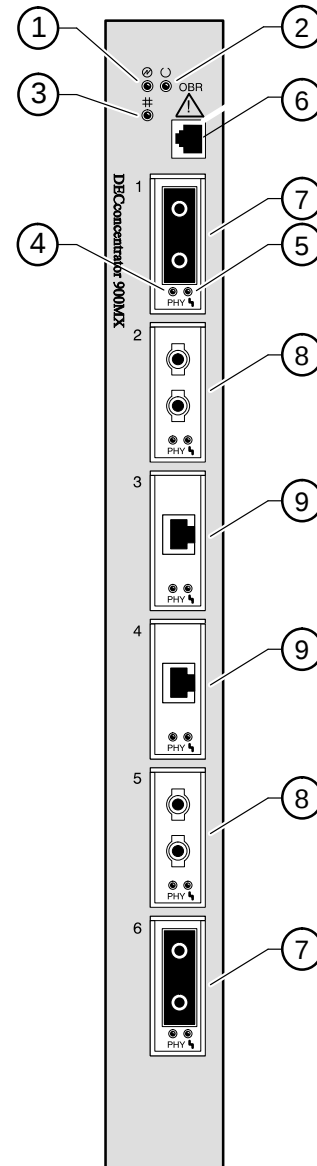
- 1) **Power**  **LED** — Lights when the module has power.
- 2) **Module OK**  **LED** — Lights when the module passes self-test. If the module fails self-test, the Module OK LED remains off.
- 3) **Network OK**  **LEDs** — Shows the status of the network connection. Lights to indicate that the FDDI 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**  **(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**

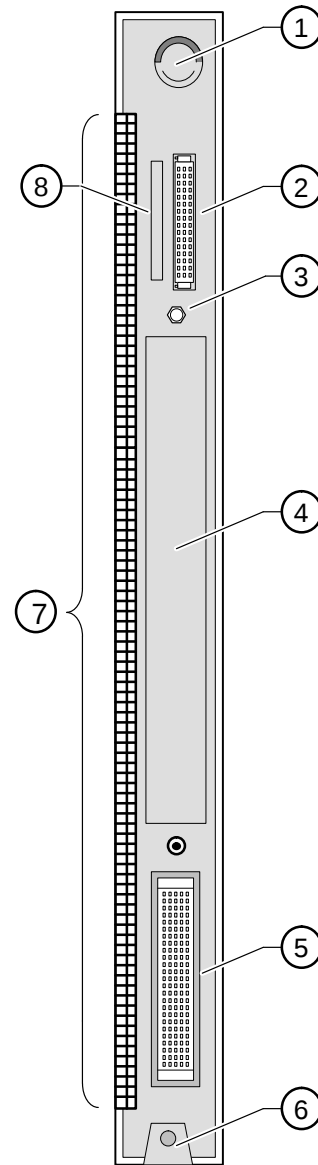


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Back Panel

- 1) **Locking tab** — Locks the module into a DEChub 900 backplane or into the 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 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** — Provides 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 Ethernet Hardware Address.

NOTE: Ensure that 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.



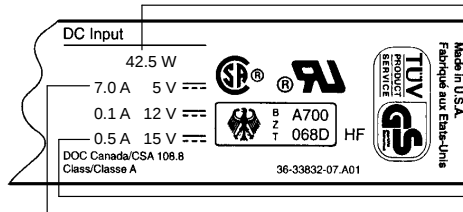
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Installing the Module

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 with the values shown in the Hub Manager status display (see examples).**

Module's Manufacturing Label (Example)



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

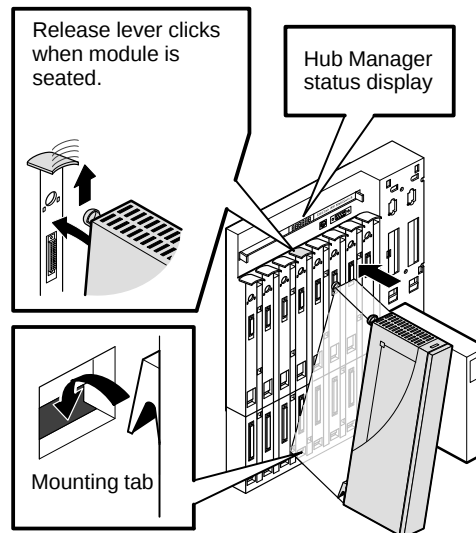
Hub Manager Status Display (Example)

Available: 90.5 W
5V: 13.0 A, 15V: 3.5 A

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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.

- 2 Seat the module into the DEChub 900.**
 - a. Place the module's mounting tab into a mounting slot on the DEChub 900.
 - b. Pivot the module on the mounting tab and align the connectors.
 - c. Firmly push the module onto the backplane connectors until the release lever clicks.
 - d. Press down on the release lever to ensure that it is locked.



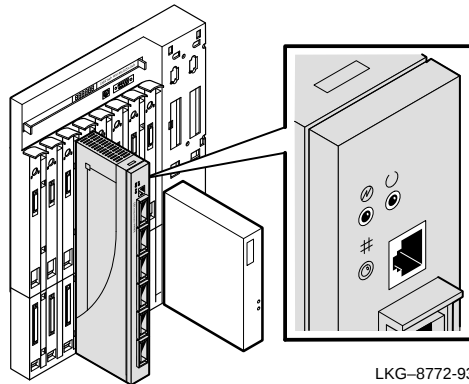
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Installing the Module (Cont.)

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:

DECconcentrator 900MX Up.



NOTE: Refer to the section titled Problem Solving Using the LEDs if the LEDs do not operate as described.

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.

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.

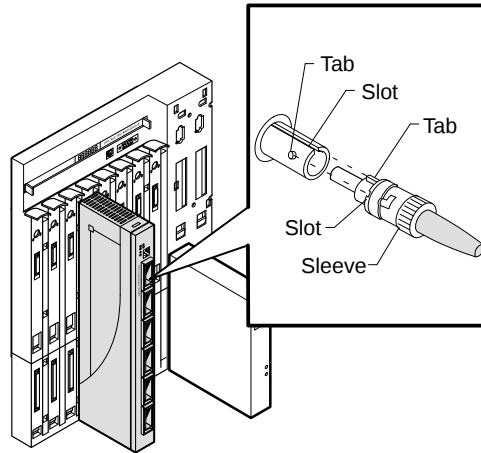
Installing the Module (Cont.)

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 SMF port cables.

NOTE: Earlier versions use threaded connectors.

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



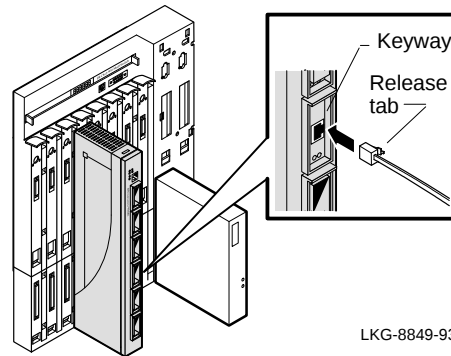
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NOTE: To disconnect the SMF port cables, push the plug's sleeve in and turn it to the left, then disconnect the cable.

Installing the Module (Cont.)

6 Connect the TP-FDDI port cables.

- a. Align the release tab on the cable plug with the keyway 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.

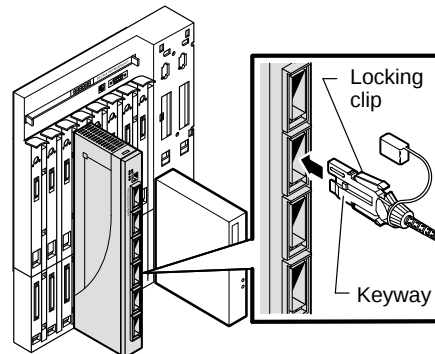


NOTE: To disconnect the TP-FDDI port cable, press the release tab on the 8-pin MJ connector, then disconnect the cable.

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.

7 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 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 on the sides of the plug snap into the locked position.



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.

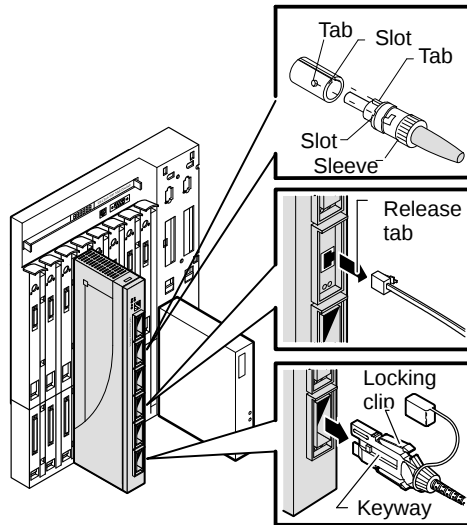
Removing the Module

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:

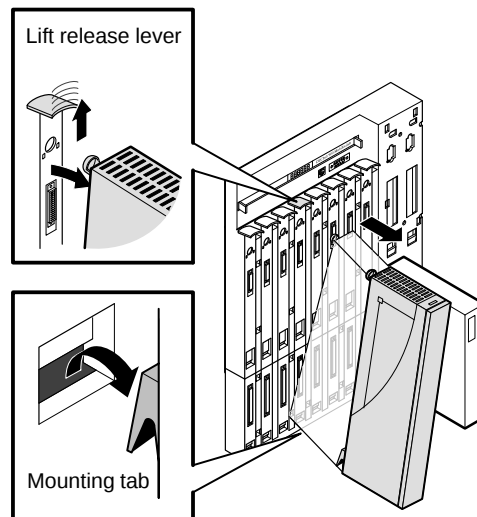
- a. SMF port cables, push the plug's sleeve in and turn it to the left, then disconnect the cable.
- b. TP-FDDI port cables, press the release tab on the 8-pin MJ connector, then disconnect the cable.
- c. MMF port cables, press the locking clips on the cable plug, then disconnect the cable.



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2 Unseat the module from the DEChub 900.

- a. Lift the release lever located on the top of the DEChub 900 slot.
- b. Pivot the module back on its bottom mounting tab, and disengage the module from the backplane.



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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 the DEChub 900 or the DEChub ONE.

NOTE: The setup port screen displays illustrated in this manual may vary slightly from the actual screen displays on your setup port device.

The signals from the DEChub 900 Hub Manager setup port and from the DEChub ONE 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.

NOTE: Devices that use the EIA-423 signaling standard are compatible with the DEChub 900 Hub Manager setup port.

Setup Port 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.

Cable/Adapter Type	Connecting Device
BN24H-xx ¹	A terminal with a 6-pin MMJ connector
BN24H-xx ¹ /H8575-A	A terminal with a 25-pin D-Sub connector
BN24H-xx ¹ /H8571-J	A PC with a 9-pin D-Sub communications port

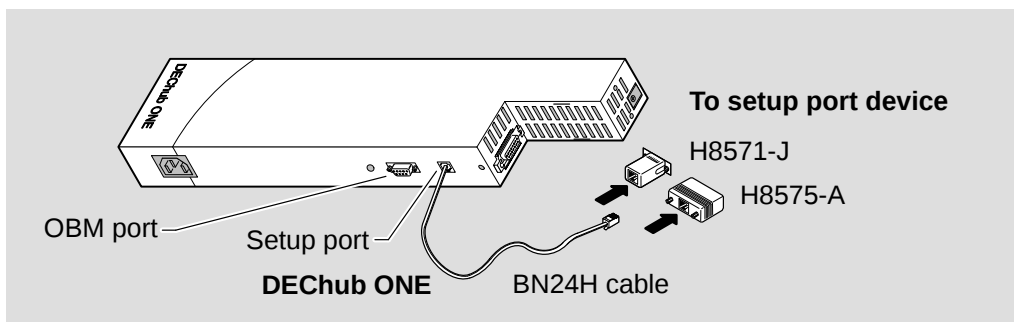
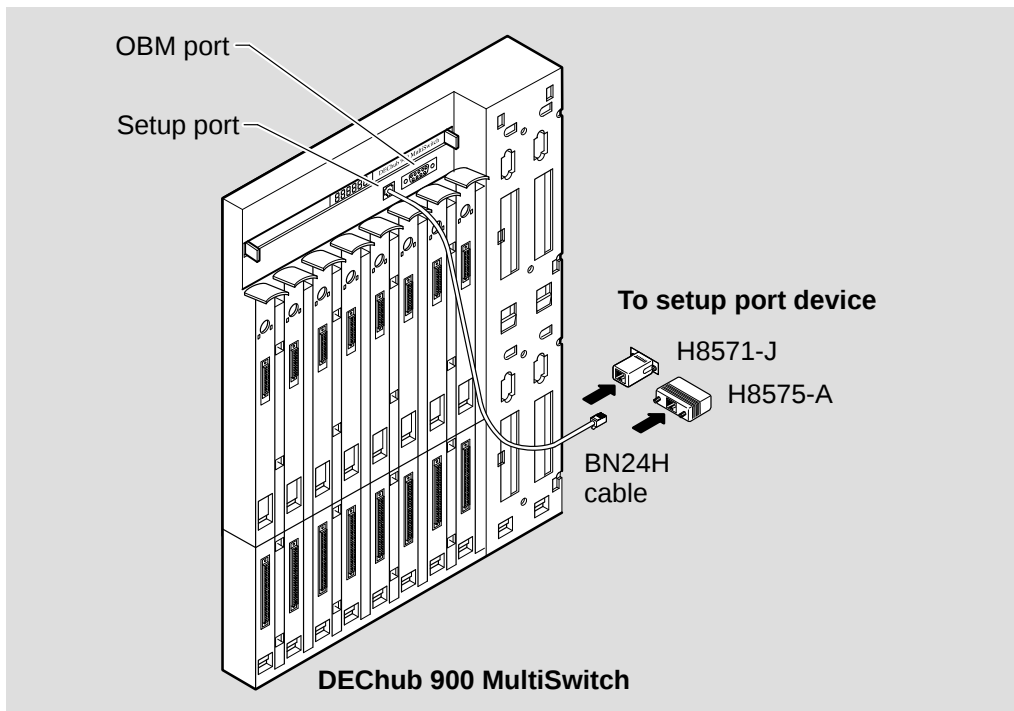
¹ xx indicates cable length in meters.

Accessing the Setup Port

To access the setup port on the DECconcentrator 900MX module, do the following:

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 (see illustration).

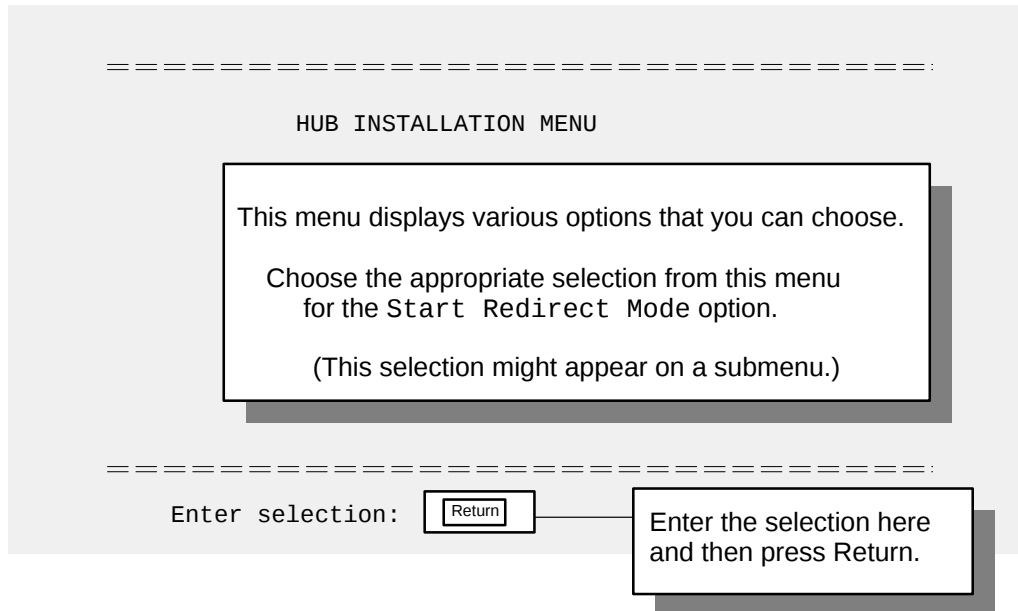
Configuring the Module (Cont.)



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Configuring the Module (Cont.)

3. 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, 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 Hub Manager Installation Menu appears (see following example).



- c. Go to the section titled Start Redirect Mode.

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 in the DEChub 900. Choosing this option allows you to configure or obtain status of an installed network module by accessing the module's installation menu.

After you choose the **Start Redirect Mode** option from the Hub Manager Installation Menu, the screen prompts you for a slot number as shown in the following code example.

The following example shows how to select a slot number (user response is shown in **boldface type**):

```
Enter selection: 8
=====
Enter the slot number for redirection (1-8): 3 Return
Setup port redirected to 3: DECconcentrator 900MX
Attempting to connect ...
=====
Connection successful!
```

Enter the number
of the slot where
the module is
installed.

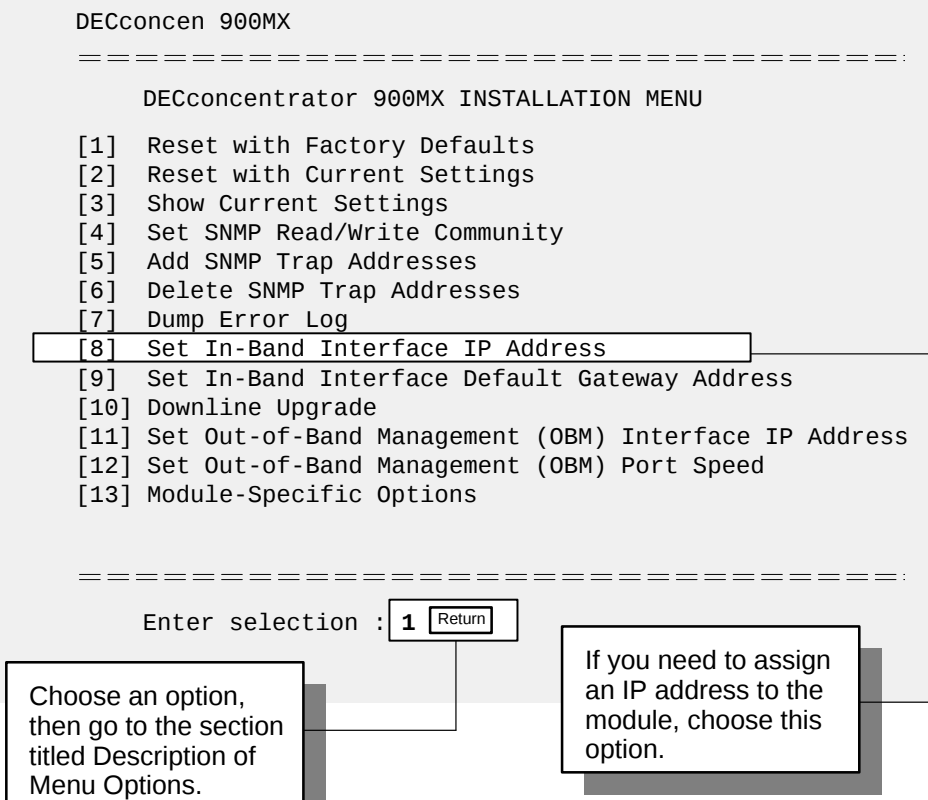
After you press **Return**, the DECconcentrator 900MX Installation Menu appears on your screen. Go to the section titled DECconcentrator 900MX Installation Menu (DEChub 900 Options).

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 is an example of the DECconcentrator 900MX Installation Menu:

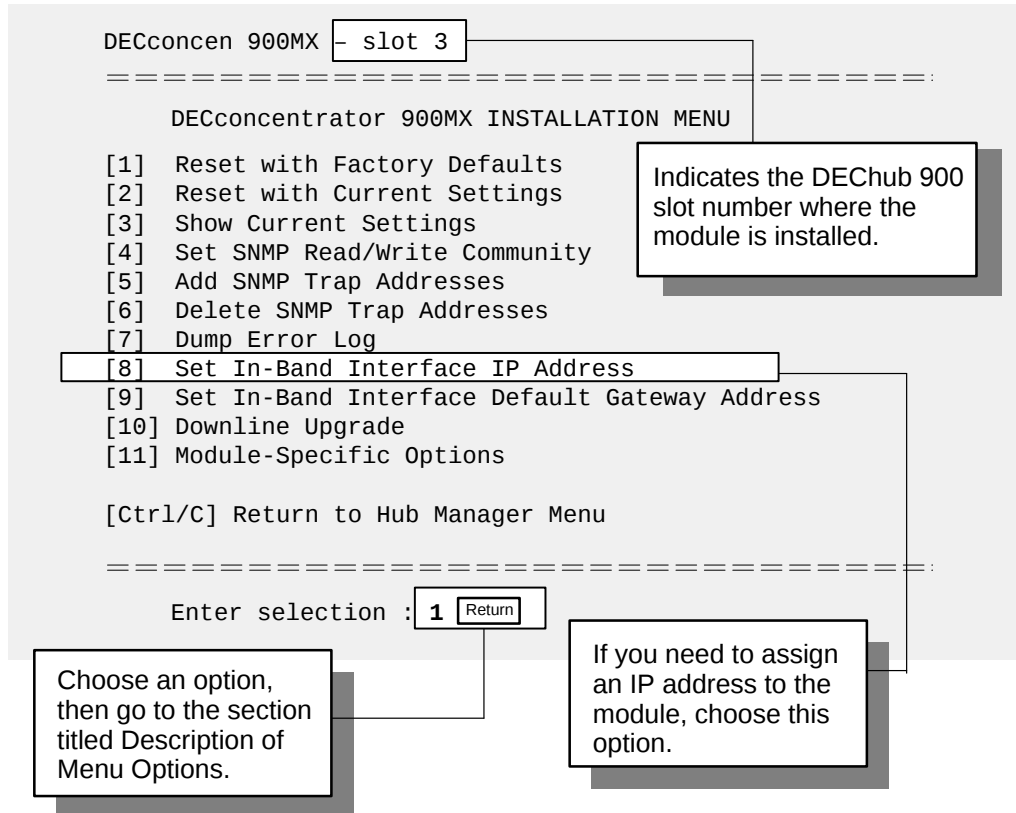


Configuring the Module (Cont.)

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.

The following is an example of the DECconcentrator 900MX Installation Menu:



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 boots the module, causing the module's configured NVRAM parameters to be initialized to factory default values.

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

The following is an example of the dialog associated with this option (user response is shown in **boldface type**):

```
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] : Return
Press Return for Main Menu ...
```

Configuring the Module (Cont.)

[2] Reset with Current Settings

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

The following is an example of the dialog associated with this option (user response is shown in **boldface type**):

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

```
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] : Return
Press Return for Main Menu ...
```

Configuring the Module (Cont.)

[3] Show Current Settings

This option shows the module's current settings.

NOTE: If the module is being configured for the first time, some fields will be blank.

The following is an example of the display associated with this option:

```
Enter selection : 3
DECconcen 900MX - slot 3
=====
DECconcen 900MX, 6-port FDDI concentrator, HW=v0/0,R0=v.2,SW=v1.1 BL
SysUpTime           : 01:39:11      14 resets
SNMP Read/Write Community : public
SNMP Trap Addresses   : Not Configured
Status of Last Downline Upgrade : TFTP Read
                                00:00:44  28 resets
                                Transfer Complete.
In-Band Interface Hardware Address : 08-00-2B-A3-4C-70
In-Band Interface IP Address       : 16.20.216.181
In-Band Interface Default Gateway Address : Not Configured
SNMP Port Traps                 : Enabled
=====
Press Return for Main Menu ...
```

Configuring the Module (Cont.)

[4] Set SNMP Read/Write Community

This option prompts you to enter the module's read/write community name.

The format for a community name is a string consisting of 4 to 31 printable ASCII characters. This community name can be used by SNMP managers for read/write access control.

The following is an example of an SNMP read/write community name: **Mario94**

The following is an example of the dialog associated with this option (user response is shown in **boldface type**):

```
Enter selection : 4
DECconcen 900MX - slot 3
=====
SET SNMP READ/WRITE COMMUNITY

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

Enter the community string [public] : Mario94 Return

SNMP Read/Write community string set.

Press Return for Main Menu ...
```

Configuring the Module (Cont.)

[5] Add SNMP Trap Addresses

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

The format for an SNMP trap 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 SNMP trap address: 16.20.54.156

The following is an example of the dialog associated with this option (user response is shown in **boldface type**):

```
Enter selection : 5
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 Return
Trap address added! Add another? [none] : Return
Press Return for Main Menu ...
```

Enter the SNMP trap address that you have chosen, then press Return.

Appears only if the module has been previously configured.

Configuring the Module (Cont.)

[6] Delete SNMP Trap Addresses

This option prompts you to select SNMP trap addresses for deletion.

The format for an SNMP trap 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 SNMP trap address: 16.20.54.156

The following is an example of the dialog associated with this option (user response is shown in **boldface type**):

```
Enter selection : 6
DECconcent 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 [Return]
                               Trap address deleted. Delete another? [] : [Return]
                               Press Return for Main Menu ...
```

Enter the SNMP trap address that you have chosen for deletion, then press Return.

Appears only if the module has been previously configured.

Configuring the Module (Cont.)

[7] Dump Error Log

This option displays error log dumps for use by Digital support personnel when analyzing system faults. Up to 4 error log dumps can be stored, and the most recent dump is displayed first.

The following is an example of the display associated with this option:

```
Enter selection : 7
DECconcen 900MX - slot 3
=====
                        DUMP ERROR LOG
                CURRENT RESET COUNT: 14
=====
Entry #           = 3
Timestamp         =   0   0   791
Reset Count       = 13
Dump another entry Y/[N]? N 
=====
No more Error Log entries.

                        Press Return for Main Menu ...
```

Configuring the Module (Cont.)

[8] Set In-Band Interface IP Address

This option prompts you to enter the module's IP address.

The format for 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

The following is an example of the dialog associated with this option (user response is shown in **boldface type**):

```
Enter selection : 8
DECconcen 900MX - slot 3
=====
SET IN-BAND INTERFACE IP ADDRESS
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.
=====
IP address [16.20.216.179] : 16.20.54.156 
IP Address set
Press Return for Main Menu ...
```

This cell data represents a previously set IP address. During the initial setup, this cell default will appear as [].

Enter the module's IP address, then press Return.

Configuring the Module (Cont.)

[9] Set In-Band Interface Default Gateway Address

This option prompts you for a default gateway IP address.

NOTE: The module does **not** need to be configured with a subnet mask for SNMP communications with a management station that is located on any subnet in the IP network.

The following is an example of a default gateway IP address: 16.07.80.156

The following is an example of the dialog associated with this option (user response is shown in **boldface type**):

```
Enter selection : 9
DECconcen 900MX - slot 3
=====
SET IN-BAND INTERFACE DEFAULT GATEWAY ADDRESS
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.

=====
Default Gateway address [] : 16.07.80.156 
Default Gateway Address set
Press Return for Main Menu ...
```

Enter the module's default gateway IP address, then press Return.

Configuring the Module (Cont.)

[10] Downline Upgrade

This option allows you to upgrade the module 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.

The following is an example of an image file name and an IP address:

`/var/dc900mx.bin` and `16.20.54.156`

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 a downline load, 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 a downline upgrade.

NOTE: The downline upgrade process can take up to 10 minutes to complete.

Note that the screen display prompts can vary, depending on whether the module is installed into a DEChub 900 or into a DEChub ONE docking station.

The following description takes you through each step of the upgrade procedure and explains the events that occur within each selection. A full screen example of the setup screen display follows the description.

Description

When you select the option, the initial setup screen display appears (see the following example display). This screen identifies the option and alerts you to be sure that the power to the module is not interrupted during the downline load.

Configuring the Module (Cont.)

[10] Downline Upgrade (Cont.)

Description (Cont.)

```
Enter selection : 10
DECconcen 900MX
=====
                               DOWNLINE UPGRADE

This process upgrade's 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 ...
```

The following is an example of the dialog associated with this option (user response is shown in **boldface type**):

When you press Return, the screen displays the following prompt:

```
Enter the Load Filename [] : /var/db900mx.bin Return
```

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

```
Enter the Load Host IP Address [] : 16.20.54.156 Return
```

Configuring the Module (Cont.)

[10] Downline Upgrade (Cont.)

Description (Cont.)

After you enter the IP address of the TFTP server and press **Return**, the screen displays one of the following screen messages, depending on your configuration:

- If the module is installed into a DEChub 900, see screen 1.
- If the module is installed into a DEChub ONE, see screen 2.

Screen 1 (DEChub 900 Configuration)

This screen and dialog appears when the module is installed in a DEChub 900:

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

When you press **Return**, the load process is initiated over the in-band network interface. Refer to the description of the load process and subsequent module LED indications in the section titled Initiating the Load.

Configuring the Module (Cont.)

[10] Downline Upgrade (Cont.)

Description (Cont.)

Screen 2 (DEChub ONE Configuration)

This screen and dialog appears when the module is installed in a DEChub ONE docking station:

When the module is installed into a DEChub ONE, two network interfaces are available to select: the module's in-band network interface, and the OBM interface residing on the DEChub ONE docking station. Each network interface has its own IP address. When the firmware reads more than one IP address (therefore more than one network interface), it prompts you to select a network interface to use for the load request.

```
Load will be initiated over the DEF6X - FDDI port network interface.  
Would you like to use a different interface? Y/[N]: 
```

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]...
```

Pressing for this selection initiates the load over the module's in-band network interface. Refer to the description of the load process and subsequent module LED indications in the section titled Initiating the Load.

Configuring the Module (Cont.)

[10] Downline Upgrade (Cont.)

Description (Cont.)

If you selected Y at the screen prompt, the setup screen displays the following:

Interface	Description
-----	-----
1	DEF6X - FDDI port
2	DEF6X - OBM port

Enter the network interface to be used [1]:

If you select 2, 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 load over the DEChub ONE docking station's OBM port. Refer to the description of the load process and subsequent module LED indications in the section titled Initiating the Load.

Initiating the Load

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.
```

Configuring the Module (Cont.)

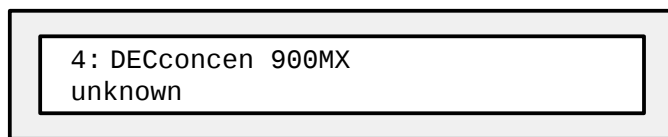
[10] Downline Upgrade (Cont.)

Initiating the Load (Cont.)

After the TFTP load transfer is completed, and the TFTP image has been verified, the module becomes nonfunctional and the Flash Load process begins. (The Flash Load process can take up to 10 minutes to complete.)

Note that if you are initiating the load process from a DEChub 900, the Hub Manager firmware attempts to communicate with the module. Because the module is nonfunctional during the Flash Load process, communications between the module and the Hub Manager cannot take place. Therefore, the Hub Manager status display shows the following message:

Hub Manager Status Display



At the same time, the setup screen displays the following message (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. The Flash Load is in progress and will take up to 10 minutes to complete. **Do Not** interrupt power to the module while the downline load is in progress.

CAUTION

If power is interrupted during a downline load, 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 a downline upgrade.

Configuring the Module (Cont.)

[10] Downline Upgrade (Cont.)

Initiating the Load (Cont.)

The DLU Load Process

The DLU process does the following:

- Loads the new firmware image into a buffer in the module.
- Checks the cyclic redundancy character (CRC) to verify that the transfer was accurate and complete.
- Transfers the new firmware image from the buffer to the Flash RAM, overwriting the old firmware image. During this process, the module is unavailable to status queries.

The module LEDs continue to indicate current network activities while the new firmware image is loading into the DECconcentrator 900MX's buffer.

After a successful transfer, the module initiates its self-tests and resumes operational status.

LED State While Checking the CRC

Once the new firmware image is loaded into the buffer, the LEDs halt in their current state while the image's CRC is checked. This takes approximately 5 seconds. If the CRC is valid, the Network OK # LED, all port PHY Status LEDs, and the Port-Type LEDs turn off. This indicates that the upgrading of the Flash RAM is starting.

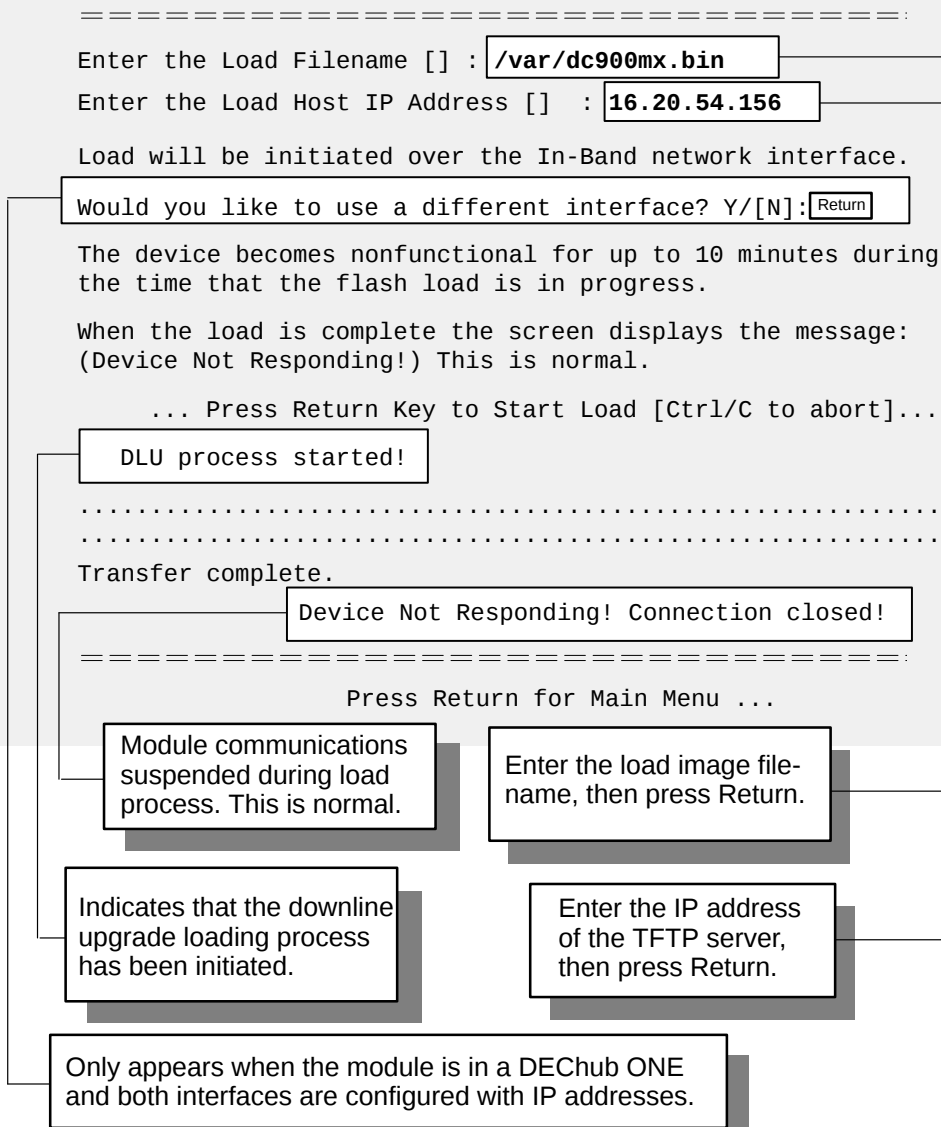
LED State While Upgrading the Flash RAM

The LEDs are off while the new firmware is written into the Flash RAM, and remain off until the upgrade finishes (or an error occurs). Upgrading the Flash RAM typically takes about 30 seconds. When the downline upgrade is complete, the module initiates its self-test and the LEDs resume reporting their operational status of the module.

(An example of the setup screen display follows this section.)

Configuring the Module (Cont.)

[10] Downline Upgrade (Cont.)



Configuring the Module (Cont.)

[11] Set Out-of-Band Management (OBM) 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 of your out-of-band management interface.

The OBM feature allows you to manage your module through the OBM port located on the DEChub 900 or on the DEChub ONE docking station as an alternative to normal in-band management. To enable out-of-band management, you need to assign an OBM IP address and select an OBM port speed from the DECconcentrator 900MX Installation Menu.

The following is an example of the dialog associated with this option (user response is shown in **boldface type**):

```
Enter selection : 11
DECconcen 900MX
=====
SET OUT-of-BAND MANAGEMENT (OBM) INTERFACE IP ADDRESS
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.

=====
IP address [none] : 16.20.54.156 
Press Return for Main Menu ...
```

Enter the module's OBM IP address, then press Return.

Configuring the Module (Cont.)

[12] Set Out-of-Band Management (OBM) Port Speed

NOTE: This selection is operational only when the module is installed into a DEChub ONE docking station.

This option prompts you to select and enter the speed of your out-of-band management (OBM) port.

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

The following is an example of the dialog associated with this option (user response is shown in **boldface type**):

```
Enter selection : 12
DECconcen 900MX
=====
      SET OUT-OF-BAND (OBM) PORT SPEED
      [1] 1200 baud
      [2] 2400 baud
      [3] 4800 baud
      [4] 9600 baud
      [5] 19200 baud
      [6] 38400 baud
=====
Enter selection [2] (9600) : 2 
OBM port speed set.
Press Return for Main Menu ...
```

The OBM port speed you select must match the speed of your setup port device.

Configuring the Module (Cont.)

[13] Module-Specific Options

NOTE: This option appears as menu selection [11] when the module is installed in the DEChub 900.

This option provides module-specific selections for the user. When selected, the option offers two selections: Enable/Disable SNMP Port Traps or Return to Main Menu.

Set SNMP Trap Configuration

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

The following is an example of the dialog associated with this option (user response is shown in **boldface type**):

```
Enter selection : 13
DECconcen 900MX
=====
DECconcen 900MX Configuration
[1] Enable/Disable SNMP Port Traps
[2] Return to Main Menu
=====
Enter selection : 1 
DECconcen 900MX
=====
Enable and Disable SNMP Port Traps
SNMP Port Traps are currently disabled.
=====
Press Y to ENABLE the Port Traps. [N]: Y 
Press Return for main menu ...
FDDI Port Trap Switch Enabled.
```

Indicates the current state of the SNMP Trap configuration.

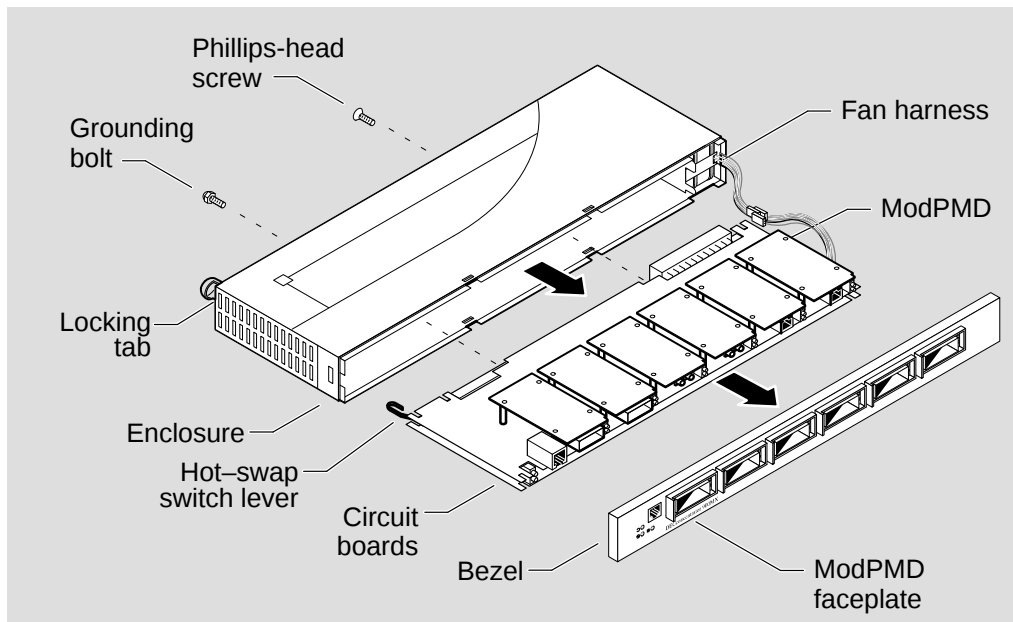
Replacing ModPMDs

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

The following illustration identifies the various components that comprise the module.



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Replacing ModPMDs (Cont.)

Tools Required

The following tools are required:

- A flat-blade screwdriver
- A Phillips-head screwdriver
- A 2.38 cm (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. Save module characteristics. Before removing the module from the DEChub 900 or DEChub ONE, ask the system manager to save or record the module's characteristics, if necessary.
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

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.

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. Note that installing the module automatically initiates the module's self-test.

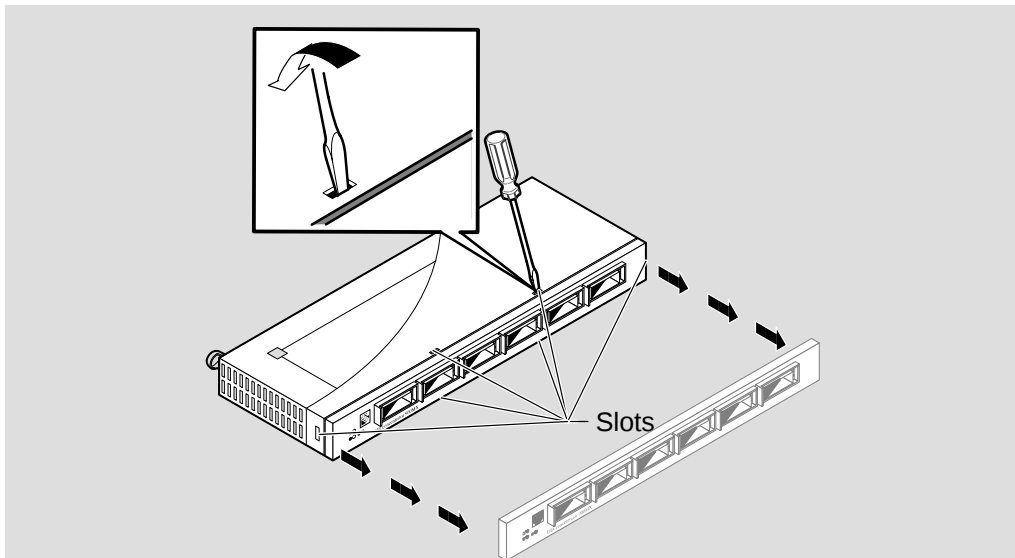
NOTE: Refer to the section of this manual titled Installing the Module for installing to the DEChub 900. See the *DEChub ONE Installation* manual for installing the module into the DEChub ONE).

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 and pry the snaplock in the direction of the bezel.
- b. When all six snaplocks are unlocked, use your fingers to grasp one end of the bezel 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.



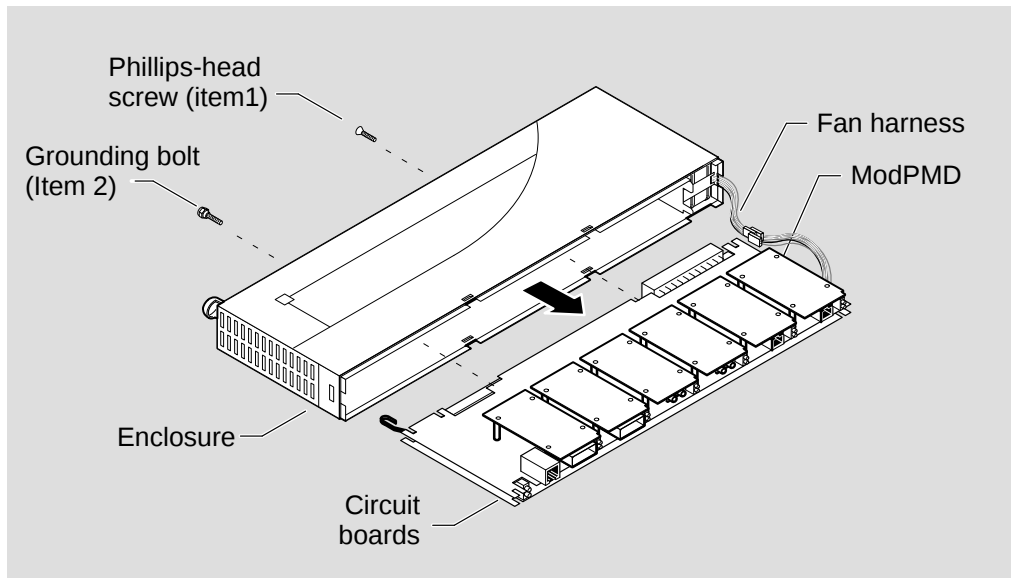
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Replacing ModPMDs (Cont.)

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 (item 1) next to the 160-pin connector.
 - c. Remove the grounding bolt (item 2).
 - d. Remove the circuit boards from the enclosure. The fan harness extends to allow the circuit boards to clear the enclosure.



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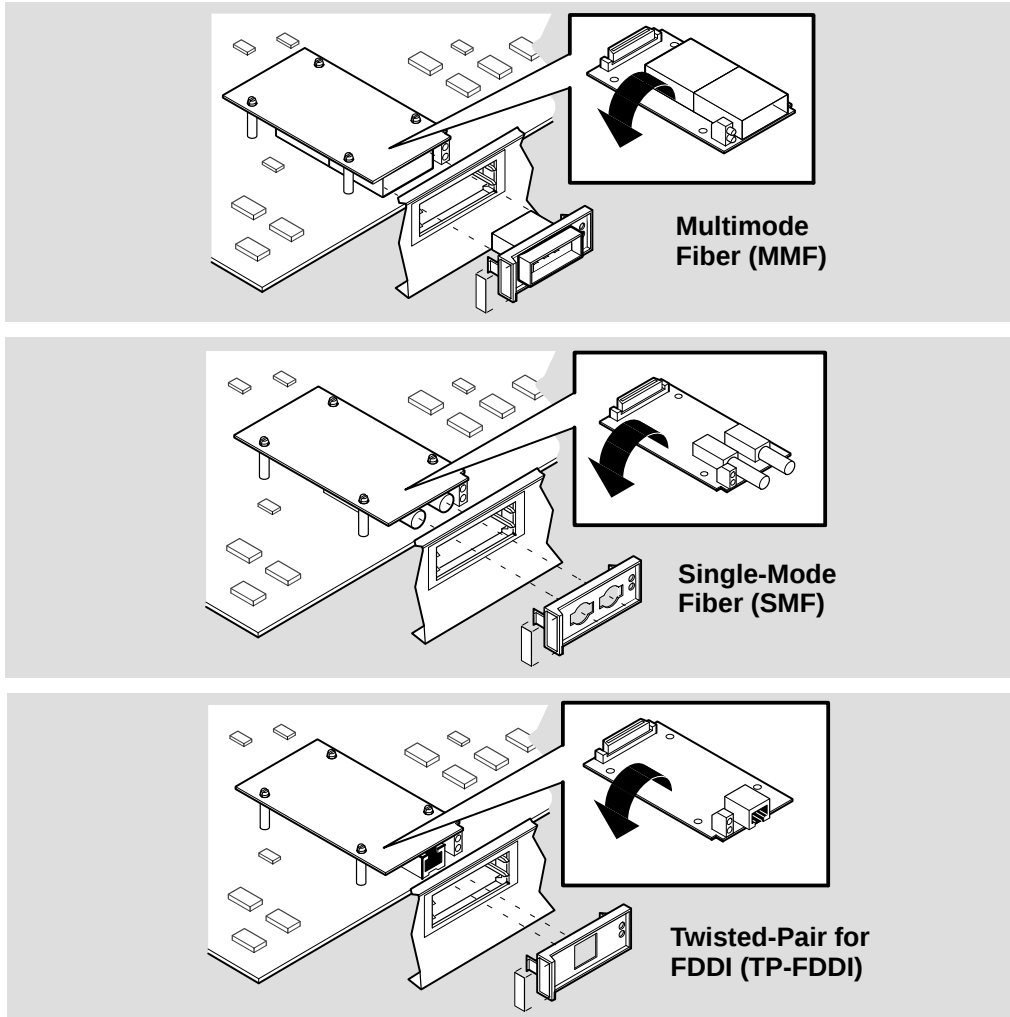
NOTE: The circuit boards may or may not be populated with ModPMDs, depending on your module's configuration.

Replacing ModPMDs (Cont.)

Removing and Installing ModPMDs (Cont.)

3 Verify the appropriate ModPMD to be Installed.

The DECconcentrator 900MX accommodates three different ModPMDs:



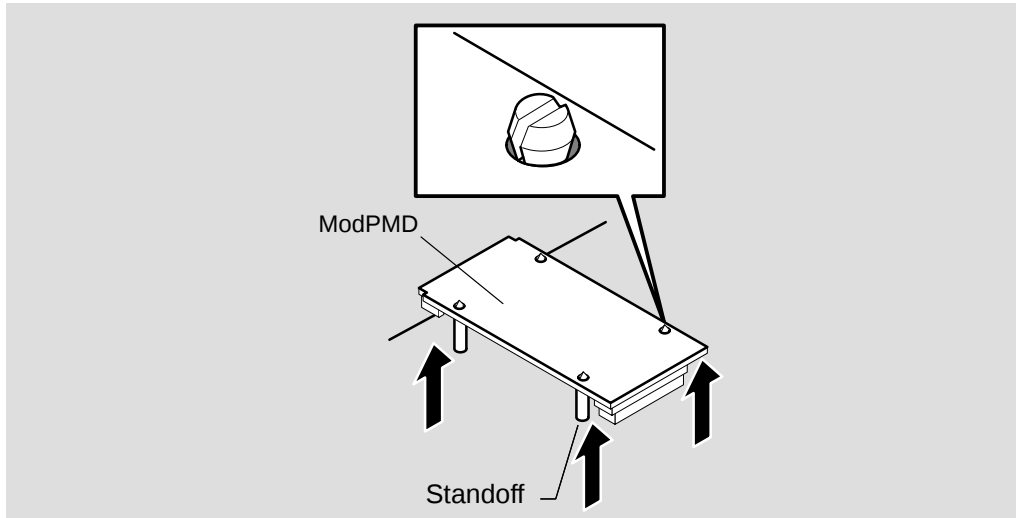
NOTE: ModPMDs are shown component-side up for identification purposes only.

Replacing ModPMDs (Cont.)

Removing and Installing ModPMDs (Cont.)

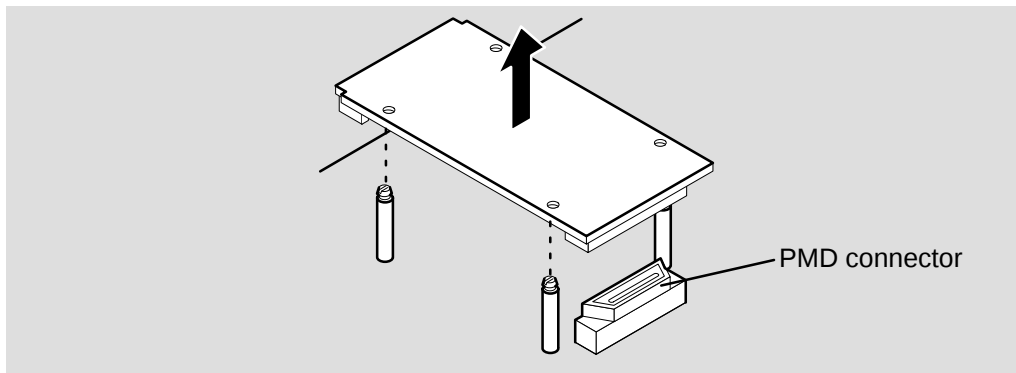
4 Remove the appropriate ModPMDs.

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



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- b. Disconnect the ModPMD from the PMD connector and remove it from the 4 standoffs.



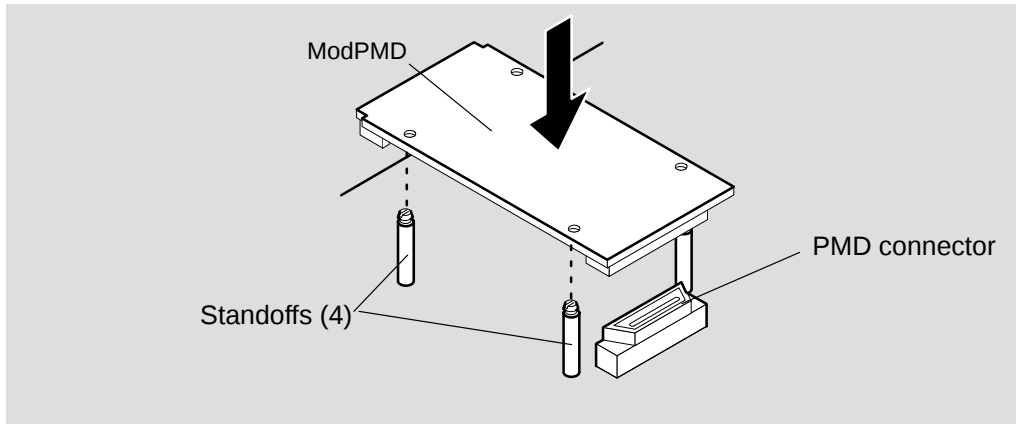
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Replacing ModPMDs (Cont.)

Removing and Installing ModPMDs (Cont.)

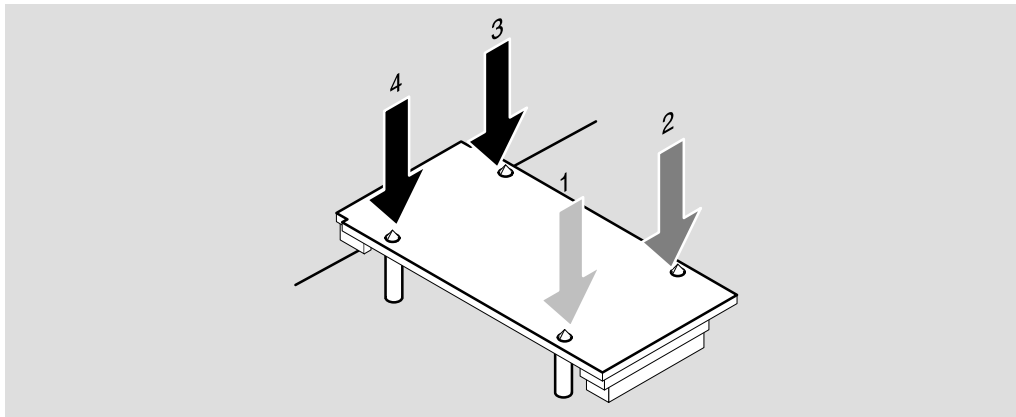
5 Install the replacement ModPMD.

- a. Align the 4 holes on the replacement ModPMD with the 4 standoffs. Ensure that the ModPMD's connector aligns properly with the PMD connector 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.

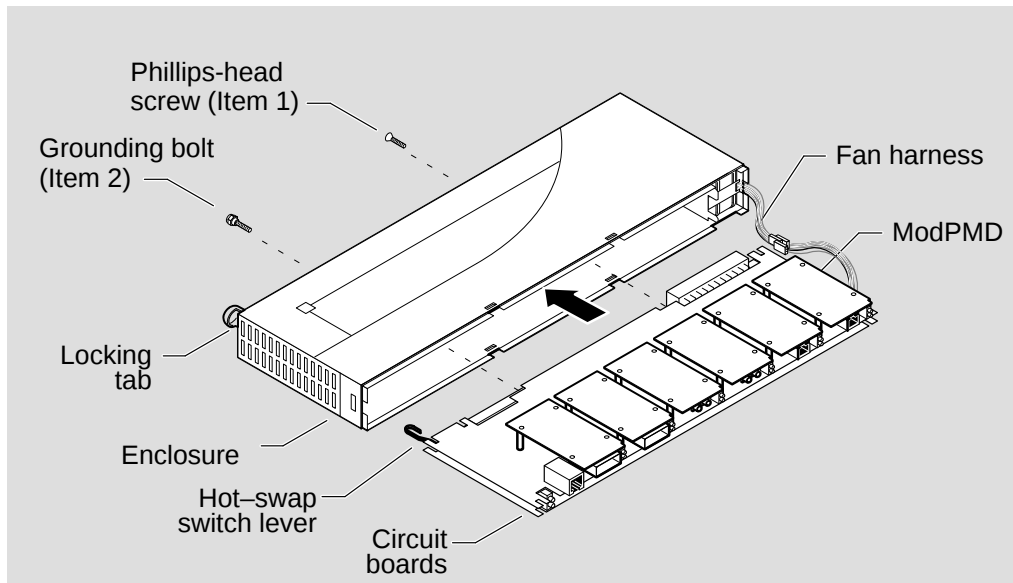


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Replacing ModPMDs (Cont.)

Removing and Installing ModPMDs (Cont.)

- 6** Install the circuit boards into the enclosure.
 - a. Carefully slide the circuit boards *partially* into the enclosure.
 - b. Using your finger, guide the hot-swap switch lever into the locking tab enclosure 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 (Item 1).
 - d. Insert and secure the grounding bolt (Item 2).
 - e. Fold the fan harness neatly between the two main circuit boards.



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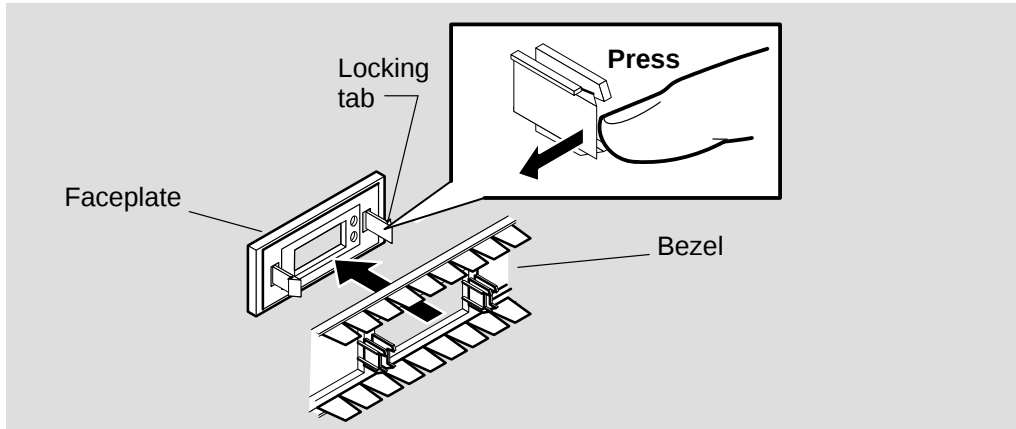
Replacing ModPMDs (Cont.)

Removing and Installing ModPMDs (Cont.)

7 Install the bezel.

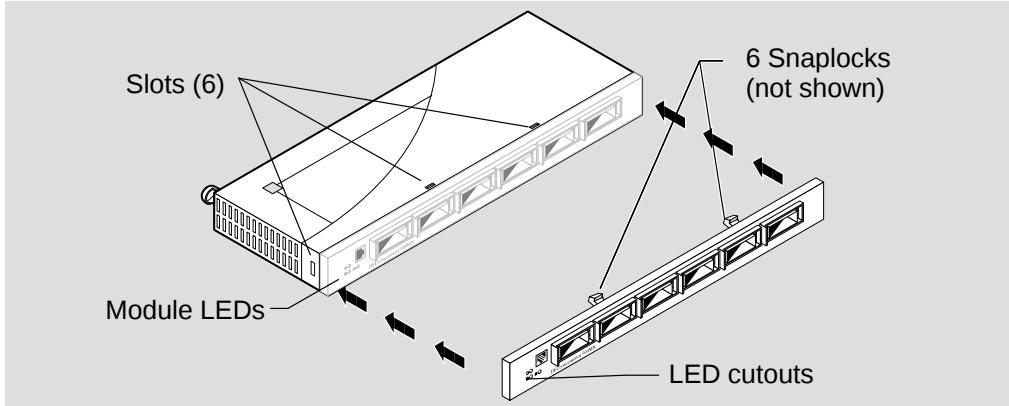
NOTE: All faceplates must be removed before you install the bezel.

- a. Press the faceplate's locking tab and remove the faceplate.



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- b. Align the bezel with the enclosure so that the module LEDs are aligned with the LED cutouts on the bezel.
- c. Starting at one end, press the bezel into place, seating it until all 6 snaplocks are locked into the 6 enclosure slots.



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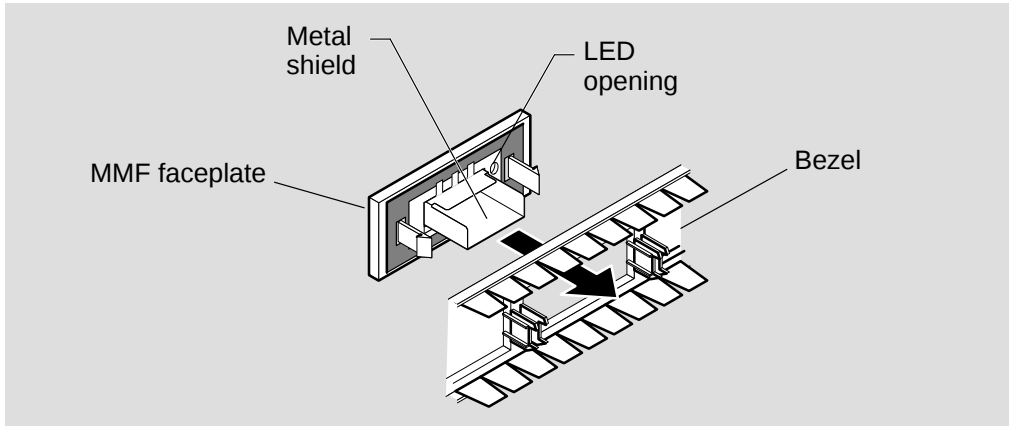
Replacing ModPMDs (Cont.)

Removing and Installing ModPMDs (Cont.)

8 Install the faceplates.

NOTE: Some MMF faceplates use metal shields (see illustration). You must install the metal shield onto the new MMF ModPMD before you install the faceplate.

- a. Position the new MMF faceplate so that the LED cutout aligns with the LEDs.
- b. Press the new faceplate into the opening in the bezel.



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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 and bezel 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 operational, ask the system manager to restore the previously saved module characteristics, if necessary.

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 (described in Table 2) can change color (green or yellow) depending on the operational status of the module or the level of activity on the network.

Table 1 shows the static states that are possible for each of the module LEDs.

Table 1 Module LED States

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

The ModPMD LEDs (see Table 2) 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, and a Port Type  LED.

Table 2 FDDI ModPMD LED States

LED Name	Off	On		Flashing		
	No Color	Green	Yellow	Green	Yellow	Green / Yellow
Port Type 	M-type	S-type	ModPMD fault	A/B type	N/A	N/A
PHY	Ready to connect	Good connection	Link Error Rate exceeded	Disabled/ 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 3 lists the typical combined states of the LEDs for various error conditions that can occur during initial installation of the device, along with probable causes and corrective actions to take.

Normal Powerup

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

1. The module Power  LED lights as soon as power is applied to the unit.
2. The module now initiates its built-in self-test.
3. While the module is performing self-test, the Module OK  LED remains off and the Network OK  LED flashes as each diagnostic test in the self-test routine runs.
4. After the successful completion of self-test, the Module OK  LED lights, and remains lit.
5. The status LEDs (Network OK  , Port-Type  , and PHY Status LEDs) now indicate their operational status , as described in Table 3.

Problem Solving

Table 3 provides a list of symptoms indicated by the LED states along with suggestions for corrective actions.

Table 3 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 the Hub Manager status display indicates that 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 3 (Cont.) Problem Solving Using the LEDs

Symptom	Probable Cause	Corrective Action
Power  LED is flashing	Faulty Power LED	Move the module to an operational hub slot. If the power LED does not light, replace module or contact your Digital 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> .
	Faulty module connection.	Reseat the module.
	Faulty slot connection.	Move the module to another slot.
Module OK  LED is off.	DEChub 900 power supply or DEChub ONE is faulty.	Replace the faulty DEChub 900 power supply or the DEChub ONE.
	Self-test in progress.	Wait for self-test to complete.
	Self-test failed.	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 Digital service representative.
Module OK  LED is off and Hub Manager status display remains stationary for more than 4 seconds.	An error has been detected during self-test.	Repeat the self-test. If self-test fails again, replace the module or contact your Digital service representative.

(continued on next page)

Problem Solving Using the LEDs (Cont.)

Table 3 (Cont.) Problem Solving Using the LEDs

Symptom	Probable Cause	Corrective Action
Module OK  LED is flashing.	Self-test has detected a fault. Module is not fully functional.	Some components of the module are operational. Use management features to determine the type of fault(s) preventing full functionality.
Port Type  Led is on yellow.	Faulty ModPMD.	Replace the ModPMD; contact your Digital service representative.
PHY Status LED is flashing green.	Port disabled by management.	Enable port via management and retest.
PHY Status LED is flashing yellow.	Invalid connection.	Use a valid connection (for example, M-to-M connections are invalid). Change one of the M-type connections to another type to achieve a valid connection. <i>Refer to A Primer to FDDI: Fiber Distributed Data Interface for additional information.</i>
PHY Status LED is on steady yellow, or it repeats the following cycle: on (yellow) for 50 seconds, then turns to green for a brief period, then returns to steady yellow.	Network problem, or the PHY port is faulty.	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. If the problem does not shift to the other concentrator port, the cable is good. Perform loopback testing on the original concentrator port. See section titled Problem Solving Using Loopback Testing, in this manual. If the problem persists, contact your Digital service representative

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

Table 4 Identifying Loopback Connectors

Port Type	Part Number
Multimode fiber (MMF)	12-32005-01
Single-mode fiber (SMF)	12-34830-01
Twisted-pair for FDDI (TP-FDDI)	H4082-AC

Attaching Loopback Connectors

This section describes the following:

- Attaching the Multimode Fiber (MMF) Loopback Connector
- Attaching the Single-mode Fiber (SMF) Loopback Connector
- Attaching the Twisted-pair for FDDI (TP-FDDI) Loopback Connector

Refer to the appropriate section to attach the loopback connector.

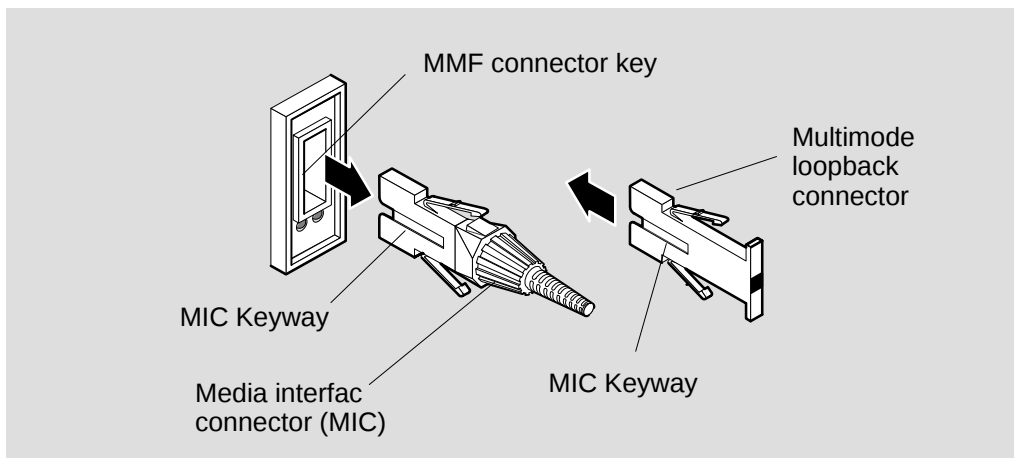
Loopback Testing (Cont.)

Attaching the Multimode Fiber (MMF) Loopback Connector

To attach an MMF loopback connector, do the following:

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

1. Press the locking clips on the MIC cable plug (or dust cap), and remove the cable (or dust cap) from the PHY port.
2. Align the keyway on the MIC cable plug with the key on the MMF connector.
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.



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.

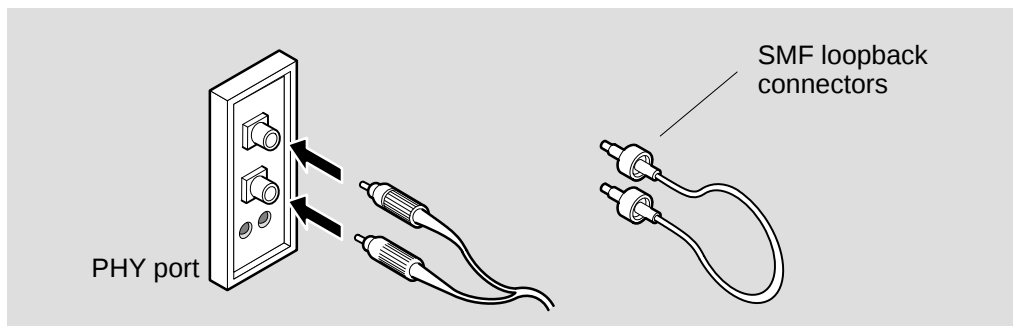
Loopback Testing (Cont.)

Attaching the Single-Mode Fiber (MMF) Loopback Connector

To attach an SMF loopback connector, do the following:

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 or (dust caps) from the PHY port's ST-type connectors.
2. Insert one end of the loopback connector into the ModPMD's transmit port connector (labeled $\ominus \rightarrow$), 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 $\rightarrow \ominus$).
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.

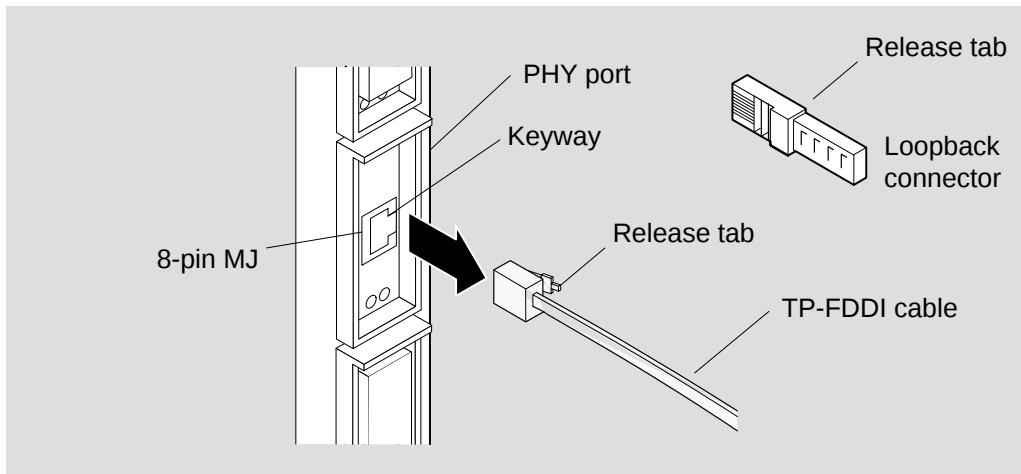
NOTE: Replacement ModPMDs are equipped with ST-type connectors. Earlier versions of the single-mode fiber ModPMD can be equipped with FC-type connectors.

Loopback Testing (Cont.)

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

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

1. Press the locking tab on the TP-FDDI cable plug, then disconnect the cable.
2. Align the release tab on the loopback connector with the keyway on the PHY port's 8-pin MJ connector.
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 5.

Table 5: Problem Solving During Loopback Testing

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

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 Cables
- Single-mode Cables
- Twisted-pair for FDDI Cables

Multimode Cables

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

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

* xx represents the cable length in meters.

The following cable lengths are available:

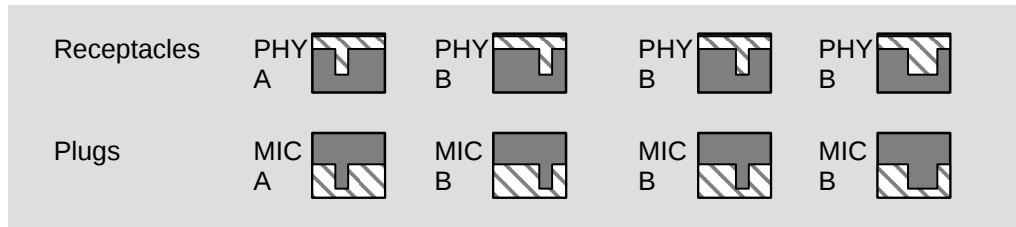
Cable Length	xx Value
1 m (3.3 ft)	01
3 m (9.8 ft)	03
4.5 m (14.8 ft)	4E
10 m (32.8 ft)	10
20 m (65.6 ft)	20
30 m (98.4 ft)	30

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
AMP Incorporated	Anixter Brothers
AT&T ¹	—
Dorran/3M	—

¹ 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. FC-to-ST adapters are not available from Digital. The vendors listed may provide FC-to-ST adapters.

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

- 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 cables with an optical fiber that conforms to EIA/TIA 492BAAA and for which the cutoff wavelength is 1240 nm or less.
- Use inline loss elements with cables of less than 12 dB of loss. Use one of the following types of inline 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

Inline 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
FDDI-to-FDDI (office, crossover)	BN25H-03 (3m (9.8 ft) only)
FDDI-to-Patch Panel (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.

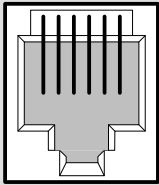
Optical Bypass Relay (6-Pin MJ) Connector

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. The following illustration shows the OBR 6-pin MJ connector and its pin assignments. Refer to this information when selecting optical bypass devices.

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

Pin 6 ← 1

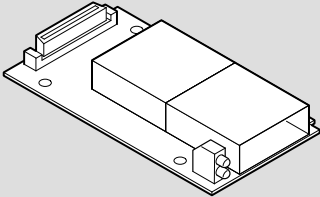


6-pin MJ connector

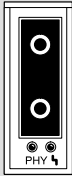
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Multimode Fiber ModPMD

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



Multimode fiber (MMF)



RX
TX
PHY

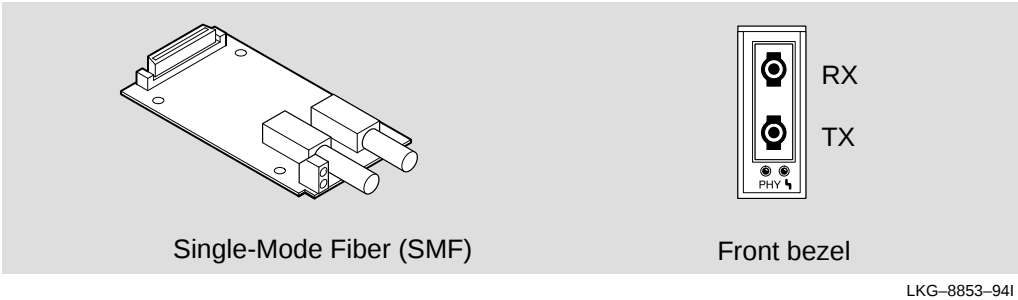
Front bezel

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Connector Pin Assignments (Cont.)

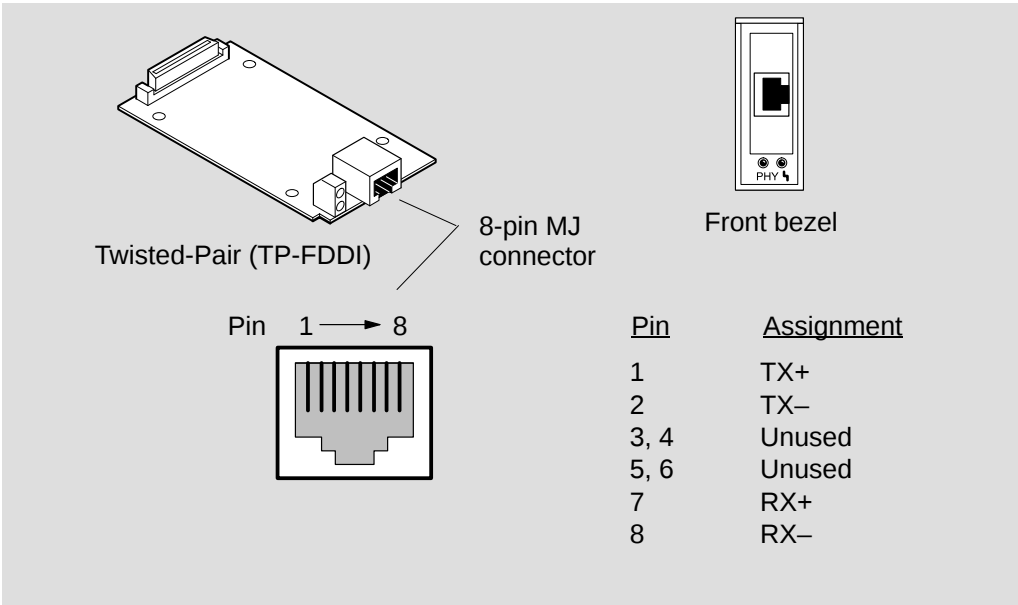
Single-Mode Fiber ModPMD

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



Twisted-Pair for FDDI ModPMD

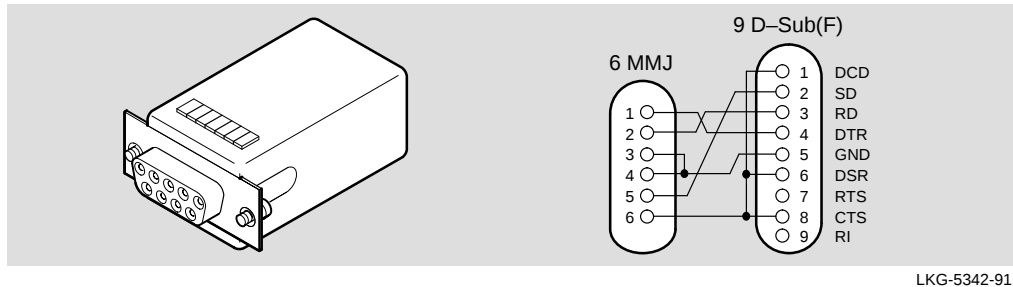
The following illustration shows the twisted-pair for FDDI (TP-FDDI) ModPMD connector and its pin assignments:



Connector Pin Assignments (Cont.)

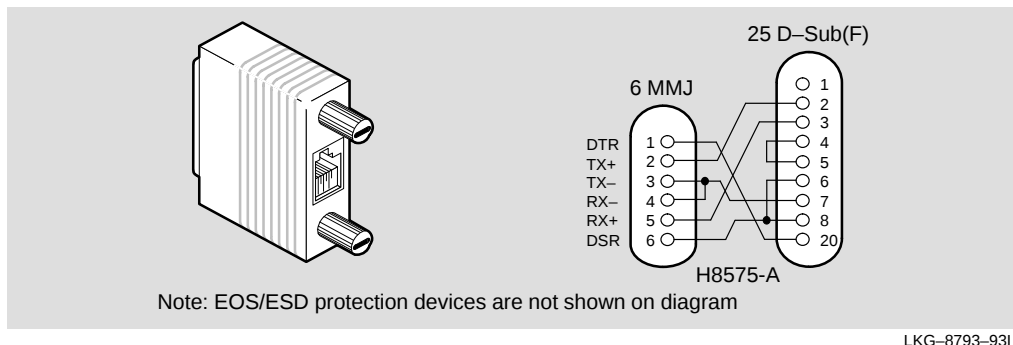
H8571-J Adapter

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



H8575-A Adapter

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



Product Specifications

Operating specifications for the DECconcentrator 900MX module are provided in Table 6.

The module's acoustical specifications are listed in Table 7.

Table 6 DECconcentrator 900MX Operating Specifications

Parameter	Specification
<i>Operating Environment</i>	
Operating Temperature ¹	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 ² 0.5 A, 15Vdc
<i>Connectors</i>	
One Shielded 6-pin MJ (OBR) connector and as many as six ModPMD port connectors of the following types: Multimode fiber (MMF), Single-mode fiber (SMF), and Twisted-pair for FDDI (TP-FDDI).	
(DEChub ONE has 1 8-pin MJ, 1 DB-9, and 1 15-pin D-Sub AUI connector.)	
<i>Physical</i>	
Height	44.45 cm (17.5 in)
Width	4.45 cm (1.75 in)
Depth	15.25 cm (6 in); 25.40 cm (10.0 in) with a DEChub ONE docking station.
Weight	1.8 kg (4 lb); 3.4 kg (7.5 lb) with a DEChub ONE docking station.
<i>Certification</i>	
CE, CSA, FCC,TÜV, UL, VCCI	

¹ 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.

² 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.

Product Specifications (Cont.)

Table 7 Acoustical Specifications

Acoustics — Declared values per ISO 9296 and ISO 7779¹

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

Schallemissionswerte — Werteangaben nach ISO 9296 und ISO 7779/DIN EN27779²

Produkt	Schalleistungspegel $L_{WA,d}$, B	Schalldruckpegel L_{pAm}, dBA (Zuschauerpositionen)
	<i>Leerlauf/Betrieb</i>	<i>Leerlauf/Betrieb</i>
DEF6X	4,2	38
DEF6X + DEHUA	5,4	41

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

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

Associated Documents

You can order the following documents from Digital:

<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>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 Installation and Configuration AA-QOFXA-TE</i>	Provides information for installing and configuring HUBwatch for Open VMS V2.0 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>Using DECndu Plus (MS-DOS) AA-PYVVA-TE</i>	Provides instructions to upgrade the firmware in an MS-DOS environment of selected network devices using Digital's Network Device Upgrade (DECndu) Plus utility.
<i>Using DECndu Plus (ULTRIX RISC) AA-PYVTA-TE</i>	Provides instructions to upgrade the firmware in an ULTRIX RISC environment of selected network devices using Digital's Network Device Upgrade (DECndu) Plus utility.
<i>Using DECndu Plus (OpenVMS VAX) AA-PYVRA-TE</i>	Provides instructions to upgrade the firmware in an OpenVMS VAX environment of selected network devices using Digital's Network Device Upgrade (DECndu) Plus utility.
<i>A Primer to FDDI: Fiber Distributed Data Interface EC-K0750-42</i>	Describes the features, topologies, and components of the FDDI local area network (LAN) standard.
<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

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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
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809-754-7575

DECconcentrator 900MX Installation and Configuration
EK-DEF6X-IN. A01

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? _____

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Did you use the appendixes? Which ones? _____

Were the illustrations helpful? _____ All? _____ Some? _____ Which ones? _____

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Thank you.

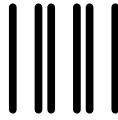
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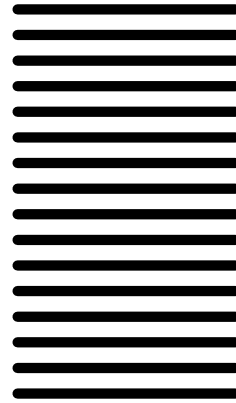
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