

DECbridge 900MX

Installation

Part Number: EK-DEFBA-IN. A01

May 1994

This manual describes how to install and verify the operation of the DECbridge 900MX module.

Revision/Update Information: This is a new manual.

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

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

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Warning!

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

Achtung!

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

Attention!

Ceci est un produit de Classe A. Dans un 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. [Page 4.]

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 and 10.]

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

This action deletes all configured settings and replaces them with factory default values. All configuration settings will be lost. [Page 17.]

ACHTUNG

Bei diesem Vorgang werden alle Konfigurationseinstellungen gelöscht und die Werkseinstellungen wieder eingesetzt. Alle Konfigurationsdaten gehen verloren.

ATTENTION

Cette action supprime tous les paramètres de configuration et les remplace par des valeurs prédéfinies. Tous les paramètres de configuration seront perdus.

PRECAUCIÓN

Esta intervención borrará todos los parámetros de configuración y los sustituirá por valores por defecto definidos de fábrica. Se perderán todos los parámetros de configuración.

CAUTION

If power is interrupted during 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 26 and 31.]

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.

Introduction

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

In this manual, the term Ethernet is Digital's term for its product compatibility with the ISO 8802-3/ANSI/IEEE 802.3 standards and the Ethernet standards for CSMA/CD local area networks.

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

The DECbridge 900MX module is protocol-independent. As such, it accommodates multiple protocols such as DECnet, LAT, TCP/IP, or any other protocol running on FDDI and Ethernet LANs. The module operates transparently for plug-and-play network operations and also includes flexible filtering options for destination and source addresses and protocols.

These features can be accessed through Simple Network Management Protocol (SNMP) management software, allowing network managers to determine which users or groups of users can gain access to the networks. As with other bridge products from Digital, access to network management can be restricted by password protection.

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

The module can be configured into the DEChub 900 MultiSwitch (also referred to in this manual as the DEChub 900) and can also be configured as a standalone unit into a DEChub ONE docking station (see the *DEChub ONE Installation* manual).

Features

Your DECbridge 900MX includes the following features:

- High-speed local traffic filtering and forwarding.
- Supports up to 8000 network addresses.

Introduction (Cont.)

- Flexible filtering capabilities (source address, destination address, and protocol) for greater network control, increased security and bandwidth utilization, and reduced propagation of network problems.
- Configurable rate limiting of multicast packets to limit the spread of multicast and broadcast storms.
- Option to turn off automatic learning and manually load the address database.
- Translation between FDDI and IEEE 802.3/Ethernet frame formats for direct, transparent connections; translation of AppleTalk 1 and 2 AARP packets; handling of "raw IEEE 802.3" Novell IPX packets.
- Fragmentation of large FDDI IP packets to legal-size Ethernet packets as per RFC-791 (Internet Protocol) and RFC-1191 (Path MTU Discovery).
- Spanning tree loop detection protocol:
 - IEEE 802.1d (default)
 - Digital LB100 mode
- Built-in SNMP agent supports the following management information bases (MIBs):
 - SNMP management (RFC-1157)
 - MIB II (RFC-1213)
 - Bridge MIB (RFC-1493)
 - FDDI MIB (RFC-1512)
 - Ethernet MIB (RFC-1398)
 - Digital ELAN MIB Extensions
- 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.

Introduction (Cont.)

- One FDDI dual attachment station (DAS) port and six 802.3/Ethernet LAN ports. Each of the ports (including FDDI PHY ports 1A and 1B) are individually switchable to a DEChub 900 backplane LAN through Hubwatch management. When connected to a DEChub ONE docking station, one of the 10BaseT ports can be switched to the DEChub ONE AUI connector.
- Out-of-band management (OBM) using SNMP over Serial Line Internet Protocol (SLIP) through the OBM connector as an alternative to normal in-band management.
- Setup port for the initial setup of the module using a setup port device (a terminal or personal computer).
- Upgradeable device firmware (in nonvolatile Flash memory) using Trivial File Transfer Protocol (TFTP) with Digital's Network Device Upgrade (DECndu) Plus utility or through the setup port with any TFTP server.

Front Panel

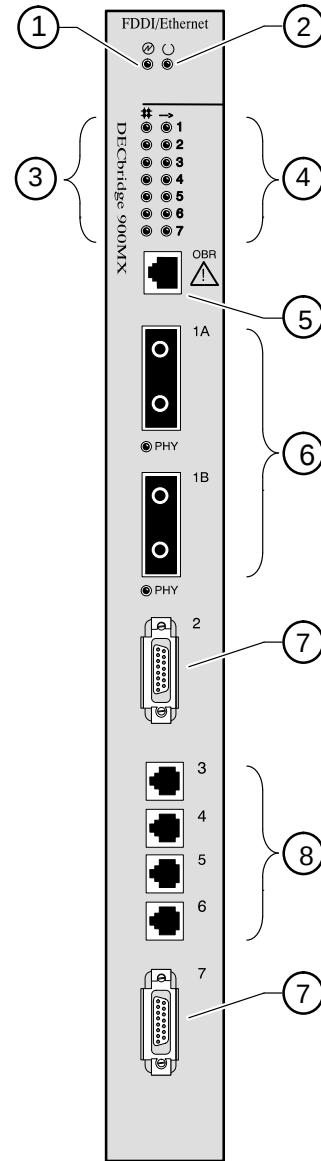
- 1) **Power**  **LED** — Lights when the module has power.
- 2) **Module OK**  **LED** — Lights when the module passes self-test. If the module fails self-test, the Module OK LED  remains off.
- 3) **Port State**  **LEDs** — Show the status of ports 1 to 7. The LEDs can be on, off, or flashing.
- 4) **Network Activity**  **LED** — Indicates network traffic level. The color of the LED (green or yellow) indicates whether the specific port's network connection is through the front panel (green) or through the backplane (yellow).

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

- 5) **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 fault conditions in a station.

WARNING  To prevent personal injury or equipment damage, **do not** insert telecommunications cables into the Optical Bypass Relay connector.

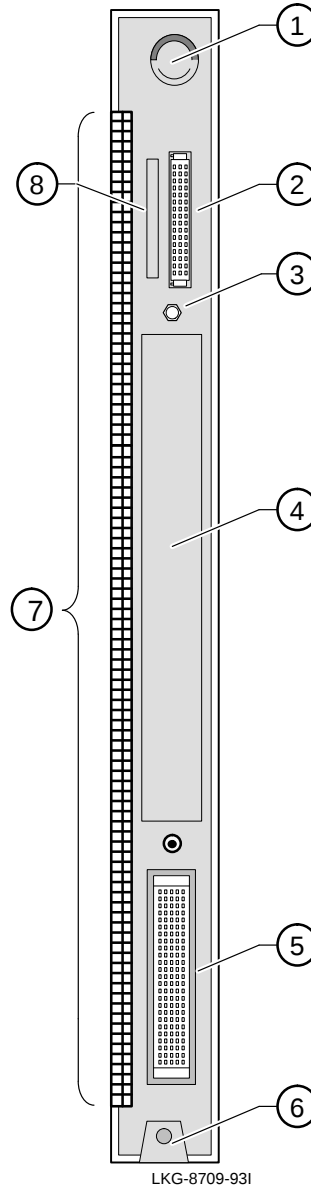
- 6) **Dual attachment station (DAS) FDDI port connectors and associated PHY LEDs** — Port A is labeled **1A** and Port B is labeled **1B**. Both ports are standard FDDI MIC connectors.
- 7) **802.3/Ethernet AUI (15-pin D-Sub) port connectors** — Refer to the *OPEN DECconnect Applications Guide* for a list of AUI media adapters you can use with your module.
- 8) **10BaseT (8-pin MJ) port connectors** — supports both UTP and STP cabling.



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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** — Represents the lowest of seven consecutive Media Access Control (MAC) addresses. For example, if this module's port 1 MAC address is 08-00-2B-AB-0C-08, then the consecutive port MAC addresses are:
 Port 1 = 08-00-2B-AB-0C-08
 Port 2 = 08-00-2B-AB-0C-09
 Port 3 = 08-00-2B-AB-0C-0A
 Port 4 = 08-00-2B-AB-0C-0B
 Port 5 = 08-00-2B-AB-0C-0C
 Port 6 = 08-00-2B-AB-0C-0D
 Port 7 = 08-00-2B-AB-0C-0E



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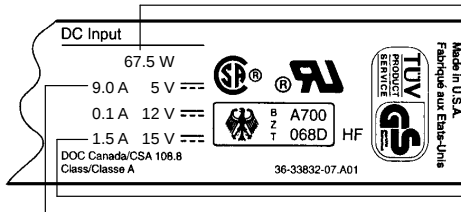
Installing the Module

The DECbridge 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).

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*).

Module's Manufacturing Label (Example)



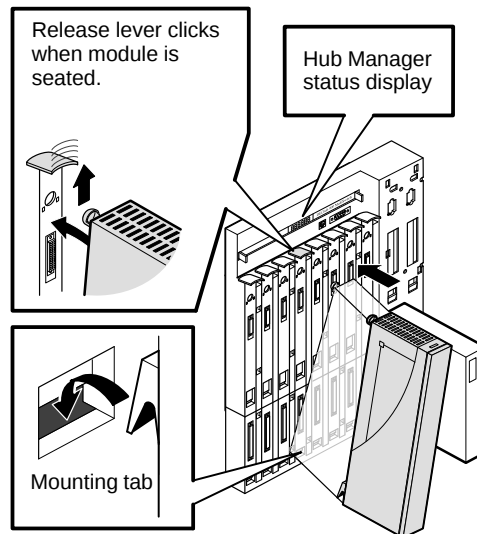
Hub Manager Status Display (Example)

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.

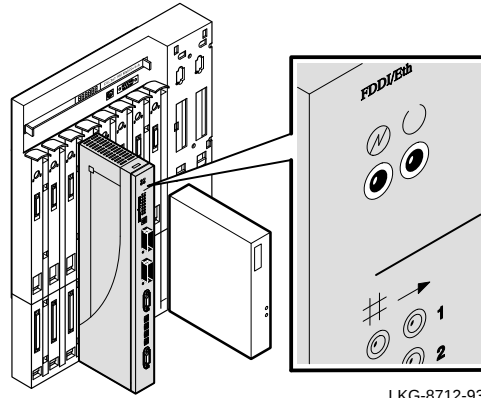


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Installing the Module (Cont.)

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:



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DECbridge 900MX Up.

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

4 Connect the port cables.

Depending on your network configuration requirements, connect FDDI cables, AUI cables, or UTP/STP cables. After all cables are connected, 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 FDDI cables, go to step 5.
- To connect AUI cables, go to step 6.
- To connect UTP/STP cables, go to step 7.
- To connect the Optical Bypass Relay (OBR), refer to the installation instructions included with the OBR.

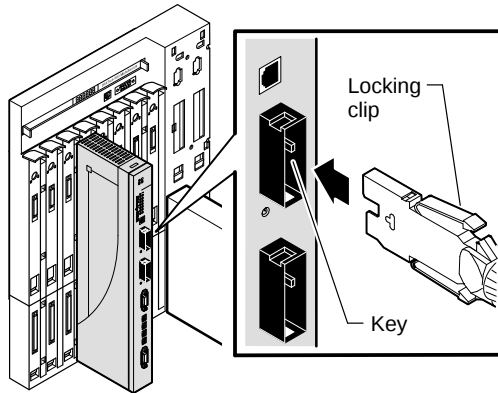
Installing the Module (Cont.)



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 FDDI cables.

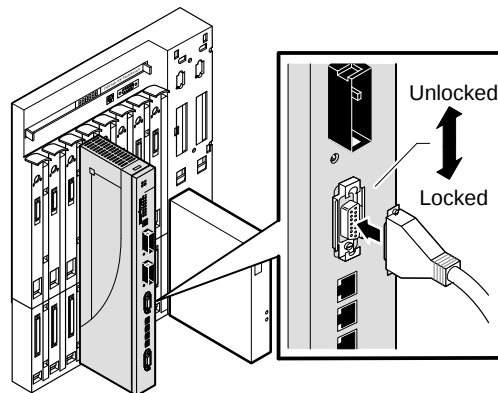
- Remove the protective caps from the module's FDDI connector and from the FDDI cable plug.
- Align the keyway on the FDDI cable plug with the key on the module's FDDI connector.
- Insert the plug into the connector, ensuring that the locking clips on the sides of the plug snap into the locked position.



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

6 Connect the AUI cables.

- Push the module's AUI connector slide latch to the unlocked position.
- Insert the AUI cable plug into the AUI connector.
- Push the module's AUI connector slide latch to the locked position.



NOTE: To disconnect the cables, push the connector slide latch to the unlocked position, then disconnect the cable.

Installing the Module (Cont.)

7 Connect the UTP/STP cables.

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

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

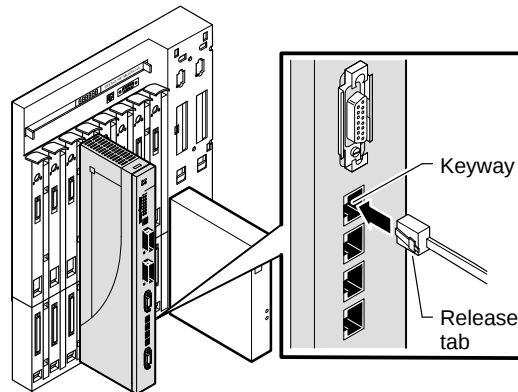
- If the device you are connecting to the module uses straight-through connectors, use crossover cables.
- If the device you are connecting to the module uses crossover connectors, use straight-through cables.
- The sum of crossovers must always equal an odd number.

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

If you need help determining the appropriate cable type to use, refer to the section titled Connector Pin Assignments.

To connect the UTP/STP cables, complete the following steps:

- a. Align the release tab on the cable plug with the keyway on the module's 10BaseT port 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 UTP/STP cables, press the release tab.

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

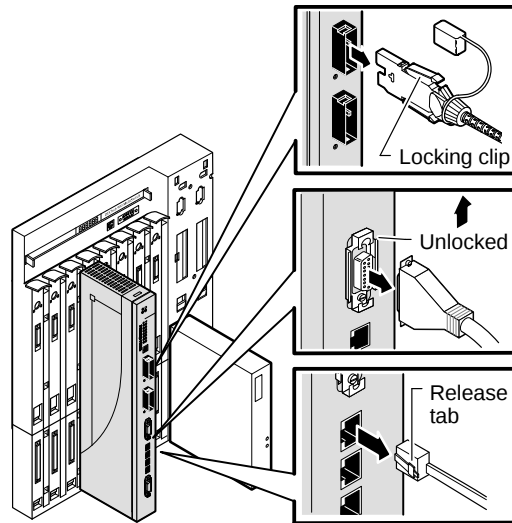
Removing the Module

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:

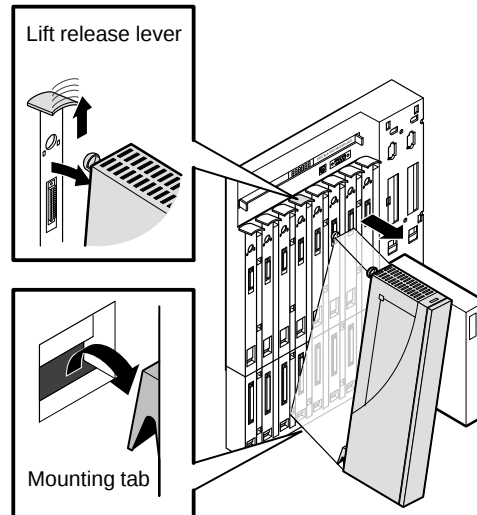
- a. FDDI cables, press the locking clips on the cable plug, then disconnect the cable.
- b. AUI cables, push the connector slide latch to the unlocked position, then disconnect the cable.
- c. UTP/STP cables, press the release tab on the cable plug, then disconnect the cable.
- d. The Optical Bypass Relay (OBR), refer to the instructions included with the OBR.



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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 docking station) allows you to access and set DECbridge 900MX parameters. This section describes how to access the module from either the DEChub 900 or from the DEChub ONE docking station.

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 docking station can be connected to a setup port device (a terminal or personal computer), using the following cables and adapters (not included in shipping kit).

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

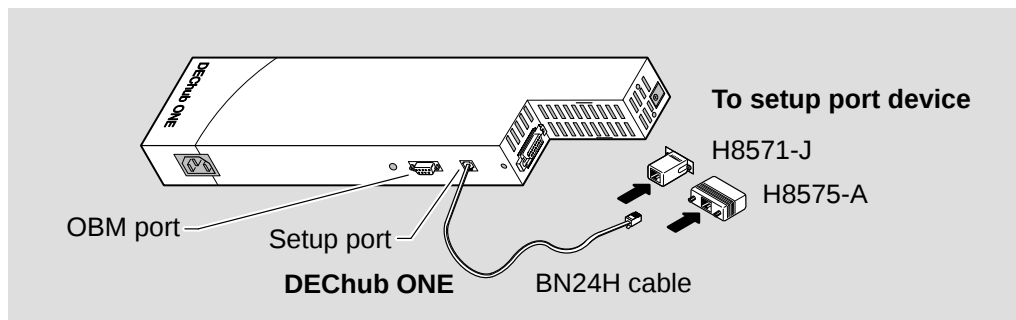
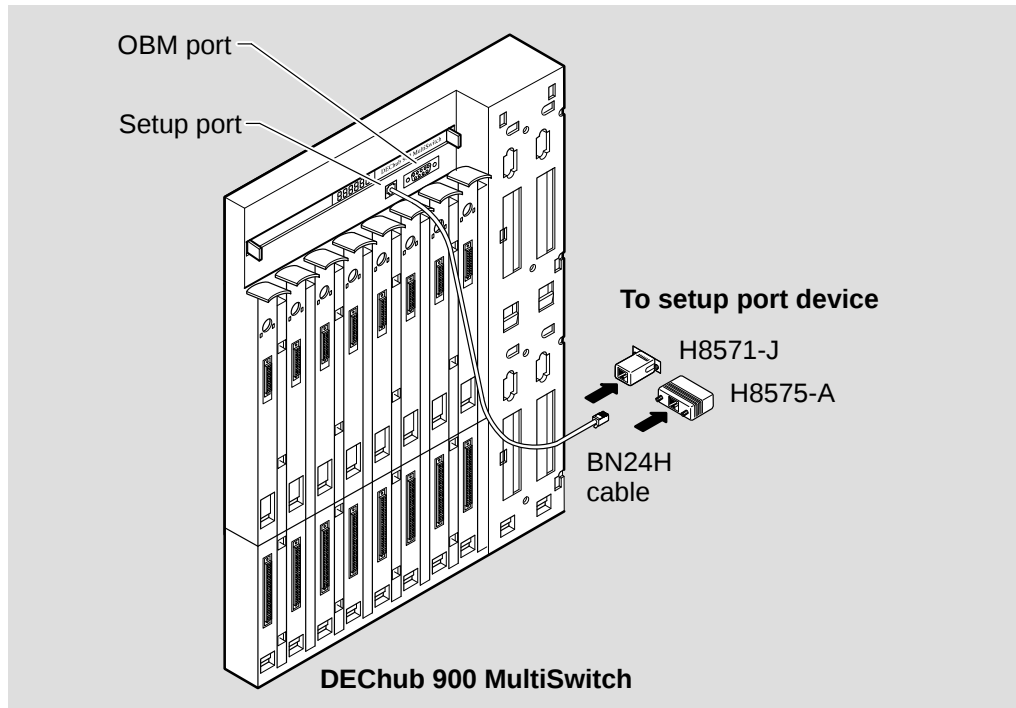
¹ xx indicates cable length in meters.

Accessing the Setup Port

To access the setup port on the DECbridge 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 docking station (see illustration).

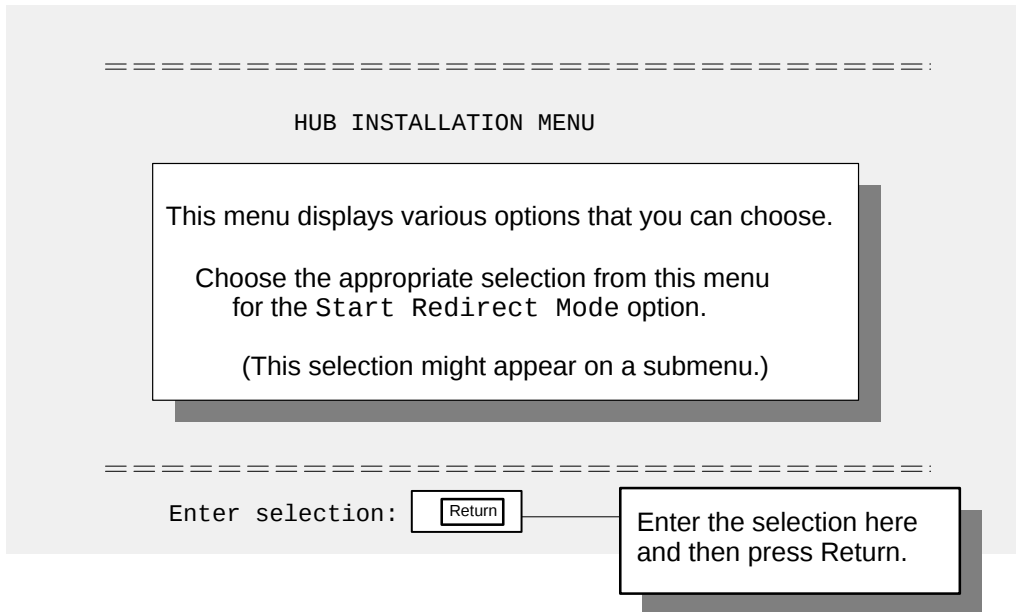
Configuring the Module (Cont.)



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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 DECbridge 900MX Installation Menu appears. Go to the section titled DECbridge 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 DECbridge 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 example shows how to select a slot number (user response is shown in **boldface type**):

```
Enter selection: 13
=====
Enter the slot number for redirection (1-8): 3 
Setup port redirected to 3: DECbridge 900MX
Attempting to connect ...
=====
Connection successful!
```

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

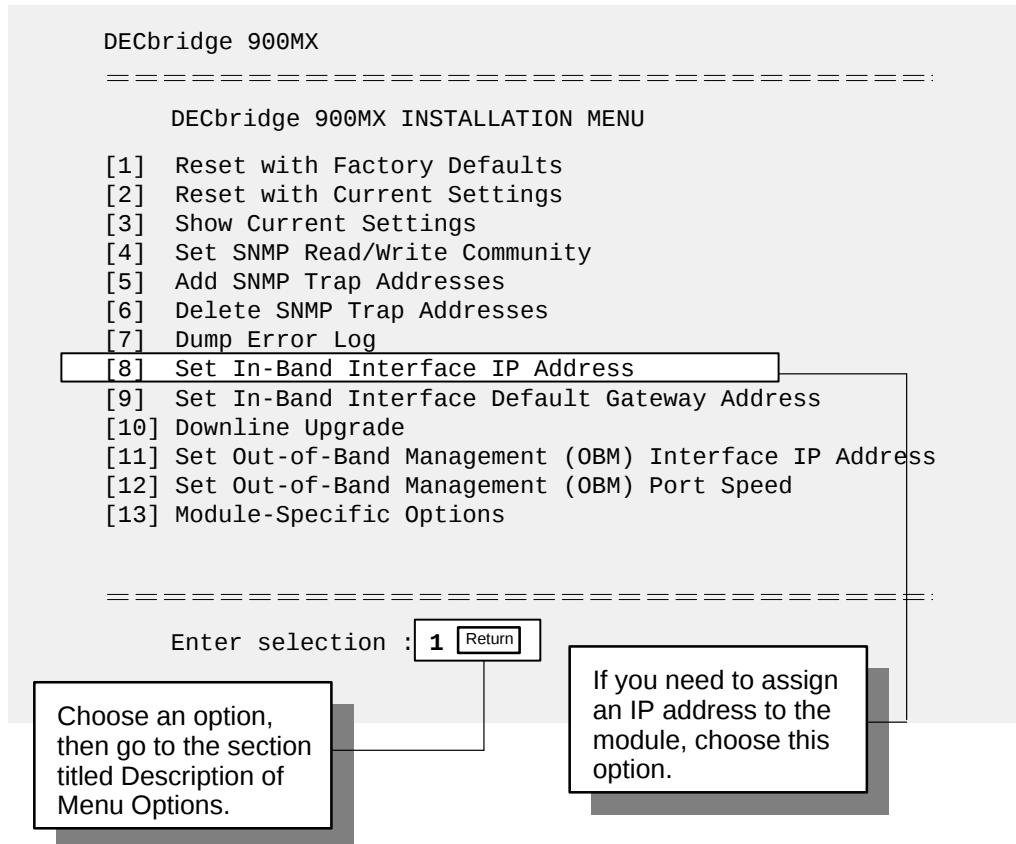
After you press , the DECbridge 900MX Installation Menu appears on your screen. Go to the section titled DECbridge 900MX Installation Menu (DEChub 900 Options).

Configuring the Module (Cont.)

DECbridge 900MX Installation Menu (DEChub ONE Options)

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

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

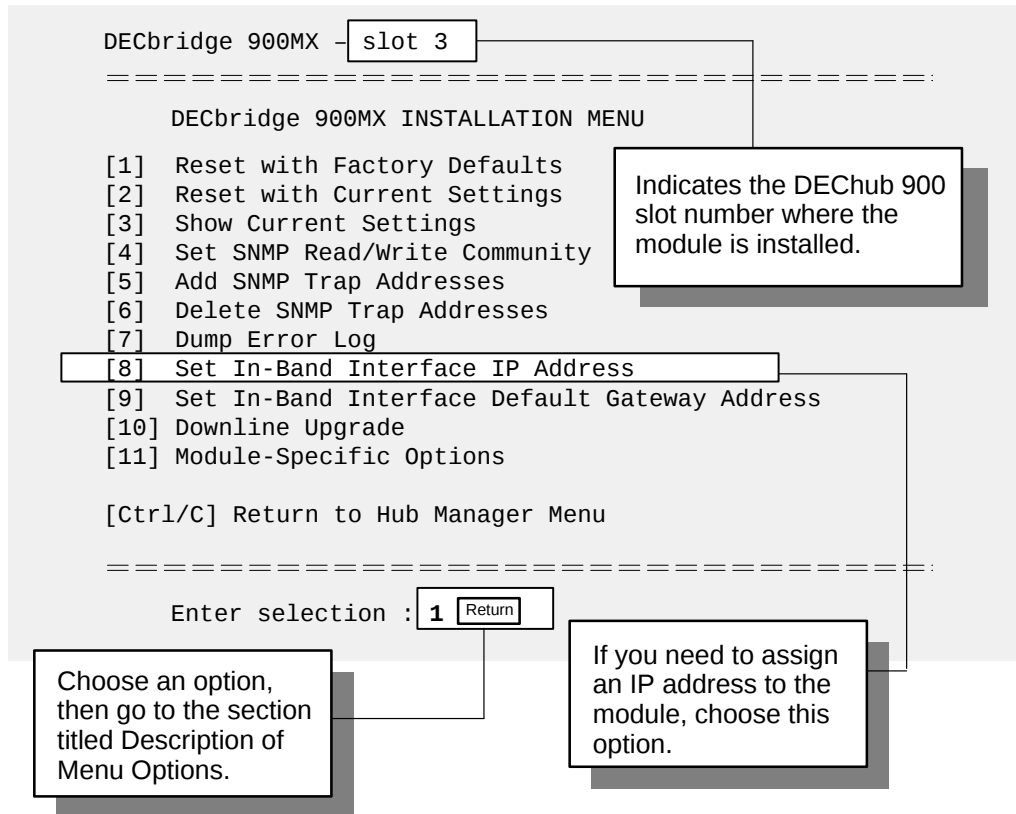


Configuring the Module (Cont.)

DECbridge 900MX Installation Menu (DEChub 900 Options)

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

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



Configuring the Module (Cont.)

Description of Menu Options

This section describes the menu options that are available from the DECbridge 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
DECbridge 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
DECbridge 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
DECbridge 900MX - slot 3
=====
DECbridge 900MX, 6-Ethernet/FDDI Bridge, 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
Port 4 using front panel UTP port
=====
Press Return for Main Menu ...
```

This line appears only when the module is connected to a DEChub ONE docking station.

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: Karen39

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

```
Enter selection : 4
DECbridge 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] : Karen39 
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 DECbridge 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
DECbridge 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? [] : 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
DECbridge 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
DECbridge 900MX - slot 3
=====
                        DUMP ERROR LOG
                CURRENT RESET COUNT: 14
=====
Entry #      = 3
Entry Status = 0 [0=valid, 1=write_error, 2=invalid, 3=empty, 4=crc_error]
Entry Id     = 10
Firmware Rev = 1.1
Reset Count  = 7
Timestamp    =      0      0      1C7
Write Count  = 24
FRU Mask     = 0
Test ID      = A60
Error Data   = SR=2000 PC=03034C4A Error Code=000023C0
Registers    = D0=ECE462A1 D1=9FFF9FFD D2=00000284 D3=EC63F2C5
               D4=9FFD9FC7 D5=00000001 D6=00000000 D7=0000FFFF
               A0=04800000 A1=0307CE50 A2=04480000 A3=00066914
               A4=03001CF8 A5=03020000 A6=0004A8BC A7=00000000
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
DECbridge 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 appears 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
DECbridge 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

[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/db900mx.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
DECbridge 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 , the screen displays the following prompt:

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

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

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

Configuring the Module (Cont.)

[10] Downline Upgrade (Cont.)

Description (Cont.)

After you enter the IP address of the TFTP server and press , 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 , 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 In-Band 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 ...
```

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	In-Band
8	OBM Port
Enter the network interface to be used [1]:	

If you select 8, then press Return, 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 ...

Pressing Return 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 Return 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.)

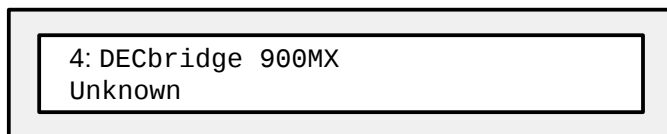
[10] Downline Upgrade (Cont.)

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.)

LED Display During the Load Process

While the load is in progress, the LEDs display the following sequence of events:

1. Port State # LED 4 lights (green) and remains lit for up to 1 minute.
2. Port State # LED 5 lights (green) and remains lit for up to 2 minutes.

This sequence indicates that the downline upgrade is in progress.

3. After Steps 1 and 2 are completed, all Port State # LEDs flash alternately (green/yellow) for 10 seconds, then the module boots and starts executing the upgraded image.

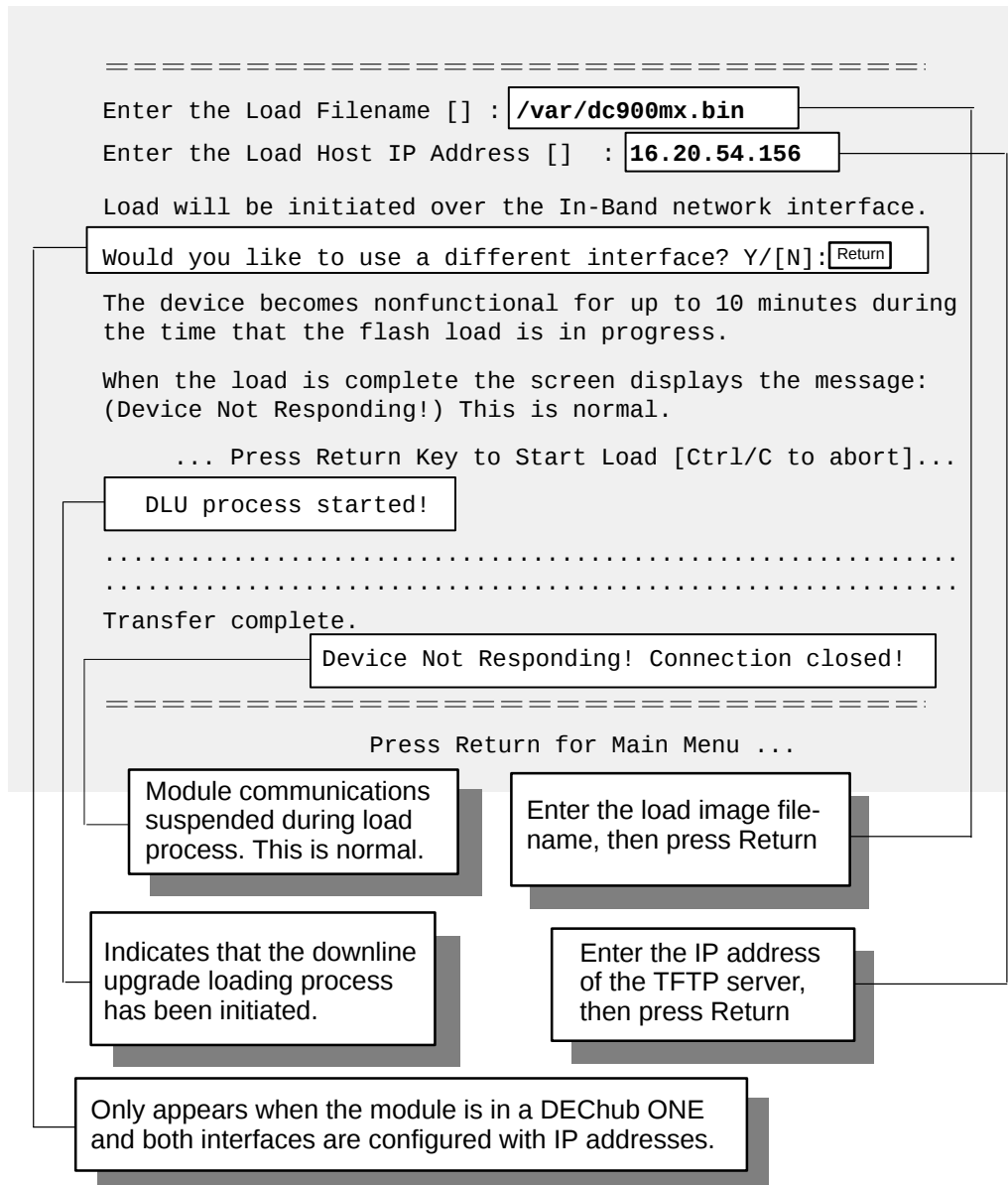
If Port State # LEDs (4 and 5) do not light, the load did not succeed. Check that the load host is operational.

If all Port State # LEDs turn on yellow (after Port State # LED 4 or 5 lights), a loading error has occurred. If this occurs, retry the loading process. If the problem persists, contact your Digital Service representative.

(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.

This option allows you to manage your module through the OBM port, located on the DEChub ONE docking station, as an alternative to normal in-band management. To enable out-of-band management, assign an OBM IP address (use this option [11]), then select an OBM port speed (use option [12]). See the DEChub ONE Installation manual for OBM cabling information.

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

```
Enter selection : 11
DECbridge 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 [] : 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
DECbridge 900MX
=====
      SET OUT-OF-BAND (OBM) PORT SPEED
      [1] 2400 baud
      [2] 9600 baud
      [3] 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. Selection 1 from this submenu takes effect only when the module is in standalone mode.

This option provides module-specific selections for the user. When selected, the option offers two selections: Set Ethernet configuration in standalone mode, and Return to Main Menu.

Set Ethernet Configuration in Standalone Mode

This selection allows you to toggle the connection of port 4 (the module's third Ethernet port) between the module's front panel and the AUI port on a DEChub ONE docking station. Note that the Network Activity --> LED corresponding to that port will change to yellow, indicating that the port is now connected to the AUI port on the DEChub ONE docking station.

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

```
Enter selection : 13
DECbridge 900MX
=====
DECbridge 900MX Installation
[1] Set Ethernet configuration in standalone mode
[2] Return to Main Menu
=====
Enter selection : 1 
NOTE: This will only take effect when the product is standalone.
Change Port 4 to use docking station AUI port?
Press Y to confirm [] : y 
Press Return for Main Menu ...
This prompt changes to:
Change Port 4 to use front panel UTP port?
when port 4 is already connected to the docking station's AUI port.
```

LED Descriptions

The module LEDs provide dynamic indications of the status of the module. The LEDs can be in various states (on, off, or flashing), and can change color (green or yellow) depending on the operational status of the module or the level of activity on the network. Table 1 shows the static states that are possible for each of the module LEDs.

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

Table 1 Module LED States

LED Name		Off	On (Green)	On (Yellow)	Flashing
Power		No power to module.	Module receiving power.	N/A.	N/A
Module OK		Self-test failed (if more than 60 seconds elapsed).	Module passed self-test.	N/A.	Nonfatal error. (Fan failure.)
Port State		Bad or no connection.	Port is in the Forwarding state.	Port failure.	Port in Backup, Listening, Learning, or management Disabled state.
Network Activity		No network activity.	Network activity. Port connected to network through module front panel connector.	Network activity. Port connected to network through hub backplane.	Intermittent network activity.

Table 2 FDDI PHY LED States

LED Name	Off	On		Flashing		
	No Color	Green	Yellow	Green	Yellow	Green / Yellow
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 initiates its built-in self-test. Flashing Port State  LEDs indicate that the module is running various subroutines as part of the self-test.
3. After the successful completion of self-test (within 60 seconds after power is applied), the the Module OK  LED lights, and remains lit.
4. The remaining LEDs (Port State  , Network Activity  -->, and PHY LEDs) now indicate their operational status, as described in Table 3.

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.)

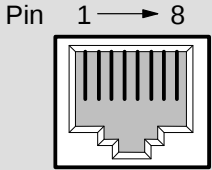
Table 3 (Cont.) Problem Solving Using the LEDs

Symptom	Probable Cause	Corrective Action
Module OK  LED is off.	Self-test in progress.	Wait for self-test to complete.
	Self-test failed.	If the LED does not light within 60 seconds, lift the release lever momentarily to repeat the self-test. If self-test fails again, replace the module. Contact your Digital Service representative to correct the problem.
Module OK  LED is off and Port State # LED for Port 1 is on green.	Module firmware image is corrupted.	Contact your Digital Service representative to correct the problem.
Module OK  LED is flashing, but module continues to operate normally.	A nonfatal error occurred.	Cycle power. If the problem persists, contact your Digital Service representative to correct the problem.
Port State # LED is off.	Port not connected or connection is bad.	Missing, loose, or incorrect cable. Correct the cable connection.
Port State # LED is on. yellow.	Port failure.	Contact your Digital Service representative to correct the problem.
Port State # LED is flashing green.	The corresponding port is in one of the following bridge states: Backup, Preforwarding or Disabled.	None — normal operation.

Connector Pin Assignments

10BaseT (8-pin MJ) Port Connector

The following illustration shows the 8-pin MJ (straight-through) connector and its pin assignments:

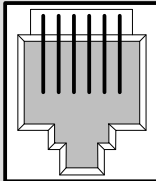
<u>Pin</u>	<u>Assignment</u>	 8-pin MJ connector
1	TX+	
2	TX-	
3	RX+	
4	Unused	
5	Unused	
6	RX-	
7	Unused	
8	Unused	

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NOTE: All 10BaseT port connectors on the module are (straight-through) connections.

Optical Bypass Relay (6-Pin MJ) Connector

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

<u>Pin</u>	<u>Assignment</u>	 6-pin MJ connector
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	

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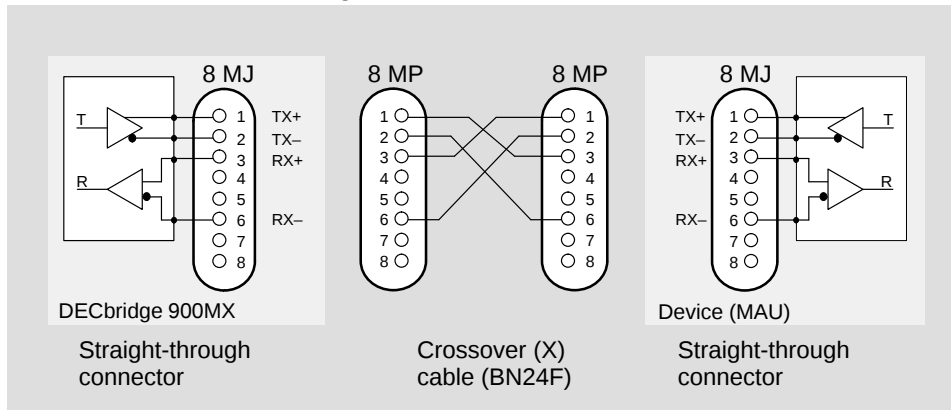
Connector Pin Assignments (Cont.)

Internal and External Crossover Configurations

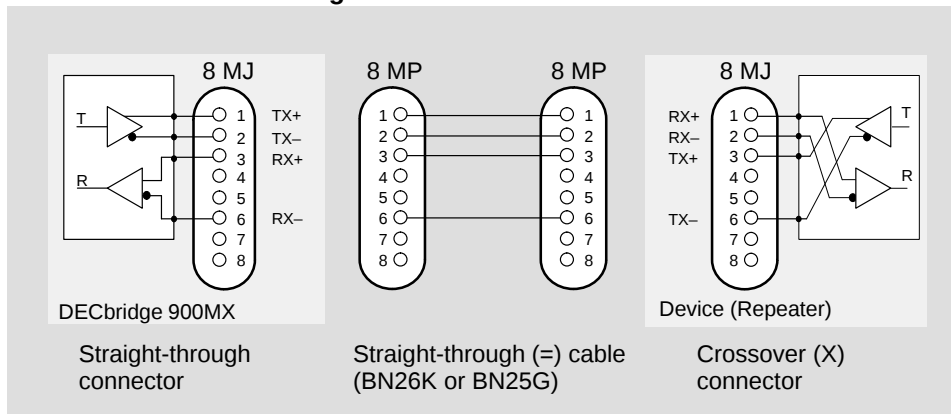
A crossover function must be implemented in every twisted-pair link. The crossover function (internal or external) allows the transmitter of one device to connect to the receiver of the device at the other end of the twisted-pair link.

The following illustration shows the use of straight-through and crossover cables for connecting internal and external crossover type devices. The DECbridge 900MX uses straight-through connectors:

External Crossover Configuration



Internal Crossover Configuration



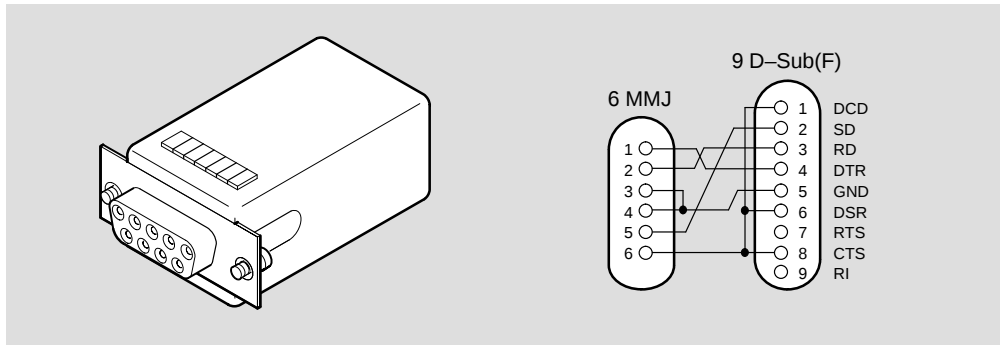
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Connector Pin Assignments (Cont.)

H8571-J Adapter

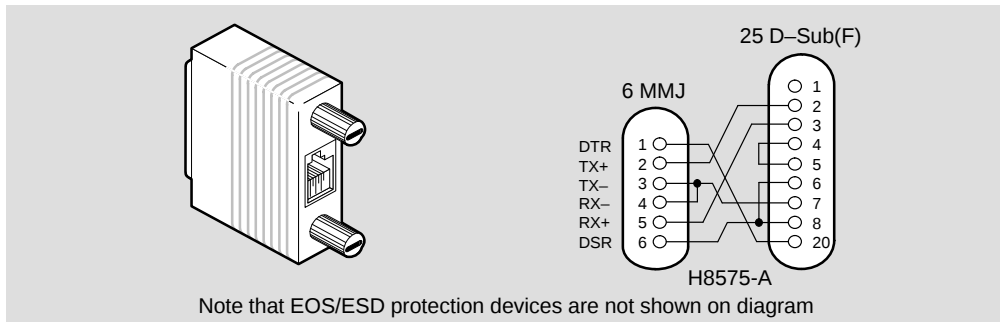
The following illustration shows the H8571-J adapter (6-pin MMJ to 9-pin D-Sub connector) and its pin assignments:



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H8575-A Adapter

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



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Connector Pin Assignments (Cont.)

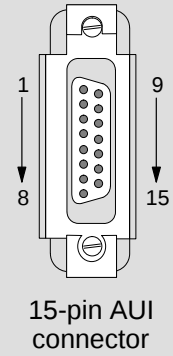
BNE4C/D AUI (15-pin D-Sub) Port Connector

The following illustration shows a 15-pin AUI connector and its pin assignments:

<u>Pin</u>	<u>Ports</u>
1	Ground
2	CI+
3	DO+
4	Ground
5	DI+

<u>Pin</u>	<u>Ports</u>
6	Power rtn
7	NC
8	Ground
9	CI-
10	DO-

<u>Pin</u>	<u>Ports</u>
11	Ground
12	DI-
13	Power (12V)
14	Ground
15	NC



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Product Specifications

Operating specifications for the DECbridge 900MX module are provided in Table 4.

The module's acoustical specifications are listed in Table 5.

Table 4 DECbridge 900MX Operating Specifications

Parameter	Specification
Operating Environment	
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	67.5 W, total power 9.0 A, 5Vdc, 0.1 A, 12Vdc ² 1.5 A, 15Vdc
Connectors	
1 Dual Attachment Station (DAS) FDDI port multimode optics (ANSI MIC), 1 Shielded 6-pin MJ (OBR), 2 15-pin D-Sub (AUI ports), 4 Shielded 8-pin MJ (10BaseT ports).	
(DEChub ONE has 1 8-pin MJ, 1 DB-9, and 1 15-pin D-Sub AUI connector.)	
Physical	
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.
Certification	
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 5 Acoustical Specifications

Acoustics — Declared values per ISO 9296 and ISO 7779¹

Product	Sound Power Level L_{WAd} , B	Sound Pressure Level L_{pAm} , dBA (bystander positions)
	<i>Idle/Operate</i>	<i>Idle/Operate</i>
DEFBA-MA	5.0	36
DEFBA-MA + DEHUA	5.4	40

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

Produkt	Schalleistungspegel L_{WAd} , B	Schalldruckpegel L_{pAm} , dBA (Zuschauerpositionen)
	<i>Leerlauf/Betrieb</i>	<i>Leerlauf/Betrieb</i>
DEFBA-MA	5,0	36
DEFBA-MA + DEHUA	5,4	40

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

<i>DEChub 900 MultiSwitch Owner's Manual EK-DH2MS-OM</i>	Provides installation, use, security, and troubleshooting information.
<i>DEChub ONE Installation EK-DEHU2-IN</i>	Provides installation and operation guidelines for single-slot hub configuration, including rack-mount options and cabling.
<i>HUBwatch Installation and Configuration AA-Q0FXB-TE</i>	Provides information for installing and configuring HUBwatch for Open VMS V3.0 and HUBwatch for Windows V2.0.
<i>HUBwatch Use AA-PW4BC-TE</i>	Provides network management, and DEChub functionality information for HUBwatch for Open VMS V3.0.
<i>Using DECndu Plus (MS-DOS) AV-PYVVA-TE</i>	Provides the 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) AV-PYVTA-TE</i>	Provides the 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) AV-PYVRA-TE</i>	Provides the instructions to upgrade the firmware in an OpenVMS VAX environment of selected network devices using Digital's Network Device Upgrade (DECndu) Plus utility.
<i>OPEN DECconnect Applications Guide EC-G2570-42</i>	Contains general descriptions to help plan and install networking systems based on Digital Equipment Corporation's OPEN DECconnect System and networking products.
<i>Bridge and Extended LAN,Reference EK-DEBAM-HR</i>	Describes how bridges are used to create extended local area networks (LANs). The descriptions include the use of bridges in extended LAN configurations, information on LAN interconnections, overall bridge operation, spanning tree, bridge management, and solving bridge-related problems in a network.

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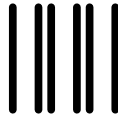
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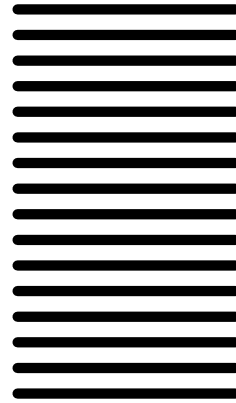
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