



PEswitch 900TX

Installation

Part Number: EK-DESBF-IN. A01

October 1994

This manual describes how to install and verify the operation of the PEs switch 900TX 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.

CE NOTICE – Class A Computing Device:

Warning!

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

Achtung!

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

CAUTION 	This action deletes all configured settings and replaces them with factory default values. All configuration settings will be lost. [Page 16.]
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.

Safety (Cont.)

CAUTION

If power is interrupted during Stage 3 of the DLU process, the firmware image can become corrupted. Do not turn off power to the unit or perform any action that can cause the unit to lose power during Stage 3 of the DLU process. [Pages 25, 26, and 32.]

ACHTUNG

Sollte während der Phase 3 des DLU-Prozesses eine Unterbrechung der Stromversorgung eintreten, kann das Firmwareprogramm zerstört werden. Aus diesem Grunde wird dringend empfohlen, Vorkehrungen zu treffen, daß während der Durchführung dieser Phase 3 die System-einheit weder ausgeschaltet noch die Stromversorgung unterbrochen werden kann.

ATTENTION

L'image du microprogramme risque d'être corrompue, en cas de coupure de courant au cours de l'étape 3 du processus DLU. Ne mettez pas l'unité hors tension et n'exécutez aucune action risquant d'entraîner une coupure d'alimentation au cours de cette étape.

PRECAUCIÓN

Si se interrumpe el suministro eléctrico durante la Etapa 3 del proceso DLU, puede dañarse la imagen del firmware. No se debe apagar la unidad ni realizar ninguna operación que pueda causar una interrupción del suministro de la unidad durante la Etapa 3 del mencionado proceso.

Introduction

The PEs switch 900TX (also referred to in this manual as the module) provides the interconnection between six 10 Mb/s Ethernet¹ LANs and a high-speed 100 Mb/s Fiber Distributed Data Interface (FDDI) network backbone.

As a self-learning IEEE 802.1d Media Access Control (MAC) 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 PEs switch 900TX 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 PEs switch 900TX 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 ONE² docking station.

Features

Your PEs switch 900TX module includes the following features:

- High-speed local traffic filtering and forwarding.
- Supports up to 8000 network addresses (64 Ethernet, 7936 FDDI).

¹ In this manual, the term Ethernet is Digital's term for its product compatibility with the ISO 8802-3/ANSI/IEEE 802.3 standards and the Ethernet standards for Carrier Sense Multiple Access with Collision Detection (CSMA/CD) local area networks (LANs).

² Throughout this manual, the term DEChub ONE refers to the DEChub ONE or the DEChub ONE-MX docking station unless otherwise specified.

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 (10BaseT) LAN ports:
 - The module's FDDI DAS port is available on the DEChub 900 backplane or, when operating standalone, on the DEChub ONE-MX docking station when optional ModPMDs are installed.
 - The 10BaseT front-panel ports are individually switchable to a DEChub 900 backplane LAN through HUBwatch management. One of the 10BaseT ports (port 3) can be redirected to the DEChub 900 backplane ThinWire LAN segment via HUBwatch.
 - When connected to a DEChub ONE docking station, one of the 10BaseT ports (port 4) can be switched to the docking station's AUI connector.
- Out-of-band management (OBM) using SNMP over Serial Line Internet Protocol (SLIP) through the OBM connector in addition 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

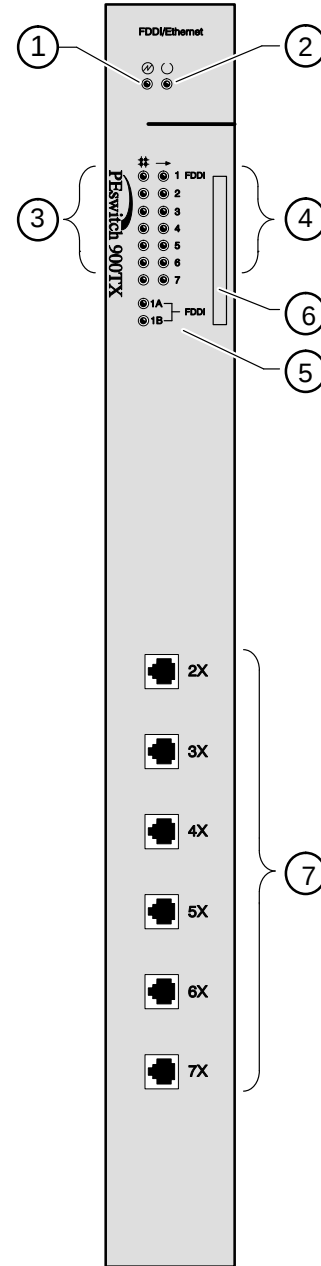
- 1) **Power**  **LED** — Lights when the module has power.
- 2) **Module OK**  **LED** — Lights when the module passes self-test. If the module fails self-test, the Module OK LED  remains off.
- 3) **Port State**  **LEDs** — Show the status of ports 1 to 7. The LEDs can be on, off, or flashing.
- 4) **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).
- 5) **FDDI port (PHY) LEDs** — Indicates the status of the connection between the module and the FDDI network. The FDDI port A LED is labeled **1A** and the FDDI port B LED is labeled **1B**. The FDDI port is a dual attachment station (DAS) port and is only available on the DEChub 900 backplane or, when operating standalone, on the DEChub ONE-MX docking station.

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

- 6) **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

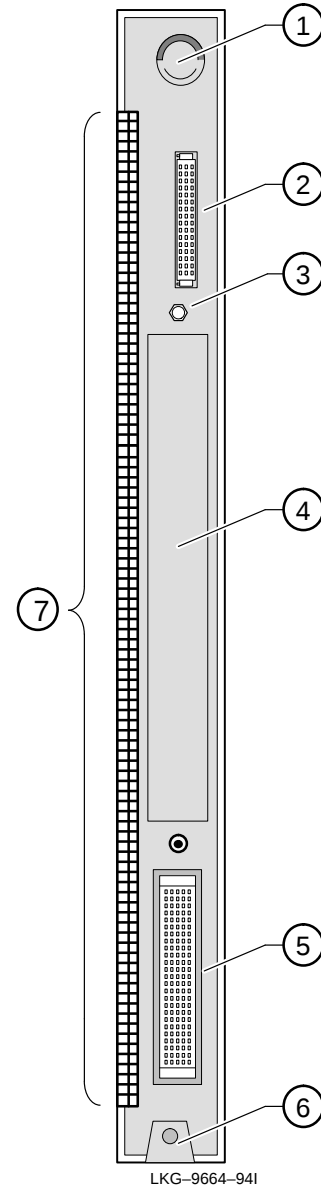
- 7) **10BaseT (8-pin MJ) port connectors** — Supports both UTP and STP cabling.



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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.

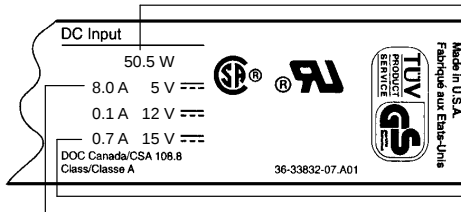


Installing the Module

The PEs switch 900TX 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 requirements with the values shown in the Hub Manager status display (see example).**

Module's Manufacturing Label (Example)



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

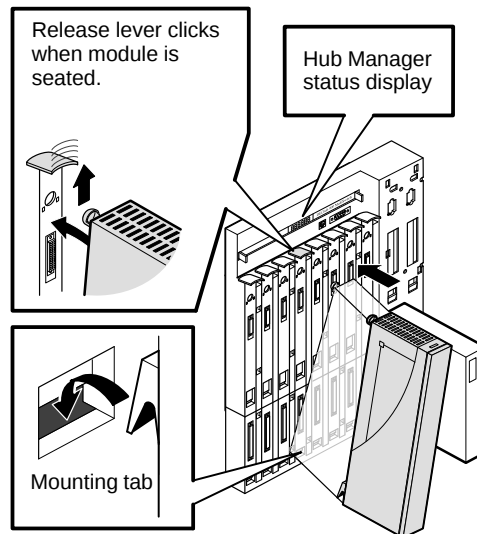
Hub Manager Status Display (Example)

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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PE switch 900TX Installation

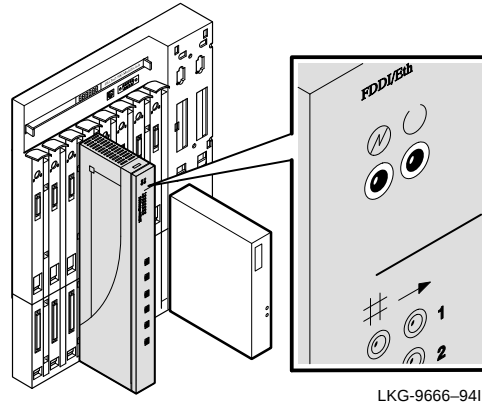
Installing the Module (Cont.)

- 3 Verify that the module's Power  LED lights immediately, and that the Module OK  LED lights (within 1 minute).

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

```
PEswitch 900TX  
up
```

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



- 4 Connect the port cables.

Depending on your network configuration requirements, connect the appropriate 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.

Connecting the UTP/STP cables.

The PEs switch 900TX module uses embedded crossover 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.

Installing the Module (Cont.)

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

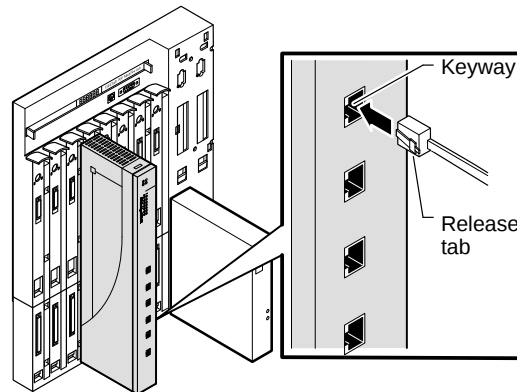
- If the device you are connecting to the module uses straight-through connectors, use straight-through cables.
- If the device you are connecting to the module uses crossover connectors, use crossover cables.
- The sum of crossovers must always equal an odd number.

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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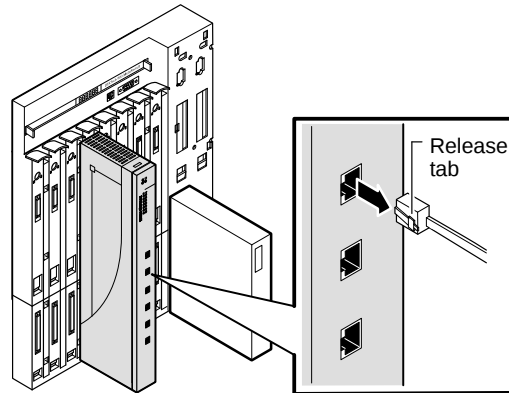
NOTE: To disconnect the UTP/STP cables, press the release tab.

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

Removing the Module

1 Disconnect all the cables from the module.

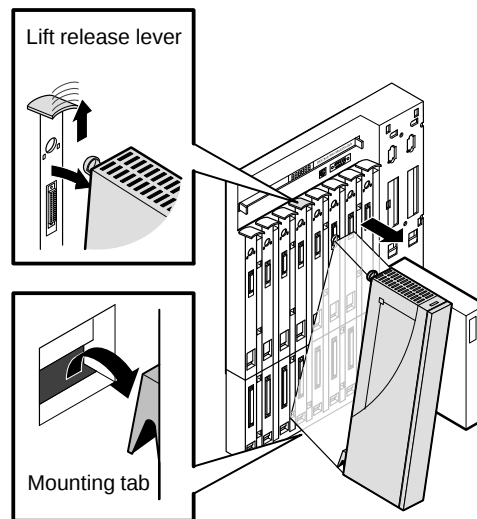
To disconnect the UTP/STP cables, press the release tab on the cable plug, then disconnect the cable.



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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 PEs switch 900TX 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 Device Cabling

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

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

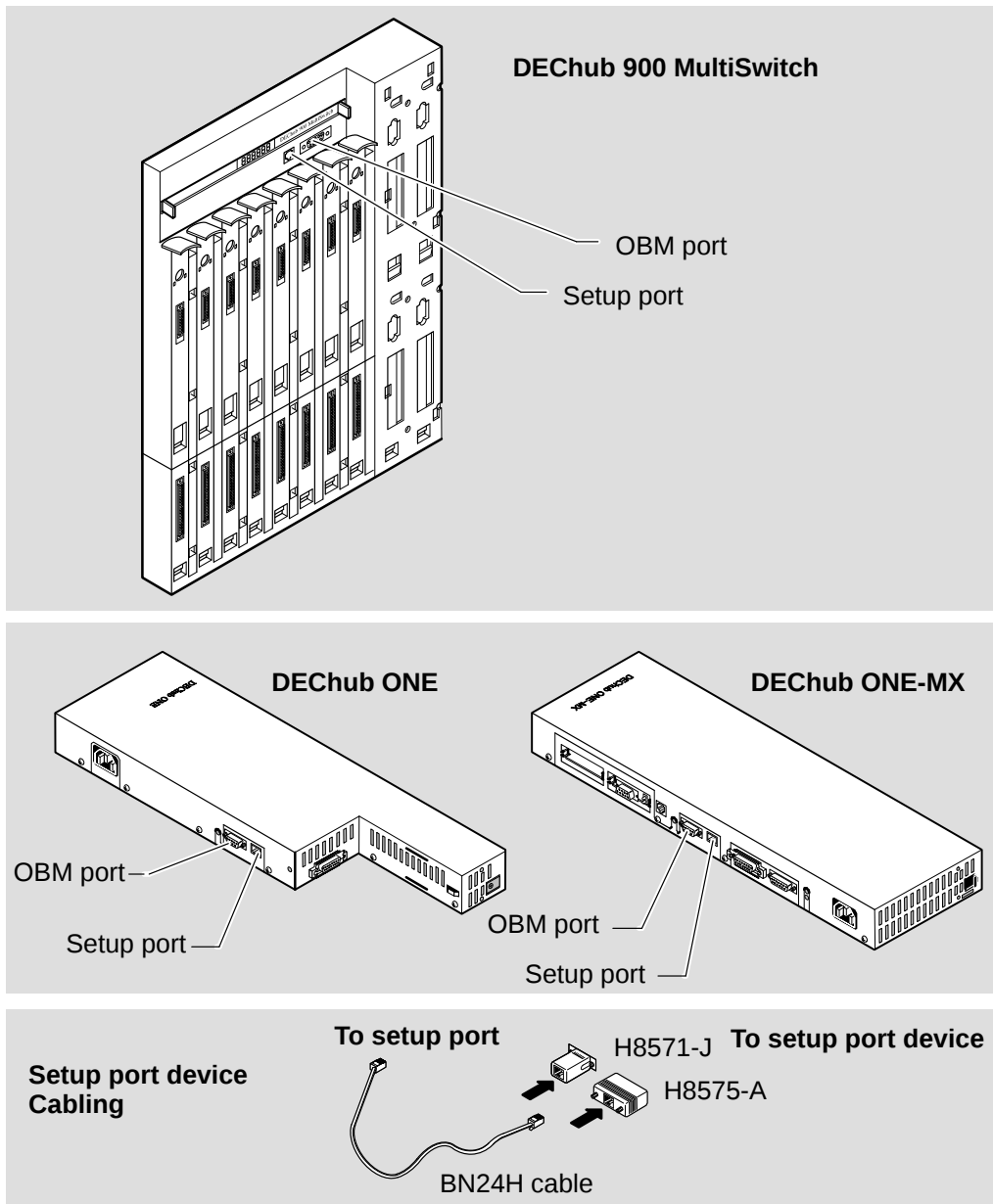
¹ xx indicates cable length in meters.

Accessing the Setup Port

To access the setup port on the PEs switch 900TX 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 **Return** on the setup port device a few times until a menu appears.
 - a. If the module is connected to the setup port on the DEChub ONE docking station, the PESwitch 900TX INSTALLATION MENU appears. Go to the section titled PESwitch 900TX Installation Menu (DEChub ONE Options).
 - b. If the module is connected to the Hub Manager setup port on the DEChub 900, the DEChub 900 MultiSwitch INSTALLATION MENU appears (see following example).

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

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

[1] Reset with Factory Defaults
[2] Reset with Current Settings
[3] Show Current Settings
[4] Set SNMP Read/Write Community
[5] Add SNMP Trap Addresses
[6] Delete SNMP Trap Addresses
[7] Dump Error Log
[8] Set In-Band Interface IP Address
[9] Downline Upgrade
[10] Set Out-of-Band Interface IP Address
[11] Set Out-of-Band Interface Port Speed
[12] Start Event Display Mode
[13] Start Redirect Mode

=====
Enter selection: 13 Return
```

Choose option 13, then go to the section titled Start Redirect Mode.

To upgrade your module, without assigning an IP address, choose this option (refer to the *DEChub 900 Owner's Manual* for details).

- c. Choose option 13, then 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 PEs switch 900TX) that is installed into the DEChub 900. Choosing this option allows you to configure or obtain status of an installed network module by accessing the specified network module's installation menu.

After you choose the Start Redirect Mode option from the DEChub 900 MultiSwitch INSTALLATION MENU, the screen display prompts you for a slot number as shown in the following example.

The following 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 
Console redirected to 3: PEs switch 900TX
    Attempting connection [Ctrl/C to abort]...
        Connection successful!
```

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

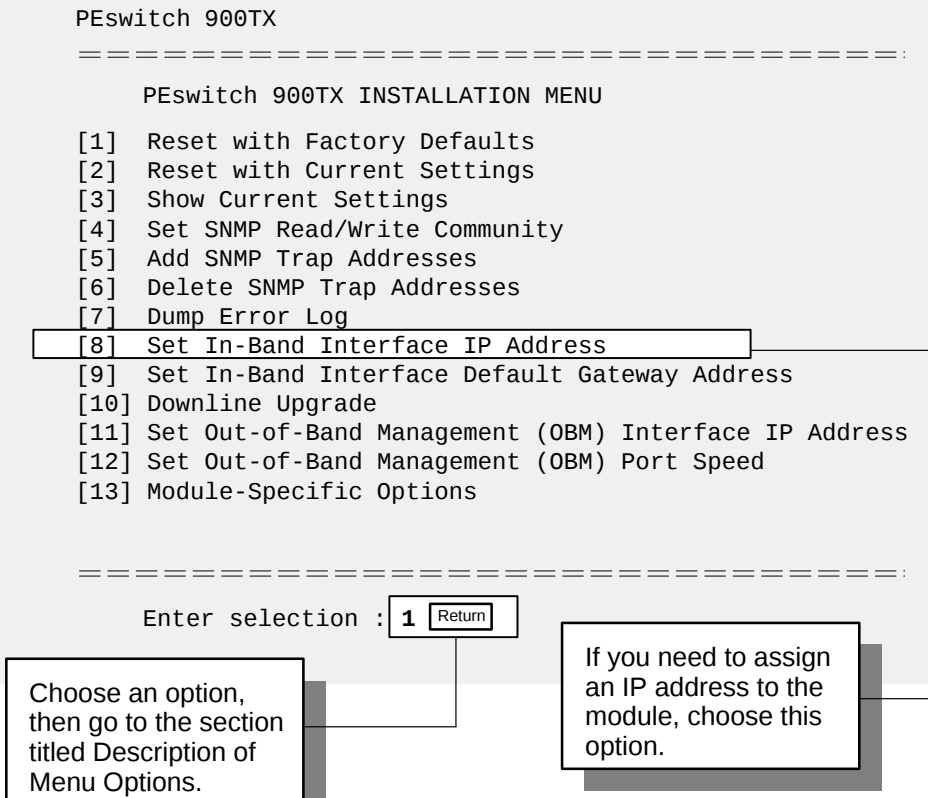
After you press , the PEs switch 900TX INSTALLATION MENU appears on your screen. Go to the section titled PEs switch 900TX Installation Menu (DEChub 900 Options).

Configuring the Module (Cont.)

PEswitch 900TX Installation Menu (DEChub ONE Options)

This section shows the options available from the PEs switch 900TX INSTALLATION MENU when the module is installed into the DEChub ONE docking station.

The following is an example of the PEs switch 900TX INSTALLATION MENU:

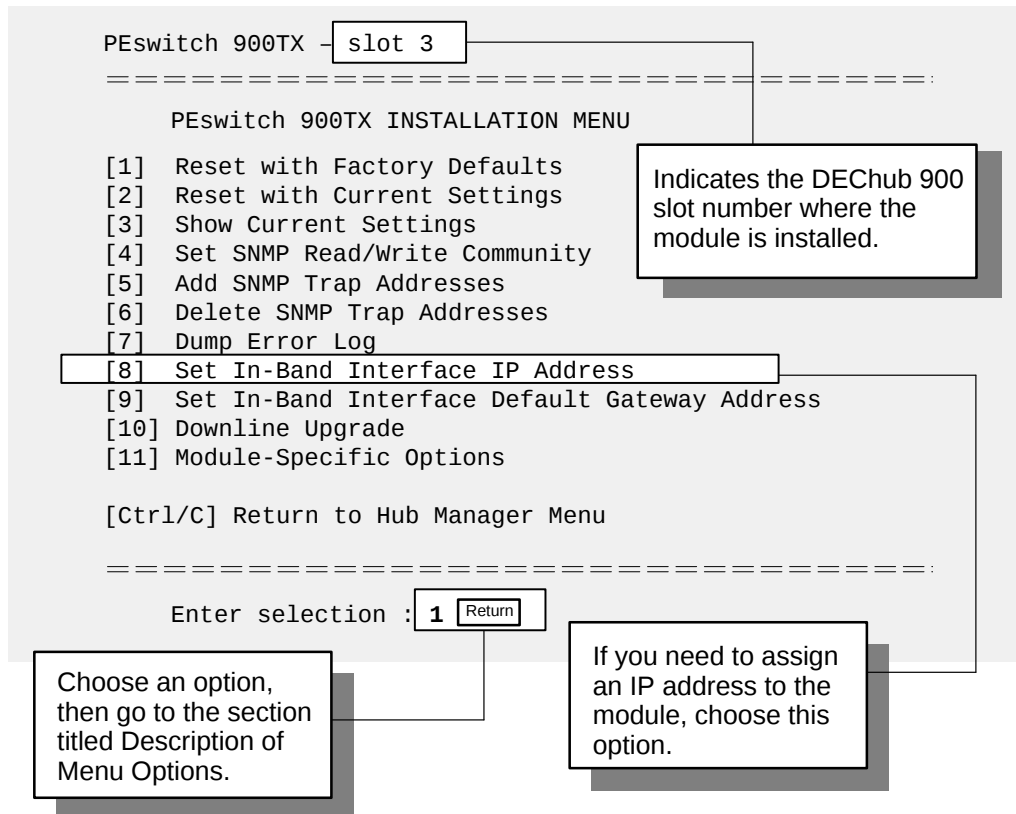


Configuring the Module (Cont.)

PEswitch 900TX Installation Menu (DEChub 900 Options)

This section shows the options available from the PEs switch 900TX INSTALLATION MENU when the module is installed into the DEChub 900.

The following is an example of the PEs switch 900TX INSTALLATION MENU:



Configuring the Module (Cont.)

Description of Menu Options

This section describes the menu options that are available from the PEs witch 900TX 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 resets 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.

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

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

```
Enter selection : 1
PEswitch 900TX - 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 resets the module but leaves the module's configured NVRAM parameters at their current values.

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

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

```
Enter selection : 2
PEswitch 900TX - 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
PEswitch 900TX - slot 3
=====
PEswitch 900TX, 6-Ethernet/FDDI Switch, HW=v1/2,R0=v0.4,SW=v1.0.2
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
Out-of-Band (OBM) Interface IP Address: Not Configured
Out-of-Band (OBM) Management Port Speed: 9600
Port 3 using front panel UTP port
=====
Press Return for Main Menu ...
```

Out-of-Band (OBM) Interface IP Address: Not Configured
Out-of-Band (OBM) Management Port Speed: 9600
Port 3 using front panel UTP port

This dialog 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: **mario94**

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

```
Enter selection : 4
PEswitch 900TX - 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 one or more SNMP trap (IP) addresses.

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

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
PEswitch 900TX - slot 3
=====
ADD SNMP TRAP ADDRESSES

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

        example: 16.20.54.156

=====
Configured SNMP Trap Addresses: 16.20.216.81
Trap address [] : 16.20.54.156 
Trap address added! Add another? [none] : 
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 (IP) addresses for deletion.

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

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
PEswitch 900TX - 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
PEswitch 900TX - 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 = 1.0
Reset Count  = 7
Timestamp    =      0      0      1C7
Write Count  = 24
FRU Mask     = 0
Test ID      = A60
Error Data   = SR=2000 PC=03034C4A Error Code=000023C0
Registers    = D0=ECE462A1 D1=9FFF9FFD D2=00000284 D3=EC63F2C5
               D4=9FFD9FC7 D5=00000001 D6=00000000 D7=0000FFFF
               A0=04800000 A1=0307CE50 A2=04480000 A3=00066914
               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
PEswitch 900TX - 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 management stations located on IP network subnets.

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
PEswitch 900TX - 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.

Before initiating this option, be sure that the module that you are upgrading has been configured with an IP address. If the module is not configured with an IP address, you can still upgrade the module by selecting the Downline Upgrade option (option [9]) from the DEChub 900 MultiSwitch INSTALLATION MENU. Refer to the *DEChub 900 MultiSwitch Owner's Manual* for more information.

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

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

desbf100.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 Stage 3 of the DLU process, the firmware image can become corrupted. Do not turn off power to the unit or perform any action that can cause the unit to lose power during Stage 3 of the DLU process.

The Downline Upgrade (DLU) Process

The DLU process consists of four stages:

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

Table 1 describes what happens during each stage of the DLU Process. An (expanded) example of the screen displays follows the description.

Configuring the Module (Cont.)

[10] Downline Upgrade (Cont.)

Table 1 DLU Process Description

Stage	What Happens
1	The new firmware image from the TFTP load host is transported across the network, and placed into a temporary storage buffer in the module. Indications that this stage is in progress include: • Module status — functional, and manageable. • Module can respond to management requests. • LED display — normal operational. • HUB Manager display — PEs switch 900TX up • Typical time to complete this stage — approximately 1 minute. However, due to variances in network configurations (load path, bit rate, and traffic levels), this stage of the DLU process can take up to 10 minutes to complete.
2	The module verifies that the firmware image is correct after Stage 1 is complete. Indications that this stage is in progress include: • Module status — functional. • Module can respond to management requests. • LED display — normal operational. • HUB Manager display — PEs switch 900TX up • Typical time to complete this stage — normally 1 second.
3	The new firmware image is transferred from the module's temporary storage buffer to the Flash RAM, overwriting the old firmware image.



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

(continued on next page)

Configuring the Module (Cont.)

[10] Downline Upgrade (Cont.)

Table 1 (Cont.) DLU Process Description

Stage	What Happens
4	Indications that this stage is in progress include: • Module status — not functional. • Module cannot respond to management requests. • LED display — the following sequence is displayed: 1. Port State # LED 4 lights (green) for about 1 minute. 2. Port State # LED 5 lights (green) for up to 2 minutes¹. 3. After Steps 1 and 2 are completed, all Port State # LEDs flash alternately (green/yellow) for 10 seconds². • HUB Manager display — PEswitch 900TX unknown • Typical time to complete this stage — approximately 3 minutes. The module resets, runs self-test, and then begins executing the new firmware image.
	Indications that this stage is in progress include: • Module status — not functional. • Module cannot respond to management requests. • LED display — (standard self-test pattern) Port State # LEDs flash, indicating various subroutines are running. • HUB Manager display — PEswitch 900TX unknown • Typical time to complete this stage — normally 1 minute. After the successful completion of self-test, the Module OK  LED turns on and the module becomes fully manageable. Note also that the HUB Manager display indicates: PEswitch 900TX up

¹ If Port State # LEDs (4 and 5) do not light, the load did not succeed. Check that the load host is operational.

² 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.

Configuring the Module (Cont.)

[10] Downline Upgrade (Cont.)

Updating Firmware from the PEs switch 900TX Installation Menu

When you select the Downline Upgrade option (option [10]) from the PEs switch 900TX INSTALLATION MENU, the initial setup screen display appears (see the following example display). This screen identifies the option and alerts users not to interrupt power during the downline load.

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

```
Enter selection : 10
PEswitch 900TX

=====

                DOWNLINE UPGRADE

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

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

=====

... Press Return Key to Continue ...
```

Configuring the Module (Cont.)

[10] Downline Upgrade (Cont.)

After you press Return, the screen display prompts you to Enter the Load Filename:

- If the firmware image load file is located in the default TFTP directory, enter only the firmware image load filename.
- If the firmware image load file is Not located in the default TFTP directory, enter the complete pathname along with the firmware image load filename.

The following screen display example shows the entry of a firmware image load file that is located in the default TFTP directory (pathname not required):

```
Enter the Load Filename [] :desbf100.bin Return
```

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

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

After you enter the IP address of the TFTP server and press Return, do the following:

IF the module is installed into a...	THEN Go to...
DEChub 900	① DEChub 900 Configuration
DEChub ONE	② DEChub ONE Configuration

Configuring the Module (Cont.)

[10] Downline Upgrade (Cont.)

① DEChub 900 Configuration

The following screen and dialog appear when the module is installed into 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:  
(Module Not Responding!) This is normal.  
  
... Press Return Key to Start Load [Ctrl/C to abort]...
```

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

Go to the section titled Starting the DLU Process if you pressed for this selection.

② DEChub ONE Configuration

When the module is installed into a DEChub ONE docking station, two network interfaces are available for selection: the module's in-band network interface, and the OBM interface that resides 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.

NOTE: If the module's firmware reads only one IP address, the display screen does not prompt you to select a network interface. Pressing initiates the load over the default in-band interface.

The following screen and dialog appear when the module is installed into a DEChub ONE:

Configuring the Module (Cont.)

[10] Downline Upgrade (Cont.)

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 [Ctrl/C to Abort]...
```

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

Go to the section titled Starting the DLU Process if you pressed for this selection.

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 , 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]...
```

If you press , the DLU process is initiated over the DEChub ONE docking station's OBM port.

Go to the section titled Starting the DLU Process if pressed for this selection.

Configuring the Module (Cont.)

[10] Downline Upgrade (Cont.)

Starting the DLU Process

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

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

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 (.) indicate that the load is in progress.
When the series of dots end, the screen displays the following message:

```
Transfer complete.
```

After the firmware image is loaded into the module's temporary storage buffer and the new firmware image is validated, the DLU process overwrites the old firmware image, in the module's Flash RAM, with the new firmware image.

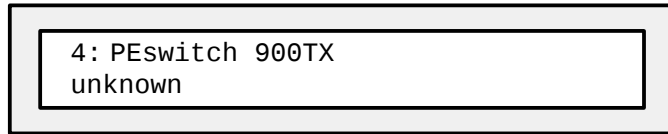
Because the module is nonfunctional during the Flash load process, communications between the module and the Hub Manager cannot take place. Therefore, the Hub manager status display and the setup screen display show the following messages:

NOTE: The following displays do not appear if you are initiating the load process from a DEChub ONE docking station.

Configuring the Module (Cont.)

[10] Downline Upgrade (Cont.)

Hub Manager Status Display



This is normal.

The following message is displayed on the setup screen (only if the module is installed into a DEChub 900):

Device not Responding! Connection closed!

This is normal.

DLU Process Completion

When the DLU process is complete, the module resets and initiates self-test. After self-test completes successfully, the module exits from the DLU process and begins the execution of the new firmware image. The Module OK  LED turns on and the module becomes fully operational.

The screen displays one of the following:

- If the module is installed into a DEChub ONE docking station, the screen displays the PEs witch 900TX INSTALLATION MENU.
- If the module is installed into a DEChub 900, the screen displays the following message:

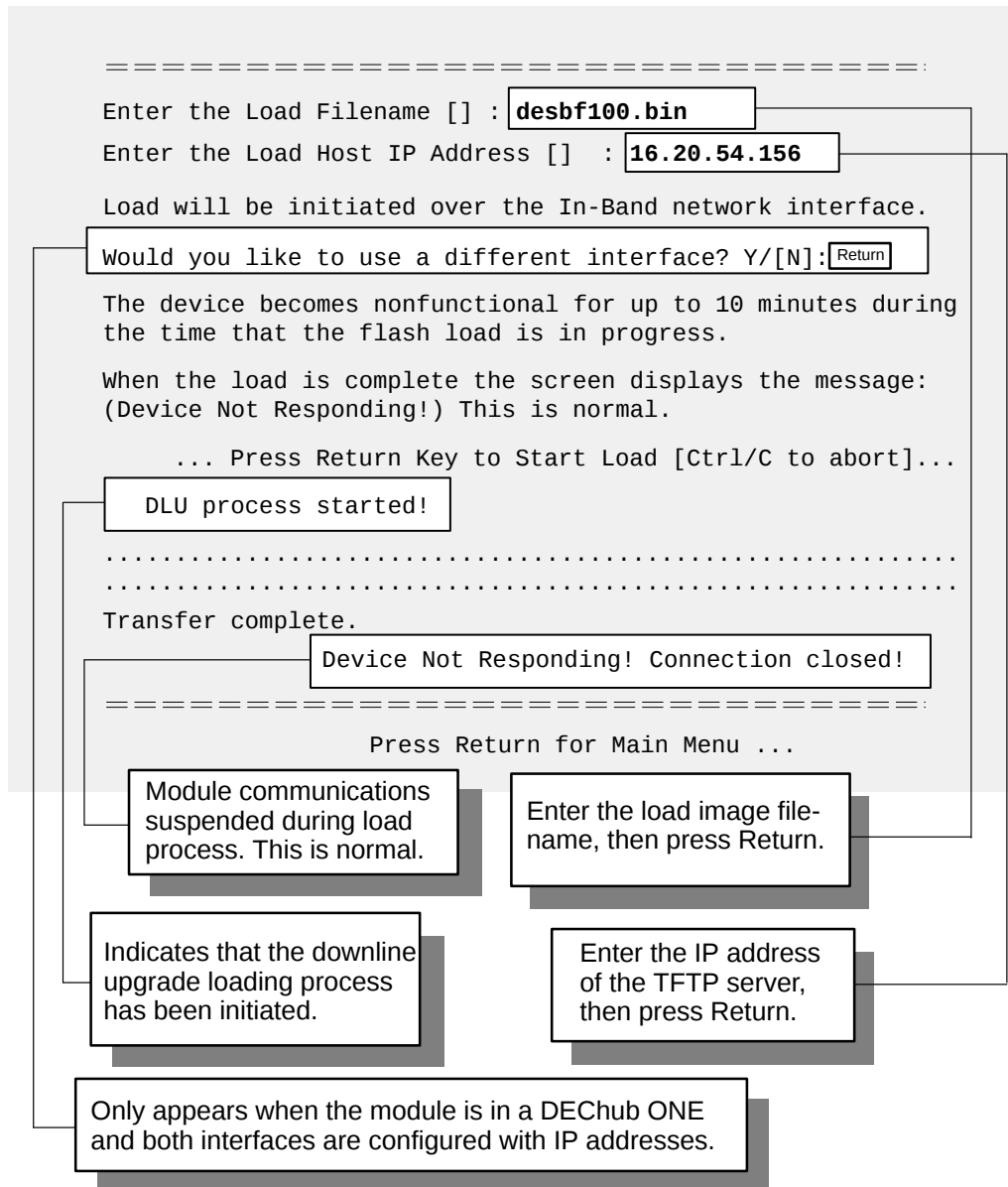
Press Return for Main Menu ...

When you press , the screen displays the DEChub 900 MultiSwitch INSTALLATION MENU.

Configuring the Module (Cont.)

[10] Downline Upgrade (Cont.)

The following illustration shows an (expanded) example of the setup screen displays:



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 into 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 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 PEs witch 900TX INSTALLATION MENU.

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

```
Enter selection : 11
PEswitch 900TX
=====
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
PEswitch 900TX
=====
      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 at the other end of the communications link.

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 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 changes 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
PEswitch 900TX
=====
PEswitch 900TX 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 [N] : y 
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 2 shows the static states that are possible for each of the module LEDs.

The FDDI Phy LEDs (see Table 3) indicate the status of the connection between the module and the FDDI network.

Table 2 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.
Port State		Bad or no connection.	Port is in the Forwarding state.	Port failure.	Port is in the Backup, Preforwarding or Disabled state.
Network Activity		No network activity.	Port connected to network through the module's front panel connector.	Port connected to network via DEChub 900 or DEChub ONE AUI port.	Intermittent network activity.

Table 3 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 4 lists the typical combined states of the LEDs for various error conditions that can occur during initial installation of the device, along with probable causes and corrective actions to take.

Normal 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 Module OK Ⓢ LED lights, and remains lit.
4. The remaining LEDs (Port State # and Network Activity → LEDs) now indicate their operational status, as described in Table 4.

Table 4 Problem Solving Using the LEDs

Symptom	Probable Cause	Corrective Action
Power Ⓢ LED is off.	The module is not receiving +5Vdc.	Check the power status on the Hub Manager status display. If 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 4 (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 blinking green (once every 8 seconds).	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 port states: Backup, Preforwarding or Disabled.	None — normal operation.

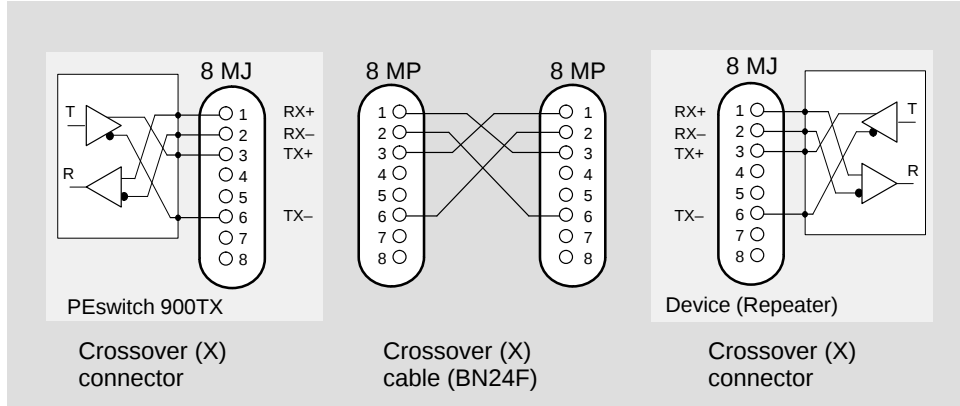
Connector Pin Assignments

Internal and External Crossover Configurations

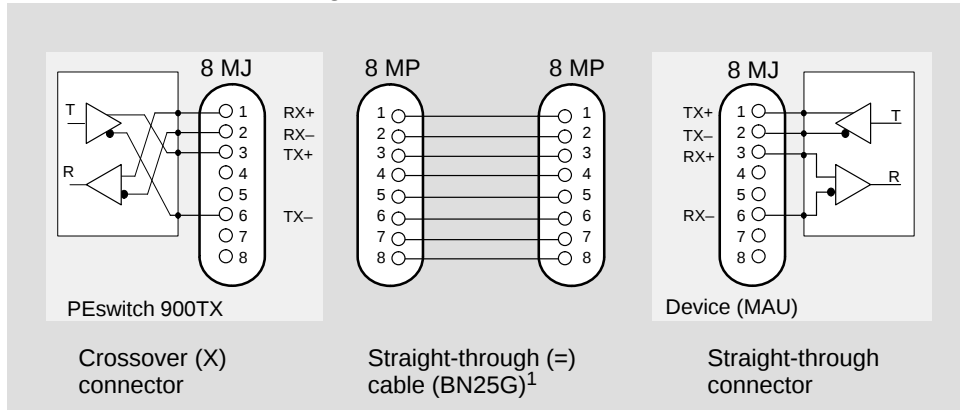
A crossover function must be implemented in every twisted-pair link. The crossover function (internal or external) allows the transmitter of one device to connect to the receiver of the device at the other end of the twisted-pair link.

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

External Crossover Configuration



Internal Crossover Configuration



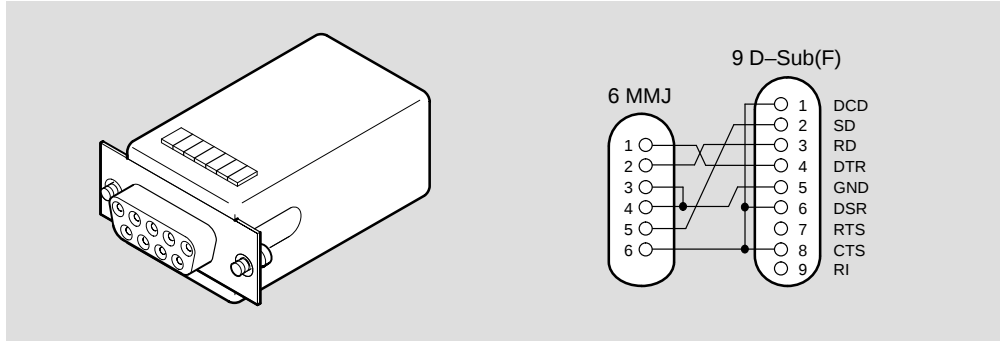
LKG-9669-941

¹ If screened cabling is required, use BN26M.

Connector Pin Assignments (Cont.)

H8571-J Adapter

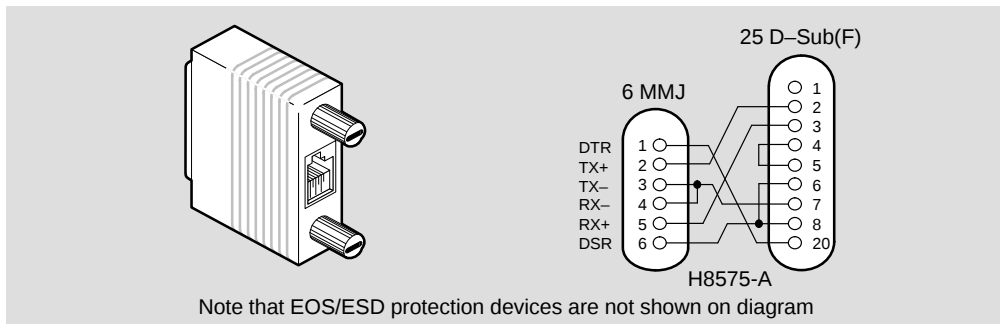
The following illustration shows the H8571-J adapter (6-pin MMJ to 9-pin D-Sub connector) and its pin assignments:



LKG-5342-91I

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:



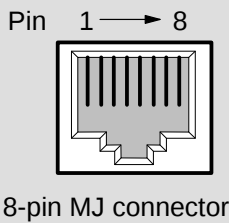
Note that EOS/ESD protection devices are not shown on diagram

LKG-8793-93I

Connector Pin Assignments (Cont.)

10BaseT (8-pin MJ) Port Connector

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

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

LKG-9552-94I

NOTE: All 10BaseT port connectors on the module are (crossover) connections.

Product Specifications

Operating specifications for the PEs switch 900TX module are provided in Table 5.

The module's acoustical specifications are listed in Table 6.

Table 5 PEs switch 900TX 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	50.5 W, total power 8.0 A, 5Vdc, 0.1 A, 12Vdc ² 0.7 A, 15Vdc
Connectors	
Module has: six Shielded 8-pin MJ (10BaseT ports).	
DEChub ONE has: one 8-pin MJ, one DB-9, and one 15-pin D-Sub AUI connector.	
DEChub ONE-MX has: one 8-pin MJ, one 6-pin MJ (OBR), one DB-9, one 15-pin D-Sub, and one redundant power connector (D-Sub).	
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
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.

³ Include an additional 1.59 kg (3.5 lb) when attached to a DEChub ONE; when attached to a DEChub ONE-MX, add 2.10 kg (4.63 lb).

Product Specifications (Cont.)

Table 6 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>
DESBF-MA	5.0	36
DESBF-MA + DEHUA	5.3	40
DESBF-MA + DEF1H	5.4	39

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>
DESBF-MA	5,0	36
DESBF-MA + DEHUA	5,3	40
DESBF-MA + DEF1H	5,4	39

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

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

Title and Order Number	Description
<i>DEChub 900 MultiSwitch Owner's Manual</i> EK-DH2MS-OM	Provides installation, use, security, and troubleshooting information.
<i>DEChub ONE Installation</i> EK-DEHU2-IN	Provides installation and operation guidelines for single-slot hub configuration, including rack-mount options and cabling.
<i>DEChub ONE-MX Installation</i> EK-DEF1H-IN	Describes the DEChub ONE-MX single-slot hub and how to install DEChub full-height network modules for standalone use.
<i>HUBwatch Installation and Configuration</i> AA-Q0FXB-TE	Provides information for installing and configuring HUBwatch for Open VMS V3.0 and HUBwatch for Windows V2.0.
<i>HUBwatch Use</i> AA-PW4BC-TE	Provides network management, and DEChub functionality information for HUBwatch for Open VMS V3.0.
<i>Using DECndu Plus (MS-DOS)</i> AV-PYVVA-TE	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)</i> AV-PYVTA-TE	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)</i> AV-PYVRA-TE	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>OPEN DECconnect Applications Guide</i> EC-G2570-42	Provides planning and installation information for systems based on Digital's OPEN DECconnect System and networking products.
<i>Bridge and Extended LAN,Reference</i> EK-DEBAM-HR	Describes how bridges are used to create extended local area networks (LANs).

HOW TO ORDER ADDITIONAL DOCUMENTATION

DIRECT TELEPHONE ORDERS

In Continental USA
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call 1-800-267-6215

In New Hampshire,
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call 1-603-884-6660

ELECTRONIC ORDERS (U.S. ONLY)

Dial 1-800-dec-demo with any VT100 or VT200
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If you need assistance, call 1-800-DIGITAL (1-800-344-4825)

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Internal orders should be placed through U.S. Software Supply Business (SSB),
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*Any prepaid order from Puerto Rico must be placed
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EK-DESBF-IN. A01**

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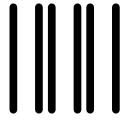
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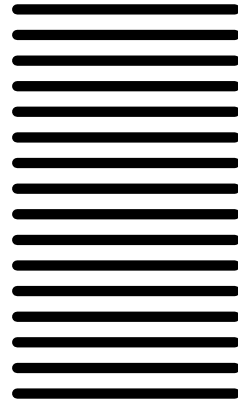
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