

DEChub 900 MultiSwitch

Owner's Manual

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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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Preface

This manual provides an overview of the DEChub 900 MultiSwitch hub. It also describes how to install, manage, and troubleshoot the hub.

Intended Audience

This manual is for personnel who will install and use the DEChub 900 MultiSwitch hub.

Structure of This Manual

This manual has six chapters and three appendixes, as follows:

Chapter	Description
1	Provides an overview of the DEChub 900 MultiSwitch hub.
2	Describes how to install the DEChub 900 MultiSwitch hub.
3	Describes the Hub Manager.
4	Describes network management.
5	Describes the hub power system.
6	Provides problem solving information for the hub.
Appendix A	Describes the mechanical, electrical, and acoustic specifications, and provides country-specific order numbers.
Appendix B	Provides connector, cable, and adapter pin assignment information.
Appendix C	Provides information about related RFCs and Digital Private MIBs.

Conventions Used in This Manual

This manual uses the following conventions:

1	A number in a black circle in text refers to the corresponding number in an accompanying figure.
Special type	Indicates a literal example of system output.
bold	Indicates a command format that you enter.
<i>italic type</i>	Indicates a variable for which you specify a value. Also used to emphasize complete titles of manuals.
Key	Indicates that you press the specified key. For example, Return means that you press the Return key.
Ctrl/x	Indicates that you hold down the Control key and then press the key specified by x.
Ethernet	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 (LANs).
Token Ring	Refers to the IEEE 802.5 standard.
Mb/s	Mb/s is an abbreviation for megabits per second.

Safety

Any warning or caution that appears in this manual is defined in English, German, French, and Spanish as follows:

WARNING	Contains information to prevent personal injury
VORSICHT	Enthält Informationen, die beachtet werden müssen, um den Benutzer vor Schaden zu bewahren.
DANGER	Signale les informations destinées à prévenir les accidents corporels.
AVISO	Contiene información para evitar daños personales

CAUTION	Contains information to prevent damage to equipment
ACHTUNG	Enthält Informationen, die beachtet werden müssen, um die Geräte vor Schaden zu bewahren
ATTENTION	Signale les informations destinées à prévenir la détérioration du matériel
PRECAUCION	Contiene información para evitar daños al equipo.

The pages where the following safety messages appear are also listed.

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.
VORSICHT	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.
DANGER	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.
AVISO	Éste es un producto de Clase A. En entornos domésticos, este producto puede causar radio–interferencias, en cuyo caso el usuario puede estar obligado a tomar las medidas adecuadas.

CAUTION

The total weight of a fully configured DEChub 900 MultiSwitch chassis with modules and cables is approximately 80 pounds. [Page 2–6]

This configuration is too heavy for an office wall partition. Be sure to install the chassis on a solid wall. [Page 2–6]

ACHTUNG

Das Gesamtgewicht einer vollständig konfigurierten Geräts vom Typ DEChub MultiSwitch beträgt etwa 36 kg.

Diese Konfiguration ist für Leichtbauwände zu schwer. Hängen Sie das Gerät nur an stabilen Wänden auf.

ATTENTION

La configuration totale d'un châssis DEChub 900 MultiSwitch, avec modules et câbles, pèse environ 36kg.

Ce poids étant trop élevé pour une cloison mobile, le châssis doit être installé contre un mur fixe.

PRECAUCION

El peso total des chasis de un DEChub 900 MultiSwitch plenamente configurado con módulos y cables es aproximadamente de 36 kilos.

Esta configuración es demasiado pesada para una mampara de oficina, por lo cual el chasis debe instalarse en una pared resistente.

WARNING

To avoid bodily injury or equipment damage, be sure to lock the power supply into place to prevent it from falling out. [Page 2–10]

VORSICHT

Zur Vorbeugung von Personen– oder Sachschäden muß das Netzteil korrekt befestigt werden, damit es nicht herausfällt.

DANGER

Pour éviter tout risque d'endommagement du matériel ou d'accident corporel, fixez correctement le bloc d'alimentation.

AVISO

Para evitar daños personales o al equipo, asegúrese de cerrar la fuente de alimentación en su lugar a fin de evitar su caída.

WARNING 	To avoid bodily injury or equipment damage, use care when connecting the power cord. [Page 2–10]
VORSICHT	Um mögliche Verletzungen oder Geräteschäden durch elektrischen Strom zu vermeiden, seien Sie besonders vorsichtig, wenn Sie das Netzkabel anschliessen.
DANGER	Lors de la connexion du cordon d'alimentation, prenez toutes les précautions nécessaires afin d'éviter tout risque corporel ou dommage matériel.
AVISO	Para evitar daños corporales o al equipo, póngase la debida atención al conectar el cable de alimentación.

WARNING 	Operational power supplies may be hot; use care when removing a power supply. [Page 2–12]
VORSICHT	Im Dauerbetrieb könnte das Netzteil sich erhitzen. Seien Sie deshalb vorsichtig, wenn Sie das Netzteil herausnehmen.
DANGER	Les blocs d'alimentation pouvant être très chauds, prenez toutes les précautions pour les retirer.
AVISO	Las fuentes de alimentación en funcionamiento pueden estar calientes, por lo que se deberán extremar los cuidados al retirarlas.

CAUTION 	This action deletes all configured settings and replaces them with factory default values. All configuration settings will be lost. [Page 3–12]
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.
PRECAUCION	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 to the unit to lose power during a downline upgrade. [Page 3–20]
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.
PRECAUCION	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.

Related Documentation

You can order the following documents from Digital:

Document Title	Description
<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 Installation and Configuration</i> AA-Q3S8A-TE	Provides information for installing and configuring HUBwatch for Open VMS V2.0 and HUBwatch for Windows V2.0.
<i>HUBwatch Use</i> AA-PW4BC-TE	Provides network management, and DEChub 900, DEChub 90, DEChub ONE functionality information for HUBwatch for Open VMS V3.0.
<i>HUBwatch for Windows Use</i> AA-Q3S3A-TE	Provides network management, and DEChub functionality information for HUBwatch for Windows V2.0.
<i>OPEN DECconnect Applications Guide</i> EC-G2570-42	Provides information to help plan and install networking systems based on Digital's OPEN DECconnect System and networking products.
<i>Using DECndu Plus (MS-DOS)</i> AA-PYVVA-TE	Provides instructions to upgrade the firmware in an MS-DOS environment of selected network devices using Digital's Network Device Upgrade (DECndu) Plus utility.
<i>Using DECndu Plus (ULTRIX RISC)</i> AA-PYVTA-TE	Provides instructions to upgrade the firmware in an ULTRIX RISC environment of selected network devices using Digital's Network Device Upgrade (DECndu) Plus utility.
<i>Using DECndu Plus (OpenVMS VAX)</i> AA-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.

Overview

This chapter describes the DEChub 900 MultiSwitch hub. It includes an overview of the features, and it describes the hub power system and backplane capabilities.

The DEChub 900 MultiSwitch hub complements Digital's DEChub 90 and DEChub ONE family of products. The DEChub 900 MultiSwitch hub uses advanced hub technology to provide complete backward compatibility with the DEChub 90 network modules.

The DEChub 900 MultiSwitch hub with either DEChub 90 or DEChub 900 MultiSwitch series network modules installed becomes an integral part of any distribution subsystem within a structured wiring environment.

This hub is a high density hub that is capable of supporting multiple network technologies. A flexible channel architecture is used to support Ethernet, Token Ring, and fiber distributed data interface (FDDI) technologies, as well as higher speed emerging technologies such as asynchronous transfer mode (ATM).

The DEChub 900 MultiSwitch uses industry standard Simple Network Management Protocol (SNMP) and a network management station (NMS) with native SNMP to manage the hub with in-band and out-of-band support.

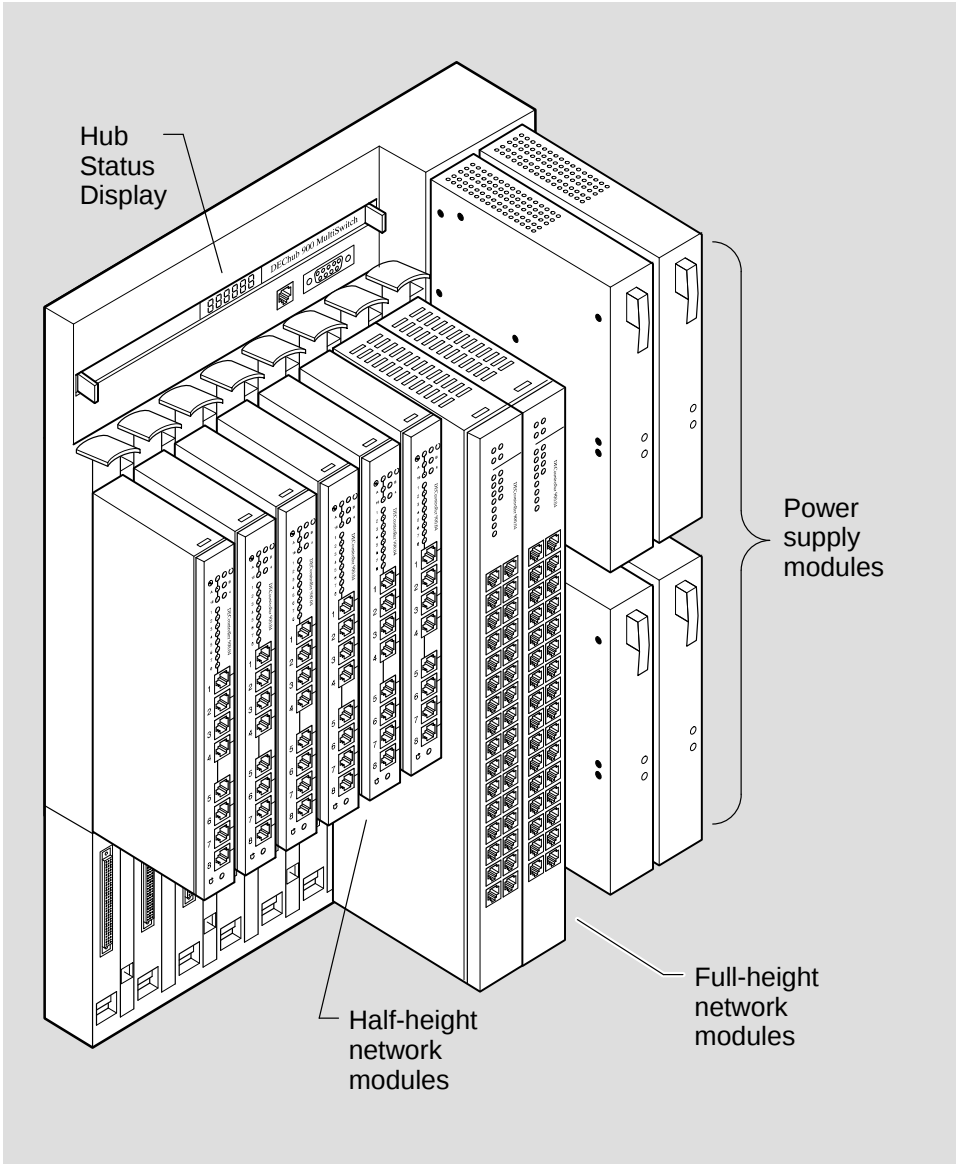
DEChub 900 MultiSwitch Hub Features

The DEChub 900 MultiSwitch (see Figure 1–1) has many advanced hub capabilities. The following list describes the DEChub 900 MultiSwitch hub features:

DEChub 900 MultiSwitch Hub Features

- Supports all the DEChub 90 series network modules
- Has no slot restrictions for any network module
- Allows for "hot swap" of power supply and network modules
- Uses Simple Network Management Protocol (SNMP)
- Provides a built-in hub management agent that includes:
 - Configuration and control of the hub and modules that are in the hub
 - Hub setup port
 - Hub out-of-band management (OBM) port
 - Hub Status Display
 - Chassis Management Information Base (MIB)
- Provides an auto-ranging redundant power system with support for external input of 48-volt backup power
- Provides a power management interface to each network module
- Provides a MultiSwitch backplane with flexible channel bandwidth allocation that includes:
 - Supports Token Ring, FDDI, and Ethernet technologies
 - Supports future technologies, such as ATM
 - A total bandwidth in excess of 3 gigabits per second
 - Dynamic reconfiguration of network modules

Figure 1–1: The DEChub 900 MultiSwitch Hub



LKG-8263-931

DEChub 900 MultiSwitch Hub Description

The DEChub 900 MultiSwitch hub implements a management architecture designed to manage multiple local area networks (LANs) using the Simple Network Management Protocol (SNMP) integrated into the chassis's Hub Manager.

The DEChub 900 MultiSwitch hub backplane (see Figure 1–2) contains two independent Token Ring channels, one dedicated Ethernet channel, and one flexible channel on the top row of connectors. The bottom row of connectors provides 14 flexible channels for full-height modules.

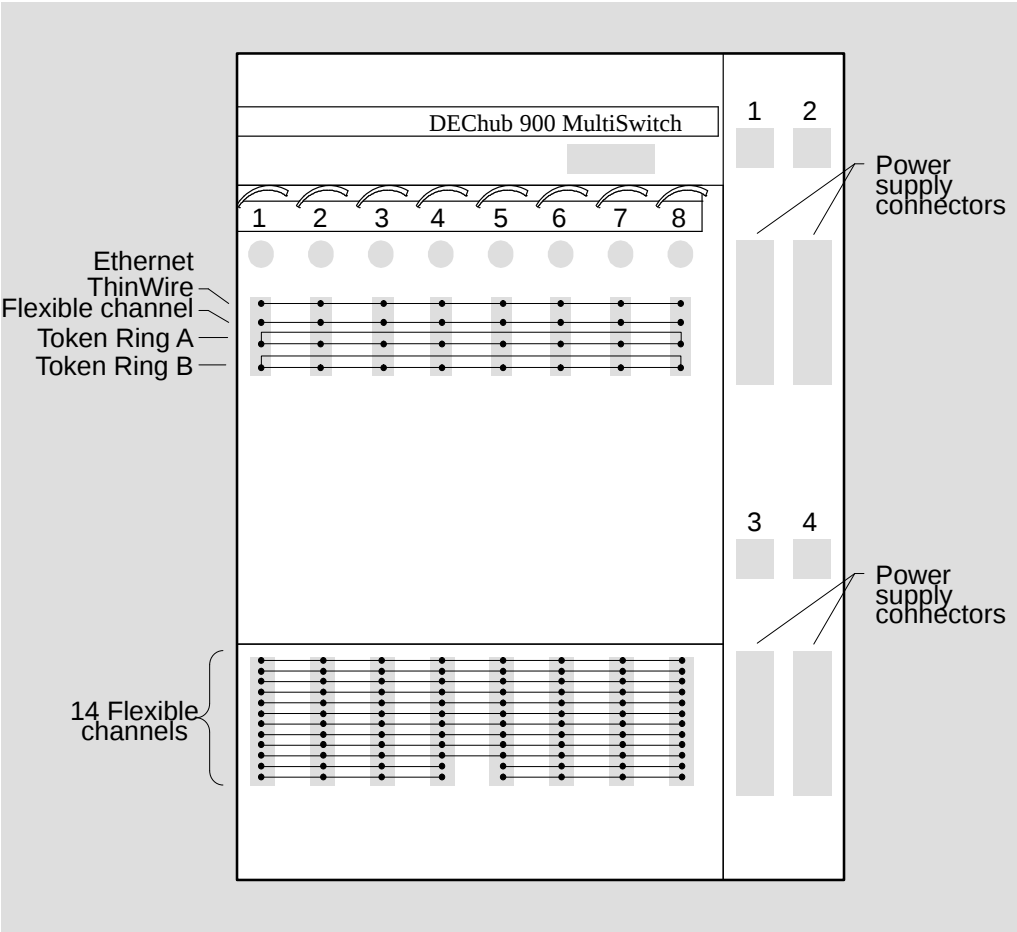
The multiple flexible channels can be used to create independent LAN segments within the hub. Using HUBwatch, network modules can be linked to LAN segments and to share data between them.

The use of the flexible channels on the chassis is dependent on the network modules installed in the hub. Specific implementations allow these channels to be used for FDDI, Ethernet, and Token Ring. The Hub Manager allocates these technology independent flexible channels to modules as needed, to provide for backplane interconnect needs. Channels may be supported as a bus for shared use (like Ethernet) or cascaded for LANs requiring ring-like implementations.

The chassis can be configured for up to eight network modules and four power supply modules. The network modules may be installed, in any combination, in slots 1 to 8. Figure 1–3 and the list that follows it show the MultiSwitch chassis and describe its components.

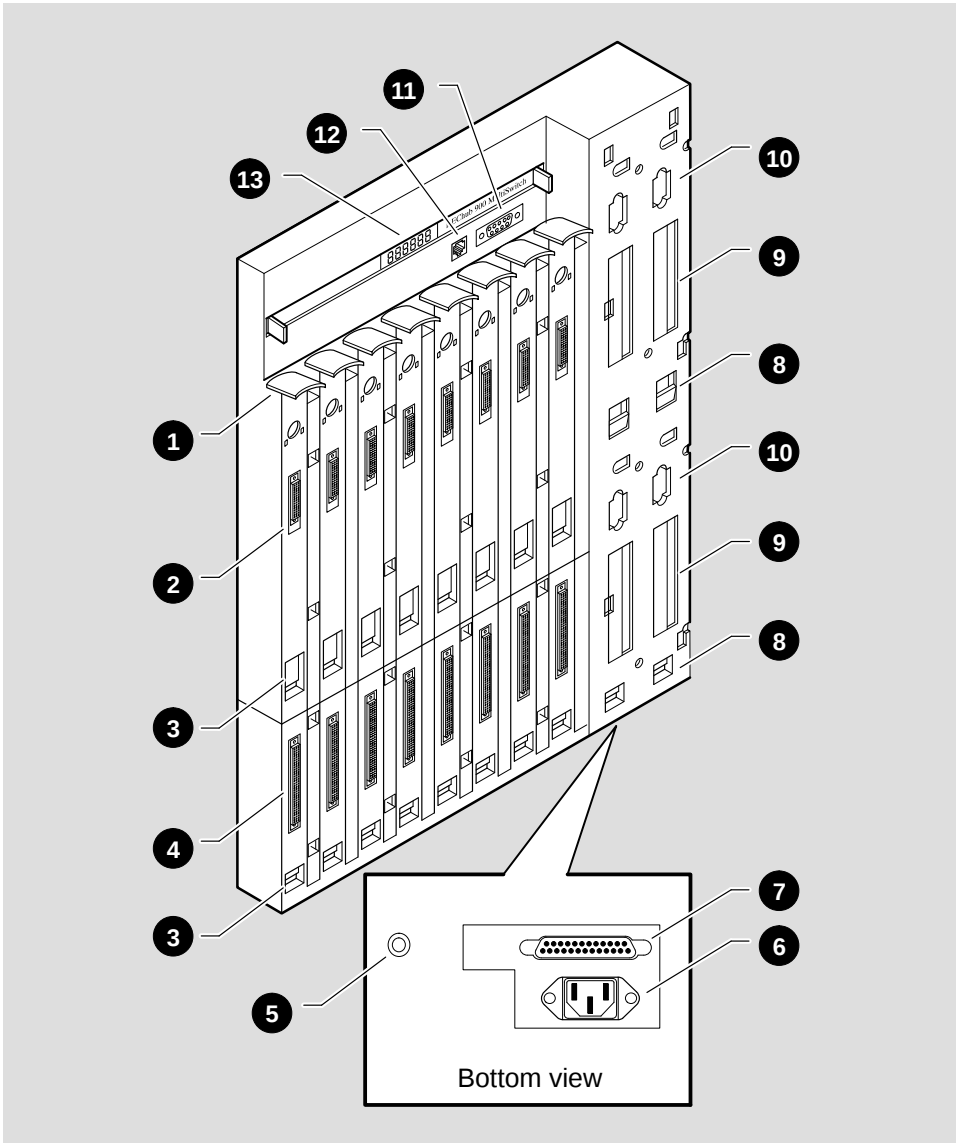
The chassis provides all the power and interconnect signals to each network module through a backplane connector. The network modules and power supply modules can be installed or swapped with the power on. This is referred to as a **hot swap**. Hot swapping allows for upgrades, modifications, or replacement of modules without interruption to other users on the hub.

Figure 1-2: Connector Backplane Data Path Interconnects



LKG-8310-93I

Figure 1-3: The DEChub 900 MultiSwitch Chassis



LKG-8264-931

- ❶ **Release lever** – Releases the backplane latching mechanism when removing and installing network modules.
- ❷ **Backplane connector** – Provides power, network connection, and management signals to network modules.
- ❸ **Module mounting slot** – Secures the lower mounting tab of a network module. The slots for modules are numbered 1 through 8 from left to right.
- ❹ **MultiSwitch connector** – Provides additional power for full-height network modules with power management. Also provides access to flexible channels, and connections between modules for control, data, and clock signals.
- ❺ **Battery backup disable switch** – With a battery backup installed, this switch allows a power system interruption when the ac power cord is removed.
- ❻ **AC connector** – Provides ac power to the power supply system.
- ❼ **External battery connector** – Provides external battery power to the hub (48 volts).
- ❽ **Power supply mounting slot** – Secures the lower mounting tab of the power supply. The power supply slots are numbered 1 through 4 from left to right and top to bottom.
- ❾ **Power supply connector** – Provides +5.0 volts and +15.0 volts power from the power supply to the backplane.
- ❿ **Power ac input connector** – Provides ac power to the power supply module.
- ⓫ **Hub out-of-band management (OBM) port** – Provides serial access to the Hub Manager over serial line internet protocol (SLIP). The hub OBM port provides modem control.
- ⓬ **Hub setup port** – Provides a local terminal access to the Hub Manager.
- ⓭ **Hub Status Display** – Provides self-test and operational status of the hub and modules within the hub.

Hub Power System Overview

The DEChub 900 MultiSwitch hub power system can:

- Power a fully-configured hub with power redundancy
- Monitor the power activity
- Calculate the power available to network modules
- Display the power status and available power
- Allocate power to network modules.

The power system consists of 1 to 4 power supply modules, and a Hub Manager that monitors and polls each power supply for identification and status.

The hub power system is designed to allow for the installation of incremental power supply modules as the hub system needs expand. Up to four power supply modules can be installed into the hub with all power supply modules sharing power delivery to the chassis and to the network modules on a common bus.

Fully configuring a DEChub 900 MultiSwitch with half-height network modules typically requires only a single power supply module. An additional power supply module provides power redundancy. You provide redundancy to the power system by adding an extra power supply module beyond what is needed to power the hub with installed network modules. For example, if a single power supply module provides enough power for the hub, and you add a second power supply module, then the hub has **redundant** (N+1) power. If either of the power supply modules fail, the hub continues to operate without interruption.

The Hub Manager monitors the power system for power supply modules that may have been inserted or removed from the hub. When changes are detected in the power system, the Hub Manager updates the amount of power available to the network modules, and determines if:

- The system is underpowered or adequately powered with all network modules powered up.
- The hub platform is configured as N+1 (or more) for redundant power system operation.

Power supply modules can be hot swapped while the DEChub 900 MultiSwitch hub is operating. This feature allows you to remove faulty power supply modules, add extra power supply modules, or move power supply modules to other slots without interrupting power or network modules.

If a power supply module fails or is removed from a hub that is not configured for N+1 redundancy, then the hub does not have sufficient power for operation. If this occurs, then the hub powers down as many full-height network modules as required to balance the demand for power and the load. Network modules are powered up from right (slot 8) to left (slot 1) and are powered down from left to right.

The Hub Manager monitors the power system and displays power system messages in the Hub Status Display. The Hub Manager power display messages that appear provide you with information on the power system status, and on the amount of power available in the hub. This information, in addition to the power needs of a network module (from the module label), lets you determine if enough power exists to install a network module in the hub.

At hub powerup, power is automatically supplied to the chassis, the Hub Manager, and all half-height network modules. Also at powerup, the Hub Manager calculates the total power available from the power system. If you install additional power supply modules in an operational hub, the Hub Manager recalculates the total power available.

You can install or remove network modules on an operational DEChub 900 MultiSwitch without having to power down the hub, and without disturbing other network modules or their configuration.

Refer to Chapter 5 for additional information on the hub power system.

Installing the Chassis and Power Supply Module

This chapter provides procedures for installing the DEChub 900 MultiSwitch chassis on a wall or in a rack and procedures for installing the power supply module. It also illustrates optional wall mounting kits available.

Before You Install the Chassis

Before you begin the installation, you should:

- Unpack the box, and check the contents.
- Gather the tools that you need to perform the installation.

Checking the Contents

Before you begin the installation, unpack the contents of the box and be sure that you have the parts listed in Table 2–1.

Table 2–1: DEChub 900 MultiSwitch Kit Content¹

Quantity	Item
1	DEChub 900 MultiSwitch chassis
1	Power supply module
1	ac power cord
2	Rack mount brackets (one left, one right)
1	H3108–CR cable ring bracket
10	#6–32 x 5/16-inch machine screws
8	#10–32 x 1/2-inch machine screws
8	#10–32 U-nuts
1	Wall mounting bracket
1	Wall mounting hanger
2	Rubber feet
9	#8 wood screws
4	#8–32 x 1/2-inch machine screws (used with DERMS–AA)
1	Cable, 8 MP to 6 MMP (BN24H)
1	Cable adapter, 6 MMJ to 25-pin D-Sub (H8575–A)
1	License, assembly kit
1	<i>DEChub 900 MultiSwitch Owner's Manual</i>

¹Appendix A lists the country specific kit variations and other related parts.

Gathering the Tools

Use the following tools to install the chassis:

- A Phillips screwdriver
- A drill with a 1/8-inch (3.1 mm) bit (for wall mount only)

You are now ready to install the chassis.

Installing the Chassis in a Rack

The DEChub 900 MultiSwitch chassis can be installed either in a 19-inch equipment rack or on a wall using the mounting bracket and hanger.

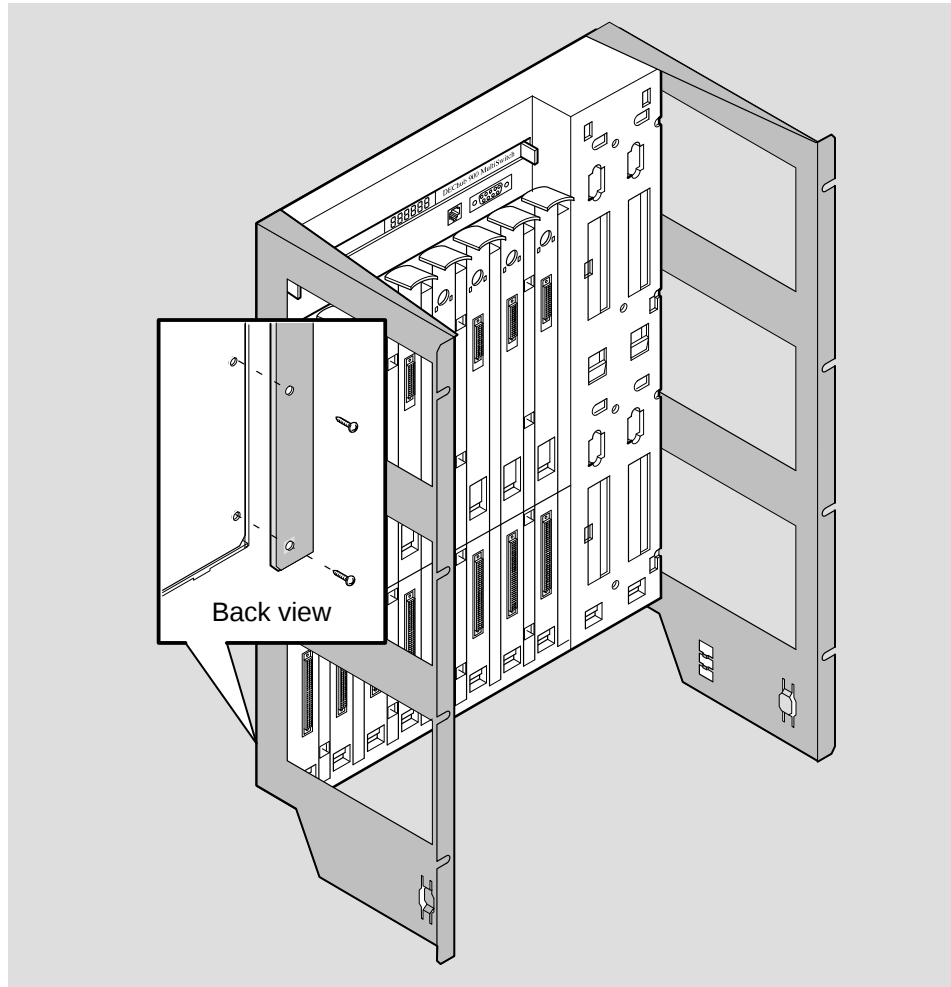
Rack mount brackets and mounting hardware, for installing the chassis into a standard RETMA 19-inch equipment rack, are supplied with the DEChub 900 MultiSwitch chassis (see Figure 2–1).

You can use the cable ring bracket supplied with your chassis to manage the cabling from the network modules (see Figure 2–2). This bracket accommodates eight cable rings. You can snap the cable rings into the holes in the bracket and then route cables through the rings.

Perform the following four steps to install the chassis in the equipment rack:

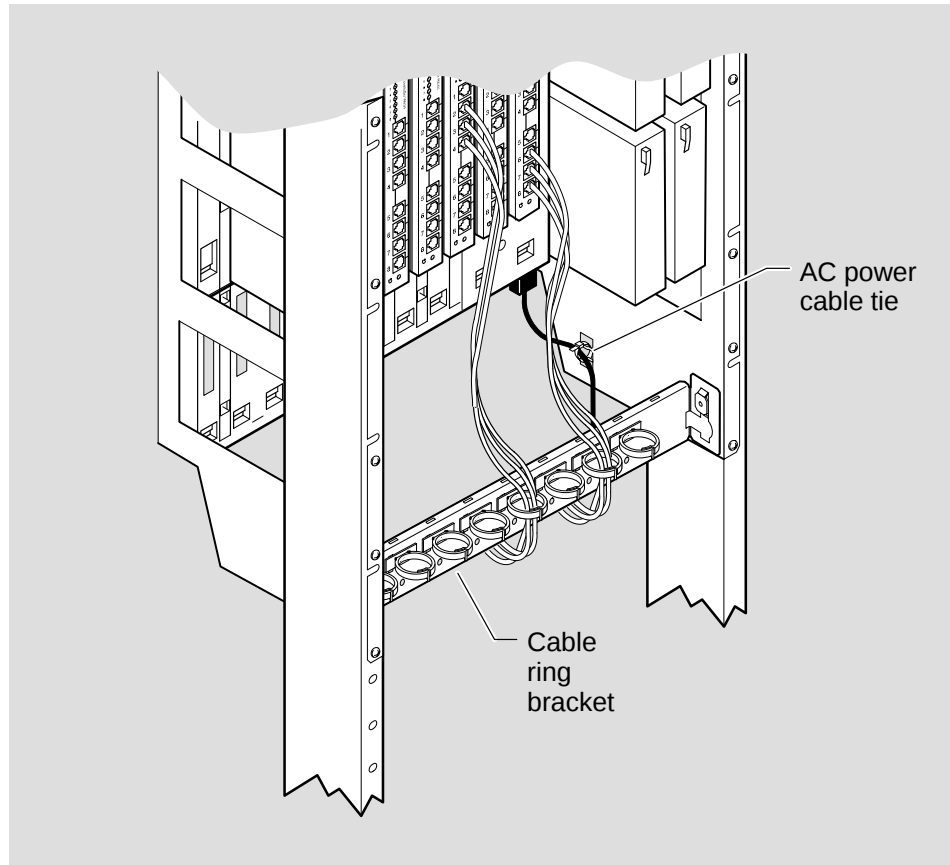
1. Locate the rack mount brackets and the ten #6–32 machine screws that are supplied with the chassis.
2. Attach the rack mount brackets, using the #6–32 screws, to the back of the chassis.
3. Install the chassis in the equipment rack using the eight #10–32 machine screws and U-nuts (if necessary).
4. Install the ac power cord into the ac connector at the bottom of the chassis.
5. Some rack mount bracket assemblies have a punchout on the right rack mount bracket, which is used to attach a cable tie. If your assembly has a punchout, secure the ac power cord to the punchout using a cable tie.

Figure 2–1: Attaching Rack Mount Brackets to the Chassis



LKG-9008-94I

Figure 2-2: Cable Ring Bracket on a 19-inch Rack



LKG-8987-941

Installing the Chassis on a Wall

The chassis can be mounted directly on a wall using the wall bracket and hanger mounting device.

CAUTION

The total weight of a fully configured DEChub 900 MultiSwitch chassis with network modules and cables is approximately 80 pounds (36 kg).

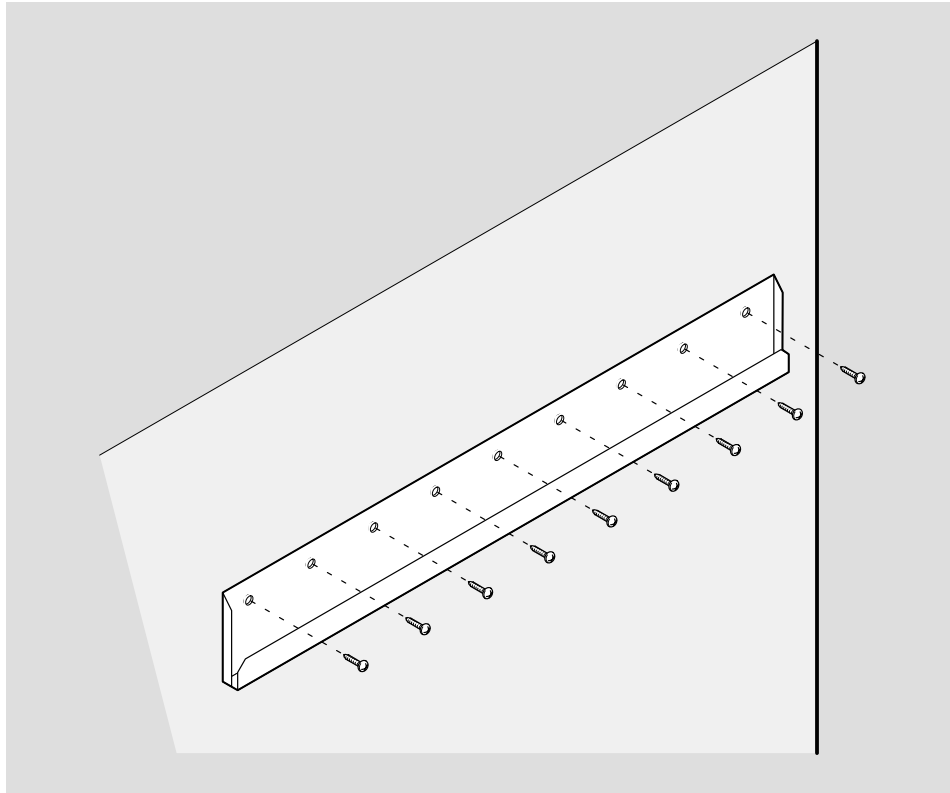
This configuration is too heavy for an office wall partition. Be sure to install the chassis on a wall that can support the weight.

Installing the Wall Mounting Bracket

Perform the following five steps to install the wall mounting bracket:

1. Mark the location for the nine #8 wood screws. Digital recommends that you place the screws so that the LED indicators on the network modules will be at eye level.
2. Using a 1/8-inch (3.1 mm) bit, drill pilot holes at the locations marked on the wall.
3. Place the mounting bracket over the drilled holes.
4. Screw two #8 wood screws into the pilot holes at each end of the mounting bracket until each head is approximately 1/8-inch from the surface of the mounting bracket.
5. Ensure that the mounting bracket is straight and level. Place screws in the remaining pilot holes and tighten the screws (see Figure 2–3).

Figure 2-3: Installing the Wall Mounting Bracket



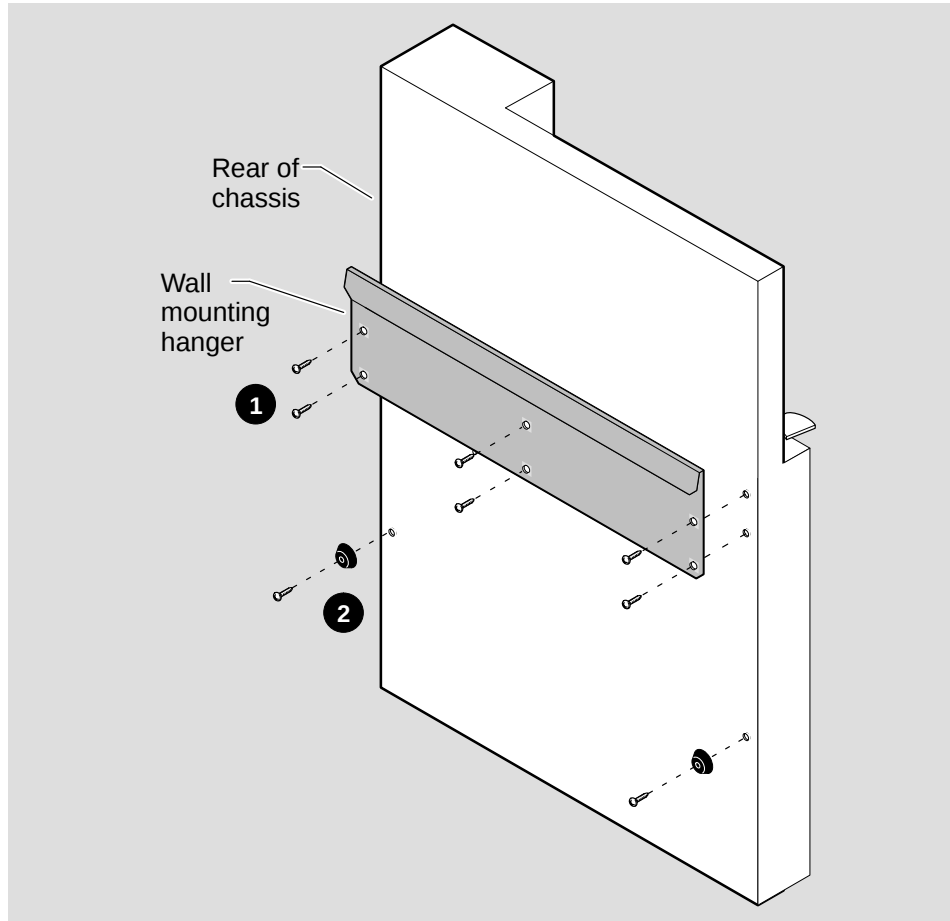
LKG-8266-931

Attaching the Mounting Hanger

Perform the following two steps to mount the hanger to the chassis (see Figure 2–4):

1. Attach the wall mounting hanger (1) to the back of the chassis using six #6–32 screws.
2. Attach the rubber feet (2) to the back of the chassis using two #6–32 screws.

Figure 2–4: Attaching the Mounting Hanger

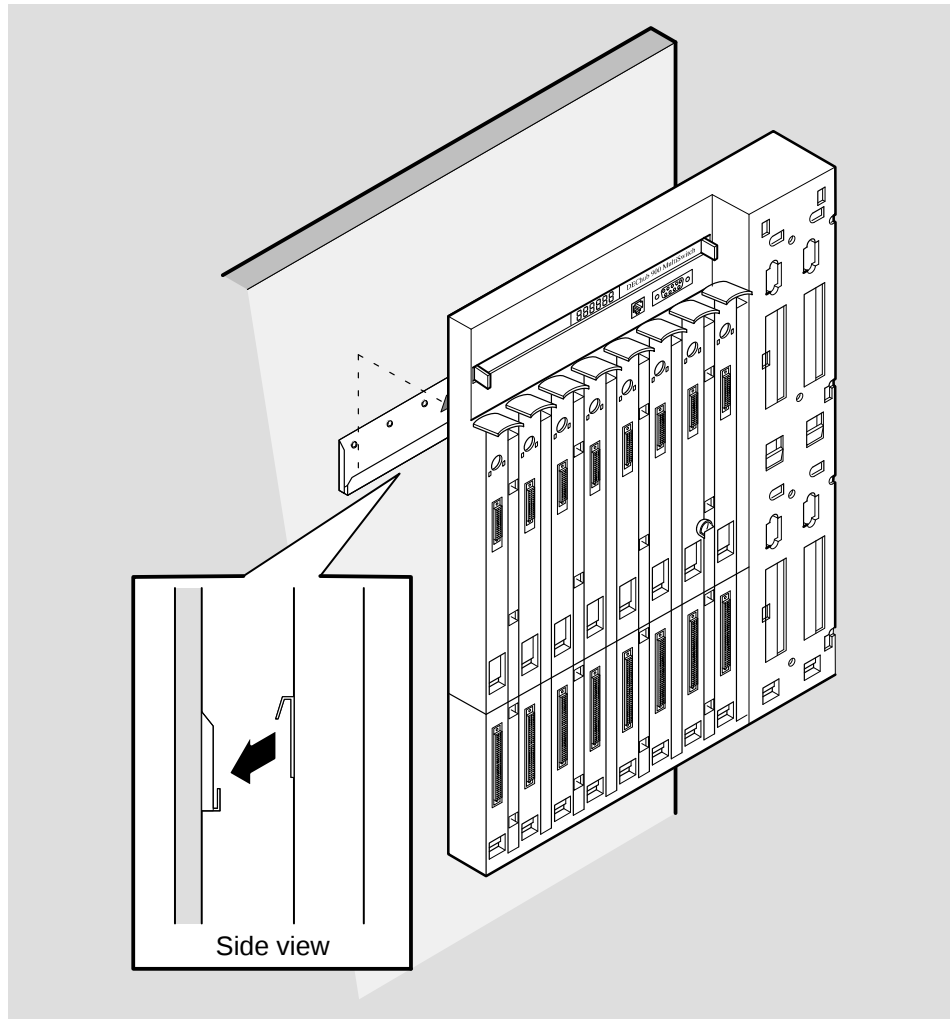


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Sliding the Chassis onto the Wall Mounting Bracket

To mount the chassis, slide the chassis onto the wall mounting bracket (see Figure 2–5).

Figure 2–5: Sliding the Chassis onto the Wall Mounting Bracket



LKG-8268-931

Installing and Removing a Power Supply Module

You can install a power supply module into any power supply slot. Perform the following three steps to install a power supply module (see Figure 2–6):

1. Ensure that the power supply locking mechanism is in the unlock position.
2. Place the mounting tab, which is located on the bottom of the power supply module, in the mounting slot of the chassis **1**
3. Align the power supply connector with the backplane connector and pivot the power supply module into place. Check the alignment of the power supply connector and backplane connector as the power supply module is pivoted into place. **2**

WARNING

To avoid bodily injury or equipment damage, be sure to lock the power supply module into place to prevent it from falling out.

4. Turn the mounting rod 90 degrees to the left (clockwise) to lock the power supply into place. **3**

You can install the ac power cord by performing the following three steps:

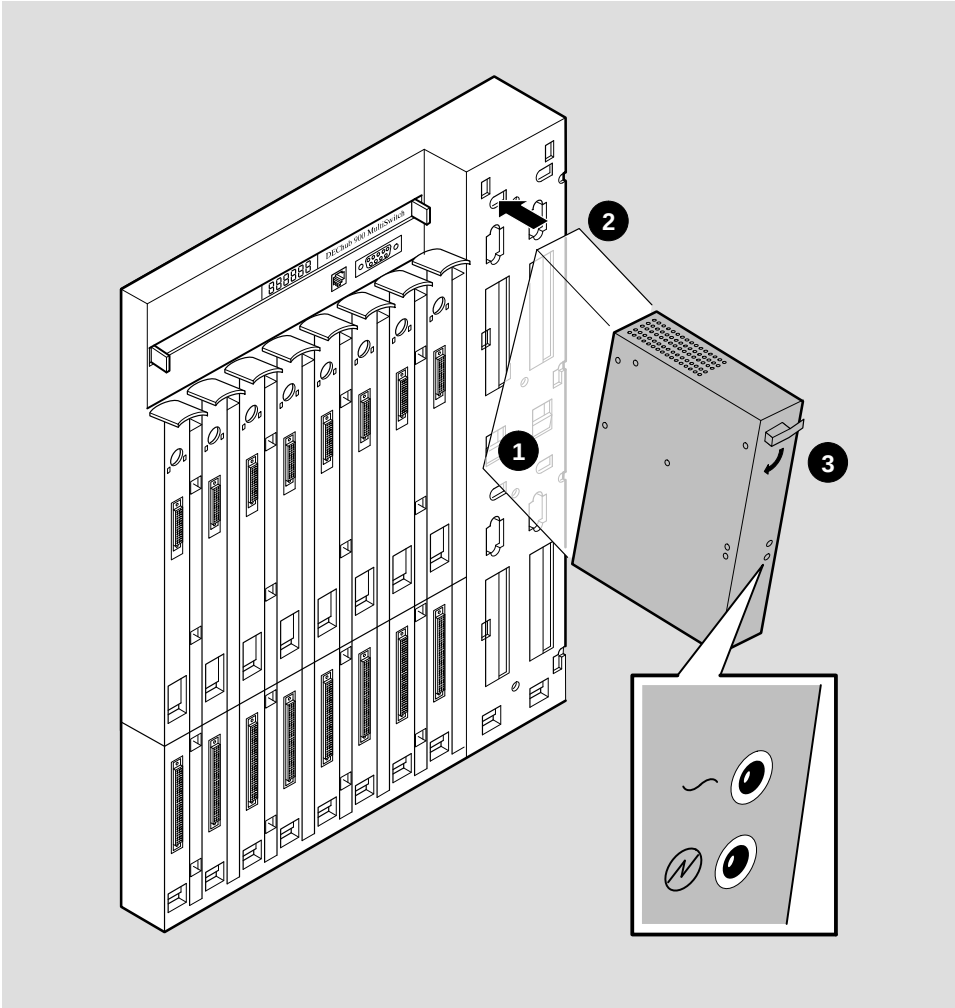
WARNING

To avoid bodily injury or equipment damage, use care when connecting the power cord.

1. Install the ac power cord into the ac connector at the bottom of the chassis.
2. Plug the ac power cord into a working ac outlet.
3. Verify that the two LEDs (AC OK  and DC OK ) on the power supply module turn on, and that the Hub Manager begins the self-test procedure.

The Hub Manager indicates the start of the self-tests by displaying various test numbers across the Hub Status Display. After the self-test procedure is complete, the Hub Manager begins normal operation.

Figure 2-6: Installing the Power Supply Module



LKG-8998-931

If you install any additional power supply modules to the DEChub 900 MultiSwitch once it is operational, you may observe a momentary flicker in the power supply LEDs each time a new power supply module is added. This is part of the normal installation power up sequence when adding additional power supply modules. This task does not cause a dc power interruption to the hub or the network modules.

You are now ready to install network modules into the chassis and make the necessary network connections. Refer to each network module's documentation for installation procedures.

Power supply modules can be removed while the hub is operational. To remove a power supply module, perform the following two steps:

WARNING

Operational power supply modules are heavy, and may be hot; use care when removing a power supply module.

1. Turn the locking mechanism 90 degrees to the right (counterclockwise) to unlock the power supply.
2. Remove the power supply module from the DEChub 900 MultiSwitch.

Resetting the Power System

The following sections describe how to reset the power system.

Resetting a Non-Battery Backup Power System

If you have a non-battery backup power system and you need to reset the entire hub and power system, cycle the power by removing the ac power cord.

Resetting a Battery Backup Power System

If you have a battery backup power system and you need to reset the entire hub and power system, cycle the power by removing the ac power cord and pressing the battery backup disable switch located near the ac connector. When the battery backup disable switch is pressed, the battery backup is disabled. With the ac power and battery removed, the system powers down and can only be restarted by plugging in the ac power cord.

Optional Mounting Methods

Digital offers optional mounting kits you can use to mount your hub. The following list contains kits you can purchase from Digital. Figure 2–7 shows a DEChub 900 Multi-Switch mounted on a DERMS–AA wall mount rail system, and Figure 2–8 shows a DEChub 900 MultiSwitch DERMS–DA cover.

- DERMS–AA wall mount rail system starter kit
- DERMS–DA cover
- H3108–CW cable ring bracket wall mount
- H3108–CS cable ring bracket

For ordering information and descriptions of these options, refer to the *OPEN DECconnect Applications Guide*, order number EC–G2570–42.

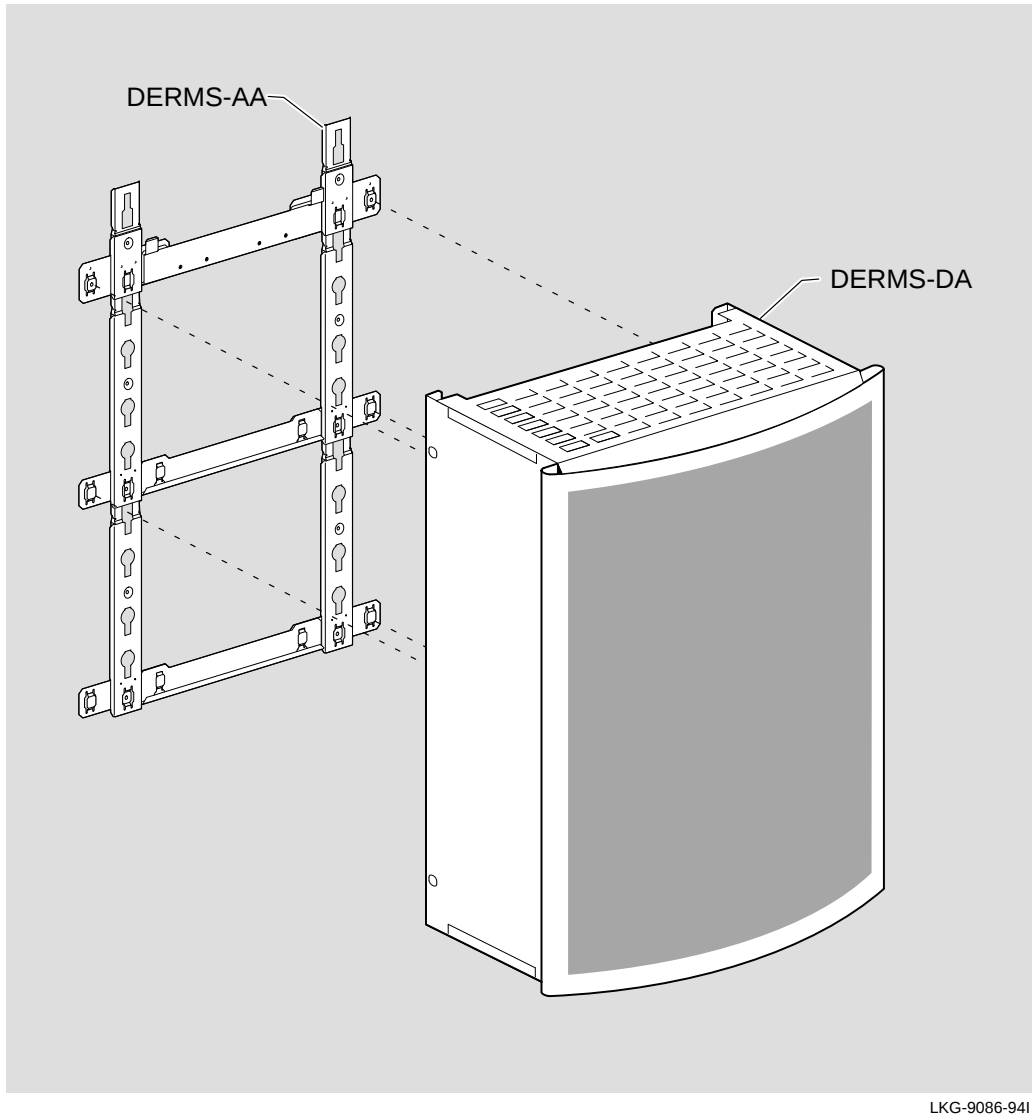
DERMS-AA

H3108-CW

H3108-CS

DEChub 900 MultiSwitch Owner's Manual

Figure 2-8: DEChub 900 MultiSwitch DERMS-DA Cover



Hub Manager

This chapter describes the features and functionality of the Hub Manager, including the setup port, the out-of-band management port, the Hub Status Display, and self-test procedures.

The Hub Manager is a replaceable microprocessor-based controller used to monitor, configure, and control the hub. It provides a central point for status and control for allocation of hub resources to hub-mounted network modules, either under remote management or local control.

Hub Manager Functions

The Hub Manager has the following functions:

- Provides a simple network management protocol (SNMP) agent that provides control and status information.
- Identifies installed network modules and available slot locations.
- Identifies media access control (MAC) and internet protocol (IP) addresses of network modules for direct in-band communication from the network management station.
- Provides power management.
- Provides status of network modules and power supply modules.
- Supports local status using a liquid crystal display (LCD).

- Supports the setup port redirection for network module initialization.
- Supports out-of-band management (OBM) for the hub and network modules.
- Supports dynamic reconfiguration of network modules and module interconnect for Ethernet, Token Ring, and FDDI across the DEChub 900 MultiSwitch backplane.

Hub Manager Ports

The Hub Manager provides two external ports: the hub setup port and the hub out-of-band management (OBM) port. Figure 3–1 illustrates the cabling for both the setup port, and the OBM port.

Hub Setup Port

The signals on the hub setup port (8-pin MJ) conform to the signaling standard EIA-232D. The port appears as a data terminal equipment (DTE) device. Devices that use the standard EIA-423 signaling are compatible with the hub setup port.

The setup port can be connected to a terminal device or a personal computer using various cables and adapters. Refer to Table 3–1 for your configuration.

Refer to Appendix B for information about signal connections. Refer to the Using the Hub Setup Port section in this chapter for information about configuring the hub.

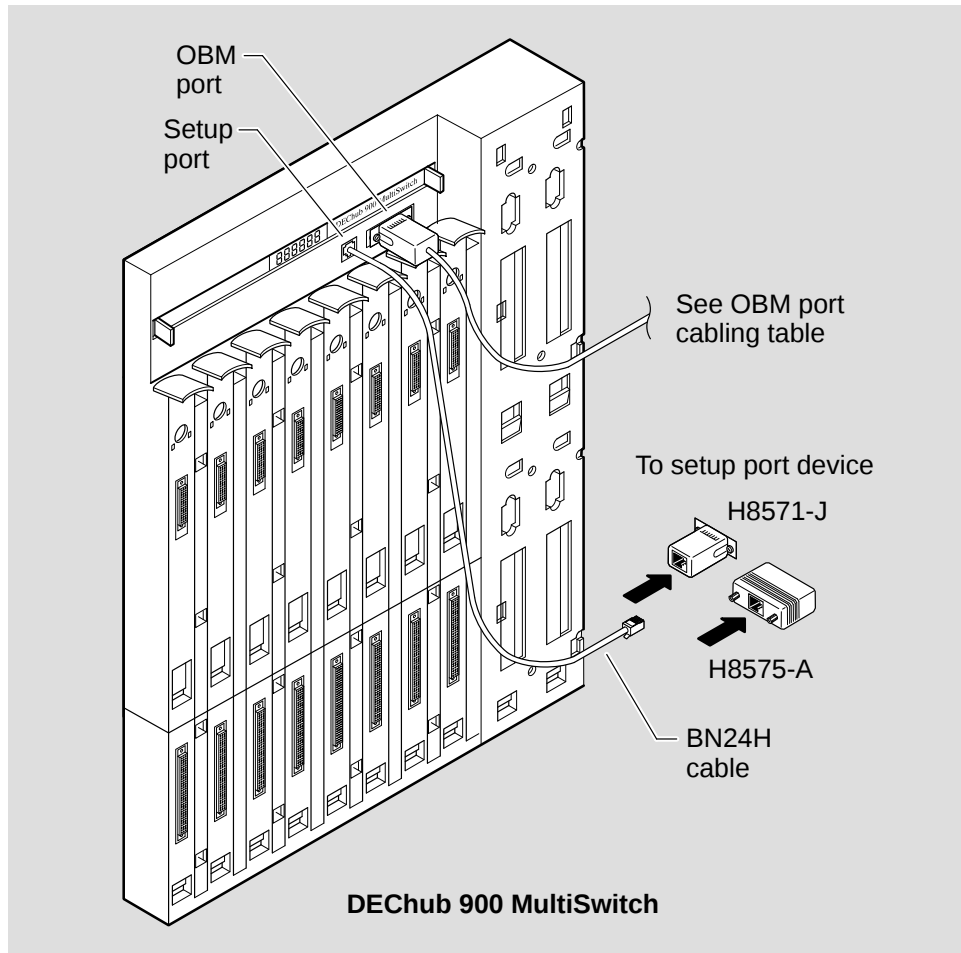
Table 3–1: Setup Port Cabling

Cable/Adapter Type	Connecting Device
BN24H–xx ¹	Terminal with a 6 MMJ connector
BN24H–xx ¹ /H8575–A	Terminal with 25-pin D-Sub connector
BN24H–xx ¹ /H8571–J ²	PC with 9-pin D-Sub communications port

¹ The xx represents the length in meters.

² Not included in the kit.

Figure 3–1: Setup Port and OBM Port Cabling



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Hub Out-of-Band Management (OBM) Port

The signals on the hub OBM port (DB-9) conform to standard EIA-574. Standard EIA-574 is based on standard EIA-232D, which uses a 9-pin connector instead of a 25-pin connector. This is the signaling standard used by most personal computers for their serial ports. The port appears as a data terminal equipment (DTE) device. The OBM port supports flow control for Request to Send (RTS) and Clear to Send (CTS) hardware communications. Refer to Appendix B for information about signal connections.

The OBM port can be connected to a terminal server, personal computer, or a modem using various cables and adapters. Refer to Table 3–2 for your configuration. Refer to Chapter 4 for additional information about OBM.

Table 3–2: OBM Port Cabling

Cable/Adapter Type	Connecting Device
BN24H-xx ¹ /H8571-J ²	DECserver 900TM, DECserver 90TL, or DECserver 90M with a 8 MJ connector
BC29Q-10 ²	PC with 9-pin D-Sub connector
BC29P-10 ²	Modem with 25-pin D-Sub connector

¹ The xx represents the length in meters.

² Not included in the kit.

Hub Status Display

The Hub Status Display is a 20-character by 2-line LCD display. The Hub Status Display continually displays new messages. However, if an **event** occurs, then the Hub Status Display pauses with an event notice message, such as when a module is installed or removed.

Table 3–3 lists the Hub Status Display messages, including event notices, and provides a description of each message.

Table 3–3: Hub Status Display Messages

Display Message	Description
Hub900MultiSwitch HW=<rev>, SW=<rev>	This message displays the DEChub 900 Multi-Switch product name and its current hardware and software revision level.
Out-of-Band IP:	This message displays the out-of-band IP address. The hub OBM IP address is blank until an address is assigned. Refer to Using the Hub Setup Port section to configure the hub OBM IP address.
In-Band IP:	This message displays the in-band IP address. The hub in-band IP address is blank until an address is assigned. Refer to Using the Hub Setup Port section to configure the hub in-band IP address.

(continued on next page)

Table 3–3: Hub Status Display Messages (Cont.)

Display Message	Description
1: <module name> <message> or 1:DECagent 90 Hub Master	This message displays the status of all the occupied slots in the hub, starting with slot 1. The display shows the slot number, the module's name, and one of three types of messages: a health string message, module status, or ! Not Enough Power ! message. If ! Not Enough Power ! is displayed, the module is not powered. Some DEChub 90 series module display messages may differ. If a DECagent 90 is installed and configured as the hub master, a hub master message appears. Refer to chapter 4 for additional information.
2 7 Available Slots or 2 7 !No More Power!	This message displays either the empty slots and an Available Slots message if sufficient power is available, or displays the empty slots and a !No More Power! message if there is insufficient power. In the first display message example, slots 2 and 7 are available and half-height modules can be added in these slots. Note, for full-height modules to be added in available slots, separate power calculations must be performed. In the second display message example, the current power supply modules cannot provide additional power to any available slots.

(continued on next page)

Table 3–3: Hub Status Display Messages (Cont.)

Display Message	Description
Power Status: No N+1 System Power: 15.0W or Power Status: N+1 System Power: 15.0W	This message displays either of two messages regarding the hub's power system status. In the first display message example, the status indicates power is okay, but redundant power (No N+1) is not available. In the second display message example, the status indicates redundant power (N+1) is available. In both examples, System Power: 15.0W refers to the power supplied to the hub chassis.
Available: xxx.x W 5V: xx.x A 15V: xx.x A	This message displays the total available power in watts (W), and the available current in amperes (A) for 5 volts and 15 volts.
Checking Power System Status	This message display only appears when a power supply module is installed or removed. Depending on the Hub Status Display message sequence, you may not see this message.

(continued on next page)

Table 3–3: Hub Status Display Messages (Cont.)

Display Message	Description
<sysName> <sysLocation>	This message display occurs only by setting MIB objects sysName and/or sysLocation. You can enter up to 80 characters for each of these MIB objects, but only the first 20 characters of each MIB object is displayed in the Hub Status Display. If set, these names are also displayed when you select the Show Current Setting option from the DECHub 900 MultiSwitch Installation Menu.
<Event Notices>	This message display occurs whenever the Hub Manager detects an important state change in the hub. If a state change occurs, a display message describing the event will immediately appear in the display. Event notice messages will be displayed longer than other Hub Status Display messages. Event messages are not queued and, therefore, when multiple events occur close in time, they may not all be displayed. Examples of events include: a module being inserted or removed, a change of module health text, or a change of module status.

Self-Test Procedure

As each Hub Manager self-test is executed, its test ID is written to the LCD. In the event of a failure, the word "Failed" appears on the display, and testing stops.

For example, if the Diagnostic Code CRC fails, then the following error message appears on the LCD display:

```
DEChub 900  V1.1.6  
0102      : Failed
```

The self-test procedure completes in about 15 seconds.

If a self-test error occurs and is displayed on the Hub Status Display, you should record the failure code number and the version number. Once the error information is recorded, either contact your Digital service representative, or refer to the *DEChub 900 MultiSwitch Hub Manager Installation* for removal and replacement procedures.

Using the Hub Setup Port

The hub setup port allows you to set parameters when the hub is initially installed. Once the hub is configured, you can perform routine network management tasks over the network and the setup port is no longer needed.

The hub setup port supports three modes:

- Installation Menu
- Redirect
- Event Display

These modes assume only ANSI/ASCII or PC-based terminal interface. Cursor control, screen management escape sequences, or flow control are not supported. The setup console may be attached to any ASCII device, including hardcopy terminals and printers.

Connecting a Terminal to the Hub Setup Port

To connect a terminal to the hub setup port, ensure that the terminal setup parameters shown in Table 3–4 are in effect:

Table 3–4: Terminal Setup Parameters

Parameter	Setting
Transmit speed	9600 baud
Character format	8 bits, no parity
Stop bits	1

Hub Setup Port Menu

When the hub setup port is in default mode, the Hub Installation menu appears:

NOTE

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

```
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 : [nn] 

Enter your selection here  
and then press Return.


```

You can exit from any of the menu options and return to the Hub Installation menu by pressing on the setup port device.

Hub Setup Port Menu Options

[1] Reset with Factory Defaults

Reset with factory defaults option boots the DEChub 900 MultiSwitch Hub Manager, initiating self-tests causing its configured NVRAM parameters to be initialized to factory default values. All local nonvolatile settings except the Hub Serial Number, will be lost.

CAUTION

This action deletes all configuration 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
DEChub 900 MultiSwitch
=====
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] :  Y 
Using factory settings. Waiting for reset ...
```

[2] Reset with Current Settings

Reset with current settings option boots the DEChub 900 MultiSwitch Hub Manager, but leaves the hub'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**):

```
=====
                                Enter selection : 2
DEChub 900 MultiSwitch
=====
                                RESET WITH CURRENT SETTINGS
                                This selection will reset your system with the current
                                configuration settings.
=====

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

Selecting **Y** initiates self-test. At the completion of self-test, the Hub Status Display displays the following message:

Selftest Complete
Start Main Firmware

Within a few seconds, the DEChub 900 MultiSwitch installation menu appears on your setup port screen.

[3] Show Current Settings

Show current settings option shows you the current settings of the Hub Manager. If the DEChub 900 MultiSwitch is being configured for the first time, some fields will be blank. HUBwatch or SNMP can be used to set or modify these values.

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

```
=====
                                Enter selection : 3
DEChub 900 MultiSwitch
=====

DEChub900MultiSwitch,DEChub 900 MultiSwitch,HW=F,R0=V1.1.6,SW=V3.0.0
SysUpTime                      : 11 days 18:52:25 100 resets
SNMP Read/Write Community      : public
SNMP Trap Addresses            : Not Configured
Status of last Downline Upgrade : 00:40:39 27 resets
                                Load Successful

In-Band Interface status       : Active
In-Band Interface IP Address   : 16.20.155 Slot number : 7
Out-of-Band (OBM) Interface IP Address : 16.20.156
Out-of-Band (OBM) Management Port Speed : 9600
Hub Name                       :
Hub Serial Number              :
Hub Location                   :
=====

                                Press Return for Main Menu ...
```

[4] Set SNMP Read/Write Community

Set SNMP read/write community option prompts you to enter the community name. The community name consists of 4 to 31 printable ASCII characters that describe the relationship between the SNMP agent and one or more SNMP managers. This defines the authentication mechanism employed to validate use of the community by the sending SNMP entity.

The factory default of this menu option sets the read/write community name to public.

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

```
=====
Enter selection : 4
DEChub 900 MultiSwitch
=====

SET SNMP READ/WRITE COMMUNITY

Format:  The format for a community name is a string,
         consisting of 4 to 31 printable ASCII characters,
         that describes the relationship between an SNMP
         agent and one or more SNMP managers. The string
         defines the authentication mechanism that is employed
         to validate the use of the community by the sending
         SNMP entity.

=====

Enter the community string [public] : public 
SNMP Read/Write community string set.
Press Return for Main Menu ...



Enter a read/write community
    name, then press Return.


```

[5] Add SNMP Trap Addresses

Add SNMP trap addresses option prompts you to enter IP addresses to which SNMP traps will be sent from the DEChub 900 MultiSwitch.

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 factory default of this menu option deletes all SNMP trap addresses.

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

```
=====
                                Enter selection : 5
DEChub 900 MultiSwitch
=====

                                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 '.' character.

                                example: 16.20.40.156

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

=====

Trap address [ ] : 16.20.40.157 
Trap address added! Add another? [none] : 
Press Return for Main Menu ...

                                Enter a trap address, then
                                press Return.
```

[6] Delete SNMP Trap Addresses

Delete SNMP trap addresses option prompts you to select SNMP trap addresses and delete it from the community trap address table.

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

```
=====
                                Enter selection : 6
DEChub 900 MultiSwitch
=====

                                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 '.' character.

                                example: 16.20.40.156

=====

Configured SNMP Trap Addresses: 16.20.40.156

                                Trap address [ ] : 16.20.40.156 
Trap address deleted. Delete another? [none] : 
                                Press Return for Main Menu ...

                                Enter the trap address to
                                delete, then press Return.
```

[7] Dump Error Log

Dump error log option displays error log dumps for use by Digital support personnel when analyzing system faults. Up to six error log messages can be stored and the most recent message is displayed first.

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

```
=====
Enter selection : 7
DEChub 900 MultiSwitch
=====
DUMP ERROR LOG
Current reset count: 115
=====

Entry      = 49
Time Stamp= 0 0
Reset Count      = 102
Catch V0  = 07C  SR=2000  PC=422540

Dump another entry [Y]/N? Return

Entry      = 48
Time Stamp= 0 0
Reset Count      = 98
Stop Thrash Cleared Non-Volatile Data

Dump another entry [Y]/N? Return
=====

No more Error Log entries.
Press Return for Main Menu ...
```

[8] Set In-Band Interface IP Address

Set in-band interface IP address option prompts you for an IP address in the standard 4-octet dotted decimal notation, in which each octet of the address is represented as a decimal value, separated by a decimal point (.). If an IP address was previously configured, an in-band IP address will be displayed. To remove an IP address, enter Y when this option prompts you to delete your current configuration.

The factory default of this menu option deletes the in-band IP address.

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

```
=====
                                Enter selection : 8
DEChub 900 MultiSwitch
=====

                                IP ADDRESS CONFIGURATION

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

         example: 16.20.40.156

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

=====

Enter the IP address for In-Band Management : 16.20.54.155 [Return]
Slot number for In-Band Management (1-8) : 7 [Return]

    Configuring IP address for In-Band Management...
    Check 'Show current settings' from main menu for status.
    Press Return for Main Menu ...

The slot you select must contain
a network module that supports
IP services. Refer to Chapter 4
for a list of IP services modules.

Enter the hub's IP address,
then press Return.
```

[9] Downline Upgrade

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

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

`mam_dh900.bin` and `16.20.54.155`

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

CAUTION

If power is interrupted while a downline load is in progress, 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 while a downline upgrade is in progress.

NOTE

The downline upgrade process normally runs for approximately 4 minutes to completion. However, the entire process could take as long as **10** minutes to complete when network traffic is extreme.

The following description takes you through the downline upgrade procedure and explains the events that occur within each selection. A full screen example of the setup screen display follows the 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 device is not interrupted during the downline load.

[9] Downline Upgrade (Cont.)

```
=====
Enter selection : 9
DEChub 900 MultiSwitch
=====

          DOWNLINE UPGRADE

This process upgrades the specified 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...
```

[9] Downline Upgrade (Cont.)

The following events occur after you: (1) select the option, (2) enter the slot number to be upgraded, enter the load file name, and enter the load host IP address, and (3) press Return when prompted. Below is an example of the setup port screen display dialog using a network module with IP services in Hub slot 8.

When both in-band and out-of-band IP addresses are assigned, two network interfaces are available to choose from.

When the downline upgrade firmware reads more than one IP address (therefore more than one network interface), it prompts you to choose a network interface to use for the load request.

After you press Return, the setup screen displays the following:

```
Load will be initiated over Hub Slot 8 network interface.  
Would you like to use a different interface? Y/[N]:
```

If you choose 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 Return initiates the load over the in-band network interface.

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

Interface	Description
-----	-----
1	OBM Port
9	Hub Slot 8

Enter the network interface to be used [9]:

[9] Downline Upgrade (Cont.)

Select the desired network interface, 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 initiates the load over the selected network interface.

After you initiate the process, the setup port screen displays the following message followed by a series of dots (.....), indicating the downline upgrade is in progress:

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

During this time, the Hub Status Display displays the following (example) message:

```
Loading SW from
IP: 16.20.40.155
```

When the TFTP load transfer is complete, and the TFTP image is verified, the device becomes nonfunctional and the flash load process begins. (The flash load process can take up to 4 minutes to complete.)

Note that if you are initiating the load process to a network module, 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. As a result, the Hub Status Display displays the following message:

```
4: <module>
unknown
```

This is normal. The flash load is in progress and takes up to 10 minutes to complete. **Do not** interrupt power to the module while the downline load is in progress.

[9] Downline Upgrade (Cont.)

When the TFTP load transfer is complete, the Hub Manager verifies the TFTP image. During this time, the Hub Status Display displays the following message:

```
SW Loaded,  
Checking Image . . .
```

After the Hub Manager verifies the image, it writes it into flash memory. During this time, the Hub Status Display displays the following message:

```
Image OK,  
Writing Image . . .
```

After the Hub Manager stores the image into flash memory, it boots the new image. During this time, the Hub Status Display displays the following message:

```
Image Stored.  
Booting New Image.
```

After the Hub Manager completes booting the new image, it may need to reset the configuration settings. During this time, the Hub Status Display displays the following message:

```
Software Upgraded,  
Configuration Reset.
```

After the Hub Manager resets the configuration, it initiates self-test. When self-test completes it starts the main firmware. During this time, the Hub Status Display displays the following message:

```
Selftest Complete  
Start Main Firmware
```

After the Hub Manager starts the main firmware, the setup port screen displays the DEChub 900 MultiSwitch installation menu, confirming the downline load is complete.

[9] Downline Upgrade (Cont.)

The following setup port screen is an example of the dialog you see when you upgrade the Hub Manager using a network module with IP services in Hub slot 8.

```
=====
Enter the slot to be upgraded [9] (Hub Manager) : 
Enter the load filename [ ] : filename.ext 
Enter the Load Host IP address [ ] : 16.20.40.155 

    Load will be initiated over Hub Slot 8 network interface.

Would you like to use a different network interface Y/[N] :  

    Interface Description
    -----
    1          OBM Port
    9          Hub Slot 8

Enter the network interface to be used [9] : 

    The module 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] ...

DLU process started!
.....

Transfer complete.
```

This screen dialog appears only when you select **Y** to use a different network interface.

If you are upgrading a network module, enter its slot number, then press Return.

Select **Y** if you want to use the OBM port, then press Return.

[10] Set Out-of-Band Interface IP Address

Set out-of-band interface IP address option prompts you for an IP address in the standard 4-octet dotted decimal notation, in which each octet of the address is represented as a decimal value, separated by a decimal point (.). If an IP address was previously configured, an out-of-band IP address will be displayed. To remove an OBM IP address, enter 0.0.0.0 in the appropriate address field.

The OBM feature allows you to manage your DEChub 900 MultiSwitch through the OBM port as an alternative to normal in-band management. To enable out-of-band management, you need to assign an OBM IP address and select an OBM port speed from the DEChub 900 MultiSwitch Installation Menu.

The factory default of this menu option deletes out-of-band IP address.

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

```
=====
Enter selection : 10
DEChub 900 MultiSwitch
=====

IP ADDRESS CONFIGURATION

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

         example: 16.20.40.156

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

=====
IP address [ ] : 16.20.54.156 
IP Address set.
Press Return for Main Menu ...



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


```

[11] Set Out-of-Band Interface Port Speed

Set out-of-band interface port speed 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 factory default of this menu option sets the out-of-band port speed to 9600.

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

```
=====
Enter selection : 11
DEChub 900 MultiSwitch
=====
SET OUT-OF-BAND MANAGEMENT INTERFACE PORT SPEED
[1] 1200 baud
[2] 2400 baud
[3} 9600 baud
[4} 19200 baud
[5} 38400 baud
=====
Enter selection [3] (9600) :3 Return
OBM port speed set.
Press Return for Main Menu ...
```

[12] Start Event Display Mode

Start event display mode allows you to display events as they occur in the DEChub 900 MultiSwitch and displayed by the Hub Manager.

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

```
=====
Enter selection : 12

Press any key to start event log [CTRL/C to abort] ...

4: Querying
Status : Module Inserted

4: DECmau 900TL
>> Description: 8 Port 100-ohm TR MAU, HW=A01,R0=1.0.,SW=1.0
Health-Text:
Status      :

4: DECmau 900TL
Description: 8 Port 100-ohm TR MAU, HW=A01,R0=1.0.,SW=1.0
Health-Text:
>> Status    : up

6: Querying
Status : Module Inserted

6: Unknown
Status : Module Removed

4: DECmau 900TL
Status : Module Removed
```

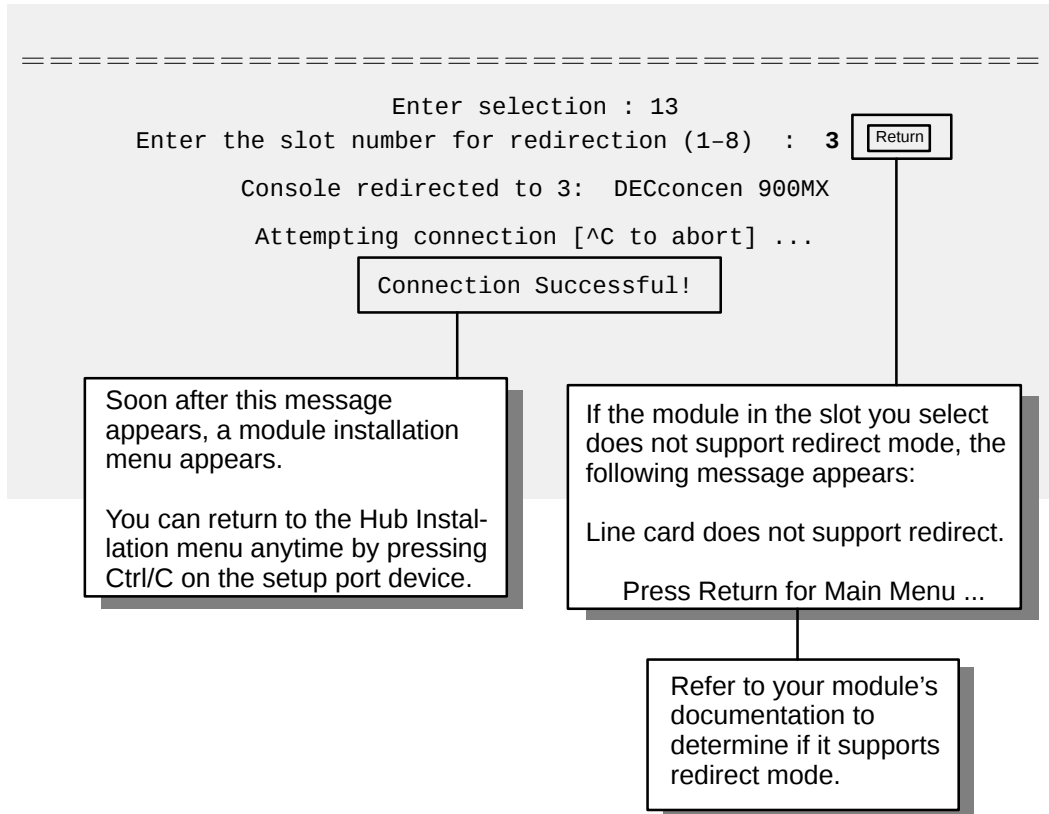
The >> indicates a change in status.

You can return to the Hub Installation menu by pressing Ctrl/C on the setup port device.

[13] Start Redirect Mode

Start redirect mode allows you to redirect the setup port input and output to the setup port of a network module that is installed in the hub. This mode lets you configure or obtain status of the network module in the slot number that you select.

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



Network Management

This chapter describes how to manage the DEChub 900 MultiSwitch and the network modules installed in your DEChub 900 MultiSwitch by using in-band management and Out-of-Band (OBM) management.

Managing Network Modules In-Band

You can manage both 900-series and 90-series modules in-band with the DEChub 900 MultiSwitch. In-band management is generally performed with the HUBwatch network management application; however, 900-series and 90-series modules can be managed in-band through other network management stations that support Simple Network Management Protocol (SNMP). You can manage modules in-band and out-of-band concurrently by assigning your hub IP address for in-band and out-of-band access. There are three methods for managing network modules in-band:

- **Using the in-band IP address of the Hub Manager.** This is the preferred method for managing hubs.
- **Using the out-of-band IP address of the Hub Manager.** This is the method for managing hubs using the Hub Manager's out-of-band port with an associated IP address.
- **Using the IP address of the DECagent 90.** This method is available for migrating your existing DEChub 90 environment to the DEChub 900 MultiSwitch chassis.

Using the In-Band IP Address of the Hub Manager

The Hub Manager does not have an in-band connection for communicating over all network types to a network management system. Instead, you use a network module that supports IP services as the primary path for in-band management.

The following is a list of common network modules that support IP services, refer to your module's documentation to determine if it provides this capability:

- DECrepeater 900TM
- DECrepeater 900GM
- DECrepeater 900FP
- DECrepeater 90FS
- DECrepeater 90TS
- DECconcentrator 900MX
- DECbridge 900MX
- DECbridge 900MP

To establish IP services for the Hub Manager, install a module that provides IP services into a slot of the DEChub 900 MultiSwitch chassis. The Hub Manager uses this module to communicate with the network management station (NMS). The combination of the IP address and slot location establish the primary path for in-band management. If you move the module to another slot, you must reconfigure the hub to utilize the new slot.

When a network module occupies a hub slot designated as the IP services slot, and that module is replaced (hot-swapped) with another IP services-type module, delete the address resolution protocol (ARP) cache from the NMS. Otherwise, it could take up to 45 minutes for the ARP cache to age out, depending on your system.

The DECagent 90 proxy agent is still required for some 90-series devices that do not support the SNMP protocol, for example, the DECbridge 90, the DECbridge 90FL, the DECserver 90L, and the DECserver 90L+. All DECreepeater 90 products; however, can be managed by the Hub Manager using the IETF repeater MIB. The DECagent 90 does not have to be installed into the same hub it manages, it can be located anywhere on the same extended LAN and manage 90-series devices.

Using the Out-of-Band IP Address of the Hub Manager

You can manage network modules in-band by using the Hub Manager's out-of-band IP address and a terminal server that supports SLIP, or with a device that supports routing IP packets from its Ethernet interface using SLIP on an asynchronous port. If you have a DECserver 900TM, DECserver 90TL, or a DECserver 90M installed in your hub, you can establish a SLIP connection between one of the terminal server ports and the Hub Manager OBM port.

Using the IP Address of the DECagent 90

With this management method, you manage the 90-series modules exactly as you do in the DEChub 90. However, they can take advantage of DEChub 900 MultiSwitch features such as redundant power and Hub Status Display messages. 900-series modules installed in a hub using this management method must be configured and managed as standalone units, and cannot use backplane flexible channels.

When you install a DECagent 90 in a DEChub 900 MultiSwitch and the DECagent 90 is managing the hub, the Hub Manager's in-band and out-of-band IP address must not be configured.

Managing Network Modules Out-of-Band

You manage the DEChub 900 MultiSwitch, 900-series and 90-series network modules with out-of-band management (OBM) through the OBM port.

This method is identical to in-band management, except that you assign an OBM IP address and an OBM port speed from the setup port Hub Installation menu. The IP address and the port speed at each end of the communications link must be identical. If you want to switch from managing your DEChub 900 MultiSwitch and network modules in-band to managing it out-of-band, change the IP address for the Hub Manager in HUBwatch from its in-band IP address to its out-of-band IP address.

The OBM port allows you to manage network modules with a computer and a network management application capable of sending SNMP commands over a Serial Line Internet Protocol (SLIP) using a modem, or a direct connection to the OBM port. If your network management application supports Ping echo, you can use it to verify the SLIP connection.

You can also manage the hub and network modules by using a terminal server that supports SLIP, or with a device that supports routing IP packets from its Ethernet interface using SLIP on an asynchronous port. If you have a DECserver 900TM, DECserver 90TL, or a DECserver 90M configured as a standalone device, you can establish a SLIP connection between one of the terminal server ports and the Hub Manager OBM port.

Refer to your terminal server documentation for instructions on setting up SLIP connections, and to Table 3–2 for cable and adapter information.

Hub Power System

The following sections describe the hub power system's functionality. It also describes installing and removing power supply modules, and guidelines for calculating power needs.

Redundant Power

In certain configurations, the hub may need one, two or three power supply modules to provide power to all the network modules. The addition of an extra power supply module allows for the failure of *any* one of these power supply modules. Adding an extra power supply module to allow for the failure of any one of the power supply modules, and continually providing sufficient power to all network modules, is referred to as an N+1 power system.

You can add extra power supply modules beyond N+1, and these will share in delivering power to the power system and will also provide the power supply system with additional backup capability.

The Hub Manager allocates a maximum of 420 watts of power to the backplane when four power supplies are installed so that the fourth power supply can always provide redundant power.

Guidelines for Calculating Power Needs

The DEChub 900 MultiSwitch power supply module is an output load sharing type power supply rated at 140 watts. Note that the sum of the combined 5-volt and 15-volt power outputs exceeds the 140-watt power rating. This power difference gives the 140-watt power supply the flexibility of supplying the desired 5-volt and 15-volt power demands to variety of hub configurations.

Table 5–1 lists the power consumption of each component of the DEChub 900 Multi-Switch. An example of calculating exact hub power needs is shown in Table 5–2.

Table 5–1: DEChub 900 MultiSwitch System Power

Component	+5 V	+15 V	Total Power
Power supply			
– Each power supply module	26.0 A	4.0 A	140.0 watts
– Maximum usable power	78.0 A	12.0 A	420.0 watts
Chassis	3.0 A	0.0 A	15.0 watts
Half-height modules, no AUI			
– general power guideline	1.5 A	0.0 A	7.5 watts
Half-height modules with AUI			
– general power guideline	1.5 A	0.5 A	15.0 watts
DECserver 900TM	4.0 A	0.5 A	27.5 watts
DECrepeater 900TM	4.0 A	0.5 A	27.5 watts
DECrepeater 900GM	4.0 A	1.0 A	35.0 watts
DECrepeater 900FP	8.0 A	0.5 A	47.5 watts
DECrepeater 90TS	1.5 A	0.0 A	7.5 watts
DECrepeater 90FS	1.5 A	0.5 A	15.0 watts
DECconcentrator 900MX	7.0 A	0.5 A	42.5 watts
DECbridge 900MX	9.0 A	1.5 A	67.5 watts
DECbridge 900MP	8.0 A	1.5 A	62.5 watts

When many modules requiring high power, such as the DECbridge 900MX, are configured in a hub, the total power required for these modules can consume the maximum usable power, thus leaving slots without power. However, these configurations are not common.

In the example below, a DEChub 900 MultiSwitch is configured with two 32-port repeaters, one fiber-optic repeater, two DEChub 90-type modules, and one multiport bridge. With this configuration, you need three power supply modules for an N+1 power system, or only two power supply modules if you do not require N+1.

Table 5–2: Power Example

Component	+5 V	+15 V	Total Power
Chassis	3.0 A	0.0 A	15.0 watts
DECbridge 900MX	9.0 A	1.5 A	67.5 watts
DECrepeater 900TM	4.0 A	0.5A	27.5 watts
DECrepeater 900TM	4.0 A	0.5A	27.5 watts
DECrepeater 900FP	8.0 A	0.5 A	47.5 watts
DEChub 90 module ¹ , without AUI (general power guideline)	1.5 A	0.0 A	7.5 watts
DEChub 90 module ¹ , with AUI (general power guideline)	1.5 A	0.5 A	15.0 watts
Total Power Consumption	31.0 A	3.5 A	207.5 watts

¹ DEChub 90 network modules report their actual power requirements.

NOTE

Refer to each module’s product documentation for power specifications. Variations of the modules may have changes to the actual power needs.

The total power needed for the hub as configured should be calculated, then enough power supply modules obtained to meet the power needs.

Power System Monitoring

The DEChub 900 MultiSwitch hub power system is monitored by the Hub Manager. When changes are detected in the hub power system, the Hub Manager updates the amount of power available to the network modules. An increase in available power can result in the powering up of previously unpowered network modules. A decrease in available power may result in powering down full-height network modules to keep the power system within its operating limits.

Half-height network modules are immediately powered up when inserted into the hub. This allows for forward compatibility for all DEChub 90 network modules, and provides exact DEChub 90 operation in the DEChub 900 MultiSwitch hub.

Hub Status Display Power Messages

The Hub Manager monitors the power system and displays four types of power system messages in the Hub Status Display. These messages let you know the current power status, whether or not you have N+1 redundancy, and how much power is available to allocate to additional network modules.

In addition to the four power system messages, a power-related message may appear during the "Available Slots" Hub Status Display time. This message displays either the status of all the available slots in the hub, or a "No More Power!" message. In most situations, when the "No More Power!" message is displayed, the current power supply(s) cannot provide power to any empty slots without interrupting other slots. Refer to Table 3–3 for a full description of Hub Status Display messages.

Power Allocation

The power system allocates power to the chassis and the network modules on a priority basis. The order of priority is:

- The chassis, including the Hub Manager, receives 15 watts of power.
- All half-height network modules installed in the chassis receive power immediately at power up.
- Available power is allocated to full-height modules from right (slot 8) to left (slot 1).

Newly installed half-height network modules receive power immediately. If there is not sufficient available power for a newly installed half-height network module, then a full-height module that is currently powered in the lowest slot number will be disabled so power can be supplied to the newly inserted half-height module.

Newly installed full-height network modules receive power only after the Hub Manager determines how much power is needed and that there is sufficient available power. If there is not sufficient available power for all full-height network modules power is allocated from right (slot 8) to left (slot 1).

Installing and Removing Network Modules

It is important to understand how power is allocated by the Hub Manager and what functions network modules have. All half-height modules power up *immediately*. This ensures backwards compatibility with existing DEChub 90 modules.

After a half-height module powers up, the Hub Manager queries the module for its exact type, and adjusts the power consumption, if necessary. This power will also be subtracted from the total power available.

Also note that many of the DEChub 90 module labels list the power at the maximum voltage of 5.1 volts. Refer to each module's documentation for actual power consumption. In the DEChub 900 MultiSwitch, all 12-volt power is created separately for each slot from the 15-volt distribution bus. This allows redundancy for the 12-volt power on a per-slot basis. Power calculations for the 12-volt current assume an equal current load on the 15-volt supply bus and all 12-volt power is allocated from the 15-volt power system.

When a half-height module is added to the hub and not enough power is available, a full-height module with power control may be powered down to provide power for the half-height module.

You can determine if the hub has enough power for a new module by:

- Reading the power requirements label on the module or module documentation.
- Reading the Hub Status Display to determine that the required power is available.
- Comparing the module's 5-volt, 15-volt, and Total Power (Watts) values with the Hub Status Display Available power values and ensuring all three power values are met.

Power supply modules may be added to provide power as needed for any configuration.

When you install half-height modules in a hub, the Hub Manager automatically deducts 7.5 watts of power from the available power. Once the module's self-test is complete, the Hub Manager recognizes the module's identity. This includes its actual power consumption, and may recalculate the available power, thus reflecting the module's actual power needs.

When a module is removed from an operational hub, the Hub Manager will display an event notification on the Hub Status Display, and the *available* power will be updated (increased) by the amount of power that was consumed by the module that was removed.

Any module that does not pass self-test procedures should be removed from the hub.

Problem Solving

This chapter provides problem solving information for the DEChub 900 MultiSwitch hub and its power system.

Use Table 6–1 as a guide to determine the probable cause and the suggested solution to problems that you may encounter.

Table 6–1: Problem Solving the DEChub 900 MultiSwitch

Symptom	Probable Cause	Corrective Action
The two LEDs on the power supply module are off.	The hub is not receiving proper power.	Check the ac power connection and verify that the ac outlet is working. Check the ac power connector (see Figure 1–3). Check the power connection to the hub. If the problem still exists, replace the power supply module.
Either of the two power supply LEDs is off.	The power supply is faulty.	Replace the power supply.
The backlighting on the Hub Status Display is not illuminated.	The Hub Manager is not receiving power.	Remove the front cover and check that the cables are attached and seated to the connectors.

Table 6–1: Problem Solving the DEChub 900 MultiSwitch (Cont.)

Symptom	Probable Cause	Corrective Action
The Hub Manager fails the self-test.	The self-test diagnostics have uncovered a hardware failure.	Power cycle the hub to see if the diagnostic failure clears. The Hub Manager or the backplane is faulty. Contact your Digital service representative to correct the problem.
There is no response on the hub setup port.	The terminal device is connected incorrectly.	Check that the correct cable and adapter are used. If not, connect the correct cable and/or adapter.
	The port and the terminal baud rates are not compatible.	Change the terminal characteristics to match the settings in Table 3–4.
	The terminal flow control is disabled by XOFF.	Use the terminal's setup to clear communications.
	The setup port is redirected, or in event display mode.	Press (Ctrl/C).
The modules do not connect to the backplane connector.	The pins on the module connector might be bent.	Gently straighten the pins.

Order Numbers and Specifications

This appendix lists the country-specific DEChub 900 MultiSwitch order numbers and related parts. It also lists hub specifications.

Country-Specific Order Numbers

Table A–1 lists the country-specific DEChub 900 MultiSwitch order numbers.

Table A–1: DEChub 900 MultiSwitch Order Numbers

Country	Order Number
United States	DMHUB–AA
Denmark	DMHUB–AD
United Kingdom	DMHUB–AE
Italy	DMHUB–AI
Switzerland	DMHUB–AK
Israel	DMHUB–AT
Austria	DMHUB–AX
Central Europe	DMHUB–AZ
India	DMHUB–BJ

Related Parts

Table A–2 lists the related parts for the DEChub 900 MultiSwitch hub.

Table A–2: Related Parts

Part	Order Number
Hub setup port connection to MMJ devices (VT420, DECserver 90L+)	BN24H–xx ¹
Hub setup port connection to MJ8 devices (DECserver 90TL)	BN24F–xx ¹
Hub OBM to MMJ adapter	H8571–J
Power supply	H7890–MA

¹ The xx represents the length in meters.

Specifications

This section describes the mechanical, electrical, and acoustic specifications for the DEChub 900 MultiSwitch hub.

Mechanical Specifications

Table A–3 through Table A–7 list the mechanical specifications for the DEChub 900 MultiSwitch hub and related components.

Table A–3: Chassis Specifications

Specification	Value
Height	57.8 cm (22.75 in)
Width	44.5 cm (17.5 in)
Depth, chassis only	5.1 cm (2.0 in)
Depth, power supply module only	21.6 cm (8.5 in)
Depth, full-height network module only	15.2 cm (6.0 in)
Depth, half-height network module only	11.2 cm (4.4 in)

Table A-4: Component Weight Specifications

Component	Weight
Chassis with rack/wall mounting brackets	12.1 kg (27 lb)
Power supply	2.25 kg (5 lb)
Half-height network module	0.68 kg (1.5 lb) typical
Full-height network module	1.8 kg (4.0 lb) typical

Table A-5: Rack Mount Option Dimension Specifications

Specification	Mounting Area
Height	57.8 cm (22.75 in)
Width	45.0 cm (17.71 in)
Depth	31.8 cm (12.5 in)

Table A-6: Rack Mount Option Clearance Specifications

Specification	Required Clearances
Top	None
Bottom	7.7 cm (3 in) ¹
Sides (beyond rack)	None
Rear (behind rack)	None
Front (in front of rack)	As required for attached cabling

¹ Required only with rack mount brackets not extending 3 inches below the chassis.

Table A-7: Wall Mount Option Specifications

Part	Specification	Value
Mounting Area	Height	57.8 cm (22.75 in)
	Width	44.5 cm (17.5 in)
Required Clearances	Top	7.7 cm (3 in)
	Bottom	7.7 cm (3 in)
	Sides	2.54 cm (1 in)
	Depth from wall	31.8 cm (12.5 in)

Electrical Specifications

Table A-8 provides the electrical specifications for the DEChub 900 MultiSwitch hub.

Table A-8: Electrical Specifications

Specification	Value
Input voltage	88 to 264 volts auto-ranging ac input
Line frequency	50 to 60 Hz
Input current	Less than 10 amperes
Maximum heat dissipation	730W
Maximum input power consumption	1000VA

Environmental Specifications

Table A-9 provides the electrical specifications for the DEChub 900 MultiSwitch hub.

Table A-9: Environmental Specifications

Parameter	DEChub 900 MultiSwitch
Operating Temperature ¹	5° C to 40° C (41° F to 104° F)
Relative Humidity	10% to 95% noncondensing
Altitude	Sea level to 4900 m (16,000 ft)

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.

Acoustic Specifications

Table A–10 and Table A–11 lists the preliminary declared acoustic values per ISO 9296 and ISO 7779, for the DEChub 900 MultiSwitch hub.

Table A–10: Acoustical Specifications – English

Acoustics: Declared values per ISO 9296 and ISO 7779¹

Product	Idle/Operate	
	Sound Power Level	Sound Pressure Level
	L _{WAd} , B	L _{pAm} , dBA
DMHUB–MB + H7890–MA	5.2	38
DMHUB–MB + 2 x H7890–MA	5.5	41
DMHUB–MB + 3 x H7890–MA	6.2	48
DMHUB–MB + 4 x H7890–MA	6.5	51
DMHUB–MB	No acoustic noise	No acoustic noise

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

NOTE

Values for half- or full-height network modules are in each module's installation documentation.

Table A-11: Acoustical Specifications – German

Schallemissionswerte: Werteangaben nach ISO 9296 und ISO 7779/DIN EN27779¹

Produkt	Leerlauf/Betrieb	
	Schalleistungspegel	Schalldruckpegel
	L_{WAd} , B	L_{pAm} , dBA
DMHUB-MB + H7890-MA	5.2	38
DMHUB-MB + 2 x H7890-MA	5.5	41
DMHUB-MB + 3 x H7890-MA	6.2	48
DMHUB-MB + 4 x H7890-MA	6.5	51
DMHUB-MB	keine meßbaren Schallemissionen	keine meßbaren Schallemissionen

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

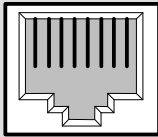
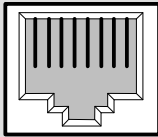
Hinweis

Werte für halb- und vollhohe Netzwerkkarten sind in den Installationshinweisen der entsprechenden Karten zu finden.

Connector, Cable and Adapter Pin Assignments

This appendix lists the connector, adapter, and cable pin assignments for the DEChub 900 MultiSwitch. Figure B–1 illustrates the Hub Manager setup port connector pin and signal assignment. Figure B–2 illustrates the Hub Manager OBM port connector pin and signal assignment. Figure B–3 through Figure B–5 illustrate the cable pin assignments for the cables associated with the setup port and the OBM port. Figure B–6 and Figure B–7 illustrate adapters associated with the Hub Manager.

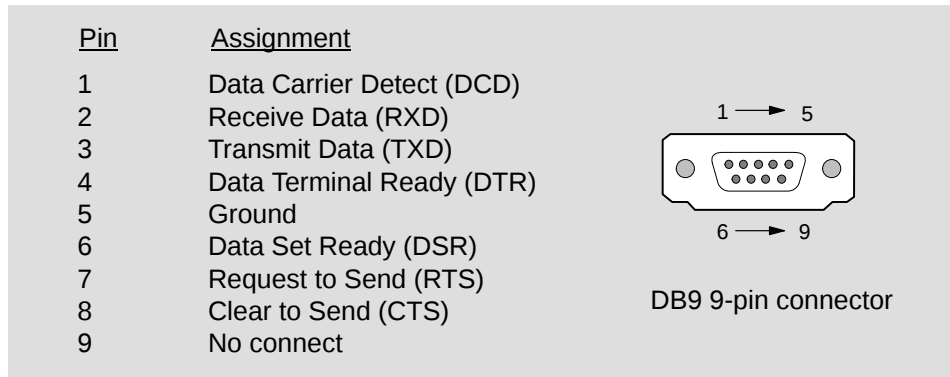
Figure B–1: Setup Port (8 MJ) Connector Pin Assignments

<u>Pin</u>	<u>Assignment</u>	
1	No connect	
2	Receive (RX)	
3	Ground	
4	No connect	
5	No connect	
6	Transmit (TX)	
7	Ready-Out or DTR ¹	
8	Ready-In or DSR ²	

¹ This signal is tied to Vcc through a 150-ohm resistor.
² This signal is tied to ground through a 3K-ohm resistor.

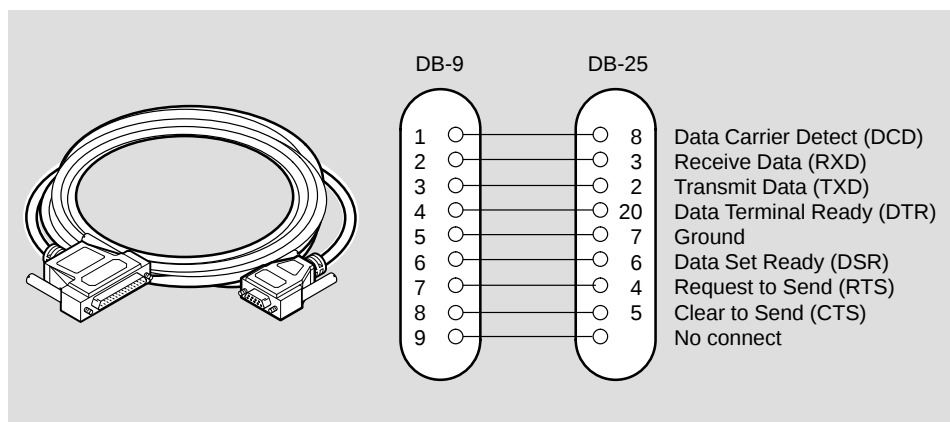
LKG-8995-931

Figure B-2: OBM Port (DB-9) Connector Pin Assignments



LKG-8996-93I

Figure B-3: BC29P Cable Pin Assignments



LKG-8989-94I

Figure B-4: BC29Q Cable Pin Assignments

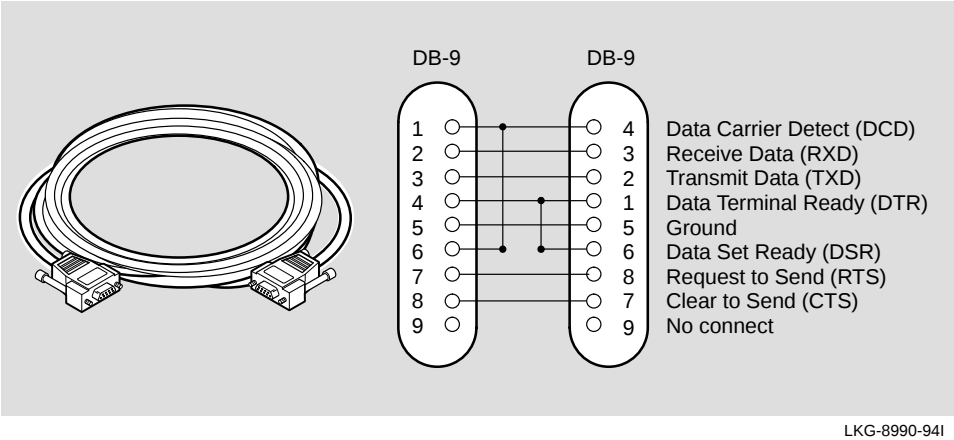


Figure B-5: BN24H Cable Pin Assignments

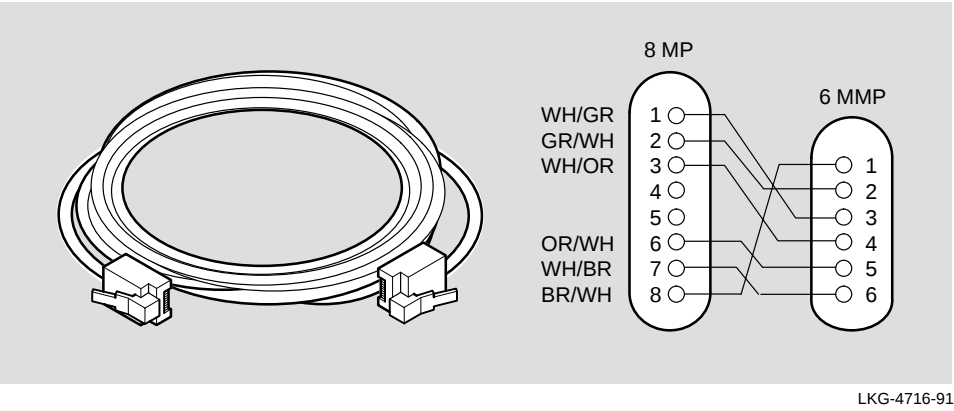
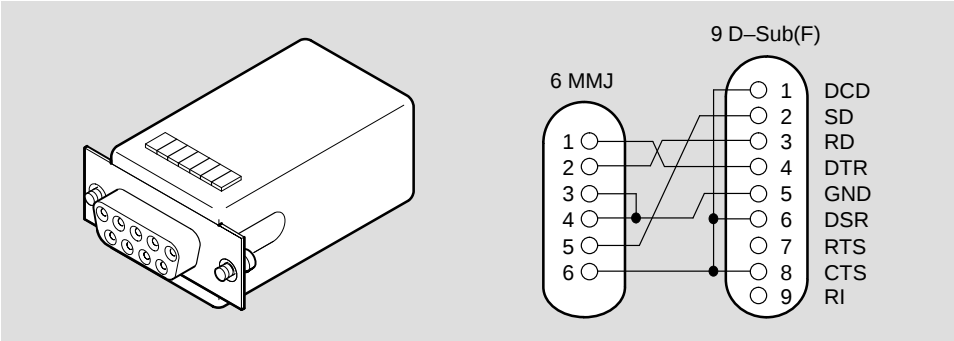
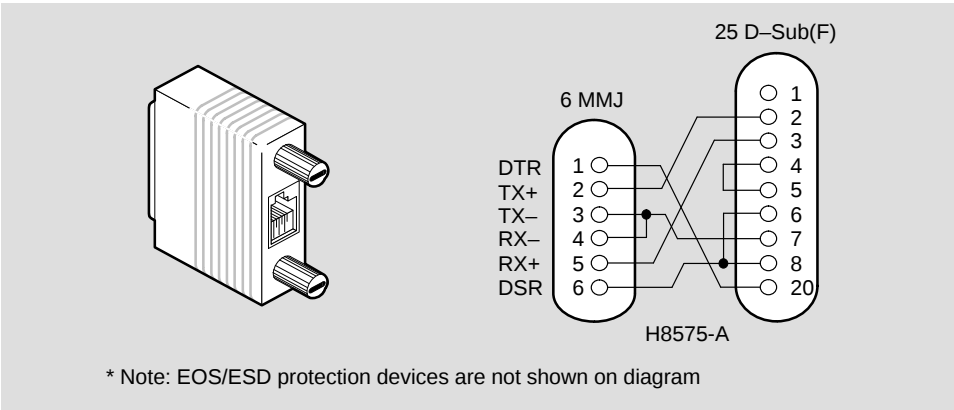


Figure B-6: H8571-J Adapter Pin Assignments



LKG-5342-91I

Figure B-7: H8575-A Adapter Pin Assignments



LKG-8793-93I

Accessing MIBs and RFCs

This appendix describes how to access Digital's private Management Information Base (MIB) and Request For Comments (RFCs).

Public MIBs can be accessed over the Internet network using any of the following methods:

- Electronic mail
- ftpmail
- Anonymous ftp
- Diskette (for some Digital products)

You can use these methods to access up-to-date MIBs, as described in the following sections.

Using Electronic Mail

The DDN Network Information Center (NIC) of SRI International provides automated access to NIC documents and information through electronic mail. This is especially useful for people who do not have access to the NIC from a direct Internet link, such as BITNET, CSNET, or UUCP sites.

To use the mail service, follow these instructions:

1. Send a mail message to `SERVICE@NIC.DDN.MIL`.

2. In the SUBJECT field, request the type of service that you want, followed by any needed arguments.

Normally the message body is ignored, but if the SUBJECT field is empty, the first line of the message body is taken as the request. The example at the end of this section lists some of the services available.

Requests are processed automatically once a day. Large files are broken down into separate messages. However, a few files are too large to be mailed.

Using ftpmail

Digital offers Internet ftpmail access to private MIB information, in ASCII text form, at `ftp.digital.com`, with up-to-date documents stored in the directory `/pub/DEC/hub900/mibs`. Check the INDEX file and the README file for the current contents.

To use ftpmail, follow these instructions:

1. Send a mail message to `ftpmail@ftp.digital.com`.
2. Ignore the subject line.
3. Include the word "connect" in the first line of the body.
4. Include `get` commands for each document required, for example:
`get /pub/DEC/hub900/mibs/README`
5. `quit`

Requests are acknowledged, then queued and processed every 30 minutes. Because of the number of requests, it may take a day or two before you receive a reply.

NOTE

For more timely access, consider using anonymous ftp (refer to the next section).

The following are example SUBJECT lines to obtain DDN NIC documents:

HELP

RFC 822

RFC INDEX

RFC 1119.PS

FYI 1

IETF 1IETF-DESCRIPTION.TXT

INTERNET-DRAFTS 1ID-ABSTRACTS.TXT

NETINFO DOMAIN-TEMPLATE.TXT

SEND RFC: RFC-BY-AUTHOR.TXT

SEND IETF/1WG-SUMMARY.TXT

SEND INTERNET-DRAFTS/DRAFT-IETF-NETDATA-NETDATA-00.TXT

HOST DIIS

Using Anonymous ftp

You can obtain RFCs and up-to-date FDDI MIBs from Digital using anonymous ftp.

Digital offers Internet anonymous ftp access to private MIB information, in ASCII text form, at `ftp.digital.com`, with up-to-date documents stored in the directory `/pub/DEC/hub900/mibs`. Check the `INDEX` file and the `README` file for the current contents.

To use anonymous ftp to copy files, follow these instructions:

NOTE

User input is case sensitive; you must type it as shown.

1. Use the Internet application ftp to connect to `ftp.digital.com`. The Internet address is `16.1.0.2`.
2. Log in as user `anonymous`.
3. Use your electronic mail address as the password.
4. Use the `cd` command to get to the directory `/pub/DEC/hub900/mibs`.
5. Use the `ascii` command to specify that you are retrieving ASCII text files.
6. Use the `get` command to get the file, or files, that you require.
7. Use the `quit` command to log out when you are finished.

The following example shows how to copy the README file from the repository:

NOTE

In the following example, user input is shown in **bold** text.

```
% ftp ftp.digital.com
Connected to ftp.digital.com
220 FTP.DIGITAL.COM FTP Service Process
Name: anonymous
331 ANONYMOUS user ok, send real ident as password.
Password: milano@netman.stateu.edu
230 User ANONYMOUS logged in at Tue 10-Aug-1993
10:24-EST, job 54.
ftp> cd /pub/DEC/hub900/mibs.
331 Default name accepted. Send password to connect to
it.
ftp> ascii
220 Type A ok.
ftp> get README
200 Port 19.54 at host nnn.nn.nn.nn accepted.
150 ASCII retrieve of /pub/DEC/hub900/mibs/README
started.
226 Transfer completed. 40239 (8) bytes transferred.
40239 bytes received in 23.65 seconds (5.8 Kbytes/s)
ftp> quit
%
```

DEChub 900 MultiSwitch Supported MIBs

The DEChub 900 MultiSwitch supports the following MIBs:

- MIB II, RFC 1213
- DEChub 900 Chassis MIB
- DEChub 900 Hub Manager MIB
- DEChub Common MIB

Obtaining Firmware Upgrades

As Digital continuously improves the quality of DEChub products, periodic releases of firmware will become available. To ensure that you have the latest functionality and quality of firmware, always use the most current version of firmware.

Information about the latest firmware releases can be obtained from your local Digital reseller or your local Digital sales office. Information can also be obtained by reading the README file found in the /pub/DEC/hub900 directory at <ftp.digital.com>.

Firmware updates are customer installable. To register for automatic notification of new firmware releases, return the Business Reply Card supplied with this product. Or you can use the Internet by sending your name, title, and mailing address to dechub_notice@lkg.dec.com.

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809-754-7575

DEChub 900 MultiSwitch Owner's manual
EK-DH2MS-OM. B01

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

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

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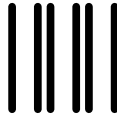
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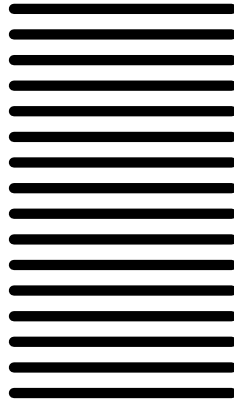
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