

DIGITAL MultiSwitch 900

Owner's Manual

Part Number: EK-DH2MS-OM. E01

March 1998

This book describes how to install, manage, and troubleshoot the DIGITAL MultiSwitch 900.

Revision/Update Information:

This is a revised document.

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Preface

Overview

About this Manual

The manual provides an overview of the DIGITAL MultiSwitch 900 chassis. It also describes how to install, manage, and troubleshoot the chassis.

Intended Audience

This manual is intended for the person who will install and use the DIGITAL MultiSwitch 900 chassis.

Organization

This manual is organized as follows:

| Chapter | Description |
|----------------|---------------------------------------------------------------------------------------------|
| 1 | Provides an overview of the DIGITAL MultiSwitch 900 |
| 2 | Describes procedures for installing the DIGITAL MultiSwitch 900 chassis |
| 3 | Describes the procedures for installing power supply modules |
| 4 | Describes the features and functionality of the Chassis Manager |
| 5 | Describes how to manage the DIGITAL MultiSwitch 900 and the network modules |
| 6 | Describes how to configure and manage the DIGITAL MultiSwitch 900 power system |
| 7 | Provides an overview of the Chassis manager remote monitor (RMON) alarms and events feature |
| A | Provides troubleshooting information for the DIGITAL MultiSwitch 900 |
| B | Contains a list of order numbers and specifications for the DIGITAL MultiSwitch 900 |
| C | Contains a list of connector, cable, and adapter pin assignments |

Conventions

This manual uses the following conventions:

| Convention | Description |
|---------------------------|----------------------------------------------------------------------------------------------------------|
| <code>Special type</code> | 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 a complete title of a manual. |
| [] | Contains default responses to menu prompts. |
| [n] | Indicates a variable response to menu prompts. |
| <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. |

For More Information

For More Information

| Topic | Manual |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Network Modules | <i>DEChub Network Products Problem Solving</i> <i>DEChub Network Configuration</i> <i>DEChub Network Modules 900-Series Switch Reference</i> <i>DEChub Network Modules Repeater Reference</i> |
| DECagent 90 | <i>DECagent 90 Installation and Configuration Manual</i> <i>DIGITAL MultiSwitch 900 Hub Manager Installation</i> <i>DEChub Network Modules Configuration Guide</i> |
| DECbridges | <i>DECbridge 90 Owner's Manual</i> <i>DECbridge 90FL Owner's Manual</i> <i>RoamAbout Access Point Owner's Manual</i> <i>RoamAbout Access Point Installation</i> |
| DECrouters | <i>DECrouter 90T1 Owner's Manual</i> <i>DECrouter 90T2 Owner's Manual</i> <i>DECrouter 90T2A Owner's Manual</i> |
| DECswitches | <i>DECswitch 900EE Installation and Configuration</i> <i>DECswitch 900EF Installation and Configuration</i> <i>DECswitch 900FO Installation and Configuration</i> <i>DECswitch 900ET Installation and Configuration</i> |

For More Information

| Topic | Manual |
|----------------|---------------------------------------------------------|
| DECrepeaters | <i>DECrepeater 90C Owner's Manual</i> |
| | <i>DECrepeater 90T Owner's Manual</i> |
| | <i>DECrepeater 90TS Installation and Configuration</i> |
| | <i>DECrepeater 90FA Owner's Manual</i> |
| | <i>DECrepeater 90FS Installation and Configuration</i> |
| | <i>DECrepeater 90FL Owner's Manual</i> |
| | <i>DECrepeater 90FL Installation</i> |
| | <i>DECrepeater 900GM Installation and Configuration</i> |
| | <i>DECrepeater 900TM Installation and Configuration</i> |
| | <i>DECrepeater 90T-16 Installation</i> |
| PORTswitches | <i>DEChub Network Modules Repeater Reference</i> |
| | <i>PORTswitch 900FP Installation and Configuration</i> |
| | <i>PORTswitch 900CP Installation and Configuration</i> |
| Access Servers | <i>PORTswitch 900TP Installation and Configuration</i> |
| | <i>DECserver 90L Owner's Manual</i> |
| | <i>DECserver 90L+ Owner's Manual</i> |
| | <i>DECserver 90TL and 90M Owner's Manual</i> |
| | <i>DECserver 900TH Installation and Configuration</i> |
| | <i>DECserver 900TM Owner's Manual</i> |

For More Information

| Topic | Manual |
|------------------|---------------------------------------------------------------------------|
| Routers | <i>DECswitch 900EE Router Installation and Configuration</i> |
| | <i>DECswitch 900EF Router Installation and Configuration</i> |
| | <i>RouteAbout Access EI Installation and Configuration</i> |
| | <i>RouteAbout Access EW Installation and Configuration</i> |
| | <i>RouteAbout Access TW Installation and Configuration</i> |
| | <i>RouteAbout Central EW Installation and Configuration</i> |
| DECconcentrators | <i>DECconcentrator 900FH Installation and Configuration</i> |
| | <i>DECconcentrator 900MX Installation and Configuration</i> |
| | <i>DECconcentrator 900TH Installation and Configuration</i> |
| | <i>DECmau 900TH Installation and Configuration</i> |
| DECwanrouters | <i>DECwanrouter 90/150/250 Management</i> |
| clearVISN | <i>clearVISN Installation</i> |
| | <i>clearVISN Overview</i> |
| | <i>clearVISN User's Guide</i> |
| Miscellaneous | <i>OPEN DECconnect Applications Guide</i> |
| | <i>OPEN DECconnect Building Wiring Components and Application Catalog</i> |
| | <i>DECconnect System Planning and Configuration Guide</i> |
| | <i>Network Products Guide</i> |
| | <i>Bridge and Extended LAN Reference</i> |

Correspondence

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Safety

Overview

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. |

The cautions that must be observed for the hardware described in this manual are listed below in English, German, French, and Spanish.

| | |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAUTION | This action deletes all configured settings and replaces them with factory default values. All configuration settings will be lost. |
| ACHTUNG | Bei diesem Vorgang werden alle Konfigurationseinstellungen gelöscht und die Werkseinstellungen wieder eingesetzt. Alle Konfigurationsdaten gehen verloren. |
| ATTENTION | Cette action supprime tous les paramètres de configuration et les remplace par des valeurs prédéfinies. Tous les paramètres de configuration seront perdus. |
| PRECAUCIÓN | Esta intervención borrará todos los parámetros de configuración y los sustituirá por valores por defecto definidos de fábrica. Se perderán todos los parámetros de configuración. |

| | |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAUTION | <p>The total weight of a fully configured DIGITAL MultiSwitch 900 chassis with modules and cables is approximately 36 kg.</p> <p>This configuration is too heavy for an office wall partition. Be sure to install the chassis on a solid wall.</p> |
| ACHTUNG | <p>Das Gesamtgewicht einer vollständig konfigurierten Geräts vom Typ DEChub MultiSwitch beträgt etwa 36 kg.</p> <p>Diese Konfiguration ist für Leichtbauwände zu schwer. Hängen Sie das Gerät nur an stabilen Wänden auf.</p> |
| ATTENTION | <p>La configuration totale d'un châssis DIGITAL MultiSwitch 900, avec modules et câbles, pèse environ 36kg.</p> <p>Ce poids étant trop élevé pour une cloison mobile, le châssis doit être installé contre un mur fixe.</p> |
| PRECAUCIÓN | <p>El peso total del chasis de un DIGITAL MultiSwitch 900 plenamente configurado con módulos y cables es aproximadamente de 36 kilos.</p> <p>Esta configuración es demasiado pesada para una mampara de oficina, por lo cual el chasis debe instalarse en una pared resistente.</p> |

| | |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| WARNING | To avoid bodily injury or equipment damage, use care when connecting the power cord. |
| 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 | To avoid bodily injury or equipment damage, turn the power supply locking mechanism 90 degrees to the left (clockwise) to lock the power supply into place. This prevents the power supply module from falling out of the chassis. |
| VORSICHT | Um Personen- und Sachschäden zu vermeiden, drehen Sie den Sperrmechanismus der Stromversorgung um 90 Grad nach links (im Uhrzeigersinn) und verriegeln damit die Stromversorgung. Auf diese Weise stellen Sie sicher, daß das Stromversorgungsmodul nicht aus dem Chassis fallen kann. |
| DANGER | Pour éviter tout dommage corporel ou matériel, tournez le mécanisme de verrouillage de la source d'alimentation de 90 degrés vers la gauche (sens des aiguilles d'une montre) afin de verrouiller la source d'alimentation. Ceci évite tout risque que le module d'alimentation ne se débranche du châssis. |
| AVISO | Para evitar daños corporales o de los equipos, se debe girar el mecanismo de bloqueo de la fuente de alimentación 90 grados a la izquierda (en el sentido de las agujas del reloj) para que la fuente quede bloqueada en su sitio y no se caiga fuera del chasis. |

| | |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| WARNING | Operational power supply modules are heavy, and may be hot; use care when removing a power supply module. |
| VORSICHT | Im Betrieb befindliche Stromversorgungsmodule sind schwer und können außerdem heiß sein. Seien Sie beim Entfernen von Stromversorgungsmodulen besonders vorsichtig. |
| DANGER | Les modules d'alimentation opérationnels sont lourds et peuvent être chauds; retirez-les avec précaution. |
| AVISO | Los módulos de fuente de alimentación en funcionamiento son pesados y pueden estar calientes. Debe tenerse cuidado al retirar un módulo. |

| | |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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. |
| ACHTUNG | Solite während der Phase 3 des DLU-Prozesses eine Unterbrechung der Stromversorgung eintreten, kann das Firmwareprogramm zerstört werden. Aus diesem Grunde wird dringend empfohlen, Vorkehrungen zu treffen, daß während der Durchführung dieser Phase 3 die Systemeinheit weder ausgeschaltet noch die Stromversorgung unterbrochen werden kann. |
| ATTENTION | L'image du microprogramme risque d'être corrompue, en cas de coupure de courant au cours de l'étape 3 du processus DLU. Ne mettez pas l'unité hors tension et n'exécutez aucune action risquant d'entraîner une coupure d'alimentation au course 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. |

| | |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| WARNING | If the network modules in the hub are operating correctly, do not turn off power to the hub after a self-test failure unless you have planned for network downtime. Turning off power to the hub causes the network modules to cease operation. |
| VORSICHT | Schalten Sie nach einem fehlgeschlagenen Selbsttest nie die Stromversorgung für wenn die Netzwerkmodule des Hubs ordnungsgemäß funktionieren, es sei denn, Sie den zeitweisen Ausfall des Netzwerks vorgesorgt. Wenn Sie die Stromversorgung für den Hub abschalten, stellen die Netzwerkmodule ihren Betrieb ein. |
| DANGER | Si les modules de réseau du concentrateur fonctionnent correctement, ne mettez pas le concentrateur hors tension après un échec de l'auto-test, sauf si vous avez pris les mesures requises pour l'indisponibilité du réseau. La mise hors tension du concentrateur entraîne l'arrêt du fonctionnement des modules de réseau. |
| AVISO | Si los módulos de red del concentrador funcionan de forma correcta, no se debe interrumpir el suministro eléctrico del concentrador después de un fallo en las autopuebas a menos que se haya previsto un tiempo de inactividad en la red. Una interrupción de la alimentación del concentrador provocará una parada del funcionamiento de los módulos de red. |

Chapter 1

Product Introduction

Overview

Introduction

This chapter describes the DIGITAL MultiSwitch 900. It includes an overview of the components and features, and describes the power system of the chassis and backplane capabilities.

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What is the DIGITAL MultiSwitch 900?

What is the DIGITAL MultiSwitch 900?

The DIGITAL MultiSwitch 900 is a high density hub that provides support for multiple network technologies. It uses a flexible channel architecture to support Ethernet, 802.5 token ring, and Fiber Distributed Data Interface (FDDI) technologies. It accommodates either 90- or 900-series modules to form an integral part of a distribution subsystem within a structured wiring environment.

The DIGITAL MultiSwitch 900 uses advanced chassis technology to provide complete backward compatibility with the 90-series network modules.

Network Management Architecture

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

The DIGITAL MultiSwitch 900 uses clearVISN, a family of software applications for managing networking products using policy-based techniques. Each clearVISN application has a graphical user interface (GUI) that allows users to manage the modules and ports with point-and-click ease.

Hardware Features

The DIGITAL MultiSwitch 900 has many advanced hardware features (as shown in Figure 1-1). The chassis can be configured for up to eight network modules. The network modules may be installed, in any combination, in slots 1 to 8.

90 Series Compatibility

The DIGITAL MultiSwitch 900 supports all the DEChub 90 series network modules.

Hot Swap Capability

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 chassis.

Incremental Power System

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

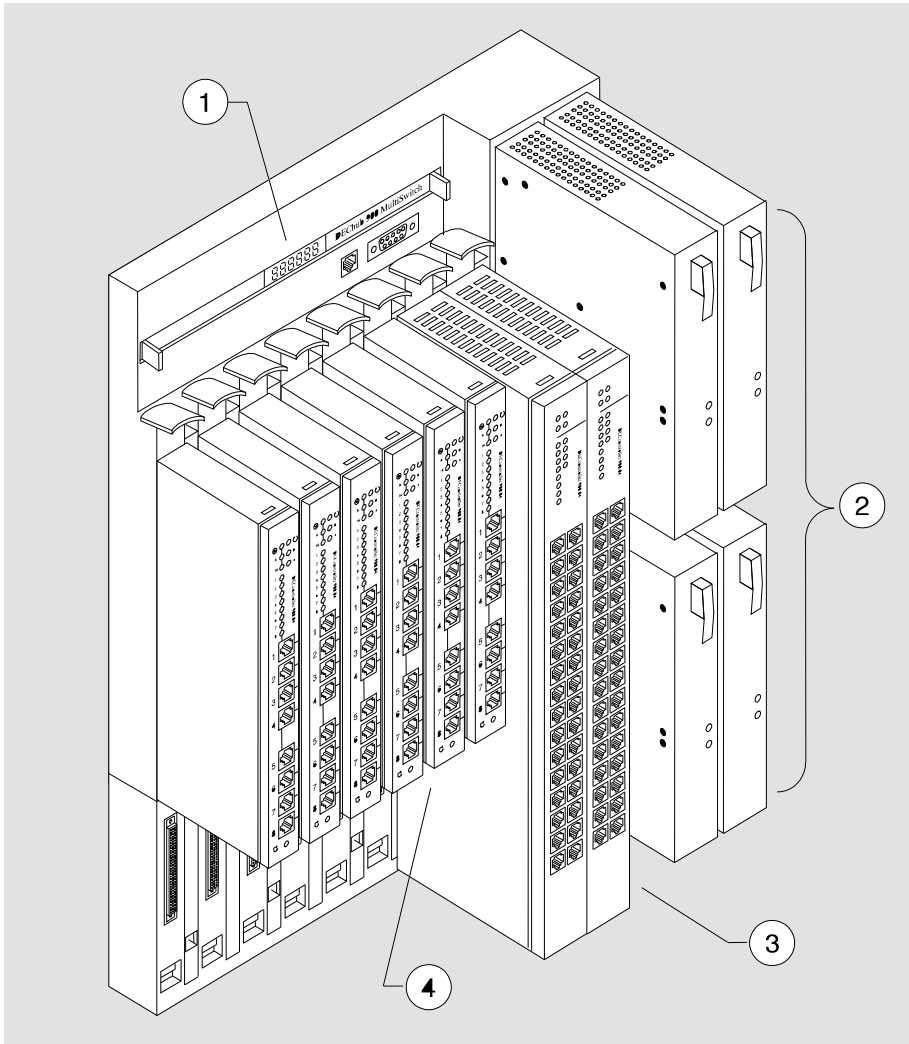
Redundant Power

Fully configuring a DIGITAL MultiSwitch 900 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 chassis with installed network modules. This feature is referred to as N+1 redundancy.

For example, if a single power supply module provides enough power for the chassis, and you add a second power supply module, then the chassis has redundant (N+1) power. If either of the power supply modules fail, the chassis continues to operate without interruption. You may add additional power supplies for even higher levels of power supply redundancy.

Hardware Features

Figure 1-1: The DIGITAL MultiSwitch 900 Chassis



NPB-0069-95F

Hardware Features

The following legend describes the hardware features shown in Figure 1-1.

| Item | Description |
|------|------------------------------------------|
| 1 | Chassis status display |
| 2 | Power supply modules |
| 3 | Full-height network modules (900-series) |
| 4 | Half-height network modules (90-series) |

Flexible Channels

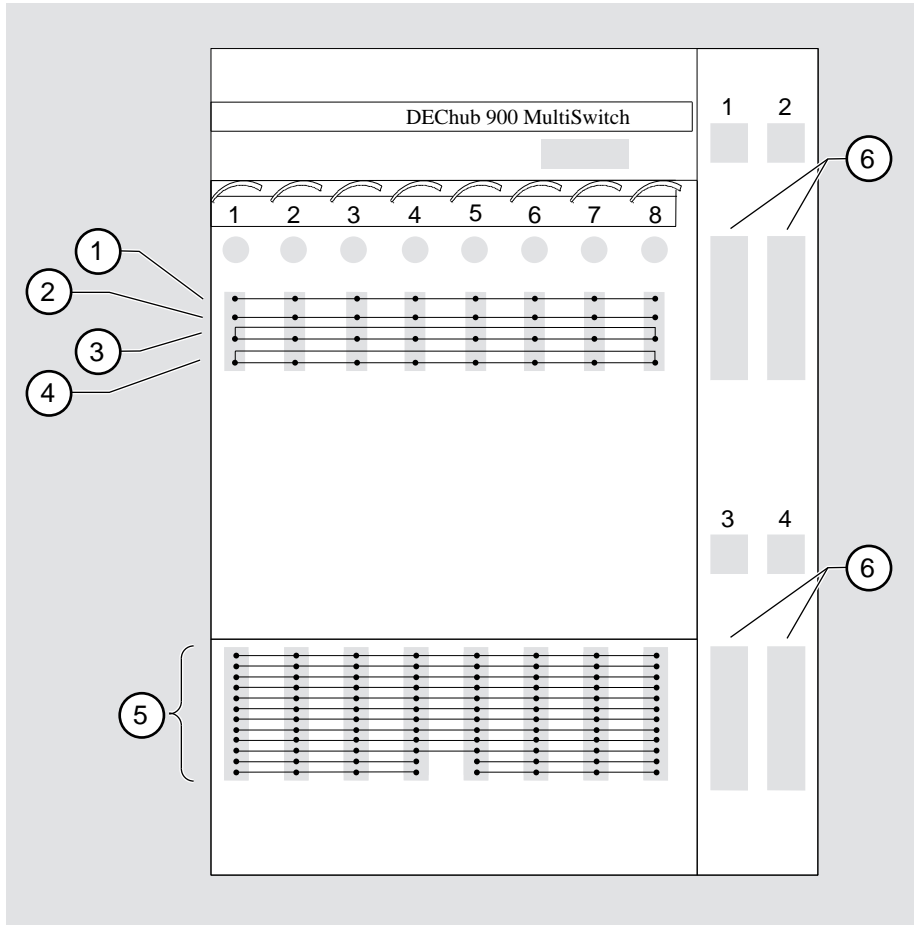
Figure 1-2 shows the DIGITAL MultiSwitch 900 backplane connectors. The multiple flexible channels can be dynamically configured to create independent LAN segments within the chassis. The MultiSwitch backplane provides a total flexible channel bandwidth in excess of 3 gigabits per second and supports the following technologies:

- Ethernet
- FDDI
- Token Ring
- ATM (Asynchronous Transfer Mode)

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

Hardware Features

Figure 1-2: Connector Backplane Data Path Interconnects



NPB-0070-95F

Hardware Features

The following legend describes the connector backplane data path components as shown in Figure 1-2.

| Item | Description |
|-------------|-------------------------|
| 1 | Dedicated Ethernet |
| 2 | Flexible channel |
| 3 | Token Ring A |
| 4 | Token Ring B |
| 5 | 14 flexible channels |
| 6 | Power supply connectors |

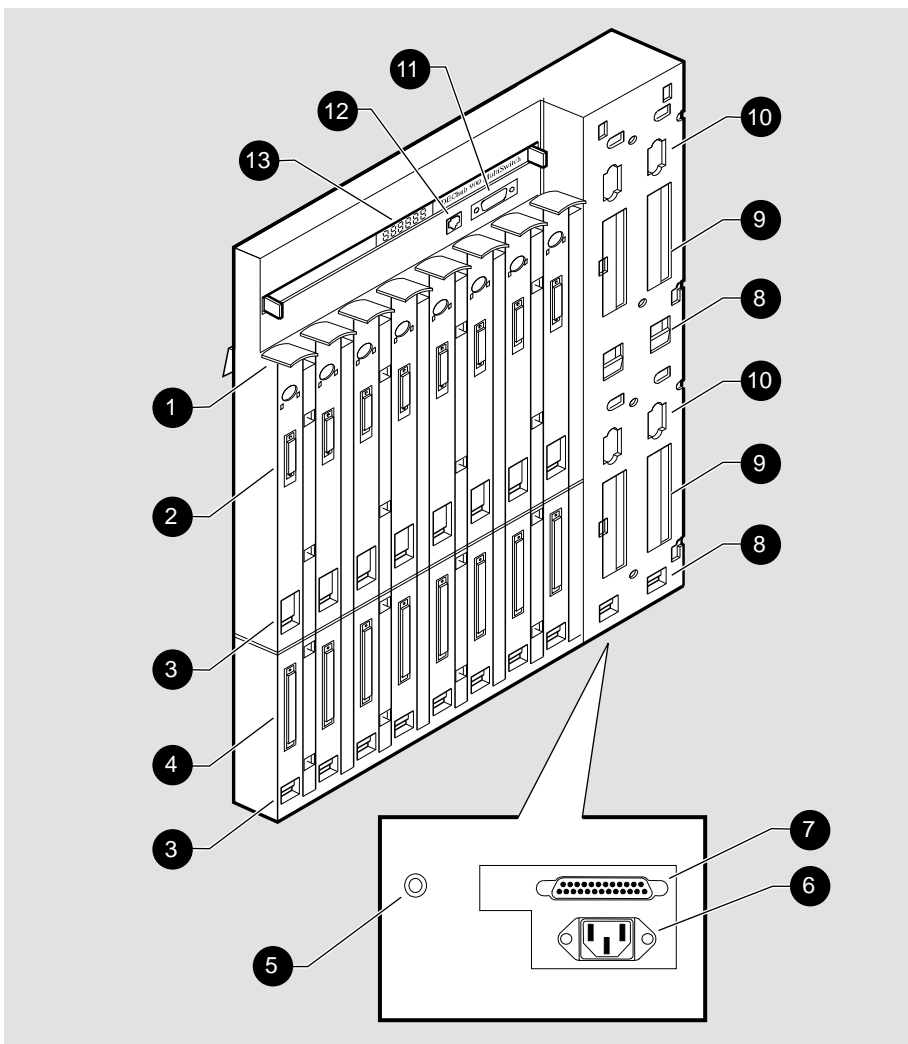
Ethernet is the term used by Digital for its product compatibility with the ISO 8802-3/ANSI/IEEE 802.3 standards and the Ethernet standards for Carrier Sense Multiple Access with Collision Detection (CSMA/CD) local area networks (LANs).

Token ring refers to the IEEE 802.5 standard.

The DIGITAL MultiSwitch 900 Chassis

Figure 1-3 illustrates the location of the components of the DIGITAL MultiSwitch 900 chassis.

Figure 1-3: The DIGITAL MultiSwitch 900 Chassis



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The DIGITAL MultiSwitch 900 Chassis

The following legend identifies the DIGITAL MultiSwitch 900 chassis components and includes a description of the components shown in Figure 1-3.

| Item Number | Component Name | Description |
|--------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Release lever | Releases the backplane latching mechanism to remove and install network modules. |
| 2 | Backplane connector | Provides power, network, connection, and management signals to network modules. |
| 3 | 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. Note that there are two groups of slots numbered 3. The upper group of slots is for 90-Series modules. The lower group of slots at the bottom of the chassis is for 900-Series modules. |
| 4 | 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. |
| 5 | Battery backup disable switch | With a battery backup installed, this switch allows a power system interruption when the AC power cord is removed. This switch is located at the bottom of the chassis. |
| 6 | AC connector | Provides AC power to the power supply system. This connector is located at the bottom of the chassis. |
| 7 | External battery connector | Provides external battery power to the chassis (48 volts). This connector is located at the bottom of the chassis. |
| 8 | 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. |

The DIGITAL MultiSwitch 900 Chassis

| Item Number | Component Name | Description |
|--------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 9 | Power supply connector | Provides +5.0 volts and +15.0 volts power from the power supply to the backplane. |
| 10 | Power AC distribution connector | Provides AC power to the power supply module. |
| 11 | Chassis out-of-band-management (OBM) port | Provides serial access to the Chassis Manager over Serial Line Internet Protocol (SLIP). The chassis OBM port provides modem control. |
| 12 | Chassis setup port | Provides a local terminal access to the Chassis Manager. |
| 13 | Chassis status display | Provides self-test and operational status of the chassis and modules within the chassis. The chassis status display is part of the Chassis Manager. |

Backplane Auto Healing

Backplane Auto Healing is a feature that restores a module's backplane port connections and backplane configuration when the same type of module is replaced into the same slot in the chassis.

Normally, when a module is removed from the chassis, its backplane port connections and configuration is deleted from the chassis manager's configuration, and it is not restored when the module is reinserted into the chassis.

Backplane Auto Healing is disabled by default and must be enabled via the MultiChassis Manager's LAN Interconnect screen if you wish to use it. At the time Backplane Auto Healing is enabled, the chassis manager takes a "snapshot" of the port connections and configuration (front/back) and uses this information to restore the connections in the future. For this reason it is important that all modules are fully up and configured correctly before enabling auto-healing. While Backplane Auto Healing is enabled, MultiChassis Manager will not allow any changes in the chassis' configuration to occur, such as adding or removing backplane connections; to make changes you must first disable Auto Healing, make the changes, then re-enable Auto Healing at which time a new snapshot will be taken. When Auto Healing is disabled it erases its snapshot of the chassis configuration.

You can remove and insert network modules from the DIGITAL MultiSwitch 900 while the power is either on (hot-swap) or off (cold-swap). In the case of cold-swap, the chassis manager does not detect that a module has been removed or replaced until the chassis is subsequently powered on.

With Backplane Auto Healing either enabled or disabled, when the chassis manager detects that a module has been removed, the backplane LANs to which the module was connected are repaired. For example, in the case of FDDI, the ring or tree is repaired by connecting the removed module's neighbors together.

When Backplane Auto Healing is enabled and you insert a module that is the same type as the one that was removed from that slot, the chassis manager restores the port configurations (front/back) and backplane connections for the module.

When Backplane Auto Healing is enabled and you are replacing a network module with one that is a different type, the Chassis Manager removes all backplane connections to the (old) removed module and deletes its backplane configuration.

Backplane Auto Healing

When Backplane Auto Healing is enabled and you are replacing a module with configurable port groups (such as DECRepeater 900TP or DIGITAL MultiSwitch Hub 624T) with an identical module, the port group configurations are not transferred from the previous module to the current one. Instead, port group configurations are stored in the non-volatile memory of each network module and thus remain with the module, not the chassis slot. Care should be taken when replacing one of these modules since a network loop could be created when the module's backplane connections are restored and yet the port groupings are different. clearVISN Recovery Manager can be used to restore the port groupings, or to copy them from one module to another.

For the purposes of Backplane Auto Healing, a DECswitch 900EF and a DECbridge 900MX are considered to be the same module type, as are a PORTswitch 900FP and a DECRepeater 900FP.

Summary

With Auto Healing Disabled (default):

- When module is removed, the backplane LANs are repaired, and module's backplane configuration is deleted.
- When any module is inserted, it is treated as a new module. No connections are restored, although default connections may apply.

With Auto Healing Enabled:

- When module is removed, the backplane LANs are repaired, and module's backplane configuration is saved.
- When same module is inserted, its port configuration is restored and its backplane connections are restored.
- When a different module is inserted, it is treated as a new module. No connections are restored, although default connections may apply.

Chassis Manager Features

The DIGITAL MultiSwitch 900 chassis has the following advanced management features.

The built-in chassis management agent, the Chassis Manager, provides the following services:

- IP services to modules
- Configuration and control of the chassis and modules that are in the chassis
- Chassis setup port
- Chassis out-of-band management (OBM) port
- Chassis in-band management
- Remote Monitor (RMON) Alarms and Events support
- Chassis Status Display
- Chassis Management Information Base (MIB)
- Simple Network Management Protocol (SNMP) integrated into the Chassis Manager

Power Management

The Chassis Manager monitors the power system and displays power system messages in the Chassis Status Display. The messages inform you about the power system status, and on the amount of power available in the chassis. This information, in addition to the power needs of a network module (from the module label), lets you determine whether enough power is available to install a network module in the chassis.

The Chassis Manager performs the following power-related functions:

- Powers a fully configured chassis with power redundancy
- Monitors the power system
- Calculates the power available to network modules
- Displays the power status and available power to its LCD display
- Allocates power to network modules
- Deallocates power from network modules when there is a power system failure in a non-redundant power configuration

Chapter 2

Installing the Chassis

Overview

Introduction

This chapter provides procedures for installing the DIGITAL MultiSwitch 900 chassis in a rack or on a wall. The chapter also illustrates optional mounting kits, which are available.

In This Chapter

| Topic | Page |
|----------------------------------------------------|------|
| Before You Install the Chassis | 2-2 |
| Installing the AC Line-Cord Strain-Relief Assembly | 2-4 |
| Installing the Chassis into a Rack | 2-6 |
| Installing the Chassis on a Wall | 2-11 |
| Optional Mounting Methods | 2-17 |

Before You Install the Chassis

Before you begin the installation, you should:

- Check the contents of the box.
- 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 make sure that you have the parts listed in Table 2-1 and Table 2-2.

Table 2-1: DIGITAL MultiSwitch 900 Kit Contents¹

| Quantity | Item |
|----------|------------------------------------------------------|
| 1 | DIGITAL MultiSwitch 900 chassis |
| 1 | Power supply module |
| 1 | AC line cord |
| 2 | Rack mount brackets (one left, one right) |
| 1 | Rack mount support bar |
| 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>DIGITAL MultiSwitch 900 Owner's Manual</i> |

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

Table 2-2: AC Line-Cord Strain-Relief Kit Contents

| Quantity | Item |
|----------|----------------------------------|
| 1 | Cable-bracket |
| 2 | #4-40 x 1/2-inch machine screws |
| 1 | #6-32 x 5/16-inch machine screws |
| 1 | Cable-bracket clamp |

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 AC line-cord strain-relief assembly to the chassis.

Installing the AC Line-Cord Strain-Relief Assembly

This section describes how to install the strain-relief assembly that secures the AC line cord to the chassis.

The strain-relief assembly consists of the following parts:

- A cable-bracket mount
- A cable-bracket clamp

Assembly Procedure

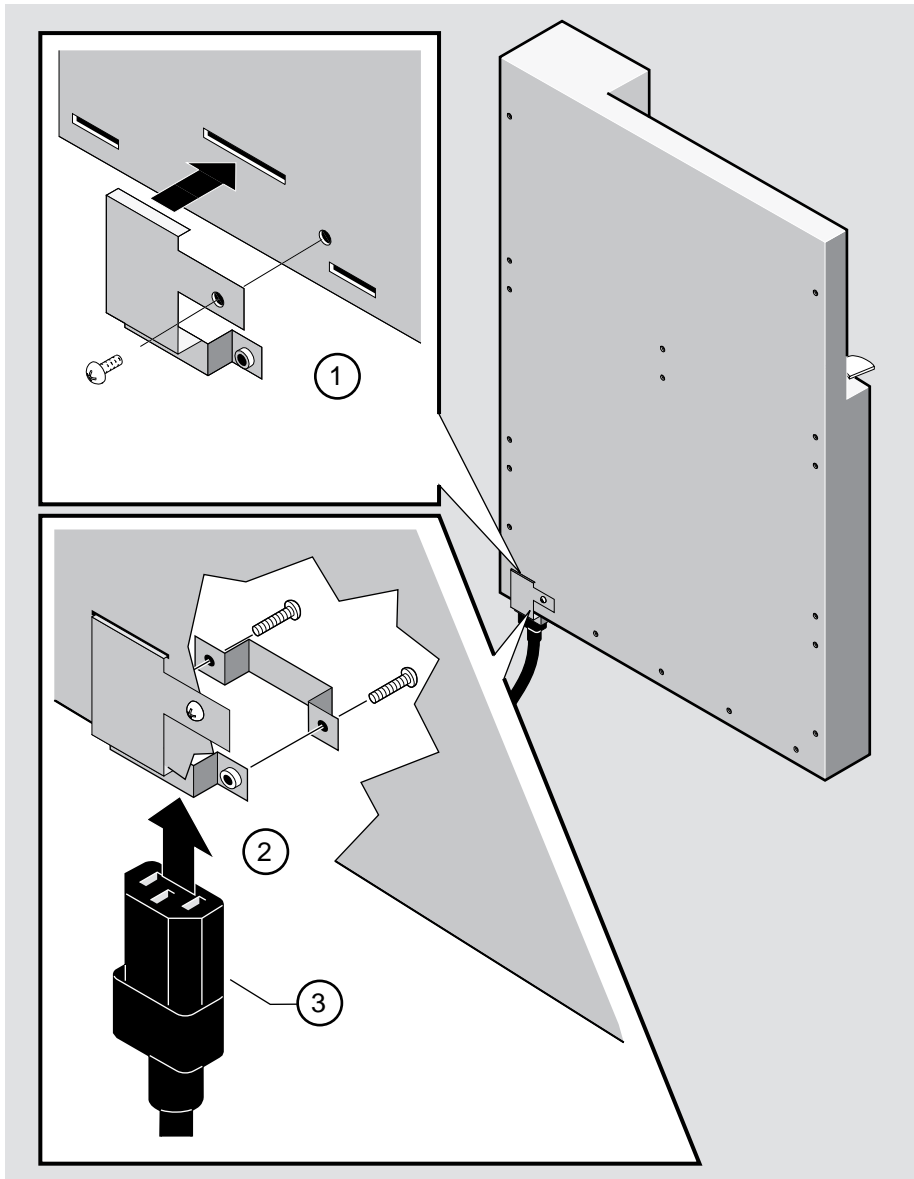
To install the strain-relief assembly, complete the following steps (as shown in Figure 2-1):

| Step | Action |
|-------------|----------------------------------------------------------------------------------------------------------------------|
| 1 | Insert the cable-bracket mount in the slot in the lower left rear of the chassis as shown in (1). |
| 2 | Secure the cable-bracket mount using the #6-32 x 5/16 machine screw (1). |
| 3 | Secure the cable-bracket clamp to the cable bracket mount using two #4-40 x 1/2-inch machine screws as shown in (2). |
| 4 | Ensure that the cable-bracket clamp is loose enough to accept the AC line cord (3). |

You are now ready to install the chassis into a rack or on a wall.

Installing the AC Line-Cord Strain-Relief Assembly

Figure 2-1: Installing the Strain-Relief Assembly



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Installing the Chassis into a Rack

To install the DIGITAL MultiSwitch 900 chassis into a 19-inch equipment rack, complete Tasks 1 through 3. Rack-mount brackets and mounting hardware for installing the chassis into a standard RETMA 19-inch equipment rack are supplied with the chassis.

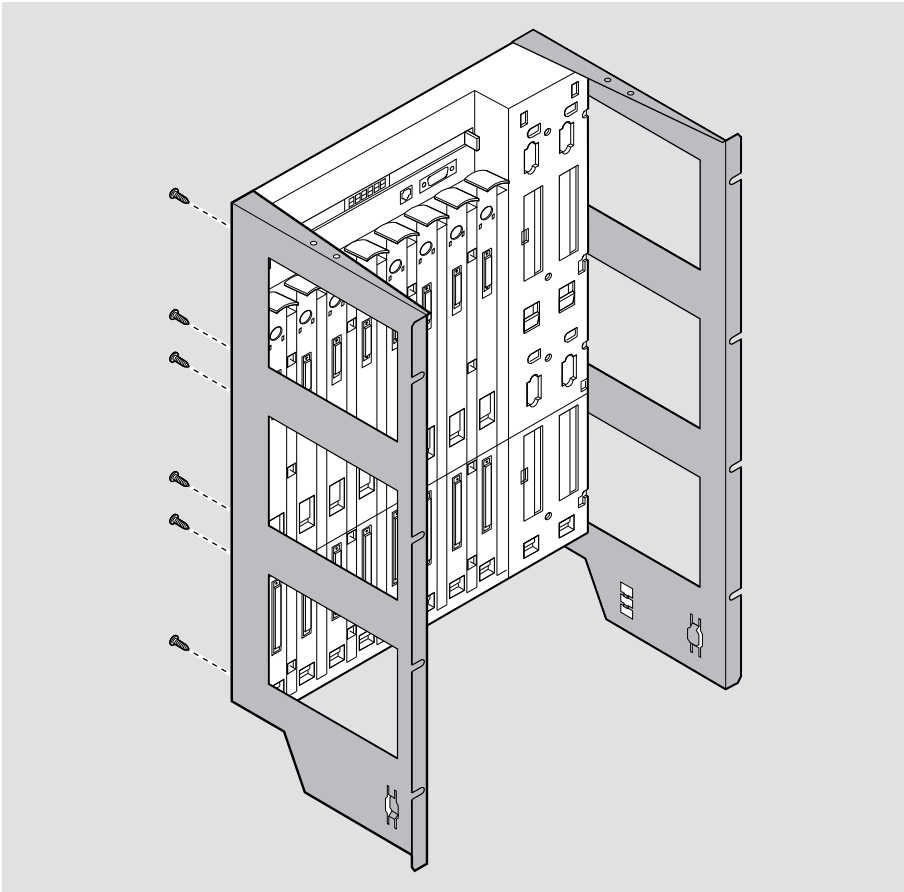
Task 1: Attach the Rack-Mount Brackets and Support Bar

To install the rack-mount brackets and support bar, complete the following steps:

| Step | Action |
|------|----------------------------------------------------------------------------------------------------------------------------|
| 1 | Locate the rack-mount brackets and the twelve #6-32 machine screws that are supplied with the chassis. |
| 2 | Attach the rack-mount brackets (see Figure 2-2), using the #6-32 screws, to the back of the chassis. |
| 3 | Attach the rack-mount support bar to the rack mount brackets (see Figure 2-3), using four #8-32 x 1/2-inch machine screws. |

Installing the Chassis into a Rack

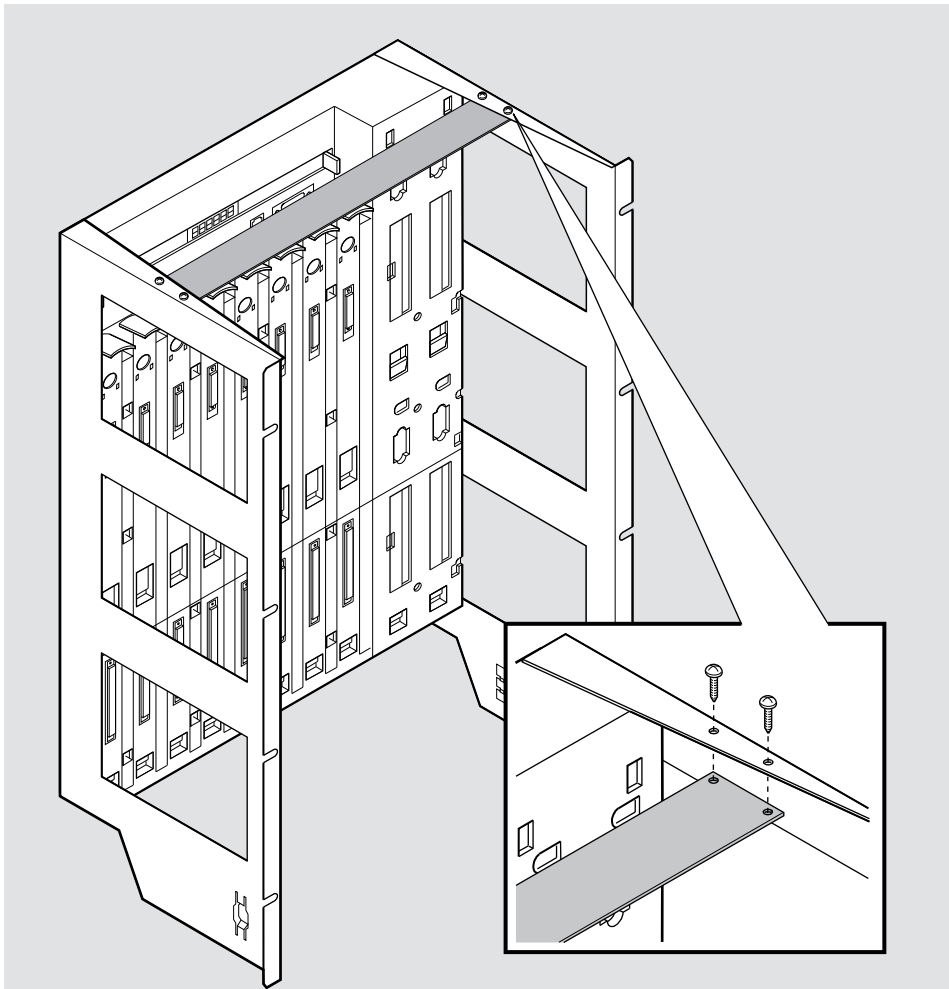
Figure 2-2: Attaching the Rack-Mount Brackets



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Installing the Chassis into a Rack

Figure 2-3: Installing the Rack-Mount Support Bar



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Task 2: Install the Chassis into the Rack

To install the chassis into the equipment rack, complete the following steps:

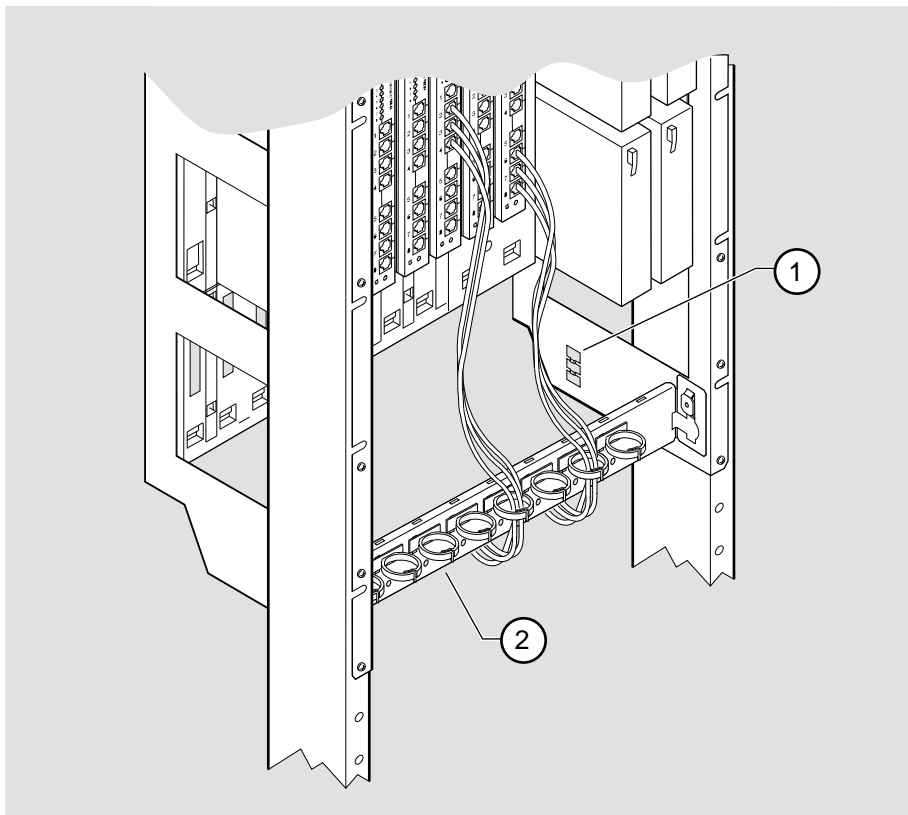
| Step | Action |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Install the chassis into the equipment rack by using the eight #10-32 machine screws and U-nuts (if necessary). |
| 2 | Install the AC line cord into the AC connector at the bottom of the chassis. |
| 3 | Tighten the two screws on the cable-bracket clamp so that the cable bracket clamp is seated firmly against the AC line cord. |
| 4 | 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 line cord to the punchout by using a cable tie. See Figure 2-4, item 1. |

Installing the Chassis into a Rack

Task 3: Install the Cable-Ring Bracket Support (Optional)

You can use the cable-ring bracket supplied with your chassis to manage the cabling from the network modules (see Figure 2-4). 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.

Figure 2-4: Cable-Ring Bracket on a 19-inch Rack



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| Item | Description |
|------|------------------------|
| 1 | AC line cord cable tie |
| 2 | Cable-ring bracket |

Installing the Chassis on a Wall

To mount the chassis directly on a wall using the wall bracket and hanger mounting device, complete Tasks 1 through 3.

CAUTION

The total weight of a fully configured DIGITAL MultiSwitch 900 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 solid wall

Installing the Chassis on a Wall

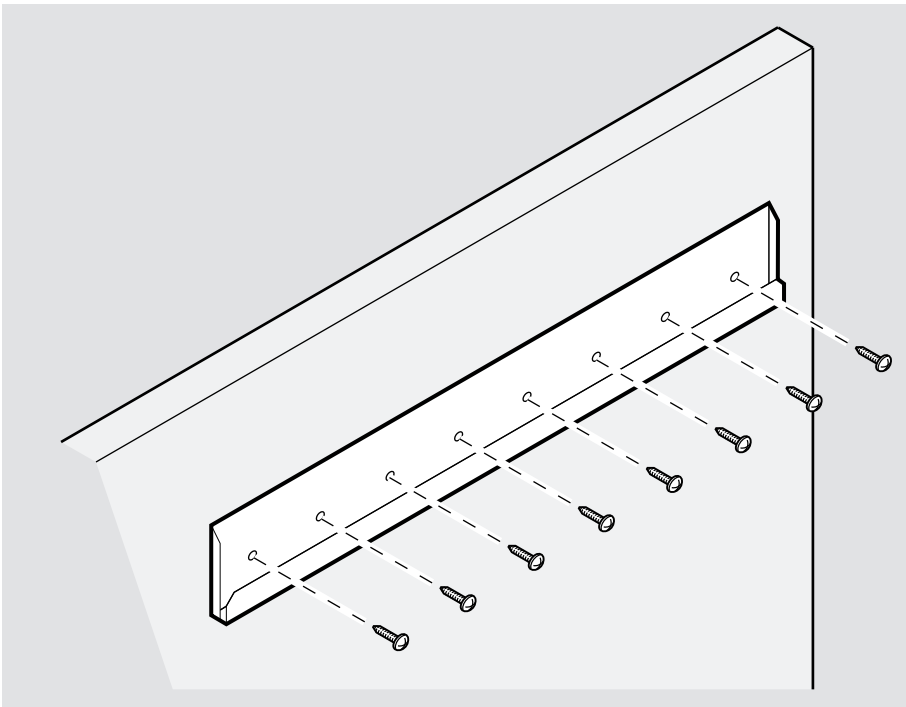
Task 1: Install the Wall-Mounting Bracket

To install the wall mounting bracket, perform the following steps:

| Step | Action |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Mark the locations of the #8 screw holes in the wall mounting bracket on the desired mounting surface. Place the screws so that the LED indicators on the network modules are 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 2-5). |

Installing the Chassis on a Wall

Figure 2-5: Installing the Wall-Mounting Bracket



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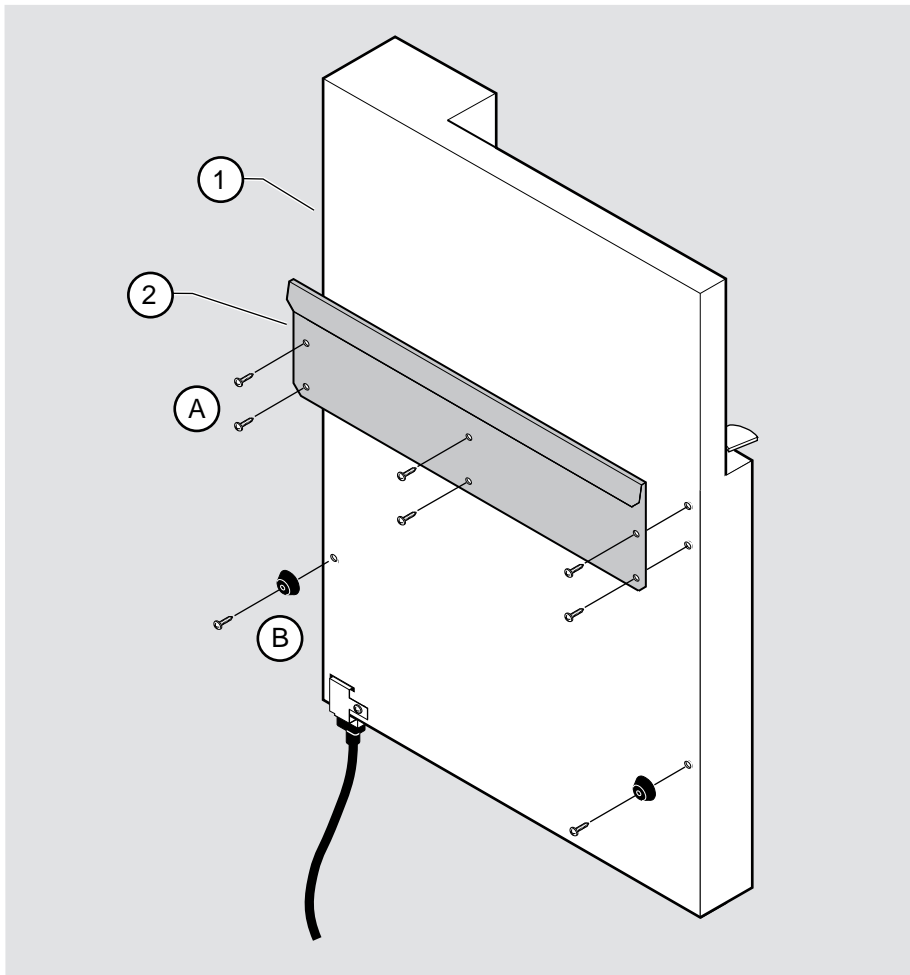
Installing the Chassis on a Wall

Task 2: Attach the Wall-Mounting Hanger

To mount the hanger to the chassis, perform the following steps (see Figure 2-6):

| Step | Action |
|-------------|---------------------------------------------------------------------------------------------------|
| 1 | Attach the wall-mounting hanger (2) to the back of the chassis (1) by using six #6-32 screws (A). |
| 2 | Attach the rubber feet (B) to the back of the chassis by using two #6-32 screws. |

Figure 2-6: Attaching the Wall-Mounting Hanger



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The following legend describes the items in Figure 2-6.

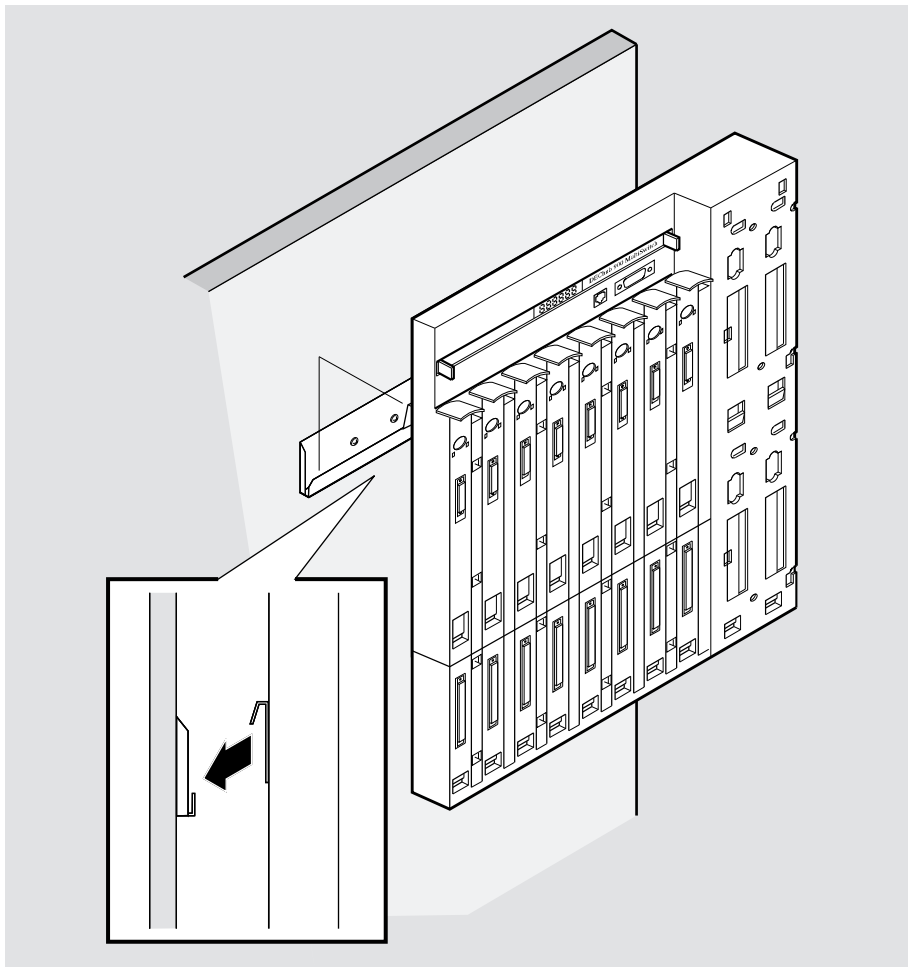
| Item | Description |
|------|----------------------|
| 1 | Rear of chassis |
| 2 | Wall mounting hanger |

Installing the Chassis on a Wall

Task 3: Slide the Chassis onto the Wall-Mounting Bracket

To mount the chassis, slide the chassis onto the wall-mounting bracket.

Figure 2-7: Sliding the Chassis onto the Wall-Mounting Bracket



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Optional Mounting Methods

DIGITAL offers the following optional mounting kits you can use to mount your chassis.

The following list contains kits you can purchase from DIGITAL:

- DERMS-AA wall-mount rail system starter kit
- DERMS-DA cover
- H3108-CW cable-ring bracket wall-mount
- H3108-CS cable-ring bracket
- H7661 POWERswitch

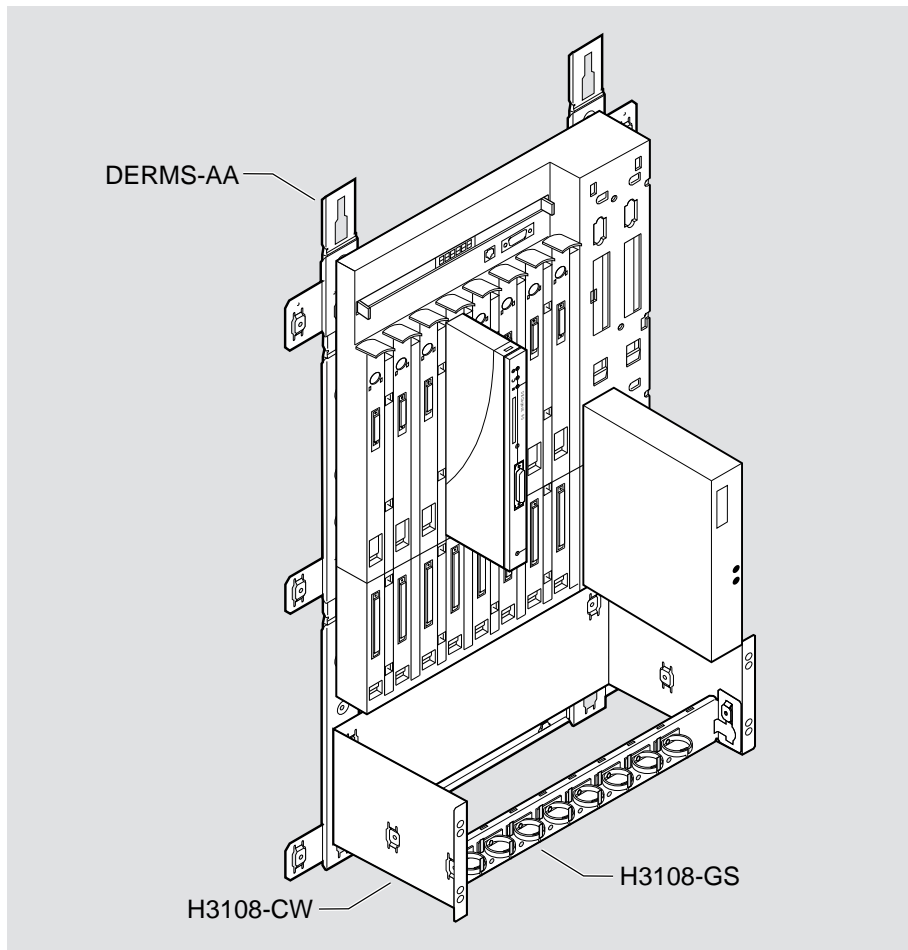
For ordering information and descriptions of these options, refer to the *OPEN DECconnect Applications Guide*, part number EC-G2570-42.

Optional Mounting Methods

Adding a Wall Mount Rail System

Figure 2-8 shows a DIGITAL MultiSwitch 900 mounted on a DERMS-AA wall-mount rail system. Refer to DERMS-AA mounting instructions included in the product kit.

Figure 2-8: DERMS-AA Wall-Mount Rail System

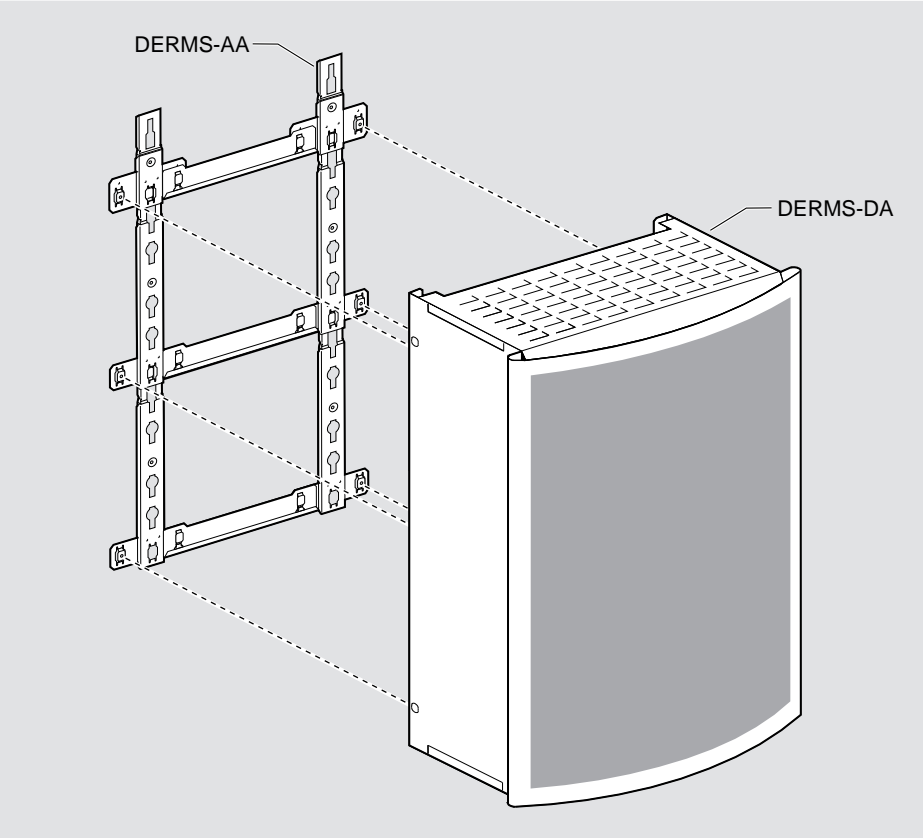


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Adding a Cover

Figure 2-9 shows the positioning of a DIGITAL MultiSwitch 900 DERMS-DA cover relative to the DERMS-AA mounting bracket without a chassis present.

Figure 2-9: DERMS-DA Cover



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Chapter 3

Installing Power Supply Modules

Overview

Introduction

This chapter provides procedures for installing, removing, and resetting a DIGITAL MultiSwitch 900 power supply module. The chapter also describes the optional H7661 POWERswitch.

In This Chapter

| Topic | Page |
|----------------------------------|------|
| Installing a Power Supply Module | 3-2 |
| Removing a Power Supply Module | 3-8 |
| Resetting the Power System | 3-9 |
| Optional H7661 POWERswitch | 3-10 |

Installing a Power Supply Module

This section describes how to install a power supply module, install the AC line cord, and reset the power system.

You can install a power supply module into any power supply slot. Perform the following steps to install a power supply module (see Figure 3-1):

| Step | Action |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Ensure that the power supply locking mechanism is in the unlock (horizontal) position. |
| 2 | Place the mounting tab, which is located on the bottom of the power supply module, in the mounting slot of the chassis. |
| 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. |

Note that the power supply LED lights (see Figure 3-3) will not light until you plug in the AC line cord.

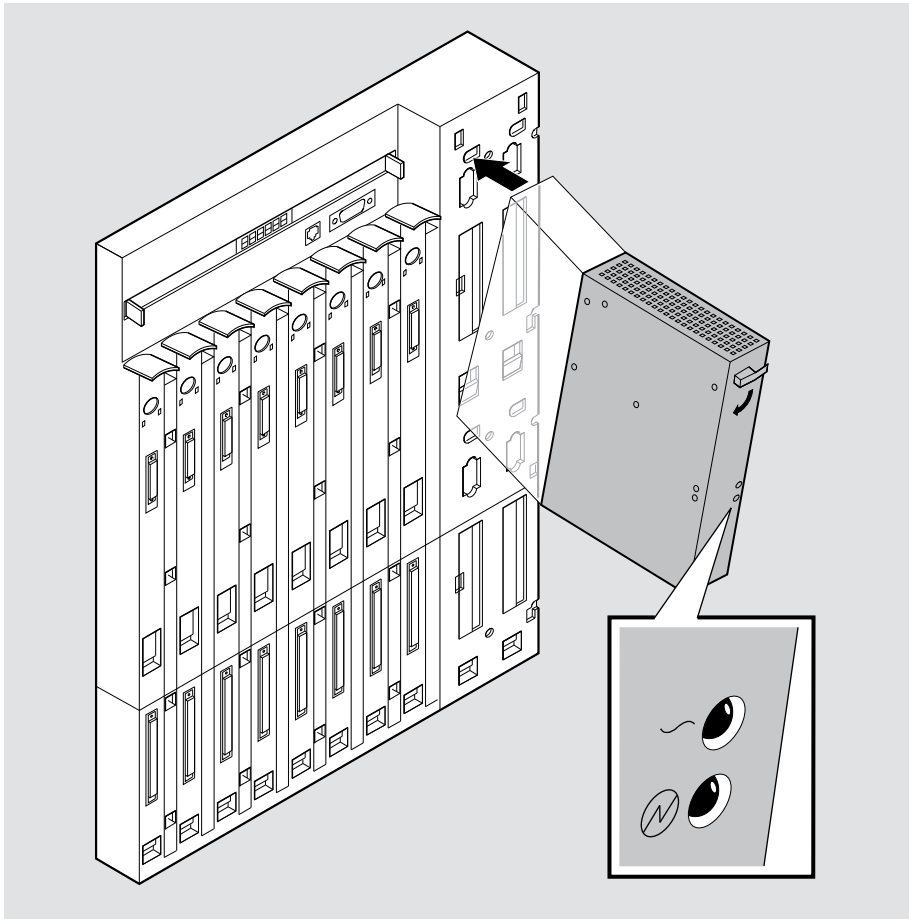
WARNING!

To avoid bodily injury or equipment damage, turn the power supply locking mechanism 90 degrees to the left (clockwise) to lock the power supply into place. This will prevent the power supply module from falling out of the chassis.

-
- | | |
|---|---------------------------------|
| 4 | Lock the power supply in place. |
|---|---------------------------------|
-

Installing a Power Supply Module

Figure 3-1: Installing the Power Supply Module



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Installing a Power Supply Module

Installing the AC Power Cord

You can install the AC power cord by performing the following steps:

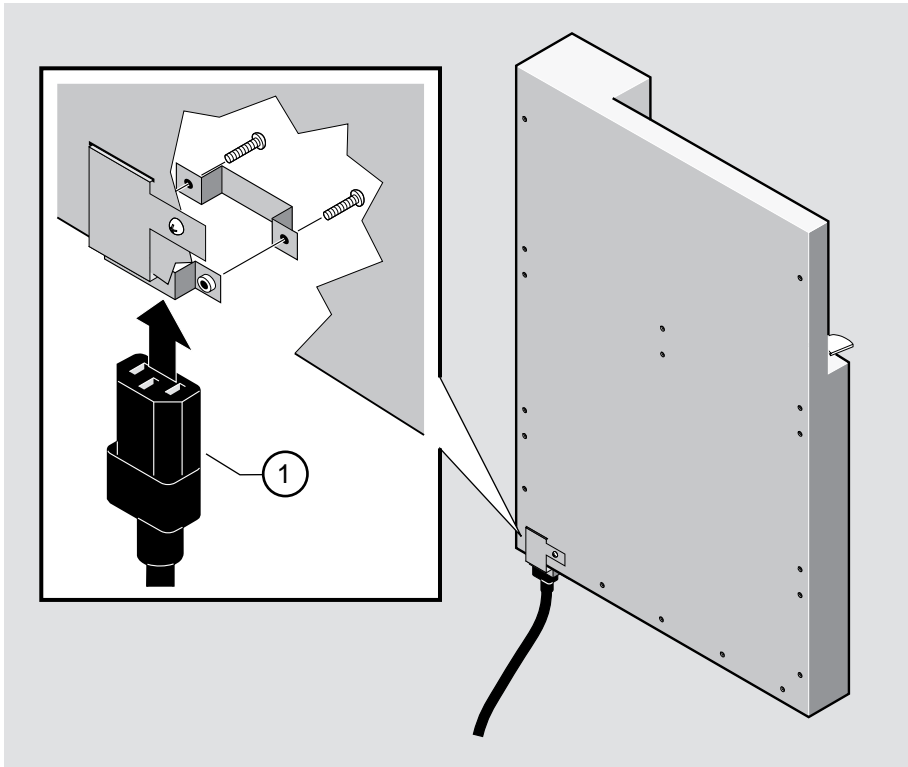
WARNING

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

| Step | Action |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Install the AC power cord into the AC connector at the bottom of the chassis (as shown in Figure 3-2) and tighten the screws on the cable clamp. |
| 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 light, and that the Chassis Manager begins the self-test procedure. |

Installing a Power Supply Module

Figure 3-2: Installing the AC Power Cord into the AC Connector



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Installing a Power Supply Module

Chassis Manager Self-Test Procedure

The Chassis Manager indicates the start of the self-tests by displaying test numbers across the Chassis Status Display.

Figure 3-3: Chassis Status Display

| |
|---------------------|
| MS 900 Vx.x 0202 |
|---------------------|

After the self-test procedure is complete, the Chassis Manager starts the decompression procedure.

Chassis Manager Decompression Process

During the decompression process, the DIGITAL MultiSwitch 900 firmware is decompressed and copied to DRAM. The self-test and decompression procedures take up to one minute to complete.

Table 3-1 shows the stages in the process.

Table 3-1: The Chassis Manager Decompression Process

| The Chassis Manager... | indicated by the LCD message... |
|----------------------------------------------|---------------------------------|
| decompresses the image found in flash memory | Decompressing image... |
| verifies decompression accuracy | Verifying decompression... |
| copies image to DRAM | Copying image... |
| initializes the system software | Initializing... |

After the decompression process is complete, the Chassis Manager begins normal operation.

Installing a Power Supply Module

After Installing An Additional Power Supply Module...

If you install any additional power supply modules to the DIGITAL MultiSwitch 900 after it is operational, you may observe a momentary flicker in the power supply LEDs each time a new power supply module is added. This flicker 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 chassis 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.

Removing a Power Supply Module

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

WARNING

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

| Step | Action |
|------|---------------------------------------------------------------------------------------------------|
| 1 | Turn the locking mechanism 90 degrees to the right (counterclockwise) to unlock the power supply. |
| 2 | Remove the power supply module from the DIGITAL MultiSwitch 900. |

Resetting the Power System

This section describes how to reset the power system to the entire chassis.

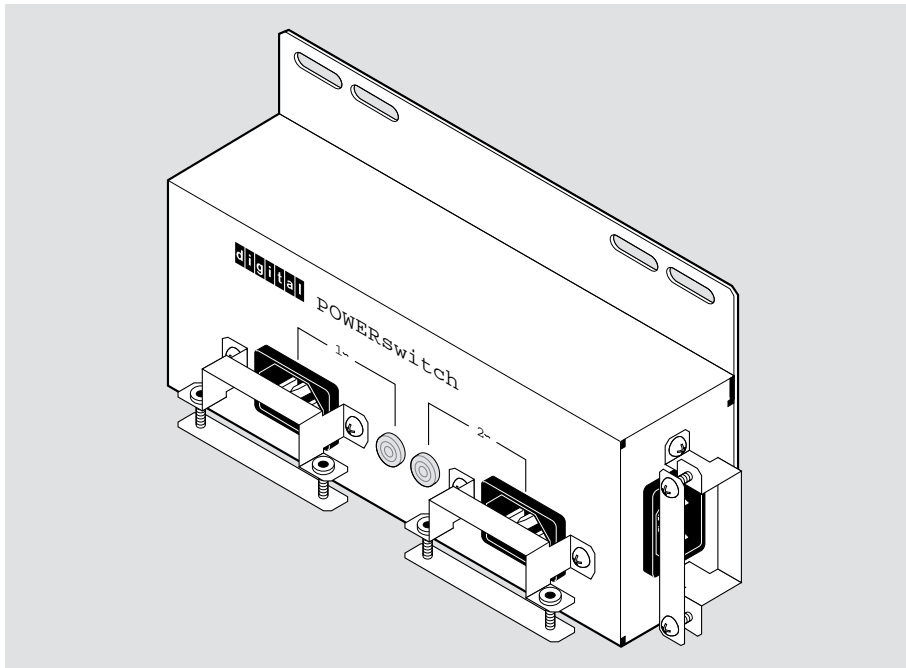
| If you have a... | Then |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| non-battery backup power system... | remove the AC power cord. |
| battery backup power system... | <ol style="list-style-type: none">1) remove the AC power cord.2) press the battery backup disable switch located near the AC connector to disable the battery backup. |

When the AC power cord and battery have been removed from the chassis, the system powers down. You can restart the system by plugging in the AC power cord.

Optional H7661 POWERswitch

The POWERswitch is an optional power device that provides automatic voltage backup. It secures to a DIGITAL MultiSwitch 900 chassis. The POWERswitch provides dual AC power input to equipment rated for less than 1.4 kVA input power.

Figure 3-4: H7661 POWERswitch



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Optional H7661 POWERswitch

The POWERswitch works as follows:

| Stage | Action |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | If the primary AC input drops below the specified voltage levels, the POWERswitch automatically switches from the primary source input to the auxiliary source input ¹ . |
| 2 | When the primary input is restored, the POWERswitch automatically switches from the auxiliary source back to the primary source. |

¹ Assuming that a power source is connected to the auxiliary port.

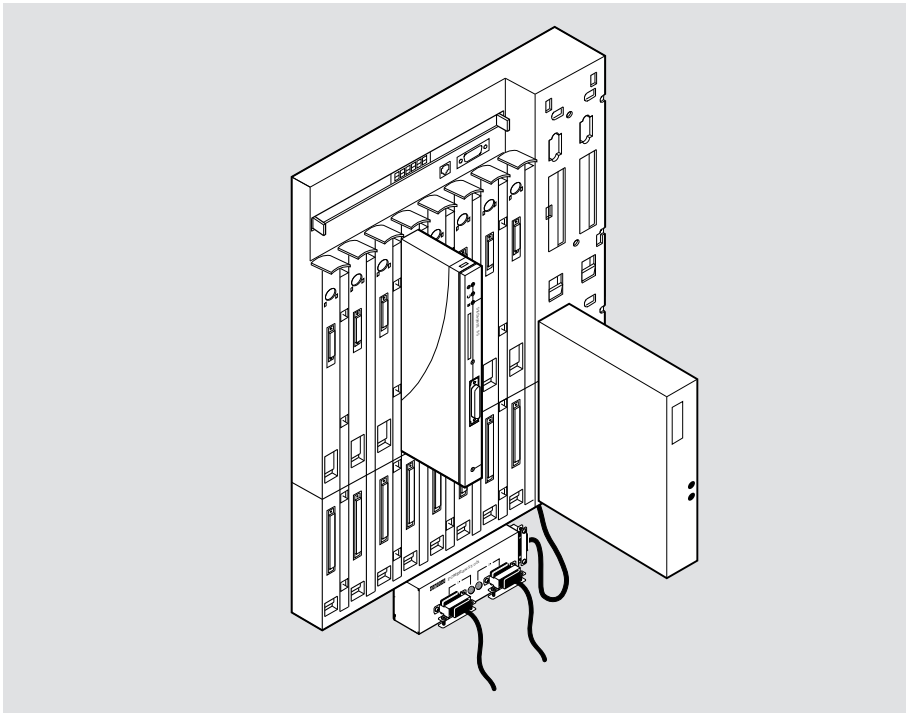
Figure 3-5 shows the H7661 POWERswitch installed in the DIGITAL MultiSwitch 900 chassis.

NOTE

Use the four #6-32 screws removed from the rear cover (shown in Figure 3-2).

Optional H7661 POWERswitch

Figure 3-5: H7661 POWERswitch Installed in the DIGITAL MultiSwitch 900 Chassis



NPB-0750-96F

Chapter 4

Chassis Manager

Overview

Introduction

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

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What is the Chassis Manager?

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

Functions

The Chassis Manager provides 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 setup.
- Supports out-of-band management (OBM) for the chassis and network modules.
- Supports LAN hopping of network modules and module interconnect for Ethernet, Token Ring, FDDI, and ATM across the DIGITAL MultiSwitch 900 backplane.
- Supports Remote Monitor (RMON) alarm and event functionality.
- Provides proxy management for DECRepeater 90 modules without an SNMP agent.
- Provides IP services for modules.

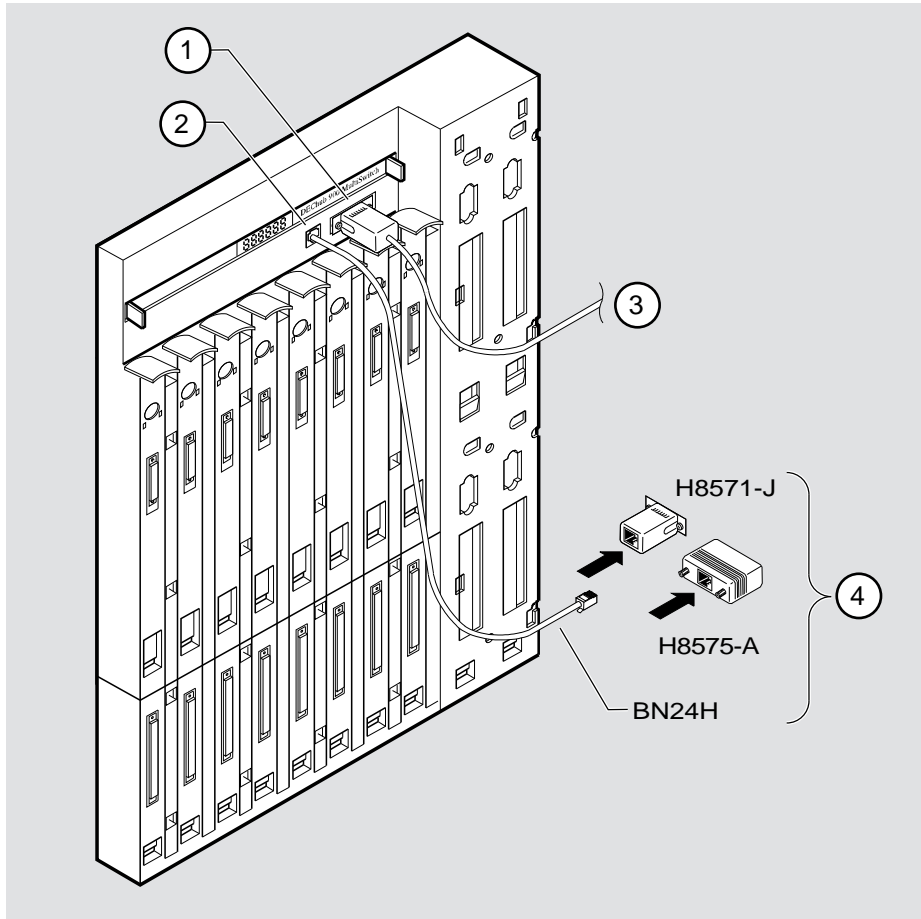
Chassis Manager Ports

The Chassis Manager provides two external ports: the chassis setup port and the chassis out-of-band management (OBM) port.

Setup Port and OBM Port Cabling

Figure 4-1 illustrates the cabling for both the setup port, and the OBM port.

Figure 4-1: Setup Port and OBM Port Cabling



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The following legend identifies the components shown in Figure 4-1.

| Item | Description |
|------|----------------------------------|
| 1 | OBM port |
| 2 | Setup port |
| 3 | OBM port cable (see Table 4-2) |
| 4 | Setup port cable (see Table 4-1) |

Chassis Manager Ports

Chassis Setup Port

The signals on the chassis 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 chassis setup port.

The setup port can be connected to a terminal device or a personal computer using various cables and adapters. Refer to Table 4-1 for your configuration.

Table 4-1: Setup Port Cabling

| If the setup port device is a... | Then use this cable... | With this adapter |
|-------------------------------------------|------------------------|----------------------|
| PC with a 9-pin D-Sub communications port | BN24H-xx ¹ | H8571-J ² |
| terminal with a 25-pin D-Sub connector | BN24H-xx ¹ | H8575-A |
| terminal with a 6-pin MMJ connector | BN24H-xx ¹ | Not required |

¹ xx indicates cable length in meters.

² Not included in the kit.

Reference Refer to Appendix B for information about signal connections. Refer to the Using the Chassis Setup Port section in this chapter for information about configuring the chassis.

Chassis Out-of-Band Management (OBM) Port

The signals on the chassis 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. EIA-574 is the signaling standard used by most personal computers for their serial ports.

The OBM port appears as a data terminal equipment (DTE) device and supports flow control for Request to Send (RTS) and Clear to Send (CTS) hardware communications. The port can be connected to a terminal server, personal computer, or a modem by using various cables and adapters.

Table 4-2: OBM Port Cabling

| Cable/Adapter Type | Connecting Device |
|---------------------------------------------|---------------------------------------------------------------------------------|
| BN24H-xx ¹ /H8571-J ² | DECserver 900TM, DECserver 90TL, or DECserver 90M with an 8-pin MJ connector |
| BC29Q-102 | PC with 9-pin D-Sub connector |
| BC29P-102 | Modem with 25-pin D-Sub connector |

1 The xx represents the length in meters.

2 Not included in the kit.

Reference

Refer to Appendix B for information about signal connections.

Refer to Chapter 4 for additional information about OBM.

Chassis Status Display

The Chassis Status Display is a 20-character by 2-line LCD display. The Chassis Status Display continually displays new messages. However, if an event occurs such as the installation or removal of a module, then the Chassis Status Display pauses with an event notice message.

Status Display Messages

Table 4-3 lists the Chassis Status Display messages, including event notices, and describes each message.

Table 4-3: Chassis Status Display Messages

| This Message | Displays... |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MultiSwitch 900 HW=<rev>, SW=<rev> | The DIGITAL MultiSwitch 900 product name and its current hardware and software revision levels. |
| Out-of-Band IP: | The out-of-band IP address. The chassis OBM IP address is blank until an address is assigned. Refer to Using the Chassis Setup Port section to configure the chassis OBM IP address. |
| In-Band IP: | Up to three in-band IP addresses and their associated chassis slots. The chassis in-band IP address is blank until an address is assigned. Refer to Using the Chassis Setup Port section to configure the Chassis in-band IP addresses. The following example shows the Chassis Manager displaying the in-band IP address for Slot 1: In-Band (slot 1) IP: 16.20.156.20 |

Chassis Status Display

| This Message | Displays... |
|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <pre>1: <module name> <message></pre> | <p>The status of all the occupied slots in the chassis, starting with slot 1.</p> <p>This message shows the following data:</p> <ul style="list-style-type: none"> • the slot number • the module's name • one of three types of messages: <ul style="list-style-type: none"> — a health string message — module status message — ! Not Enough Power ! message. <p>If the ! Not Enough Power ! message is displayed, the module is not powered.</p> <p>Note that some DEChub 90 series module display messages may differ.</p> |
| <pre> 2 7 Available Slots or 2 7 !No More Power!</pre> | <p>Either the empty slots and an Available Slots message (if sufficient power available) or the empty slots and a !No More Power! message (if there is insufficient power)</p> <p>In the first example slots 2 and 7 are available and half-height modules can be added in these slots. To add full-height modules in available slots, separate power calculations must be performed.</p> <p>In the second example the current power supply modules cannot provide additional power to any available slots.</p> |
| <pre>Power Status: No N+1 System Power: 15.0W</pre> <p>or</p> <pre>Power Status: N+1 System Power: 15.0W</pre> | <p>Either a message which indicates that power is okay, but redundant power (No N+1) is not available.</p> <p>Or a message which indicates that redundant power (N+1) is available.</p> <p>In both examples, System Power: 15.0W refers to the power supplied to the chassis</p> |
| <pre>Available: xxx.x W 5V: xx.x A 15V: xx.x A</pre> | <p>The total available power in watts (W), and the available current in amperes (A) for 5 volts and 15 volts.</p> |

Chassis Status Display

| This Message | Displays... |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Checking Power System Status | Appears only when a power supply module is installed or removed. Depending on the Chassis Status Display message sequence, you may not see this message. |
| <sysName> <sysLocation> | Occurs only by setting MIB objects <code>sysName</code> and/or <code>sysLocation</code> . You can enter up to 80 characters for each of these MIB objects, but only the first 20 characters are displayed in the Chassis Status Display. If set, these names are also displayed when you select the Show Current Setting option from the DIGITAL MultiSwitch 900 Installation Menu. |
| <Event Notices> | Occurs whenever the Chassis Manager detects an important state change in the chassis. If a state change occurs, a message describing the event immediately appears in the display. Event notice messages are displayed longer than other Chassis Status Display messages. Event messages are not queued; therefore, when multiple events occur close in time, they may not all be displayed. Examples of events include: <ul style="list-style-type: none">• a module being inserted or removed• a change of module health text• a change of module status |

Self-Test Process

As each Chassis 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.

Example If the Diagnostic Code CRC fails, then the following error message appears on the LCD display:

```
DEChub 900   Vx.x  
0102       : Failed
```

where V1.1.6 is the ROM version number and 0102 is the failure code number.

The self-test procedure completes in about 15 seconds.

Self-Test Errors

If a self-test error occurs and is displayed on the Chassis Status Display, you should record the failure code number and the version number. After you record the error information, contact your Digital service representative for removal and replacement procedures.

WARNING

If the network modules in the chassis are operating correctly, do not powercycle the chassis after a self-test failure unless you have planned for network downtime. The DEChub MultiSwitch 900 must be functional in order to grant power to the network modules. Powercycling the chassis after a self-test failure will cause the network modules to cease operation.

Chassis Manager Decompression Procedure

During the decompression procedure, the DIGITAL MultiSwitch 900 firmware is decompressed and copied to DRAM. The self-test and decompression procedures take about 35 seconds to complete.

The decompression procedure is performed when you:

- Power up the chassis
- Select the Reset to Current Settings option on the Installation Menu
- Select the Reset to Factory Default option on the Installation Menu

Decompression Process

Table 4-4 shows the stages in the process.

Table 4-4: The Chassis Manager Decompression Process

| The Chassis Manager... | indicated by the LCD display message... |
|----------------------------------------|------------------------------------------------|
| decompresses the image in flash memory | Decompressing image... |
| verifies decompression accuracy | Verifying decompression... |
| copies image to DRAM | Copying image... |
| initializes the system software | Initializing... |

After the decompression process is complete, the Chassis Manager begins normal operation.

Connecting a Terminal to the Chassis Setup Port

To connect a terminal to the chassis setup port, ensure that the following terminal setup parameters are in effect:

Table 4-5: Terminal Setup Parameters

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

Using the Chassis Setup Port

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

Modes of Operation

The chassis setup port supports the following modes:

- Installation Menu
- Redirect
- Event display

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

DIGITAL MultiSwitch 900 Installation Menu

The DIGITAL MultiSwitch 900 Installation Menu provides you with ten main menu options. Some of these options contain additional submenu options. When the chassis setup port is in default mode, the DIGITAL MultiSwitch 900 Installation Menu appears. The user response for all menu selections are shown in boldface type.

The format for an SNMP 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 (.).

You can exit from any of the menu options and return to the DIGITAL MultiSwitch 900 Installation Menu by pressing <Ctrl/C> on the setup port device.

Menu Options

NOTE

The DIGITAL MultiSwitch 900 Installation Menu screen displays illustrated in this manual may vary slightly from those on your setup port device.

To access a module's set up screen, you must choose option [9] Start Redirect Mode.

```

DIGITAL MultiSwitch 900
=====
          DIGITAL MultiSwitch 900 INSTALLATION MENU

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

=====
Enter selection number: 9 <Return>
          Press Return for Main Menu...
  
```

The options on this menu are described in the following pages:

| Topic | Page |
|-----------------------------------|------|
| [1] Restart with Factory Defaults | 4-17 |
| [2] Restart with Current Settings | 4-18 |
| [3] Show Current Settings | 4-19 |
| [4] Configure IP... | 4-20 |

Using the Chassis Setup Port

| Topic | Page |
|-----------------------------------|-------------|
| [5] Dump Error Log | 4-26 |
| [6] Downline Upgrade | 4-27 |
| [7] Configure Out-of-Band Port... | 4-38 |
| [8] Start Event Display Mode | 4-41 |
| [9] Start Redirect Mode | 4-42 |
| [10] Product-Specific Options | 4-43 |

[1] Restart with Factory Defaults

This option reboots the DIGITAL MultiSwitch 900 Chassis Manager, initiating self-tests and causing its configured NVRAM parameters to be initialized to factory default values. All local nonvolatile settings except the Chassis Serial Number, will be lost. To retain parameters, use option [2] Reset with Current Settings.

CAUTION

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

At the completion of the self-test, the Chassis Status Display displays the following message:

```
Selftest Complete
Start Main Firmware
```

After decompression (which takes about 30 seconds), the DIGITAL MultiSwitch 900 installation menu appears on your setup port screen.

The following example shows the dialog associated with this option:

```
Enter selection : 1
DIGITAL MultiSwitch 900
=====
                RESTART 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...
```

[2] Restart with Current Settings

[2] Restart with Current Settings

This option reboots the DIGITAL MultiSwitch 900 Chassis Manager, but leaves the chassis' configured NVRAM parameters at their current values.

Select Y to initiate the self-test. At the completion of self-test, the Chassis Status Display shows the following message:

```
Selftest Complete
Start Main Firmware
```

After decompression (which takes about 30 seconds), the DIGITAL MultiSwitch 900 installation menu appears on your setup port screen.

The following example shows the dialog associated with this option:

```
Enter selection: 2

DIGITAL MultiSwitch 900
=====
                RESTART 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...
```


[3] Show Current Settings

This option shows you the current settings of the Chassis Manager. If the DIGITAL MultiSwitch 900 is being configured for the first time, some fields are blank.

MultiChassis Manager or another SNMP-based manager can be used to set or modify these values.

The following example shows the dialog associated with this option:

```

=====
                        Enter selection : 3
DIGITAL MultiSwitch 900
=====
DIGITAL MultiSwitch 900,HW=F,RO=V1.1.6,SW=V5.x.x
SysUpTime           : 11 days 18:52:25  100 resets
SNMP Read/Write Community : public
SNMP Trap Addresses  : None Configured
Status of last Downline Upgrade : 00:40:39  27 resets
                                Load Successful

Out-of-Band (OBM) Management RTS : Disabled

Interface      IP Address      Subnet Mask      Def.Gateway      Other Info
-----
OMB Port       16.20.156.20    255.255.0.0      -----
Speed 9600 bps
ChassisSlot 6 16.20.156.26    255.255.0.0      16.20.156.56    Active
ChassisSlot 7 16.20.156.27    255.255.0.0      16.20.156.57    Active
ChassisSlot 8 16.20.156.28    255.255.0.0      16.20.156.58    Active
=====
                        ...Press Return Key to Continue...

DIGITAL MultiSwitch 900
=====
Hub Name           : DIGITAL MultiSwitch 900
Hub Serial Number  :
Hub Location       :
Hub Contact        :
=====
                        ...Press Return Key to Continue...

```

[4] Configure IP

[4] Configure IP

The Configure IP option provides you with five IP configuration selections.

IP Configure Selections

The following example shows the five configuration selections associated with this option:

```
Enter selection : 4
DIGITAL MultiSwitch 900
=====
IP CONFIGURATION

[1] Set SNMP Read/Write Community
[2] Add SNMP Trap Addresses
[3] Delete SNMP Trap Addresses
[4] Set In-Band Interface IP Address
[5] Set Out-of-Band Interface IP Address
[6] Return to Main Menu

=====
Enter selection: [n] <Return>
```

The following pages describe the IP Configuration menu selections.

| Topic | Page |
|------------------------------------------|------|
| [1] Set SNMP Read/Write Community | 4-21 |
| [2] Add SNMP Trap Addresses | 4-22 |
| [3] Delete SNMP Trap Addresses | 4-23 |
| [4] Set In-Band Interface IP Address | 4-24 |
| [5] Set Out-of-Band Interface IP Address | 4-25 |

[1] Set SNMP Read/Write Community

This option prompts you to enter the SNMP read/write community name.

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

The following example shows the dialog associated with this option.

```
Enter selection : 1

DIGITAL MultiSwitch 900
=====
                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] : engineering<Return>

SNMP Read/Write community string set.
Press Return for IP Configuration Menu...
```

NOTE

While a 31-character string is allowed, it is strongly recommended that you enter a maximum of 29 characters, because the Chassis Manager appends two characters to the string (a dash and a slot number) when passing SNMP management command to a module. The full string cannot exceed 31 characters.

[4] Configure IP

[2] Add SNMP Trap Addresses

This option prompts you to enter IP addresses to which SNMP traps will be sent from the DIGITAL MultiSwitch 900. SNMP managed devices are able to send trap messages to network management stations. You configure the IP addresses of NMS "trap sinks" that are to receive the trap messages. (For more information on traps, refer to RFC 1215.)

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

The following example shows the dialog associated with this option.

```
Enter selection : 2
DIGITAL MultiSwitch 900
=====
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
=====
Enter Trap addresses [ ]: 16.20.40.156
Trap address added! Enter a Trap Address [none] : <Return>
Press Return for IP Configuration Menu...
```

[3] Delete SNMP Trap Addresses

This option prompts you to select SNMP trap addresses and delete them, one at a time, from the community trap address table.

The following example shows the dialog associated with this option.

```
Enter selection : 3
DIGITAL MultiSwitch 900
=====
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
Enter a Trap address [ ] : 16.20.216.81:
Trap address deleted. Enter a Trap Address [ ] : <Return>
Press Return for IP Configuration Menu...
```

[4] Configure IP

[4] Set In-Band Interface IP Address

This option prompts you for a slot number and an IP address for in-band configuration. If an IP address was previously configured for a slot, the screen displays an in-band IP address.

To remove an IP address, enter 0 in the appropriate address field.

You can enter up to three different in-band IP addresses, one each for up to three slots. You can enter IP addresses whether or not a module is installed in the slot.

For In-Band IP Services to be operational, the slot number you selected must contain a network module that supports IP services.

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

The following example shows the dialog associated with this option.

```
Enter selection : 4
DIGITAL MultiSwitch 900
=====
                IN-BAND INTERFACE IP ADDRESS CONFIGURATION
Format: The standard 4 octet dotted decimal notation in which each
       octet of the address is represented as a decimal value,
       separated by a '.' character.
       .
       example: 16.20.40.156
To delete the IP address, enter 0 in the appropriate address field.
Interface  IP Address  Subnet Mask  Def.Gateway  Other Info
OBM Port   Speed 38400 bps
Hub Slot 1 16.20.66.156 255.255.255.0 16.21.0.1   Active
=====
Slot Number (1-8) [1] :
Enter the IP address [16.20.126.24 ] : 16.20.54.156 <Return>
Enter the Subnet Mask [255.0.0.0 ] : 255.255.0 0 : <Return>
Enter the Default Gateway [16.21.0.1] 16.21.0.1 <Return>.
Press Return for IP Configuration Menu.....
```

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

This option prompts you for an IP address for out-of-band configuration. If an IP address was previously configured, the screen displays an out-of-band (OBM) IP address.

To remove an OBM IP address, enter 0 in the appropriate address field.

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

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

The following example shows the dialog associated with this option.

```

Enter selection :5
DIGITAL MultiSwitch 900
=====
OUT-OF-BAND INTERFACE IP ADDRESS CONFIGURATION

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

        example: 16.20.40.156

To delete the address, enter 0 in the appropriate address field.
=====
Interface  IP Address  Subnet Mask  Def.Gateway  Other Info
OBM Port                               Speed 38400 bps
Hub Slot 1 16.20.66.156 255.255.255.0 16.21.0.1   Active
=====
Enter the IP address [16.20.66.156 ] : 16.20.54.157 <Return>

```

Press Return for IP Configuration Menu...

[5] Dump Error Log

[5] Dump Error Log

This 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 example shows the dialog associated with this option.

```
Enter selection : 5
DIGITAL MultiSwitch 900
=====
                DUMP ERROR LOG
                Current reset count: 115
=====
    Entry 49
    .   Time Stamp 0 46235
        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
        SW V4.2 -> V5.0 ; Config retained.
Dump another entry [Y]/N? Return
=====
No more Error Log entries.
                Press Return for Main Menu...
```

[6] Downline Upgrade

This option allows you to upgrade the Chassis Manager firmware and network module firmware (in nonvolatile Flash memory).

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.

Approximate Download Completion Time

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.

[6] Downline Upgrade

Choosing the Type of Firmware

You need to determine whether you want to upgrade the firmware for Chassis Manager or one of the network modules installed in the chassis.

Table 4-6: Choosing the Firmware Upgrade

| If you want to upgrade the firmware in... | Then... |
|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| A network module installed in the DIGITAL MultiSwitch 900 | Refer to the network module's installation and configuration manual and Complete the steps in the following sections |
| The Chassis Manager | Complete the steps shown in the following sections |

Initial Setup Screen

When you select the Downline Upgrade option from the Installation Menu, the initial setup screen display appears. This screen identifies the option and alerts you to be sure that the power to the device is not interrupted during the downline load.

```
=====
                          Enter selection : 6
DIGITAL MultiSwitch 900
=====
                          DOWNLINE UPGRADE
This process upgrades the specified module's firmware
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...
```

Current Versions Screen

Press <Return> after viewing the initial setup screen to display the current version levels of each module in the chassis.

The following screen shows the current versions of the modules installed in slot 1 and slot 2 of a DIGITAL MultiSwitch 900:

```
Slot  SysDescriptor
-----
1 DECrepeater 900TM,TP Ethernet Rptr SNMP,HW=v2, RO=v1, SW=V2.0.0
2 DECswitch 900EF, 6-Ethernet/FDDI Switch,HW=v1/2,RO=v01.03,SW=v1/6/1R
```

[6] Downline Upgrade

Selecting the Slot to be Upgraded

The Chassis Manager prompts you for the slot to which the upgrade will be downloaded. The default is Slot 9 (the Chassis Manager).

Enter the slot to be upgraded [9] (Chassis Manager):

Enter the slot number of the module to be upgraded or accept the default and press <Return>.

NOTE

The Chassis Manager cannot load the following modules:

- DECrepeater 900TM
- DECrepeater 900GM
- DECrepeater900FP
- PORTswitch 900FP
- DECrepeater 90TS
- DECrepeater 90FS

To load these devices, you must use setup menu item [9] (Start Redirect Mode) to redirect to the network module's main menu. Then you should assign an In-Band Address to the module and perform a downline upgrade directly to the module. See the installation manual for the network module.

Entering the Load File Name

The Chassis Manager prompts you for the load file name.

Enter the Load Filename [] :

[6] Downline Upgrade

Enter the load file name using the following guidelines and press <Return> :

| If the file is... | Then enter... |
|----------------------------------------------|-------------------------------------------------|
| Located in the default TFTP directory... | Only the filename. |
| Not located in the default TFTP directory... | The complete path name along with the filename. |

Load Host IP Address

The Chassis Manager prompts you for the Load Host IP Address. This is the IP address of the host from which the firmware upgrade will be downloaded.

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

Enter the address and press <Return>.

Choosing a Network Interface

If there is only one network interface for the Chassis Manager to choose from, the firmware upgrade download processing begins. Skip to the section titled Download Processing Stages for a description of the messages that appear during the firmware upgrade download processing.

When both in-band and out-of-band IP addresses are assigned, or when more than one in-band address is assigned, you must choose from the multiple network interfaces that are available.

When more than one IP address (therefore, more than one network interface) is present, you are prompted to choose a network interface to use for the load request.

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

[6] Downline Upgrade

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 [ctrl/c to Abort]...
```

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 dialog using a network module with IP services in Chassis slot 8.

```
Interface      Description
-----
1              OBM Port
9              ChassisSlot 8
Enter the network interface to be used [9]:
```

If you are choosing an IP Services network interface, you should use the Show Current Settings option to verify that the interface is currently active.

Select the desired network interface, then press <Return>. The setup screen displays the following message:

```
...Press Return Key to Start Load [ctrl/c to Abort] ...
```

Pressing <Return> initiates the load over the selected network interface.

The device becomes nonfunctional for up to 10 minutes during the time that the flash load is in progress.

TFTP Load Host and Image File Example

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

```
dmhub500.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.

Download Processing Stages

The Download process consists of four stages:

| Stage | Description |
|-------|-----------------------------------------------------------------|
| 1 | Transferring the image to the module's temporary storage buffer |
| 2 | Verifying the image |
| 3 | Writing the new image into nonvolatile flash memory |
| 4 | Module reset and self-test |

Table 4-7 explains what happens during each stage of the download process:

Table 4-7: Download Process Description

| Stage | Description |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <p>The DLU Process transports the new firmware image across the network from the TFTP load host and places it into a temporary storage buffer.</p> <p>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:</p> |

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

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

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

[6] Downline Upgrade

| Stage | Description |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 | <p>The module verifies that the firmware image is correct. This stage normally takes 10 seconds to complete.</p> <p>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 10 minutes to complete.)</p> <p>When the TFTP load transfer is complete, the Chassis Manager verifies the TFTP image. During this time, the Chassis Status Display displays the following message:</p> <div data-bbox="488 938 755 1026" style="border: 1px solid black; padding: 5px; margin: 10px 0;"><pre>SW Loaded Checking Image . .</pre></div> |
| 3 | <p>The DLU process transfers the new image from a temporary storage buffer to the nonvolatile flash memory, overwriting the old image.</p> <p>After the Chassis Manager verifies the image, it writes the image into flash memory. During this time, the Chassis Status Display displays the following message:</p> <div data-bbox="488 1333 755 1421" style="border: 1px solid black; padding: 5px; margin: 10px 0;"><pre>Image OK, Writing Image . . .</pre></div> |

| Stage | Description |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4 | <p data-bbox="505 590 1170 646">The Chassis Manager resets, runs self-test, and then begins executing the new firmware image.</p> <p data-bbox="505 659 1192 747">After the Chassis Manager stores the image into flash memory, it boots the new image. During this time, the Chassis Status Display displays the following message:</p> <div data-bbox="532 789 812 875" style="border: 1px solid black; padding: 5px; margin: 10px 0;"><pre data-bbox="557 810 803 852">Image Stored. Booting New Image...</pre></div> <p data-bbox="505 953 1192 1041">After the Chassis Manager completes booting the new image, it may need to reset the configuration settings. During this time, the Chassis Status Display displays the following message:</p> <div data-bbox="532 1083 812 1169" style="border: 1px solid black; padding: 5px; margin: 10px 0;"><pre data-bbox="557 1104 803 1146">Software Upgraded, Configuration Reset</pre></div> <p data-bbox="505 1247 1162 1373">After the Chassis Manager resets the configuration, it initiates self-test. When self-test completes it starts the main firmware. During this time, the Chassis Status Display displays the following message:</p> <div data-bbox="532 1415 812 1472" style="border: 1px solid black; padding: 5px; margin: 10px 0;"><pre data-bbox="557 1436 787 1457">Selftest Complete.</pre></div> |
| 5 | <p data-bbox="505 1577 1179 1661">After the Chassis Manager completes the self-test, the decompression procedure begins (as described previously in this chapter).</p> |

[6] Downline Upgrade

Download Processing for Network Modules

If you are initiating the load process to a network module, the Chassis Manager firmware attempts to communicate with the module. Because the module is nonfunctional during the flash load process, communications between the module and the Chassis Manager cannot take place. As a result, the Chassis Status Display displays the following message:

```
8: <module>  
unknown
```

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

You can perform network module firmware upgrades on up to eight slots concurrently. However, you cannot do multiple loads while you are upgrading the Chassis Manager firmware.

NOTE

During the download process for a network module, the messages may differ from those displayed during the download procedure for the Chassis Manager firmware (as shown in the preceding section of this manual).

Verifying the Upgrade

After the downline upgrade process has completed, you can verify the firmware upgrade by completing the following steps:

| Step | Action |
|------|-------------------------------------------------------------------------------------------------------|
| 1 | Select Option [3] Show Current Settings from the Installation Menu |
| 2 | Press <Return> |
| 3 | Verify that the correct version was loaded by checking the software version (SW=Vx.x.x) on the screen |

The screen displays the following text:

```

=====
                        Enter selection : 3
DIGITAL MultiSwitch 900
=====
DIGITAL MultiSwitch 900,HW=F,RO=V1.1.6,SW=V5.x.x
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
Out-of-Band (OBM) Management RTS : Disabled

Interface      IP Address      Subnet Mask      Def.Gateway      Other Info
-----
OMB Port       16.20.156.20    255.255.0.0
ChassisSlot 6 16.20.156.26    255.255.0.0      16.20.156.56    Active
ChassisSlot 7 16.20.156.27    255.255.0.0      16.20.156.57    Active
ChassisSlot 8 16.20.156.28    255.255.0.0      16.20.156.58    Active
=====
                        ...Press Return Key to Continue...

```

[7] Configure Out-of-Band Port

[7] Configure Out-of-Band Port

This option provides you with two configuration selections:

- Set Port Speed
- Enable/Disable RTS

Out-of-Band Port Configuration Menu Selections

The following example shows the menu selections associated with this option:

```
Enter selection : 7
DIGITAL MultiSwitch 900
=====
OUT-OF-BAND PORT CONFIGURATION

[1] Set Port Speed
[2] Enable/Disable RTS
[3] Return to Main Menu
=====
Enter selection: [n] <Return>
```

The following pages describe the Out-of-Band Port Configuration menu selections.

| Topic | Page |
|------------------------|------|
| [1] Set Port Speed | 4-39 |
| [2] Enable/Disable RTS | 4-40 |

[7] Configure Out-of-Band Port

[1] Set Port Speed

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

NOTE

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

The factory default for this menu option sets the out-of-band port speed to 9600 baud.

The following example shows the dialog associated with this option.

```
Enter selection : 1
DIGITAL MultiSwitch 900
=====
          SET OUT-OF-BAND (OBM) PORT SPEED
          [1] 1200 baud
          [2] 2400 baud
          [3] 9600 baud
          [4] 19200 baud
          [5] 38400 baud

[=====
          Enter selection : [3] (9600) : 5 <RETURN>
                   OBM port speed set

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

[7] Configure Out-of-Band Port

[2] Enable/Disable RTS Selection

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

The factory default for this menu option is disabled.

The following example shows the dialog associated with this option.

```
=====
                          Enter selection : 2
DIGITAL MultiSwitch 900
=====
                          ENABLE/DISABLE RTS

Enable/Disable Request to Send (RTS) allows additional
control to modem communications. When the RTS option is
Disabled the RTS signal on the OBM port is asserted after
self-test is completed and left asserted. When the RTS
option is Enabled the RTS signal is asserted only when there
is data to be transmitted and deasserted after the data has
been transmitted.
=====
RTS is Disabled. Would you like to Enable RTS? [N]
...Press Return Key to Continue...
```

[8] Start Event Display Mode

This option allows you to display events as they occur in the DIGITAL MultiSwitch 900.

When >> appears in the screen dialog, it indicates a change in status.

You can return to the Chassis Installation Menu any time by pressing <Ctrl/C> on the setup port device.

The following example shows the dialog associated with this option.

```
=====
Enter selection : 8
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,RO=1.0,SW=1.0
Health-Text:
Status      :

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

6: Querying
Status : Module Inserted

6: Unkown
Status : Module Removed

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

[9] Start Redirect Mode

[9] Start Redirect Mode

The `Start Redirect Mode` option redirects the DIGITAL MultiSwitch 900 Chassis Manager set-up port to the set-up port of any network module (such as the RouteAbout Central EP) that is installed into the DIGITAL MultiSwitch 900. Choosing this option allows you to set-up or obtain the status of an installed network module by accessing the specified network module's installation menu.

After you choose the `Start Redirect Mode` option, the screen display prompts you for a slot number (8) as shown in the following example of the RouteAbout Central EP module. After you enter the number of the slot in which the module is installed, the console is redirected to this slot.

NOTE

The slot number may change to reflect the slot number in which your module is installed.

The following example shows the dialog associated with this option, using the RouteAbout Central EP.

```
Enter selection: 9
=====
Enter the slot number for redirection (1-8): 8 <Return>
Console redirected to 8: RtAbt Cntrl EP/MP
Attempting connection
[Ctrl/C] to abort...
```

If the redirection is successful after you press the `<Return>` key, the network module's `INSTALLATION MENU` appears on your screen. Refer to documentation for a specific module for more information.

[10] Product-Specific Options (DIGITAL MultiSwitch 900)

This option provides product-specific selections when you are using a MultiSwitch 900.

Example For example, the option, when selected, allows you to enable and disable an automatic VNbus connection:

```
DIGITAL MultiSwitch 900
=====
                PRODUCT-SPECIFIC OPTIONS
    [1] Enable/Disable Automatic VNbus Connection
    [2] Return to Main Menu

                Enter selection:
```


Chapter 5

Network Management

Overview

Introduction

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

In This Chapter

| Topic | Page |
|-----------------------------------------------------------|------|
| Managing Network Modules In-Band | 5-2 |
| Managing Network Modules Out-of-Band | 5-5 |
| OBM Management Using the Chassis Manager's OBM IP Address | 5-6 |

Managing Network Modules In-Band

You can manage both 900-series and 90-series modules in-band with the DIGITAL MultiSwitch 900.

In-Band Management Options

In-band management is generally performed with the MultiChassis Manager network management application; however, 900-series and 90-series modules can be managed in-band through other network management stations that support the Simple Network Management Protocol (SNMP).

You can manage modules in-band and out-of-band concurrently by assigning your chassis IP addresses for in-band and out-of-band access.

The Chassis 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.

Network Modules Supporting In-Band Services

The following common network modules support in-band IP services. Refer to your module's documentation to determine whether the module provides this capability.

| | |
|-------------------|-----------------------|
| DECrepeater 900TM | DECconcentrator 900MX |
| DECrepeater 900GM | DECconcentrator 900TH |
| DECrepeater 90TS | DECmau 900TH |
| DECrepeater 90FS | DECswitch 900EE |
| Portswitch 900FP | DECswitch 900EF |
| Portswitch 900TP | PEswitch 900TX |
| Portswitch 900CP | |

Establishing IP Services for the Chassis Manager

To establish IP services for the Chassis Manager complete the following steps:

| Step | Action |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Install a module that provides IP services into a slot of the DIGITAL MultiSwitch 900 chassis. |
| 2 | Use the Chassis Manager's setup port to designate the module as an IP server. The Chassis Manager uses this module to communicate with the network management station (NMS). |

The combination of the IP address and slot location establish a path for in-band management. If you move the module to another slot, you must configure the chassis to utilize the new slot.

Up to three network modules can be used for IP services, each providing a separate in-band management address for the chassis. If you are using MultiChassis Manager, and the module providing in-band IP access fails or is removed, you can direct MultiChassis Manager to use another in-band IP address. See the *clearVISN User's Guide* for more information on how to use the Manage Table function to do this.

Managing Network Modules In-Band

Configuring an In-Band Address

The Chassis Manager allows you to configure an in-band IP address and slot number for any network module installed in your chassis that supports IP services, up to a total of three network modules.

The Chassis Manager continuously accepts network management traffic from all modules that are installed and configured with in-band addresses.

Hot-Swapping IP Service-Type Modules

When a network module occupies a chassis 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. If you do not delete the ARP cache from the NMS, it could take up to 45 minutes for the ARP cache to age out, depending on your system.

Managing Network Modules Out-of-Band

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

To manage network modules out-of-band use one of the following addresses:

- The Chassis Manager's out-of-band IP address
- The module's out-of-band IP address.

OBM Management Using the Chassis Manager's OBM IP Address

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 Chassis Installation menu. The IP addresses and the port speeds at each end of the communications link must be identical.

Switching from In-Band to Out-of-Band Management

If you want to switch from managing your DIGITAL MultiSwitch 900 and network modules in-band to managing them out-of-band, change the IP address for the Chassis Manager in MultiChassis Manager from its in-band IP address to its out-of-band IP address.

See the *clearVISN User's Guide* for more information on how to use the Manage Table function to do this.

Managing Network Modules

The OBM port allows you to manage network modules with a PC and a network management application capable of sending SNMP commands over a Serial Line Internet Protocol (SLIP). Use 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 chassis 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 Chassis Manager OBM port.

Reference

Refer to your terminal server documentation for instructions on setting up SLIP connections

Refer to Appendix C for cable and adapter information.

Chapter 6

Chassis Power System

Overview

Introduction

This chapter describes the chassis power system's functionality and provides configuration-related information about installing and removing power supply modules. It also provides guidelines for calculating power needs.

In This Chapter

| Topic | Page |
|----------------------------------------|------|
| Redundant Power | 6-2 |
| Power Source Failover | 6-3 |
| Guidelines for Calculating Power Needs | 6-4 |
| Power System Monitoring | 6-9 |
| Power Allocation Priority | 6-10 |

Redundant Power

In certain configurations, the chassis may need one, two, or three power supply modules to provide power to all the network modules.

Adding Power Supply Modules

The addition of an extra power supply module allows for the failure of any one of the chassis power supply modules and continually provides sufficient power to all network modules. This configuration is referred to as an N+1 power system.

Adding Power Beyond N+1

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

The Chassis Manager allocates a maximum amount of power to the backplane when four power supplies are installed so that the fourth power supply will always provide redundant power.

Power Source Failover

When a DIGITAL MultiSwitch 900 chassis is operating from AC line voltage and also has battery backup, the chassis will automatically switch to the DC backup if AC power is removed. When AC power is restored, the chassis will switch back to using the AC input.

Monitoring Failover Events

You can monitor failover events by selecting the `Start Event Display Mode` option from the DIGITAL MultiSwitch 900 Chassis Installation Menu. Failover events are not errors, therefore they are not recorded in the error log.

Guidelines for Calculating Power Needs

This section describes how to calculate the power requirements for your DIGITAL MultiSwitch 900. The DIGITAL MultiSwitch 900 supports two types of power supplies:

- 140-watt Power Supply (H7890)
- 163-watt Power Supply (H7894)

The DIGITAL MultiSwitch 900 140-watt power and 163-watt supplies are output load-sharing power supplies rated at 140 watts and 163-watts, respectively. The sum of the combined 5-Vdc and 15-Vdc outputs exceeds the 140-watt and 163-watt power rating. These power differences give the power supplies the flexibility to supply 5-volt and 15-Vdc power demands to a variety of chassis configurations.

Mixing Power Supplies

Your power supply configuration can include a mixture of both types of power supplies. However, the higher wattage is only available in certain power configurations (as shown in Table 6-1).

Table 6-1: Available Wattage for Specific Power Configurations

| If the chassis contains... | then... |
|----------------------------------------------------|--------------------------------------------------------------------|
| All 163-watt power supplies | the labeled wattage of the each supply is available to the chassis |
| All 140-watt power supplies | the labeled wattage of the each supply is available to the chassis |
| A mixture of 163-watts and 140-watt power supplies | the 163-watt power supplies provides only 140 watts |

Guidelines for Calculating Power Needs

Table 6-2 shows the total available wattage for all configurations using 163-watt and 140-watt power supplies.

Table 6-2: Total Available Wattage for All Configurations

| Number of Power Supplies | Total Available Wattage | | |
|--------------------------|-------------------------|---------------|---------|
| | 140-watt Only | 163-watt Only | Mixture |
| 1 | 140 | 163 | |
| 2 | 280 | 326 | 280 |
| 3 | 420 | 489 | 420 |
| 4 | 420 | 489 | 420 |

Guidelines for Calculating Power Needs

Power Consumption of DIGITAL MultiSwitch 900 Components

Table 6-3 lists the power consumption of each component of the DIGITAL MultiSwitch 900.

Table 6-3: DIGITAL MultiSwitch 900 System Power

| Component | +5V | +15V | Total Power |
|-------------------------------|------------|-------------|--------------------|
| Power supply | | | |
| 140-watt power supply module | 26.0 A | 4.0 A | 140.0 watts |
| 163-watt power supply module | 26.0 A | 4.0 A | 163.0 watts |
| Maximum usable power | 78 A | 12.0 A | 489.0 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 |
| DECserver 900GM | 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 90FA | 1.4 A | 0.5 A | 14.5 watts |
| DECrepeater 90TS | 1.2 A | 0.0 A | 7.5 watts |
| DECrepeater 90FS | 1.5 A | 0.5 A | 15.0 watts |
| DECrepeater 90T-16 | 1.2A | 0.0A | 6.0 watts |
| PORTswitch 900FP | 8.0 A | 0.5 A | 47.5 watts |
| PORTswitch 900TP | 6.0 A | 0.5 A | 37.5 watts |
| PORTswitch 900TP/12 | 6.0 A | 0.5 A | 37.5 watts |
| PORTswitch 900CP | 8.0 A | 0.5 A | 47.5 watts |
| DECconcentrator 900MX | 7.0 A | 0.5 A | 42.5 watts |
| DECconcentrator 900TH | 8.6 A | 0.5 A | 50.5 watts |
| DECconcentrator 900FH | 9.5 A | 0.5 A | 55.0 watts |
| DECmau 900TH | 3.0 A | 0.16A | 17.5 watts |
| DECswitch 900EE | 8.0 A | 1.5 A | 62.5 watts |

Guidelines for Calculating Power Needs

| Component | +5V | +15V | Total Power |
|-------------------------------------------|------------|-------------|--------------------|
| DECswitch 900EF | 9.0 A | 1.5 A | 67.5 watts |
| DECswitch 900ET | 3.4A | 1.72 A | 29.0 watts |
| DECswitch 900FO | 8.5A | 0.7 A | 53.0 watts |
| PEswitch 900TX | 8.0 A | 0.7 A | 50.5 watts |
| RouteAbout Access EI | 1.0 A | N/A | 5.0 watts |
| RouteAbout Access EW | 1.0 A | 0.0 A | 3.0 watts |
| RouteAbout Central EW | 5.5 A | .4 A | 33.5 watts |
| RoamAbout Access Point | 1.0 A | 0.0 A | 5.0 watts |
| MultiSwitch 612EX | 3.7 A | 0.08 A | 19.7 watts |
| MultiSwitch 612TX | 4.0 A | 0.0 A | 22.4 watts |
| MultiSwitch Hub 624T | 4.8 A | 0.0 A | 31.8 watts |
| MultiSwitch 600 modules in low power mode | 2.8 A | 0.04 A | 15.0 watts |
| MultiSwitch 600FE hub | 6.0 A | .2 A | 33.0 watts |
| DECagent 90 (DENMA) | 1.4 A | .5 A | 14.5 watts |
| ATM FO | 13.0 A | .6 A | 61.0 watts |
| ATM UTP | 13.0 A | .6 A | 61.0 watts |
| 24-port FE repeater | 8.0 A | .4 A | 46.0 watts |
| Router, Central EI | 7.0 A | .5 A | 42.5 watts |
| DECbridge 900 MP | 8.0 A | 1.5 A | 62.5 watts |
| VNswitch 900 EA | 8.5 A | .5 A | 50.0 watts |
| VNswitch 900 EE | 9.2 A | .5 A | 53.5 watts |
| VNswitch 900 EF | 8.1 A | .5 A | 62.5 watts |
| VNswitch 900 EX | 8.9 A | .5 A | 52.0 watts |
| VNswitch 900 FA | 8.0 A | .5 A | 47.5 watts |
| VNswitch 900 FF | 6.8 A | .5 A | 41.5 watts |
| VNswitch 900 FX | 7.8 A | .5 A | 46.5 watts |
| VNswitch 900 XA | 8.6 A | .5 A | 50.5 watts |
| VNswitch 900 XX | 8.6 A | .5 A | 50.5 watts |
| VNswitch 900 LL | 11.0 A | .5 A | 62.5 watts |

Guidelines for Calculating Power Needs

Configuring Your Chassis with Sufficient Power

To configure your chassis with sufficient power, complete the following steps:

| Step | Action |
|------|----------------------------------------------------------|
| 1 | Calculate the total power required by your configuration |
| 2 | Determine whether you want N+1 or greater power |
| 3 | Obtain the required power supplies to meet your needs |

Example

In the example below, a DIGITAL MultiSwitch 900 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.

| Component | +5V | +15V | Total Power |
|-----------------------------------------------------------------------|--------|-------|--------------|
| Chassis | 3.0 A | 0.0 A | 15.0 watts |
| DECswitch 900EF | 9.0 A | 1.5 A | 67.5 watts |
| DECrepeater 900TM | 8.0 A | 1.5 A | 62.5 watts |
| DECrepeater 900TM | 8.0 A | 1.5 A | 62.5 watts |
| PORTswitch 900FP | 8.0 A | 0.5A | 47.5 watts |
| DEChub 90 module1, without AUI (general power guideline) | 1.5 A | 0.0 A | 10.0 watts |
| DEChub 90 module ¹ , with AUI (general power guideline) | 1.5 A | 0.5 A | 15.00 watts |
| Total Power Consumption | 31.0 A | 3.5 A | 207.5 wattts |

¹ Some DEChub 90 network modules do not report their actual power requirements. The Chassis will derive a value once it learns the identity of the module. Many of the DEChub 90 module labels list the power at the maximum voltage of 5.1 volts.

NOTE

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

Power System Monitoring

The DIGITAL MultiSwitch 900 chassis power system is monitored by the Chassis Manager. When changes are detected in the chassis power system, the Chassis 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 chassis. Immediate powerup allows for forward compatibility for all DEChub 90 network modules, and provides exact DEChub 90 operation in the DIGITAL MultiSwitch 900 chassis.

Power System Status Display Messages

The Chassis Manager monitors the power system and displays four types of power system messages in the Chassis Status Display. Table 4-3 lists the Chassis Manager power system status display messages.

Power Allocation Priority

This section describes how the power system allocates power to the chassis and the network modules at power-up and when additional full and half-height modules are installed.

Chassis and Installed Network Modules

The power system allocates power to the chassis and the network modules on a priority basis as shown in the following table.

| Stage | Description |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | The chassis, including the Chassis Manager, receives 15 watts of power. |
| 2 | All half-height network modules installed in the chassis receive power immediately at power up. |
| 3 | If there is insufficient available power for a newly installed half-height network module, then a full-height module that is currently powered in the lowest slot number is powered down so power can be supplied to the newly installed half-height module. 600-Series full-height modules cannot be fully powered down. These are put into a low power mode. These modules consume a maximum of 15 watts in low power mode. |
| 4 | Newly-installed 600-Series modules are immediately powered up to 15 watts and are considered to be in low power mode. |
| 5 | Newly installed full-height network modules receive full power only after the Chassis Manager determines how much power is needed and that there is sufficient available power. |
| 6 | Available power is allocated to full-height modules from right (slot 8) to left (slot 1). |

Recalculations When a Module Is Added or Removed

When you install half-height modules (including 600-Series modules) in a chassis, the Chassis Manager automatically deducts 10.0 watts of power from the available power. Once the module's self-test is complete, the Chassis Manager recognizes the module's identity and can derive the actual power consumption. The Chassis Manager may then recalculate the available power to reflect the module's actual power needs.

Power Allocation Priority

When a module is removed from an operational chassis, the Chassis Manager displays an event notification on the Chassis Status Display, and the available power is updated (increased) by the amount of power that was consumed by the module that was removed.

Remove from the chassis any module that does not pass self-test procedures.

Power Management Process

It is important to understand how power is allocated by the Chassis Manager and what functions network modules have. The following table shows the power management process:

| Stage | Description |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | All half-height modules power up immediately. This ensures backwards compatibility with existing DEChub 90 modules. All 600-series modules power up immediately in low power mode. |
| 2 | The Chassis Manager queries the module for its type and adjusts the power consumption, if necessary. |
| 3 | The Chassis Manager subtracts the power calculated in Stage 2 from the total power available. |

12-Volt Power Considerations

In the DIGITAL MultiSwitch 900, 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.

Power Allocation Priority

Determining If a New Module Has Enough Power

To determine whether the chassis has enough power for a new module, complete the following steps:

| Step | Action |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Read the power requirements label on the module or module documentation. |
| 2 | Read the Chassis Status Display to determine that the required power is available. |
| 3 | Compare the module's 5-volt, 15-volt, and Total Power (watts) values with the Chassis Status Display Available power values and ensure all three power values are available. |
| 4 | Read the power requirements label on the module or module documentation. |
| 5 | If adequate power is not available, add power supply modules to provide power as needed for any configuration. |

Chapter 7

Remote Monitor Alarms and Events

Overview

Introduction

This chapter provides an overview of the Chassis Manager remote monitor (RMON) alarms and events feature.

In This Chapter

| Topic | Page |
|------------------------------|------|
| What is RMON? | 7-2 |
| RMON Alarms and Event Groups | 7-3 |

What is RMON?

What is RMON?

RMON is a Remote Network Monitoring Management Information Base (RMON MIB). The RMON-MIB is an industry standard (based on the IETF draft standard MIB specified by RFC 1757) that defines objects for managing remote network devices.

The DIGITAL MultiSwitch 900 Chassis Manager supports a subset of the RMON MIB. These groups are used to monitor local events occurring on the chassis:

- RMON Alarms Group
- RMON Events Group

You can use the alarms and events to monitor MIB objects within the Chassis Manager.

Reference Refer to RFC 1757 for information on RMON MIB objects.

RMON Alarms and Event Groups

RMON Alarms Group

The RMON alarms group samples variables from the Chassis Manager and compares them to preconfigured and configurable thresholds. The Chassis Manager's alarm table stores values of MIB objects which define polling frequency, thresholds, alarm types, and the events to be generated when an alarm exceeds its threshold.

RMON Events Group

The RMON events group controls the generation and notification of Chassis Manager events. Each entry in the Chassis Manager's event table contains parameters that can be activated. Events are activated by alarms configured in the alarms group.

Chassis Manager Default Alarms and Events

The Chassis Manager is configured with seven default alarms and events in its local MIB.

Table 7-1 contains a list of event messages that are generated by the Chassis Manager when an alarm exceeds its threshold.

Table 7-1: Event Messages Generated By MIB Objects

| This MIB object... | generates this event message... | which means... |
|----------------------------|-------------------------------------------|--------------------------------------------------------------------------|
| chasNumSlotsOccupied | A network module was inserted or removed. | A network module was inserted or removed from the backplane. |
| chasEnvironChanges | An environment change occurred | A network module's fan failed, or a network module is overheating. |
| chasPowerConfigNumSupplies | A power supply was inserted or removed. | A power supply was inserted or removed from the DIGITAL MultiSwitch 900. |

RMON Alarms and Event Groups

| This MIB object... | generates this event message... | which means... |
|--------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| chasPowerConfigRedundancyState | Power supply N+1 | Available power has either increased or decreased. Refer to Chapter 5 for information on N+1 redundancy. |
| chasConnChanges | A backplane connection change has occurred. | The LAN interconnect environment has changed. Refer to MultiChassis Manager documentation. |
| pcomEsysNVRAMavailableOctets | Nonvolatile RAM cannot accept any additional parameters. | There is no more memory for additional nonvolatile parameters. Parameters include IP addresses, trap addresses, error log messages or events. |
| pcomEsysNVRAMfailedFlag | Nonvolatile RAM failure | Nonvolatile memory failed. Correct by resetting the Chassis Manager to factory defaults or by replacing the Chassis Manager. |

Manipulating RMON Alarms and Events

It is possible to create, modify, and delete alarms and events using an SNMP application. Refer to the *DIGITAL clearVISN RMON Manager V3.3* manual for more information.

Appendix A

Problem Solving

Overview

Introduction

This appendix provides problem solving information for the DIGITAL MultiSwitch 900 chassis and its power system.

In This Appendix

| Topic | Page |
|-----------------------|------|
| Problem Solving Table | A-2 |

Problem Solving Table

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

Table A-1: Problem Solving the DIGITAL MultiSwitch 900

| Symptom | Probable Cause | Corrective Action |
|------------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The two LEDs on the power supply module are off. | The chassis 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 1-1). Check the power connection to the chassis. 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 Chassis Status Display is not lit. | The Chassis Manager is not receiving power. | Remove the front cover; check that the cables are attached and seated to the connectors. |

Problem Solving Table

| Symptom | Probable Cause | Corrective Action |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Chassis Manager fails the self-test. | The self-test diagnostics have uncovered a hardware failure. | <p>If the chassis network modules are currently operational, schedule network downtime.</p> <p>When the network modules are not needed, power cycle the chassis to see if the diagnostic failure clears.</p> <p>If the failure persists, the Chassis Manager or the backplane is faulty. Contact your Digital service representative to correct the problem.</p> <p>NOTE</p> <p>900-series modules will not resume operation after power cycling the chassis if the self-test error persists.</p> |
| There is no response on the chassis setup port. | <p>The terminal device is connected incorrectly</p> <p>or</p> <p>the port and the terminal baud rates are not compatible.</p> <p>or</p> <p>the terminal flow control is disabled by XOFF</p> <p>or</p> <p>the setup port is redirected or is in event display mode.</p> | <p>Check that the correct cable and adapter are used. If not, connect the correct cable and/or adapter. Refer to Table 4-1.</p> <p>Change the terminal characteristics to match the settings in Table 4-5.</p> <p>Use the terminal's setup to clear communications.</p> <p>Press Ctrl/C.</p> |

Problem Solving Table

| Symptom | Probable Cause | Corrective Action |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The modules do not connect to the backplane connector. | The pins on the module connector might be bent. | Replace the module. |
| LCD display says "BOOTP Request" | Chassis firmware is corrupted. When this occurs, it is usually because power was disrupted during the downline load procedure to update the chassis firmware. | <p>Do one of the following:</p> <ol style="list-style-type: none"> 1. Contact your Digital Service Representative about getting a replacement chassis. 2. Contact your DIGITAL Service Representative about using the Chassis' primitive loader to load a clean firmware image. This procedure requires a TFTP server configured to serve the chassis firmware file, a SLIP connection to the chassis OBM port, and a system that supports invoking TFTP from a command line. <p>The procedure is shown in the section titled When the LCD Display Says "BOOTP Request"</p> |

Problem Solving Table

| Symptom | Probable Cause | Corrective Action |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A network management system, such as clearVISN MultiChassis Manager, shows many errors when trying to access the chassis. | The same IP address is configured for more than one chassis module or for a chassis module and the chassis itself. | <ol style="list-style-type: none"> 1. Use the menu function Show Current Settings to look at the chassis' IP address. 2. Use the Start Redirect Mode and Show Current Settings menu functions to examine the IP address configured for each module in the chassis. 3. Remove all duplicate IP addresses. |

When the LCD Display Says "BOOTP Request"

| Step | Action |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Configure the chassis OBM port to run SLIP (see Chapter 2). |
| 2 | Set the OBM port speed to 9600 bits per second. |
| 3 | If the boot request message had been displayed before the SLIP connection was setup for 9600 bits per second, power cycle the chassis to start the boot request. |
| 4 | Issue the following command on a system that supports command line TFTP: <pre>>tftp <ip_address> -put <dmhubXXX.bin> mam_bin -image</pre> |

where:

| Parameter | Description |
|--------------|-------------------------------------------------|
| ip_address | the IP address of the SLIP connection address |
| dmhubXXX.bin | the name of the image file you want to download |
| mam_bin | the file name used by the chassis |
| -image | sets the transfer mode to binary |

Appendix B

Order Numbers and Specifications

Overview

Introduction

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

In This Appendix

| Topic | Page |
|--------------------------------|------|
| Country-Specific Order Numbers | B-2 |
| Related Parts | B-3 |
| Specifications | B-4 |

Country-Specific Order Numbers

Table B-1 lists the country-specific DIGITAL MultiSwitch 900 order numbers.

Table B-1: DIGITAL MultiSwitch 900 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 B-2 lists the related parts for the DIGITAL MultiSwitch 900 chassis.

Table B-2: Related Parts

| Part | Order Number |
|-------------------------------------------------------------------------|-----------------------|
| Chassis setup port connection to MMJ devices (VT420, DECserver 90L+) | BN24H-xx ¹ |
| Chassis setup port connection to 8-pin MJ devices (DECserver 90TL) | BN24F-xx ¹ |
| Chassis OBM to MMJ adapter | H8571-J |
| 140-watt power supply | H7890-MA |
| 163-watt power supply | H7894-MA |

¹ The xx represents the length in meters.

Specifications

Introduction

This section describes the mechanical, electrical, and acoustic specifications for the DIGITAL MultiSwitch 900 chassis.

Mechanical Specifications

Table B-3 through Table B-7 list the mechanical specifications for the DIGITAL MultiSwitch 900 chassis and related components.

Table B-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 B-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 |

Specifications

Table B-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 B-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 that extend less than 3 inches below the chassis.

Table B-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) |

Specifications

Electrical Specifications

Table B-8 provides the electrical specifications for the DIGITAL MultiSwitch 900 chassis.

Table B-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 B-9 provides the environmental specifications for the DIGITAL MultiSwitch 900 chassis.

Table B-9: Environmental Specifications

| Parameter | DIGITAL MultiSwitch 900 |
|------------------------------------|-----------------------------------------------------------------------------------------------|
| Operating temperature ¹ | H7890 (140W) 10C to 40C (50F to 104F) H7894 (163W) 5C to 50C (41F to 122F) |
| Relative humidity | 10% to 95% noncondensing |
| Altitude | Nonoperating Sea level to 2400 m (8,000 ft) Operating Sea level to 4900N (16,000 ft) |

¹ For sites above 4900 m (16,000 ft), decrease the operating temperature specification by 1.85C for each 1000 m or 3.25F for each 3200 ft.

Acoustic Specifications

Table B-10 and Table B-11 list the preliminary declared acoustic values per ISO 9296 and ISO 7779, for the DIGITAL MultiSwitch 900 chassis.

Table B-10: Acoustical Specifications - English

Acoustics: Declared values per ISO 9296 and ISO 7779¹

| Product | Idle Sound Power Level (L_{wad}, B) | /Operate Sound Pressure Level (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 |
| DMHUB-MB + H7894-MA | 5.2 | 38 |
| DMHUB-MB + 2 x H7894-MA | 5.5 | 41 |
| DMHUB-MB + 3 x H7894-MA | 6.2 | 48 |
| DMHUB-MB + 4 x H7894-MA | 6.5 | 51 |

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.

Specifications

Table B-11: Acoustical Specifications - German

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

| Produkt | Leerlauf Schalleistungspegel ($L_{WA,d}$, B) | /Betrieb Schalldruckpegel (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 me-baren Schallemissionen | keine me-baren Schallemissionen |
| DMHUB-MB + H7894-MA | 5.2 | 38 |
| DMHUB-MB + 2 x H7894-MA | 5.5 | 41 |
| DMHUB-MB + 3 x H7894-MA | 6.2 | 48 |
| DMHUB-MB + 4 x H7894-MA | 6.5 | 51 |

¹Aktuelle Werte für spezielle Ausr-stungsstufen sind über die Digital Equipment Vertretungen erh-ltlich. 1 B = 10 dBA.

Hinweis

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

Appendix C

Connector, Cable, and Adapter Pin Assignments

Overview

Introduction

This appendix lists the connector, adapter, and cable pin assignments for the DIGITAL MultiSwitch 900.

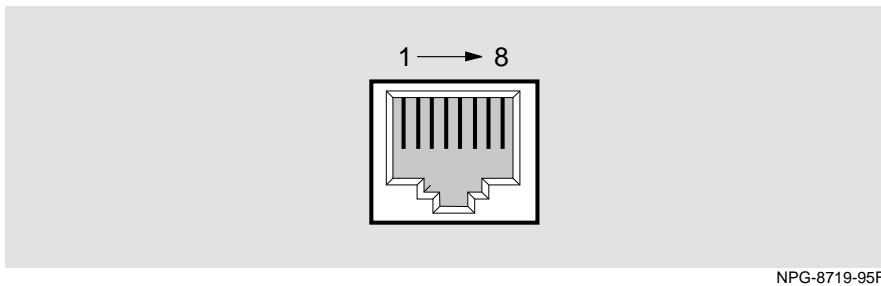
In This Appendix

| Topic | Page |
|---------------------------|------|
| Connector Pin Assignments | C-2 |
| Cable Pin Assignments | C-4 |
| Adapter Pin Assignments | C-7 |

Connector Pin Assignments

Chassis Manager Setup Port (8-Pin MJ) Connector

Figure C-1: Setup Port (8-Pin MJ) Connector



NPG-8719-95F

Table C-1: Setup Port Connector Pin and Signal Assignment

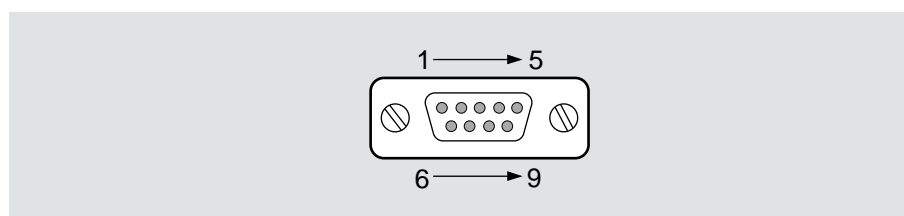
| Pin | Assignment |
|-----|-------------------------------|
| 1 | No connect |
| 2 | Receive (RX) |
| 3 | Ground |
| 4 | No connect |
| 5 | No connect |
| 6 | Transmit (TX) |
| 7 | Ready-Out or DTR ¹ |
| 8 | Ready-In or DSR ² |

¹ This signal is tied to Vcc through a 150-ohm resistor.

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

Chassis Manager OBM Port Connector Pin Assignments

Figure C-2: OBM Port (DB-9) Connector



NPG-0299-95F

Table C-2: OBM Port (DB-9) Connector Pin Assignments

| Pin | Assignment |
|-----|---------------------------|
| 1 | Data Carrier Detect (DCD) |
| 2 | Receive Data (RXD) |
| 3 | Transmit Data (TXD) |
| 4 | Data Terminal Ready (DTR) |
| 5 | Ground |
| 6 | Data Set Ready (DSR) |
| 7 | Request to Send (RTS) |
| 8 | Clear to Send (CTS) |
| 9 | No connect |

Cable Pin Assignments

BC29P Cable

Figure C-3: BC29P Cable Pin

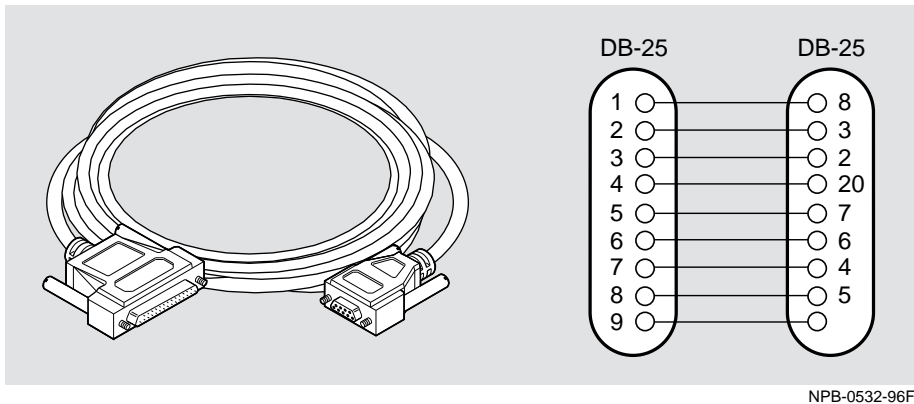


Table C-3: BC29P Cable Pin Assignments

| DB-9 | DB-25 | Signal |
|------|-------|---------------------------|
| 1 | 8 | Data Carrier Detect (DCD) |
| 2 | 3 | Receive Data (RXD) |
| 3 | 2 | Transmit Data (TXD) |
| 4 | 20 | Data Terminal Ready (DTR) |
| 5 | 7 | Ground |
| 6 | 6 | Data Set Ready (DSR) |
| 7 | 4 | Request to Send (RTS) |
| 8 | 5 | Clear to Send (CTS) |
| 9 | | No connect |

BC29Q Cable

Figure C-4: BC29Q Cable Pin Assignments

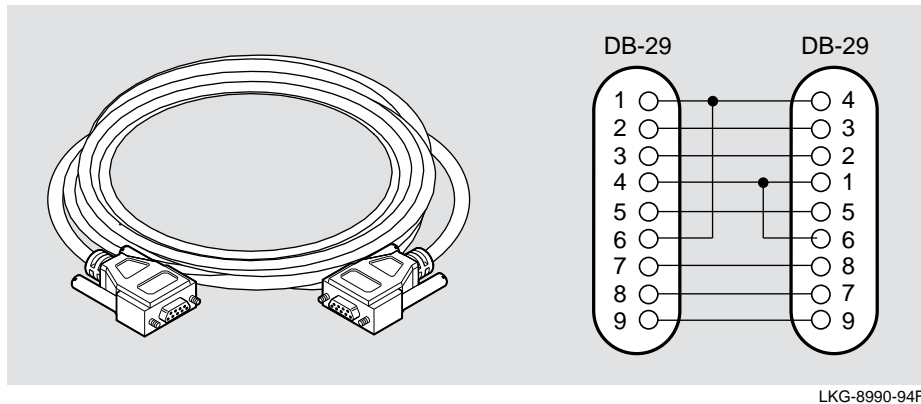


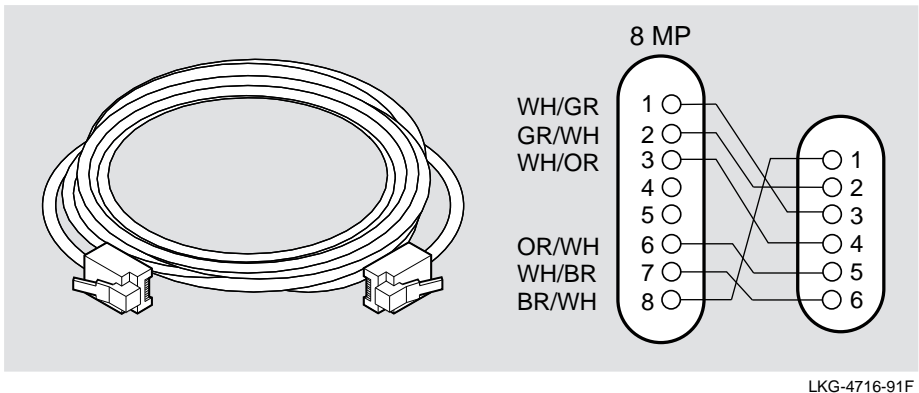
Table C-4: BC29Q Cable Pin Assignments

| DB-9 | DB-25 | Signal |
|------|-------|---------------------------|
| 1 | 4 | Data Carrier Detect (DCD) |
| 2 | 3 | Receive Data (RXD) |
| 3 | 2 | Transmit Data (TXD) |
| 4 | 1 | Data Terminal Ready (DTR) |
| 5 | 5 | Ground |
| 6 | 6 | Data Set Ready (DSR) |
| 7 | 8 | Request to Send (RTS) |
| 8 | 7 | Clear to Send (CTS) |
| 9 | 9 | No connect |

Cable Pin Assignments

BN24H Cable

Figure C-5: BN24H Cable Pin Assignments



LKG-4716-91F

Adapter Pin Assignments

Figure C-6: H8571-J Adapter Pin Assignments

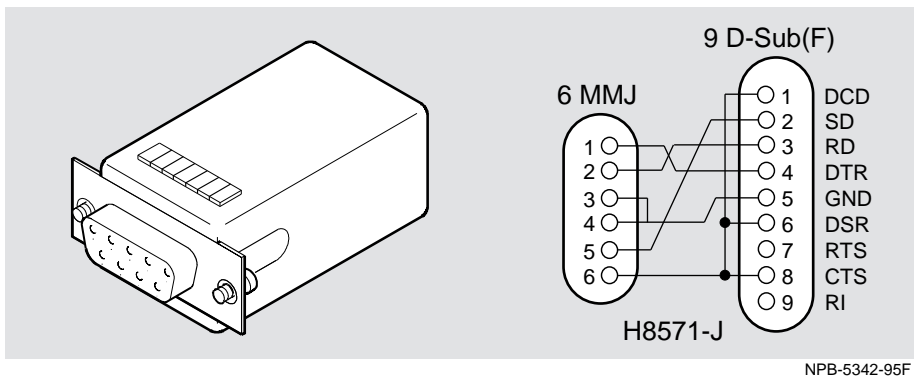
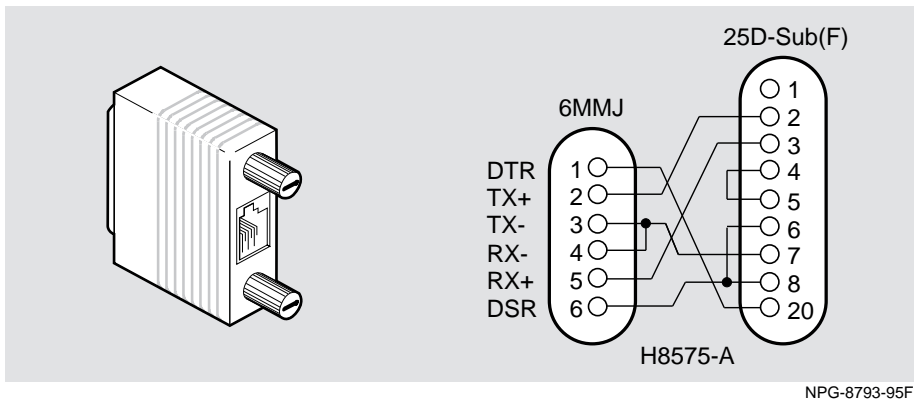


Figure C-7: H8575-A Adapter Pin Assignments



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