DIGITAL MultiSwitch 900-4

Installation and Configuration

Part Number: EK-DLHUB-IN. A01

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This manual describes how to assemble, configure, and manage a DIGITAL MultiSwitch 900-4.

Revision Information: This is a new document.

FCC Notice — Class A Computing Device:
This equipment generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC rules, which are designed to provide reasonable protection against such radio frequency interference. Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference. Any modifications to this device - unless expressly approved by the manufacturer - can void the user's authority to operate this equipment under part 15 of the FCC rules.

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

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警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

CE Notice — Class A Computing Device:

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

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

Avertissement!
Cet appareil est un appareil de Classe A. Dans un environment résidentiel cet appareil peut provoquer des brouillages radioélectriques. Dans ce cas, il peut être demandé à l'utilisateur de prendre les mesures appropriées.

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Preface

Overview

About This Manual

This manual provides information on installing, configuring, and managing the DIGITAL MultiSwitch 900-4.

Intended Audience

This manual is intended for use by personnel who assemble, configure, and manage the MultiSwitch 900-4.

Organization

This manual is organized as follows:

Section	Description
Chapter 1	Provides an overview of the DIGITAL MultiSwitch 900-4.
Chapter 2	Provides procedures for installing, removing, and resetting a MultiSwitch 900-4 power supply.
Chapter 3	Provides instructions for managing the MultiSwitch 900-4 using the Management Agent Module and procedures for replacing a Management Agent Module in the MultiSwitch 900-4.
Chapter 4	Provides instructions on how to install a MultiSwitch 900-4 and how to install and remove MultiSwitch 900 and MultiSwitch 600 modules.
Appendix A	Provides installation-specific problem solving information using the LEDs.
Appendix B	Provides connector and pin assignment information.
Appendix C	Provides product specifications.
Appendix D	Lists orderable options, associated documentation and related communication information, and provides service and support information.

Conventions

Overview

This manual uses the following conventions:

Convention	Description
NOTE	Contains information of special interest.
`Special Type`	Indicates system output in examples.
Boldface	Indicates user input in examples.
<Return>	Indicates that you should press the Return key.
italic type	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

Safety

Any warning or caution that appears in this manual is defined in this section. The cautions that must be observed for the hardware described in this manual are listed below in English, German, French, and Spanish.

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 Gerate 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.

CAUTION	Static electricity can damage modules and electronic components. DIGITAL recommends using a grounded antistatic wrist strap and a grounded work surface when handling any modules.
ACHTUNG	Module und elektronische Komponenten können durch elektrostatische Entladungen beschädigt werden. Benutzen Sie immer eine antistatische Gelenkmanschette und eine geerdete Arbeitsunterlage, wenn Sie am offenen Gerät arbeiten.
ATTENTION	Les charges excessives d'électricité statique peuvent endommager les modules et les composants électroniques. DIGITAL conseille l'utilisation d'un bracelet de masse et d'un plan de travail mis à la terre lors de la manipulation des modules.
PRECAUCIÓN	La electricidad estática puede dañar los componentes electrónicos y los módulos. DIGITAL recomienda que se utilicen cintas de pasadores y superficies de trabajo conectadas a tierra al trabajar con cualquier módulo.

CAUTION	Always make sure this unit is adequately grounded.
ACHTUNG	Stellen Sie in jedem Falle sicher, daß dieses Gerät vorschriftsmäßig geerdet ist. An einen Stromversorgungskreis dürfen nur dann mehr als fünf Stack Stations angeschlossen werden, wenn der Stromkreis durch einen Schutzschalter abgesichert ist.
ATTENTION	Vérifiez toujours que cette unité est correctement reliée à la terre. Ne connectez pas plus de cinq stations empilables sur une même lisière électrique, sauf si la lisière est protégée par un dispositif GFCI.
PRECAUCIÓN	Asegúrese siempre de que esta unidad esté puesta a tierra adecuadamente. No conecte más de cinco estaciones en pila en una platina de alimentación a menos que esté protegida por un dispositivo GFCI.

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 verden. 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 corrumpue, 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.

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.

WARNING	High energy levels are present on the backplane. Do not touch the backplane unless all power is removed from the unit. Electrical burns could result.
VORSICHT	An der Rückseite des Geräts sind hohe Spannungswerte vorhanden. Berühren Sie die Teile dort nicht, wenn das Netzkabel noch angeschlossen ist. Es besteht die Gefahr von Stromschlägen.
DANGER	Le panneau arrière comporte des branchements électriques. N'y touchez pas avant d'avoir mis l'unité hors tension. Dans le cas contraire, vous risquez de vous électrocuter.
AVISO	El panel posterior tiene niveles de potencia elevados. No toque el panel posterior a menos que se haya desconectado la alimentación eléctrica de la unidad. Podría causar quemaduras.

WARNING	To avoid bodily injury or equipment damage, use care when connecting the power cord.
VORSICHT	Seien Sie beim Anbringen des Stromkabels sehr vorsichtig, um Verletzungen oder einen Geräteschaden zu vermeiden.
DANGER	Pour éviter tout accident corporel ou matériel, soyez prudent lorsque vous branchez le cordon d'alimentation.
AVISO	Para evitar lesiones corporales o daños al equipo, tenga cuidado al conectar el cable de alimentación.

WARNING	Use care when removing a power supply. Power supplies are heavy, and may be hot.
VORSICHT	Seien Sie beim Trennen des Netzteils sehr vorsichtig. Netzteile sind schwer und könnten heiß sein.
DANGER	Soyez prudent lorsque vous retirez une unité d'alimentation. Les unités d'alimentation sont lourdes et sont parfois brûlantes.
AVISO	Tenga cuidado al desconectar la fuente de alimentación. Las fuentes de alimentación son pesadas y es posible que estén calientes.

Chapter 1

MultiSwitch 900-4 Description

Overview

Introduction

This chapter describes the MultiSwitch 900-4.

In This Chapter

What Is the MultiSwitch 900-4?

The MultiSwitch 900-4 is a versatile four-slot chassis that provides multitechnology integration. It supports Ethernet, FDDI, ATM, and VNbus technologies. The chassis accommodates any combination of MultiSwitch 900 and MultiSwitch 600 modules. It is managed with clearVISN.

The MultiSwitch 900-4 includes these features:

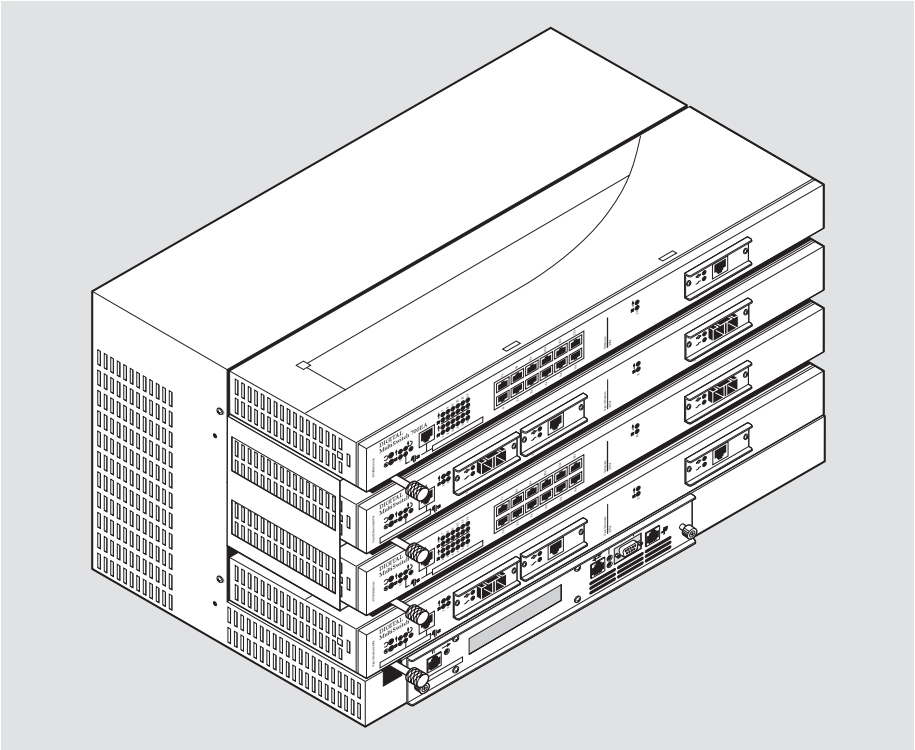
- Is technology independent supporting Ethernet, FDDI, ATM, and the VNbus.
- Features a unique, open technology backplane functionality that is defined by firmware, not limited by hardware.
- Is preconfigured with one power supply. This power supply module provides power to the whole system. An optional power supply is available to provide the MultiSwitch 900-4 with a redundant source of power.
- Can hot-swap MultiSwitch 900 and MultiSwitch 600 modules, the Management Agent Module, and the power supply, making it easy to accommodate network changes without disrupting users.
- Uses any combination of MultiSwitch 900 and MultiSwitch 600 modules. These separately orderable hardware modules support various networking requirements.
- Fits on a desktop or can be rack-mounted.

The Management Agent Module includes these features:

- Supports easy, low-cost management with *clear*VISN. This graphical network management application features simple point-and-click commands that allow network managers to configure and reconfigure the chassis to accommodate changing networks.
- Provides a connection to a network management station, either in-band or out-of-band. It also communicates with the functional modules installed in the MultiSwitch 900-4.
- Uses a single IP address to manage an entire MultiSwitch 900-4.
- Supports four groups of RMON.
- The MultiSwitch 900-4 is preconfigured with a Management Agent Module. A backup Management Agent Module is available as an option. For information on the Management Agent Module, refer to *The Management Agent Module* on page 1-3 and in Chapter 3.

Figure 1-1 shows a typical MultiSwitch 900-4 configuration that can use MultiSwitch 900 or MultiSwitch 600 modules installed in its four slots. The Management Agent Module is located at the bottom of the MultiSwitch 900-4.

Figure 1-1: Typical MultiSwitch 900-4 Configuration



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For information on ordering MultiSwitch 900-4 options, see Appendix D. Functional modules are described in their associated documentation.

The Management Agent Module

A Management Agent Module provides network management for the MultiSwitch 900-4 through a Simple Network Management Protocol (SNMP) management agent. It also communicates with the MultiSwitch 900 and MultiSwitch 600 modules installed in the MultiSwitch 900-4 and controls the backplane resources.

For information on the Management Agent Module, refer to Chapter 3.

Chapter 2

Power Supply Overview, Installation, and Removal

Overview

Introduction

This chapter provides procedures for installing, removing, and resetting a MultiSwitch 900-4 power supply.

In This Chapter

Power System Monitoring

The MultiSwitch 900-4 power system is monitored by the Management Agent Module. When changes are detected in the MultiSwitch 900-4 power system, the Management Agent Module updates the amount of power available to the network modules.

Power System Status Display Messages

The Management Agent Module monitors the power system and displays power system messages in the Management Agent Module Status Display. Table 2-1 lists the Management Agent Module power system status display messages.

Table 2-1: Management Agent Module Status Display Messages

Message	Explanation
`2 4` `Avail. Hub Slots`	The empty hub slots and available hub slots message (if sufficient power is available). Modules can be inserted in hub slots 2 and 4.
	or
`2 4` `!No More Power!`	The empty hub slots and a !No More Power! message if insufficient power is available. The possible no more power messages are: • `No More Total Power!` • `No More 5V Power!` • `No More 15V Power!`
`3:DECbridge 900MX Up`	The modules in an occupied slot are powered up.
	or
`3:DECconcentrator` `! Not Enough Power!`	Not enough power exists to power this module up. Messages include: • `Not Enough Power!` • `Not Enough 5V Power!` • `Not Enough 15V Power!`
`Available: xxx.x W` `5V: xx.x A 15V: xx.x A`	The total available power in watts (W) and the available current in amperes (A) for 5 volts and 15 volts.
`Checking Power System Status`	Appears only when a power supply module is installed or removed. Depending on the Management Agent Module Status Display message sequence, you may never see this message.

Power Allocation Policy

This section describes how the power system allocates power to the chassis, the Management Agent Module, and the MultiSwitch 900 and the MultiSwitch 600 modules.

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 Management Agent Module, receives 47.5 watts of power.
2	Newly installed MultiSwitch 600 modules are immediately powered up to 15 watts (low power mode).
3	Newly installed MultiSwitch 900 and MultiSwitch 600 modules receive full power only after the Management Agent Module determines how much power is needed and that sufficient power is available.
4	Available power is allocated to MultiSwitch 900 and MultiSwitch 600 modules from the bottom (slot 1) to the top (slot 4) on the chassis.

Management Agent Module Recalculations When a Module Is Added

When you install MultiSwitch 600 modules in a MultiSwitch 900-4, the Management Agent Module automatically deducts 15 watts from the available power. Once the module’s self-test is complete, it notifies the Management Agent Module of its actual power needs. The Management Agent Module may then recalculate the available power to reflect the module's actual power needs. Remove any module that does not pass self-test from the MultiSwitch 900-4.

Management Agent Module Recalculations When a Module Is Removed

When a module is removed from an operational MultiSwitch 900-4, the Management Agent Module displays an event notification on the MultiSwitch 900-4 Status Display. The available power is updated (increased) by the amount of power that was consumed by the removed module.

Guidelines for Calculating Power Needs

This section describes how to calculate the power requirements for your MultiSwitch 900-4. The MultiSwitch 900-4 supports two 300-watt redundant power supplies (H7898-MA).

Power Rating of the MultiSwitch 900-4 Power Supplies

The average input power is 428 watts maximum with the outputs loaded to 300 watts. The ratio of real power to apparent power (power factor) is 0.99.

The MultiSwitch 900-4 power supply meets IEC 1000-3-2 requirements. At lower ac input voltages, the power factor may drop off, but the power supply will continue to meet requirements.

Power Consumption of the MultiSwitch 900-4 and MultiSwitch 900 and 600 Modules

Table 2-2 lists the power consumption of each component of the MultiSwitch 900-4, the power consumption of the MultiSwitch 900 and MultiSwitch 600 modules which can be used in this chassis.

Table 2-2: MultiSwitch 900-4 System Power and Supported Modules

Component	+5V	+15V	Total Power
MultiSwitch 900-4 Chassis:			
300-watt power supply module Maximum usable power	55.0 A	6.0 A	300.0 watts
Management Agent Module	1.5 A	0.0 A	7.5 watts
MultiSwitch 900-4 Supported Modules:			
Single MultiSwitch 600 module in low power mode	2.8 A	0.04 A	15.0 watts
MultiSwitch 612EX	3.7 A	0.08 A	19.5 watts
MultiSwitch Hub 612TX	4.0 A	0.0 A	22.4 watts
MultiSwitch Hub 624T	5.5 A	0.7 A	35.9 watts
MultiSwitch Fast Ethernet Hub 924TX	8.4 A	0.5 A	4.95 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
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
DECswitch 900EE	8.0 A	1.5 A	62.5 watts
DECswitch 900EF	9.0 A	1.5 A	67.5 watts

Table 2-2: MultiSwitch 900-4 System Power and Supported Modules

Component	+5V	+15V	Total Power
VNswitch 900EA	8.2 A	0.5 A	48.5 watts
VNswitch 900EA/RMON	8.5 A	0.50 A	50.0 watts
VNswitch 900EE	8.6 A	0.50 A	50.5 watts
VNswitch 900EE/RMON	9.2 A	0.50 A	53.5 watts
VNswitch 900EF	7.8 A	0.50 A	46.5 watts
VNswitch 900EF/RMON	8.1 A	0.50 A	48.0 watts
VNswitch 900EX	8.6 A	0.50 A	50.5 watts
VNswitch 900EX/RMON	8.9 A	0.50 A	52.0 watts
VNswitch 900FA	8.0 A	0.50 A	47.5 watts
VNswitch 900FF	6.8 A	0.50 A	41.5 watts
VNswitch 900FX	7.8 A	0.50 A	46.5 watts
VNswitch 900LL	11.0 A	0.50 A	62.5 watts
VNswitch 900XA	8.6 A	0.50 A	50.5 watts
VNswitch 900XX	8.6 A	0.50 A	50.5 watts
VNswitch 900GV	6.7 A	0.50 A	41.0 watts

Redundant Power Overview

The MultiSwitch 900-4 is preconfigured with one power supply. This power supply provides power to the whole system. You can install a second power supply to provide a redundant source of power. This allows for the failure of either power supply and guarantees that sufficient power is continually provided to all MultiSwitch 900 and MultiSwitch 600 modules installed in the MultiSwitch 900-4.

The Management Agent Module allocates maximum power to the system regardless of whether one or two power supplies are installed in the MultiSwitch 900-4.

Installing the Optional Redundant Power Supply

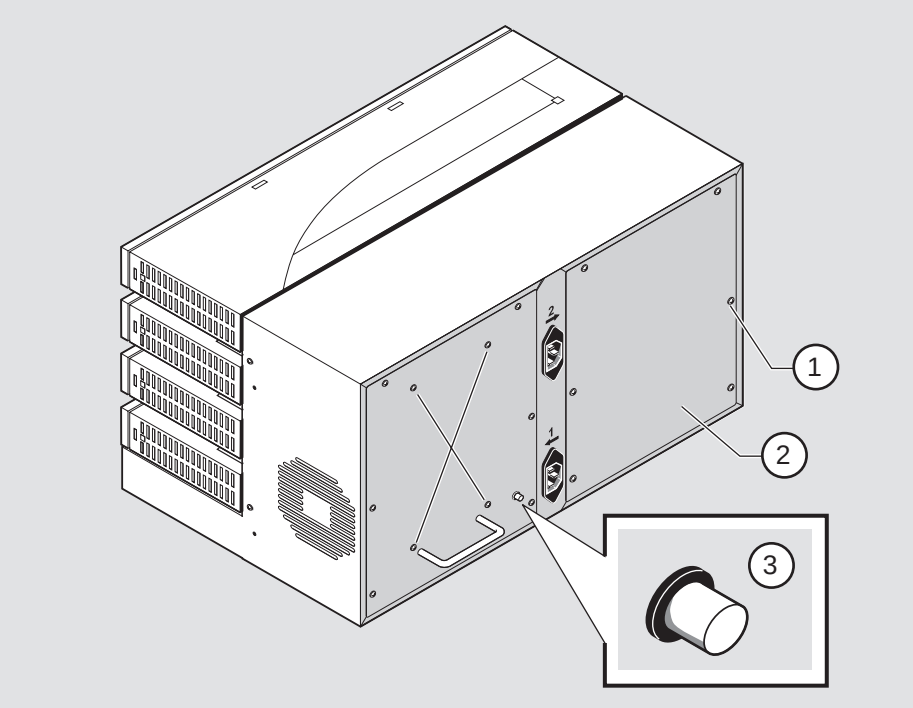
This section describes how to install an optional power supply, install the ac line cord, and reset the power system.

Step 1: Removing the Blank Panel

Follow these steps to remove the blank panel covering the empty power supply slot. You do not need to power down the original power supply.

Step	Action
1	Remove the six Phillips-head screws **(1)** from the blank panel **(2)** on the back of the MultiSwitch 900-4 chassis. The blank panel does not contain a DC OK LED **(3)** (see Figure 2-1). Note: If the LED is on (green), the power is functioning. If the LED is off, the power is not functioning.
2	Remove the blank panel **(2)** from the MultiSwitch 900-4 chassis.

Figure 2-1: Optional Redundant Power Supply Back Panel

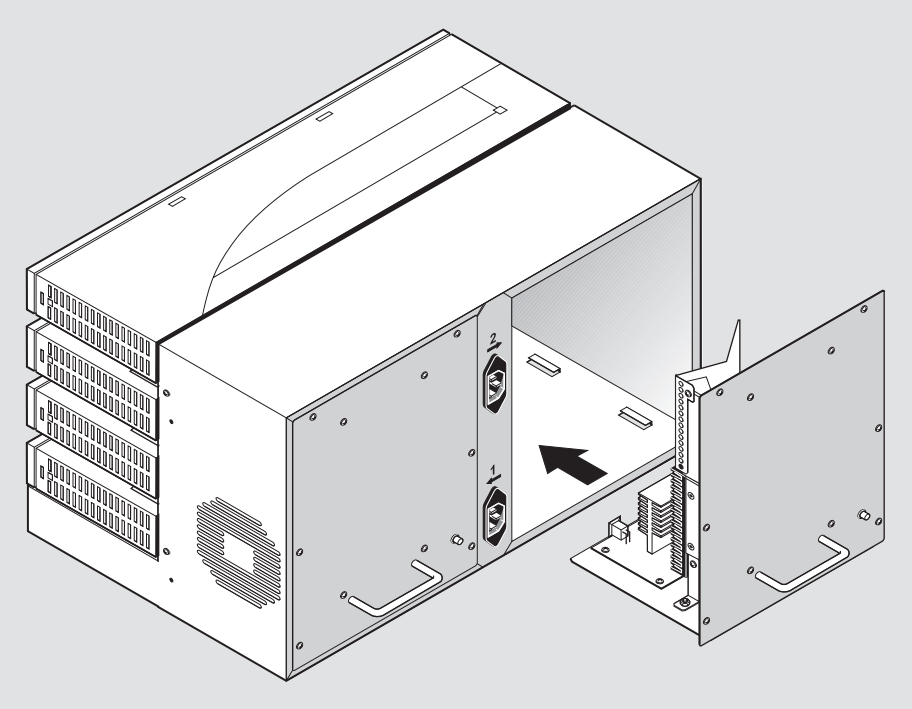


Step 2: Installing the Optional Redundant Power Supply

Follow these steps to install a second power supply module into the empty power supply slot on the MultiSwitch 900-4:

Step	Action
1	Align the new power supply with the metal-form card guide inside the chassis. Slide the power supply in place. Check the alignment of the power supply connector and backplane connector (Figure 2-2).
2	Lock the power supply in place by reinserting the six Phillips-head screws into the power supply assembly.

Figure 2-2: Installing the Optional Redundant Power Supply



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Step 3: Installing the AC Cord

To install the ac power cord for the optional power supply (Figure 2-3), follow these steps:

WARNING

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

Step	Action
1	Note: The DC OK LED does not light until you plug in the ac line cord. Install the labeled ac line cord into the labeled ac connector at the top of the chassis.
2	Plug the ac line cord into a working AC outlet.
3	Verify that the DC OK LED on the power supply is lit, and that the Management Agent Module begins the self-test procedure (refer to *Management Agent Module Self-Test Procedure* on page 2-13).
4	If the power does not come on, check to ensure that the power cord is plugged into the correct receptacle on the back of the MultiSwitch 900-4.

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

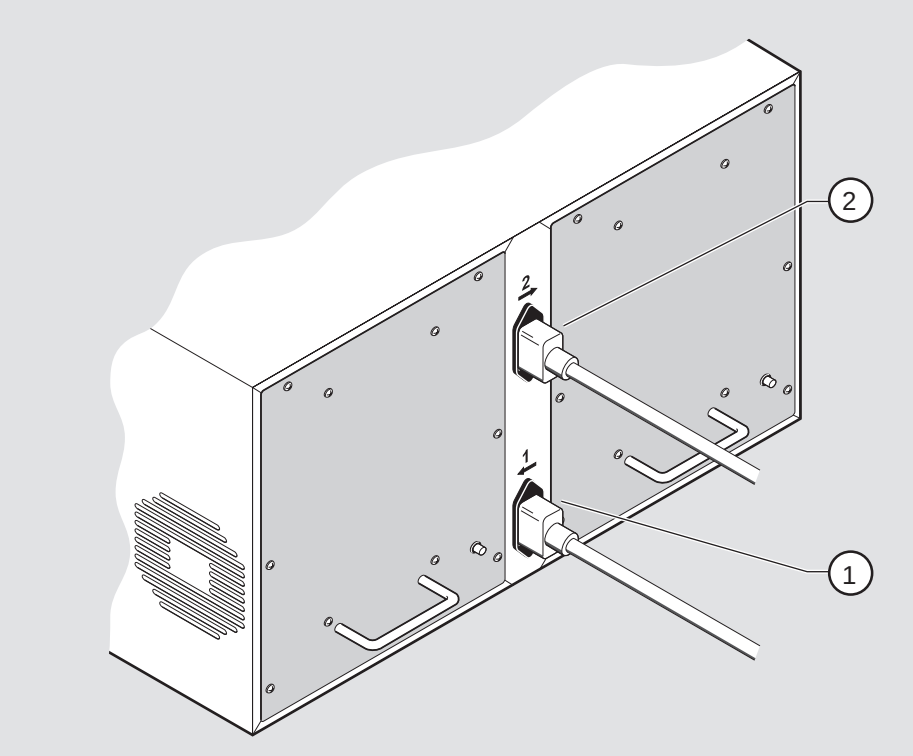

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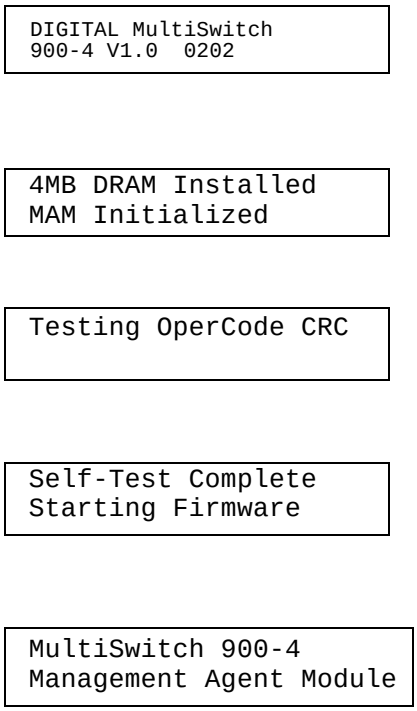
Table 2-3: AC Cord Description (Rear View of the MultiSwitch 900-4)

Item	Description
1	AC cord for the power supply (slot 1) on the left
2	AC cord for the power supply (slot 2) on the right

Management Agent Module Self-Test Procedure

The Management Agent Module indicates the start of the self-tests by displaying test numbers across its Status Display.

Figure 2-4: Self-Test Status Display



NOTE

After installing a optional redundant power supply, you may observe a momentary flicker in the power supply LEDs. This flicker is part of the normal installation power-up sequence when adding additional power supply modules. This task does not cause a power interruption to the MultiSwitch 900-4 or to the MultiSwitch 900 or 600 modules installed in it.

You are now ready to install MultiSwitch 900 and MultiSwitch 600 modules into the chassis and make the necessary network connections. Refer to specific product documentation for installation procedures.

How to Avoid Overheating of a Power Supply

Overheating of the power supply in slot 1 can occur in a MultiSwitch 900-4 that uses two power supplies when both of these conditions exist:

- The power supply in slot 2 becomes nonfunctional or is not plugged in.
- A fan is not working.

The power supply in slot 1 will work for a while, but you should remove the nonfunctioning power supply in slot 2 as soon as possible.

To avoid overheating of the power supply in slot 1, perform the following steps:

Step	Action
1	Remove the nonfunctioning power supply in slot 2. (Refer to *Removing a Power Supply* on page 2-17.)
2	Install the blank panel that originally shipped with the product. If you cannot find the blank panel, then remove the power supply and temporarily leave slot 2 open.
3	Replace the fan as soon as possible.

Removing Power Cords and Cables

To disconnect power cords and cables from the MultiSwitch 900-4, perform the procedure in the following table:

Step	Action
1	Remove the ac power cord or cords from the rear of the MultiSwitch 900-4. (See Figure 2-5.)
2	Remove the cable from the Management Agent Module Management Access port (**1**). (See Figure 2-6.)
3	Remove the cable from the Management Agent Module OBM port (**2**). (See Figure 2-6.)
4	Remove the setup port cable from the Management Agent Module (**3**). (See Figure 2-6.)

Figure 2-5: AC Cords

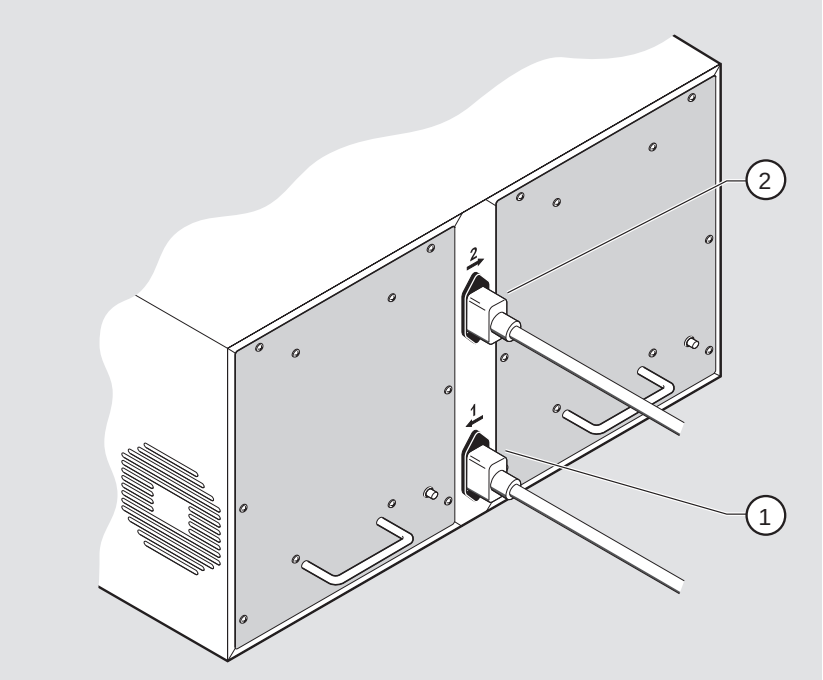


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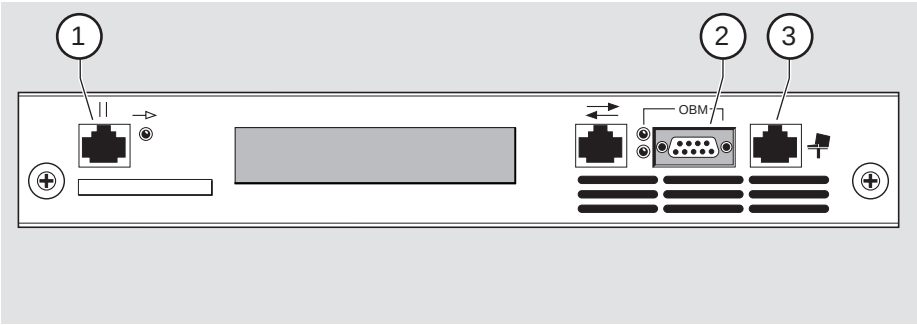
Figure 2-6: Cable Locations



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Removing a Power Supply

If you have two power supplies, one can be removed while the MultiSwitch 900-4 is operational. To remove a power supply, perform the following steps:

WARNING

Use care when removing a power supply. Power supplies are heavy, and may be hot.

Step	Action
1	Verify that a Management Agent Module Status Display message indicates that the power supply is no longer operational.
2	Make sure that the DC OK LED on the power supply is off.
3	Pull out the power cord whose label is identical to that of the power supply you are removing. Note: If you are removing a failed power supply, be sure to remove the correct power cord; otherwise, the MultiSwitch 900-4 will be without power.
4	Remove the six Phillips-head screws from the back of the power supply assembly.
5	Remove the power supply.
6	Insert the new power supply (refer to *Installing the Optional Redundant Power Supply* on page 2-8) or replace the back panel that originally came with the MultiSwitch 900-4.

Chapter 3

Configuring the Management Agent Module

Overview

Introduction

This chapter describes how to configure the Management Agent Module that provides power, backplane interconnections, and Simple Network Management Protocol (SNMP) management for a MultiSwitch 900-4.

In This Chapter

This chapter contains the following topics:

Management Agent Module Features

The Management Agent Module enables DIGITAL MultiSwitch 900 functionality for the MultiSwitch 900-4.

The Management Agent Module has front panel connections, LED indicators, an LCD display for the management agent (see Figure 3-1 for the Management Agent Module), and a replaceable flash memory card. The flash card retains system configuration information.

The Management Agent Module includes the following features:

- A built-in SNMP agent that manages up to four functional modules as a single domain using a single IP address
- Removable Flash memory card (flash RAM)
- Hot-swap autosensing that informs the Management Agent Module when a functional module is inserted or removed from the MultiSwitch 900-4.
- Backplane autohealing that restores backplane connections for a reinserted functional module of the same type that was previously removed
- In-band management communications through a module connection or a direct connection to a UTP/STP 10BaseT port
- Autodetect capabilities that automatically select the in-band management port
- Out-of-band management via SLIP
- A serial set up port to setup and configure the Management Agent Module and functional MultiSwitch 900 and MultiSwitch 600 modules in the chassis
- Load services, which allow you to upgrade firmware of functional modules in the MultiSwitch 900 using the Trivial File Transfer Protocol (TFTP) protocol
- Support for the BOOTP protocol for IP address configuration
- LEDs for determining the status of the MultiSwitch 900-4
- RMON support - Alarm and Event capability to monitor functional modules in the chassis and to report events to a network management station (NMS) when thresholds are reached; Ethernet Statistics and History information (on the in-band management port) on functional modules
- Temperature sensor and fan control circuitry

MIBs Supported by the Management Agent Module

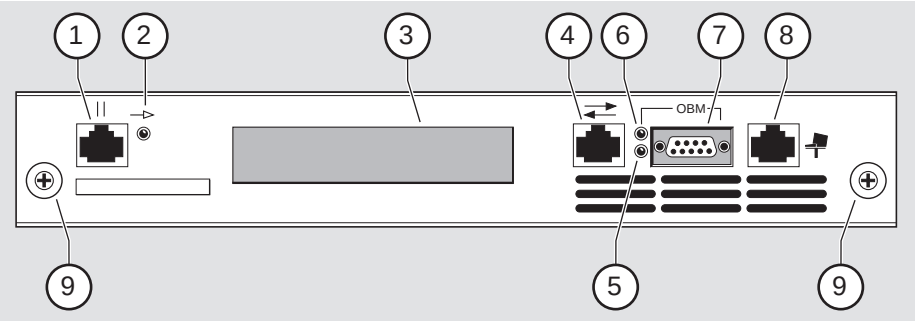
The Management Agent Module supports the following Management Information Bases (MIBs):

- MIB-II (RFC 1213)
- RMON Alarms, Events, Statistics, and History
- Ethernet MIB (RFC 1643)
- DIGITAL Chassis MIB
- DIGITAL Public Common MIB
- Management Agent Module Specific MIB

Management Agent Module Front Panel View

Figure 3-1 shows the location of he front panel components on the Management Agent Module, and Table 3-1 describes them. For detailed information about the LEDs, refer to Appendix A.

Figure 3-1: Management Agent Module Front Panel Components



NPB-1040-97F

Table 3-1: Management Agent Module Front Panel Component Description

Item	Icon	Name	Description
1		Management access port	A UTP/STP port dedicated to in-band management. This is the default port for management if connected to an active 10BaseT link.
2		Management access port activity LED	Indicates that the management access port is transmitting or receiving packets.
3		LCD display	Lights when the Management Agent Module receives power. Displays on-going status of the MultiSwitch 900-4.
4		Reserved	Reserved.
5		Reserved	Reserved.
6		OBM port LED	When on, SLIP is available through this interface. When blinking, there is SLIP activity on the port.
7		OBM port	An RS-232 port for out-of-band management (OBM) communication.
8		Setup port	A port to connect a terminal and configure an attached functional module in the MultiSwitch 900-4. Can also be used to configure other functional modules.
9		Thumbscrew	Locks the Management Agent Module into the MultiSwitch 900-4 chassis.

Management Information

In-Band and Out-of-Band Management

The MultiSwitch 900-4 system can be managed through in-band management or out-of-band management using Simple Network Management Protocol (SNMP).

To use SNMP management for a single device or for a Management Agent Module, you need one Management Agent Module configured with an in-band or out-of-band IP address (or both).

Some control parameters are available to the network manager, even on unmanaged devices. These parameters can be accessed via a local connection to the device's setup port.

Connecting to a Network Management Station

The MultiSwitch 900-4 communicates with a network management station (NMS) via the Management Agent Module's SNMP management agent. The SNMP management agent can be used to manage the Management Agent Module itself, or to manage the modules that are inserted and available in the MultiSwitch 900-4 chassis.

The Management Agent Module's SNMP management agent can be accessed in-band through the Management Agent Module's MAC (media access control), or via IP services available through the installed modules, or via the out-of-band (OBM) port on the Management Agent Module

In-Band Management

The NMS can access the Management Agent Module's SNMP management agent for in-band management through the internal 10Base2 LAN channel. The Management Agent Module assigns the internal 10Base2 LAN channel to the MAC as its default connection. The internal 10Base2 LAN channel can be accessed in the following ways:

- Connected directly to the 8-pin MJ 10BaseT management access port on the front of the Management Agent Module. A valid connection to the management access port automatically reassigns the internal MAC to this port.
- Through a switch or MultiSwitch 900-4 port that has access to the 10Base2 channel. In this case, the NMS must have switched access to the 10Base2 channel.
- Connected by a UTP cable to the management access port and a LAN segment where the NMS resides. A valid connection to the management access port automatically reassigns the internal MAC to this port. Using the UTP management access port precludes the use of the 10Base2 LAN segment for management traffic. However, the 10Base2 LAN segment is still active for use by other stations.

The NMS can access the Management Agent Module's SNMP management agent via IP services. The following is a list of common network modules that support IP services. Refer to your module's documentation to determine if it provides this capability.

- DECrepeater 900TM
- DECrepeater 900GM
- DECrepeater 900FP
- DECconcentrator 900MX
- DECbridge 900MX
- DECbridge 900MP

To establish IP services for the Management Agent Module, install a module that provides IP services into a slot of the MultiSwitch 900-4 chassis; then configure the slot IP via the Configure IP menu on the console. The Management Agent Module uses this module to communicate with the network management station (NMS). The combination of the IP address and slot location establish the primary path for in-band management. If you move the module to another slot, you must reconfigure the MultiSwitch 900-4 to utilize the new slot.

When a network module occupies a MultiSwitch 900-4 slot designated as the IP services slot, and that module is replaced (hot-swapped) with another IP services type module, delete the address resolution protocol (ARP) cache from the NMS. Otherwise, it could take up to 45 minutes for the ARP cache to age out, depending on your system.

Out-of-Band Management

The NMS can access the Management Agent Module's SNMP management agent via out-of-band management.

For out-of-band management, connect to the 9-pin OBM port on the front of the Management Agent Module. The OBM port is a serial communications port that uses SLIP to communicate with an NMS.

This method is identical to in-band management except that you assign an OBM IP address and OBM port speed from the setup port MultiSwitch 900-4 installation menu. The IP address and the port speed at each end of the communications link must be identical.

SNMP Management Applications

Any standards-based SNMP management application can manage the MultiSwitch 900-4. However, to gain full benefit from the internal stack backplane, you should use the clearVISN Stack Manager or MultiChassis Manager applications. These applications provide an intuitive graphical user interface (GUI), which enables the full benefit of point-and-click management.

Other benefits of SNMP management include:

- Assignment of switch and hub ports to the stack backplane
- Definition of up to seven 10 Mb/s Ethernet backplane channels
- Auto-restoration of backplane connections in the event a functional module is hot-swapped and replaced with the same module or a same type module

The Management Agent Module's setup port enables configuration, reset, and downline upgrade features from a locally attached terminal or terminal emulator. Except for the assignment of an IP address, the functions are also available through clearVISN applications.

The Management Agent Module's setup port menus are described in the following section.

Using the Setup Port

The setup port on the Management Agent Module allows you to set parameters when the MultiSwitch 900-4 is initially installed. Once the system is configured, you can perform routine network management tasks over the network and the setup port is no longer needed.

Modes of Operation

The MultiSwitch 900-4 setup port supports the following modes:

- Installation menu
- IP address assignment
- Redirect
- Event display

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

Connecting a Terminal to the Setup Port

To connect a terminal to the setup port, ensure that the following terminal setup parameters are in effect (see Table 3-2).

Table 3-2: Terminal Setup Parameters

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

Installation Menu Description

The `MultiSwitch 900-4 Mgmnt Agent INSTALLATION MENU` provides you with nine menu options. Some of these options contain additional submenu options. When the MultiSwitch 900-4 setup port is in default mode, the `MultiSwitch 900-4 Mgmnt Agent INSTALLATION MENU` appears.

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 `MultiSwitch 900-4 Mgmnt Agent INSTALLATION MENU` by pressing <Ctrl/C> on the setup port device.

Menu Options

The `MultiSwitch 900-4 Mgmnt Agent INSTALLATION MENU` screen displays shown in these examples may vary slightly from the actual screen displays on your setup port device. The user response for all menu selections is shown in boldface type.

```
 MultiSwitch 900-4 Mgmnt Agent
============================================================

          MultiSwitch 900-4 Mgmnt Agent 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

 ============================================================

         Enter selection:          <Return>
```

[1] Restart with Factory Defaults

This option reboots the Management Agent Module, initiating self-tests and resetting its configured NVRAM parameters to factory default values. All local nonvolatile settings except the Stack Director Serial Number, will be lost. To retain parameters, use option `[2] Restart 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 Management Agent Module displays the following message:

```
Selftest Complete

Start Main Firmware
```

Within a few seconds, the `Mgmnt Agent INSTALLATION MENU` appears on your setup port screen. The following example shows the dialogue associated with this option:

```
                        Enter selection: 1

 MultiSwitch 900-4 Mgmnt Agent
 ============================================================

               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

This option reboots the Management Agent Module, but leaves the system's configured NVRAM parameters at their current values.

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

```
Selftest Complete

Start Main Firmware
```

Within a few seconds, the `MultiSwitch 900-4 Mgmnt Agent INSTALLATION MENU` appears on your setup port screen.

The following example shows the dialogue associated with this option:

```
                        Enter selection:  2

MultiSwitch 900-4 Mgmnt Agent
============================================================

            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 Management Agent Module. If the MultiSwitch 900-4 is being configured for the first time, some fields are blank.

Use clearVISN MultiChassis Manager or another SNMP-based management application to set or modify these values.

The following example shows the dialogue associated with this option:

```
                          Enter selection : 3
MultiSwitch 900-4 Mgmnt Agent
======================================================================
Management Agent, MultiSwitch 900-4 Management Agent, HW=C,RO=V00.11,SW=V1.0
SysUpTime                              : 11 days 18:52:25  100 resets
SNMP Read/Write Community              : public
SNMP Trap Addresses                    : None Configured
Status of Last Downline Upgrade        :

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

Interface     IP Address    Subnet Mask   Def.Gateway   Other Info
---------     ----------   -----------   -----------   ----------
OBM Port      16.20.156.20  255.255.0.0                 Speed 9600 bps
EthernetPort  16.20.156.26  255.255.0.0   16.20.156.56  Active

======================================================================
                ...Press Return Key to Continue...

DIGITAL Management Agent Module
======================================================================
Hub Name                               : MultiSwitch 900-4 Management Agent
Hub Serial Number                      :
Hub Location                           :


======================================================================
Slot1, MS Hub 624T                    Status : up
Slot2, Empty
======================================================================

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

[4] Configure IP

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

IP Configure Selections

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

```
                        Enter selection: 4

MultiSwitch 900-4 Mgmnt Agent
=====================================================
                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]  Enable/Disable BootP
[7]  Return to Main Menu

=====================================================
              Enter selection: 4
```

The following pages describe the IP Configuration menu selections.

[4] Configure IP

[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 dialogue associated with this option:

```
                      Enter selection : 1

   MultiSwitch 900-4 Mgmnt Agent
 ================================================================
              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. The Management Agent Module appends two characters to the string (a dash and a slot number) when passing an SNMP management command to a module. The full string cannot exceed 31 characters.

[2] Add SNMP Trap Addresses

This option prompts you to enter IP addresses to which the MultiSwitch 900-4 sends SNMP traps. 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 dialogue associated with this option:

```
                    Enter selection : 2

 MultiSwitch 900-4 Mgmnt Agent
================================================================
                 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 dialogue associated with this option:

```
================================================================
                    Enter selection : 3
MultiSwitch 900-4 Mgmnt Agent
================================================================

                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] 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.

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

The following example shows the dialogue associated with this option:

```
                          Enter selection: 4

 MultiSwitch 900-4 Mgmnt Agent
=============================================================
       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 address, enter 0 in the appropriate address
 field.
 Interface  IP Address Subnet Mask Def.Gateway Other Info
 OBM Port                                    Speed 38400 bps
 Ethernet Port                                  08-00-2B-B1-4D-C7
 ============================================================
 Slot (1-4,9) [9] (Management Agent Module Ethernet Port):
 Enter the IP address [ ]: 16.20.156.54 <Return>
 Enter the Subnet Mask [ ]: 255.255.255.0 <Return>
 Enter the Default Gateway [ ]: <Return>
 Press Return for IP Configuration Menu...
```

[4] Configure IP

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

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

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

The OBM feature allows you to manage your MultiSwitch 900-4 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 `MultiSwitch 900-4 Mgmnt Agent INSTALLATION MENU`.

The factory default of this menu option is to delete the out-of-band IP address.

The following example shows the dialogue associated with this option:

```
                    Enter selection: 5

MultiSwitch 900-4 Mgmnt Agent
============================================================
            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
Ethernet Port                          08-00-2B-B1-4D-C7
============================================================
     Enter the IP address [ ]: 16.20.54.156 <Return>
     Enter the Subnet Mask [ ]: 255.0.0.0 <Return>

     Press Return for IP Configuration Menu...
```

[6] Enable/Disable BootP

This option allows you to enable or disable the BootP IP bootstrap protocol. The following example shows the dialogue associated with this option:

```
                      Enter selection : 6

      MultiSwitch 900-4 Mgmnt Agent
 ================================================================

                      ENABLE/DISABLE BOOTP

    BOOTP is the IP bootstrap protocol. BOOTP may be used
    to obtain the module's IP address, subnet mask and default
    gateway. When BOOTP is Enabled and the module is not configured
    with an IP Address the module will send out BOOTP requests
    until it receives a response or is manually configured with
    an IP Address. When BOOTP is Disabled no BOOTP requests will
    be sent.

   The BOOTP Server must be properly configured to return the
    address information.
 ================================================================
 The BOOTP process is DISABLED

 Would you like to ENABLE BOOTP Y/[N]
```

[5] Dump Error Log

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

The following example shows the dialogue associated with this option:

```
                        Enter selection : 5
MultiSwitch 900-4 Mgmnt Agent
============================================================
                         DUMP ERROR LOG
                    Current reset count: 115
============================================================
        Entry 49
.       Time Stamp 0 46235
        Reset Count 102
        Firmware Rev = T1.0.26
 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 firmware for the Management Agent Module and network module 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.

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 heavy.

Initial Setup Screen

When you select the `[6] Downline Upgrade` option from the `MultiSwitch 900-4 Mgmnt Agent 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

MultiSwitch 900-4 Mgmnt Agent
=====================================================================
                       DOWNLINE UPGRADE
    This process upgrades the specified module's firmware
    (in nonvolatile Flash memory). Enter the IP Address
     of your TFTP (Trivial File Transfer Protocol) load host
     and the image file name when prompted.
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*      IMPORTANT!      IMPORTANT!         IMPORTANT!             *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*  If power is interrupted during the downline load, the         *
*  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...
```

[6] Downline Upgrade

Selecting the Slot to be Upgraded

The Management Agent Module prompts you for the slot number of the device to which the upgrade is to be downloaded. The default is slot 9 (the Management Agent Module).

```
Enter the level to be upgraded [9] (MiniHub Director):
```

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

Entering the Load File Name

The Management Agent Module prompts you for the load file name.

```
Enter the Load Filename [ ]  :
```

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 file name.
Not located in the default TFTP directory	The complete path name along with the file name.

Entering the Load Host IP Address

The Management Agent Module prompts you for the Load Host IP Address. This is the IP address of the host from which the firmware upgrade is to be downloaded.

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

Enter the address and press <Return>.

Choosing a Network Interface

If only one network interface exists from which the Management Agent Module can choose, the firmware upgrade download processing begins. Skip to Download Processing Stages for the Management Agent Module on page 3-26 for a description of the messages that appear during the firmware upgrade download process.

When both in-band and out-of-band IP addresses are 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 the Ethernet Port network interface.
Would you like to use a different interface?  Y/[N] :
```

If you enter 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 dialogue:

```
Interface          Description
----------         -------------
   1                OBM Port
   2                Ethernet
Enter the network interface to be used [2]:
```

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] ...
```

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

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

NOTE

The console is disabled during downline load of the Management Agent Module.

If you are having problems starting the download process from a remote TFTP server, verify that:

- You can ping the Management Agent Module from the remote server.
- The Internet Subnet Mask assigned to the Management Agent Module is properly set.

TFTP Load Host and Image File Example

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

```
dlssm100.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 for the Management Agent Module

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 3-3 explains what happens during each stage of the download process.

Table 3-3: Download Process Description

Stage	Description

1	**The DLU Process transports the new firmware image across the network from the TFTP load host and places it into a temporary storage buffer.**
	After you initiate the process, the setup port screen displays the following message followed by a series of dots, indicating the downline upgrade is in progress:
	`DLU process started!`
	`.....`
	This screen is seen only when downloading a functional module in a stack.

2	**The module verifies that the firmware image is correct. This stage normally takes 10 seconds to complete.** 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.) When the TFTP load transfer is complete, the Management Agent Module verifies the TFTP image.
3	**The DLU process transfers the new image from a temporary storage buffer to the nonvolatile flash memory, overwriting the old image.** After the Management Agent Module verifies the image, it writes the image into flash memory.
4	**The Management Agent Module resets, runs self-test, and then begins executing the new firmware image.** After the Management Agent Module stores the image into flash memory, it boots the new image. After the Management Agent Module completes booting the new image, it may need to reset the configuration settings. After the Management Agent Module resets the configuration, it initiates self-test. When self-test completes, it starts the main firmware.

[6] Downline Upgrade

Download Processing for Modules

If you are initiating the load process to a module, the Management Agent Module firmware attempts to communicate with the module. Because the module is nonfunctional during the flash load process, communications between the module and the Management Agent Module cannot take place.

The flash load takes up to10 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 four slots concurrently. However, you cannot do multiple loads while you are upgrading the Management Agent Module firmware.

NOTE

During the download process for a MultiSwitch 900 or MultiSwitch 600 module, the messages may differ from those displayed during the download procedure for the Management Agent Module firmware (as shown in the preceding section of this manual).

Verifying the Upgrade

After the downline upgrade process has completed, you should verify the firmware upgrade as follows.

For the Management Agent Module:

Step	Action
1	Select option `[3] Show Current Settings` from the `MultiSwitch 900-4 Mgmnt Agent INSTALLATION MENU`.
2	Press <Return>.
3	Verify that the correct version was loaded.

For a functional module:

Step	Action
1	Select option `[6] Downline Upgrade` from the `MultiSwitch 900-4 Mgmnt Agent INSTALLATION MENU`.
2	Press <Return>.
3	Verify that the correct version was loaded.
4	Press <Ctrl/C> to return to Main Menu.

Alternatively, you can redirect to the module (option `[9]`) and select option `[3] Show Current Settings` to verify the upgrade for the module.

[6] Downline Upgrade

The screen displays the following text:

```
==========================================================================
                            Enter selection : 3
MultiSwitch 900-4 Mgmnt Agent
==========================================================================
Stack Director, DIGITAL Management Agent Module, HW=F,RO=V00.07,SW=V1.0.0
SysUpTime                              :  11 days 18:52:25  100 resets
SNMP Read/Write Community              :  public
SNMP Trap Addresses                    :  None Configured
Status of Last Downline Upgrade        :


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


Interface     IP Address     Subnet Mask   Def.Gateway   Other Info
---------     ----------     -----------   -----------   ----------
OBM Port      16.20.156.20   255.255.0.0                 Speed 9600 bps
Ethernet Port 16.20.156.26   255.255.0.0   16.20.156.56  Active

==========================================================================
                  ...Press Return Key to Continue...


DIGITAL Management Agent Module
==========================================================================
                                        DIGITAL Management Agent Module
Hub Name
Hub Serial Number                      :
Hub Location                           :
Hub Contact                            :

==========================================================================
Slot1, MS Hub 624T                Status : up
Slot2, Empty
==========================================================================

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

[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

 MultiSwitch 900-4 Mgmnt Agent
 ============================================================
             OUT-OF-BAND PORT CONFIGURATION


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

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

[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 of this menu option sets the out-of-band port speed to 9600 baud.

The following example shows the dialogue associated with this option:

```
                    Enter selection : 1

DMultiSwitch 900-4 Mgmnt Agent
=========================================================
              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) : 3 <RETURN>
                       OBM port speed set.

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

[2] Enable/Disable RTS Selection

This option allows you to enable or 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 of this menu option is disabled.

The following example shows the dialogue associated with this option:

```
                    Enter selection : 2

MultiSwitch 900-4 Mgmnt Agent
================================================================
             ENABLE/DISABLE OUT-OF-BAND PORT 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 MultiSwitch 900-4.

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

You can return to the `MultiSwitch 900-4 Mgmnt Agent INSTALLATION MENU` any time by pressing <Ctrl/C> on the setup port device.

The following example shows the dialogue associated with this option:

```
================================================================
                    Enter selection : 8

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

  4: Querying
  Status : Module Inserted

  4: MS Hub 624T
  >> Description:  HW=V1,RO=V01.03,SW=V1.0.0
     Health-Text:
     Status     :

  4: MS Hub 624T
  >> Description:  HW=V1,RO=V01.03,SW=V1.0.0
     Health-Text:
     Status     :

  6: Querying
  Status : Module Inserted

  6: Unknown
  Status : Module Removed

  4: MS Hub 624T
  Status : Module Removed
```

[9] Start Redirect Mode

The `[9] Start Redirect Mode` option redirects the Management Agent Module setup port to the functional module (such as the DIGITAL MultiSwitch 612EX or DIGITAL MultiSwitch Hub 624T) that is installed in the requested slot. Choosing this option allows you to configure an installed module or obtain its status by accessing the specified network module's installation menu.

After you choose the `[9] Start Redirect Mode` option from the `MultiSwitch 900-4 Mgmnt Agent INSTALLATION MENU`, the screen display prompts you for a slot number. Type the slot number where the functional module resides. Slot (4) is used in the following example. After you enter the number of the slot in which the module is installed, the console is redirected to that slot.

NOTE

The slot number may vary depending on the slot number in which your module is installed.

The following example shows the dialogue associated with this option:

```
================================================================

    Enter the slot number for redirection (1-4): 4

Console redirected to 4: MultiSwitch 612EX

     Attempting connection [Ctrl/C to abort]...
```

If the redirection is successful, after you press <Return>, the screen for the redirected module automatically is displayed or as for this example, the `DIGITAL MultiSwitch 612EX INSTALLATION MENU` appears on your screen.

Replacing the Management Agent Module and Flash

This section describes the procedures for installing, removing, and resetting a MultiSwitch 900-4 Management Agent Module and flash memory card.

Task 1: Removing the Management Agent Module

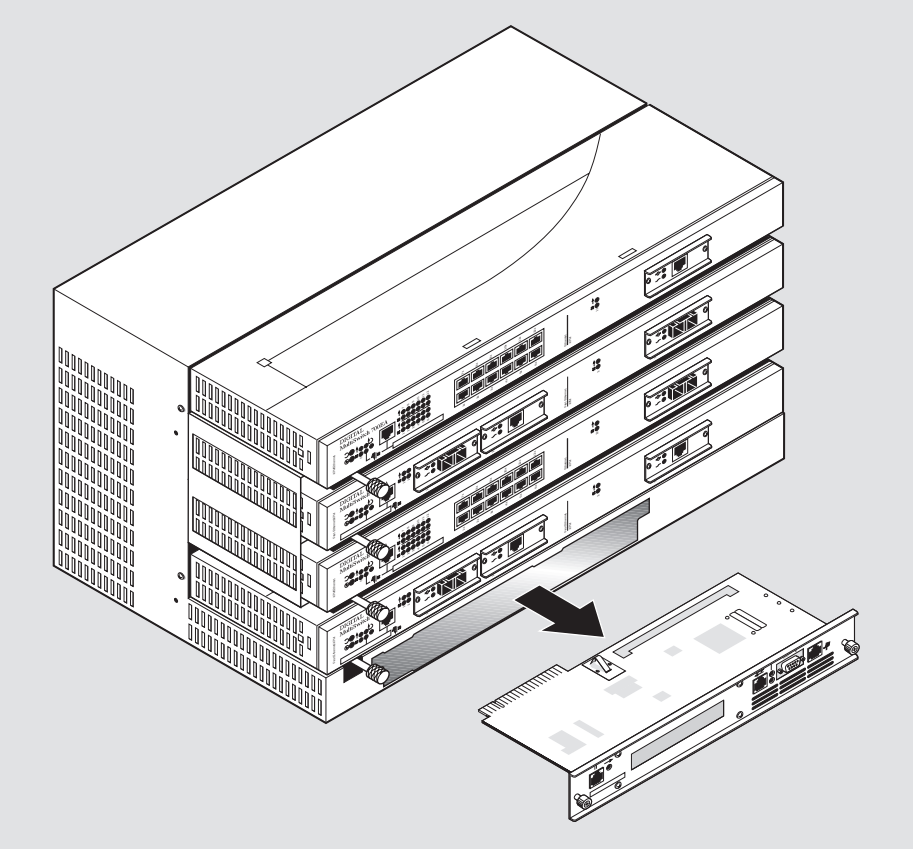
To upgrade or replace a malfunctioning Management Agent Module, follow the procedure below (Figure 3-2):

CAUTION

Static electricity can damage modules and electronic components. DIGITAL recommends using a grounded antistatic wrist strap and a grounded work surface when handling any modules.

Step	Action
1	Use clearVISN Recovery Manager to back up your current configuration.
2	Loosen the two thumbscrews on the Management Agent Module located at the bottom of the front panel of the MultiSwitch 900-4 (see Figure 3-2).
3	Place your hands on each thumbscrew and pull the Management Agent Module out straight.

Figure 3-2: Removing the Management Agent Module



NPB-1036-97F

Task 2: Changing the Flash Memory Card

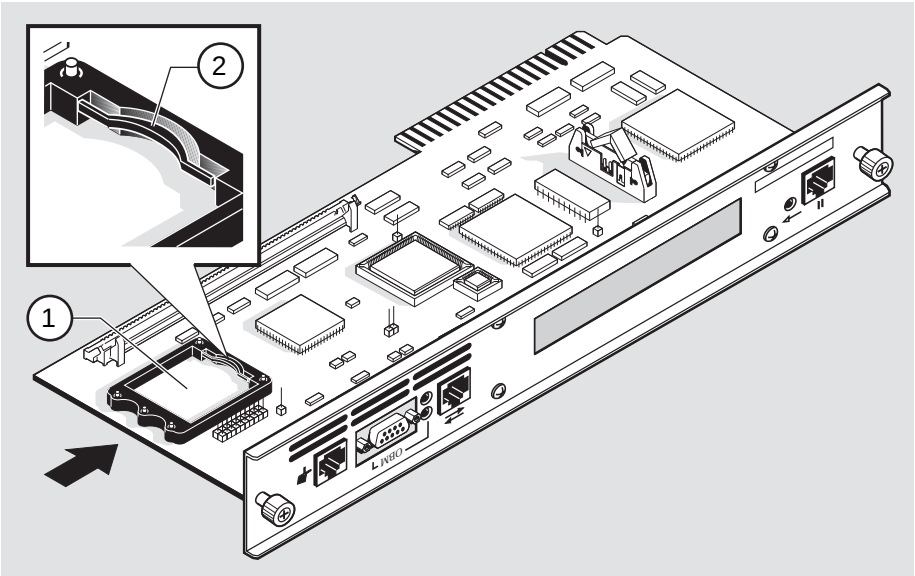
Once the Management Agent Module is removed from the MultiSwitch 900-4 chassis, you can remove the flash memory card and place it in the new Management Agent Module board. (Flash memory stores the current configuration of the MultiSwitch 900-4.)

To change the flash memory card on the Management Agent Module, follow the procedure below:

Step	Action
1	Locate the flash memory card **(1)** on the Management Agent Module (Figure 3-3). When you pull the module, the flash socket is located on the underside.

Step	Action
2	Remove the flash memory card from the Management Agent Module. Slip your thumbnail (or a nonscraping instrument) under the flash memory card at the flash socket's lock lever **(2)** and lift the card up and out from this side.
3	Insert the new flash memory card into the new Management Agent Module. Carefully push in the pin side of the card, then snap in the opposite edge.

Figure 3-3: Locating the Flash Card on the Management Agent Module



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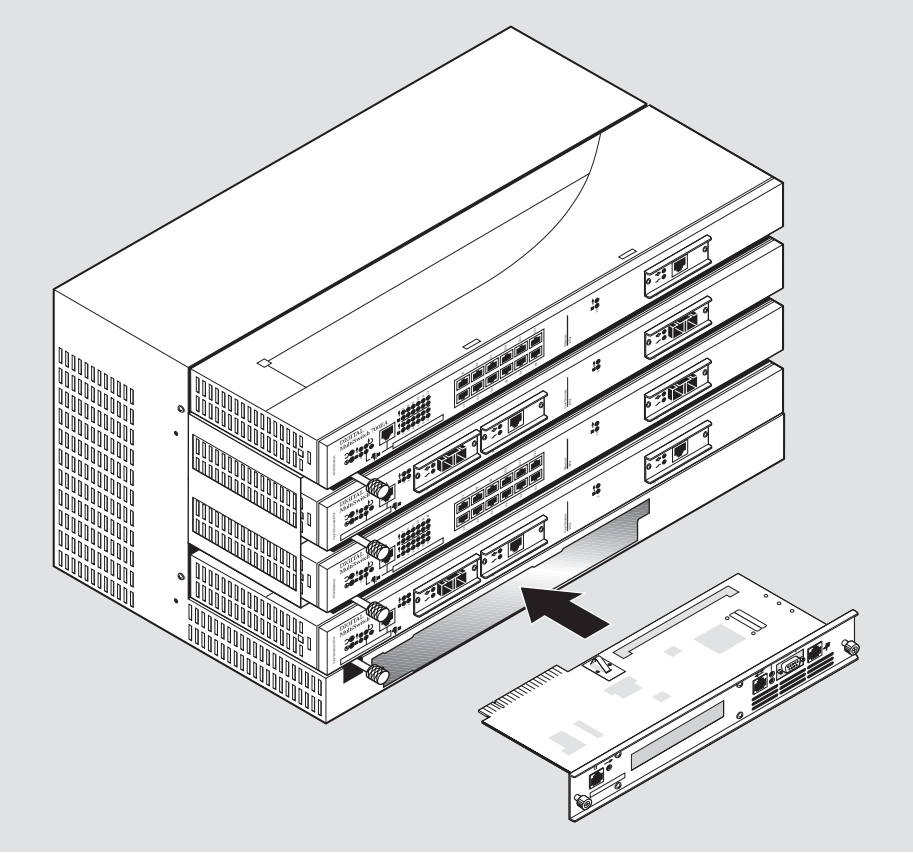
Task 3: Installing the Management Agent Module

To reinstall the Management Agent Module into the MultiSwitch 900-4 (see Figure 3-4), follow the procedure below:

Step	Action
1	Locate the card-guide inside the MultiSwitch 900-4 chassis.
2	Turn the Management Agent Module upside-down (with the components on the underside).

Step	Action
3	Grasp the new Management Agent Module by the thumbscrews and align it with the card-guide.
4	Push the Management Agent Module in until it snaps into place.
5	Tighten both thumbscrews.
6	Use clearVISN Recovery Manager to reset the MultiSwitch 900-4 configuration.

Figure 3-4: Reinstalling the Management Agent Module



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Chapter 4

Installing MultiSwitch 900-4 Modules

Overview

Introduction

This chapter describes how to install modules into the MultiSwitch 900-4.

In This Chapter

Planning Considerations

This section describes considerations you should take into account when planning the MultiSwitch 900-4's configuration.

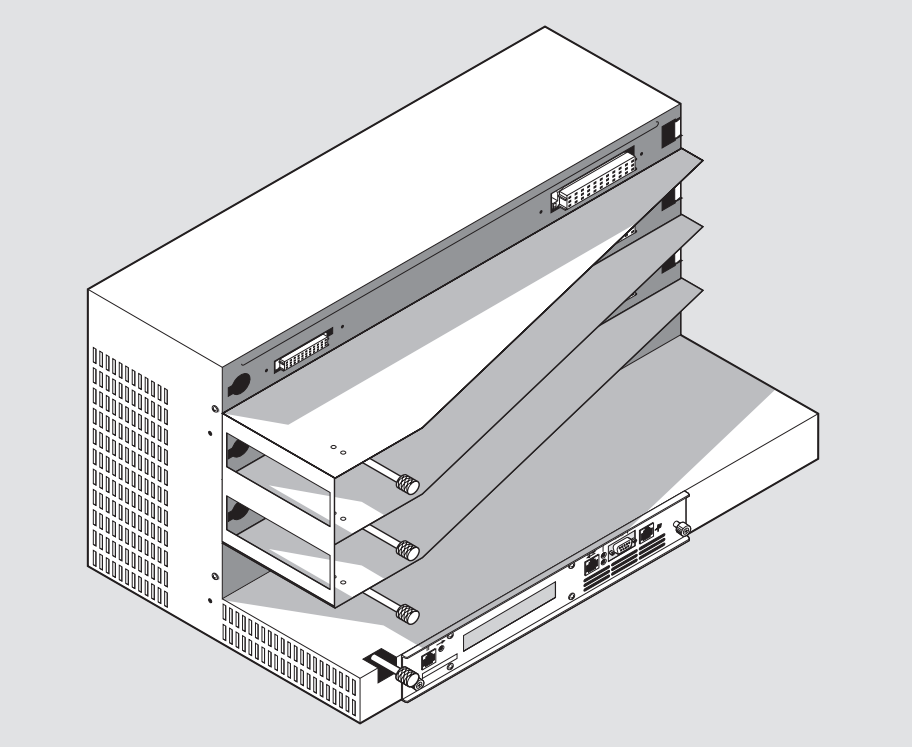
Keep the following in mind when planning your configuration:

- A Management Agent Module is required to manage a MultiSwitch 900-4.
- A MultiSwitch 900-4 can contain the following configurations:
  - — Four MultiSwitch 600 functional modules in slots 1 through 4
  - — Four MultiSwitch 900 functional modules in slots 1through 4 (only)
  - — Any combination of four MultiSwitch 600 and MultiSwitch 900 functional modules in slots 1through 4
- When choosing MultiSwitch 900 or MultiSwitch 600 modules for the MultiSwitch 900-4, be sure to consider the power requirements of each module and the backplane availability.
- MultiSwitch 600 and MultiSwitch 900 modules are hot-swappable in the MultiSwitch 900-4.
- The types of installation options are:
  - — Relay rack mount
  - — Standard 19-inch rack mount
  - — Table top

Installing MultiSwitch 900 and MultiSwitch 600 Modules

The MultiSwitch 900-4 contains four slots (Figure 4-1). Each slots contains one 48-pin and one 160-pin connector providing the flexibility to install either a MultiSwitch 900 or MultiSwitch 600 module.

Figure 4-1: MultiSwitch 900-4 with Slots 1 through 4 Available



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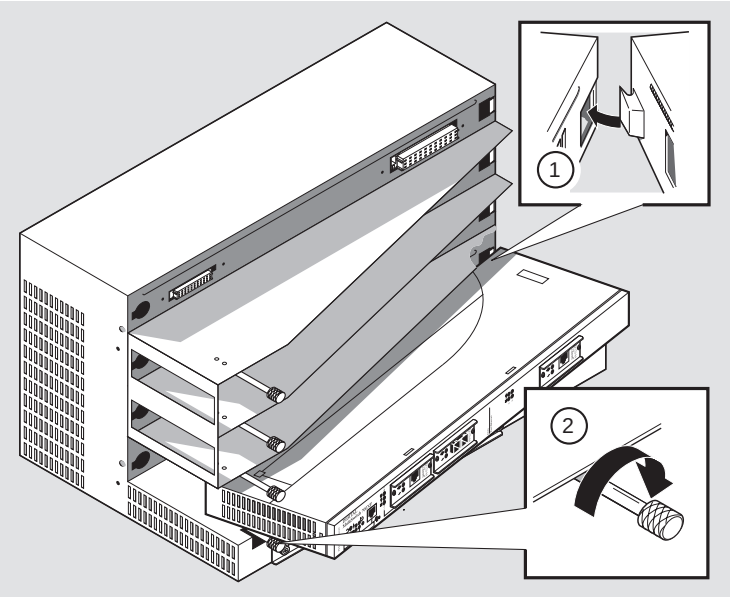
Installing MultiSwitch 900 and MultiSwitch 600 Modules

To install MultiSwitch 900 or MultiSwitch 600 modules into the MultiSwitch 900-4, perform the following tasks (Figure 4-2):

Step	Action
1	Turn the knob of the threaded rod (see Figure 4-2) counter-clockwise all the way to its unlocked position before inserting the module.
2	Place the module's mounting tab **(1)** into the mounting slot on the right side of the MultiSwitch 900-4 chassis slot.
3	Pivot the module on the mounting tab, align the connectors, and slide the module onto the backplane connectors being careful not to damage the connector pins.
4	Turn the knob of the threaded rod clockwise **(2)** and tighten with your fingers to the locked position.

Figure 4-2: Inserting a Module in Slot 1



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Installing a MultiSwitch 900-4

To install a MultiSwitch 900-4, complete the tasks in this section. You will need a Phillips and flat-blade screwdrivers for the installation. The following four installation options are available for the MultiSwitch 900-4:

- Table top (no additional installation work required)
- Relay rack mount
- Standard 19 inch rack mount with optional rack mount kit

Securing a MultiSwitch 900-4 to the Relay Rack

The following procedure explains how to secure the MultiSwitch 900-4 to a relay rack mount.

Step	Action
1	Attach a mounting bracket to one side of the MultiSwitch 900-4 using two 10-32 screws (Figure 4-3).
2	Attach the other mounting bracket to the second side of the MultiSwitch 900-4 using two 10-32 screws.
3	Attach the MultiSwitch 900-4 to the rack using the four 10-32 screws and U-nuts (if needed).

Figure 4-4 shows the relay rack configuration.

Figure 4-3: Relay Rack Brackets

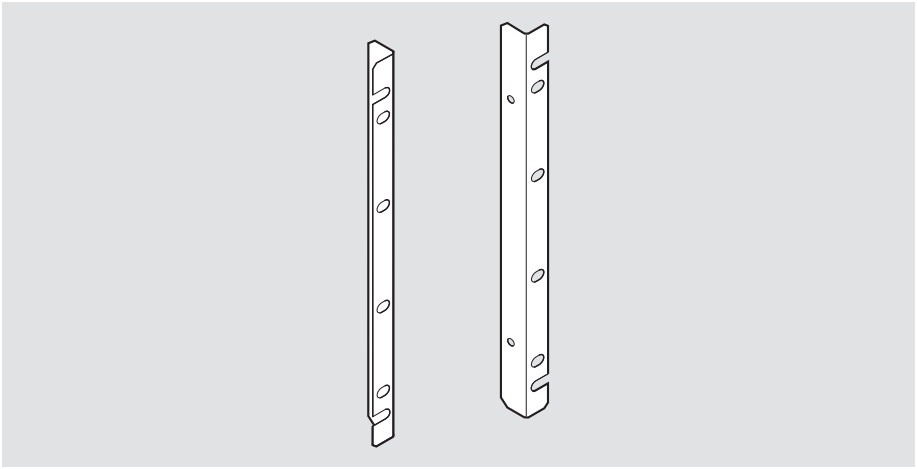

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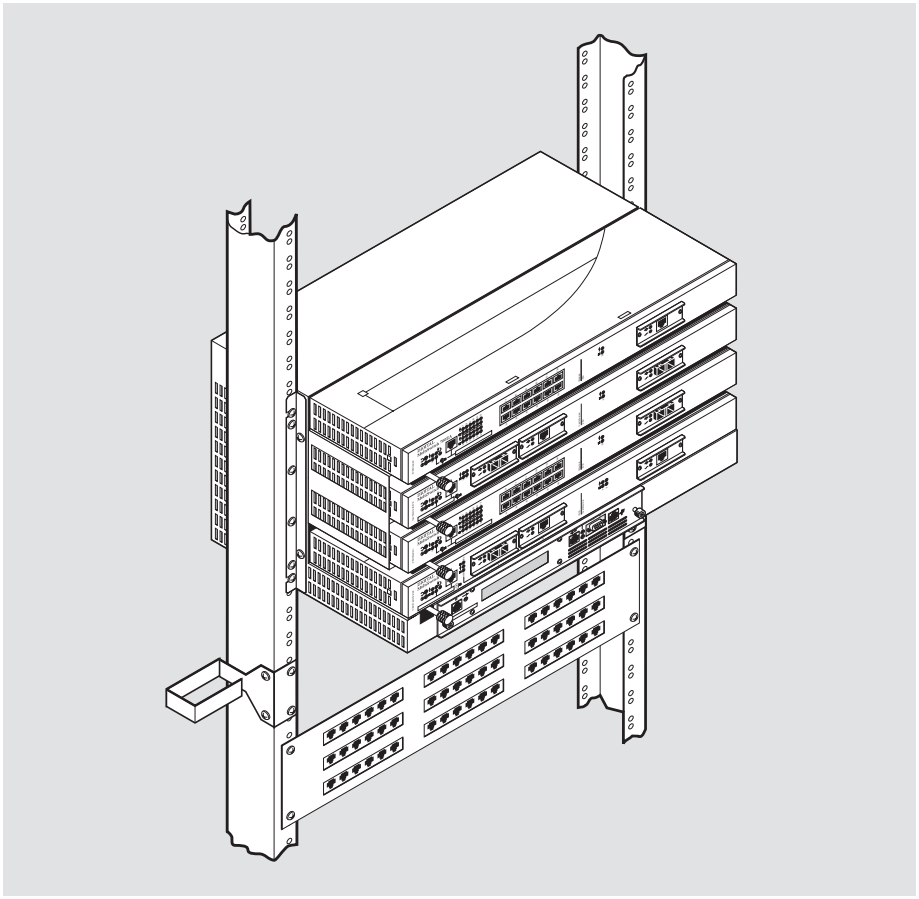
Figure 4-4: Relay Rack Mount Configuration



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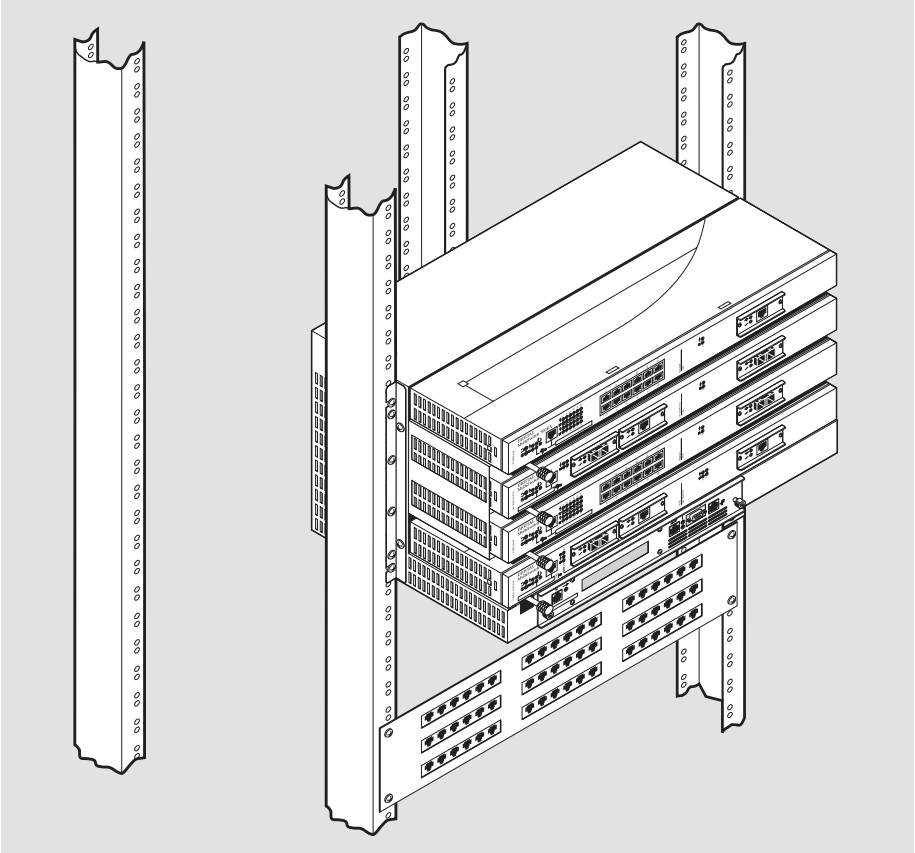
Securing a MultiSwitch 900-4 to a Rack Mount

The following procedure explains how to secure the MultiSwitch 900-4 to a standard 19-inch rack.

Step	Action
1	Attach a relay rack bracket to one side of the MultiSwitch 900-4 using two 10-32 screws (Figure 4-3).
2	Repeat step 1 for the other side of the MultiSwitch 900-4.
3	Attach the MultiSwitch 900-4 to the rack using the four 10-32 screws and U-nuts (if needed).

Figure 4-5 shows the standard rack mount configuration.

Figure 4-5: Standard 19 Inch Rack Mount Configuration



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If you want to hot-swap modules easily in a standard rack mount, you can purchase the optional rack mount kit. Refer to the section *Optional Rack Mount* on page 4-10.

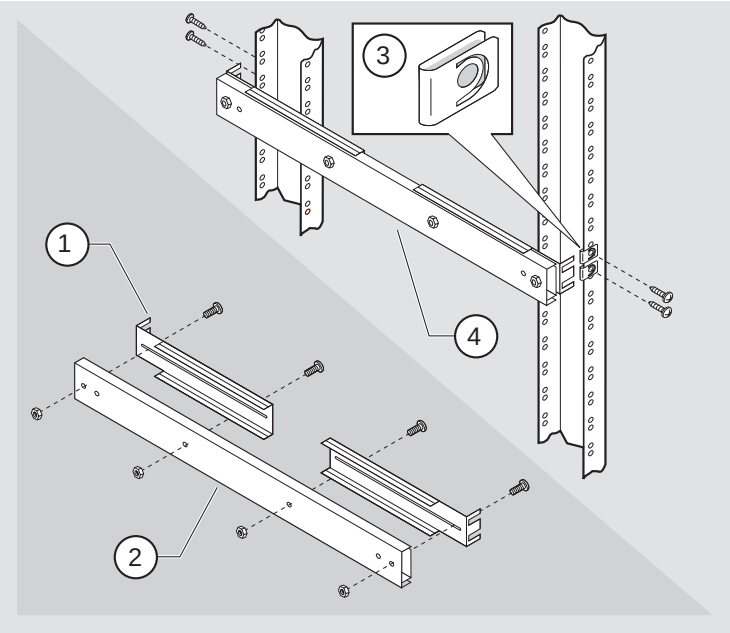
Optional Rack Mount

This section describes how to assemble the optional rack, mount the MultiSwitch 900-4, and hot-swap modules.

Assembling the Rack

To assemble the MultiSwitch 900-4, follow these steps:

Step	Action
1	Secure the mounting brackets **(1)** to the slide rails (**2**).
2	Fasten the U-nuts (**3**) to the mounting holes on the rack.
3	Attach the assembled slide rail (**4**) to the rack with screws.



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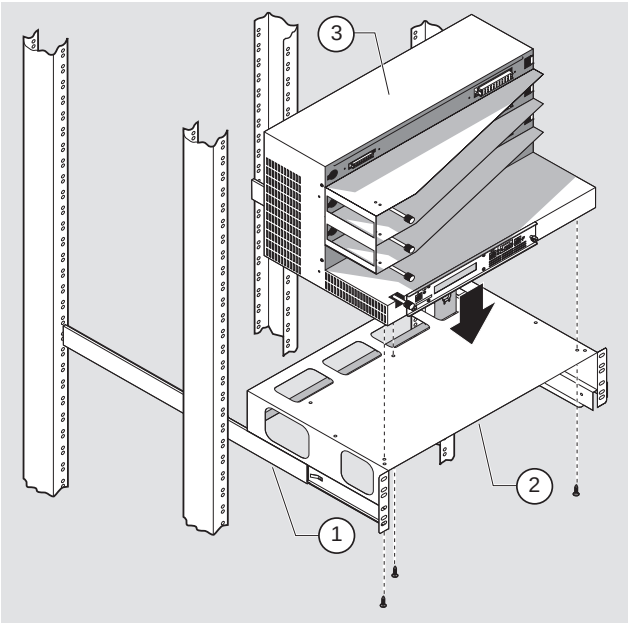
Mounting the MultiSwitch 900-4

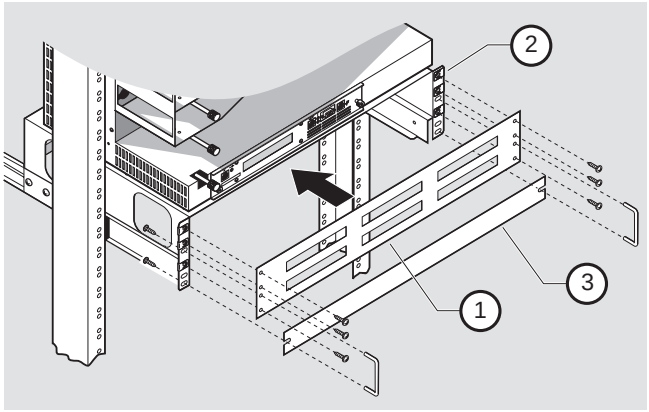
To mount the MultiSwitch 900-4, follow these steps:

Step	Action
1	Extend the slide rails (**1**) to the open position.
2	Position the pedestal (**2**) on the slide rails, and secure it with screws.
3	Attach the MultiSwitch 900-4 (**3**) to the pedestal with screws.



4	Attach the U-nuts to the first, second, and fourth holes down on each side of the pedestal mounting brackets.

Step	Action
5	Attach the patch panel (**1**) to the pedestal (**2**) with four screws.
6	Attach the blank panel (**3**) to the pedestal (**2**) with the handles. Use four screws with flat washers to attach it from the back.



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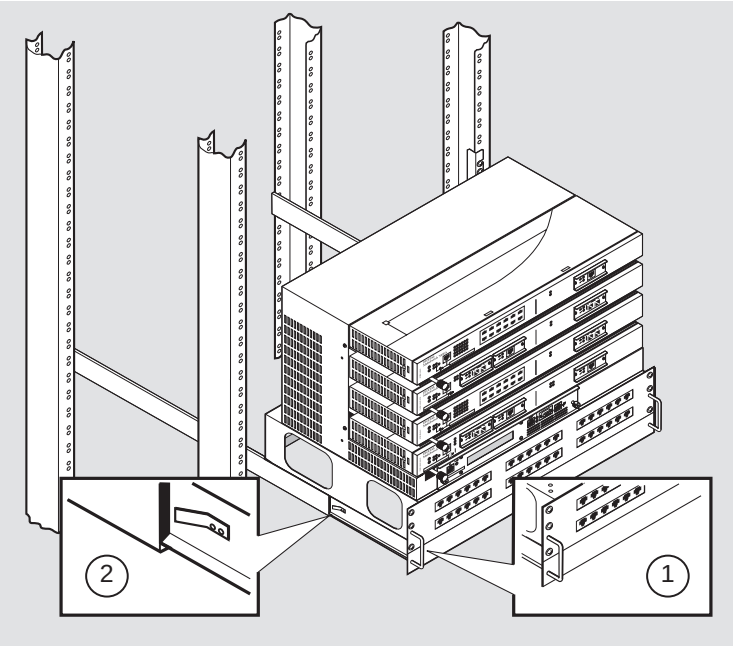
Opening and Closing the Rack to Hot-Swap Modules

To hot-swap modules, follow these steps:

Step	Action
1	Pull out the unit using the handles (**1**)on the panel.



NPB-1077-98F

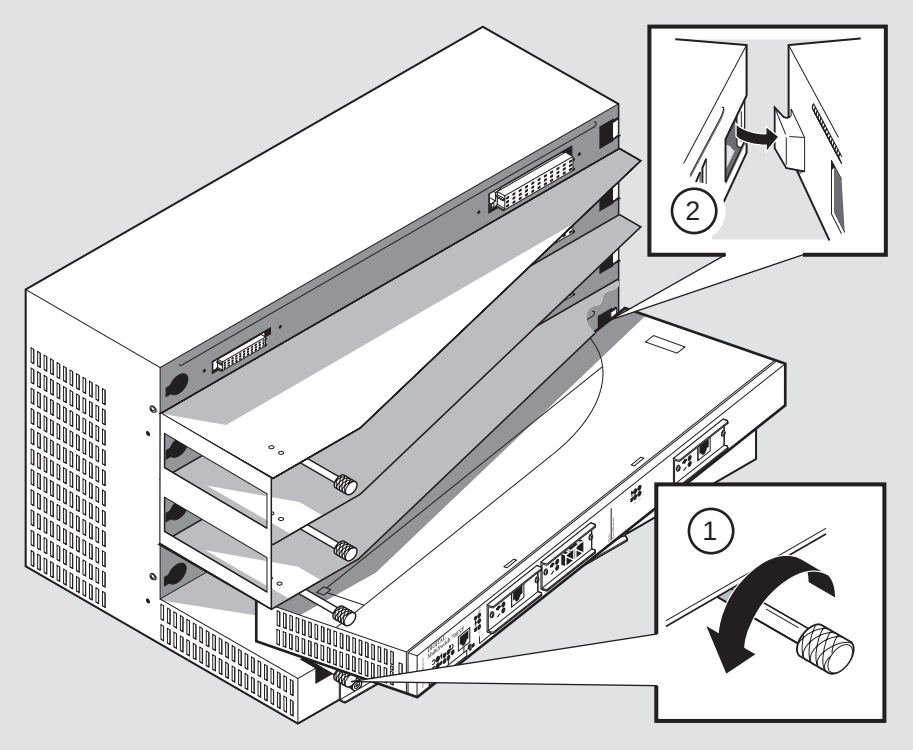
2	After you have removed or inserted the modules, press the lock (**2**) on both of the slides, and push the unit back to the closed position.

Removing Modules from the MultiSwitch 900-4

To remove a MultiSwitch 900 or MultiSwitch 600 module from the MultiSwitch 900-4 chassis, complete the following steps. Details are shown in Figure 4-6:

Step	Action
1	Turn the knurled end of the threaded rod **(1)** in a counterclockwise direction to the unlocked position.
2	Rotate the module away from the mounting tab **(2)** and carefully slide out the module.

Figure 4-6: Remove Modules from MultiSwitch 900-4 Backplane



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Appendix A

Troubleshooting

Overview

Introduction

This appendix describes the light-emitting diode (LED) states and troubleshooting information for the MultiSwitch 900-4.

In This Appendix

LED Descriptions

This section describes the LEDs states for the Management Agent Module.

Table A-1 lists LED states for the Management Agent Module that are useful when troubleshooting. In addition, check the LCD for useful information.

Table A-1: Management Agent Module LED States

LED Name	Off	On	Blinking
OBM port	SLIP is not available through this interface.	SLIP is available through this interface.	SLIP activity exists on this line.
Network activity →◄	No network traffic on the 10BaseT port or 10Base2 LAN channel.	Network has heavy traffic on the 10BaseT port or 10Base2 LAN channel.	Blinks faster and brighter as traffic increases on the 10BaseT port or 10Base2 LAN channel.
String management port status	The port is disabled by network management.	The port is enabled.	N/A

Table A-2 lists possible error conditions useful for troubleshooting the Management Agent Module. Also check the LCD for helpful information.

Table A-2: Management Agent Module Error Conditions

Symptom	Probable Cause	Corrective Action
OBM port status LED does not light when self-test completes.	OBM port is faulty.	Replace the Management Agent Module.
Network activity LED does not light.	No network activity, cabling problem, or MAC is faulty on the Management Agent Module.	Check network connection or replace Management Agent Module.

Troubleshooting the MultiSwitch 900-4

Use Table A-3 as a guide to determine the probable cause and the suggested solution to problems that you may encounter.

Table A-3: Problem Solving the MultiSwitch 900-4

Symptom	Probable Cause	Corrective Action
The LED on the power supply is off.	The MultiSwitch 900-4 is not receiving proper power.	Check the ac power connection and verify that the ac outlet is working. Check the ac power connector. Check the power connection to the MultiSwitch 900-4. If the problem still exists, replace the power supply.
Either of the two power supply LEDs is off.	The power supply is faulty.	Replace the power supply.
The backlighting on the MultiSwitch 900-4 Status Display is not lit.	The Management Agent Module is not receiving power.	If the rest of the hub has power, loosen the screws in front of the Management Agent Module, then remove and restart the Management Agent Module. If you still experience problems, check that the flash card is present in the Management Agent Module.

Symptom	Probable Cause	Corrective Action
The Management Agent Module fails the self-test.	The self-test diagnostics have uncovered a hardware failure.	If the MultiSwitch 900-4 network modules are currently operational, schedule network downtime. When the network modules are not needed, power cycle the Management Agent Module by removing the front screws and pulling the Management Agent Module module forward. Reinsert and tighten the screws to see if the diagnostic failure clears. If the failure persists, the Management Agent Module or the backplane is faulty. Contact your DIGITAL service representative to correct the problem. **NOTE** Functional modules in slots 1through 4 will not resume operation after power cycling the Management Agent Module if the self-test error persists.
There is no response on the MultiSwitch 900-4 setup port.	The terminal device is connected incorrectly or	Check that the correct cable and adapter are used. If not, connect the correct cable and/or adapter.

Symptom	Probable Cause	Corrective Action
	The port and the terminal baud rates are not compatible. or	Change the port and terminal characteristics to match.
	The terminal flow control is disabled by XOFF. or	Use the terminal's setup to clear communications.
	The setup port is redirected or is in event display mode.	Press Ctrl/C.
The modules do not connect to the backplane connector.	The pins on the module connector might be bent.	Replace the module.

Symptom	Probable Cause	Corrective Action
LCD says "BOOTP Request"	MultiSwitch 900-4 firmware is corrupted. When this occurs, it is usually because power was disrupted during the downline load procedure to update the hub firmware.	Do one of the following: 1. Contact your DIGITAL service representative about getting a replacement chassis. 2. Contact your DIGITAL service representative about using the MultiSwitch 900-4's primitive loader to load a clean firmware image. This procedure requires a TFTP server configured to serve the hub firmware file, and either a system that supports invoking TFTP from a command line, or a BOOTP server configured to assign the MultiSwitch 900-4 an IP address and hub firmware file name. These servers must be accessible to the MultiSwitch 900-4's front 10BaseT management access port. (refer to *LCD Displays "BOOTP Request"* on page A-9).

Symptom	Probable Cause	Corrective Action
A network management system, such as clearVISN MultiChassis Manager or Stack Manager, shows many errors when trying to access the hub.	The same IP address is configured for more than one hub module or for a hub module and the hub itself.	1. Use the menu function Show Current Settings to look at the hub's 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 hub. 3. Remove all duplicate IP addresses.
! Warning! Fan Failure	Backplane fans 1 or 2, or both, have failed.	Contact your DIGITAL service representative. Do not use the system.
! Warning! Temp Yellow Conditn	The temperature sensor circuit has detected an environmental condition which is 10 degrees C below the trigger for a Temp Red condition. This is an early warning sign of a Temp Red condition.	Contact your DIGITAL service representative. Do not use the system.
! Warning! Temp Red Conditn	The temperature sensor circuit has determined that a serious fault condition exists in the module or the environment causing the temperature to be above the specified operating limits of the circuitry.	Contact your DIGITAL service representative. Do not use the system.

LCD Displays “BOOTP Request”

To answer the BOOTP request on the MultiSwitch 900-4 LCD, perform the following steps:

Step	Action
1	Power cycle the MultiSwitch 900-4 to start the boot request.
2	Issue the following command on a system that supports command line TFTP and is available to the MultiSwitch 900-4’s front 10BaseT Management Access port: >**tftp <*ip_address*> -put <dmhub*XXX*.bin> mam_bin -image** where:

Parameter	Description
ip_address	IP address of the SLIP connection address
dmhub*XXX*.bin	Name of the image file you want to download
mam_bin	File name used by the hub
-image	Used to transfer mode to binary

As an alternative to issuing the TFTP command manually, configure a BOOTP server (most likely the same system as the TFTP server and available to the MultiSwitch 900-4’s front 10BaseT management access port) to contain a table (bootptab) file, which automatically assigns the MultiSwitch 900-4 an IP address and hub firmware file name. This action the starts the TFTP download procedure.

Appendix B

Connector, Cable, and Adapter Pin Assignments

Overview

Introduction

This appendix shows the pin assignments of the connectors, cables, and adapters that are part of, or can be used with, the MultiSwitch 900-4 Management Agent Module.

In This Appendix

Connector Pin Assignments

Setup Port Connector (8-pin MJ)

The setup port connector is used with the Management Agent Module. Figure B-1 shows the 8-pin MJ (straight-through) connector and its pin assignments.

Figure B-1: Setup Port Connector (8-pin MJ)

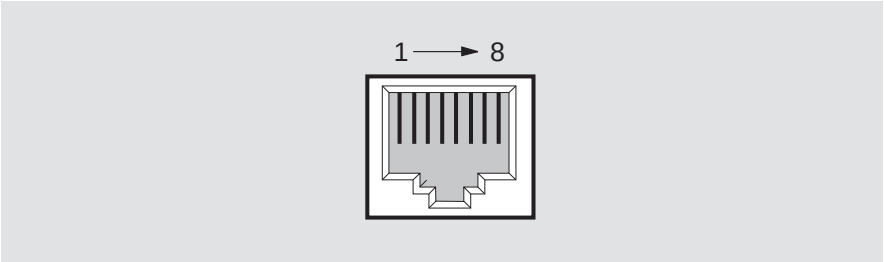

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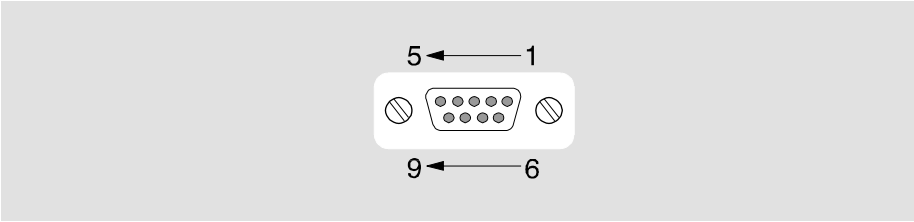
Table B-1: Setup Port Connector (8-pin MJ) Pin Assignment

Pin No.	Assignment
1	Not Connected
2	Receive Data (RD)
3	Ground (GND)
4	Not Connected
5	Not Connected
6	Transmit Data (TD)
7	+5V
8	Ground (GND)

OBM Port (9-Pin) Connector

The OBM connector (Figure B-2) is used on the Management Agent Module.

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



NPG-0299

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

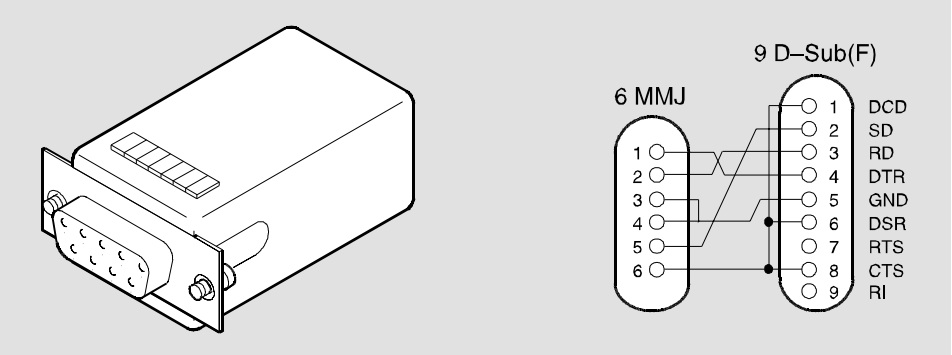
Pin No.	Assignment
1	Data Carrier Detect (DCD)
2	Receive Data (RXD)
3	Transmit Data (TXD)
4	Data Terminal Ready (DTR)
5	Ground
6	Data Set Ready (DSR)
7	Request To Send (RTS)
8	Clear To Send (CTS)
9	Not Connected

Adapter Pin Assignments

H8571-J Adapter

Figure B-3 shows the H8571-J adapter (6-pin MMJ connector to 9-pin D-Sub connector) and its pin assignments.

Figure B-3: H8571-J Adapter



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Cable Pin Assignments

BC29P Cable

Figure B-4: BC29P Cable Pin

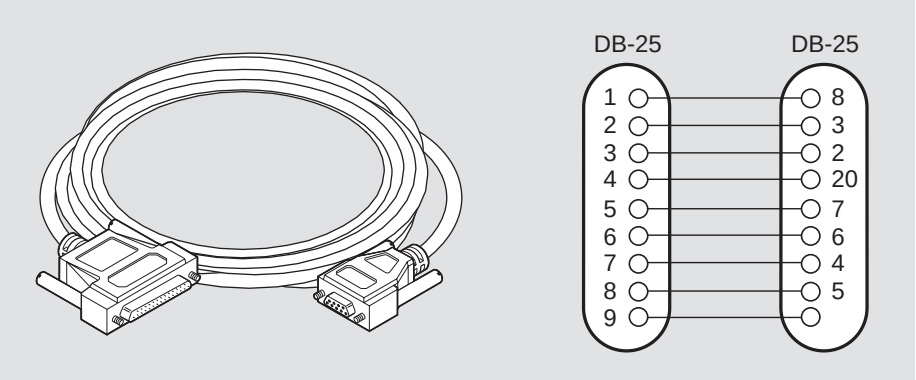


Table B-3: BC29P Cable Pin Assignments

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	N/A	No connect

BC29Q Cable

Figure B-5: BC29Q Cable Pin Assignments

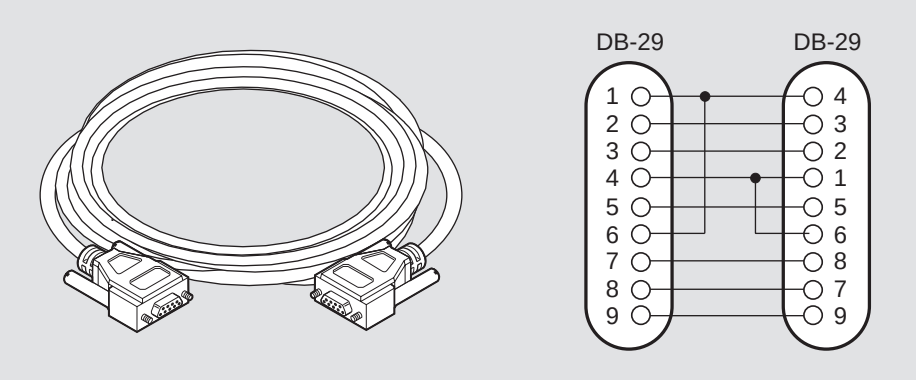
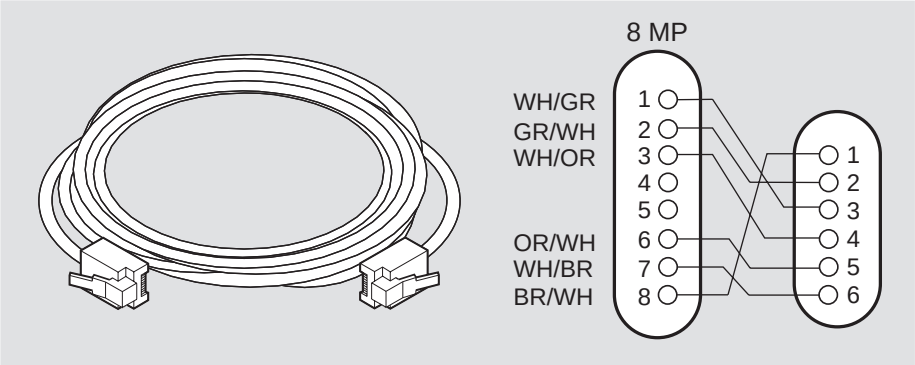


Table B-4: BC29Q Cable Pin Assignments

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

BN24H Cable

Figure B-6: BN24H Cable Pin Assignments



Appendix C

Specifications and Connectors

Overview

Introduction

This appendix lists the specifications and connectors for the MultiSwitch 900-4.

In This Appendix

Product Specifications

Table C-1 lists the product specifications for the MultiSwitch 900-4.

Table C-1: MultiSwitch 900-4 Specifications

Parameter	Specification
Environment	
Operating Temp.[1]	5°C to 50°C (41° F to 122°F)
Relative Humidity	10% to 95% noncondensing
Altitude	
• Operating	Sea level to 4267 m (14,000 ft)
• Nonoperating	Sea level to 12192 m (40,000 ft)
Power	428 W total input power
• Input	100 Vac to 120 Vac @ 1.8A 220 Vac to 240 Vac @ 1.0 A
• Output at 48-pin connector (max.)	55.0 A @ 5.15 Vdc 6.0 A @ 15.5 Vdc
Physical	
Height	28.03 cm (11.034 in)
Width	44.64 cm (17.516 in)
Depth	36.52 cm (14.376 in)
Weight	9545 grams (21 lb) (one power supply installed)
Shock (Class A/B for products weighing under 100 lbs)	10 G / 10 ms half sine pulse in three orthogonal axes
Vibration (Class C)	5 to 200 Hz sine sweep @ 0.25 G limited by 0.5 mm (0.02") displacement DA* 200 to 500 Hz sine sweep @ 0.10 G
Certification	CE, CSA, FCC, TÜV, UL, VCCI, BCIQ, C-TICK

[1] For sites above 2400 m (8,000 ft), decrease the operating temperature specification by 1.8°C for each 1000 m or 3.2°F for each 3,200 ft.

Connectors

MultiSwitch 900-4 Management Agent Module

Table C-2 provides a list of connectors used on the Management Agent Module.

Table C-2: Connectors for the Management Agent Module

Connectors	Quantity
Setup port connector	1
OBM (RS-232) port	1
Management access (UTP/ScTP) port	1

OBM Connector

The out-of-band management (OBM) connector is a DB9 connector. It is accessible on the front panel of the Management Agent Module and is used to connect a modem for out-of-band management. It has the following pin assignments:

Pin Number	Signal
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

Console Connector

The console connector is a shielded 8-pin MJ connector (RJ-45). It is accessible on the front panel of the Management Agent Module and is used to connect a console device. It has the following pin assignments:

Pin Number	Signal
1	No connect
2	Receive Data (RXD)
3	Ground
4	No connect
5	No connect
6	Transmit Data (TXD)
7	+5V
8	3K Ohms to Ground

String Management Connector

The String Management Connector is not supported.

10Base-T Port

The 10Base-T connector is a shielded 8-pin MJ connector (RJ-45). It is accessible on the front panel of the Management Agent Module and is used to connect the Management Agent Module's MAC to a twisted-pair Ethernet segment. This port is attached only to the Management Agent Module's in-band management Ethernet port. It is not connected to any of the backplane channels in the MultiSwitch 900-4 or stack. This connector is wired with no internal crossover, allowing it to be connected to a repeater port using straight-through cables. It has the following pin assignments:

Pin Number	Signal
1	Transmit Data +
2	Transmit Data -
3	Receive Data +
4	No connect
5	No connect
6	Receive Data -
7	No connect
8	No connect

Appendix D

Ordering and Support Information

Overview

Introduction

This appendix describes how to order parts, lists associated documentation and related information, and provides service and support information for the MultiSwitch 900-4.

In This Appendix

Ordering Options

Option	Part Number
MultiSwitch 900-4 chassis	DLHUB-*
Redundant power option — 300 watt power supply	H7898-MA
Hot-swappable management agent — Ethernet, Fast Ethernet, FDDI, ATM, and VNbus	H7897-MB
Optional rack mount kit	H7896-MA
Straight-through cable	BN25G-xx
Crossover cable	BN24F-xx
Adapter	H8571-J
Adapter	H8575-A

* indicates one of the following:

Suffix	Country	Suffix	Country
-AA	United States	-AT	Israel
-AD	Denmark	-AX	Central Europe
-AE	United Kingdom	-AZ	Australia
-AJ	Italy	-A3	No power cord
-AK	Switzerland	-BJ	India

Ordering Modules and Cards

Note the following requirements when ordering MultiSwitch 900-4 components:

- Order basic 600-series functional modules (hubs or switches or both) available for a MultiSwitch 600 stack.
- Order basic 900-series functional modules (hubs or switches or both) available for a MultiSwitch 900 stack.
- Order necessary options such as port expansion cards and modular media interface cards.

Associated Documents

The following documents provide information relating to the MultiSwitch 900-4. To order any of the following documents, refer to the section titled *Ordering Additional Documentation* on page D-5):.

Title and Order Number	Description
DIGITAL MultiSwitch 900 Owner's Manual (formerly *DEChub 900 MultiSwitch Owner's Manual*) EK-DH2MS-OM	Provides installation, use, security, and troubleshooting information for the DIGITAL MultiSwitch 900 (formerly DEChub 900 MultiSwitch).
clearVISN Installation AA-QX86*-TK	Describes how to install clearVISN software. It includes a list of distribution kit contents, system requirements, pre-installation considerations, and the installation procedure.
clearVISN Overview AA-QX87*-TK	Provides an overview of clearVISN software, an explanation of each clearVISN application, and descriptions of all concepts necessary to understand and use the application efficiently.
clearVISN User's Guide AA-QX88*-TK	Provides information for starting each application, configuration (when necessary), and general use information.
DEChub Network Modules 900-Series Repeater Reference EK-REPTR-HR	Describes the functions and features of the DIGITAL HUB-based 900-series repeaters.
Bridge and Extended LAN Reference EK-DEBAM-HR	Describes how bridges are used to create extended local area networks (LANs). This includes the use of bridges in extended LAN configurations, overall bridge operation, spanning tree, and solving bridge-related problems in a network.

Correspondence

Documentation Comments

If you have comments or suggestions about this document, send them to **TechWriting@cabletron.com**

Online Services

To locate product-specific information, refer to the Digital Equipment Corporation Network Products Business Home Page on the World Wide Web at the following addresses:

Americas:	http://www.networks.digital.com or http://www.cabletron.com
Europe:	http://www.networks.europe.digital.com
Asia Pacific:	http://www.networks.digital.com.au

Glossary

Overview

This glossary lists and defines terms used in the DIGITAL MultiSwitch 900-4 documentation.

Terms

This manual uses the following terms:

Terms	Descriptions
MultiSwitch 900-4	A four-slot hub that supports both DIGITAL MultiSwitch 600 and DIGITAL MultiSwitch 900 functional modules.
Management Agent Module	Module that provides network management to the DIGITAL MultiSwitch 900-4 that provides MultiSwitch 900 functionality.
10Base2	Thin coaxial cable 10 Mb/s Ethernet connection.
10Base5	Thick coaxial cable 10 Mb/s Ethernet connection.
10BaseT	Twisted-pair cable 10 Mb/s Ethernet connection.
ATM	Asynchronous Transfer Mode, a data transmission technology viable for both local and wide area networks (WANs). Provides high-speed data transmission rates.
Ethernet	Local area network (LAN) compatible with the ISO 8801-3/ANSI/IEEE 802.3 standards and the Ethernet standards for Carrier Sense Multiple Access with Collision Detection (CSMA/CD) LANs.

Terms	Descriptions
FDDI	Fiber Distributed Data Interface, a set of industry standards for high-speed, fiber-optic ring, local area networks.
Internet Protocol (IP) Address	The format of an IP address is the standard 4-octet dotted decimal notation, where each octet of the address is represented as a decimal value, separated by a decimal point (.). For example 16.20.54.156
Media Access Control (MAC) Address	The following format represents a Media Access Control (MAC) address in examples and figures: 08-00-2B-A3-00-00
ThinWire	10Base2 thin coaxial cable 10 Mb/s Ethernet connection.
Twisted Pair	Twisted-pair cable 10 Mb/s Ethernet connection. This type of cable is similar to that found in the telephone system. It consists of two insulated wires loosely twisted around each other to help cancel out induced noise in balanced circuits.

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