

# DIGITAL MultiSwitch Hub 612TX

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## Installation and Configuration

Part Number: EK-DLMT1-IN. C01

**March 1998**

This manual describes how to install, cable, and configure the DIGITAL MultiSwitch Hub 612TX when residing in a DIGITAL MultiSwitch 600 System (Stack Director or Stack Station) or a DIGITAL MultiSwitch 900 (formely DEChub 900 MultiSwitch).

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# Preface

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## Overview

### About this Manual

This manual describes how to install, cable, and configure the DIGITAL MultiSwitch Hub 612TX in a DIGITAL MultiSwitch 600 System, or in a DIGITAL MultiSwitch 900 (formerly DEChub 900 MultiSwitch).

The DIGITAL MultiSwitch Hub 612TX is a 12-port 100 Mb/s Fast Ethernet Hub. The module has eleven 8-pin MJ ports for 100BaseTX connections. The 12th port is provided by an optional Modular Media Interface (MM-100) that is installed in the module's expansion slot. An MM-100 provides either a 100BaseFX, 100BufFX or 100BaseTX port.

The DIGITAL MultiSwitch Hub 612TX can be installed in a DIGITAL MultiSwitch 600 stack, or a DIGITAL MultiSwitch 900 chassis.

### Intended Audience

This manual is intended for use by personnel who will install, set up, cable, and configure the DIGITAL MultiSwitch Hub 612TX in a DIGITAL MultiSwitch 900, or DIGITAL MultiSwitch 600 System (with Stack Director or Stack Station).

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## Organization

This manual is organized as follows:

<b>Chapter/ Appendix</b>	<b>Description</b>
<b>Part I</b>	<b>DIGITAL MultiSwitch Hub 612TX</b>
1	Describes the features and front and back panels of the DIGITAL MultiSwitch Hub 612TX module, and the features of the DIGITAL MultiSwitch 600 system.
2	Provides instructions for installing the MM-100 cards.
3	Provides instructions for installing and cabling the DIGITAL MultiSwitch Hub 612TX module.
4	Provides instructions for configuring the DIGITAL MultiSwitch Hub 612TX in a DIGITAL MultiSwitch 600 System and a DIGITAL MultiSwitch 900.
5	Provides instructions for using clearVISN to manage the DIGITAL MultiSwitch Hub 612TX in a DIGITAL MultiSwitch 600 System and a DIGITAL MultiSwitch 900.
6	Provides instructions for removing the DIGITAL MultiSwitch Hub 612TX from a DIGITAL MultiSwitch 600 System or a DIGITAL MultiSwitch 900.
<b>Part II</b>	<b>DIGITAL MultiSwitch 600 System</b>
7	Provides an overview, describes features, and describes the front and back panels of the Stack Director and Stack Station.
8	Provides instructions for assembling the DIGITAL MultiSwitch 600 Stack Director and Stack Station.
9	Provides instructions for managing the DIGITAL MultiSwitch 600 System.
10	Provides instructions for removing or replacing a level from a DIGITAL MultiSwitch 600 System.



<b>Chapter/ Appendix</b>	<b>Description</b>
<b>Part III</b>	<b>Reference Information</b>
A	Provides installation-specific troubleshooting information using the LEDs.
B	Provides connector and pin assignment information.
C	Provides product specifications.
D	Lists product ordering options and defines the part list for the product.
E	Lists associated documents and provides ordering information.
F	Lists service and support information for the DIGITAL MultiSwitch Hub 612TX.
G	Describes how to access RMON groups.
Glossary	Provides a glossary of terms and acronyms.
Index	Provides an index for the manual.

## Conventions

This book uses the following conventions.

Convention	Description
<b>Bold Type</b>	Indicates user input.
Monospaced Type	Indicates system output.
<Return>	Indicates that you press the Return Key.

---

## Safety

Any warning or caution that appears in this manual is defined as follows:

---

<b>WARNING</b>	Contains information to prevent personal injury.
<b>CAUTION</b>	Contains information to prevent damage to equipment.
<b>VORSICHT</b>	Enthält Informationen, die beachtet werden müssen um den Benutzer vor Schaden zu bewahren.
<b>ACHTUNG</b>	Enthält Informationen, die beachtet werden müssen um die Geräte vor Schaden zu bewahren.
<b>DANGER</b>	Signale les informations destinées à prévenir les accidents corporels.
<b>ATTENTION</b>	Signale les informations destinées à prévenir la détérioration du matériel.
<b>AVISO</b>	Contiene información para evitar daños personales.
<b>PRECAUCIÓN</b>	Contiene información para evitar daños al equipo.

---

## Safety

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

---

<b>CAUTION</b>	This action deletes all configured settings and replaces them with factory default values. All configuration settings will be lost.
<b>ACHTUNG</b>	Bei diesem Vorgang werden alle Konfigurationseinstellungen gelöscht und die Werkseinstellungen wieder eingesetzt. Alle Konfigurationsdaten gehen verloren.
<b>ATTENTION</b>	Cette action supprime tous les paramètres de configuration et les remplace par des valeurs prédéfinies. Tous les paramètres de configuration seront perdus.
<b>PRECAUCIÓN</b>	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.

---

<b>WARNING</b>	Some fiber optic equipment can emit laser or infrared light that can injure your eyes. Never look into an optical fiber or connector port. Always assume the cable is connected to a light source.
<b>VORSICHT</b>	Bestimmte Lichtleitergeräte können für die Augen gefährliches Laser- oder Infrarotlicht abstrahlen. Vermeiden Sie es daher unter allen Umständen, direkt in ein Lichtleiterkabel oder einen Lichtleiteranschluß zu schauen. Gehen Sie immer davon aus, daß Lichtleiterkabel mit einer Lichtquelle verbunden sind.
<b>DANGER</b>	Certains équipements à fibre optique peuvent émettre un rayonnement laser ou infra-rouge pouvant provoquer des troubles oculaires. Ne regardez jamais à l'intérieur d'une fibre optique ou d'un port de connecteur. Considérez que le câble est connecté en permanence à une source lumineuse.
<b>AVISO</b>	Ciertos equipos de fibras ópticas pueden emitir luz láserica o infrarroja con riesgos de lesiones en los ojos. No se debe nunca mirar en una fibra óptica o una puerta de conexión. Siempre hay que suponer que el cable está conectado a una fuente luminosa.

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

---

<b>WARNING</b>	Always make sure this unit is adequately grounded. Do not connect more than five Stack Stations into a single power strip unless the power strip is protected by a GFCI device.
<b>VORSICHT</b>	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.
<b>DANGER</b>	<b>DANGER</b> : 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.
<b>AVISO</b>	<b>ADVERTENCIA</b> - 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.

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## Safety

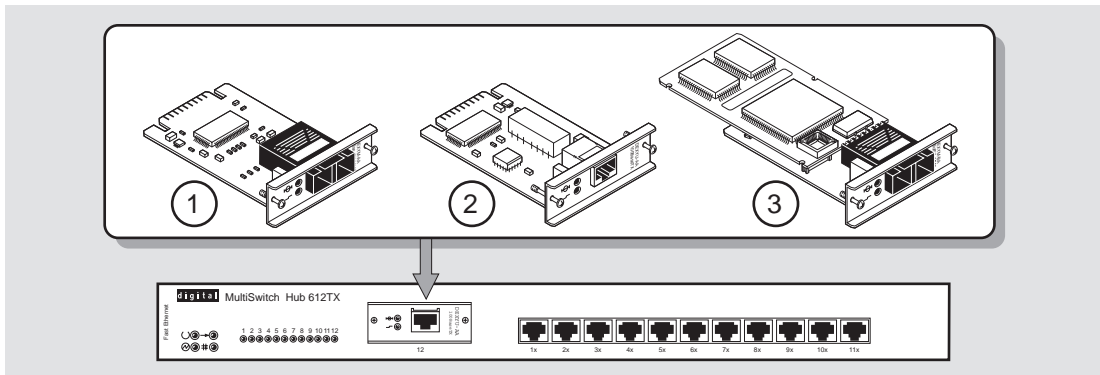
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<b>CAUTION</b>	Static electricity can damage modules and electronic components. DIGITAL recommends using a grounded antistatic wrist strap and a grounded work surface when handling any modules.
<b>ACHTUNG</b>	Module und elektronische Komponenten können durch elektrostatische Entladungen beschädigt werden. Benutzen Sie immer eine antistatische Gelenkmanschette und eine geerdete Arbeitsunterlage, wenn Sie am offenen Gerät arbeiten.
<b>ATTENTION</b>	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.
<b>PRECAUCION</b>	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.

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## Part I

# DIGITAL MultiSwitch Hub 612TX



NPB-0840-97F

This illustration shows the DIGITAL MultiSwitch Hub 612TX module and its supported 100 Mb/s Fast Ethernet Modular Media Interfaces (MM-100s): the 100BaseFX, 100BuffX and 100BaseTX.

The DIGITAL MultiSwitch Hub 612TX is a Class II Fast Ethernet hub. It can be installed in a DIGITAL MultiSwitch 600 System or in a DIGITAL MultiSwitch 900 chassis (formerly DEChub 900 MultiSwitch).





# Chapter 1

---

## Product Description

---

### Overview

#### Introduction

This chapter contains a technological overview of the DIGITAL MultiSwitch 600 System and a description of the DIGITAL MultiSwitch Hub 612TX. For detailed information about the DIGITAL MultiSwitch 600 System, refer to Part II. For additional information about the DIGITAL MultiSwitch 900 (formerly DEChub 900 MultiSwitch), refer to the *DIGITAL MultiSwitch 900 Owner's Manual*.

#### In This Chapter

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Topic	Page
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DIGITAL MultiSwitch 600 System Features	1-8
Using DIGITAL MultiSwitch 600 System Modules in a DIGITAL MultiSwitch 900	1-9
What Is the DIGITAL MultiSwitch Hub 612TX?	1-10
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DIGITAL MultiSwitch Hub 612TX Front Panel	1-13
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## Network Topology for Class II Hubs to Switches with MMIs

This section illustrates recommended network topologies. You should use these topologies when configuring your network with 100BaseFX, 100BaseTX, or 100BuffFX Fast Ethernet cards. These 100Mb/s Fast Ethernet Modular Media Interface (MMI) cards are used in the DIGITAL Class II MultiSwitch 600 Fast Ethernet Hubs. The 100BuffFX Fast Ethernet card allows FX buffered support for Fast Ethernet Hubs extending the cabling distance to 2 kilometers.

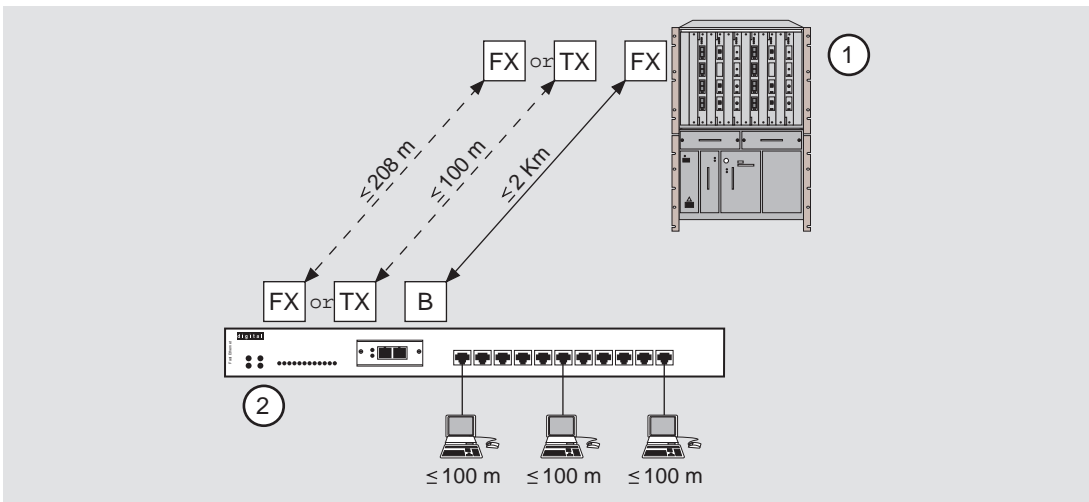
Figure 1-1 shows a single Class II Hub configuration with a GIGAswitchFE (1) connected to a DIGITAL MultiSwitch Hub 612TX module (2). This connection is made using 100Mb/s Fast Ethernet Modular Media Cards. The combinations for connecting these cards are as follows:

100BaseFX	Connects to another 100BaseFX card at a distance of up to 208 meters in half-duplex mode
100BaseTX	Connects to another 100BaseTX card at a distance of up to 100 meters in half-duplex mode.
100BuffFX	Connects to another 100BaseFX card at a distance of up to 2 kilometers in full-duplex mode

**NOTE**

While a hub to hub configuration using two 100BuffFX cards at a distance of up to 2 km will work, we *do not* recommend it.

**Figure 1-1: Single Class II Hub Configuration**



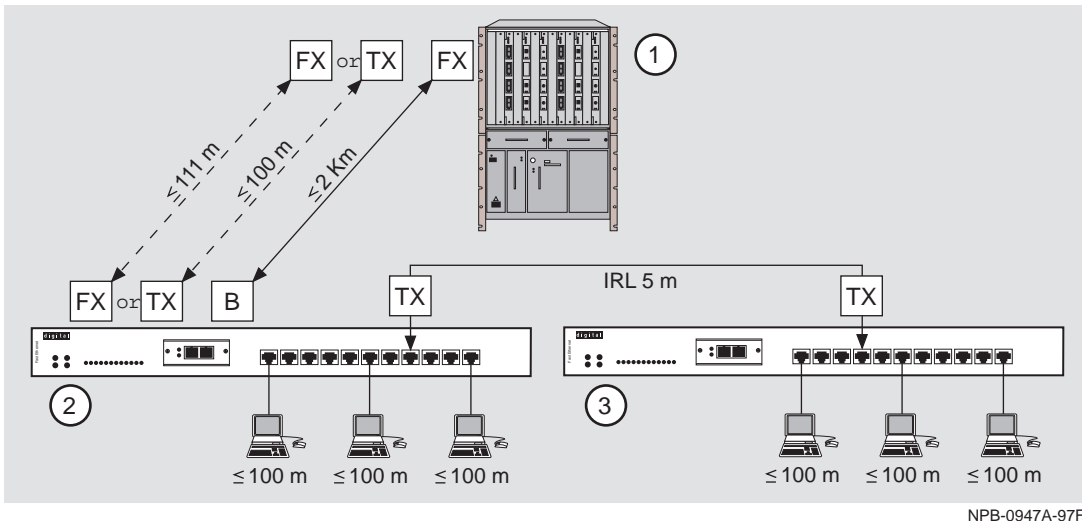
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## Network Topology for Class II Hubs to Switches with MMIs

Figure 1-2 shows a primary and redundant Class II Hub configuration with a switch (1) connected to two DIGITAL MultiSwitch Hub 612TX modules (2) and (3). In this configuration, the 100BaseFX to 100BaseFX connection is at a distance of up to 111 meters. The 100BaseTX to 100BaseTX is 100 meters. The 100BufFX to 100BaseFX connection is up to 2 kilometers.

This figure also shows the two Hub modules (2) and (3) connected via two 100BaseTX fixed ports using a 5 meter Inter-Repeater Link (IRL) in half-duplex mode.

**Figure 1-2: Two Class II Hub Configuration**



## Auto-Negotiation

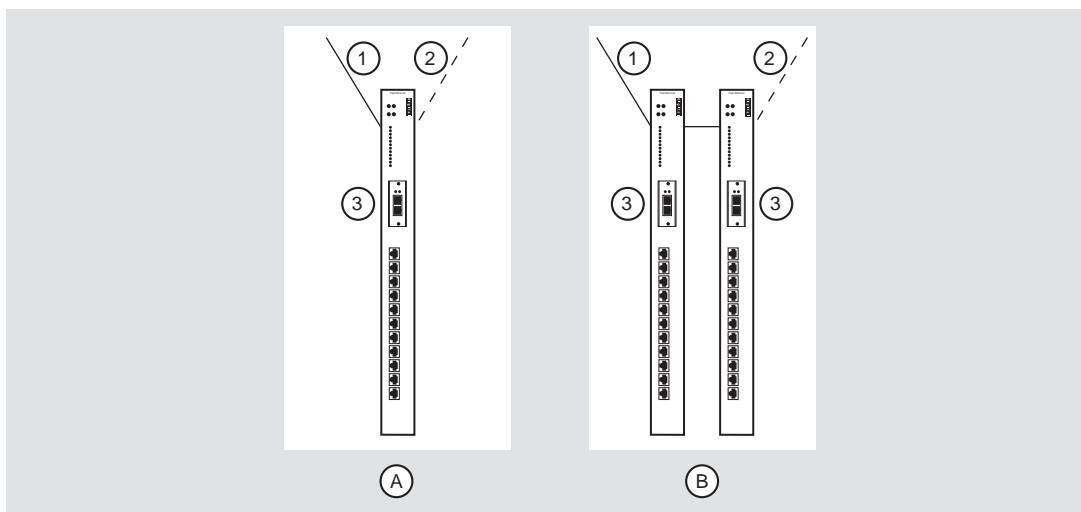
The 100BufFX has a full duplex 100BaseFX interface and as such, does not auto-negotiate. You must manually configure the switch port to full duplex 100Base FX operation.

## Network Topology for Class II Hubs to Switches with MMIs

### User Support

Figure 1-3 shows user support for two configurations using primary link (1) and redundant link controlled by a switch that is configured appropriately (2) configurations. The configurations use DIGITAL MultiSwitch Hub 612TX (3) modules. Table 1-1 describes the number of users supported with each configuration.

**Figure 1-3: Various Class II Hub Configurations**



NPB-0948-97F

**Table 1-1: User Support for Various Class II Hub Configuration**

Configuration	Module(s)	Maximum Users	Uplink(s)
A	One DIGITAL MultiSwitch Hub 612TX	11	1
B	Two DIGITAL MultiSwitch Hub 612TX	20-21	1-2

## Technology Overview

This section describes the technology you should be familiar with to use these products effectively.

### Ethernet

Ethernet is a 10 Mb/s network communications system developed and standardized by DIGITAL, Intel, and Xerox. It uses baseband transmission, carrier sense multiple access with collision detection (CSMA/CD) access, and logical bus topology. This industry-standard protocol is specified by ISO 802-3 ANSI/IEEE Standard 802.3.

### Fast Ethernet

Fast Ethernet is a 100 Mb/s extension to Ethernet and is standardized by ANSI/IEEE Standard 802.3. MAC frame formats and sizes are identical to those used by 10 Mb/s Ethernet.

The Fast Ethernet standard includes the following subsets, collectively known as 100BaseX:

- 100BaseTX. A standard that specifies baseband operation over two pairs of category 5 unshielded twisted pair (UTP) cable. One pair of wires is for receiving and the other pair is for transmitting. It is based on the Fiber Distributed Data Interface (FDDI) Twisted Pair Physical Layer Medium (TP-PMD) standard. The maximum distances between devices is 100 meters in half-duplex mode and 200 meters in full-duplex mode.
- 100BaseFX. A standard that specifies baseband operation over two strands of 62.5/125  $\mu\text{m}$ , multimode, fiber-optic cable. The maximum distances between devices is 412 meters in half-duplex mode and 2000 meters in full-duplex mode.

### Shared Hubs

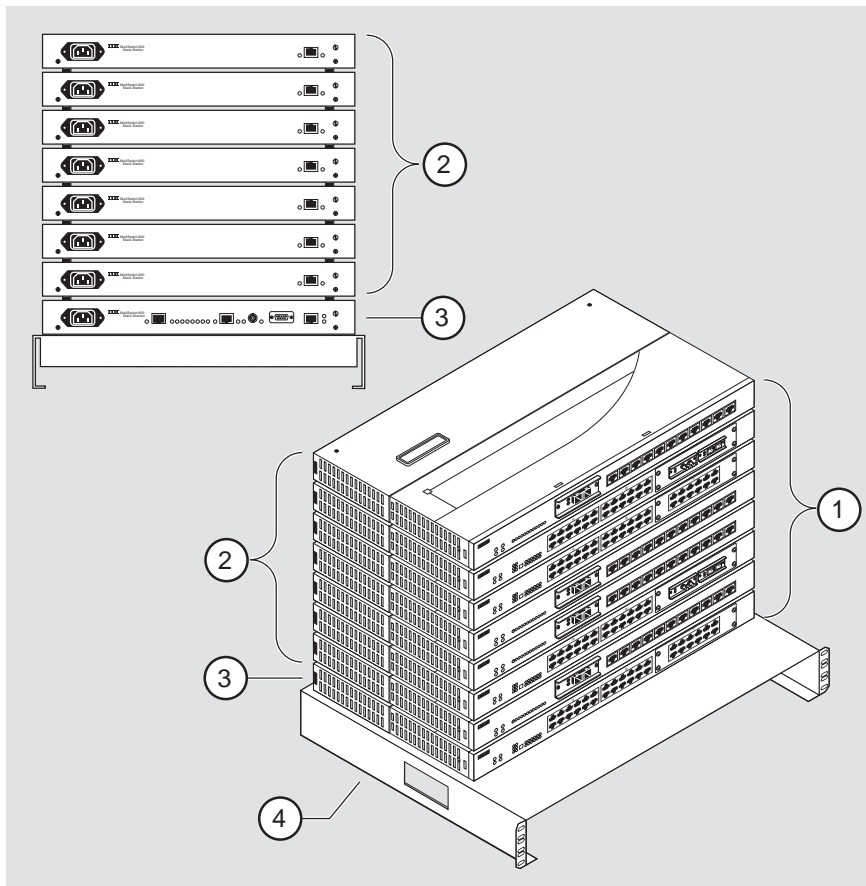
A shared hub provides a collection of LAN ports, all of which belong to a single collision domain. A shared hub does not allow simultaneous transmissions by multiple stations connected to the hub. The total bandwidth of the LAN, for example 10 Mb/s or 100 Mb/s, is shared among the attached stations. Fast Ethernet hubs can be of type Class I (limited to one hub) or Class II (expandable to a second hub in the same collision domain).

What Is the DIGITAL MultiSwitch 600 System?

## What Is the DIGITAL MultiSwitch 600 System?

The DIGITAL MultiSwitch 600 System is an integrated workgroup switching system into which the DIGITAL MultiSwitch Hub 612TX can be installed. The DIGITAL MultiSwitch 600 System components provide a complete system of Ethernet and Fast Ethernet shared hubs and switches. DIGITAL MultiSwitch 600 System modules (1) are attached to a Stack Station (2) or a Stack Director (3) for power and backplane access (see Figure 1-4). Stack Director and Stack Station are interconnected with cable-free stack interconnect cards to Ethernet LAN channels and management signals for easy installation and use. The Stack Director also provides Simple Network Protocol Management Protocol (SNMP) management support for the stack. Only one Stack Director is needed to manage a stack of up to 8 hubs, switches, or a combination of hubs and switches. The Stack Director attaches to an optional Mounting Tray (4).

Figure 1-4: DIGITAL MultiSwitch 600 System



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## What Is the DIGITAL MultiSwitch 600 System?

After a stack is assembled, hubs and switches can be managed via the Stack Director by the clearVISN Stack Manager or the clearVISN MultiChassis Manager network management software applications. The clearVISN Stack Manager provides a graphical user interface (GUI) that allows you to manage the DIGITAL workgroup products, including the DIGITAL MultiSwitch 600 System. The clearVISN MultiChassis Manager also provides a GUI that allows you to manage the full range of DIGITAL network products, including the DIGITAL MultiSwitch 900 and GIGAswitch product families, and the DIGITAL MultiSwitch 600 System.

What Is the DIGITAL MultiSwitch 600 System?

## **DIGITAL MultiSwitch 600 System Features**

When assembled, the DIGITAL MultiSwitch 600 System can include the following features:

- Modular architecture.
- Choice of 10 Mb/s and 100 Mb/s hubs and switches integrated as a single SNMP management domain.
- Cable-free stack interconnect for seven internal 10 Mb/s Ethernet LAN and management channels.
- Ability to create a stack of up to eight network devices.
- Functional modules that are hot-swappable to eliminate network downtime during network changes.
- A Stack Director that contains SNMP management agent with one IP address that manages all modules in the stack.
- Support for four RMON groups.
- Modular Media Interface (MM-100) and port expansion options, specific to the functional modules.
- Rack mountable.

For a complete description of the DIGITAL MultiSwitch 600 System, including planning and configuration information, refer to Part II, DIGITAL MultiSwitch 600 System.

---

### **NOTE**

The MultiSwitch Hub 612TX does not support 10 Mb/s Ethernet backplane connections to the DIGITAL MultiSwitch 900 or to the DIGITAL MultiSwitch 600 System. Only 10 Mb/s hub or switch ports can connect to the internal stack backplane. 100 Mb/s switch uplinks or hub ports must be connected via front-panel ports.

---



## Using DIGITAL MultiSwitch 600 System Modules in a DIGITAL MultiSwitch 900

The DIGITAL MultiSwitch 600 System modules, such as the DIGITAL MultiSwitch Hub 612TX, may also be used in the DIGITAL MultiSwitch 900. Power connections for a MultiSwitch Hub 612TX module are implemented using the common 48-pin connector. The MultiSwitch Hub 612TX does not support Ethernet backplane connections to the DIGITAL MultiSwitch 900 or to the DIGITAL MultiSwitch 600 System. Only 10 Mb/s hub or switch ports can connect to the internal stack backplane. 100 Mb/s switch uplinks or hub ports must be connected via front-panel ports.

DIGITAL MultiSwitch 600 System modules are fully managed and are hot-swappable, both in the DIGITAL MultiSwitch 600 System platform and in the DIGITAL MultiSwitch 900.

DIGITAL MultiSwitch 600 System modules do not provide the IP services function. A DIGITAL MultiSwitch 900 requires the use of an IP services module for in-band access to the SNMP Management Agent through an in-band connection. When using DIGITAL MultiSwitch 600 System modules in a DIGITAL MultiSwitch 900, at least one module supporting IP services is needed if using In-Band Management.

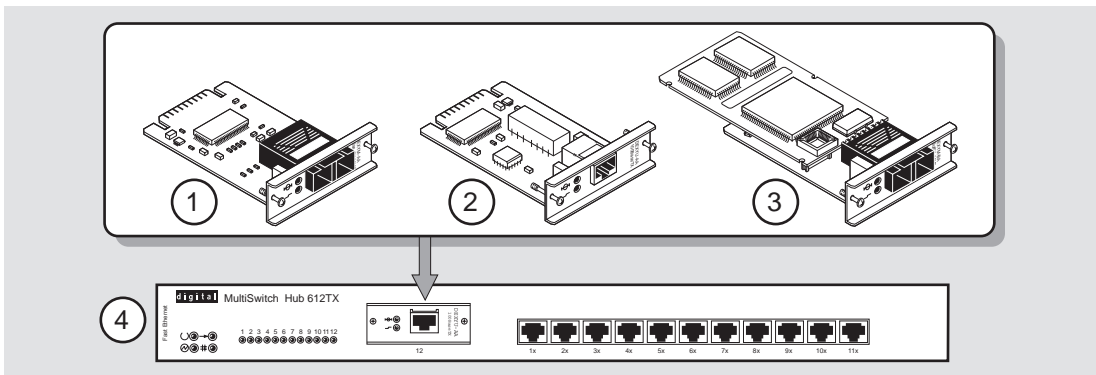
What Is the DIGITAL MultiSwitch Hub 612TX?

---

## What Is the DIGITAL MultiSwitch Hub 612TX?

The DIGITAL MultiSwitch Hub 612TX (also referred to in this document as the module) is a 12-port Fast Ethernet hub. It has eleven fixed 100BaseTX ports and an expansion slot for an optional MM-100 that provides a 100BaseTX, 100BufFX or 100BaseFX port (Figure 1-5).

**Figure 1-5: DIGITAL MultiSwitch Hub 612TX**



NPB-0821-97F

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Item	Description
1	100BaseFX MM-100
2	100BaseTX MM-100
3	100BufFX MM-100
4	DIGITAL MultiSwitch Hub 612TX

---

The DIGITAL MultiSwitch Hub 612TX module can be installed in a DIGITAL MultiSwitch 600 Stack Director, a DIGITAL MultiSwitch 600 Stack Station, or in a DIGITAL MultiSwitch 900, all of which supply power and mechanical support to the module.

The Stack Director and the DIGITAL MultiSwitch 900 provide the ability to manage the module using SNMP.

## DIGITAL MultiSwitch Hub 612TX Features

The DIGITAL MultiSwitch Hub 612TX includes the following features:

- Eleven fixed 8-pin MJ 100BaseTX crossover ports for 100 Mb/s Fast Ethernet connections.
- Support for the following front insertable MM-100s, which support both the 100BaseTX, 100BaseFX and 100BaseFX 100 Mb/s Fast Ethernet media standards:
  - 100BaseTX (UTP-5 with 8-pin MJ connectors)
  - 100BaseFX (multimode fiber-optic cables with SC connectors)
  - 100BaseFX (multimode fiber-optic cables with SC connectors)
- Class II hub that allows two repeaters to be interconnected in a single collision domain.
- Ability to hot-swap modules in a DIGITAL MultiSwitch 600 System or DIGITAL MultiSwitch 900.
- Alarms, Events, Statistics, and History RMON group support in a DIGITAL MultiSwitch 600 System (requires a Stack Director).
- Port-level statistics for monitoring performance on every port.
- Port-level security to prevent unauthorized access to the network, including automatic and manual authorization of secure addresses. The DIGITAL MultiSwitch Hub 612TX offers intrusion protection, a feature that prevents unauthorized stations from successfully transmitting data into a DIGITAL MultiSwitch Hub 612TX port. The module compares the source address of the packets received on a port to the list of authorized addresses assigned to that port. If the addresses do not match, the DIGITAL MultiSwitch Hub 612TX logs an intrusion violation and can disable the port that detected the violation.
- Port State and Module State LEDs for visual monitoring and troubleshooting.
- Compliance with the IEEE 802.3u standard.
- Upgradeable device firmware (in nonvolatile flash memory) using Trivial File Transfer Protocol (TFTP) with clearVISN Flash Loader or through the setup port with any TFTP server. An IP address is not necessary for the module to be upgraded.
- Advanced graphical user interface (GUI) manageability with DIGITAL's clearVISN MultiChassis Manager or Stack Manager applications.

## DIGITAL MultiSwitch Hub 612TX Features

### MIB Support

The module provides SNMP agent support for the following management information bases (MIBs) when used in a managed stack or a DIGITAL MultiSwitch 900:

- MIB II (RFC 1213)
- DIGITAL MultiSwitch 900 Public Common MIB
- DIGITAL Extended Repeater MIB
- Internet Engineering Task Force (IETF) Repeater MIB (RFC 1516)

For information on how to access DIGITAL MIBs, follow the procedures in the Release Notes for this product.

### Remote Monitoring (RMON)

In a DIGITAL MultiSwitch 900 or in a stack that is managed by a Stack Director, the DIGITAL MultiSwitch Hub 612TX supports sophisticated Ethernet monitoring with the Remote Network Monitoring Information Base (RMON-MIB). The following RMON features and options are available:

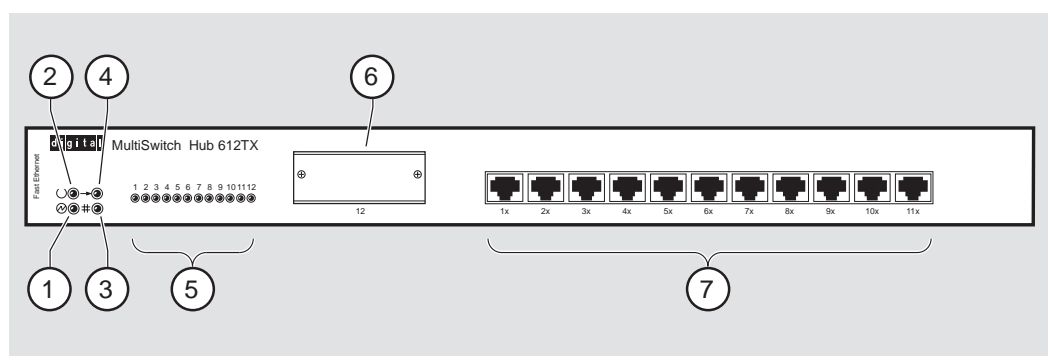
- RMON functions are performed concurrently with the module's repeater function.
- Within the module, RMON is accessible by multiple managers.
- Basic RMON capability at the LAN level for the following groups:
  - *Statistics*. Various statistics measured for the monitored Fast Ethernet channel, including utilization, packet rates, broadcast and multicast rates, and error information.
  - *History*. Capturing of periodic statistical samples for later retrieval and analysis.
  - *Alarms*. Specification of thresholds for various monitored variables, in order to generate events.
  - *Events*. Controls the generation and notification of events from the probe.
- GUI Management with clearVISN RMON Manager

For information on how to access and use the basic RMON features, refer to Appendix G.

## DIGITAL MultiSwitch Hub 612TX Front Panel

Table 1-2 describes the DIGITAL MultiSwitch Hub 612TX front panel components and Figure 1-6 shows their location. For detailed information about the LEDs, refer to Appendix A.

**Figure 1-6: DIGITAL MultiSwitch Hub 612TX Front Panel**



NPB-0842-97F

**Table 1-2: DIGITAL MultiSwitch Hub 612TX Front Panel Features**

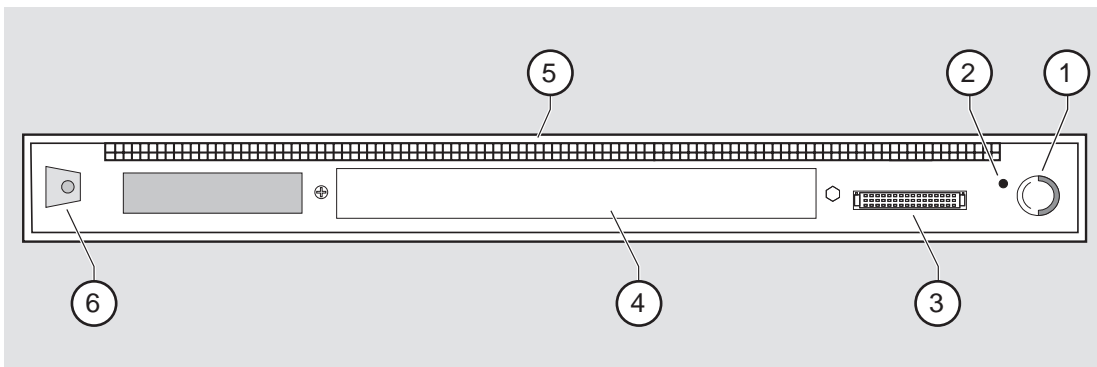
Item	Icon	Name	Description
1		Power OK LED	Indicates that the module has sufficient power.
2		Module OK LED	Indicates that the module passed self-test.
3		Backplane Status	Not used.
4		Network Activity LED	Indicates the level of network traffic.
5		Port Status LEDs 1 – 12	Provide the status of the port connections for the eleven 100BaseTX ports and the 12th port supplied by the MM-100.
6		MM-100 Modular Media Interface card slot	Holds either a 100BaseFX, 100BassTX, or 100BufFX port MM-100, which can connect to end devices such as PCs, workstations, hubs (repeaters), and switches.
7		100BaseTX, 8-pin MJ port crossover connectors	Used to connect end devices such as PCs, workstations, hubs (repeaters), and switches.

## DIGITAL MultiSwitch Hub 612TX Features

### DIGITAL MultiSwitch Hub 612TX Back Panel

Table 1-3 describes the DIGITAL MultiSwitch Hub 612TX back panel components and Figure 1-7 shows their location.

**Figure 1-7: DIGITAL MultiSwitch Hub 612TX Back Panel**



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**Table 1-3: DIGITAL MultiSwitch Hub 612TX Back Panel Features**

Item	Name	Description
1	Locking Tab	Secures the DIGITAL MultiSwitch Hub 612TX to a DIGITAL MultiSwitch 900 chassis.
2	Opening for slotted thumbscrew	Secures the module to a Stack Station or a Stack Director.
3	48-pin Connector	Provides network and power connections to the DIGITAL MultiSwitch Hub 612TX when it is connected to a Stack Station or the DIGITAL MultiSwitch 900 chassis.
4	Manufacturing Label	Lists the DIGITAL MultiSwitch Hub 612TX module part number, serial number, revision level, and power requirements.
5	Grounding Fingers	Provide chassis grounding between the DIGITAL MultiSwitch Hub 612TX and the Stack Station.
6	Mounting Tab	Attaches the DIGITAL MultiSwitch Hub 612TX to a DIGITAL MultiStack 600 Stack Station or a DIGITAL MultiSwitch 900 locking receptacle.

## Chapter 2

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# Installing A Modular Media Interface

---

## Overview

### Introduction

This chapter describes how to install a 100 Mb/s Fast Ethernet Modular Media Interface (MM-100) into the module. The installation and removal instructions in this chapter are applicable to all the cards.

For detailed information on the available cards, refer to the *100 Mb/s Fast Ethernet Modular Media Interface Cards Installation* manual.

### In This Chapter

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Topic	Page
Installing DIGITAL MultiSwitch Hub 612TX Options	2-2
Required Tools	2-2
Removing the Dust Cover	2-3
Installing the MM-100 (Hot-Swappable)	2-4

---

## Installing DIGITAL MultiSwitch Hub 612TX Options

The DIGITAL MultiSwitch Hub 612TX has an option slot that accepts an MM-100. The following sections provide instructions for installing and removing an MM-100.

### Required Tools

DIGITAL recommends the use of, but does not supply, the following tools to install the cards:

- Phillips-head screwdriver
- Antistatic grounding strap

To prepare to install the card into the module, complete the following steps:

---

<b>Step</b>	<b>Action</b>
<b>1</b>	Remove the contents from the box and be sure to keep all original packing materials. The card comes packed in protective antistatic material. You should not remove the card from the material until you are ready to install the card.
<hr/> <b>CAUTION</b> <hr/>	
	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.
<b>2</b>	Check the shipment for damaged and missing parts. In case of damaged or missing parts, contact your delivery agent and your sales representative.

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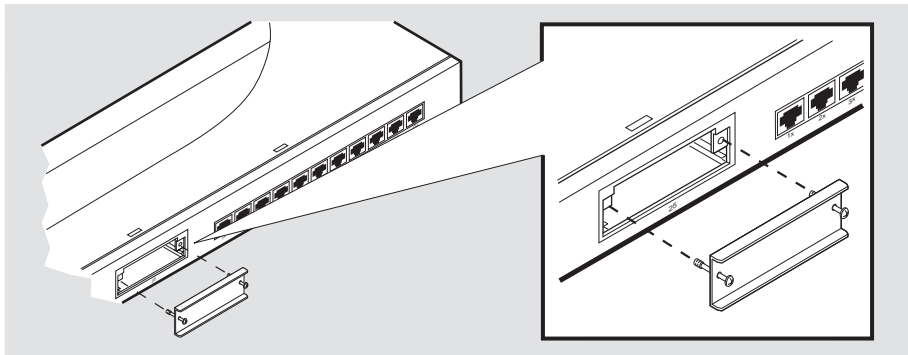


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## Removing the Dust Cover

To remove the dust cover from the expansion slot (Figure 2-1), perform the following steps.

**Figure 2-1: Dust Cover Removal**



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<b>Step</b>	<b>Action</b>
<b>1</b>	Using a Phillips-head screwdriver, loosen the two captive screws on the dust cover.
<b>2</b>	Save the dust cover and its attached captive screws.

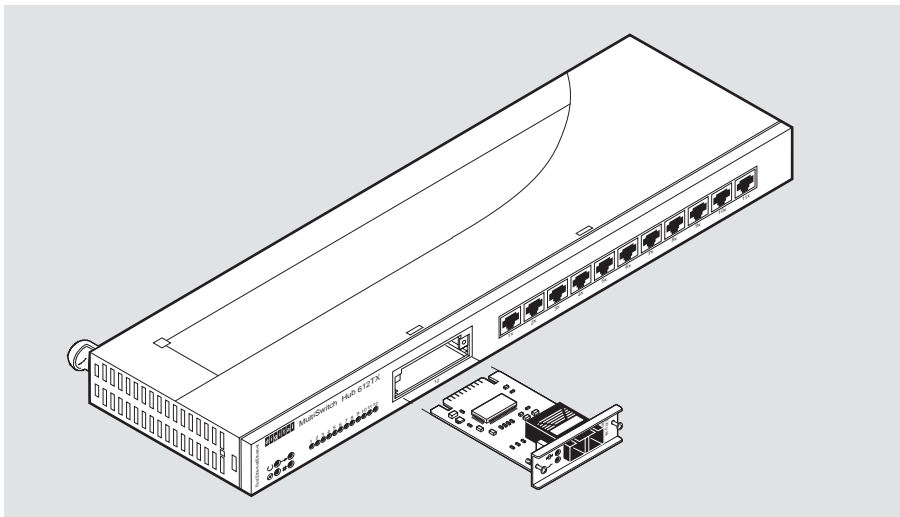
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## Installing the MM-100 (Hot-Swappable)

Complete the following steps to install an MM-100 into the module (Figure 2-2).

**Figure 2-2: Installing the MM-100**



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Depending on the type of connectors used on the card, there will be differences in the way cables are attached and removed. For cable connection information for the modular media interfaces, refer to the *100 Mb/s Fast Ethernet Modular Media Interface Cards Installation* manual.

## Installing the MM-100 (Hot-Swappable)

---

<b>Step</b>	<b>Action</b>
<b>1</b>	Attach one end of the antistatic wrist strap to your wrist and the other end to the chassis ground.

---

**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.

---

<b>2</b>	Remove the dust caps from the card, if necessary.
<b>3</b>	Hold the card by the edges of the bezel and position it so that it is parallel with the slot opening.
<b>4</b>	Insert the card into the slot opening and slide the card along the card guides until the card's bezel is flush with the module. <u>Note:</u> To prevent the screws from interfering with the card insertion, make sure that the captive screws on the bezel are partially threaded into the bezel threads.
<b>5</b>	Firmly fasten the card to the module with the two captive screws.

---



## Chapter 3

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# Module Installation and Cabling

---

## Overview

### Introduction

This chapter describes how to install the module in a DIGITAL MultiSwitch 600 System and in a DIGITAL MultiSwitch 900 (formerly DEChub 900 MultiSwitch).

### In This Chapter

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Topic	Page
Installing a DIGITAL MultiSwitch Hub 612TX in a Stack Director or Stack Station	3-2
Installing the DIGITAL MultiSwitch Hub 612TX in a DIGITAL MultiSwitch 900	3-4
Task 1: Compare the Power Ratings	3-5
Task 2: Seat the Module into the DIGITAL MultiSwitch 900	3-6
Task 3: Verify Initial LED Operation	3-7
Task 4: Connect the Setup Port Cables to the DIGITAL MultiSwitch 900	3-8
Connecting Cables to the 100BaseTX Ports on the DIGITAL MultiSwitch Hub 612TX	3-10

---

## Installing a DIGITAL MultiSwitch Hub 612TX in a Stack Director or Stack Station

Before you cable the DIGITAL MultiSwitch Hub 612TX or its MM-100 (if installed), you should first install the module into a Stack Director, Stack Station, or DIGITAL MultiSwitch 900. This section describes how to attach a DIGITAL MultiSwitch Hub 612TX to a Stack Director or Stack Station. You will need a flat-bladed screwdriver for the installation.

Part II of this manual explains the features of the Stack Director and Stack Station and how to build a stack using the those components.

---

### NOTES

Hot-swapping is the removal or insertion of a module into either the DIGITAL MultiSwitch 600 System or the DIGITAL MultiSwitch 900 without disrupting power to the unit. Do not simultaneously hot-swap more than one module. Simultaneously inserting or removing more than one module can cause problems with the operation of other installed modules.

MultiSwitch 600 modules are fully managed and are hot-swappable, in both the MultiSwitch 600 platform and in the DIGITAL MultiSwitch 900.

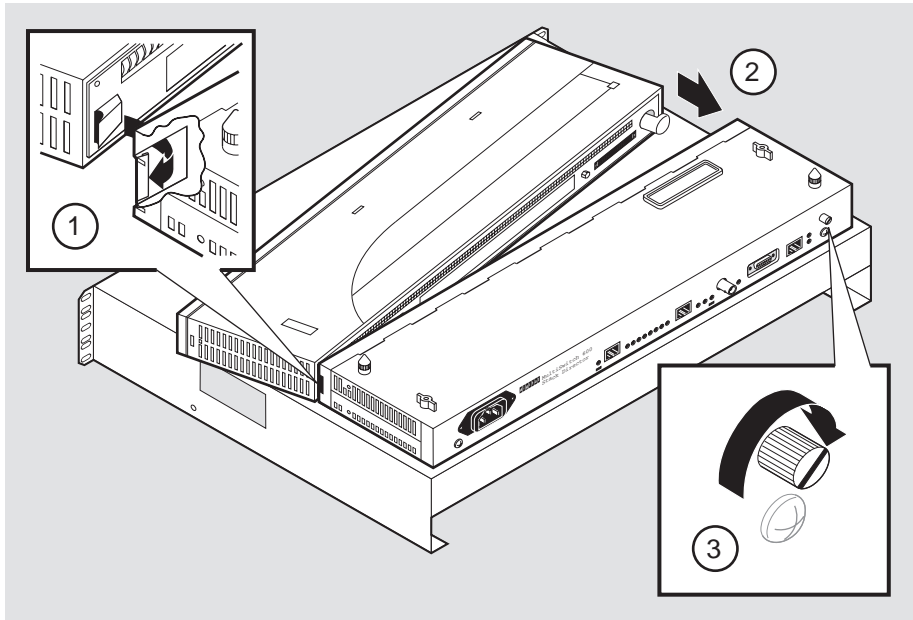
The MM-100s are hot-swappable. You may install the MM-100s before or after installing the module in a stack or a hub.

---

Complete the following steps to attach a DIGITAL MultiSwitch Hub 612TX to the Stack Director and Stack Station as shown in Figure 3-1.

Installing a DIGITAL MultiSwitch Hub 612TX in a Stack Director or Stack Station

**Figure 3-1: Attaching the Module to the Stack Director or Stack Station,**



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Step	Action
1	Refer to Part II for instructions on mounting the Stack Director or Stack Station to a mounting tray.
2	Place the mounting tab (1) on the DIGITAL MultiSwitch Hub 612TX module into the mounting slot on the Stack Director or Stack Station.
3	Push the DIGITAL MultiSwitch Hub 612TX securely against the Stack Director or Stack Station (2).
4	Securely tighten the slotted thumbscrew on the Stack Director or Stack Station (3).
5	For information about assembling, cabling, and managing a stack, see Part II, DIGITAL MultiSwitch 600 System.

## Installing the DIGITAL MultiSwitch Hub 612TX in a DIGITAL MultiSwitch 900

The DIGITAL MultiSwitch Hub 612TX hot-swap feature allows you to install the module into the DIGITAL MultiSwitch 900 without turning off power. If you are using an MM-100, you may install it in the module before or after installing the module in the DIGITAL MultiSwitch 900 because MM-100s are hot-swappable. Seating the module initiates the module's power-up sequence.

---

### NOTES

Hot-swapping is the removal or insertion of a module into either the DIGITAL MultiSwitch 600 System or the DIGITAL MultiSwitch 900 without disrupting power to the unit. Do not simultaneously hot-swap more than one module. Simultaneously inserting or removing more than one module can cause problems with the operation of modules.

MultiSwitch 600 modules are fully managed and are hot-swappable, both in the MultiSwitch 600 platform and in the DIGITAL MultiSwitch 900.

The MM-100s are hot-swappable. You may install the MM-100s before or after installing the module in a stack or a hub.

---

The following table describes the tasks necessary for installing the module in a DIGITAL MultiSwitch 900.

---

<b>Task</b>	<b>Description</b>
<b>1</b>	Compare the power ratings.
<b>2</b>	Seat the module into the DIGITAL MultiSwitch 900.
<b>3</b>	Verify initial LED operation.
<b>4</b>	Connect the setup port cables.

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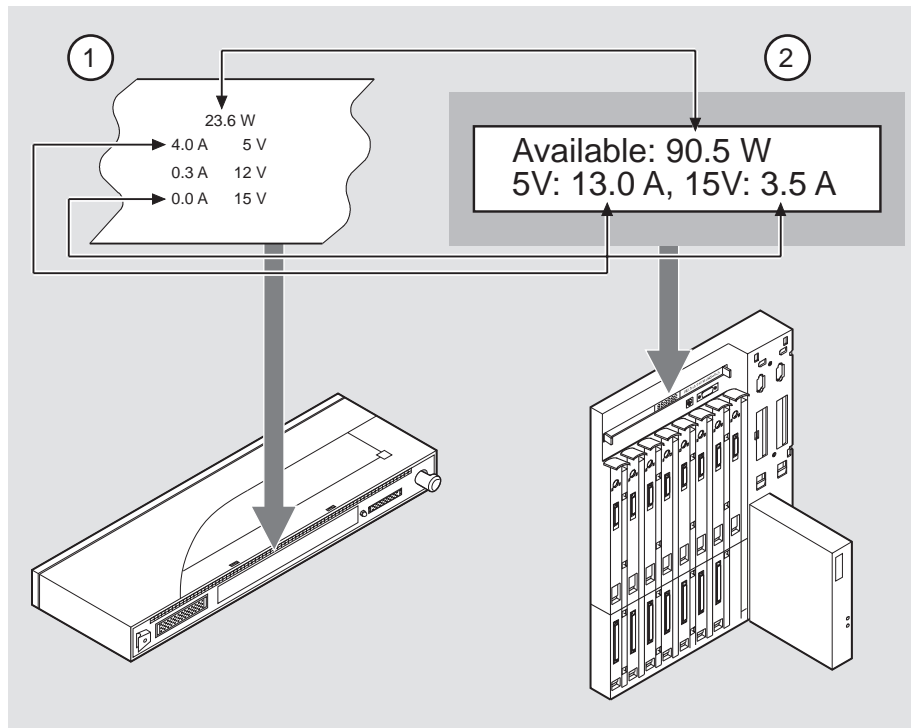
Installing the DIGITAL MultiSwitch Hub 612TX in a DIGITAL MultiSwitch 900

### Task 1: Compare the Power Ratings

Compare the DIGITAL MultiSwitch Hub 612TX power ratings (1) with the available power value shown in the DIGITAL MultiSwitch 900 Manager Status display (2) (see Figure 3-2). For the DIGITAL MultiSwitch 900, the 12V power is derived from the 15V power source. Although it is listed separately in the DIGITAL MultiSwitch Hub 612TX's product specification, the 12V requirements are included in the DIGITAL MultiSwitch 900 15V power total.

If any of the module's power requirements exceed the available power value shown in the status display, add another power supply (see the *DIGITAL MultiSwitch 900 Owner's Manual*). If you do not, the module enters a low power mode and disables the ports.

**Figure 3-2: Module Power Ratings**



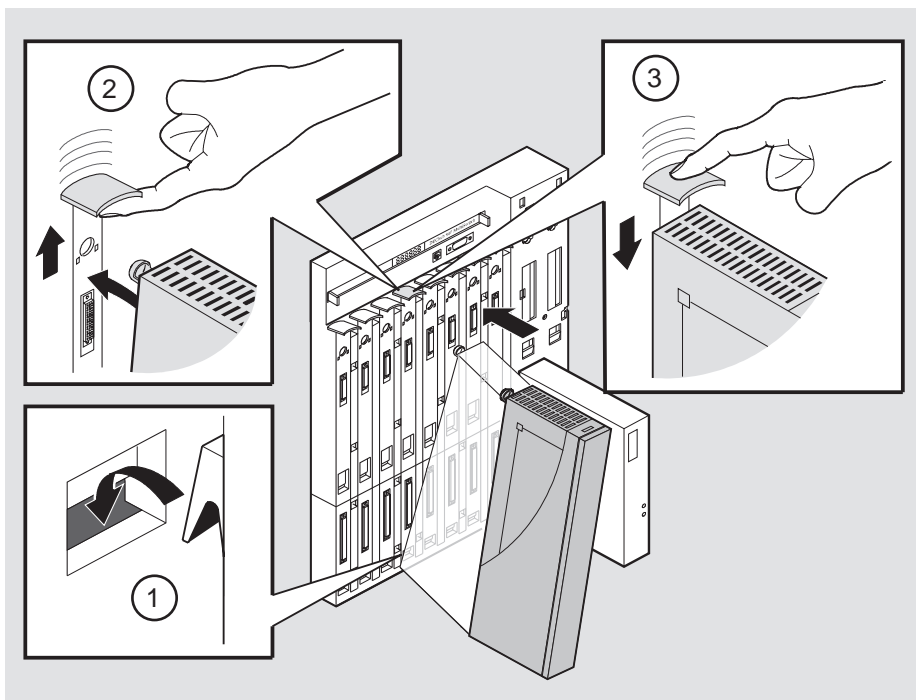
NPB-0844-97F

Installing the DIGITAL MultiSwitch Hub 612TX in a DIGITAL MultiSwitch 900

## Task 2: Seat the Module into the DIGITAL MultiSwitch 900

Complete the following steps to seat the module in a DIGITAL MultiSwitch 900 as shown in Figure 3-3.

**Figure 3-3: Seating the Module**



NPG-0004-95F

Step	Action
1	Place the module's mounting tab into a mounting slot <b>(1)</b> on the DIGITAL MultiSwitch 900.
2	Pull up the release lever <b>(2)</b> to its unlocked position.
3	Pivot the module on the mounting slot and align the connectors.
4	Firmly push the module onto the backplane connectors.
5	Press down on the release lever <b>(3)</b> to ensure that the module is locked.

Installing the DIGITAL MultiSwitch Hub 612TX in a DIGITAL MultiSwitch 900

### Task 3: Verify Initial LED Operation

Verify that the module's Power LED and the Module OK LED light within one minute. The following table describes the LEDs shown in Figure 1-6.

---

Stage	Description
1	The Power LED lights when power is applied to the module, then the module performs a self-test. During the self-test, the port status LEDs display the various patterns that reflect diagnostic tests.
2	After the module completes self-test, the Module OK LED lights and remains lit. The Hub Manager identifies the module as the DIGITAL MultiSwitch Hub 612TX.

---

---

#### NOTE

Refer to Appendix A, Problem Solving, if the LEDs do not operate as described.

---

Installing the DIGITAL MultiSwitch Hub 612TX in a DIGITAL MultiSwitch 900

#### Task 4: Connect the Setup Port Cables to the DIGITAL MultiSwitch 900

Before you perform this task, make sure that you have installed and cabled the any MM-100 cards you may require according to the instructions provided in Chapter 2.

Connect the setup port on the DIGITAL MultiSwitch 900 to a setup port device (terminal or PC). Once connected, you can use the DIGITAL MultiSwitch 900 setup port or the clearVISN application to configure parameters.

To connect the DIGITAL MultiSwitch 900 setup port to a setup port device, use the following cables and adapters:

If the setup port device is...	Use this cable...	With this adapter...
A PC with a 9-pin D-Sub communications port	BN24H-xx <sup>1</sup>	H8571-J
A terminal with a 25-pin D-Sub connector	BN24H-xx <sup>1</sup>	H8575-A
A terminal with a 6-pin MMJ connector	BN24H-xx <sup>1</sup>	Not required

<sup>1</sup>xx indicates cable length in meters.

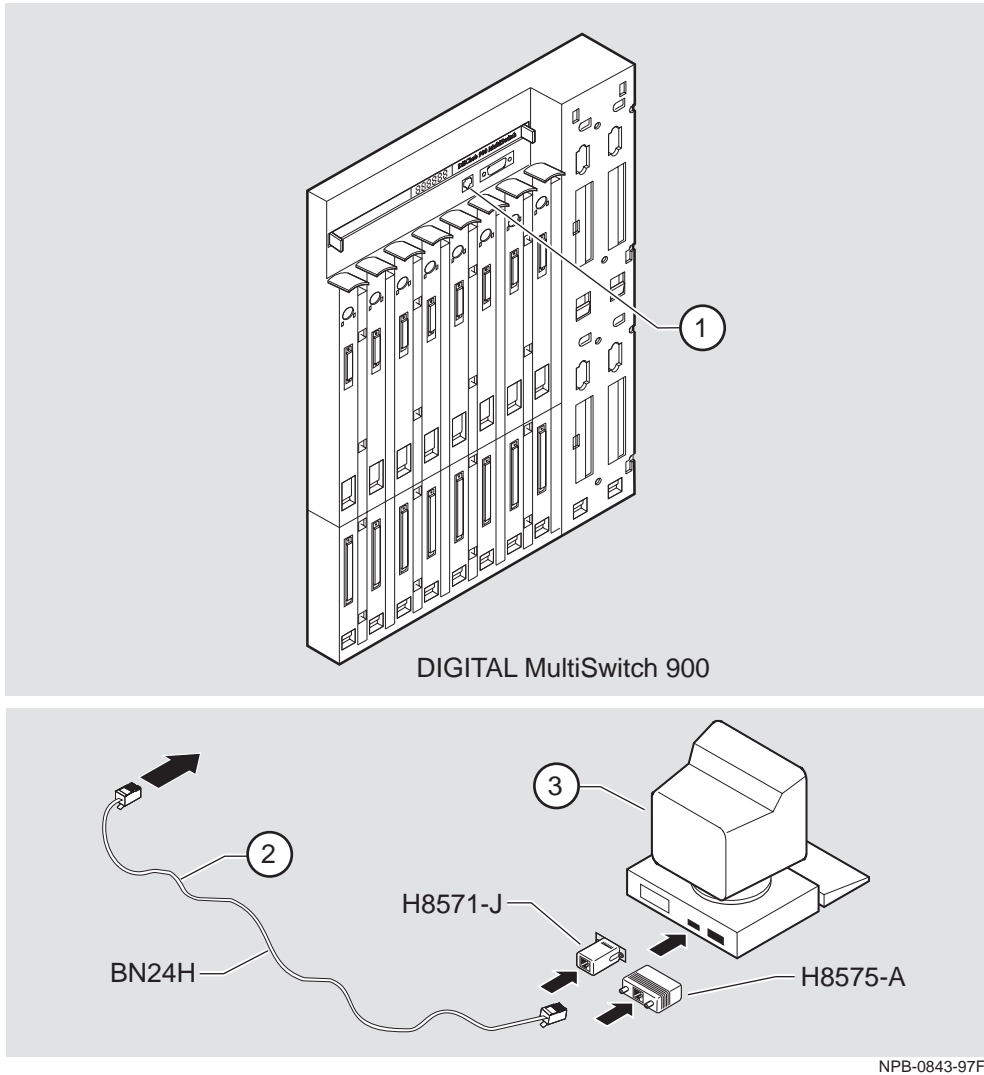
For information on pinout assignments, refer to Appendix B.

To connect the DIGITAL MultiSwitch 900 setup port to a setup port device, complete the following steps.

Step	Action
1	Configure the setup port device (terminal or PC) as follows: <ul style="list-style-type: none"><li>• 9600 baud</li><li>• 8 bits</li><li>• no parity</li><li>• 1 stop bit</li></ul>
2	Connect the setup port device cable to the setup port connector on the DIGITAL MultiSwitch 900 (refer to Figure 3-4).

Installing the DIGITAL MultiSwitch Hub 612TX in a DIGITAL MultiSwitch 900

**Figure 3-4: Setup Port Cabling**



Item	Description
1	Setup port
2	Setup port cable
3	Setup port device

---

## Connecting Cables to the 100BaseTX Ports on the DIGITAL MultiSwitch Hub 612TX

This section describes how to connect cables to the 100BaseTX ports on the DIGITAL MultiSwitch Hub 612TX. The 100BaseTX ports on the module have crossover port connectors. The port provided by the 100BaseTX MM-100 has a straight-through port connector. Use the appropriate cable type (crossover or straight-through) to ensure that the module's transmit and receive signals connect correctly to the connected device. Before connecting the cables to the port, note the guidelines in Table 3-1 and Table 3-2. These guidelines ensure that the sum of crossovers always equal an odd number, which is required for proper operation.

Table 3-1 is a guideline for connecting to the module's eleven 100BaseTX ports, which have crossover port connectors.

**Table 3-1: Cabling 100BaseTX Crossover Connector on Module**

<b>If the connector on the remote device is . . .</b>	<b>Use this cable type . . .</b>
Straight-through connector <sup>1</sup>	Straight-through cable <sup>1</sup>
Crossover connector <sup>1</sup>	Crossover cable <sup>1</sup>

<sup>1</sup>DIGITAL's straight-through cables are marked (=); crossover connectors and cables are marked (X).

Table 3-2 is a guideline for connecting to the 100BaseTX port on the MM-100, which has a straight-through port connector.

**Table 3-2: Cabling 100BaseTX Straight-Through Connector on MM-100**

<b>If the connector on the remote device is . . .</b>	<b>Use this cable type . . .</b>
Crossover connector <sup>1</sup>	Straight-through cable <sup>1</sup>
Straight-through connector <sup>1</sup>	Crossover cable <sup>1</sup>

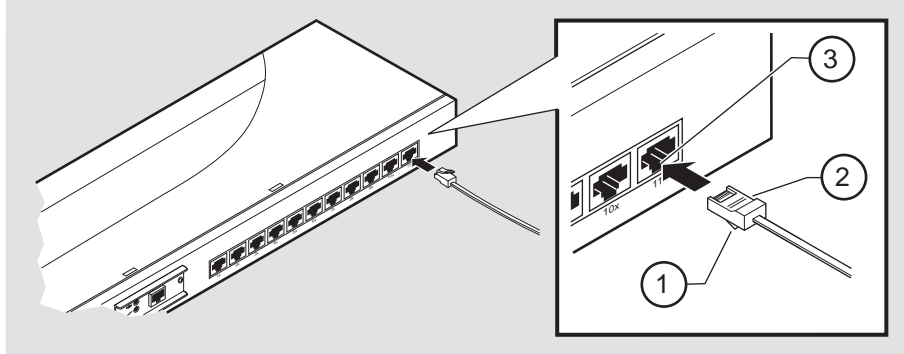
<sup>1</sup>DIGITAL's straight-through cables are marked (=); crossover connectors and cables are marked (X).

To determine the appropriate cable type to use, refer to Appendix B, Connectors and Pin Assignments.

Complete the following steps to connect the 100BaseTX cables, as shown in Figure 3-5.

Connecting Cables to the 100BaseTX Ports on the DIGITAL MultiSwitch Hub 612TX

**Figure 3-5: 100BaseTX Cable Connections**



NPB-0828-97F

Step	Action
1	Align the release tab (1) on the cable plug (2) with the connector (3) on the module's 100BaseTX port connector.
2	Insert the plug (2) into the connector (3) until the release tab snaps into the locked position.
3	Connect the other end of the cable to a network device (PC, workstation, switch or hub).





# Chapter 4

---

## Module Configuration

---

### Overview

#### Introduction

This chapter describes how to configure the module in a DIGITAL MultiSwitch 600 System with a Stack Director and Stack Station, as a standalone module with a Stack Station or in a DIGITAL MultiSwitch 900 (formerly DEChub 900 MultiSwitch).

---

#### NOTE

The module must be installed and cabled prior to configuration.

---

### In This Chapter

---

Topic	Page
Configuring the Module in a Stack Director or DIGITAL MultiSwitch 900	4-3
[9] Start Redirect Mode	4-4
Using the Module's Menus	4-5
[1] Restart with Factory Defaults	4-6
[2] Restart with Current Settings	4-7
[3] Show Current Settings	4-8
[4] Dump Error Log	4-9

<b>Topic</b>	<b>Page</b>
Configuring the Module in a Stack Station	4-10
[1] Restart with Factory Defaults	4-11
[2] Restart with Current Settings	4-12
[3] Show Current Settings	4-13
[4] Dump Error Log	4-14

---

## Configuring the Module in a Stack Director or DIGITAL MultiSwitch 900

This section describes how to configure the module in a DIGITAL MultiSwitch 600 System or a DIGITAL MultiSwitch 900. The following screen is an example of the MS 600 Stack Director INSTALLATION MENU when the DIGITAL MultiSwitch Hub 612TX module is installed in a DIGITAL MultiSwitch 600 System containing a Stack Director. If the module is installed in a DIGITAL MultiSwitch 900, the screen will display the DIGITAL MultiSwitch 900 INSTALLATION MENU.

For information about cabling the DIGITAL MultiSwitch 600 System setup port, refer to Chapter 8, Task 5: Cabling the Stack Director and Stack Station. For information about cabling the DIGITAL MultiSwitch 900 setup port, refer to Chapter 3 Task 4: Connect the Setup Port Cables to the DIGITAL MultiSwitch 900.

---

### NOTE

Periodically, upgrades to the firmware are released. If you need to upgrade the firmware of an existing module, use the Downline Upgrade procedures provided in Chapter 9.

---

To access the module's setup screen, you must choose option [9] Start Redirect Mode.

```
=====
DIGITAL MS 600 Stack Director 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 number: 9 <Return>
```

Examples of the setup screen displays are provided in this chapter to aid in the description of the setup port and to display the options that are available. Because they are examples only, the displays can vary slightly from the actual screen displays on your setup port device.

## [9] Start Redirect Mode

---

### [9] Start Redirect Mode

The `Start Redirect Mode` option redirects the DIGITAL MultiSwitch 600 setup port or the DIGITAL MultiSwitch 900 Hub Manager setup port to the module that is installed in the requested slot. Choosing this option allows you to configure an installed module or to obtain its status by accessing the specified network module's installation menu.

After you choose the `Start Redirect Mode` option from the DIGITAL MultiSwitch 600 `INSTALLATION MENU`, the screen display prompts you for a slot number. Type the slot number in which the DIGITAL MultiSwitch Hub 612TX resides. Slot number (8) is used in the following example. After you enter the module's slot number, the console is redirected to that slot.

---

#### NOTE

In the DIGITAL MultiSwitch 600, Slot 1 is the bottom slot (which has the Stack Director).

---

The following example shows the dialog associated with this option.

```
=====
Enter the slot number for redirection (1-8): 8
Console redirected to 8: MS Hub 612TX
Attempting connection [Ctrl/C to abort]...
```

If the redirection is successful, after you press **<Return>**, the `MS Hub 612TX INSTALLATION MENU` appears on your screen.

---

## Using the Module's Menus

This section describes the options that are available from the MS Hub 612TX INSTALLATION MENU.

When your module is installed in either a DIGITAL MultiSwitch 600 System or a DIGITAL MultiSwitch 900, the slot number in which the DIGITAL MultiSwitch Hub 612TX is installed appears at the top of the menu.

The following example shows the dialog associated with this option.

```

MS Hub 612TX - slot 8
=====
                MS Hub 612TX INSTALLATION MENU

                [1] Restart with Factory Defaults
                [2] Restart with Current Settings
                [3] Show Current Settings
                [4] Dump Error Log

                [Ctrl/C] Return to Hub Manager Installation Menu
=====

                Enter selection:

```

The installation menu options are as follows:

Topic	Page
[1] Restart with Factory Defaults	4-6
[2] Restart with Current Settings	4-7
[3] Show Current Settings	4-8
[4] Dump Error Log	4-9

## Using the Module's Menus

### [1] Restart with Factory Defaults

This option reboots the module, causing its configured Nonvolatile Random Access Memory (NVRAM) parameters to be cleared and reinitialized to factory default values. If you need to reboot the module and retain the current settings, choose option [2] Restart with Current Settings from the MS Hub 612TX INSTALLATION MENU. Allow approximately one minute for the module to reboot and complete self-test.

---

#### CAUTION

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

---

The following example shows the dialog associated with this option.

```
Enter selection: 1
MS Hub 612TX - slot 8
=====
                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 restarts the module but leaves its configured NVRAM configuration parameters at their current values. Allow approximately one minute for the module to restart.

The following example shows the dialog associated with this option.

```
Enter selection:  2

MS Hub 612TX - slot 8
=====
                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 ...
```

## Using the Module's Menus

### [3] Show Current Settings

This option shows the module's current settings. If the module is being configured for the first time, some fields will be blank. The software (SW) version number reflects the current version. The hardware ID (HW) and ROM boot code (RO) versions are displayed.

The following is an example screen and the fields included in it.

```
Enter selection : 3
MS Hub 612TX - slot 8
=====
MS Hub 612TX, HW=V2,RO=V1.04,SW=V1.0
Last Firmware Upgrade V1.0 --> V1.1 @7 resets
SysUpTime : 00:31:18 8 resets
=====
Press Return for Main Menu ...
```

Line	Field	Description
①	MS Hub 612TX	The name of the module.
	slot 8	The slot number where the module is located (1 through 8).
②	HW=V2	The hardware version.
	RO=V1.04	The boot ROM version.
	SW=V1.0	The current software version number.
③	Last Firmware Upgrade V1.0	Provides details about the last firmware upgrade. These lines will not be displayed if a Downline Upgrade has never been performed.
	@7 resets	The reset count at the time that the last Downline Upgrade was performed.
④	SysUpTime 00:31:18	The time since the last reset.
	Resets	The total resets for the module.



#### [4] Dump Error Log

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

The following example shows the display associated with this option:

```
Enter selection: 4
MS Hub 612TX - slot 8
=====
DUMP ERROR LOG
Current Reset Count: 9
=====
Entry          = 3
Time Stamp     = 0      0      1c7
Reset Count    = 8
Firmware Rev. = V1.0
Backplane Clock Failure
Dump another entry [Y]/N? <Return>
=====
No more Error Log entries
Press Return for Main Menu ...
```

---

#### NOTE

The format for some entries in the error log may be different from those shown here.

---

## Configuring the Module in a Stack Station

This section describes how to configure your DIGITAL MultiSwitch Hub 612TX when the module is installed either as a standalone device or in an unmanaged stack. For cabling and setup port information refer to Chapter 3.

The following example shows the dialog associated with this option.

```
MS Hub 612TX
-----
                MS Hub 612TX INSTALLATION MENU

                [1] Restart with Factory Defaults
                [2] Restart with Current Settings
                [3] Show Current Settings
                [4] Dump Error Log

                [Ctrl/C] Return to Hub Manager Installation Menu
                -----

                Enter selection:
```

The installation menu options are as follows:

Topic	Page
[1] Restart with Factory Defaults	4-11
[2] Restart with Current Settings	4-12
[3] Show Current Settings	4-13
[4] Dump Error Log	4-14

## [1] Restart with Factory Defaults

This option reboots the module, causing its configured Nonvolatile Random Access Memory (NVRAM) parameters to be cleared and reinitialized to factory default values. If you need to reboot the module and retain the current settings, choose option [2] Restart with Current Settings from the MS Hub 612TX INSTALLATION MENU. Allow approximately one minute for the module to reboot and complete self-test.

---

### CAUTION

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

---

The following example shows the dialog associated with this option.

```
Enter selection: 1
MS Hub 612TX
=====
                        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 ...
```

## Configuring the Module in a Stack Station

### [2] Restart with Current Settings

This option restarts the module but leaves the module's configured NVRAM storage parameters at their current values. Allow approximately one minute for the module to restart.

The following example shows the dialog associated with this option.

```
Enter selection: 2

MS Hub 612TX
=====
                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 ...
```

## Configuring the Module in a Stack Station

### [3] Show Current Settings

This option shows the module's current settings. If the module is being configured for the first time, some fields will be blank. The software (SW) version number reflects the current version. The hardware ID (HW) and ROM Boot code (RO) versions are displayed.

The following example shows the display associated with this option and its fields are defined following the screen.

```
Enter selection : 3
MS Hub 612TX
=====
MS Hub 612TX, HW=V2,RO=V1.04,SW=V1.1           ①
Last Firmware Upgrade V1.0      -->  V1.0    @7 resets  ②
SysUpTime                       : 00:31:18  8 resets  ③
=====
Press Return for Main Menu ...
```

Line	Field	Description
①	MS Hub 612TX	The name of the module.
	HW=V2	The hardware version.
	RO=V1.04	The boot ROM version.
	SW=V1.0	The current software version number.
②	Last Firmware Upgrade V1.0	Provides details about the last firmware upgrade. These lines will not be displayed if a Downline Upgrade has never been performed.
	@7 resets	The reset count at the time that the last Downline Upgrade was performed.
③	SysUpTime 00:31:18	Indicates how long the system has been up since the last reset.
	Resets	The total resets for the module.

## Configuring the Module in a Stack Station

### [4] Dump Error Log

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

The following example shows the display associated with this option:

```
Enter selection: 4
MS Hub 612TX
=====
DUMP ERROR LOG
Current Reset Count: 9
=====
Entry      = 3
Time Stamp = 0      0      1c7
Reset Count = 8
Firmware Rev.= V1.0
Backplane Clock Failure
Dump another entry [Y]/N? <Return>
=====
No more Error Log entries
Press Return for Main Menu ...
```

---

#### NOTE

The format for some entries in the error log may be different from those shown here.

---

# Chapter 5

---

## Module Management

---

### Overview

#### Introduction

This chapter describes how to manage the DIGITAL MultiSwitch Hub 612TX using clearVISN applications.

#### In This Chapter

---

Topic	Page
What Is clearVISN?	5-2
Requirements for Managing the Module	5-3
Managed Functions	5-4
Repeater Summary Window	5-5
Repeater Port Summary Window	5-7
Repeater Port Details Window	5-8
Repeater Security Summary Window	5-10
Repeater Security Intrusion Log Window	5-11
MIBs Supported by the DIGITAL MultiSwitch Hub 612TX	5-12

---

What Is clearVISN?

---

## What Is clearVISN?

clearVISN is an integrated family of software applications for managing a network using policy-based techniques. clearVISN manages DIGITAL networking products. Each clearVISN application has a graphical user interface (GUI) and supports Simple Network Management Protocol (SNMP).

The use of clearVISN is recommended to gain the full benefit of SNMP management on MultiSwitch 600 and DIGITAL MultiSwitch 900 modules.

Use the clearVISN Stack Manager or clearVISN MultiChassis Manager (refer to the *clearVISN User's Guide* for a description of how to access online help) to manage each module in the DIGITAL MultiSwitch 900.

### MultiChassis Manager

The MultiChassis Manager manages the DEChub 90, the DIGITAL MultiStack 90 System, and the DIGITAL MultiSwitch 600 System, DEChub ONE, DIGITAL MultiSwitch 900, GIGAswitch/FDDI, GIGAswitch/IP, and GIGAswitch/ATM families of devices. MultiChassis Manager displays a GUI menu detailing the actual configuration, and allows users to manage the modules and ports with point-and-click ease.

### Stack Manager

The Stack Manager manages the DEChub 90, DIGITAL MultiStack System 90, and DIGITAL MultiSwitch 600 System. Stack Manager displays a GUI menu detailing the actual configuration, and allows users to manage the modules and ports with point-and-click ease.



## Requirements for Managing the Module

The following configurations are required for managing the DIGITAL MultiSwitch Hub 612TX in either a DIGITAL MultiSwitch 600 System or a DIGITAL MultiSwitch 900.

### DIGITAL MultiSwitch 600 System

To manage a DIGITAL MultiSwitch 600 System, you need the following components:

- Stack Director configured with an IP address (see Part II)
- clearVISN Stack Manager or MultiChassis Manager Software Application
- In-Band access to the Stack Director's management MAC via the 10Base2 connection *or* an external connection to the management access port *or* Out-of-Band (OBM) access via the OBM port using Serial Line Internet Protocol (SLIP)

Only one Stack Director is required to manage a stack or standalone MultiSwitch Hub 612TX. All other functional DIGITAL MultiSwitch 600 System modules (such as the DIGITAL MultiSwitch Hub 612TX) in the same stack may be powered by a Stack Station and will be managed by the Stack Director.

### DIGITAL MultiSwitch 900

To manage a DIGITAL MultiSwitch 900 and its installed modules, you need the following components:

- DIGITAL MultiSwitch 900 configured with an IP address
- clearVISN MultiChassis Manager
- In-band access to the DEChub Management Agent via the IP services module, or OBM access via the OBM port using SLIP on the DIGITAL MultiSwitch 900

---

#### NOTE

The MultiSwitch Hub 612TX does not support 10 Mb/s Ethernet backplane connections to the DIGITAL MultiSwitch 900 or to the DIGITAL MultiSwitch 600 System. Only 10 Mb/s hub or switch ports can connect to the internal stack backplane. 100 Mb/s switch uplinks or hub ports must be connected via front-panel ports.

---

## Managed Functions

clearVISN and DIGITAL MultiSwitch Hub 612TX provide support for the following managed functions:

- Port control for the eleven fixed 100BaseTX ports and either the 100BaseTX or 100BaseFX port supplied by the MM-100 card.
- Port-level intrusion security.
- Hot-swapping of modules in a MultiSwitch 600 or DIGITAL MultiSwitch 900.
- Auto-discovery of stations connected to each managed port.
- Downline Upgrade of Firmware Revisions.

The tables that follow, list and define functions managed by the clearVISN management repeater windows.

---

### NOTE

In this chapter only, the DIGITAL MultiSwitch Hub 612TX is referred to as a repeater. All Repeater windows apply to the DIGITAL MultiSwitch Hub 612TX.

---

The following pages describe functions of these Repeater windows. This information is also available in clearVISN online help.

---

<b>Function</b>	<b>Page</b>
Repeater Summary Window	5-5
Repeater Port Summary Window	5-7
Repeater Port Details Window	5-8
Repeater Security Summary Window	5-10
Repeater Security Intrusion Log Window	5-11

---

---

## Repeater Summary Window

The clearVISN Repeater Summary Window displays repeater status in summary form. Use this window to modify repeater management information and to monitor port information. The following table lists functions of the Repeater Summary Window.

<b>Selection</b>	<b>Description</b>
Identification	Displays the following information identifying the repeater being managed: <ul style="list-style-type: none"> <li>• Slot</li> <li>• Name</li> <li>• Module Description</li> <li>• Port Number</li> <li>• Port Name</li> <li>• Port Type</li> </ul>
Management Information	Displays the SNMP information used to manage the repeater: <ul style="list-style-type: none"> <li>• Agent Slot</li> <li>• IP Address</li> <li>• Community</li> <li>• Access</li> <li>• Up Time</li> </ul>
Status	Displays the status of the repeater: <ul style="list-style-type: none"> <li>• Status</li> <li>• Health Text</li> <li>• Health Text Changes</li> <li>• Partitioned Ports</li> <li>• Media Unavailable Ports</li> <li>• Transmit Collisions</li> </ul>
Configuration	Displays the configuration of the repeater: <ul style="list-style-type: none"> <li>• Auto-Partition Algorithm</li> <li>• Auto-Partition Reconnection Algorithm</li> <li>• Jam Bits</li> </ul>

*(continued on following page)*

## Repeater Summary Window

Selection	Description
Port Table	<p data-bbox="626 590 1179 674">A graphical representation of the status of a port and a list of Ethernet stations attached to the port. Includes information on the following:</p> <ul data-bbox="626 684 894 989" style="list-style-type: none"><li data-bbox="626 684 802 709">• Port Number</li><li data-bbox="626 726 769 751">• Port Type</li><li data-bbox="626 768 781 793">• Port Status</li><li data-bbox="626 810 894 835">• Administration Status</li><li data-bbox="626 852 781 877">• Port Name</li><li data-bbox="626 894 834 919">• Offered Load %</li><li data-bbox="626 936 802 961">• Collisions %</li><li data-bbox="626 978 850 1003">• Invalid Frames %</li></ul>

---

## Repeater Port Summary Window

The clearVISN Repeater Port Summary Window displays port status and performance information in summary form. Use this window to monitor performance and connected stations information on a per-port basis. The following table lists functions of the Repeater Port Summary Window.

<b>Selection</b>	<b>Description</b>
Identification	Displays the following information identifying the repeater being managed: <ul style="list-style-type: none"><li>• Slot</li><li>• Name</li><li>• Module Description</li><li>• Port Number</li><li>• Port Name</li><li>• Port Type</li></ul>
Status	Displays the following information on the condition of the port: <ul style="list-style-type: none"><li>• Status</li><li>• Operational State</li><li>• Media State</li><li>• Auto-partition State</li><li>• Partitions</li><li>• Partition Reason</li><li>• SQE Test Error</li></ul>
Performance	Displays the following performance statistics for the port: <ul style="list-style-type: none"><li>• Units</li><li>• Octets</li><li>• Frames/Sec (or Valid Frames %)</li><li>• Collisions/Sec (or Collisions %)</li><li>• Errors/Sec (or Invalid Frames Percent)</li></ul>
Connected Stations	Displays the following information about the stations connected to this port: <ul style="list-style-type: none"><li>• MAC Address</li><li>• IP Address</li><li>• IP Name</li><li>• DECnet Address</li><li>• DECnet Name</li><li>• Total</li><li>• Last Source Address Seen</li></ul>

---

---

## Repeater Port Details Window

The clearVISN Repeater Port Details Window displays port counters, MAU information, and Port Administration status. Use this window to view counters and MAU information and to enable or disable ports on a per-port basis. The following table lists functions of the Repeater Port Details Window.

<b>Selection</b>	<b>Description</b>
Identification	Displays the following information identifying the repeater being managed: <ul style="list-style-type: none"><li>• Slot</li><li>• Name</li><li>• Module Description</li><li>• Port Number</li><li>• Port Name</li><li>• Port Type</li></ul>
Status	Displays the condition of the port. <ul style="list-style-type: none"><li>• Status</li><li>• Operational State</li><li>• Media State</li><li>• Auto-partition State</li><li>• Partitions</li><li>• Partition Reason</li><li>• SQE Test Error</li></ul>
Counters	Displays the content of the following port counters: <ul style="list-style-type: none"><li>• Readable Frames</li><li>• Readable Bytes</li><li>• Collisions</li><li>• Total Errors</li><li>• Frame Check Sequence Errors</li><li>• Frame Alignment Errors</li><li>• Frame Too Long</li></ul>

*(continued on following page)*

Repeater Port Details Window

Selection	Description
Counters <i>(cont'd.)</i>	<ul style="list-style-type: none"><li>• Short Events</li><li>• Late Events</li><li>• Very Long Events</li><li>• Data Rate Mismatches</li><li>• Runts</li><li>• Auto-partitions</li><li>• Runts</li><li>• Auto-partitions</li><li>• Jabber</li><li>• Isolates</li></ul>

---

## Repeater Security Summary Window

The clearVISN Repeater Security Summary Window displays repeater and port security information. Use this window to set up and manage security for the repeater and for individual repeater ports. The following table lists functions of the Repeater Security Summary Window.

---

Selection	Description
Identification	Displays the following information identifying the repeater being managed: <ul style="list-style-type: none"><li>• Slot</li><li>• Name</li><li>• Module Description</li><li>• Port Number</li><li>• Port Name</li><li>• Port Type</li></ul>
Port Information	Displays the following information about the selected port.: <ul style="list-style-type: none"><li>• Port</li><li>• Port Name</li></ul>
Select Port	Use this information to select the repeater port or ports whose security functions you want to set up. You can select one port or all ports.
Security Functions	Sets up security for the selected port or ports.
Address Learning	Allows you to enable and disable address learning for a selected port and to create and modify the port's <b>Authorized Stations</b> list.
Address Authorization	Displays the addresses of the authorized stations attached to a selected port and allows you to specify addresses to be added or removed from the repeater's list of authorized addresses.

---



---

## Repeater Security Intrusion Log Window

The clearVISN Repeater Security Intrusion Log Window displays the contents of repeater security violations logs. Use this window to display the intrusion log for the entire repeater or a particular repeater port. The following table lists functions of the Repeater Security Intrusion Log Window.

<b>Selection</b>	<b>Description</b>
Identification	Displays the following information identifying the repeater being managed: <ul style="list-style-type: none"><li>• Slot</li><li>• Name</li><li>• Module Description</li><li>• Port Number</li><li>• Port Name</li><li>• Port Type</li></ul>
Port Information	Displays the following information about the selected port.: <ul style="list-style-type: none"><li>• Port</li><li>• Port Name</li></ul>
Intrusions	Displays a row of information about each security violation. The information includes: <ul style="list-style-type: none"><li>• Intrusions (total number of intrusions)</li><li>• Time (that the violation occurred)</li><li>• SysUpTime (value at time violation occurred)</li><li>• Group (logical group in which violation occurred)</li><li>• Port (on which violation occurred)</li><li>• Unauthorized MAC Address (of the station causing violation)</li></ul>

---

MIBs Supported by the DIGITAL MultiSwitch Hub 612TX

---

## **MIBs Supported by the DIGITAL MultiSwitch Hub 612TX**

MIBs supported by the DIGITAL MultiSwitch Hub 612TX are as follows.

- MIB II (RFC 1213)
- DIGITAL MultiSwitch 900 Public Common MIB
- DIGITAL Extended Repeater MIB
- Internet Engineering Task Force (IETF) Repeater MIB (RFC 1516)

For information on how to access DIGITAL MIBs, follow the procedures in the *DIGITAL MultiSwitch Hub 612TX Release Notes*.

## Chapter 6

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# Removing a Module and Option Cards

---

## Overview

### Introduction

This chapter describes how to remove modules, cables, and MM-100 option cards from the DIGITAL MultiSwitch 600 System or a DIGITAL MultiSwitch 900 (formerly DEChub 900 MultiSwitch).

### In This Chapter

---

Topic	Page
Removing Modules from the DIGITAL MultiSwitch 600 System (Hot-Swappable)	6-2
Removing Modules from the DIGITAL MultiSwitch 900 (Hot-Swappable)	6-4
Removing Cables from the 100BaseTX Ports	6-6
Removing the MM-100 (Hot-Swappable)	6-7
Replacing the Dust Cover on the DIGITAL MultiSwitch Hub 612TX	6-9

---

## Removing Modules from the DIGITAL MultiSwitch 600 System (Hot-Swappable)

This section describes how to remove a module from the DIGITAL MultiSwitch 600 System on a hot-swap basis. You will need a flat-blade screwdriver for the removal.

---

### NOTE

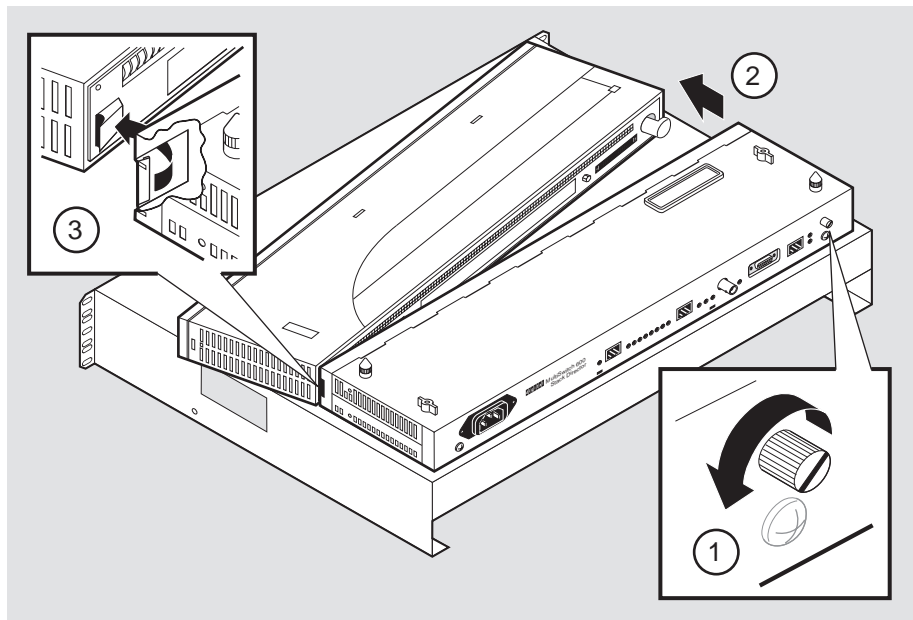
Hot-swapping is the removal or insertion of a module into either the DIGITAL MultiSwitch 600 System or the DIGITAL MultiSwitch 900 without disrupting power to the unit or affecting connectivity to other modules in the stack or chassis. Do not simultaneously hot-swap more than one module. Simultaneously inserting or removing more than one module can cause problems with the operation of other installed modules.

---

Complete the following steps to remove a module from the Stack Director or Stack Station as shown in Figure 6-1.

## Removing Modules from the DIGITAL MultiSwitch 600 System (Hot-Swappable)

**Figure 6-1: Removing the Module from a DIGITAL MultiSwitch 600**



NPB-0593-96F

Step	Action
1	Using a flat-blade screwdriver, loosen the slotted thumbscrew (1) on the Stack Director or Stack Station module by turning it counterclockwise.
2	Pull the top of the module (the end with the locking tab) (2) away from the Stack Director or Stack Station.
3	Unseat the module from the Stack Director or Stack Station (3).

## Removing Modules from the DIGITAL MultiSwitch 900 (Hot-Swappable)

To remove the module from the DIGITAL MultiSwitch 900, complete the following steps (see Figure 6-2).

---

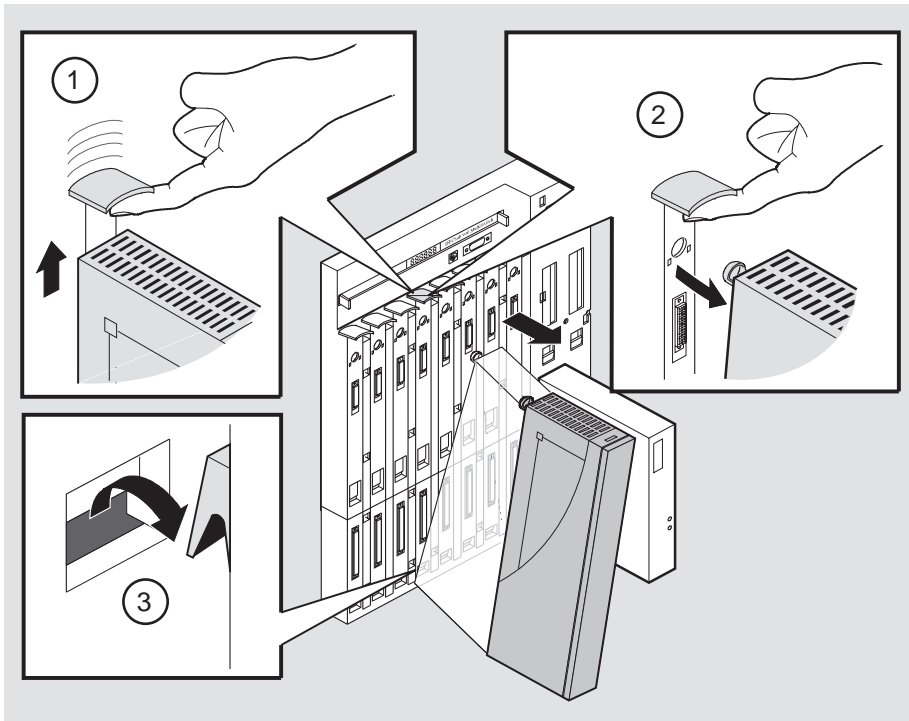
### NOTE

Hot-swapping is the removal or insertion of a module into either the DIGITAL MultiSwitch 600 System or the DIGITAL MultiSwitch 900 without disrupting power to the unit or affecting connectivity to other modules in the stack or chassis. Do not simultaneously hot-swap more than one module. Simultaneously inserting or removing more than one module can cause problems with the operation of other modules.

---

Removing Modules from the DIGITAL MultiSwitch 900 (Hot-Swappable)

Figure 6-2: Removing the Module from a DIGITAL MultiSwitch 900



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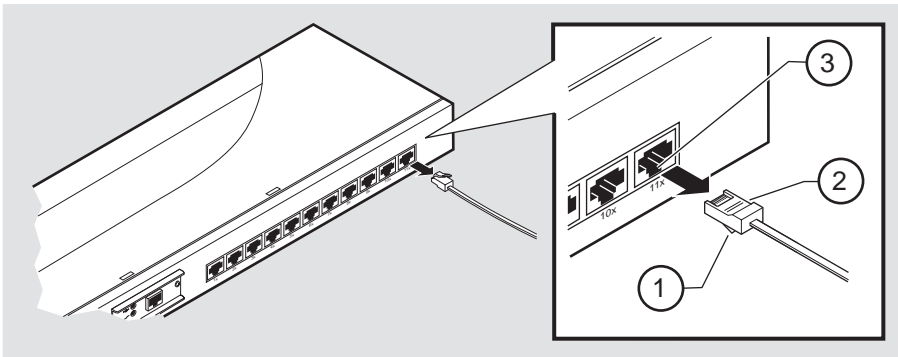
Step	Action
1	Lift the release lever (1) located at the top of the DIGITAL MultiSwitch 900 slot.
2	While holding up the release lever (2), pivot the module back on its bottom mounting tab (3).
3	Remove the module.

---

## Removing Cables from the 100BaseTX Ports

Complete the following steps to remove 100BaseTX cables as shown in Figure 6-3.

**Figure 6-3: 100BaseTX Cable Removal**



NPB-0827-97F

---

<b>Step</b>	<b>Action</b>
<b>1</b>	Push down on the release tab (1) and remove the connector (2) from the module's 100BaseTX port (3).
<b>2</b>	Remove the other end of the cable from the network device (PC or workstation), if needed.
<b>3</b>	Repeat steps 1 and 2 for additional 100BaseTX connectors.

---

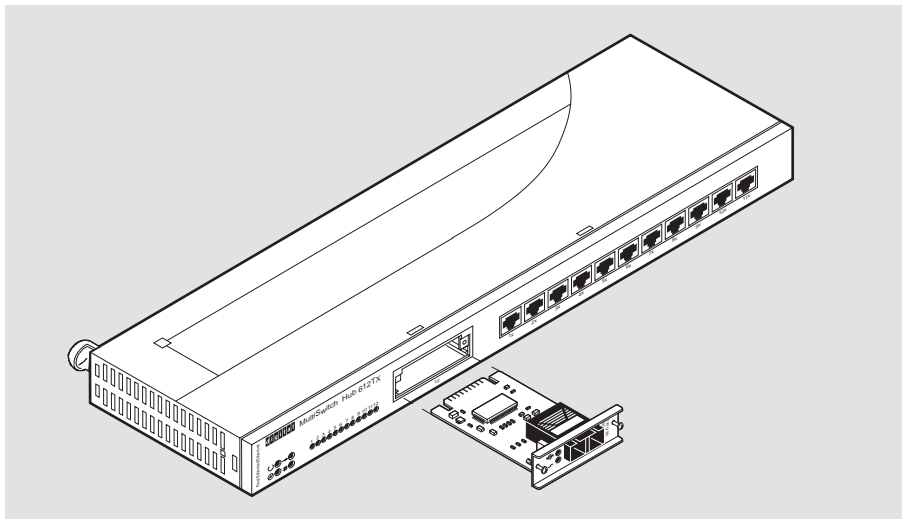


---

## Removing the MM-100 (Hot-Swappable)

Complete the following steps to remove an MM-100 from the module (Figure 6-4).

**Figure 6-4: Removing the MM-100**



NPB-0825-97F

Depending on the type of connectors used on the card, there will be differences in the way cables are removed. For cable removal information for the modular media interfaces, refer to the *100 Mb/s Fast Ethernet Modular Media Interface Cards Installation* manual.

---

Step	Action
1	Attach one end of the antistatic wrist strap to your wrist and the other end to the chassis ground.

---

### 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.

---

2	Disconnect all cables from the card. Refer to the <i>100 Mb/s Modular Media Interface Installation</i> manual for removal information.
---	--

## Removing the MM-100 (Hot-Swappable)

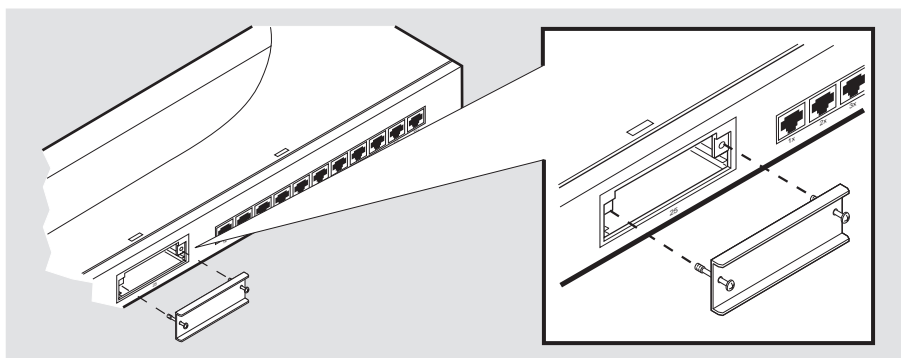
<b>Step</b>	<b>Action</b>
<b>3</b>	Use a Phillips-head screwdriver to loosen the two captive screws that hold the card in place.
<b>4</b>	Grasp the captive screws and disconnect the card from the host module by pulling on the screws.
<b>5</b>	Gently slide the card out of the slot.
<b>6</b>	Place the card into a static-proof bag.
<b>7</b>	If the slot is to be unused, reinstall the dust cover.

---

## Replacing the Dust Cover on the DIGITAL MultiSwitch Hub 612TX

Figure 6-5 shows dust cover location and the table describes how to replace the cover.

**Figure 6-5: Dust Cover Replacement**



NPB-0823-97F

---

<b>Step</b>	<b>Action</b>
<b>1</b>	Align the two captive screws with the threaded holes in the module.
<b>2</b>	Tighten the captive screws.

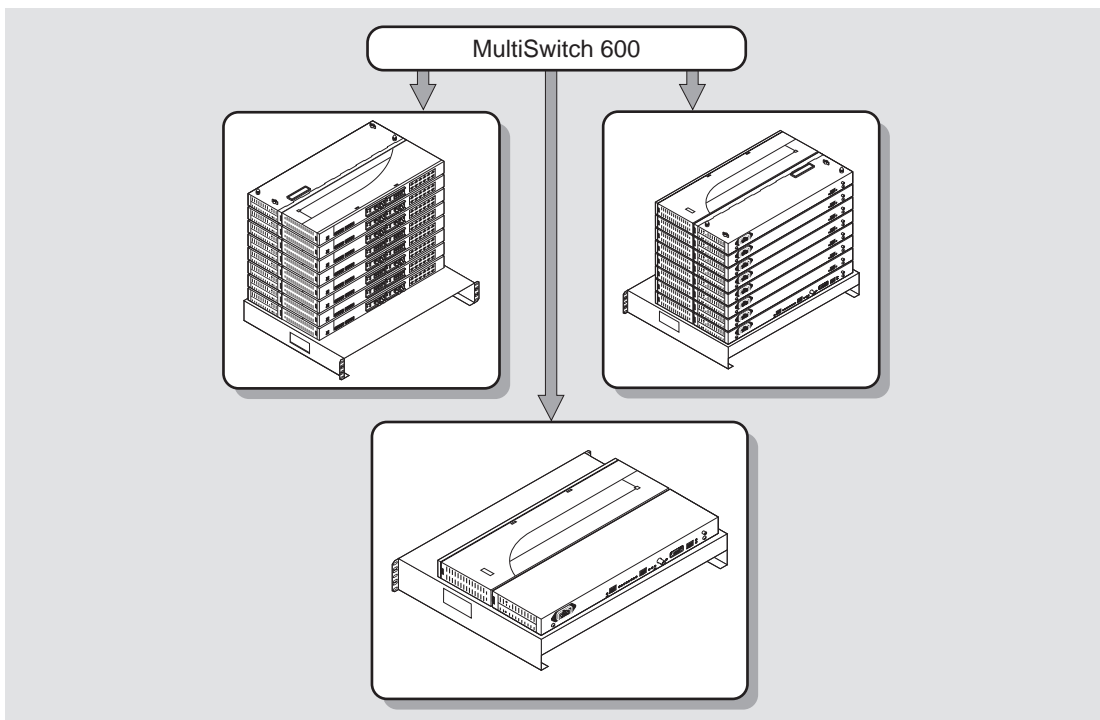
---



## Part II

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# DIGITAL MultiSwitch 600 System



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This illustration shows two DIGITAL MultiSwitch 600 System configurations.



# Chapter 7

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## Stack Description

---

### Overview

#### Introduction

The DIGITAL MultiSwitch 600 is a shared-to-switch workgroup system with modular components. This chapter describes the DIGITAL MultiSwitch 600 Stack Station and Stack Director, which provide power, backplane interconnect and Simple Network Management Protocol (SNMP) management to a DIGITAL MultiSwitch 600 system in a stack configuration. The DIGITAL MultiSwitch 600-series functional modules (hubs and switches) which attach to the Stack Station and Stack Director, are described in the documentation that accompanies the functional module.

#### In This Chapter

Topic	Page
What Is the DIGITAL MultiSwitch 600 System?	7-2
What Is a Stack Director?	7-7
What Is a Stack Station?	7-12

What Is the DIGITAL MultiSwitch 600 System?

---

## What Is the DIGITAL MultiSwitch 600 System?

The DIGITAL MultiSwitch 600 family is the first, integrated workgroup switching system for Ethernet and Fast Ethernet workgroup environments. The MultiSwitch 600 System provides scalability to increase bandwidth from shared-to-switched 10 Mb/s and 100 Mb/s modules in a scalable, integrated system, and offers customers the ability to:

- Triple the bandwidth of each group-switching hub from 10 Mb/s to an aggregate of 30 Mb/s (DIGITAL MultiSwitch Hub 624T)
- Microsegment and assign a total of 24 port-group switched LAN segments across up to seven 10 Mb/s Ethernet backplane channels
- Build up to 8 switches and hubs in stack — up to 288 shared Ethernet ports and 208 switched Ethernet ports using a single IP address in one single management domain
- Build workgroups cost-effectively and easily with a state-of-the-art cable-free stack interconnection and port and media expansion capabilities
- Manage and monitor the stack using SNMP management and Remote Networking Monitoring (RMON) via clearVISN Stack Manager or MultiChassis Manager, a single, integrated PC-based manager
- Cost-effective integration of high performance networks with the multi-technology, multi-gigabit DIGITAL MultiSwitch 900



## What Is the DIGITAL MultiSwitch 600 System?

### MultiSwitch 600 Components

The key DIGITAL MultiSwitch 600 products include:

Products	Description
DIGITAL MultiSwitch 600 Stack Director	Power supply and SNMP manager for MultiSwitch 600 hub and switch modules
DIGITAL MultiSwitch 600 Stack Station	Power supply for MultiSwitch hub and switch modules
DIGITAL MultiSwitch Hub 624T	24-port group switching 10BaseT hub module
DIGITAL MultiSwitch 612EX	12-port 10-to-100 Mb/s Ethernet/Fast Ethernet switch module
DIGITAL MultiSwitch Hub 612TX	12-port 100 Mb/s Fast Ethernet hub module

Built with the uniquely modular and flexible DIGITAL MultiSwitch 900 design, all MultiSwitch 600 products are hot-swappable, operate and are managed in both the MultiSwitch 600 System and DIGITAL MultiSwitch 900.

The DIGITAL MultiSwitch 600 system is a modular stacking system for network devices. A DIGITAL MultiSwitch 600 network device consists of a DIGITAL MultiSwitch 600-series functional module (hub or switch) attached to and interconnected with a Stack Station or Stack Director.

A DIGITAL MultiSwitch 600 stack can consist of 2-8 devices (stack levels) interconnected with the cable-free Stack Interconnect Card. The Stack Interconnect Card provides the ability to create a stack backplane, which can be configured into a management channel and seven internal 10 Mb/s Ethernet LAN channels.

Figure 7-1 shows a DIGITAL MultiSwitch 600 stack front view (**A**) and back view (**B**). One Stack Director (**1**) and seven Stack Stations (**2**) are shown mounted on a mounting tray (**3**). The DIGITAL MultiSwitch 600-series functional modules needed to create a stackable device are represented as phantom boxes (**4**) in the illustration.

## What Is the DIGITAL MultiSwitch 600 System?

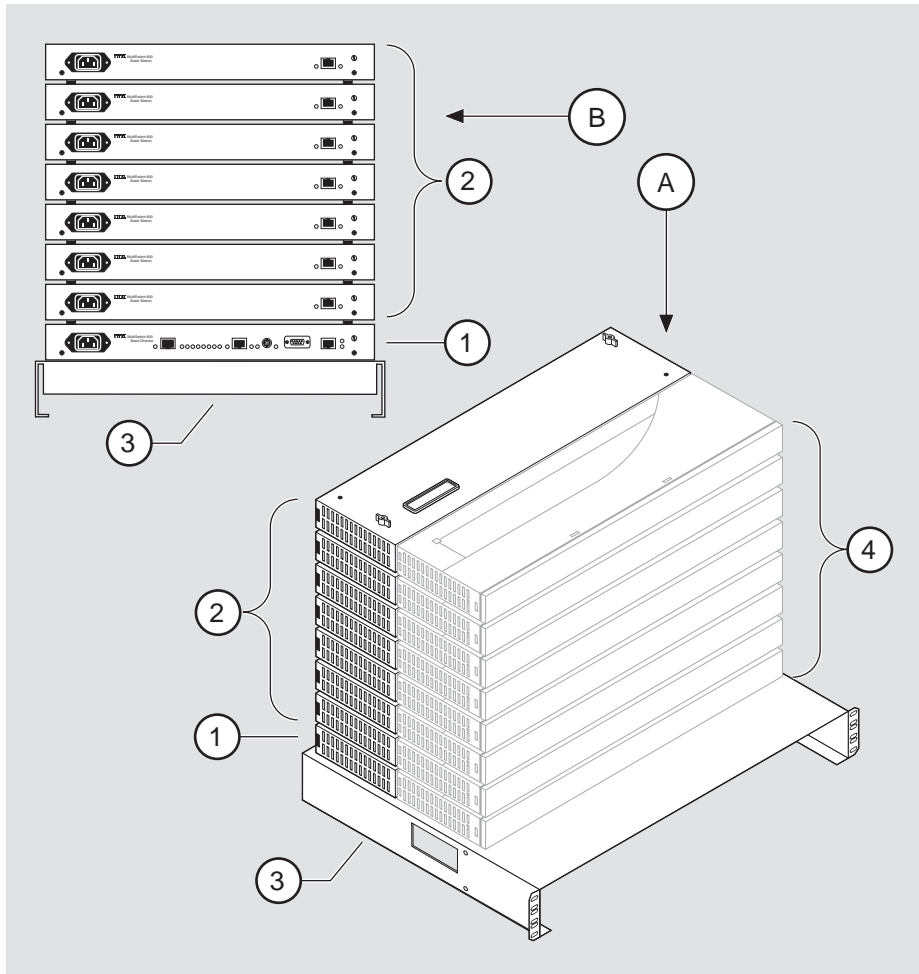
The DIGITAL MultiSwitch 600 system can serve as a managed or as an unmanaged stack:

- The MultiSwitch Hub 612TX does not support 10 Mb/s Ethernet backplane connections to the DIGITAL MultiSwitch 900 or to the DIGITAL MultiSwitch 600 System. Only 10 Mb/s hub or switch ports can connect to the internal stack backplane. 100 Mb/s switch uplinks or hub ports must be connected via front-panel ports. However, all 10 Mb/s and 100 Mb/s DIGITAL MultiSwitch 600 products can be managed as a single management domain via the stack backplane.
- A managed stack includes one Stack Director on the bottom of the stack and up to seven Stack Stations. The Stack Director contains the SNMP management agent for the integrated management domain and supports seven 10 Mb/s internal Ethernet LAN segments.
- An unmanaged stack can include up to eight Stack Stations without a Stack Director. There is no access to the backplane in an unmanaged stack.

DIGITAL recommends that a mounting tray be used with stacks of more than one level. The mounting tray provides stability to the stack when hot-swapping functional modules in the lower levels of the stack. The mounting tray is included with the Stack Director, or may be purchased separately. Refer to Ordering Options in Appendix D for the order part number.

What Is the DIGITAL MultiSwitch 600 System?

Figure 7-1: Typical DIGITAL MultiSwitch 600 Configuration



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What Is the DIGITAL MultiSwitch 600 System?

## **DIGITAL MultiSwitch 600 Features**

The DIGITAL MultiSwitch 600 system includes the following features:

- Modular architecture.
- Choice of 10 Mb/s and 100 Mb/s hub and switches integrated as single SNMP management domain.
- Cable-free stack interconnect for seven 10 Mb/s internal Ethernet LAN and management channels.
- An ability to create a stack of up to eight network devices.
- Functional modules are hot-swappable to ensure network uptime and facilitate network changes.
- Only one Stack Director that contains SNMP management agent with one IP address is needed to manage a stack.
- Support for four RMON groups.
- Modular Media Interface (MMI) and port expansion options, specific to the functional modules.
- Rack mountable.

The following sections describe the Stack Director and Stack Station. Functional modules are described in their associated documentation.

## What Is a Stack Director?

The Stack Director provides power to the attached functional module and contains the SNMP agent for a DIGITAL MultiSwitch 600 stack. The Stack Director communicates with the functional module at each level of the stack and controls the stack backplane resources. Only one Stack Director can be installed in a DIGITAL MultiSwitch 600 stack. The Stack Director must be located at the bottom of the stack.

### Stack Director Features

The Stack Director includes the following features:

- A built-in SNMP Agent that manages up to eight functional modules as a single domain using a single IP address within a stack.
- Cable-free stack interconnect slot on the Stack Director.
- Manages up to seven internal Ethernet LAN channels for seven segments.
- Hot-swap autosensing informs the Stack Director when a functional module is inserted or removed from the stack.
- Backplane Auto Healing restores backplane connections for a re-inserted functional module of the same type as previously removed.
- In-band management communications through a module connection or a direct connection to a UTP/ScTP 10BaseT or 10Base2 port.
- Autodetect capabilities automatically select the in-band management port.
- Out-of-band management via SLIP.
- A serial setup port to setup and configure the Stack Director and functional modules in the stack.
- Load services which allow you to upgrade firmware of functional modules in the stack using the Trivial File Transfer Protocol (TFTP) protocol.
- Support for the BootP protocol for IP address configuration.
- LEDs for determining the status of the stack.
- Alarm and Event capability to monitor functional modules in the stack and 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 in the stack.
- Temperature sensor and thermal shutdown protection.
- Rack mountable.

What Is a Stack Director?

## Supported MIBs

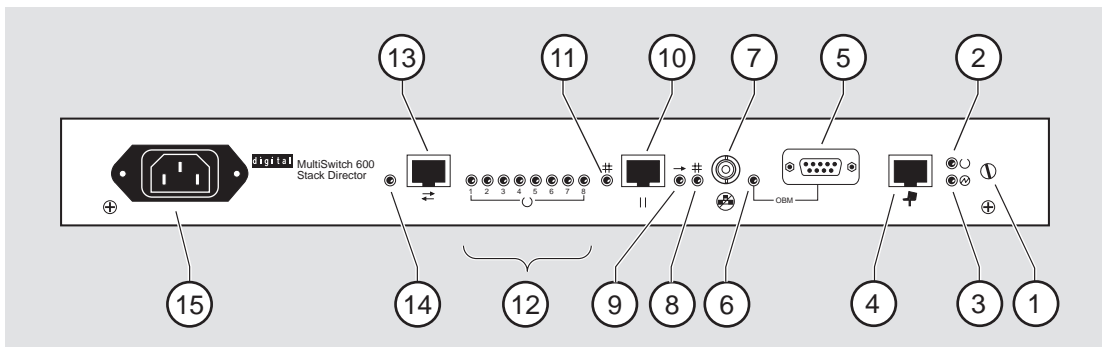
The Stack Director supports the following Management Information Bases (MIBs):

- MIB-II (RFC 1213)
- RMON Alarms and Events (RFC 1757)
- Ethernet MIB (RFC 1643)
- DIGITAL Chassis MIB
- DIGITAL Public Common MIB
- Management Agent Module Private MIB

### Stack Director Front Panel




Table 7-1 describes the front panel components on the Stack Director and Figure 7-2 shows their location. For detailed information about the LEDs, refer to Appendix A.

**Figure 7-2: Stack Director Front Panel Components**










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**Table 7-1: Stack Director Front Panel Component Descriptions**

Item	Icon	Name	Description
1		Slotted Thumbscrew	Locks the functional module and Stack Director together.
2		FRU OK LED	Lights when the Stack Director passed self-test.
3		Power OK LED	Lights when the Stack Director has sufficient power.
4		Setup Port	A port to connect a terminal and configure the attached functional module. Can also be used to configure other functional modules in a managed stack.
5		OBM Port	An RS-232 port for out-of-band management (OBM) communication.
6		OBM Port LED	When on, SLIP is available through this interface. When blinking, there is SLIP activity on the port.

## What Is a Stack Director?

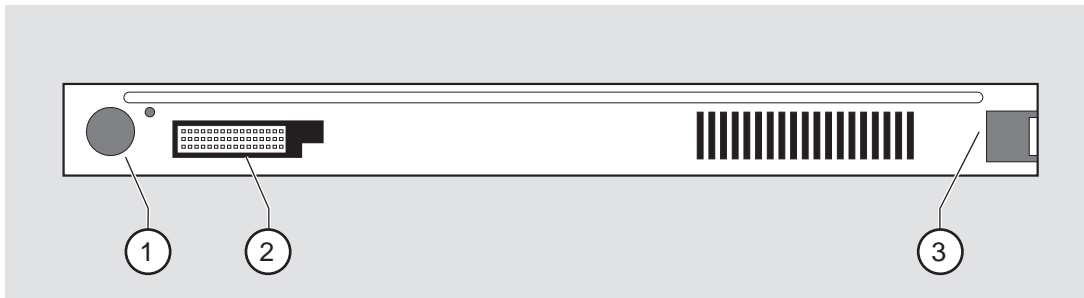
Item	Icon	Name	Description
7		10Base2 Port	A 10Base2 port for connecting to the internal 10Base2 network of the DIGITAL MultiSwitch 600. This port can also be used for in-band management. This port must be externally terminated if it is not used. A T-connector cannot be used on this port.
8		10Base2 Port Status LED	The port is available and can be connected to an operational LAN.
9		Network Activity LED	Indicates network traffic on the management access or the 10Base2 ports.
10		Management Access Port	A UTP/ScTP port dedicated to in-band management. This is the default port for management if connected to an active 10BaseT link.
11		Management Access Status LED	The port is available and can be connected to an operational LAN.
12		Stack Level Management LEDs	The module at this level is functional and is communicating with the Stack Director.
13		Reserved	Reserved.
14		Reserved	Reserved.
15		IEC Power Connector	The input connector to the unit's power supply.



### Stack Director Back Panel

Table 7-2 describes the back panel components on the Stack Director and Figure 7-3 shows their location. For detailed information about the LEDs, refer to Appendix A.

**Figure 7-3: Stack Director Rear Panel Component Descriptions**



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**Table 7-2: Stack Director Back Panel Components**

Item	Name	Description
1	Clearance Hole	Allows insertion of functional module locking tab.
2	48-pin Connector	Enables signaling between the functional module and Stack Director.
3	Locking Receptacle	Secures the functional module to the Stack Director.

What Is a Stack Station?

---

## What Is a Stack Station?

A Stack Station provides power to the attached functional module and extends the internal management channel and LAN channels by one level for a managed DIGITAL MultiSwitch 600 stack. In a managed stack, an attached functional module can be managed only if a Stack Director is included at the bottom of the stack and is interconnected.

Figure 7-4 and Figure 7-5 show the Stack Station front and back panels.

## Features

The Stack Station has the following features:

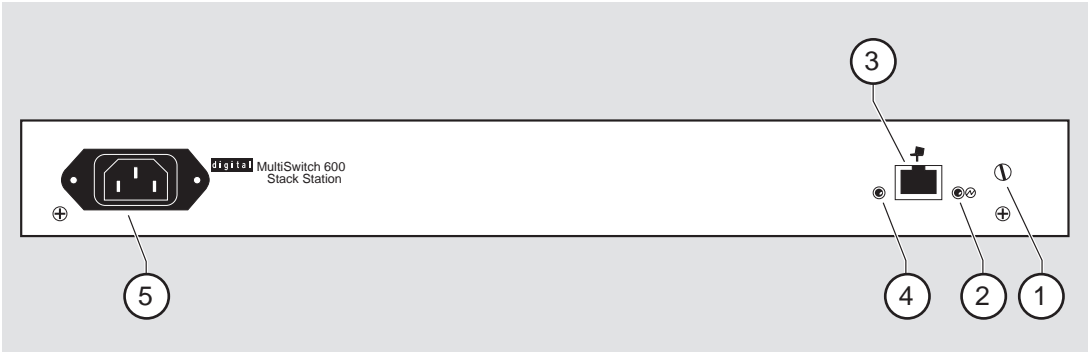
- Provide power to the attached functional module.
- Provide hot-swap circuitry for functional modules.
- Provide a serial set-up port to setup and configure the functional module in an unmanaged stack.
- Have a stack interconnect slot on the top and bottom for cable-free stack interconnect card.

For further information on Stack Station power ratings refer to Appendix C.

**Stack Station Front Panel**

Figure 7-4 shows the front panel components locations on the Stack Station and Table 7-3 describes the components. For detailed information about the LEDs, refer to Appendix A.

**Figure 7-4: Stack Station Front Panel Components**



NPB-0464-96F

**Table 7-3: Stack Station Front Panel Component Descriptions**

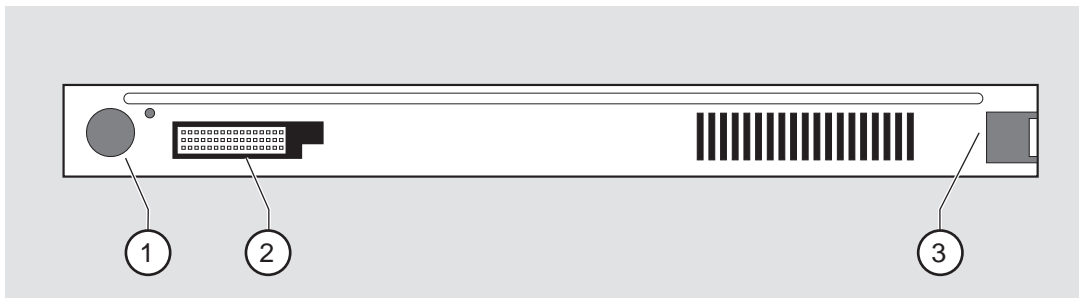
Item	Icon	Name	Description
1		Slotted Thumbscrew	Locks the functional module and the Stack Station together.
2		Setup Port LED	Indicates that the setup port is active.
3		Setup Port	A port to connect a terminal and configure the attached functional module.  <i>Note:</i> This port is only active when the stack does not contain a Stack Director.
4		Power OK LED	Indicates that the Stack Station has sufficient power.
5		IEC Power Connector	The input connector to the unit's power supply.

What Is a Stack Station?

## Stack Station Back Panel

Figure 7-5 shows the back panel component locations on the Stack Station, and Table 7-4 describes the components. For detailed information about the LEDs, refer to Appendix A.

**Figure 7-5: Stack Station Back Panel Components**



NPB-0463-96F

**Table 7-4: Stack Station Back Panel Component Descriptions**

Item	Name	Description
1	Clearance Hole	Allows insertion of a functional module locking tab.
2	48-pin Connector	Enables signaling between the functional module and a Stack Station.
3	Clearance Slot	Allows insertion of a functional module's mounting tab.

## Chapter 8

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# Assembling a Stack

---

## Overview

### Introduction

This chapter describes how to assemble a DIGITAL MultiSwitch 600 stack.

### In This Chapter

---

Topic	Page
Planning the Configuration	8-2
Building a DIGITAL MultiSwitch 600 Stack	8-4
Task 1: Securing a Stack Director and Stack Station to Mounting Tray	8-4
Task 2: Securing the Mounting Tray to the Rack Mount	8-7
Task 3: Inserting the Stack Interconnect Card and Functional Module	8-9
Task 4: Attaching the Next Level in the Stack	8-10
Task 5: Cabling the Stack Director and Stack Station	8-12
Task 6: Connecting Power	8-15
Task 7: Adding a Stack Level after Initial Installation	8-17

---

## Planning the Configuration

This section discusses considerations you should take into account when planning the DIGITAL MultiSwitch 600's configuration.

### Planning Considerations

Keep the following in mind when planning your configuration:

- A Stack Director is required to manage a DIGITAL MultiSwitch 600 system. In a managed DIGITAL MultiSwitch 600 system, the Stack Director must be the bottom level of the stack.
- A DIGITAL MultiSwitch 600 system can have a maximum of eight DIGITAL MultiSwitch 600-series functional modules.
- A stack can contain any combination of DIGITAL MultiSwitch 600-series functional modules (hubs and switches).
- DIGITAL MultiSwitch 600-series functional modules are hot-swappable in the DIGITAL MultiSwitch 600 system.
- DIGITAL recommends that all configurations use the mounting tray for stability. The tray is supplied with the Stack Director. It can also be ordered separately. Refer to Appendix D for the order part number.
- The mounting tray is required for rack mounting.
- When you are using the mounting tray, the first step in building a stack is to attach the Stack Director or Stack Station to the mounting tray.
- Install the MMIs in the DIGITAL MultiSwitch 600-series functional modules before you install the functional modules in the DIGITAL MultiSwitch 600 Stack.
- There are three types of configurations: Standard 19-inch rack mount (Figure 8-3), relay rack mount (Figure 8-4), and table top (Figure 8-10).

## Cable Restrictions

The 10Base2 port on the Stack Director can be used to extend the internal 10Base2 LAN channel of the DIGITAL MultiSwitch 600 system. An external 10Base2 segment attached to the 10Base2 port can be a maximum of 120 meters with a maximum 15 stations or nodes attached. A T-connector is not allowed on the Stack Director's 10Base2 port. If you want to connect two DIGITAL MultiSwitch 600 systems together with a 10Base2 segment, they must be at each end of the segment. For example, you can use this configuration:

stack — node — node— node — stack

but you cannot use this configuration:

stack — node — node— stack — node

Because each DIGITAL MultiSwitch 600 stack director is the electrical equivalent of 65 meters of cable, the 10Base2 cable between the two DIGITAL MultiSwitch 600 systems cannot be greater than 55 meters.

---

### CAUTION

Always make sure this unit is adequately grounded. Do not connect more than five Stack Stations into a single power strip unless the power strip is protected by a GFCI (Ground Fault Circuit Interrupt) device.

---

## Building a DIGITAL MultiSwitch 600 Stack

To build a managed stack, complete the tasks in this section. You will need both a Phillips-head and flat-blade screwdrivers for the installation.

### Task 1: Securing a Stack Director and Stack Station to Mounting Tray

DIGITAL recommends that a mounting tray be used with stacks of more than one level. The mounting tray provides stability to the stack when hot-swapping functional modules in the lower levels. This tray is supplied with the Stack Director and can be ordered separately. Refer to Appendix E for the part number.

---

#### NOTE

The Stack Director must be at the bottom of the stack (on the mounting tray) for management. If you are building an unmanaged stack, install a Stack Station on the mounting tray.

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---

#### CAUTION

Static electricity can damage modules and electronic components. It is recommended that you use a grounded antistatic wrist strap and a grounded work surface when handling any circuit cards.

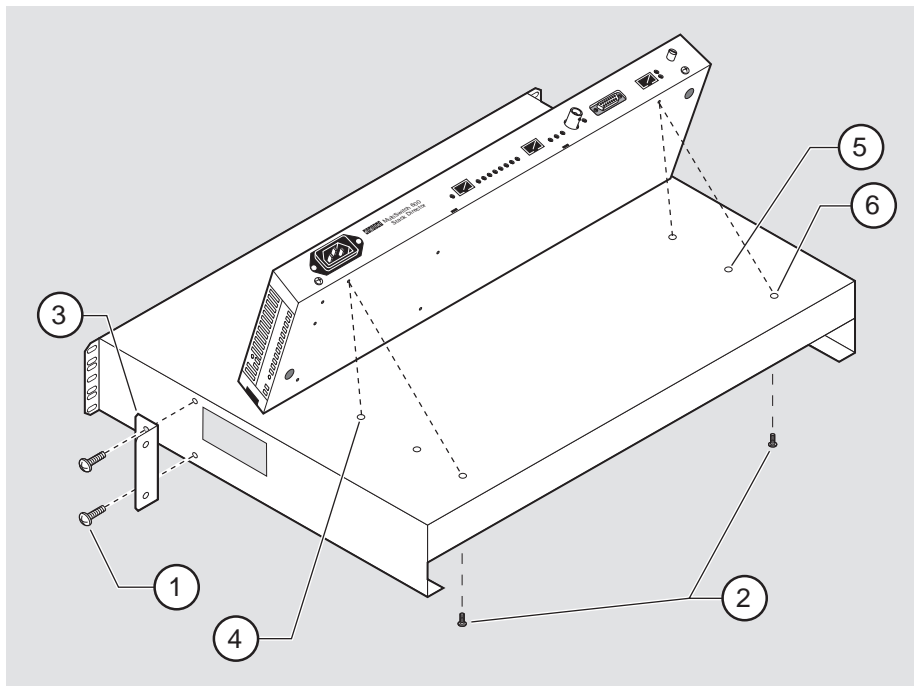
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## Securing a Stack Director to Mounting Tray

To attach a Stack Director to the tray, perform the procedure in the following table. Figure 8-1 shows installation details.

**Figure 8-1: Stack Director Mounting Tray Attachment**



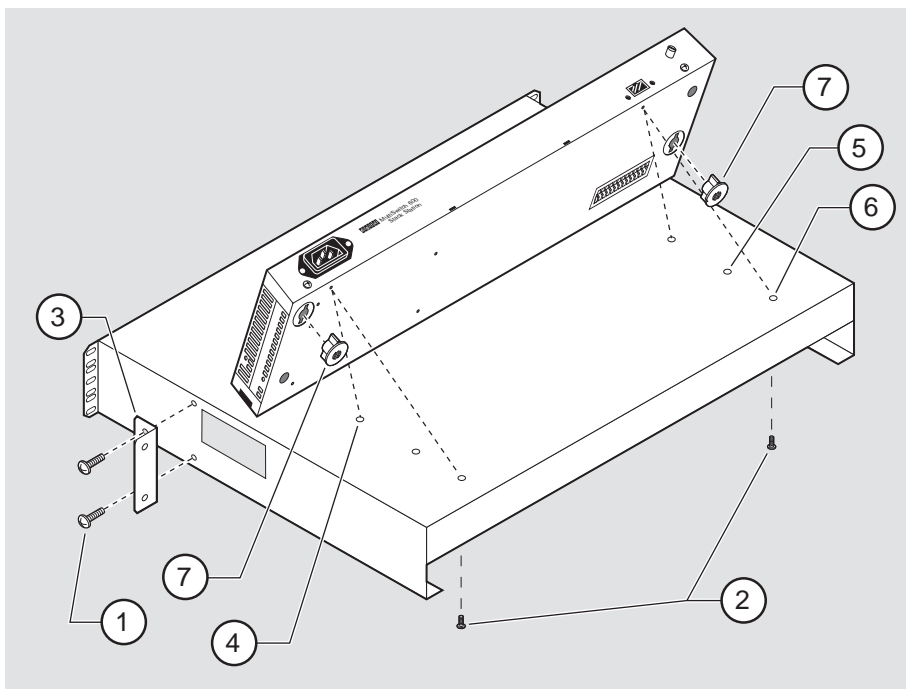
NPB-0739-96F

Step	Action
1	Align the holes on the bottom of the Stack Director with the mounting holes on top of the tray (Figure 8-1).
2	Mounting holes:  <b>For desk top configuration</b> , use any one of the three sets of two mounting holes (4), (5), and (6) to mount the Stack Director on the mounting tray.  <b>For 19" rack mount configuration (for hot-swapping modules)</b> , use the set of holes closest to the edge of the tray (6).  <b>For relay rack configuration</b> , use the mounting holes farthest from the edge of the tray (4). Attach mounting tray to relay rack using two front angle brackets (3) and using two # 6 mounting screws (1).
3	Secure the Stack Director onto the tray using the two 6-32 machine screws (2).

## Securing a Stack Station to Mounting Tray

To attach a Stack Station to the tray, perform the procedure in the following table. Figure 8-2 shows installation details.

**Figure 8-2: Stack Station Mounting Tray Attachment**



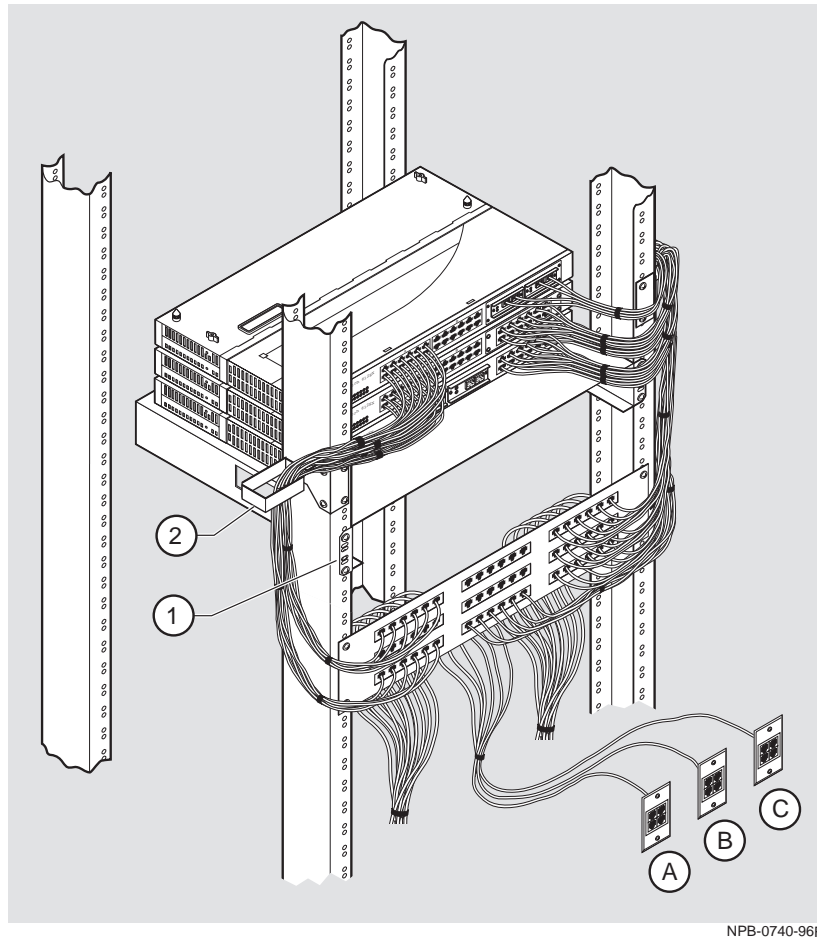
NPB-0741-96F

Step	Action
1	Install the mounting plugs to the bottom of the Stack Station (7).
2	Align the holes on the bottom of the Stack Station with the mounting holes on top of the tray (Figure 8-2).
3	Mounting holes: <b>For desk top configuration,</b> use any one of the three sets of two mounting holes (4), (5), and (6) to mount the Stack Station on the mounting tray. <b>For 19" rack mount configuration (for hot-swapping modules),</b> use the set of holes closest to the edge of the tray (6). <b>For relay rack configuration,</b> use the mounting holes farthest from the edge of the tray (4). Attach mounting tray to relay rack using two front angle brackets (3) and using two # 6 mounting screws (1).
4	Secure the Stack Station onto the tray using the two 6-32 machine screws (2).

## Task 2: Securing the Mounting Tray to the Rack Mount

Figure 8-3 shows a standard 19-inch rack mount configuration and Figure 8-4 shows a relay rack mount configuration. Tables following figures describe the procedures.

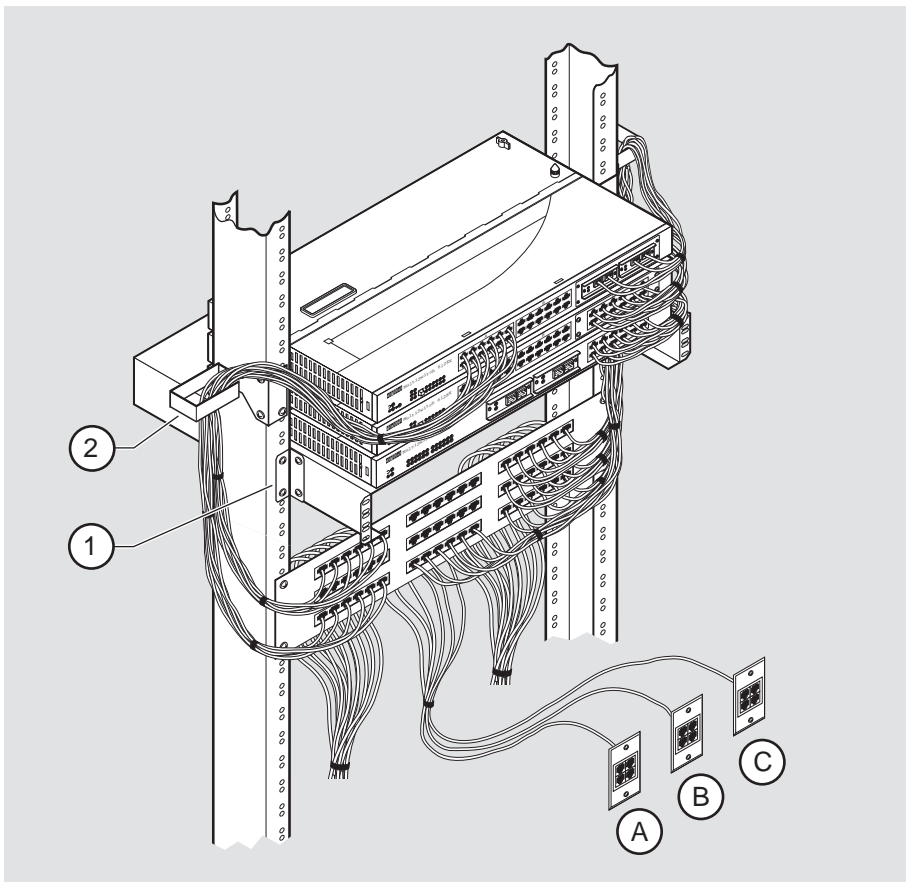
**Figure 8-3: Standard 19" Rack Mount Configuration**



Step	Action
1	Secure the mounting flange (1) on the tray to the mounting rails of the standard 19" rack using the mounting screws.
2	Attach the cable harness bracket (2) and office attachment connectors A, B and C.

## Building a DIGITAL MultiSwitch 600 Stack

**Figure 8-4: Relay Rack Mount Configuration**



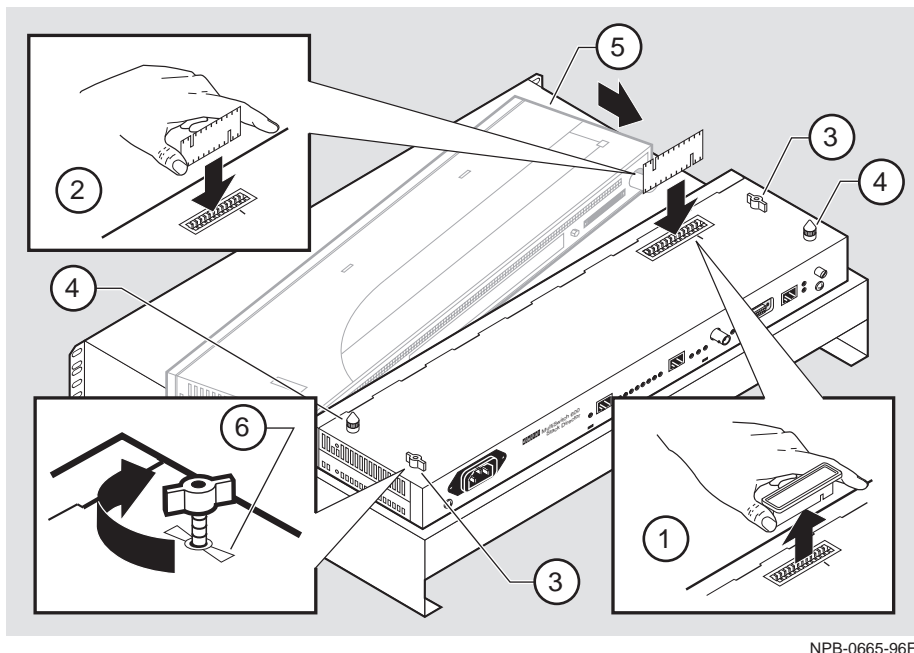
NPB-0725-96F

Step	Action
1	Attach the mounting tray to the rack (1) using the four 10-32 screws and U-nuts (if needed).
2	Attach the cable harness bracket (see Figure 8-4) (2) and office attachment connectors A, B and C.

### Task 3: Inserting the Stack Interconnect Card and Functional Module

A Stack Interconnect Card is located in each box that contains a Stack Director or a Stack Station. To insert the Stack Interconnect Card, perform the following procedure. Figure 8-5 shows installation details.

**Figure 8-5: Stack Interconnect Card Attachment**



NPB-0665-96F

Step	Action
1	Remove the dust cap (1) from the vertical connector on the Stack Director.
2	Holding the Stack Interconnect Card by its sides (2), place it into the vertical connector. <i>Note:</i> The Stack Interconnect Card is notched so that it will be inserted into the vertical connector properly. Align the notch in the card with the corresponding key in the connector which is identified by the line next to the connector slot.
3	Press down on the Stack Interconnect Card until it is fully seated being careful not to damage the strip metal gaskets (copper fingerstocks).
4	Insert and tighten wing nuts (3). These are placed at offset locations indicated by the wing guide symbol. When fully seated, the wing nuts must be within wing guides.

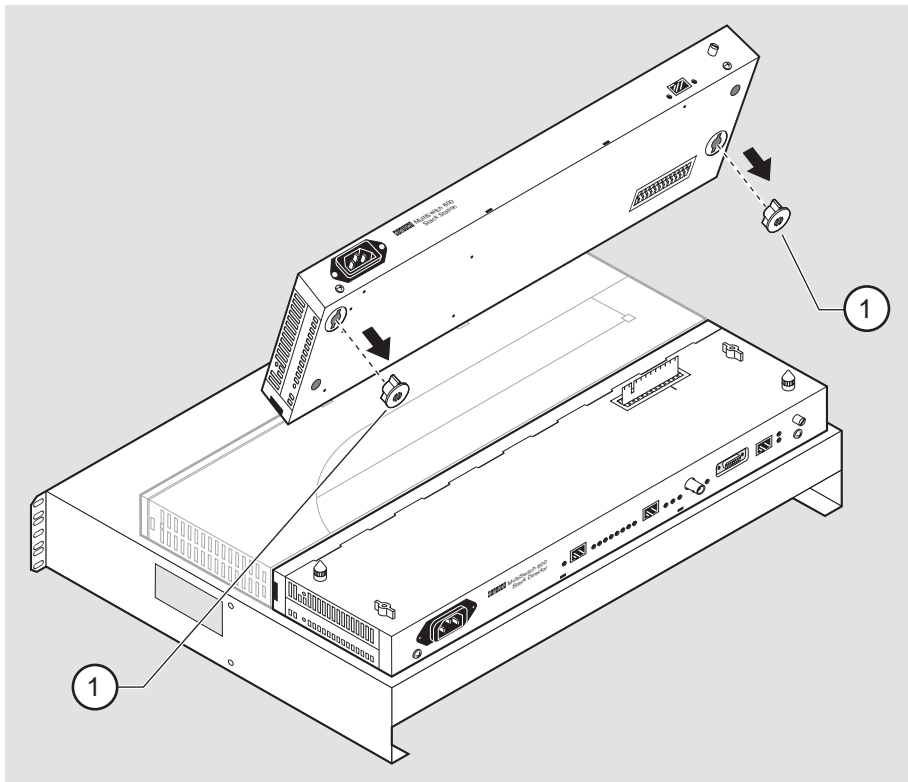
## Building a DIGITAL MultiSwitch 600 Stack

Step	Action
5	Install pylons (4) if they are not already installed. Pylons are normally installed in the factory.
6	Attach a functional module (5) to the Stack Director. (See appropriate functional module Installation and Configuration manual for details.)

### Task 4: Attaching the Next Level in the Stack

To remove the mounting plugs, perform the following step. See Figure 8-6.

**Figure 8-6: Mounting Plug Location**



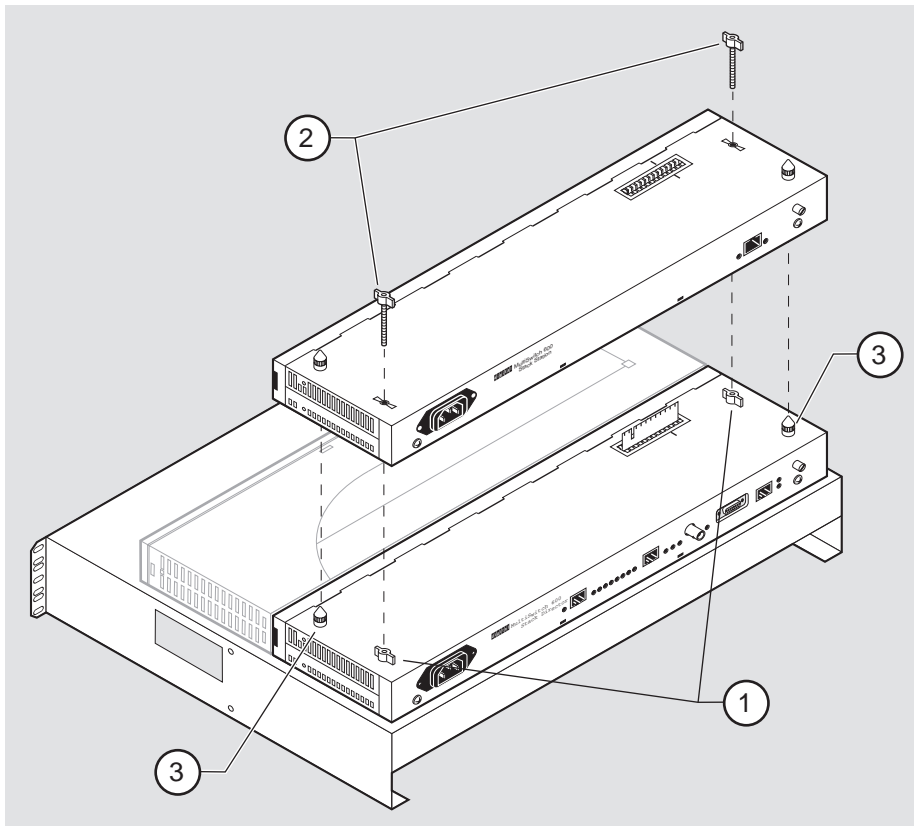
NPB-0734-96F

Step	Action
1	Prior to seating the next level's Stack Station on the previous level, remove the mounting plugs (1), if present (Figure 8-6).

## Building a DIGITAL MultiSwitch 600 Stack

To add a second level to a stack, perform the following steps. Figure 8-7 illustrates installation details.

**Figure 8-7: Next Stack Station Attachment**



NPB-0660-96F

Step	Action
1	On the previously installed level, align the wings on the wing nuts (1) within the wing guide symbol on the Stack Station or the Stack Director (See Figure 8-5 for wing guide symbol location.)
2	Align the alignment pylons (3).
3	Press down on the corners of the Stack Station until it snaps into place.
4	Insert and finger tighten two wing nuts (2) to the Stack Station. Align the wings on the wing nuts within the wing guide on the Stack Station.

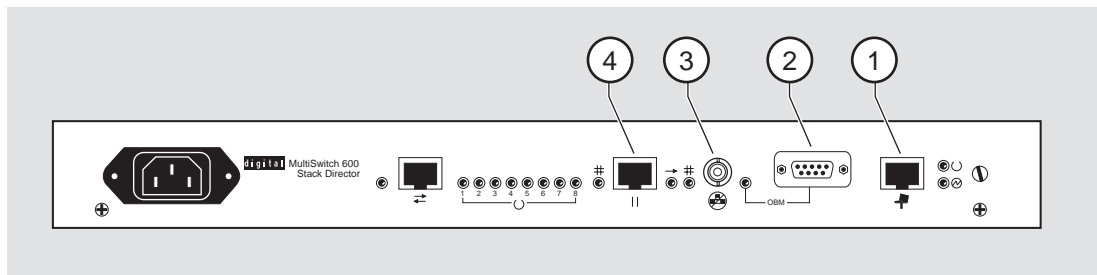
## Building a DIGITAL MultiSwitch 600 Stack

Step	Action
5	Attach a functional module to the Stack Station. (See appropriate functional module Installation and Configuration manual.)
6	To continue adding levels to the stack, repeat steps 1 through 5 of this task.  <u>Note:</u> The Stack Station at the top of the stack should have the dust cap installed on its vertical slot connector.

### Task 5: Cabling the Stack Director and Stack Station

Figure 8-8 shows the Stack Director interface ports.

**Figure 8-8: Stack Director Port Connections**



NPB-0512-96F

The setup port (1) on the Stack Director is used to set initial configuration parameters, including the assignment of an IP address for the stack. It is also used to perform basic management operations such as: resetting the functional module, upgrading the functional module and redirecting to another functional module for setup operations.

Use the OBM port (2) on the Stack Director for out-of-band management.

Use the 10Base2 port (3) on the Stack Director to extend the internal 10Base2 LAN channel of the MultiSwitch 600 system. The 10Base2 cable must be plugged directly into the Stack Director BNC 10Base2 port connector. A T-connector cannot be used.

If you do not extend the internal 10Base2 LAN channel, you must terminate the channel (3) using an H8225 50-ohm terminator supplied.

Use the management access port (4) on the Stack Director to redirect the SNMP management agent from the internal 10Base2 assignment to this port. A network management station can be connected directly to this port or this port can be cabled to another network segment.



---

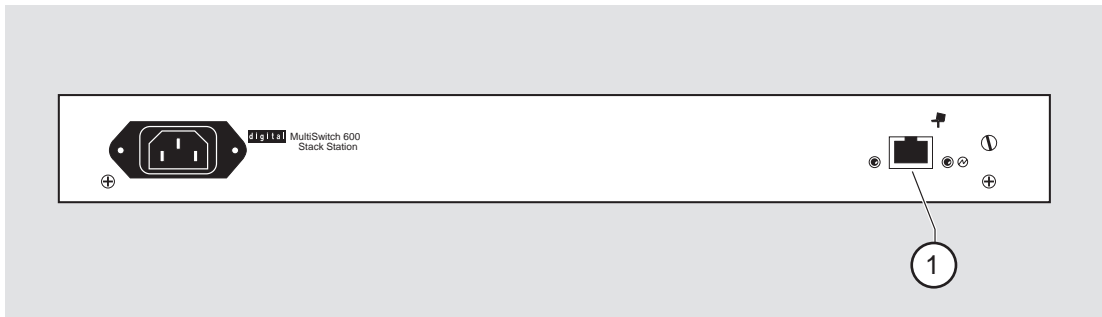
**NOTE**

If a 10BaseT cable is attached to the management access port, and a 10Base2 cable is attached to the 10Base2 port, the 10BaseT port will be utilized by the Stack Director and the 10Base2 port will be ignored. However, data is still passed on the 10Base2 segment for use by other stations.

---

Figure 8-9 shows the Stack Station interface port.

**Figure 8-9: Stack Station Port Connection**



NPB-0686-96F

The setup port on the Stack Station is used to set initial configuration parameters in an unmanaged stack.

Refer to Appendix B for the pin assignments for the ports, cables, and adapters.

## Building a DIGITAL MultiSwitch 600 Stack

### Setup Procedures

To connect and setup the Stack Director and Stack Station ports, follow the procedure in the following table.

Step	Action												
1	Each setup port uses a standard 8-pin MJ connector. To connect a setup device (terminal or PC) to the setup port, use the following cables and adapters: <table border="1"><thead><tr><th>If the device connecting to the setup port is:</th><th>Use this cable</th><th>With this adapter</th></tr></thead><tbody><tr><td>A PC with a 9-pin D-Sub communications port</td><td>BN24H-xx<sup>1</sup></td><td>H8571-J</td></tr><tr><td>A terminal with a 25-pin D-Sub connector</td><td>BN24H-xx<sup>1</sup></td><td>H8575-A</td></tr><tr><td>A terminal with a 6-pin MMJ connector</td><td>BN24H-xx-X<sup>1,2</sup></td><td>Not required</td></tr></tbody></table>	If the device connecting to the setup port is:	Use this cable	With this adapter	A PC with a 9-pin D-Sub communications port	BN24H-xx <sup>1</sup>	H8571-J	A terminal with a 25-pin D-Sub connector	BN24H-xx <sup>1</sup>	H8575-A	A terminal with a 6-pin MMJ connector	BN24H-xx-X <sup>1,2</sup>	Not required
If the device connecting to the setup port is:	Use this cable	With this adapter											
A PC with a 9-pin D-Sub communications port	BN24H-xx <sup>1</sup>	H8571-J											
A terminal with a 25-pin D-Sub connector	BN24H-xx <sup>1</sup>	H8575-A											
A terminal with a 6-pin MMJ connector	BN24H-xx-X <sup>1,2</sup>	Not required											
	<sup>1</sup> xx indicates cable length in meters. <sup>2</sup> this is a cross-wired cable.												
2	Configure the setup port device (terminal or PC) as follows: <ul style="list-style-type: none"><li>• 9600 baud</li><li>• 8 bits</li><li>• no parity</li><li>• 1 stop bit</li></ul>												
3	Connect a modem or access service to the Stack Director OBM port using a 9-pin D-sub connector. See Appendix B for pin assignments.												
4	Connect the Stack Director 10Base2 port to a 10Base2 cable with a BNC connector. If you are not using this port, you MUST attach a 50-ohm terminator (H8225). See Appendix B for pin assignments.												
5	Connect the Stack Director Management Access port using a straight-through cable with an 8-pin MJ port connector. See Appendix B for pin assignments.												

## Task 6: Connecting Power

The Stack Director and each Stack Station has its own power supply. This requires the connection of an AC power line cord to each IEC power connector.

---

### CAUTION

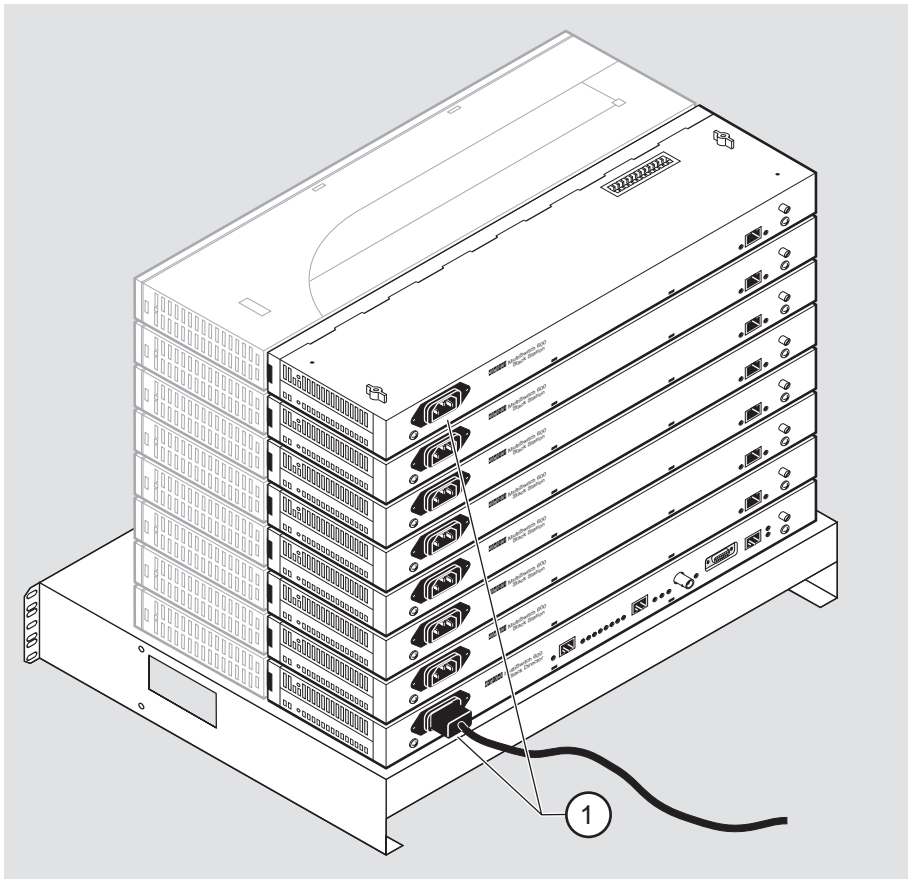
Always make sure this unit is adequately grounded. Do not connect more than five Stack Stations into a single power strip unless the power strip is protected by a GFCI (Ground Fault Circuit Interrupt) device.

---

To connect the power supplies, follow the procedure in the following table. Figure 8-10 shows their location.

## Building a DIGITAL MultiSwitch 600 Stack

**Figure 8-10: IEC Power Connector Locations**



NPB-0662-96F

Step	Action
1	<p>Connect the supplied AC line cord to the IEC power connector (1) on each Stack Station. Then, connect each AC line cord into an AC outlet or power strip.</p> <p>The following states occur:</p> <p>The Stack Station Power OK LED should be on. Refer to Stack Station Front Panel on page 7-13.</p>
2	<p>Connect an AC line cord into the IEC power connector of the Stack Director (at the bottom of the stack) and into an AC outlet or power strip.</p> <p>The following states occur:</p> <p>The Stack Director Power OK LED should be on. Refer to Stack Station Front Panel on page 7-13.</p>

## Task 7: Adding a Stack Level after Initial Installation

To add a level to a stack after the initial installation, perform the procedure in the following table. Figure 8-6 and Figure 8-7 illustrate installation details.

---

### NOTE

DIGITAL recommends that a stack level not be removed or added to a live stack. If you must remove or add a stack level, the stack must be powered down.

---

---

Step	Action
1	If available, use clearVISN Recovery Manager to backup current settings for each device (including the Stack Director) on the stack.
2	Remove power from every level. Refer to Chapter 11 Task 1: Removing Power Cords and Cables.
3	Remove the dust cap from the vertical connector on the top level Stack Station or Stack Director.
4	Perform steps 1 through 5 of Task 4: Attaching the Next Level in the Stack <u>Note:</u> Inserting a stack interconnect card in a live stack will disrupt the backplane configuration. Performing step 8 re-establishes the configuration.
5	Repeat steps 3 and 4 as needed.
6	Replace the dust cap in the vertical connector slot on the top level remaining in the stack.
7	Perform Task 5: Cabling the Stack Director and Stack Station and Task 6: Connecting Power.

## Building a DIGITAL MultiSwitch 600 Stack

---

<b>Step</b>	<b>Action</b>
<b>8</b>	<p>If available, use clearVISN Recovery Manager to restore settings for each device on the stack that may have lost its settings.</p> <p>Functional modules that are in the same slot when the stack is powered up as they were when the stack was powered down will be automatically reconfigured with their previous backplane settings by the Stack Director.</p> <p>Functional modules that are not in the same slot, but are the same type (that is DIGITAL MultiSwitch 612EX, DIGITAL MultiSwitch Hub 624T, and so on) as the module that was previously in the slot, will be reconfigured with the backplane settings used by the previous module. However, Port Switch group configuration is saved in the non-volatile memory of the DIGITAL MultiSwitch Hub 624T, and thus stays with the module, not the slot.</p> <p>For example, if you have a stack with slot 2 and slot 3 each containing a DIGITAL MultiSwitch Hub 624T, and the slot 2 level is removed and the DIGITAL MultiSwitch Hub 624T formerly in slot 3 is now in slot 2, it will be reconfigured with its own Port Switch groups but with the backplane settings previously used for slot 2.</p> <p>Functional modules that are not the same type as the module previously in the slot will not be automatically configured.</p>

---

## Chapter 9

---

# Managing a Stack

---

### Overview

#### Introduction

This chapter describes how to manage the DIGITAL MultiSwitch 600 system.

#### In This Chapter

Topic	Page
In-Band and Out-of-Band Management	9-2
Connecting to a Network Management Station	9-3
SNMP Management Applications	9-4
Backplane Auto Healing	9-5
Installation Menu Introduction	9-6
Installation Menu Description	9-7

## **In-Band and Out-of-Band Management**

The DIGITAL MultiSwitch 600 system can be managed through in-band management or out-of-band Simple Network Management Protocol (SNMP) management.

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

Stacks may also be unmanaged. When used as unmanaged single devices or unmanaged stacks, there is no connection available to the stack backplane. The interconnect riser card may or may not be used, but it has no functional benefit in the unmanaged configuration.

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 Stack Director communicates with a network management station (NMS) via its SNMP management agent. The channel between the Stack Director's SNMP management and the NMS is defined by a combination of the user-defined IP address and the internal MAC (media access control) facility.

The NMS can access the MAC in the following ways:

- Through the 10Base2 LAN channel. The Stack Director assigns the stack's 10Base2 LAN channel to the MAC as its default connection. The NMS must reside on the Ethernet LAN segment that has access to this 10Base2 LAN channel. Or, the NMS can be attached to a switch or hub port that has access to the 10Base2 channel; in this case, the NMS must have switched access to the 10Base2 channel.
- Connect the NMS directly to the 10Base2 BNC port on the rear of the Stack Director.
- Connect the NMS directly to the 8-pin MJ 10BaseT management access port on the rear of the Stack Director. A valid connection to the management access port automatically reassigns the internal MAC to this port.
- Connect an 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.

Note that 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.

- For out-of-band management, use the 9-pin OBM port on the rear of the Stack Director to connect to the NMS. The OBM port is a serial communications port that uses SLIP to communicate with an NMS.

## SNMP Management Applications

Any standards-based SNMP management application can manage the DIGITAL MultiSwitch 600 system. 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 Stack Director'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 Stack Director's setup port menus are described in the following section.

---

## Backplane Auto Healing

Part of the installation process for a managed DIGITAL MultiSwitch 600 system may be to connect the functional module ports to the internal Ethernet LAN channels. This is generally done to create individual shared and switched Ethernet segments conforming to the desired network topology. clearVISN MultiChassis Manager (MCM) or clearVISN Stack Manager is used to set up the initial connections after the DIGITAL MultiSwitch 600 system is built. Swapping or removing functional modules in a DIGITAL MultiSwitch 600 stack is sensed by the Stack Director to update the stack's internal Ethernet LAN channel connections. Backplane Auto Healing must be enabled using clearVISN MultiChassis Manager or Stack Manager for this feature to be activated. This feature allows you to remove, replace and/or swap functional modules of the same type without reconfiguring the internal LAN connections with clearVISN.

When a functional module is removed from a stack level, any connections to the internal Ethernet LAN channels are deleted. However, with Backplane Auto Healing enabled, connections are restored when a functional module of the same type is re-inserted in that level. If another type of functional module is inserted into the stack level the connections are not restored and are permanently deleted. You must then use clearVISN MultiChassis Manager or Stack Manager to make the desired connections.

## Installation Menu Introduction

### Using the Setup Ports

The setup ports on the Stack Director and Stack Stations allow you to set parameters when the DIGITAL MultiSwitch 600 system 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 hub setup port supports the following modes:

- Installation menu
- Redirect
- Event display

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

### Connecting a Terminal to the Setup Port

To connect a terminal to the setup port, ensure that the following terminal setup parameters are in effect (see Table 9-1).

**Table 9-1: Terminal Setup Parameters**

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

## Installation Menu Description

The Digital MS 600 Stack Director INSTALLATION MENU provides you with 9 menu options. Some of these options contain additional submenu options. When the MultiSwitch 600 setup port is in default mode, the Digital MS 600 Stack Director INSTALLATION MENU appears. The user response for all menu selections is shown in boldface type.

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

You can exit from any of the menu options and return to the Digital MS 600 Stack Director INSTALLATION MENU by pressing <Ctrl/C> on the setup port device.

## Installation Menu Description

### Menu Options

---

#### NOTE

The Digital MS 600 Stack Director INSTALLATION MENU screen displays illustrated in this manual may vary slightly from the actual screen displays on your setup port device.

---

```
Digital MS 600 Stack Director
=====
                Digital MS 600 Stack Director 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:  n <Return>
```

---

## [1] Restart with Factory Defaults

This option reboots the DIGITAL MultiSwitch 600 Stack Director, initiating self-tests and causing its configured NVRAM parameters to be initialized 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 DIGITAL MultiSwitch 600 Status Display displays the following message:

```
Selftest Complete  
Start Main Firmware
```

Within a few seconds, the DIGITAL MultiSwitch 600 installation menu appears on your setup port screen. The following example shows the dialogue associated with this option:

```
Enter selection: 1  
Digital MS 600 Stack Director  
=====
```

```
                RESTART WITH FACTORY DEFAULTS
```

```
* * * * *  
*           IMPORTANT!   IMPORTANT!   IMPORTANT!           *  
* * * * *  
* This selection will delete the current configuration *  
* settings and reset the system with the factory default*  
* settings. All configuration settings will be lost.    *  
* * * * *
```

```
=====
```

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

## [2] Restart with Current Settings

---

### [2] Restart with Current Settings

This option reboots the DIGITAL MultiSwitch 600 Stack Director, 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 Digital MS 600 Stack Director INSTALLATION MENU appears on your setup port screen.

The following example shows the dialogue associated with this option:

```
Enter selection: 2

Digital MS 600 Stack Director
=====
                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 Stack Director. If the DIGITAL MultiSwitch 600 system 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
Digital MS 600 Stack Director
=====
Stack Director,Digital MS 600 Stack Director, 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
EthernetPort   16.20.156.26    255.255.0.0      16.20.156.56    Active

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

Digital MS 600 Stack Director
=====
Hub Name                : Digital MS 600 Stack Director
Hub Serial Number       :
Hub Contact              :
=====
Slot1, MS Hub 624T      Status : up
Slot2, Empty
=====
...Press Return Key to Continue...

```

[4] Configure IP

---

## [4] Configure IP

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

### IP Configure Selections

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

```
Enter selection: 4
Digital MS 600 Stack Director
=====
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.

Topic	Page
[1] Set SNMP Read/Write Community	9-13
[2] Add SNMP Trap Addresses	9-14
[3] Delete SNMP Trap Addresses	9-15
[4] Set In-Band Interface IP Address	9-16
[5] Set Out-of-Band Interface IP Address	9-17
[6] Enable/Disable BootP	9-18

## [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

Digital MS 600 Stack Director
=====
SET SNMP READ/WRITE COMMUNITY

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

Enter the community string [public] : engineering<Return>

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

---

### NOTE

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

---

[4] Configure IP

## [2] Add SNMP Trap Addresses

This option prompts you to enter IP addresses to which SNMP traps will be sent from the DIGITAL MultiSwitch 600 system. 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
Digital MS 600 Stack Director
=====
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
Digital MS 600 Stack Director
=====

                        DELETE SNMP TRAP ADDRESSES

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

        example: 16.20.40.156

=====
Configured SNMP Trap Addresses: 16.20.216.81
Enter a Trap address [ ] : 16.20.216.81:
Trap address deleted. Enter a Trap Address [ ] : <Return>
Press Return for IP Configuration Menu...
```

#### [4] Configure IP

### [4] Set In-Band Interface IP Address

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

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

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
Digital MS 600 Stack Director
=====
                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
EthernetPort                           08-00-2B-B1-4D-C7
=====
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...
```

## [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 DIGITAL MultiSwitch 600 system through the OBM port as an alternative to normal in-band management. To enable out-of-band management, assign an OBM IP address and select an OBM port speed from the Digital MS 600 Stack Director INSTALLATION MENU.

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

The following example shows the dialogue associated with this option.

```

Enter selection: 5
Digital MS 600 Stack Director
=====
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...

```

[4] Configure IP

### [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

Digital MS 600 Stack Director
=====
                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
Digital MS 600 Stack Director
=====
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 (DLU)

---

## [6] Downline Upgrade (DLU)

This option allows you to upgrade firmware for the Hub Manager 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.

---

### Approximate Downline Upgrade Completion Time

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

## [6] Downline Upgrade (DLU)

### Initial Setup Screen

When you select the [6] Downline Upgrade option from the Digital MS 600 Stack Director INSTALLATION MENU, the initial setup screen display appears. This screen identifies the option and alerts you to be sure that the power to the device is not interrupted during the downline load.

```
=====
                          Enter selection : 6
Digital MS 600 Stack Director
=====
                          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...
```

### Selecting the Level to be Upgraded

The Stack Director prompts you for the level to which the upgrade will be downloaded. The default is Slot 9 (the Stack Director).

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

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

## [6] Downline Upgrade (DLU)

### Entering the Load File Name

The Stack Director prompts you for the load filename.

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

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

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

### Load Host IP Address

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

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

Enter the address and press <Return>.

### Choosing a Network Interface

If there is only one network interface for the Stack Director to choose from, the firmware upgrade download processing begins. Skip to the next section (Download Processing Stages) for a description of the messages that appear during the firmware upgrade download processing.

When both in-band and out-of-band IP addresses are assigned, 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] :
```

## [6] Downline Upgrade (DLU)

If you choose the default [N], the setup screen displays the following message:

```
The device becomes nonfunctional for up to 10 minutes during
the time that the flash load is in progress.
... Press Return Key to Start Load [ctrl/c to Abort]...
```

Pressing <Return> initiates the load over the in-band network interface.

If you choose **Y** at the screen prompt, the setup screen displays the following 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 will be disabled during downline load of the Stack Director.

---

## [6] Downline Upgrade (DLU)

### 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

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 9-2 explains what happens during each stage of the download process.

**Table 9-2: Download Process Description**

Stage	Description
1	<p><b>The DLU Process transports the new firmware image across the network from the TFTP load host and places it into a temporary storage buffer.</b></p> <p>After you initiate the process, the setup port screen displays the following message followed by a series of dots (. . . . .), indicating the downline upgrade is in progress:</p> <pre>DLU process started! .....</pre>

This screen is seen only when downloading a functional module in a stack.

Stage	Description
2	<p><b>The module verifies that the firmware image is correct. This stage normally takes 10 seconds to complete.</b></p> <p>When the TFTP load transfer is complete and the TFTP image is verified, the device becomes nonfunctional, and the flash load process begins. (The flash load process can take up to 10 minutes to complete.)</p> <p>When the TFTP load transfer is complete, the Stack Director verifies the TFTP image.</p>
3	<p><b>The DLU process transfers the new image from a temporary storage buffer to the nonvolatile flash memory, overwriting the old image.</b></p> <p>After the Stack Director verifies the image, it writes the image into flash memory.</p>
4	<p><b>The Stack Director resets, runs self-test, and then begins executing the new firmware image.</b></p> <p>After the Stack Director stores the image into flash memory, it boots the new image.</p> <p>After the Stack Director completes booting the new image, it may need to reset the configuration settings.</p> <p>After the Stack Director resets the configuration, it initiates self-test. When self-test completes, it starts the main firmware.</p>

## Download Processing for Network Modules

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

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

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

## [6] Downline Upgrade (DLU)

---

### NOTE

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

---

## Verifying the Upgrade

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

For the Stack Director:

---

Step	Action
1	Select Option [3] Show Current Settings from the Digital MS 600 Stack Director 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 Digital MS 600 Stack Director INSTALLATION MENU.
2	Press <Return>.
3	Verify that the correct version was loaded.
4	Press <Ctrl/C> to return to Main Menu.

---



## [6] Downline Upgrade (DLU)

The screen displays the following text:

```
=====
                                Enter selection : 3
Digital MS 600 Stack Director
=====
Stack Director, Digital MS 600 Stack Director, 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
EthernetPort   16.20.156.26    255.255.0.0    16.20.156.56    Active

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

Digital MS 600 Stack Director
=====
Hub Name                :Digital MS 600 Stack Director
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

---

### [7] Configure Out-of-Band Port

This option provides you with two configuration selections:

- Set Port Speed
- Enable/Disable RTS

#### Out-of-Band Port Configuration Menu Selections

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

```
Enter selection : 7
Digital MS 600 Stack Director
=====
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 Configure Out-of-Band Port Configuration menu selections.

## 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
Digital MS 600 Stack Director
=====
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...
```

## [7] Configure Out-of-Band Port

### Enable/Disable RTS Selection

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

The factory default of this menu option is disabled.

The following example shows the dialogue associated with this option.

```
=====
                          Enter selection : 2
Digital MS 600 Stack Director
=====
                          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 DIGITAL MultiSwitch 600 and displayed by the Stack Station.

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

You can return to the Digital MS 600 Stack Director 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

---

### [9] Start Redirect Mode

The [9] Start Redirect Mode option redirects the DIGITAL MultiSwitch 600 Stack Director 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 Digital MS 600 Stack Director INSTALLATION MENU, the screen display prompts you for a slot number. Type the slot number where the functional module resides. Slot number (8) 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 (1-8): 8
Console redirected to 8: MultiSwitch 612EX
    Attempting connection [Ctrl/C to abort]...
    Connection Successful!
```

If the redirection is successful, after you press <Return>, the Digital MultiSwitch 612EX INSTALLATION MENU appears on your screen.

## Chapter 10

---

# Removing or Replacing a Level on the Stack

---

## Overview

### Introduction

This chapter describes how to remove and replace a level in the DIGITAL MultiSwitch 600 stack.

### In This Chapter

---

Topic	Page
Removing or Replacing Components	10-2
Task 1: Removing Power Cords and Cables	10-2
Task 2: Removing or Replacing the Levels	10-4
Task 3: Removing the Stack Director and Stack Station from the Tray	10-8

---

## Removing or Replacing Components

To remove or replace components in a stack, complete the tasks in this section. You will need both Phillips-head and flat-blade screwdrivers for the removal.

---

### NOTE

DIGITAL recommends that a stack level not be removed from or added to a live stack. If available, backup your current stack settings using clearVISN Recovery Manager, power down the stack, and reconfigure the stack.

---

### Task 1: Removing Power Cords and Cables

To disconnect power cords and cables from the DIGITAL MultiSwitch 600 stack, perform the procedure in the following table (See Figure 10-1).

---

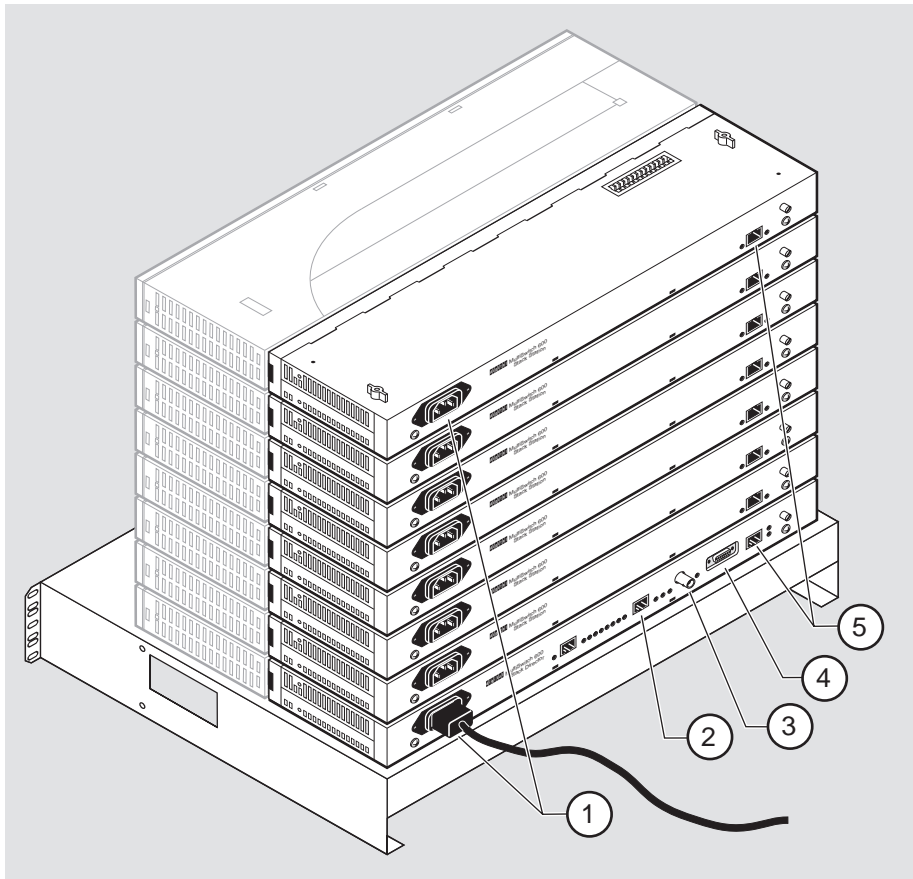
Step	Action
1	Remove the AC line cord from the IEC power connectors <b>(1)</b> of all Stack Stations and the Stack Director.
2	If used, remove the cable from the Stack Director Management Access port <b>(2)</b> .
3	If used, remove the cable from the Stack Director 10Base2 port <b>(3)</b> .
4	If used, remove the cable from the Stack Director OBM port <b>(4)</b> .
5	If used, remove the setup port cable from the Stack Director and Stack Station setup ports <b>(5)</b> .

---



## Removing or Replacing Components

**Figure 10-1: Connector Locations**



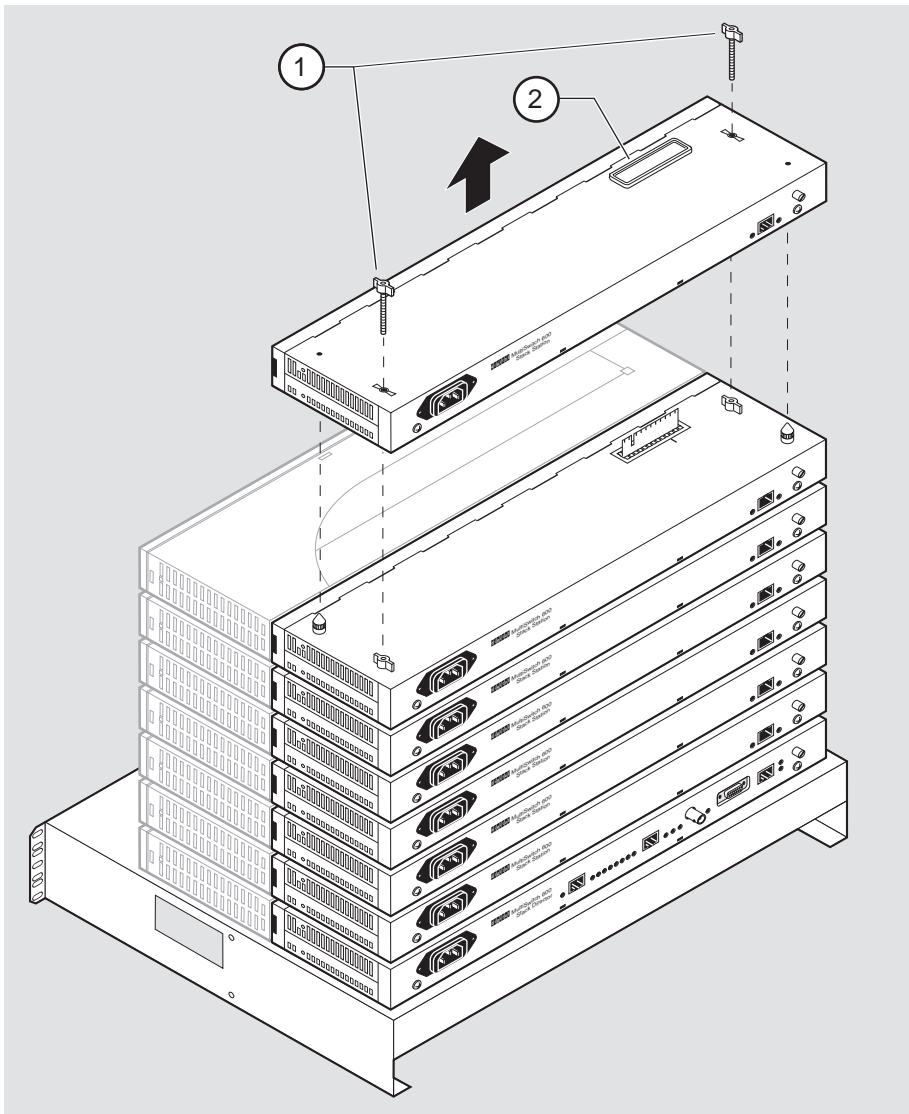
NPB-0662-96F

## Removing or Replacing Components

### Task 2: Removing or Replacing the Levels

To remove a level from the stack, perform the procedure described in the following table. Figure 10-2 shows removal details.

**Figure 10-2: Removing a Stack Station**



NPB-0688-96F

## Removing or Replacing Components

---

### NOTE

DIGITAL recommends that a stack level not be removed from or added to a live stack. If you must remove or add a stack level, the stack must be powered down. If available, backup your current stack settings using clearVISN Recovery Manager.

---

---

Step	Action
1	If available, use clearVISN Recovery Manager to backup current settings for each device (including the Stack Director) on the stack.
2	Remove power cords and cables. Refer to Task 1: Removing Power Cords and Cables.
3	Remove the dust cap (2) from the vertical connector slot on the top level (Stack Station) of the stack.
4	Loosen and remove the wing nuts (1) from the Stack Station by turning them counterclockwise.
5	Remove the Stack Interconnect Card from the Stack Station by holding the Stack Interconnect Card by its sides and pulling it up from the vertical connector (Figure 10-3) being careful not to damage the strip metal gaskets (copper fingerstocks).
6	To rebuild the stack, attach the next level on the stack. Refer to Chapter 8, Task 4: Attaching the Next Level in the Stack for more information.
7	Replace the dust cap in the vertical connector slot on the top level of the stack.
8	Cable the Stack Director and Stack Station. Refer to Chapter 8, Task 5: Cabling the Stack Director and Stack Station and Task 6: Connecting Power for more information.

## Removing or Replacing Components

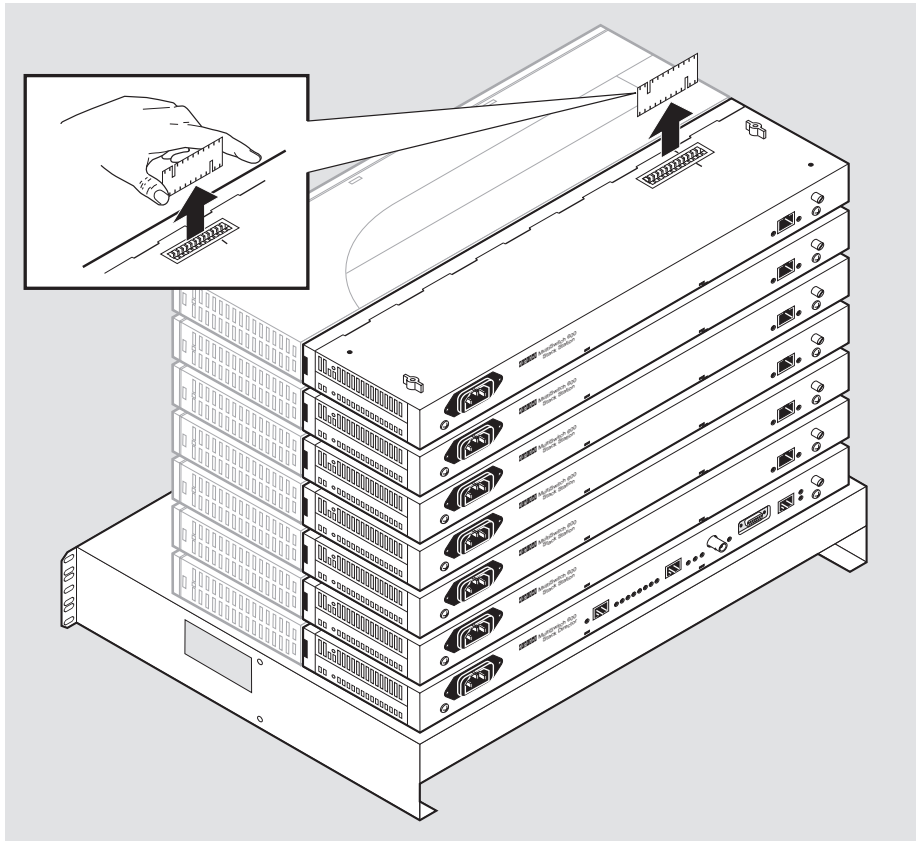
---

<b>Step</b>	<b>Action</b>
<b>9</b>	<p>If available, use clearVISN Recovery Manager to restore settings for each device on the stack that lost its settings.</p> <p>Functional modules that are in the same slot when the stack is powered up as they were when the stack was powered down will be automatically reconfigured with their previous backplane settings by the Stack Director.</p> <p>Functional modules that are not in the same slot, but are the same type (that is DIGITAL MultiSwitch 612EX, DIGITAL MultiSwitch Hub 624T, and so on) as the module that was previously in the slot, will be reconfigured with the backplane settings used by the previous module. However, Port Switch group configuration is saved in the nonvolatile memory of the DIGITAL MultiSwitch Hub 624T, and thus stays with the module, not the slot.</p> <p>Functional modules that are not the same type as the module previously in the slot will not be automatically configured.</p>

---

Removing or Replacing Components

Figure 10-3: Stack Interconnect Card Removal



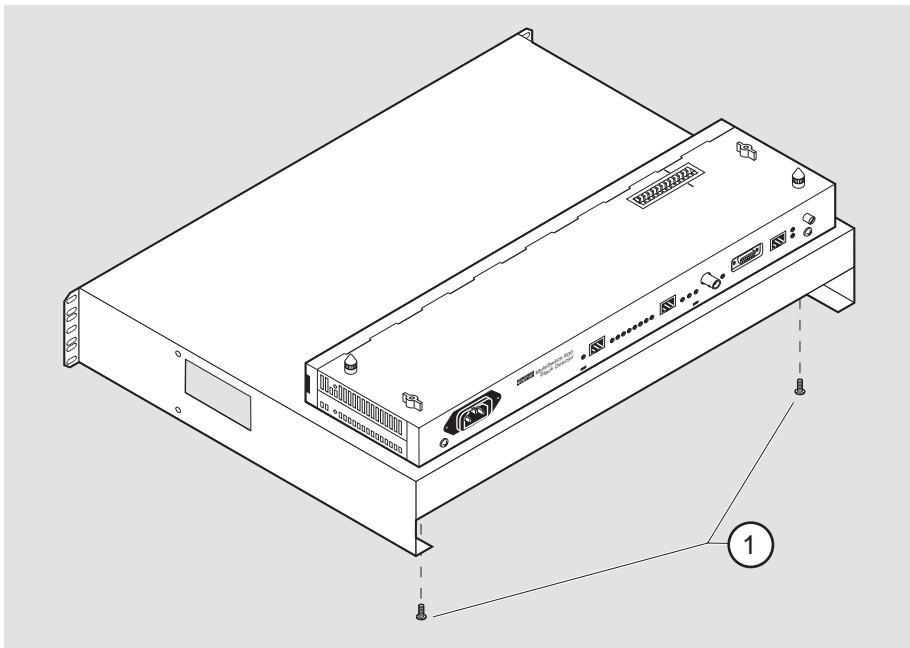
NPB-0659-96F

## Removing or Replacing Components

### Task 3: Removing the Stack Director and Stack Station from the Tray

To remove a Stack Director and Stack Station from the mounting tray, perform the procedure in the following table. Figure 10-4 shows the location of screws securing the Stack Director to the mounting tray.

**Figure 10-4: Removing Stack Director and Stack Station from Mounting Tray**



NPB-0513-96F

Step	Action
1	Remove the Stack Director and Stack Station from the mounting tray by removing the two 6-32 machine screws (1).
2	For a rack-mount configuration, remove the mounting tray from the rack.

## **Part III**

---

# **Reference Information**





# Appendix A

---

## Problem Solving

---

### Overview

#### Introduction

This appendix describes the LED states and troubleshooting information for the DIGITAL MultiSwitch Hub 612TX.

For detailed information about modular media interface LEDs, refer to the *100 Mb/s Fast Ethernet Modular Media Cards Installation* manual.

#### In This Appendix





Topic	Page
DIGITAL MultiSwitch Hub 612TX LED States	A-2
Stack Director LED States	A-3
Stack Station LED States	A-5
DIGITAL MultiSwitch Hub 612TX Problem Solving Using the LEDs	A-6
Stack Director Problem Solving Using the LEDs	A-8
Stack Station Problem Solving Using the LEDs	A-10

---

## DIGITAL MultiSwitch Hub 612TX LED States

Table A-1 describes the states indicated by the module's LEDs.

**Table A-1: DIGITAL MultiSwitch Hub 612TX LED States**






LED Name	Off	Green On	Green Blinking
Power OK LED 	Module is not receiving power.	Module has power.	Faulty power connection or insufficient power.
Module OK LED 	Module failed self-test or module problem exists.	Module passed self-test.	Non-fatal failure (for example: bad fan).
Backplane Status 	N/A	N/A	N/A
Network Activity LED 	There is no network traffic on any port.	There is a high level of network traffic.	There is a low or moderate level of network traffic.
Port Status LEDs 1 – 12	Bad or no connection.	Port is connected to another operational network device.	Port is disabled by network management.

---

## Stack Director LED States


This section describes the LEDs states for the Stack Director. Table A-2 lists LED states for the Stack Director that are useful when troubleshooting the Stack Director.

**Table A-2: Stack Director LED States**

LED Name	Off	On	Blinking
Power OK 	Stack Director is not receiving power.	Stack Director has power.	Faulty power connection or insufficient power.
FRU OK 	Self-test is executing or LED is bad.	Stack Director passed self-test.	Stack Director failed self-test.
OBM Port	SLIP is not available through this interface.	SLIP is available through this interface.	There is SLIP activity on this line.
10Base2 Port Status 	The port is disabled by network management.	The port is available and can be connected to an operational LAN.	N/A
Network Activity 	No network traffic on the 10Base2 port or 10BaseT port.	Network has heavy traffic on the 10Base2 port or 10BaseT port.	Blinks faster and brighter as traffic increases on the 10Base2 port or 10BaseT port.
Management Access Port Status 	The port is disabled by network management.	The port is available and can be connected to an operational LAN.	N/A

*(continued on following page)*

## Stack Director LED States

LED Name	Off	On	Blinking
Stack Level Management Status 	The device at this level is not functional or not communicating with the Stack Director.	The device at this level is functional and is communicating with the Stack Director.	N/A



---

## Stack Station LED States

This section describes the LEDs states for the Stack Station.

Table A-3 lists LED states for the Stack Station that are useful when troubleshooting the Stack Station.

**Table A-3: Stack Station LED States**

LED Name	Off	On	Blinking
Power OK 	Stack Station is not receiving power.	Stack Station has power.	Faulty power connection or there is insufficient power.
Setup Port 	Stack Station failed self-test.	Stack Station passed self-test.	Fan is faulty.

---

## DIGITAL MultiSwitch Hub 612TX Problem Solving Using the LEDs

A problem is often indicated by the combined states of the DIGITAL MultiSwitch Hub 612TX's LEDs. Table A-4 lists the states of the LEDs for various error conditions, the probable causes, and corrective action to take.

---

### NOTE

If sufficient power becomes unavailable to a DIGITAL MultiSwitch Hub 612TX that is operating in a DIGITAL MultiSwitch 900, the module enters into a low power mode and suspends operations. The DIGITAL MultiSwitch 900 LCD displays the message, "Not Enough Power!"

---

**Table A-4: Problem Solving using LEDs.**

Symptom	Probable Cause	Corrective Action
Power LED is off.	The module is not receiving +5Vdc.	Check the power status on the module, Stack Director and Stack Station, or DIGITAL MultiSwitch 900.  If the module indicates that power is available for this module, press the release lever and reseal or remove the module.  If the problem persists, either replace the module or contact your service representative to correct the problem.

## DIGITAL MultiSwitch Hub 612TX Problem Solving Using the LEDs

Symptom	Probable Cause	Corrective Action
Module OK LED is off.	The module self-test is in progress.	Wait for self-test to complete.
	Self-test failed.	<p>If the LED does not light within 60 seconds, disconnect the module and plug in again.</p> <p>If self-test fails again, replace the module. If the problem persists, contact your service representative to correct the problem.</p>
The module OK LED is blinking, but continues to operate normally.	<p>A non-fatal error occurred.</p> <p>The module passed diagnostics with a non-fatal error; or a non-fatal error (fan failure) is being sensed currently, even though module passed diagnostics successfully when it was initialized.</p>	Power off and on. If the problem persists, either replace the module or contact your service representative to correct the problem.
Port Status LED is off.	Connection is bad (loose or incorrect cable).	Correct the cable connection.
	Port not connected.	None — normal operation.
Port Status LED is blinking green.	Port is disabled by management.	None — normal operation.

---

## Stack Director Problem Solving Using the LEDs

A problem is often indicated by the states of the LEDs on the Stack Director. The following table lists the states of the LEDs for various error conditions, the probable causes, and corrective action you may take.

---

### NOTE

During the power up reset sequence, the Activity LED and the FRU OK LED do not light.

---

Table A-5 list possible error conditions for the Stack Director that are useful when troubleshooting the Stack Director.

**Table A-5: Stack Director Error Conditions**

Symptom	Probable Cause	Corrective Action
Power OK LED is off.	Stack Director is not receiving primary power.	Ensure that the power cord is properly plugged into the Stack Director and a working AC outlet. Replace the Stack Director.
FRU OK LED is off or blinking.	Stack Director self-test failed.	Replace the Stack Director.
OBM Port Status LED does not light when self-test completes.	OBM port is faulty.	Replace the Stack Director.
10Base2 Port Status LED does not light when self-test completes.	Port is not enabled due to error.	Replace the Stack Director.
Network Activity LED does not light.	No network activity, cabling problem, or MAC is faulty on the Stack Director.	Check network connection or Replace Stack Director.



### Stack Director Problem Solving Using the LEDs

<b>Symptom</b>	<b>Probable Cause</b>	<b>Corrective Action</b>
Management Access Port Status LED does not light when self-test completes.	Port is not enabled due to error.	Replace the Stack Director.
A Stack Level Management Status LED does not light for a particular module.	Stack Director does not communicate with corresponding module.	Replace associated module.

## Stack Station Problem Solving Using the LEDs

A problem is often indicated by the states of the LEDs on the Stack Stations. The following table lists the state of the LEDs for various error conditions, the probable causes, and corrective action you may take.

---

### NOTE

During the power up reset sequence, the Activity LED and the FRU OK LED do not light.

---

Table A-6 list possible error conditions for the Stack Station that are useful when troubleshooting the Stack Station.

**Table A-6: Stack Station Error Conditions**

Symptom	Probable Cause	Corrective Action
Power OK LED is off.	Stack Station is not receiving primary power.	Check that the power cord is plugged in. Replace the Stack Station.
Setup Port LED does not light when a module is connected. <b>Note:</b> The Setup Port LED should not light when the Stack Station is a member of a managed stack.	Module or Stack Station is faulty.	Replace module, Stack Station.

---

# Appendix B

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## Connectors and 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 DIGITAL MultiSwitch Hub 612TX module and DIGITAL MultiSwitch 600 System.

For detailed information about Modular Media Interface (MM-100) connectors, refer to the *100 Mb/s Fast Ethernet Modular Media Cards Installation* manual.

#### In This Appendix

Topic	Page
DIGITAL MultiSwitch Hub 612TX Connectors and Pin Assignments	B-2
100BaseTX (8-pin MJ) Port Connector	B-2
Stack Director and Stack Station Connectors and Pin Assignments	B-3
Setup Port and Management Access Port Connector	B-3
OBM Port (9-Pin) Connector	B-4
10Base2 Connector	B-5
H8225 50-Ohm Terminator	B-5
Adapter	B-6
H8571-J Adapter	B-6

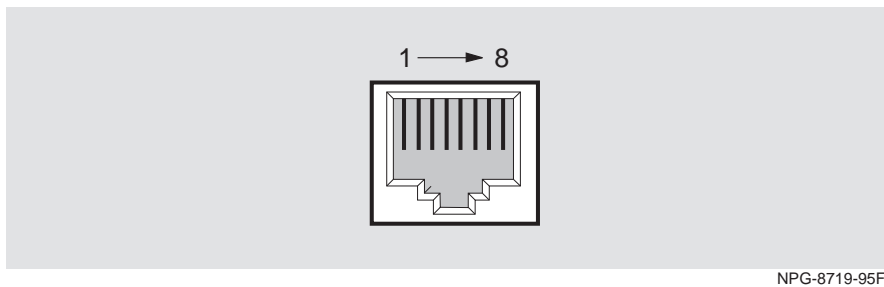
---

## DIGITAL MultiSwitch Hub 612TX Connectors and Pin Assignments

### 100BaseTX (8-pin MJ) Port Connector

All eleven fixed port connectors on the DIGITAL MultiSwitch Hub 612TX are 100BaseTX, 8-pin MJ, crossover connectors. Table B-1 defines the 8-pin MJ connector pin assignments. Figure B-1 shows their location.

**Figure B-1: 100BaseTX (8-pin MJ) Connector**



NPG-8719-95F

**Table B-1: 100BaseTX (8-pin MJ) Connector Pin Assignments**

Pin No.	Assignment
1	RX+
2	RX-
3	TX+
4	Not Connected
5	Not Connected
6	TX-
7	Not Connected
8	Not Connected

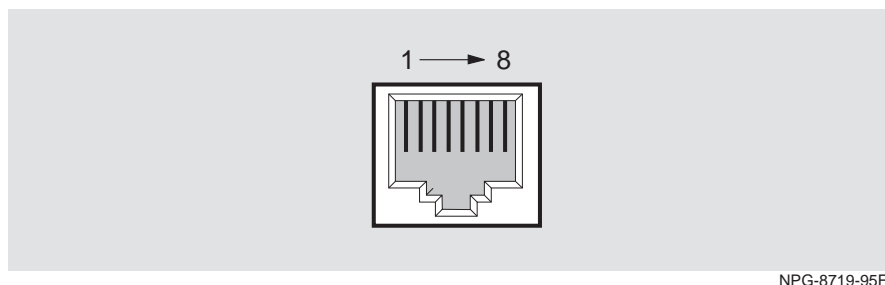
---

## Stack Director and Stack Station Connectors and Pin Assignments

### Setup Port and Management Access Port Connector

This 8-pin MJ connector is used for the setup port on the Stack Director and Stack Station and for the management access port on the Stack Director only. Table B-2 defines the pin assignments as shown in Figure B-2.

**Figure B-2: Stack Director and Stack Station Setup Port Connector**



NPG-8719-95F

**Table B-2: Stack Director and Stack Station Setup Port Connector Pin Assignments**

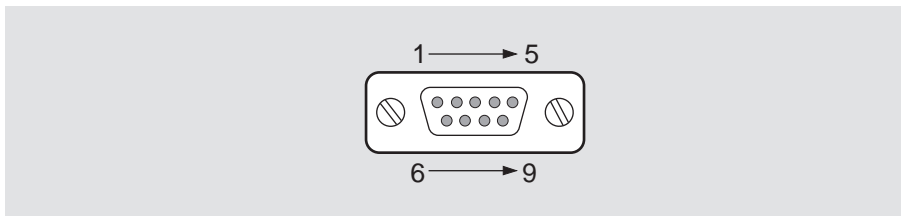
Pin No.	Assignment
1	No Connect
2	RD
3	GND
4	Unused
5	Unused
6	TD
7	+5
8	GND

## Stack Director and Stack Station Connectors and Pin Assignments

### OBM Port (9-Pin) Connector

Table B-3 describes the OBM connector pin assignments used on the Stack Director and Figure B-3 shows their location.

**Figure B-3: OBM Port (9-Pin) Connector**



NPG-0299-95F

**Table B-3: OBM Port (9-Pin) Connector Pin Assignments**

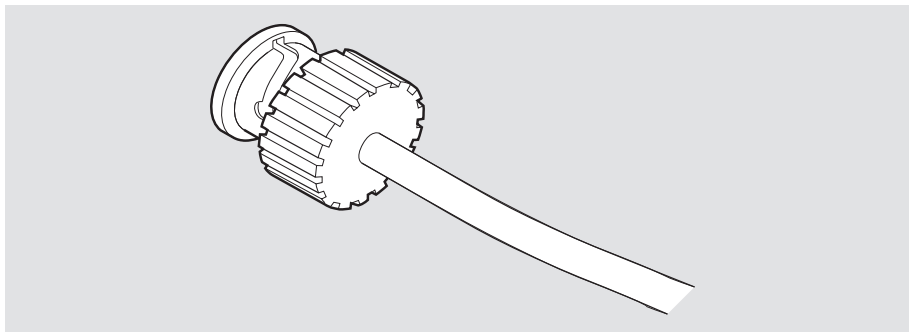
Pin No.	Assignment
1	Data Carrier Detect (DCD)
2	Receive Data (RXD)
3	Transmit Data (TXD)
4	Data Terminal Ready (DTR)
5	Ground
6	Data Set Ready (DSR)
7	Request To Send (RTS)
8	Clear To Send (CTS)
9	Not Connected

## Stack Director and Stack Station Connectors and Pin Assignments

### 10Base2 Connector

Figure B-4 shows the 10Base2 connector used on the Stack Director.

**Figure B-4: 10Base2 Connector**

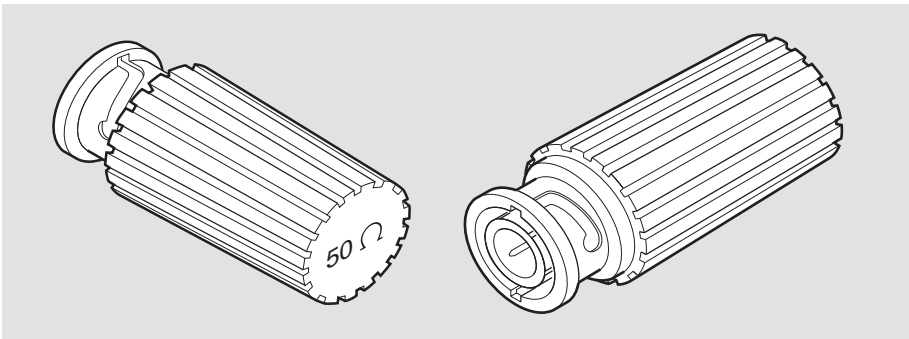


NPB-0626-96F

### H8225 50-Ohm Terminator

Figure B-5 shows the 50-ohm terminator needed to terminate the 10Base2 port on the Stack Director.

**Figure B-5: 50-Ohm Terminator**



NPB-0594-96F

## Adapter

---

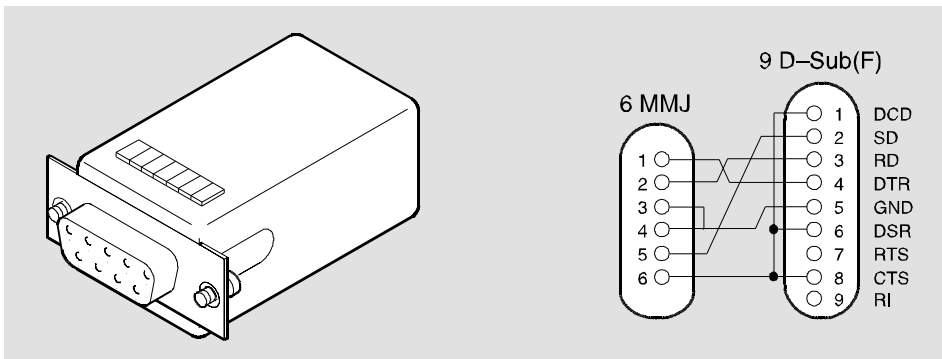
# Adapter

The following adapter can be used when connecting to the OBM port on the Stack Director.

### H8571-J Adapter

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

**Figure B-6: H8571-J Adapter**



NPG-5342-95F



# Appendix C

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## Product Specifications

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### Overview

#### Introduction

This appendix lists product and acoustical specifications for the DIGITAL MultiSwitch Hub 612TX, Stack Director, Stack Station, and connectors used with these products.

#### In This Appendix

Topic	Page
Product Specifications for the DIGITAL MultiSwitch Hub 612TX	C-2
Product Specifications for the Stack Director	C-3
Product Specifications for the Stack Station	C-4
Acoustical Specifications	C-5
Connectors	C-7

---

## Product Specifications for the DIGITAL MultiSwitch Hub 612TX

Table C-1 lists the product specifications for the DIGITAL MultiSwitch Hub 612TX.

**Table C-1: Product Specifications for the DIGITAL MultiSwitch 612TX**

---

<b>Parameter</b>	<b>Specification</b>
<b>Environment</b>	
Operating Temperature <sup>1</sup>	5° C to 50° C (41 ° F to 122 ° F)
Relative Humidity	10% to 95% noncondensing
Altitude	
• Operating	Sea level to 2400 m (8000 ft)
• Non-operating	Sea level to 4900 m (16000 ft)
Power	23.6 W total power
	• 4.0 A, 5 Vdc
	• 0.3 A, 12 Vdc
	• 0.0 A, 15 Vdc
<b>Physical</b>	
Height (installed horizontally)	4.45 cm (1.75 in)
Height (installed vertically)	44.45 cm (17.5 in)
Width (installed horizontally)	44.45 cm (17.5 in)
Width (installed vertically)	4.45 cm (1.75 in)
Depth	15.25 cm (6.02 in)
Weight	1.25 kg (2.75 lb)
<b>Shock (Class A/B for products weighing under 100 lbs)</b>	10 G / 10 ms half sine pulse in three orthogonal axes
<b>Vibration (Class C)</b>	5 to 200 Hz sine sweep @ 0.25 G limited by 0.02" (0.5mm) displacement DA* 200 to 500 Hz sine sweep @ 0.10 G
<b>Certification</b>	CE, CSA, FCC, TÜV, UL, VCCI

---

<sup>1</sup> 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 3200 ft.

## Product Specifications for the Stack Director

Table C-2 lists the product specifications for the Stack Director.

**Table C-2: Product Specifications for the Stack Director**

Parameter	Specification
<b>Environment</b>	
Operating Temperature <sup>1</sup>	5° C to 50° C (4° F to 122° F)
Relative Humidity	10% to 95% noncondensing
Altitude	
• Operating	Sea level to 2400 m (8000 ft)
• Non-operating	Sea level to 4900 m (16000 ft)
Power	72 W total input power
• Input:	100 Vac - 120 Vac @ 1.8A 220 Vac - 240 Vac @ 1.0 A
• Output at 48-pin connector (max):	6.0 A @ 5.2 Vdc 0.7 A @ 12.0 Vdc
<b>Physical</b>	
Height	4.45 cm (1.75 in) The height of the mounting tray is 8.89 cm (3.5 in).
Width	44.45 cm (17.5 in)
Depth	12.65 cm (4.975 in); 27.9 cm (10.975 in) with a functional module attached
Weight	2.02 Kg (4.45 lb)
<b>Shock (Class A/B for products weighing under 100 lbs)</b>	10 G / 10 ms half sine pulse in three orthogonal axes
<b>Vibration (Class C)</b>	5 to 200 Hz sine sweep @ 0.25 G limited by 0.5mm (0.02 in) displacement DA* 200 to 500 Hz sine sweep @ 0.10 G
<b>Certification</b>	CE, CSA, FCC, TÜV, UL, VCCI, C-TICK

<sup>1</sup> For sites above sea level 2400 m (8,000 ft), decrease the operating temperature specification by 1.8° C for each 1000 m or 3.2°F for each 3200 ft.

---

## Product Specifications for the Stack Station

Table C-3 lists the product specifications for the Stack Station.

**Table C-3: Product Specifications for the Stack Station**

---

Parameter	Specification
<b>Environment</b>	
Operating Temperature <sup>1</sup>	5° C to 50° C (41 ° F to 122 ° F)
Relative Humidity	10% to 95% noncondensing
Altitude	
• Operating	Sea level to 2400 m (8000 ft)
• Non-operating	Sea level to 4900 m (16000 ft)
Power	72 W total input power
• Input:	100 Vac - 120 Vac @ 1.8A 220 Vac - 240 Vac @ 1.0 A
• Output at 48-pin connector (max):	6.0 A @ 5.2 Vdc 0.7 A @ 12.0 Vdc
<b>Physical</b>	
Height	4.45 cm (1.75 in) The height of the Mounting Tray is 8.89 cm (3.5 in)
Width	44.45 cm (17.5 in)
Depth	12.65 cm (4.975 in); 27.9 cm (10.975 in) with a functional module attached
Weight	1.75 kg (3.85 lb)
<b>Shock (Class A/B for products weighing under 100 lbs)</b>	10 G / 10 ms half sine pulse in three orthogonal axes
<b>Vibration (Class C)</b>	5 to 200 Hz sine sweep @ 0.25 G limited by 0.5mm (0.02 in) displacement DA* 200 to 500 Hz sine sweep @ 0.10 G
<b>Certification</b>	CE, CSA, FCC, TÜV, UL, VCCI, C-TICK

---

<sup>1</sup> For sites above sea level 2400 m (8,000 ft), decrease the operating temperature specification by 1.8° C for each 1000 m or 3.2°F for each 3200 ft.

---

## Acoustical Specifications

Table C-4 lists the acoustical specifications for the module with the Stack Station and Stack Director in English. Table C-5 lists the acoustical specifications for the module in German.

**Table C-4: Acoustical Specifications**

Declared Values per ISO 9296 and ISO 7779<sup>1</sup>

Product	Sound Power Level $L_{WA,d}$ , B	Sound Pressure Level $L_{pAm}$ , dBA (bystander positions)
	Idle/Operate	Idle/Operate
DLSSM-S* Stack Director	5.2	37
DLSSM-S* + DLMT1-MA Stack Director + DIGITAL MultiSwitch Hub 612TX	5.5	40
DLSSU-S* Stack Station	no measurable noise emission	no measurable noise emission
DLSSU-S* + DLMT1-MA Stack Station + DIGITAL MultiSwitch Hub 612TX	5.1	37

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

Acoustical Specifications

**Table C-5: German Acoustical Specifications**  
**Schallemissionswerte Werteangaben nach ISO 9296 und ISO 7779/DIN**  
**EN27779<sup>2</sup>**

<b>Produkt</b>	<b>Schalleistung- speigel <math>L_{WAd}</math>, B</b>	<b>Schalldruckpegel <math>L_{pAm}</math>, dBA (Zuschauer- positionen)</b>
	Leerlauf/Betrieb	Leerlauf/Betrieb
DLSSM-S* Stack Director	5,2	37
DLSSM-S* + DLMT1-MA Stack Director + DIGITAL MultiSwitch Hub 612TX	5,5	40
DLSSU-U* Stack Station	keine meßbaren Geräuschemissionen	keine meßbaren Geräuschemissionen
DLSSU-U* + DLMT1-MA Stack Station + DIGITAL MultiSwitch Hub 612TX	5,1	37

<sup>2</sup> Aktuelle Werte für spezielle Ausrüstungsstufen sind über die Digital Equipment Vertretungen erhältlich.  
 1 B = 10 dBA.

\* indicates one of the following:

<b>Suffix</b>	<b>Country</b>	<b>Suffix</b>	<b>Country</b>
-SA/-UA	United States	-ST/-UT	Israel
-SD/-UD	Denmark	-SX/-UX	Central Europe
-SE/-UE	United Kingdom	-SZ/-UZ	Australia
-SI/-UI	Italy	-S3/-U3	No Power Cord
-SK/-UK	Switzerland	-TJ/-VJ	India

---

## Connectors

Table C-6 provides a list connectors for the DIGITAL MultiSwitch Hub 612TX, Stack Director and Stack Station.

**Table C-6: Connectors**

<b>Connectors</b>	<b>Quantity</b>
<b>DIGITAL MultiSwitch Hub 612TX</b>	
8-pin MJ Port Connector	11
<b>Stack Director</b>	
Console Port Connector	1
10Base2 (ThinWire) Port Connector	1
OBM (RS-232) Port Connector	1
UTP/ScTP (Screened Twisted Pair) Port Connector	1
Reserved Port Connector	1
<b>Stack Station</b>	
Setup Port Connector	1
IEC Connector (Power)	1

---





# Appendix D

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## Ordering Options

---

### Overview

#### Introduction

This appendix describes the ordering information for the DIGITAL MultiSwitch Hub 612TX.

#### In This Appendix

Topic	Page
Ordering Options	D-2
Ordering Notes	D-4
Parts List	D-5

---

## Ordering Options

Option	Part Number
DIGITAL MultiSwitch Hub 612TX, 12-port 100 Mb/s Hub (see note 1 in Ordering Notes section)	DLMT1-MA
Stack Station (see note 2 in Ordering Notes section)	DLSSU-U*
Stack Director (see note 2 in Ordering Notes section)	DLSSM-S*
Expansion Slot MM-100 Options (see note 3):	
• 100BaseTX	DEXYU-AA
• 100BaseFX	DEXYM-AA
• 100BufFX	DEXYM-BA
Rack Mounting Tray (see note 4)	H3108-MU Included with Stack Director.
Accessory package includes <sup>1</sup> :	DLSCC-M4
• Dust Cap (1)	
• Mounting Plugs (2)	
• Cable-free stack interconnect card (4)	
• Stabilizer Screw (8)	
• Pylons (8)	
Straight-through Cable	BN25G-xx <sup>2</sup>
Crossover Cable	BN24Q-xx <sup>2</sup>
Adapter	H8571-J
Adapter	H8575-A

<sup>1</sup>Accommodates four Stack Station levels. These parts are supplied as spares. All needed parts are supplied with the Stack Director and Stack Station.

<sup>2</sup>Cables are in 1, 3, 4, and 7 meter lengths.

## Ordering Options

\* indicates one of the following:

<b>Suffix</b>	<b>Country</b>	<b>Suffix</b>	<b>Country</b>
-SA/-UA	United States	-ST/-UT	Israel
-SD/-UD	Denmark	-SX/-UX	Central Europe
-SE/-UE	United Kingdom	-SZ/-UZ	Australia
-SI/-UI	Italy	-S3/-U3	No Power Cord
-SK/-UK	Switzerland	-TJ/-VJ	India

## Ordering Options

### Ordering Notes

The following option notes should be considered when ordering DIGITAL MultiSwitch 600 components:

<b>Note</b>	<b>Description</b>
<b>1</b>	Order basic 600-series functional modules (hubs, switches, or both) available for a DIGITAL MultiSwitch 600 system. It will work in a DIGITAL MultiSwitch 600 or in a DIGITAL MultiSwitch 900.
<b>2</b>	Order one Stack Station or Stack Director to build a DIGITAL MultiSwitch 600 System. One Stack Director (DLSSM) is needed to manage a stack of up to eight modules. The Stack Director comes complete with a rack mount kit.
<b>3</b>	Order necessary Modular Media Interface Options.
<b>4</b>	Order a mounting tray if you are not ordering a Stack Director and you plan to build a stack of more than one level or you plan to install the stack in a standard 19-inch or relay rack.

---

## Parts List

The following table provides a list of available parts and part numbers for the DIGITAL MultiSwitch 600 system.

Part	Part Number
<b>Stack Director (includes):</b>	<b>DLSSM-S*</b>
Stack Director	DLSSM-M
AC Power Cable	BN*
Quick Start Card	EK-DLSSM-QS
Installation Guide	EK-DLSSM-IN
Warranty Card	EK-NETWW-CM
MultiSwitch 600 Document Sub-Assembly (QC Kit)	QC-04RAA-GZ
Riser Card	50-24214-01
Terminator, 50 ohm	H8225-MU
Rack Mount Tray Kit	H3108-MU
<b>Stack Station (includes):</b>	<b>DLSSU-U*</b>
Stack Station	DLSSU-M
AC Power Cable	BN*
Quick Start Card	EK-DLSSM-QS
Installation Guide	EK-DLSSM-IN
Warranty Card	EK-NETWW-CM
MultiSwitch 600 Document Sub-Assembly (QC Kit)	QC-04RAA-GZ
Riser Card	50-24214-01
1 Stabilizer Screw (Wing Nuts) - (2)	74-51632-01
1 Wing Nut (Mounting plug) - (2)	74-51644-01
<b>Accessories Package<sup>1</sup>:</b>	<b>DLSCC-M4</b>
Dust Cap (1)	
Mounting Plugs (2)	
Backplane Interconnect Riser Card (4)	
Stabilizer Screw (8)	
Alignment Pylons (8)	

<sup>1</sup>Accessories Package is included with each Stack Station and Stack Director.

## Parts List

\* indicates one of the following:

<b>Suffix</b>	<b>Country</b>	<b>Suffix</b>	<b>Country</b>
-SA/-UA	United States	-ST/-UT	Israel
-SD/-UD	Denmark	-SX/-UX	Central Europe
-SE/-UE	United Kingdom	-SZ/-UZ	Australia
-SI/-UI	Italy	-S3/-U3	No Power Cord
-SK/-UK	Switzerland	-TJ/-VJ	India

# Appendix E

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## Associated Documentation

---

### Overview

#### Introduction

This appendix describes the associated documentation, how to order additional documentation, and correspondence.

#### In This Appendix

Topic	Page
Documentation	E-2
How to Order Additional Documentation	E-5
Correspondence	E-6

---

## Documentation

The following documents provide information relating to the DIGITAL MultiSwitch 612TX module. To order any of the following documents, refer to the section titled How to Order Additional Documentation.

---

<b>Title and Order Number</b>	<b>Description</b>
<i>DIGITAL MultiSwitch 600 System Installation and Configuration</i> EK-DLSSM-IN	Provides installation, setup, and configuration information for the DIGITAL MultiSwitch 600 System.
<i>DIGITAL MultiSwitch 600 System Quick Start</i> EK-DLSSM-QS	Provides a four-page guide for installation and setup information for the DIGITAL MultiSwitch 600 System.
<i>DIGITAL MultiSwitch Hub 612TX Quick Start</i> EK-DLMT1-QS	Provides a four-page guide for installation, setup, and configuration information for the DIGITAL MultiSwitch Hub 612TX installed in a DIGITAL MultiSwitch 600 System or DIGITAL MultiSwitch 900.
<i>DIGITAL MultiSwitch Hub 624T Installation and Configuration</i> EK-DLMR2-IN	Provides installation, setup, and configuration information for the DIGITAL MultiSwitch Hub 624T installed in a DIGITAL MultiSwitch 600 System or DIGITAL MultiSwitch 900.
<i>DIGITAL MultiSwitch Hub 624T Quick Start</i> EK-DLMR2-QS	Provides a four-page guide for installation, setup, and configuration information for the DIGITAL MultiSwitch Hub 624T installed in a DIGITAL MultiSwitch 600 System or DIGITAL MultiSwitch 900.



Title and Order Number	Description
<i>DIGITAL MultiSwitch 612EX Installation and Configuration</i> EK-DLMWL-IN	Provides installation, setup, and configuration information for the DIGITAL MultiSwitch 612EX installed in a DIGITAL MultiSwitch 600 System or DIGITAL MultiSwitch 900.
<i>DIGITAL MultiSwitch Hub 612EX Quick Start</i> EK-DLMWL-QS	Provides a four-page guide for installation, setup, and configuration information for the Digital MultiSwitch 612EX installed in a Digital MultiSwitch 600 System or DIGITAL MultiSwitch 900.
<i>100 Mb/s Fast Ethernet Modular Media Interface Cards Installation</i> EK-MBITM-IM	Provides installation and operating guidelines for installing, verifying, and removing modular media interface cards. Describes cabling and LED information.
<i>DIGITAL MultiSwitch 900 Owner's Manual</i> EK-DH2MS-OM	Provides installation, use, security, and troubleshooting information for the DIGITAL MultiSwitch 900.
<i>DEChub ONE Installation</i> EK-DEHU2-IN	Provides installation and operation guidelines for standalone DIGITAL MultiSwitch Hub 612TX configuration, including mounting options and cabling.
<i>clearVISN Installation</i> AA-QX86B-TK	Describes how to install clearVISN software. It includes a list of distribution kit contents, system requirements, pre-installation considerations, and the installation procedure.
<i>clearVISN Overview</i> AA-QX87B-TK	Provides an overview of clearVISN, an explanation of each clearVISN application, and descriptions of all concepts necessary to understand and use the application efficiently.

## Documentation

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<b>Title and Order Number</b>	<b>Description</b>
<i>clearVISN User's Guide AA-QX88B-TK</i>	Provides information for starting each application, configuring them (when necessary), and general use information.
<i>DEChub Network Modules 900-Series Switch Reference EK-SWTCH-HR</i>	Describes the functions and features of DIGITAL's HUB-based 900-Series switching products.
<i>Bridge and Extended LAN Reference EK-DEBAM-HR</i>	Describes how bridges are used to create extended local area networks (LANs). This includes the use of bridges in extended LAN configurations, information on LAN interconnections, overall bridge operation, spanning tree, and solving bridge-related problems in a network.

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## How to Order Additional Documentation

To order additional documentation, use the following information.

---

<b>To Order:</b>	<b>Contact:</b>
By Telephone	U.S.A. (except Alaska, New Hampshire, and Hawaii): 1-800-DIGITAL (1-800-344-4825) Alaska, New Hampshire, and Hawaii: 1-603-884-6660 Canada: 1-800-267-6215
Electronically (U.S.A. only)	Dial 1-800-DEC-DEMO (For assistance, call 1-800-DIGITAL)
By Mail (U.S.A. and Puerto Rico)	DIGITAL EQUIPMENT CORPORATION P.O. Box CS2008 Nashua, New Hampshire 03061 (Place prepaid orders from Puerto Rico with the local DIGITAL subsidiary: 809-754-7575)
By Mail (Canada)	DIGITAL EQUIPMENT of CANADA LTD. 940 Belfast Road Ottawa, Ontario, Canada K1G 4C2 Attn.: A&SG Business Manager
Internationally	DIGITAL EQUIPMENT CORPORATION Attn.: A&SG Business Manager c/o local DIGITAL subsidiary or approved distributor
Internally	U.S. Software Supply Business (SSB) DIGITAL EQUIPMENT CORPORATION 8 Cotton Road Nashua, New Hampshire 03063

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## Correspondence

### Documentation Comments

If you have comments or suggestions about this document, send them to the Network Products Business Organization.

Attn.: Documentation Project Manager  
FAX: (978) 506-6093  
E-MAIL: doc\_feedback@lkg.mts.dec.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:

<b>Americas:</b>	<a href="http://www.networks.digital.com">http://www.networks.digital.com</a>
<b>Europe:</b>	<a href="http://www.networks.europe.digital.com">http://www.networks.europe.digital.com</a>
<b>Asia Pacific:</b>	<a href="http://www.networks.digital.com.au">http://www.networks.digital.com.au</a>
<b>Japan:</b>	<a href="http://www.dec-j.co.jp/ic/network">http://www.dec-j.co.jp/ic/network</a>

# Appendix F

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## Service Information and Support

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### Overview

#### Introduction

This appendix provides service and support information for the Digital MultiSwitch 600 system.

#### In This Appendix

Topic	Page
Warranty Service	F-2

## Warranty Service

This product has a limited one year RETURN TO DIGITAL WARRANTY. Please refer to the Network Products Warranty and Service Information Notice (EK-NETWW-CM) that accompanies the product for more detailed information.

Warranty support services include the product advisory assistance, available from Digital's Customer Support Centers. This support is designed to help customers who have questions regarding the use and setup of their networking product. This will include:

- Assistance in using the product documentation.
- Verifying that correct procedures or commands are being used.
- Answering general questions on such issues as product compatibility, configuration rules and guidelines, and software/firmware release levels.
- Assistance in verifying that product hardware is functioning correctly or malfunctioning.

## Appendix G

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# Accessing and Configuring RMON Groups

---

## Overview

### Introduction

This appendix describes how to access the four RMON groups and how to configure the Alarms and Events groups.

### In This Appendix

Topic	Page
What Is RMON?	G-2
Groups Supported	G-3
How to Access RMON Groups	G-4

What Is RMON?

---

## What Is RMON?

RMON is a Remote Network Monitoring Management Information Base (RMON MIB). RMON gathers a wide variety of statistical information about network operation. A typical network consists of multiple network segments with one RMON agent connected to each segment. RMON gathers this information by examining each packet passed on a network segment. Segment statistics are stored in counters within the module. The counters are continuously updated and reset at powerup.

RMON also captures and stores network traffic information. RMON allows you to examine these captured packets or sequences of packets to identify and isolate network operational software or hardware problems.

A list of RMON features is described in Chapter 1.

---

### NOTE

The online help includes management tasks and information for the RMON Manager application.

---



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## Groups Supported

The four RMON groups supported by this module are Statistics, History, Alarms, and Events. The following table defines these four groups:

<b>This group...</b>	<b>Allows you to...</b>
Statistics	Obtain an array of operational statistics including: <ul style="list-style-type: none"> <li>• Packets</li> <li>• Octets</li> <li>• Broadcasts</li> <li>• Collisions</li> <li>• Dropped packets</li> <li>• Fragments</li> <li>• CRC alignment errors</li> <li>• Undersize/oversize packets</li> <li>• Multicasts</li> <li>• Jabbers</li> <li>• 64 octet packets</li> <li>• 65 to 127 octet packets</li> <li>• 128 to 255 octet packets</li> <li>• 256 to 511 octet packets</li> <li>• 512 to 1023 octet packets</li> <li>• 1024 to 1518 octet packets</li> </ul>
History	Obtain a historical representation of statistics for individual ports for customized trend analysis.
Alarms	Set a wide variety of thresholds and sampling intervals on any statistic to create an alarm condition. An alarm will cause an event. You may set threshold values as: <ul style="list-style-type: none"> <li>• An absolute value</li> <li>• A rising value</li> <li>• A falling value</li> <li>• A delta value</li> </ul>
Events	Create entries in the monitor log and generate SNMP traps for selected events. You can initiate events by setting an alarm on any counter. The log includes a description and the time of each event.

---

---

## How to Access RMON Groups

This section provides you with procedures that describe how to access the RMON Groups.

<b>RMON Group</b>	<b>To Access/Use these Groups ...</b>
Statistics and History	Use the clearVISN MultiChassis Manager
Alarms and Events	Use any SNMP network manager

### Accessing Statistics and History

To access the Statistics and History groups, you must use the clearVISN MultiChassis Manager as follows:

<b>Step</b>	<b>Action</b>
<b>1</b>	Run the clearVISN MultiChassis Manager.
<b>2</b>	Double-click on the DIGITAL MultiSwitch Hub 612TX module. (The summary screen displays the module's summary.)
<b>3</b>	Click on the RMON button to display the Statistics screen.
<b>4</b>	Click on the HISTORY button on the Statistics screen.

For additional Statistics and History information refer to online help.

### Accessing Alarms and Events

This section describes how to set up a condition to be monitored (an alarm) and an event to be generated once that condition has occurred. You use an SNMP network manager to set up conditions and events. For a more complete description of the alarmTable and eventTable, refer to RFC 1757: S. Waldbusser, "Remote Network Monitoring Management Information Base", 02/10/1995.

The event group consists of the eventTable and the logTable. The alarmTable contains configuration entries that define a variable, polling period, and threshold parameters.

If an entry is found to have crossed the threshold value, an event is generated that is processed as specified by your entries in the eventTable. Thus, the eventTable controls the generation and notification of events from the device.

## How to Access RMON Groups

The RMON Alarms and Events MIB objects eventDescription, alarmOwner, and eventOwner support up to 127 characters. MIB object eventCommunity supports up to 32 characters. The maximum number of entries that can be placed in the alarmTable is 20. For the eventTable, the maximum is 32.

### Alarm and Event Table Entries

Alarm table entries can only be created for SNMP Integer MIB variables of the following types:

- INTEGER
- Counter
- Gauge
- TimeTicks

Table G-1 and Table G-2 list and define the fields that make up an alarm table entry and an event table entry.

## How to Access RMON Groups

**Table G-1: Alarm Table Entry Fields**

<b>Alarm Table Entry Fields</b>	<b>Definition</b>
alarmIndex	An index that uniquely identifies an entry (see note below).
alarmInterval	The interval, in seconds, over which the data is sampled and compared with the rising and falling threshold.
alarmVariable	The object identifier of the particular variable to be sampled.
alarmSampleType	The method of sampling the selected variable and calculating the value to be compared against the thresholds.
alarmValue	The value of the statistic during the last sampling period (see note below).
alarmStartupAlarm	The alarm that may be sent when this entry is first set to valid.
alarmRisingThreshold	Rising (increasing) threshold for the sampled statistic.
alarmFallingThreshold	Falling (decreasing) threshold for the sampled statistic.
alarmRisingEventIndex	The index of the eventEntry that is used when a rising threshold is crossed.
alarmFallingEventIndex	The index of the eventEntry that is used when a falling threshold is crossed.
alarmOwner	The person who configured this entry and is therefore using the resources assigned to it.
alarmStatus	The status of this alarm entry.

---

### **NOTE**

The alarmIndex and alarmValue objects are read-only. You cannot set these fields. The alarmIndex is implicitly specified when the entry is created. The alarmValue is made available after the current sampling period.

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**Table G-2: Event Table Entries**

<b>Event Table Entry Fields</b>	<b>Definition</b>
eventIndex	An index that uniquely identifies an entry (see note below).
eventDescription	A comment describing this event.
eventType	The type of notification that will occur when the threshold is being reached.
eventCommunity	If an SNMP trap is to be sent, it will be sent to the SNMP community specified.
eventLastTimeSent	The value of sysUpTime at the time this event entry last generated an event. (see note below).
eventOwner	The person who configured this entry and is therefore using the resources assigned to it.
eventStatus	The status of this event entry.

**NOTE**

The eventIndex and eventLastTimeSent objects are read-only. You cannot set these fields. The eventIndex is implicitly specified when the entry is created. The eventLastTimeSent is made available after the current sampling period.

**How Traps Work**

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 RMON trap messages. For additional information on traps, refer to RFC 1215: M. Rose, “A Convention for Defining Traps for use with the SNMP”, 03/27/1991.

The trap IP address can be configured on all DIGITAL MultiSwitch 900 modules through the device’s set-up port. With the exception of the DECserver 900 products, the trap IP address can also be added via SNMP set-requests to the device’s private MIB (pcomSnmpAuthTrapAddressTable).

## How to Access RMON Groups

You can specify that when an alarm condition is reached, a trap is generated and sent to the trap sinks specified. For additional information on how to specify trap generation, refer to eventType RFC 1757: S. Waldbusser, "Remote Network Monitoring Management Information Base", 02/10/1995.

# Glossary

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## Overview

### Introduction

This glossary lists and defines terms used in the DIGITAL MultiSwitch 600 system documentation.

### In This Glossary

Topic	Page
Terms	Glossary-2

## Terms

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## Terms

This manual uses the following terms

<b>Terms</b>	<b>Descriptions</b>
Ethernet	Local Area Network (LAN) compatible with the ISO 802-3 ANSI/IEEE 802.3 standards and the Ethernet standards for Carrier Sense Multiple Access with Collision Detection (CSMA/CD) local area networks (LANs).
Fast Ethernet	A 100 Mb/s extension to Ethernet, also referred to as 100BaseT. Fast Ethernet uses ISO 802-3 ANSI/IEEE Standard 802.3, but implements the protocol at 100 Mb/s. MAC frame formats and sizes are identical to those used by 10 Mb/s Ethernet.
Hot-swappable	<p>The removal or insertion of a module into either the DIGITAL MultiSwitch 600 System or the DIGITAL MultiSwitch 900 without disrupting power to the unit or affecting the connectivity to other modules in the stack or chassis.</p> <p>Do not simultaneously hot-swap more than one module. Simultaneously inserting or removing more than one module can cause problems with the operation of other installed modules.</p>
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



## Terms

<b>Terms</b>	<b>Descriptions</b>
DIGITAL MultiSwitch 600 System	<p>The DIGITAL MultiSwitch 600 System is a shared-to-switch workgroup system with modular components.</p> <p>The DIGITAL MultiSwitch 600 System contains Stack Stations and a Stack Director which provide power, backplane interconnect and SNMP management to a DIGITAL MultiSwitch 600 System system in a stack configuration. The DIGITAL MultiSwitch 600-series functional modules (hubs and switches) attach to the Stack Station or Stack Director.</p>
Stack Director	A 72 watt power supply, setup port, backplane, and SNMP agent interface for a functional module and the MultiSwitch 600 system.
Stack Station	A 72 watt power supply and setup port interface for functional module.
dedicated Ethernet (formerly ThinWire)	10Base2 coaxial cable 10 Mb/s Ethernet connection.
Twisted Pair	<p>Twisted-pair cable 10 Mb/s Ethernet connection.</p> <p>This is wiring similar to that found in the telephone system, consisting of two insulated wires loosely twisted around each other to help cancel out induced noise in balanced circuits.</p>
100BaseTX	100 Mb/s Fast Ethernet connection using UTP cable.
100BaseFX	100Mb/s Fast Ethernet connection using multimode fiber-optic cable.



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