

DIGITAL MultiSwitch 600 System

Installation and Configuration

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This book describes how to assemble, configure, and disassemble a DIGITAL MultiSwitch 600 System.

Revision/Update Information:

This is a revised document.

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Preface

Overview

About this Manual

This manual provides a description of the DIGITAL MultiSwitch 600 Stack Director and Stack Station and provides procedures for assembling, configuring, and disassembling the DIGITAL MultiSwitch 600 system.

Intended Audience

This manual is intended for use by personnel who assemble, configure, and disassemble the DIGITAL MultiSwitch 600 system.

Organization

This manual is organized as follows:

Chapter/ Appendix	Description
1	Provides an overview, describes features, and describes the front and back panels of the Stack Director and the Stack Station.
2	Provides instructions for assembling the DIGITAL MultiSwitch 600 Stack Director and Stack Stations.
3	Provides instructions for managing the DIGITAL MultiSwitch 600 stack.
4	Provides instructions for removing a level from a DIGITAL MultiSwitch 600 stack.
A	Provides installation-specific problem solving information using the LEDs.
B	Provides connector and pin assignment information.
C	Provides product specifications.
D	Provides list of ordering options.
E	Provides list of associated documents.
F	Service Information/Support.
Glossary	Provides a glossary of terms.
Index	Provides an index.

Conventions

Overview

This manual uses the following conventions.

Convention	Description
Special Type	Indicates system output in examples.
Boldface	Indicates user input in examples.
<Return>	Indicates that you should press the Return Key.

Safety

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

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

CAUTION	Static electricity can damage modules and electronic components. DIGITAL recommends using a grounded antistatic wrist strap and a grounded work surface when handling any modules.
ACHTUNG	Module und elektronische Komponenten können durch elektrostatische Entladungen beschädigt werden. Benutzen Sie immer eine antistatische Gelenkmanschette und eine geerdete Arbeitsunterlage, wenn Sie am offenen Gerät arbeiten.
ATTENTION	Les charges excessives d'électricité statique peuvent endommager les modules et les composants électroniques. DIGITAL conseille l'utilisation d'un bracelet de masse et d'un plan de travail mis à la terre lors de la manipulation des modules.
PRECAUCION	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.

Safety

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 device.
ACHTUNG	Stellen Sie in jedem Falle sicher, daß dieses Gerät vorschriftsmäßig geerdet ist. An einen Stromversorgungskreis dürfen nur dann mehr als fünf Stack Stations angeschlossen werden, wenn der Stromkreis durch einen Schutzschalter abgesichert ist.
DANGER	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.
ADVERTENCIA	Asegúrese siempre de que esta unidad esté puesta a tierra adecuadamente. No conecte más de cinco estaciones en pila en una platina de alimentación a menos que esté protegida por un dispositivo GFCI.

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

Safety

CAUTION	If power is interrupted during Stage 3 of the DLU process, the firmware image can become corrupted. Do not turn off power to the unit or perform any action that can cause the unit to lose power during Stage 3 of the DLU process.
ACHTUNG	Solite während der Phase 3 des DLU-Prozesses eine Unterbrechung der Stromversorgung eintreten, kann das Firmwareprogramm zerstört werden. Aus diesem Grunde wird dringend empfohlen, Vorkehrungen zu treffen, daß während der Durchführung dieser Phase 3 die Systemeinheit weder ausgeschaltet noch die Stromversorgung unterbrochen werden kann.
ATTENTION	L'image du microprogramme risque d'être corrompue, en cas de coupure de courant au cours de l'étape 3 du processus DLU. Ne mettez pas l'unité hors tension et n'exécutez aucune action risquant d'entraîner une coupure d'alimentation au cours de cette étape.
PRECAUCIÓN	Si se interrumpe el suministro eléctrico durante la Etapa 3 del proceso DLU, puede dañarse la imagen del firmware. No se debe apagar la unidad ni realizar ninguna operación que pueda causar una interrupción del suministro de la unidad durante la Etapa 3 del mencionado proceso.

Chapter 1

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

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What Is the DIGITAL MultiSwitch 600 System?	1-2
What Is a Stack Director?	1-6
What Is the Stack Station?	1-11

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 7 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 Network 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 DEChub 900 MultiSwitch

The key DIGITAL MultiSwitch 600 products include:

- 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 624EX — 24-port 10-to-100 Mb/s Ethernet/Fast Ethernet switch module
- DIGITAL MultiSwitch Hub 612TX — 12-port 100 Mb/s Fast Ethernet hub module
- DIGITAL MultiSwitch 600 Stack Station — power supply for MultiSwitch hub and switch modules
- DIGITAL MultiSwitch 600 Stack Director — power supply and SNMP manager for MultiSwitch 600 hub and switch modules

What Is the DIGITAL MultiSwitch 600 System?

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

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 several internal LAN channels.

Figure 1-1 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.

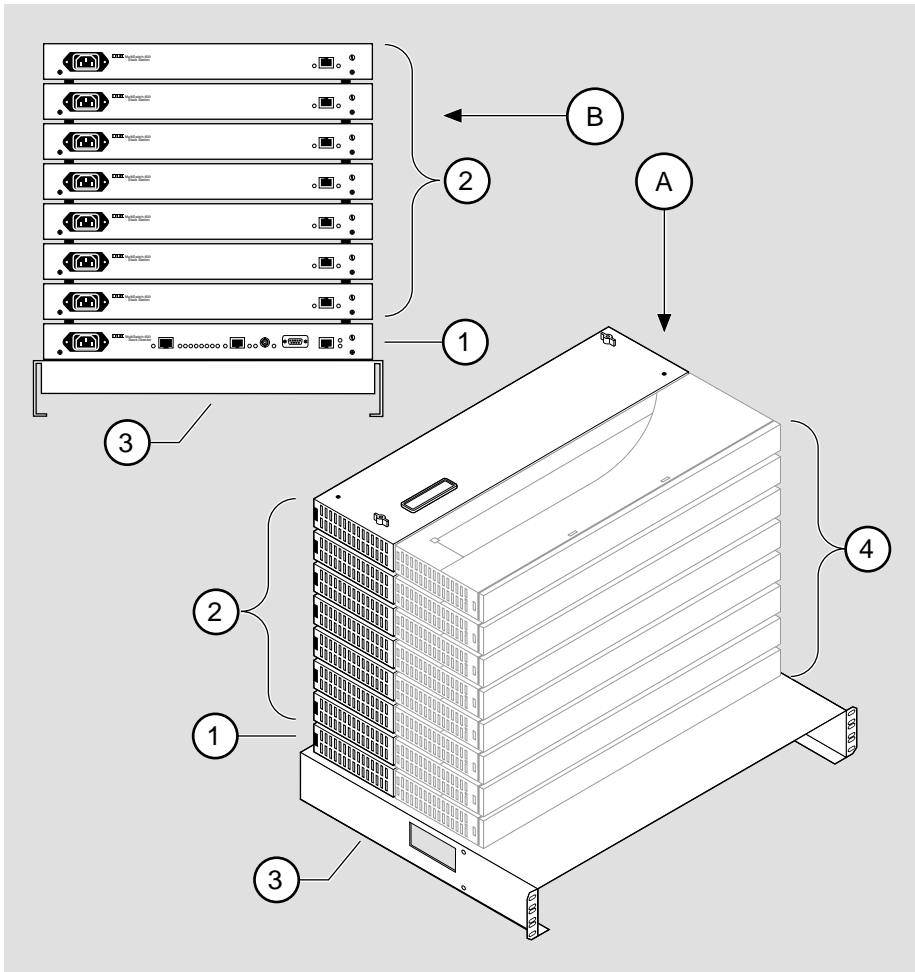
The DIGITAL MultiSwitch 600 system can serve as a managed or as an unmanaged stack:

- 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 stack and controls the stack backplane.
- 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 1-1: 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 internal 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 the Stack Station. Functional modules are described in their associated documentation.

What Is a Stack Director?

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.

Supported MIBs

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

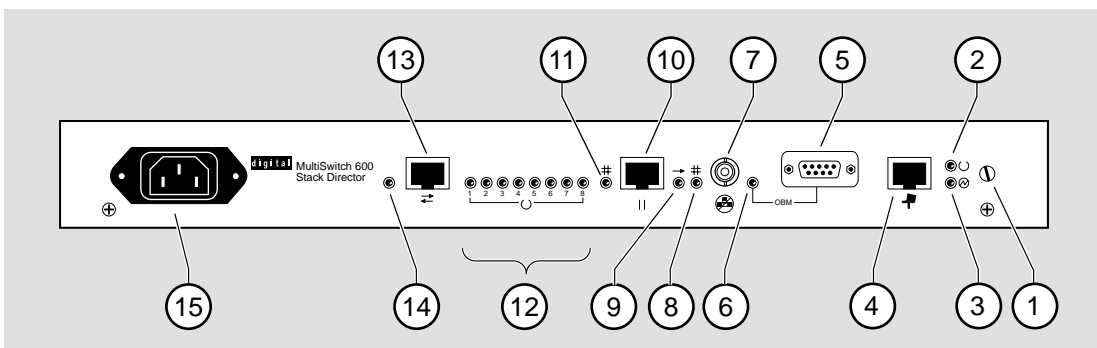
- MIB-II (RFC 1213)
- RMON Alarms and Events (RFC 1757)
- Ethernet MIB (RFC 1643)
- DIGITAL Chassis MIB
- DIGITAL Public Common MIB
- Management Agent Module Private MIB

What Is a Stack Director?

Stack Director Front Panel

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

Figure 1-2: Stack Director Front Panel Components










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Table 1-1: 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?

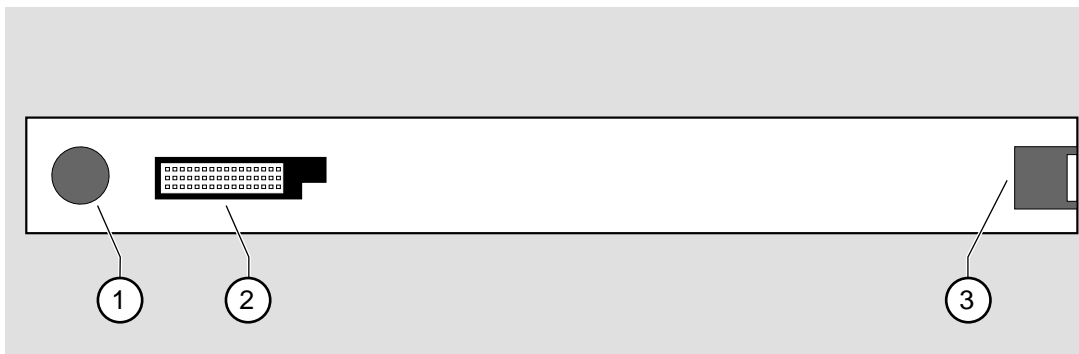
Item	Icon	Name	Description
7		10Base2 Port	A 10Base2 port for connecting to the internal 10Base2 network of the DIGITAL MultiSwitch 600. This port can also be used for in-band management. This port must be externally terminated if it is not used. A T-connector cannot be used on this port.
8		10Base2 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.

What Is a Stack Director?

Stack Director Back Panel

Table 1-2 describes the back panel components on the Stack Director and Figure 1-3 shows their location. For detailed information about the LEDs, refer to Appendix A.

Figure 1-3: Stack Director Back Panel Component Descriptions



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Table 1-2: 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 the Stack Station?

The Stack Station provides power to the attached functional module and extends the internal management channel and LAN channels 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 1-4 and Figure 1-5 show the Stack Station Front and Back Panels.

Stack Station Features

The Stack Station includes the following features:

- Provides power to the attached functional module.
- Hot-swap circuitry for functional modules.
- A serial setup port to setup and configure the functional module in an unmanaged stack.
- Stack interconnect slot on the top and bottom for cable-free stack interconnect card.

What Is the Stack Station?

Stack Station Front Panel

Table 1-3 describes the front panel components on the Stack Station and Figure 1-4 shows their location. For detailed information about the LEDs, refer to Appendix A.

Figure 1-4: Stack Station Front Panel Components

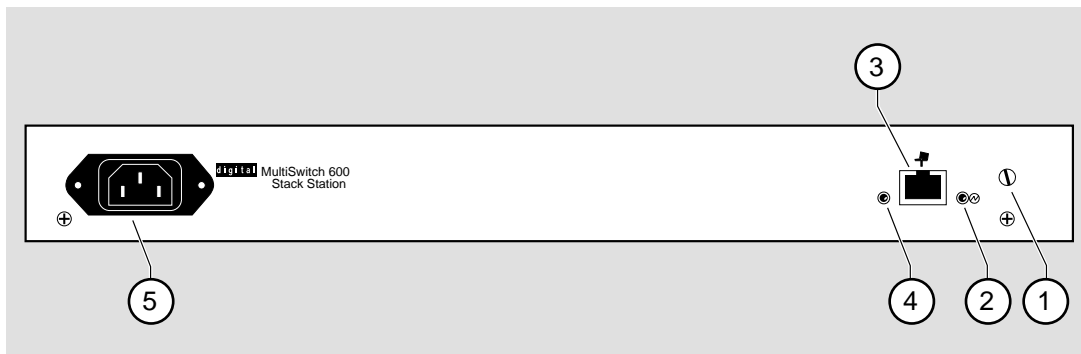


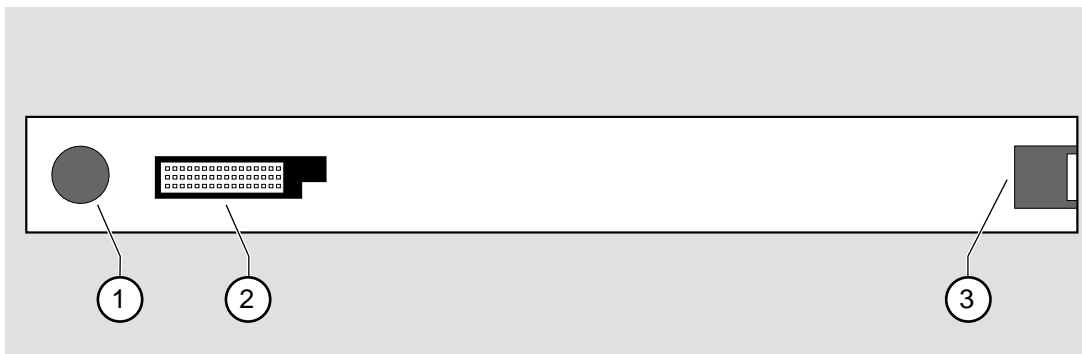
Table 1-3: Stack Station Front Panel Component Descriptions

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

Stack Station Back Panel

Table 1-4 describes the back panel components on the Stack Station and Figure 1-5 shows their location. For detailed information about the LEDs, refer to Appendix A.

Figure 1-5: Stack Station Back Panel Components



NPB-0463-96F

Table 1-4: 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 the Stack Station.
3	Locking Receptacle	Secures the functional module to the Stack Station.

Chapter 2

Assembling a Stack

Overview

Introduction

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

In This Chapter

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Task 2: Securing the Mounting Tray to the Rack Mount	2-8
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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 a 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 2-3), relay rack mount (Figure 2-4), and table top (Figure 2-10).

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 Phillips-head and flat-blade screwdrivers for the installation.

Task 1: Securing a Stack Director or 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.

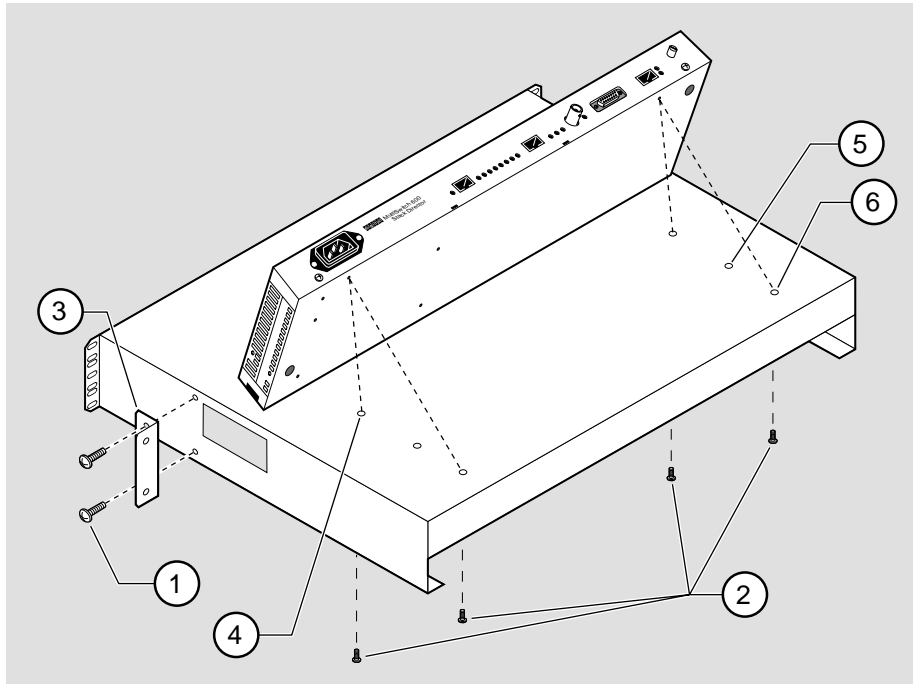
CAUTION

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.

Securing a Stack Director to Mounting Tray

To attach a Stack Director to the tray, perform the procedure in the following table. Figure 2-1 shows installation details.

Figure 2-1: Stack Director Mounting Tray Attachment



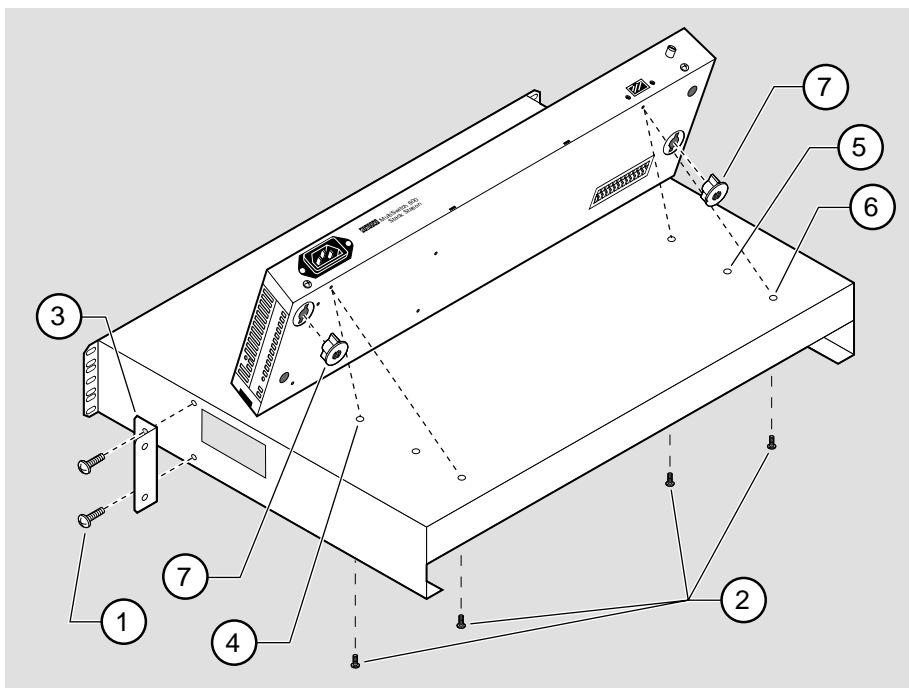
NPB-0739-96F

Step	Action
1	Align the holes on the bottom of the Stack Director with the mounting holes on top of the tray (Figure 2-1).
2	Mounting holes: For desk top configuration , use any one of the three sets of two mounting holes (4), (5), and (6) to mount the Stack Director on the mounting tray. For 19" rack mount configuration (for hot-swapping modules) , use the set of holes closest to the edge of the tray (6). For relay rack configuration , 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 2-2 shows installation details.

Figure 2-2: 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 2-2).
3	Mounting holes: For desk top configuration , use any one of the three sets of two mounting holes (4), (5), and (6) to mount the Stack Station on the mounting tray. For 19" rack mount configuration (for hot-swapping modules) , use the set of holes closest to the edge of the tray (6).

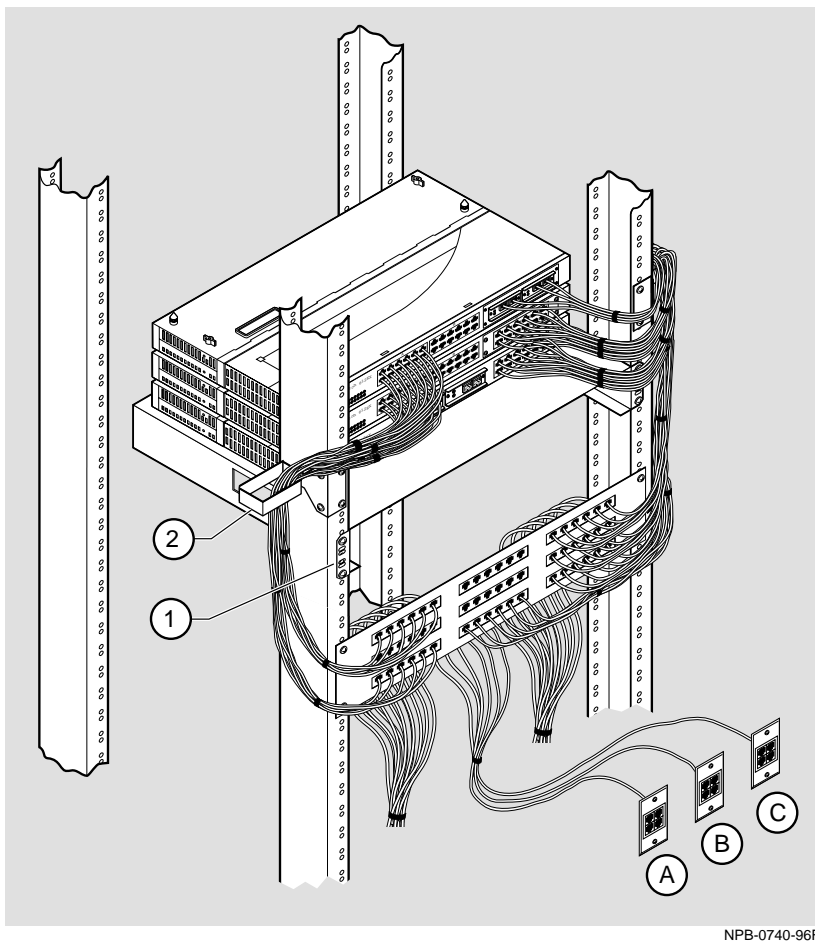
Building a DIGITAL MultiSwitch 600 Stack

Step	Action
4	<p>For relay rack configuration, 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).</p> <p>Secure the Stack Station onto the tray using the two 6-32 machine screws (2).</p>

Task 2: Securing the Mounting Tray to the Rack Mount

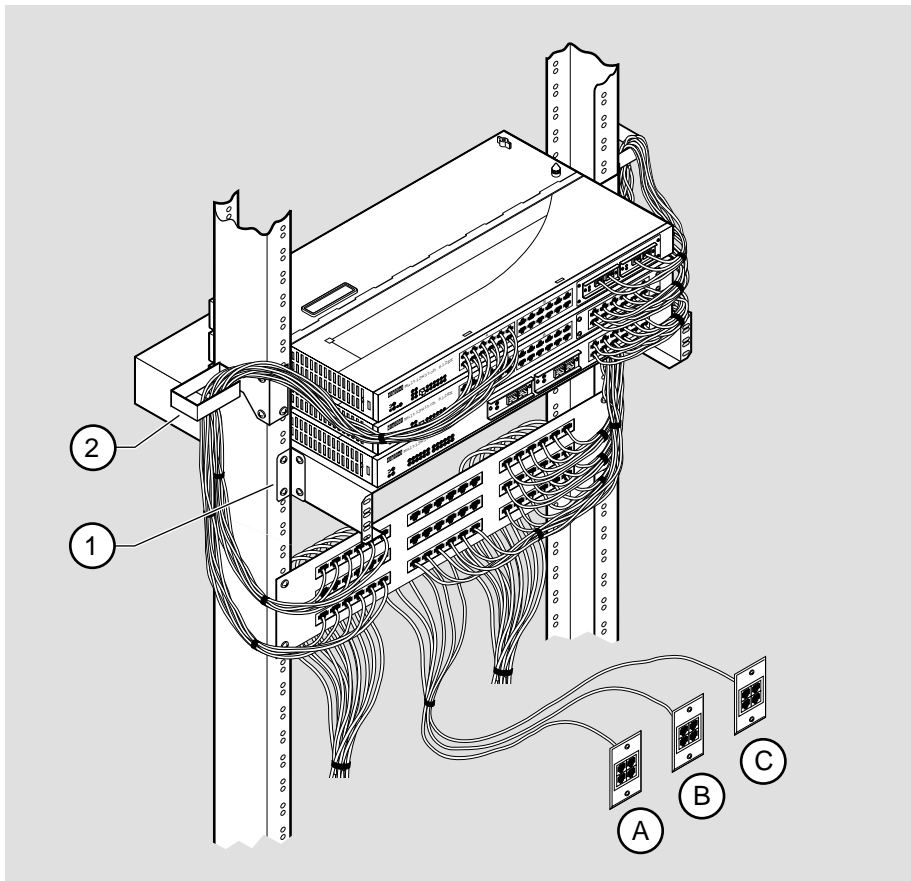
Figure 2-3 shows a standard 19-inch rack mount configuration and Figure 2-4 shows a relay rack mount configuration. Tables following figures describe the procedures.

Figure 2-3: 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.

Figure 2-4: Relay Rack Mount Configuration



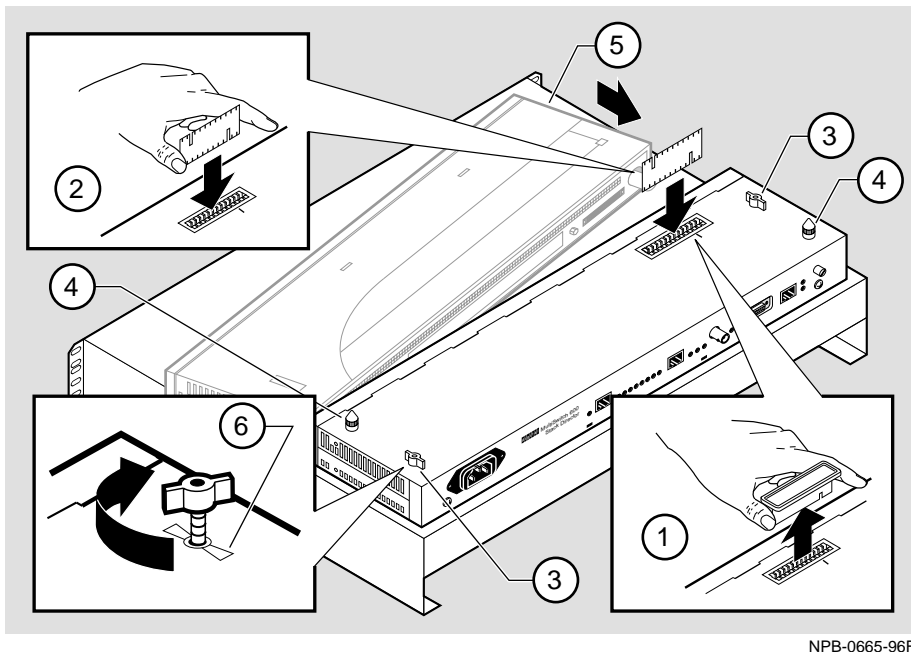
NPB-0725-96F

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 2-4) (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 2-5 shows installation details.

Figure 2-5: Stack Interconnect Card Attachment



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.

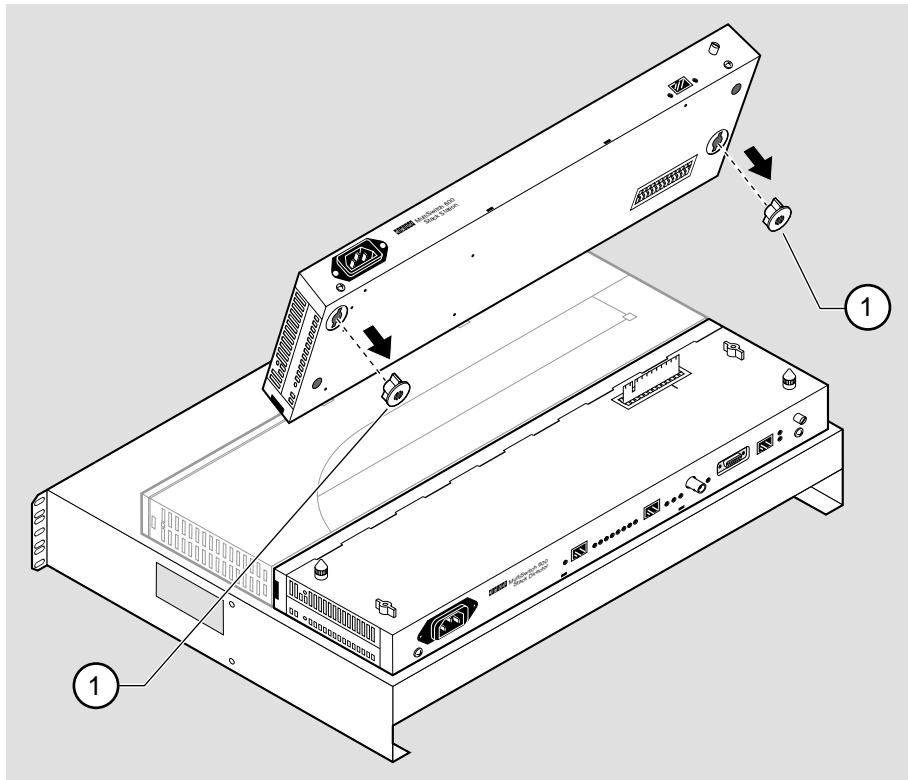
Building a DIGITAL MultiSwitch 600 Stack

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 the 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 2-6.

Figure 2-6: Mounting Plug Location



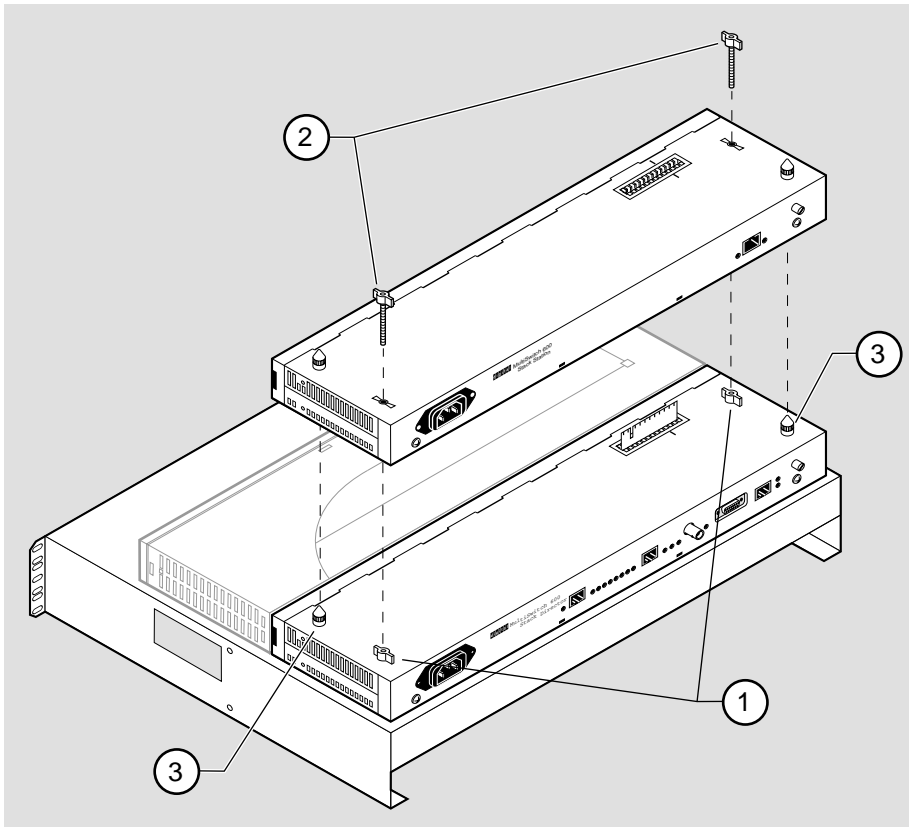
NPB-0734-96F

Step	Action
1	Prior to seating the next level's Stack Station on the previous level, remove the mounting plugs (1), if present (Figure 2-6).

Building a DIGITAL MultiSwitch 600 Stack

To add a second level to a stack, perform the following steps. Figure 2-7 illustrates installation details.

Figure 2-7: 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 2-5 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.

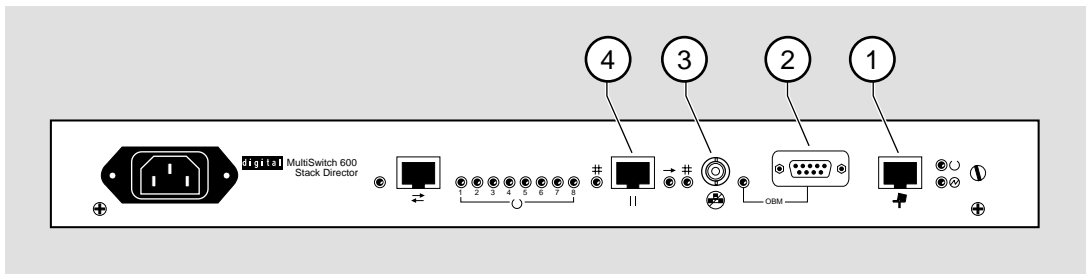
Building a DIGITAL MultiSwitch 600 Stack

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. Note: 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 2-8 shows the Stack Director interface ports.

Figure 2-8: 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.

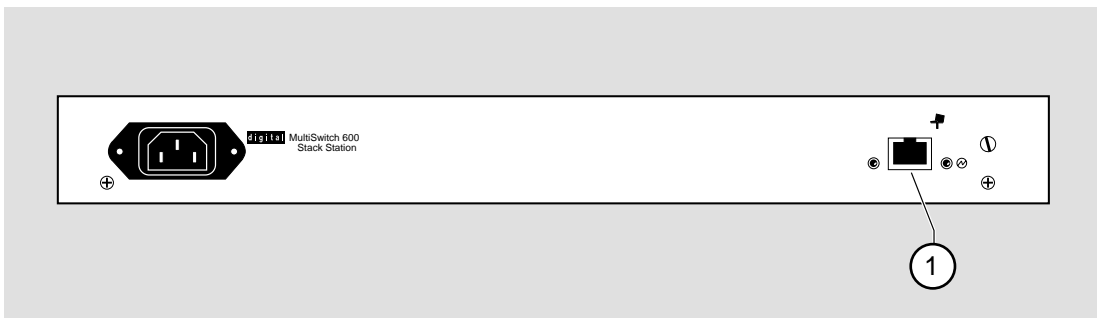
Use the management access port (4) on the Stack Director to redirect the SNMP management agent from the internal 10Base2 assignment to this port. A network management station can be connected directly to this port or this port can be cabled to another network segment.

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 2-9 shows the Stack Station interface port.

Figure 2-9: Stack Station Port Connection



NPB-0686-96F

The setup port on the Stack Station (1) 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.

Setup Procedures

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

Step	Action												
1	<p>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:</p> <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-xx¹</td> <td>H8571-J</td> </tr> <tr> <td>A terminal with a 25-pin D-Sub connector</td> <td>BN24H-xx¹</td> <td>H8575-A</td> </tr> <tr> <td>A terminal with a 6-pin MMJ connector</td> <td>BN24H-xx-X^{1,2}</td> <td>Not required</td> </tr> </tbody> </table> <p>¹ xx indicates cable length in meters. ² this is a cross-wired cable.</p>	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 ¹	H8571-J	A terminal with a 25-pin D-Sub connector	BN24H-xx ¹	H8575-A	A terminal with a 6-pin MMJ connector	BN24H-xx-X ^{1,2}	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 ¹	H8571-J											
A terminal with a 25-pin D-Sub connector	BN24H-xx ¹	H8575-A											
A terminal with a 6-pin MMJ connector	BN24H-xx-X ^{1,2}	Not required											
2	<p>Configure the setup port device (terminal or PC) as follows:</p> <ul style="list-style-type: none"> • 9600 baud • 8 bits • no parity • 1 stop bit 												
3	<p>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.</p>												
4	<p>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.</p>												
5	<p>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.</p>												

Building a DIGITAL MultiSwitch 600 Stack

Task 6: Connecting Power

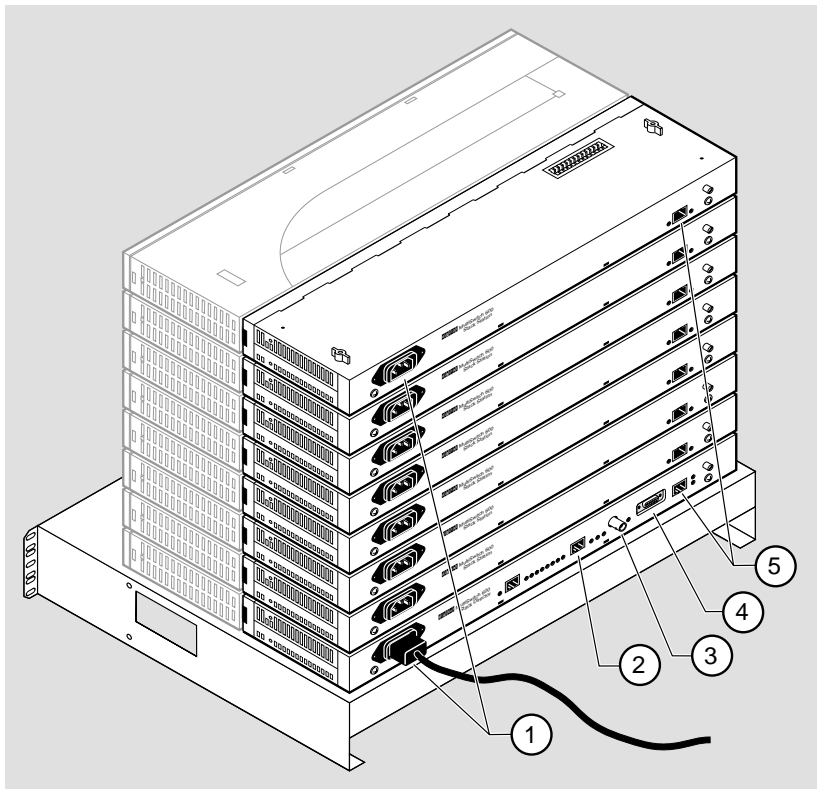
The Stack Director and each Stack Station has its own power supply. This requires the connection of an AC power line cord to each IEC power connector.

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 2-10 shows their location.

Figure 2-10: IEC Power Connector Locations



NPB-0662-96F

Building a DIGITAL MultiSwitch 600 Stack

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 1-12.</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 Director Front Panel on page 1-8.</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 2-6 and Figure 2-7 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 4 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	<p>Perform steps 1 through 5 of Task 4: Attaching the Next Level in the Stack</p> <p>Note: Inserting a stack interconnect card in a live stack will disrupt the backplane configuration. Performing step 8 re-establishes the configuration.</p>

Building a DIGITAL MultiSwitch 600 Stack

Step	Action
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.
8	<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 3

Managing a Stack

Overview

Introduction

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

In This Chapter

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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 3-1).

Table 3-1: 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.

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

[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

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

[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           Speed 9600 bps
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

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	3-12
[2] Add SNMP Trap Addresses	3-13
[3] Delete SNMP Trap Addresses	3-14
[4] Set In-Band Interface IP Address	3-15
[5] Set Out-of-Band Interface IP Address	3-16
[6] Enable/Disable BootP	3-17

[4] Configure IP

[1] Set SNMP Read/Write Community

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

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

The following example shows the dialogue associated with this option.

```
Enter selection : 1

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.

[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...
```

[4] Configure IP

[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] 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...

```

[4] Configure IP

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

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

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

The OBM feature allows you to manage your 3DIGITAL 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...
```


[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

[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

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

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>.

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

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.

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 3-2 explains what happens during each stage of the download process.

Table 3-2: Download Process Description

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

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

[6] Downline Upgrade

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

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

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

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.

[7] Configure Out-of-Band Port

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

[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

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 4

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

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.

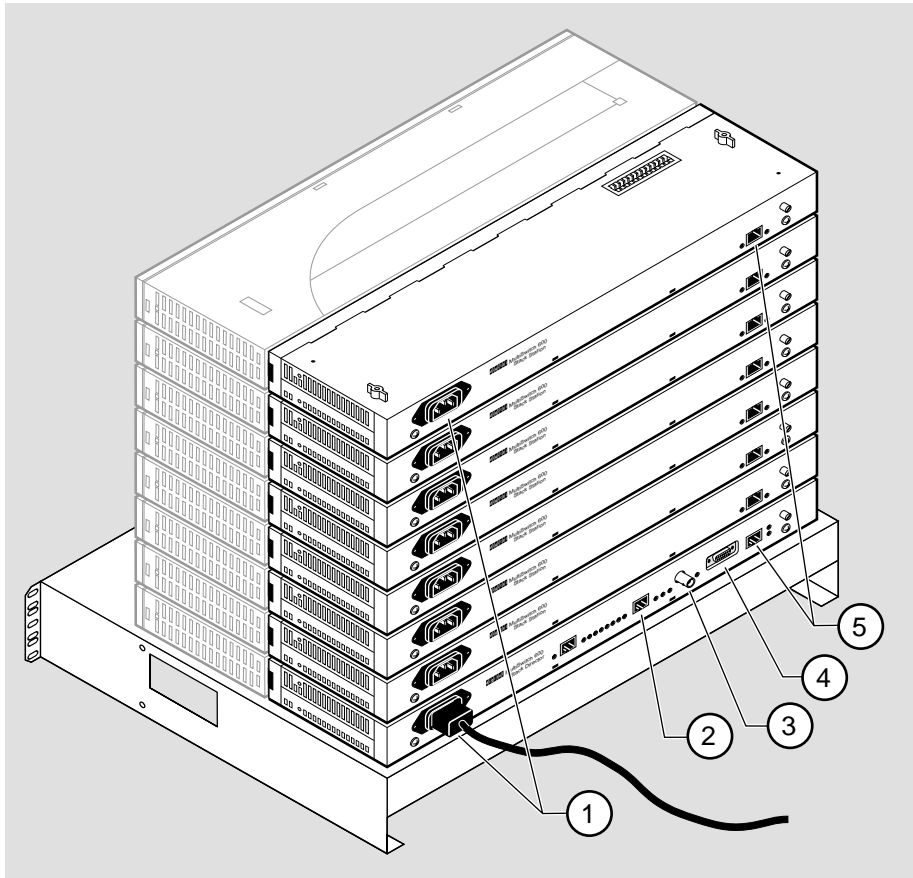
Task 1: Removing Power Cords and Cables

To disconnect power cords and cables from the DIGITAL MultiSwitch 600 stack, perform the procedure in the following table (See Figure 4-1).

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

Removing or Replacing Components

Figure 4-1: Connector Locations



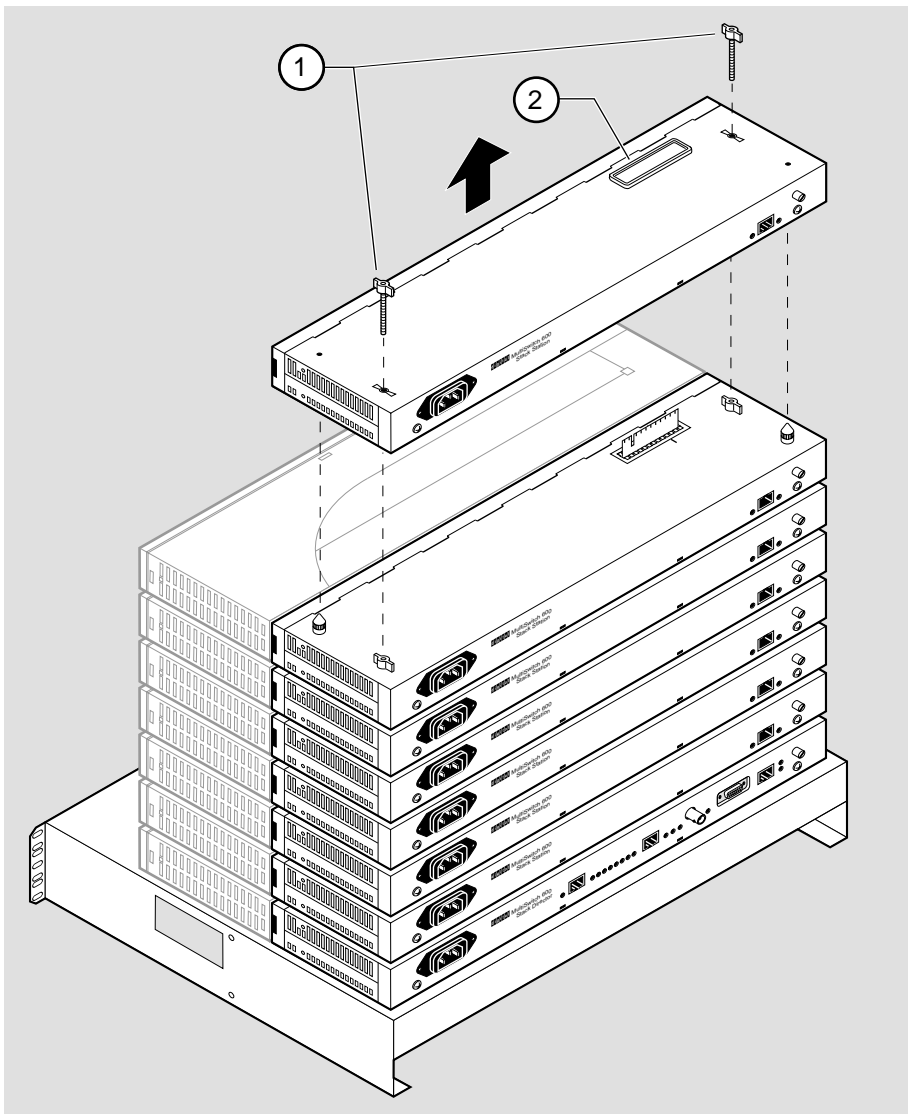
NPB-0662-96F

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 4-2 shows removal details.

Figure 4-2: 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.

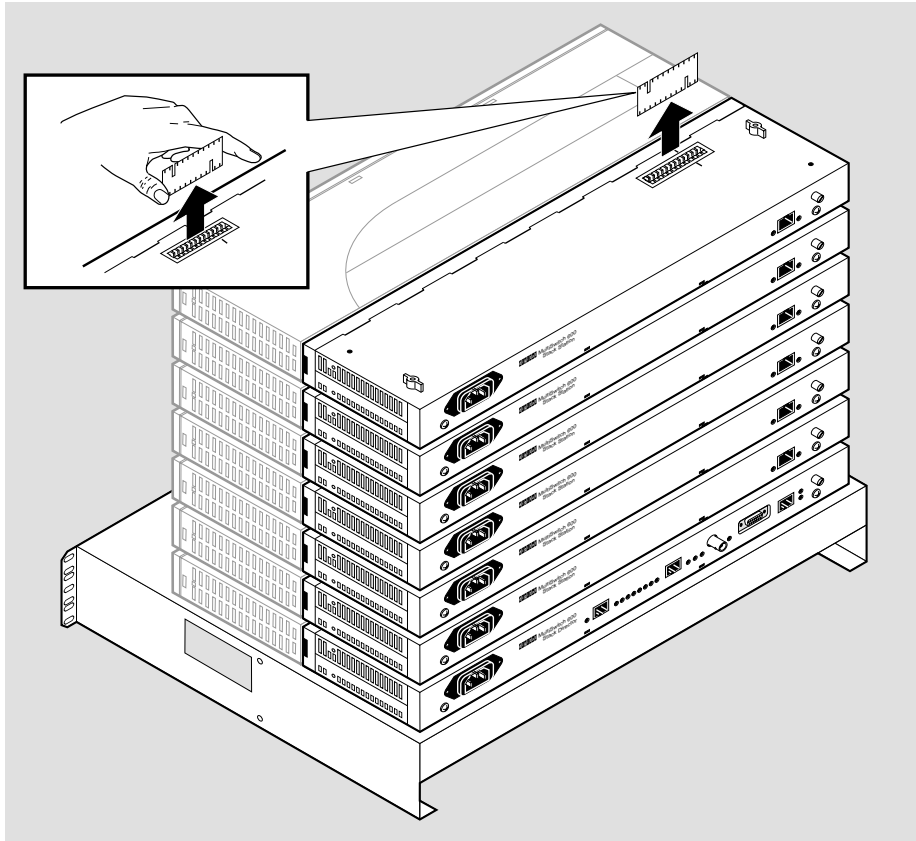
Step	Action
1	If available, use clearVISN Recovery Manager to backup current settings for each device (including the Stack Director) on the stack.
2	Remove power cords and cables. Refer to Task 1: Removing Power Cords and Cables.
3	Remove the dust cap (2) from the vertical connector slot on the top level (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 4-3) 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 2, 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 2, Task 5: Cabling the Stack Director and Stack Station and Task 6: Connecting Power for more information.

Removing or Replacing Components

Step	Action
9	<p data-bbox="420 590 1183 646">If available, use clearVISN Recovery Manager to restore settings for each device on the stack that lost its settings.</p> <p data-bbox="420 659 1183 772">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 data-bbox="420 785 1183 989">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 data-bbox="420 1001 1183 1058">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 4-3: Stack Interconnect Card Removal



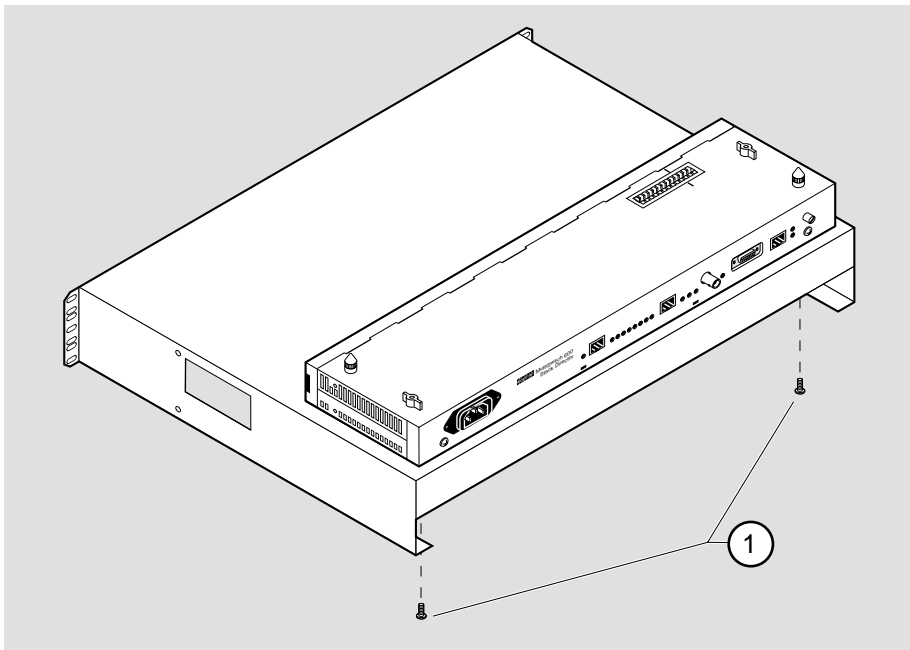
NPB-0659-96F

Removing or Replacing Components

Task 3: Removing Stack Director or Stack Station from Mounting Tray

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

Figure 4-4: Removing Stack Director or Stack Station from Mounting Tray



NPB-0513-96F

Step	Action
1	Remove the Stack Director or 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.

Appendix A

Problem Solving

Overview

Introduction

This appendix describes the LED states and troubleshooting information for the DIGITAL MultiSwitch 600 Stack Director and the Stack Station.

In This Appendix

Topic	Page
LED Descriptions	A-2
Problem Solving Using the LEDs	A-4



LED Descriptions

LED Descriptions

This section describes the LEDs states for the Stack Director and Stack Station.

Table A-1 lists LED states for the Stack Station that are useful when troubleshooting the Stack Station.







Table A-1: 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.

LED Descriptions

Table A-2 list 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
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

Problem Solving Using the LEDs

A problem is often indicated by the states of the LEDs on the Stack Director and Stack Stations. 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-3 list possible error conditions for the Stack Station that are useful when troubleshooting the Stack Station.

Table A-3: 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 device is connected. Note: The Setup Port LED should not light when the Stack Station is a member of a managed stack.	Device or Stack Station is Faulty.	Replace Device or Stack Station.

Problem Solving Using the LEDs

Table A-4 list possible error conditions for the Stack Director that are useful when troubleshooting the Stack Director.

Table A-4: 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.
Management Access Port Status LED does not light when self test completes.	Port is not enabled due to error.	Replace the Stack Director.
A particular Stack Level Management Status LED does not light.	Stack Director does not communicate with corresponding device.	Replace associated device.

Appendix B

Connector 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 Stack Director and Stack Station.

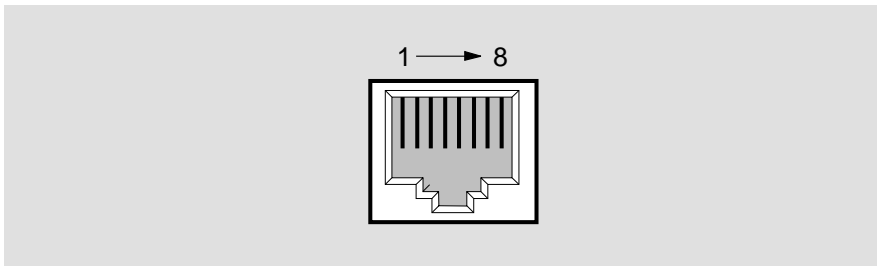
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Topic	Page
Setup and Management Access Port Connectors (8-pin MJ)	B-2
OBM Port (9-Pin) Connector	B-3
10Base2 Connector	B-5
H8225 50-Ohm Terminator	B-5
H8571-J Adapter	B-6
H8575-A Adapter	B-7

Setup and Management Access Port Connectors (8-pin MJ)

The Setup Port connector is used with the Stack Director and Stack Station. The Management Access Port is available only on the Stack Director. Figure B-1 shows the 8-pin MJ (straight-through) connector and its pin assignments.

Figure B-1: Setup and Management Access Port Connectors (8-pin MJ)



NPG-8719-95F

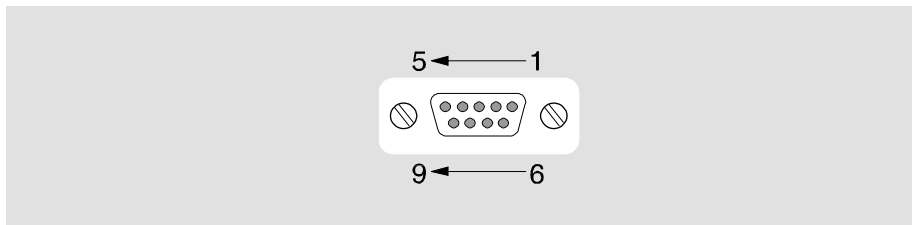
Table B-1: Setup and Management Access Port Connector (8-pin MJ) Pin Assignments

Pin No.	Assignment
1	Not Connected
2	RD
3	GND
4	Not Connected
5	Not Connected
6	TD
7	+5V
8	GND

OBM Port (9-Pin) Connector

The OBM connector (Figure B-2) is used on the Stack Director.

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



NPG-0299

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

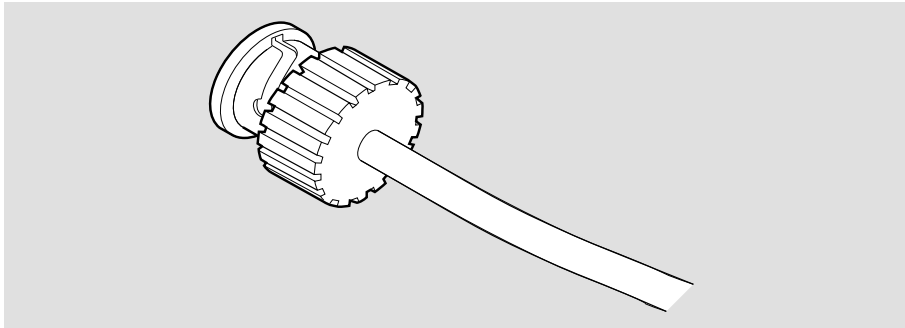
Pin No.	Assignment
1	Data Carrier Detect (DCD)
2	Receive Data (RXD)
3	Transmit Data (TXD)
4	Data Terminal Ready (DTR)
5	Ground
6	Data Set Ready (DSR)
7	Request To Send (RTS)
8	Clear To Send (CTS)
9	Not Connected

10Base2 Connector

10Base2 Connector

The 10Base2 connector (Figure B-3) is used on the Stack Director.

Figure B-3: 10Base2 Connector

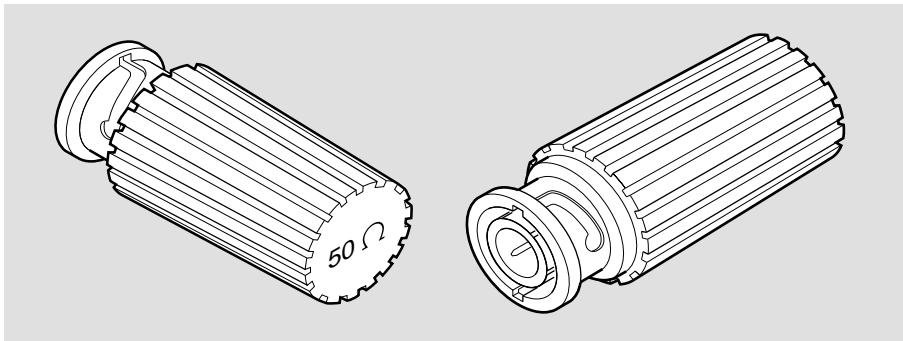


NPB-0626-96F

H8225 50-Ohm Terminator

Figure B-4 shows the 50-ohm terminator needed to terminate the 10Base2 port on the Stack Director.

Figure B-4: H8225 50-ohm Terminator



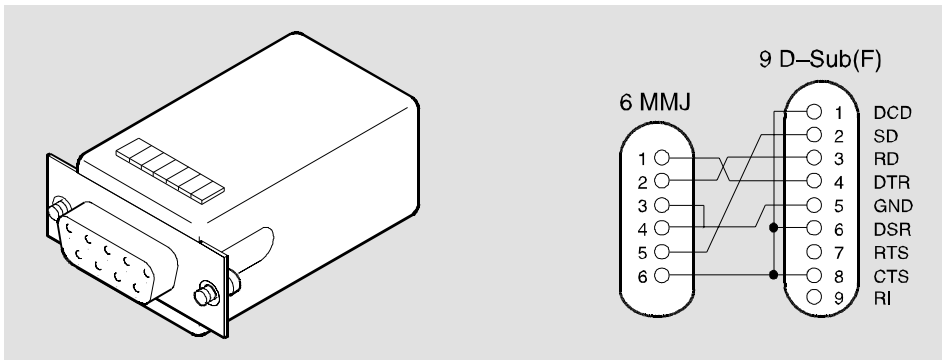
NPB-0594-96F

Adapters

H8571-J Adapter

Figure B-5 shows the H8571-J adapter (6-pin MMJ connector to 9-pin D-Sub connector) and its pin assignments:

Figure B-5: H8571-J Adapter

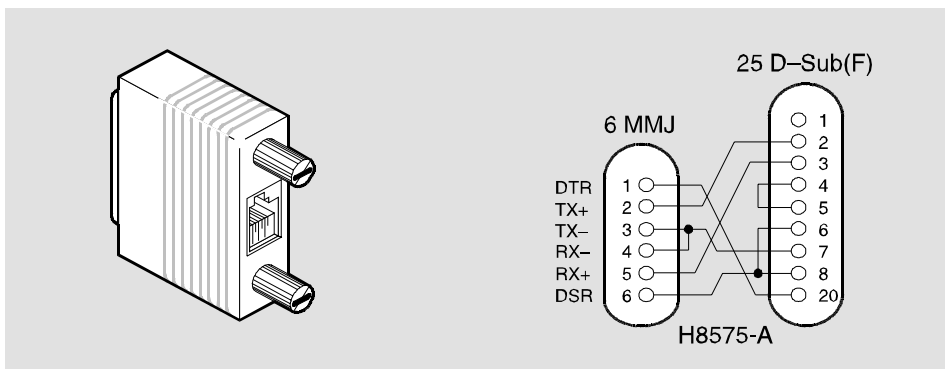


NPG-5342-95F

H8575-A Adapter

Figure B-6 shows the H8575-A adapter (6-pin MMJ connector to 25-pin D-Sub connector) and its pin assignments:

Figure B-6: H8575-A Adapter



NPG-8793-95F

Appendix C

Specifications and Connectors

Overview

Introduction

This appendix lists the specifications and connectors for the MultiSwitch 600 Stack Director and Stack Stations.

In This Appendix

Topic	Page
Product Specifications	C-2
Acoustical Specifications	C-5
Connectors	C-7

Product Specifications

This section contains the product specifications for the Stack Director and the Stack Station.

Stack Director

Table C-1 lists the product specifications for the Stack Director.

Table C-1: Stack Director Specifications

Parameter	Specification
Environment	
Operating Temperature ¹	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
Physical	
Height	4.45 cm (1.75 in). The height of the mounting tray is 8.89 cm (3.5").
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)
Shock (Class A/B for products weighing under 100 lbs)	10 G / 10 ms half sine pulse in three orthogonal axes

Product Specifications

Parameter	Specification
Vibration (Class C)	5 to 200 Hz sine sweep @ 0.25 G limited by 0.5mm (0.02") displacement DA* 200 to 500 Hz sine sweep @ 0.10 G
Certification	CE, CSA, FCC, TÜV, UL, VCCI

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

Product Specifications

Stack Station

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

Table C-2: Stack Station Specifications

Parameter	Specification
Environment	
Operating Temperature ¹	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
Physical	
Height	4.45 cm (1.75 in). The height of the Mounting Tray is 8.89 cm (3.5").
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)
Shock (Class A/B for products weighing under 100 lbs)	10 G / 10 ms half sine pulse in three orthogonal axes
Vibration (Class C)	5 to 200 Hz sine sweep @ 0.25 G limited by 0.5mm (0.02") displacement DA* 200 to 500 Hz sine sweep @ 0.10 G
Certification	CE, CSA, FCC, TÜV, UL, VCCI

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

Acoustical Specifications

Table C-3 lists the acoustical specifications in English for the Stack Director and Stack Station modules.

Table C-3: Acoustical Specifications

Declared Values per ISO 9296 and ISO 7779¹

Product	Sound Power Level L _{WA} , B	Sound Pressure Level L _{pAm} , dBA (bystander positions)
	Idle/Operate	Idle/Operate
DLSSM-S* Stack Director	5.2	37
DLSSU-S* Stack Station	No measurable noise emission	No measurable noise emission

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

* indicates one of the following:

Suffix	Country	Suffix	Country
-SA	United States	-ST	Israel
-SD	Denmark	-SX	Central Europe
-SE	United Kingdom	-SZ	Australia
-SI	Italy	-S3	No Power Cord
-SK	Switzerland	-TJ	India

Acoustical Specifications

Table C-4 lists the German acoustical specifications for the module.

Table C-4: German Acoustical Specifications

Schallemissionswerte Werteangaben nach ISO 9296 und ISO 7779/DIN EN27779²

Gerät	Schalleistungspegel L_{WA}d, B	Schalldruckpegel L_{pAm}, dBA (Zuschauerpositionen)
	Leerlauf/Betrieb	Leerlauf/Betrieb
DLSSM-S* Stack Director	5.2	37
DLSSU-S* Stack Station	Keine meßbaren Geräuschemissionen	Keine meßbaren Geräuschemissionen

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

* indicates one of the following:

Suffix	Country	Suffix	Country
-SA	United States	-ST	Israel
-SD	Denmark	-SX	Central Europe
-SE	United Kingdom	-SZ	Australia
-SI	Italy	-S3	No Power Cord
-SK	Switzerland	-TJ	India

Connectors

Stack Director

Table C-5 provides a list of connectors used on the Stack Director.

Table C-5: Connectors for the Stack Director

Connectors	Quantity
Setup Port Connector	1
OBM (RS-232) Port	1
10Base2 (ThinWire) Port Connector	1
Management Access (UTP/ScTP) Port	1
IEC Connector (Power)	1
Reserved	1

Stack Station

Table C-6 provides a list of connectors used on the Stack Station.

Table C-6: Connectors for the Stack Station

Connectors	Quantity
Setup Port Connector	1
IEC Connector (Power)	1

Appendix D

Ordering Options

Overview

Introduction

This appendix describes how to order parts for the DIGITAL MultiSwitch 600 system.

In This Appendix

Topic	Page
Ordering Options	D-2
Ordering Requirements	D-3
Parts List	D-4

Ordering Options

Option	Part Number
Stack Station	DLSSU-U*
Stack Director	DLSSM-S*
Mounting Tray	H3108-MU Included with Stack Director.
Accessories Package ¹ :	DLSCC-M4
<ul style="list-style-type: none"> • Top Cap (1) • Mounting Plugs (2) • Stack Interconnect Card (4) • Stabilizer Screw (8) • Alignment Pylons (8) 	
Straight-through Cable	BN25G-xx
Crossover Cable	BN24F-xx
Adapter	H8571-J
Adapter	H8575-A

¹Accommodates four stack station levels. These parts are supplied as spares. All needed parts are supplied with the Stack Director or Stack Station.

* indicates one of the following:

Suffix	Country	Suffix	Country
-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 Requirements

Note the following requirements when ordering DIGITAL MultiSwitch 600 components:

- Order 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.
- Order one Stack Station or Stack Director for each functional module to build a DIGITAL MultiSwitch 600 stack. Only one Stack Director (DLSSM) is needed to manage a stack of up to eight devices. The Stack Director comes complete with a rack mount kit.
- Order basic 600-series functional modules (hubs or switches or both) available for a DIGITAL MultiSwitch 600 stack.
- Order necessary options such as Port Expansion Cards and Modular Media Interface cards.

Parts List

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

Part	Part Number
Stack Director (includes):	DLSSM-S*
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
Stack Station (includes):	DLSSU-U*
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
Stabilizer Screw (Wing Nuts) - (2)	74-51632-01
Wing Nut (Mounting plug) - (2)	74-51644-01
Accessories Package¹ :	DLSCC-M4
Top Cap (1)	
Mounting Plugs (2)	
Backplane Interconnect Riser Card (4)	
Stabilizer Screw (8)	
Alignment Pylons (8)	

¹Accessories Package is included with each Stack Station and Stack Director.

Parts List

* indicates one of the following:

Suffix	Country	Suffix	Country
-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

Associated Documentation

Overview

Introduction

This appendix lists associated documentation and related communication information for the DIGITAL MultiSwitch 600 system.

In This Appendix

Topic	Page
Documents	E-2
How to Order Additional Documentation	E-4
Correspondence	E-5

Documents

The following documents provide information relating to the MultiSwitch 600 system. To order any of the following documents, refer to the section titled How to Order Additional Documentation.

Title and Order Number	Description
<i>DIGITAL MultiSwitch 600 System Quick Start EK-DLSSM-QS</i>	Provides a four page guide for installation and setup information for the DIGITAL MultiSwitch 600 System (Stack Director or Stack Station).
<i>DIGITAL MultiSwitch Hub 624T Installation and Configuration EK-DLMR2-IN</i>	Provides installation, setup, and configuration information for the Hub 624T installed in a MultiSwitch 600 (Stack Director or Stack Station) or DEChub 900 MultiSwitch.
<i>DIGITAL MultiSwitch Hub 624T Quick Start EK-DLMR2-QS</i>	Provides a four page guide for installation, setup, and configuration information for the DIGITAL MultiSwitch Hub 624T installed in a DIGITAL MultiSwitch 600 System (Stack Director or Stack Station) or DEChub 900 MultiSwitch.
<i>DIGITAL MultiSwitch 612EX Installation and Configuration EK-DLMWL-IN</i>	Provides installation, setup, and configuration information for the MultiSwitch 612EX installed in a MultiSwitch 600 System or DEChub 900 MultiSwitch.
<i>DIGITAL MultiSwitch 612EX Quick Start EK-DLMWL-QS</i>	Provides a four page guide for installation, setup, and configuration information for the DIGITAL MultiSwitch 612EX installed in a DIGITAL MultiSwitch 600 System (Stack Director or Stack Station) or DEChub 900 MultiSwitch.
<i>DEChub 900 MultiSwitch Owner's Manual EK-DH2MS-OM</i>	Provides installation, use, security, and troubleshooting information for the DEChub 900 MultiSwitch.
<i>clearVISN Installation AA-QX86B-TK</i>	Describes how to install clearVISN software. It includes a list of distribution kit contents, system requirements, pre-installation considerations, and the installation procedure.

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

How to Order Additional Documentation

To order additional documentation, use the following information.

To Order:	Contact:
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

Correspondence

Documentation Comments

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

Attn.: Documentation Project Manager
FAX: (508) 486-6093
E-MAIL: doc_feedback@lkg.mts.dec.com

Online Services

To locate product-specific information, refer to the following online services:

BBS

To read the Bulletin Board System, set your modem to 8 bits, no parity, 1 stop bit and dial 508-486-5777 (U.S.A.)

WWW

The Digital Equipment Corporation Network Products Business Home Page on the World Wide Web is located at the following addresses:

North America: <http://www.networks.digital.com>

Europe: <http://www.networks.europe.digital.com>

Australia: <http://www.digital.com.au/networks>

Appendix F

Service Information/Support

Overview

Introduction

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

In This Appendix

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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 includes:

- Assistance in using the product documentation.
- Verifying 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 function or malfunctioning.

Glossary

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

This manual uses the following terms:

Terms	Descriptions
10Base2	Thin coaxial cable 10 Mb/s Ethernet connection.
10Base5	Thick coaxial cable 10 Mb/s Ethernet connection.
10BaseT	Twisted-pair cable 10 Mb/s Ethernet connection.
Ethernet	Local area network (LAN) compatible with the ISO 8801-3/ANSI/IEEE 802.3 standards and the Ethernet standards for Carrier Sense Multiple Access with Collision Detection (CSMA/CD) LANs.
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
MultiSwitch 600 System	Stackable Ethernet switch and hub system.
Stack Director	Power supply, setup port, backplane, and SNMP agent interface for functional module and the MultiSwitch 600 system.
Stack Station	Power supply and setup port interface for functional module.
ThinWire	10Base2 thin coaxial cable 10 Mb/s Ethernet connection.

Glossary

Terms	Descriptions
Twisted Pair	Twisted pair cable 10 Mb/s Ethernet connection. 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.

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