GIGAswitch System

Installation and Service Manual

Order Number: EK-GGSVA-IN-001

This document provides qualified DIGITAL service personnel with instructions for installing, and servicing the GIGAswitch System hardware.

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Preface

This document provides qualified DIGITAL service personnel with instructions for installing, and servicing the GIGAswitch System hardware.

Intended Audience

This document is intended for DIGITAL service personnel who are experienced in installing and servicing network hardware.

Document Structure

This document is structured as follows:

Part I contains overview information and instructions for installing the GIGAswitch System:

- **Chapter 1** describes the GIGAswitch System and its component modules.
- **Chapter 2** describes the procedures that you must complete before installing the GIGAswitch System. These procedures include verifying the site preparation, unpacking the system, testing the system modules, installing the lower plenum in the rack, setting up electrostatic discharge (ESD) protection, and removing the modules.
- **Chapter 3** describes the procedures for installing the GIGAswitch System. These procedures include lifting the empty GIGAswitch System onto the lower plenum, attaching the GIGAswitch System to the rack, installing the upper plenum, and installing the modules.

Part II contains information for testing the GIGAswitch System:

- **Chapter 4** describes the procedures that you must complete before testing the GIGAswitch System. These procedures include connecting the out-of-band management (OBM) terminal, and setting the security switch.
- **Chapter 5** describes the procedures for initiating the module self-tests (MSTs) and provides instructions for evaluating the results of the MSTs.

Part III contains information for replacing the field replaceable units (FRUs)

- **Chapter 6** describes the replacement requirements for each GIGAswitch System module, and describes the procedures used in replacing some of the GIGAswitch System modules. These procedures include setting up electrostatic discharge (ESD) protection, and removing or applying system power.
- **Chapter 7** describes the procedures for replacing the cooling and power modules and the logic modules. Cooling and power modules include modules of the fan tray assembly, front end unit (FEU), power status assembly (PSA) , and power system controller (PSC) families. Logic modules include modules of the line card, physical medium dependent (PMD) daughter card, switch control processor (SCP), clock card (CLK), and crossbar switch (CBS) families.
- **Chapter 8** describes the procedure for removing the GIGAswitch System.
- **Chapter 9** describes the procedures for replacing the power and logic backplanes.

Part IV contains reference information.

- **Appendix A** provides the physical, electrical, and environmental specifications for the GIGAswitch System.
- **Appendix B** describes the cooling and power modules in the fan tray assembly, FEU, PSA, and the PSC card families.
- **Appendix C** describes the logic modules in the line card, physical medium dependent (PMD) daughter card, SCP card, CBS card, and clock card families.
- **Appendix D** provides guidelines for installing additional logic modules.

Customer Documentation

The customer GIGAswitch System documentation set consists of the following documents:

document	Part Number
GIGAswitch System Manager's Guide	EK-GGMGA-MG

Internal Documentation

The internal GIGAswitch System documentation set is for DIGITAL internal use only. This documentation set includes this manual and the following documents:

document	Part Number
GIGAswitch System Maintenance Card	EK-GGGSV-CD
GIGAswitch System Installation Card	EK-GGGIN-CD

Related Documentation

Additional information is available in the following documents:

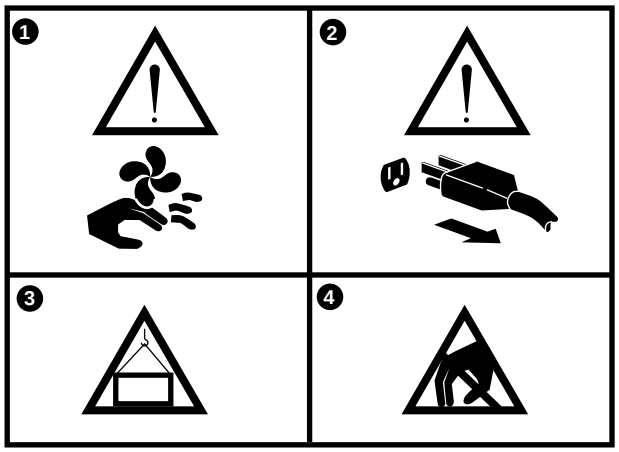
document	Part Number
Fiber Distributed Data Interface Media Connection Information	EK-A0597-M1
DECconnect System Requirements Evaluation Workbook	EK-DECSY-EG

Conventions

The following conventions are used in this document:

Bold typeface	Indicates that a word or phrase is being emphasized to the reader.
Italic typeface	Indicates the complete titles of manuals.
Return	Indicates that you press the return key on the keyboard.
Ctrl/O	Indicates that you must hold down the key labeled Ctrl while you press another key or a pointing device button.

Safety Symbols



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Number	Symbol	Description
❶	Caution - Rotating fans	Allow the fans to run down before removing the fan tray from the unit.
❷	Caution	Remove system power before removing or installing the system module.
❸	Warning	The weight of this unit when empty is 31.75 Kg (70 lb). Use two people to lift the unit.
❹	Caution - Electrostatic sensitive device	Take precautions to protect against equipment damage due to electrostatic discharge (ESD).

Part I

Install

Part I contains overview information and instructions for installing the GIGAswitch System:

- **Chapter 1** describes the GIGAswitch System and its component modules.
- **Chapter 2** describes the procedures that you must complete prior to installing the GIGAswitch System. These procedures include verifying the site preparation, unpacking the system, testing the system modules, installing the lower plenum in the rack, setting up electrostatic discharge (ESD) protection, and removing the modules.
- **Chapter 3** describes the procedures for installing the GIGAswitch System. These procedures include lifting the empty GIGAswitch System onto the lower plenum, attaching the GIGAswitch System to the rack, installing the upper plenum, and installing the modules.

1

Overview of the GIGAswitch System

Chapter Contents

This chapter introduces you to the GIGAswitch System and its component modules including:

- Purpose of the GIGAswitch System
- Parts of the GIGAswitch System
- Location of the modules
- Description of the logic modules
- Description of the cooling and power modules

Purpose of the GIGAswitch System

General Description

The GIGAswitch System is a standalone, intelligent, switching system that forwards packets among a set of connected data links. The data links can be connected to end stations, bridges, routers, and to other GIGAswitch Systems. The core of the GIGAswitch System is a crossbar switch (CBS) card that forms point-to-point communication paths by mapping inputs to outputs.

The GIGAswitch System acts as a multiport FDDI bridge with all attached local area networks (LANs) being bridged together. Subsequently, added line cards will have their data links automatically added to the bridged LANS.

Versions

Two versions of the GIGAswitch System are available. The DEFGA-BA version is compatible with the US power requirements. The DEFGA-BB version in conjunction with a selected country kit is compatible with the power requirements for the selected country. See Appendix A for a listing of the power cord types found in country kits.

Functions

Both versions (DEFGA-Bx) function as a modular, multiport, FDDI bridge that uses the CBS card as the interconnection mechanism for its line cards and processing engines. The DEFGA-Bx utilizes both distributed and centralized packet processing algorithms to perform the following ANSI and IEEE 802.1d bridging functions:

- Forwarding
- Filtering
- Learning
- Aging
- Spanning tree

Parts of the GIGAswitch System

Part (Order Number)	Quantity		
	DEFGB-BA	DEFGA-BB	Option
2-port FDDI line card (DEFGL-AA) (contains one or more of the following types of PMD daughter cards [1]):	1	1	Up to 11
• MMF ANSI MIC PMD (DEFXM-AA) [2]			
• SMF PMD (DEFXS-AA) [3]			
Switch control processor (SCP) card (DEFGP-AA)	1	1	1
Crossbar switch (CBS) card (54-22116-01)	1	1	0
Clock card (54-22120-01)	1	1	0
Chassis (contains):	1	1	0
• Fan tray assembly (70-30578-01)[4]			
• Logic backplane (54-21849-01)			
• Power backplane (54-22138-01)			
Front end unit (FEU) (DEFGB-AA)	1	0	1
Front end unit (FEU) (DEFGB-AB)	0	1	1
Power status assembly (PSA) (70-30585-01) (contains):	1	1	0
• Power system controller (PSC) card (54-22132-01)			
Power cord (U.S.) (17-00083-42)	1	0	0
Power cord (Non-U.S.)	0	0	1 country kit per FEU

[1]PMD daughter cards ordered separately as options (Maximum of 4 PMD daughter cards per line card)

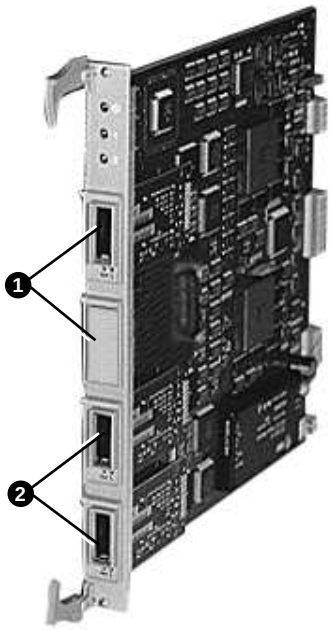
[2]MMF=multimode fiber, ANSI=American National Standards Institute, MIC=medium interface connector, and PMD=physical medium dependent.

[3]SMF=single-mode fiber, and PMD=physical medium dependent.

[4]Two per chassis

Configuration Used in This Document

The configuration used in this document is a DEFGA-Bx. The upper port of the line card is configured as a single-attachment station (SAS) port, and the lower port of the line card is configured as a dual-attachment station (DAS) port.§ Multimode fiber (MMF) ANSI MIC PMD daughter cards are installed in both ports of the line card.



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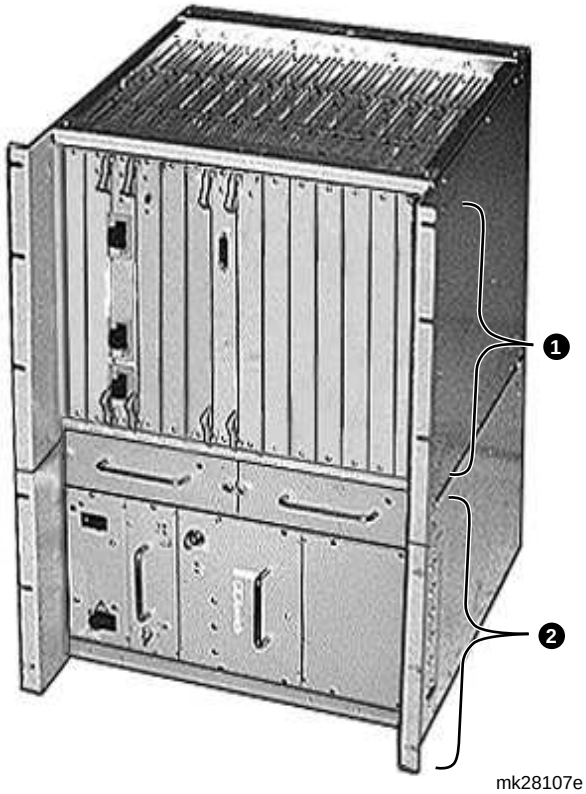
Number	Port Type	Number	Port Type
❶	SAS Port	❷	DAS Port

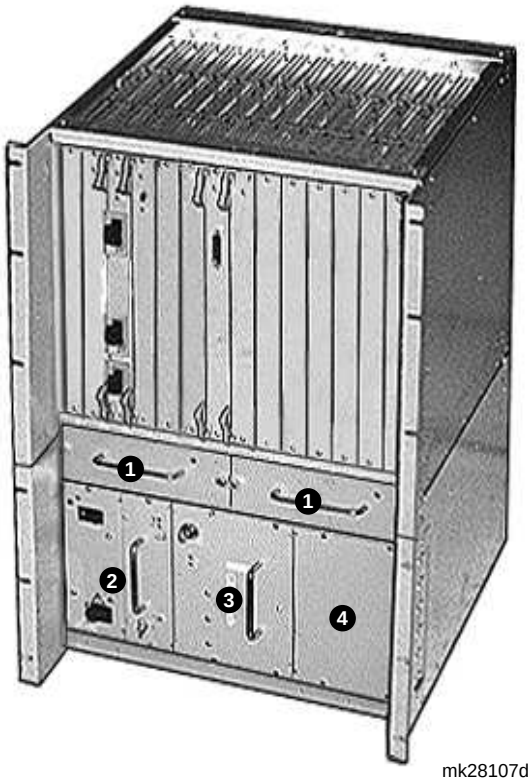
§ Any port on the line card can be configured as either as SAS or a DAS port.

Location of the Modules



Number	Location of the . . .
❶	Logic modules
❷	Cooling and power modules

Description of the Cooling and Power Modules



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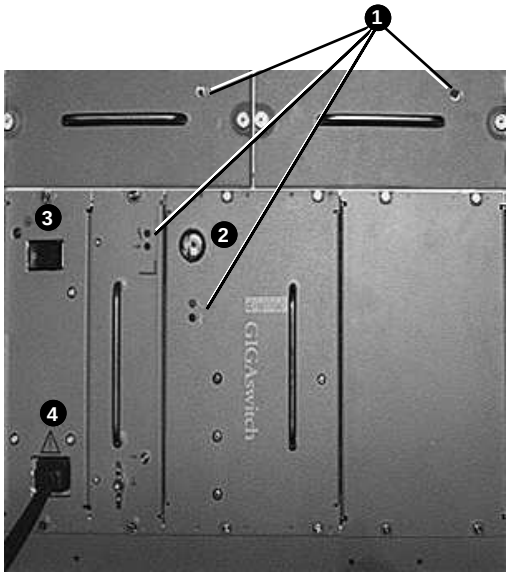
Name	Function
❶ Fan tray assembly	Cools the GIGAswitch System. The GIGAswitch System houses two fan tray assemblies. Each fan tray assembly contains two fans.
❷ Front end unit (FEU)	Converts ac primary power to regulated 48 Vdc power and to 12 Vdc through 26 Vdc power. The regulated 48 Vdc power is used to energize the discrete power modules located on each logic card. The 12 Vdc through 26 Vdc power is used to energize the fans.§
❸ Power status assembly (PSA)	Provides monitoring and control of the cooling and power systems. Also provides a security keyswitch for in-band or out-of-band management.
❹ Slot for backup Front end unit (FEU)	Contains either power supply filler panel or backup FEU

§Another FEU can be installed for redundancy.

Hotswap Capability

All cooling and power modules can be hotswapped.

LEDs, Controls, and Connectors on the Cooling and Power Modules



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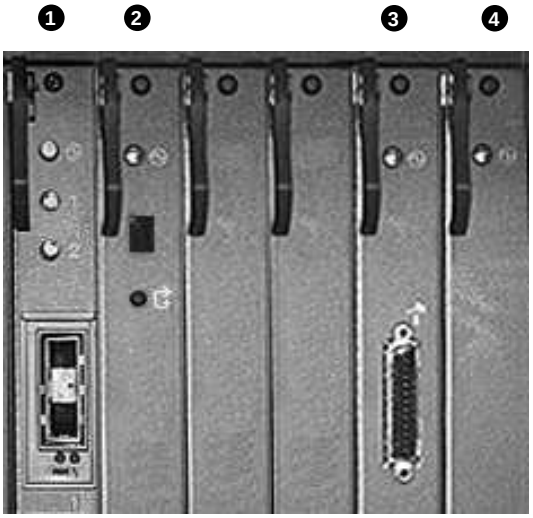
Item	Modules	Function
❶ Status LED (amber)	All	Indicates module self-test (MST) failed. §
❶ Status LED (green)	FEU	Indicates MST passed. §
❶ Status LED (red)	PSA	Indicates overtemperature. §
❷ Security switch (key operated)	Power status assembly (PSA)	Controls the ability to configure or monitor the GIGAswitch System with in-band or out-of-band management commands using password security. Positions: 1 - No access, 2 - Secure Access, 3 - Normal Access, and 4 - Easy Access.
❸ Power switch	Front end unit (FEU)	Enables or disables power to the GIGAswitch System.
❹ Power connector	Front end unit (FEU)	Provides ac power for the GIGAswitch System.

§For further information on LED functions refer to Chapter 5

Power Switch

The power switch is located on the FEU. There is no circuit breaker for overcurrent protection although the modules have fuses that are not field replaceable units (FRUs).

Description of the Logic Modules



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Module	Description
❶ Line card	Provides the packet input/output ports for the GIGAswitch System. Filters selected packets. Directly forwards packets with known destination addresses. Forwards other packets to the switch control processor (SCP) for further consideration. §
❷ SCP card	Acts as a switch control processor (SCP) when elected. Forwards multicast packets and packets with an unknown destination address. §
❸ Clock card	Provides the clock signals for the GIGAswitch System. Responsible for the central arbitration for the backplane (BP) bus. Identifies presence, model number, and type of module in slots 1 through 6, and 8 through 14. Permanently stores management parameters. Contains the OBM port. †
❹ CBS card	Houses the crossbar switch chips. Provides interconnection of the ports on the GIGAswitch System. Allows multiple connections to exist at the same time. ‡

§Can be installed in slots 1 through 6, and 9 through 14.

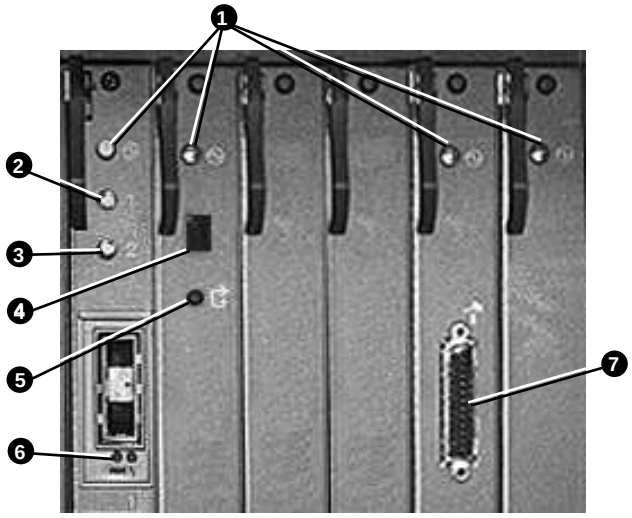
†Must be installed in slot 7.

‡Must be installed in slot 8.

Hotswap Capability

The SCP card **can** be hotswapped. All other logic modules **can not** be hotswapped.

LEDs, Controls, and Connectors on the Logic Modules



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Item	Modules	Function
❶ MST LED (amber/green LED)	All	Indicates power available and MST status. §
❷ ❸ Status (amber/green LED)	Line card	Indicates status of data port. §
❹ Diagnostic readout (hexadecimal LED)	SCP card	Indicates coded diagnostic results. §
❺ Reset (push button)	SCP card	Resets the SCP.
❻ PMD daughter card LEDs	Line card	Indicates status of PMD daughter card. §
❼ OBM port	Clock card	Connects serial port of a console or modem to the GIGAswitch System. Primarily used for out-of-band management and diagnostics.

§For further information on LED functions refer to Chapter 5

2

Preparing to Install the System

Chapter Contents

This chapter describes the procedures that you must complete prior to installing the GIGAswitch System:

1. Verifying the site preparation
2. Unpacking the system
3. Testing the system modules
4. Preparing the rack
5. Setting up ESD protection
6. Removing the system modules

Verifying the Site Preparation

Verify the following requirements are met prior to installing the GIGAswitch System:

- Area
- Cable plant
- Rack space

Area

Appendix A provides the physical, electrical, and environmental specifications for the GIGAswitch System.

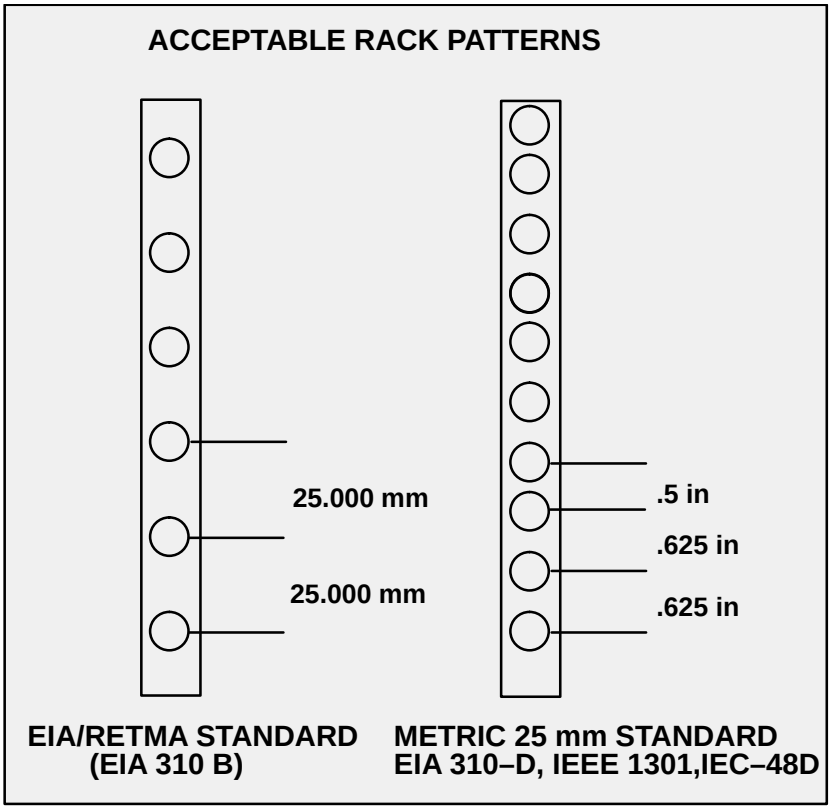
Cable Plant

The *DECconnect System Requirements Evaluation Workbook* contains checklists and additional references used to verify proper cable plant installation.

Rack

A grounded rack 47.5 cm (19 in) wide with 90.0 cm (35.4 in) contiguous vertical space is required for the installation of the GIGAswitch System, the lower plenum, and the upper plenum. The template provided in the rackmount kit is 90.0 cm (35.4 in) long and can be used to verify the contiguous space.

The spacing between the holes of the rack should comply with EIA/RETMA standard EIA 310B or one of the metric 25mm standards (EIA 310-D, IEEE 1301, or IEC-48D) (See the following figure).



Unpacking the System

Time Required 15 minutes.

Tools Required

- Band cutter

Procedures

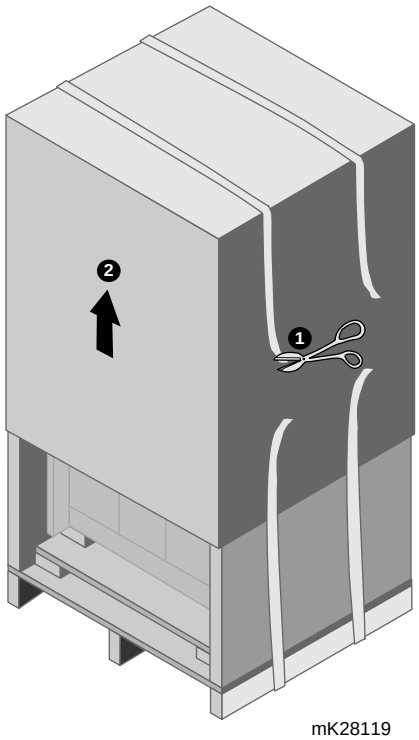
1. Removing the packing material
2. Identifying the contents of the shipping container
3. Testing the modules

Removing the Packing Material

Note

DO NOT remove GIGAswitch System from the pallet. The pallet will serve as a temporary operational platform during system module testing.

Step	Action
1	Locate the banding ❶ and the shipping container ❷.



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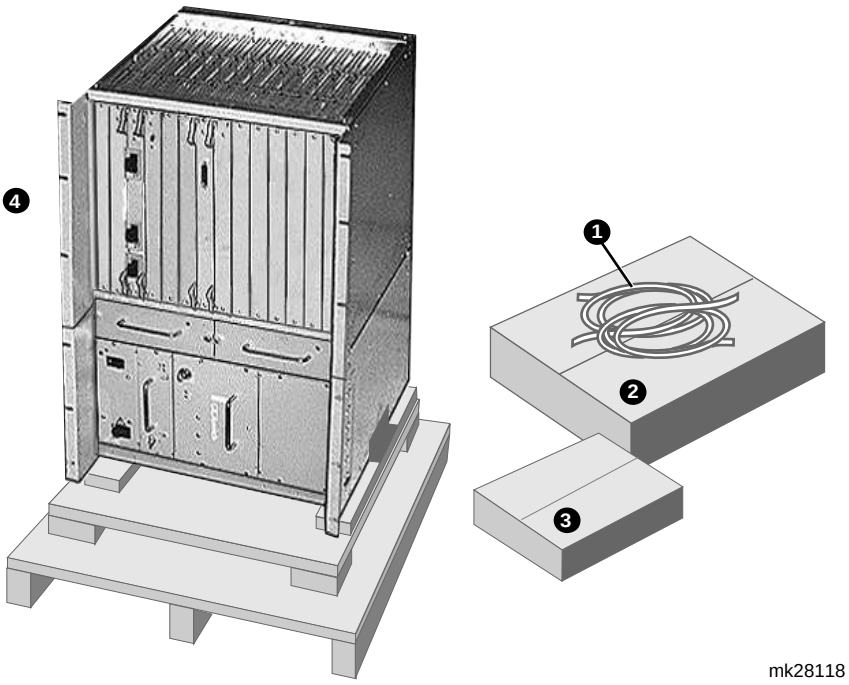
2	Cut the banding ❶ from the shipping container and the pallet using a band cutter.
3	Slide the shipping container ❷ up and off the GIGAswitch System using two people.
4	Remove the packing material, the rack mount kit, and the accessory kit
5	Remove the shipping bag from the GIGAswitch System.

Identifying the Contents of Shipping Container



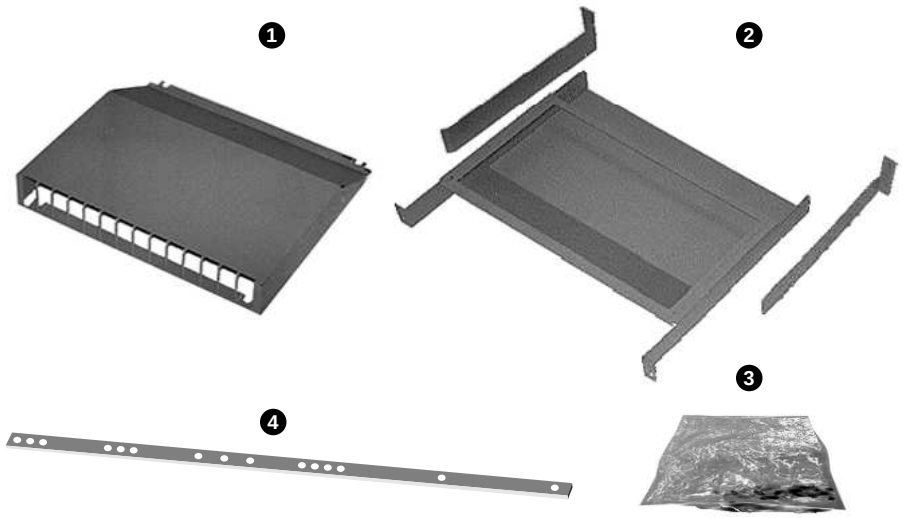
Number	Part Number	Description
❶	17-00083-42	Power cord, term 3-18 SJT or the power cord from the appropriate country kit §
❷	70-30580-01	Rack mount kit
❸	70-30582-01	Accessory kit
❹	DEFGA-Bx §	GIGAswitch System

§DEFGA-BA includes a power cord, term 3-18 SJT. DEFGA-BB **does not** include a power cord, term 3-18 SJT. The customer ordering the DEFGB-BB version must order a country kit to obtain the proper power cord.

Identifying the Options

Appendix D provides a description of these options, as well as where the options should be installed in the GIGAswitch System.

Identifying the Contents of the Rackmount Kit



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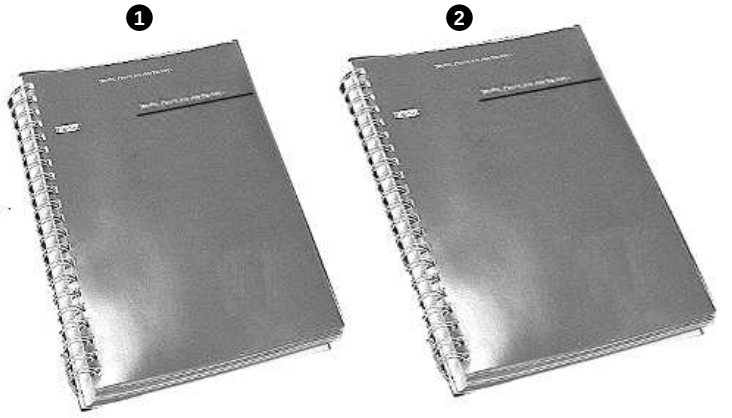
Number	Part Number	Name	Function
❶	74-45687-01	Upper plenum	Directs air from the front of the rack into the top of the GIGAswitch System and down through the GIGAswitch System.
❷	70-30586-01	Lower plenum (with brackets)	Supports the GIGAswitch System and directs the air exhausting from the fans in the GIGAswitch System to the rear of the rack.
❸	N/A	Hardware container	Contains the 18 clip nuts and 23 screws used to install the lower plenum, the GIGAswitch System, and the upper plenum.
❹	36-40161-01	Template	Used to determine the location on the rack for the clip nuts.

Identifying the Contents of the Accessory Kit



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Number	Part Number	Name
❶	EK-GGGAA-AP	*GIGAswitch System Planning Guide*§
❷	EK-GGMGA-MG	*GIGAswitch System Manager's Guide*

§The *GIGAswitch System Planning Guide* shown in the figure is not currently available.

Testing the System Modules

Time Required 5 minutes.

Tools Required None

Procedures

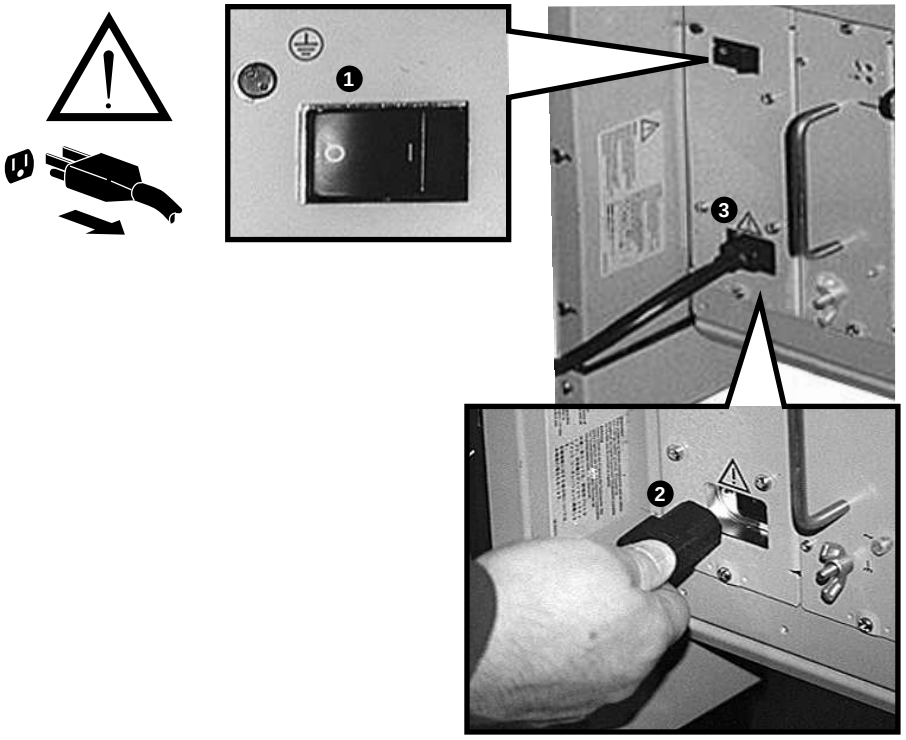
1. Applying power to the GIGAswitch System
2. Evaluating the results of the MST

Applying Power to the GIGAswitch System

Complete the following steps to apply power to the GIGAswitch System:

Step	Action
1	Locate the power switch, ❶, the power cord § ❷ and the power connector ❸.

§Some power cords are shipped separately in country kits



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2	Place the power switch ❶ in the 0 (OFF) position.
3	Plug the power cord ❷ into the power connector ❸ and then into the connector for the primary power source.
4	Place the power switch ❶ in the 1 (ON) position.

Evaluating the Results of the MST

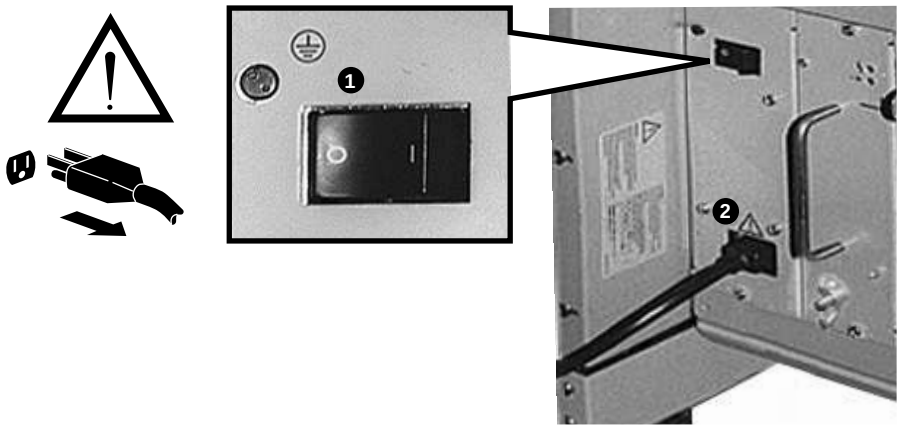
Observe the operational status of the GIGAswitch System after the power-on MST is complete. If one or more of the following conditions exist see Chapter 5. If none of the following conditions exist see the next section:

- One or more of the LEDs on the GIGAswitch System remains solid amber or solid red.
- None of the LEDs light.

Removing Power from the GIGAswitch System

Complete the following steps to remove the power from the GIGAswitch System:

Step	Action
1	Locate the power switch ❶ and the power connector ❷



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2	Place the power switch ❶ in the 0 (OFF) position.
3	**Do not** remove the power cord from the power connector ❷. The power cord provides the ground for ESD protection.
4	Repeat steps 1 and 2 for any alternate power supply.

Preparing the Rack

Time Required 30 minutes.

Tools Required

- Number 2 cross-point screwdriver
- Pencil

Procedures

1. Installing the clip nuts
2. Installing the lower plenum

Installing the Clip Nuts

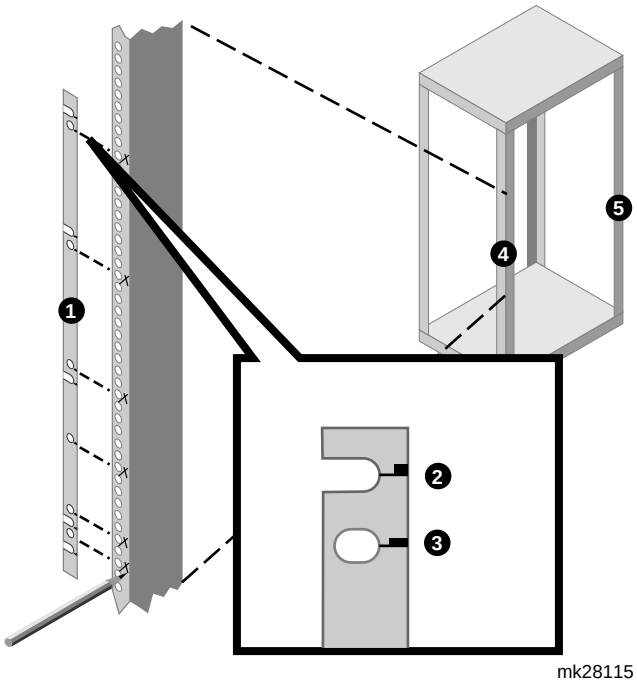
Procedures

1. Marking the position for the clip nuts
2. Attaching the clip nuts

Marking the Position for the Clip Nuts

Step	Action
1	Locate the template ❶ and distinguish between the metric markings ❷, and the RETMA § markings ❸.
2	Locate the front rails ❹, and the rear rails ❺.

§RETMA - Radio Electronics Television Manufacture's Association



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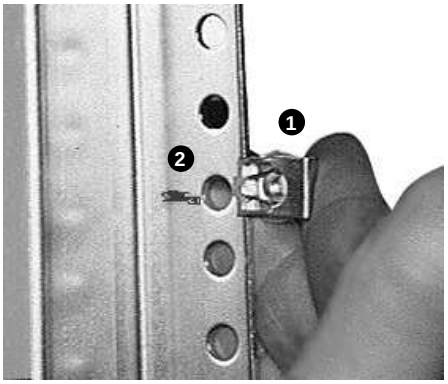
3	Identify the area in the rack designated for the GIGAswitch System.
4	Position the template ❶ behind one of the front rails ❹. Match the markings on the template ❶ to the holes in rail using one of the following: • Metric markings ❷ (open slot) for metric racks. • RETMA markings ❸ (closed slot) for RETMA racks. If the whole template does not fit in the spaced reserved, move equipment, as necessary, to reserve the additional space.
5	Mark the position on the front rail ❹ for the two clip nuts associated with the lower plenum and the six clip nuts associated with the GIGAswitch System.
6	Repeat steps 4 through 5 for the other front rail ❹.
7	Repeat step 4 for a rear rail ❺.
8	Mark the position on the inside of the rear rail ❺ for the clip nut associated with the lower plenum bracket.
9	Repeat steps 7 and 8 for the other rear rail ❺.

Attaching the Clip Nuts

Complete the following steps to attach the clip nuts to the front and rear rails of the rack:

Step	Action
1	Locate the clip nuts ❶, and the marked holes ❷ on the rack.



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2	Place eight clip nuts over the marked holes on the right front rail of the rack. Orient each clip nut ❶ so the screw can be installed from the front of the rack, and press each clip nut onto the marked hole ❷.
3	Repeat step 2 for the left front rail.
4	Place one clip nut over the marked holes on the right rear rail of the rack. Orient the clip nut ❶ so the screw can be installed from the front of the rack, and press each clip nut onto the marked hole ❷.
5	Repeat step 4 for the left rear rail.

Installing the Lower Plenum

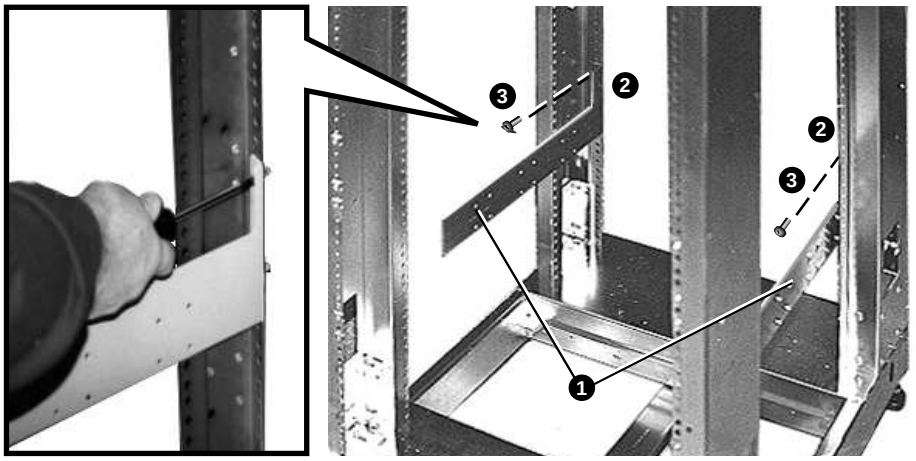
Procedures

1. Attaching the lower plenum brackets
2. Attaching the lower plenum

Attaching the Lower Plenum Bracket

Complete the following steps to attach the lower plenum bracket to the rear rails of the rack:

Step	Action
1	Locate hole and the attached pin on the rear of the lower plenum brackets ❶, rear rails ❷, two screws ❸ used to attach the lower plenum brackets to the rear rails of the rack, and the clip nuts (not shown) on the rear rails of the rack.



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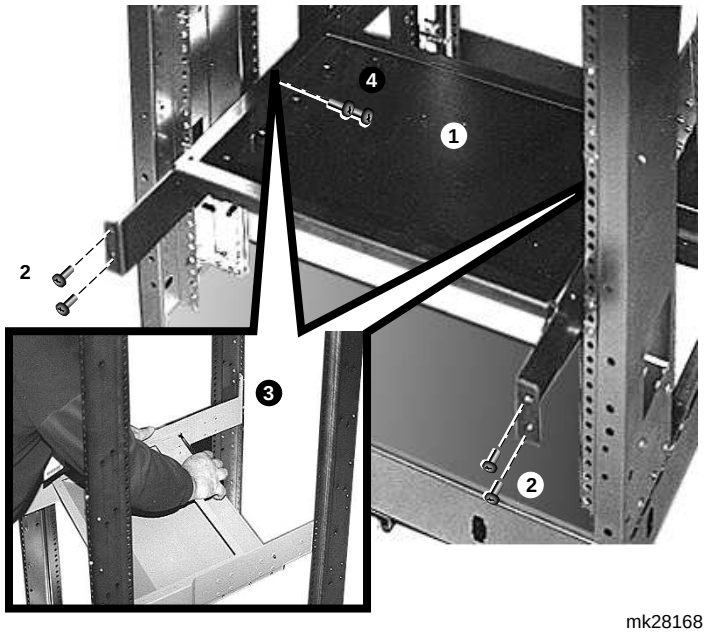
2	Align the hole and the attached pin of the right lower plenum bracket ❶ with the corresponding clip nut and hole on the inside of the rear rail ❷, and insert the pin of the right lower plenum bracket ❶ into the corresponding hole in the rack.
3	Attach the right lower plenum bracket to the right rear rail ❷. Install one screw ❸ using a number 2 cross-point screwdriver.
4	Repeat steps 2 and 3 for the left lower plenum bracket ❶.

Attaching the Lower Plenum

Complete the following steps to attach the lower plenum to the rack and to the lower plenum brackets:

Step	Action
1	Locate the lower plenum ❶, the four clip nuts and associated screws ❷, the right and left lower plenum bracket ❸, the two screws ❹ used to connect the right and left lower plenum brackets to the lower plenum



mk28168

2	Align the holes in the brackets on the lower plenum ❶ with the clip nuts on the front rails of the rack designated for the lower plenum ❶.
3	Attach the lower plenum ❶ to the front rails of the rack. Install the four screws ❷ using a number 2 cross-point screwdriver.
4	Attach the lower plenum ❶ to the right plenum bracket ❸. Install the two screws ❹ using a number 2 cross-point screwdriver.
5	Repeat step 4 for the left plenum bracket.

Setting Up ESD Protection

Protect the logic module against damage from electrostatic discharge (ESD) by using:

- Static-free containers for long-term storage.
- Grounded ESD wrist strap while installing and removing modules.
- Grounded ESD mat for tempory storage.

Using ESD Equipment

The Portable Static-Dissipative Field Service Kit (Part No. 29-26246) is used to protect ESD sensitive modules against damage. Complete the following steps to set up and maintain a static-free area.

Step	Action
1	Ground the unit. The unit is grounded through the power cord when it is connected between the unit and the primary power source.
2	Lay out the static-dissipative work surface (ESD mat) on a flat surface.
3	Connect the ground cord assembly to the ESD mat and to an unpainted surface on the unit.
4	Wear the ESD wrist strap and attach it to the ground cord assembly.

Removing the System Modules

Warning

Remove all system modules from the unit to make it light enough for two people to lift the unit.

Caution

Ensure the power cord is connected at both ends to place the chassis at earth ground potential.

Procedures

1. Removing the logic modules
2. Installing the PMD Daughter Cards
3. Removing the fan tray assemblies
4. Removing the cooling and power moduless

Removing the Logic Modules

Warning

Remove all system modules from the unit to make it light enough for two people to lift the unit.

Note

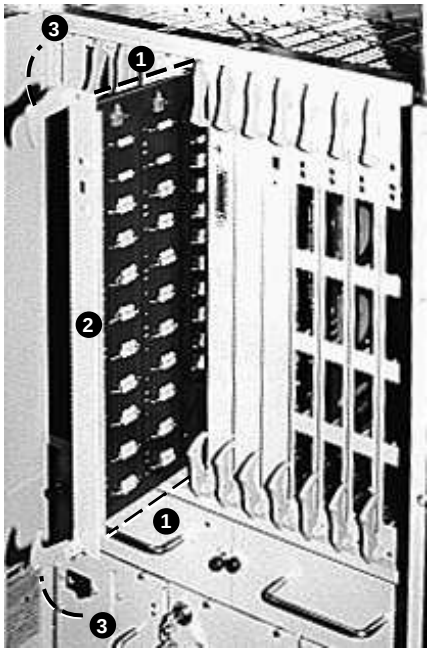
The SCP card shown in the figure represents any logic module since all logic modules are removed in the same manner

Note

Remove the line card last to make it accessable for PMD daughter card installation.

Complete the following steps to remove the logic modules from the GIGAswitch System:

Step	Action
1	Locate the two screws ❶ that fasten the selected module ❷ to the GIGAswitch System and the ejectors ❸ used to seat the module.



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1	Set up the ESD equipment.
2	Slip on ESD wrist band.
3	Loosen the upper and lower screws ❶.
4	Move the ejectors ❸ outward to unseat the module ❷ from the unit.
5	GENTLY slide the module ❷ out of the unit.
6	Place module ❷ in a static proof bag.
7	Place bagged module ❷ on a flat surface or on another bagged module. The modules can be stacked four modules high.
8	Repeat steps 3 through 6 to remove the rest of the logic modules.

Installing the PMD Daughter Cards

The following table provides the part numbers for the possible PMD daughter cards:

Physical Media	PMD Part Number
ANSI Multimode Fiber FDDI	DEFXM-AA
Single-mode Fiber FDDI	DEFXS-AA

Installing the MMF ANSI MIC PMD

Unpacking the PMD

Note

(The extra posts and the PHY M key provided in the package are not used in this installation. The PHY A and PHY B keys are used in the DAS configuration of the ANSI Multimode Fiber FDDI PMD only.

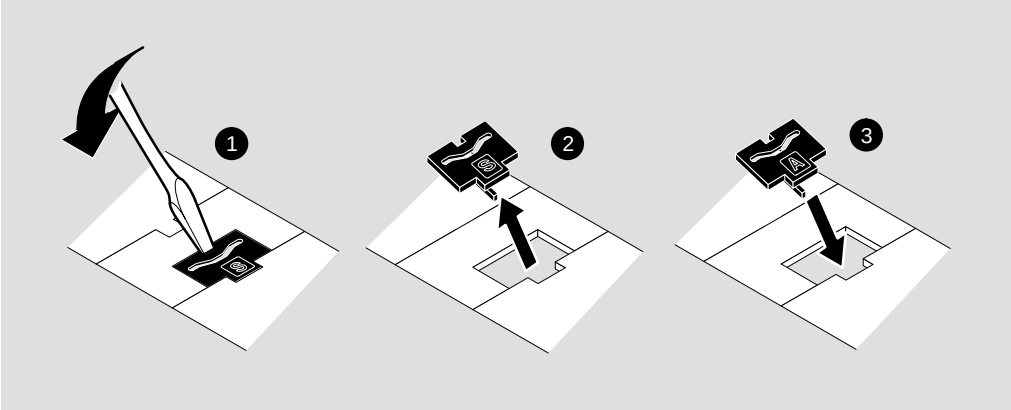
1	Set up the ESD equipment.
2	Slip on ESD wrist band.
3	Unpack the PMD and check the contents against the packing slip.

Installing a PHY Port Key

Note

This section applies to a dual-attachment station (DAS) configuration only

The connector on the PMD daughter card is shipped with a universal (PHY S) key installed. The PHY S key is replaced by a PHY A key for the PMD daughter card designated for the top slot. The PHY S key is replaced by a PHY B key for the PMD daughter card designated for the bottom slot. Complete the following procedure to replace the PHY keys:



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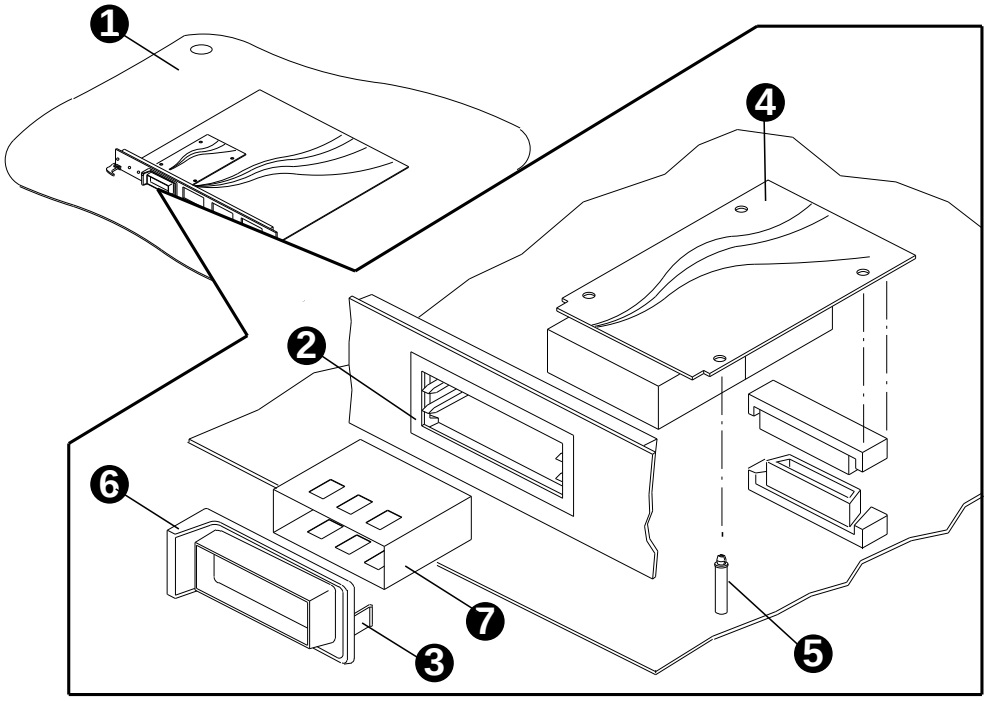
Step	Action
❶	Release the edge of the PHY key using a thin flat blade (4.41 mm (3/16 in)) screwdriver
❷	Slide the key forward and remove it.
❸	Tip the replacement key in place and press down.

Mounting the MMF ANSI MIC PMD

Complete the following steps to install multimode fiber (MMF) ANSI MIC PMD: daughter cards.

Step	Action
1	Identify the ESD mat ❶, port slot ❷, the two retaining clips ❸, the PMD daughter card ❹, the brass standoffs ❺, the bezel ❻, and the collar shroud ❼.



2	**Slip on ESD wrist strap and place the line card on the ESD mat ❶** with the components of the line card facing up and the top of the line card facing left.

Note

Remove the top blank bezel for a SAS configuration. Remove both the top and the bottom blank bezel for a DAS configuration.

3 **Remove the blank bezel**. Release the locking tabs on both sides of the bezel using a screwdriver.

4 **Insert the collar shroud ❼** into the port slot ❷ in the handle of the line card. Orient the open portion of the U shaped collar shroud ❼ in the up position and insert the collar shroud into the port slot ❷ in the handle of the line card. Slide the collar shroud into the port slot ❷ in the handle of the line card until the fingers of the collar shroud rest against the handle of the line card.

5 **Mount the PMD daughter card ❹ containing the PHY S key or the PHY A key in the upper slot of the selected port.** Orient the PMD daughter card with the connector facing down and away from the handle of the line card and position the PMD daughter card over the line card. Place the collar shroud ❼ around the front of the PMD daughter card. Snap the PMD daughter card onto the two brass standoffs ❺ mounted on the line card, and then mate the connector by pressing down on the back of the PMD daughter card.

Note

Ensure the bezel completely surrounds the collar shroud before snapping the bezel onto the front of the handle of the line card.

6 **Snap the bezel ❻ onto the front of the handle** of the line card. Orient the bezel ❻ with the label area facing the top of the line card.

7 **This step is for DAS configuration only**. Repeat steps 4 through 6 to install the PMD daughter card containing the PHY B key in the lower slot of the selected port.

8 **Place line card in a static proof bag.**

9 **Place bagged module on a flat surface or on another bagged module.** The modules can be stacked four modules high.

Installing the SMF PMD

Unpacking the PMD

Note

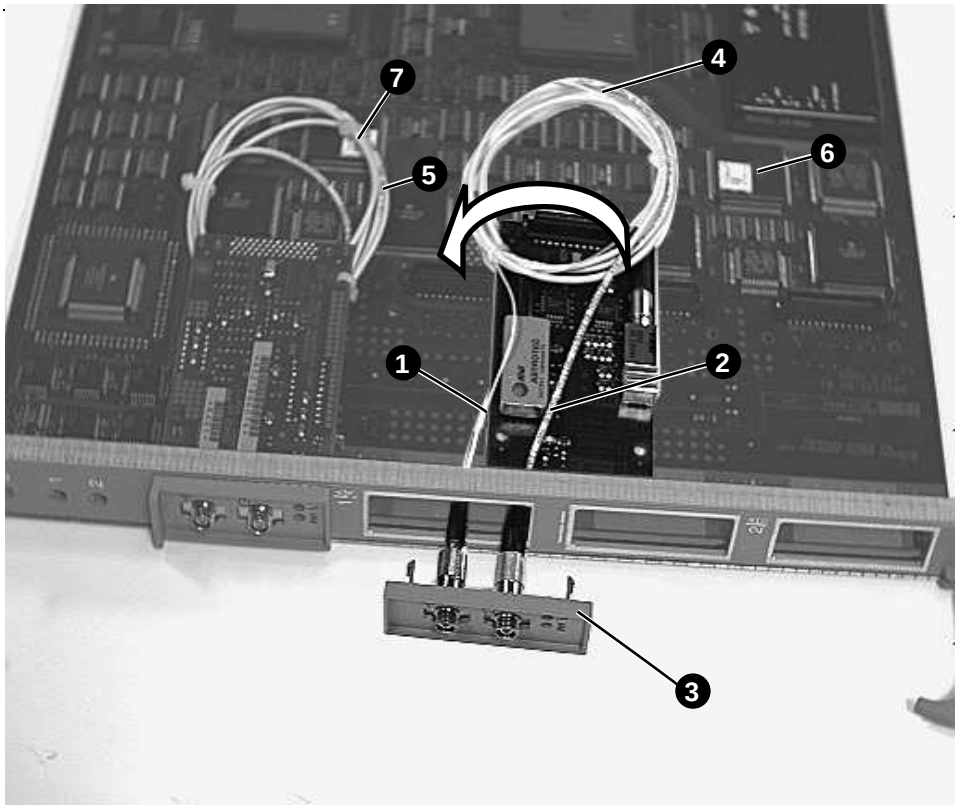
(**The extra posts are not used in this installation**

1	Set up the ESD equipment.
2	Slip on ESD wrist band.
3	Unpack the PMD and check the contents against the packing slip.
4	Remove the cable-ties from the coiled cable bundle.

Prepairing the SMF PMD

Complete the following steps to prepare single-mode fiber (SMF) PMD (DEFXS-AA) daughter cards:

Step	Action
1	Identify the receiver cable ❶, the transceiver cable ❷, the bezel ❸, the coiled cable bundle ❹, the coiled cable tie point ❺, the lower port cable-tie anchor mounting location ❻, and the upper port cable-tie anchor mounting location ❼.



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2	**Slip on ESD wrist strap and place the line card on the ESD mat** with the components of the line card facing up and the top of the line card facing left.

Note

Remove the top blank bezel for a SAS configuration. Remove both the top and the bottom blank bezel for a DAS configuration.

3	**Remove the blank bezel**. Release the locking tabs on both sides of the bezel using a screwdriver.

Note

The receiver cable is the thin white cable. The transceiver cable is the thick yellow cable

4 **Mate the connectors** of the receiver cable ❶ and the transceiver cable ❷ to the respective connectors on the bezel ❸. Orient the bezel ❸ with the label area facing the top of the line card. Extend the loose ends of the receiver cable ❶ and the transceiver cable ❷ through the hole in the line card. The receiver cable ❶ will be to the left and the transceiver cable ❷ will be to the right.

Caution

Do not exceed the 3" minimum bend diameter when adjusting coils.

5 **Roughly dress the coiled cable bundle ❹**. Equalize the cables in the coiled cable bundle and dress the coiled cable bundle to the rear of the PMD daughter card as shown in the figure.

Note

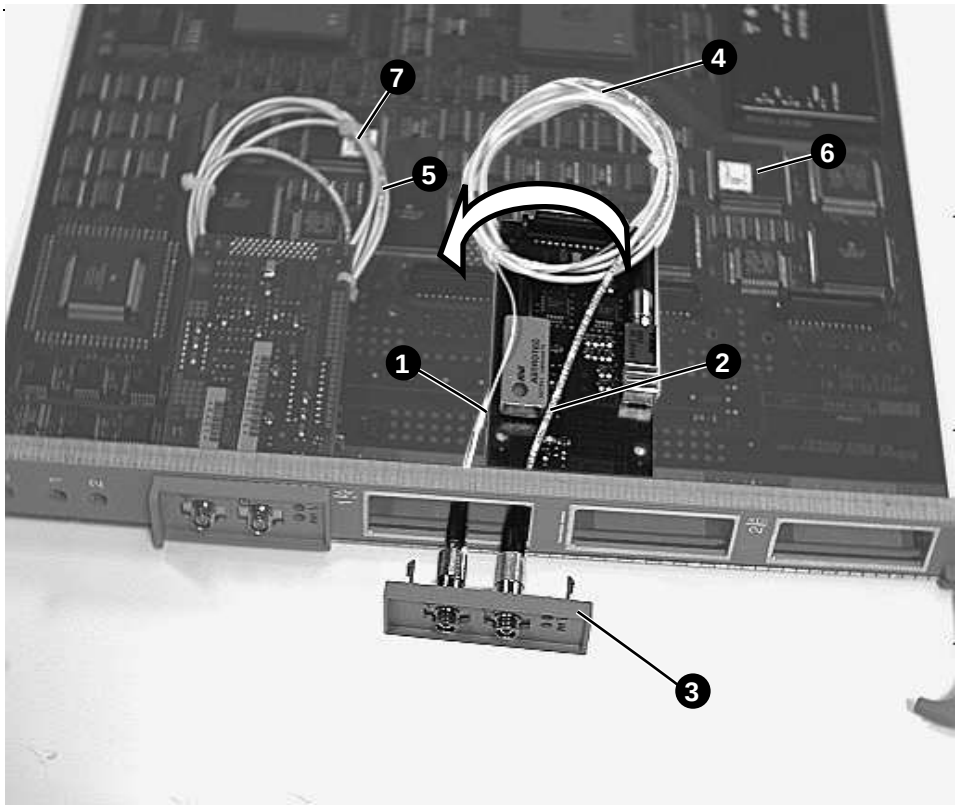
Loosely install the cable-ties to allow for final dressing of the loops.

6 **Install the cable-ties**. Wrap one cable-tie around all the cables in the coiled cable bundle ❹ and attach it to the PMD daughter card using the after post hole on the TX side of the PMD daughter card. Wrap the other cable-tie around all the cables in the coiled cable bundle ❹ and position it near the RX connector.

Mounting the SMF PMD

Complete the following steps to mount the single-mode fiber (SMF) PMD (DEFXS-AA) daughter cards:

Step	Action
1	Identify the receiver cable ❶, the transceiver cable ❷, the bezel ❸, the coiled cable bundle ❹, the coiled cable tie point ❺, the lower port cable-tie anchor mounting location ❻, and the upper port cable-tie anchor mounting location ❼.



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2 **Mount the PMD daughter card.** Turn the PMD daughter over. Orient the PMD daughter card with the connector facing down and away from the handle of the line card and position the PMD daughter card over the line card. Snap the PMD daughter card onto the two brass standoffs mounted on the line card.

Note

Ensure the coiled cable bundle ❹ is clear of the connector before mating the connector.

3 **Mate the connector** by pressing down on the back of the PMD daughter card.

4 **Snap the bezel ❸ onto the front of the handle** of the line card. Orient the bezel ❸ with the label area facing the top of the line card.

5 **Dress the cables in the coiled cable bundle and tighten the cable-ties.**

6 **Install final cable_tie.** If SMF PMD daughter card is already installed in the port, attach the two coiled cable bundles together at the tie point ❺ shown using a cable-tie. If this is the first SMF PMD daughter card to be installed, mount the cable-tie anchor in the appropriate position (the position for the upper port ❼ or the position for the lower port ❻), and attach the coiled cable bundle ❹ to the appropriate cable-tie anchor.

7 **This step is for DAS configuration only**. Repeat steps 4 through 6 to install the other PMD daughter card.

8 **Place line card in a static proof bag.**

9 **Place bagged module on a flat surface or on another bagged module.** The modules can be stacked four modules high.

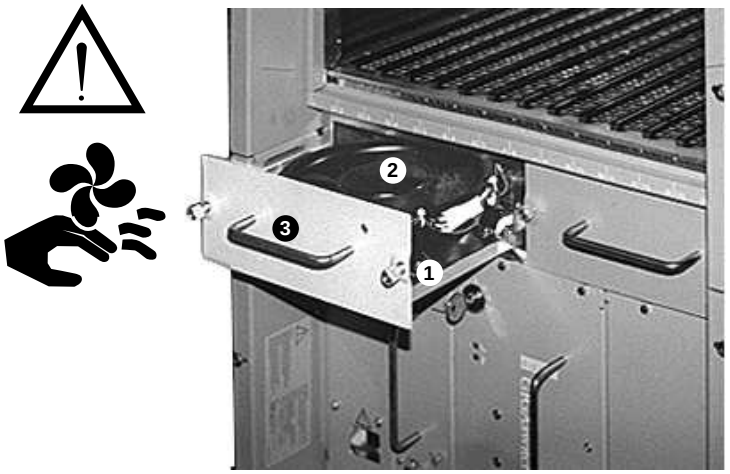
Removing the Fan Tray Assemblies

Warning

Remove all system modules from the unit to make it light enough for two people to lift the unit.

Complete the following steps to remove the fan tray assemblies from the GIGAswitch System:

Step	Action
1	Locate the two fasteners ❶ that attach the selected fan tray assembly ❷ to the GIGAswitch System, and the handle ❸.



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2	Release the two fasteners ❶ that attach the selected fan tray assembly to the GIGAswitch System.
3	Grasp the handle ❸ and slide the fan tray assembly ❷ out of the unit enough to see if the fan is rotating.
4	Wait for the fan to stop rotating.
5	Slide the fan tray assembly out of the unit. Grasp the handle ❸ with one hand and support the bottom of the fan tray assembly with your other hand.
6	Repeat steps 1 through 5 to remove the other fan tray assembly.

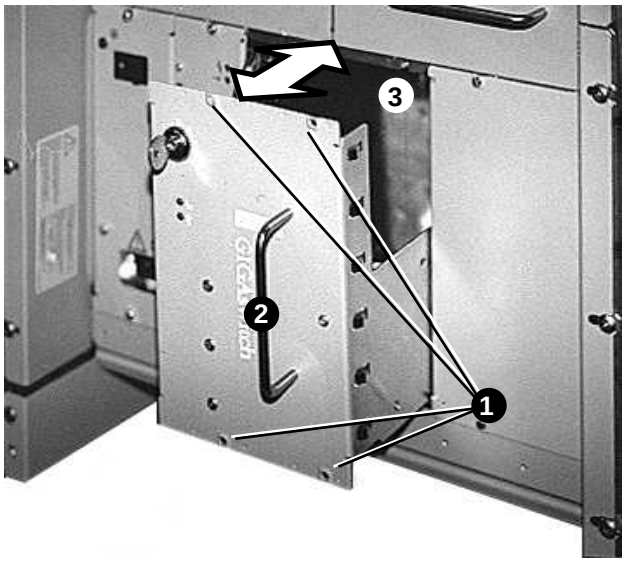
Warning

Remove all system modules from the unit to make it light enough for two people to lift the unit.

Removing the PSA

Complete the following steps to remove the power status assembly (PSA).

Step	Action
1	Locate the four screws ❶ that fasten the module to the GIGAswitch System, the handle ❷ of the module, and the slot ❸ designated for the module.



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2	Remove the four screws ❶ on the module using a number 2 cross-point screwdriver.
3	Slide the module out of the unit. Grasp the handle ❷ with one hand and support the bottom of the module with your other hand. When the module comes to a stop, lift up to allow it to clear the upper edge of the chassis and continue removal.

Warning

Remove all system modules from the unit to make it light enough for two people to lift the unit.

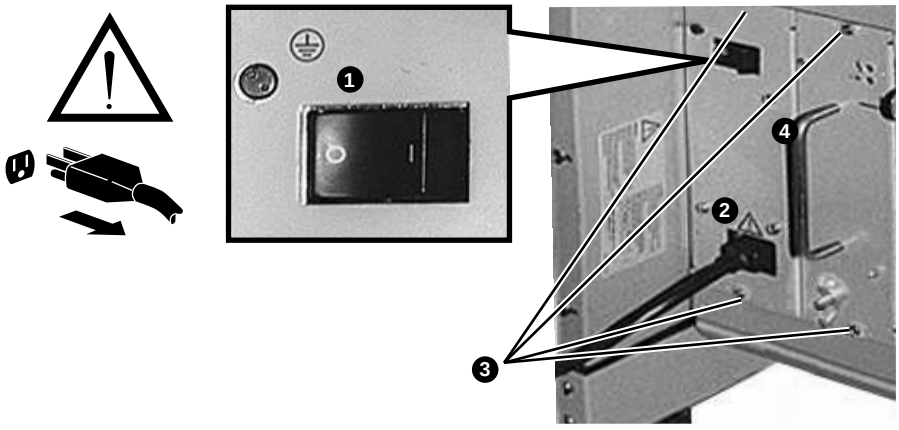
Caution

Remove FEU after removing all logic modules. The power cord provides the ground required for ESD protection.

Removing the FEU

Complete these steps to remove a front end unit (FEU).

Step	Action
1	Locate the power switch ❶, the power cord ❷, the four screws ❸ that fasten the selected module to the GIGAswitch System, and the handle ❹ of the selected module.



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2	Place the power switch ❶ in the O (OFF) position and remove the power cord ❷ from the primary power outlet and the power connector.
3	Remove the four screws ❸ on the module using a number 2 cross-point screwdriver.
4	Slide the module out of the unit. Grasp the handle ❹ with one hand and support the bottom of the module with your other hand.
5	Repeat steps 1 through 4 to remove the other module if installed.

What is Next?

Now that you have removed all of the system modules you are now ready to lift the empty GIGAswitch System onto the lower plenum. Continue to the next chapter.

3

Installing the GIGAswitch System

Note

Complete the procedures described in Chapter 2 before proceeding with this chapter.

Chapter Contents

This chapter describes the procedures for installing the empty GIGAswitch System including:

1. Installing the GIGAswitch System in the rack
2. Attaching the upper plenum to the GIGAswitch System
3. Installing the system modules

Installing the GIGAswitch System in the Rack

Time Required 45 minutes.

Needed Tools

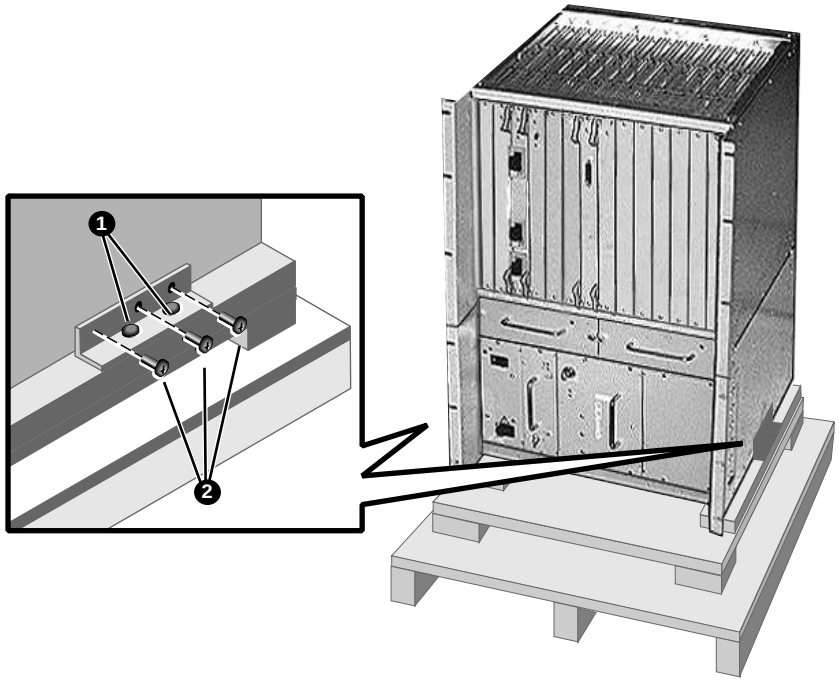
- Adjustable wrench
- Number 2 cross-point screwdriver
- ESD equipment

Procedures

1. Removing the GIGAswitch System from the pallet
2. Placing the GIGAswitch System on the lower plenum
3. Attaching the GIGAswitch System to the rack

Removing the GIGAswitch System from the Pallet

Step	Action
1	Locate the four screws ❶ attaching the brackets to the pallet, and the six screws ❷ attaching the brackets to the GIGAswitch System.

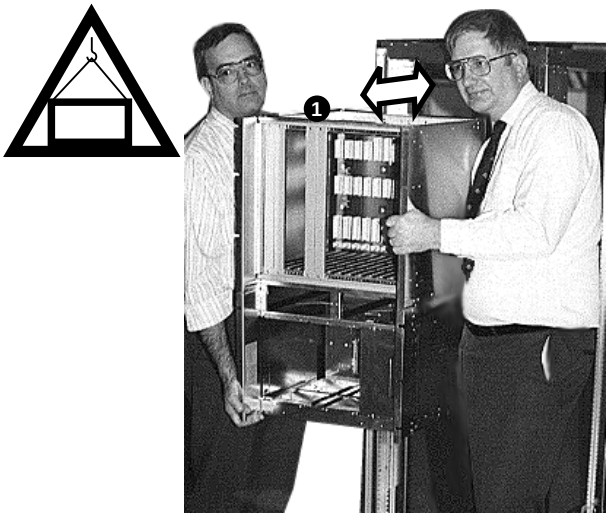


2	Loosen the four screws ❶ attaching the brackets to the pallet using the adjustable wrench.
3	Remove the six screws ❷ attaching the brackets to the GIGAswitch System using the adjustable wrench.

Placing the GIGAswitch System on the Lower Plenum

Warning

The **empty GIGAswitch System weighs 31.75 kg (70 lbs). Use two people to lift the unit.**



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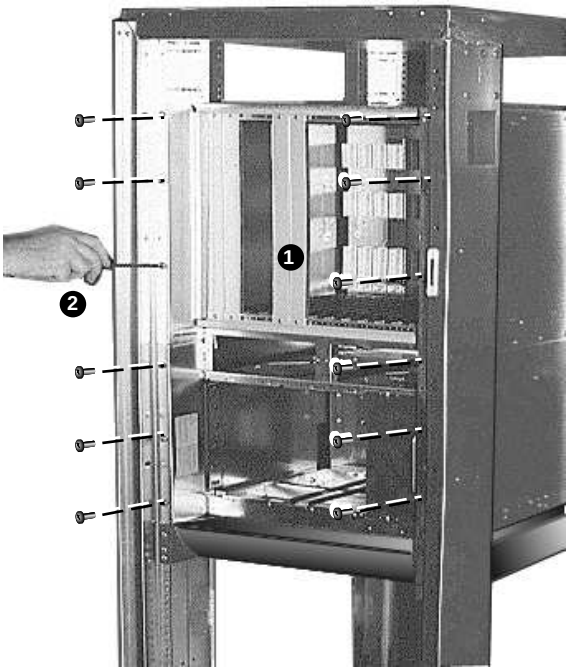
Step	Action
1	Lift the empty GIGAswitch System❶ to the height of the lower plenum in the rack using two people.
2	Gently slide the empty GIGAswitch System❶ into the rack, placing it onto the lower plenum.

Attaching the GIGAswitch System to the Rack

Step	Action
1	Locate the GIGAswitch System ❶, the 12 clip nuts (not shown) designated for the GIGAswitch System, and the 12 screws ❷.



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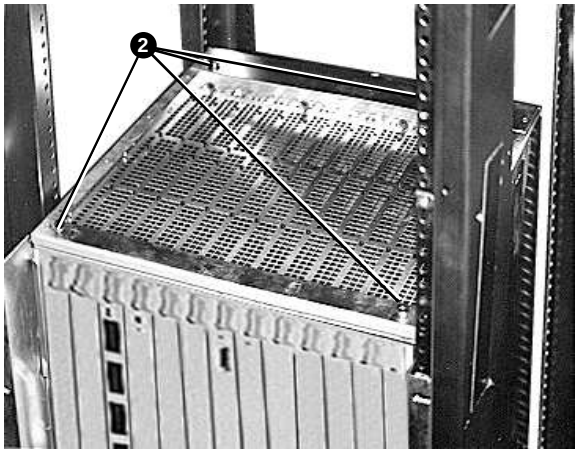
2	Align the holes in the GIGAswitch System ❶ with the corresponding clip nuts on the rack.
3	Partially start the 12 screws ❷ using a number 2 cross-point screwdriver beginning with the bottom screws.
4	Finish tightening the 12 screws ❷ using a number 2 cross-point screwdriver.

Attaching the Upper Plenum to the GIGAswitch System

Step	Action
1	Locate the upper plenum ❶, the four shoulder screws ❷, and the mounting screw ❸.



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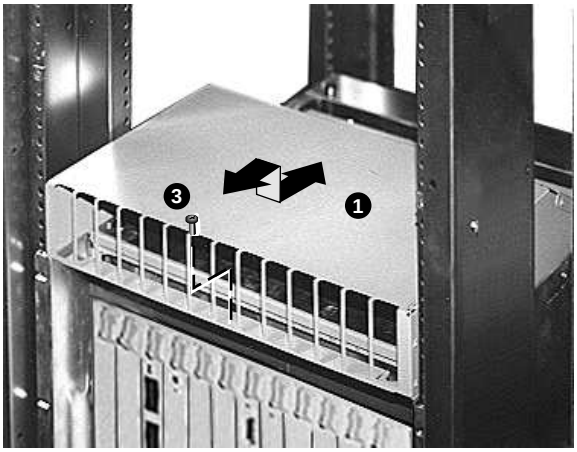

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2	Place the upper plenum ❶ on the GIGAswitch System. Slide the upper plenum in until it catches under the four shoulder screws ❷.
3	Install the mounting screw ❸ to attach the upper plenum ❶ to the GIGAswitch System using a number 2 cross-point screwdriver.

Installing the System Modules

Procedures

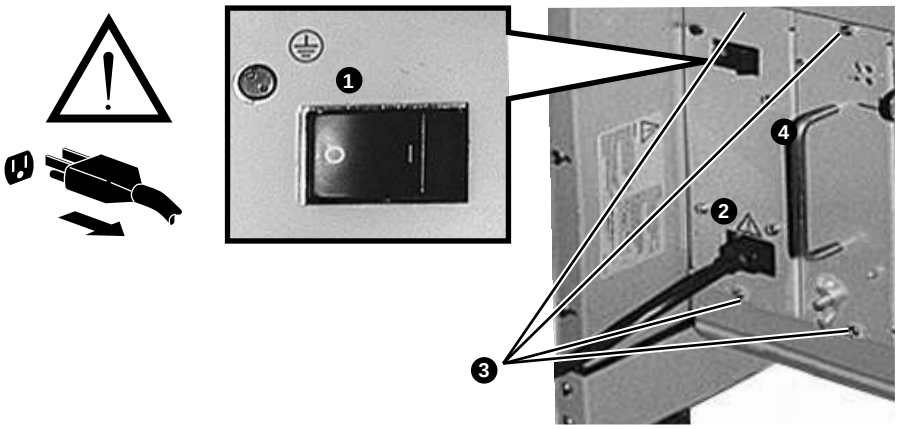
1. Installing the FEUs
2. Installing the PSA
3. Installing the fan tray assemblies
4. Installing the logic modules

Caution

Install the FEU before installing any logic modules. The power cord provides the ground required for ESD protection.

Installing the FEU

Step	Action
1	Locate the power switch ❶, the power cord ❷, the four screws ❸ that fasten the selected module to the GIGAswitch System, and the handle ❹ of the selected module.



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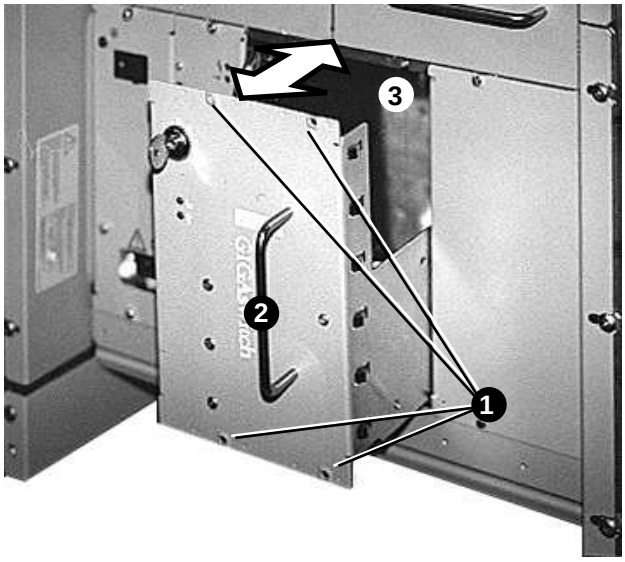
2	Align the selected module with the module guides of the slot designated for the module.
3	Grasp the handle ❹ and slide the module into the unit.
4	Tighten the four screws ❸ using a number 2 cross-point screwdriver.
5	Place the power switch ❶ in the 0 (OFF) position.
6	Plug the power cord ❷ into the power connector and then into the connector for the primary power source.

Installing the PSA

Step	Action
1	Locate the four screws ❶ that fasten the module to the GIGAswitch System, the handle ❷ of the module, and the slot ❸ designated for the module.



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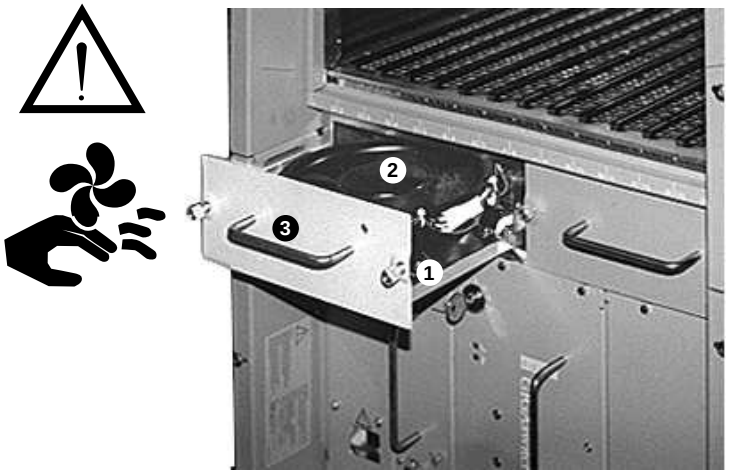
2	Align the module with the module guides of the slot ❸ designated for the module. Lower the rear of the module slightly to allow the lip on the upper rear edge of the module to clear the upper edge of the slot ❸ designated for the module.
3	Slide the module into the unit. Grasp the handle ❷ with one hand and support the bottom of the module with your other hand.
4	Tighten the four screws ❶ using a number 2 cross-point screwdriver.

Installing the Fan Tray Assemblies

Step	Action
1	Locate the two fasteners ❶ that attach the selected fan tray assembly ❷ to the GIGAswitch System, and the handle ❸ of the selected fan tray assembly.



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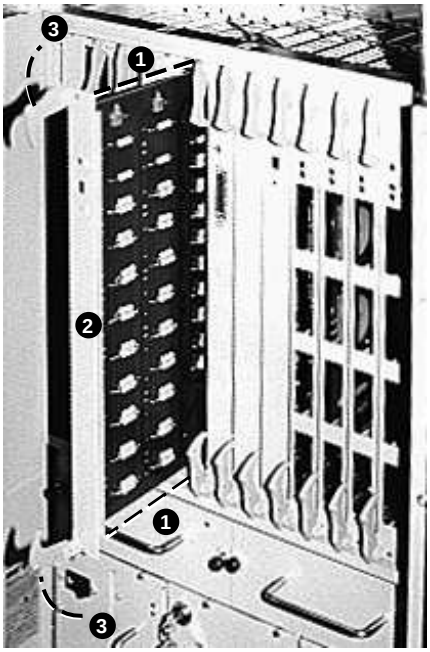
2	Align the fan tray assembly (LED to the upper right of the handle) ❷ with module guides of the slot designated for fan tray assembly.
3	Slide the fan tray assembly ❷ into the GIGAswitch System.
4	Tighten the two fasteners ❶.
5	Repeat steps 1 through 4 to install the other fan tray assembly.

Installing the Logic Module

Step	Action
1	Locate the screws ❶ that fasten the selected module ❷ to the GIGAswitch System and the ejectors ❸ used to seat the module.



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2	Remove power and set up the ESD equipment (See Chapter 6).§
3	Wear the ESD wrist band.
4	Align the module (component side facing right) with the upper and lower guides, and GENTLY slide the module ❷ into the unit.
5	Move the ejectors ❸ inward to seat the module ❷ in the unit.
6	Tighten the upper and lower screws ❶ using a number 2 cross-point screwdriver.

§The SCP card can be hotswapped

What is Next

If	Then
Options were ordered	Proceed to Chapter 7
Options were **not** ordered	Proceed to Chapter 5

Part II

Test

Part II contains information for testing the GIGAswitch System:

- **Chapter 4** describes the procedures that you must complete before testing the GIGAswitch System. These procedures include preparing the ports, connecting the Out-of-Band Management (OBM) terminal, and setting the security switch.
- **Chapter 5** describes the procedures for initiating the MSTs and provides instructions for evaluating the results of the MSTs.

4

Preparing to Test the System

Chapter Contents

This chapter describes the following procedures that should be completed prior to conducting tests on the GIGAswitch System:

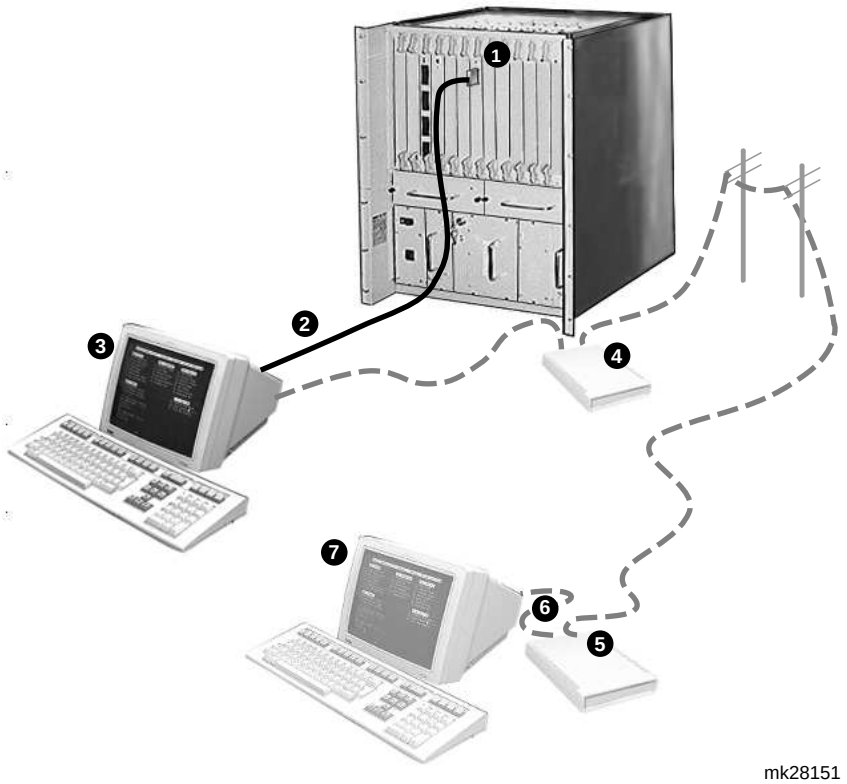
1. Connecting the OBM terminal
2. Setting the security switch

Connecting the OBM terminal

Complete the following steps to connect an out-of-band management (OBM) terminal to the OBM port on the clock card: [1]

Step	Action
1	Locate the OBM port ❶, the OBM terminal ❸, the modem ❹, remote modem ❺, remote OBM terminal ❼, and the associated cables ❷, ❻ §

§Typical part numbers BC22D-xx, and BC05D-xx respecively where xx = length of cable in feet.



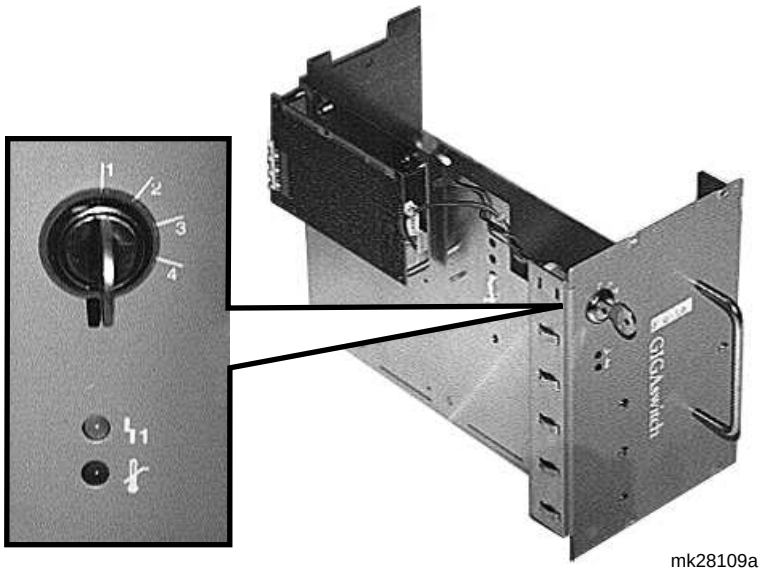
[1] The OBM terminal, and modems meeting CCITT V.32 standards and the associated cables are supplied by the customer.

2	Connect an RS232 cable ❷ to the terminal ❸ and to the OBM port ❶.
3	Install a modem ❹ as described in the appropriate modem documentation and connect the modem ❹ to the OBM terminal ❸ †.
4	Have the remote modem ❺, and the remote OBM terminal ❼ installed at the remote site †.
5	Refer to the terminal documentation and set up the terminal as follows. 9600 baud rate 8 bits no parity 1 stop bit
6	Press Return or Ctrl/O to prepare the terminal for out-of-band commands.
7	Set the security switch position 4 to allow OBM access without password.

†Modem installation only

Setting the Security Switch

The security switch controls the ability to configure or monitor the GIGAswitch System using in-band § or out-of-band (OBM) † management commands. The following figure and table identify the security switch and the positions of the security switch.



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Position	Function	Access Allowed §	
		Out-of-Band	In-Band
1	No Access	No	No
2	Secure Access	With password	SNMP get, and getnext protocol data units (PDUs) only
3	Normal Access	With password	SNMP get, getnext, and set PDU
4	Easy Access	Without password	SNMP get, getnext, and set PDUs

§Security for OBM is set by password. Security for in-band management is set by community and privileged port designation. Both can be changed using in-band or out-of-band management commands.

What is Next?

You are now ready to initiate and evaluate the MSTs for the units of the GIGAswitch System. Continue to the next chapter.

§ Issued from any GIGAswitch System management station.
† Issued through the terminal/modem interface for the GIGAswitch System.

5

Testing the System

Chapter Contents

This chapter describes the various screens associated with the diagnostics mode and the following procedures:

1. Initiating the MST
2. Evaluating the results of the MST

Diagnostic Mode Screens

The following figures show the various screens available in diagnostic mode and their interconnection.

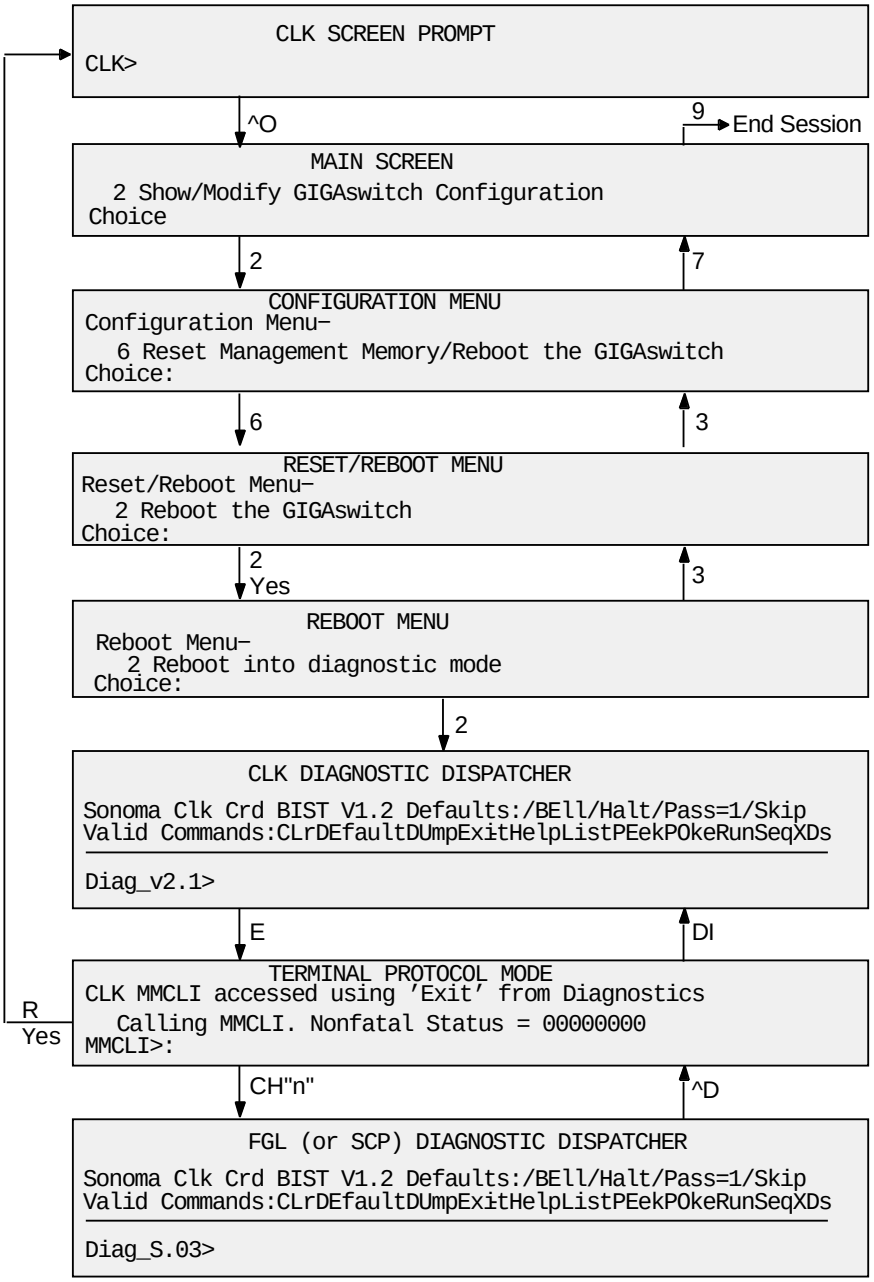
```
                CLK SCREEN PROMPT
CLK>{Ctrl O]
```

```
                   MAIN SCREEN
   ***GIGAswitch Out-of Band Management***
   Copyright (c)1993 Digital Equipment Corporation
   Control-D will abort OBM session at any time
 Main Menu-
   1 Show/Set IP Addresses
   2 Show/Modify GIGAswitch Configuration
   3 Show/Set Privileged Ports
   4 Show/Set Bootserver Ports
   5 Set OBM password
   6 Dump Mib-2 counters
   7 Show forwarding-database entry
   8 Do Get/GetNext of MIB variables
   9 End this session
 Choice
```

```
                CONFIGURATION MENU
Configuration Menu-
   1 Show Box Configuration (fans,power,etc.)
   2 Show Slot Configuration
   3 Show LAN Addresses
   4 Power Up a card
   5 Power Down a card
   6 Reset Management Memory/Reboot the GIGAswitch
   7 Return to Main menu
Choice:
```

```
                RESET/REBOOT MENU
Reset/Reboot Menu-
   1 Reset Management Memory
   2 Reboot the GIGAswitch
   3 Return to Main menu
Choice:
```

```
                   REBOOT MENU
Reboot Menu-
   1 Reboot the GIGAswitch
   2 Reboot into diagnostic mode
   3 Return to previous menu
Choice:
```


CLK SCREEN PROMPT
CLK>
^O
9
End Session
MAIN SCREEN
2 Show/Modify GIGAswitch Configuration
Choice
2
7
CONFIGURATION MENU
Configuration Menu–
6 Reset Management Memory/Reboot the GIGAswitch
Choice:
6
3
RESET/REBOOT MENU
Reset/Reboot Menu–
2 Reboot the GIGAswitch
Choice:
2
Yes
3
REBOOT MENU
Reboot Menu–
2 Reboot into diagnostic mode
Choice:
2
CLK DIAGNOSTIC DISPATCHER
Sonoma Clk Crd BIST V1.2 Defaults:/BEll/Halt/Pass=1/Skip
Valid Commands:CLrDEfaultDUmpExitHelpListPEekPOkeRunSeqXDs
Diag_v2.1>
E
DI
TERMINAL PROTOCOL MODE
CLK MMCLI accessed using 'Exit' from Diagnostics
Calling MMCLI. Nonfatal Status = 00000000
MMCLI>:
R
Yes
CH"n"
^D
FGL (or SCP) DIAGNOSTIC DISPATCHER
Sonoma Clk Crd BIST V1.2 Defaults:/BEll/Halt/Pass=1/Skip
Valid Commands:CLrDEfaultDUmpExitHelpListPEekPOkeRunSeqXDs
Diag_S.03>

Help Screens

The following figures describe the commands available in the diagnostic dispatcher and the terminal protocol modes.

TERMINAL PROTOCOL MODE

```
MCCLI>Help

CH[annel]n                Make connection to Module n, n=1 to 6, 9 to 14
CL[ear]                   Clears the terminal screen
DI[ag_Dispat]             Return to the Diagnostic Dispatcher
DO[wnline_load]           Update of non−bootblock firmware
Help                      This help message
O[per_Firmware]           Call the Operational Firmware (does not return)
PS[C]                     Transparant access to PSC
PO[werup_rslts]           Powerup execution results
R[eset_Clock              Reset the Clock Module
T[ime]                    Read/Update the Clock Module's Real Time Clock
V[ersions]                Bootblock and Hardware Versions
MCCLI>
```

FGL (OR SCP) DIAGNOSTIC DISPATCHER

```
Diag_v2.1>Help

Clear                              Clear the Non−Volatile error log
DEfault                            Set default switches and update header
DUmp                               Dump the Non−Volatile error log
Exit                               Exit to Terminal Protocol Mode
Help                               Display this help screen
LIst [start_id][end_id][seq_mask]  Run range of tests with sequence mask
Run [start_id][end_id][sesq_mask] Run range of tests bybe,sord or longwords
Sequence [seq_mask]                Run all tests with sequence mask
XDs                                Jump to XDS application
SWITCHES:/Bell/NOBel/NB            Bell or no bell on error
SWITCHES:/Continue/Halt LOop Continue, halt, or loop error
SWITCHES:/INHIBIT_A/IA             Inhibit all output except summaries
SWITCHES:/NOInhibit/NI             Don't inhibit any output
SWITCHES:/Pass=n                   Repeat length for run, Seq
SWITCHES:/Ski/NOSkip/NS            Skip or don't skip over tests on error
Diag_v2.1>
```

Initiating the MST

The following methods are used to initiate the module self-test (MST).

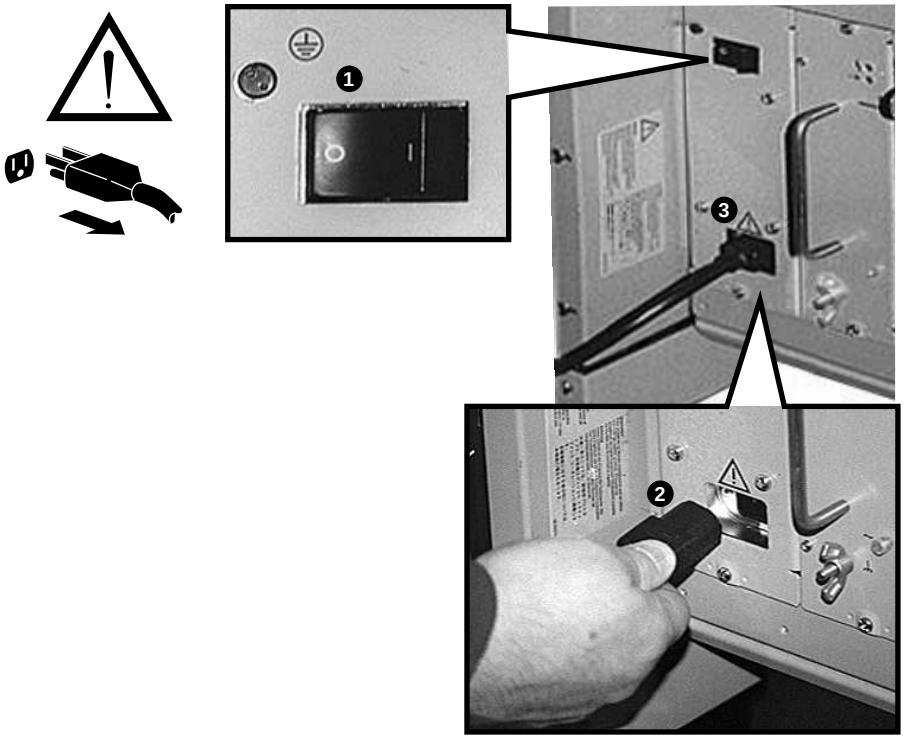
- Applying power to the GIGAswitch System
- Rebooting the GIGAswitch System
- Running MST in diagnostic mode

Applying Power to the GIGAswitch System

Complete the following steps to apply power to the GIGAswitch System:

Step	Action
1	Locate the power switch, ❶, the power cord § ❷ and the power connector ❸.

§Some power cords are shipped separately in country kits



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2	Place the power switch ❶ in the 0 (OFF) position.
3	Plug the power cord ❷ into the power connector ❸ and then into the connector for the primary power source.
4	Place the power switch ❶ in the 1 (ON) position.

Rebooting the GIGAswitch System

The following contains the displays and selections required to reboot the GIGAswitch System from the OBM terminal. To initiate an OBM session apply power to the OBM terminal or press ctrl-O.§

```
CLK>[Control-O}
***GIGAswitch Out-of-Band Management***
  Copyright (c) 1993 Digital Equipment Corporation
  Contros-D will abort OBM session at any time
Main Menu -
  2 Show/Modify GIGAswitch Configuration
 Choice 2
Configuration Menu-
   6 Reset Management Memory/Reboot the GIGAswitch
Choice: 6
Reset/Reboot Menu-
   2 Reboot the GIGAswitch
Choice: 2
WARNING: This will terminate your OBM session and REBOOT the GIGAswitch.
Do you really want to do this? (yes/no)): yes
 Reboot Menu-
    1 Reboot the GIGAswitch
 Choice: 1
CLK>
```

Action	Results
Look for operational firmware prompt CLK)	
Type Ctrl/O	Main Menu appears§
Type **2** to select Show /Modify GIGAswitch Configuration	Configuration Menu appears
Type **6** to select Reset Management/Reboot the GIGAswitch	Reset/Reboot Menu appears
Type **2** to select Reboot the GIGAswitch	WARNING: . . . (yes/no) appears
Type **yes**	Reboot Menu appears
Type **1** to select Normal Reboot	CLK) appears

§If an error message appears, set the security switch to position 4 and try again.

§ If power has already been applied the Main Menu will be present.

Running the MST in Diagnostic Mode

The following methods are used to enter diagnostic mode:

- Rebooting into diagnostic mode - preferred
- Installing the maintenance jumper - alternate

Rebooting into Diagnostic Mode

The following contains the displays and selections required to reboot the GIGAswitch System from the OBM terminal into diagnostic mode. To initiate an OBM session apply power to the OBM terminal or press ctrl-O.§

```
CLK>[Control-O}
***GIGAswitch Out-of-Band Management***
  Copyright (c) 1993 Digital Equipment Corporation
  Contros-D will abort OBM session at any time
Main Menu -
  2 Show/Modify GIGAswitch Configuration
 Choice 2
Configuration Menu-
   6 Reset Management Memory/Reboot the GIGAswitch
 Choice: 6
Reset/Reboot Menu-
   2 Reboot the GIGAswitch
Choice: 2
WARNING: This will terminate your OBM session and REBOOT the GIGAswitch.
Do you really want to do this? (yes/no)): yes
 Reboot Menu-
    2 Reboot into diagnostic mode
 Choice: 2
Sonoma Clk Crd BIST V1.2 Defaults:/BEll/Halt/Pass=1/Skip
Valid Commands:CLrDEfaultDUmpExitHelpListPEekPOkeRunSeqXDs
Diag_v2.1>
```

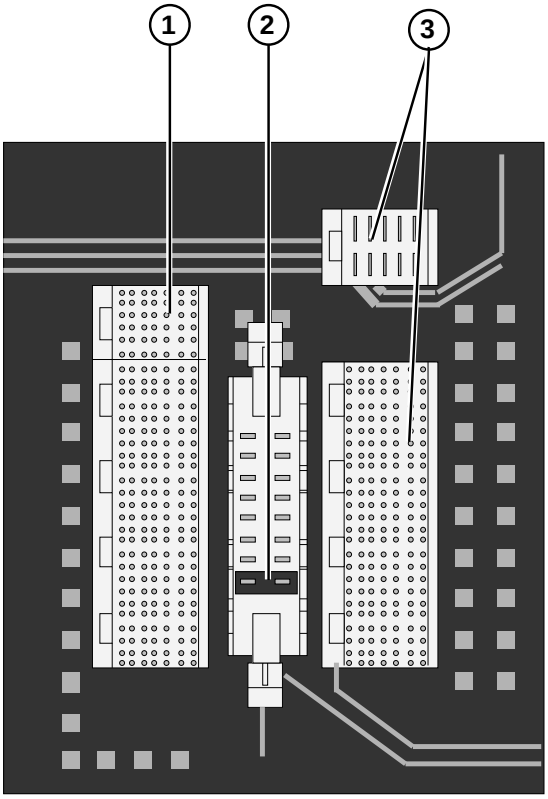
Action	Results
Look for operational firmware prompt CLK)	CLK) appears
Type Ctrl/O	Main Menu appears
Type **2** to select Show /Modify GIGAswitch Configuration	Configuration Menu appears
Type **6** to select Reset Management/ Reboot the GIGAswitch	Reset/Reboot Menu appears
Type **2** to select Reboot the GIGAswitch	WARNING: . . . (yes/no) appears
Type **yes**	Reboot Menu appears
Type **2** to select Reboot into diagnostic mode	CLK diagnostic dispatcher menu and prompt appears

§ If power has already been applied the Main Menu will be present.

Installing the Maintenance Jumper

An SCP card must be operational to enter an OBM mode of operation. Using a maintenance jumper allows entry into the OBM maintenance mode without an operational SCP.

The following figure and table describe how to enter the OBM maintenance mode using a maintenance jumper.



Number	Description
❶	Slot 6
❷	Maintenance jumper
❸	Slot 7

Action	Results
Primary power switch placed in O position	Power removed from unit
Access the maintenance connector	Cards removed from slots 6 and 7
Install maintenance jumper	Jumper installed as shown
Install cards in slots 6 and 7	Cards reinstalled
Primary power switch placed in the (1)(ON) position	CLK diagnostic dispatcher menu and prompt appears

Testing Procedures

Module self-tests (MSTs) are initiated when power is applied or when the system is rebooted. See MST summary to interpret the results of the MSTs.

The diagnostic mode can be used to run selected tests multiple times to isolate intermittent faults. (See example on the next page). When the fault is identified Repeat the MSTs to ensure that all faults have been corrected.

Example of Using Diagnostic Mode

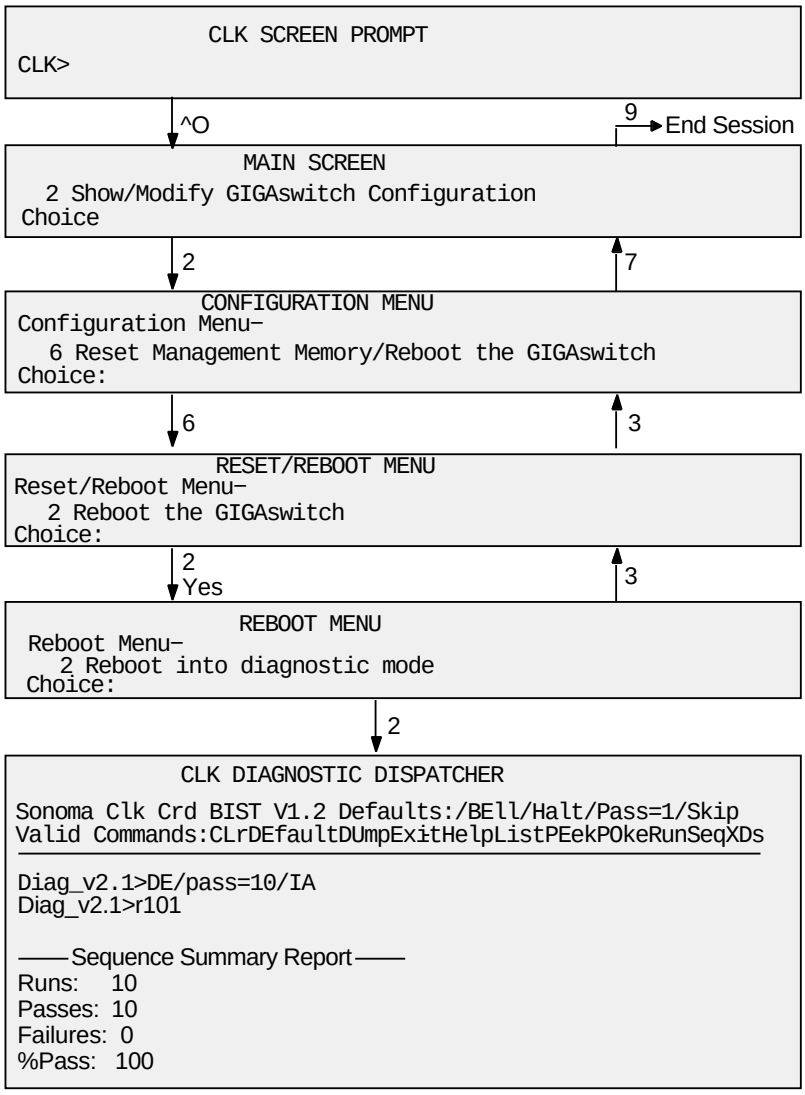
The following figure is an example of using the diagnostic mode to isolate an intermittent fault in the clock module. Complete navigational information for the diagnostic mode is also provided. For a list of available tests for a given module type "li" at the Diagnostic Dispatcher prompt.

Description of Example

After rebooting into diagnostic mode and entering the CLK Diagnostic Dispatcher mode the following line was entered to set the number of passes from 1 to 10 and to inhibit all outputs except the summaries. Since the module will be replaced if any test fails, it is not necessary to see the other displays.

After setting the default switches, test 101 was run 10 times. The summary indicates the results of the test.

A line card or an SCP card can be tested using the same commands once the Diagnostic Dispatcher mode for that card is entered.

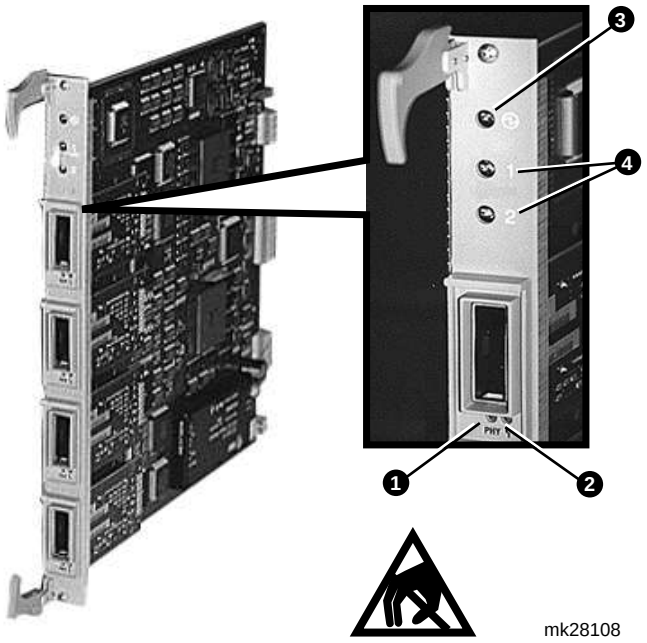

CLK SCREEN PROMPT
CLK>
^O
9
End Session
MAIN SCREEN
2 Show/Modify GIGAswitch Configuration
Choice
2
7
CONFIGURATION MENU
Configuration Menu–
6 Reset Management Memory/Reboot the GIGAswitch
Choice:
6
3
RESET/REBOOT MENU
Reset/Reboot Menu–
2 Reboot the GIGAswitch
Choice:
2
Yes
3
REBOOT MENU
Reboot Menu–
2 Reboot into diagnostic mode
Choice:
2
CLK DIAGNOSTIC DISPATCHER
Sonoma Clk Crd BIST V1.2 Defaults:/BEll/Halt/Pass=1/Skip
Valid Commands:CLrDEfaultDUmpExitHelpListPEekPOkeRunSeqXDs
Diag_v2.1>DE/pass=10/IA
Diag_v2.1>r101
——Sequence Summary Report——
Runs: 10
Passes: 10
Failures: 0
%Pass: 100

Meaning of LEDs

This section identifies each LED on the logic module and describes its purpose:

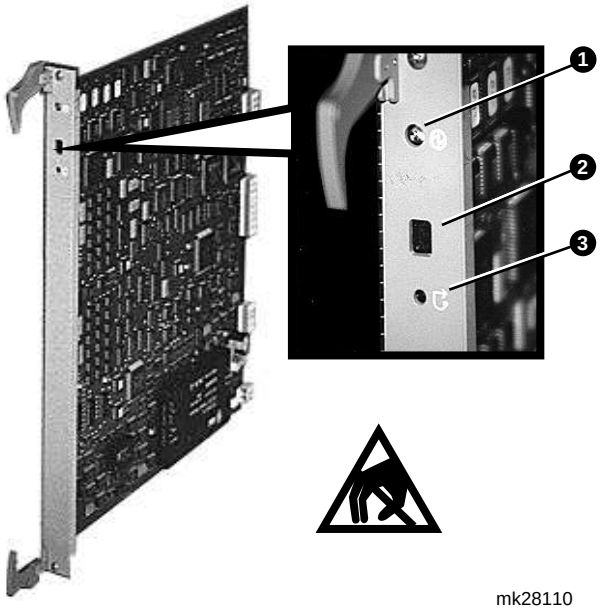
- Line card
- SCP card
- Clock card
- CBS card

Line Card LEDs



Event Number	Event	LED Condition	Meaning
1	SCP card applies power to line card	Both port LEDS ❹ amber, PMD FRU LED ❶ and PMD PHY LEDS ❷ out	Port LEDs ❹ are operational
2	Line card MST	Flashing amber	MST in progress
		Line card LED ❸ solid green	MST passed
		Line card LED ❸ solid amber or out	MST failed

SCP Card LEDs and Control



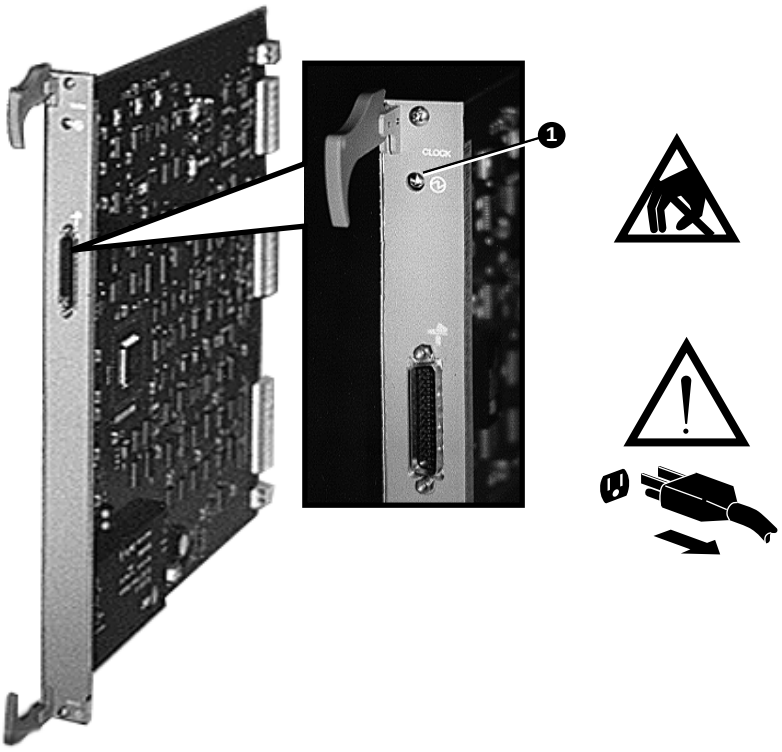
Number	Item	Function
❶	Module LED (Amber/green LED)	Indicates power available and MST status.
❷	Diagnostic Readout (Hexadecimal LED)	Indicates coded diagnostic results.
❸	Reset (push button)	Resets the SCP.

SCP HEX LED Table

The following table further identifies the purpose of the SCP LEDs.

Number/Event	LED ❶ Condition	HEX LED ❷ Condition	Meaning
1/SCP card startup	Amber	Out	MST has not passed.
2/Startup complete	Solid amber LED	F	Startup complete
3/SCP card MST	Flashing amber	Test number updated	MST in progress
	Solid green	B	MST passed, SCP card in backup mode
	Solid amber or out	Solid number	MST failed
4/SCP election	Solid green	E	Elected switch control processor
	Solid green		Test passed
	Solid amber		Test failed
5/Downline load	Solid green	D	New firmware images are being loaded into the flash memory during a firmware upgrade.
	Solid green	Alternating D/E	Corrupt image detected during system boot. SCP continues to try to retrieve a good image from the bootserver.

Clock Card LEDs



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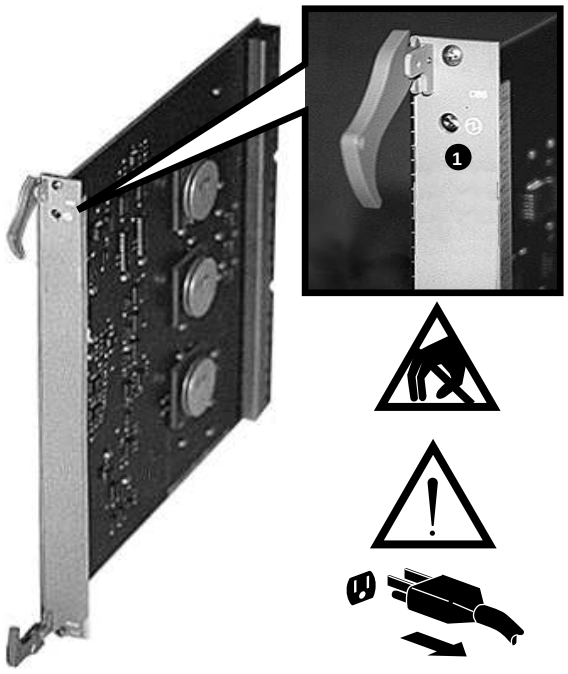
Event Number	Event	LED ❶ Condition	Meaning
1	Clock card startup	Solid amber	After reset, MST has not passed
2	Clock card MST	Flashing amber	MST in progress
		Solid green	MST passed
		Solid amber	MST failed

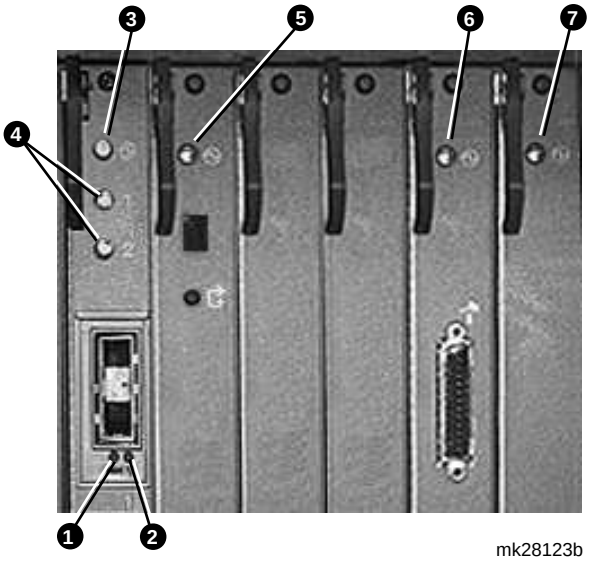
CBS LEDs



Event Number	Event	LED ❶ Condition	Meaning
1	Clock card tests the CBS card	Flashing amber	Test in progress
		Solid green	Test passed
		Solid amber	Test failed

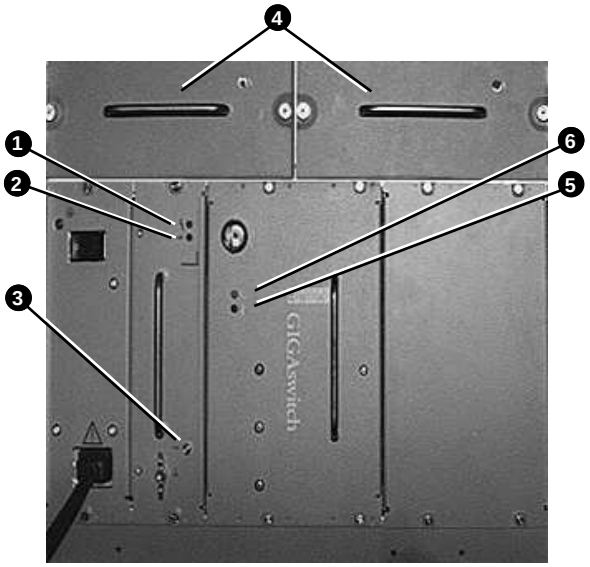
Logic Module LED Summary

The following figures and tables identify each indicator and the meaning of its various conditions.



Number/Name	Condition
❶/PMD FRU	Off = PMD OK and fully operational or no power
	Steady amber = PMD loop test failure (defective PMD FRU)
❷/PMD PHY	Off = no power.
	Steady amber = Link confidence test (LCT) failure
	Flashing amber = Topology reject
	Steady green = Connection accepted
	Flashing green = Awaiting a connection
	Flashing amber/green = Stand by (dual-homing)
❸/Line card	Off = No power or with port LEDs off and PMD daughter card LEDs on, card is not fully seated or in process of being removed.
	Steady amber = MST failure or fatal firmware error.
	Flashing amber = MST in progress (Wait).
	Steady green = MST passed.
	Flashing green = Firmware down-line load (DLL) in progress - will flash at 1/2 second intervals.
	Flashing amber/green = Non-fatal firmware error.
❹/Port	Off = No power or with port LEDs off and PMD daughter card LEDs on, card is not fully seated or in process of being removed.
	Steady amber = MST failure in this port
	Flashing amber = MST in progress (wait)
	Steady green = MST passed, port active and in forwarding state.
	Flashing green = MST passed, port in backup , preforwarding state, or station management is off.
❺/SCP card	Off = No power or severe fault
	Steady amber = MST failure
	Flashing amber = MST in progress (Wait)
	Steady green with B or E in HEX LED = MST passed
	Steady green with D in HEX LED = Downline load in progress
	Steady green with alternating D/E in HEX LED = Corrupt image detected during downline load. Retrying
❻/Clock card	Steady amber = MST failure
	Flashing amber = MST in progress
	Steady green = MST passed
❼/CBS card	Steady amber = MST failure
	Flashing amber = MST in progress
	Steady green = MST passed

Cooling and Power Modules LED Summary



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Number/Name	Condition
❶/Front end unit (FEU)	Steady amber = MST failure
❷/Front end unit (FEU) OK	Steady green = MST passed
❸/AC power	Off = power is **not** available for FEU circuit breaker
	On = power is available for FEU circuit breaker
❹/Fan tray assembly fault	Off = MST passed
	Steady amber = MST failure
❺/System temperature fault	Steady Red = system temperature fault
	Off = system temperature normal
❻/PSC card Fault	Off = MST passed
	Steady amber = MST failure

Part III

Service

Part III contains information for replacing the field replaceable units (FRUs)

- **Chapter 6** describes the procedures you must complete before replacing the GIGAswitch System modules. Failure to perform these procedures can result in harm to personnel or equipment. These procedures include setting up electrostatic discharge (ESD) protection, evaluating the need for power removal, and for applying power.
- **Chapter 7** describes the procedures for replacing the cooling and power modules and the logic modules. Cooling and power modules include modules of the fan tray assembly, front end unit (FEU), power status assembly (PSA) , and power system controller (PSC) families. Logic modules include modules of the line card, physical medium dependent (PMD) daughter card, switch control processor (SCP), clock card, and crossbar switch (CBS) families.
- **Chapter 8** describes the procedures for removing the GIGAswitch System.
- **Chapter 9** describes the procedures for replacing the logic and power backplanes after all the modules have been removed from the selected backplane.

6

Preparing to Replace Modules

Chapter Contents

This chapter lists the prerequisites for replacing the GIGAswitch System modules and describes the following procedures:

- Setting up ESD protection
- Removing power from the system

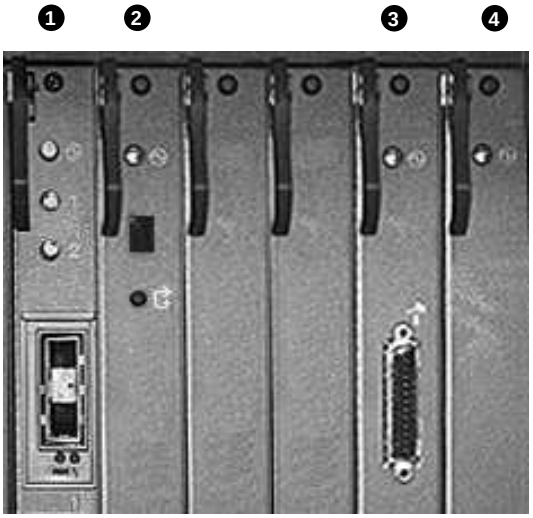
Prerequisites for Replacing GIGAswitch System Modules

GIGAswitch System modules include the following:

- Logic modules
- Cooling and power modules

Logic Modules

The following figure and associated table summarize the prerequisites for removing logic modules. They identify slot limitations, which modules must be removed prior to performing the replacement procedure for the desired module, and whether or not power must be removed or ESD equipment used.



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Number	Module	ESD Required?	Power Removed?	Slot Limitations?	Other Modules Removed?
❶	Line card	Yes	Yes	1 through 6, 9 through 14	None
❷	SCP card	Yes	No	1 through 6,9 through 14	None
❸	Clock card	Yes	Yes	7	None
❹	CBS card	Yes	Yes	8	None
Not Shown	Logic backplane	Yes	Yes	N/A	All logic modules §.

§The GIGAswitch System will also have to be removed from the rack prior to logic backplane replacement if the rear of the rack **is not** accessible.

Setting Up ESD Protection

Protect the logic module against damage from electrostatic discharge (ESD) by using:

- Static-free containers for long-term storage.
- Grounded ESD wrist strap while installing and removing modules.
- Grounded ESD mat for tempory storage.

Using ESD Equipment

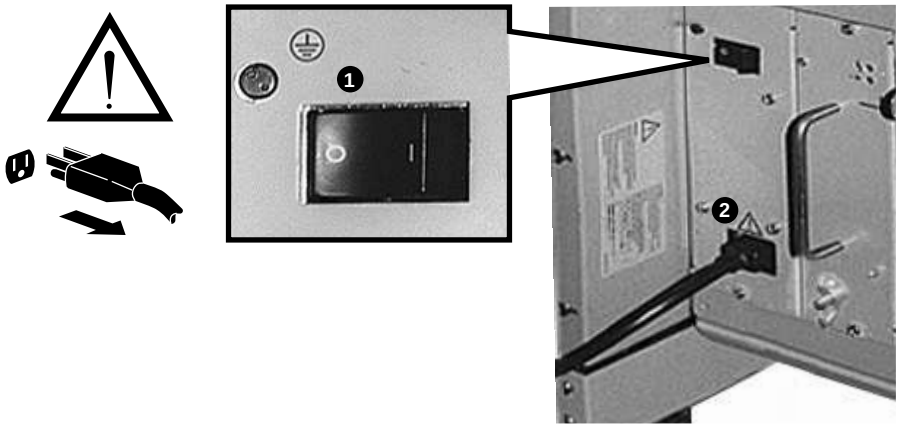
The Portable Static-Dissipative Field Service Kit (Part No. 29-26246) is used to protect ESD sensitive modules against damage. Complete the following steps to set up and maintain a static-free area.

Step	Action
1	Ground the unit. The unit is grounded through the power cord when it is connected between the unit and the primary power source.
2	Lay out the static-dissipative work surface (ESD mat) on a flat surface.
3	Connect the ground cord assembly to the ESD mat and to an unpainted surface on the unit.
4	Wear the ESD wrist strap and attach it to the ground cord assembly.

Removing Power

Complete the following steps to remove the power from the GIGAswitch System:

Step	Action
1	Locate the power switch ❶ and the power connector ❷



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2	Place the power switch ❶ in the 0 (OFF) position.
3	**Do not** remove the power cord from the power connector ❷. The power cord provides the ground for ESD protection.
4	Repeat steps 1 and 2 for any alternate power supply.

7

Replacing Modules

Caution

Read Chapter 6 before attempting to replace any module in the GIGAswitch System.

Chapter Contents

This chapter describes the following procedures for replacing the GIGAswitch System:

- Replacing a logic module
- Replacing a PMD daughter card
- Replacing a blank handle
- Replacing a fan tray assembly
- Replacing a FEU
- Replacing a power supply filler panel
- Replacing a PSA
- Replacing a PSC card

Replacing a Logic Module

Note

Appendix D contains the recommended location for the modules.

Complete the following steps to replace a logic module:

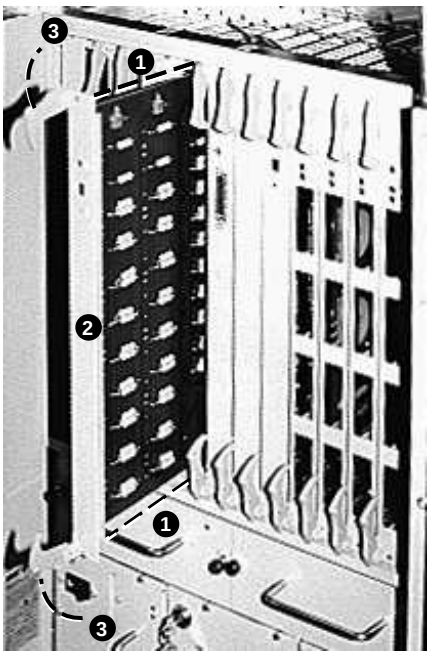
1. Remove power and set up the ESD equipment. See Chapter 6 §.
2. Wear the grounded ESD wrist band.
3. Unpack the replacement module. Leave the module in the ESD bag.
4. Place the ESD bagged replacement module on a flat surface.
5. Place the empty container on the ESD mat.
6. Remove the module to be replaced from the chassis. See the procedure in Removing the Logic Module.
7. Place the module to be replaced in the empty container.
8. Remove the replacement module from the ESD bag.
9. Install the replacement module in the chassis. See the procedure in Installing the Logic Module.
10. Remove the module to be replaced from the container and place it in the ESD bag.
11. Place the ESD bagged module in the container.
12. Remove the ESD wrist band.

§ The SCP card can be hotswapped

Removing the Logic Module

The following procedure describes how to remove the logic module. See Replacing a Logic Module for the complete replacement procedure:

Step	Action
1	Locate the two screws ❶ that fasten the selected module ❷ to the GIGAswitch System and the ejectors ❸ used to seat the module.



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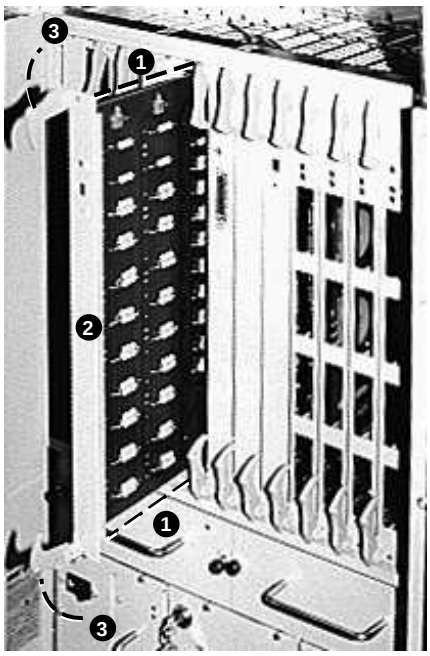
2	Remove power and set up the ESD equipment (See Chapter 6).§
3	Slip on ESD wrist band
4	Loosen the upper and lower screws ❶.
5	Move ejectors outward to unseat logic module ❷ from the unit.
6	GENTLY slide the module ❷ out of the unit.

§The SCP card can be hotswapped

Installing the Logic Module

The following procedure describes how to install the logic module. See Replacing a Logic Module for the complete replacement procedure:

Step	Action
1	Locate the screws ❶ that fasten the selected module ❷ to the GIGAswitch System and the ejectors ❸ used to seat the module.



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2	Remove power and set up the ESD equipment (See Chapter 6).§
3	Wear the ESD wrist band.
4	Align the module (component side facing right) with the upper and lower guides, and GENTLY slide the module ❷ into the unit.
5	Move the ejectors ❸ inward to seat the module ❷ in the unit.
6	Tighten the upper and lower screws ❶ using a number 2 cross-point screwdriver.

§The SCP card can be hotswapped

What is Next

Proceed to Chapter 5 to test the system.

Replacing the PMD Daughter Cards

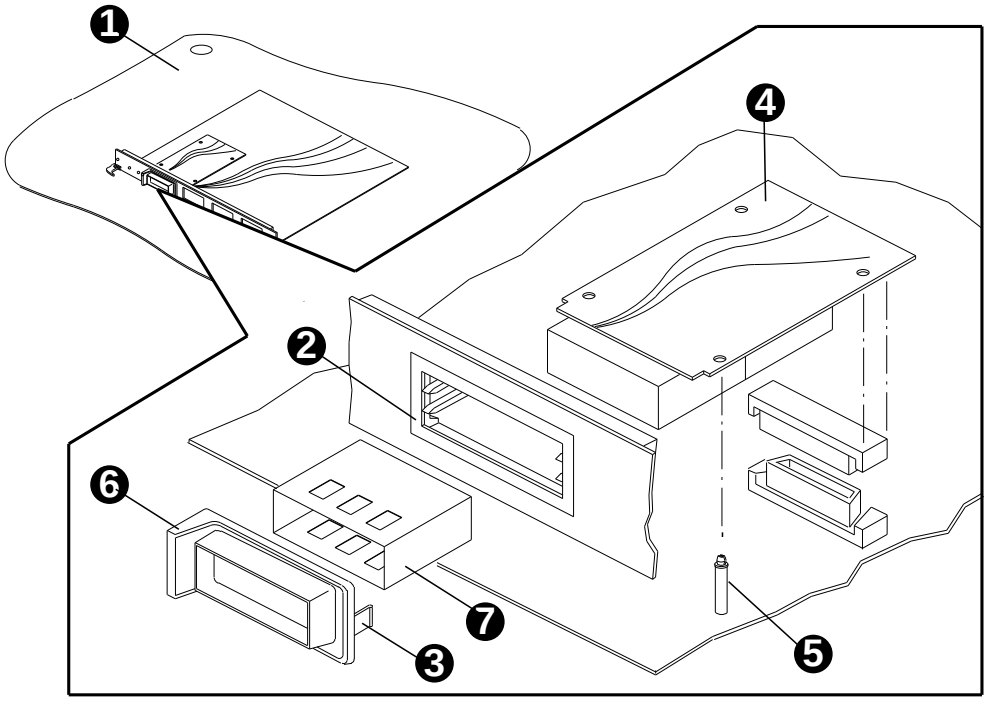
The following table provides the part numbers for the possible PMD daughter cards:

Physical Media	PMD Part Number
ANSI Multimode Fiber FDDI	DEFXM-AA
Single-mode Fiber FDDI	DEFXS-AA

Removing the MMF ANSI MIC PMD

Complete the following steps to remove the multimode fiber (MMF) ANSI MIC PMD:

Step	Action
1	Identify the ESD mat ❶, port slot ❷, the two retaining clips ❸, the PMD daughter card ❹, the brass standoffs ❺, the bezel ❻, and the collar shroud ❼.



2	**Remove the line card** that will contain the new PMD daughter card from the unit. See *Removing the Logic Module*
3	**Place the line card on the ESD mat ❶** with the components of the line card facing up and the top of the line card facing left.
4	**Unsnap the bezel ❻ from the front of the handle** of the line card. Access the retaining clips from the back of the line card handle, release the retaining clips ❸, and separate the PMD blank cover from the line card.
5	**Remove the collar shroud ❼** from the port slot ❷ in the handle of the line card.
6	**Remove the PMD daughter card ❹ from the line card.** Mate the connector by lifting up on the back of the PMD daughter card, and then unsnap the PMD daughter card from the two brass standoffs ❺ mounted on the line card.
7	**Install new PMD daughter card or blank PMD cover.** To install a blank PMD cover snap the PMD cover into the selected port slot. To install a new PMD daughter card see the appropriate installation procedure for the PMD daughter card concerned.
8	**Install the line card** in the unit. See *Installing the Logic Module*.

Installing the MMF ANSI MIC PMD

Unpacking the PMD

Note

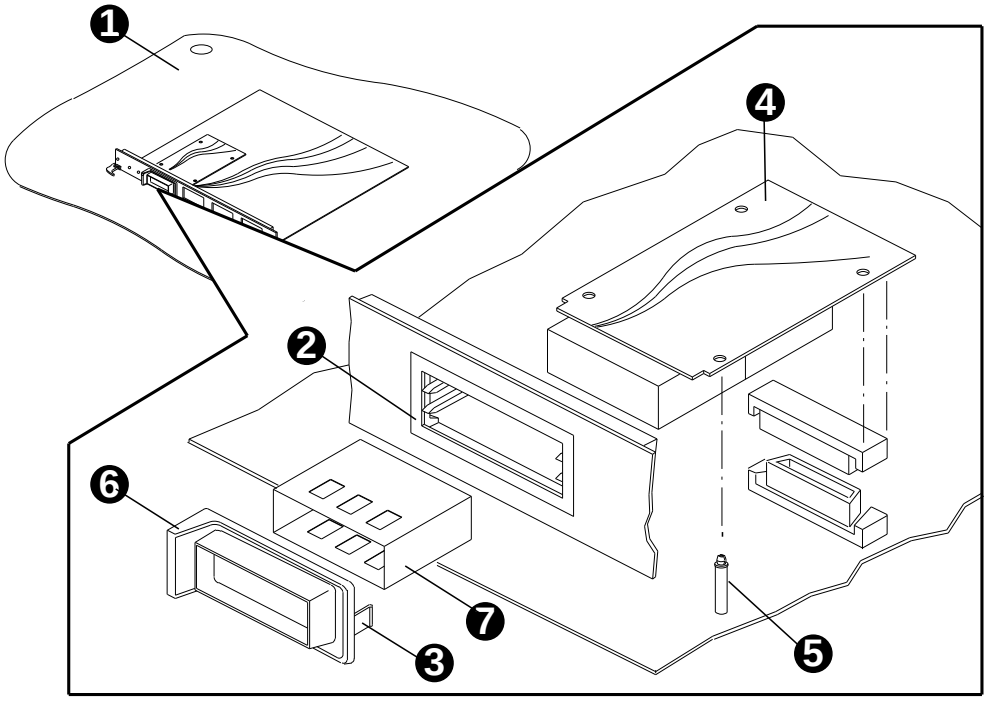
(The extra posts and the PHY M key provided in the package are not used in this installation. The PHY A and PHY B keys are used in the DAS configuration of the ANSI Multimode Fiber FDDI PMD only.

1	Set up the ESD equipment.
2	Slip on ESD wrist band.
3	Unpack the PMD and check the contents against the packing slip.

Mounting the MMF ANSI MIC PMD

Complete the following steps to install multimode fiber (MMF) ANSI MIC PMD: daughter cards.

Step	Action
1	Identify the ESD mat ❶, port slot ❷, the two retaining clips ❸, the PMD daughter card ❹, the brass standoffs ❺, the bezel ❻, and the collar shroud ❼.



2	**Slip on ESD wrist strap and place the line card on the ESD mat ❶** with the components of the line card facing up and the top of the line card facing left.

Note

Remove the top blank bezel for a SAS configuration. Remove both the top and the bottom blank bezel for a DAS configuration.

3 **Remove the blank bezel**. Release the locking tabs on both sides of the bezel using a screwdriver.

4 **Insert the collar shroud ❼** into the port slot ❷ in the handle of the line card. Orient the open portion of the U shaped collar shroud ❼ in the up position and insert the collar shroud into the port slot ❷ in the handle of the line card. Slide the collar shroud into the port slot ❷ in the handle of the line card until the fingers of the collar shroud rest against the handle of the line card.

5 **Mount the PMD daughter card ❹ containing the PHY S key or the PHY A key in the upper slot of the selected port.** Orient the PMD daughter card with the connector facing down and away from the handle of the line card and position the PMD daughter card over the line card. Place the collar shroud ❼ around the front of the PMD daughter card. Snap the PMD daughter card onto the two brass standoffs ❺ mounted on the line card, and then mate the connector by pressing down on the back of the PMD daughter card.

Note

Ensure the bezel completely surrounds the collar shroud before snapping the bezel onto the front of the handle of the line card.

6 **Snap the bezel ❻ onto the front of the handle** of the line card. Orient the bezel ❻ with the label area facing the top of the line card.

7 **This step is for DAS configuration only**. Repeat steps 4 through 6 to install the PMD daughter card containing the PHY B key in the lower slot of the selected port.

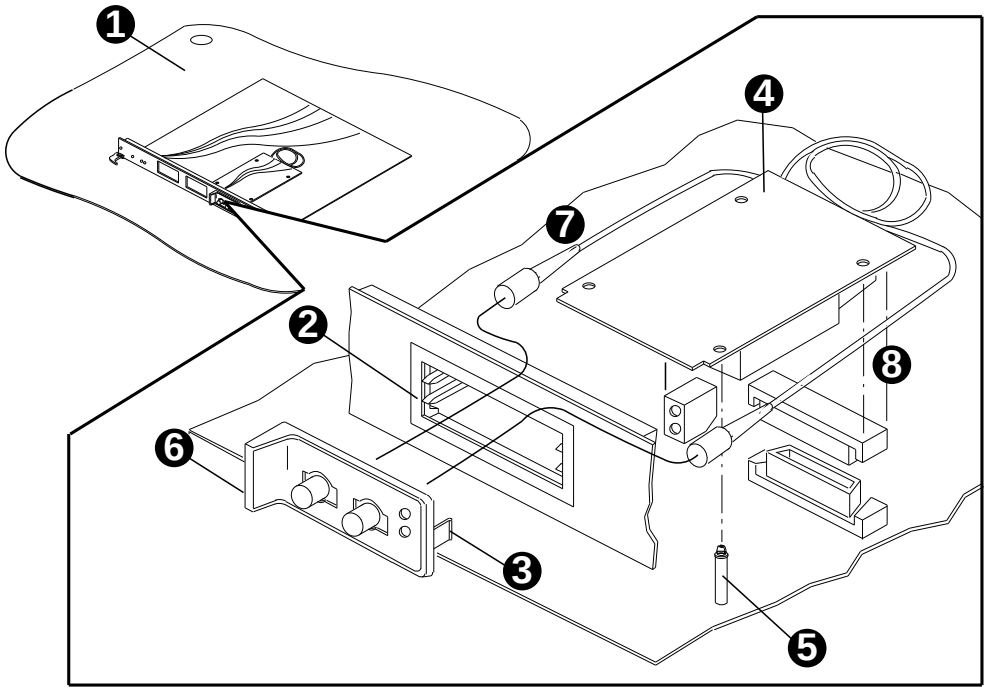
8 **Place line card in a static proof bag.**

9 **Place bagged module on a flat surface or on another bagged module.** The modules can be stacked four modules high.

Removing the SMF PMD Daughter Card

Complete the following steps to remove the single-mode fiber (SMF) PMD (DEFXS-AA) daughter card:

Step	Action
1	Identify the ESD mat ❶, port slot ❷, the two retaining clips ❸, the PMD daughter card ❹, the brass standoffs ❺, the bezel❻, the receiver cable ❼ and the transceiver cable ❽.



2	**Remove the line card** that will contain the new PMD daughter card from the unit. See *Removing the Logic Module*.
3	**Place the line card on the ESD mat ❶** with the components of the line card facing up and the top of the line card facing left.
4	**Cut the cable-tie** that connects the coiled cable bundles the cable-tie anchor or to another PMD.
5	**Unsnap the bezel ❻ from the front of the handle** of the line card. Access the retaining clips from the back of the line card handle, release the retaining clips ❸, and separate the PMD blank cover from the line card.
6	**Disconnect the connectors** of the receiver cable ❼ and the transceiver cable ❽ from the respective connectors on the bezel.
7	**Remove the PMD daughter card ❹ from the line card.** Break the connection by lifting up on the back of the PMD daughter card, and then unsnap the PMD daughter card from the two brass standoffs ❺ mounted on the line card.
8	**Install new PMD daughter card or blank PMD cover.** To install a blank PMD cover snap the PMD cover into the selected port slot. To install a new PMD daughter card see the appropriate installation procedure for the PMD daughter card concerned.
9	**Install the line card** in the unit. See *Installing the Logic Module*.

Installing the SMF PMD

Unpacking the PMD

Note

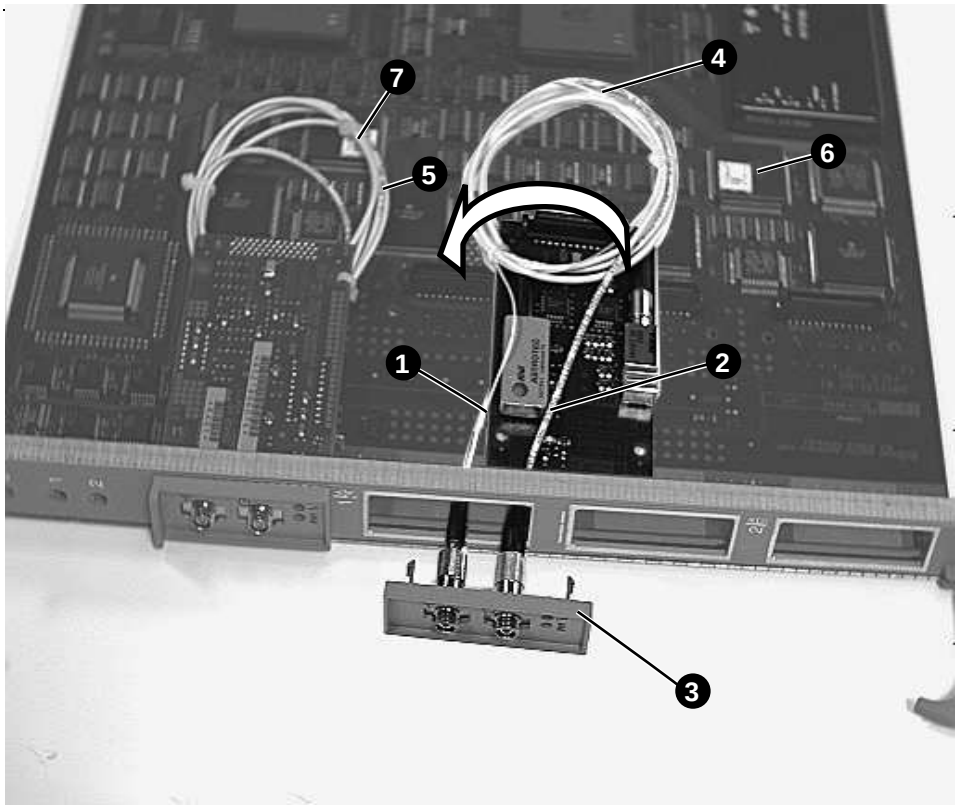
(**The extra posts are not used in this installation**

1	Set up the ESD equipment.
2	Slip on ESD wrist band.
3	Unpack the PMD and check the contents against the packing slip.
4	Remove the cable-ties from the coiled cable bundle.

Prepairing the SMF PMD

Complete the following steps to prepare single-mode fiber (SMF) PMD (DEFXS-AA) daughter cards:

Step	Action
1	Identify the receiver cable ❶, the transceiver cable ❷, the bezel ❸, the coiled cable bundle ❹, the coiled cable tie point ❺, the lower port cable-tie anchor mounting location ❻, and the upper port cable-tie anchor mounting location ❼.



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2	**Slip on ESD wrist strap and place the line card on the ESD mat** with the components of the line card facing up and the top of the line card facing left.

Note

Remove the top blank bezel for a SAS configuration. Remove both the top and the bottom blank bezel for a DAS configuration.

3	**Remove the blank bezel**. Release the locking tabs on both sides of the bezel using a screwdriver.

Note

The receiver cable is the thin white cable. The transceiver cable is the thick yellow cable

4 **Mate the connectors** of the receiver cable ❶ and the transceiver cable ❷ to the respective connectors on the bezel ❸. Orient the bezel ❸ with the label area facing the top of the line card. Extend the loose ends of the receiver cable ❶ and the transceiver cable ❷ through the hole in the line card. The receiver cable ❶ will be to the left and the transceiver cable ❷ will be to the right.

Caution

Do not exceed the 3" minimum bend diameter when adjusting coils.

5 **Roughly dress the coiled cable bundle ❹**. Equalize the cables in the coiled cable bundle and dress the coiled cable bundle to the rear of the PMD daughter card as shown in the figure.

Note

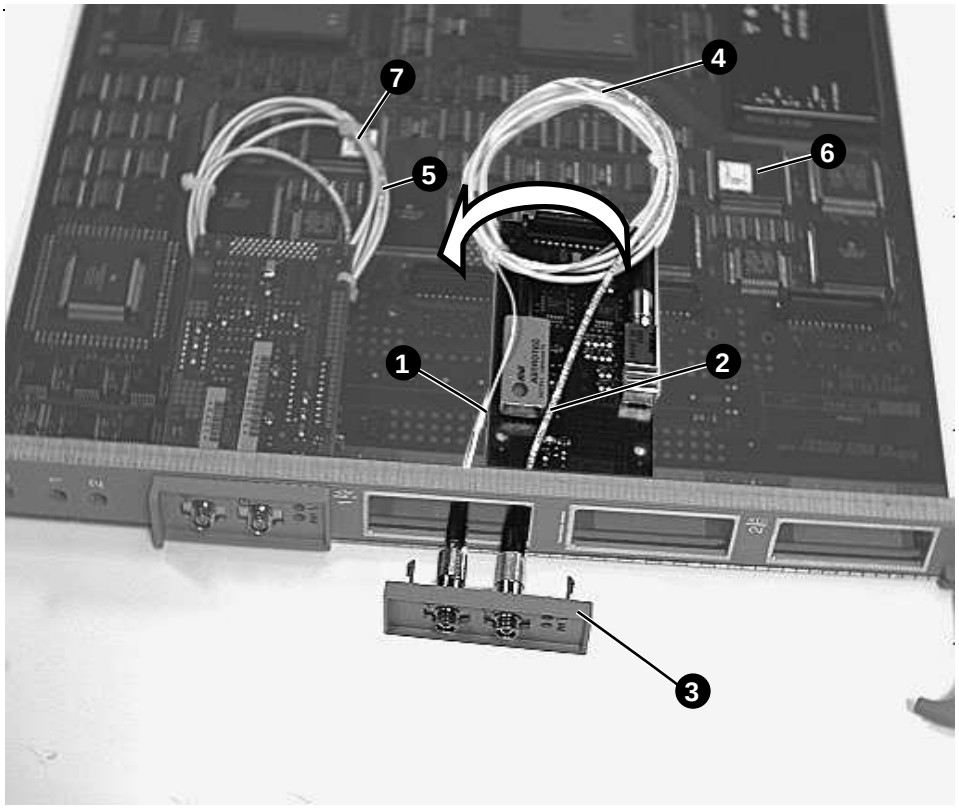
Loosely install the cable-ties to allow for final dressing of the loops.

6 **Install the cable-ties**. Wrap one cable-tie around all the cables in the coiled cable bundle ❹ and attach it to the PMD daughter card using the after post hole on the TX side of the PMD daughter card. Wrap the other cable-tie around all the cables in the coiled cable bundle ❹ and position it near the RX connector.

Mounting the SMF PMD

Complete the following steps to mount the single-mode fiber (SMF) PMD (DEFXS-AA) daughter cards:

Step	Action
1	Identify the receiver cable ❶, the transceiver cable ❷, the bezel ❸, the coiled cable bundle ❹, the coiled cable tie point ❺, the lower port cable-tie anchor mounting location ❻, and the upper port cable-tie anchor mounting location ❼.



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2 **Mount the PMD daughter card.** Turn the PMD daughter over. Orient the PMD daughter card with the connector facing down and away from the handle of the line card and position the PMD daughter card over the line card. Snap the PMD daughter card onto the two brass standoffs mounted on the line card.

Note

Ensure the coiled cable bundle ❹ is clear of the connector before mating the connector.

3 **Mate the connector** by pressing down on the back of the PMD daughter card.

4 **Snap the bezel ❸ onto the front of the handle** of the line card. Orient the bezel ❸ with the label area facing the top of the line card.

5 **Dress the cables in the coiled cable bundle and tighten the cable-ties.**

6 **Install final cable_tie.** If SMF PMD daughter card is already installed in the port, attach the two coiled cable bundles together at the tie point ❺ shown using a cable-tie. If this is the first SMF PMD daughter card to be installed, mount the cable-tie anchor in the appropriate position (the position for the upper port ❼ or the position for the lower port ❻), and attach the coiled cable bundle ❹ to the appropriate cable-tie anchor.

7 **This step is for DAS configuration only**. Repeat steps 4 through 6 to install the other PMD daughter card.

8 **Place line card in a static proof bag.**

9 **Place bagged module on a flat surface or on another bagged module.** The modules can be stacked four modules high.

What is Next

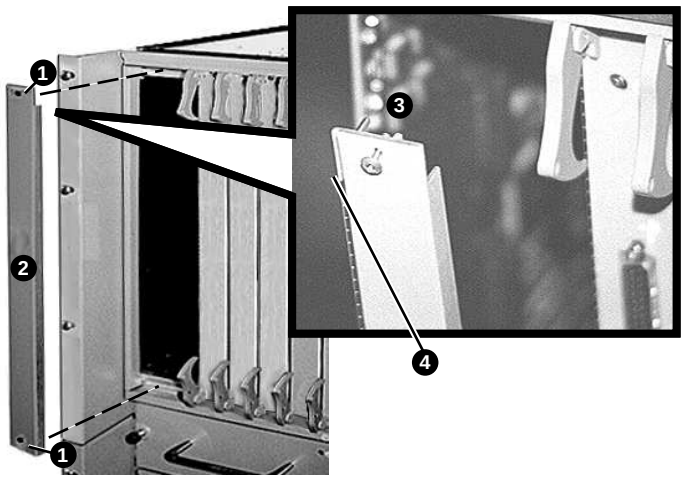
Proceed to Chapter 5 to test the system.

Replacing a Blank Handle

Removing a Blank Handle

Complete the following steps to remove a blank handle from the GIGAswitch System:

Step	Action
1	Locate the screws ❶ that fasten the selected blank handle ❷ to the GIGAswitch System, the ❸ guide pins, and the EMI shield ❹.



mk28106

Caution

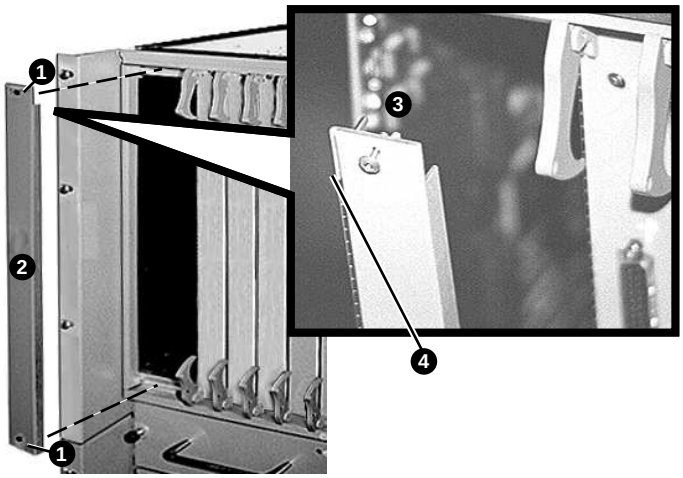
Be careful not to damage the EMI shield.

2	Loosen the upper and lower screws that fasten the selected blank handle to the system ❶ using a number 2 cross-point screwdriver.
3	Lift the blank handle ❷ away from the GIGAswitch System.

Installing a Blank Handle

Complete the following steps to install a blank handle:

Step	Action
1	Locate the screws ❶ that fasten the selected blank handle ❷ to the GIGAswitch System, the guide pins ❸, and the EMI shield ❹.



mk28106

Caution

Be careful not to damage the EMI shield.

2	Align the upper and lower guide pins ❸ on the blank handle (EMI shield ❹ facing left) with the associated holes in the card cage.
3	Tighten the upper and lower screws ❶ using a number 2 cross-point screwdriver.

Replacing a Fan Tray Assembly

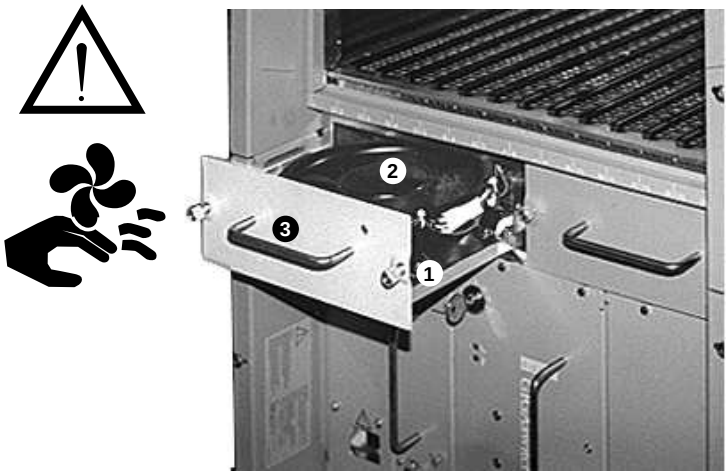
Removing the Fan Tray Assemblies

Warning

Remove all system modules from the unit to make it light enough for two people to lift the unit.

Complete the following steps to remove the fan tray assemblies from the GIGAswitch System:

Step	Action
1	Locate the two fasteners ❶ that attach the selected fan tray assembly ❷ to the GIGAswitch System, and the handle ❸.



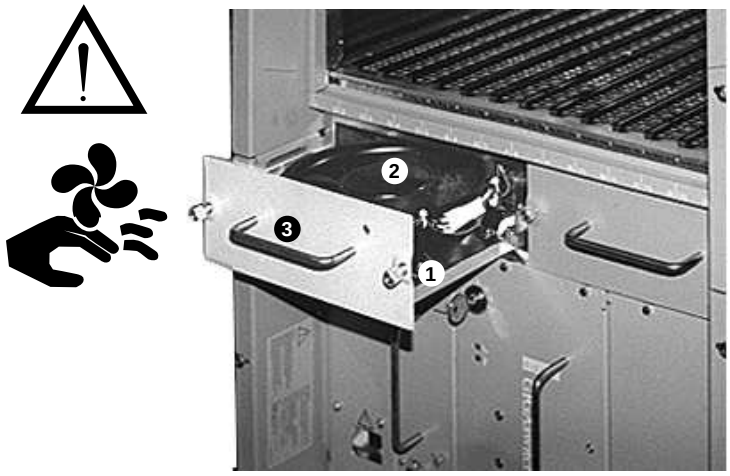
mk28152

2	Release the two fasteners ❶ that attach the selected fan tray assembly to the GIGAswitch System.
3	Grasp the handle ❸ and slide the fan tray assembly ❷ out of the unit enough to see if the fan is rotating.
4	Wait for the fan to stop rotating.
5	Slide the fan tray assembly out of the unit. Grasp the handle ❸ with one hand and support the bottom of the fan tray assembly with your other hand.
6	Repeat steps 1 through 5 to remove the other fan tray assembly.

Installing the Fan Tray Assemblies

Complete the following steps to install the fan tray assemblies in the GIGAswitch System:

Step	Action
1	Locate the two fasteners ❶ that attach the selected fan tray assembly ❷ to the GIGAswitch System, and the handle ❸ of the selected fan tray assembly.



mk28152

2	Align the fan tray assembly (LED to the upper right of the handle) ❷ with module guides of the slot designated for fan tray assembly.
3	Slide the fan tray assembly ❷ into the GIGAswitch System.
4	Tighten the two fasteners ❶.
5	Repeat steps 1 through 4 to install the other fan tray assembly.

What is Next

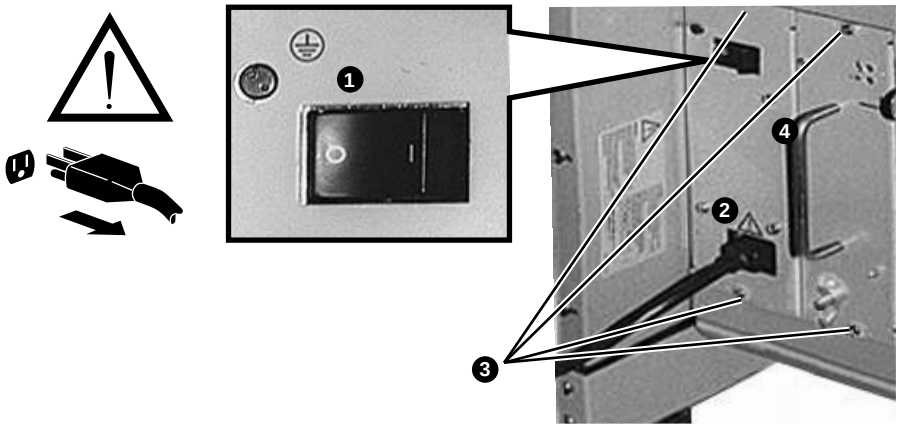
Proceed to Chapter 5 to test the system.

Replacing a FEU

Removing the FEU

Complete these steps to remove a front end unit (FEU).

Step	Action
1	Locate the power switch ❶, the power cord ❷, the four screws ❸ that fasten the selected module to the GIGAswitch System, and the handle ❹ of the selected module.



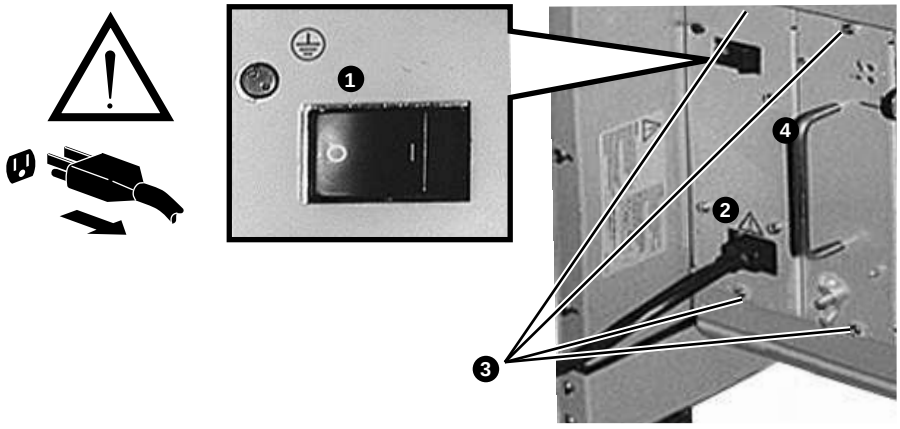
mk28175b

2	Place the power switch ❶ in the O (OFF) position and remove the power cord ❷ from the primary power outlet and the power connector.
3	Remove the four screws ❸ on the module using a number 2 cross-point screwdriver.
4	Slide the module out of the unit. Grasp the handle ❹ with one hand and support the bottom of the module with your other hand.

Installing the FEU

Complete the following steps to install the front end units (FEUs):

Step	Action
1	Locate the power switch ❶, the power cord ❷, the four screws ❸ that fasten the selected module to the GIGAswitch System, and the handle ❹ of the selected module.



mk28175b

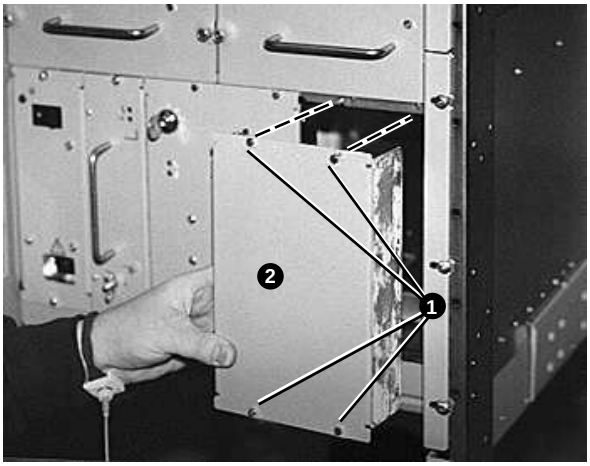
2	Align the selected module with the module guides of the slot designated for the module.
3	Grasp the handle ❹ and slide the module into the unit.
4	Tighten the four screws ❸ using a number 2 cross-point screwdriver.
5	Place the power switch ❶ in the 0 (OFF) position.
6	Plug the power cord ❷ into the power connector and then into the connector for the primary power source.
7	Repeat steps 1 through 6 for the remaining FEU.

Replacing a Power Supply Filler Panel

Removing a Power Supply Filler Panel

Complete the following steps to remove a power supply filler panel:

Step	Action
1	Locate the screws ❶ that fasten the power supply filler panel❷ to the GIGAswitch System.



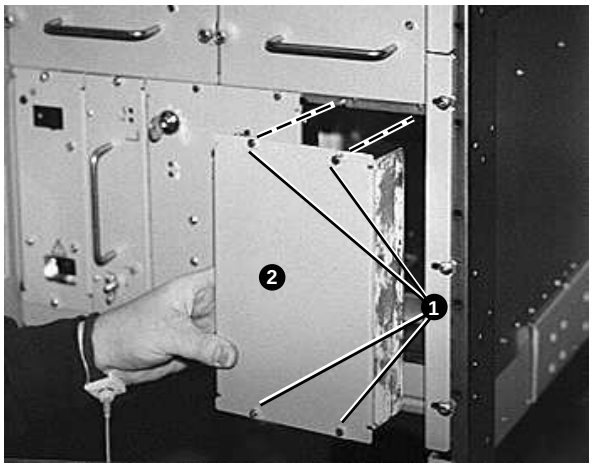
mk28153

2	Remove the two upper and the two lower screws ❸ using a number 2 cross-point screwdriver.
3	Lift the power supply filler panel❷ away from the GIGAswitch System.

Installing a Power Supply Filler Panel

Complete the following steps to install a power supply filler panel:

Step	Action
1	Locate the screws ❶ that fasten the power supply filler panel ❷ to the GIGAswitch System.



mk28153

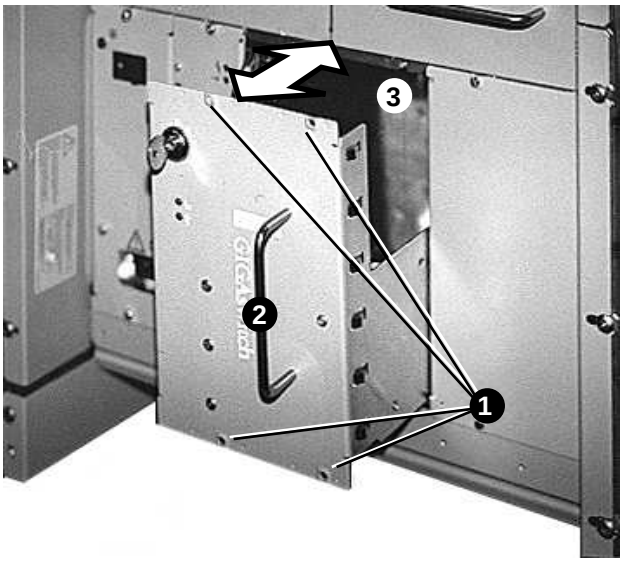
3	Align the power supply filler panel with the associated holes in the system.
4	Tighten the 2 upper and 2 lower screws ❸ using a number 2 cross-point screwdriver.

Replacing a PSA

Removing the PSA

Complete the following steps to remove the power status assembly (PSA).

Step	Action
1	Locate the four screws ❶ that fasten the module to the GIGAswitch System, the handle ❷ of the module, and the slot ❸ designated for the module.



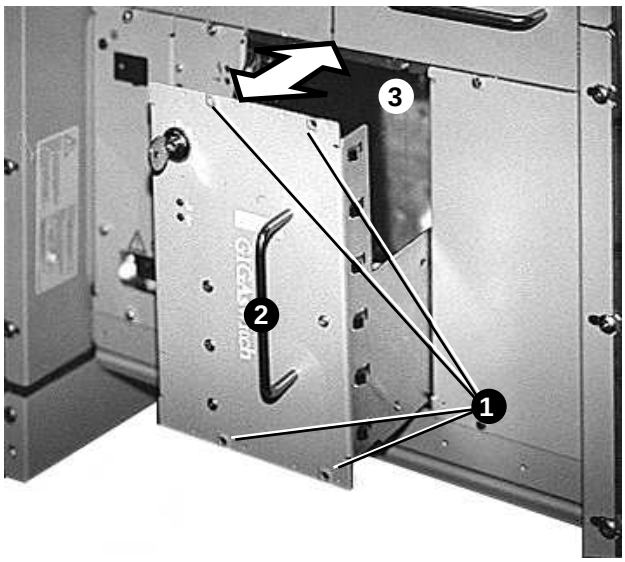
mk28169

2	Remove the four screws ❶ on the module using a number 2 cross-point screwdriver.
3	Slide the module out of the unit. Grasp the handle ❷ with one hand and support the bottom of the module with your other hand. When the module comes to a stop, lift up to allow it to clear the upper edge of the chassis and continue removal.

Installing the PSA

Complete the following steps to install the power status assembly (PSA).

Step	Action
1	Locate the four screws ❶ that fasten the module to the GIGAswitch System, the handle ❷ of the module, and the slot ❸ designated for the module.



mk28169

2	Align the module with the module guides of the slot ❸ designated for the module. Lower the rear of the module slightly to allow the lip on the upper rear edge of the module to clear the upper edge of the slot ❸ designated for the module.
3	Slide the module into the unit. Grasp the handle ❷ with one hand and support the bottom of the module with your other hand.
4	Tighten the four screws ❶ using a number 2 cross-point screwdriver.

What is Next

Proceed to Chapter 5 to test the system.

Replacing a PSC Card

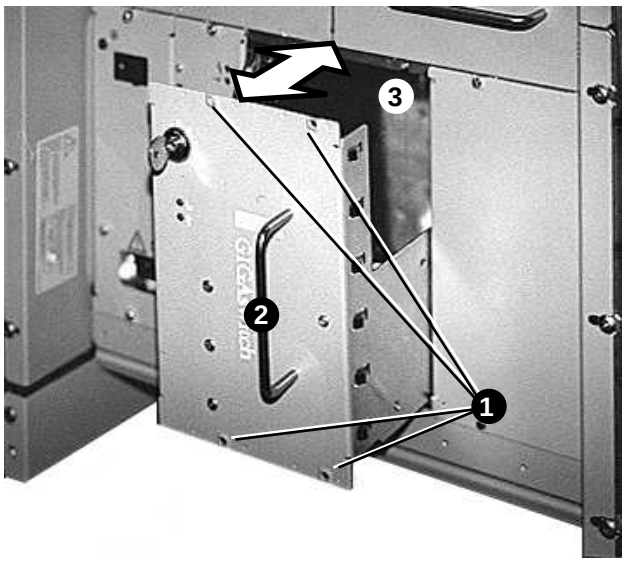
Complete the following procedures to replace a power system controller (PSC) card:

1. Remove the PSA
2. Remove the PSC card
3. Install the PSC card
4. Install the PSA

Removing the PSA

Complete the following steps to remove the power status assembly (PSA).

Step	Action
1	Locate the four screws ❶ that fasten the module to the GIGAswitch System, the handle ❷ of the module, and the slot ❸ designated for the module.



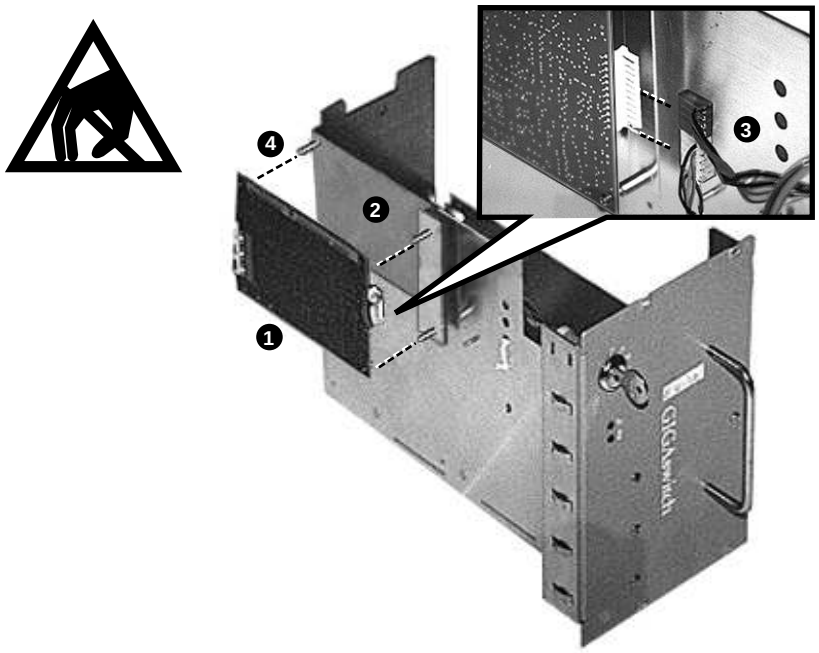
mk28169

2	Remove the four screws ❶ on the module using a number 2 cross-point screwdriver.
3	Slide the module out of the unit. Grasp the handle ❷ with one hand and support the bottom of the module with your other hand. When the module comes to a stop, lift up to allow it to clear the upper edge of the chassis and continue removal.

Removing the PSC Card

Once the power status assembly (PSA) has been removed, complete the following steps to remove the power system controller (PSC):

Step	Action
1	Locate the PSC card ❶, the PSA ❷, and the two cables ❸ connecting the PSC card ❶ to the PSA ❷, and the standoffs ❹.

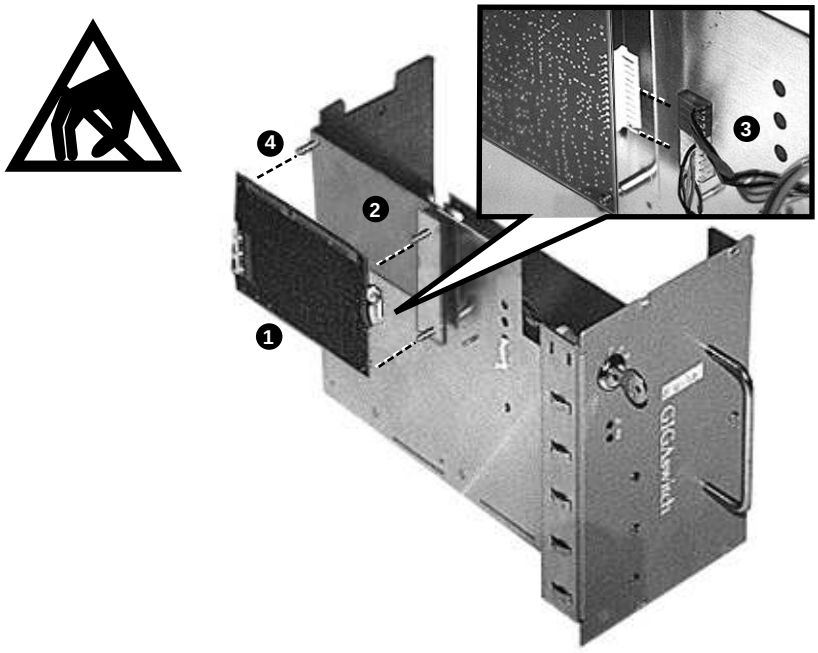


2	Unplug the two cables ❸ from the PSC card ❶.
3	Unsnap the PSC card ❶ from the standoffs ❹ on the PSA ❷, and pull the PSC card ❶ away from the PSA.

Installing a PSC Card

Complete the following steps to install a power system controller (PSC):

Step	Action
1	Locate the PSC card ❶, the PSA ❷, and the two cables ❸ connecting the PSC card ❶ to the PSA ❷, and the standoffs ❹.



2	Align the holes in the PSC card ❶ with the standoffs on the PSA ❷ and snap the PSC card ❶ onto the standoffs ❹.

Note

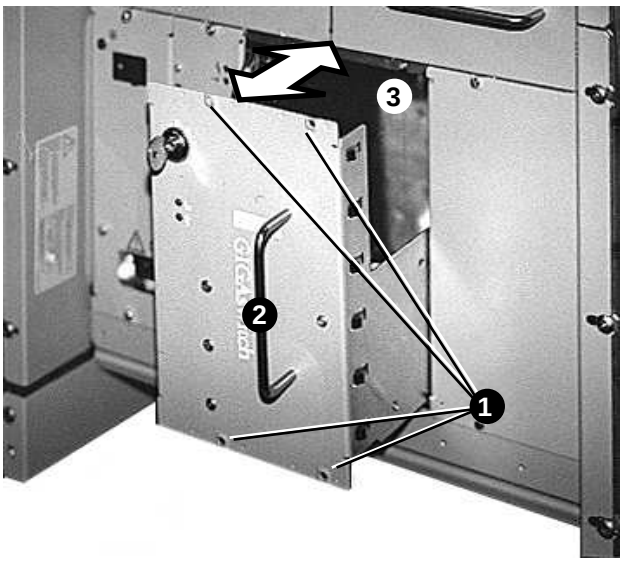
The bottom connector has 5 wires, the top connector has 4 wires and the top three pins remain disconnected.

3	Starting from the bottom pin on the connector, plug the two cables ❸ from the PSA ❷ onto the PSC card ❶ as shown in the figure.

Installing the PSA

Complete the following steps to install the power status assembly (PSA).

Step	Action
1	Locate the four screws ❶ that fasten the module to the GIGAswitch System, the handle ❷ of the module, and the slot ❸ designated for the module.



mk28169

2	Align the module with the module guides of the slot ❸ designated for the module. Lower the rear of the module slightly to allow the lip on the upper rear edge of the module to clear the upper edge of the slot ❸ designated for the module.
3	Slide the module into the unit. Grasp the handle ❷ with one hand and support the bottom of the module with your other hand.
4	Tighten the four screws ❶ using a number 2 cross-point screwdriver.

What is Next

Proceed to Chapter 5 to test the system.

8

Removing the System from the Rack

Chapter Contents

Warning

Remove all system modules from the unit to make it light enough for two people to lift the unit. See Chapter 7 for removal procedures

This chapter describes the following procedures that should be completed to remove the GIGAswitch System in the rack.

1. Removing the upper plenum
2. Detaching the empty GIGAswitch System from the rack

Time Required

45 minutes.

Needed Tools

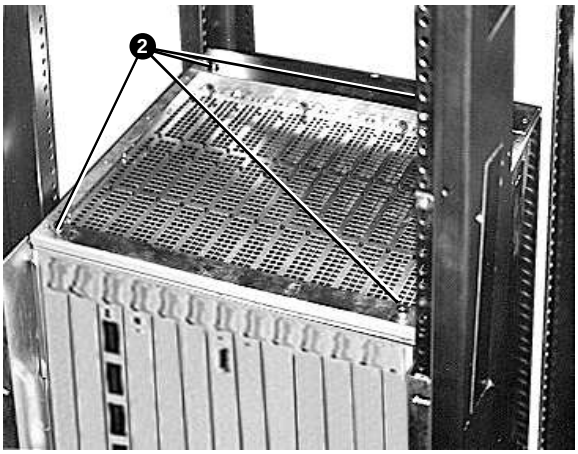
You will need the following tools:

- Number 2 cross-point screwdriver
- ESD equipment
- Static proof containers for modules

Removing the Upper Plenum

Complete the following steps to remove the upper plenum:

Step	Action
1	Locate the upper plenum ❶, the four shoulder screws ❷, and the mounting screw ❸.



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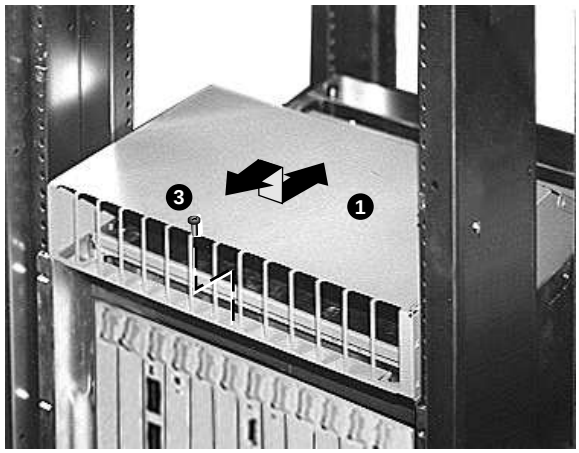

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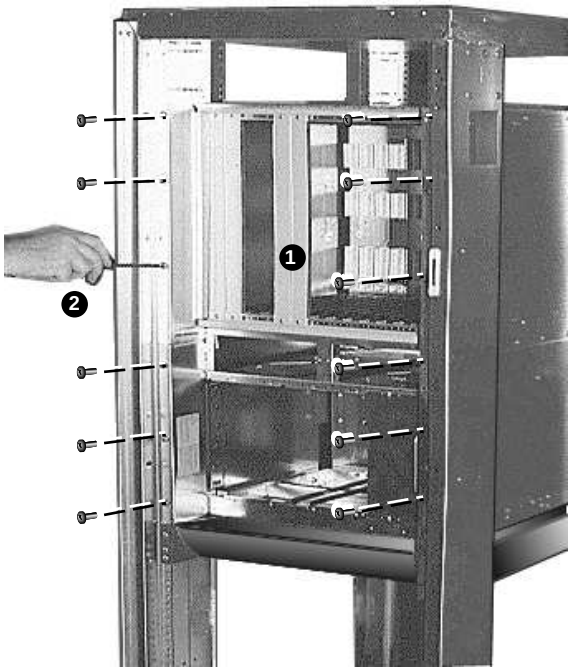
2	Remove the mounting screw ❸ that attaches the upper plenum ❶ to the GIGAswitch System using a number 2 cross-point screwdriver.
3	Pull the upper plenum away from the rack.

Detaching the Empty GIGAswitch System from the Rack

Complete the following steps to detach the GIGAswitch System from the rack:

Step	Action
1	Locate the GIGAswitch System ❶, and the twelve screws ❷.



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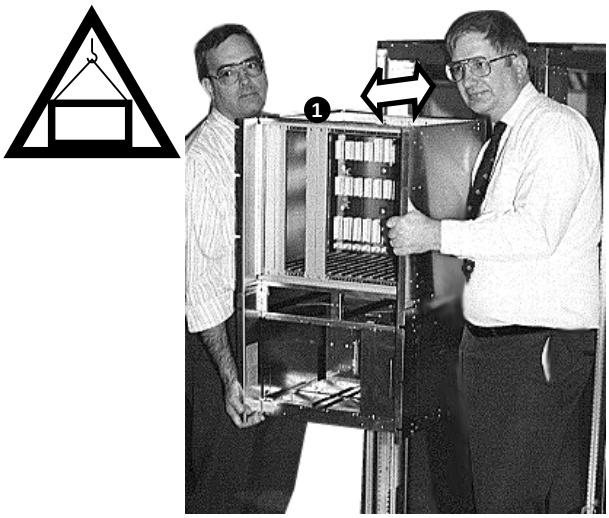
2	Remove 12 screws ❷ using a number 2 cross-point screwdriver.

Lowering the Empty GIGAswitch System

Warning

The Empty GIGAswitch System weighs 31.75 kg. Use two people to lift the unit.

Complete the following procedure to lower the GIGAswitch System:



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1	Pull the empty GIGAswitch System away from the rack.
2	Lower the empty GIGAswitch System and place it on a flat surface.

9
Replacing Backplanes

Chapter Contents

Caution

Read Chapter 6 before attempting to replace a logic or power backplane, as described in this chapter.

Note

The modules from the selected backplane should have already been removed (see Chapter 7) for to remove the modules

This chapter describes the procedures for replacing the logic and power backplanes.

Time Required

60 minutes.

Tools Required

- Number 2 cross-point screwdriver
- Thin flat blade (4.41 mm (3/16 in)) screwdriver

Procedures

- Accessing the backplanes
- Replacing the logic backplane
- Replacing the power backplane
- Restoring the system

Accessing the Backplanes

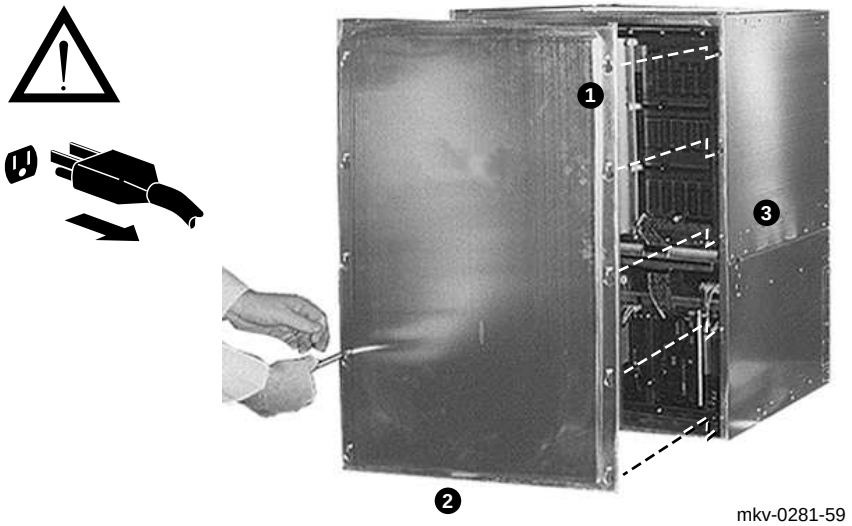
This section contains the following procedures:

- Removing the back door
- Installing the back door

Removing the Back Door

Complete the following steps to remove the back door from the GIGAswitch System:

Step	Action
1	Locate the 10 screws ❶ that fasten the back door to the GIGAswitch System❸ and the lower lip ❷ used to remove the back door.

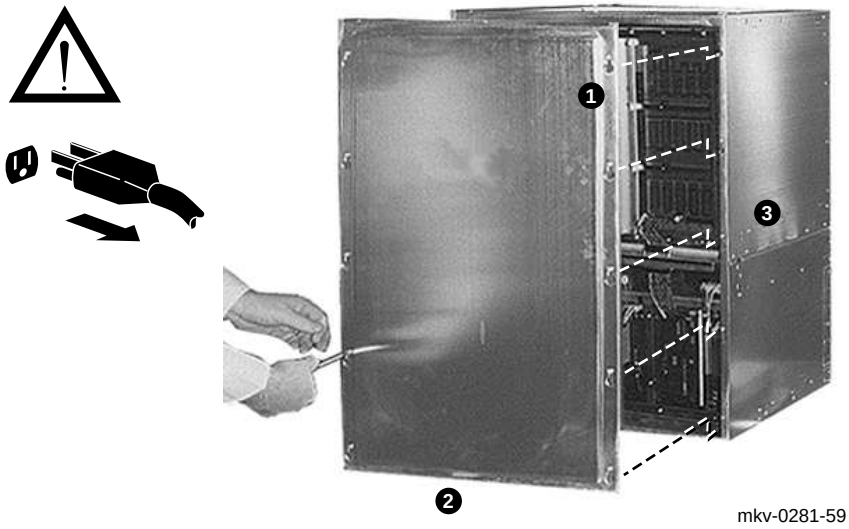


2	Loosen the 10 screws ❶ several turns using a number 2 cross-point screwdriver.
3	Grasp the lower lip ❷ and pull the back door up far enough to clear the keyhole slots in the back door.
4	Pull the back door away from the GIGAswitch System ❸.

Installing the Back Door

Complete the following steps to install the back door on the GIGAswitch System:

Step	Action
1	Locate the screws ❶ that fasten the back door to the GIGAswitch System❸, and the back door ❷.



2	Align the keyslots on the back door ❷ with the ten screws on the GIGAswitch System ❸ and press down.
3	Tighten the ten screws ❶ using a number 2 cross-point screwdriver.

Replacing the Power Backplane

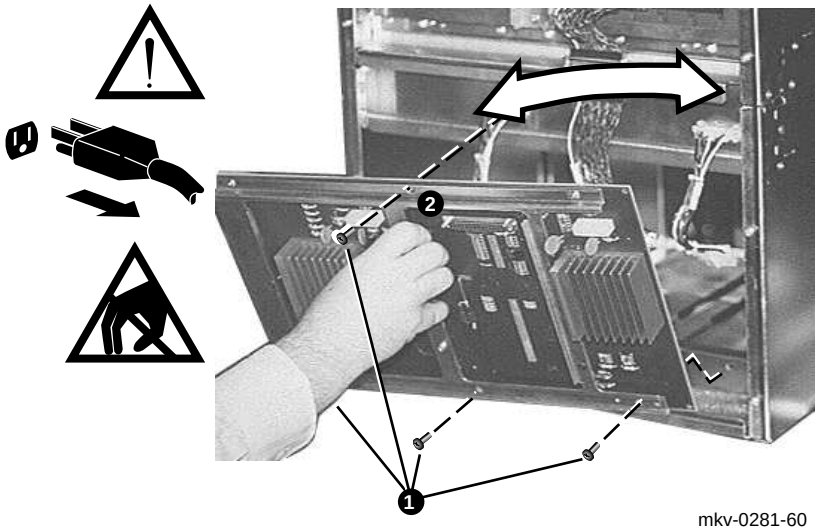
Removing the Back Door

Remove the back door (see Accessing the Backplanes)

Removing the Power Backplane

Complete the following steps to remove the power backplane from the GIGAswitch System.

Step	Action
1	Locate the four screws ❶ that fasten the power backplane ❷ to the GIGAswitch System, and the three cables ❸ used to connect the power backplane ❷ with the logic backplane ❹ and with the fan tray assemblies.



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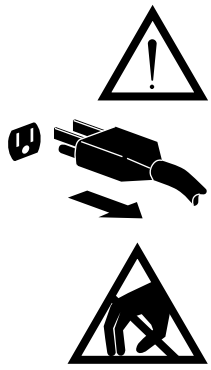

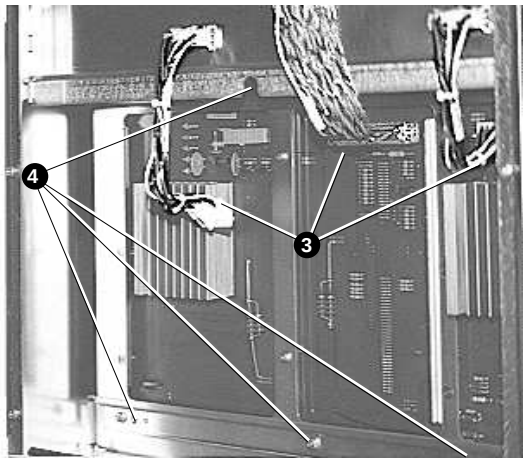

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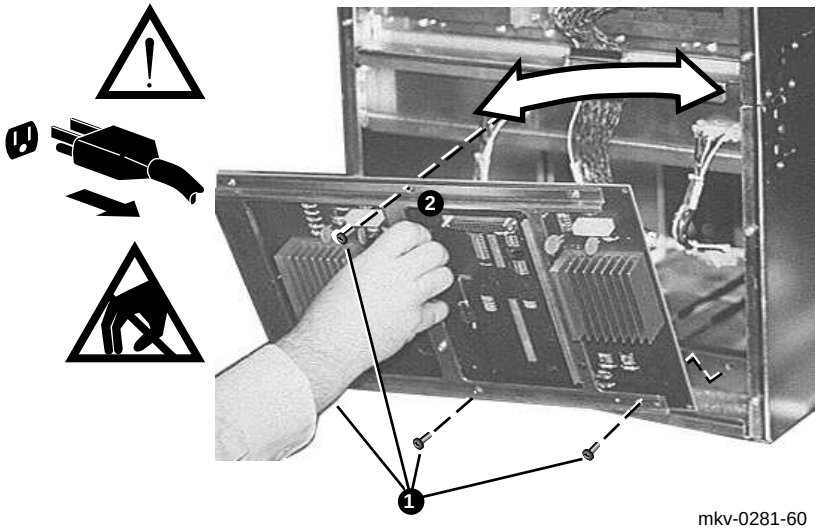
2	Unplug the three cables ❸. Remove the two fan tray assembly cables with the Molex type connectors (squeeze tab) and remove the backplane end. Remove the D connector on the power backplane to backplane bulkhead by loosening the two screws and pulling away from the backplane using a thin flat blade (4.41 mm (3/16 in)) screwdriver.
3	Remove the four screws ❶ using a number 2 cross-point screwdriver. Remove the three bottom screws first and then remove the top screw.
4	Drop the top back and lift the power backplane away from the GIGAswitch System.

Installing the Power Backplane

Complete the following steps to install the power backplane onto the GIGAswitch System:

Step	Action
1	Locate the four screws ❶ that fasten the power backplane ❷ to the GIGAswitch System, and the three cables ❸ used to connect the power backplane ❷ with the logic backplane and with the fan tray assemblies.



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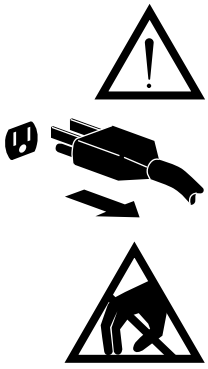

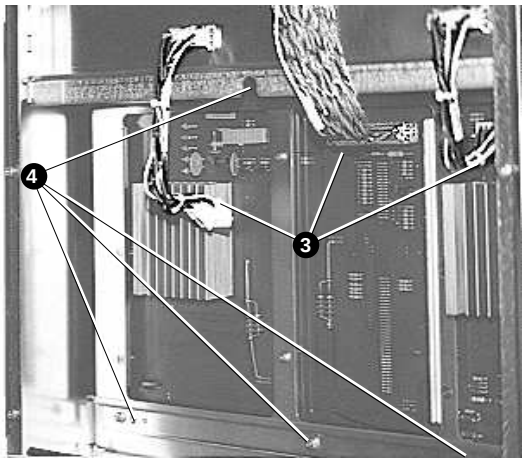

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2	Insert the bottom of the power backplane (lift the cables out of the way) and place the power backplane on the upper and lower alignment pins.
3	Install the four screws ❶ using a number 2 cross-tip screwdriver. Install the top screw first, then install the bottom three screws.
4	Install the three cables ❸. Install the two fan tray assembly cables. Install the power backplane to the bulkhead cable and tighten the two screws.

Installing the Back Door

Remove the back door (see Accessing the Backplanes)

Replacing the Logic Backplane

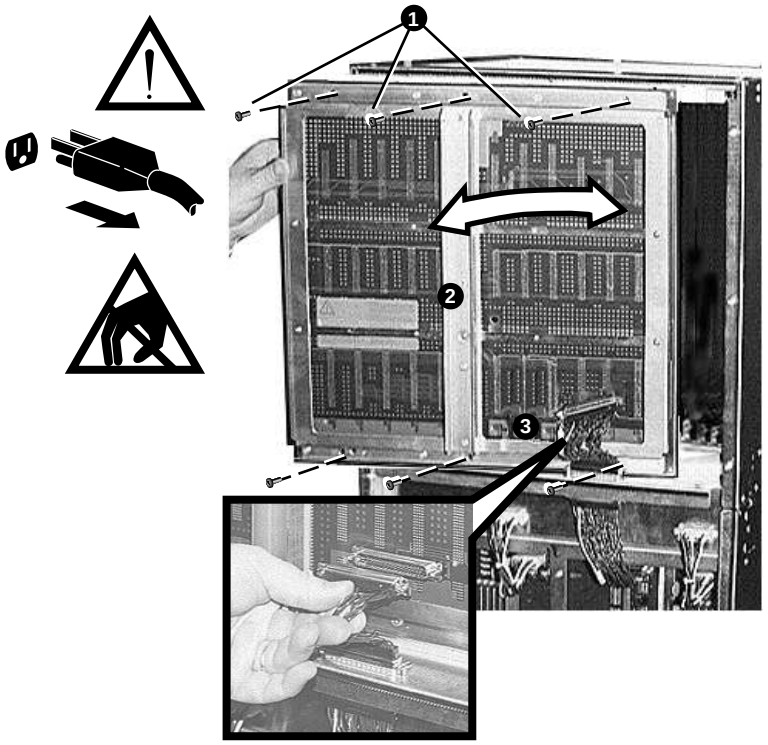
Removing the Back Door

Remove the back door (see Accessing the Backplanes)

Removing the Logic Backplane

Complete the following steps to remove the logic backplane from the GIGAswitch System:

Step	Action
1	Locate the six screws ❶ that fasten the logic backplane ❷ to the GIGAswitch System, and the cable ❸ used to interconnect the logic backplane with the power backplane.



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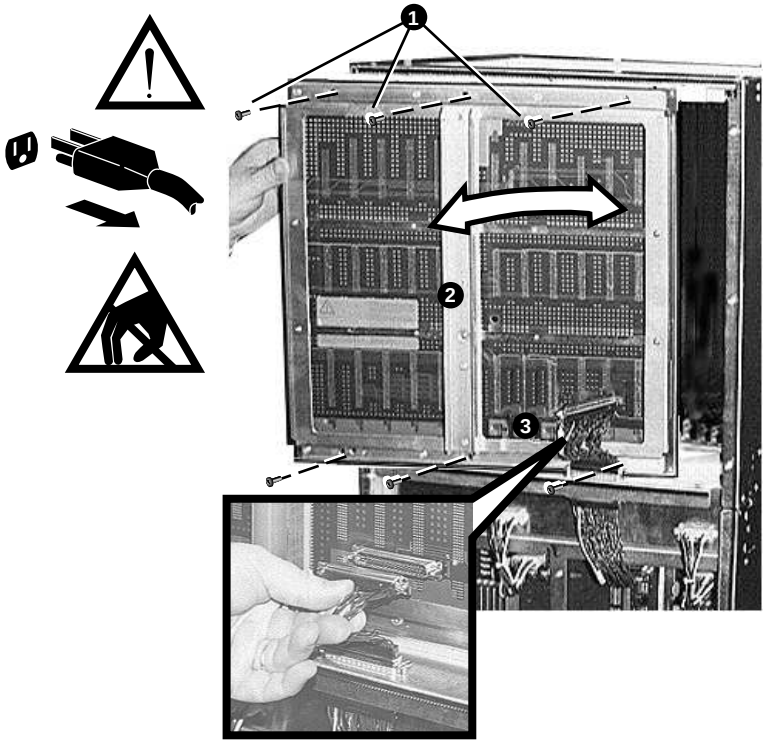
Caution

Hold the backplane in place while removing the screws.

2	Disconnect, unplug, and remove the cable assembly ❸. Loosen the two screws on each connector (backplane and chassis sides) using a thin flat blade (4.41 mm (3/16 in)) screwdriver.
3	Remove the six screws ❶ using a number 2 cross-point screwdriver. Remove the three lower screws first, then remove the three upper screws.
4	Lift the logic backplane away from the GIGAswitch System. Rotate the backplane slightly (right side turning inward and the left side turning outward during removal).

Installing the Logic Backplane

Step	Action
1	Locate the screws ❶ that fasten the logic backplane ❷ to the GIGAswitch System, and the cables ❸ used to connect the logic backplane ❷ with the fan tray assemblies.



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2	Insert the lower edge of the backplane behind the power connector and into the lower right corner of unit.
3	Install the six screws (three upper and three lower) ❶ (1) using a number 2 cross-point screwdriver. Install the three upper screws first, then install the three lower screws.
4	Install the cable assembly ❸. Plug in the connector and tighten the two screws using a thin flat blade (4.41 mm (3/16 in)) screwdriver.

Installing the Back Door

Remove the back door (see Accessing the Backplanes)

Restoring the System

Complete the following procedures to restore the system:

- Install the modules in the selected backplane (See Chapter 7).

Part IV
Reference

Part IV contains reference information.

- **Appendix A** provides the physical, electrical, and environmental specifications for the GIGAswitch System.
- **Appendix B** describes the cooling and power modules in the fan tray assembly, FEU, PSA, and the PSC card families.
- **Appendix C** describes the logic modules in the line card, physical medium dependent (PMD) daughter card, SCP card, CBS card, and clock card families.
- **Appendix D** provides guidelines for installing additional logic modules.

A

GIGAswitch System Specifications

This appendix provides the specifications for the GIGAswitch System. These specifications include:

- Physical specifications for the GIGAswitch System.
- Electrical specifications for the GIGAswitch System.
- Environmental specifications for the GIGAswitch System.

Physical Dimensions of the GIGAswitch System

The following table shows the physical specifications for the GIGAswitch System. Allow 90.0 cm (35.4 in) contiguous vertical space for the installation of the GIGAswitch System, the lower plenum, and the upper plenum. (Physical Specifications)

Parameter	Min	Typ	Max	Units	Symbol
Mounting type		Rack Mounted		–	–
Height	–	896.2	–	millimeters	mm
	–	35.25	–	inches	in
Width	–	507	–	millimeters	mm
	–	19.95	–	inches	in
Depth	–	495	–	millimeters	mm
	–	19.50	–	inches	in
Weight	–	87.1	–	kilogams	kg
	–	192	–	pounds	lb
Operation clearance (front)	51	–	–	millimeters	mm
	2.0	–	–	inches	in
Operation clearance (rear)	76	–	–	millimeters	mm
	3.0	–	–	inches	in
Operation clearance (side)	0	–	–	millimeters	mm
	0	–	–	inches	in
Service clearance (front)	914	–	–	millimeters	mm
	36.0	–	–	inches	in
Service clearance (rear)	914	–	–	millimeters	mm
	36.0	–	–	inches	in
Service clearance (side)	0	–	–	millimeters	mm
	0	–	–	inches	in
Service clearance (top)	0	–	–	millimeters	mm
	0	–	–	inches	in
Shipping height§	–	1283	–	millimeters	mm
	–	50.5	–	inches	in
Shipping width§	–		–	millimeters	mm
	–	26.0	–	inches	in
Shipping depth§	–		–	millimeters	mm
	–	32.0	–	inches	in
Shipping weight§	–	99.8	120	kilograms	kg
	–	220	264	pounds	lbs

§Shipping for standard shipping container

Electrical Information

AC Input Power Requirements

The following table shows the ac input power requirements for the GIGAswitch System.

Parameter	Min	Typ	Max	Units	Symbol
Nominal Voltage	–	120	–	volts	V
Operational Voltage Range	93	–	264	volts	V
Nominal Frequency	–	50/60	–	hertz	Hz
Frequency Range	47	–	63	hertz	Hz
Number of Phases	–	1	–	none	NA
120V Single Phase Input Current (Steady State)	–	8.0	15	amperes	A
120V Single Phase Input Current (Neutral N)	–	4.0	7.5	amperes	A
120V Single Phase Input Current (Ground G)	–	1.0	–	milliamperes	mA
240V Single Phase Input Current (Steady State)	–	4.0	7.5	amperes	A
240V Single Phase Input Current (Neutral N)	–	4.0	7.5	amperes	A
240V Single Phase Input Current (Ground G)	–	1.0	–	milliamperes	mA
Ride-Through Time	100	–	–	milliseconds	ms
Inrush Current	–	–	n/a	amperes peak	A
Start-Up Current	–	–	n/a	rms amperes	A
Start-Up Current Duration	–	–	n/a	seconds	s
Power Consumption	–	800	1250	watts	W
Apparent Power	–	1052	1316	volt amperes	VA
Power Factor	–	.95	–	none	PF
Crest Factor	–	1.37	–	none	CF

Power Cord Types

The following table lists the power cords used in the various country kits available with the GIGAswitch System.

Country	Part Number	Country	Part Number
Denmark	BN16A-2E	Israel	BN18W-2E
UK/Ireland	BN12A-2E	Central Europe	BN13A-2E
Italy	BN17A-2E	Austraila	BN22C-2E
Switzerland	BN14A-2E	New Zealand	BN22C-2E

Line cords are 2.5 meters in length. Use different outlets and services breakers for redundant power supplies.)

DC Power Requirements

The following table shows the DC power requirements for the GIGAswitch System.

Parameter	Min	Typ	Max	Units	Symbol
Power Consumption	–	640	1000	watts	W
Current at 48 Vdc	–	12	20	amperes	A
Current at 12-26 Vdc	—	3.6	5.0	amperes	A
DC voltage range (48 Vdc)	46.32	–	49.68	volts	Vdc
DC voltage range (12Vdc - 26 Vdc)	11.0	–	27.1	volts	Vdc
Output Watts Available	–	–	1000	watts	W
Current available at 48 Vdc	–	–	22.	amperes	A
Current available at 11-27.1 Vdc	—	–	1.5-5.0	amperes	A

Environmental Information

Parameter	Min	Typ	Max	Units	Symbol
Temperature (Operating)	10	–	35	degrees Celsius	°C
	50	–	95	degrees Fahrenheit	°F
Altitude derating	–	1.8	–	degrees Celsius per kilometer	°C/km
	–	1.0	–	degrees Fahrenheit per 1000 feet	°F/1000 ft
Temperature (Nonoperating)	-40	–	66	degrees Celsius	°C
	-40	–	151	degrees Fahrenheit	°F
Temperature (Storage)	-40	–	66	degrees Celsius	°C
	-40	–	151	degrees Fahrenheit	°F
Relative Humidity (Operating)	10	–	90	percent relative humidity (noncondensing)	%RH
Relative Humidity (Nonoperating)	<50	–	95	percent relative humidity (noncondensing)	%RH
Relative Humidity (Storage)	<50	–	95	percent relative humidity (noncondensing)	%RH
Maximum Wet Bulb Temperature (Operating)	–	–	25	degrees Celsius	°C
	–	–	77	degrees Fahrenheit	°F
Maximum Wet Bulb Temperature (Storage)	–	–	146	degrees Celsius	°C
	–	–	115	degrees Fahrenheit	°F
Minimum Dew Point Temperature (Operating)	2	–	–	degrees Celsius	°C
	36	–	–	degrees Fahrenheit	°F
Heat Dissipation	–	800	1250	watts	W
	–	2730	4265	Btu/hr	Btu/hr
Altitude (Operating)	–	–	2400	meters above sea level	m
	–	–	8000	feet above sea level	ft
Altitude (Nonoperating)	–	–	4900	meters above sea level	m
	–	–	16000	feet above sea level	ft
Mechanical Shock (Operating)	Duration		10+3	milliseconds	ms
	Level		10g	gravities	G
Vibration Freq Range (Operating)	5	–	500	hertz	Hz
Vibration Level (Operating)	.010-in DB	.25g	peak		
Mechanical Shock (Nonoperating)	Duration		29.2	milliseconds	ms
	Level		13.67	gravities	G
Vibration Freq Range (Nonoperating)	10	–	300	hertz	Hz
Vibration Level (Nonoperating)	1.40g	–	.029 gz/hz		
Acoustic Emission (Operating)	–		–	Bels	B

Parameter	Min	Typ	Max	Units	Symbol
Acoustic Emission (LNPE)	–	5.9	–	decibels	dBA
Acoustic Emission (LPA)	–	46	–	decibels	dBA
Acoustic Emission (Idle /Standby)	–		–	Bels	B
Acoustic Emission (LNPE)	–	5.9	–	decibels	dBA
Acoustic Emission (LPA)	–	46	–	decibels	dBA
Airflow Intake Location		Top-Front			
Airflow Exhaust Location		Bottom Rear			

Ventilation

The GIGAswitch System cooling system is designed to be tolerant of various rack installation configurations. However, to provide adequate ventilation:

- Do not block off the inlet air vents (upper grilles).
- Do not block off the outlet air vents (lower grilles).
- Do not allow the cooling air entering the GIGAswitch System to rise above 32°C (90°F).

EMI Susceptibility

The following table shows the electromagnetic interference (EMI) susceptibility for the GIGAswitch System.

Parameter		Maximum	Units	Symbol
Broadband Conducted EMI	Class A	Composite (FCC/VDE) -3db	Volts dbuv	dbuv
Narrowband Conducted Transients	Frequency Range	10KHZ to 30MHZ	kilohertz, megahertz	kHz, MHz
	V rms into 50 ohms	3VRMS	Volts	V
Narrowband Radiated Susceptibility	Frequency Range	.01MHZ-1GHZ	kilohertz, megahertz	kHz, MHz
	Level	5 Volts/M	Volts per Meter	V/m
ESD Control		15KV	kilovolts	kV

B

Cooling and Power Modules

This appendix provides a description of the cooling and power modules belonging to the following families:

- Fan tray assembly
- Front end unit (FEU)
- Power status assembly (PSA)
- PSC card

Fan Tray Assembly

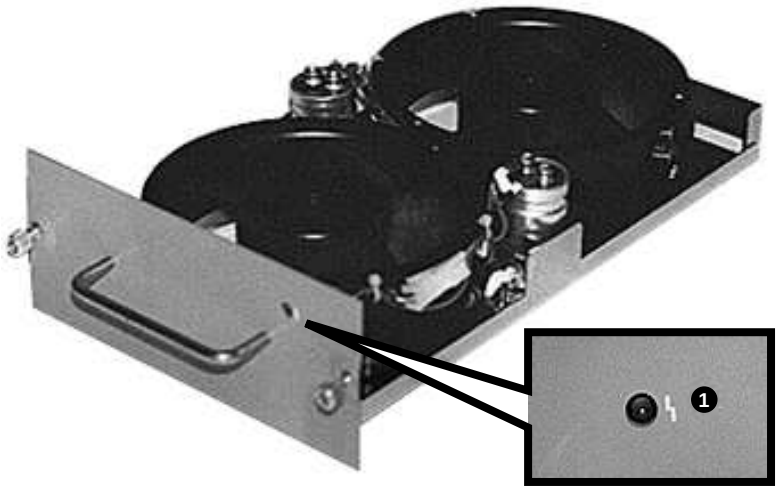
The fan tray assembly (70-30578-01) is a member of the fan tray assembly family of cooling modules. The fan tray assembly contains two 5.75 inch fans used to provide convective cooling to the GIGAswitch System. These variable speed fans are controlled by the PSC card based on ambient temperature.

Air Flow

The air above the GIGAswitch System is drawn from the front of the GIGAswitch System, directed on the modules inside the GIGAswitch System, and exhausted from the bottom rear of the GIGAswitch System.

LED Meaning

The following figure identifies the LEDs on the fan tray assembly.



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Number/Name	Condition
❶/Fan tray assembly fault	Off = MST passed
	Steady Amber = MST failure

FEU

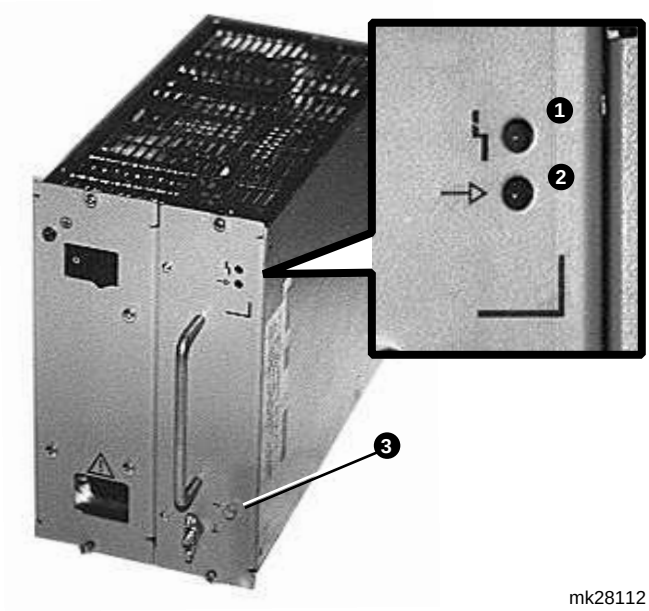
The front end unit (FEU) (DEFGB-AB) is a member of the FEU family of power modules.

Function

Front end unit (FEU) converts primary AC power to system 48 Vdc and to 12 Vdc through 26 Vdc fan power. The FEU also houses the system circuit breaker.

LEDs

The following figure identifies the LEDs on the FEU.



Number/Name	Condition
❶/Front end unit (FEU)	Steady Amber = MST failure
❷/Front end unit (FEU) OK	On Green = MST passed
❸/AC Power	Off = Power NOT available for FEU circuit breaker
	On = Power is available for FEU circuit breaker

PSA

Description

The power status assembly (PSA) (70-30585-01) is a member of the FEU family of power modules.

Function

The PSA houses the security switch and the PSC card.

Security Switch

The security switch controls the ability to configure or monitor the GIGAswitch System using in-band § or out-of-band (OBM) † management commands. The following table identifies the various positions of the security switch.

Position	Name	Function	Access Allowed? §	
			Out-of-Band	In-Band
1	1	No Access	No	No
2	2	Secure Access	With password	SNMP Get, and getnext PDUs only
3	3	Normal Access	With password	SNMP Get, getnext, and set PDU
4	4	Easy Access	Without password	SNMP Get, getnext, and set PDUs

§Security for out-of-band management is set by password. Security for in-band management is set by community and privileged port designation. Both can be changed using in-band or out-of-band management commands.

PSC

The PSC card is an FRU that is mounted on the PSA.

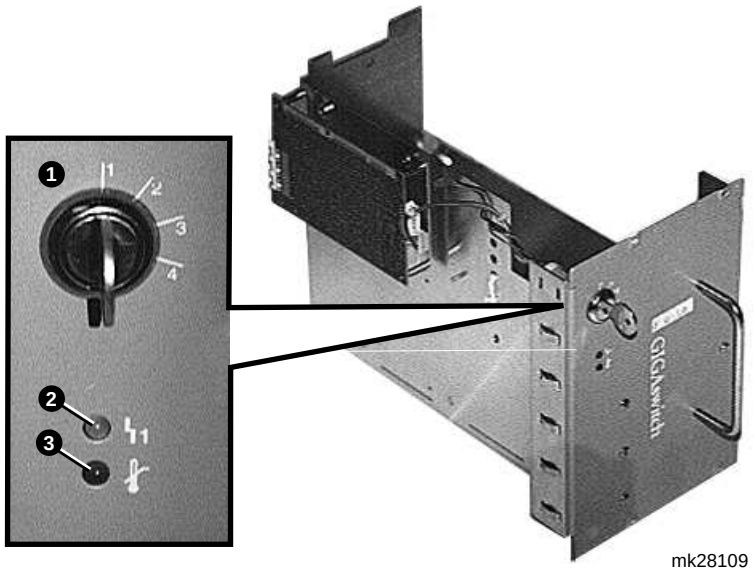
LED Testing

All LEDs are lit for one second during start-up to ensure that the LEDs are operational. After start-up only those LEDs indicating faults remain lit.

§ Issued from any GIGAswitch System management station.
† Issued through the terminal/modem interface for the GIGAswitch System.

LED Meaning

The following figure and associated table identify the security switch and the LEDs on the PSA.



Number/Name	Condition
❷/PSC card Fault	Off = MST passed
	Steady Amber = MST failure
❸/System temperature fault	Steady Red = System temperature fault
	Off = System temperature normal

PSC Card

The power system controller (PSC) card (54-22132-01) is a member of the FEU family of power modules.

The PSC card is a module that snaps onto standoffs on the PSA. The PSC card automatically plugs into the power backplane when the PSA is installed in the GIGAswitch System.

Function

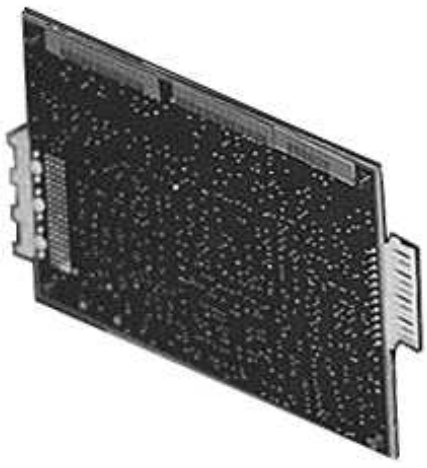
The PSC card is that portion of the GIGAswitch System that controls and monitors the redundant 48 Vdc power supplies, and the fan tray assemblies. The PSC card reports the operational status of the monitored units to the clock card.

The PSC card performs the following functions:

- MST diagnostics, and fan tests at start-up.
- Temperature and fan speed monitoring.
- Fan speed control to minimize audible noise and to insure sufficient cooling.
- Power and cooling system status, configuration and fault reporting by way of the serial bus to the clock card.
- Power failure early warning signaling to the clock card.
- Power and cooling system LED LEDs on/off control.
- System security key switch monitoring.

Description

The following figure shows the physical characteristics of the PSC card.



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C

Logic Modules

This appendix describes of the logic modules belonging to the following families:

- Line card
- PMD daughter card
- SCP card
- Clock card
- CBS card

Line Card

The 2-port FDDI line card (DEFGL-AA) is a member of the line card family of logic modules.

Hotswap Capability

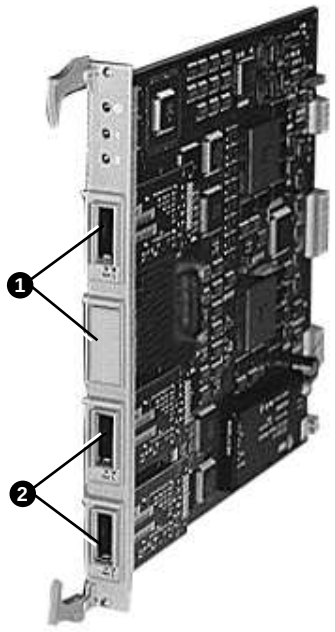
The line card can not be replaced without removing the power from the system.

Function

The line card performs bridge forwarding functions, including packet filtering, assisting in learning, and determining the correct output data link to which a packet should be forwarded. Packets with unknown destinations, multicast packets, or exceptions are sent to the switch control processor (SCP).

The line card implements two fully independent FDDI forwarding bridge ports and interfaces these ports to the CBS card. Either or both ports may be configured in a single-attachment station (SAS) or a dual-attachment station (DAS) mode.

Each of the two line card ports is capable of processing over 430,000 FDDI packets per second while the maximum connection rate from the line card to the CBS card is over 500,000 connections per second.



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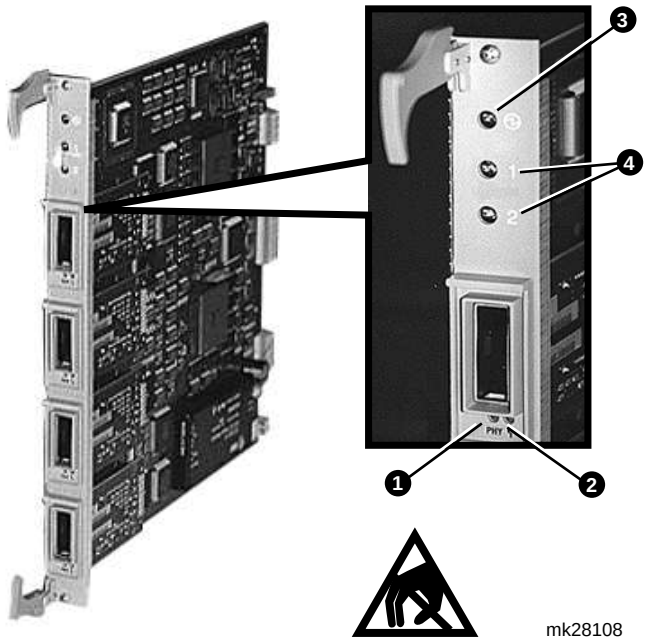
Number	Port Type	Number	Port Type
❶	SAS Port	❷	DAS Port

LEDs on Line Card

The following figure identifies the LEDs and connectors on the line card and the associated PMD daughter cards.



LED Meaning The following table provides the meaning for the line card LEDs .

	Indication			
Number/Name	**OFF**	**Amber**	**Green**	**Green/Amber**
❶/PMD FRU LED	PMD OK and fully operational or no power. Steady - PMD loop test failed (defective PMD FRU) Flashing - Reserved	Steady - Reserved Flashing - Reserved	Flashing - Reserved	
❷/PMD PHY LED	No power or severe fault	Steady - Link confidence test (LCT) failure Flashing - Topology reject	Steady - Connection accepted Flashing - Awaiting a connection	Flashing - Standby (dual-homing)
❸/Line card LED	No power or with port LEDs off and PMD daughter card LEDs on, card is not fully seated or in process of being removed.	Steady - MST failed or fatal firmware error. Flashing - MST in progress (wait)	Steady - MST passed Flashing - Firmware down-line load (DLL) in progress - will flash at 1/2 second intervals.	Flashing - Non-fatal firmware error.
❹/Port LED	No power or or with port LEDs off and PMD daughter card LEDs on, card is not fully seated or in process of being removed.	Steady - MST failure in this port, Flashing - MST in progress (Wait)	Steady - MST passed, port active and in forwarding state. Flashing - MST passed, port in backup, preforwarding state or station management is off.	Flashing - Reserved

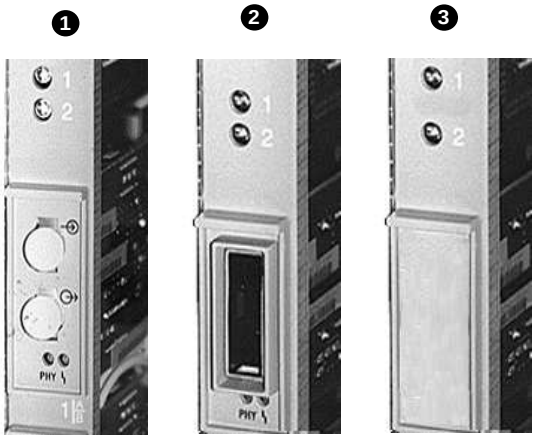
PMD Daughter Cards

The line card can have up to four physical medium dependent (PMD) daughter cards installed as independent field replaceable units (FRUs). The PMD daughter card houses a PMD option § Each PMD daughter card contains a PMD FRU LED and a PMD PHY LED.

The following figure and table identify the various PMD options.

Name	Part Number		Description
	PMD	Loopback	
❶ Single-Mode Fiber	12-34685-01	12-34830-01	FC-to-FC
❷ ANSI Multimode Fiber	BN24B-xx §	12-32005-01	FDDI-to-FDDI
❷ ANSI Multimode Fiber	BN24D-xx §	12-32005-01	FDDI-to- 2.5 mm ST-type
❸ Blank PMD Bezel			

§xx = cable length in meter (See *Fiber Distributed Data Interface Media Connection Information*).



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§ Typical PMD options include multimode fiber (MM), and single-mode fiber (SM)

SCP Card

The switch control processor (SCP) card (DEFGP-AA) is a member of the SCP card family of logic modules.

Application

The most common application for the SCP card is to serve as the System Control Processor (SCP) for the GIGAswitch System. During system initialization, an election takes place in software to assign one SCP card the role of primary SCP. If other switch engines are installed, they might be used by the system as backup SCPs for redundancy.

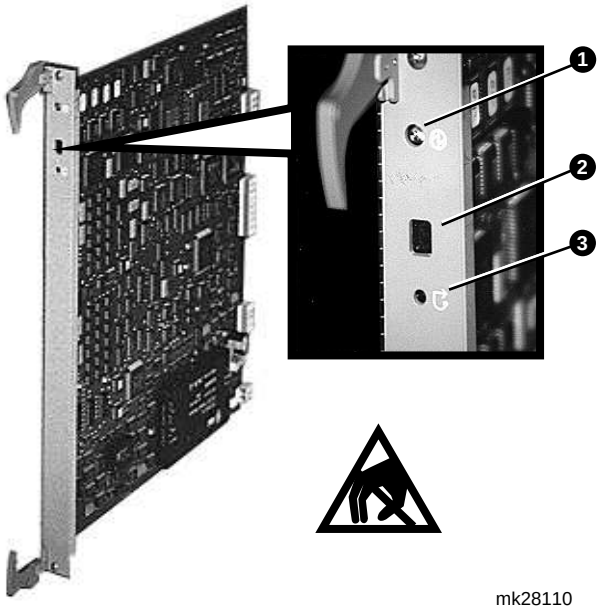
SCP Function

The SCP function includes central functions such as initialization, remote management, and control of services (such as bridging) that are distributed across modules.

One of the major bridging services is to send and receive packets that cannot be handled by the line cards. The SCP card sends and receives packets for these purposes, among others:

- Exchanging intraswitch control packets between SCPs and line cards, including background monitor (keep-alive packets, address learning packets for transparent bridging, and packets to read or set management parameters.
- Forwarding multicast packets to an SCP by each line card. The primary SCP uses special resources in the system to broadcast each packet to the proper set of outbound line-card ports and other switch engines.
- Interpreting network control packets diverted from line cards.
- Acting as a station on the network and emitting packets for remote management the GIGAswitch System.

SCP Card LEDs and Control



Number	Item	Function
❶	Module LED (Amber/green LED)	Indicates power available and MST status.
❷	Diagnostic Readout (Hexadecimal LED)	Indicates coded diagnostic results.
❸	Reset (push button)	Resets the SCP.

SCP HEX LED Table

The following table further identifies the purpose of the SCP LEDs.

Number/Event	LED ❶ Condition	HEX LED ❷ Condition	Meaning
1/SCP card startup	Amber	Out	MST has not passed.
2/Startup complete	Solid amber LED	F	Startup complete
3/SCP card MST	Flashing amber	test number updated	MST in progress
	Solid green	B	MST passed, SCP card in backup mode
	Solid amber or out	solid number	MST failed
4/SCP election	Solid green	E	Elected switch control processor
5/Downline load	Solid green	D	New firmware images are being loaded into the flash memory during a firmware upgrade.
	Solid green	Alternating D/E	Corrupt image detected during system boot. SCP continues to try to retrieve a good image from the bootserver.
	Solid green		Test passed
	Solid amber		Test failed

Clock Card

The clock card (54-22120-01) is a member of the clock card family of logic modules. The clock card must be included in any GIGAswitch System configuration.

Application

The clock card performs the following functions:

- Clock generation and distribution
- Arbitration
- Terminal or modem interface
- PSC card interface
- PSC card power source

Clock Generation and Distribution

The clock card generates master system clocks and distributes them through the backplane to each of the line card and the SCP card. This allows resources associated with the backplane (in particular the CBS card and the Backplane bus) to be used in a synchronous and efficient manner.

Arbitration

The clock card also arbitrates access to the backplane bus to grant ownership of the potential users in a fair manner.

Terminal or Modem Interface

The clock card provides the GIGAswitch System user with a standard terminal or modem interface conforming to RS232 specifications, and compatible with RS423. The interface can be used to connect a terminal to GIGAswitch System for local management and diagnostic purposes. Full modem support is also provided for remote maintenance and diagnostic support.

User specific parameters, such as baud rates, stop bits, parity, data length and so forth are stored locally on the clock card in nonvolatile (FLASH) memory.

PSC Card Interface

The clock card receives environmental status from the PSC card when requested. This status includes:

- Power supply status
- The state of the fans
- Ambient temperature

Line Card Monitoring and Power Control

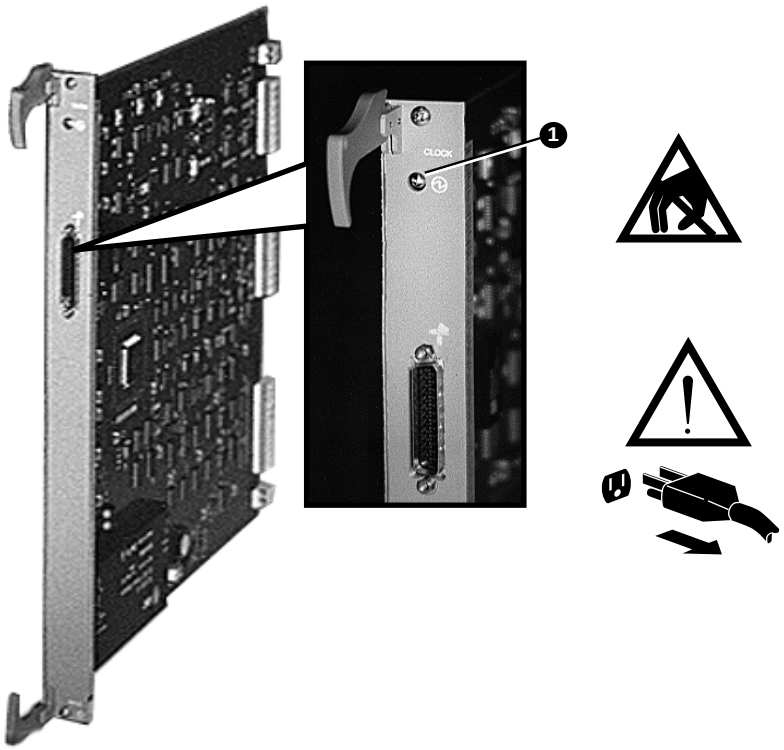
The clock card monitors line card, SCP card, and CBS card to determine the type of card present during power initialization, and to determine when a card is removed or inserted. The major functions of the clock card are:

- Clock generation and distribution.
- Backplane bus arbitration and power sourcing.

- Arbitration and tie breaking on behalf of the SCP card.
- Local console (terminal or modem interface.
- Sensing and control of the environment and of other modules.

In addition, many centralized resources exist on the clock card. Examples of such resources include the many Ethernet addresses associated with each GIGAswitch System platform, network and local management parameters, and parameters learned about any local topology.

Clock Card LEDs



Event Number	Event	LED ❶ Condition	Meaning
1	Clock card startup	Solid amber	After reset, MST has not passed
2	Clock card MST	Flashing amber	MST in progress
		Solid green	MST passed
		Solid amber	MST failed

CBS Card

The crossbar switch (CBS) card (54-22116-01) is a member of the CBS card family of logic modules. The crossbar is comprised of three CBS-36 chips each operating in 36x36x2 mode to make a 6-bit wide, 36 port crossbar.

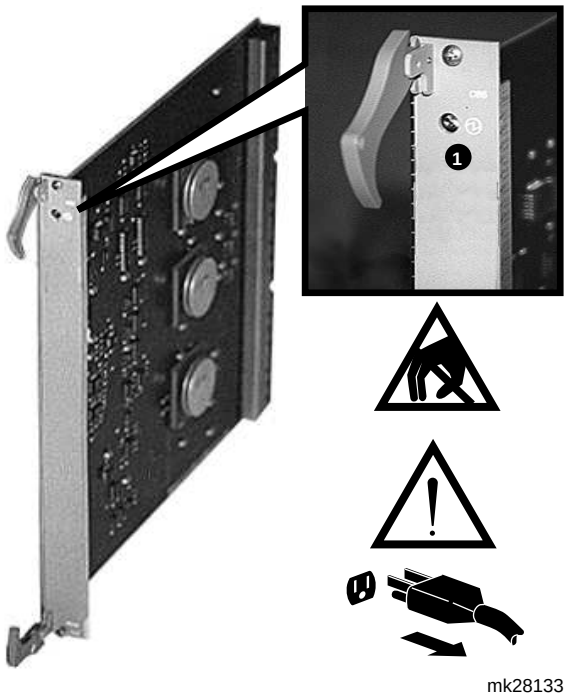
Function

The function of the CBS card is to connect numerous 100 Mbit links together in a dynamic fashion. Any input port may be connected to any single-output or group of outputs. Each connection must be specified individually.

Specifications

The CBS card has an aggregate maximum bandwidth of 3.6 Gigabits/second. Connections are made through the crossbar between 100 Mbit/second links at a maximum rate of 6.25 million connections per second. Half duplex connections are made independently; a full duplex connection may be established as two half duplex connections.

CBS LEDs



Event Number	Event	LED ❶ Condition	Meaning
1	Clock card tests the CBS card	Flashing amber	Test in progress
		Solid green	Test passed
		Solid amber	Test failed

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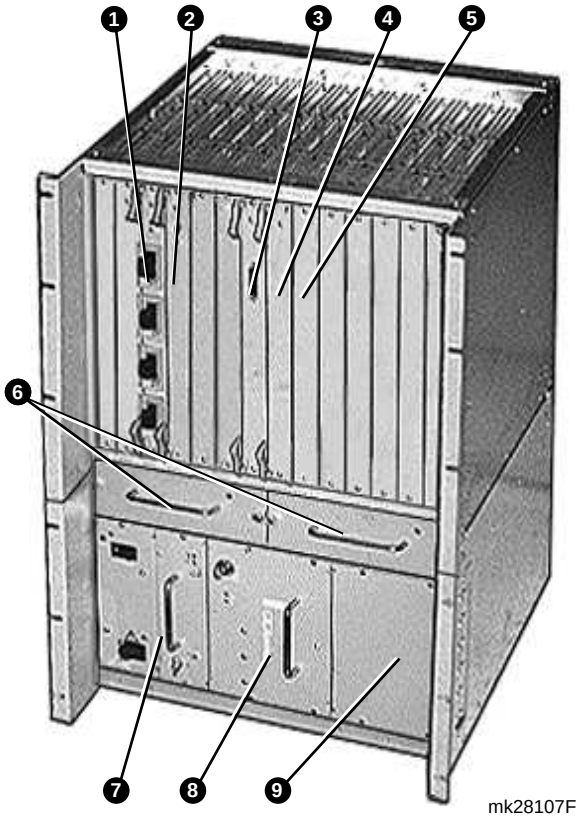
Guidelines for Installing Additional Modules

This appendix provides guidance for installing additional logic module.

Identifying the Contents of the GIGAswitch System

The contents of the GIGAswitch System depend on any options the customer may have ordered. These options were installed in the GIGAswitch System before shipment. Refer to the following figure and table to identify the contents of the GIGAswitch System configuration.



Number	Order Number	Description
❶	DEFGL-AA	A line card with the requested PMD daughter cards (ordered separately) installed §. One line card is included with the DEFGA-BA, and DEFGA-BB versions of the product. Additional line cards can be ordered separately by the customer.
❷	DEFGP-AA	A SCP card. One SCP card is included in all versions of the product. Additional SCP cards can be ordered separately by the customer.
❸	54-22120-01	A clock card is included in all versions of the product.
❹	54-22116-01	A CBS card is included in all versions of the product.
❺	70-30587-05	All empty logic slots are covered by blank handles.
❻	70-30578-01	Two fan tray assemblies are included in all versions of the product.
❼	DEFGB-AB	A FEU is included in all versions of the product. One additional FEU can be ordered as a redundant power supply.
❽	70-30585-01	A PSA is included in all versions of the product.
❾	74-45749-01	A power supply filler panel is included in all versions of the product. It covers the empty slot that can be occupied by the optional redundant FEU.

§See the *Fiber Distributed Data Interface Media Connection Information* document for available versions, part numbers, and associated loopback connectors.

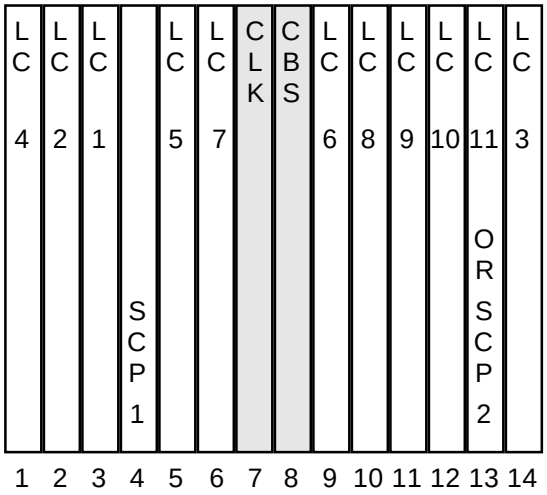
Recommended Location for Logic Modules

Although line cards or SCP cards can fit in any slot (except 7 or 8) [1] Digit al recommends the positions identified in the following figure for these reasons:

- **High availability:** Zone 1 and zone 2 [2] are cooled by different fans so the first SCP card is placed in slot 4 (zone 1) and the second SCP card is placed in slot 13 (zone 2).
- **Minimum future upgrade impact:** 2-port backplane slots [3] are filled first. This leaves the 4-port backplane slots [4] open for 4-port line cards when they become available.

The following figure identifies where each additional line card and SCP card should be installed §.

[1] Slot 7 is reserved for the CLK card only. Slot 8 is reserved for the CBS card only.
[2] Zone 1 = slots 1 through 7. Zone 2 = slots 8 through 14.
[3] 2-port slots = 1,2,3,4,13, and 14
[4] 4-port slots = 5,6,9,10,11, and 12
§ All empty logic slots are covered by blank handle (70-30587-05)s.



Abbrev.	Order Number	Description
LC	DEFGL-AA	A line card with the requested PMD daughter cards (ordered separately) installed. One line card is included with the DEFGA-BA, and DEFGA-BB versions of the product. Additional line card can be ordered separately by the customer.
SE	DEFGP-AA	A SCP card. One SCP card is included in all versions of the product. Additional SCP cards can be ordered separately by the customer.
CLK	54-22120-01	A clock card is included in all versions of the product.
CBS	54-22116-01	A CBS card is included in all versions of the product.

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