HP SureStore
Fibre Channel SCSI Bridge 2100 ER

User Guide

Edition 3

HEWLETT PACKARD ®

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See Appendix C for important safety and regulatory information.

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HP PRODUCT: HP SureStore 2100 ER SCSI Fibre Channel Bridge C6340F

DURATION OF LIMITED WARRANTY: Two Years

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Printing History

This guide is the first edition of all included material. The guide printing date and part number indicate the current edition. The printing date changes when a new edition is printed. (Minor corrections and updates incorporated at reprint do not change this date.)

Edition 1:   July 1998

Edition 2:   December 1998: Added textual enhancements and revised illustrations

Edition 3:   February 2000: Added references to magneto-optical devices and revised illustrations

Typographical Conventions

The following typographical conventions are used in this guide:

Italic font: Denotes important information.

KEYCAP : Denotes keystrokes.

`Computer Output`: Denotes information displayed in the control panel and screen menu items that you select.

WARNING   **Warnings call attention to a procedure or practice that could result in personal injury if not correctly performed. Do not proceed until you fully understand and meet the required conditions.**

CAUTION   Cautions call attention to an operating procedure or practice that could damage the product if not correctly performed. Do not proceed until you fully understand and meet the required conditions.

NOTE   Notes provide information that can be helpful in understanding the operation of the product.

In This Guide

In this guide, the following areas are described:

Chapter 1 Introduction: Contents of the parts kit, supported products, environmental requirements for the Fibre Bridge, and sample configurations.

Chapter 2 Setting Up the Fibre Bridge: How to install the Fibre Bridge, including rackmounting and cabling.

Chapter 3 Operating the Fibre Bridge: The Fibre Bridge start sequence, default settings (and how to change them), and verification of the system setup.

Chapter 4 Troubleshooting Guide: Possible start sequence errors, instructions for starting diagnostic procedures, and how to proceed.

Appendix A Fibre Channel Overview: Background information about the Fibre environment, including specifics relating to the Fibre Bridge.

Appendix B Support and Customer Service: Resource information about access to Hewlett-Packard customer support and service.

Appendix C Safety and Regulatory Information: Safety and regulatory information for the Fibre Bridge.

Glossary A list of terms with definitions.

Contents

Contents

Contents

C. Safety and Regulatory Information

Glossary

Index

Contents

Tables

Tables

Figures

Figures

1   Introduction

Chapter Overview

This chapter provides the following information:

- Fibre Bridge Components and Supported Products

- Choosing a Location

- Fibre Channel Configurations

Fibre Bridge Components and Supported Products

This section includes a list of all parts supplied with the Fibre Bridge, products that Hewlett-Packard supports for use with the Fibre Bridge, environmental considerations, and sample system configurations.

Product Components

Table 1-1 lists the parts that are supplied with the Fibre Bridge.

Table 1-1   **Supplied Components**

Item	Quantity	Description
Feet	4	Rubber pads for bottom of Fibre Bridge. (Not required for rackmount installation.)
Fibre Channel SCSI Bridge 2100 ER User Guide CD-ROM	1	User Guide in English, French, German, and Japanese. CD also contains a Fibre Share Primer, and Application Notes
Filler Panel Decal	1	Adhesive-backed decal for filler panel, provided by rack manufacturer.
French Statement	1	A French regulatory requirement.
HP SureStore Fibre Channel SCSI Bridge 2100 ER	1	Fibre Bridge.
Rackmount Hardware	2	Two L-brackets that fasten to the Fibre Bridge and mount in a rack.

Item	Quantity	Description
SCSI Cables (for Digitial Linear Tape libraries)	2	Two Single-ended, 2 meter length - 68 pin high density.
SCSI Cable (for Magneto-Optical libraries)	2	Two Single-ended, 2 meter length - 50-to-68 pin, high density.
Serial Cable	1	RJ-11 to RJ-11 cable, included for troubleshooting and reconfiguration purposes only.
SW Optical FC Cable	1	Short Wave Optical Fibre Channel Cable, 16 meter length.
SW Optical GBIC	2	Gigabit Interface Converter.
Terminator	2	Single-ended 68-pin D connector with screws.
User Guide	1	English manual.
Rackmount screws and nuts	1 package (Includes extra parts)	Six (6) 6x32 screws with lock-washers, for mounting the Fibre Bridge to L-brackets. Six (6) 10x32 screws and six (6) clipnuts for installing the L-brackets with Fibre Bridge into a rack.
RJ-11 to DB9 Adapter	1	Adapter to use with the RJ-11 to RJ-11 Serial Cable.

Supported Products

Table 1-2 shows the products that Hewlett-Packard supports for connection with the Fibre Bridge:

Table 1-2   **Supported Products**

Product	Description
HP DLT libraries and autoloaders with single-ended SCSI interfaces	Library models are subject to change. Consult with your sales representative.
HP magneto-optical (MO) libraries with single-ended SCSI interfaces	Library models are subject to change. Consult with your sales representative.
HP Fibre Channel hub	Consult with your sales representative for model of hub.
HP Host bus adapter	HHBA-5101B for NT Systems.

Choosing a Location

Physical Specifications

The Fibre Bridge is designed for rackmounting. The unit can be mounted in most standard 19-inch rack configurations. The physical characteristics are as follows:

Table 1-3   **Physical Specifications of the Fibre Bridge**

Height	1.7 inches (4.2 cm)
Width	16.9 inches (42.9 cm)
Depth	9 inches (22.8 cm)
Physical package weight	Approximately 8 pounds (3.6 kg)

Environmental Specifications

Choose a location that meets the following criteria:

Table 1-4   **Location Criteria**

Room temperature	40–104° F (5–40° C).
Humidity	5% to 80% relative humidity, non-condensing.
Power source	AC power voltage: 100/120V to 220/240 V.
Clearance	Rackmount configuration—requires 1 EIA unit in a rack. 1 EIA = 1.75 inches (44 mm). Requires 5 inches (125 mm) clearance between the rear edge of the Fibre Bridge and the backplane of the rack, to allow adequate room for cables.

NOTE   See Chapter 2 for rackmounting instructions.

Introduction

Fibre Channel Configurations

The Fibre Bridge is supported in a basic configuration on Digital Linear Tape (DLT) and Magneto-Optical (MO) libraries. The bridge is support in expanded configurations on DLT libraries. A basic configuration is comprised of only one Fibre Bridge (two SCSI buses available) and a host. Expanded configurations may include multiple hubs and hosts, usually connected to one or more networks.

Basic Configuration

Figure 1-1 shows the Fibre Bridge in a basic configuration, including one host or server, one Fibre Bridge, and one library.

NOTE   Magneto-optical libraries are supported only on the basic configuration. You may connect a maximum of two MO libraries (one on each SCSI bus from the bridge).

Figure 1-1   **Sample Fibre Channel Configuration—Basic**
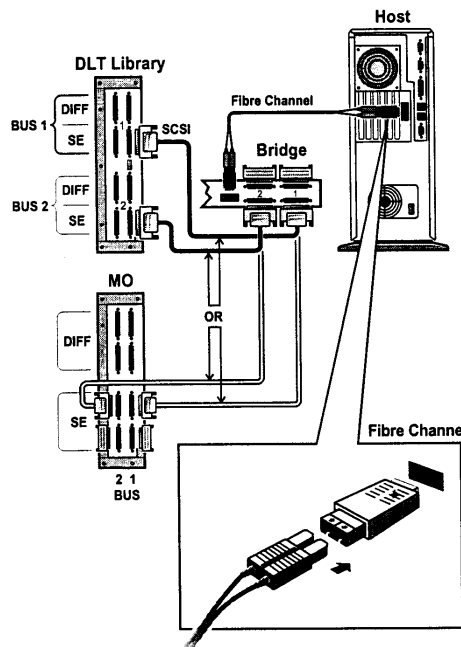
Expanded Configuration (DLT libraries only)

Figure 1-2 and Figure 1-3 shows the Fibre Bridge in two possible expanded configurations . These configurations are supported on DLT libraries only.

Figure 1-2   **Sample Fibre Channel Configuration— Minimum Expansion**
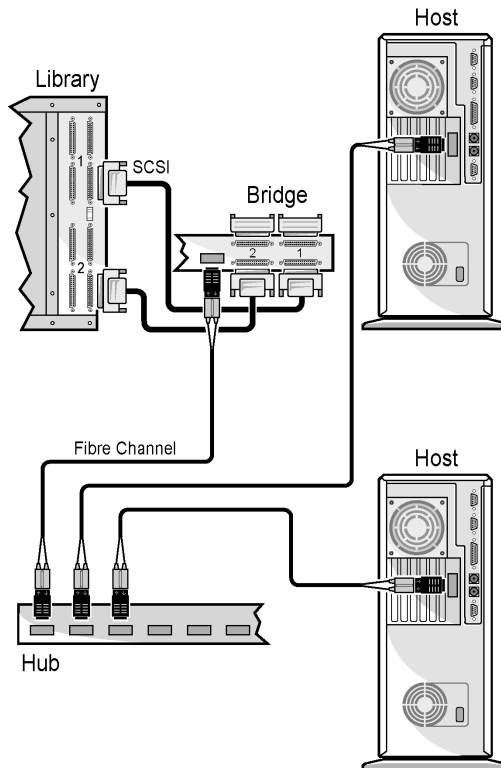
Figure 1-3   Sample Fibre Channel Configuration—Maximum Expansion
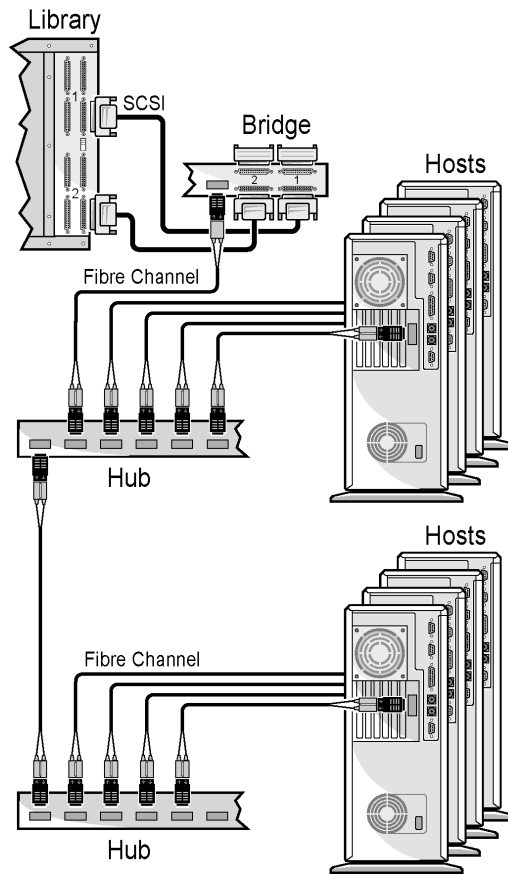
2   Setting Up the Fibre Bridge

Chapter Overview

This chapter provides instructions on completing the following setup procedures:

- Mounting the Fibre Bridge in a Rack

- Installing Cables

Mounting the Fibre Bridge in a Rack

Mounting the Fibre Bridge in a rack requires assembling L-brackets to the Fibre Bridge and then mounting the L-brackets to a rack. L-brackets allow the Fibre Bridge to be mounted in a fixed position, near the back of a rack.

NOTE All connections and user displays are located on the back of the Fibre Bridge. Consequently, mount toward the back of a rack.

Before you begin, verify you have the assembly components listed in Table 2-1.

Table 2-1 **Assembly Components**

Tool	1	#2 Phillips screwdriver (not supplied).
Mounting brackets	1 pair	L-brackets, for assembly with Fibre Bridge.
Rackmount screws and nuts	1 package (Includes extra parts)	Six (6) 6x32 screws to attach Fibre Bridge to L-brackets. Six (6) 10x32 screws and six (6) clip nuts for installing the Fibre Bridge (with L-brackets attached) into a rack.
Filler panel decal	1	Decal for filler panel, provided by customer (supplied separately by rack manufacturer).

Assemble the L-brackets to the Fibre Bridge

1. Facing the back of the Fibre Bridge, position the first L-bracket with the mounting tab toward the back of the rack and pointing away from the unit, as shown in Figure 2-1.

2. Insert 6x32 screws through the first and third holes from the mounting tab and tighten. Use the first and third holes (from the mounting tab end of the bracket) for mounting in a Hewlett-Packard rack. (Non-HP racks may require mounting holes number two and four. See note below.)

3. Follow the same procedure for the second L-bracket.

NOTE   For non-HP racks, allow for cable turn: A minimum distance of 5 inches (125 mm) is required between the back of the Fibre Bridge and the backplane of the rack. When installing in racks where the mounting holes in step 2 produces a distance less than 5 inches (125 mm), use the second and fourth holes when attaching the mounting bracket to the Fibre Bridge.

Figure 2-1   **Assembling L-brackets to the Fibre Bridge**
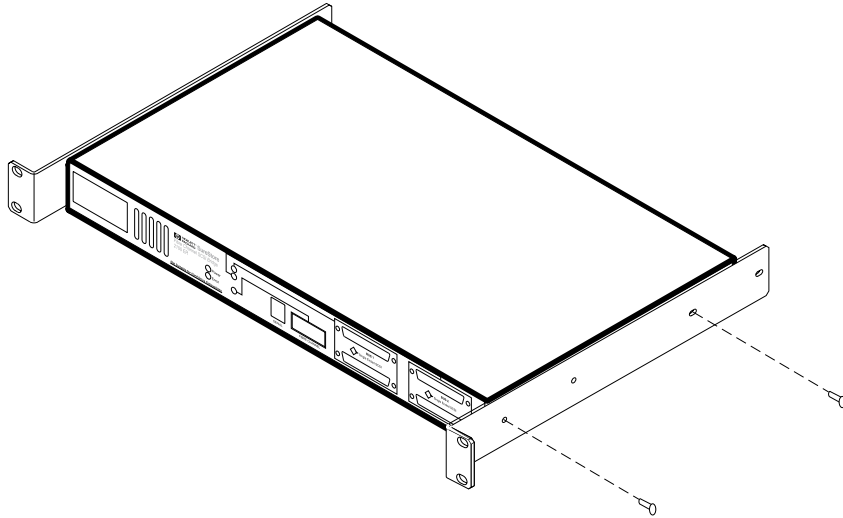
Install the Fibre Bridge in the Rack

1. Facing the back of the rack, install a total of four clip nuts above any existing product, two into each of the rails. Install the clip nuts so that the top nut aligns with the top hole of the L-bracket and the other with the bottom hole. (Figure 2-2).

   To ensure level mounting, verify that the clip nuts are in the same position on the right and left rails.

NOTE   The Fibre Bridge mounts from the back of the rack. All user functionality is located on the back of the unit; no access to the front is required.

2. Holding the Fibre Bridge in position, align the holes in the mounting brackets with the holes in the clip nuts.

3. Install four 10x32 screws into the clip nuts and hand-tighten.

4. Tighten all four screws.

5. Install the front filler panel (supplied by the rack vendor) and apply the decal.

Figure 2-2   **Mount the Fibre Bridge in the Rack**
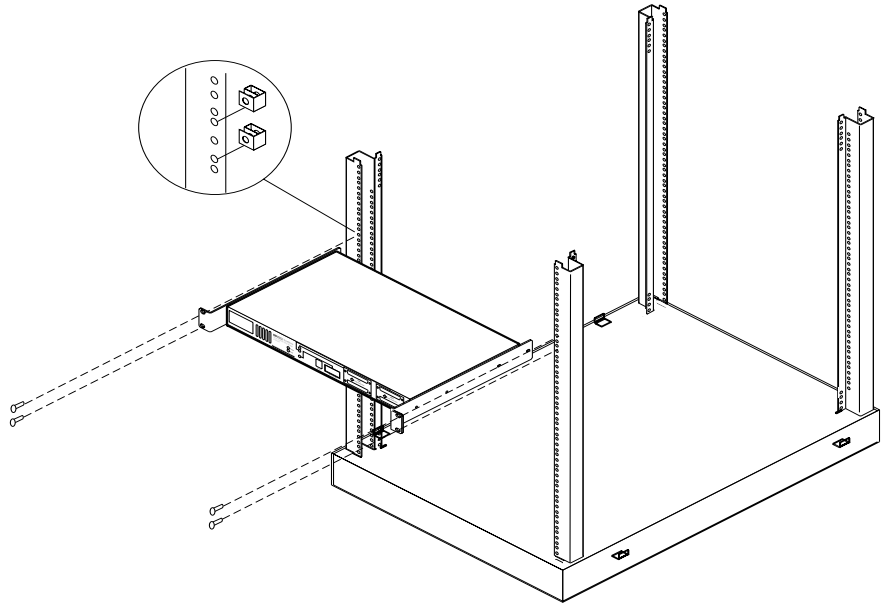
Installing Cables

The Fibre Bridge can be used in either basic or expanded system configurations. This section provides the steps to install cables in both configurations.

NOTE   The following section explains overall configuration cabling. For complete installation procedures, refer to the INSTALL subdirectory on the CD-ROM shipped with the bridge.

Fibre Bridge Connection, Basic Configuration Example (DLT and MO Libraries)

CAUTION   Be sure all devices in the configuration have been turned off and disconnected from the power source before making any connections. Failure to disconnect all power could result in damage to the devices.

1. Properly shut down all peripheral devices that will be connected to the Fibre Bridge, including the host. If the host computer is connected to a network, check with the system administrator before switching off power.

2. Connect the SCSI cable from bus 1 on the Fibre Bridge to bus 1 on the library.

   For a two-*drive* DLT library, connect a SCSI cable from bus 2 on the Fibre Bridge to bus 2 on the library.

   For a two-*bus* MO library, connect a SCSI cable from bus 2 on the Fibre Bridge to bus 2 on the library.

NOTE   A basic, point-to-point configuration is "One HBA to one bridge to one or two SCSI buses."

   A two-drive DLT library uses both SCSI buses, so only one two-drive DLT library may be connected to one HBA.

   An MO library may be connected to each SCSI bus on a bridge, so two MO libraries (maximum) may be connected to one HBA.

3. Connect one end of the optical cable into the GBIC on the Fibre Bridge and the other end into the GBIC on the Fibre Channel HBA in the host.

4. Connect the power cord from the Fibre Bridge to an grounded outlet.

5. Confirm that all cable ends are connected securely and both ends of the SCSI bus are properly terminated, as shown in Figure 2-3 on page 2-7.

6. Go to "Powering on the System" in Chapter 3.

Figure 2-3   **Fibre Bridge Connection, Basic Configuration (DLT and MO Libraries)**
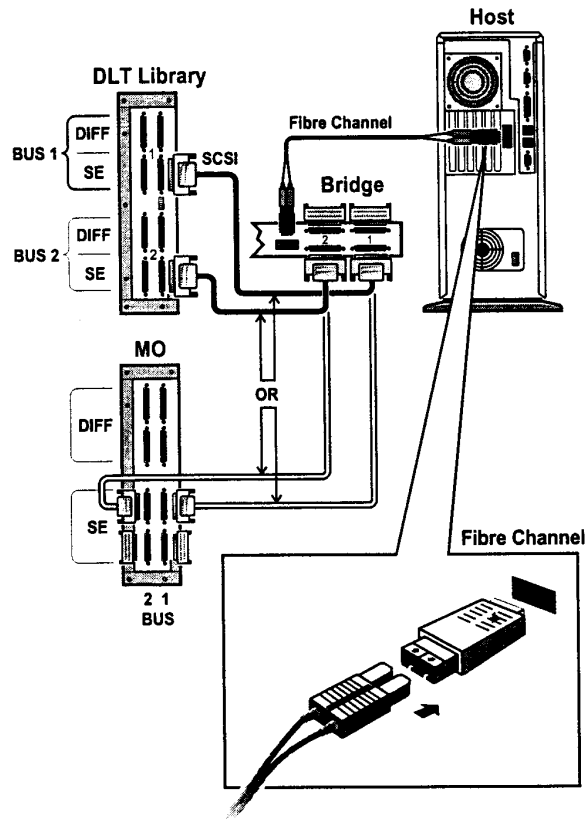
Fibre Bridge Connection, Expanded Configuration Example (DLT Libraries Only)

1. Properly shut down all peripheral devices that will be connected to the Fibre Bridge, including the hub(s). Check with the system administrator before turning off power to either hubs or libraries.

CAUTION   Failure to turn off all power could result in damage to the devices.

2. Connect a SCSI cable from bus 1 on the Fibre Bridge to bus 1 on the library one. For a two-drive library, connect a SCSI cable from bus 2 on the Fibre Bridge to bus 2 on the library.

3. Connect the optical cable from the Fibre Bridge to the hub.

4. Connect an optical cable from the hub to each host system.

   If you have a 6-8 host system, you will need an additional hub. (See Figure 2-3 and Figure 2-4 for examples of expanded configurations.)

5. Connect the power cord from Fibre Bridge one to an grounded outlet.

6. Confirm that all cable ends are connected securely and both ends of each SCSI bus are properly terminated, as shown in Figure 2-4 or Figure 2-5 on page 2-10.

7. See poweron instructions in Chapter 3.

Figure 2-4   **Fibre Bridge Connection, Expanded Configuration (Minimum) (DLT Only)**
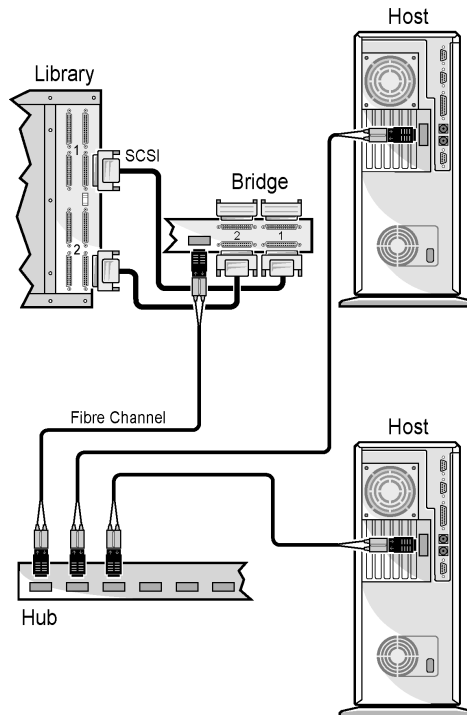
Figure 2-5 **Fibre Bridge Connection, Expanded Configuration (Maximum) (DLT Only)**
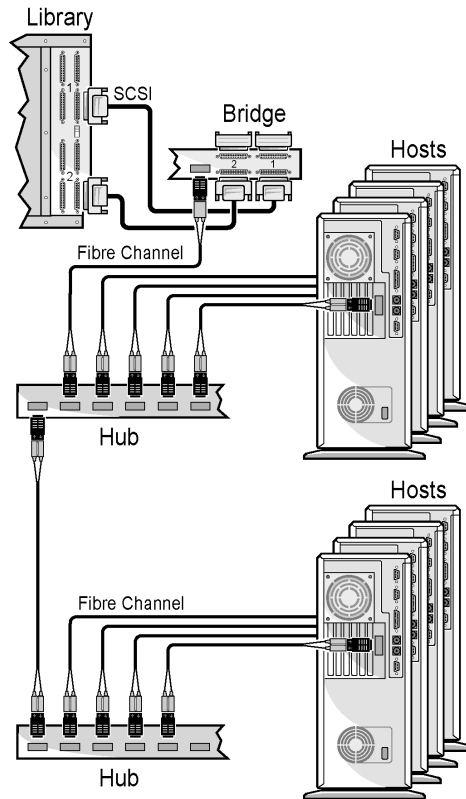
Optical Fibre Channel Cable Options

The Fibre Bridge uses fiber-optic cables available in the lengths listed in Figure 2-2:

Table 2-2   **Fiber-Optic Cable Options**

Product Number	Length
D6980A	164 ft (50 m)
D6981A	328 ft (100 m)

NOTE   For additional information regarding the Fibre Channel environment, configuration, and other Fibre issues, refer to Appendix A, "Fibre Channel Overview."

3 Operating the Fibre Bridge

Chapter Overview

This chapter provides the following information:

- Powering on the System
- Changing the Default Settings
- Making Configuration Changes

Powering on the System

The HP SureStore Fibre Channel SCSI Bridge 2100 ER is configured for most Fibre Channel installations without intervention. The basic configuration uses one Fibre Bridge connected directly to a Fibre Channel Host Bus Adapter (HBA) within a host computer. In expanded configurations (DLT libraries only), the Fibre Bridge may be connected to *either* a Fibre Channel HBA *or* a Fibre Channel hub. The Fibre Bridge is set up to support an HP single-ended SCSI library on a Fibre Channel arbitrated loop.

Use the following sequence when powering on the system:

NOTE   Powering on each device in the proper sequence is important. When devices are turned on out of order, communication failures may result.

1. Power on the library, which allows the Fibre Bridge to connect properly to the library when it scans the SCSI bus.

2. Power on the Fibre Bridge. When you do, notice that the power indicator comes on immediately. The Fault indicator may flash momentarily. After about 30 seconds, the SCSI activity indicator will flash once. The Fibre Channel activity indicator will not flash until other devices have been attached and powered on.

3. Power on the hub, if required.

4. Power on the host.

   (If DLT) If there are multiple hosts , power them on sequentially. Order is important. Wait for for each host to finish booting before powering on the next host.

NOTE   If any fault indicators are encountered on the Fibre Bridge or other equipment, consult the appropriate user guide.

5. (If DLT) Install backup software.

Figure 3-1   **Fibre Bridge, Back View**
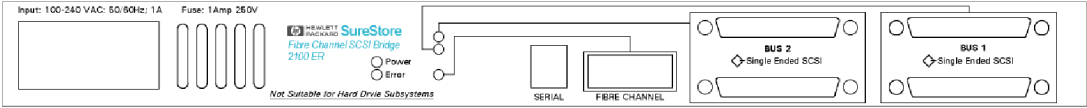
Changing the Default Settings

The basic Fibre Bridge configuration assumes there is only one Fibre Bridge included in the system. If this is a DLT installation and more than one Fibre bridge will be installed, or if there is another Fibre Channel device using the same address, you must change the fibre channel address, using the serial port of the Fibre Bridge.

Connecting the Serial Cable

Using the serial cable is not necessary in most installations. The default settings work in most configurations. Use the serial cable only if one of the following situations occurs:

- The default configuration must be changed.
- A failure has occurred that requires diagnostic procedures. See "Chapter 4: Troubleshooting."

If any of these scenarios occur, attach the serial cable and RJ-11 to DB9 adapter as shown in Figure 3-2 on page 3-6.

1. Plug the RJ-11 connector into the Fibre Bridge.
2. Plug the DB9 adapter into the Com1 or Com2 port of the computer.
3. Verify that the RJ-11 serial cable is properly plugged into the RJ-11 to DB9 adapter.

Operating the
Fibre Bridge

Figure 3-2   **Connecting the Serial Cable**
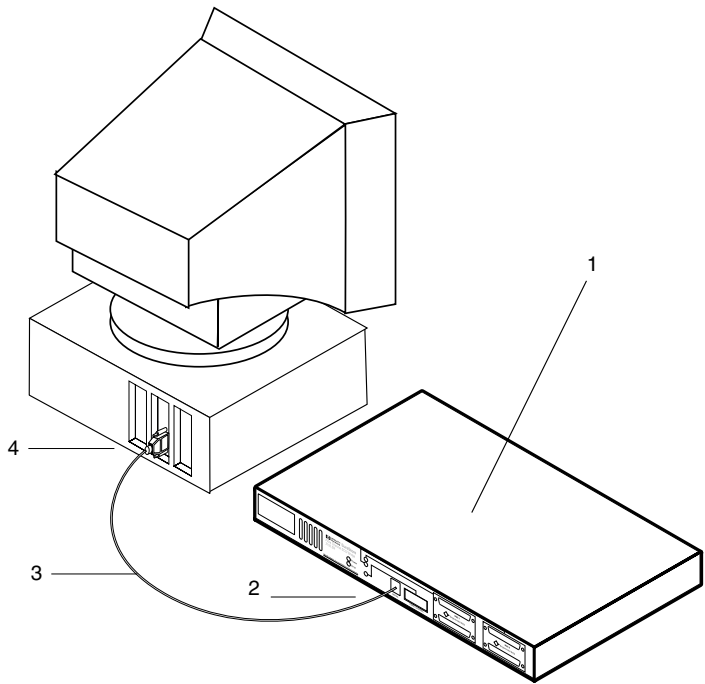
1	Fibre Bridge
2	RJ-11 connector
3	Serial cable
4	RJ-11 to DB9 adapter

Serial Port Setup

Before communicating, the PC serial port must be connected to the Fibre Bridge and terminal emulation software (Hyperterminal, or similar) must be installed on the host. Configure the terminal emulation program to use the settings in Table 3-1 on page 3-8 for the PC's serial port.

NOTE   When initially powered on, the Fibre Bridge uses the default (or previously set) baud rate during self-tests. After completing the self-tests, pressing **ENTER** several times causes the Fibre Bridge to reset itself to the baud rate used by the host.

Serial Port Operation

The serial port on the Fibre Bridge connects to a terminal or computer that is running a terminal emulator such as Hyperterminal on Windows NT. The operator can then perform the following:

- Change the system addresses and address modes
- Check the results of the POST tests
- Change the operating level of diagnostic routines

NOTE   The serial port cannot be used to transfer data to devices on the SCSI buses or on the Fibre Channel loop.

An EEPROM inside the Fibre Bridge stores configuration changes. Because the Fibre Bridge stores its original settings, it can be reset to the original configuration at any time. See Table 3-1 on page 3-8 for the default configuration settings.

NOTE   If there is trouble communicating between the serial port and the Fibre Bridge, contact an HP service representative.

Operating the
Fibre Bridge

Table 3-1   **Fibre Bridge Default Configuration Settings**

Serial Port	• Baud rates: 9600, 19200, 38400, 57600, 115200 (baud rate will auto-configure).
	• No handshake.
	• No parity.
	• 8 data bits.
	• 1 stop bit.
Fibre Channel	• Hard address mode uses address 0x82.
	• User may change both address mode and hard address.
SCSI	Initiator address 7.
	Bus automatically negotiates for wide ultra SCSI performance, per ANSI SCSI specifications.
	Only the initiator addresses may be changed.
	Each bus can be set to its own initiator address independently of the other bus.
Trace Debug Level	Level 0, 1, 2, and 3.

Making Configuration Changes

To make configuration changes, follow these steps:

1. Start your terminal emulation application software.

2. Press the **ENTER** key. The following menu will display:

NOTE   The user may need to press **ENTER** several times to prompt the Fibre
Bridge to recognize the serial port settings.

Figure 3-3   **Fibre Bridge Configuration, Main Menu**

```
          Hewlett Packard 2100 ER Configuration
                   Version #.#    ####

   1) Perform Configuration
   2) Display Status of Power-on Self Test
   3) Display Trace and Assertion History
   4) Reboot
   5) Download a New Revision of the Firmware

Command >
```

3. Use the `Perform Configuration` menu option to make changes to
   the configuration. To select the option, type **1** on the keyboard and
   press **ENTER** to display the Fibre Bridge configuration menu.

Figure 3-4   **Fibre Bridge Configuration Menu**

```
                    Configuration Menu
                    Version #.#    ####

     1) Fibre Channel Configuration
     2) SCSI Configuration
     3) Fibre Channel to SCSI Mapping Configuration
     4) Trace Settings Configuration

     A) Save Configuration
     B) Restore Last Saved Configuration
     C) Reset Configuration to Factory Defaults

     X) Reset to main menu
```

4. To initiate a change, enter the number of any item on the list. After all changes have been completed, save the changes by pressing **a** on the keyboard. To make changes take effect, restart the Fibre Bridge.

CAUTION   Making changes under options B or C does not change the settings in memory. Before closing the configuration menu and restarting the Fibre Bridge, always select option A, "Save Configuration".

Reconfigure the Fibre Channel Address

Use the Fibre Channel Configuration menu to change from the hard address mode to the soft address mode.

NOTE   The Fibre Bridge default setting is hard addressing, where the address is preset to 71 (0x82). Use this procedure when an additional bridge is installed in a system or to resolve a Fibre Channel device ID conflict.

1. From the Configuration menu (Figure 3-4 on page 3-10), select option 2, Fibre Channel Configuration.

2. To toggle between hard addressing and soft addressing, select option 1.

3. To choose a new address, select option 2 and enter a new address from the table in Figure 3-6 on page 3-12.

NOTE   The "Change ALPA Value" option is not available when the soft address mode has been selected.

Figure 3-5   **Fibre Channel Configuration Menu**

```
              Fibre Channel Configuration Menu
                   Version #.#   ####


Current Fibre Channel Configuration:
Use Hard ALPA:  Yes
   Hard ALPA Value:  0x82

   1) Toggle Hard ALPA Usage
   2) Change ALPA Value

   X) Return to previous menu
```

Operating the
Fibre Bridge

Selecting the "Change ALPA Value (option 2 in the previous menu) produces the following list of addresses:

Figure 3-6   **Fibre Channel Addresses**

```
                 Arbitrated Loop Node Number to ALPA Lookup Table
                               Version: #.#   ####


     0:0x01    16:0x29   32:0x45   48:0x5A   64:0x75   80:0x9E    96:0xB5   112:0xD2
     1:0x02    17:0x2A   33:0x46   49:0x5C   65:0x76   81:0x9F    97:0xB6   113:0xD3
     2:0x04    18:0x2B   34:0x47   50:0x63   66:0x79   82:0xA3    98:0xB9   114:0xD4
     3:0x08    19:0x2C   35:0x49   51:0x65   67:0x7A   83:0xA5    99:0xBA   115:0xD5
     4:0x0F    20:0x2D   36:0x4A   52:0x66   68:0x7C   84:0xA6   100:0xBC   116:0xD6
     5:0x10    21:0x2E   37:0x4B   53:0x67   69:0x80   85:0xA7   101:0xC3   117:0xD9
     6:0x17    22:0x31   38:0x4C   54:0x69   70:0x81   86:0xA9   102:0xC5   118:0xDA
     7:0x18    23:0x32   39:0x4D   55:0x6A   71:0x82   87:0xAA   103:0xC6   119:0xDC
     8:0x1B    24:0x33   40:0x4E   56:0x6B   72:0x84   88:0xAB   104:0xC7   120:0xE0
     9:0x1D    25:0x34   41:0x51   57:0x6C   73:0x88   89:0xAC   105:0xC9   121:0xE1
    10:0x1E    26:0x35   42:0x52   58:0x6D   74:0x8F   90:0xAD   106:0xCA   122:0xE2
    11:0x1F    27:0x36   43:0x53   59:0x6E   75:0x90   91:0xAE   107:0xCB   123:0xE4
    12:0x23    28:0x39   44:0x54   60:0x71   76:0x97   92:0xB1   108:0xCC   124:0xE8
    13:0x25    29:0x3A   45:0x55   61:0x72   77:0x98   93:0xB2   109:0xCD   125:0xEF
    14:0x26    30:0x3C   46:0x56   62:0x73   78:0x9B   94:0xB3   110:0xCE
    15:0x27    31:0x43   47:0x59   63:0x74   79:0x9D   95:0xB4   111:0xD1


Enter node number >
```

4. Select an address by entering the number before the colon.

    Pressing any key, except a valid number, will display an invalid entry message. The address will not be changed. The firmware will return to the Fibre Channel Configuration menu.

NOTE   Confirm that the Fibre Channel device address selected is unique on the FC-AL.

Change the Trace Settings

CAUTION
Changing options in the Trace Settings menu directly affects the current operation of the Fibre Bridge. Pressing **U** changes the current operating parameters without restarting the Fibre Bridge.

The Trace Level menu is included for troubleshooting purposes. The Trace Settings menu enables options in the Fibre Bridge firmware. Changing the trace level does not affect the Fibre Bridge's operation, but can affect the performance.

The HP service technician may require that you change one or more settings. Do not use the Trace Settings menu unless an HP service technician requests that you do so.

Figure 3-7   **Trace Settings Menu**

```
                    Trace Settings
                Version:  #.#    ####

Level 0 : ON   Level 1 : OFF
Level 2 : OFF  Level 3 : OFF
Level 4 : OFF  Level 5 : OFF
Level 6 : OFF  Level 7 : OFF

U) Update Current Operating Trace Levels
X) Return to previous menu
```

Operating the
Fibre Bridge

Fibre Channel to SCSI Mapping Configuration

Use the Fibre Channel to SCSI Mapping Configuration menu to display the SCSI devices that are present on the Fibre Bridge.

4   **Troubleshooting Guide**

Chapter Overview

This chapter provides the following information:

- Possible problems that a user may encounter when installing the Fibre Bridge.

- Recommended procedures for analyzing and solving problems.

- What to do when problems cannot be resolved using the documented approach.

Troubleshooting

This section describes potential problems and solutions. If you are unable to diagnose and solve a problem using these guidelines, contact an HP service representative or your sales representative. By using these suggested procedures, you can determine in advance some of the information that a service technician will need.

Problem: Cannot Turn On the DLT Library

If the library will not power-up, use the following steps before taking further action:

1. Verify all power connections, breakers, and switch settings are working and correct.

2. Confirm that the indicator is on and green.

3. Check to see that the indicator is not amber, which indicates a self-test failure.

4. Consult the library user guide for additional troubleshooting steps and support options.

Problem: Cannot Turn On the MO Library

If the library will not power-up, use the following steps before taking further action:

1. Verify all power connections, breakers, and switch settings are working and correct.

2. Confirm that READY is displayed in the control panel.

3. Consult the library user guide for additional troubleshooting steps and support options.

Troubleshooting
Guide

Problem: Cannot Turn On the Hub (DLT Only)

If the hub will not power-up, use the following steps before taking further action:

1. Verify all power connections, breakers, and switch settings are working and correct.

2. Confirm that the power indicator is illuminated.

3. Verify that the fault indicator is not illuminated.

4. If the fault indicator is illuminated, the hub is inoperable; further diagnostic procedures cannot be performed. Contact the sales representative or an HP service representative.

Problem: Cannot Turn On the Fibre Bridge

If the Fibre Bridge will not power on, use the following procedures to diagnose the problem:

1. Verify that all power connections, breakers, and switch settings are powered on and are set correctly.

2. Confirm that the power indicator is illuminated green.

3. Verify that the fault indicator (amber) is not illuminated.

4. If the fault indicator is illuminated, the unit is inoperable; further diagnostic procedures cannot be performed. Contact the sales representative or an HP service representative.

Problem: Cannot Confirm the Library Connection

1. Confirm the library connection by using the control panel menu on the NT server to review the SCSI device folder.

NOTE   The NT discovery process is not dynamic. When SCSI devices are powered on after the host, the control panel will not display their connection.

2. Make sure the libraries, Fibre Bridge, and hubs (DLT only) are powered on and connected appropriately before powering on workstations. If they were not connected, powered on, and configured properly before the NT workstation was powered on, restart the workstation (and any other on the loop, one at a time) so they can re-discover the library.

NOTE   (DLT Only) Do not restart multiple NT workstations on a Fibre Channel loop at the same time. Allow each workstation to complete the process and display the NT login prompt before turning on the next computer. If more than one workstation is powered on at the same time, only one will locate devices on the Fibre Channel loop. This sequential process is particularly critical when recovering from a power failure.

Troubleshooting
Guide

3. If the workstation does not display the SCSI devices under the Fibre Channel HBA in the control panel, restart the workstation and then recheck for the appearance of the library SCSI devices.

4. (If DLT) Run the tape diagnostic utility from the NT workstation to verify that the library and drives are detected and pass all self-tests.

NOTE   (If DLT) If the tape diagnostic utility has not been installed, install this software from the DIAG subdirectory on the User Guide CD-ROM.

5. Verify SCSI Bus Configuration: Check all appropriate devices for the following conditions:

   • Termination: Problems with termination can cause intermittent or hard failure. Two connectors are implemented for each SCSI bus, supporting middle of bus configurations.

     Terminate the SCSI bus on both ends, and only at the ends of the bus. Check each terminator and connector for bent pins.

   • Bus Type: Single-ended devices cannot be combined with differential devices on the same bus. Similarly, differential terminators cannot be used on the single-ended Fibre Bridge.

   • Device ID: Each device on a SCSI bus must have a unique ID. The default SCSI ID of the Fibre Bridge is 7. Make sure that this ID is not in use on the bus. Check the library user guide for the default SCSI IDs. Verify that other IDs on the bus are not in conflict.

   • Cabling: Check SCSI cables to verify that they are functional, then perform the following procedures:

     a. Be sure the maximum cable length on the single-ended SCSI cable connected to the Fibre Bridge does not exceed a total of 3 meters.

     b. Check all cable connections and pins on the connectors. Reseat the connections if necessary.

6. Verify SCSI bus operation: Use the serial connection between the NT workstation and the Fibre Bridge. See Chapter 3, "Fibre Bridge Default Configuration Settings," on page 3-8 for default settings and for steps to initiate the following procedures:

   • Perform a Fibre Bridge self-test.

   • Verify device locations using the Fibre Channel to SCSI Mapping menu. See Chapter 3, "Fibre Channel to SCSI Mapping Configuration," on page 3-14.

NOTE If you experience communication difficulty with the Fibre Bridge, confirm that the terminal emulation software (Hyperterminal, or similar) has been configured properly. See Chapter 3, page 6.

7. Verify Fibre Bridge Configuration: Configuration changes may result in an invalid configuration. If you are in doubt about the configuration, refer to "Making Configuration Changes" on page 3-9. If this procedure fails, contact an HP service representative.

8. Verify devices: If the previous diagnostic procedure have not resulted in a functional connection between the Fibre Bridge and each device, use the following steps:

   a. Connect the library to a SCSI HBA on the host and restart the workstation. Verify functionality with the SCSI connection.

   b. Confirm that the library is visible in the SCSI devices folder of the control panel.

   c. (If DLT) Confirm that there are no error indicators illuminated on the front panel of the library.

A   Fibre Channel Overview

Overview

In this appendix, we will describe the following:

- Defining Fibre Channel
- Implementing Fibre Channel
- Working With Fibre Channel
- Problems with Fibre Channel

Defining Fibre Channel

This overview of Fibre Channel is intended to briefly explain the technology, its potential uses, and possible problems that a user should consider. Individuals requiring more information should consider additional publications, seminars, and Fibre Channel user groups.

Fibre Channel is an information transport protocol that can be used to send information between computers and computer sub-systems. Defined by the American National Standards Institute (ANSI), Fibre Channel supports the following:

- Internet Protocol (IP)

- Transmission Control Protocol/Internet Protocol (TCP/IP)

- Small Computer System Interface (SCSI)

- High-Performance Parallel Interface (HIPPI)

- Asynchronous Transfer Mode (ATM)

- Other high-level protocols

Using Fibre Channel, these protocols can run at the same time. For example, a host bus adapter (HBA) can simultaneously send Local Area Network (LAN) information to another computer and read or write data to a Redundant Array of Inexpensive Disks (RAID). Fibre Channel was defined with multiple initiators in mind. In addition to supporting a number of protocols on the same connection, Fibre Channel offers users the following advantages:

- High speed data transmission

- Long distance support

- Large address space

- Multiple device configuration opportunities

Fibre Channel
Overview

A fully implemented Fabric system supports over 16 million device addresses, allowing a user to send data from each device at 100 MB per second. Using fiber optic cable, Fibre Channel devices can be spaced at maximum intervals of 10 km, supporting distributed hosts in a campus environment, with centralized storage systems. Fibre Channel uses three connection topologies, illustrated in the following table:

Table A-1   **Fibre Channel Supported Fabric Topologies**

Topology	Description	Advantages/ Disadvantages
Point to point	Dedicated connection between two devices.	Low cost, high performance.
Fibre Channel Arbitrated Loop (FC-AL)	Supports up to 126 devices, distributing the 100 MBps data bandwidth among all devices on the loop.	Supports more devices. Increasing the number of devices reduces performance.
Fabric	A switching concept, similar to a telephone system, providing simultaneous data-transmission among multiple devices at 100 MBps.	Supports multiple devices without performance reduction. Higher cost.

Implementing Fibre Channel

Whether designing a new system or enhancing a system that is in place, Fibre Channel offers significant speed and distance and cost advantages. Fibre Channel works with existing systems and software, with the addition of a Fibre Channel HBA; new systems are not required to take advantage of Fibre Channel technology.

Distributed Devices

Computer and storage systems can be separated and distributed more efficiently because of the distance capability of Fibre Channel. Contrasting with the address range and distance limitations of SCSI, adding storage with a Fibre Channel system does not require adding servers, except when extra performance is needed.

Supporting distributed configurations, Fibre Channel improves disaster recovery planning. Faster speeds and greater transmission distances allow for remotely located backup systems.

Cabling Advantages

Using less cable-associated hardware than a typical SCSI environment, Fibre Channel reduces total system costs and supports greater performance. Easily added, and often using LAN cables, Fibre Channel cable is smaller and lighter than SCSI cable, making it easier to install and manage.

Fibre Channel supports copper and optical cables. Optical cable, while more expensive, will carry data further than copper and is not susceptible to noise interference. Although current HBA drivers use SCSI commands, future driver enhancements will support other protocols specified for Fibre Channel, including LAN. Optical cables, carrying LAN protocols, will be used in place of existing LAN cabling in the future.

Fibre Channel
Overview

Working With Fibre Channel

Fibre Channel is a transport protocol. Differing from protocols such as SCSI, Fibre Channel does not use data manipulation commands. An addressing scheme with advance handshaking requirements verifies that data was transferred correctly.

Fibre Channel specifications are divided into multi-layered, functional levels. The five layers define the physical media and transmission rates, encoding scheme, framing protocol and flow control, common services, and the upper-level protocol interfaces. Each section of the Fibre Channel specification can be changed without affecting other sections. Upper level specifications for Fibre Channel map commands and data from different supported protocols to the Fibre Channel system. The mapped commands and data are then segmented into frame sequences. Each frame is encoded and sent to the desired target device. At the target device, the frames are decoded and reassembled into the original sequence. The data in the sequence is extracted and then processed by the target system. This whole process is done without knowledge of the contents of the information being transferred.

Because Fibre Channel supports many different communication protocols, the highest level of the Fibre Channel specifications identify the type of communication protocol encoded. As information is divided into sequences of frames, Fibre Channel attaches address and sequence information to each packet. This transport protocol is required to reconstruct the original information into its original form.

More complex than simply dividing information up into frames and sending it to an address, Fibre Channel also has special frames to pass the following Fibre Channel-specific information between devices:

- New devices added to the system

- All device addresses

- How and when data can be transferred

- Problem detection

The Fibre Channel protocol will work when devices are connected or disconnected while data is being transferred because of this additional information. Error detection and recovery at all levels of the protocol are also provided.

A *fairness* algorithm is built into the FCAL protocol so that all devices have equal access to the system. To keep the phase lock loops synchronized, Fibre Channel continually communicates, even between frames, supporting device arbitration for access to the loop. Fibre Channel devices also use this communication to report on buffer size available for communication. If there is nothing to report, the Fibre Channel protocol fills up the space between frames with *idle* characters. Characters must be present on the bus at all times to keep the high frequency circuits working correctly, reconstructing data clocks and detecting data on the bus. Even the data encoding is arranged so that there is never a continuous string of ones or zeros.

The lower levels of Fibre Channel protocol is handled in the hardware and, to a minor extent, by the low level HBA drivers. System and application software does not need to be aware of any low level protocol operations. Additional features exist in the protocol that more advanced applications can use.

Fibre Channel addressing introduces three major advantages:

- Provides large number of addresses

- Detects address conflicts

- Automatically reassigns new addresses when conflicts occur

With Fibre Channel, the data network can be distributed and very large. The ANSI Fibre Channel committee developed a method that devices must use to check and report addresses before data can be sent or received. ANSI also added the ability to semi-dynamically assign address devices on the loop. Addresses are only checked and conflicts resolved when a Fibre Channel device is added or removed. During normal operations (i.e. no devices being connected or disconnected), device addresses are not changed. When a Fibre Channel bus configuration changes, each device on the bus verifies and reports its address.

Fibre Channel
Overview

Fibre Channel devices may use either of two modes: soft or hard
addressing. Hard addressing is similar to the existing SCSI approach.
Fibre Channel devices can only use the assigned address. If that address
is already being used by another device, the Fibre Channel device will
not respond to any bus activity. Soft addressing is similar to LAN
addressing, where the system determines device addresses. As part of
the addressing protocol, all Fibre Channel devices have one or more
unique addresses that are not duplicated any where in the world. These
addresses are provided by ANSI to manufactures of Fibre Channel
products.

Problems with Fibre Channel

Fibre Channel accommodates many protocols and physical interfaces. Problems result in the attempt to do many things with one solution. Awareness of the potential problems helps users create and maintain reliable systems. This section addresses three of the main problems:

• Physical Connections

• Laser Power Control Systems

• Device Addressing

Physical Connections

Physical problems arise from connecting devices with different types of cables. Fibre Channel supports copper and optical interfaces.

ANSI specifies types of copper cable. The maximum distance between devices depends on the type of cable being used, but is limited to less than 20 meters. As with all electrical media, Fibre Channel copper media can radiate RF interference and can be affected by external RF noises. Because of the distance limitation and noise problems, copper media should be used only inside a cabinet or rack.

An optical interface should be used to send data farther. ANSI specifies multiple optical interfaces that use lasers, light-emitting diodes (LED's), and different types of optical cable. Generally, cable that supports greater distance transmission commands is more expensive than cables that support shorter distances.

Using a Fibre Channel hub allows multiple cable types within a system. For example, all devices in a rack can be connected to a hub using copper cable. The hub can be connected to a Fibre Channel loop or Fabric using a fiber optic cable.

Fibre Channel
Overview

Additional optical cable considerations are as follows:

- Cable between two nodes must use the same core size.

NOTE
The limitation on mixing core sizes applies only to cable between two nodes and is only a concern when splicing or connecting optical cables directly together. Different size optical cable can be used in the same Fabric between different sets of nodes.

- Three core sizes supported by Fibre Channel are: 62.5 micron, 50 micron, and 9 micron.

Laser Power Control Systems

There are two types of systems approved for use: OFC and non-OFC. These two types of control systems can exist on the same network, but are not optically compatible and cannot be hooked up to the same optical cable.

Device Addressing

The two modes of addressing used in Fibre Channel, included on page A-7, are hard and soft addressing. In small, controlled environments, hard addressing works well. Also, some operating systems and host bus adapters do not support soft addressing. Large Fabric networks, connecting many devices, require the flexibility of soft addressing; hard addressing is not supported in a Fabric environment.

HBA drivers cannot dynamically track device addresses that can change after the system is turned on. Physical addresses change while the operating system uses the same logical name for the device. Applications that always use the same physical device may use the World-Wide Name (WWN). For example, backup programs must locate the library and all of its drives regardless of the bus address. Fibre Channel resolves these issues.

Proper system planning and research prior to installing a Fibre Channel system will help avoid these problems. Configured properly, Fibre Channel is as reliable and easy to use as current SCSI systems.

Fibre Channel
Overview

B   Support and Customer Service

Chapter Overview

This chapter contains information to help users obtain supplies and obtain support. In this section you will find the following:

- Supplies and Accessories
- Hewlett-Packard Customer Support

Supplies and Accessories

A full range of supplies may be ordered through a Hewlett-Packard authorized dealer, sales office, or through HP Direct. To contact HP Direct, call 1-800-227-8164.

Call 1-800-752-0900 for the location of the nearest authorized Hewlett-Packard dealer.

Hewlett-Packard Customer Support

If a Fibre Bridge fails during the warranty period, and the troubleshooting guide and user manual do not solve the problem, you can receive support by doing the following:

- Consult HP FIRST or QUICK FAX for faxback services. See "HP FIRST/QUICK FAX Faxback Services" on page B-5.

- Consult one of the computer/modem connectivity services available, such as America Online or CompuServe. See "Electronic Support Services" on page B-8.

- Consult one of the customer support centers in your area for standard or post warranty work. See "Customer Care Centers" on page B-9. If you have upgraded your support to on-site service, call the number listed on the Support Pack or Service Contract.

If the Fibre Bridge fails after the warranty period, contact your authorized HP dealer/distributor or the nearest HP sales and service office. Customers in the US and Europe can also use a credit card for phone assistance.

Support Pack Service Contract

If you purchased a Support Pack from Hewlett-Packard to upgrade the support level, make sure that you immediately send in the registration card. Failure to submit the Support Pack registration card may delay the on-site response time.

NOTE   Registering allows the local repair office to prepare for the proper response level needed.

HP FIRST/QUICK FAX Faxback Services

QUICK FAX and HP FIRST are automated systems that fax requested product information and/or technical support documents to you. These faxback services are available 24 hours/day.

To use this service, dial the appropriate fax number below for your country from a touch-tone phone. Follow the voice prompts to select an index of available support and product documents.

NOTE   Remember to dial the country code before these numbers.

NOTE   HP FIRST/QUICK FAX was discontinued in many countries. To obtain product information and/or technical support documents, go to "www.hp.com". Select "HP Services and Support" and then select your product type.

Asia-Pacific

Australia	(03) 9272 2627
China	(81610) 65055280
Hong Kong	800-96-7729
India	+91 (0) 11 682 6031
Indonesia	6221-350-3408
Japan	(3) 3335-8622
Korea	(02) 769-0543
Malaysia	800-1611
New Zealand	(09) 356 6642
Philippines	632-867-3551
Singapore	(65) 291-7951
Taiwan	(02) 719 5589
Thailand	(02) 661 4011
Vietnam	001- (84) 823-4530

Europe

Austria	06 60 63 86
Belgium, Dutch	0800 11906
Belgium, French	0800 17043
Denmark	800 10453
Finland	0800 13134
France	05 905900
Germany	0130 810 061
Ireland	01 662 5525
Italy	1678 59020
Netherlands	06 022 2420
Norway	800 11319
Portugal	01 441 7199
Spain	900 993123
Sweden	020 795743
Switzerland, German	0800 55 1527
Switzerland, French	0800 55 1526
United Kingdom	0800 960271
Other locations in Europe	31 20 681 5792

North and South America (includes Canada)

(800) 368-9673 or (970) 635-1510

Other Countries

(970) 635-1510

Electronic Support Services

For 24-hour access to information over your modem:

On-line Service Providers

Technical information is available on CompuServe and America Online.

Service Provider	Description	Address
CompuServe	To download software, firmware, and support documents, and to discuss issues in user forums.	Go HPSYS
America Online	To download software, firmware, and support documents, and to discuss issues in user forums.	Go HPSTOR

Hewlett-Packard Web Site

Product and support information is available on the Hewlett-Packard web site www.hp.com.

Customer Care Centers

NOTE	Contact the Customer Care Center in your area for technical assistance during the warranty of your product.

North and South America (includes Canada)

Monday - Friday, 7 am - 5 pm MST

(970) 635-1500

European Customer Care Centers

Monday - Friday, 8:30 - 18:00 (C.E.T)

NOTE	Language or country support might not be available for all products.

Austria	0711 420 1080
Belgium, Dutch	02 626 8806
Belgium, French	02 626 8807
Denmark	3929 4099
Finland	0203 47 288
France	01 43 62 34 34
Germany	0180 52 58 143
Ireland	01 662 5525
Italy	02 264 10350
Netherlands	020 606 8751
Norway	22 11 6299
Portugal	21 317 6333
South Afreica	086 000 1030
Spain	902 321 123
Sweden	08 619 2170
Switzerland	0848 80 11 11
United Kingdom	0870 842 2339

Israel	09 952 4848
Russia	095 797 3520
Turkey	0212 221 6969

Asia-Pacific

Australia .	+61 (3) 8877 8000
China .	+86 10 656 45959
Hong Kong .	800 96 7729
India .	+ 91 (0) 11 682 6035
Indonesia .	+62 21 350 3408
Japan .	+81 3 3335 8333
Korea .	+82 (0) 2 3270 0700 Outside Seoul: 080 999 0700
Malaysia .	+60 3 295 2566
New Zealand .	+64 (9) 356 6640
Philippines .	+63 2 867 3551
Singapore .	+65 272 5300
Taiwan .	+886 2 2717 0055
Thailand .	+66 2 661 4000

Elsewhere

Contact your authorized HP dealer/distributor or the nearest HP sales and service office.

Telephone Support After Warranty

Before Calling

Before calling, please complete the following information so that you will have it ready for the support center representative:

- Serial number of product _____

- Brand and model of host computer _____

- Version of software used; driver selected _____

US and Canada

Using a VISA or MasterCard, call one of the following:

- (800) 810-0130: Per incident fee of $25.00 will be charged to the credit card.

- (900) 555-1800: $2.50 per minute with a maximum of $25.00 will be charged to the credit card.

Europe

Call the appropriate number listed under "European Customer Care Centers" on page B-9. A per incident fee will be charged for after-warranty support. Please have a credit card, PO number, or billing number address ready.

Elsewhere

Contact your authorized HP dealer/distributor or the nearest HP sales and service office for after-warranty support.

HP Reseller Locator Numbers

US	(800) 752-0900
Canada	(800) 387-3867
Mexico and South America	(305) 267-4220

Support and
Customer Service

C   Safety and Regulatory Information

Chapter Overview

This section contains important safety and regulatory information for the United States, Finland, Sweden, Germany, United Kingdom, European Union, and Japan.

CDRH Regulations (USA Only)

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States. The labels and artwork shown below indicate compliance with CDRH regulations and must be attached to laser products marketed in the United States.

WARNING | **Use of controls, adjustments or performing procedures other than those specified in this manual may result in hazardous laser radiation exposure.**

NOTE | Complies with 21 CFR Chapter 1 Subchapter J.

Laser Class Information: A label which reads, "Class 1 Laser Product" printed in English, German, Finnish.

United Kingdom Telecommunications Act 1984

The HP SureStore Fibre Channel SCSI Bridge is approved under Approval Number NS/G/1234/J/100003 for indirect connection to Public Telecommunication Systems within the United Kingdom.

Safety and
Regulatory

Declaration of Conformity

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: Hewlett-Packard Co.

Manufacturer's Address: Storage Systems Division
700 71st Avenue
Greeley, CO 80634 USA

declares, that the product

Product Name: **HP SureStore Fibre Channel SCSI Bridge**

Model Numbers: C6340F (with or w/o suffixes)

Product Options: All Options

conforms to the following Product Specifications:

Safety: EN 60950: 1992+A1+A2:1993+A3:1995/IEC950(1991)+A1+A2+A3
EN 60825-1 (1994) / IEC825-1 (1993), Laser Class 1

EMC: EN 55022 (1994) / CISPR 22 (1993), Class A
EN 50082-1 (1992)
prEN 55024-2 (1992) / IEC 1000-4-2 (1995), 4 kV CD, 8 kV AD
prEN 55024-3 (1991) / IEC 1000-4-3 (1995), 3 V/m
prEN 55024-4 (1993) / IEC 801-4-4 (1988), 1 kV Peak Power Lines
0,5 kV Signal Lines
EN 61000-3-2 (1995) / IEC 1000-3-2 (1995), Harmonics
EN 61000-3-3 (1995) / IEC 1000-3-3 (1994), Flicker

Supplementary Information:
The product herewith complies with the requirements of the following Directives and carries the CE marking accordingly:
the EMC Directive 89/336/EEC -the Low Voltage Directive 73/23/EEC (including 93/68EEC)

The Manufacturer listed above declares that this product has been tested and found to comply with the limits of a Class A
digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against
harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy
and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio
communications. However, there is no guarantee that interference will not occur in a particular installation. If this
equipment does cause harmful interference to radio or television reception, which can be determined by turning the
equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
a) Reorient or relocate the receiving antenna, b) Increase the separation between the equipment and receiver, c) Connect the
equipment into an outlet on a circuit different from that to which the receiver is connected, or d) Consult the dealer or an
experienced radio/TV technician for help.

Change or modification of this equipment not expressly approved by Hewlett-Packard could void the user's authority to
operate this equipment. Only use the cables, connectors, power cords, and accessories supplied with this equipment or
expressly approved by Hewlett-Packard.

Storage Systems Division   July, 1998 Greeley, Colorado, USA

For Regulatory Compliance Information ONLY, contact:
Australian: Product Regulations Manager, Hewlett-Packard, Australia Ltd., 31-41 Joseph Street, Blackburn, Victoria
3130, Australia
European: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department TRE,
Herrenberger Strasse 130, D-71304 Boblingen (FAX:+49-7031-14 3143
USA: Product Regulations Manager, Hewlett-Packard Company, 700 71st Avenue, Greeley, CO 80634 USA,
(Phone: 970-350-5600).

Herstellerbescheinigung

Diese Information steht im Zusammenhang mit den Anforderungen der Maschinenlärn information sverordnung vom 18 Januar 1991.

Schalldruckpegel Lp < 70 dB(A)

- am arbeitsplatz
- normaler betrieb
- nach ISO 7779:1988/EN 27779:1991 (Typprüfung)

English Translation of German Sound Emission Directive

This statement is provided to comply with the requirements of the German Sound Emission Directive, from 18 January 1991.

Sound pressure Lp < 70 dB(A)

- at operator position
- normal operation
- according to ISO 7779: 1988/EN 27779: 1991 (type test)

Turvallisuusyhteenveto

Laserturvallisuus

LUOKAN 1 LASERLAITE

KLASS 1 LASER APPARAT

HP SureStore Fibre Channel SCSI Bridge - laitteeseen on asennettu optista tiedonsiirtoa varten laserlähetin, joker lähettää signaalit siihen kytketyn optisen kuidun kautta.

Optisessa lähetinmoduulissa ei ole huollettavia kohteita eikä sen tehtaalla tehtyjä säätöjä tule muuttaa.

Lähetinmoduulin turvallisen toiminnan varmistamiseksi on noudatettava tarkoin sen asentamisesta ja toiseen vastaanottavaan laitteistoon kytkemisestä annettuja ohjeita.

Tie-dye optisessa lähetinmoduulissa käytettävien laserdiodien säteilyominaisuuksista:

Aallonpituus   780 - 680 nm

Teho   3 mW

Luokan   3B laser

English Translation of Finland Regulatory Information

Laser Safety

CLASS 1 LASER DEVICE

HP SureStore Fibre Channel SCSI Bridge has a laser transmitter module installed for optical data transmission. Optical fibre connected to the module is used for data transmission.

Under normal operating conditions the transmitter is a safe Class 1 laser device for the user and the user cannot be exposed to the laser radiation it generates. The safety class of the transmitter has been defined according to the EN 60825-1 (1994) standard.

The are no user serviceable parts inside the laser transmitter module and the factory settings should not be adjusted.

In order to ensure safe operation of the transmitter module all the instructions about installing and connecting to receiving equipment should be closely followed.

Information about radiation characteristics of the laser diode used in the transmitter module:

Wavelength	780 - 860 nm
Power	3 mW (Typical)
Class	3B laser

Japanese VCCI Statement

この装置は，情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準
に基づく クラスA 情報技術装置です。この装置を家庭環境で使用すると 電波
妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ず
るよう 要求されることがあります。

This equipment is in the Class A category information technology
equipment based on the rules of Voluntary Control Council For
Interference by Information Technology Equipment (VCCI). When used
in a residential area, radio interference may be caused. In this case, user
may be required to take appropriate corrective actions.

Glossary

A

ANSI An acronym for the American National Standards Institute, the coordinating organization for voluntary standards in the United States.

Arbitrated loop topology Fibre Channel topology that provides a low-cost solution to attach multiple communicating ports in a loop without switches.

Asynchronous SCSI signals are transmitted one at a time down the SCSI communication path.

ATM Asynchronous Transfer Mode

C

CDB An acronym for the Command Descriptor Block.

CRC An acronym for Cyclic Redundancy Check. An error-correcting code used in Fibre Channel.

D

Differential SCSI A SCSI implementation that allows a cable length of up to 25 meters.

F

Fabric Fibre Channel-defined interconnection methodology that supports high-speed data routing in Fibre Channel networks.

FC-AL An acronym for Fibre Channel Arbitrated Loop topology.

FC-SW An acronym for Fibre Channel Switched topology. The highest performance Fibre Channel fabric, providing a choice of multiple path routings between pairs of F-ports.

FDDI An acronym for the Fibre Distributed Data Interface. ANSI's architecture for a Metropolitan Area Network; a network based on the use of optical fibre cable to transmit data at 100 MBsc

Fibre Bridge Bi-directional connectivity for data transfers between Fibre and SCSI.

Glossary

Fibre Channel A switched protocol that allows concurrent communication among workstations, supercomputers, mainframes, data storage devices, and other periperals. Fibre Channel is capable of transmitting at rates exceeding one gigabit per second in both directions simultaneously.

G

GBIC An acronym for the Gigabit Interface Converter.

Gigabit One billion bits, or one thousand megabits.

GLM An acronym for the Gigabaud Link Module.

H

HBA Host Bus Adapter.

HIPPI High-Performance Parallel Interface.

I

IP Internet Protocol.

L

Local Area Network (LAN) A communications system with dimensions that are typically less than 5 kilometers. Transmissions within a local area network are mostly digital, carrying data among stations at rates usually above one megabit/sec.

M

MIA An acronym for the Media Interface Adapter plug-ins, which allow you to go from copper to optical or visa versa.

MIM An acronym for the Media Interface Module.

Multicast Refers to delivering a single transmission to multiple destination N_ports.

Multimode Fibre Method by which multiple light waves can travel through multiple paths with wavelike movements down the cable.

N

Native Interface The unconverted interface for a device.

Glossary

Narrow SCSI A SCSI implementation that utilizes a 50-pin cable; can be single-ended or differential.

Non-OFC An acronym for Non Open-Ended Fibre Control. This approach does not drop the laser power when a cable link is dropped. Non-OFC uses a lower power laser than an OFC system.

O

OFC An acronym for Open-Ended Fibre Control. When a cable link is dropped, the laser drops, to eliminate the potential for eye damage.

Originator A Fibre Channel term that refers to the initiating device.

P

Port The hardware entity within a node that performs data communications over the Fibre Channel link.

PPP An acronym for Point-to-Point Protocol. A transmission path over which data is transmitted between two Fibre Channel devices.

Protocol A data transmission convention encompassing timing, control formatting, and data representation.

R

RAID Redundant Array of Inexpensive Disks.

Receiver A terminal device that includes a detector and signal processing.

S

SCSI Small Computer Systems Interface.

Single-ended SCSI A SCSI implementation that allows a maximum length of six meters.

SW Optical GBIC Short Wave Optical Gigabit Interface Converter.

SW Optical FC Cable Short Wave Optical Fibre Channel Cable.

Synchronous Simultaneous transmission of multiple transmissions down the SCSI path.

Glossary

T

Topology The logical and/or
physical arrangement of stations
on a network.

TCP/IP Transmission Control
Protocol/Internet Protocol.

W

Wide SCSI A SCSI
implementation that utilizes a 68-
pin cable; can be single-ended or
differential.

Index