

HP StorageWorks

FC1142SR and FC1242SR DC 4Gb

PCI Express host bus adapters for Linux and Windows installation guide

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About this guide

This guide provides information about:

- Installing, configuring, and troubleshooting the HP StorageWorks FC1142SR single-channel Peripheral Component Interconnect Express (PCIe) 4Gb host bus adapter (HBA) and the HP StorageWorks FC1242SR DC dual-channel PCIe 4Gb HBA for Linux® and Microsoft® Windows® operating systems (hereafter called the FC1142SR HBA and the FC1242SR DC HBA, or “the HBAs”)
- Contacting technical support for additional assistance

Intended audience

This guide is intended for system administrators who are experienced with the following:

- Linux operating systems
- Windows operating systems
- HBAs

Related documentation

In addition to this guide, see the *HP StorageWorks FC1142SR and FC1242SR DC 4Gb PCI Express host bus adapters for Linux and Windows release notes*.

These and other HP documents are available on the HP web site: <http://www.docs.hp.com>.

Document conventions and symbols

Table 1 Document conventions

Convention	Element
Medium blue text: Figure 1	Cross-reference links and e-mail addresses
Medium blue, underlined text (http://www.hp.com)	Web site addresses
Bold font	<ul style="list-style-type: none">• Key names• Text typed into a GUI element, such as into a box• GUI elements that are clicked or selected, such as menu and list items, buttons, and check boxes
<i>Italics font</i>	Text emphasis
Monospace font	<ul style="list-style-type: none">• File and directory names• System output• Code• Text typed at the command-line
<i>Monospace, italic font</i>	<ul style="list-style-type: none">• Code variables• Command-line variables
Monospace, bold font	Emphasis of file and directory names, system output, code, and text typed at the command-line



WARNING! Indicates that failure to follow directions could result in bodily harm or death.



CAUTION: Indicates that failure to follow directions could result in damage to equipment or data.



IMPORTANT: Provides clarifying information or specific instructions.



NOTE: Provides additional information.



TIP: Provides helpful hints and shortcuts.

HP technical support

Telephone numbers for worldwide technical support are listed on the HP web site:

<http://www.hp.com/support>.

Collect the following information before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

For continuous quality improvement, calls may be recorded or monitored.

HP strongly recommends that customers sign up online using the Subscriber's choice web site

<http://www.hp.com/go/e-updates>.

- Subscribing to this service provides you with e-mail updates on the latest product enhancements, newest versions of drivers, and firmware documentation updates as well as instant access to numerous other product resources.
- After signing up, you can quickly locate your products by selecting **Business support** and then **Storage** under Product Category.

Subscription service

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Subscribing to this service provides you with e-mail updates on the latest product enhancements, newest driver versions, and firmware documentation updates as well as instant access to numerous other product resources. After subscribing, locate your products by selecting **Business support** and then **Storage** under Product Category.

Helpful web sites

For product information, see the following web sites:

- <http://www.hp.com>
- <http://www.hp.com/go/storage>
- <http://www.hp.com/support/>
- <http://www.docs.hp.com>

1 HBA features

This chapter describes the features of the FC1142SR (part number AE311A) and FC1242SR DC (part number AE312A) HBAs.

- [Performance specifications](#), page 10
- [Environmental specifications](#), page 10
- [Physical specifications](#), page 11

Performance specifications

The FC1142SR HBA and the FC1242SR DC HBA are 4 Gb/s Fibre Channel PCIe HBAs. The HBAs' Fibre Channel controller incorporates a multifunction native PCIe core that is compliant to the PCIe Base Specification 1.0a and PCIe CEM Specification 1.0a. The supported physical PCIe connector is x4, x8 or x16.

These HBAs have the following performance features:

- Auto-negotiation between 1, 2, or 4Gb/s link attachments
- High-performance Fibre Channel host bus adapter
- Full support for all Fibre Channel topologies: point-to-point, arbitrated loop, and fabric
- Full support for Fibre Channel Service Class 2 and Service Class 3
- Compliance with the PCIe Base and CEM 1.0a specifications:
 - x1 or x4 lane link interface (auto negotiated with system) at 2.5 Gb/s
 - Support for VCO (1 Virtual Channel) and TC0 (1 Traffic Class)
 - Configuration, I/O, memory, read/write, completion, and message support
 - Support for 64-bit addressing
 - ECRC for all transmitted PCIe data packets
 - Link CRC on all PCIe packets and message information
 - Support for large payload size (2048 bytes for read/write)
 - Support for large read request size (4096 bytes)
- Internal high-speed static RAM (SRAM)
- Error correcting code (ECC) protection of local memory, including single-bit correction and double-bit protection
- Small form factor (SFF) multimode optic with LC connector
- Parts and construction compliant to the European Union Directive of Restriction of Hazardous Substances (RoHS)

Environmental specifications

Table 2 lists the environmental specifications.

Table 2 HBA environmental specifications

Environmental feature	Minimum	Maximum
Operating temperature	0°C/32°F	55°C/131°F
Storage temperature	-20°C/-4°F	70°C/158°F
Relative humidity (non-condensing)	10%	90%
Storage humidity (non-condensing)	5%	95%

Physical specifications

Table 3 lists the physical specifications.

Table 3 HBA physical specifications

Component	Specification
Host bus	Complies with: PCI Express Base Specification 1.0a PCI Express Card Electromechanical Specification 1.0 PCI Bus Power Management Interface Specification 1.1
Fibre Channel	Bus type: fiber optic media Bus transfer rate: <ul style="list-style-type: none"> FC1142SR single channel—4 Gb/s Fibre Channel increases aggregate throughput rate to 800 MB/s in full-duplex mode FC1242SR DC dual channel—4 Gb/s Fibre Channel increases aggregate throughput rate to 1.6 GB/s in full-duplex mode
Central processing unit (CPU)	Single-chip design that includes a RISC processor, Fibre Channel protocol manager, PCI-e DMA controller, integrated serializer/deserializer (SERDES), and electrical transceivers that can auto negotiate a data rate of 1, 2, or 4 Gb/s.
Memory	1 MB SRAM, 1 MB flash (SPI), and 2 KB NVRAM (SPI)
Signal voltage	3.3 V (mode 1), 3.3 V/1.5 V (mode 2)
Distance	1 Gb/s: 500 meters 50/125 μm fiber, 300 meters 62.5/125 μm fiber 2 Gb/s: 300 meters 50/125 μm fiber, 150 meters 62.5/125 μm fiber 4 Gb/s: 150 meters 50/125 μm fiber, 70 meters 62.5/125 μm fiber
Cable	50/125 μm multimode fiber, 62.5/125 μm multimode fiber
Connectors	LC connectors that support non-OFC, multimode fiber optic cabling using a SFF optical transceiver module
Form factor	Low-profile PCIe: 16.765 cm \times 6.89 cm (6.6 in. \times 2.713 in.)
Bracket	Standard: 1.84 cm \times 12.08 cm (.73 in. \times 4.76 in.) Low-profile: 1.84 cm \times 8.01 cm (.73 in. \times 3.15 in.)
Power consumption	~11.0 watts

2 Installing the HBAs

This chapter describes how to install the FC1142SR and FC1242SR DC HBAs.

- [Installation prerequisites](#), page 14
- [Installation procedure](#), page 14

See your host documentation for installation instructions.

⚠ WARNING! Disconnect the host from the power source before installing the HBA. To reduce the risk of personal injury from hot surfaces, allow the internal server or workstation components to cool before touching.

⚠ WARNING! Electrostatic discharge (ESD) can damage electronic components. Before you begin, ensure that you are properly grounded, as described in "[Electrostatic discharge](#)" on page 34.

Installation prerequisites

Before you begin, ensure that:

- You have an optical multimode cable with an LC duplex connector.
- You record the HBA's serial number, in the unlikely event that the NVRAM is corrupted. Each HBA has a unique serial number located on the bottom of the HBA.

Installation procedure

To install the HBA:

1. Check the motherboard and make any necessary configuration changes to accommodate the HBA.
2. Turn off the computer.
3. Disconnect the power cable.
4. Open and remove the computer cover and save the screws.
5. Locate the slot in which you will install the HBA, and remove the slot cover.
6. Place the HBA in the slot and press carefully until it is seated properly.
7. Secure the HBA to the chassis, following the server manufacturer's instructions.
8. Connect the appropriate cable from the devices to the corresponding LC connector.
9. Close the computer cover. Insert and tighten the computer cover screws.
10. Plug in the power cable.
11. Turn on the computer and observe the monitor and the LED indicators to ensure proper operation (see "LED indicators" on page 14).

LED indicators

Table 4 describes the LED indicators.

Table 4 LED indicators

Yellow LED	Green LED	Amber LED	Activity
Off	Off	Off	Power off
On	On	On	Power on before or after firmware initialization
Flashing	Flashing	Flashing	Power on after firmware initialization
Alternately flashing	Alternately flashing	Alternately flashing	Firmware fault
Off	Off	Flashing	Activity at 1 Gb/s
Off	Flashing	Off	Activity at 2 Gb/s
Flashing	Off	Off	Activity at 4 Gb/s
Flashing	Off	Flashing	Beacon

3 Installing the Windows drivers

This chapter describes how to install the Windows SCSIPORT miniport driver and Storport miniport driver.

- [Installation prerequisites](#), page 16
- [Installing the Windows device drivers using the HP Smart Component kit](#), page 16


Installation prerequisites

Before you install the Windows drivers:

- Obtain the *HP StorageWorks FC1142SR and FC1242SR DC 4 Gb PCI Express host bus adapters for Linux and Windows release notes* from the following HP web site: <http://h18006.www1.hp.com/storage/saninfrastructure.html>.
- Obtain the HP Smart Component kit with the latest drivers from the following HP web site: <http://h18006.www1.hp.com/storage/saninfrastructure.html>.
- Familiarize yourself with the operating system on which the HBA will operate, and obtain standard system documentation.
- Review any restrictions or mandatory hot fixes that apply to your configuration and operating system.

Installing the Windows device drivers using the HP Smart Component kit

This section describes how to install the Windows SCSI PORT miniport and Storport miniport drivers. To install the latest SCSI PORT or Storport driver, you must use the HP Smart Component kit.

 **NOTE:** HP does not support Device Manager to update drivers. Using Device Manager can delete registry parameters and cause erratic behavior.

1. Select the FC1142SR or FC1242SR DC HBA from the Fibre Channel Host Bus Adapters list on the SAN infrastructure web page described in "[Installation prerequisites](#)".
The web page for the HBA appears.
2. Click **Software and drivers**.
3. Select a language from the drop-down list.
4. Select a Windows operating system.
5. In the Driver Storage Controllers - FC HBA section, click **Download** in the row for either the SCSI PORT or Storport driver component.
6. Open or save .zip file that contains the installation program:
 - Click **Open** to extract the driver software installation program immediately.
 - Click **Save** to save the .zip file containing the HP Smart Component executable to your system and run the installation at a later time.
7. Extract the HP Smart Component executable to your computer.
8. Double-click the HP Smart Component executable (cp00xxxx.exe) file to start the installation.
9. Click **Install** to install the driver software.
10. Click **Reboot** to complete the installation.

4 Installing the Linux drivers

This chapter describes how to install the Linux qla2300 device drivers for the FC1142SR HBA and FC1242SR DC HBA on an installed Red Hat Enterprise Linux (RHEL) system or on a SUSE Linux Enterprise Server (SUSE SLES) system.


You can obtain the software kit for the driver from the following HP web site <http://h18006.www1.hp.com/storage/saninfrastructure.html>.

To install the drivers, you must be familiar with the operating system on which the HBA is to operate, and have access to standard system documentation. Use the procedures and information in the following sections:

- [Installing the driver kit](#), page 18
- [Using the fibreutils RPM](#), page 19

Installing the driver kit

HP recommends that you install the complete driver kit for the FC1142SR and FC1143SR HBAs. The kit contains the driver and utilities you need to deploy HBAs on Linux.

 **NOTE:** You must install the `gcc` compiler and the kernel sources or the kernel development package on your system before installing the driver kit.


To install the complete driver kit, copy the `.gz` file to your system and enter the following commands:

```
# gunzip hp_qla2300version_info.tar.gz
# tar -xvf hp_qla2300version_info.tar
# cd hp_qla2300
# ./INSTALL
```

See the `README` file included with the driver kit for more information.

Using the RPM to install drivers

The RPM Package Manager (RPM) is a package management system that facilitates the installation of Linux software. Using RPM, you can install software in prebuilt bundles called RPM packages. The driver RPM packages have the driver source code and driver utilities.

 **NOTE:** This section is provided as a reference for future RPM installations.

Installing the RPM

To install the RPM, copy the RPM package file to your system and enter the following command:

```
# rpm -ivh package_name.rpm
```

For example, to install the Linux HBA driver RPM manually, enter the following command:

```
# rpm -ivh hp_qla2300-version.rpm
```

Upgrading the RPM

To upgrade the RPM, copy the RPM package file to your system and enter the following command:

```
# rpm -Uvh package_name.rpm
```

Uninstalling the RPM

To uninstall the RPM, enter the following command:

```
# rpm -e package_name
```

Using the fibreutils RPM

HP recommends using the `fibreutils` RPM that is included with the driver kit. It contains useful utilities for managing fibre-connected storage. To install this RPM manually, enter the following command:

```
# rpm -ivh fibreutils-version.rpm
```

For more information about `fibreutils`, see the file `/opt/hp/hp_fibreutils/README`.

Changing driver parameters

To change driver parameters:


1. Run the `set_parm` script, located in the `/opt/hp/src...` directory.
2. Reboot the server; otherwise, you may not be able to unload the `qla2300` driver if there is a process or file system using a device connected to the HBA.

Loading and unloading the qla2300 driver manually

By loading the `qla2300` driver manually, you can access the devices and unload the driver without rebooting the system.

To load the `qla2300` driver, enter the following command:

```
# modprobe qla2300
```

 **NOTE:** HP recommends using the `modprobe` command to load the driver so that any driver parameter value specified in the `/etc/modules.conf` file takes effect.

Alternatively, you can load the driver by entering the following command from the directory that contains the `qla2300.o` file:

1. Enter the `insmod` command. For example:

```
# insmod qla2300.o
```

2. If your system has a previous version of the `qla` driver, rename the old binary included in the original distribution to ensure that it does not interfere with the new version as follows:

```
# cd /lib/modules/kernel_release_version/kernel/drivers/addon/qla2300
# mv qla2300.o qla2300_rh.o
```

3. After renaming the old driver, update the dependency file, then load the new driver using the `modprobe` command.
4. To unload the `qla2300` driver manually, enter the command as shown in the following example:

```
# modprobe -r qla2300
```

5 Troubleshooting

This chapter provides troubleshooting information that you can use in the event of an HBA problem.

- [Troubleshooting checklists](#), page 22
- [Using the Event Viewer](#), page 23
- [Linux driver events](#), page 23

Troubleshooting checklists

Three basic types of installation problems can cause HBAs to malfunction: hardware problems, system configuration problems, and Fibre Channel problems. This section provides checklists to help you determine why the HBA is not functioning properly.

Hardware checklist

Check the following:

- Are circuit cards installed securely in the system?
- Are cables connected securely to the correct connectors? For example, the optical transmit connector on the HBA must be connected to the optical receive connector on the device. An easy way to check for correct seating is to switch the connectors on the HBA or the device, then reboot your system. If the BIOS is enabled, devices connected to the HBA are displayed on the screen.
- Is the HBA installed correctly and seated firmly in the PCIe slot?
- Is there interference due to nonstandard PCIe connectors?
- Is the *Fast!UTIL* data rate setting correct? See "[Adapter Settings](#)" on page 26 for information about setting the data rate.

System configuration checklist

Check the following:

- Is the motherboard properly connected?
- Did you check the motherboard for proper configuration? All PCI-compliant and PCI-X-compliant systems automatically detect 32-bit or 64-bit adapters and set the appropriate bus speed (for example, 33 MHz or 133 MHz).

See the documentation for your computer or contact your computer dealer to determine if the motherboard requires special configuration.

Fibre Channel checklist

Check the following:

- Did you power up the Fibre Channel devices before powering up the server?
- Are cables connected properly?
- Did you configure the RAID controller using the utilities provided by the manufacturer?
- If the Fibre Channel switch supports zoning, is the switch configured correctly?

Using the Event Viewer

The SCSIPORT and Storport miniport drivers verify the HBA's power-on self-test (POST) LED states. If there is a failure or a suspected failure, an error log entry is written to the Windows event log.

To view the event log:

1. Select **Start > Programs > Administrative Tools > Event Viewer**, or right-click **My Computer** and select **Manage**.
2. Click **Event Viewer** in the Computer Management dialog box.
The Event Viewer window appears.
3. Review the miniport driver event codes. See the following web site for information about interpreting the event codes: http://www.qlogic.com/support/logs/evlogV9xxx_error.asp.

Linux driver events

If the Linux driver detects any fabric or driver events, the information is written to in the `/var/log/messages` file. Check this file periodically to review fabric or Linux driver events.

A Configuring the HBAs

This appendix provides detailed configuration information for advanced users who want to customize the configuration of the HBAs and connected devices.

△ **CAUTION:** If the configuration settings are incorrect, the HBA may not function properly.

This appendix describes the following *Fast!UTIL* options:

- [Running Fast!UTIL](#), page 26
- [Configuration Settings](#), page 26
- [Scan Fibre Channel Devices](#), page 30
- [Fibre Disk Utility](#), page 31
- [Loopback Data Test](#), page 30
- [Select Host Adapter](#), page 30

Running *Fast!UTIL*

You configure the HBAs using *Fast!UTIL*, HP's BIOS-resident configuration tool. To run *Fast!UTIL*:

1. Press **ALT+Q** during HBA BIOS initialization (it may take a few seconds for the *Fast!UTIL* Options menu to display).
2. If you have more than one HBA, *Fast!UTIL* asks you to select the HBA you want to configure.
3. Change the settings and exit the utility. *Fast!UTIL* reboots the system to load the new parameters.

Configuration Settings

Use Configuration Settings to configure the Fibre Channel devices and the HBA to which they connect.

Adapter Settings

From the Configuration Settings menu in *Fast!UTIL*, select **Adapter Settings**. [Table 5](#) lists the default settings for the HBA.

Table 5 Adapter Settings


Setting	Values	Default
Host Adapter BIOS	Enabled, Disabled	Disabled
Frame Size	512, 1024, 2048	2048
Loop Reset Delay	0–60 seconds	5 seconds
Adapter Hard Loop ID	Enabled, Disabled	Disabled
Hard Loop ID	0–125	0
Spin Up Delay	Enabled, Disabled	Disabled
Connection Options	0, 1, 2	2
Fibre Channel Tape Support	Enabled, Disabled	Enabled
Data Rate	0, 1, 2, 3	2

A description of each setting follows:

- **Host Adapter BIOS**—When this setting is disabled, the ROM BIOS on the HBA is disabled, freeing space in upper memory. This setting must be enabled if you are booting from an Fibre Channel hard disk connected to the HBA. The default is Disabled.
- **Frame Size**—Specifies the maximum frame length supported by the HBA. The default 2048 provides maximum performance for F_Port (point-to-point) connections.
- **Loop Reset Delay**—After resetting the loop, the firmware refrains from initiating any loop activity for the number of seconds specified by this setting. The default is 5 seconds.
- **Adapter Hard Loop ID**—Forces the HBA to attempt to use the ID specified in the Hard Loop ID setting. The default is Disabled.
- **Hard Loop ID**—When this setting has a Loop ID other than 0, the HBA uses the ID specified by this setting. The default is 0.
- **Spin Up Delay**—When this setting is enabled, the BIOS waits up to two minutes to find the first drive. The default is Disabled.
- **Connection Options**—Defines the connection type. The default is 2. The options are:
 - 0—Loop
 - 1—Point-to-point
 - 2—Loop preferred, then point-to-point
- **Fibre Channel Tape Support**—When this setting is enabled, FCP-2 recovery can occur. The default is Enabled.
- **Data Rate**—This setting determines the data rate. The default is 2. The options are:
 - 0—Runs at 1 Gb/s
 - 1—Runs at 2 Gb/s
 - 2—Auto negotiates and determines the data rate
 - 3—Runs at 4 Gb/s

Selectable Boot Settings

This option lets you select the node from which you want the system to boot. When enabled, this option forces the system to boot from the selected Fibre Channel hard disk, ignoring any IDE hard disks connected to the system. When disabled, the system looks for a boot device (specified in the system BIOS). When disabled, the Boot ID and Boot LUN parameters have no effect.

 **NOTE:** This option applies only to hard disks; it does not apply to tape drives and other nondisk devices.

You can select the boot device as follows:

Enable Selectable Boot?	Boot WWPN/LUN list	Boot device
No	N/A (xxx appears)	BIOS configures the first disk drive it finds as the boot device.
Yes	Not specified	BIOS configures the first disk drive it finds that is LUN 0 as the boot device.
Yes	Specified	BIOS scans the specified WWPN and LUN list until it finds a disk drive. This drive is configured as the boot device.

To enable the Selectable Boot option:

1. From the Configuration Settings menu, select **Adapter Settings**.
2. Enable the HBA BIOS, and then press **ESC** to return to the Configuration Settings menu. Use the menu as follows:
 - Use the arrow keys to select Selectable Boot Settings.
 - Press **ENTER** to enable or disable (toggle) the Selectable Boot option.
3. Move to the primary location of the Selectable Boot List menu.
4. Press **ENTER** to view a list of accessible devices (these are the devices in the Select Fibre Channel Device menu).
5. Using the arrow keys to select the device you want to add to the Selectable Boot List menu. Press **ENTER** to select the device. Repeat [step 5](#) to specify up to three alternate boot devices.

Advanced Adapter Settings

From the Configuration Settings menu in *Fast!UTIL*, select **Advanced Adapter Settings**. [Table 6](#) lists the default settings for the HBA.

Table 6 Advanced Adapter Settings

Setting	Options	Default
Execution Throttle	1–256	16
Luns per Target	0, 8, 16, 32, 64, 128, 256	128
Enable LIP Reset	Yes, No	No
Enable LIP Full Login	Yes, No	Yes
Enable Target Reset	Yes, No	Yes
Login Retry Count	0–255	8
Port Down Retry Count	0–255	16
Link Down Timeout	0–255	8

Table 6 Advanced Adapter Settings (continued)

Setting	Options	Default
Operation Mode	0, 5, 6	0
Interrupt Delay Timer	0–255	0

A descriptions of each setting follows:

- **Execution Throttle**—The maximum number of commands executing on one port. When a port’s execution throttle value is reached, no new commands are executed until the current command finishes executing. Values for this setting are 1–256. The default is 16.
- **Luns per Target**—The number of LUNs per target. Multiple LUN support is typically for RAID arrays that use LUNs to map drives. The default is 128. If you do not need multiple LUN support, set the number of LUNs to 0.
- **Enable LIP Reset**—The type of loop initialization process (LIP) reset used when the operating system initiates a bus reset routine. When this setting is Yes, the driver initiates a global LIP reset to clear the target device reservations. When this setting is No, the driver initiates a global LIP reset with full login. The default is No.
- **Enable LIP Full Login**—Instructs the ISP chip to log in to all ports after LIP. The default is Yes.
- **Enable Target Reset**—Enables drivers to issue a `Target Reset` command to all devices on the loop when a `SCSI Bus Reset` command is issued. The default is No.
- **Login Retry Count**—The number of times the software tries to log in to a device. The default is 8.
- **Port Down Retry Count**—The number of times the software issues a command to a port returning port down status. The default is 16 retries.
- **Link Down Timeout**—The number of seconds the software waits for a link to come up or go down. Values for this setting are 0–255 seconds. The default is 8.
- **Operation Mode**—Specifies the reduced interrupt operation (RIO) mode, if supported by the driver. The RIO mode allows multiple command completions in a single interrupt. The modes are:
 - 0—Interrupt for every I/O completion (default)
 - 5—Interrupt when Interrupt Delay timer expires
 - 6—Interrupt when Interrupt Delay timer expires or there is no active I/O
- **Interrupt Delay Timer**—The wait time in 200-microsecond increments used by the timer to set the wait time between interrupts. Values for this setting are 0–255 seconds. The default is 0.

Restore Default Settings

This option restores the HBA default settings.

Raw NVRAM Data

This option displays the HBA’s NVRAM contents in hexadecimal format. This is a troubleshooting tool; you cannot modify the data.

Scan Fibre Channel Devices

This option scans the Fibre Channel loop and lists all connected devices by loop ID. Information about each device is listed, such as the vendor name, product name, and revision. This information is useful when configuring the HBA and connected devices.

Fibre Disk Utility

This option scans the Fibre Channel loop and lists all connected devices by loop ID. You can select a hard disk and perform a low-level format or verify the hard disk.

△ **CAUTION:** Performing a low-level format destroys all data on the hard disk.

Loopback Data Test

This option lets you perform a loopback test. Ensure that the Fibre Channel loop is up or that a loopback plug is connected to the HBA before starting the test.

Select Host Adapter

If your system has multiple HBAs, use this option to select and then configure or view the settings for an HBA.

B Regulatory compliance and safety

Laser device

All HP systems equipped with a laser device comply with safety standards, including International Electrotechnical Commission (IEC) 825. With specific regard to the laser, the equipment complies with laser product performance standards set by government agencies as a Class 1 laser product. The product does not emit hazardous light.

Laser safety warning

-
- ⚠ **WARNING!** To reduce the risk of exposure to hazardous radiation:
- Do not try to open the laser device enclosure. There are no user-serviceable components inside.
 - Do not operate controls, make adjustments, or perform procedures to the laser device other than those specified herein.
 - Allow only HP-authorized service technicians to repair the laser device.
-

Certification and classification information

This product contains a laser internal to the fiber optic (FO) transceiver for connection to the Fibre Channel communications port.

In the USA, the FO transceiver is certified as a Class 1 laser product conforming to the requirements contained in the Department of Health and Human Services (DHHS) regulation 21 CFR, Subchapter J. A label on the plastic FO transceiver housing indicates the certification.

Outside the USA, the FO transceiver is certified as a Class 1 laser product conforming to the requirements contained in IEC 825-1:1993 and EN 60825-1:1994, including Amendment 11:1996 and Amendment 2:2001.

Laser product label

The optional label in [Figure 1](#) or equivalent may be located on the surface of the HP-supplied laser device.



Figure 1 Class 1 laser product label

International notices and statements

Canadian notice (avis Canadien)

Class A equipment

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union notice

Products bearing the CE marking comply with the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community, and if this product has telecommunication functionality, the R&TTE Directive (1999/5/EC).

Compliance with these directives implies conformity to the following European Norms (in parentheses are the equivalent international standards and regulations):

- EN55022 (CISPR 22) - Electromagnetic Interference
- EN55024 (IEC61000-4-2, IEC61000-4-3, IEC61000-4-4, IEC61000-4-5, IEC61000-4-6, IEC61000-4-8, IEC61000-4-11) - Electromagnetic Immunity
- Power Quality:
 - EN61000-3-2 (IEC61000-3-2) - Power Line Harmonics
 - EN61000-3-3 (IEC61000-3-3) - Power Line Flicker
- EN60950 (IEC60950) - Product Safety
- Also approved under UL 60950/CSA C22.2 No. 60950-00, Safety of Information Technology Equipment.

BSMI notice

警告使用者:

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

Japanese notice

ご使用になっている装置にVCCIマークが付いていましたら、次の説明文をお読み下さい。

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B情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

VCCIマークが付いていない場合には、次の点にご注意下さい。

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。

Korean notice

A급 기기 (업무용 정보통신기기)

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약 잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

B급 기기 (가정용 정보통신기기)

이 기기는 가정용으로 전자파적합등록을 한 기기로서 주거지역에서는 물론 모든지역에서 사용할 수 있습니다.

Safety

Electrostatic discharge

To prevent damage to the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

Preventing electrostatic damage

To prevent electrostatic damage, observe the following precautions:


- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly (see “Grounding methods” on page 34).

Grounding methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm (± 10 percent) resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an HP authorized reseller install the part.

 **NOTE:** For more information on static electricity, or assistance with product installation, contact your HP authorized reseller.

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