Gigabit Fibre Channel PCI Adapter
2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus
2 Gigabit Fibre Channel PCI-X Adapter

Installation and Using Guide

Gigabit Fibre Channel PCI Adapter
2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus
2 Gigabit Fibre Channel PCI-X Adapter

Installation and Using Guide

Seventh Edition (August 2004)

Before using this information and the product it supports, read the information in "Safety Information" on page v and Appendix B, "Notices," on page 33.

Contents

Safety Information

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communications lines.
D05

Laser Safety Information

All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with the IEC 825 (first edition 1984) as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

CAUTION:
All laser modules are designed so that there is never any human access to laser radiation above a class 1 level during normal operation, user maintenance, or prescribed service conditions. Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. Only trained service personnel should perform the inspection or repair of optical fiber cable assemblies and receptacles.
C25, C26

Handling Static-Sensitive Devices

Attention: Static electricity can damage this device and your system unit. To avoid damage, keep this device in its anti-static protective bag until you are ready to install it. To reduce the possibility of electrostatic discharge, follow the precautions listed below:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or other printed circuitry.
- Do not leave the device where others can handle and possibly damage the device.
- While the device is still in its anti-static package, touch it to an unpainted metal part of the system unit for at least two seconds. (This drains static electricity from the package and from your body).
- Remove the device from its package and install it directly into your system unit without setting it down. If it is necessary to set the device down, place it on its static-protective package. (If your device is an adapter, place it component-side up). Do not place the device on your system unit cover or on a metal table.
- Take additional care when handling devices during cold weather, as heating reduces indoor humidity and increases static electricity.

About This Book

This book provides information about installing the Gigabit Fibre Channel PCI Adapter (Type 4-S), 2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (Type 4-W), and 2 Gigabit Fibre Channel PCI-X Adapter (Type 5704). Use this book with your specific system unit and operating system documentation.

ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

Highlighting

The following highlighting conventions are used in this book:

Bold	Identifies commands, subroutines, keywords, files, structures, directories, and other items whose names are predefined by the system. Also identifies graphical objects such as buttons, labels, and icons that the user selects.
Italics	Identifies parameters whose actual names or values are to be supplied by the user.
`Monospace`	Identifies examples of specific data values, examples of text similar to what you might see displayed, examples of portions of program code similar to what you might write as a programmer, messages from the system, or information you should actually type.

References to AIX Operating System

This document may contain references to the AIX operating system. If you are using another operating system, consult the appropriate documentation for that operating system.

This document may describe hardware features and functions. While the hardware supports them, the realization of these features and functions depends upon support from the operating system. AIX provides this support. If you are using another operating system, consult the appropriate documentation for that operating system regarding support for those features and functions.

Related Publications

The following publications contain related information:

- System unit documentation for information specific to your hardware configuration
- Operating system documentation for information specific to your software configuration

  The AIX documentation library is available at the IBM @server pSeries and AIX Information Center at http://publib16.boulder.ibm.com/pseries/index.htm. Click **AIX documentation**. AIX documentation is also contained on the AIX Documentation CD that was shipped with your AIX operating system.

- *PCI Adapter Placement Reference*, order number SA23-2504 (for the latest version, you may need to contact your marketing representative)
- *Fibre Channel Storage Manager Installation and User's Guide*, order number SC26-7290 (for the latest version, you may need to contact your marketing representative)
- *Parallel System Support Program for AIX Administration Guide*, order number GC23-3897
- *PSSP: Command and Technical Reference*, order number GC23-3900

Trademarks

The following terms are trademarks of International Business Machines Corporation in the United States, other countries, or both:

- AIX
- @server
- pSeries
- RS/6000
- SP

Other company, product, and service names may be trademarks or service marks of others.

Chapter 1. Overview

Use a Gigabit Fibre Channel PCI Adapter (Type 4-S) to make high-speed connections between stand-alone system units and storage servers on a Fibre Channel network at speeds up to one Gigabit per second. This adapter requires a PCI 2.1, 32-bit, 33 MHz slot.

Use a 2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (Type 4-W) to make high-speed connections between stand-alone system units and storage servers on a Fibre Channel network at speeds up to two gigabits per second. This adapter requires a PCI 2.2, 64-bit, 66 MHz slot, or a PCI 2.1, 32-bit, 33 MHz slot. Use of the 64-bit slot is recommended.

Use a 2 Gigabit Fibre Channel PCI-X Adapter (Type 5704 or 280B) to make high-speed connections between stand-alone system units and storage servers on a Fibre Channel network at speeds up to two Gigabits per second. This adapter requires a PCI 2.1, 32-bit, 33 MHz slot. For best performance, use of a 64-bit, 133 MHz slot is recommended.

Adapter Features

Gigabit Fibre Channel PCI Adapter (Type 4-S)

- 1062Mb/s Fibre Channel Interface
- PCI Bus Compatible (32-bit slot)
- Supports Short Wave Optics (non-OFC)
- Upgradeable microcode (See your system user's guide or contact your service representative)
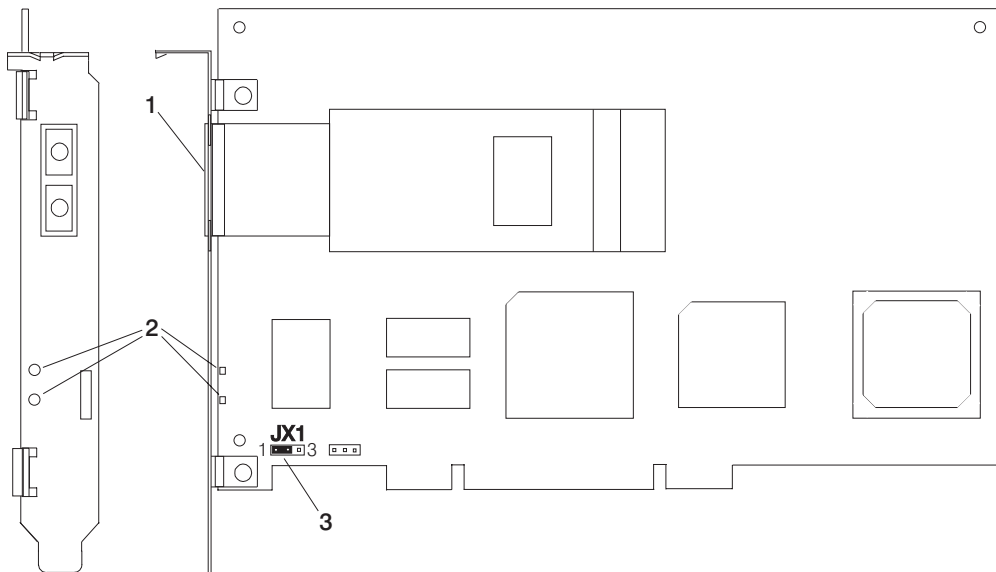
1. Multimode Fiber SC Connector
2. Data Link Status LEDs
3. Jumper JX1, Pins 1 to 2 only

2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (Type 4-W)

- 2 Gigabit per second Fibre Channel Interface
- PCI Bus Compatible (64-bit or 32-bit slot)

  Note: The adapter will operate with a decrease in performance in a 32-bit slot.
- Supports Short Wave Optics (non-OFC)
- Upgradeable microcode (See your system user's guide or contact your service representative)
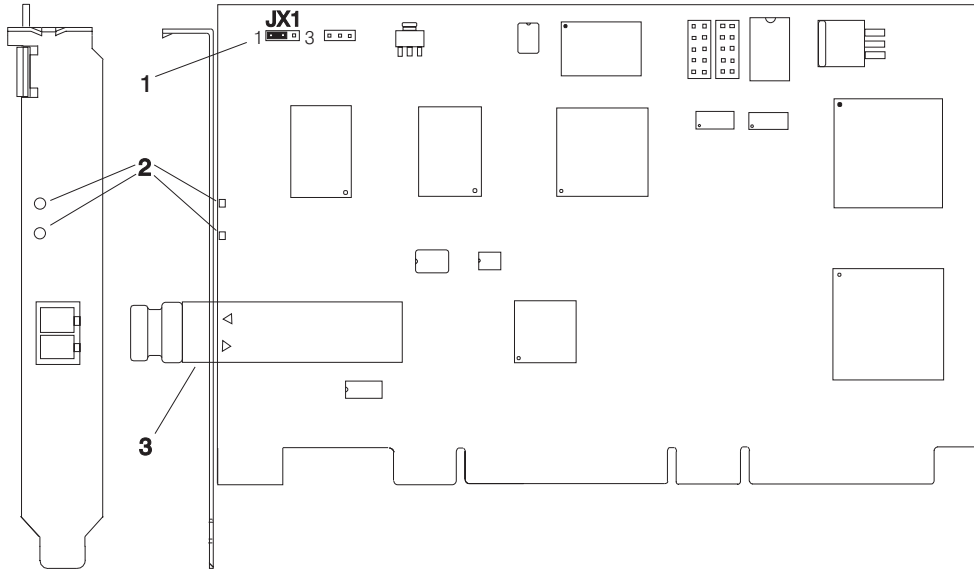
1. Jumper JX1, Pins 1 to 2 only
2. Data Link Status LEDs
3. Multimode Fiber LC Connector

2 Gigabit Fibre Channel PCI-X Adapter (Type 5704 and 280B)

Type 5704
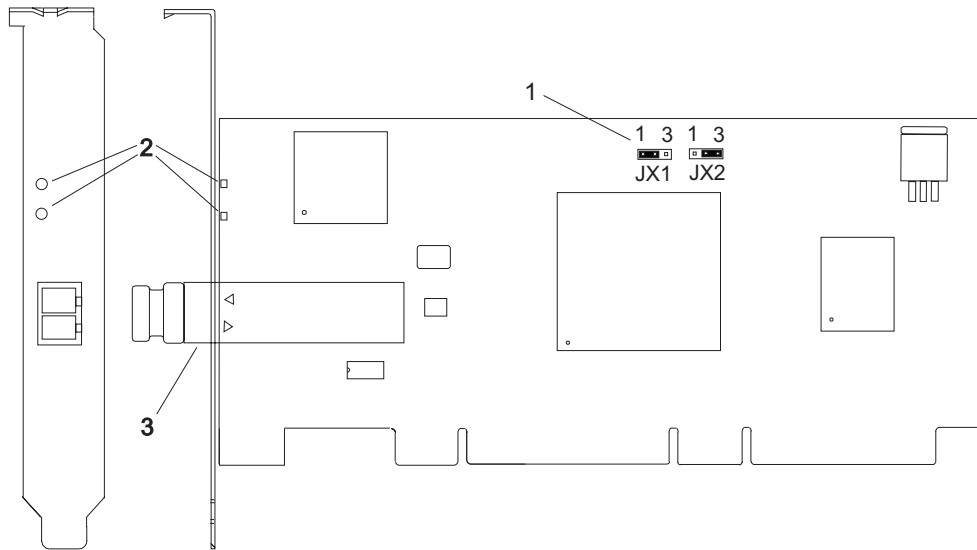
Type 280B
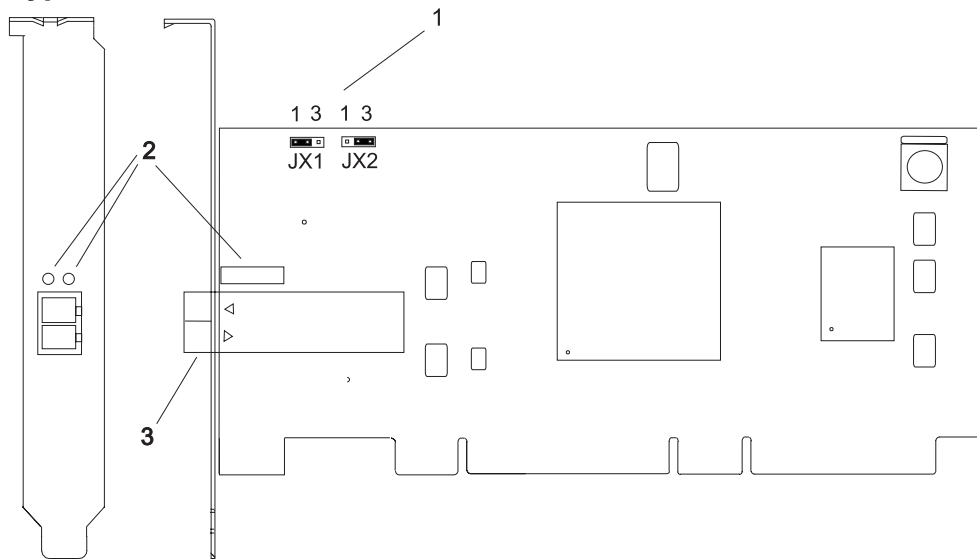
1. Jumper JX1, Pins 1 to 2 only and Jumper JX2, Pins 2 to 3 only
2. Data Link Status LEDs
3. Multimode Fiber SC Connector
- 2125Mb/s Fibre Channel Interface
- PCI Bus Compatible (32-bit slot)
- Supports Short Wave Optics (non-OFC)
- Upgradeable microcode (See your system user's guide or contact your service representative)

Software Requirements

- The Gigabit Fibre Channel PCI Adapter (Type 4-S) is supported on AIX version 4.3.2 and later.
- The 2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (Type 4-W) is supported on AIX Version 4.3 and later.

- The 2 Gigabit Fibre Channel PCI-X Adapter (Type 5704) is supported on AIX 5L for Power with the 5100-04 Required Maintenance Package (APAR IY39794) and AIX 5.2 with the 5200-01 Required Maintenance Package or later.
- The 2 Gigabit Fibre Channel PCI-X Adapter (Type 280B) is supported on AIX 5.2 with the 5200-04 Required Maintenance Package and AIX 5.3 or later.

Environmental Requirements

- Operating temperature: 5 degrees C to 40 degrees C
- Operating humidity: 0 to 90% (non-condensing)
- Barometric operating pressure: 86 to 106 kPascals
- Maximum tolerance in power supply variation: +5% to -5%

Chapter 2. Preparing to Install a Gigabit Fibre Channel PCI Adapter

This chapter helps you prepare to install a Gigabit Fibre Channel PCI Adapter.

If AIX is not installed on your system unit, install your adapter before you install the operating system. See Chapter 5, "Installing the Gigabit Fibre Channel PCI Adapter," on page 15. When you install AIX, your device driver software automatically installs.

If AIX is operating on your system, install your device driver software before you install your adapter. Chapter 3, "Installing the Device Driver on an RS/6000 and pSeries System," on page 7 and Chapter 4, "Installing the Device Driver Software on an RS/6000 SP System," on page 9 provide information on how to install the device driver software.

Note: The instructions in Chapter 3, "Installing the Device Driver on an RS/6000 and pSeries System," on page 7 and Chapter 4, "Installing the Device Driver Software on an RS/6000 SP System," on page 9 pertain to the AIX operating system. If you have another operating system installed, refer to your operating system documentation for information about installing the device driver software and configuring your system.

Checking Prerequisites

To install a Gigabit Fibre Channel PCI Adapter, you need the following on hand:
* The system unit documentation
* The operating system documentation
* A flat-blade screwdriver
* Media containing device driver software

Proceeding With the Installation

To proceed with the installation of the Gigabit Fibre Channel PCI Adapter, select the *one* procedure from the following list that describes the particulars of this installation:
* If you are installing the Gigabit Fibre Channel PCI Adapter in a system on which the AIX operating system is *not* yet installed, proceed directly to Chapter 5, "Installing the Gigabit Fibre Channel PCI Adapter," on page 15.
* If you are installing the Gigabit Fibre Channel PCI Adapter in an RS/6000 SP system on which AIX is already installed, proceed directly to Chapter 4, "Installing the Device Driver Software on an RS/6000 SP System," on page 9.
* If you are installing the Gigabit Fibre Channel PCI Adapter in an RS/6000 or pSeries system on which AIX is already installed, proceed directly to Chapter 3, "Installing the Device Driver on an RS/6000 and pSeries System," on page 7.

Chapter 3. Installing the Device Driver on an RS/6000 and pSeries System

This chapter explains how to install device driver software on an RS/6000 and pSeries (not an RS/6000 SP) system unit.

Note: If the adapter was installed prior to the installation of the AIX operating system, do not continue with this section. The device driver software was automatically installed with AIX. Proceed to "Verifying the Installation" on page 15.

Each Fibre Channel adapter requires a different device driver. To determine the correct device driver for your adapter, see the following table.

Adapter	Device Driver
Gigabit Fibre Channel PCI Adapter (FC 6227, Type 4-S)	devices.pci.df1000f7
2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (FC 6228, Type 4-W)	devices.pci.df1000f9
2 Gigabit Fibre Channel PCI-X Adapter (FC 6239, Type 5704)	devices.pci.df1080f9
2 Gigabit Fibre Channel PCI-X Adapter (FC 5716, Type 280B)	devices.pci.df1000fa

If you are installing the adapter in a system that already has AIX installed, proceed with the software installation and perform the following steps:

1. Ensure that the system unit power is on.
2. Log in as root user.
3. Insert the media containing the device driver software (for example, CD-ROM) into the appropriate media device.
4. Type the following:

       smitty devinst

5. Press Enter.
6. The Install Additional Device Software menu is displayed, and the **INPUT device/directory for software** option is highlighted.
7. Select or type *your input device*:
   - Press F4 for a list of devices and select the correct device. Press Enter.

     OR

   - Type the *name of the input device* you are using in the entry field and press Enter (for example, CD-ROM).
8. The Install Additional Device Software menu is expanded, and the **SOFTWARE to install** option is highlighted.
9. Press F4 to display the SOFTWARE to install menu.
10. Type the following to display the Find window:

        /

11. To find the device driver for your adapter, do the following:
    - For adapter Type 4-S, type `devices.pci.df1000f7`
    - For adapter Type 4-W, type `devices.pci.df1000f9`
    - For adapter Type 5704, type `devices.pci.df1080f9`
    - For adapter Type 280B, type `devices.pci.df1000fa`

    Press Enter. The system will find and highlight the device driver software, for example, for adapter Type 4-S:

```
devices.pci.df1000f7                    ALL
```

12. Press F7 to select the highlighted device driver software.

13. Repeat steps 10 through 12 for:
```
devices.common.IBM.fc
```

14. Repeat steps 10 through 12 for each of any other device drivers you need to install.

    Examples of additional device drivers for other devices you may be installing include:

    • devices.fcp.disk

    • devices.fcp.tape

    • devices.fcp.disk.array

15. Press Enter. The Install Additional Device Software menu displays again. The entry data fields are automatically updated. Press Enter to accept the values.

16. The ARE YOU SURE pop-up window displays. Press Enter to continue with the installation.

17. The **COMMAND STATUS** is displayed. After the installation process has completed, **OK** will be displayed. Scroll to the bottom to view the results to ensure that the installation was successful.

18. Remove the installation media from the drive.

19. Press F10 to exit SMIT.

20. Proceed to Chapter 5, "Installing the Gigabit Fibre Channel PCI Adapter," on page 15.

Chapter 4. Installing the Device Driver Software on an RS/6000 SP System

This chapter explains how to install the device driver on an AIX SP system on which AIX is already installed.

Note: If the adapter was installed prior to the installation of the AIX operating system, do not continue with this section. The device driver software was automatically installed with AIX. Proceed to "Verifying the Installation" on page 15.

Installing device drivers in an SP system is complicated by two factors. First, the SP nodes normally do not have CD-ROM or diskette devices. Secondly, it is often necessary, or at least desirable, to install the device drivers on multiple nodes.

- To overcome the first problem, place the installable images on the SP system's control workstation, and then install them on the target nodes from there.
- To overcome the second problem, use the **dsh** (distributed shell) command, which enables the execution of commands on multiple nodes simultaneously. This provides significant advantage over using **telnet** or **rlogin** to install the device drivers on a node-by-node basis. Refer to the *Parallel System Support Program for AIX Administration Guide*, order number GC23-3897 or *PSSP: Command and Technical Reference*, order number GC23-3900 for details on using the **dsh** command.

Note: To use the **dsh** command, the Kerberos ticket for the SP system must be current. If you are unsure whether the Kerberos ticket is current, consult the system administrator for the system on which the installation is to occur.

To complete the installation of the device drivers on the node(s) of an SP system, perform the following steps:

1. Set up for the **dsh** command, that is, set up the working collective file in the control workstation.
2. Check prerequisites on the system nodes by using the **dsh** command.
3. Create an installable device driver image on the control workstation.
4. Install the device drivers on the system nodes by using the **dsh** command.

If the site setup precludes the use of the **dsh** command, install the device drivers on each node individually. To do so, **telnet** to each node and perform the steps in the various procedure sections below, omitting the **dsh** prefix. If only a few nodes are involved, you can use the **dsh** command without using the working collective file. Use the **-w** option to include the node names within the command. For example, to determine the AIX level on three nodes, run the following command:

```
dsh -w [nodename1,nodename2,nodename3] oslevel
```

where the actual node names are substituted for [nodename1], [nodename2], and [nodename3].

Note: In the following instructions, brackets are used to indicate that the user must supply actual values for input, or that the system will supply actual values for output.

Proceed with the device driver installation, starting with "Setting Up and Checking System Prerequisites" on page 10 and perform the following tasks on the control workstation.

Setting Up and Checking System Prerequisites

Each Fibre Channel adapter requires a different device driver. To determine the correct device driver for your adapter, see the following table.

Adapter	Device Driver
Gigabit Fibre Channel PCI Adapter (FC 6227, Type 4-S)	devices.pci.df1000f7
2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (FC 6228, Type 4-W)	devices.pci.df1000f9
2 Gigabit Fibre Channel PCI-X Adapter (FC 6239, Type 5704)	devices.pci.df1080f9
2 Gigabit Fibre Channel PCI-X Adapter (FC 5716, Type 280B)	devices.pci.df1000fa

Do the following to check system prerequisites:

1. Log in to the control workstation as root user.
2. If there are several nodes involved, and you are going to use the **dsh** command with a working collective file, perform the following steps:
   a. Go to a temporary directory by typing:

      ```
      cd /tmp
      ```

      Press Enter.
   b. Create the working collective file containing a list of the relevant nodes on which to perform the update in preparation for the **dsh** command.

      Type the following commands on the AIX command line (substituting actual node names for each [nodenameN]). Press Enter after each line:

      ```
      cat >group1
      [nodename1]
      [nodename2]
      [nodename3]
            .
      [nodenameN]
      CTRL-D
      export WCOLL=/tmp/group1
      ```

   c. Test the working collective file by typing:

      ```
      dsh date
      ```

      Press Enter. The results should include a line for each node in the list, where [nodename1 - N] will be the actual node names, and should be similar to:

      ```
      [nodename1]:  Wed Nov 10 10:37:46 EST 1999
      [nodename2]:  Wed Nov 10 10:37:46 EST 1999
      [nodename3]:  Wed Nov 10 10:37:47 EST 1999
            .
      [nodenameN]:  Wed Nov 10 10:37:48 EST 1999
      ```

      If the list does not include all (and only) the required system nodes, examine the **group1** file you created in step 2b to ensure that it contains the correct and complete list.
3. Determine if the AIX operating system on each relevant node is at the required level by typing:

   ```
   dsh oslevel
   ```

   ```
   OR
   ```

   without the working collective file

   ```
   dsh -w [nodename1,nodename2,nodename3] oslevel
   ```

   where the actual node names are substituted for [nodename1, 2, and 3]. Press Enter.

   See "Software Requirements" on page 3 for AIX level requirements for the adapter you are installing. If the nodes are *not* at a supported AIX level, upgrade the AIX level on the nodes. Contact the system administrator for assistance.

4. Determine if the PSSP level on the system is at the required level by typing:

```
/usr/lpp/ssp/bin/splstdata -G -b
```

Press Enter. The results are in a form similar to the following:

```
node#  hostname        hdw_enet_addr srvr   response              install_disk
last_install_image   last_install_time     next_install_image  lppsource_name
                                                                      pssp_ver
------------------------------------------------------------------------------
1 eion01.ppd.pok.i    08005A75A6D4    0     disk                        hdisk0
default                Fri_Mar_12_10:41:23   default                [lppsource]
                                                                   [pssp_level]
```

Perform the following steps:

a. Examine the value of [pssp_level]. This is the PSSP level installed on the system. If the system is not at the required level of 3.1.1 and higher , it must be upgraded before proceeding. Contact the system administrator for assistance.

b. Record the value of [lppsource] for the system. This value is the name of the LPP source directory for device driver installation. You will need this name for later steps.

5. Determine if the installable image for the device driver is already present in the LPP source directory by typing the following command:

```
cd  /spdata/sys1/install/[lppsource]
```

substituting the directory name which was recorded in step 4b for [lppsource].

a. Once in this directory, type the following command:

```
ls devices.pci.df10*
```

   - If devices.pci.df1000f7 is returned, the device driver image for the Gigabit Fibre Channel PCI Adapter (FC 6227, Type 4-S) is present.
   - If devices.pci.df1000f9 is returned, the device driver image for the 2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (FC 6228, Type 4-W) is present.
   - If devices.pci.df1080f9 is returned, the device driver image for the 2 Gigabit Fibre Channel PCI-X Adapter (FC 6239, Type 5704) is present.
   - If devices.pci.df1000fa is returned, the device driver image for the 2 Gigabit Fibre Channel PCI-X Adapter (FC 5716, Type 280B) is present.
   - If nothing is returned, neither image is present.

b. Type the following command:

```
ls devices.common.IBM.fc
```

c. Repeat Step 5b for all device drivers for Fibre Channel devices you are installing. Other image names you may need to perform the **ls** command for are:
   - devices.fcp.disk
   - devices.fcp.tape
   - devices.fcp.disk.array

If the required device driver images are *not* in the LPP source directory, proceed to "Creating an Installable Image on the Control Workstation" to create the image.

If the required device driver images *are* already in the LPP source directory, proceed to "Finalizing Preparations for Device Driver Installation" on page 12 to finalize preparations for installation.

Creating an Installable Image on the Control Workstation

Do the following to create an installable image on the control workstation:

Note: If your system is *partitioned* (that is, there is more than one operating system among the nodes), you may *only* install this adapter in nodes that are at the required AIX level.

1. If you are not already logged in to the control workstation as root user, do so now. You may also need to export the working collective. Refer to "Setting Up and Checking System Prerequisites" on page 10.
2. Insert the installation media into the control workstation's drive.
3. Transfer the files to the control workstation's LPP source, as follows:

   a. Type the following:

      ```
      smitty bffcreate
      ```

      Press Enter.

   b. Select **INPUT device/directory for software**. In the entry field, type the following:

      ```
      /spdata/sys1/install/[lppsource]
      ```

      substituting the directory name which was recorded in step 4b on page 11 for [lppsource]. Press Enter.

   c. Move the cursor to the **SOFTWARE package to copy** option and press F4 to select the software to be installed. Use the F7 key to select the required device drivers.

      • For adapter Type 4-S, select `devices.pci.df1000f7`
      • For adapter Type 4-W, select `devices.pci.df1000f9`
      • For adapter Type 5704, select `devices.pci.df1080f9`
      • For adapter Type 280B, select `devices.pci.df1000fa`

   d. Use the F7 key to select the following device driver:

      ```
      devices.pci.common.IBM.fc
      ```

   e. Repeat Step 3d for any other device drivers that you may need. These may include:

      • devices.fcp.disk
      • devices.fcp.disk.array
      • devices.fcp.tape

      Press Enter.

   f. Move the cursor down to **DIRECTORY for storing the software package** and enter the appropriate LPP source destination directory:

      ```
      /spdata/sys1/install/[lppsource]
      ```

      substituting the directory name that was recorded in step 4b on page 11 for [lppsource]. Press Enter to begin copying the files.

      Note: This step may take several minutes while the directory table of contents is updated.

   Continue to the next section, "Finalizing Preparations for Device Driver Installation."

Finalizing Preparations for Device Driver Installation

Do the following to finalize preparations for device driver installation:

1. Update the SPOT (Shared Product Object Tree).

   a. Type the following:

      ```
      smitty nim_res_op
      ```

      The Resource Name panel displays with

      ```
      boot           resources    boot
      ```

      highlighted.

   b. Move the cursor down until the SPOT resource is highlighted. The SPOT resource should look similar to:

```
        spot_AIX433    resources    spot_[lppsource]
```

where [lppsource] is the directory name recorded in step 4b on page 11.

c. When the SPOT resource is highlighted, press Enter to select this option. The Network Install Operation to Perform panel displays with the **reset** option highlighted for selection.

d. Move the cursor until the **cust** option is highlighted. Press Enter to select this option. The Customize a SPOT panel displays with the **Source of Install Images** highlighted for selection.

e. Press F4 to display the list of installation images and select the appropriate LPP source directory. Move the cursor until the appropriate LPP source directory is displayed. For example:

```
        lppsource_AIX433    resources    [lppsource]
```

where [lppsource] is the name of the directory recorded in step 4b on page 11. Press Enter.

f. Move the cursor to **fileset names** and do the following:

- For adapter Type 4-S, type `devices.pci.df1000f7`
- For adapter Type 4-W, type `devices.pci.df1000f9`
- For adapter Type 5704, type `devices.pci.df1080f9`
- For adapter Type 280B, select `devices.pci.df1000fa`

Press Enter to start the SPOT update. This operation can take up to 15 minutes.

g. Repeat step 1f for each device you want to install, for example:

```
        devices.common.ibm.fc
        devices.fcp.disk
        devices.fcp.disk.array
        devices.fcp.tape
```

2. Determine if the software is already installed on the node(s). Type the following commands one line at a time, including the quotation marks, at the AIX command prompt. Press Enter after each line.

For adapter Type 4-S:

```
        dsh "lslpp -l devices.pci.df1000f7\ 2>&1" |more
```

For adapter Type 4-W:

```
        dsh "lslpp -l devices.pci.df1000f9\ 2>&1" |more
```

For adapter Type 5704:

```
        dsh "lslpp -l devices.pci.df1080f9\ 2>&1" |more
```

For adapter Type 280B:

```
        dsh "lslpp -l devices.pci.df1000fa\ 2>&1" |more
```

And continue for other device drivers being installed, such as:

```
        dsh "lslpp -l devices.common.IBM.fc\ 2>&1" |more
        dsh "lslpp -l devices.fc.disk\ 2>&1" |more
        dsh "lslpp -l devices.fc.disk.array\ 2>&1" |more
        dsh "lslpp -l devices.fc.tape\ 2>&1" |more
```

If the device driver *is* already installed on the node(s), contact your service provider to have the adapter(s) installed. There is no need to continue with the device driver installation.

3. If the device driver is *not* installed on the node(s), proceed to section "Installing Device Drivers on the RS/6000 SP System Nodes."

Installing Device Drivers on the RS/6000 SP System Nodes

Do the following to install device drivers on the SP system nodes:

1. Ensure that the LPP source directory is exported to the nodes by typing the following:

```
        showmount -e
```

The result should be similar to the following:

```
        /spdata/sys1/install/[lppsource] (everyone)
```

where [lppsource] is the name of the directory recorded in step 4b on page 11.

2. If the directory is not exported, you may temporarily export the directory by typing:

```
exportfs -i /spdata/sys1/install/[lppsource]
```

substituting the directory name which was recorded in step 4b on page 11 for [lppsource].

3. Perform an NFS mount of the LPP source directory by typing:

```
dsh mount [controlwks]:/spdata/sys1/install/[lppsource] /mnt
```

substituting the directory name which was recorded in step 4b on page 11 for [lppsource], and substituting the name of the Control Workstation for [controlwks].

4. Perform a preview of the files to be installed on the nodes. Type the following commands one line at a time, including the quotation marks, at the AIX command prompt. Press Enter after each line.

For adapter Type 4-S:

```
dsh "lslpp -l devices.pci.df1000f7\ 2>&1" |more
```

For adapter Type 4-W:

```
dsh "lslpp -l devices.pci.df1000f9\ 2>&1" |more
```

For adapter Type 5704:

```
dsh "lslpp -l devices.pci.df1080f9\ 2>&1" |more
```

For adapter Type 280B:

```
dsh "lslpp -l devices.pci.df1000fa\ 2>&1" |more
```

And continue for other device drivers being installed, such as:

```
dsh "lslpp -l devices.common.IBM.fc\ 2>&1" |more
dsh "lslpp -l devices.fc.disk\ 2>&1" |more
dsh "lslpp -l devices.fc.disk.array\ 2>&1" |more
dsh "lslpp -l devices.fc.tape\ 2>&1" |more
```

5. Perform the device driver installation. Type the following commands one line at a time, including the quotation marks, at an AIX command prompt. Press Enter after each line.

For adapter Type 4-S:

```
dsh "installp -p acgqXd /mnt devices.pci.df1000f7 2>&1"| more
```

For adapter Type 4-W:

```
dsh "installp -p acgqXd /mnt devices.pci.df1000f9 2>&1"| more
```

For adapter Type 5704:

```
dsh "installp -p acgqXd /mnt devices.pci.df1080f9 2>&1"| more
```

For adapter Type 280B:

```
dsh "installp -p acgqXd /mnt devices.pci.df1000fa 2>&1"| more
```

And continue for other device drivers being installed, such as:

```
dsh "installp -p acgqXd /mnt devices.common.IBM.fc 2>&1"| more
dsh "installp -p acgqXd /mnt devices.fcp.disk 2>"&1| more
dsh "installp -p acgqXd /mnt devices.fcp.disk.array 2>&1"| more
dsh "installp -p acgqXd /mnt devices.fcp.tape 2>"&1| more
```

6. When device driver installation is complete on the node(s), contact your service provider to have the adapter(s) installed.

Chapter 5. Installing the Gigabit Fibre Channel PCI Adapter

This chapter provides instructions for installing the Gigabit Fibre Channel PCI Adapter (Type 4-S), 2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (Type 4-W), and 2 Gigabit Fibre Channel PCI-X Adapter (Type 5704 and 280B) adapters. All references to ″Gigabit Fibre Channel PCI Adapter″ apply to all adapters, unless otherwise noted.

Attention: Be sure you have read "Handling Static-Sensitive Devices" on page vii before handling your Gigabit Fibre Channel PCI Adapter. Do not remove the Gigabit Fibre Channel PCI Adapter from its anti-static package at this time.

Installing the Adapter

To install the adapter, do the following:

1. Be sure you have read Chapter 2, "Preparing to Install a Gigabit Fibre Channel PCI Adapter," on page 5 to determine:
   - If you should install your adapter hardware first
   - If you should install your device driver software first
2. If you should install your adapter hardware first, go to step 4 and continue with this section.
3. If you should install your device driver software first, refer to either Chapter 3, "Installing the Device Driver on an RS/6000 and pSeries System," on page 7 or Chapter 4, "Installing the Device Driver Software on an RS/6000 SP System," on page 9. Return here to install your hardware.
4. Refer to your system unit documentation to perform the following:
   a. Shut down your system unit.
   b. Install the adapter into your system unit in any primary PCI bus.
5. After the installation is complete, connect the cable to the adapter.
6. Turn on your system unit. Go to "Verifying Hardware Installation."

Verifying the Installation

Verify the initial installation by using the following procedures:
- Verify Hardware Installation (lsdev)
- Verify AIX Software Installation (lslpp)

Verifying Hardware Installation

To verify that your system unit recognizes the Gigabit Fibre Channel PCI Adapter, do the following:

1. If necessary, log in as root user.
2. Type:
   ```
   lsdev -C | grep fcs
   ```
3. Press Enter.

   Possible results are as follows:
   - If the adapter did install, the following is an example of the data that displays on your screen:
     ```
     fcs0 Available 20-60
     ```
     If more than one Gigabit Fibre Channel PCI Adapter is installed, one line of output displays for each adapter.
   - If the message on your screen indicates your adapter is `Defined` instead of `Available`, shut down your machine. Check the adapter to ensure that it is installed correctly. Go to Chapter 5, "Installing the Gigabit Fibre Channel PCI Adapter," and return to "Verifying Hardware Installation" and repeat steps 1-3.

Note: If the message on your screen indicates your adapter is `Defined` a second time, it may be necessary to contact your service representative.

- If no data displays on your screen, two possible problems exist:
    - The device drivers did not install. Go to "Verifying AIX Software Installation."
    - The adapter did not install correctly. Go to Chapter 5, "Installing the Gigabit Fibre Channel PCI Adapter," on page 15, and return to "Verifying Hardware Installation" on page 15 and repeat steps 1-3.

        If that is not the problem, check your adapter installation. Go to Chapter 3, "Installing the Device Driver on an RS/6000 and pSeries System," on page 7 or Chapter 4, "Installing the Device Driver Software on an RS/6000 SP System," on page 9.

Verifying AIX Software Installation

To verify that the device driver for the adapter is installed, do the following:

1. If necessary, log in as **root** user, and do the following:
    - For adapter Type 4-S, type `lslpp -h | grep -p df1000f7`
    - For adapter Type 4-W, type `lslpp -h | grep -p df1000f9`
    - For adapter Type 5704, type `lslpp -h | grep -p df1080f9`
    - For adapter Type 280B, type `lslpp -h | grep -p df1000fa`
2. Press Enter.

    Possible results are as follows:

    - If the device driver is installed, the following is an example of the data that displays on your screen:

```
devices.pci.df1000f7.rte
            5.1.0.0    COMMIT    COMPLETE    10/01/01    11:59:10
devices.pci.df1000f7.com
            5.1.0.0    COMMIT    COMPLETE    10/01/01    11:59:10
devices.fcp.disk.array.rte
            5.1.0.0    COMMIT    COMPLETE    10/01/01    11:59:21
devices.pci.df1000f7.diag
            5.1.0.0    COMMIT    COMPLETE    10/01/01    11:59:11
devices.fcp.disk.array.diag
            5.1.0.0    COMMIT    COMPLETE    10/01/01    11:59:22
```

Note: The above data is for the Gigabit Fibre Channel PCI Adapter (Feature 6227, Type 4-S). If you installed the device driver for the 2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (Feature 6228, Type 4-W), the data displayed will be `df1000f9` instead of `df1000f7`. If you installed the device driver for the 2 Gigabit Fibre Channel PCI-X Adapter (Feature 6239, Type 5704 or 280B), the data displayed will be `df1080f9` or `df1000fa`, respectively, instead of `df1000f7`

If this data displays on your screen but you continue to have problems, go to Chapter 5, "Installing the Gigabit Fibre Channel PCI Adapter," on page 15.

- If no data displays on your screen, the adapter device driver did not install correctly. Return to Chapter 3, "Installing the Device Driver on an RS/6000 and pSeries System," on page 7 or Chapter 4, "Installing the Device Driver Software on an RS/6000 SP System," on page 9.

Configuring the Adapter using SMIT

This section provides instructions for configuring options for the Gigabit Fibre Channel PCI Adapter.

Use SMIT to configure options as follows:

1. Log in as root user.
2. To start SMIT, type:

```
        smit
```

Press Enter.

3. Select **Devices**.

Gigabit Fibre Channel Adapter Configuration

To configure the Gigabit Fibre Channel (FC) Adapter, do the following:

1. Select the **FC Adapter** section.

   FC Adapter Configurable Options are displayed on the screen.

2. Select **Change/Show Characteristics**.

   A list of configurable FC Adapter options is displayed.

```
                    Change/Show Characteristics of a FC Adapter

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                    [Entry Fields]
  FC Adapter                                        fcs0
  Description                                       FC Adapter
  Status                                            Available
  Location                                          20-58
  Maximum number of COMMANDS to queue to the adapter [200]+#
  Maximum Transfer Size                             [0x100000]+
  Preferred AL_PA                                   [0x1]+
  INIT Link flags                                   [al]+
  Apply change to DATABASE only                      no+
```

Configuration Options

The FC Adapter has the following configuration options:

• Maximum Number of Commands to Queue to the Adapter

• Maximum Transfer Size

• Preferred AL_PA

• INIT Link Flags (AIX Version 5.1 only)

Maximum Number of Commands to Queue to the Adapter: Use this option to adapt to various memory/system conditions. The default is 200, but you can conserve memory at the expense of performance by reducing this number to as low as 20. If you have sufficient memory, the maximum is 1024 for a Gigabit Fibre Channel PCI Adapter (Type 4-S). The maximum is 2048 for a 2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (Type 4-W).

If the SCSI target device is connected to the host through a SAN Data Gateway (SDG), this parameter cannot exceed the SDG limit of 240 (SAN Data Gateway is a SCSI-to-Fibre Channel bridge).

Maximum Transfer Size: The default is 256 kilobytes, which is the largest single transfer size. For tape, transfers of 2 megabytes or more are possible. The range is 256 kilobytes to 16 megabytes.

Preferred AL_PA: The preferred AL_PA (Arbitrated Loop Physical Address) value is the address that the adapter requests at the beginning of every LIP (Loop Initialization Process). This configuration option must be used to set a unique AL_PA for each adapter in an Arbitrated Loop.

No two devices on a loop should have the same Preferred AL_PA. The outcome of arbitration would be random and would result in permanent I/O errors.

Every device on a loop must have unique AL_PAs. To maximize efficiency, hosts must have low AL_PAs for higher loop priorities. Targets must have higher AL_PAs for lower priorities.

INIT Link Flags: This option is available for AIX 5.1 and later. This must be configured for AL (Arbitrated Loop) mode.

Applying Changes to Database Only
The default is No for the Apply Changes to Database Only field. If the field is No, the ODM database is changed and the device is unconfigured and reconfigured.

If the field is Yes, only the ODM database is changed. Configuration changes are not applied to the device until it is unconfigured and reconfigured, or the system is rebooted.

Information Fields
The rest of the FC Adapter's Change/Show Characteristics screen contains the following information:

FC Adapter: Parent FC adapter driver instance's identification.

Description: Description of the parent FC adapter driver.

Status: Parent adapter driver's current status. *Available* indicates that the driver and its adapter are functioning.

Location: Location code of the FC adapter driver. The parent adapter driver instance *fcsX* will have for its location code the first two values of this three-value location code. For example, if the parent FC adapter driver instance (fcs0) has a location code of 20-58, all children will have the location code of 20-58-01.

Fibre Channel SCSI Protocol Driver Configuration
To configure the Fibre Channel (FC) SCSI protocol driver, do the following:
1. Select the **FC SCSI Protocol Driver** section.

    FC SCSI Protocol Driver Options are displayed on the screen.
2. Select **Change/Show Device Characteristics**.

    A list of configurable FC SCSI Protocol Device options is displayed.

```
            Change/Show Characteristics of a FC SCSI Protocol Device

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                            [Entry Fields]
   FC SCSI virtual device                 fscsi0
   Description                            FC SCSI I/O Controller
   Status                                 Available
   Location                               20-58-01
   Adapter SCSI ID                        0x1
   How this adapter is CONNECTED          al
   FC Class for Fabric                    [3] +
   Apply change to DATABASE only          no+
```

Configuration Options
The FC SCSI Protocol Device has the following configuration option:

FC Class for Fabric: This option is available for AIX 5.1 and later. The default is for class 3 operation. Class 2 is not currently supported. The FC Class for Fabric is the only configurable field.

Applying Changes to Database Only

The default is No for the Apply Changes to Database Only field. If the field is No, the ODM database is changed and the device is unconfigured and reconfigured.

If the field is Yes, only the ODM database is changed. Configuration changes are not applied to the device until it is unconfigured and reconfigured, or the system is rebooted.

Information Fields

The rest of the FC SCSI Protocol Device's Change/Show Characteristics screen contains the following information:

FC SCSI virtual device: Adapter's identification as a virtual device.

Description: Description of the virtual device.

Status: Virtual device's current status. *Available* means the device is functioning.

Location: Location code of the FC SCSI Protocol Driver. All children of this protocol device will have the same value for location. The parent adapter driver instance *fcsX* instance will have for its location code the first two values of this three-value location code. So, for example, if Location is 20-58-01 for fscsi0, all children will have the location code of 20-58-01, and the parent FC adapter driver instance (for example, fcs0) will have a location code of 20-58.

Adapter SCSI ID: This is the adapter's SCSI ID (identical to the N_Port ID in the Fibre Channel).

How this adapter is CONNECTED: This field indicates either *al* if connected to an arbitrated loop, or *sw* if connected to a switch.

Chapter 6. Gigabit Fibre Channel PCI Adapter Interface

The Gigabit Fibre Channel PCI Adapter (Type 4-S), 2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (Type 4-W), and 2 Gigabit Fibre Channel PCI-X Adapter (Type 5704 and 280B) connect host systems to a storage subsystem through a Fibre Channel interface.

Adapter LEDs

The adapters have two LEDs: green and yellow, both located near the connectors. These LEDs can be used to determine the state of the adapter.

The following table provides LED information for the Gigabit Fibre Channel PCI Adapter (Type 4-S).

Gigabit Fibre Channel PCI Adapter (Type 4-S)		
Green LED	**Yellow LED**	**State**
Off	Off	Wake up failure (dead board)
Off	On	POST failure (dead board)
Off	Slow blink	Wake up failure
Off	Fast blink	Failure in POST
Off	Flashing	POST processing in progress
On	Off	Failure while functioning
On	On	Failure while functioning
On	Slow blink	Normal - inactive
On	Flashing	Normal - active
On	Fast blink	Normal - busy
Slow blink	Off	Normal - link down or not yet started
Slow blink	Slow blink	Off line for download
Slow blink	Fast blink	Restricted off-line mode (waiting for restart)

The following table provides LED information for the 2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (Type 4-W).

2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (Type 4-W)		
Green LED	**Yellow LED**	**State**
Off	Off	Wake up failure (dead board)
Off	On	POST failure (dead board)
Off	Slow blink	Wake up failure monitor
Off	Fast blink	Failure in POST
Off	Flashing	POST processing in progress
On	Off	Failure while functioning
On	On	Failure while functioning
On	Slow blink	1 Gb link rate - normal, link up
On	Fast blink	2 Gb link rate - normal, link up
Slow blink	Off	Normal, link down
Slow blink	On	Not defined

2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (Type 4-W)		
Green LED	**Yellow LED**	**State**
Slow blink	Slow blink	Off line for download
Slow blink	Fast blink	Restricted off-line mode, waiting for restart
Slow blink	Flashing	Restricted off-line mode, test active
Fast blink	Off	Debug monitor in restricted mode
Fast blink	On	Not defined
Fast blink	Slow blink	Debug monitor in text fixture mode
Fast blink	Fast blink	Debug monitor in remote debug mode
Fast blink	Flashing	Debug monitor output active

The following table provides LED information for the 2 Gigabit Fibre Channel PCI-X Adapter (Type 5704 and 280B).

2 Gigabit Fibre Channel PCI-X Adapter (Type 5704 and 280B)		
Green LED	**Yellow LED**	**State**
Off	Off	Wake up failure (dead board)
Off	On	POST failure (dead board)
Off	Slow blink	Wake up failure monitor
Off	Fast blink	Failure in POST
Off	Flashing	POST processing in progress
On	Off	Failure while functioning
On	On	Failure while functioning
On	Slow blink	1 Gb link rate - normal, link up
On	Fast blink	2 Gb link rate - normal, link up
Slow blink	Off	Normal, link down
Slow blink	On	Not defined
Slow blink	Slow blink	Off line for download
Slow blink	Fast blink	Restricted off-line mode, waiting for restart
Slow blink	Flashing	Restricted off-line mode, test active
Fast blink	Off	Debug monitor in restricted mode
Fast blink	On	Not defined
Fast blink	Slow blink	Debug monitor in text fixture mode
Fast blink	Fast blink	Debug monitor in remote debug mode
Fast blink	Flashing	Not defined

Product Descriptions

The Fibre Channel-PCI Host Adapters (PCIHA) are configured for fibre media by the installed Gigabit Link Module (GLM).

Product Summaries

Gigabit Fibre Channel PCI Adapter (Type 4-S)

Host Interface
PCI 32-bit, 5V or 3.3V signaling

Fiber Channel Interfaces
FC-PH compliant, optical short wave, multimode: Non-OFC, 1062.5 Mb/s-SC connectors

Compatible Cables
Multimode 50/125 micron fiber with SC connectors: 1062.5 Mb/s:2m - 500m Multimode 62.5/125 micron fiber with SC connectors: 1062.5 Mb/s:2m - 175m

2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (Type 4-W)

Host Interface
PCI 64-bit, 5V or 3.3V signaling

Fiber Channel Interfaces
FC-PH/PI compliant, optical short wave, multimode: Non-OFC, LC connectors

Compatible Cables
Multimode 50/125 micron fiber with LC connectors: 1062.5 Mb/s:2m - 500m
Multimode 62.5/125 micron fiber with LC connectors: 1062.5 Mb/s:2m - 175m
Multimode 50/125 micron fiber with LC connectors: 2 Gb/s:2m - 300m
Multimode 62.5/125 micron fiber with LC connectors: 2 Gb/s:2m - 150m
FC 2456, IBM FRU PN 11P1373, LC-SC Converter Cable
LC Multimode/single mode wrap plug PN 11P3847

2 Gigabit Fibre Channel PCI-X Adapter (Type 5704 and 280B)

Host Interface
PCI-X 64-bit, 3.3V signaling (5V tolerant)

Fiber Channel Interfaces
FC-PH compliant, optical short wave, multimode: Non-OFC, LC connectors

Compatible Cables
Multimode 50/125 micron fiber with LC connectors: 1062.5 Mb/s:2m - 500m
Multimode 62.5/125 micron fiber with LC connectors: 1062.5 Mb/s:2m - 175m
Multimode 50/125 micron fiber with LC connectors: 2 Gb/s:2m - 300m
Multimode 62.5/125 micron fiber with LC connectors: 2 Gb/s:2m - 150m
FC 2456, IBM FRU PN 11P1373, LC-SC Converter Cable
LC Multimode/single mode wrap plug PN 11P3847

Cables

The tables in this section provide FRU part numbers for various Fibre Channel cable length and connector combinations.

Use the following table for information about multimode 50 micron LC to LC cables.

Multimode 50 micron LC to LC Cables				
Part Number	EC	Description	Vendor	Cable Rating
11P1336	H24870	Cable Asm: 2 meter	CCI/Fujikura	Riser
11P1337	H24870	Cable Asm: 7 meter	CCI/Fujikura	Riser

Multimode 50 micron LC to LC Cables				
Part Number	EC	Description	Vendor	Cable Rating
11P1338	H24870	Cable Asm: 13 meter	CCI/Fujikura	Riser
11P1339	H24870	Cable Asm: 22 meter	CCI/Fujikura	Riser
11P1340	H24870	Cable Asm: 31 meter	CCI/Fujikura	Riser
11P1341	H24870	Cable Asm: 46 meter	CCI/Fujikura	Riser
11P1342	H24870	Cable Asm: 61 meter	CCI/Fujikura	Riser
11P1343	H24870	Cable Asm: Custom Length	CCI/Fujikura	Riser

Use the following table for information about multimode 50 micron LC to SC cables.

Multimode 50 micron LC to SC Cables				
Part Number	EC	Description	Vendor	Cable Rating
11P1344	H24870	Cable Asm: 2 meter	CCI/Fujikura	Riser
11P1345	H24870	Cable Asm: 7 meter	CCI/Fujikura	Riser
11P1346	H24870	Cable Asm: 13 meter	CCI/Fujikura	Riser
11P1347	H24870	Cable Asm: 22 meter	CCI/Fujikura	Riser
11P1348	H24870	Cable Asm: 31 meter	CCI/Fujikura	Riser
11P1349	H24870	Cable Asm: 46 meter	CCI/Fujikura	Riser
11P1350	H24870	Cable Asm: 61 meter	CCI/Fujikura	Riser
11P1351	H24870	Cable Asm: Custom Length	CCI/Fujikura	Riser

Appendix A. Communications Statements

The Gigabit Fibre Channel PCI Adapter (Type 4-S) is a Class B device. For complete details, see "Gigabit Fibre Channel PCI Adapter (Type 4-S) Communications Statements," below.

The 2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (Type 4-W) is a Class A device. For complete details, see "2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (Type 4-W) Communications Statements" on page 27.

The 2 Gigabit Fibre Channel PCI-X Adapter (Type 5704 and 280B) is a Class A device. For complete details, see "2 Gigabit Fibre Channel PCI-X Adapter (Type 5704 and 280B) Communications Statements" on page 29.

Gigabit Fibre Channel PCI Adapter (Type 4-S) Communications Statements

The Gigabit Fibre Channel PCI Adapter (Type 4-S) is a Class B device.

The following statement applies to this product. The statement for other products intended for use with this product appears in their accompanying documentation.

Communications Statements

The following statement applies to this product. The statement for other products intended for use with this product appears in their accompanying documentation.

Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the 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 instructions, 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:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from authorized dealers. Neither the provider nor the manufacturer are responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:

- International Business Machines Corporation
- New Orchard Road
- Armonk, New York 10504
- Telephone: (919) 543-2193

FC Tested to Comply
With FCC Standards

FOR HOME OR OFFICE USE

European Union (EU) Statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. The manufacturer cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards supplied by third parties. Consult with your dealer or sales representative for details on your specific hardware.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with IEC Standard 950.

United Kingdom Telecommunications Safety Requirements

This equipment is manufactured to the International Safety Standard EN60950 and as such is approved in the UK under the General Approval Number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.

The network adapter interfaces housed within this equipment are approved separately, each one having its own independent approval number. These interface adapters, supplied by the manufacturer, do not use or contain excessive voltages. An excessive voltage is one which exceeds 70.7 V peak ac or 120 V dc. They interface with this equipment using Safe Extra Low Voltages only. In order to maintain the separate (independent) approval of the manufacturer's adapters, it is essential that other optional cards, not supplied by the manufacturer, do not use main voltages or any other excessive voltages. Seek advice from a competent engineer before installing other adapters not supplied by the manufacturer.

Avis de conformité aux normes du ministère des Communications du Canada

Cet appareil numérique de la classe B est conform à la norme NMB-003 du Canada.

Canadian Department of Communications Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

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。

The following is a summary of the VCCI Japanese statement in the box above.

This product is a Class B Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). This product is aimed to be used in a domestic environment. When used near a radio or TV receiver, it may becaome the cause of radio interference. Read the instructions for correct handling.

Radio Protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG vom 9.Nov.92 das EG–Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse B.

---

2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (Type 4-W) Communications Statements

The 2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus (Type 4-W) is a Class A device.

The following statement applies to this product. The statement for other products intended for use with this product appears in their accompanying documentation.

Communications Statements

The following statement applies to this product. The statement for other products intended for use with this product appears in their accompanying documentation.

Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. 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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Neither the provider nor the manufacturer is responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

European Union (EU) Statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. The manufacturer cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards supplied by third parties. Consult with your dealer or sales representative for details on your specific hardware.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with IEC Standard 950.

United Kingdom Telecommunications Safety Requirements

This equipment is manufactured to the International Safety Standard EN60950 and as such is approved in the UK under the General Approval Number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.

The network adapter interfaces housed within this equipment are approved separately, each one having its own independent approval number. These interface adapters, supplied by the manufacturer, do not use or contain excessive voltages. An excessive voltage is one which exceeds 70.7 V peak ac or 120 V dc. They interface with this equipment using Safe Extra Low Voltages only. In order to maintain the separate (independent) approval of the manufacturer's adapters, it is essential that other optional cards, not supplied by the manufacturer, do not use main voltages or any other excessive voltages. Seek advice from a competent engineer before installing other adapters not supplied by the manufacturer.

Avis de conformité aux normes du ministère des Communications du Canada

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

Canadian Department of Communications Compliance Statement

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

VCCI Statement

この装置は、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。　　　　　　　ＶＣＣＩ－Ａ

The following is a summary of the VCCI Japanese statement in the box above.

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

Electromagnetic Interference (EMI) Statement - Taiwan

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。

The following is a summary of the EMI Taiwan statement above.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user will be required to take adequate measures.

Radio Protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit Dem deutschen EMVG vom 9.Nov.92 das EG–Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse A. Für diese von Geräten gilt folgende Bestimmung nach dem EMVG:

Geräte dürfen an Orten, für die sie nicht ausreichend entstört sind, nur mit besonderer Genehmigung des Bundesministers für Post und Telekommunikation oder des Bundesamtes für Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Störungen zu erwarten sind.

(Auszug aus dem EMVG vom 9.Nov.92, Para.3, Abs.4)

Hinweis

Dieses Genehmigungsverfahren ist von der Deutschen Bundespost noch nicht veröffentlicht worden.

2 Gigabit Fibre Channel PCI-X Adapter (Type 5704 and 280B) Communications Statements

The 2 Gigabit Fibre Channel PCI-X Adapter (Type 5704) is a Class A device.

The following statement applies to this product. The statement for other products intended for use with this product appears in their accompanying documentation.

Communications Statements

The following statement applies to this product. The statement for other products intended for use with this product appears in their accompanying documentation.

Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. 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.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Neither the provider nor the manufacturer is responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

European Union (EU) Statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. The manufacturer cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards supplied by third parties. Consult with your dealer or sales representative for details on your specific hardware.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with IEC Standard 950.

United Kingdom Telecommunications Safety Requirements

This equipment is manufactured to the International Safety Standard EN60950 and as such is approved in the UK under the General Approval Number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.

The network adapter interfaces housed within this equipment are approved separately, each one having its own independent approval number. These interface adapters, supplied by the manufacturer, do not use or contain excessive voltages. An excessive voltage is one which exceeds 70.7 V peak ac or 120 V dc. They interface with this equipment using Safe Extra Low Voltages only. In order to maintain the separate (independent) approval of the manufacturer's adapters, it is essential that other optional cards, not supplied by the manufacturer, do not use main voltages or any other excessive voltages. Seek advice from a competent engineer before installing other adapters not supplied by the manufacturer.

Avis de conformité aux normes du ministère des Communications du Canada

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

Canadian Department of Communications Compliance Statement

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

VCCI Statement

この装置は、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。　　　　　　　ＶＣＣＩ－Ａ

The following is a summary of the VCCI Japanese statement in the box above.

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

Electromagnetic Interference (EMI) Statement - Taiwan

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。

The following is a summary of the EMI Taiwan statement above.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user will be required to take adequate measures.

Radio Protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit Dem deutschen EMVG vom 9.Nov.92 das EG–Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse A. Für diese von Geräten gilt folgende Bestimmung nach dem EMVG:

Geräte dürfen an Orten, für die sie nicht ausreichend entstört sind, nur mit besonderer Genehmigung des Bundesministers für Post und Telekommunikation oder des Bundesamtes für Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Störungen zu erwarten sind.

(Auszug aus dem EMVG vom 9.Nov.92, Para.3, Abs.4)

Hinweis

Dieses Genehmigungsverfahren ist von der Deutschen Bundespost noch nicht veröffentlicht worden.

Appendix B. Notices

This information was developed for products and services offered in the U.S.A.

The manufacturer may not offer the products, services, or features discussed in this document in other countries. Consult the manufacturer's representative for information on the products and services currently available in your area. Any reference to the manufacturer's product, program, or service is not intended to state or imply that only that product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any intellectual property right of the manufacturer may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any product, program, or service.

The manufacturer may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to the manufacturer.

The following paragraph does not apply to the United Kingdom or any country where such provisions are inconsistent with local law: THIS MANUAL IS PROVIDED ″AS IS″ WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions; therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. The manufacturer may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Information concerning products made by other than the manufacturer was obtained from the suppliers of those products, their published announcements, or other publicly available sources. The manufacturer has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to products made by other than the manufacturer. Questions on the capabilities of products made by other than the manufacturer should be addressed to the suppliers of those products.

Part Number: 80P5260

Printed in USA

(1P) P/N: 80P5260