

SGI Onyx Next Generation Scalable Graphics Platform User's Guide

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About This Guide

This publication provides information about the SGI Onyx Next Generation Scalable Graphics Platform.

Related Publications

The following publication contain additional information that may be helpful:

- SGI Origin 350 Server User's Guide

Obtaining Publications

You can obtain SGI documentation in the following ways:

- See the SGI Technical Publications Library at <http://docs.sgi.com>. Various formats are available. This library contains the most recent and most comprehensive set of online books, release notes, man pages, and other information.
- If it is installed on your SGI system, you can use InfoSearch, an online tool that provides a more limited set of online books, release notes, and man pages. With an IRIX system, select **Help** from the Toolchest, and then select **InfoSearch**. Or you can type `infosearch` on a command line.
- You can also view release notes by typing either `grelnotes` or `relnotes` on a command line.
- You can also view man pages by typing `man <title>` on a command line.

Conventions

The following conventions are used throughout this publication:

Convention	Meaning
<code>command</code>	This fixed-space font denotes literal items such as commands, files, routines, path names, signals, messages, and programming language structures.
<i>variable</i>	Italic typeface denotes variable entries and words or concepts being defined.
user input	This bold, fixed-space font denotes literal items that the user enters in interactive sessions. (Output is shown in nonbold, fixed-space font.)
[]	Brackets enclose optional portions of a command or directive line.
...	Ellipses indicate that a preceding element can be repeated.
<code>manpage(x)</code>	Man page section identifiers appear in parentheses after man page names.
GUI element	This font denotes the names of graphical user interface (GUI) elements such as windows, screens, dialog boxes, menus, toolbars, icons, buttons, boxes, fields, and lists.

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SGI Onyx Next Generation Scalable Graphics Platform Overview

The SGI Onyx Next Generation Scalable Graphics Platform (Onyx Next Generation Graphics) is a high-performance visualization system running the SGI IRIX operating system. The platform is available in a number of configurations to meet your visualization requirements.

This chapter introduces the two graphics bricks used in the SGI Onyx Next Generation Scalable Graphics Platform, and provides an overview of their connection to the rest of the platform.

G2-bricks and G2N-bricks

The SGI Onyx Next Generation Graphics Platform uses two bricks for graphics output: a graphics-only brick (called a G2-brick) and a graphics/node brick (called a G2N-brick).

The G2-brick is a 2U rack mountable enclosure containing two high-performance graphics pipes. This brick connects as an I/O device.

The G2N-brick is a 2U rack mountable enclosure which, in addition to the two high-performance graphics pipes, adds to the host system a node board with two or four CPUs and up to eight memory DIMMs. This brick connects as an integral part of the host system's compute fabric. Though it contains CPUs and memory, the G2N-brick does not have boot I/O functionality, and therefore may not be used as a standalone system.

Though internally different, the G2-brick and the G2N-brick may not be distinguished by external features.

Connection Types: XIO Versus NUMALink

The G2-brick is a graphics-only I/O brick, and therefore connects to a host system using XIO.

The G2N-brick is a compute brick, and therefore connects to the host system using NUMALink, either directly or through a NUMALink module (router). This way the brick becomes an integral part of the host computer, and contains both CPUs and memory, in addition to graphics output capabilities.

Graphics Capabilities

Each G2-brick or G2N-brick contains two graphics pipes, each capable of supporting two display devices. An Onyx Next Generation Graphics system may contain up to eight such bricks, providing a maximum of sixteen pipes and thirty-two display devices.

Chassis Tour

The sections below show front, rear, and internal views of the SGI Onyx Next Generation Graphics G2-bricks and G2N-bricks.

Front Panel Items

This section describes the front panel controls and indicators of the G2-bricks and G2N-bricks, as shown in Figure 1-1.

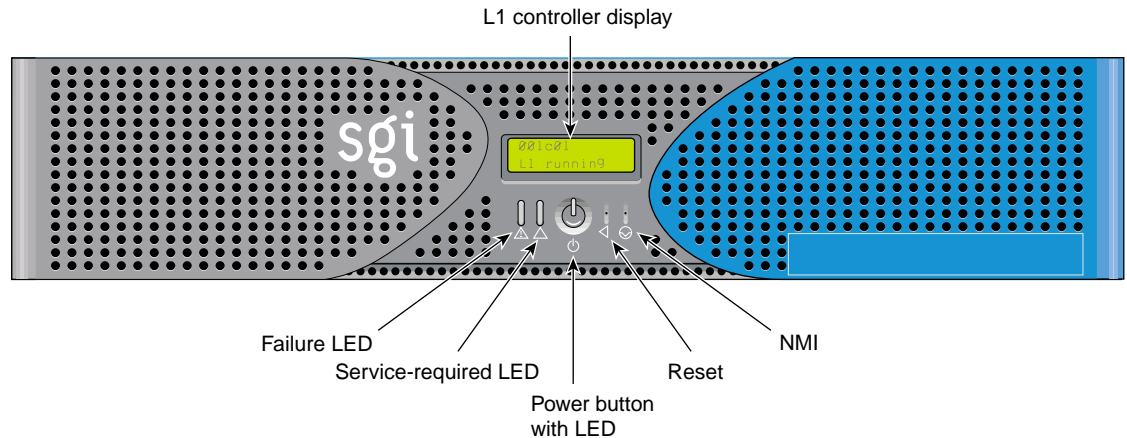


Figure 1-1 G2-brick and G2N-brick Front Panel Items

The front panels of the G2-brick and G2N-brick have the following items:

- **L1 controller display.** A liquid crystal display (LCD) that shows status and error messages generated by the L1 controller.

Note: Refer to the *SGI L1 and L2 Controller Software User's Guide* (007-3938-00x) for more information on the L1 controller.

- **Status LEDs.** The front panel has the following LEDs:
 - Power button LED. This LED illuminates green when the internal components are on.

- **Service-required LED.** This LED illuminates yellow to indicate that an item is not functioning properly (for example, a fan is off), but the system is still operating.
- **Failure LED.** This LED illuminates red to indicate that a failure has occurred and the system is down.
- **Power button.** Press this button to power on the system. Alternatively, you can power on the system at a system console.
- **Reset button.** Press this button to reset the internal processors and ASICs. The reset will cause a memory loss.
- **NMI button.** Press this button issues a non-maskable interrupt command to a brick. When the system hangs, you can send the affected brick an NMI interrupt. The interrupt goes to PROM and causes the CPU state to be captured for that brick. This information is saved in flash PROM and in the system log, and can assist SGI technicians in debugging system hangs and customer problems.

Rear Panel Items

Figure 1-2 shows a view of the rear panel of an SGI Onyx Next Generation Graphics G2-brick and G2N-brick.

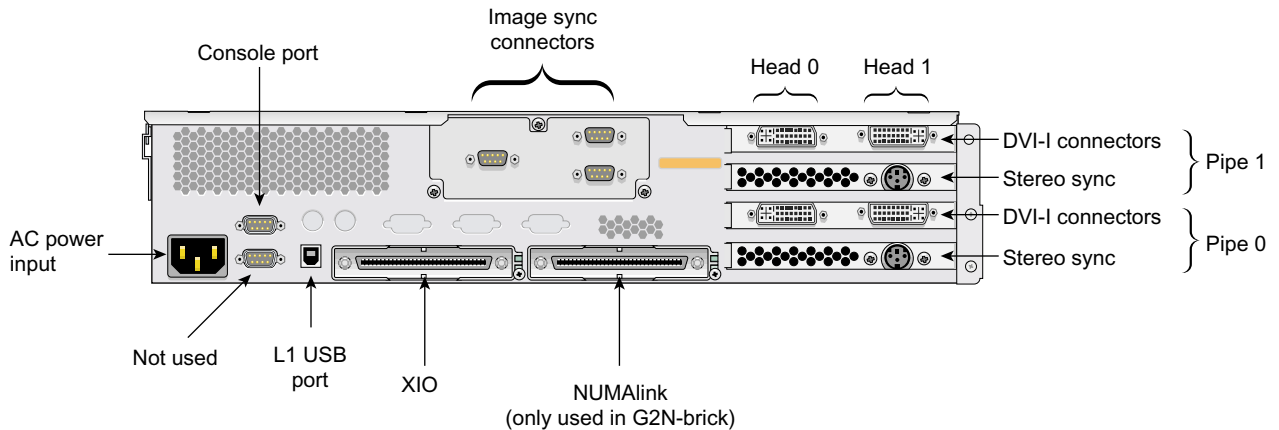


Figure 1-2 SGI Onyx Next Generation Graphics G2-brick and G2N-brick Rear Panel

The rear panel of the SGI Onyx Next Generation Graphics G2-brick and G2N-brick has the following items:

- **AC power input.** This connector connects the graphics brick to an AC power outlet.
- **Console port.** This DB-9 serial port (console and diagnostic port) enables you to connect a system console to the L1 controller on the graphics brick.
- **L1 port (USB type B).** This universal serial bus (USB) type B connector connects the graphics brick L1 controller to an L2 controller.
- **XIO connector.** This Crosstown2 connector connects the G2-brick to a host system compute brick. This connection is made with a NUMalink cable at 800 MB/s in each direction.
 - **XIO connector LEDs.** The XIO connector has a yellow LED and a green LED. The yellow LED indicates that both the graphics brick and the host system brick to which it is connected are powered on. The green LED indicates that the host system has established a link to the graphics brick.

- **Image Sync connectors.** These connectors are used in conjunction with an IS1 (image sync) card.
- **NUMAlink connector (only used in G2N-bricks).** This NUMAlink connector connects the G2N-brick to the host system. This connection is made with a NUMAlink cable at 1.6 GB/s in each direction.
 - **NUMAlink LED.** The NUMAlink connector has a yellow LED and a green LED (located to the right of the NUMAlink connector). The yellow LED indicate that both the graphics brick and the host system brick to which it is connected are powered on. The green LED indicates that the host system has established a link to the graphics brick.
- **DVI-I display connectors.** These connectors are used to attach one or more external displays.
- **Stereo Sync connectors.** Stereo Sync is not supported in the current release.

Internal Components

Figure 1-3 shows an internal view of the SGI Onyx Next Generation Graphics G2N-brick.

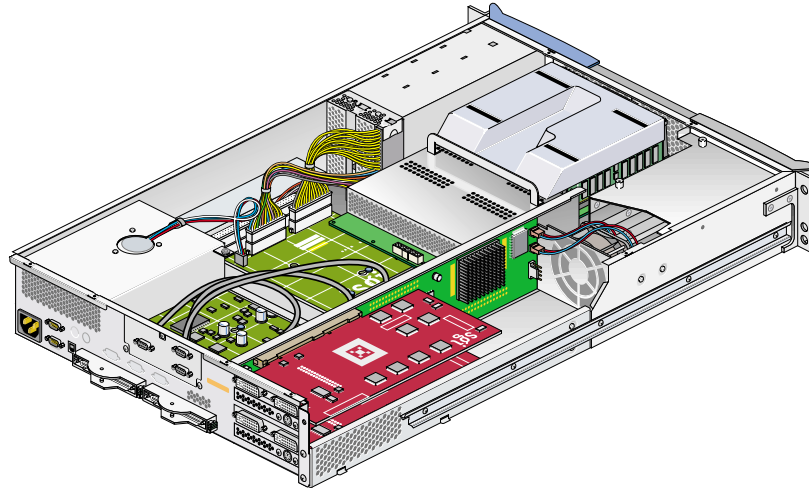


Figure 1-3 SGI Onyx Next Generation Graphics G2N-brick Internal View

Safety Precautions

Before you install an SGI Onyx Next Generation Scalable Graphics system, you should familiarize yourself with the safety precautions discussed in the following subsections:

- “Hazard Statements” on page 8
- “ESD Precautions” on page 8
- “Safety Measures” on page 9

Hazard Statements

During the installation of the computer system, be alert for hazard advisory statements with icons, which signify the following:

- **Caution** Indicates a potentially hazardous situation that, if not avoided, can result in minor or moderate injury. A caution statement also alerts you to unsafe practices that can result in equipment damage and/or data corruption. A caution message is accompanied by an icon as shown in the following example:



Caution:

- **Warning** indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. A warning message is accompanied by icon as shown in the following example:



Warning:

ESD Precautions

Observe electrostatic discharge (ESD) precautions during the entire installation process to eliminate possible ESD damage to the equipment. Wear an SGI-approved wrist strap when you handle an ESD-sensitive device. Connect the wrist strap cord directly to earth ground.



Caution: Observe all ESD precautions. Failure to do so can result in damage to the equipment.

Safety Measures

Observe the following safety measures when you install the system:

- Use caution when you remove the system from the shipping crate. Failure to handle the system carefully can result in personal injury or property damage.



Warning: Ensure that the shipping crate is positioned close to its destination before you unpack the crate.



Warning: Employ a minimum of two people to lift the brick or bricks off the shipping pallet, to move the brick(s) from one location to another, and to install the brick(s) in a rack. Otherwise, someone could be seriously injured.

- Do not move the system while it is connected to power.



Warning: Keep fingers and conductive tools away from high-voltage areas. Failure to follow these precautions will result in serious injury or death. The high-voltage areas of the system are indicated with high-voltage warning labels.

- Ensure that a qualified electrician has properly installed the power receptacles.
- Set all circuit breakers to the OFF (O) position before you plug in the system power cord.



Warning: Use the following guidelines to prevent the rack from toppling over. Otherwise, people could be seriously injured and/or equipment could be damaged.

Follow these guidelines to prevent the rack from toppling over:

- Make sure that only one brick is extended out of the rack at one time.
- Install all equipment in the lowest available position in the rack.
- Ensure that the tip tray is bolted to the front of the rack.

Connecting SGI G2-bricks and G2N-bricks to a Host System

This section describes upgrading an existing SGI host system to an SGI Onyx Next Generation Scalable Graphics Platform or expanding an existing Onyx Next Generation Graphics system to include more graphics output pipes.

If you purchased your SGI Onyx Next Generation Scalable Graphics Platform preconfigured from SGI, you should proceed directly to Chapter 3, “Setting Up Your Onyx Next Generation Graphics System”.

The SGI Onyx Next Generation Scalable Graphics Platform uses either of two different graphics output bricks: a G2-brick (graphics-only) and a G2N-brick (graphics, CPUs, and memory).

Each type of brick attaches to its host system in a different manner. The two styles of bricks are thus addressed in the first two sections of this chapter:

- “XIO Connections (G2-brick)” on page 12
- “NUMALink Connections (G2N-brick)” on page 14

The third section of this chapter details the installation of PCI cards in the host system:

- “PCI Card Locations” on page 16

The fourth section addresses connecting cables from the optional IS1 (image sync) card:

- “Connecting an IS1 (Image Sync) Card to G2-bricks and G2N-bricks” on page 19

XIO Connections (G2-brick)

The Onyx Next Generation Graphics G2-brick uses XIO to attach to a host system.

Note: A host system may also be connected to an Onyx Next Generation Graphics G2N-brick via NUMAlink. For details of this connection, see “NUMAlink Connections (G2N-brick)” on page 14.



Caution: The connectors on the NUMAlink cables (used for XIO and NUMAlink connections) are delicate, and must be handled carefully. Use care when removing and replacing these cables.

Connecting a G2-brick to an Onyx Next Generation Host System via XIO

An Onyx Next Generation Graphics G2-brick attaches to an XIO port on a host system, as shown in Figure 2-1.

For IS1, sound card, and USB installation information, see “Locations for PCI Cards in Host Systems” on page 18.

Before connecting the bricks they should be mounted in a rack, as described in Appendix C, “Installing G2-bricks and G2N-bricks”.

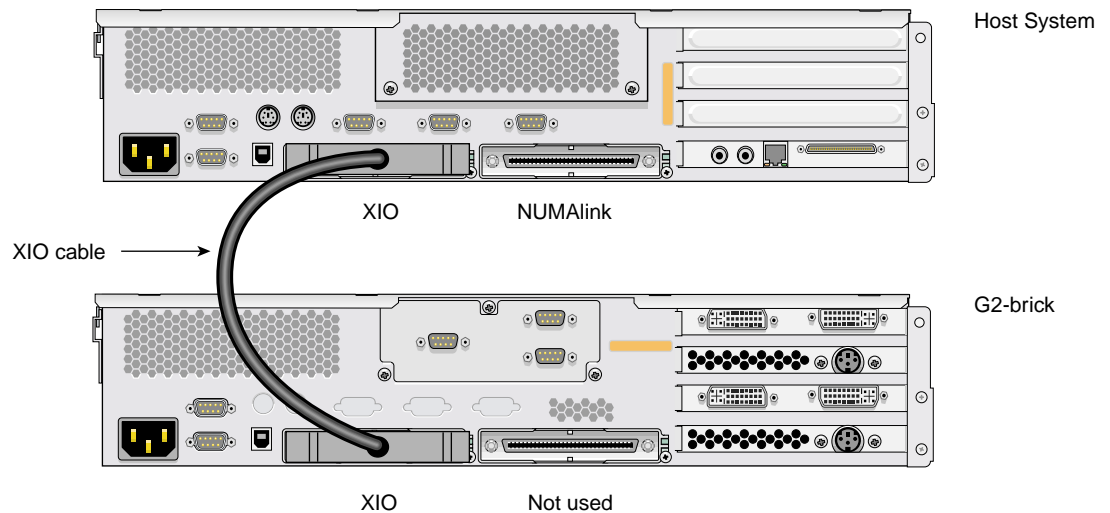


Figure 2-1 Connecting a G2-brick to a Host Via XIO

Note: The relative positions of the chassis are for illustration purposes only, and may not represent the actual positions in a rack.

NUMAlink Connections (G2N-brick)

The Onyx Next Generation Graphics G2N-brick uses NUMAlink to attach to a host system.

This NUMAlink connection is addressed in this section.

Note: The host system may also be connected to an SGI G2-brick via XIO. For details of this connection, see “XIO Connections (G2-brick)” on page 12.



Caution: The connectors on the NUMAlink cables (used for XIO and NUMAlink connections) are delicate, and must be handled carefully. Use care when removing and replacing these cables.

Connecting a G2N-brick to a Host System via NUMAlink

An Onyx Next Generation Graphics G2N-brick attaches to a NUMAlink port on a host system, as shown in Figure 2-2.

For IS1, sound card, and USB installation information, see “Locations for PCI Cards in Host Systems” on page 18.

Before connecting the bricks they should be mounted in a rack, as described in Appendix C, “Installing G2-bricks and G2N-bricks”.

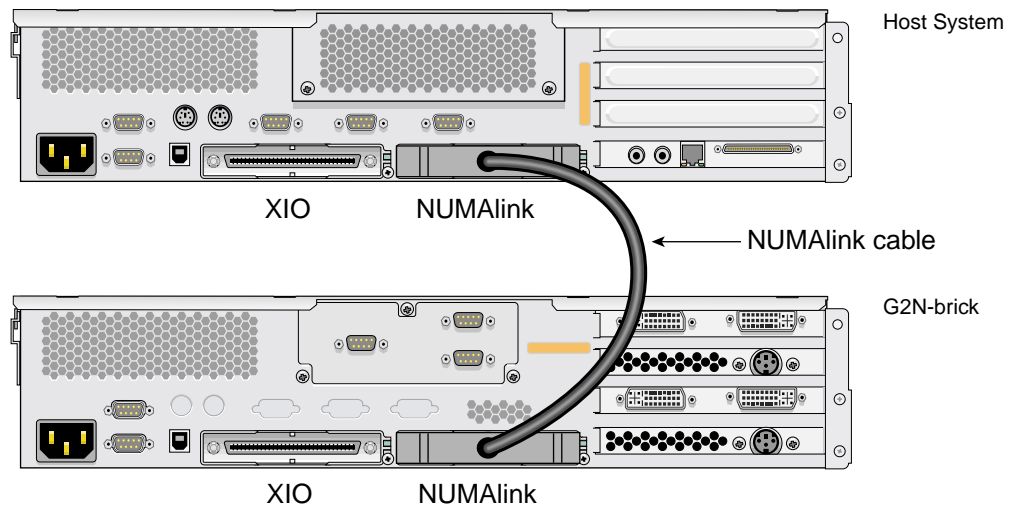


Figure 2-2 Connecting a G2N-brick to a Host System Via NUMAlink

Note: The relative positions of the chassis are for illustration purposes only, and may not represent the actual positions in a rack.

PCI Card Locations

Various configurations of the Onyx Next Generation Graphics systems may ship with one or more PCI cards. These cards include:

- BaseI/O (IO9) PCI card
- IS1 (image sync) PCI card
- Four-port USB PCI card
- Basic or professional PCI sound card

This section describes the requirements for each of these cards, then shows the preferred location of these PCI cards in the host system.

Requirements for PCI Cards

Some of the PCI cards used with Onyx Next Generation Graphics systems have specific requirements that may constrain their placement. Care must be taken that these requirements are met when installing PCI cards.

Note: These PCI cards are not installed in the G2-bricks or the G2N-bricks, but are instead installed in PCI slots in the host system.

Requirements for BaseI/O (IO9) PCI Card

The BaseI/O (IO9) PCI card is factory-installed in the certain host systems. It is not a customer-installable option. Though the IO9 card will run at either 33 MHz or 66 MHz, 66 MHz operation is strongly preferred. This means any cards that share a bus with an IO9 card should also be capable of running at 66 MHz.

Requirements for IS1 (Image Sync) PCI Card

The IS1 (image sync) PCI card will run at either 33 MHz or 66 MHz. However 66 MHz operation is strongly preferred. This means any cards that share a bus with an IS1 card should also be capable of running at 66 MHz.

Requirements for Four-Port USB PCI Card

The four-port USB PCI card is only capable of running at 33 MHz. This means any cards that share a bus with this card will also run at only 33 MHz.

Requirements for Basic or Professional Sound Card

The basic or professional PCI sound cards will work at either 33 MHz or 66 MHz. This means these cards can share a bus with cards that run only at 33 MHz (in which case all cards in that bus will run at 33 MHz) or share a bus only with cards capable of running at 66 MHz (in which case all cards in that bus will run at 66 MHz).

Locations for PCI Cards in Host Systems

The preferred location for the IS1 PCI card in your hosts system is bus 1, slot 2 (i.e., the second PCI slot from the bottom).

The preferred location for the basic or professional sound card in your host system is bus 2, slot 1 (i.e., the third PCI slot from the bottom).

The preferred location for the USB card in your host system is bus 2, slot 2 (i.e., the fourth PCI slot from the bottom).

When present, the BaseI/O (IO9) card in your host system will be in bus 1, slot 1 (i.e., the bottom PCI slot).

Note: A BaseIO (IO9) card will always be present in the host system boot module, but may not be present in other host system compute modules.

Figure 2-3 shows the rear panel of a host system with an IS1 card, a sound card, a USB card, and a BaseI/O card installed in the preferred locations.

Detailed instructions for installing PCI cards may be found in the user's guide that came with your host system.

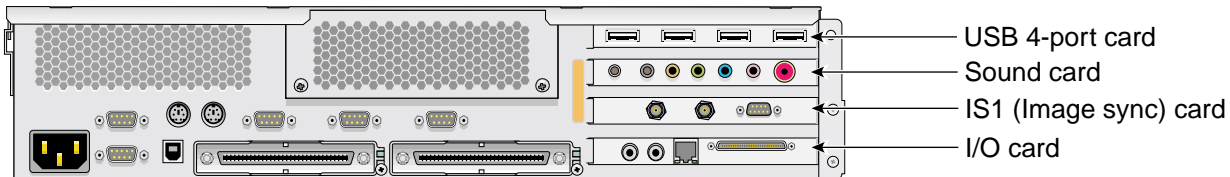


Figure 2-3 Preferred PCI Card Locations in a Host System Base Compute Module

Connecting an IS1 (Image Sync) Card to G2-bricks and G2N-bricks

If your Onyx Next Generation Graphics system came with an IS1 (image sync) card, you will need to connect appropriate cables to each G2-brick or G2N-brick you wish to control.

Figure 2-4 shows the connector locations on an IS1 card.

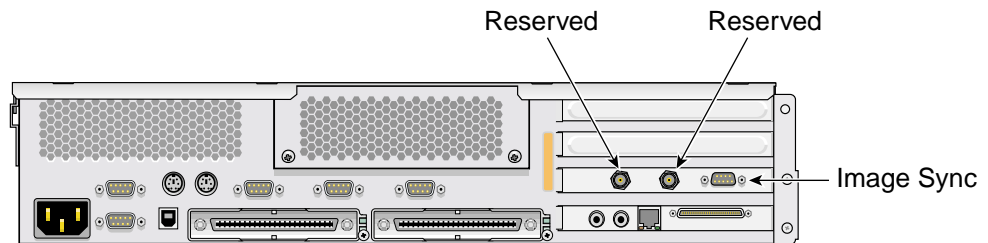


Figure 2-4 IS1 Card Connectors (Shown in Next Generation Host System)

Image Sync Cabling Overview

The image sync signal runs from the IS1 card (installed in the host system) to one of the G2-bricks or G2N-bricks, then from that brick to another G2-brick or G2N-brick, and so on, to each additional graphics brick in the system.

Figure 2-5 shows the image-sync connector locations on a G2-brick or G2N-brick.

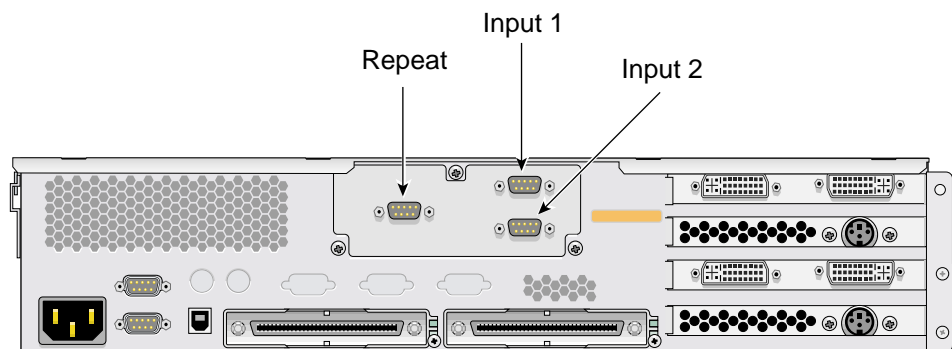


Figure 2-5 Image-Sync Connectors on G2-brick and G2N-brick

Connecting Image Sync Cables

Follow these steps to connect your image sync cables:

1. Locate a DB9-to-DB9 image-sync cable.
2. Connect one end of the image-sync cable to the DB9 connector on the IS1 card in your host system.
3. Connect the other end of the image-sync cable to the upper right image sync DB9 connector on one of the graphics bricks.
4. If you have only one graphics brick, you are done connecting image sync cables.
5. If you have additional graphics bricks, connect another image-sync cable between the left image sync DB9 connector on the last-connected system and the upper right image sync DB9 connector on the next graphics brick.

Note: There is no required order for the image sync cabling.

6. Repeat step 5 until all graphics bricks are connected via image sync cables.

Figure 2-6 shows an IS1 card installed in a host system with image-sync cables connected to three G2-bricks.

Note: Figure 2-6 does not show a complete system, and should not be used as a guide for brick placement. It is intended only to show how the image sync cables connect.

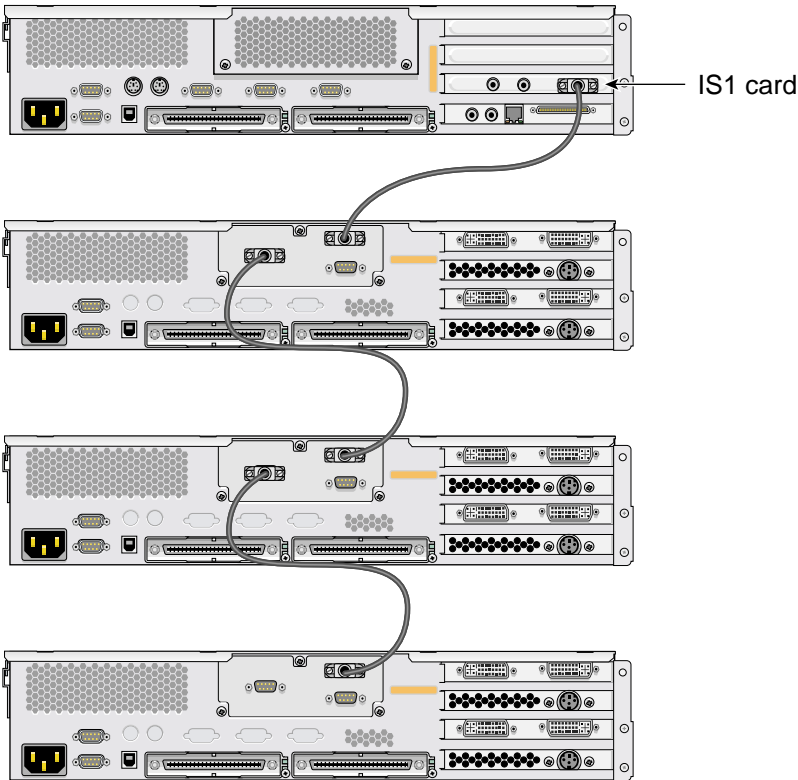


Figure 2-6 Cabling an IS1 card to G2-bricks and G2N-bricks

Setting Up Your Onyx Next Generation Graphics System

This chapter describes how to set up your SGI Onyx Next Generation Graphics System. Before following the instructions in this chapter, your system should be assembled and bootable, and all G2-bricks and G2N-bricks should be connected to the host.

This will be the case if you purchased your system preconfigured from SGI. Otherwise you should configure your system by following the instructions in Chapter 2, “Connecting SGI G2-bricks and G2N-bricks to a Host System”.

Attaching Displays to an Onyx Next Generation Graphics System

Your Onyx Next Generation Graphics system can drive as many as four displays per G2-brick or G2N-brick.

Note: Though each graphics card has two DVI-I ports, only the first DVI-I port (head 0, on the left) may be connected to either a digital display or an analog display. The second DVI-I port (head 1, on the right) may only be connected to an analog display.

See “Display Requirements” on page 73 for detailed display requirements and “DVI-I Connector Pinout” on page 77 for detailed information about the DVI-I connectors.

Display Connection Overview

Figure 3-1 shows the four display connectors on G2-bricks and G2N-bricks.

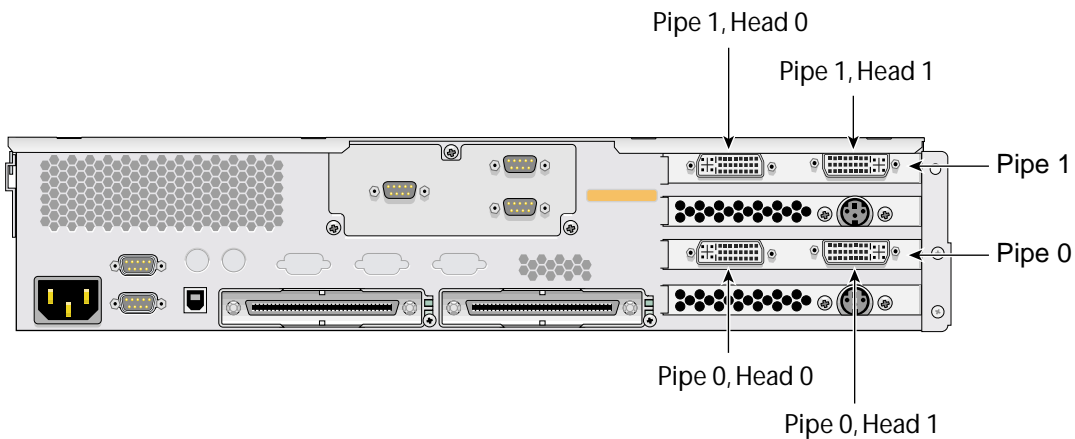


Figure 3-1 Display Connections on G2-bricks and G2N-bricks

Figure 3-2 shows the connection of four displays to an SGI Onyx Next Generation Graphics System G2-brick or G2N-brick.

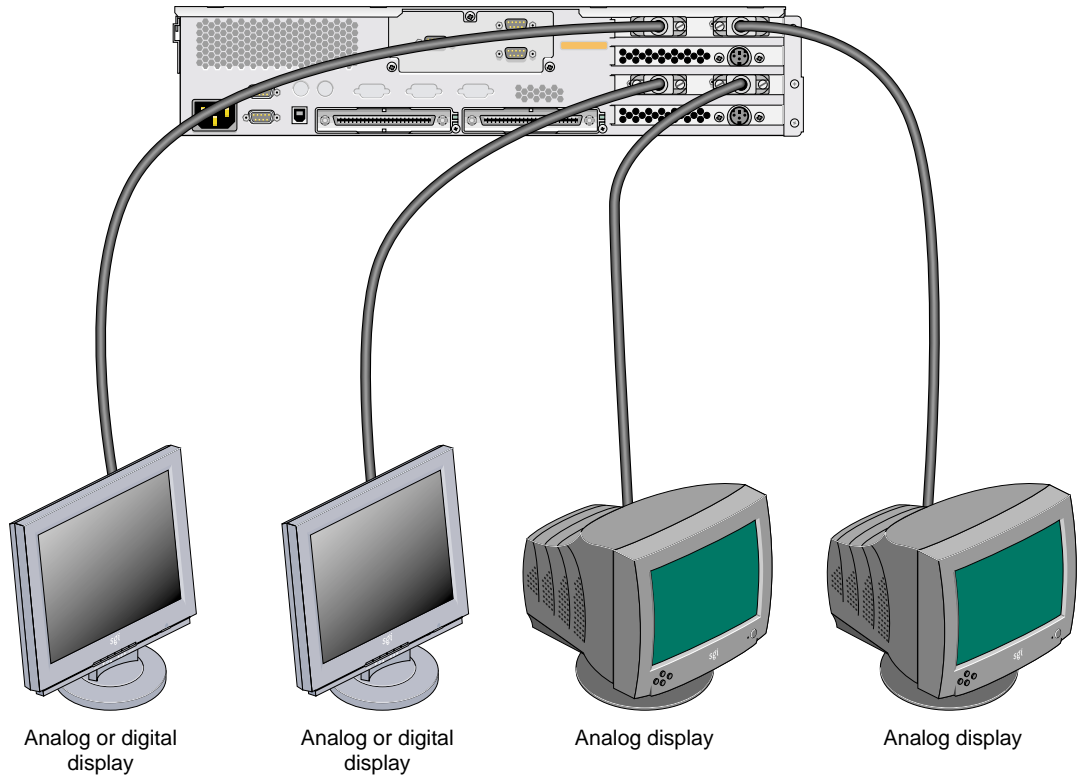


Figure 3-2 Connecting Displays to a G2-brick or G2N-brick

Locating Pipe 0

In a system containing only one G2-brick or G2N-brick, that brick will contain pipe 0.

In systems containing more than one G2-brick or G2N-brick, pipe 0 will typically be the graphics brick located closest to the bottom of the rack. For more information on rack locations and cabling, see Appendix C, “Installing G2-bricks and G2N-bricks”.

The best way to determine the location of pipe 0, however, is to use the IRIX `gfxtopology` command, as follows:

1. From an IRIX command prompt, run `/usr/gfx/gfxtopology`. The output will look similar to:

```
l# /usr/gfx/gfxtopology
pipe 0  g @ 001c12/CG:15/0      SG2
pipe 1  g @ 001c12/CG:15/1      SG2
pipe 2  g @ 001c14/CG:15/0      SG2
pipe 3  g @ 001c14/CG:15/1      SG2
pipe 4  g @ 001c16/CG:15/0      SG2
pipe 5  g @ 001c16/CG:15/1      SG2
pipe 6  g @ 001c18/CG:15/0      SG2
pipe 7  g @ 001c18/CG:15/1      SG2

input   k @ 001c10/I:5/1        m @ 001c10/I:5/2
2#
```

2. Locate the line in the `gfxtopology` output that begins “pipe 0.”
3. On this line, locate the string following the “@” symbol. This string will be of the form AAAxBB (in the example provided above, the string would be “001c12”).
4. Decode this string as follows:
 - “AAA” is the rack number (in this example, rack 001)
 - “x” is module type (in this case, c indicates a compute module)
 - “BB” is the “U” number within that rack, counting from the bottom (in this case, slot 12).
5. Locate the brick at the rack location indicated. The L1 controller display on the front of that brick should be displaying the same string you just decoded.
6. Go to the back of the rack, and determine if this brick is a G2N-brick or a host system compute module.

If the brick has four DVI-I connectors (as shown in Figure 1-2), it is a G2N-brick, and it contains pipe 0.

If the brick does not have DVI-I connectors, it is a host-system compute brick. In this case, a G2-brick will be connected to its XIO port. This XIO-connected G2-brick will contain pipe 0.

Attaching Keyboards and Mice to an Onyx Next Generation Graphics System

Your Onyx Next Generation Graphics system uses USB keyboards and mice. This section describes how to connect them to a host system.

If you need to connect more keyboards and mice than you have available USB ports on your host system, refer to “Using a USB Hub for Keyboards and Mice” on page 29.

If the keyboards and mice will be more than 10 feet (3 meters) from the host system, refer to “Using a USB Extender to Connect Keyboards and Mice” on page 30.

Attaching Keyboards and Mice to a Host System

Figure 3-3 shows the connection of a USB keyboard and mouse to a host system with a USB card in the top PCI slot.

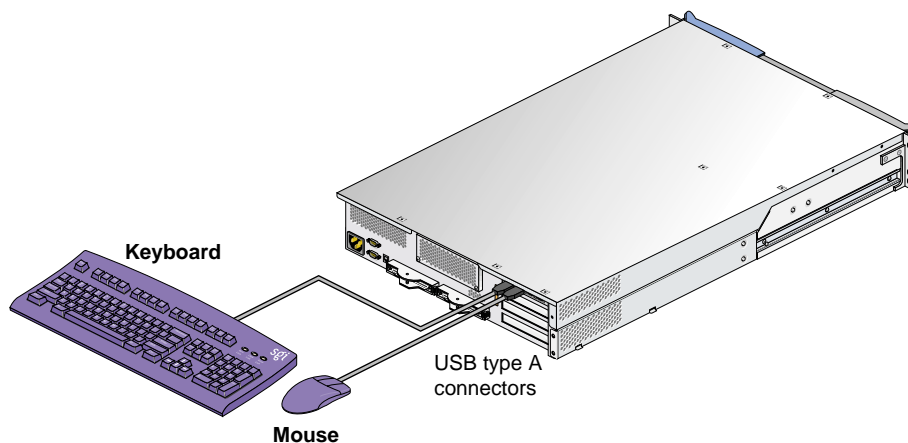


Figure 3-3 Connecting a USB Keyboard and Mouse to a Host System

Using a USB Hub for Keyboards and Mice

If the number of USB devices connected to your host system will be greater than the number of USB ports on that system, you will need one or more USB hubs. Figure 3-4 shows how a USB hub is used for this purpose.

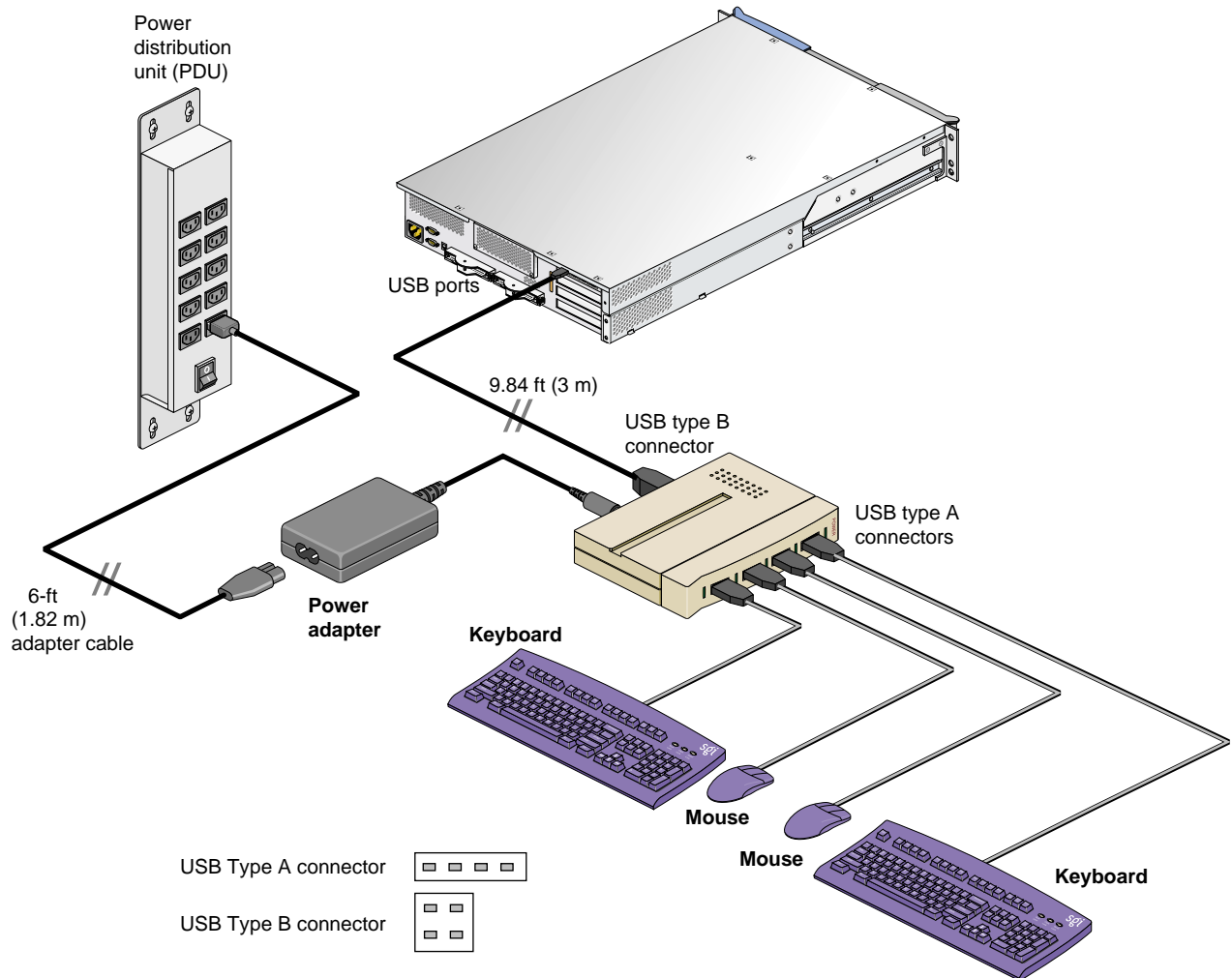


Figure 3-4 Using a USB Hub to Connect Multiple Keyboards and Mice to a Host System (USB Hub May Differ From Illustration)

Using a USB Extender to Connect Keyboards and Mice

If one or more of your keyboard/mouse pairs will be further than 10 feet (3 meters) away from the USB ports on the host system, you will need to use one or more USB extenders. The use of an extender will allow keyboards and mice to be placed up to 328 feet (100 meters) from the host system (a 30-foot (9.1 meter) cable is supplied with the USB extender).

Figure 3-5 shows how a USB extender is connected.

Only keyboards and mice may be connected through USB extenders. Hubs, in particular, will not work through a USB extender. A USB extender, however, may be plugged into a hub.

Note: The local extender (LEX) receives AC power from a standard AC outlet (typically the power distribution unit (PDU) in the rack). A 6-ft. (1.82-m) adapter cable connects the extender's power adapter to the PDU. The remote extender (REX) does not use an external power source.

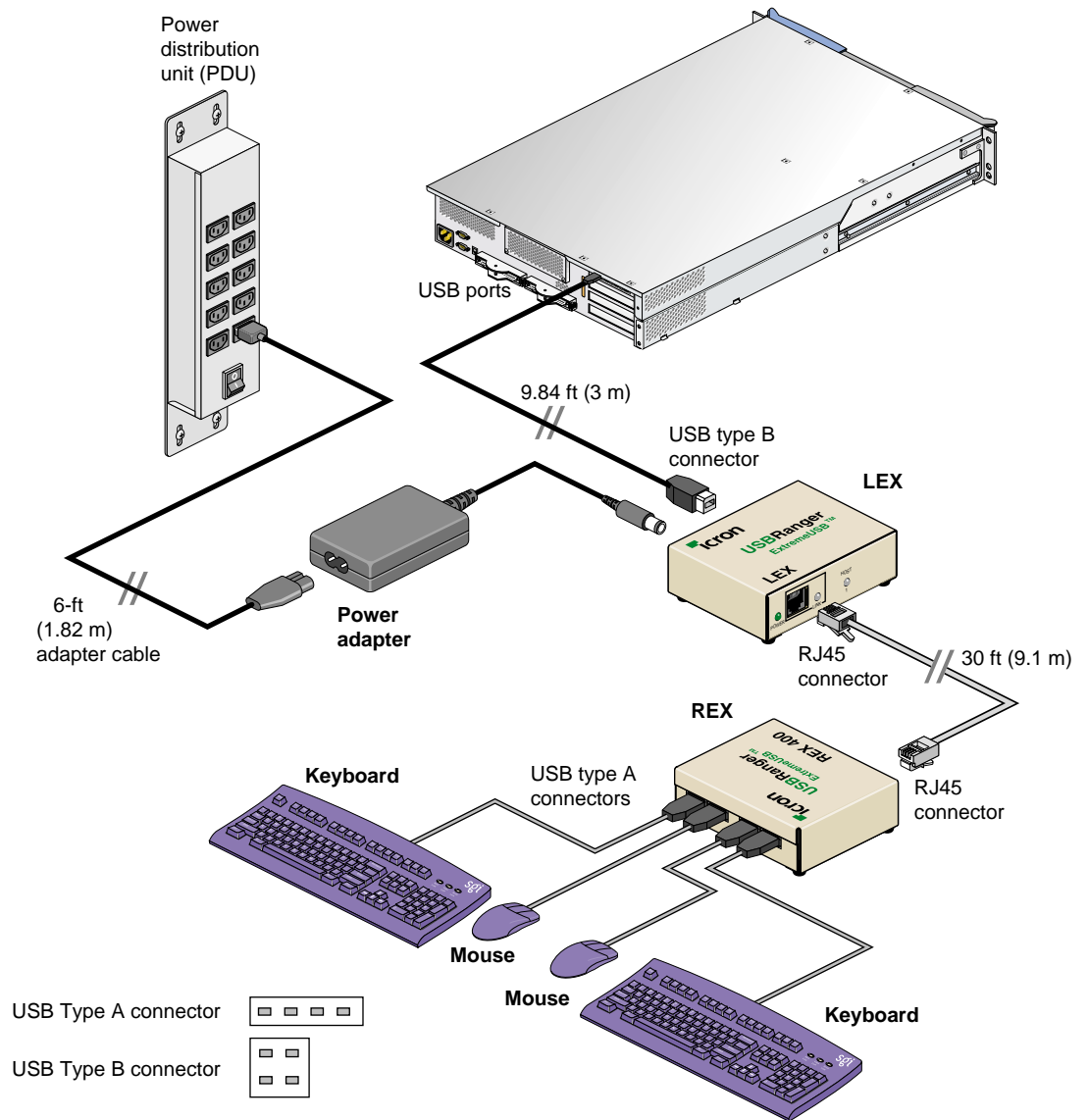


Figure 3-5 Using a USB Extender to Connect Keyboards and Mice

Attaching Stereo-Sync Devices

The SGI Onyx Next Generation Graphics System has two stereo sync connectors. However, stereo is not supported in this release of the product.

Figure 3-6 shows the location of the two stereo sync ports on G2-bricks and G2N-bricks.

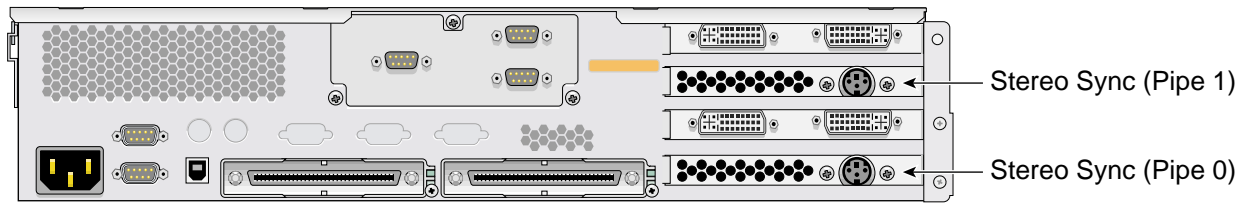


Figure 3-6 Stereo Sync Ports on G2-bricks and G2N-bricks

Attaching Audio Devices

Follow the instructions in your host system user's guide for the connection of audio devices.

IRIX Operating System Version Requirements

This section guides you through the process of determining if the version of the IRIX operating system installed on your host system is suitable for use with the SGI Onyx Next Generation Graphics Platform.

If you purchased your Onyx Next Generation Graphics system as a pre-configured system, it will already have the correct version of IRIX installed on the host. In this case, you may safely skip this section.

If you purchased your Onyx Next Generation Graphics system as an upgrade to an existing host system, you must ensure that your host system has the correct version of IRIX installed.

To determine your IRIX version, type the following at an IRIX prompt:

```
[1%] uname -R  
6.5 6.5.21f  
[2%]
```

If your system is running IRIX version 6.5.20 or earlier, you must upgrade your operating system.

If your system is running IRIX version 6.5.21 or later, your operating system is suitable for use with Onyx Next Generation Graphics.

If you need to upgrade your operating system, you may use the CD included with your Onyx Next Generation Graphics system. Instructions are included with the CD.

Configuring Displays, Keyboards, Mice and Audio Devices

The SGI Onyx Next Generation Graphics Platform is capable of driving multiple displays, and connecting to multiple keyboards, mice, and audio devices.

This section describes how to configure these multiple devices to work as desired.

Cursor Crossover Locations

To move the cursor from one monitor to the other, move the cursor off the screen it is on toward the other monitor. The cursor will jump to the other monitor.

The default is for the primary monitor to be located to your left as you face the front of the monitors and the secondary monitor to be located to your right. By default, the cursor moves from the right edge of the primary monitor to the left edge of the secondary monitor.

To switch cursor crossover locations, follow these instructions and refer to Table 3-1.

1. Move your monitors to the chosen position.
2. If your host system is powered off, follow the steps in your host system owner's guide to plug in the system and power it on.
3. Log in to the host system.
4. From the **Toolchest**, click on **Desktop**, then select **Open Unix Shell** to open a shell window.
5. Place the cursor inside the shell window.
6. Become superuser by typing **su** and pressing the Return key, then entering the root password.
7. Change the directory to access the `Xservers` file as follows:

```
cd /usr/lib/X11/xdm
```
8. Change the permissions on this file (to be able to write to it) before you begin by typing the following command:

```
chmod u+rw Xservers
```
9. Using your favorite text editor, open the **Xservers** file.
10. Add the appropriate line from Table 3-1 to the file.

Note: The contents of the file should be on one line. Do not insert hard returns.

Table 3-1 Changing Cursor Crossover Locations

If you want:	Add this:
Primary (0) on the left, Secondary (1) on the right (default)	Delete any command found in this table from the <code>Xservers</code> file.
Secondary (1) on the left, Primary (0) on the right	<code>-hw board=0,left=1 -hw board=1,right=0</code>
Primary (0) below, Secondary (1) above	<code>-hw board=0,above=1 -hw board=1,below=0</code>
Secondary (1) below, Primary (0) above	<code>-hw board=0,below=1 -hw board=1,above=0</code>

11. Save the file and exit the text editor.

Caution: Close any open applications before you perform step 12. The command closes any running applications, and any unsaved work will be lost.

12. Restart your host system.

- a. Stay in superuser mode.
- b. Type on the command line: `killall Xsgi`

13. After a few seconds, the login window appears.

14. Log in to the system.

Selecting the Head on Which a Program Runs

During an interactive session with the Window Manager, you can use the `DISPLAY` environment variable to control the head on which newly started graphics programs run. When the `DISPLAY` variable is set to `:0.0`, programs you start will run on head 0 (the primary head); when it is set to `:0.1`, programs you start will run on head 1 (the secondary head).

For convenience, the default startup files (`.login`, `.profile`) for `root` and `guest` shells set the `DISPLAY` variable to a reasonable initial value if it is not already set. Each head has a toolchest that can be used to invoke graphics programs. Each toolchest has the `DISPLAY` variable in its environment set to the correct value for the head on which it appears, so any application you invoke from a toolchest inherits this `DISPLAY` value, and thus appears on the same head as the toolchest from which it was invoked.

Similarly, programs started by clicking on an icon appear on the head from which you invoked them.

Once a program has been launched, it is not possible to move it from one head to another from the Window Manager.

Reconfiguring the Software for Use with Stacked Monitors

The software's default is for the monitors to be positioned side by side. If your monitors are stacked on top of each other, you will need to reconfigure the software.

Follow these steps to reconfigure the software:

1. If your host system is powered off, follow the steps in your host system owner's guide to plug in the system and power it on.
2. Log in to the system.
3. From the **Toolchest**, click on **Desktop**, then select **Open Unix Shell** to open a shell window.
4. Place the cursor inside the shell window.
5. Become superuser by typing `su` and pressing the Return key, then entering the root password.
6. Change the directory to access the `Xservers` file as follows:

```
cd /usr/lib/X11/xdm
```
7. Change the permissions on this file (to be able to write to it) before you begin by typing the following command:

```
chmod u+rw Xservers
```
8. Using your favorite text editor, open the `Xservers` file. Once you are in the `Xservers` file, find the line that reads:

```
0 secure /usr/bin/X11/x -bs -c -pseudomap 4sight
```
9. Add `-stacked` to the end of the following line:

```
0 secure /usr/bin/X11/x -bs -c -pseudomap 4sight
```
10. It should now read:

```
0 secure /usr/bin/X11/x -bs -c -pseudomap 4sight -stacked
```
11. Save the file and exit the text editor.

Caution: Close any open applications before you perform step 12. The command closes any running applications, and any unsaved work will be lost.

12. Restart your X Windows server.
 - a. Stay in superuser mode.
 - b. Type on the command line: `killall xsgi`
13. After a few seconds, the login window appears.
14. Log in to the system.

You are finished reconfiguring the software for use with stacked monitors.

Configuring Multiple Keyboards and Mice

The `ioconfig(1m)` command establishes logical device numbers for each keyboard and mouse in an Onyx Next Generation Graphics System. When the system first initializes the USB hardware, it scans each USB bus looking for devices. Initially, these devices are assigned a device ID of -1. Later in the boot process, the `ioconfig(1m)` command assigns device IDs based on the contents of the file

```
/etc/ioconfig.conf.
```

If the device is already represented in `ioconfig.conf`, the associated device ID is assigned. If the device is new (not already in `ioconfig.conf`), a new device ID is allocated and assigned, and a corresponding entry is appended to the `ioconfig.conf` file.

Each line in the `ioconfig.conf` file is a two-column entry. The left column is the numeric logical device ID (0 in our example), and the right column is the hardware path pointing to the device. For example:

```
0 /hw/module/001c13/Ibrick/xtalk/15/pci/5/usb/1/1/keyboard
0 /hw/module/001c13/Ibrick/xtalk/15/pci/5/usb/1/2/mouse
```

Note: The device IDs are unique only among devices of a given type. Different device types may use overlapping device IDs.

For USB devices, the hardware path is divided into two parts: the USB controller prefix and the USB relative path. The controller prefix is the portion of the path up to and including the component “usb.” For example:

```
/hw/module/001c13/Ibrick/xtalk/15/pci/5/usb
```

The controller prefix encodes the hardware components leading to the USB controller. In the previous example, the controller path indicates that there is a USB controller at PCI slot 5 of the compute module that is located at 001c13.

The USB relative path is the portion of the path after the “usb” component. This path indicates the path leading from the controller to the actual device. The path is a series of numeric components terminated with a device type. The numeric components represent USB hub port numbers. You can think of the ‘/’ separator as representing a hub and the numeric component as a port on that hub.

Multiple numeric components represent multiple layers of USB hubs, with the leftmost component representing the root hub, or the hub built into the USB controller.

The following example indicates a keyboard device attached to port 1 of a hub, which is attached to port 1 of the root hub:

```
... /usb/1/1/keyboard
```

The following example shows a mouse attached to port 2 of the same hub:

```
... /usb/1/2/mouse
```

You can use the `hinv` command to display the ID of a device. See the `hinv(1)` man page for additional information.

The device ID of a keyboard or mouse determines under which `/dev/input` directory the keyboard or mouse is placed. A keyboard or mouse with device ID 0 will be placed under `/dev/input` (for historical reasons), while a device with an ID greater than 0 will be placed under `/dev/inputX` (where `X` is the numeric device ID).

When the X Window System server starts, the `-devdir` option controls which directory is searched for input devices. By default, `/dev/input` is used.

If it becomes necessary to reconfigure the keyboard or mouse layout, manual configuration is necessary. Reasons for reconfiguration may include:

- Adding a new keyboard and mouse
- Adding hubs
- Moving a keyboard and mouse

Follow these steps to reconfigure the keyboard and mouse setup:

1. Run `/usr/gfx/stopgfx` to shut down the graphics subsystem.
2. Add or move devices as necessary.
3. Run `/sbin/ioconfig -f /hw` to assign temporary device IDs.
4. Edit the `/etc/ioconfig.conf` file.
5. Re-run `/sbin/ioconfig -f /hw` if you made changes in step 4.
6. Restart the graphics subsystem using the command `/usr/gfx/startgfx`.

Steps 4 and 5 are the keys to binding the devices in your new configuration to the correct IDs. Because a keyboard and mouse with the same ID are put in the same `/dev/inputX` directory, you must ensure that the keyboard and mouse pair used by a given X server has the same ID. Because `ioconfig` does not know what device IDs to assign automatically for new devices, step

3 may not assign the correct IDs. You can change the device IDs manually by editing `/etc/ioconfig.conf` and then re-running `ioconfig`. The `/dev/input/keyboard` and `/dev/input/mouse` entries are always created, even if a keyboard and/or mouse with device ID 0 are not present. This allows the default X server to run without a keyboard or mouse physically attached for manufacturing checkout purposes.

Note: If you boot the system in this mode (that is, without a keyboard, mouse, or both) and plug in a keyboard or mouse after the system is running, you must restart the graphics system to use the devices.

Troubleshooting and Replacing Parts

This Appendix describes the steps to be taken to locate problems with an SGI Onyx Next Generation Graphics system, and provides the procedures for the removal and replacement of user-replaceable parts.

Troubleshooting G2-bricks and G2N-bricks

If you are experiencing problems with your SGI Onyx Next Generation Graphics system, you can follow the steps detailed in this section to help isolate and correct the problem.

If you are having problems with your host system you should refer to the user's manual for that host system.

For problems not addressed in this section, please contact your SGI authorized support representative.

General Procedures

Before proceeding to the sections addressing specific issues, follow the steps in this section.

1. Ensure that each graphics brick in your system is connected to AC power.
See "Providing Power to G2-bricks and G2N-bricks" on page 101.
2. Ensure that each graphics brick in your system is powered on.
See "Front Panel Items" on page 3.
3. Ensure that the host system can "see" each graphics brick in your system.
See "Verifying System Connections" on page 102.

Troubleshooting Chart

Table A-1 lists recommended actions for problems that can occur on your system. For problems that are not listed in this table, use the SGI Electronic Support system to help solve your problem or contact your SGI system support engineer (SSE). More information about the SGI Electronic Support system is provided in this appendix.

Table A-1 Troubleshooting Chart

Problem Description	Recommended Action
The system will not power on.	Ensure that the power cord of the PDU is seated properly in the power receptacle. Ensure that the PDU circuit breaker is on. If the power cord is plugged in and the circuit breaker is on, contact your SSE.
An individual brick will not power on.	Ensure that the power cord between the PDU and the brick is securely plugged in at both ends. View the L1 display, refer to Table A-2 if an error message is present. If the L1 controller is not running, contact your SSE.
The system will not boot the operating system.	Contact your SSE.
The Service Required LED illuminates on a brick.	View the L1 display of the failing brick; refer to Table A-2 for a description of the error message.
The Failure LED illuminates on a brick.	View the L1 display of the failing brick; refer to Table A-2 for a description of the error message.
The green or yellow LED of a NUMAlink port (rear of NUMAlink brick) is not illuminated.	Ensure that each end of the NUMAlink cable is seated properly.

L1 Controller Error Messages

Table A-2 lists error messages that the L1 controller generates and displays on the L1 display. This display is located on the front of the brick.

Note: In Table A-2, a voltage warning occurs when a supplied level of voltage is below or above the nominal (normal) voltage by 10 percent. A voltage fault occurs when a supplied level is below or above the nominal voltage by 20 percent.

Table A-2 L1 Controller Messages

L1 System Controller Message	Message Meaning and Action Needed
Internal voltage messages:	
ATTN: x.xV high fault limit reached @ x.xxV	30-second power-off sequence for the brick.
ATTN: x.xV low fault limit reached @ x.xxV	30-second power-off sequence for the brick.
ATTN: x.xV high warning limit reached @ x.xxV	A higher than nominal voltage condition is detected.
ATTN: x.xV low warning limit reached @ x.xxV	A lower than nominal voltage condition is detected.
ATTN: x.xV level stabilized @ x.xV	A monitored voltage level has returned to within acceptable limits.
Fan messages:	
ATTN: FAN # x fault limit reached @ xx RPM	A fan has reached its maximum RPM level. The ambient temperature may be too high. Check to see if a fan has failed.
ATTN: FAN # x warning limit reached @ xx RPM	A fan has increased its RPM level. Check the ambient temperature. Check to see if the fan stabilizes.
ATTN: FAN # x stabilized @ xx RPM	An increased fan RPM level has returned to normal.

Table A-2 L1 Controller Messages (continued)

L1 System Controller Message	Message Meaning and Action Needed
Temperature messages: low altitude	
ATTN: TEMP # advisory temperature reached @ xxC xxF	The ambient temperature at the brick's air inlet has exceeded 30 °C.
ATTN: TEMP # critical temperature reached @ xxC xxF	The ambient temperature at the brick's air inlet has exceeded 35 °C.
ATTN: TEMP # fault temperature reached @ xxC xxF	The ambient temperature at the brick's air inlet has exceeded 40 °C.
Temperature messages: high altitude	
ATTN: TEMP # advisory temperature reached @ xxC xxF	The ambient temperature at the brick's air inlet has exceeded 27 °C.
ATTN: TEMP # critical temperature reached @ xxC xxF	The ambient temperature at the brick's air inlet has exceeded 31 °C.
ATTN: TEMP # fault temperature reached @ xxC xxF	The ambient temperature at the brick's air inlet has exceeded 35 °C.
Temperature stable message:	
ATTN: TEMP # stabilized @ xxC/xxF	The ambient temperature at the brick's air inlet has returned to an acceptable level.
Power off messages:	
Auto power down in xx seconds	The L1 controller has registered a fault and is shutting down. The message displays every 5 seconds until shutdown.
Base module appears to have been powered down	The L1 controller has registered a fault and has shut down.

SGI Electronic Support

SGI Electronic Support provides system support and problem-solving services that function automatically, which helps resolve problems before they can affect system availability or develop into actual failures. SGI Electronic Support integrates several services so they work together to monitor your system, notify you if a problem exists, and search for solutions to the problem.

Figure A-1 shows the sequence of events that occurs if you use all of the SGI Electronic Support capabilities.

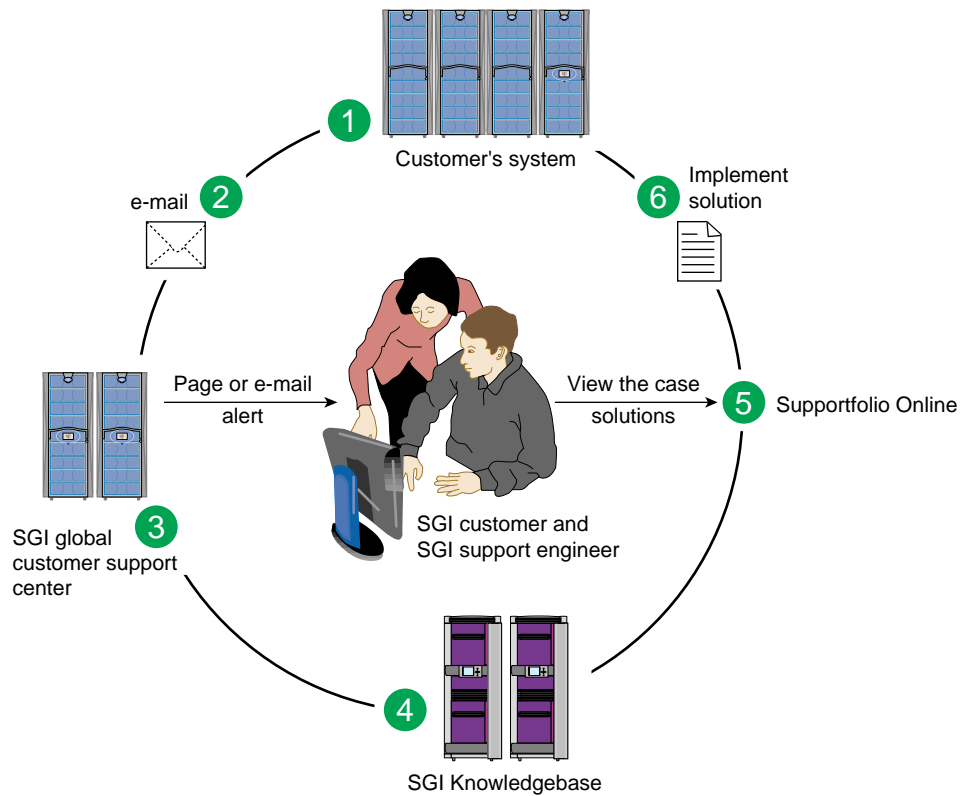


Figure A-1 Full Support Sequence

The sequence of events can be described as follows:

1. Embedded Support Partner (ESP) monitors your system 24 hours a day.
2. When a specified system event is detected, ESP notifies SGI via e-mail (plain text or encrypted).
3. Applications that are running at SGI analyze the information, determine whether a support case should be opened, and open a case if necessary. You and SGI support engineers are contacted (via pager or e-mail) with the case ID and problem description.
4. SGI Knowledgebase searches thousands of tested solutions for possible fixes to the problem. Solutions that are located in SGI Knowledgebase are attached to the service case.
5. You and the SGI support engineers can view and manage the case by using Supportfolio Online as well as search for additional solutions or schedule maintenance.
6. Implement the solution.

Most of these actions occur automatically, and you may receive solutions to problems before they affect system availability. You also may be able to return your system to service sooner if it is out of service.

In addition to the event monitoring and problem reporting, SGI Electronic Support monitors both system configuration (to help with asset management) and system availability and performance (to help with capacity planning).

The following three components compose the integrated SGI Electronic Support system:

SGI Embedded Support Partner (ESP) is a set of tools and utilities that are embedded in the IRIX operating system. ESP can monitor a single system or group of systems for system events, software and hardware failures, availability, performance, and configuration changes, and then perform actions based on those events. ESP can detect system conditions that indicate potential problems, and then alert appropriate personnel by pager, console messages, or e-mail (plain text or encrypted). You also can configure ESP to notify an SGI call center about problems; ESP then sends e-mail to SGI with information about the event.

SGI Knowledgebase is a database of solutions to problems and answers to questions that can be searched by sophisticated knowledge management tools. You can log on to SGI Knowledgebase at any time to describe a problem or ask a question. Knowledgebase searches thousands of possible causes, problem descriptions, fixes, and how-to instructions for the solutions that best match your description or question.

Supportfolio Online is a customer support resource that includes the latest information about patch sets, bug reports, and software releases.

The complete SGI Electronic Support services are available to customers who have a valid SGI Warranty, FullCare, FullExpress, or Mission-Critical support contract. To purchase a support contract that allows you to use the complete SGI Electronic Support services, contact your SGI sales representative. For more information about the various support contracts, refer to the following Web page:

<http://www.sgi.com/support/customerservice.html>

For more information about SGI Electronic Support, refer to the following Web page:

<http://www.sgi.com/support/es>

Replacing Parts

This section describes the parts in an SGI Onyx Next Generation Graphics system that may be replaced by a user.

For information about parts in your host system you should refer to the user's manual for that host system.

For parts not addressed in this Appendix, please contact your SGI authorized support representative.

Safety Instructions

Before you perform any type of maintenance to your system, read the following safety instructions:

- Follow all warnings and instructions marked on the product and noted in this and other documentation included with the product.
- Unplug this product from the wall outlet before you clean it. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
- Do not use this product near water.
- Do not place this product or components of this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
- Slots and openings on the cabinet and components are provided for ventilation, reliable operation, and protection from overheating of the product. These slots and openings must not be blocked or covered. This product should never be placed near or over a radiator or heat register, or in a built-in installation unless proper ventilation is provided.
- This product should be operated with the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
- Do not allow anything to rest on the power cord. Do not locate this product where people will walk on the cord.
- Do not use extension cords with your SGI system.
- Never push objects of any kind into this product through cabinet slots because they may touch dangerous voltage points or short out parts that could result in a fire or electric shock.
- Never spill liquid of any kind on the product.

- Do not attempt to service this product yourself except as noted in this guide. Opening or removing covers of internal components may expose you to dangerous voltage points or other risks. Refer all servicing to qualified service personnel.
- Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - If the power cord or plug is damaged or frayed.
 - If the product has been exposed to rain, water, or other type of liquid.
 - If the product does not operate normally when the operating instructions are followed.

Note: Adjust only those controls that are covered by the operating instructions, because improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal condition.

- If the product has been dropped or if the cabinet has been damaged.
- If the product exhibits a distinct change in performance, which indicates a need for service.
- Only qualified service personnel should replace the soldered lithium battery (or batteries) in the system. Please see the “Lithium Battery Statement” on page 109 for more information.
- Use only the proper type of power supply cord set (provided with the system) for this unit.

Power Supply

Each G2-brick or G2N-brick contains a sled-mounted power supply (refer to Figure A-2).

This section provides the following information:

- “Reading the Power Supply LEDs” on page 53
- “Replacing the Power Supply” on page 54

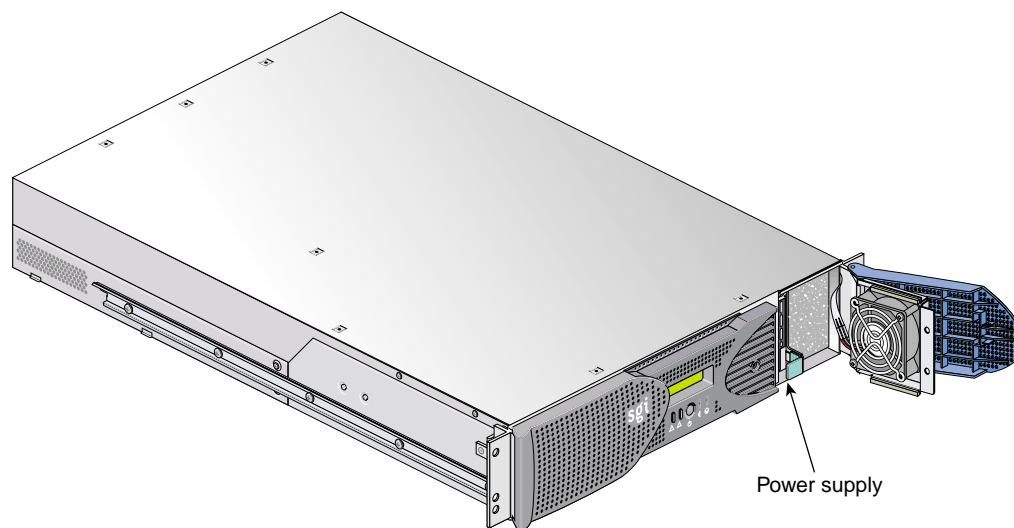


Figure A-2 Power Supply Location

Reading the Power Supply LEDs

Use the LED located on the front (towards the top) of the power supply to read the condition of the power supply. Table A-3 shows the LED status and the power supply condition the LED status indicates.

Table A-3 LED Status and Power Supply Condition

LED Status	Power Supply Condition Indicated
Off	Indicates that the power supply is not receiving AC power. Power supplies will not be receiving AC power because either the brick is not plugged into power, or an electrical fuse has blown.
Amber	Indicates a fault condition for one of the following reasons: <ul style="list-style-type: none">- The voltage limit has been exceeded.- The temperature limit has been exceeded.- The current limit has been exceeded.
Blinking Green	The power supply is receiving AC power, but the main primary DC power has not yet activated.
Green	The power supply is operating properly.

Replacing the Power Supply

To replace the power supply, follow these steps:

1. Power off the host system as described in the user's guide that came with your host system.



Warning: Components may be hot. To avoid injury, allow the components to cool for approximately five minutes before you proceed with these instructions.

2. Remove the power supply, as follows:
 - a. Swing open the bezel door located on the right side of the brick front panel. With a Phillips screw driver, unscrew the two screws on the screen cover as shown in Figure A-3A.
 - b. Swing open the screen cover as shown in Figure A-3B.
 - c. Disengage the power supply from the power supply bay by pushing the interior release button to the right and pulling up and out on the green-colored handle lock as shown in Figure A-3C.
 - d. Gently pull out the power supply from the chassis until it clears the power supply bay as shown in Figure A-3D. Place the power supply on an ESD-safe surface.

Caution: When pulling the power supply out from the chassis, make sure not to disturb the power supply fan's ribbon cable.

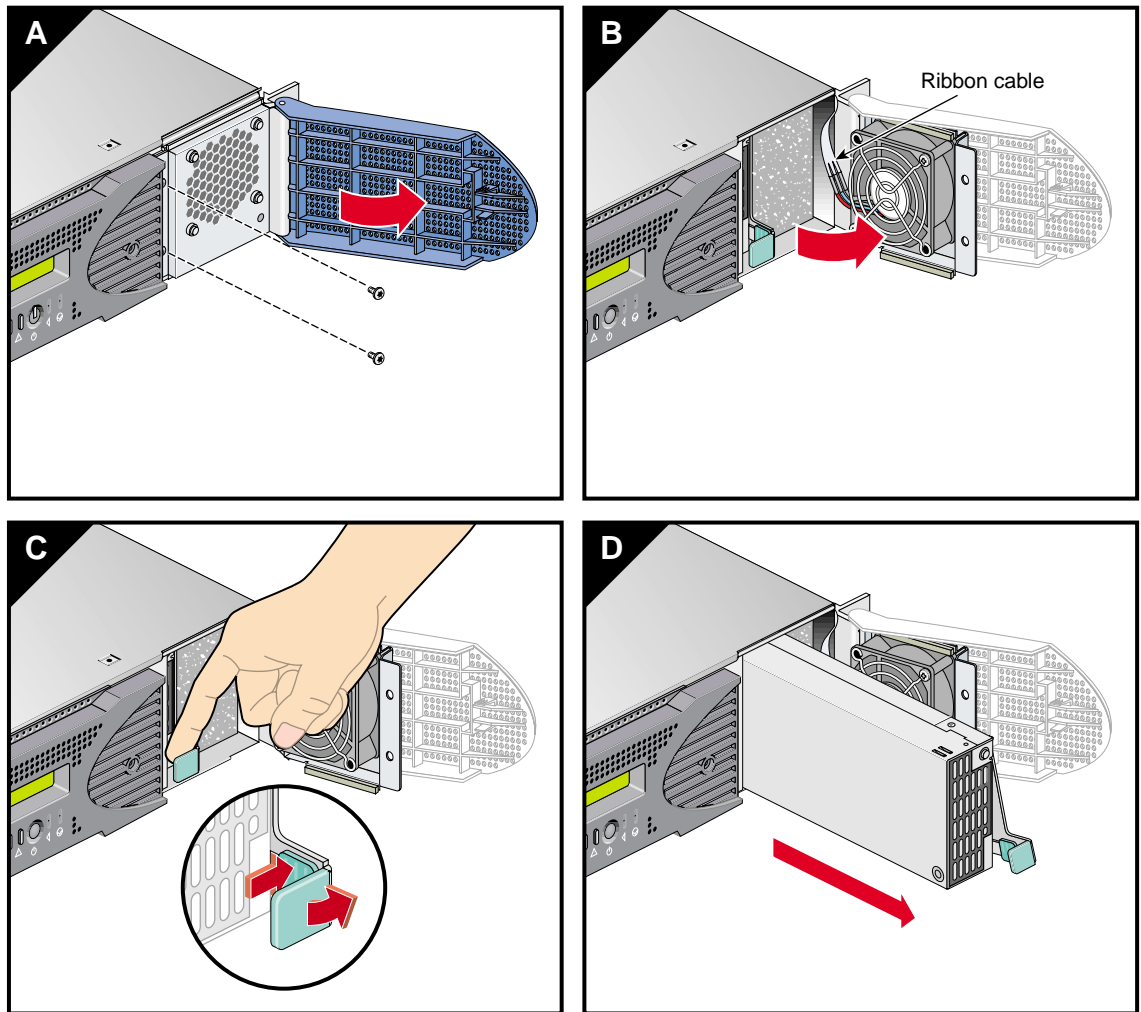


Figure A-3 Removing the Power Supply

3. Install the replacement power supply, as follows:
 - a. Position the power supply in the slot and with the power supply handle pulled up (fully opened), gently push the power supply into the bay as shown in Figure A-4A.

Caution: When installing the power supply, make sure that the power supply does not clip or pinch the power supply fan's ribbon cable.

- b. Push in and down on the green-colored handle and snap the power supply into place as shown in Figure A-4B.
 - c. After you have installed the power supply, swing the screen cover until it closes as shown in Figure A-4C.

Caution: When closing the screen cover, make sure that the cover does not clip or pinch the power supply fan's ribbon cable.

- d. Screw in the two Phillips screws that you had removed as shown in Figure A-4D, and close the bezel door.
4. Power on the host system as described in the user's guide that came with your host system.

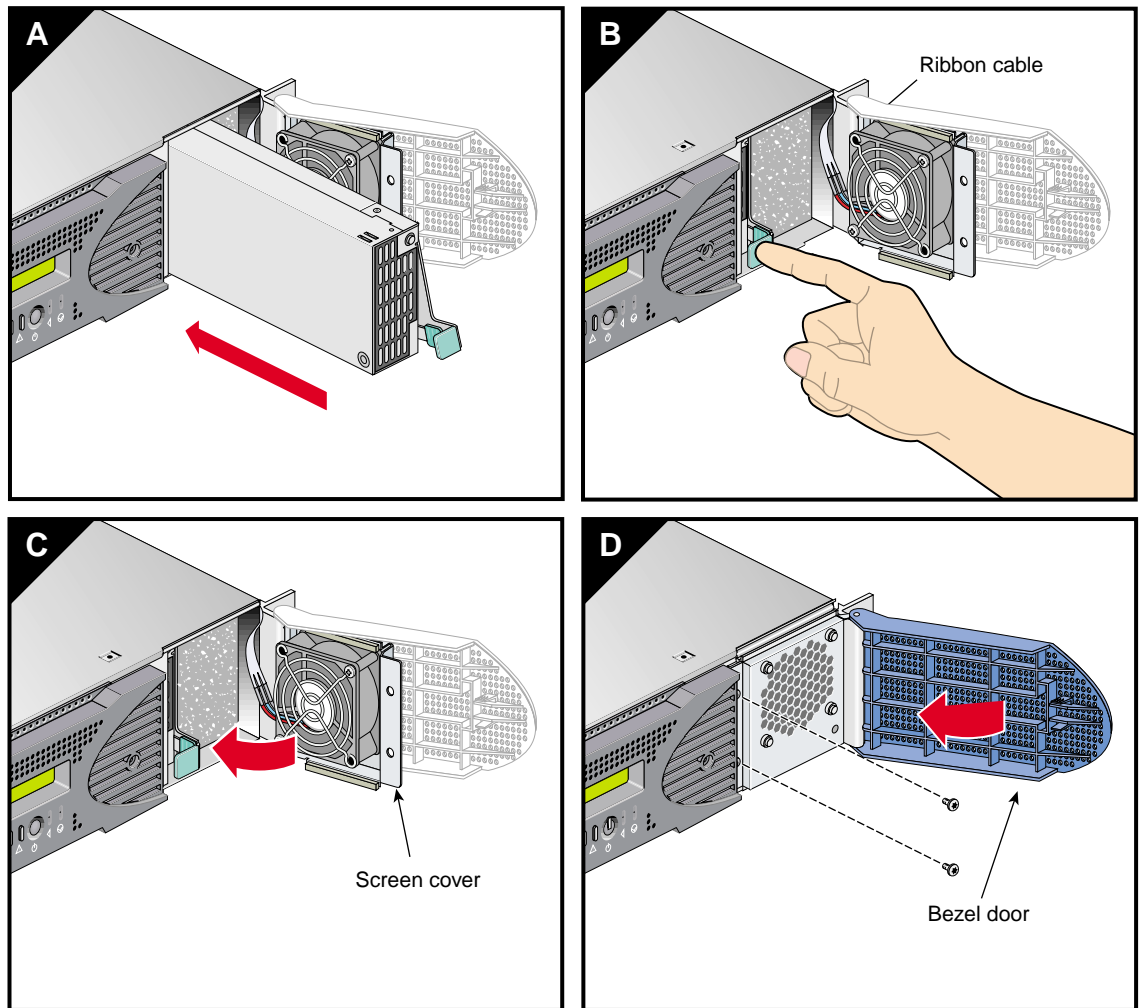


Figure A-4 Installing the Power Supply

Memory

Memory is contained on cards that are referred to as DIMMs (dual inline memory modules). Each G2N-brick can contain two, four, six, or eight DIMMs installed in eight DIMM slots located in the brick.

Note: G2N-bricks contain memory. G2-bricks, however, do not have DIMM slots, and therefore can not contain memory.

These eight DIMM slots are physically grouped into even-numbered slots (0, 2, 4, and 6) and odd-numbered slots (1, 3, 5, and 7) as shown in Figure A-5 on page 60.

DIMMs must be installed in pairs, one per DIMM slot, so that the two DIMMs installed provide local memory for the same pair of banks. For example, if you install a DIMM in slot 0, you must also install a DIMM in slot 1. (This adds memory to bank pairs 0 and 1). Table A-4 lists the DIMM slots and the corresponding bank pairs to which local memory is provided when DIMMs are installed.

Table A-4 DIMMs and Bank Pairs

DIMM in Slot Number	Provides Local Memory for Bank Pair Numbers
0 ^a	0 and 1
1	0 and 1
2	2 and 3
3	2 and 3
4	4 and 5
5	4 and 5
6	6 and 7
7	6 and 7

a. The first two DIMMs must be installed in DIMM slot 0 and DIMM slot 1.

You must note these guidelines when installing DIMMs:

- Memory is increased or decreased in two-DIMM increments only.
- The two DIMMs that make up a bank pair must be the same memory size; however, each pair of DIMMs can differ in memory size.
- The first two DIMMs must be installed in DIMM slot 0 and DIMM slot 1. Subsequent DIMMs can be installed into any bank pairs as long as the two DIMMs are installed so that they provide local memory for the same bank pair. For example, you can install DIMMs in slots 2 and 3 to provide local memory for banks 2 and 3. Or you can install DIMMs in slots 4 and 5 to provide memory to banks 4 and 5, or you can install DIMMs in slots 6 and 7 to provide memory for banks 6 and 7.
- The DIMMs used in the G2N-brick are compatible with the DIMMs used in Origin 300 and Origin 350 server system base compute modules, the system expansion compute module, and the MPX module. They are not compatible with the DIMMs used in the Origin 200, SGI 2000 series, Onyx2, or Octane systems.
- The G2N-brick supports the following memory kits:
 - 1-GB kit with integrated directory memory.
 - 2-GB kit with integrated directory memory.

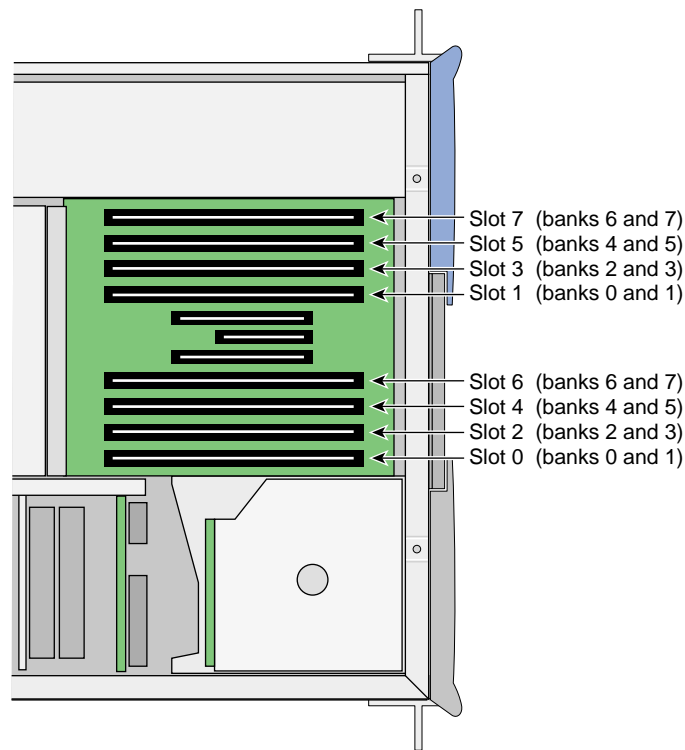


Figure A-5 Layout of DIMM Slots and Local Memory Banks



Caution: Electronic equipment can be irreparably damaged by electrostatic discharge (ESD). Always follow these preventive measures when you handle a system component:

- Remove a component from its antistatic bag only when you are ready to install it.
 - If you handle a component before installation, do not place it on surfaces that produce ESD (carpeting, for example) or near devices that create static electricity.
 - Attach a static wrist strap to a grounded connection on your system when you install or remove a component.
-

Installing a DIMM

To install a DIMM, follow these steps:

1. Power off the host system as described in the user's guide that came with your host system.
2. Disconnect all of the cables at the rear of the brick.



Warning: Components may be hot. To avoid injury, allow the components to cool for approximately five minutes before you proceed with these instructions.

3. Remove the two screws that secure the brick to the front rails of the rack.
4. Pull the brick from the rack until it is stopped by the safety latches.
5. To access the DIMMs, remove the ten Phillips screws shown in Figure A-6 and lift and open the hinged cover.

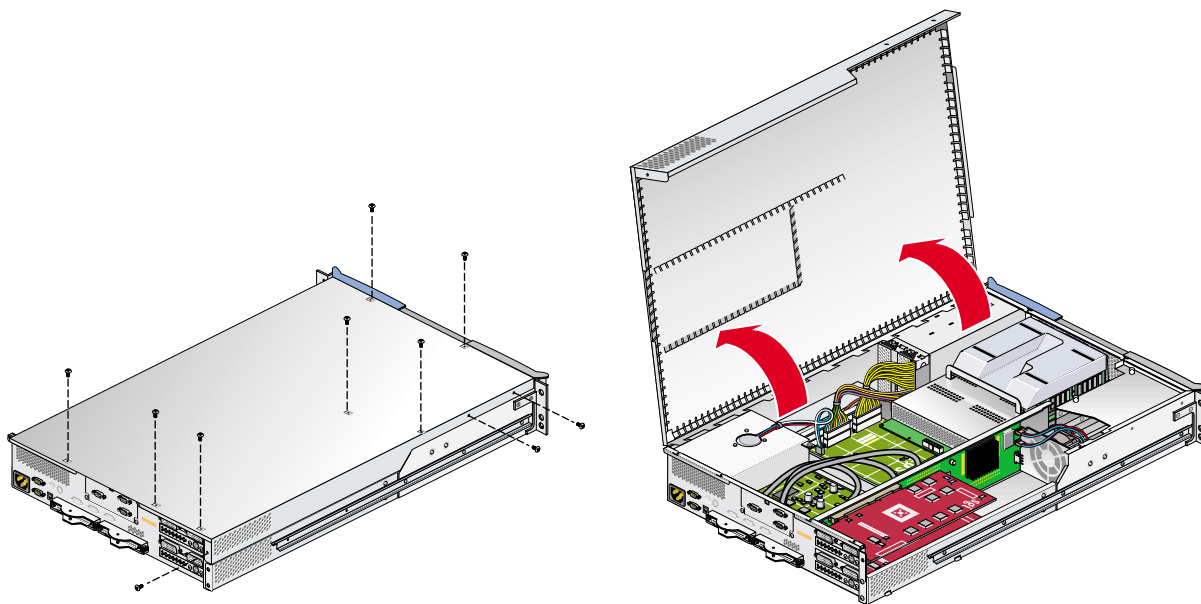


Figure A-6 Opening Module Cover to Install DIMMs

6. Remove the plastic air baffle covering the DIMMs, as shown in Figure A-7.

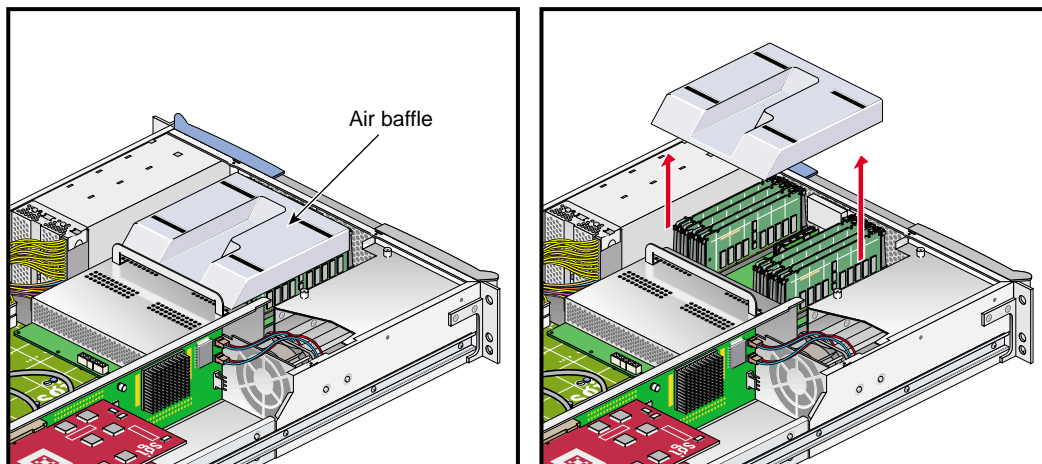


Figure A-7 Removing the Plastic Air Baffle

7. Install the DIMM, as follows (see Figure A-8):

Note: If you need to find the correct location in which to install the DIMMs, make sure to read the introductory material in “Memory” on page 58.

- a. Open the ejector latches.
 - b. Hold the DIMM only by its edges and remove it from its antistatic package.
 - c. Align the three notches in the bottom edge of the DIMM with the keyed socket.
 - d. Insert the bottom edge of the DIMM into the socket, and then press down on the DIMM until it seats correctly. Use extreme care when you install a DIMM. If you apply too much pressure, you can damage the socket.
 - e. Gently push the plastic ejector latches down to secure the DIMM, as shown in Figure A-8. When the DIMM is fully seated in the connector, the ejector latches snap into place.
8. Repeat Step 7 for the second DIMM of the pair.
 9. Replace the plastic air baffle.

10. Attach the hinged cover and secure it to the brick with ten Phillips screws.
11. Press the safety latches on both sides of the brick and slide the brick into the rack.
12. Install the two screws that secure the brick to the front rails of the rack.
13. Install all of the cables at the rear of the brick.
14. Power on the host system as described in the user's guide that came with your host system.

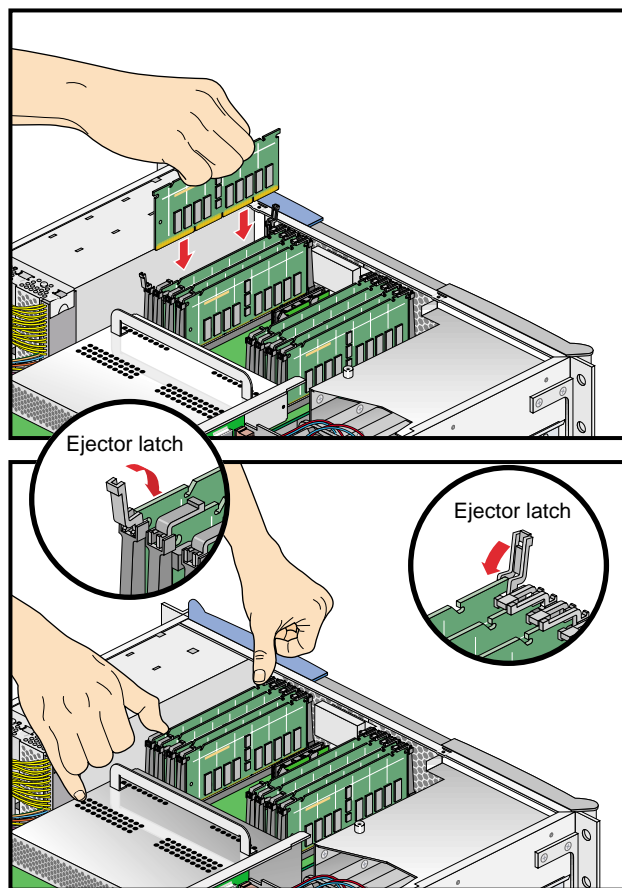


Figure A-8 Inserting a DIMM

Removing a DIMM

To remove a DIMM, follow these steps:

1. Power off the host system as described in the user's guide that came with your host system.
2. Disconnect all of the cables at the rear of the brick.



Warning: Components may be hot. To avoid injury, allow the components to cool for approximately five minutes before you proceed with these instructions.

3. Remove the two screws that secure the brick to the front rails of the rack.
4. Pull the brick from the rack until it is stopped by the safety latches.
5. To access the DIMMs, remove the ten Phillips screws shown in Figure A-9 and open the hinged cover.

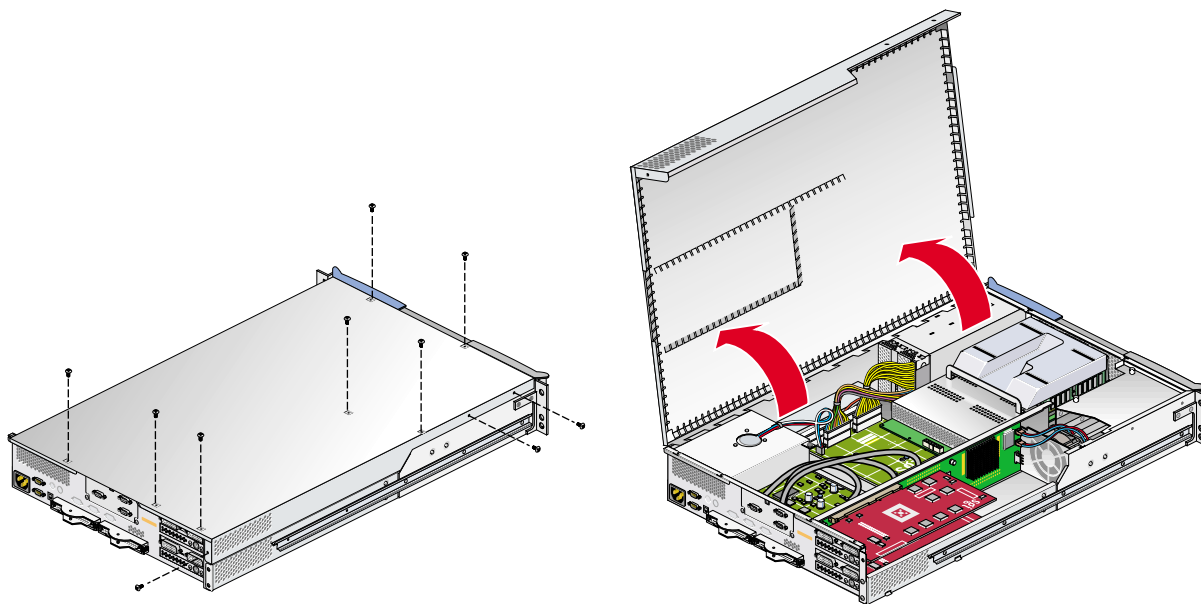


Figure A-9 Opening Module to Remove DIMM

6. Remove the plastic air baffle covering the DIMMs, as shown in Figure A-10.

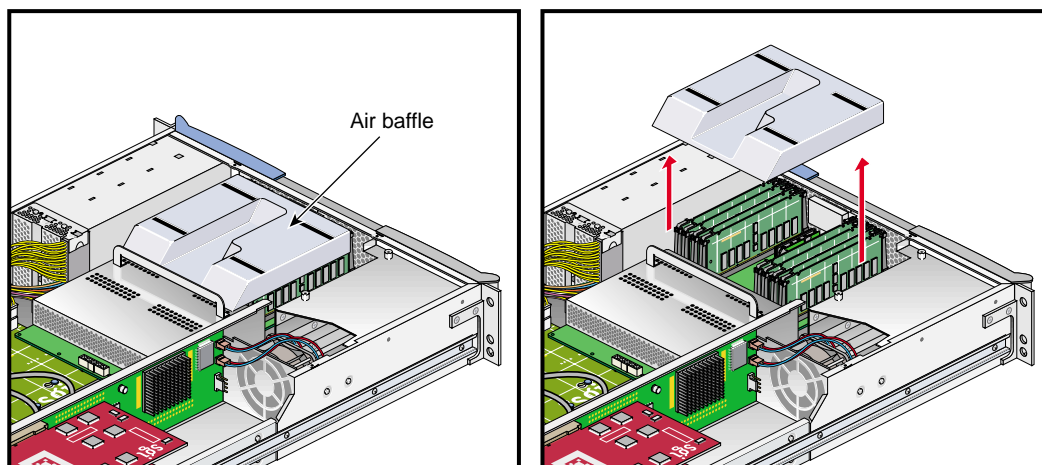


Figure A-10 Removing the Plastic Air Baffle

7. Remove the DIMM, as follows (see Figure A-11):

Note: If you need to find the correct location from which to remove the DIMMs, make sure to read the introductory material in “Memory” on page 58.

- a. Lift the two ejector latches simultaneously to disengage the DIMM from its connector.
- b. Carefully grasp the DIMM and pull it up and out of the guide rails.

Note: Hold the DIMM only by its edges. Be careful not to touch its components or gold edge connectors.

- c. Place the DIMM on an ESD-safe surface.
8. If you are installing a new DIMM, proceed to “Installing a DIMM” on page 61. If you are not installing a new DIMM, proceed to the next step.
 9. Repeat Step 7 for the second DIMM of the pair.
 10. Replace the plastic air baffle covering the DIMMs.
 11. Attach or close the hinged cover and secure it to the brick with the ten Phillips screws.

12. Press the safety latches on both sides of the brick and slide the brick into the rack.
13. Install the two screws that secure the brick to the front rails of the rack.
14. Install all of the cables at the rear of the brick.
15. Power on the host system as described in the user's guide that came with your host system.

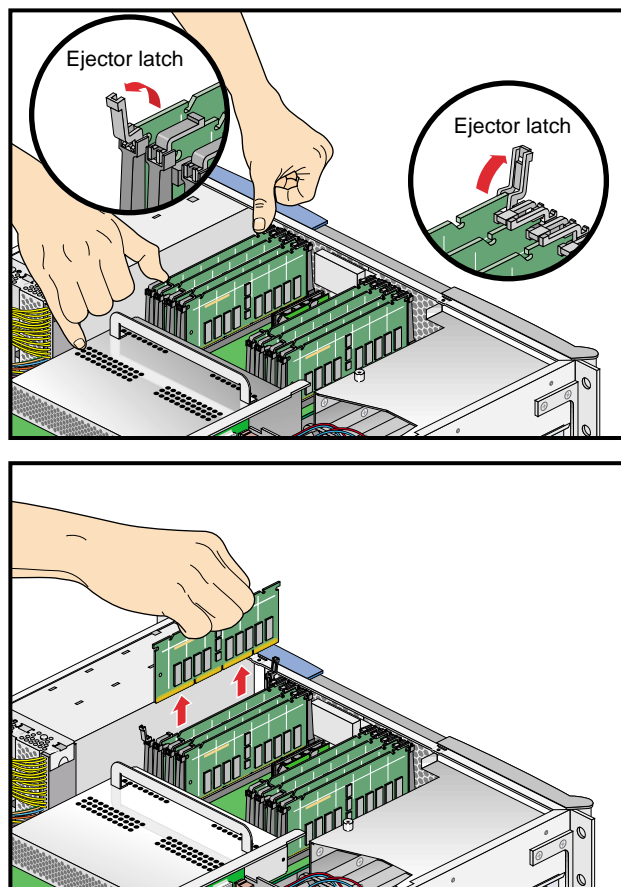


Figure A-11 Removing a DIMM

L1 Controller Display

The L1 controller, which is used to monitor and manage the G2-brick or G2N-brick, has a display located on the front panel of the brick, as shown in Figure A-12. Every G2-brick and G2N-brick is factory-shipped with an L1 controller display. This section describes how to replace an L1 controller display panel.

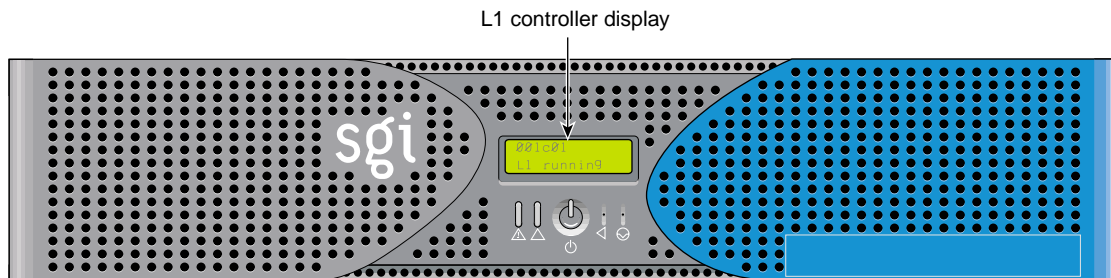


Figure A-12 L1 Controller Display on G2-bricks and G2N-bricks

To replace an L1 controller display, follow these steps:

1. Power off the host system as described in the user's guide that came with your host system.
2. Disconnect all of the cables at the rear of the brick.



Warning: Components may be hot. To avoid injury, allow the components to cool for approximately five minutes before you proceed with these instructions.

3. Remove the two screws that secure the brick to the front rails of the rack.
4. Pull the brick from the rack until it is stopped by the safety latches.

5. To access the area where the L1 display is replaced, remove the ten Phillips screws shown in Figure A-13, and lift and open the hinged cover.

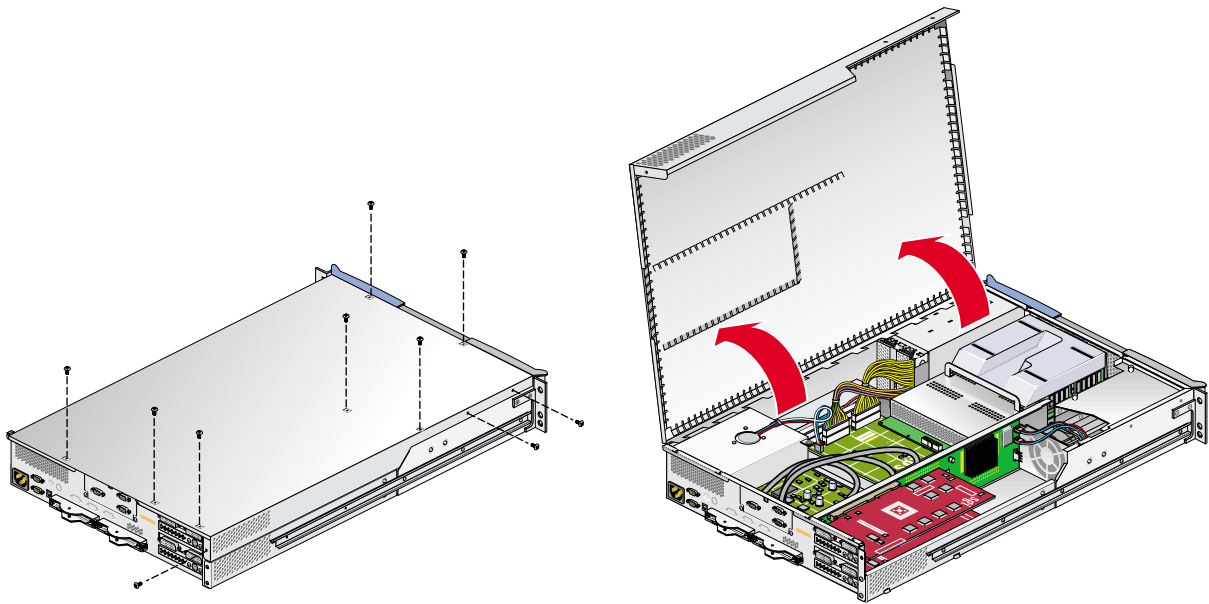


Figure A-13 Opening the Module to Access the L1 Controller Display

6. Remove the plastic air baffle covering the DIMMs, as shown in Figure A-7 in “Memory” on page 58.
7. On the front panel of your system, remove the front bezel by unscrewing the two Phillips screws holding the bezel to the chassis, as shown in Figure A-14A.
8. Holding the L1 display cover with one hand, unscrew the single Phillips screw holding the L1 display cover to the chassis, as shown in Figure A-14B. Gently unhook and pull away the L1 display cover from the chassis.
9. Unscrew the two Phillips screws holding the L1 controller display panel to the L1 display protective cover, as shown in Figure A-14C.
10. Gently disconnect the L1 controller cable from the connector on the L1 controller display, as shown in Figure A-14D.

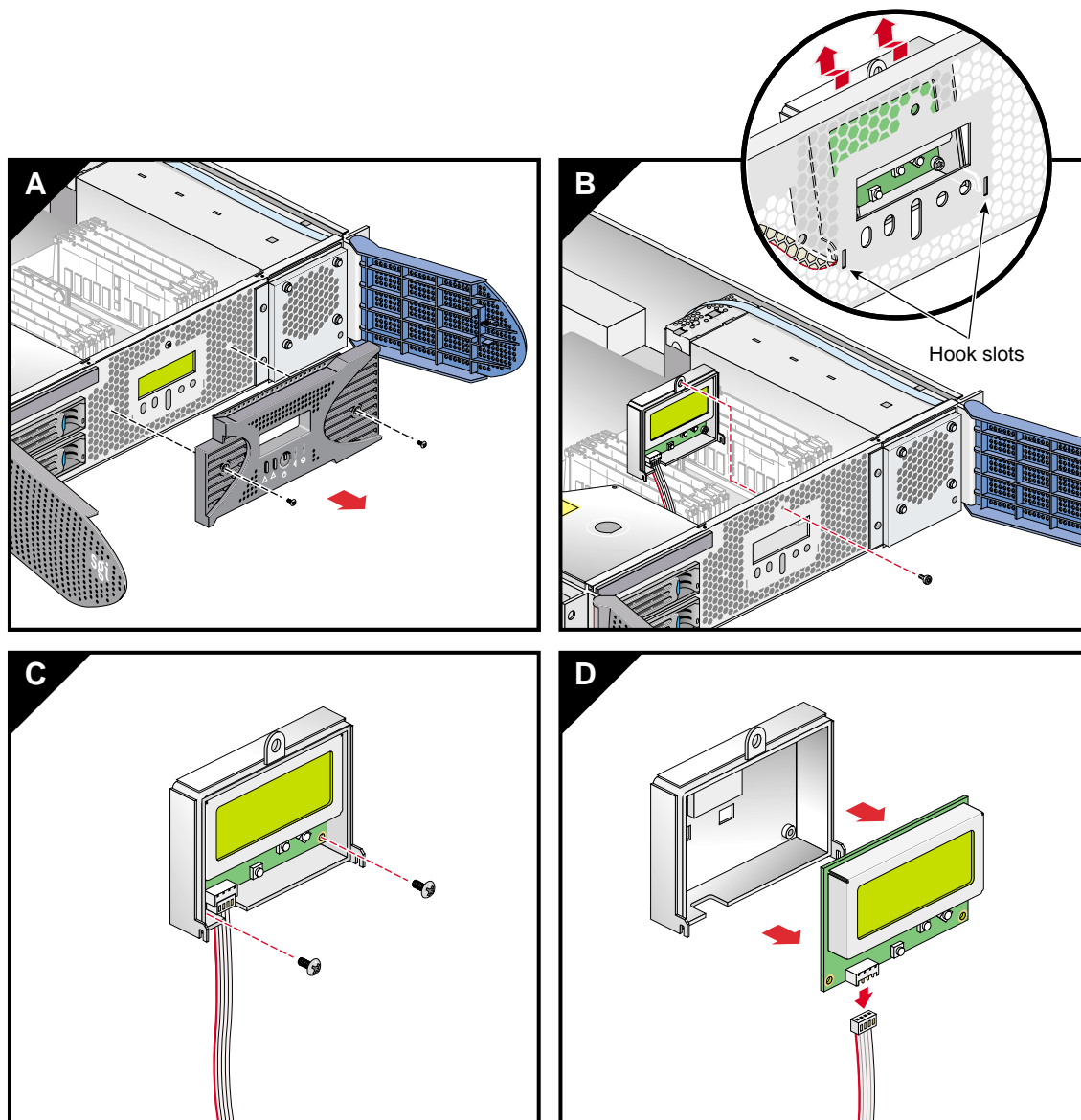


Figure A-14 Removing an L1 Controller Display Panel

11. Connect the L1 controller cable to the connector on the new L1 controller display, making sure that the red stripe is to your left, as shown in Figure A-15A.
12. Align the two screw holes on the L1 controller display with the holes on the L1 display protective cover, and screw in the two Phillips screws, as shown in Figure A-15B.
13. Hook in the L1 display protective cover onto the slots on the front chassis and, holding the L1 display cover up against the front chassis, screw in the Phillips screw, as shown in Figure A-15C.
14. Replace the front bezel onto the front chassis of the system by screwing in the two Phillips screws holding the bezel to the chassis, as shown in Figure A-15D.

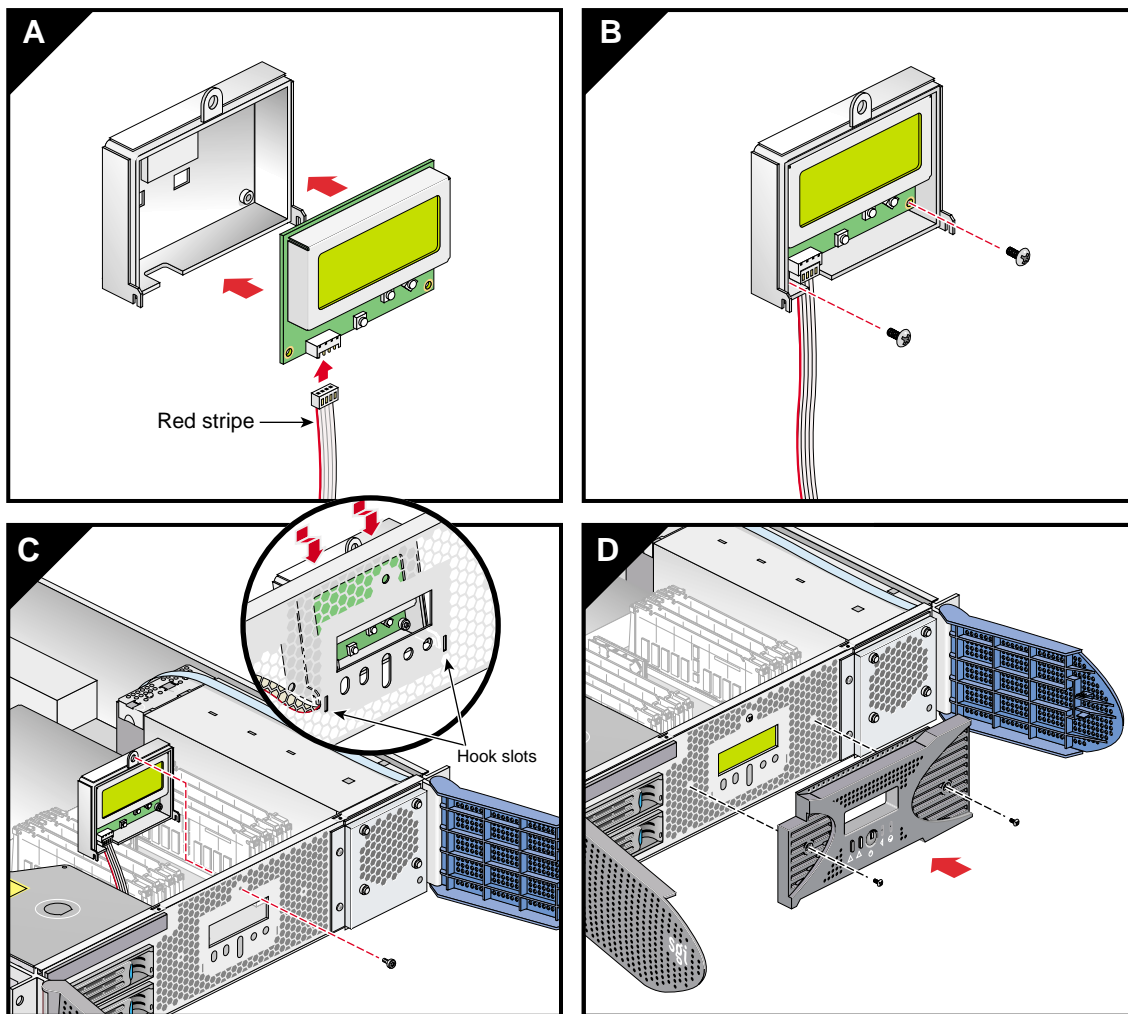


Figure A-15 Installing an L1 Controller Display Panel

15. Replace the plastic air baffle covering the DIMMs.
16. Attach the hinged cover and secure it to the brick with the ten Phillips screws.
17. Press the safety latches on both sides of the brick, and slide the brick into the rack.
18. Install the two screws that secure the brick to the front rails of the rack.

19. Install all of the cables at the rear of the brick.
20. Power on the host system as described in the user's guide that came with your host system.

Technical Information

This Appendix presents technical information about the SGI Onyx Next Generation Graphics Platform G2-bricks and G2N-bricks.

Display Requirements

The SGI Onyx Next Generation Graphics system supports analog or digital monitors with the following specifications:

Table B-1 Video Modes Supported on SGI Onyx Next Generation Graphics Pipes

Resolution	Refresh Rates
1024x768	60 Hz
1280x1024	60 Hz
1600x1200	60 Hz
1920x1080	72 Hz
1920x1200	60 Hz

Note: Though each graphics card has two DVI-I ports, only the first DVI-I port (head 0, on the left) may be connected to either a digital display or an analog display. The second DVI-I port (head 1, on the right) may only be connected to an analog display.

Note: Stereo is not supported in this release of the product.

Technical Specifications for G2-bricks and G2N-bricks

This section lists the technical specifications for the G2-bricks and G2N-bricks.

Table B-2 G2-brick and G2N-brick Technical Specifications

	G2-brick	G2N-brick
Dimensions		
Length	26.8 inches (68 cm)	26.8 inches (68 cm)
Width	17.1 inches (43.4 cm)	17.1 inches (43.4 cm)
Height	3.5 inches (8.8 cm)	3.5 inches (8.8 cm)
Form-factor	19-inch rack mount	19-inch rack mount
Weight	30 lb. (13.6 kg)	35 lb. (15.9 kg)
Voltage Ranges	90VAC-132VAC or 180VAC-264VAC	90VAC-132VAC or 180VAC-264VAC
Frequency	50Hz-60Hz	50Hz-60Hz
Power	285 watts maximum	600 watts maximum
Inrush current	20 amps (per power supply)	20 amps (per power supply)
Thermal load	975 Btu/hour maximum	2050 Btu/hour maximum
Temperature (operating)	+41 to +95 °F (+5 to +35 °C) <5,000 ft +41 to +86 °F (+5 to +30 °C) 5,000-10,000 ft	+41 to +95 °F (+5 to +35 °C) <5,000 ft +41 to +86 °F (+5 to +30 °C) 5,000-10,000 ft
Temperature (nonoperating)	-40 to +140 °F (-40 to +60 °C)	-40 to +140 °F (-40 to +60 °C)
Acoustic output	6 bel (idle), 41-86 °F (5-30 °C) <5,000 ft	6 bel (idle), 41-86 °F (5-30 °C) <5,000 ft
Altitude	Operating: 0-10,000 ft (0-3,048 m) Non-operating: 0-40,000 ft (0-12,192 m)	Operating: 0-10,000 ft (0-3,048 m) Non-operating: 0-40,000 ft (0-12,192 m)
Humidity	10% to 95% RH, noncondensing	10% to 95% RH, noncondensing

Connector Pinouts

This section describes the various connectors found on an SGI Onyx Next Generation Scalable Graphics brick. For details of connectors found on the host system, or on other bricks, see the documentation that came with those bricks.

DB9 Connector

Figure B-1 shows the DB9 serial port connector pin assignments. This connector is used for the console and diagnostic port of the G2-brick and G2N-brick, and enables you to connect a system console to the L1 controller on the graphics brick.

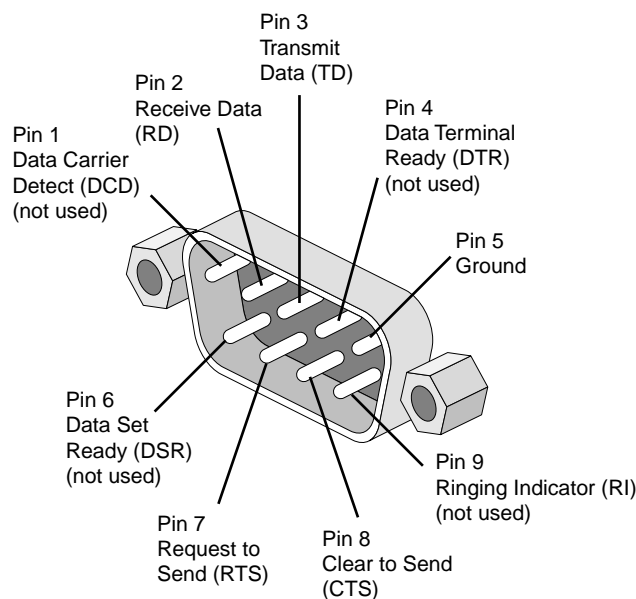


Figure B-1 DB9 Connector Pin Assignments

USB Type B Connector

Figure B-2 shows the USB type B connector that is used for the L1 USB port of the G2-bricks and G2N-bricks. Table B-3 lists the pin assignments.

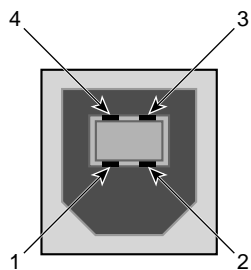


Figure B-2 USB Type B Connector Pin Number Locations

Table B-3 USB Type B Connector Pin Assignments

Signal	Color	Pin Number
VCC	Red	1
-Data	White	2
+Data	Green	3
Ground	Black	4

DVI-I Connector Pinout

The DVI connectors on each graphics card incorporate both digital and analog signals. Figure B-3 shows the pin numbers and Table B-4 shows the signals.

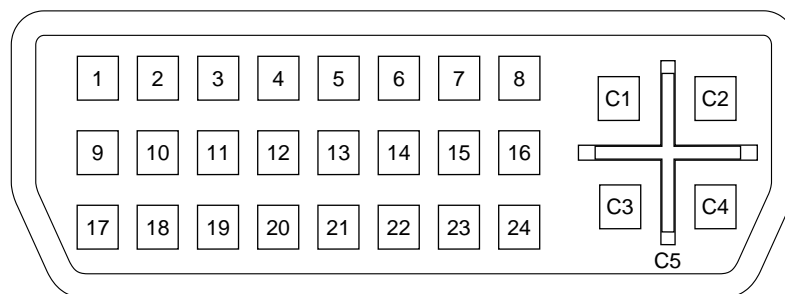


Figure B-3 DVI-I Connector Pinout

Table B-4 DVI-I Connector Signals

Pin	Function	Pin	Function
1	T.M.D.S. ^a Data 2-	16	Hot Plug Detect
2	T.M.D.S. Data 2+	17	T.M.D.S. Data 0-
3	T.M.D.S. Data 2/4 Shield	18	T.M.D.S. Data 0+
4	T.M.D.S. Data 4-	19	T.M.D.S. Data 0/5 Shield
5	T.M.D.S. Data 4+	20	T.M.D.S. Data 5-
6	DDC Clock	21	T.M.D.S. Data 5+
7	DDC Data	22	T.M.D.S. Clock Shield
8	Analog Vertical Sync	23	T.M.D.S. Clock+
9	T.M.D.S. Data 1-	24	T.M.D.S. Clock-
10	T.M.D.S. Data 1+		
11	T.M.D.S. Data 1/3 Shield	C1	Analog Red Video Out
12	T.M.D.S. Data 3-	C2	Analog Green Video Out
13	T.M.D.S. Data 3+	C3	Analog Blue Video Out
14	+5V Power	C4	Analog Horizontal Sync
15	Ground (for +5V)	C5	Analog Common Ground

a. Transition Minimized Differential Signaling

Installing G2-bricks and G2N-bricks

Depending on how you purchased your SGI Onyx Next Generation Graphics Platform, you may need to install one or more G2-bricks or G2N-bricks in a rack. This Appendix describes:

- “Choosing Rack Locations” on page 79.
- “Using G2-bricks or G2N-bricks with a Rack” on page 84.
- “Providing Power to G2-bricks and G2N-bricks” on page 101.
- “Verifying System Connections” on page 102.

Choosing Rack Locations

The rack locations for your G2-bricks or G2N-bricks will be partially determined by cable lengths and routings.

Since the SGI Onyx Next Generation Graphics Platform is a highly-configurable system, it is not practical to list every possible configuration. For configurations not shown here, consult your SGI sales or support representative.

The following figures show the most common configurations of the SGI Onyx Next Generation Graphics Platform. To assist in image sync cabling, the typical location of pipe 0 is called out in these figures.

Figure C-1 shows a configuration containing one host brick and one G2-brick.

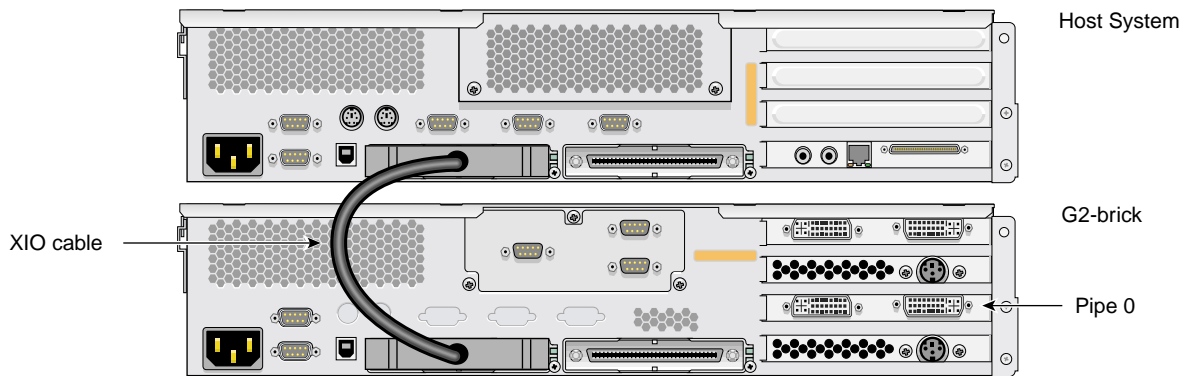


Figure C-1 One Host Brick with One G2-brick

Figure C-2 shows a configuration containing one host brick and one G2N-brick.

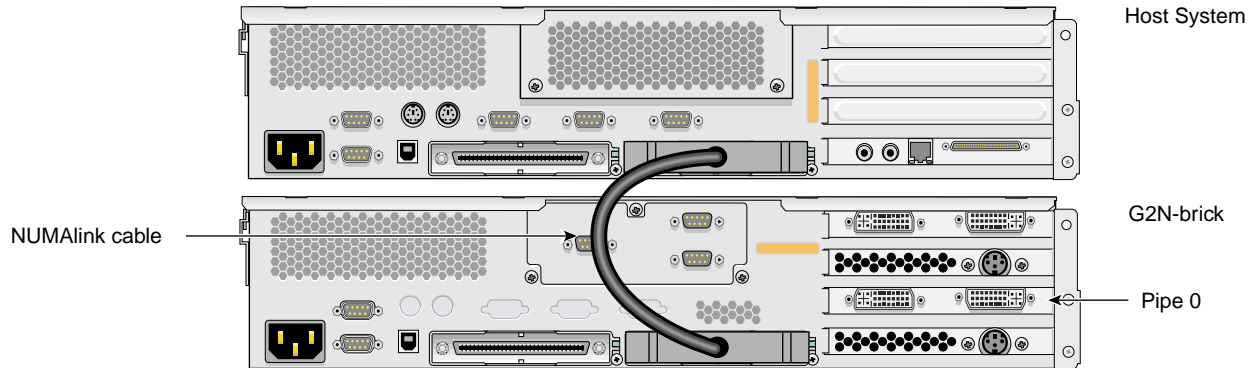


Figure C-2 One Host Brick with One G2N-brick

Figure C-3 shows a configuration containing one host brick, one G2-brick, and one G2N-brick.

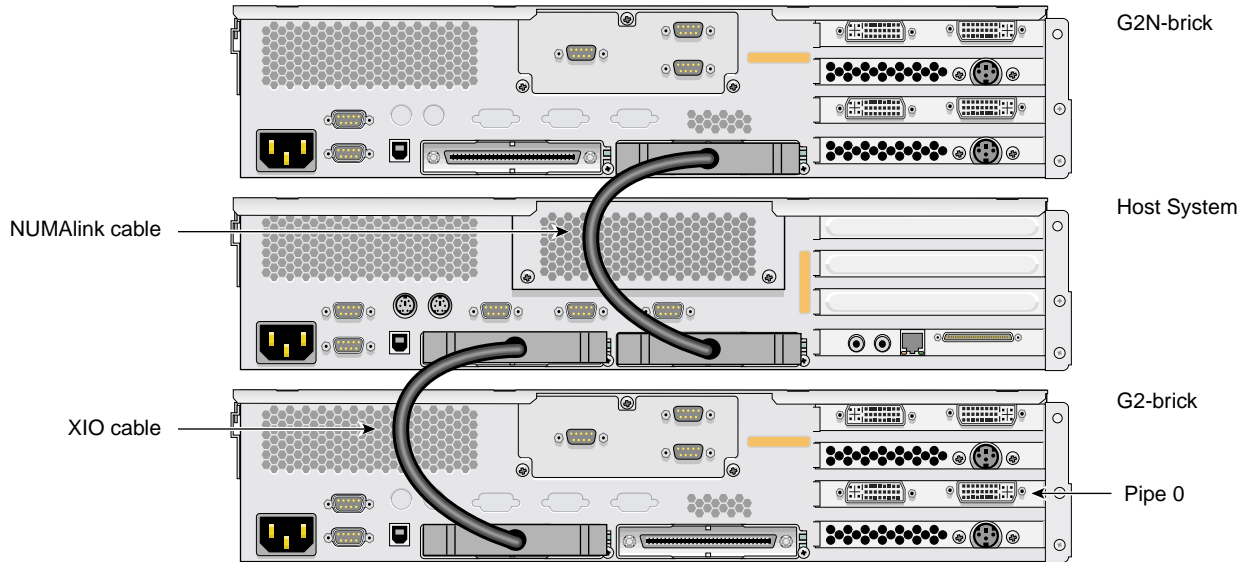


Figure C-3 One Host Brick, One G2-brick, and One G2N-brick

Figure C-4 shows a configuration containing two host bricks and one G2-brick.

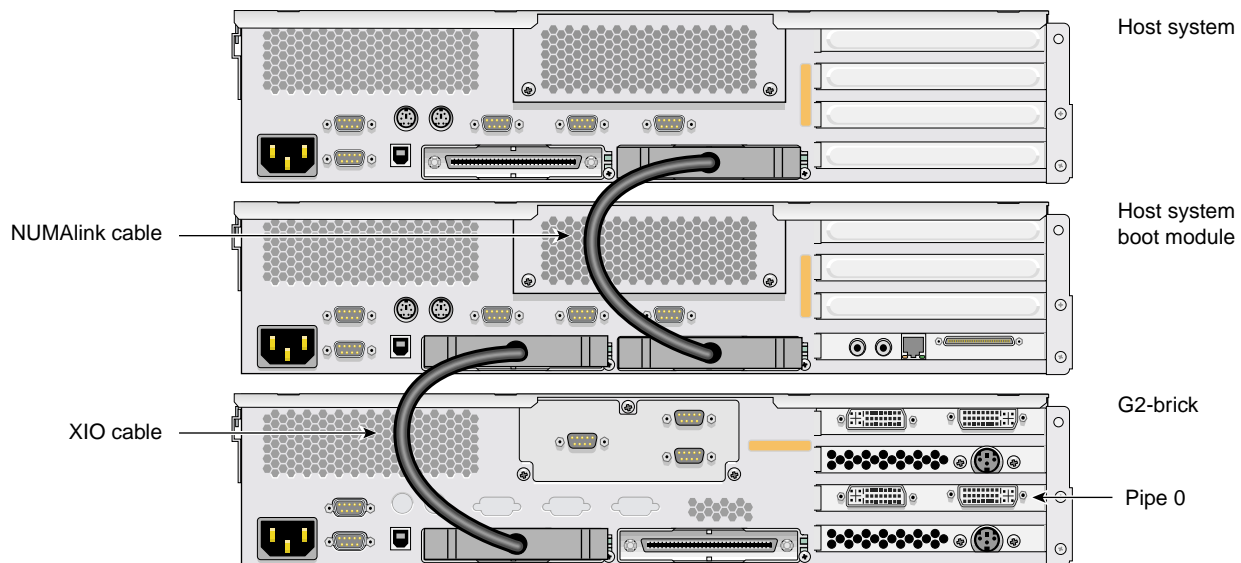


Figure C-4 Two Host Bricks and One G2-brick

Figure C-5 shows a configuration containing two host bricks and two G2-bricks.

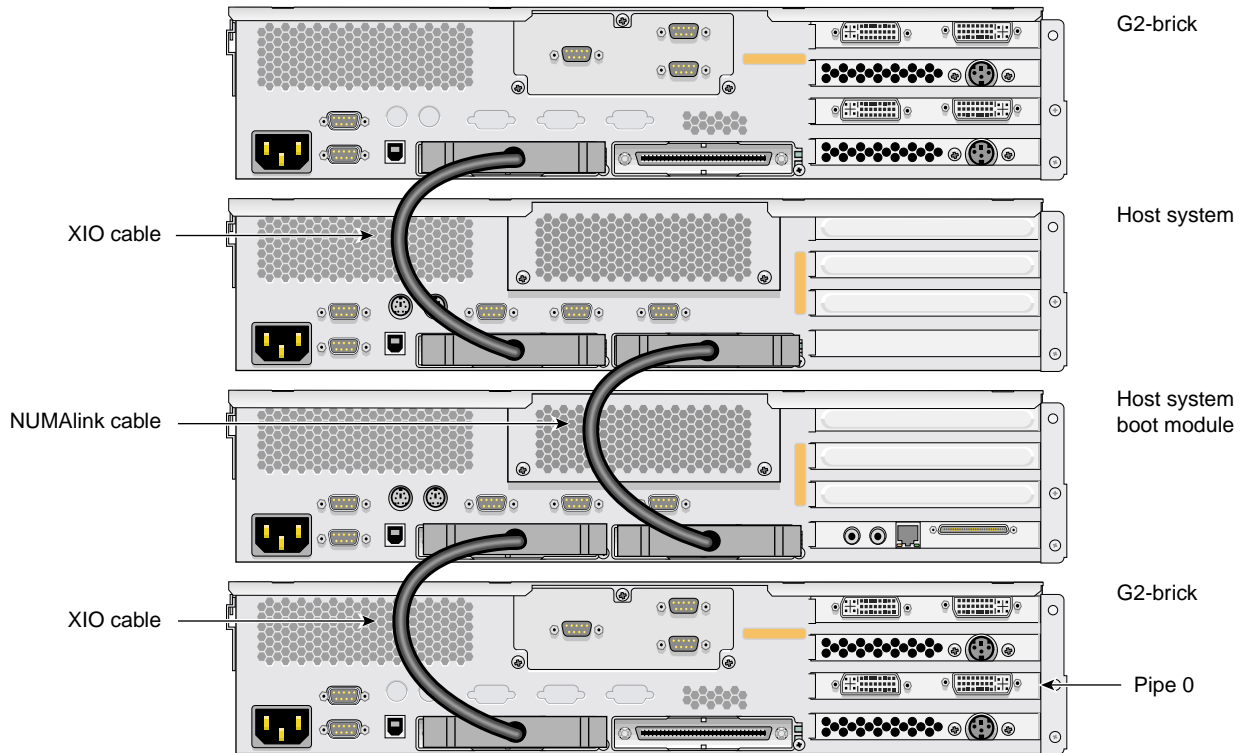


Figure C-5 Two Host Bricks and Two G2-bricks

Using G2-bricks or G2N-bricks with a Rack

This section describes how to install a G2-brick or G2N-brick in a rack using slide rails. It also describes how to remove the bricks from these racks.

This rackmounting information is found in the following sections:

- “Rackmounting Bricks with Slide Rails” on page 84
- “Removing a G2-brick or G2N-brick from a Rack” on page 98

Rackmounting Bricks with Slide Rails

This section describes how to rackmount bricks with slide rail assemblies. This section includes the following topics:

- “Determining Space Requirements” on page 85
- “Checking the Slide Rail Hardware” on page 85
- “Preparing the Slide Rail Assemblies” on page 86
- “Preparing the Brick” on page 89
- “Determining Where to Attach the Slide Rail in the Rack” on page 90
- “Attaching the Slide Rail to the Rack” on page 91
- “Installing Clip Nuts in Rack Rails” on page 94
- “Installing the Brick in the Rack” on page 95
- “Adjusting the Position of the Rackmounted Brick” on page 97

Determining Space Requirements

Table C-1 specifies the space requirements when rackmounting a G2-brick or a G2N-brick in a 19-inch rack.

Table C-1 G2-brick and G2N-brick Space Requirements

Height	3.44 inches (8.74 cm)
Width	17.06 inches (43.33 cm)
Depth	27 inches (68.58 cm) (with bezel)
Weight	37.80 lb. (17.18 kg) minimum configuration; 44.50 lb. (20.23 kg) maximum configuration ^a
Required front clearance for brick	8.25 inches (20.96 cm)
Required rear clearance for brick	10 inches (25.40 cm)
Required side clearance for brick	6 inches (15.24 cm) (right side) No clearance requirement for left side.
Required front clearance for rack	36 inches (91 cm)
Required rear clearance for rack	36 inches (91 cm)

a. Weight will vary depending on configuration.

Checking the Slide Rail Hardware

Table C-2 lists the hardware that you will use to mount each G2-brick or G2N-brick in a 19-inch rack.

Table C-2 Rackmounting Hardware

Hardware Type	Qty	Usage
Slide rail assembly (includes chassis rail)	2	Allows the brick to slide in and out of rack. (The left and right slides are identical.)
2-inch rear mounting bracket	2	Mounts the slide rails to the rear rack rails. (The left and right brackets are identical.)
10-24 x 1/4-inch Phillips screw	10	Secures the chassis rails to the brick.

Table C-2 Rackmounting Hardware **(continued)**

Hardware Type	Qty	Usage
10-32 x 1/2-inch Phillips screw	8	Secures the slide rails to the rack rails.
Shoulder washer	8	
Bar nut	4	
10-32 x 1/2-inch Phillips screw	4	Secures the slide rails to their mounting brackets.
Bar nut	2	
10-32 clip nut	2	Provides a threaded hole for fastening the brick front panel to the rack rails.
10-32 x 1/2-inch Phillips screw	2	Fastens the brick front panel to the clip nut.

Preparing the Slide Rail Assemblies

The slide rail assembly consists of a chassis rail and a slide rail. You need to remove the chassis rail from the slide rail so that you can install a mounting bracket to the slide rail and attach the chassis rail to the brick (see “Preparing the Brick” on page 89). To remove the chassis rail from the slide rail, follow these steps:

1. Remove the two slide rail assemblies and the rear mounting brackets from the shipping container.
2. Extend each slide rail assembly until the safety latch snaps into place.
3. Press the safety latch and remove the chassis rail from the slide rail, as shown in Figure C-6.

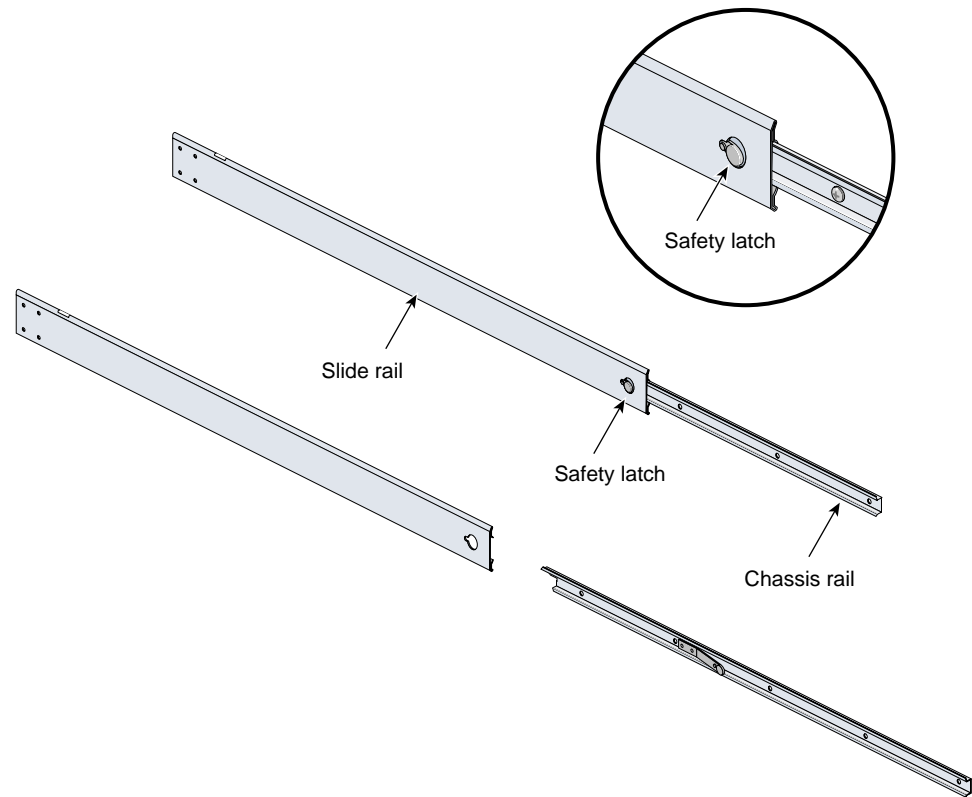


Figure C-6 Removing the Chassis Rail from the Slide Rail

4. Place one of the mounting brackets on the back of the slide rail as shown in Figure C-7. Adjust the position of the mounting bracket on the slide rail according to the depth of the rack.
5. Place a bar nut next to the mounting bracket. Secure the mounting bracket to the slide rail by inserting two 10-32 x 1/2-inch screws through the assembly and into the bar nut as shown in Figure C-7.
6. Repeat steps 4 and 5 to attach a mounting bracket to the other slide rail.

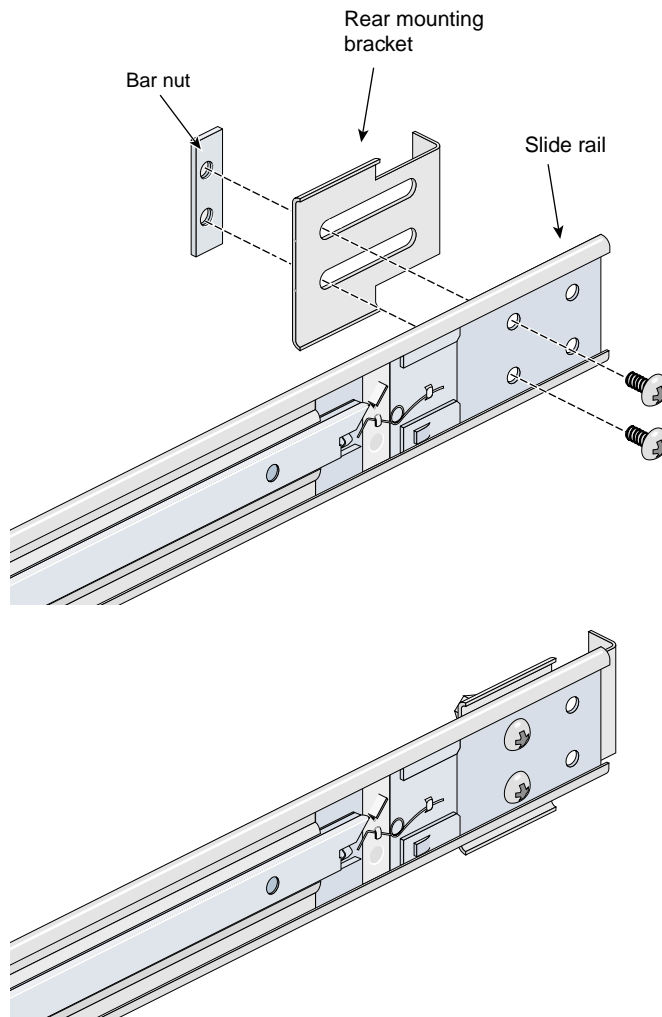


Figure C-7 Attaching the Rear Mounting Bracket to the Slide Rail

Preparing the Brick

To attach the chassis rails to the brick, follow these steps:

1. Place the brick on a flat, stable surface.
2. Using four 10-24 x 1/4-inch screws, attach one of the chassis rails to the right side of the brick chassis. Ensure that the rail is installed in the correct direction (see Figure C-8).



Caution: Use only the 1/4-inch (0.64 cm) length screws. Longer screws damage internal components in the brick.

3. Using five 10-24 x 1/4-inch screws, attach the second rail to the left side of the brick chassis. Again, ensure that the rail is installed in the correct direction.

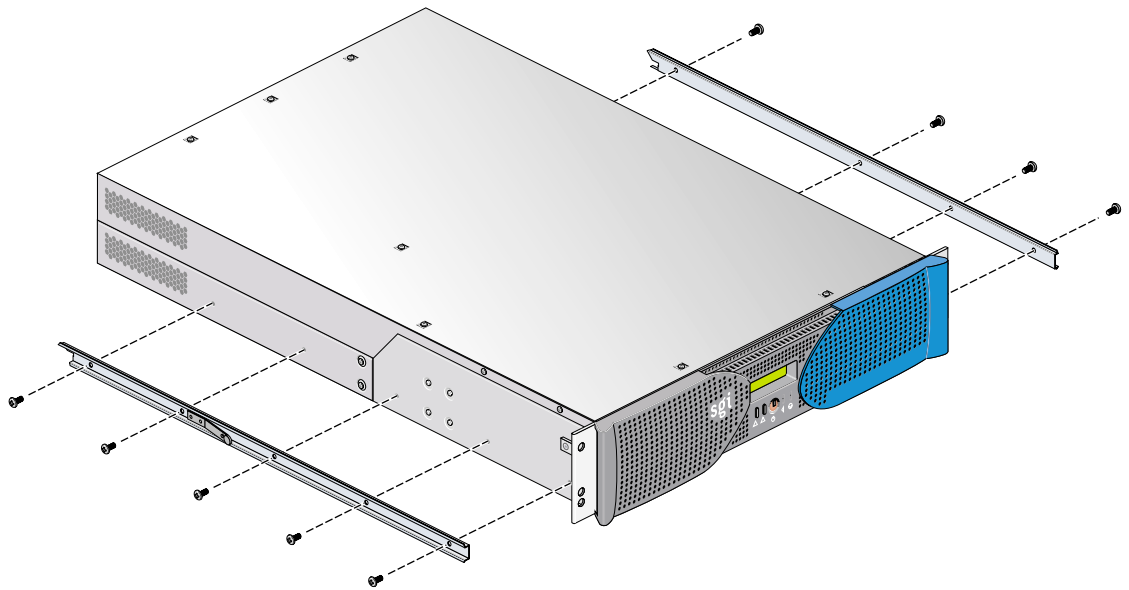


Figure C-8 Attaching Chassis Rails to the Brick Chassis

Determining Where to Attach the Slide Rail in the Rack

The brick requires two units (2U) of space within the rack (one unit is equivalent to 1.75 inches [44.5 cm]). To determine where you should install the slide rails in the rack, you must count mounting holes. Each U contains three mounting holes; therefore, in the 2U of space that the brick occupies, there are six mounting holes. The bottom hole of the 2U space is hole 1. The top mounting hole in the 2U space is hole 6. See Figure C-9.

Note: A brick in the rack is identified by the lowest U number that it occupies. For example, in Figure C-9 the brick resides in U5 (the fifth unit within the rack).

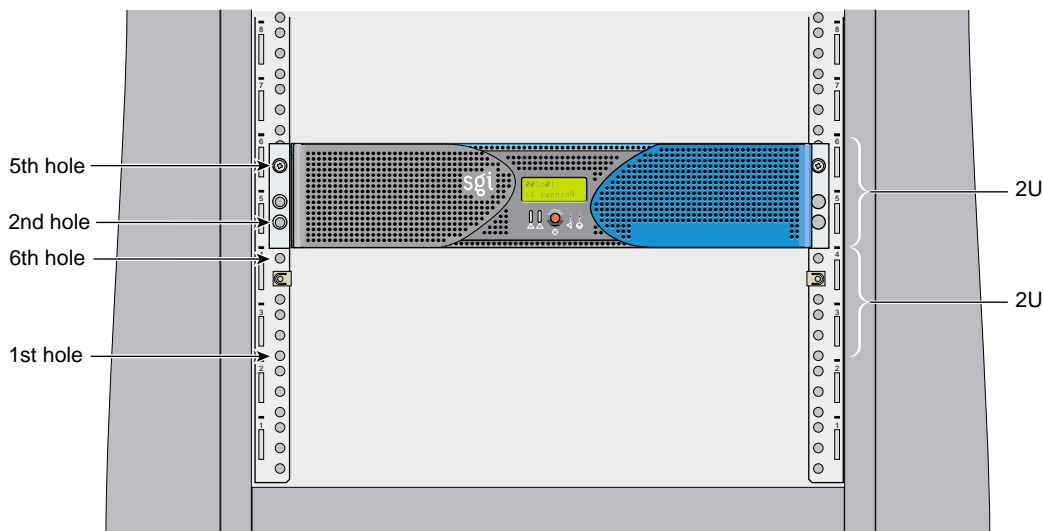


Figure C-9 Mounting-hole Pattern of Rack Vertical Rails

To determine how many mounting holes you must count, use the following formula: **3 x (the lowest U number that the brick will occupy) - 2**. For example, when you want to install the brick in locations U9 and U10, count 25 mounting holes ($3 \times 9 - 2$) starting from the bottom of the rack. The 25th hole is the first mounting hole of U9.

Attaching the Slide Rail to the Rack

To attach the slide rail to the rack, follow these steps:

Tip: The slide rails must be level in the rack. To ensure that you install the slide rails correctly, carefully count the mounting holes on all of the rack rails (the two front rails and the two rear rails).

1. Locate eight 10-32 x 1/2-inch Phillips screws, eight shoulder washers, and four bar nuts.
2. Place one of the bar nuts inside the rack and align it with the second and third holes of the selected 2U of space (see Figure C-10).

Note: The holes in the bar nuts are not centered. The bar nuts need to be placed in such a way that the holes are closest to the inside edge of the rack rails. See Figure C-10.

3. Insert two screws with shoulder washers through the rack rail to hold the bar nut in place. The screws should not be tightened at this point.
4. Repeat steps 2 and 3 to install the remaining three bar nuts on the other three rack rails (front and rear of rack).

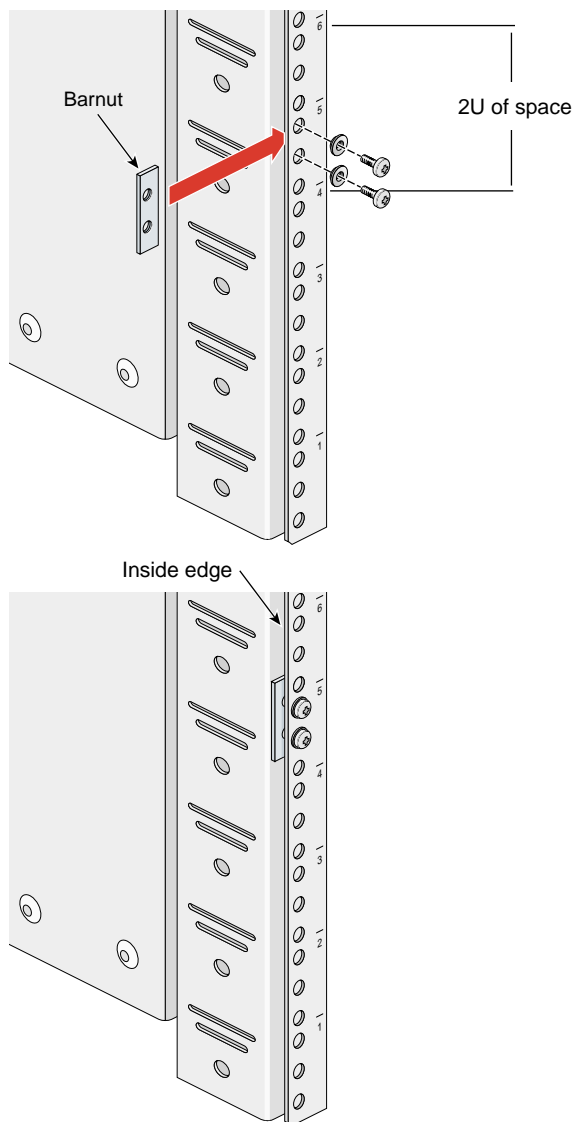


Figure C-10 Placing the Bar Nuts on the Rack Rails

5. Insert the front and rear brackets of one of the slide rails between the rack rails and the bar nuts, as shown in Figure C-11.
6. Tighten the screws on the front- and rear-end of the rails. Do not tighten firmly at this point, because all screws will be firmly tightened once the brick is installed in the rack.
7. Repeat steps 5 and 6 to attach the second slide rail to the other side of the rack.

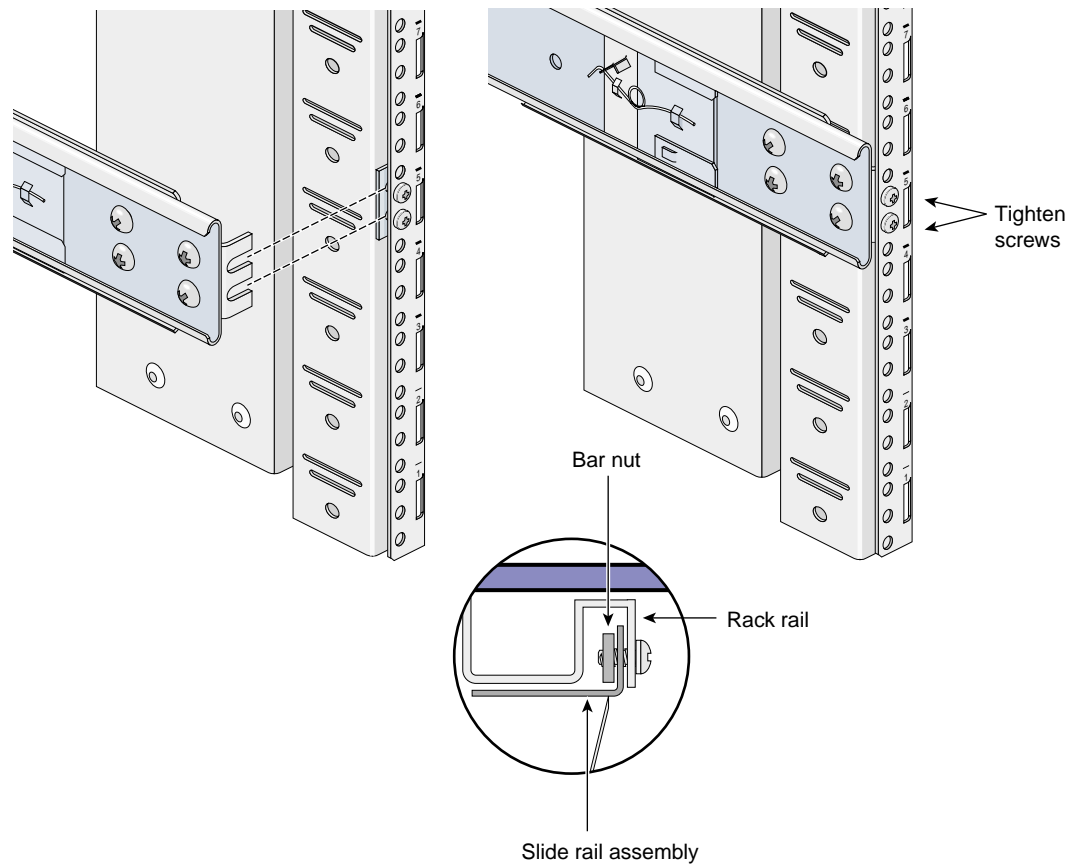


Figure C-11 Attaching the Slide Rail to the Rack

Installing Clip Nuts in Rack Rails

Clip nuts secure the bricks to the rack. To install the clip nuts, slide the clip nuts over the fifth hole of the selected 2U of space on each of the front rails. See Figure C-12 for details.

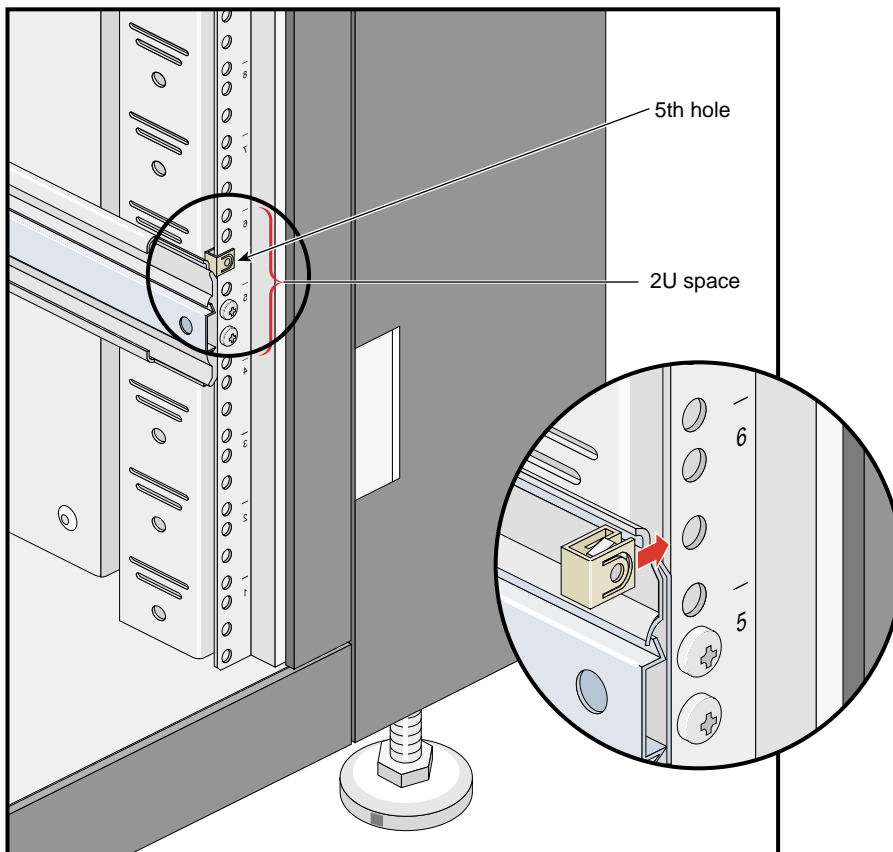


Figure C-12 Installing Clip Nuts in Rack Rails

Installing the Brick in the Rack

To install the brick in the rack, follow these steps:

Note: Step 2 requires two people.

1. Fully extend the left and right slide rails from the rack until they lock into place.
2. With one person holding each side of the brick, align the chassis rails of the brick with the slide rails of the rack.
3. Slide the chassis rails into the slide rails until the chassis rails are stopped by the safety latches.
4. Press the safety latches on both sides of the brick to fully seat the chassis rails into the slide rails (see Figure C-13).
5. Firmly tighten all screws (the eight screws that secure the slide rails to the rack rails).

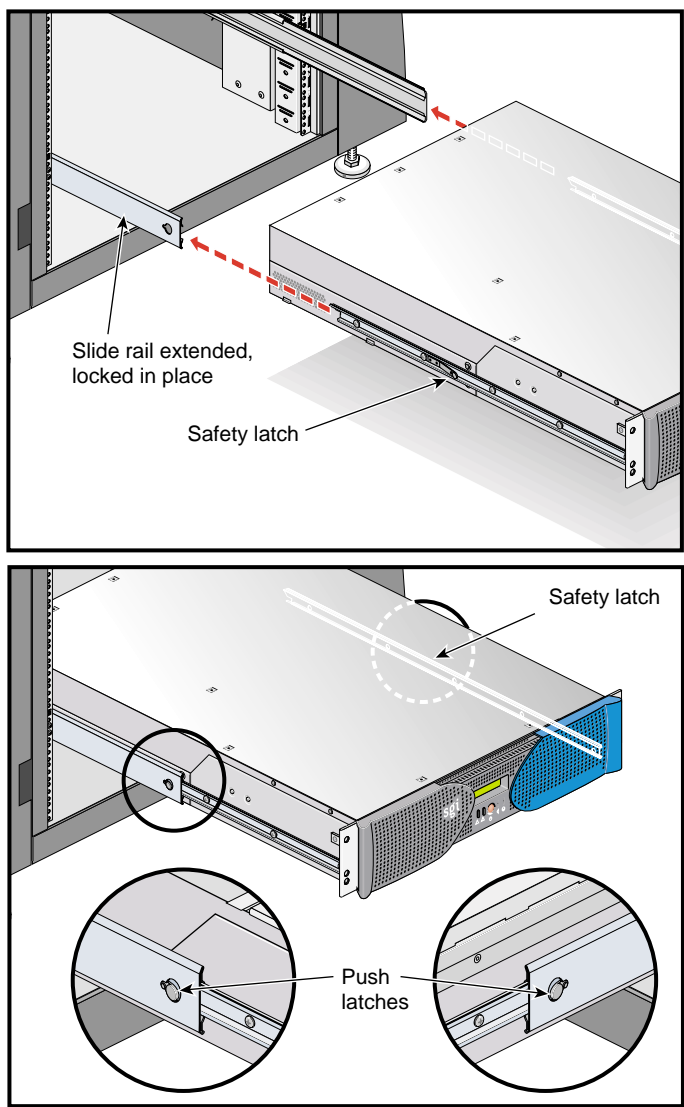


Figure C-13 Pressing the Safety Latches

- Secure the brick to the rack by inserting a 10-32 x 1/2-inch Phillips screw in the top hole of each chassis ear (see Figure C-14).

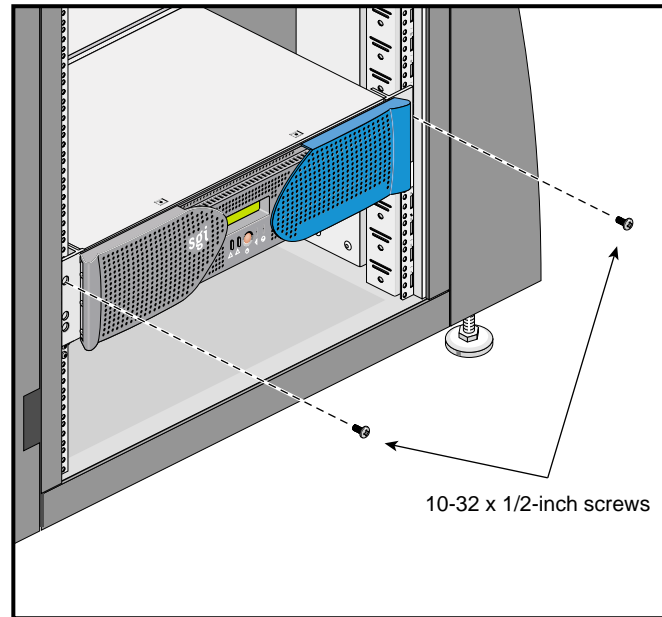


Figure C-14 Securing the Brick to the Rack

Adjusting the Position of the Rackmounted Brick

Once the brick is installed in the rack, you can adjust the position of the brick in the rack (up and down, side-to-side). To adjust the position of the brick, loosen the front mounting screws, adjust the brick to the desired position, then tighten the mounting screws.



Caution: Do not lift the brick by its bezel; it is not designed to handle the weight of the brick. Instead, use the chassis ears to move the brick (see Figure C-14).

Removing a G2-brick or G2N-brick from a Rack

To remove a G2-brick or G2N-brick from a rack, follow these steps:

1. Power off the brick.
2. Disconnect all of the cables at the rear of the brick.



Warning: Components may be hot. To avoid injury, allow the components to cool for approximately five minutes before you proceed with these instructions.

3. Remove the two screws that secure the brick to the front rails of the rack.
4. Carefully pull the brick from the rack until it is stopped by the safety latches.
5. With one person holding each side, release the safety latches on both sides of the brick and pull the brick out of the slide rail (see Figure C-15).
6. Place the brick on a flat, stable surface.

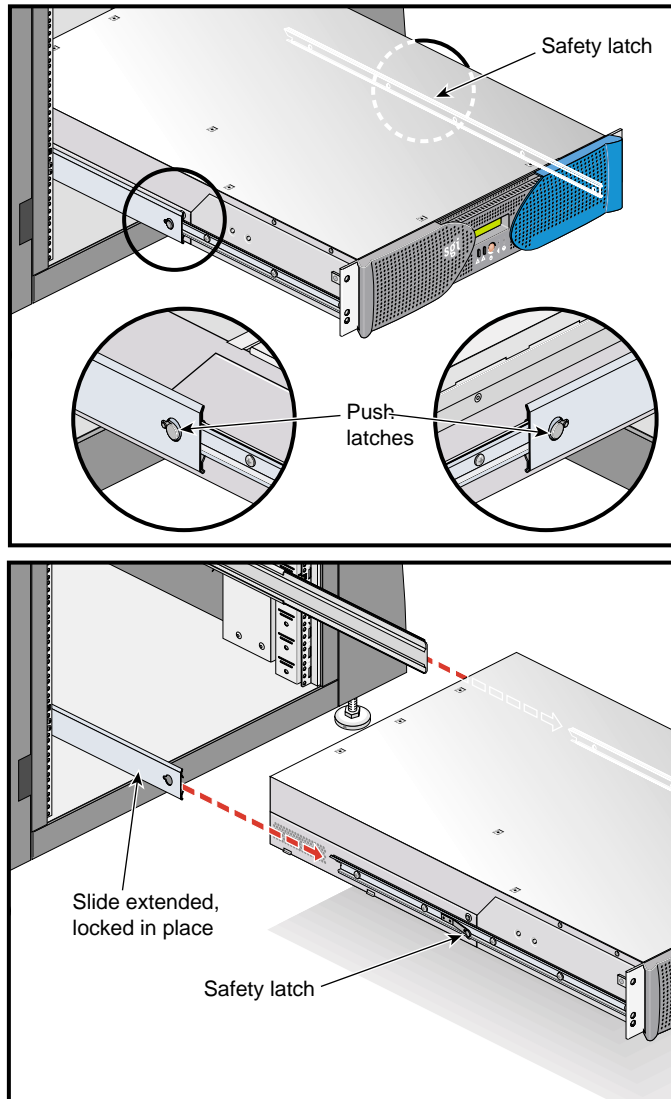


Figure C-15 Releasing the Safety Latches

7. To slide the slide rails back into the rack, push down on the slide latches as shown in Figure C-16.

Note: Before you reinstall a brick into the rack, fully extend the slide rails from the rack until they lock into place.

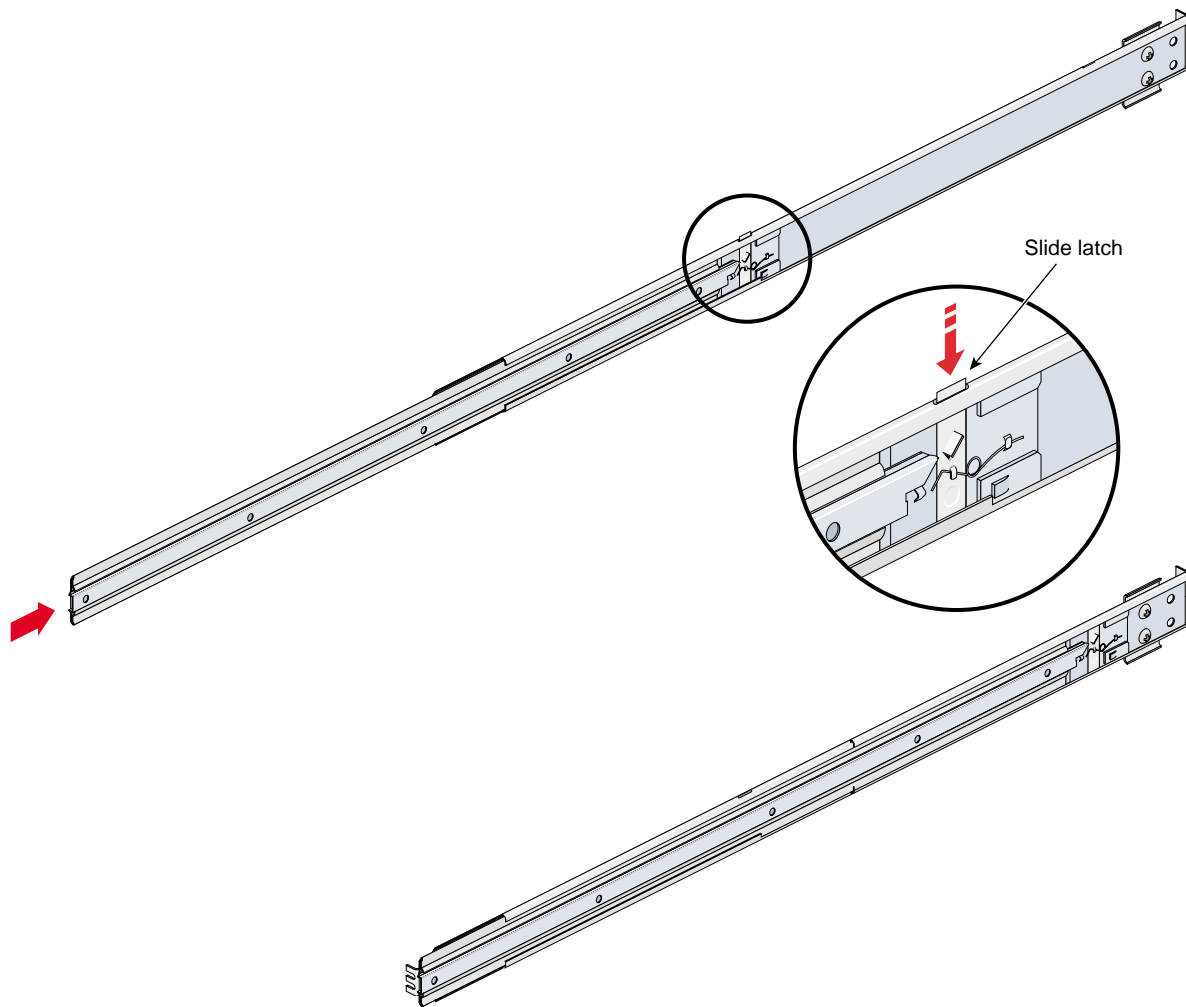


Figure C-16 Releasing the Slide Latches

Providing Power to G2-bricks and G2N-bricks

G2-bricks and G2N-bricks require AC power (see “Technical Specifications for G2-bricks and G2N-bricks” on page 74 for details). G2-bricks and G2N-bricks will therefore generally plug into a PDU (power distribution unit) at the rear of the rack.

Note: This is different from some other SGI bricks, such as C-bricks, Cx-bricks, IX-bricks, and PX-bricks, which receive 48V DC power from a power bay.

Figure C-17 shows the AC input location for the SGI Onyx Next Generation Graphics G2-brick and the G2N-brick.

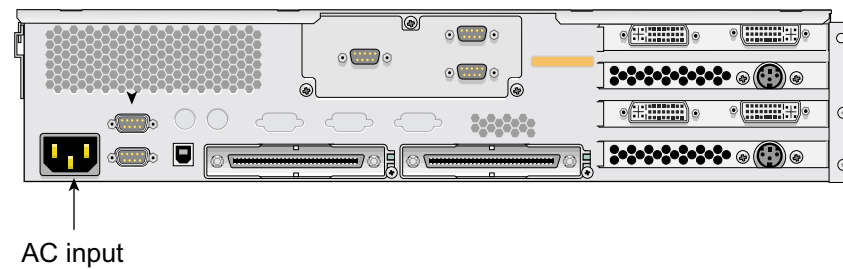


Figure C-17 SGI Onyx Next Generation Graphics G2-brick and G2N-brick AC Input

Verifying System Connections

Once your system is installed in a rack (or otherwise situated), is cabled together via NUMALink and/or XIO, and is powered on, you should verify that all G2-bricks and G2N-bricks are being seen by IRIX.

To do this, follow these steps:

1. From an IRIX prompt, type `hinv`:
`[1%] hinv`
2. Count the number of lines in the `hinv` output that match the following:
`Graphics board: SG2`
3. For each G2-brick or G2N-brick there should be two such lines. If you do not see the correct number of lines, refer to the Appendix A, “Troubleshooting and Replacing Parts”.

Compliance and Regulatory Statements

This appendix contains compliance and regulatory information.

Electromagnetic Emissions

The equipment described in this guide complies with the Class A limits of Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment does not exceed the Class B limits of Canada's Department of Communications Radio Interference Regulations for radio noise emissions.

This device complies with Class B electromagnetic emissions limits of C.I.S.P.R. Publication 22, Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment, Germany's BZT Class B limits for Information Technology Equipment, and with Japan's VCCI Class 2 limits.



Caution: Do not modify this product in any way that is not expressly approved by Silicon Graphics, Inc. If you do, you may lose your FCC or other government agency authority to operate this device.

Radio and Television Interference

The equipment described in this guide generates and uses radio frequency energy. If it is not installed and used in accordance with the instructions in this guide, it can cause radio and television interference.

This equipment has been tested and complies with the limits for a Class A computing device in accordance with the specifications in Part 15 of FCC rules. These specifications are designed to provide reasonable protection against such interference in an industrial or office installation. However, there is no guarantee that the interference will not occur in a particular installation. This system is not certified for home use.

You can determine whether your system is causing interference by turning it off. If the interference stops, it was probably caused by the workstation or one of the peripherals. To tell if the interference is caused by one of the peripherals, try disconnecting one peripheral at a time to see if the interference stops. If it does, that peripheral is the cause of the interference.

If your workstation does cause interference to radio or television reception, try to correct the interference by using one or more of the following suggestions:

- Turn the television or radio antenna until the interference stops.
- Move the workstation to one side or the other of the radio or television.
- Move the system farther away from the radio or television.
- Plug the system into an outlet that is on a different circuit from the radio or television. (That is, make certain the workstation and the radio or television are on circuits controlled by different circuit breakers or fuses.)

Product Safety

This product has been tested and is listed, certified, or approved to the following product safety standards:

- UL 1950
- CAN/CSA C22.2, No. 950-M89
- IEC 950
- EN 60 950
- Standard for Safety of Information Technology Equipment, including Electrical Business Equipment, Class1, SELV

Ergonomics

This product meets the applicable requirements of ISO 9241, and the European Community Directive 90/270/EEC (Workstation Safety Law) specifications. This product also meets Germany's ZH1/618 requirements for deskside and bookshelf products.

Electrostatic Discharge

SGI designs and tests its products to be immune to effects of electrostatic discharge (ESD). ESD is a source of electromagnetic interference and can cause problems ranging from data errors and lockups to permanent component damage.

It is important that while you are operating this equipment you keep all the covers and doors, including the plastics, in place. The shielded cables that came with the system and its peripherals should be installed correctly, with all thumbscrews fastened securely.

An ESD wrist strap is included with some products, such as memory and graphics upgrades. The wrist strap is used when installing these upgrades to prevent the flow of static electricity, and it should protect your system from ESD damage.

Shielded Cables

The equipment described in this guide is FCC-compliant under test conditions that include the use of shielded cables between it and its peripherals. This equipment and any peripherals you purchase from SGI have shielded cables. Shielded cables reduce the possibility of interference with radio, television, and other devices. If you use any cables that are not from SGI, make sure they are shielded. Telephone cables do not need to be shielded.

In Germany, a shielded cable must be used on the Ethernet 10-BASE T port.

The monitor cable supplied with your system uses additional filtering molded into the cable jacket to reduce radio frequency interference. Always use the cable supplied with your system. If your monitor cable becomes damaged, a replacement cable should be obtained from SGI.

FCC Warning

The equipment described in this guide has been tested and found compliant 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 their own expense.

VDE 0871/6.78

The equipment described in this guide has been tested to and is in compliance with the Level A limits per VDE 0871.

European Union Statement

This device complies with the European Directives listed on the “Declaration of Conformity,” which is included with each product. The CE mark insignia displayed on the device is an indication of conformity to the aforementioned European requirements.



International Special Committee on Radio Interference (CISPR)

The equipment described in this guide has been tested to and is in compliance with the Class A limits per CISPR publication 22.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Attention

Cet appareil numérique n'émet pas de perturbations radioélectriques dépassant les normes applicables aux appareils numériques de Classe A prescrites dans le Règlement sur les interférences radioélectriques établi par le Ministère des Communications du Canada.

Japanese Class A Compliance Statement

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

Japanese Class B Compliance 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。

Compliance Statement in Chinese

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。

Korean Compliance Statement

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

Lithium Battery Statement



Warning: Only qualified service personnel should replace the soldered lithium battery (or batteries) in the SGI Origin 350 server system.



Warning: Advarsel!: Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Léver det brugte batteri tilbage til leverandøren.



Warning: Advarsel: Eksplosjonsfare ved feilaktig skifte av batteri. Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten. Brukte batterier kasseres i henhold til fabrikantens instruksjoner.



Warning: Varning: Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.



Warning: Varoitus: Päristö voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.



Warning: Vorsicht!: Explosionsgefahr bei unsachgemäßen Austausch der Batterie. Ersatz nur durch denselben oder einen vom Hersteller empfohlenem ähnlichen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

Limited User Warranty Test

Silicon Graphics, Inc., warrants this hardware product, option or accessory against defects in material and workmanship for a period of ninety (90) days after the date of its original retail purchase (the “Warranty Period”). If you discover a defect in the Product during the Warranty Period, Silicon Graphics will, at its sole option, repair or replace the Product at no charge to you, provided that you (i) return the product (transportation charges prepaid) during the Warranty Period to the authorized Silicon Graphics dealer (or Silicon Graphics service center, if purchased directly from Silicon Graphics) from whom it was purchased, or return it to another authorized Silicon Graphics dealer in the country of its original purchase, and (ii) have included a copy of a bill of sale bearing the appropriate Silicon Graphics serial number as proof of the original date and location of the Product’s purchase. This warranty applies only to hardware products manufactured by or for Silicon Graphics and distributed under Silicon Graphics’ trademarks, and does not apply to any (i) Silicon Graphics software accompanying the Product, which is licensed under a separate statement included with the software, (ii) Product that has been damaged by abuse, accident, misuse, misapplication or improper installation, and (iii) any Product that has been modified or has had its serial number removed or defaced.

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