

Silicon Graphics® Scalable Graphics Capture PCI-X Option User's Guide

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Record of Revision

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001	March 2004 Initial version
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About This Guide

This guide describes how to set up and use your workstation with the Silicon Graphics Scalable Graphics Capture (SGC) PCI option. The option is a PCI-X card(s).

This guide includes only a single chapter.

Related Publications

The following publications contain additional information that may be helpful:

- *Silicon Graphics Prism Visualization System User's Guide* (007-4701-00x)
- *Silicon Graphics Onyx4 UltimateVision Start Here* (007-4667-00x)
- *Silicon Graphics Onyx4 UltimateVision User's Guide* (007-4632-00x)

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- 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.)
<code>manpage(x)</code>	Man page section identifiers appear in parentheses after man page names.

Reader Comments

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The Scalable Graphics Capture Option

This chapter provides information on using the Silicon Graphics Scalable Graphics Capture (SGC) option with your Silicon Graphics Prism visualization system.

The Silicon Graphics SGC option can also be used with a Silicon Graphics Onyx4 visualization system, as described in “Using the SGC Option with Onyx4 Visualization Systems” on page 6.

Product Description

The Silicon Graphics SGC option is a video frame capture PCI-X card that allows a stream of digital computer resolution video (as compared to Standard Definition or High Definition Digital TV signals) to be read into the memory of a Silicon Graphics Prism system. The computer resolution video is delivered in a digital form to the card via a single link DVI-D connector.

The card itself is seen as an OpenML 1.1 device, and can be programmed for use by applications, video ingest from external DVI sources, or it can be used directly by OpenGL Vizserver to support a Visual Area Networking (VAN) environment. Multiple cards may be configured in a single system to support multiple input streams in an SGI Reality Center or multiple remote VAN sessions. Note that the SGC card is required when OpenGL Vizserver is used with the hardware compositor.

As shown in Figure 1-1, each SGC card has two connectors:



Figure 1-1 SGC PCI-X Card Bulkhead View

The DVI interface accepts digital video output from a graphics pipeline or scalable graphics compositor on a Prism visualization system, or from another digital video source.

System DVI Y-Cable

Included with each SGC option card is a 2 meter DVI “Y-cable” that splits out the analog RGB signals from the DVI cable onto a separate DB15 connector. This cable can be seen in the lower right section of Figure 1-2.

The purpose of this cable is to allow the output from a single graphics pipeline, (or from a scalable graphics compositor as depicted in Figure 1-2) to be seen by a local user (using the analog RGB signals) and at the same also be read back into the system using the SGC card (using the digital DVI signals).

This is especially critical in a Visual Area Networking (VAN) environment where either a user wants to work locally with an output and be able to share the results with a remote colleague, or where a single Prism resource is used for both local users and remote users via VAN.

The DVI Digital/ Analog Y-cable is used to connect a single Prism graphics pipeline or scalable graphics compositor output to both a local monitor and the SGC option card.

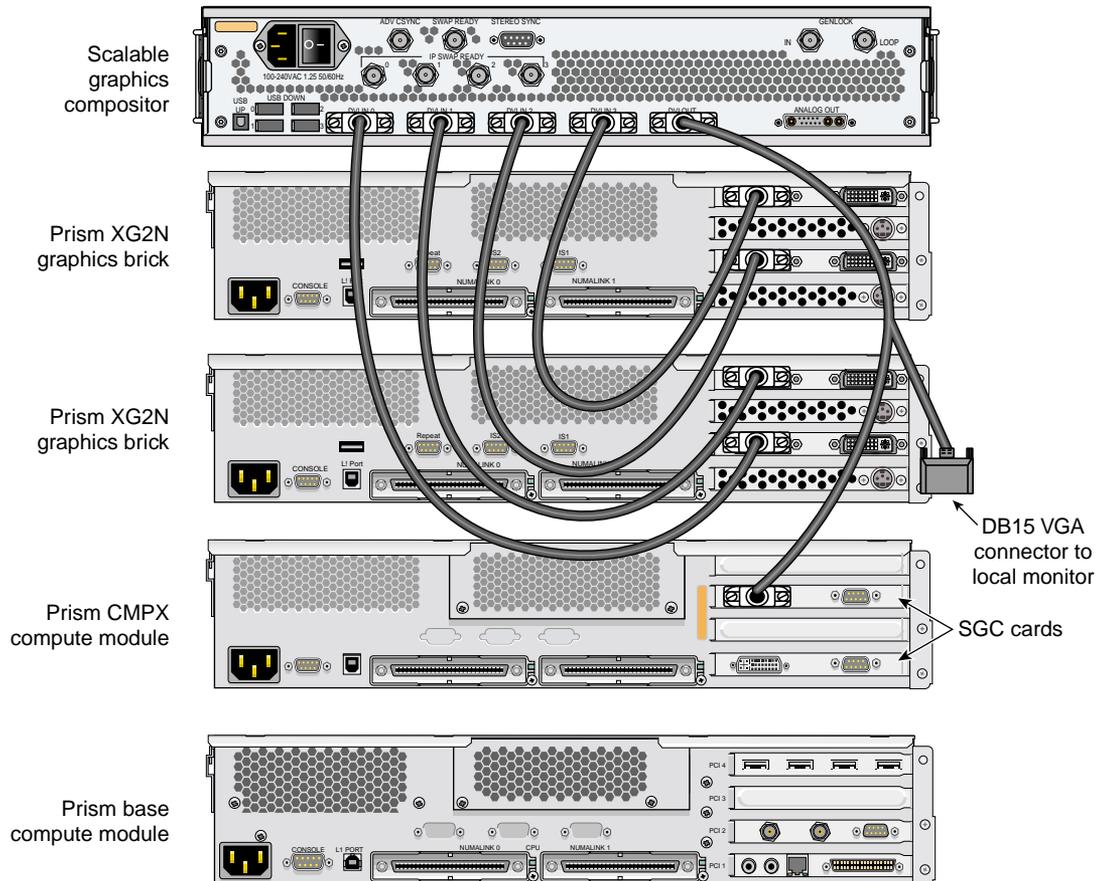


Figure 1-2 Example System With Single Y-cable Connection From a Scalable Graphics Compositor to an SGC Card (NUMALink Connections Not Shown for Clarity)

Confirming PCI Installation in a System

You can tell if you have an SGC PCI-X card installed in your SGI Prism system through the use of the `hinv(1M)` command.

On an SGI Prism system, the `hinv` command reports the presence of an SGC video capture board with an information line similar to the following:

```
DVI Capture: SGC (Rev 10) on pci02.01.0
```

Video Input Formats

SGC capture cards have been tested to function with the following input formats:

- 640x480@60Hz
- 800x600@60Hz
- 1024x768@60Hz, 1024x768@96Hz_Stereo
- 1280x1024@60Hz, 1280x1024@75Hz, 1280x1024@96Hz_Stereo
- 1600x1200@60Hz
- 1920x1080@60Hz
- 1920x1200@60Hz

The card also performs auto-recognition of incoming signals, so a wider variety of formats may work. The only limitation on input formats is that the width of the input image must be divisible by 8 pixels, and the maximum bandwidth of the DVI link (165Mpixels/second).

Connecting SGC Cards in a System

When using the SGC card to accelerate VAN performance for a single graphics pipeline, the base of the Y-cable is connected to the Channel 0 output of a graphics pipe on a Prism system. The digital end of the Y-cable is connected to the input of the card, and the analog end of the cable can be connected directly to a local monitor (if the graphics pipe is only going to be used for remote access via VAN, the RGB end of the Y-cable can be left unattached, or the entire cable can be replaced by a straight- through DVI cable). This is shown in Figure 1-3 with two independent graphics pipes from the Prism system driving two SGC cards and outputs for two local monitors.

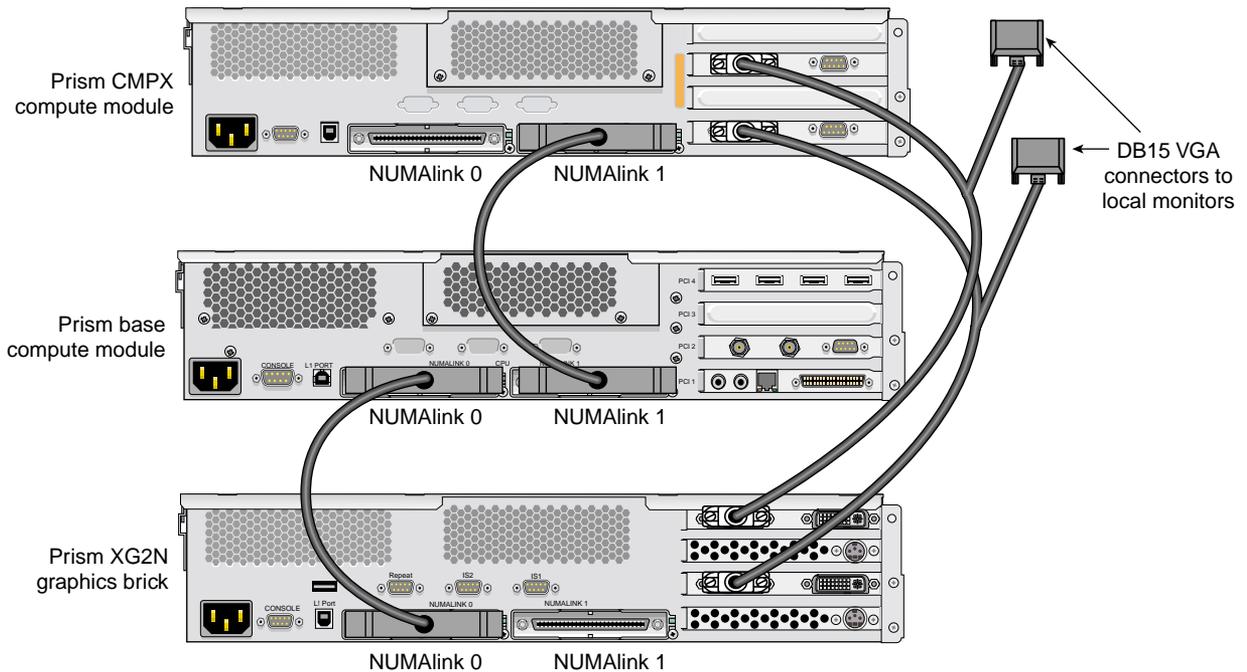


Figure 1-3 Prism With Two Graphics Pipes Connected to Two SGC Cards and Monitors

The SGC card is also designed to connect to the output of the scalable graphics compositor found in the Prism system. As shown in Figure 1-2 on page 3, all four outputs from the independent graphics cards on the Prism are fed into the scalable graphics compositor. The DVI output signal and separate stereo sync signal from the compositor are routed to the SGC card. If it is desired to run analog output from the compositor to a local monitor then the analog end of the Y-cable is not used, and a separate analog RGB cable is used to connect from the analog output port of the compositor to the local monitor.

When used with OpenGL Vizserver 3.3, Vizserver will automatically identify which SGC card is connected to which graphics pipeline. Note that version 3.3 of Vizserver does not support connections involving the scalable graphics compositor.

System Configuration Rules

SGC cards are 64-bit/66MHz PCI-X cards. SGC cards do not function as PCI cards, and may not be mixed with PCI cards on the same bus. SGC cards are supported as one or two cards per PCI-X bus, but may not be mixed with other PCI-X cards on the same bus.

Large format and high refresh rate displays that are presented to the SGC card will drop some frames. Configurations with two SGC cards per PCI-X bus will drop an increased number of frames.

Systems with a requirement to capture the maximum number of frames should be configured with a single SGC card per bus.

It is recommended that four SGC cards be configured for any single brick (compute, XG2N, MPX, or PX2U) **only** if the format per channel captured is 1280X1024 @ 60Hz or less, or if the frame skip parameter within OpenML is set to 1 or greater. This is a limitation of aggregate bandwidth to the brick, and within the brick.

In all cases, all frames that are transferred are completely transferred, with no losses within a frame.

A maximum of four SGC cards may be connected through a single NUMALink-attached module. Connecting 5 to 8 SGC cards through a single NUMALink connection is not supported.

Programming the SGC Card

The SGC card is presented to the system as an OpenML 1.1 device and may be programmed using the OpenML library. Details are provided in the SGC man pages.

Using the SGC Option with Onyx4 Visualization Systems

The SGC option can be used with a Silicon Graphics Onyx4 visualization systems just as it can be used with a Silicon Graphics Prism visualization system.

As with an SGI Prism system, you can tell if you have an SGC PCI-X card installed in your SGI Onyx4 system through the use of the `hinv(1M)` command.

On an SGI Onyx4 system, the `hinv` command reports the presence of an SGC video capture board with an information line similar to the following:

```
DVI Capture: SGC (unit # rev. 1.0) in module #/bus #/slot #
```

