Sun™ XVR-100 Graphics Accelerator Installation Guide

Sun Microsystems, Inc.
www.sun.com

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Contents

Regulatory Compliance Statements viii

Declaration of Conformity xii

Preface xiv

1. Sun XVR-100 Graphics Accelerator Overview 1

Installation Kit 1

Features 2

Video Formats 3

Technical Support 5

2. Installing the Sun XVR-100 Graphics Accelerator Hardware and Software 7

Before Installation 7

Installing the Hardware 8

Supported Systems and PCI Slots 8

Installing the Sun XVR-100 Graphics Accelerator Software 9

Sun XVR-100 Graphics Accelerator Software Packages 10

Solaris Operating System Patches 11

Sun OpenGL for Solaris Software 11

Installing the Software 12

Removing the Sun XVR-100 Graphics Accelerator Software 14
Avoiding Colormap Flash 15
Using the `-depth 24` Option 15
Using the `-fake8` Option 16
Sun XVR-100 Graphics Accelerator Default Console Display 16
Man Pages 18

3. Configuring Multiple Frame Buffers 19
Configuring Multiple Frame Buffers Through the Xservers File 19
Xinerama 21
Using Xinerama 21
Restrictions When Using Xinerama 22

4. Using Sun XVR-100 Graphics Accelerator Features 23
Video Output Methods 23
Setting Up Video Output Methods 24
Setting Up Single Video Output (Default) 24
Setting Up Two Video Outputs Over One Large Frame Buffer 25
Setting Up Two Independent Video Outputs 26
Default Color Depth 27
Checking Device Configuration 28

A. Sun XVR-100 Graphics Accelerator I/O Port Specifications 31
I/O Port Specifications 31
HD15 Video Output Port 32
DVI Video Output Port 33

Index 35

Figures

FIGURE 1-1 Sun XVR-100 Graphics Accelerator 2

FIGURE 1-2 Sun XVR-100 Graphics Accelerator Back Panel I/O Ports 2

FIGURE A-1 Sun XVR-100 Graphics Accelerator Back Panel I/O Ports 31

FIGURE A-2 Sun XVR-100 Graphics Accelerator HD15 Connector 32

FIGURE A-3 Sun XVR-100 Graphics Accelerator DVI Connector 33

Sun XVR-100 Graphics Accelerator HD15 Video Formats 3
Sun XVR-100 Graphics Accelerator Video Formats (DVI-A, DVI-D and HD15) 4
Supported Systems and Maximum Number of Sun XVR-100 Graphics Accelerators Per System 8
Sun XVR-100 Graphics Accelerator CD Directories 9
Location of Sun XVR-100 Software Packages 10
Solaris 8 and 9 Software Package Names 10
Sun XVR-100 for Solaris Software Patches 11
Sun OpenGL 1.3 for Solaris Software Patches 11
Sun XVR-100 Graphics Accelerator HD15 Connector Pinout 32
Sun XVR-100 Graphics Accelerator DVI Video Output Port 33

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- Industry Canada Equipment Standard for Digital Equipment (ICES-003) — Canada
- Voluntary Control Council for Interference (VCCI) — Japan
- Bureau of Standards Metrology and Inspection (BSMI) — Taiwan

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2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables in order to maintain compliance with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted pair (UTP) cables.

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使用者 會被要求採取某些適當的對策。

Declaration of Conformity

Compliance Model Number: A259
Product Family Name: Sun XVR-100 **(X7296A and 7296A)**

EMC

USA—FCC Class B

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2. This equipment must accept any interference that may cause undesired operation.

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This equipment complies with the following requirements of the EMC Directive 89/336/EEC:

As Information Technology Equipment (ITE) Class B per (as applicable):

EN 55022:1994 +A1:1995 +A2:1997	Class B
EN 61000-3-2:2000	Pass
EN 61000-3-3:1995 +A1:2000	Pass
EN 55024:1998 +A1:2001 +A2:2003	Required Limits:
IEC 61000-4-2	4 kV (Direct), 8kV (Air)
IEC 61000-4-3	3 V/m
IEC 61000-4-4	1 kV AC Power Lines, 0.5 kV Signal and DC Power Lines
IEC 61000-4-5	1 kV AC Line-Line and Outdoor Signal Lines, 2 kV AC Line-Gnd, 0.5 kV DC Power Lines
IEC 61000-4-6	3 V
IEC 61000-4-8	1 A/m
IEC 61000-4-11	Pass

Safety

This equipment complies with the following requirements of the Low Voltage Directive 73/23/EEC:

EC Type Examination Certificates:

UL 60950-1:2003, 1st Ed., CSA C22.2, No. 60950-1--03 1st Ed. File: E154871-A10-UL-1

Supplementary Information

This equipment was tested and complies with all the requirements for the CE Mark. This equipment complies with the Restriction of Hazardous Substances (RoHS) directive 2002/95/EC.

/S/

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Preface

This guide describes how to install the Sun™ XVR-100 graphics accelerator hardware and software in a Sun system.

How This Book Is Organized

Chapter 1 provides an overview of the Sun XVR-100 graphics accelerator.

Chapter 2 provides hardware and software installation instructions.

Chapter 3 describes procedures for configuring multiple frame buffers.

Chapter 4 provides Sun XVR-100 graphics accelerator feature information, including video output methods.

Appendix A provides I/O port specifications for the Sun XVR-100 graphics accelerator.

Using UNIX Commands

This document might not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices. See the following for this information:

- Software documentation that you received with your system
- Solaris™ Operating System documentation, which is at

  `http://docs.sun.com`

Typographic Conventions

Typeface or Symbol	Meaning	Examples
`AaBbCc123`	The names of commands, files, and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
`AaBbCc123`	What you type, when contrasted with on-screen computer output	`% su` `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the *User's Guide*. These are called *class* options. To delete a file, type **`rm`** *filename*.

Shell Prompts

Shell	Prompt
C shell	*machine-name*`%`
C shell superuser	*machine-name*`#`
Bourne shell and Korn shell	`$`
Bourne shell and Korn shell superuser	`#`

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Please include the title and part number of your document with your feedback:

Sun XVR-100 Graphics Accelerator Installation Guide, part number 819-3290-12

CHAPTER 1

Sun XVR-100 Graphics Accelerator Overview

The Sun™ XVR-100 graphics accelerator (FIGURE 1-1) is a 24-bit high-resolution PCI-based graphics frame buffer. The Sun XVR-100 graphics accelerator runs on Sun PCI-based system platforms.

- "Installation Kit" on page 1
- "Features" on page 2
- "Video Formats" on page 3
- "Technical Support" on page 5

Installation Kit

The Sun XVR-100 graphics accelerator installation kit includes:

- Sun XVR-100 graphics accelerator
- Sun XVR-100 software CD-ROM
- Antistatic wrist strap
- *Sun XVR-100 Graphics Accelerator Installation Guide,* this document

Features

The Sun XVR-100 graphics accelerator (FIGURE 1-1) offers the following features:

- 2D 24-bit graphics
- Flexible 8- and 24-bit color application support
- 24-bit color, high resolution for multihead displays in supported systems
- HD15 and DVI monitor connectors for a wide range of Sun and third party monitors
- 3D support through Sun OpenGL® for Solaris™ software

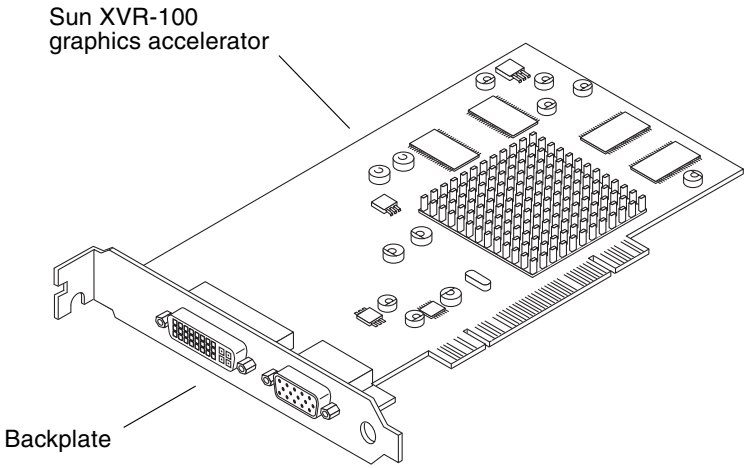

FIGURE 1-1 Sun XVR-100 Graphics Accelerator

FIGURE 1-2 shows the Sun XVR-100 graphics accelerator back panel I/O ports; the HD15 and DVI monitor connectors.

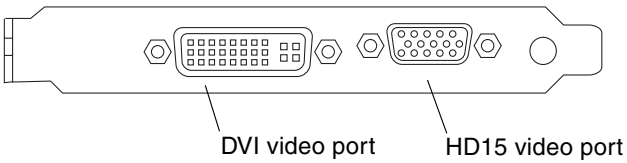

FIGURE 1-2 Sun XVR-100 Graphics Accelerator Back Panel I/O Ports

Video Formats

TABLE 1-1 and TABLE 1-2 lists the monitor video formats supported by the Sun XVR-100 graphics accelerator.

- **To get a list of available screen resolutions for your display device, type:**

```
host% fbconfig -res \?
```

If you have selected a resolution where support for this resolution cannot be verified, `fbconfig` displays the following output:

```
SUNWpfb_config: Cannot verify that selected resolution is a supported
video resolution for this monitor
```

Note – The maximum supported screen resolution for the DVI port is 1280 × 1024.

TABLE 1-1 lists video formats supported by the HD15 ports only.

TABLE 1-1 Sun XVR-100 Graphics Accelerator HD15 Video Formats

Display Resolution	Vertical Refresh Rate	Sync Standard	Aspect Ratio Format	Maximum Color Depth
1920 x 1200	60, 70, 75 Hz	Sun	16:10	24-bit
1920 x 1080	60, 72 Hz	Sun	16:9	24-bit
1600 x 1280	76 Hz	Sun	5:4	24-bit
1600 x 1200	65, 70, 75, 85 Hz	VESA	4:3	24-bit
1600 x 1000	66, 76 Hz	Sun	16:10	24-bit
1440 x 900	76 Hz	Sun	16:10	24-bit

TABLE 1-2 lists video formats supported by the DVI-A, DVI-D and HD15 ports.

TABLE 1-2 Sun XVR-100 Graphics Accelerator Video Formats (DVI-A, DVI-D and HD15)

Display Resolution	Vertical Refresh Rate	Sync Standard	Aspect Ratio Format	Maximum Color Depth
1280 x 1024	60, 75, 85 Hz	VESA	5:4	24-bit
1280 x 1024	67, 76 Hz	Sun	5:4	24-bit
1280 x 800	76 Hz	Sun	16:10	24-bit
1152 x 900	66, 76 Hz	Sun	5:4	24-bit
1152 x 864	75 Hz	VESA	4:3	24-bit
1024 x 768	60, 70, 75, 85 Hz	VESA	4:3	24-bit
800 x 600	56, 60, 72, 75 Hz	VESA	4:3	24-bit
720 x 400	85 Hz	VESA	9:5	24-bit
640 x 480	60, 72, 75 Hz	VESA	4:3	24-bit

Note – The Sun XVR-100 graphics accelerator only supports XOR composite sync.

Note – Not all resolutions are supported by all monitors. Using resolutions that are not supported by the monitor may damage the monitor. Please refer to your monitor manuals for supported resolutions.

Video Display Ports

The Sun XVR-100 graphics accelerator HD15 video port only supports analog video formats. The DVI video port supports both analog (DVI-A) and digital (DVI-D) video formats. Although the DVI port supports both analog and digital video formats, they cannot be used simultaneously from the individual DVI port.

Technical Support

For assistance and other information not found in this document concerning the Sun XVR-100 graphics accelerator, see Support Services at:
http://www.sun.com/service/online/

For the most up-to-date version of the installation guide, go to:
http://www.sun.com/documentation

CHAPTER 2

Installing the Sun XVR-100 Graphics Accelerator Hardware and Software

This chapter provides Sun XVR-100 graphics accelerator hardware and software installation information.

- "Before Installation" on page 7
- "Installing the Hardware" on page 8
- "Installing the Sun XVR-100 Graphics Accelerator Software" on page 9
- "Removing the Sun XVR-100 Graphics Accelerator Software" on page 14
- "Avoiding Colormap Flash" on page 15
- "Sun XVR-100 Graphics Accelerator Default Console Display" on page 16
- "Man Pages" on page 18

Before Installation

Refer to the *Solaris Handbook for Sun Peripherals* that corresponds to your Solaris Operating System. The handbook describes how to shut down the system safely before installing any internal cards and how to reboot your system after installation.

Installing the Hardware

Refer to the hardware installation documentation provided with your Sun system for instructions on accessing your system and installing Sun PCI graphics cards. Your system platform documentation also provides removal procedures.

To find the most recent information on supported systems for the Sun XVR-100 graphics accelerator, and additional specifications, go to:

http://www.sun.com/desktop/products/graphics/xvr100/

Supported Systems and PCI Slots

Up to four Sun XVR-100 graphics accelerators are supported on Sun systems that support four or more PCI slots. TABLE 2-1 lists the maximum number of Sun XVR-100 graphics accelerators for each Sun system supported.

Note – The Sun XVR-100 graphics accelerator operates best when installed in the system 66 MHz PCI bus connector slots (applies to systems with available 66 MHz PCI bus slots).

TABLE 2-1 Supported Systems and Maximum Number of Sun XVR-100 Graphics Accelerators Per System

System	Maximum Number of Boards
Sun Blade 1500 system	3
Sun Blade 2500 system	3
Sun Fire V210 system	1
Sun Fire V240 system	1
Sun Fire V440 system	4
Sun Fire V490 system	4
Sun Fire V890 system	4
Netra 240 system	1
Netra 440 system	1

Installing the Sun XVR-100 Graphics Accelerator Software

The Sun XVR-100 graphics accelerator software is bundled with the Solaris 10 Operating System.

For the Solaris 8 or Solaris 9 Operating Systems, you must install the required software packages or software patches for your system Solaris Operating System. Install the Sun XVR-100 software from the CD-ROM provided with your Sun XVR-100 graphics accelerator installation kit. TABLE 2-2 lists the Sun XVR-100 graphics accelerator CD-ROM directories:

TABLE 2-2 Sun XVR-100 Graphics Accelerator CD Directories

Directory Name	Description
`Copyright`	U.S. version of copyright
`Docs`	Sun XVR-100 graphics accelerator documentation
`FR_Copyright`	French version of copyright
`install`	Product installation script
`License`	Binary Code License
`README`	Listing of Sun XVR-100 graphics accelerator CD contents
`remove`	Product removal script
`Solaris_8/Packages`	Solaris 8 software packages
`Solaris_8/Patches`	Solaris 8 software patches
`Solaris_9/Packages`	Solaris 9 software packages
`Solaris_9/Patches`	Solaris 9 software patches
`Solaris_10/Patches`	Solaris 10 software patches

Sun XVR-100 Graphics Accelerator Software Packages

Software Package Locations

The Sun XVR-100 software packages are located in the directories listed in TABLE 2-3.

TABLE 2-3 Location of Sun XVR-100 Software Packages

Software Packages	Directory Location
Solaris 8 software	`/cdrom/cdrom0/Solaris_8/Packages`
Solaris 9 software	`/cdrom/cdrom0/Solaris_9/Packages`

Software Package Names

TABLE 2-4 lists the Sun XVR-100 software package names and descriptions.

TABLE 2-4 Solaris 8 and 9 Software Package Names

Package name	Description
`SUNWpfbcf`	Sun XVR-100 Graphics Configuration Software
`SUNWpfbx`	Sun XVR-100 Graphics System Software Device Driver (64-bit)
`SUNWpfbw`	Sun XVR-100 Graphics Window System Support
`SUNWpfbmn`	Sun XVR-100 Graphics Manual Pages (Solaris 8 and Solaris 9 Operating Systems only)

Solaris Operating System Patches

TABLE 2-5 lists the Sun XVR-100 graphics accelerator software patches required for the Solaris 8 and Solaris 9 Operating Systems. For the latest patches, go to: http://sunsolve.sun.com

---

Note – Sun XVR-100 drivers are bundled with the Solaris 10 Operating System.

TABLE 2-5 Sun XVR-100 for Solaris Software Patches

Solaris Operating System	Patch	Directory Location
Solaris 8	114537-35	/cdrom/cdrom0/Solaris_8/Patches
Solaris 9	114538-35	/cdrom/cdrom0/Solaris_9/Patches
Solaris 10	118712-08	/cdrom/cdrom0/Solaris_10/Patches

Sun OpenGL for Solaris Software

The Sun OpenGL 1.5 for Solaris software supports the Sun XVR-100 graphics accelerator through software implementation.

If you require Sun OpenGL for Solaris to run certain applications, download the Sun OpenGL 1.3 for Solaris software from the following site:

http://wwws.sun.com/software/graphics/opengl/download.html

Sun OpenGL 1.3 for Solaris Patches

TABLE 2-6 lists the Sun OpenGL 1.3 for Solaris software patches required.

TABLE 2-6 Sun OpenGL 1.3 for Solaris Software Patches

Patch Number	Description
113886-03 or later	OpenGL 1.3 32-bit libraries, any Solaris
113887-03 or later	OpenGL 1.3 64-bit libraries, any Solaris

Download these patches from the following site:

http://sunsolve.sun.com

Updated versions of Sun OpenGL for Solaris are located at:

http://wwws.sun.com/software/graphics/opengl/

Installing the Software

1. **After installing a Sun XVR-100 graphics accelerator into your system, boot your system at the** `ok` **prompt:**

```
ok boot
```

2. **Log in as superuser.**

3. **Insert the Sun XVR-100 graphics accelerator CD-ROM into the drive.**
   - If the drive is already mounted, type the following, and go to Step 4:

```
# cd /cdrom/cdrom0
```

   - If the CD-ROM is not already mounted, type:

```
# mount -F hsfs -O -o ro /dev/dsk/c0t6d0s0 /cdrom
# cd /cdrom
```

Note – The CD-ROM device might be different on your system. For example, `/dev/dsk/c0t2d0s2`.

---

4. **Install the Sun XVR-100 software. Type:**

```
# ./install
```

In this example, the following is displayed:

```
Installing SUNWpfbx.u SUNWpfbcf SUNWpfbw SUNWpfbmn for Solaris 8 ...
Installing required patch 114537-35 ...
*** Installation complete.

To remove this software, use the 'remove' script on this CDROM, or
the following script:
        /var/tmp/xvr-100.remove

A log of this installation can be found at:
        /var/tmp/xvr-100.install.2005.02.10

To configure a Sun XVR-100 graphics accelerator, use the fbconfig
utility. See the fbconfig(1m) and SUNWpfb_config(1m) manual
pages for more details.

*** IMPORTANT NOTE! ***
This system must be rebooted for the new software to take effect.
Reboot this system as soon as possible using the shutdown command and the
'boot -r' PROM command (see the shutdown(1M) and boot(1M) manual
pages for more details).
```

If previously installed, the following is displayed:

```
The version is the same on the system. Packages not installed.
All required software is already on the system.
```

You can use the following command to check if the Sun XVR-100 graphics accelerator is already on your system. Type:

```
# /usr/bin/pkginfo | grep pfb
```

If previously installed, the following list of software packages is displayed:

```
application SUNWpfbcf  Sun XVR-100 Graphics Configuration Software
system      SUNWpfbx   Sun XVR-100 Graphics System Software Device Driver (64-bit)
application SUNWpfbw   Sun XVR-100 Graphics Window System Support
system      SUNWpfbmn  Sun XVR-100 Graphics Manual Pages
```

5. **Do a reconfiguration reboot of your system at the `ok` prompt to complete the installation:**

```
ok boot -r
```

Removing the Sun XVR-100 Graphics Accelerator Software

1. **Log in as superuser.**
2. **Insert the Sun XVR-100 graphics accelerator CD-ROM into the drive.**
   - If the drive is already mounted, type the following, and go to Step 3:

```
# cd /cdrom/cdrom0
```

   - If the CD-ROM is not already mounted, type:

```
# mount -F hsfs -O -o ro /dev/dsk/c0t6d0s0 /cdrom
# cd /cdrom
```

Note – The CD-ROM device might be different on your system. For example, `/dev/dsk/c0t2d0s2`.

---

3. **To remove Sun XVR-100 software, type:**

```
# ./remove
```

In this example, the following is displayed.

```
Removal of Sun XVR-100 Graphics Accelerator Software is complete.
A log of this removal is at:
        /var/tmp/xvr-100.remove.2005.02.10
```

Avoiding Colormap Flash

When multiple windows are used in an 8-bit window system, the colors can change as the cursor is moved from window to window. There are two methods for avoiding colormap flash:

- Using the `-depth 24` command option to run the window system in 24-bit mode, or
- Use `-fake8 enable` if you need both 8-bit and 24-bit visuals simultaneously.

The default is 24-bit.

Using the `-depth 24` Option

1. **Using the `fbconfig` command, type:**

```
% fbconfig -dev pfb0 -depth 24
```

2. **Log out, then log back in.**

Note – 24-bit depth performance can be slower than 8-bit depth mode.

Using the -fake8 Option

1. **Using the** fbconfig **command, type:**

```
% fbconfig -dev pfb0 -fake8 enable
```

Note – 8-bit depth performance is slower in 8+24 (-fake8) mode.

2. **Log out, then log back in.**

Sun XVR-100 Graphics Accelerator Default Console Display

Note – Only the Sun XVR-100 graphics accelerator HD15 video output connector can provide console output. You cannot set the DVI video connector as the console.

To set the Sun XVR-100 graphics accelerator as the default monitor console display:

1. **At the** ok **prompt, type:**

```
ok show-displays
```

The following shows how to set the console device:

```
a) /pci@1f,700000/SUNW,XVR-100@3
b) /pci@1e,600000/SUNW,XVR-100@5
q) NO SELECTION
```

2. **Select the graphics accelerator you want to be the default console display.**

   In this example, you would select `b` for the Sun XVR-100 graphics accelerator.

```
Enter Selection, q to quit: b

/pci@1e,600000/SUNW,XVR-100@5 has been selected.
Type ^Y ( Control-Y ) to insert it in the command line.
e.g. ok nvalias mydev ^Y
        for creating devalias mydev for
/pci@1e,600000/SUNW,XVR-100@5
```

3. **Create an alias name for the Sun XVR-100 graphics accelerator device.**

   This example shows `mydev` as the alias device name.

```
ok nvalias mydev
```

   Press Control-Y, then Return.

4. **Set the device you selected to be the console device.**

```
ok setenv output-device mydev
```

5. **Store the alias name that you have created.**

```
ok setenv use-nvramrc? true
```

6. **Reset the output-device environment:**

```
ok reset-all
```

7. **Connect your monitor cable to the Sun XVR-100 graphics accelerator on your system back panel.**

Man Pages

The Sun XVR-100 graphics accelerator man pages describe how you can query and set frame buffer attributes such as screen resolutions and visual configurations.

Use the `fbconfig(1M)` man page for configuring all Sun graphics accelerators. `SUNWpfb_config(1M)` contains Sun XVR-100 device-specific configuration information. To get a list of all graphics devices on your system, type:

```
host% fbconfig -list
```

This example shows a list of graphics devices displayed:

```
  Device-Filename              Specific Config Program
  ---------------              -----------------------
  /dev/fbs/pfb0                SUNWpfb_config
```

Use the `fbconfig -help` option to display the attributes and parameters information of the man page.

```
host% fbconfig -dev pfb0 -help
```

- **To access the `fbconfig` man page, type:**

```
host% man fbconfig
```

- **To access the Sun XVR-100 graphics accelerator man page, type:**

```
host% man SUNWpfb_config
```

CHAPTER 3

Configuring Multiple Frame Buffers

This chapter describes procedures for setting up multiple frame buffers.

Configuring Multiple Frame Buffers Through the Xservers File

To run more than one frame buffer you must modify your `Xservers` file. The Sun XVR-100 graphics accelerator device name is `pfb` (for example, `pfb0` and `pfb1` for two Sun XVR-100 graphics accelerator devices). To do this:

1. **Become superuser and open the `/etc/dt/config/Xservers` file.**

```
# cd /etc/dt/config
# vi + Xservers
```

If the `/etc/dt/config/Xservers` file does not exist, create the `/etc/dt/config` directory and copy the `Xservers` file from `/usr/dt/config/Xservers` to `/etc/dt/config`.

```
# mkdir -p /etc/dt/config
# cp /usr/dt/config/Xservers /etc/dt/config
# cd /etc/dt/config
# vi + Xservers
```

2. **Modify the file by adding the device locations for the applicable frame buffers being used. See the following examples:**

   Enter the `Xservers` file content in one long line.

   This example shows the `Xservers` configuration file modified for one Sun XVR-500 graphics accelerator (`ifb0`) and one Sun XVR-100 graphics accelerator (`pfb0`):

```
:0 Local local_uid@console root /usr/openwin/bin/Xsun -dev /dev/fbs/ifb0
-dev /dev/fbs/pfb0
```

   This example shows how to remove two Sun XVR-500 graphics accelerators and add one Sun XVR-100 graphics accelerator in the `Xservers` configuration file.

   - Old `Xservers` configuration file with two Sun XVR-500 graphics accelerators:

```
:0 Local local_uid@console root /usr/openwin/bin/Xsun -dev /dev/fbs/ifb0
defdepth 24 -dev /dev/fbs/ifb1 defdepth 24
```

   - New `Xservers` configuration file with one Sun XVR-100 graphics accelerator:

```
:0 Local local_uid@console root /usr/openwin/bin/Xsun -dev /dev/fbs/pfb0
```

3. **Log out, then log back in.**

   If you are editing the `Xservers` file after completing installation, reboot your system.

Xinerama

Refer to the proper `Xservers(1)` man page and Xservers documentation for further information. Xinerama is an X window system feature available in Solaris 8 system software and subsequent compatible releases for Sun graphics boards including the Sun XVR-100 graphics accelerator.

Using Xinerama

When the window system is started in Xinerama mode, all windows can be seamlessly moved across screen boundaries, thus creating one large, super high-resolution, virtual display. With Sun OpenGL 1.3 for Solaris, or subsequent compatible releases, this functionality is extended to OpenGL applications. No recompilation is necessary for a legacy application to work with Xinerama mode across multiple screens, even if the application was compiled with an older version of Sun OpenGL for Solaris.

- **To enable Xinerama mode (single logical screen) on multiscreen displays, add `+xinerama` to the `Xsun` command line in the `/etc/dt/config/Xservers` file.**

  See the following example.

Note – Be sure to enter `+xinerama` after `.../Xsun` in the command line.

For example, as superuser, type:

```
# cd /etc/dt/config
# vi + Xservers
```

Enter the `Xservers` file content in one long line.

```
:0  Local local_uid@console root /usr/openwin/bin/Xsun +xinerama
-dev /dev/fbs/pfb0 -dev /dev/fbs/pfb1
```

"Setting Up Two Video Outputs Over One Large Frame Buffer" on page 25, in Chapter 4, describes an alternative to Xinerama, useful in some cases, where performance may be better.

Restrictions When Using Xinerama

- Both screens must have the same visuals to be combined using Xinerama. In practice, this means they must be the same device (family).
- Both screens that the X window system thinks are side by side must have the same height to be combined using Xinerama.
- Both screens that the X window system thinks are above and below must have the same width to be combined using Xinerama.

CHAPTER 4

Using Sun XVR-100 Graphics Accelerator Features

This chapter provides Sun XVR-100 graphics accelerator feature information.

- "Video Output Methods" on page 23
- "Setting Up Video Output Methods" on page 24
- "Default Color Depth" on page 27
- "Checking Device Configuration" on page 28

Video Output Methods

There are three methods described in this section for video output from which to choose with the Sun XVR-100 graphics accelerator. This section lists the options:

- Single video output for full performance on a single screen (default)
- Two video outputs over one large frame buffer
- Two independent video outputs

The following section, "Setting Up Video Output Methods" on page 24, describes how to set up these video output methods.

Setting Up Video Output Methods

When there are two Sun XVR-100 graphics accelerators in a system, they are numbered from 0 and by ones (0, 1, 2, ...)

Setting Up Single Video Output (Default)

This enables the HD15 video output only. This is the default the system uses if no `fbconfig` commands have been given, or after `fbconfig -dev pfb0 -defaults`.

To set up single video output, do the following:

1. **If enabled, disable `doublewide` mode.**

   To disable `doublewide` mode, type:

   ```
   host% fbconfig -dev pfb0 -defaults
   ```

2. **Set the desired screen resolution. For example, type:**

   ```
   host% fbconfig -dev pfb0 -res 1280x1024x76
   ```

   To find all possible Sun XVR-100 graphics accelerator resolutions, type:

   ```
   host% fbconfig -dev pfb0 -res \?
   ```

Setting Up Two Video Outputs Over One Large Frame Buffer

This enables two monitor support without the use of Xinerama software. This means that the Sun XVR-100 graphics accelerator creates one wide (or tall) frame buffer, displayed across two screens using the DVI port.

To set up two video outputs over one frame buffer, do the following:

1. **Enable both video outputs, sharing a single frame buffer. Type**:

```
host% fbconfig -dev pfb0 -doublewide enable
```

   - Use the `-doublehigh` option for displays that are set one above the other (rather than side-by-side as for the `-doublewide` option). Both monitors must have the same resolution.
   - Use the `-outputs swapped` option to reverse the positions of the two video outputs relative to each other. The default is `direct`. Both monitors must have the same resolution.
   - Use the `-offset` option to adjust the position of the specified video output by the value specified.

     `-offset xval yval`

     This is implemented only in `-doublewide` and `-doublehigh` modes. For `-doublewide`, `xval` is used to position the rightmost video output. Negative is left (overlaps with the left video output). For `-doublehigh`, the `yval` is used to position the bottom video output. Negative is up (overlaps with top video output). The default is [0, 0].

2. **Set the desired screen resolution. Type:**

```
host% fbconfig -dev pfb0 - res 1280x1024x76
```

Note – Screen resolutions higher than 1280 × 1024 are *not* supported for the DVI video port. (See TABLE 1-2 for DVI port supported display resolutions.)

The following is an example of a full overlap for the 1280 × 1024 resolution, replicating one stream on two screens:

```
host% fbconfig -dev pfb0 -offset -1280 0 -doublewide enable
```

Setting Up Two Independent Video Outputs

This allows independent resolution for each video output.

Note – The use of two independent video outputs on a single board with Xinerama is not supported. The X window system and Sun OpenGL for Solaris performance may be noticeably degraded in this mode.

Set up two video outputs over one large frame buffer whenever possible for a dual video output configuration. See "Setting Up Two Video Outputs Over One Large Frame Buffer" on page 25.

To set up two independent video outputs, do the following:

1. **To enable both video outputs, both devices** `/dev/fbs/pfb0a` **and** `/dev/fbs/pfb0b` **must appear in the** `/etc/dt/config/Xservers` **file.**

   As superuser, modify the `Xservers` file. For example:

   For example, as superuser, type:

```
# cd /etc/dt/config
# vi + Xservers
```

   Enter the `Xservers` file content in one long line.

```
:0  Local local_uid@console root /usr/openwin/bin/Xsun -dev
/dev/fbs/pfb0a -dev /dev/fbs/pfb0b
```

2. **Select an independent screen resolution for each frame buffer. For example:**

```
host% fbconfig -dev pfb0a -res 1280x1024x76
host% fbconfig -dev pfb0b -res 1152x900x66
```

Default Color Depth

Use the `-depth` option to set the default depth (bits per pixel) on the device. Possible values are 8 or 24.

```
-depth 8 | 24
```

For example:

```
host% fbconfig -dev pfb0a -depth 24
```

Log out of the current window system session and log back in for the change to take effect. Any depth setting in the `Xserver` command line takes precedence over what is set using `fbconfig`. The default is 24.

For the Solaris 10 Operating System, do the following to set or reset the default color depth. To set 8 or 24 as the default color depth, use `/usr/sbin/svccfg` to reconfigure your `Xservers` file.

```
/usr/sbin/svccfg -s x11-server setprop options/default_depth=8
/usr/sbin/svccfg -s x11-server setprop options/default_depth=24
```

Checking Device Configuration

Use `fbconfig` to check the X window system (`-propt`) and Sun XVR-100 graphics accelerator (`-prconf`) device configuration values.

The `fbconfig -propt` option displays the values of all options (for the specified device) saved in the `OWconfig` file (see below for an example). These are the values the X window system will use the next time it starts on that device:

```
host% fbconfig -dev pfb0 -propt

--- OpenWindows Configuration for /dev/fbs/pfb0 ---

OWconfig: machine
Video Mode: SUNW_DIG_1920x1200x60
Depth: 24

Screen Information:
        Doublewide: Disabled
        Doublehigh: Disabled
        Offset/Overlap: [0, 0]
        Output Configuration: Direct
        Fake8 Rendering: Disabled
```

`fbconfig -prconf` option displays the current Sun XVR-100 graphics accelerator device configuration (see below for an example). If certain values differ from those displayed in `-propt`, it is because those values have been configured since the X window system started.

```
host% fbconfig -dev pfb0 -prconf

--- Hardware Configuration for /dev/fbs/pfb0 ---

Type: XVR-100
ASIC: version 0x5159            REV: version 0x3000000
PROM: version 3.11

Monitor/Resolution Information:
        Monitor Manufacturer: SUN
        Product code: 1414
        Serial #: 808464432
        Manufacture date: 2002, week 32
        Monitor dimensions: 51x32 cm
        Monitor preferred resolution: 1920x1200x60
        Separate sync supported: yes
        Composite sync supported: yes
        EDID:  Version 1, Revision 3
        Monitor possible resolutions: 1920x1200x60, 1920x1080x60,
        1280x1024x60, 1600x1200x60, SUNW_DIG_1920x1200x60,
        SUNW_DIG_1920x1080x60, VESA_STD_1280x1024x60,
        SUNW_STD_1280x1024x76, VESA_STD_1600x1200x60,
        SUNW_STD_1152x900x66, VESA_STD_720x400x70, VESA_STD_640x480x60,
        VESA_STD_640x480x67, VESA_STD_640x480x72, VESA_STD_640x480x75,
        VESA_STD_800x600x56, VESA_STD_800x600x60, VESA_STD_800x600x72,
        VESA_STD_800x600x75, VESA_STD_832x624x75, VESA_STD_1024x768x60,
        VESA_STD_1024x768x70, VESA_STD_1024x768x70,
        VESA_STD_1280x1024x75, APPLE_1152x870x75
        Current resolution setting: 1920x1200x60

Depth Information:
        Possible depths: 8, 24
        Current depth: 24
```

APPENDIX **A**

Sun XVR-100 Graphics Accelerator I/O Port Specifications

This appendix provides I/O port specifications for the Sun XVR-100 graphics accelerator.

I/O Port Specifications

The external I/O ports are accessible through the I/O connectors on the Sun XVR-100 graphics accelerator back panel (FIGURE A-1).

FIGURE A-1 shows the connector locations on the board back panel.

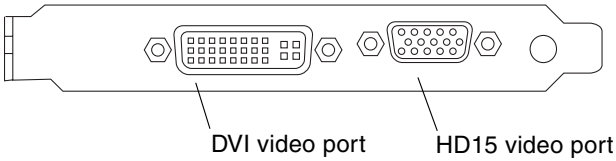

FIGURE A-1 Sun XVR-100 Graphics Accelerator Back Panel I/O Ports

The Sun XVR-100 graphics accelerator I/O video ports include the HD15 and DVI video ports.

HD15 Video Output Port

FIGURE A-2 and TABLE A-1 shows the Sun XVR-100 graphics accelerator HD15 connector and pinout signals.

The console video output port is the HD15 15-pin connector that connects to the workstation monitor. The HD15 video connector supports DDC2 monitor support and Display Power Management Signaling (DPMS).

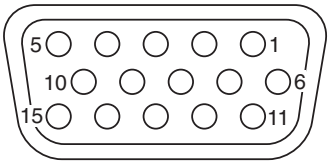

FIGURE A-2 Sun XVR-100 Graphics Accelerator HD15 Connector

TABLE A-1 Sun XVR-100 Graphics Accelerator HD15 Connector Pinout

Pin Number	Signal
1	Red analog video
2	Green analog video
3	Blue analog video
4	No Connect
5	Ground
6	Ground
7	Ground
8	Ground
9	+5V Supply
10	Ground
11	No Connect
12	Monitor ID1

TABLE A-1 Sun XVR-100 Graphics Accelerator HD15 Connector Pinout *(Continued)*

Pin Number	Signal
13	Horizontal Sync
14	Vertical Sync
15	Monitor ID2

DVI Video Output Port

FIGURE A-3 and TABLE A-2 shows the Sun XVR-100 graphics accelerator DVI connector and pinout signals. The DVI video output port is a 30-pin connector for a supported workstation monitor. The DVI video port supports both analog and digital resolutions, but cannot be used simultaneously from the individual DVI port.

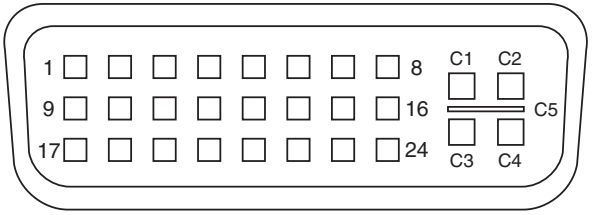

FIGURE A-3 Sun XVR-100 Graphics Accelerator DVI Connector

TABLE A-2 Sun XVR-100 Graphics Accelerator DVI Video Output Port

Pin	Signal
1	TMDS Data2—
2	TMDS Data2+
3	TMDS Data2/4 Shield
4	No Connect
5	Ground
6	DDC clock
7	DDC data
8	Analog VSYNC

TABLE A-2 Sun XVR-100 Graphics Accelerator DVI Video Output Port *(Continued)*

Pin	Signal
9	TMDS Data1—
10	TMDS Data1 +
11	TMDS Data1/3 Shield
12	No Connect
13	No Connect
14	+5V Power
15	Ground
16	Hot Plug Detect
17	TMDS Data0—
18	TMDS Data0+
19	TMDS Data0/5 Shield
20	No connect
21	No connect
22	TMDS Clock Shield
23	TMDS Clock+
24	TMDS Clock—
C1	Analog R
C2	Analog G
C3	Analog B
C4	Analog HSYNC
C5	Analog GND

Index

B

back panel I/O ports, 2, 31
  DVI video port, 2, 33
  HD15 video port, 2, 32

C

CD directories, 9
configuring multiple frame buffers, 19
  Xinerama, 21
  `Xservers` file, 19

D

default console, 16
device configuration, checking
  `-prconf`, 29
  `-propt`, 28
`-doublehigh`, 25
`-doublewide`, 25
DVI video port, 2

F

`fbconfig`, 3, 18
  `-depth`, 27
  `-doublehigh`, 25
  `-doublewide`, 25
  `-list`, 18
  man page, 18
  `-offset xval yval`, 25
  `-outputs`, 25
  `-prconf`, 29
  `-propt`, 28
  `-res`, 25
features, 23

H

hardware installation, 7
hardware removal, 8
HD15 video port, 2

I

I/O ports, 2
  DVI video port, 2
  HD15 video port, 2
installing the hardware, 7
installing the software, 12

M

man pages, 18
  `fbconfig`, 18
  `SUNWpfb_config`, 18
modifying `Xservers` file, 20
multiple frame buffers, configuring, 19

O

OpenGL patches, 11

P

PCI slots, system maximum, 8
`-prconf`, 29
`-propt`, 28

R

reboot, 14

removing the hardware, 8
removing the software, 14
resolutions, 3

S

screen resolutions, 3, 4
software installation, 9, 12
software packages, 10
software patches, Solaris, 11
software removal, 14
Solaris 10 Operating System, 11
  default color depth, 27
  Sun XVR-100 software installation, 9
Solaris patches, 11
Solaris software releases, 11
Sun XVR-100 graphics accelerator
  back panel I/O ports, 2, 31
  CD directories, 9
  default console, 16
  features, 23
  hardware installation, 7
  I/O ports, 2, 31, 32, 33
  illustration, 2
  installation kit, 1
  man pages, 18
  OpenGL patches, 11
  overview, 1
  software installation, 9, 12
  software packages, 10
  software patches, 11
  software removal, 14
  supported system platforms, 8
  technical support, 5
  video display ports, 4
  video formats, 3
  video formats, DVI-A, DVI-D, and HD15, 4
  video formats, HD15, 3
  video output methods, 23
  `Xservers` file, 19
`SUNWpfb_config`, 18
supported system platforms, 8

T

technical support, 5

V

video display ports, 4
  DVI-A (analog), 4
  DVI-D (digital), 4
  HD15, 4
video formats, 3
  DVI-A, DVI-D, and HD15, 4
  HD15, 3
video output methods, 23
  single video output, 24
  two independent video outputs, 26
  two video outputs, one large frame buffer, 25

X

Xinerama, 21
  restrictions, 22
  using, 21
`Xservers` file, 19, 20
`Xsun`, 20, 21, 26