



Sun™ XVR-300 Graphics Accelerator User's Guide

Sun Microsystems, Inc.
www.sun.com

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Preface

This guide describes how to install the Sun™ XVR-300 graphics accelerator hardware and software in a Sun system.

How This Book Is Organized

[Chapter 1](#) provides an overview of the Sun XVR-300 graphics accelerator.

[Chapter 2](#) provides hardware and software installation information.

[Chapter 3](#) describes procedures for configuring multiple frame buffers.

[Chapter 4](#) provides feature information, including video output methods.

[Appendix A](#) describes cabling for DVI and HD15 (VGA) type monitor video ports.

[Appendix B](#) provides product and I/O video port specifications.

[Appendix C](#) provides color depth option information.

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 <code>.login</code> file. Use <code>ls -a</code> to list all files. % You have mail.
AaBbCc123	What you type, when contrasted with on-screen computer output	% su Password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. To delete a file, type rm <i>filename</i> .

Shell Prompts

Shell	Prompt
C shell	<i>machine-name%</i>
C shell superuser	<i>machine-name#</i>
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

Documentation, Support, and Training

Sun Function	URL
Documentation	http://www.sun.com/documentation/
Support	http://www.sun.com/support/
Training	http://www.sun.com/training/

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Sun XVR-300 Graphics Accelerator User's Guide, part number 817-5454-10

Sun XVR-300 Graphics Accelerator Overview

The Sun XVR-300 graphics accelerator is a 24-bit high-resolution PCI-Express graphics frame buffer. The Sun XVR-300 graphics accelerator runs on Sun PCI-Express full-height or low-profile system platforms.

- [“Installation Kit” on page 1](#)
- [“Features” on page 2](#)
- [“Video Formats” on page 4](#)
- [“Technical Support” on page 6](#)

Installation Kit

The Sun XVR-300 graphics accelerator installation kit includes:

- Sun XVR-300 graphics accelerator
- Sun XVR-300 software CD-ROM
- One DMS-59 – 2xDVI-I adapter splitter cable
- One DVI – HD15 (VGA) adapter
- One low profile bracket
- Antistatic-wrist strap
- *Sun XVR-300 Graphics Accelerator User’s Guide*, this document

Features

The Sun XVR-300 graphics accelerator offers the following features for full-height and low-profile Sun PCI-Express systems:

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

Note – For low-profile systems, you must replace the board bracket with the low-profile bracket supplied in the installation kit. See [Chapter 2](#).

[FIGURE 1-1](#) shows the full-height Sun XVR-300 graphics accelerator.

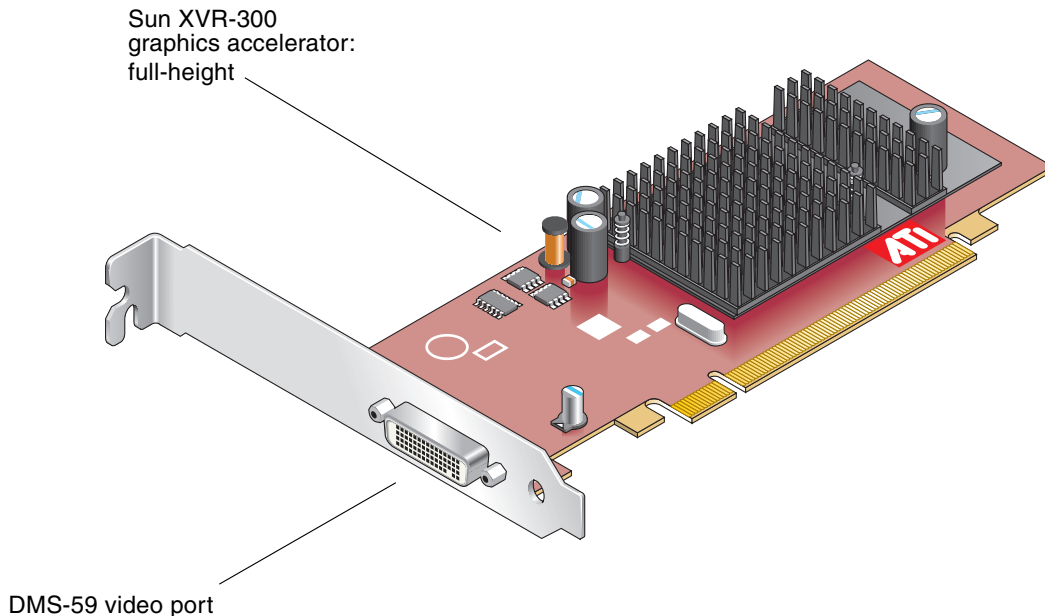


FIGURE 1-1 Full-Height Sun XVR-300 Graphics Accelerator

FIGURE 1-2 shows the low-profile Sun XVR-300 graphics accelerator.

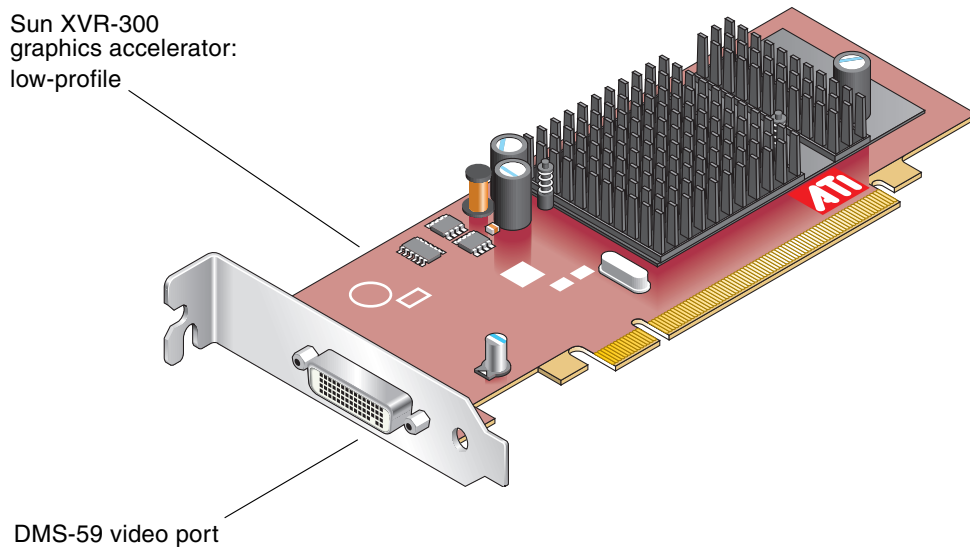


FIGURE 1-2 Low-Profile Sun XVR-300 Graphics Accelerator

FIGURE 1-3 shows the DMS-59 video port on the full-height I/O bracket.

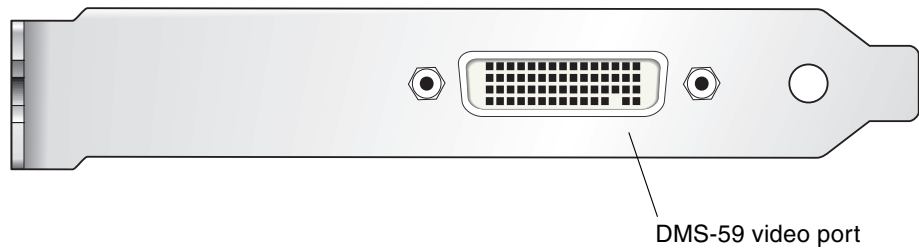


FIGURE 1-3 Sun XVR-300 Graphics Accelerator DMS-59 Video Port

Video Formats

TABLE 1-1 lists the monitor video formats supported by the Sun XVR-300 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:

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

TABLE 1-1 lists video formats supported.

TABLE 1-1 Sun XVR-300 Graphics Accelerator 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 (See Note)	Sun	16:9	24-bit
1856 x 1392	60 Hz	VESA	4:3	24-bit
1792 x 1344	60, 75 Hz	VESA	4:3	24-bit
1600 x 1280	76 Hz	Sun	5:4	24-bit
1600 x 1200	60, 65, 70, 75, 85 Hz	VESA	4:3	24-bit
1600 x 1200	60 Hz	Sun	4:3	24-bit
1600 x 1200	73 Hz	SIEMENS	4:3	24-bit
1600 x 1200	73 Hz	SI-LMT_RFE	4:3	24-bit
1600 x 1024	60 Hz	SGI_STD	4:3	24-bit
1600 x 1024	60 Hz	Sun	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
1400 x 1050	60 Hz	Sun	16:10	24-bit

TABLE 1-1 Sun XVR-300 Graphics Accelerator Video Formats (*Continued*)

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	60, 67, 76 Hz	Sun	5:4	24-bit
1280 x 800	76 Hz	Sun	16:10	24-bit
1280 x 768	56 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 800	84 Hz	Sun	4:3	24-bit
1024 x 768	60, 70, 75, 85 Hz	VESA	4:3	24-bit
1024 x 768	77 Hz	Sun	4:3	24-bit
800 x 600	56, 60, 72, 75, 85 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
640 x 480	60, 180 Hz	Sun	4:3	24-bit

Note – Digital resolution 1920 x 1080 x 60 is not supported on the 24 in. LCD flat panel color monitor (Kenari) (X7203A, 365-1427-01).

Note – The Sun XVR-300 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 might damage the monitor. Please refer to your monitor manuals for supported resolutions.

Video Display Ports

The Sun XVR-300 graphics accelerator support both DVI analog (DVI-A) and DVI digital (DVI-D) video formats. Although both analog and digital video formats are supported, 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-300 graphics accelerator, see Support Services at:

<http://www.sun.com/service/online/>

For the most up-to-date version of this document, go to:

<http://www.sun.com/documentation>

Installing the Hardware and Software

This chapter provides Sun XVR-300 graphics accelerator hardware and software installation information.

- “Before Installation” on page 7
- “Installing the Hardware” on page 8
- “Sun XVR-300 Graphics Accelerator Software” on page 10
- “Default Console Display” on page 17
- “Man Pages” on page 19

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-Express graphics cards. Your system platform documentation also provides removal procedures.

To find the most recent information on supported systems for the Sun XVR-300 graphics accelerator, and additional specifications, go to:

<http://www.sun.com/desktop/products/graphics/xvr300/>

Supported Systems and PCI-Express Slots

TABLE 2-1 lists the maximum number of Sun XVR-300 graphics accelerators for each Sun system supported.

For information on cabling DVI and HD15 (VGA) type monitor video ports, see [Appendix A](#).

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

System	Maximum Number of Boards
Sun Ultra™ 25 system	2
Sun Ultra 45 system	2
Sun Fire™ V215 system	1
Sun Fire V245 system	1
Sun Fire V445 system	2

Note – If installing a Sun XVR-300 graphics accelerator in a Sun Fire V215, Sun Fire V245, or Sun Fire V445 system, refer to the system Release Notes for specific instructions and considerations.

▼ To Replace the Full-Height Bracket With the Low-Profile Bracket

Your system might require replacing the Sun XVR-300 graphics accelerator full-height bracket with a low-profile bracket. The low-profile bracket is included in the installation kit.

1. **Remove the two hexagon screws that secure the mounting bracket to the board assembly and set them aside (FIGURE 2-1).**

Use a 1/8-inch hexagon socket screwdriver.

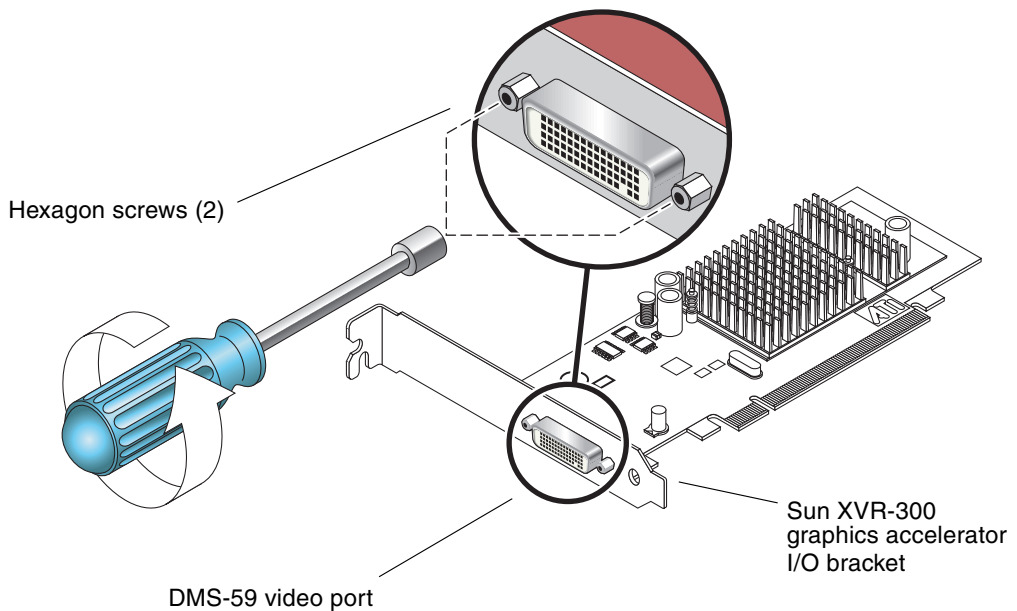


FIGURE 2-1 Replacing the I/O Bracket

2. **Remove the full-height bracket by sliding the bracket off the board assembly DMS-59 video port connector.**
3. **Install the low-profile bracket by placing it on the board assembly in the same orientation.**
4. **Secure the bracket to the board assembly by replacing the two hexagon screws and tightening them.**

Sun XVR-300 Graphics Accelerator Software

The Sun XVR-300 graphics accelerator software is bundled with the Solaris 9 9/05 HW and Solaris 10 11/06 Operating Systems. The minimum Solaris Operating System version required is Solaris 9 9/05 HW or Solaris 10 1/06 Operating Systems.

Install the Sun XVR-300 software from the CD-ROM provided with your Sun XVR-300 graphics accelerator installation kit. [TABLE 2-2](#) lists the Sun XVR-300 graphics accelerator CD-ROM directories:

TABLE 2-2 Sun XVR-300 Graphics Accelerator CD Directories

Directory Name	Description
Copyright	U.S. version of copyright
Docs	Sun XVR-300 graphics accelerator documentation
FR_Copyright	French version of copyright
install	Product installation script
SLA_TRANSLATED.pdf	Translated software licensing agreement
README	Listing of Sun XVR-300 graphics accelerator CD contents
uninstall	Product removal script
Solaris_9/Packages	Solaris 9 OS software packages
Solaris_10/Packages	Solaris 10 OS software packages

Software Packages

Software Package Locations

The Sun XVR-300 software packages are located in the directories listed in [TABLE 2-3](#).

TABLE 2-3 Location of Sun XVR-300 Software Packages

Software Packages	Directory Location
Solaris 9 OS software	/cdrom/cdrom0/Solaris_9/Packages
Solaris 10 OS software	/cdrom/cdrom0/Solaris_10/Packages

Software Package Names

[TABLE 2-4](#) lists the Sun XVR-300 software package names and descriptions.

TABLE 2-4 Solaris 9 and 10 Software Package Names

Package name	Description
SUNWnfbcf	Sun XVR-300 Graphics Configuration Software
SUNWnfb	Sun XVR-300 Graphics System Software Device Driver (64-bit)
SUNWnfbw	Sun XVR-300 Graphics Window System Support
SUNWnfbmn	Sun XVR-300 Graphics Manual Pages

Note – Sun XVR-300 graphics accelerator drivers can be downloaded from the Sun Download Center.

Sun OpenGL for Solaris Software

The Sun OpenGL 1.5 for Solaris software supports the Sun XVR-300 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://www.sun.com/software/graphics/opengl/download.html>

TABLE 2-5 Sun OpenGL 1.5 for Solaris Software Patches

Patch Number	Description
120812-12 or later	Sun OpenGL 1.5 for Solaris

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
113886-38 or later	Sun OpenGL 1.3 for Solaris, 32-bit
113887-38 or later	Sun OpenGL 1.3 for Solaris, 64-bit

Download these patches from the following site:

<http://sunsolve.sun.com>

Updated versions of Sun OpenGL for Solaris are located at:

<http://www.sun.com/software/graphics/opengl/>

Installing the Software

▼ To Install the Software

1. After installing a Sun XVR-300 graphics accelerator into your system, boot your system at the `ok` prompt:

```
ok boot
```

2. Log in as superuser.
3. Insert the Sun XVR-300 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. Run the installation script. Type:

```
# ./install
```

The following Sun Entitlement information is displayed:

```
Sun Microsystems, Inc. ("Sun") ENTITLEMENT for SOFTWARE
```

```
Licensee/Company: Entity receiving Software
```

```
Effective Date: Date Sun delivers the Software to You.
```

```
Software: "Software" means all software provided to You to be used with  
the Host.
```

```
Host: The hardware product described in the Software's documentation  
with which the Software is intended to be used.
```

```
.  
. .  
. .
```

```
Do you accept the license agreement? [y/n]: y
```

At the end of the licensing agreement information, you are asked to accept it.

5. Type *y* and Return, to accept the license agreement.

The following is displayed.

In this example, using the Solaris 10 Operating System, the following is displayed:

```
Installing SUNWnfb SUNWnfbcf SUNWnfbw SUNWnfbmn for Solaris 10 ...
*** Installation of drivers is complete.

To uninstall this software, use the 'uninstall' script on this CDROM, or
the following script:
    /var/tmp/xvr-300.uninstall

A log of this installation can be found at:
    /var/tmp/xvr-300.install.2006.10.09

To configure a Sun XVR-300 accelerator, use the fbconfig
utility. See the fbconfig(1m) and SUNWnfb_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).
```

You can use the following command to check if the Sun XVR-300 graphics accelerator is already on your system. Type:

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

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

```
ok boot -r
```

▼ To Remove the Software

1. Log in as superuser.
2. Insert the Sun XVR-300 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-300 software, type:

```
# ./uninstall
```

In this example, the following is displayed.

```
Removal of Sun XVR-300 Graphics Accelerator software is complete.
A log of this removal is at:
    /var/tmp/xvr-300.uninstall.2006.09.29
```

Default Console Display

Note – The DMS-59 – 2xDVI-I adapter splitter cable for the Sun XVR-300 graphics accelerator has two DVI-I video ports, but *only* the monitor DVI-I number “1” video port can be console.

▼ To Set the Sun XVR-300 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-300@0
b) /pci@1e,600000/pci@0/pci@8/SUNW,XVR-300@0
q) NO SELECTION
Enter Selection, q to quit:
```

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

In this example, you would select `b` for the Sun XVR-300 graphics accelerator.

```
Enter Selection, q to quit: b

/pci@1e,600000/pci@0/pci@8/SUNW,XVR-300@0 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-300@5
```

3. Create an alias name for the Sun XVR-300 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-300 graphics accelerator on your system back panel.

Man Pages

The Sun XVR-300 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. `SUNWnfb_config(1M)` contains Sun XVR-300 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/nfb0	SUNWnfb_config

▼ To Display Man Pages

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

```
host% fbconfig -dev nfb0 -help
```

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

```
host% man fbconfig
```

- To access the Sun XVR-300 graphics accelerator man page, type:

```
host% man SUNWnfb_config
```


Configuring Multiple Frame Buffers

This chapter describes procedures for setting up multiple frame buffers.

- [“Configuring Multiple Frame Buffers Through the Xservers File”](#) on page 21
- [“Xinerama”](#) on page 23

Configuring Multiple Frame Buffers Through the Xservers File

To run more than one frame buffer you must modify your `Xservers` file. The Sun XVR-300 graphics accelerator device name is `nfb` (for example, `nfb0` and `nfb1` for two Sun XVR-300 graphics accelerator devices).

▼ To Modify the Xservers File

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.

Note – Solaris 9 and Solaris 10 Operating Systems use different configuration file paths within the `Xservers` file:

For the Solaris 9 Operating System, use the `/usr/openwin/bin/Xsun` configuration file. For the Solaris 10 Operating System and later, use `/usr/X11/bin/Xserver`.

The following examples are on a Solaris 10 Operating System.

This example shows the `Xservers` configuration file modified for one Sun XVR-2500 graphics accelerator (`kfb0`) and one Sun XVR-300 graphics accelerator (`nfb0`):

```
:0 Local local_uid@console root /usr/X11/bin/Xserver :0 -dev /dev/fbs/kfb0
-dev /dev/fbs/nfb0
```

This example shows how to remove two Sun XVR-2500 graphics accelerators and add one Sun XVR-300 graphics accelerator in the `Xservers` configuration file.

- Old `Xservers` configuration file with two Sun XVR-2500 graphics accelerators:

```
:0 Local local_uid@console root /usr/X11/bin/Xserver :0 -dev /dev/fbs/kfb0
-dev /dev/fbs/kfb1
```

- New `Xservers` configuration file with one Sun XVR-300 graphics accelerator:

```
:0 Local local_uid@console root /usr/X11/bin/Xserver :0 -dev /dev/fbs/nfb0
```

3. Log out, then log back in.

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.

Refer to the proper `Xservers(1)` man page and Xservers documentation for further information.

▼ To Enable Xinerama

- **Add `+xinerama` to the command line in the `/etc/dt/config/Xservers` file.**
See the following example on a Solaris 10 Operating System.

Note – Ensure that you enter `+xinerama` after `/usr/X11/bin/Xserver` 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/X11/bin/Xserver :0 +xinerama
-dev /dev/fbs/nfb0 -dev /dev/fbs/nfb1
```

[“To Set Up Two Video Outputs Over One Large Frame Buffer”](#) on page 27, in [Chapter 4](#), describes an alternative to Xinerama, useful in some cases, where performance might 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.

Using Features

This chapter provides Sun XVR-300 graphics accelerator feature information.

- [“Video Output Methods” on page 25](#)
- [“Setting Up Video Output Methods” on page 26](#)
- [“Checking Device Configuration” on page 30](#)

Video Output Methods

You may choose one of the three methods described in this section for video output from which to choose with the Sun XVR-300 graphics accelerator. This section lists the options:

- Single video output 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 26](#), describes how to set up these video output methods.

Setting Up Video Output Methods

When there are two Sun XVR-300 graphics accelerators in a system, they are numbered from 0 and by ones (0, 1, 2, ...)

▼ To Set Up Single Video Output (Default)

This enables the DVI video output “1” only. This is the default the system uses if no `fbconfig` commands have been given, or after `fbconfig -dev nfb0 -defaults`.

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

To disable `doublewide` mode, type:

```
host% fbconfig -dev nfb0 -defaults
```

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

```
host% fbconfig -dev nfb0 -res 1280x1024x60
```

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

To find all possible Sun XVR-300 graphics accelerator resolutions, type:

```
host% fbconfig -dev nfb0 -res \?
```

▼ To Set 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-300 graphics accelerator creates one wide (or tall) frame buffer, displayed across two screens using both DVI ports. This example shows `doublewide` mode.

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

```
host% fbconfig -dev nfb0 -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 nfb0 -res 1280x1024x60
```

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

▼ To Set Up Two Independent Video Outputs

This set up enables 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 might 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 [“To Set Up Two Video Outputs Over One Large Frame Buffer” on page 27](#).

1. **To enable both video outputs edit the `/etc/dt/config/Xservers` file so that both devices appear.**

The device names are `/dev/fbs/nfb0a` and `/dev/fbs/nfb0b`.

For example, as superuser, type:

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

Enter the `Xservers` file content in one long line (Solaris 10 Operating System in this example).

```
:0 Local local_uid@console root /usr/X11/bin/Xserver :0 -dev
/dev/fbs/nfb0a -dev /dev/fbs/nfb0b
```

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

For example:

```
host% fbconfig -dev nfb0a -res 1280x1024x60
host% fbconfig -dev nfb0b -res 1152x900x66
```

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

▼ To Duplicate Video Output

1. Use the `-clone` option to duplicate the DVI video port “1” display to the DVI video port “2” display.

For example:

```
host% fbconfig -dev nfb0 -clone enable
```

Note – Both monitor displays *must* have the same screen resolution.

2. Log out of the current window system session and log back in for the change to take effect.

Checking Device Configuration

Use `fbconfig` to check the X window system (`-propt`) and Sun XVR-300 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 nfb0 -propt

--- Graphics Configuration for /dev/fbs/nfb0 ---

OWconfig: machine
Video Mode: 1280x1024x60

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

The `fbconfig -prconf` option displays the current Sun XVR-300 graphics accelerator device configuration (see the following code 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 nfb0 -prconf

--- Hardware Configuration for /dev/fbs/nfb0 ---

Type: XVR-300
ASIC: version 0x5b64          REV: version 0x380080
PROM: version 1.6

Monitor/Resolution Information:
Monitor 1:
Monitor Manufacturer: SUN
Product code: 1415
Serial #: 28722509
Manufacture date: 2003, week 24
Monitor dimensions: 36x29 cm
Monitor preferred resolution: SUNW_STD_1280x1024x60
Separate sync supported: no
Composite sync supported: no
Gamma: 2.82
EDID: Version 1, Revision 3
Monitor Supported resolutions from EDID: SUNW_STD_1280x1024x60,
      VESA_STD_1280x1024x60, SUNW_STD_1280x1024x76,
      SUNW_STD_1152x900x66, VESA_STD_1280x1024x75,
      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_1024x768x70,
      VESA_STD_1024x768x75, VESA_STD_1280x1024x75, APPLE_1152x870x75
Current resolution setting: 1280x1024x76
Monitor 2:
Monitor Manufacturer: SUN
Product code: 1399
Serial #: 147538508
Manufacture date: 2000, week 12
Monitor dimensions: 40x30 cm
Monitor preferred resolution: SUNW_STD_1280x1024x76
Separate sync supported: yes
Composite sync supported: yes
Gamma: 2.50
Monitor name: GDM-5410
      EDID: Version 1, Revision 2
Monitor Supported resolutions from EDID: SUNW_STD_1280x1024x76,
      SUNW_STD_1280x1024x76, SUNW_STD_1152x900x76,
      VESA_STD_1280x1024x75, SUNW_STD_1280x1024x67,
      SUNW_STD_1152x900x66, VESA_STD_1024x768x75,
      SUNW_STD_1600x1200x75, SUNW_STD_1280x1024x112s,
      VESA_STD_720x400x70, VESA_STD_720x400x88, 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_1024x768x75,
      VESA_STD_1280x1024x75, APPLE_1152x870x75, 1152x870x75
Current resolution setting: 1280x1024x76

```


Monitor Cable Adapters

This appendix describes Sun XVR-300 graphics accelerator cabling for DVI and HD15 (VGA) type monitor video ports.

- “Cable Adapters” on page 33
- “Connecting Monitors With DVI Video Ports” on page 34
- “Connecting Monitors With HD15 (VGA) Video Ports” on page 35

Cable Adapters

The Sun XVR-300 graphics accelerator installation kit includes the following cable adapters:

- One DMS-59 – 2xDVI-I adapter splitter cable
- One DVI – HD15 adapter

You can order DVI – HD15 adapters (part number 530-3474) through the Sun store (<http://store.sun.com>).

Connecting Monitors With DVI Video Ports

▼ To Connect Monitors With DVI Video Ports

1. Connect the DMS-59 end of DMS-59–DVI adapter splitter cable to the Sun XVR-300 graphics accelerator DMS-59 video port.
2. Connect each DVI connector end of the adapter splitter cable to the DVI ports of your digital monitor ([FIGURE A-1](#)).

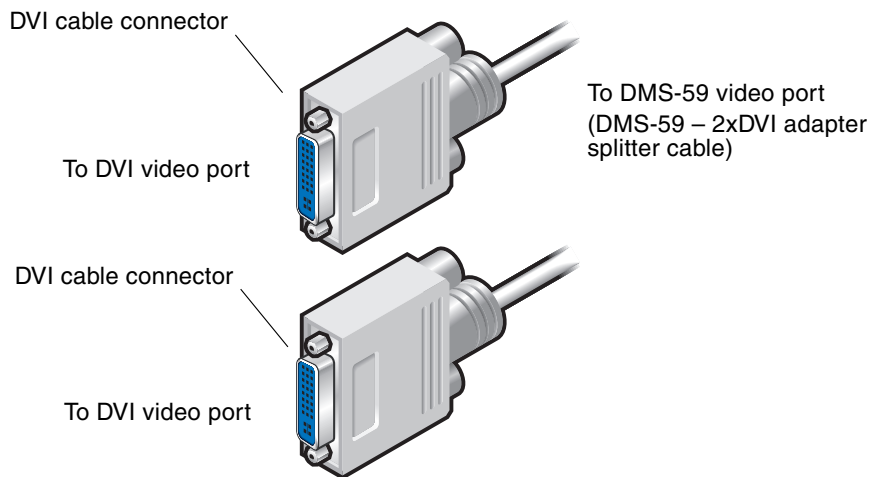


FIGURE A-1 DMS-59 Video Port Connection Using DMS-59 – 2xDVI Adapter Splitter Cable

Connecting Monitors With HD15 (VGA) Video Ports

▼ To Connect Monitors With HD15 Video Ports

1. Connect the DMS-59 end of the DMS-59–DVI adapter splitter cable to the Sun XVR-300 graphics accelerator DMS-59 video port.
2. Connect a DVI–HD15 adapter to each end of the DMS-59–DVI adapter splitter cable DVI connector (FIGURE A-2).
3. Connect the HD15 end of the DVI–HD15 adapter to the HD15 (VGA) monitor video port.

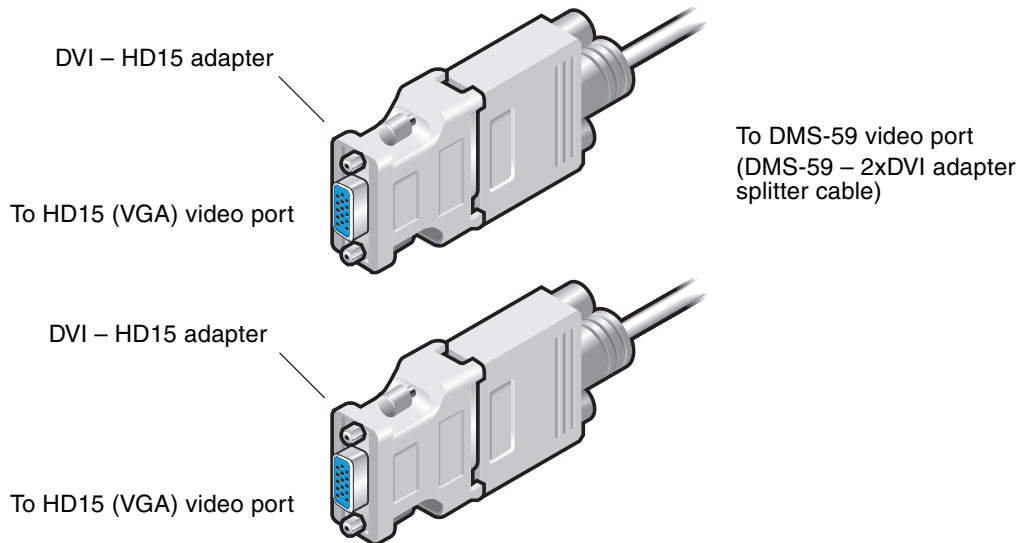


FIGURE A-2 DMS-59 Video Port Connection Using DVI–HD15 Adapters

Sun XVR-300 Graphics Accelerator Specifications

This appendix provides the Sun XVR-300 graphics accelerator product specifications.

- “Board Specifications” on page 37
- “DMS-59 Video Port” on page 38
- “DMS-59 Connector Pinouts” on page 39
- “DVI Connector Pinouts” on page 42
- “HD15 (VGA) Connector Pinouts” on page 44

Board Specifications

This graphics accelerator is for use with UL Listed ITE that have installation instructions detailing user installation of card cage accessories.

TABLE B-1 lists the product specifications.

TABLE B-1 Sun XVR-300 Graphics Accelerator Specifications

Parameter	Specification
Weight	3.7 oz (105 grams)
Length	6.6 in. (165mm)
Width	2.3 in. (55mm)
Power specification	5.0 V +/- 5% 3.3 V +/- 5% 12 V +/- 5% VDDQ V +/- 5%

TABLE B-1 Sun XVR-300 Graphics Accelerator Specifications

Parameter	Specification
Current consumption	5V 3.3V 12V VDDQ V
Temperature	Power-on: 10° to 50° C Power-off: 0° to 70° C (storage/transport)
Humidity	Power-on: 5 to 90% RH Power-off: 0 to 95% RH
Temperature gradient	Less than 15° C/hr

DMS-59 Video Port

FIGURE B-1 shows the Sun XVR-300 graphics accelerator DMS-59 video port.

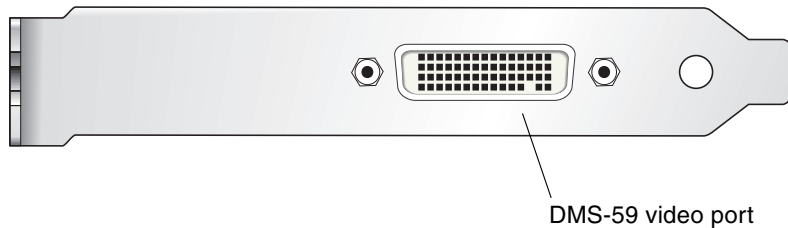


FIGURE B-1 Sun XVR-300 Graphics Accelerator DMS-59 Video Port

DMS-59 Connector Pinouts

FIGURE B-2 and TABLE B-2 shows the DMS-59 connector and pinout signals.

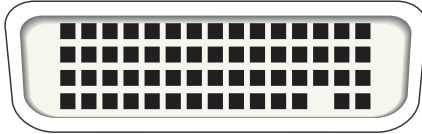


FIGURE B-2 DMS-59 Connector

TABLE B-2 Sun XVR-300 Graphics Accelerator DMS-59 Pinout

Pin	Signal
1	Ground
2	A_R_DAC1_F
3	A_B_DAC1_F
4	Ground
5	+5_VESA
6	DDCCLK_DAC1_R
7	DDCDATA_DAC1_R
8	Ground
9	DDCDATA_DAC2_R
10	DDCCLK_DAC2_R
11	+5_VESA2
12	Ground
13	A_R_DAC2_F
14	A_B_DAC2_F
15	Ground
16	TMDS_TX0P
17	TMDS_TX0N

TABLE B-2 Sun XVR-300 Graphics Accelerator DMS-59 Pinout (*Continued*)

Pin	Signal
18	TMDS_TX1P
19	TMDS_TX1N
20	TMDS_TX2P
21	TMDS_TX2N
22	Ground
23	No Connect
24	Ground
25	TX2P_EXT
26	TX2M_EXT
27	TX1P_EXT
28	TX1M_EXT
29	TX0P_EXT
30	TX0M_EXT
31	TXCP_EXT
32	TXCM_EXT
33	Ground
34	Ground
35	Ground
36	HPD_ExtTMDS_LFH
37	No Connect
38	Ground
39	No Connect
40	HPD_DMS59
41	Ground
42	Ground
43	Ground
44	TMDS_TXCN
45	TMDS_TXCP
46	Ground
47	A_G_DAC2_F

TABLE B-2 Sun XVR-300 Graphics Accelerator DMS-59 Pinout (*Continued*)

Pin	Signal
48	No Connect
49	Ground
50	A_HSYNC_DAC2_R
51	A_VSYNC_DAC2_R
52	Ground
53	No Connect
54	Ground
55	A_VSYNC_DAC1_R
56	A_HSYNC_DAC1_R
57	Ground
58	No Connect
59	A_G_DAC1_F
60	Ground

DVI Connector Pinouts

FIGURE B-3 and TABLE B-3 shows the DVI connector and pinout signals of the 2xDVI-I adapter splitter cable.

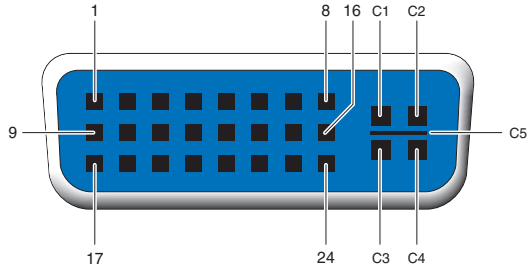


FIGURE B-3 DMS-59 – 2xDVI-I Adapter Splitter Cable DVI Connector

TABLE B-3 DVI Video Cable Connector Pinout

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
9	TMDS Data1—
10	TMDS Data1 +
11	TMDS Data1/3 Shield
12	No Connect
13	No Connect
14	+5V Power

TABLE B-3 DVI Video Cable Connector Pinout (*Continued*)

Pin	Signal
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

HD15 (VGA) Connector Pinouts

FIGURE B-4 and TABLE B-4 shows the HD15 (VGA) adapter connector and pinout signals.

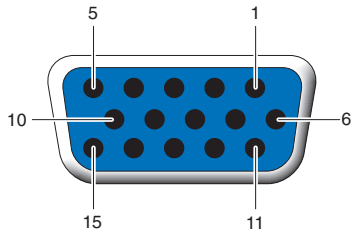


FIGURE B-4 HD15 (VGA) Connector

TABLE B-4 HD15 (VGA) 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
13	Horizontal Sync
14	Vertical Sync
15	Monitor ID2

Color Depth Options

This appendix provides color depth option information.

- [“Default Color Depth” on page 45](#)
- [“Setting Color Depth Options” on page 46](#)

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`

For example:

```
host% fbconfig -dev nfb0a -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 option/default_depth=8  
/usr/sbin/svccfg -s x11-server setprop option/default_depth=24
```

Setting Color Depth Options

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,
- Using `-fake8 enable` if you need both 8-bit and 24-bit visuals simultaneously.

The default is 24-bit.

When the Sun XVR-300 graphics accelerator is set to `-depth 24`, it can only run OpenGL applications with RGBA visual.

When it is set to `-depth 8`, it can only run OpenGL applications with INDEX visual.

▼ To Use the `-depth 24` Option

1. Using the `fbconfig` command, type:

```
% fbconfig -dev nfb0 -depth 24
```

2. Log out, then log back in.

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

▼ To Use the `-fake8` Option

1. Using the `fbconfig` command, type:

```
% fbconfig -dev nfb0 -fake8 enable
```

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

2. Log out, then log back in.

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