Sun™ XVR-300 x8 Graphics Accelerator User's Guide

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Your Sun product is marked to indicate its compliance class:

- Federal Communications Commission (FCC) — USA
- 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

Please read the appropriate section that corresponds to the marking on your Sun product before attempting to install the product.

FCC Class A Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
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 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 it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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

Modifications: Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

FCC Class B Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
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.

Modifications: Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

ICES-003 Class A Notice - Avis NMB-003, Classe A

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

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

ICES-003 Class B Notice - Avis NMB-003, Classe B

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

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

VCCI 基準について

クラス A VCCI 基準について

クラス A VCCI の表示があるワークステーションおよびオプション製品は、クラス A 情報技術装置です。これらの製品には、下記の項目が該当します。

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。

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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ください。

BSMI Class A Notice

The following statement is applicable to products shipped to Taiwan and marked as Class A on the product compliance label.

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。

Declaration of Conformity

Compliance Model Number: A259
Product Family Name: Product Name **(X3000A and 3000A)**

EMC

USA—FCC Class B

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This equipment may not cause harmful interference.
2. This equipment must accept any interference that may cause undesired operation.

European Union

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-300 x8 graphics accelerator hardware and software in a Sun system.

Using UNIX Commands

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

- Software documentation that you received with your system

- Solaris™ Operating System documentation, which is at:

  http://docs.sun.com

Shell Prompts

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

Typographic Conventions

Typeface	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. You *must* be superuser to do this. To delete a file, type rm *filename*.

Note – Characters display differently depending on browser settings. If characters do not display correctly, change the character encoding in your browser to Unicode UTF-8.

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/

Third-Party Web Sites

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Sun Welcomes Your Comments

Sun is interested in improving its documentation and welcomes your comments and suggestions. You can submit your comments by going to:

http://www.sun.com/hwdocs/feedback

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

Sun XVR-300 x8 Graphics Accelerator User's Guide, part number 820-3107-11.

Sun XVR-300 x8 Graphics Accelerator Overview

The Sun XVR-300 x8 graphics accelerator is a 24-bit high-resolution PCI-Express graphics frame buffer. The Sun XVR-300 x8 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 x8 graphics accelerator installation kit includes:

- Sun XVR-300 x8 graphics accelerator
- Sun XVR-300 x8 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 x8 Graphics Accelerator User's Guide,* this document

Features

The Sun XVR-300 x8 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 x8 graphics accelerator.

Sun XVR-300 x8 graphics accelerator: full-height
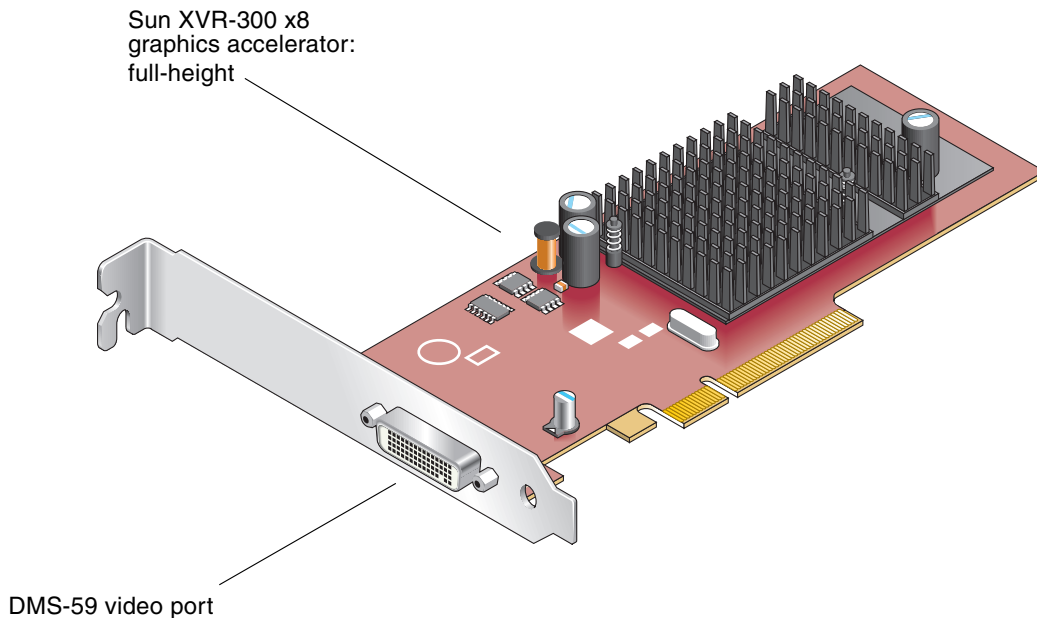
DMS-59 video port

FIGURE 1-1   Full-Height Sun XVR-300 x8 Graphics Accelerator

FIGURE 1-2 shows the low-profile Sun XVR-300 x8 graphics accelerator.

Sun XVR-300 x8
graphics accelerator:
low-profile
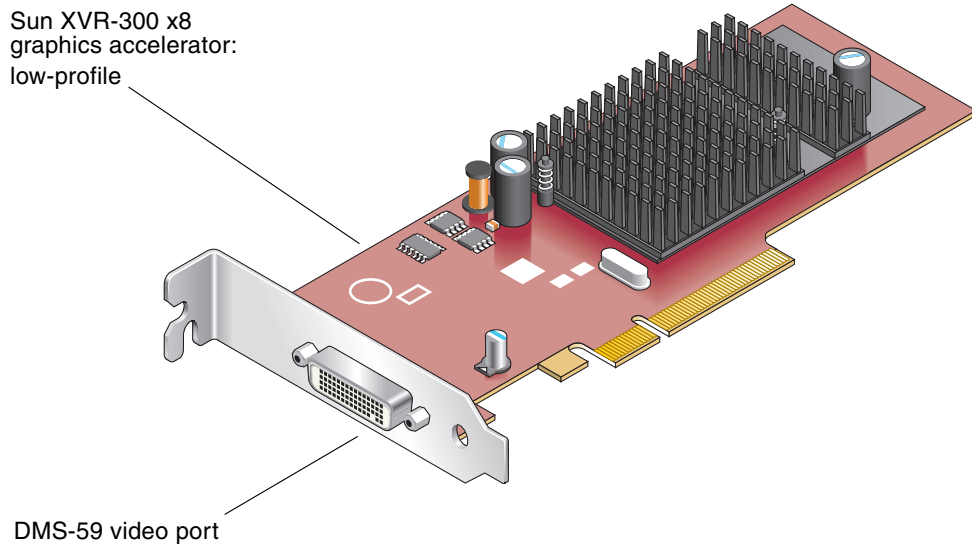
DMS-59 video port

FIGURE 1-2   Low-Profile Sun XVR-300 x8 Graphics Accelerator

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

DMS-59 video port

FIGURE 1-3   Sun XVR-300 x8 Graphics Accelerator DMS-59 Video Port
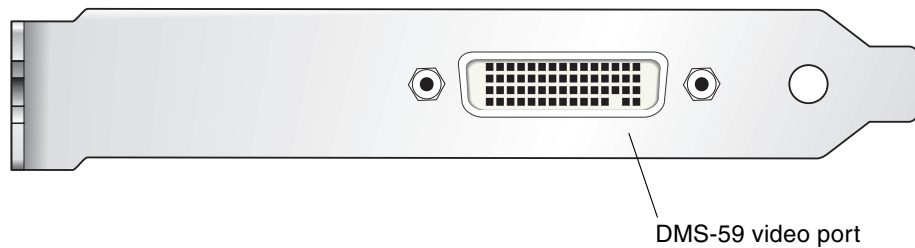
Video Formats

TABLE 1-1 lists the monitor video formats supported by the Sun XVR-300 x8 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 x8 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

TABLE 1-1 Sun XVR-300 x8 Graphics Accelerator Video Formats *(Continued)*

Display Resolution	Vertical Refresh Rate	Sync Standard	Aspect Ratio Format	Maximum Color Depth
1400 x 1050	60 Hz	Sun	16:10	24-bit
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 x8 graphics accelerator composite sync is an 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 x8 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 x8 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 x8 graphics accelerator hardware and software installation information.

- "Before Installation" on page 7
- "Installing the Hardware" on page 7
- "Sun XVR-300 x8 Graphics Accelerator Software" on page 11
- "Installing the Software" on page 14
- "Default Console Display" on page 19
- "Man Pages" on page 20

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 x8 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 x8 graphics accelerators for each Sun system supported. (The Sun XVR-300 x8 Solaris drivers also support the Sun XVR-300 graphics accelerator.)

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 (see "Note 1" on page 9)	2
Sun Ultra 45 system (see "Note 1" on page 9)	2
Sun Fire™ V215 system (see "Note 2" on page 9)	1
Sun Fire V245 system (see "Note 2" on page 9)	1
Sun Fire V445 system (see "Note 2" on page 9)	2
Sun Fire T2000 system	3
Sun SPARC Enterprise T2000 system	3
Sun SPARC Enterprise M3000 system	2
Sun SPARC Enterprise M4000 system	4
Sun SPARC Enterprise M5000 system	4
Sun SPARC Enterprise T5120 system (see "Note 3" on page 9)	3
Sun SPARC Enterprise T5140 system (see "Note 3" on page 9)	3
Sun SPARC Enterprise T5220 system (see "Note 3" on page 9)	4
Sun SPARC Enterprise T5240 system (see "Note 3" on page 9)	4
Sun SPARC Enterprise T5440 system (see "Note 3" on page 9)	4
Netra T2000 (see "Note 3" on page 9)	1
Netra T5220 (see "Note 3" on page 9)	1

Notes

Note 1

The Sun Ultra 25 system requires OpenBoot PROM (OBP) version 4.25.7, patch 124412-01 or later, if using PCI-E slot number 0. The Sun Ultra 45 system requires OBP version 4.25.4, patch 124411-01 or later, if using PCI-E slot number 0. If you are using the Sun XVR-300 x8 board in a Sun Fire V445 system, OBP 4.25.9, patch 124413-01 or later is required.

Note 2

If installing a Sun XVR-300 x8 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.

Note 3

For this platform, a graphics console is supported after installing both Solaris 10 patches 137111-01 (or later) and 124149-09 (or later) on Solaris 10 8/07 or Solaris 10 5/08 operating systems. No patch is needed for Solaris 10 10/08, or later, operating system.

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

Your system might require replacing the Sun XVR-300 x8 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.

Hexagon screws (2)

Sun XVR-300 x8
graphics accelerator
I/O bracket
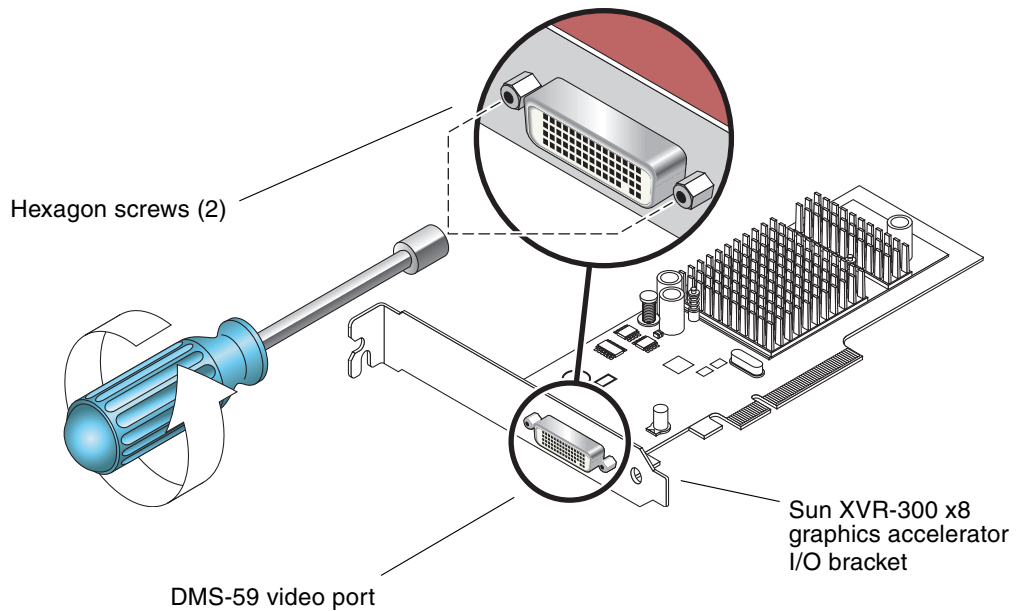
DMS-59 video port

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 x8 Graphics Accelerator Software

The Sun XVR-300 x8 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 x8 software from the CD-ROM provided with your Sun XVR-300 x8 graphics accelerator installation kit. TABLE 2-2 lists the Sun XVR-300 x8 graphics accelerator CD-ROM directories:

TABLE 2-2   Sun XVR-300 x8 Graphics Accelerator CD Directories

Directory Name	Description
Copyright	U.S. version of copyright
Docs	Sun XVR-300 x8 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 x8 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 x8 software packages are located in the directories listed in TABLE 2-3.

TABLE 2-3 Location of Sun XVR-300 x8 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 x8 software package names and descriptions.

TABLE 2-4 Solaris 9 and 10 Software Package Names

Package name	Description
`SUNWnfbcf`	Sun XVR-300 x8 Graphics Configuration Software
`SUNWnfb`	Sun XVR-300 x8 Graphics System Software Device Driver (64-bit)
`SUNWnfbw`	Sun XVR-300 x8 Graphics Window System Support
`SUNWnfbmn`	Sun XVR-300 x8 Graphics Manual Pages

Note – Sun XVR-300 x8 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 x8 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

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

Installing the Software

▼ To Install the Software

1. After installing a Sun XVR-300 x8 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 x8 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-300x8.uninstall

A log of this installation can be found at:
        /var/tmp/xvr-300x8.install.2007.10.09

To configure a Sun XVR-300 x8 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 x8 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 use the Sun XVR-300 x8 graphics accelerator as a console, type at a Solaris prompt:

```
# eeprom output-device=screen
# eeprom input-device=keyboard
# reboot -- -r
```

This reboot creates the symbolic link `/dev/fb -> fbs/nfb0`. After the reboot, the window system login appears on the monitor connected to the graphics card cable video 1. If you did not set the OpenBoot configuration variables as described in this step (`output-device`, `input-device`), the symbolic link is not created and the window system will not start. You can resolve this by manually creating the link `/bin/ln -s fbs/nfb0 /dev/fb` as root and rebooting the Solaris OS.

To query the current state from Solaris, type:

```
# eeprom | grep put
```

If the screen and keyboard is already set, there is no need to change the input and output devices.

If you have a mouse and keyboard attached, you should be presented with a graphics console after rebooting.

▼ To Remove the Software

1. **Log in as superuser.**

2. **Insert the Sun XVR-300 x8 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 x8 software, type:

```
#./uninstall
```

In this example, the following is displayed.

```
Removal of Sun XVR-300 x8 Graphics Accelerator software is complete.
A log of this removal is at:
        /var/tmp/xvr-300x8.uninstall.2007.09.29
```

Default Console Display

Note – The DMS-59 – 2xDVI-I adapter splitter cable for the Sun XVR-300 x8 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 x8 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 x8 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 x8 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 x8 graphics accelerator on your system back panel.**

Man Pages

The Sun XVR-300 x8 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 x8 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 x8 graphics accelerator man page, type:**

```
host% man SUNWnfb_config
```

Configuring Multiple Frame Buffers

This chapter describes procedures for setting up multiple frame buffers.

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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 x8 graphics accelerator device name is `nfb` (for example, `nfb0` and `nfb1` for two Sun XVR-300 x8 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 x8 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 x8 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 x8 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 28, 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 x8 graphics accelerator feature information.

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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 x8 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, , describes how to set up these video output methods.

Setting Up Video Output Methods

When there are two Sun XVR-300 x8 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 x8 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 x8 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 28.

---

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* support 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 x8 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 x8 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-300x8
ASIC: version 0x5b64        REV: version 0x3800080
PROM: version 1.11

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: 1280x1024x60
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 monitor cable adapters.

- "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 x8 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 x8 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-2**).**

DVI cable connector

To DMS-59 video port
(DMS-59 – 2xDVI adapter
splitter cable)

To DVI video port

DVI cable connector

To DVI video port

DVI cable connector

To DMS-59 video port
(DMS-59 – 2xDVI adapter splitter cable)

To DVI video port

DVI cable connector

To DVI video port
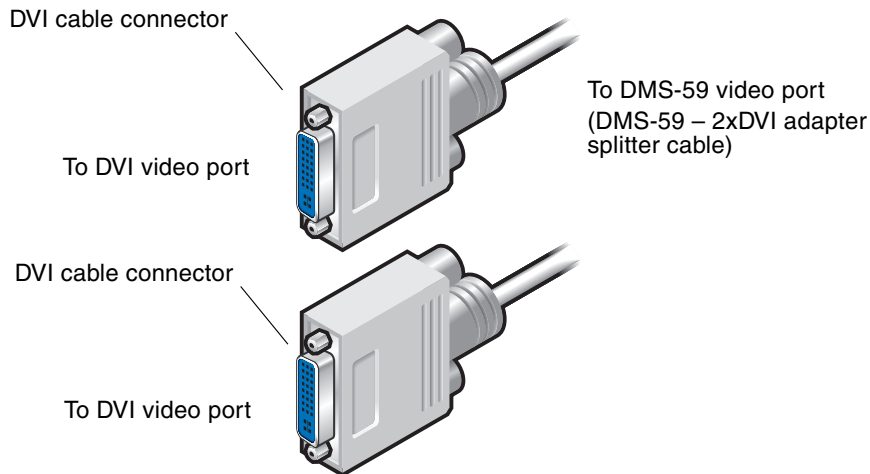
FIGURE A-2   DMS-59 Video Port Connection Using DMS-59 – 2xDVI Adapter Splitter Cable

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 x8 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-3**).**

3. **Connect the HD15 end of the DVI-HD15 adapter to the HD15 (VGA) monitor video port.**

DVI – HD15 adapter

To DMS-59 video port
(DMS-59 – 2xDVI adapter
splitter cable)

To HD15 (VGA) video port

DVI – HD15 adapter

To HD15 (VGA) video port
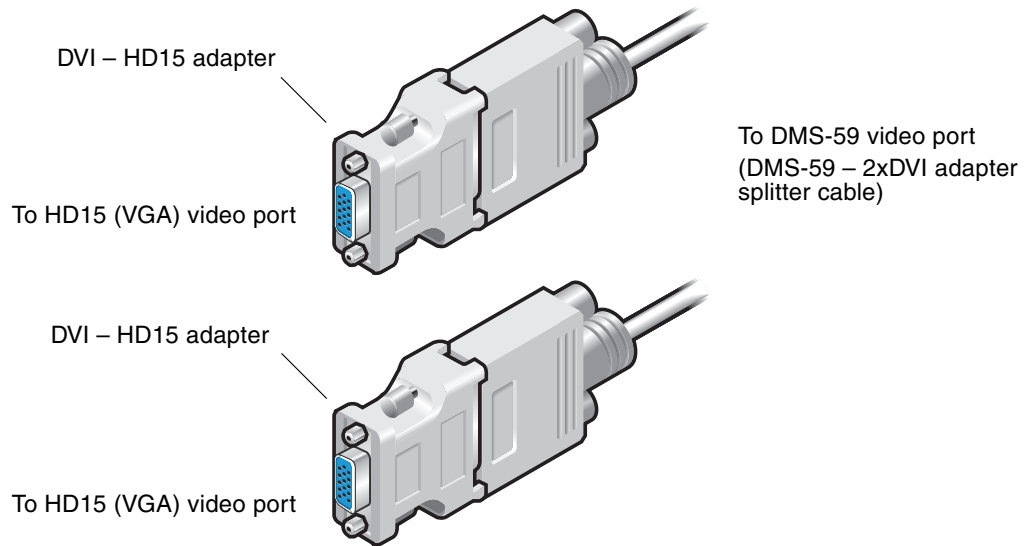
FIGURE A-3   DMS-59 Video Port Connection Using DVI–HD15 Adapters

Sun XVR-300 x8 Graphics Accelerator Specifications

This appendix describes Sun XVR-300 x8 graphics accelerator specifications and I/O port information.

- "Board Specifications" on page 37
- "DMS-59 Video Port" on page 38
- "DMS-59 Connector Pinouts" on page 38
- "DVI Connector Pinouts" on page 41
- "HD15 (VGA) Connector Pinouts" on page 43

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 x8 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%

Parameter	Specification
Power consumption	15W
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 x8 graphics accelerator DMS-59 video port.
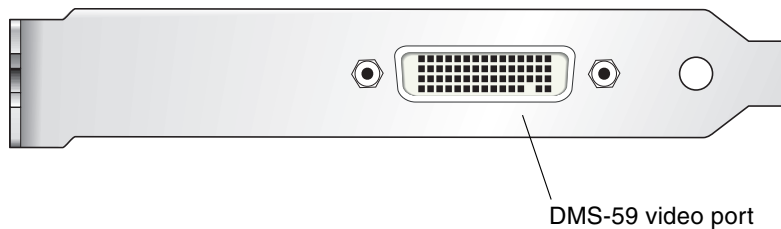
DMS-59 video port

FIGURE B-1   Sun XVR-300 x8 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.
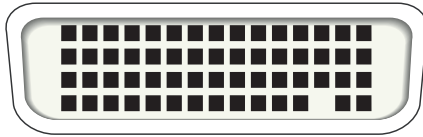
FIGURE B-2   DMS-59 Connector

TABLE B-2   Sun XVR-300 x8 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
18	TMDS_TX1P
19	TMDS_TX1N
20	TMDS_TX2P
21	TMDS_TX2N
22	Ground

TABLE B-2 Sun XVR-300 x8 Graphics Accelerator DMS-59 Pinout *(Continued)*

Pin	Signal
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
48	No Connect
49	Ground
50	A_HSYNC_DAC2_R
51	A_VSYNC_DAC2_R
52	Ground

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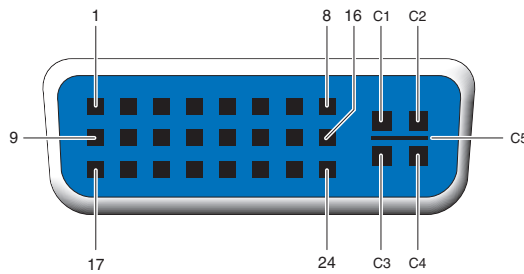
FIGURE B-3   DMS-59 – 2xDVI-I Adapter Splitter Cable DVI Connector

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
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

Pin	Signal
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.
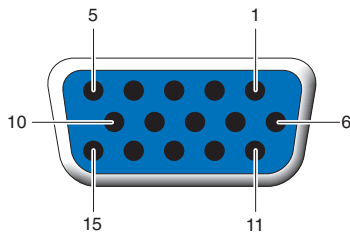
FIGURE B-4   HD15 (VGA) Connector

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

TABLE B-4   HD15 (VGA) Connector Pinout *(Continued)*

Pin Number	Signal
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

Use the `-depth` option to set the default depth (bits per pixel) on the device on the Solaris 9 Operating System. 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
```

Log out, then log back in.

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 x8 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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