



Sun™ XVR-100 Graphics Accelerator Installation Guide

Sun Microsystems, Inc.
www.sun.com

Part No. 816-7560-14
February 2004, Revision A

Submit comments about this document at: <http://www.sun.com/hwdocs/feedback>

Copyright 2004 Sun Microsystems, Inc., 4150 Network Circle, Santa Clara, California 95054, U.S.A. All rights reserved.

Sun Microsystems, Inc. has intellectual property rights relating to technology embodied in the product that is described in this document. In particular, and without limitation, these intellectual property rights may include one or more of the U.S. patents listed at <http://www.sun.com/patents> and one or more additional patents or pending patent applications in the U.S. and in other countries.

This document and the product to which it pertains are distributed under licenses restricting their use, copying, distribution, and decompilation. No part of the product or of this document may be reproduced in any form by any means without prior written authorization of Sun and its licensors, if any.

Third-party software, including font technology, is copyrighted and licensed from Sun suppliers.

Parts of the product may be derived from Berkeley BSD systems, licensed from the University of California. UNIX is a registered trademark in the U.S. and in other countries, exclusively licensed through X/Open Company, Ltd.

Sun, Sun Microsystems, the Sun logo, AnswerBook2, docs.sun.com, Sun Fire, Sun Blade, and Solaris are trademarks or registered trademarks of Sun Microsystems, Inc. in the U.S. and in other countries.

All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. in the U.S. and in other countries. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc.

The OPEN LOOK and Sun™ Graphical User Interface was developed by Sun Microsystems, Inc. for its users and licensees. Sun acknowledges the pioneering efforts of Xerox in researching and developing the concept of visual or graphical user interfaces for the computer industry. Sun holds a non-exclusive license from Xerox to the Xerox Graphical User Interface, which license also covers Sun's licensees who implement OPEN LOOK GUIs and otherwise comply with Sun's written license agreements. OpenGL is a registered trademark of Silicon Graphics, Inc.

U.S. Government Rights—Commercial use. Government users are subject to the Sun Microsystems, Inc. standard license agreement and applicable provisions of the FAR and its supplements.

DOCUMENTATION IS PROVIDED "AS IS" AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID.

Copyright 2004 Sun Microsystems, Inc., 4150 Network Circle, Santa Clara, California 95054, Etats-Unis. Tous droits réservés.

Sun Microsystems, Inc. a les droits de propriété intellectuelle relatant à la technologie incorporée dans le produit qui est décrit dans ce document. En particulier, et sans la limitation, ces droits de propriété intellectuelle peuvent inclure un ou plus des brevets américains énumérés à <http://www.sun.com/patents> et un ou les brevets plus supplémentaires ou les applications de brevet en attente dans les Etats-Unis et dans les autres pays.

Ce produit ou document est protégé par un copyright et distribué avec des licences qui en restreignent l'utilisation, la copie, la distribution, et la décompilation. Aucune partie de ce produit ou document ne peut être reproduite sous aucune forme, par quelque moyen que ce soit, sans l'autorisation préalable et écrite de Sun et de ses bailleurs de licence, s'il y en a.

Le logiciel détenu par des tiers, et qui comprend la technologie relative aux polices de caractères, est protégé par un copyright et licencié par des fournisseurs de Sun.

Des parties de ce produit pourront être dérivées des systèmes Berkeley BSD licenciés par l'Université de Californie. UNIX est une marque déposée aux Etats-Unis et dans d'autres pays et licenciée exclusivement par X/Open Company, Ltd.

Sun, Sun Microsystems, le logo Sun, AnswerBook2, docs.sun.com, Sun Fire, Sun Blade, et Solaris sont des marques de fabrique ou des marques déposées de Sun Microsystems, Inc. aux Etats-Unis et dans d'autres pays.

Toutes les marques SPARC sont utilisées sous licence et sont des marques de fabrique ou des marques déposées de SPARC International, Inc. aux Etats-Unis et dans d'autres pays. Les produits portant les marques SPARC sont basés sur une architecture développée par Sun Microsystems, Inc.

L'interface d'utilisation graphique OPEN LOOK et Sun™ a été développée par Sun Microsystems, Inc. pour ses utilisateurs et licenciés. Sun reconnaît les efforts de pionniers de Xerox pour la recherche et le développement du concept des interfaces d'utilisation visuelle ou graphique pour l'industrie de l'informatique. Sun détient une licence non exclusive de Xerox sur l'interface d'utilisation graphique Xerox, cette licence couvrant également les licenciées de Sun qui mettent en place l'interface d'utilisation graphique OPEN LOOK et qui en outre se conforment aux licences écrites de Sun. OpenGL est une marque déposée de Silicon Graphics, Inc.

LA DOCUMENTATION EST FOURNIE "EN L'ÉTAT" ET TOUTES AUTRES CONDITIONS, DECLARATIONS ET GARANTIES EXPRESSES OU TACITES SONT FORMELLEMENT EXCLUES, DANS LA MESURE AUTORISÉE PAR LA LOI APPLICABLE, Y COMPRIS NOTAMMENT TOUTE GARANTIE IMPLICITE RELATIVE A LA QUALITE MARCHANDE, A L'APTITUDE A UNE UTILISATION PARTICULIERE OU A L'ABSENCE DE CONTREFAÇON.



Regulatory Compliance Statements

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。

クラス B VCCI 基準について

クラス B 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 B 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。

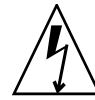
この装置は、情報処理装置等電波障害自主規制協議会 (VCCI) の基準に基づくクラス B 情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。取扱説明書に従って正しい取り扱いをしてください。

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。

Safety Precautions



For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions and instructions marked on the equipment.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Never push objects of any kind through openings in the equipment. Dangerous voltages might be present. Conductive foreign objects could produce a short circuit that could cause fire, electric shock, or damage to your equipment.
- Do not make mechanical or electrical modifications to the equipment. Sun Microsystems is not responsible for the safety or regulatory compliance of a modified Sun product.
- Do not block or cover the openings of your Sun product. Never place a Sun product near a radiator or heat register. Failure to follow these guidelines can cause overheating and affect the reliability of your Sun product.
- Sun products are designed to work with power systems having a grounded neutral (grounded return for DC-powered products). To reduce the risk of electric shock, do not plug Sun products into any other type of power system. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.
- Not all power cords have the same current ratings. Household extension cords do not have overload protection and are not meant for use with computer systems. Do not use household extension cords with your Sun product.
- Batteries might explode if mishandled or incorrectly replaced. See the service manual for proper handling and replacement instructions. Do not dispose of the battery in fire. Do not disassemble it or attempt to recharge it.
- Do not operate Sun products without the covers in place. Failure to take this precaution might result in personal injury and system damage.
- For products with a Standby power switch, the power cord serves as the primary disconnect device for the system. Be sure to plug the power cord into a grounded power outlet that is nearby the system and is readily accessible. Do not connect the power cord when the power supply has been removed from the system chassis.

This product complies with regulatory requirements for safety and EMC as documented in the Sun Microsystems online document repository of hardware documentation at:

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

Declaration of Conformity

Compliance Model Number: **855**
Product Family Name: **Sun XVR-100 Graphics Accelerator (X3769A, X3770A)**

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 Telecommunication Network Equipment (TNE) in both Telecom Centers and Other Than Telecom Centers per (as applicable): EN300-386 V.1.3.1 (09-2001) Required Limits:

EN55022/CISPR22	Class B
EN61000-3-2	Pass
EN61000-3-3	Pass
EN61000-4-2	6 kV (Direct), 8 kV (Air)
EN61000-4-3	3 V/m 80-1000MHz, 10 V/m 800-960 MHz and 1400-2000 MHz
EN61000-4-4	1 kV AC and DC Power Lines, 0.5 kV Signal Lines
EN61000-4-5	2 kV AC Line-Gnd, 1 kV AC Line-Line and Outdoor Signal Lines, 0.5 kV Indoor Signal Lines > 10m
EN61000-4-6	3 V
EN61000-4-11	Pass

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

EN55022:1998/CISPR22:1997	Class B
EN55024:1998	Required Limits:
EN61000-4-2	4 kV (Direct), 8kV (Air)
EN61000-4-3	3 V/m
EN61000-4-4	1 kV AC Power Lines, 0.5 kV Signal and DC Power Lines
EN61000-4-5	1 kV AC Line-Line and Outdoor Signal Lines, 2 kV AC Line-Gnd, 0.5 kV DC Power Lines
EN61000-4-6	3 V
EN61000-4-8	1 A/m
EN61000-4-11	Pass
EN61000-3-2:1995 + A1, A2, A14	Pass
EN61000-3-3:1995	Pass

Safety

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

EC Type Examination Certificates:

EN60950:2000, 3rd Edition	TÜV Rheinland Certificate No.
IEC 60950:1999, 3rd Edition	CB Scheme Certificate No. US/6923/UL
Evaluated to all CB Countries	
UL 60950, 3rd Edition, CSA C22.2 No. 60950*	File: E15487-A1-UL-1

Supplementary Information

This product was tested and complies with all the requirements for the CE Mark.

/S/	DATE	/S/	DATE
Dennis P. Symanski Manager, Compliance Engineering Sun Microsystems, Inc. 4150 Network Circle, MPK15-102 Santa Clara, CA 95054 U.S.A. Tel: 650-786-3255 Fax: 650-786-3723		Donald Cameron Program Manager Sun Microsystems Scotland, Limited Blackness Road, Phase I, Main Bldg Springfield, EH49 7LR Scotland, United Kingdom Tel: +44 1 506 672 539 Fax: +44 1 506 670 011	

Contents

Preface xvii

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 10

 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 <code>-fake8</code> 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	27
A. Sun XVR-100 Graphics Accelerator I/O Port Specifications	29
I/O Port Specifications	29
HD15 Video Output Port	30
DVI Video Output Port	31
Index	33

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	29
FIGURE A-2	Sun XVR-100 Graphics Accelerator HD15 Connector	30
FIGURE A-3	Sun XVR-100 Graphics Accelerator DVI Connector	31

Tables

TABLE 1-1	Sun XVR-100 Graphics Accelerator HD15 Video Formats	3
TABLE 1-2	Sun XVR-100 Graphics Accelerator Video Formats (DVI-A, DVI-D and HD15)	4
TABLE 2-1	Supported Systems and Maximum Number of Sun XVR-100 Graphics Accelerators Per System	8
TABLE 2-2	Sun XVR-100 Graphics Accelerator CD Directories	9
TABLE 2-3	Location of Sun XVR-100 Software Packages	10
TABLE 2-4	Solaris 8 and 9 Software Package Names	10
TABLE 2-5	Sun XVR-100 for Solaris Software Patches	10
TABLE 2-6	Sun OpenGL 1.3 for Solaris Software Patches	11
TABLE A-1	Sun XVR-100 Graphics Accelerator HD15 Connector Pinout	30
TABLE A-2	Sun XVR-100 Graphics Accelerator DVI Video Output Port	31

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 <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 <code>rm filename</code> .

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	#

Accessing Sun Documentation

You can view, print, or purchase a broad selection of Sun documentation, including localized versions, at:

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

Contacting Sun Technical Support

If you have technical questions about this product that are not answered in this document, go to:

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

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-100 Graphics Accelerator Installation Guide, part number 816-7560-14

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 the software

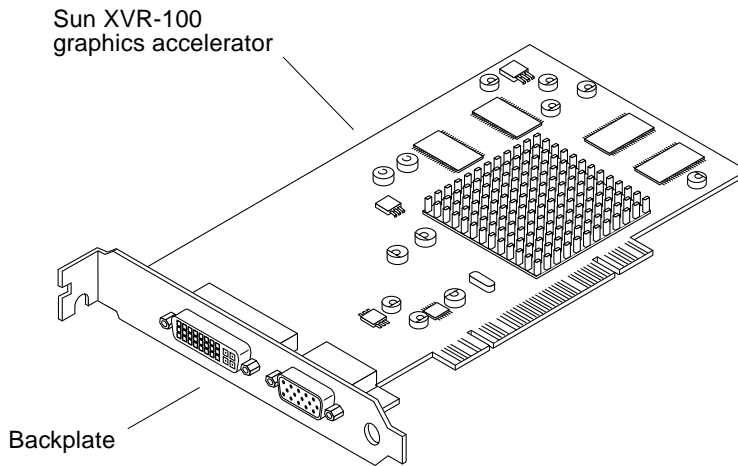


FIGURE 1-1 Sun XVR-100 Graphics Accelerator

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

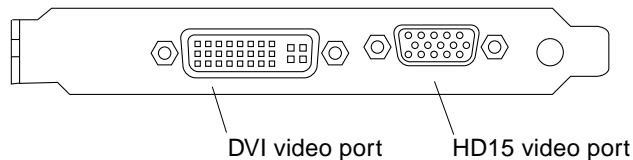


FIGURE 1-2 Sun XVR-100 Graphics Accelerator Back Panel I/O Ports

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 – 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>

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 150 system	3
Sun Blade 1500 system	3
Sun Blade 2000 system	4
Sun Blade 2500 system	3
Sun Fire V120 system	1
Sun Fire V210 system	1
Sun Fire V240 system	1
Sun Fire V250 system	1
Sun Fire 280R system	4

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

System	Maximum Number of Boards
Sun Fire V440 system	4
Sun Fire V480 system	4
Sun Fire V880 system	4

Installing the Sun XVR-100 Graphics Accelerator Software

Your system requires the Solaris 8 or Solaris 9 Operating Systems, or a subsequent compatible version of the Operating System, to support the Sun XVR-100 graphics accelerator software.

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

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>

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

Solaris Operating System	Patch	Directory Location
Solaris 8	114537-19	/cdrom/cdrom0/Solaris_8/Patches
Solaris 9	114538-20	/cdrom/cdrom0/Solaris_9/Patches

Sun OpenGL for Solaris Software

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>

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://www.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 114537-19 ...
*** 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.2004.02.10

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
```

Note – After you complete the basic installation and configuration of your system, you can use the Sun Install Check Tool to check proper patches, software levels, and so on. Download tool at:

<http://www.sun.com/software/installcheck/index.html>

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.2004.02.10
```

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
```

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.

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
- “Checking Device Configuration” on page 27

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.)

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 8.

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 1.5

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
```


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.

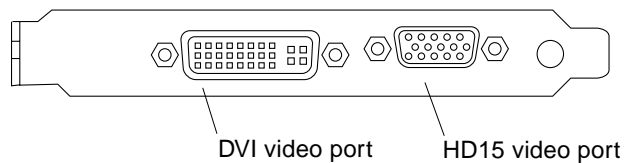


FIGURE A-1 Sun XVR-100 Graphics Accelerator Back Panel I/O Ports

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).

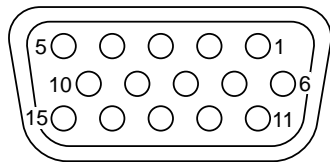


FIGURE A-2 Sun XVR-100 Graphics Accelerator HD15 Connector

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.

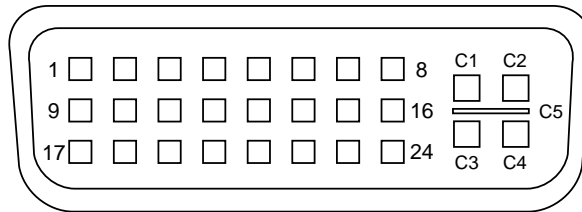


FIGURE A-3 Sun XVR-100 Graphics Accelerator DVI Connector

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, 29
DVI video port, 2, 31
HD15 video port, 2, 30

C

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

D

default console, 16
device configuration, checking
-prconf, 28
-propt, 27
-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, 28
-propt, 27
-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, 28
-propt, 27
- 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, 10
software removal, 14
Solaris patches, 10
Solaris software releases, 10
Sun XVR-100 graphics accelerator
 back panel I/O ports, 2, 29
 CD directories, 9
 default console, 16
 features, 23
 hardware installation, 7
 I/O ports, 2, 29, 30, 31
 illustration, 2
 installation kit, 1
 man pages, 18
 OpenGL patches, 11
 overview, 1
 software installation, 9, 12
 software packages, 10
 software patches, 10
 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