



# Sun PGX64 Graphics Card Installation Guide

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

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

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

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# Preface

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This guide describes how to install the Sun™ PGX64 PCI graphics card hardware and software in a Sun system.

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## How This Book Is Organized

Chapter 1 provides an overview of the Sun PGX64 graphics card.

Chapter 2 provides hardware and software installation instructions.

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## Using UNIX Commands

This document may not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:

- *Solaris Handbook for Sun Peripherals*
- AnswerBook2™ online documentation for the Solaris™ operating environment
- Other software documentation that you received with your system

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# Typographic Conventions

Typeface	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.
<b>AaBbCc123</b>	What you type, when contrasted with on-screen computer output	% <b>su</b> Password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be superuser to do this.
	Command-line variable; replace with a real name or value	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	#

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# Sun PGX64 Graphics Card Overview

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The Sun PGX64 graphics card (FIGURE 1-1) is a 24-bit high-resolution PCI-based graphics frame buffer. The Sun PGX64 graphics card runs on all Sun PCI-based system platforms.

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## Installation Kit

The PGX64 graphics card installation kit includes:

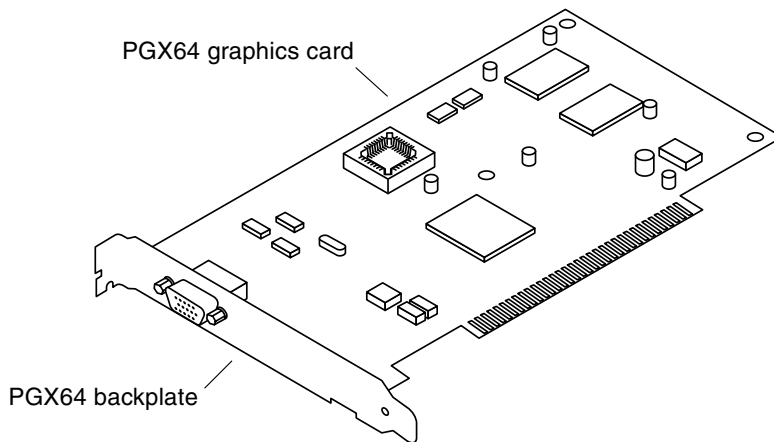
- Sun PGX64 graphics card
- Antistatic wrist strap
- Sun PGX64 software on CD-ROM
- HD15 to 13W3 adapter cable
- *Sun PGX64 Graphics Card Installation Guide*, this document

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# Features

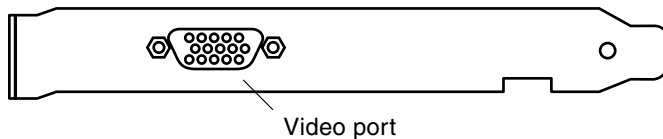
The PGX64 graphics card (FIGURE 1-1) offers the following features:

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



**FIGURE 1-1** Sun PGX64 Graphics Card

FIGURE 1-2 shows the Sun PGX64 graphics card backplate and HD15 monitor connector.



**FIGURE 1-2** Sun PGX64 Backplate

---

# Sun PGX64 Screen Resolutions and Video Formats

TABLE 1-1 lists the monitor screen resolutions and video formats supported by the Sun PGX64 graphics card:

**TABLE 1-1** Sun PGX64 Monitor Screen Resolutions

<b>Display Resolution</b>	<b>Vertical Refresh Rate</b>	<b>Sync Standard</b>	<b>Aspect Ratio Format</b>	<b>Color Depth</b>
1920 x 1200	70 Hz	Sun	16:10	8-bit
1920 x 1080	72 Hz	Sun	16:9	8-bit
1600 x 1280	76 Hz	Sun	5:4	8-bit
1600 x 1200	75 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
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, 85 Hz	VESA	4:3	24-bit
720 x 400	85 Hz	VESA	9:5	24-bit
640 x 480	60, 72, 75, 85 Hz	VESA	4:3	24-bit

---

**Note** – For assistance and information not found in this document concerning the Sun PGX64 card, see SunService<sup>SM</sup> at <http://www.sun.com/service/online/>.

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# Installing the PGX64 Hardware and Software

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This chapter provides Sun PGX64 hardware and software installation information.

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## Before Installation

Refer to the *Solaris Handbook for Sun Peripherals* that corresponds to your operating environment. 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.

## System PCI Slots

Up to four PGX64 graphics cards are supported on Sun systems that support four or more PCI slots. TABLE 2-1 lists the maximum number of PGX64 graphics cards supported on Sun systems, including the maximum number of UPA bus graphics cards allowed in systems using the PGX64 card.

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**Note** – If your Sun system contains a Sun Elite3D m6 graphics accelerator which occupies the UPA bus slot, the double-wide Sun Elite3D m6 accelerator prevents you from using the PCI slot for the PGX64 graphics card.

---

**TABLE 2-1** Maximum Number of PGX64 Cards Supported on Sun Systems

<b>System</b>	<b>Maximum Number of PGX64 Cards</b>	<b>Maximum Number of UPA Bus Cards Allowed</b>
Sun Ultra™ 5 system	3	N/A
Sun Ultra 10 system	4	1
Sun Ultra 60 system	4	2
Sun Ultra 80 system	4	1 or 2
Sun Blade™ 100 system	3	N/A
Sun Blade 1000 system	4	1 or 2
Sun Enterprise™ 250 system	4	N/A
Sun Enterprise 450 system	4	N/A
Sun Enterprise 220R system	4	N/A
Sun Enterprise 280R system	4	1 or 3
Sun Enterprise 420R system	4	N/A
Sun Enterprise 3500 system	4	N/A
Sun Enterprise 4500 system	4	N/A
Sun Enterprise 5500 system	4	N/A
Sun Enterprise 6500 system	4	N/A

## Video Adapter Cable

The PGX64 graphics card installation kit provides a Sun HD15-to-13W3 video adapter cable. This cable is used to connect the HD15 video output connector of the PGX64 graphics card to Sun monitor displays with a 13W3 captive cable or 13W3 video input connector.

---

# Installing the PGX64 Software

The following Solaris platforms support the Sun PGX64 graphics card:

- Solaris 2.5.1 operating environment
- Solaris 2.6 operating environment
- Solaris 7 operating environment
- Solaris 8 operating environment

You must install the required software packages or software patches for your system Solaris operating environment. Install the Sun PGX64 software from the CD-ROM provided with your Sun PGX64 installation kit. TABLE 2-2 lists the PGX64 CD-ROM directories:

**TABLE 2-2** Sun PGX64 CD Directories

Directory Name	Description
Copyright	U.S. version of copyright
FR_Copyright	French version of copyright
Solaris_2.5.1	Sun PGX64 software for this environment in package and patch format
Solaris_2.6	Sun PGX64 software for this environment in package and patch format
Solaris_7	Sun PGX64 software for this environment in package and patch format
Solaris_8	Sun PGX64 software for this environment in package and patch format
Tools	Script and compressed tar files for patching network installation images for Solaris 2.5.1, Solaris 2.6, Solaris 7 and Solaris 8 operating environments

# Sun PGX64 Software Packages

## Software Package Locations

The Sun PGX64 software packages are located in the directories listed in TABLE 2-3.

**TABLE 2-3** Location of Sun PGX64 Software Packages

<b>PGX64 Software Packages</b>	<b>Directory Location</b>
Solaris 2.5.1 software	/cdrom/cdrom0/Solaris_2.5.1/Packages
Solaris 2.6 software	/cdrom/cdrom0/Solaris_2.6/Packages
Solaris 7 software	/cdrom/cdrom0/Solaris_7/Packages
Solaris 8 software	/cdrom/cdrom0/Solaris_8/Packages

## Software Package Names

TABLE 2-4 lists the Sun PGX64 software package names and descriptions.

**TABLE 2-4** Solaris 2.5.1, Solaris 2.6, Solaris 7, and Solaris 8 Software Package Names

<b>Package name</b>	<b>Description</b>
SUNWm64.u	32-bit device driver for the M64 graphics accelerator
SUNWm64cf	Configuration utility for the M64 graphics accelerator
SUNWm64mn	Manual pages (man page) for the M64 graphics accelerator (Applicable to Solaris 2.5.1 only. For later releases, the M64 man page is bundled in SUNWman.)
SUNWm64w	X server loadable module for the M64 graphics accelerator
SUNWm64x.u	64-bit device driver for the M64 graphics accelerator
SUNWm64xr.u	Extended configuration for Xclaim and Charger graphics cards



# Sun PGX64 Software Patches

TABLE 2-5 lists the Sun PGX64 software patches required for Solaris 2.5.1, Solaris 2.6, Solaris 7 and Solaris 8 operating environments.

**TABLE 2-5** Sun PGX64 for Solaris Software Patches

Solaris Operating Environment	Patch	Directory Location
Solaris 2.5.1	103792-29	/cdrom/cdrom0/Solaris_2.5.1/Patches
Solaris 2.6	105362-31	/cdrom/cdrom0/Solaris_2.6/Patches
Solaris 7	106146-17	/cdrom/cdrom0/Solaris_7/Patches
Solaris 8	108606-08	/cdrom/cdrom0/Solaris_8/Patches

## Installing the Software

1. After installing a Sun PGX64 card into your system, boot your system at the **ok** prompt:

```
ok boot -r
```

2. Log in as superuser.
3. Insert the PGX64 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 PGX64 software.

##### a. Determine the installation method for installing the software.

Check to see if PGX64 software already exists on your system. Type:

```
# /usr/bin/pkginfo | grep m64
```

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

```
SUNWm64    M64 System Software (Device Driver)
SUNWm64cf M64 Graphics Configuration Software
SUNWm64w   M64 Window System Support
SUNWm64x   M64 Graphics System Software/Device Driver (64-bit)
SUNWm64xr  M64XR System Software (Device Driver Config.)
```

##### b. If there are no previous versions of PGX64 installed, go to the software package location and run the `pkgadd` program:

```
# cd /cdrom/cdrom0/Solaris_X/Packages
# pkgadd -d . *
```

where *Solaris\_X* is the Solaris operating environment on your system. Follow the prompts of the `pkgadd` program. This procedure is the same when adding a second PGX64 card to your system.

##### c. If a previous version of PGX64 software is installed on systems running the Solaris 2.5.1 operating environment, go to the software patch location and run the `installpatch` program:

```
# cd /cdrom/cdrom0/Solaris_2.5.1/Patches/103792-29
# ./installpatch `pwd`
```

- d. If a previous version of PGX64 software is installed on systems running Solaris 2.6, Solaris 7, Solaris 8 (but *not* Solaris 8 Update 4 or later releases) operating environments, go to the software patch location and run the `patchadd` program.

```
# cd /cdrom/cdrom0/Solaris_X/Patches/patch_number
# /usr/sbin/patchadd `pwd`
```

where *Solaris\_X* is the Solaris operating environment on your system, and *patch\_number* is the patch (TABLE 2-5) for your Solaris operating environment.

5. Reboot the system to complete the installation:

```
ok boot -r
```

## Patching Network Installation Image

---

**Note** – The following instructions are intended for experienced system administrators only. For more details, contact SunService at <http://www.sun.com/service/online/>

---

These instructions describe how to apply PGX64 patches to network images for Solaris 2.5.1, Solaris 2.6, Solaris 7, and Solaris 8 operating environments.

1. After installing the Sun PGX64 card into your system, boot your system at the `ok` prompt:

```
ok boot -r
```

2. Log in as superuser.
3. Insert the PGX64 CD-ROM into the drive.
4. Choose the correct Solaris operating environment where you will apply the patch to network install image.

5. To apply the PGX64 software patches for the network install image, go to the PGX64 Tools directory location and set the path to the network image directory:

```
# cd /cdrom/cdrom0/Tools
# ./pgx64_patch_netimage -r x.x -d path to net image directory
```

where *x.x* is the Solaris operating environment on your system by revision number only (for example, type “2.6” and not “Solaris 2.6”), and *path to net image directory* is the directory to the network image directory.

6. Continue to perform the standard network installation procedure.

---

## Removing Sun PGX64 Software

1. To remove Sun PGX64 software, become superuser and type:

```
# /usr/bin/pkginfo | grep m64
```

The following list of software packages is displayed.

```
system      SUNWm64    M64 System Software (Device Driver)
application SUNWm64cf  M64 Graphics Configuration Software
application SUNWm64w   M64 Window System Support
system      SUNWm64x   M64 Graphics System Software/Device Driver (64-bit)
system      SUNWm64xr  M64XR System Software (Device Driver Config.)
```

2. Use `pkgrm` to remove the software packages listed. Type:

```
# /usr/sbin/pkgrm SUNWm64 SUNWm64cf SUNWm64w SUNWm64x SUNWm64xr
```

For Solaris 2.5.1 operating environments, include the `SUNWm64mn` package and exclude the `SUNWm64x` package. Type:

```
# /usr/sbin/pkgrm SUNWm64 SUNWm64cf SUNWm64w SUNWm64mn SUNWm64xr
```

---

# Sun PGX64 Default Console Display

To set the Sun PGX64 graphics card 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,0/pci@5/TSI,gfxp@2
b) /pci@1f,0/pci@5/SUNW,m64B@1
c) /pci@1f,0/pci@5/SUNW,Expert3D-Lite@0
q) NO SELECTION
```

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

In this example, you would select `b` for the Sun PGX64 card.

```
Enter Selection, q to quit: b

/pci@1f,0/pci@5/SUNW,m64B@1 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@1f,0/pci@5/SUNW,m64B@1
```

**3. Create an alias name for the Sun PGX64 device.**

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

```
ok nvalias mydev <Control-Y> <ENTER>
```

**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
```

7. Connect your monitor cable to the Sun PGX64 card on your system back panel.

---

## Accessing the English and Localized Documentation

The PGX64 CD-ROM contains the *Sun PGX64 Graphics Card Installation Guide* in the following languages:

- English
- French
- German
- Spanish
- Italian
- Swedish
- Japanese
- Korean
- Simplified Chinese
- Traditional Chinese

All localized documentation is contained in the following directory: `/cdrom/cdrom0/Docs/language`. For example, the localized Italian installation guide is located at: `/cdrom/cdrom0/Docs/it/`

**TABLE 2-6** Directories for Localized Documents

Language	Directory Name
English	C/
French	fr/
German	de/
Spanish	es/

**TABLE 2-6** Directories for Localized Documents (*Continued*)

<b>Language</b>	<b>Directory Name</b>
Italian	it/
Swedish	sv/
Japanese	ja/
Korean	ko/
Simplified Chinese	zh/
Traditional Chinese	zh_TW/

