

Quadro Plex S4 Visualization System



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Introduction

The NVIDIA Quadro® Plex S4 GPU visualization system contains more Quadro® graphics processing power in less space than has ever been achieved before, enabling interactive visualization of extremely large-scale data sets by multiple users with a minimal footprint.

The Quadro Plex Model S4 is designed to serve high-quality interactive visualization of large models to multiple users. Its 6 GB frame buffer (1.5 GB per GPU) can process large textures with full-screen antialiasing while Shader Model 4.0 vertex and pixel programmability delivers ultra-realistic effects for OpenGL and DirectX 10 applications. The server's accelerated 3D texture performance provides greater interactivity for the visualization of large volumetric datasets often required in energy and scientific research.

Note: It is important to register your Quadro Plex S4 in order to receive NVIDIA® Customer Care online and phone support. You can register your Quadro Plex S4 at www.nvidia.com/register.

About This Guide

This installation guide provides instructions to connect the Quadro Plex S4 to an NVIDIA-tested host system¹ in a rack-mount environment. For information on using the system with applications, refer to the NVIDIA web site at www.nvidia.com/quadroplex

Features

Visual Computing System Features

- **Breakthrough Visual Compute Density**
Unmatched graphics compute per cubic centimeter provides highest visual compute density enabling breakthrough levels of capability and productivity for applications such as offline rendering, remote graphics serving, and embedded visual computing.
- **Dedicated Visual Computing System**
Enables NVIDIA SLI™ multi-GPU capability on any NVIDIA Quadro Plex certified PCI Express platform.
- **1U Server Form Factor**
The new server contains more Quadro graphics processing power in less space than has ever been achieved before, enabling interactive visualization of extremely large-scale data sets by multiple users with a minimal footprint.

GPU Features

- **Cg High-Level Graphics Shader Language**
Cg—“C” for graphics—is a high-level, open-standard programming language for OpenGL that takes advantage of the power of programmable GPUs. NVIDIA Quadro® FX programmable graphics pipelines leverage high-level shading languages to enable the creation and integration of real-time photorealistic effects into 3D models, scenes, and designs. This represents a major leap forward in ease and speed for the creation of real-time, realistic graphics within MCAD, DCC, and scientific applications.
- **Fast 3D Textures**
Fast transfer and manipulation of 3D textures resulting in more interactive visualization of large volumetric dataset
- **12-Bit Subpixel Precision**
12-bit sub-pixel precision delivers high geometric accuracy, eliminating speckles, cracks, and other rasterization anomalies.

- **128-Bit Precision Graphics Pipeline**

Enables sophisticated mathematical computations to maintain high accuracy, resulting in unmatched visual quality. Full IEEE 32-bit floating-point precision per color component (RGBA) delivers millions of color variations with the broadest dynamic range.
- **32-Bit Floating Point Precision**

Sets new standards for image clarity and quality through 32-bit floating point capabilities in shading, filtering, texturing, and blending. Enables unprecedented rendered image quality for visual effects processing.
- **32-Bit Filtering and Blending**

Enables unprecedented rendered image quality for visual effects processing.
- **384-Bit Memory Interface**

Delivers the industry's highest memory bandwidth (up to 76.8 GB/sec) for blistering data transfer. Supports the world's fastest GDDR3 memory with lower power consumption than previous generation systems.
- **1.5 GB Frame Buffer per GPU**

Delivers high throughput for interactive visualization of large models and high-performance for real time processing of large textures and frames and enables the highest quality and resolution full-scene antialiasing (FSAA).
- **Advanced Color Compression, Early Z-Cull**

Improved pipeline color compression and early z-culling to increase effective bandwidth and improve rendering efficiency and performance.
- **Graphics API Extensions**

NVIDIA provides a full set of API extensions for Linux and Windows, enabling applications to take maximum advantage of the hardware's capabilities.

Minimum System Requirements

The Quadro Plex S4 is designed to connect to an NVIDIA-tested PCI Express host system. The specific motherboard and SBIOS of your system may affect the functionality of the Quadro Plex S4. Refer to the NVIDIA web site (www.nvidia.com/quadroplex) for a list of NVIDIA-tested host systems.

The Quadro Plex S4 minimum system requirements include:

- **System and Platform**

- NVIDIA-tested system or platform

- **Operating System**

- Linux (64-bit)
 - Red Hat Enterprise Linux 3, 4 and 5
 - SUSE 10.1, 10.2 and 10.3
- Windows Server 2003

- **Processor**

- Intel Pentium 4 or Xeon processor or higher
- AMD Opteron processor or higher

- **RAM**

- Minimum 2 GB, 4 GB recommended

- **System Interface**

- PCI Express ×16 slot
- PCI Express ×8 slot if you are using the optional ×8 interface card



Unpacking

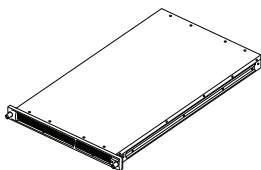
Unpacking

The Quadro Plex S4 is shipped as a 1U rack-mount chassis configuration for connection to a host system.

Be sure to inspect each piece of equipment shipped in the packing box. If anything is missing or damaged, contact your supplier.

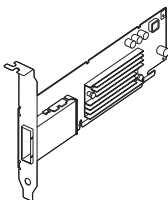
Equipment

The following equipment is included in the Quadro Plex S4 box.



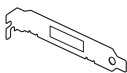
Quadro Plex S4

Chassis includes four (4) Quadro Plex S4 GPU visualization processors.



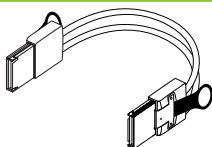
Two (2) NVIDIA Interface Cards (Quadro Plex S4)

Installs into the PCI Express x16 slot in the host system. The card comes with the standard ATX height bracket attached. A low profile bracket is also provided and can replace the standard bracket on the card.



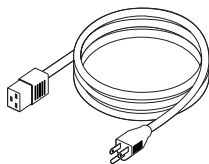
Two (2) Low Profile Brackets (Quadro Plex S4)

Used to replace the standard ATX (long) bracket shipped attached to the interface card.



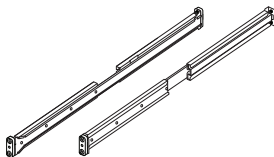
Two (2) Interconnect Cables (Quadro Plex S4)

Connects from the interface card in the host system to the Quadro Plex S4.



Power Cord(s)

Used to supply power to the Quadro Plex S4. The host system controls the power. 1, 2 or 3 cords are supplied depending on regional kit.



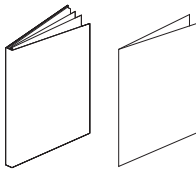
One (1) Rail Kit

Each rail kit includes two (2) rails for use with a standard 4-post 19 inch, EIA compliant rack.



One (1) Quadro Plex Installation CD

Contains all the necessary drivers to enable the Quadro Plex S4. To keep your drivers current, visit www.nvidia.com and download the latest drivers. The installation guide is also included on the CD.



One (1) Quick Start Guide

The Quick Start Guide (a summary of the Installation Guide) provides the basic procedures necessary to install and bring-up the Quadro Plex S4. If you use the Quick Start Guide, refer to the Installation Guide for detailed information.



Hardware Installation and Connections

Installing and connecting the Quadro Plex S4 requires opening the host system. Follow all of the safety instructions provided here to ensure that there is no damage to you, your host system, or the Quadro Plex unit.

Safety Instructions

To reduce the risk of fire, electric shock, and injury always follow basic safety precautions.

Remember to remove power from your host system by disconnecting the AC main source before installing any equipment into the host system chassis. For more information regarding important safety instructions, refer to the *Important Safety Information* section starting on page 43.

Before You Begin

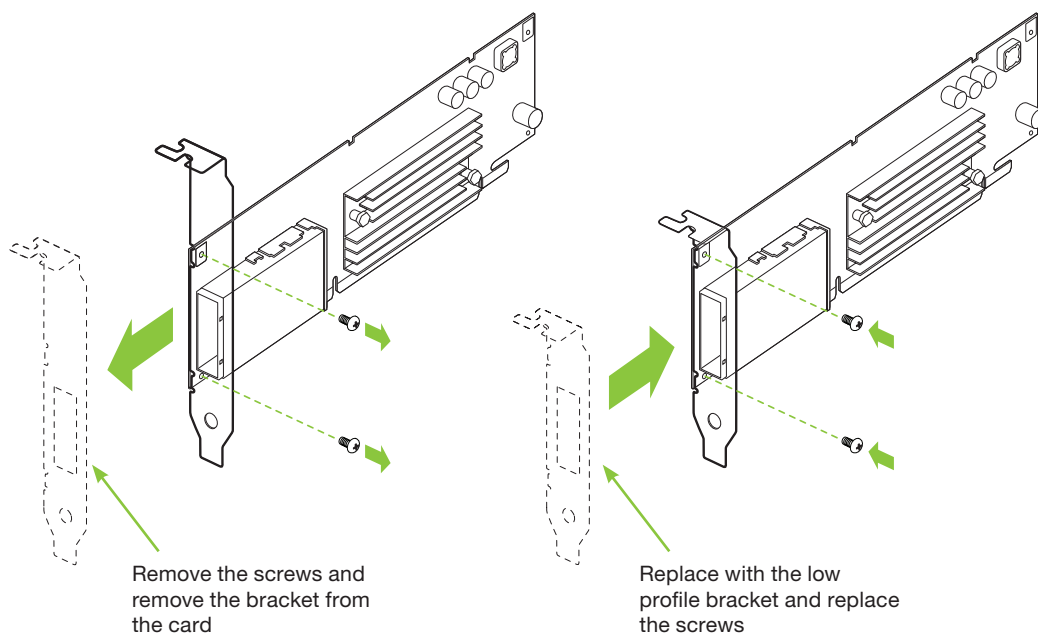
The Quadro Plex S4 must be connected to a host system. The host system accessing the Quadro Plex S4 must have an open $\times 16$ PCI Express slot or an open $\times 8$ PCI Express slot with an optional $\times 8$ PCI Express interface card.

Note: All hardware must be installed prior to installation of the drivers.

Optional Low Profile Bracket

Before beginning the installation, determine if you are going to need the NVIDIA interface card with the standard (long) bracket or the shorter low profile bracket. If you require the low profile bracket, use the following instructions to replace the standard bracket. Replacing the bracket requires a Philips #2 screw driver.

1. Remove the two (2) jack screws from the connector.
2. Install the two (2) screws to attach the low profile bracket to the NVIDIA interface card.



Installation Instructions

For connection to a host system, be sure to review the minimum system requirements given on page 4. Then start your installation with *Connecting to the Host System* (page 15).

The installation procedure will take you through the following steps:

- Installing the NVIDIA interface cards
- Installing and connecting the Quadro Plex system

Mounting the Quadro Plex System in a Rack

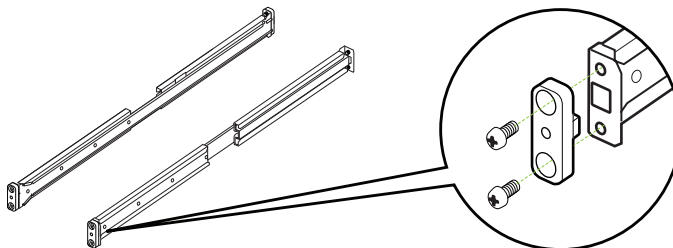
Plan your rack configuration to ensure you have the proper cables to reach from the Quadro Plex system to your host system for each system and host connection. The Quadro Plex system ships with 0.5 meter length cables by default. An optional 2 meter cable is available.

The Quadro Plex system also ships with rails to fit a 4-post 19-inch EIA rack as the default configuration.

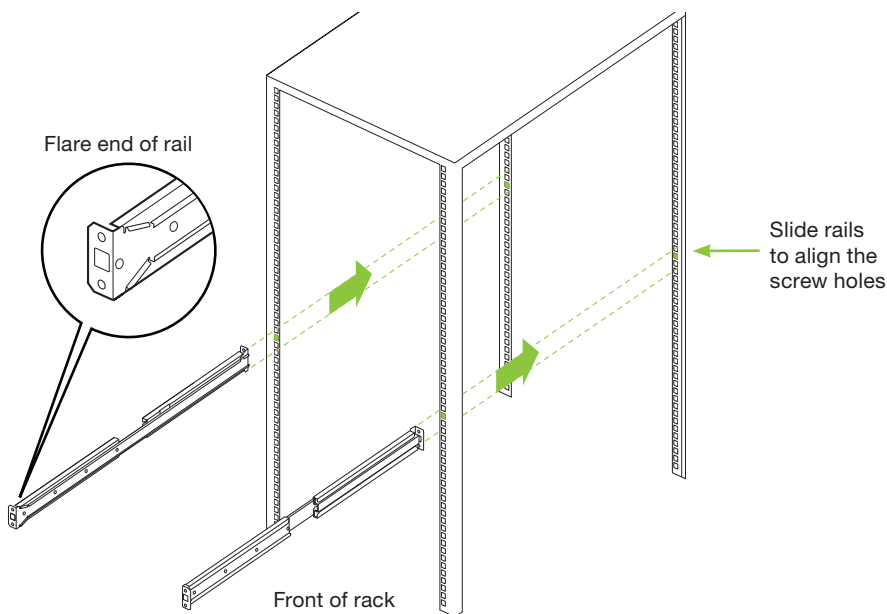
If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (T_{mra}). The maximum operating ambient temperature is 35 C.

Quadro Plex S4 Visualization System Installation Guide

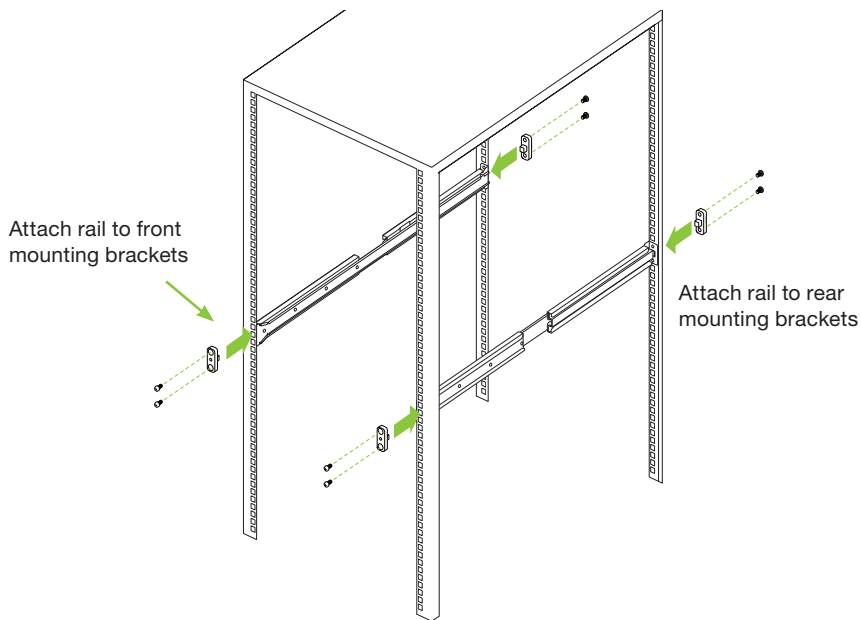
1. Remove one of the rails from the packing box.
2. Remove the mounting brackets attached to either end of the rail. Set aside as you will need these to secure the rail to the rack at the end of the steps.



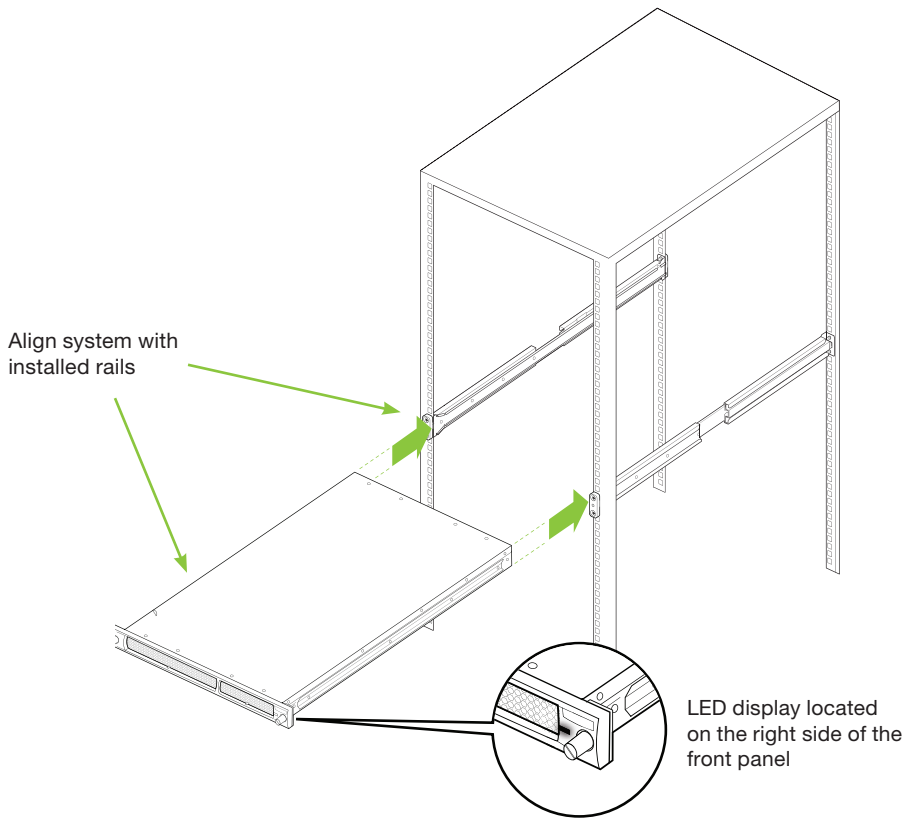
3. Choose either the front or the rear of the rack to start your rail installation.
4. Slide the rail into the side of the rack, and adjust the length accordingly. Make sure the flare end of the rail is positioned at the front of the rack.



5. Hold the mounting bracket onto the rack at the proper location. Make sure you align the screw holes. You will need to do this for the front and rear mounting brackets.
6. Slide the rail onto rack post.
7. Attach the rail to the front and rear mounting brackets using the supplied screws. It may be helpful to tighten the screws fully and then unscrew them 1 to 2 turns of the screw driver. This will allow the rails to align better with the Quadro Plex unit when you slide it into the rails. Of course these screws will need to be re-tightened before the unit is pushed all the way into the rack.



8. Repeat Step 1 through Step 7 to install the other rail.
9. Unpack the Quadro Plex system.



10. Align the Quadro Plex system with the installed rails. The brackets on each side of the Quadro Plex system are beveled to allow you to rest the system on the front edges of the rails.
11. Slide the Quadro Plex system unit onto the rails. Make sure the LED display on the front panel of the system is located on the right side for proper installation into the rack.
12. Hold the Quadro Plex system horizontally while sliding the unit into the installed rails. Slide the unit most of the way into the rack, leaving room to tighten the screws on the mounting bracket if you left them slightly loose to facilitate alignment. See Step 7.
If the unit is not aligned with the rails or is not horizontal, it may be difficult to slide. If the brackets stick or catch in the rails, you can pull the unit back out of the rails slightly. Then check the alignment and retry sliding the unit into the rails.
13. Tighten the thumb screws on the front of the unit to secure the Quadro Plex system to the rack system.

Connecting to the Host System

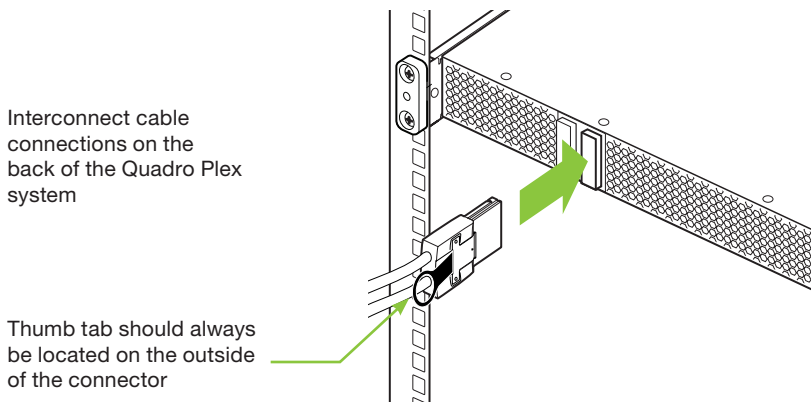
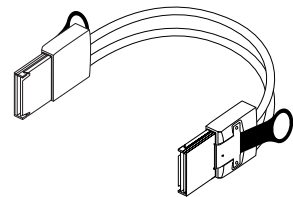
Use the following procedures to connect the Quadro Plex system to a host system. Before you begin, you will want to make sure you disconnect the power cord to the host system.

Installing the NVIDIA Interface Card

1. Open the host system. Refer to your host system documentation from the original manufacturer for assistance.
2. Locate an open (unused) $\times 16$ PCI Express slot that matches the host adaptor card you are using (either $\times 16$ slot, or a $\times 8$ slot).
3. Install the NVIDIA interface card (to replace the standard bracket with a low profile bracket, see the instructions given on page 10).
4. Close the host system.

Connecting the Quadro Plex System

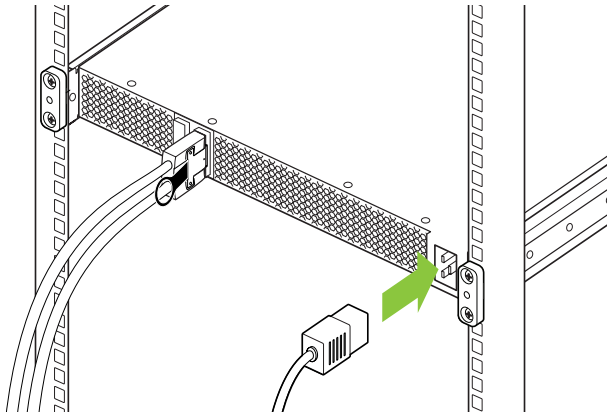
1. Connect one end of the interconnect cable supplied in the box to the exposed connector of the NVIDIA interface card in the host system.
2. Connect the other end of the cable to the back of the Quadro Plex S4. The thumb tabs should always be on the outside.



Note: There is no specific order when connecting the interconnect cables between the host system and the Quadro Plex S4.

Connecting the Power Cord

1. Connect the power cord to the Quadro Plex system.
2. Plug the power cord from the Quadro Plex system to an AC outlet (it is recommended to use a power surge protected outlet).



The power on state of the Quadro Plex system is controlled by the host system. The Quadro Plex system is powered on only when the host system is powered on.

3. Reconnect the power cord to your host system.
The host power cord should have been unplugged at the beginning of the whole installation process.
4. Power on the host system.
At this time, power is also applied to the Quadro Plex system.

Driver Installation

This section contains the instructions to install the software drivers within a Windows and a Linux environment.

In addition to the NVIDIA drivers located on the Installation CD (included), the drivers can be downloaded from the NVIDIA web site at www.nvidia.com.

Linux Installation

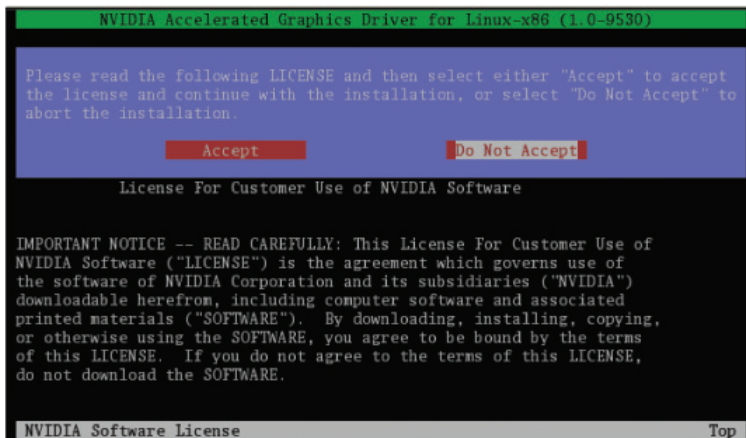
To verify the connection of the Quadro Plex S4 unit before driver installation, you should type **lspci** at the root. You will see **3D controller: nVidia Corporation:** for each GPU. If connected to one side you will see two lines, and if connected to both sides you will see four lines.

The driver follows a unified architecture model in which a single driver set is used for all supported GPUs. Your previous NVIDIA unified driver may not support your Quadro Plex board. In that case, you will need to install the drivers from the CD or download from www.nvidia.com.

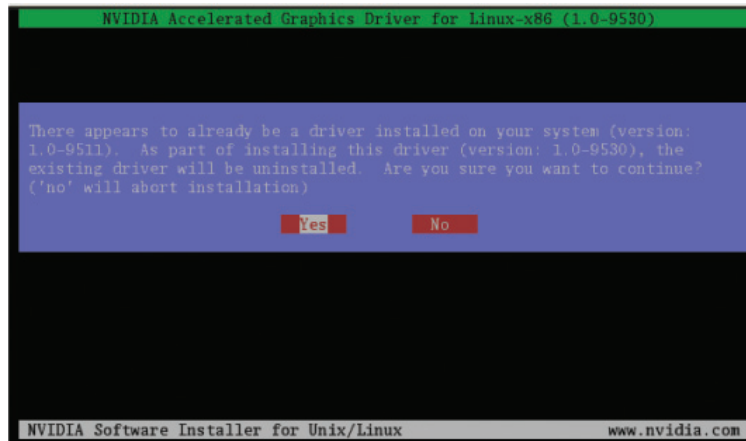
If you are running X server or OpenGL applications, you should exit them before you begin the installation (it is possible that some OpenGL applications persist even after the X server has stopped). You should also set the default run level on your system such that it will boot to a VGA console and not directly to X. Doing so will make it easier to recover if there is a problem during the installation process.

Note: Refer to the readme.txt located at `/usr/share/doc/NVIDIA_GLX-1.0/README.txt` for more detailed information regarding the linux driver installation.

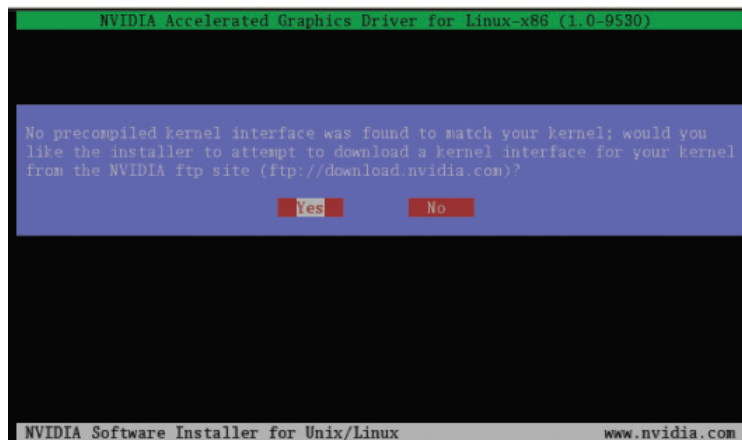
1. Download the 64-bit driver (**NVIDIA-Linux-x86_64-100.14.11-pkg2.run**). This file name is for example only. The newest driver will have a similar name with a new driver version number.
2. Change to the directory containing the downloaded file.
3. Run as root the **NVIDIA-Linux*.run** file downloaded in Step 1. As the root user you can run the following executables:
cd download_directory
NVIDIA-Linux-x86_64-100.14.11-pkg2.run
The **NVIDIA-Linux*.run** file is a self-extracting archive. When executed, it extracts the content of the archive and runs the contained **nvidia-installer** utility, which provides an interactive interface to walk you through the installation.
nvidia-installer will also install itself to **/usr/bin/nvidia-installer** which may be used at some later time to uninstall drivers, auto download updated drivers, etc.
4. Select **Accept** to accept the License Agreement.



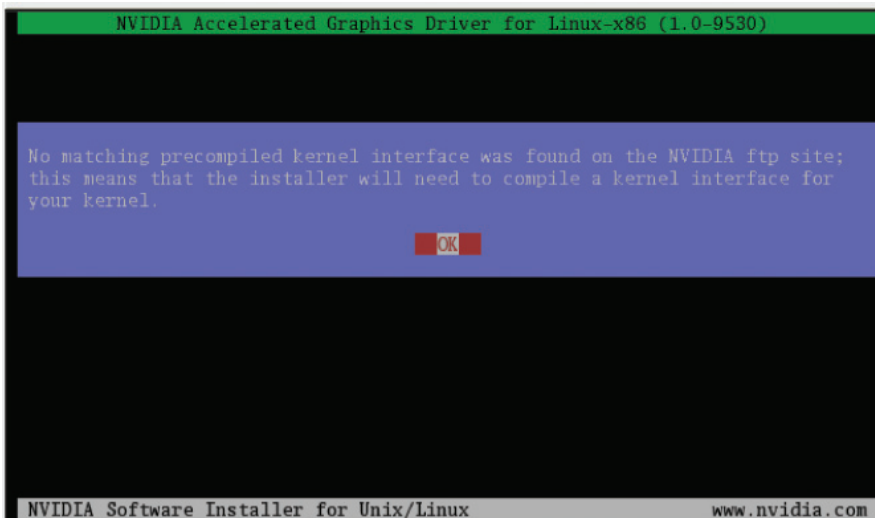
5. Select **Yes** if a warning window displays indicating that there are drivers already installed. Selecting **Yes** tells the installation process to overwrite the previously installed drivers.

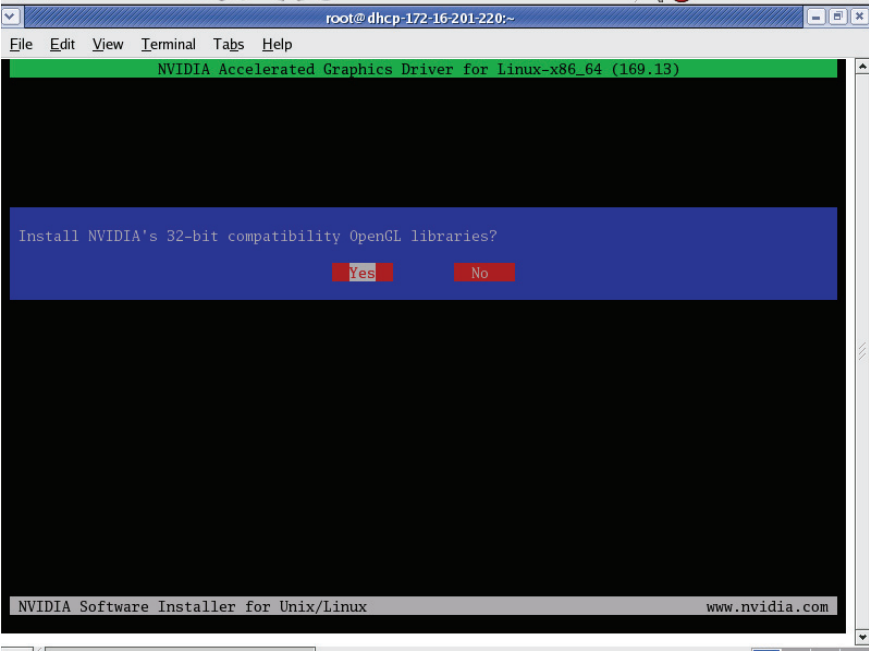


6. Select **Yes** when the Kernel Interface window displays. When the installer is run, it will determine if it has a precompiled kernel interface for the kernel you are running. If it does not have one, it will check if there is one on the NVIDIA FTP site and download it.

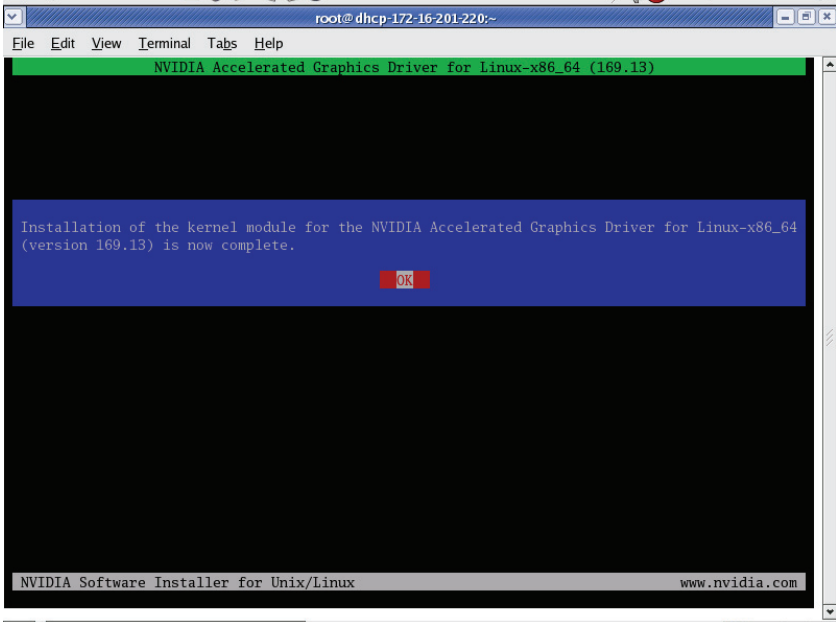


7. Select **OK** to compile a Kernel interface.
If a Kernel interface cannot be downloaded, either because the FTP site cannot be reached or because one is not provided, the installer will check your system for the required Kernel sources and compile the interface for you. You must have the source code for your Kernel installed for compilation to work. On most systems this means that you will need to locate and install the correct Kernel source, Kernel headers or Kernel development package.
Linking of the Kernel interface (in the case that the interface downloaded or compiled at installation) required you to have a linker installed on your system. The linker, usually **/usr/bin/ld**, is part of the binutils package. If a precompiled Kernel interface is not found, you must install a linker prior to installing the NVIDIA driver.





Select Yes to install the OpenGL libraries



Letting you know that the driver is now installed

8. Type **nvidia-xconfig -a** at the root.
This will find the X configuration file, make a backup copy and automatically modify it using the NVIDIA X driver. The X configuration file **xorg.conf** is located in **/etc/X11**.
If you are using a host system with a non-nvidia graphics card, you will need to edit the **xorg.conf** file in order to set up the NVIDIA X Server Settings. The following is a sample **xorg.conf** file that will allow the user to do this. Text in **bold, and blue font** are lines and sections that you will have to add to the xorg.conf file.

Section "ServerLayout"

```
Identifier    "Default Layout"

Screen      0  "Screen0"

Screen      1  "Screen1" RightOf "Screen0"

Screen      2  "Screen2" RightOf "Screen1"

Screen      3  "Screen3" RightOf "Screen2"

Screen      4  "Screen4" RightOf "Screen3"

InputDevice  "Mouse0" "CorePointer"

InputDevice  "Keyboard0" "CoreKeyboard"
```

EndSection

Section "Files"

```
# RgbPath is the location of the RGB database.
Note, this is the name of the

# file minus the extension (like ".txt" or ".db"). There is normally

# no need to change the default.

# Multiple FontPath entries are allowed (they are concatenated together)
```

```
# By default, Red Hat 6.0 and later now use a font server independent of  
# the X server to render fonts.
```

```
    RgbPath      "/usr/X11R6/lib/X11/rgb"
```

```
    FontPath     "unix/:7100"
```

```
EndSection
```

```
Section "Module"
```

```
    Load        "dbe"
```

```
    Load        "extmod"
```

```
    Load        "fbdevhw"
```

```
    Load        "glx"
```

```
    Load        "record"
```

```
    Load        "freetype"
```

```
    Load        "type1"
```

```
EndSection
```

```
Section "InputDevice"
```

```
# Specify which keyboard LEDs can be user-controlled (eg, with xset(1))
```

```
#     Option "Xleds"        "1 2 3"
```

```
# To disable the XKEYBOARD extension, uncomment XkbDisable.
```

```
#     Option "XkbDisable"
```

```
# To customise the XKB settings to suit your keyboard, modify the
```

```
# lines below (which are the defaults). For example, for a non-U.S.
```

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```
# keyboard, you will probably want to use:

#     Option "XkbModel"    "pc102"

# If you have a US Microsoft Natural keyboard, you can use:

#     Option "XkbModel"    "microsoft"

#

# Then to change the language, change the Layout setting.

# For example, a german layout can be obtained with:

#     Option "XkbLayout"   "de"

# or:

#     Option "XkbLayout"   "de"

#     Option "XkbVariant"  "nodeadkeys"

#

# If you'd like to switch the positions of your capslock and

# control keys, use:

#     Option "XkbOptions"   "ctrl:swapcaps"

# Or if you just want both to be control, use:

#     Option "XkbOptions"   "ctrl:nocaps"

#

Identifier "Keyboard0"

Driver     "kbd"

Option     "XkbModel" "pc105"
```

Option "XkbLayout" "us"

EndSection

Section "InputDevice"

Identifier "Mouse0"

Driver "mouse"

Option "Protocol" "IMPS/2"

Option "Device" "/dev/input/mice"

Option "ZAxisMapping" "4 5"

Option "Emulate3Buttons" "yes"

EndSection

Section "Monitor"

Identifier "Monitor0"

VendorName "Unknown"

ModelName "Unknown"

HorizSync 30.0 - 110.0

VertRefresh 50.0 - 150.0

Option "DPMS"

EndSection

Section "Monitor"

Identifier "Monitor1"

VendorName "Unknown"

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ModelName "Unknown"

HorizSync 30.0 - 110.0

VertRefresh 50.0 - 150.0

Option "DPMS"

EndSection

Section "Monitor"

Identifier "Monitor2"

VendorName "Unknown"

ModelName "Unknown"

HorizSync 30.0 - 110.0

VertRefresh 50.0 - 150.0

Option "DPMS"

EndSection

Section "Monitor"

Identifier "Monitor3"

VendorName "Unknown"

ModelName "Unknown"

HorizSync 30.0 - 110.0

VertRefresh 50.0 - 150.0

Option "DPMS"

EndSection

Section "Monitor"

Identifier "Monitor4"

VendorName "Unknown"

ModelName "Unknown"

HorizSync 30.0 - 110.0

VertRefresh 50.0 - 150.0

Option "DPMS"

EndSection

Section "Device"

Identifier "Videocard0"

Driver "mga"

VendorName "Videocard vendor"

BoardName "Matrox G200e"

EndSection

Section "Device"

Identifier "Device0"

Driver "nvidia"

VendorName "NVIDIA Corporation"

BoardName "Quadro FX 5600"

BusID "PCI:28:0:0"

Option "UseDisplayDevice" "none"

EndSection

Section “Device”

Identifier “Device1”

Driver “nvidia”

VendorName “NVIDIA Corporation”

BoardName “Quadro FX 5600”

BusID “PCI:26:0:0”

Option “UseDisplayDevice” “none”

EndSection

Section “Device”

Identifier “Device2”

Driver “nvidia”

VendorName “NVIDIA Corporation”

BoardName “Quadro FX 5600”

BusID “PCI:17:0:0”

Option “UseDisplayDevice” “none”

EndSection

Section “Device”

Identifier “Device3”

Driver “nvidia”

VendorName “NVIDIA Corporation”

BoardName “Quadro FX 5600”

BusID "PCI:15:0:0"

Option "UseDisplayDevice" "none"

EndSection

Section "Screen"

Identifier "Screen0"

Device "Videocard0"

Monitor "Monitor0"

DefaultDepth 24

SubSection "Display"

Viewport 0 0

Depth 24

EndSubSection

EndSection

Section "Screen"

Identifier "Screen1"

Device "Device0"

Monitor "Monitor1"

DefaultDepth 24

SubSection "Display"

Depth 24

Virtual 640 480

EndSubSection

EndSection

Section "Screen"

Identifier "Screen2"

Device "Device1"

Monitor "Monitor2"

DefaultDepth 24

SubSection "Display"

Depth 24

Virtual 640 480

EndSubSection

EndSection

Section "Screen"

Identifier "Screen3"

Device "Device2"

Monitor "Monitor3"

DefaultDepth 24

SubSection "Display"

Depth 24

Virtual 640 480

EndSubSection

EndSection

Section "Screen"

```
Identifier "Screen4"
Device "Device3"
Monitor "Monitor4"
DefaultDepth 24
SubSection "Display"
    Depth 24
    Virtual 640 480
EndSubSection
EndSection
```

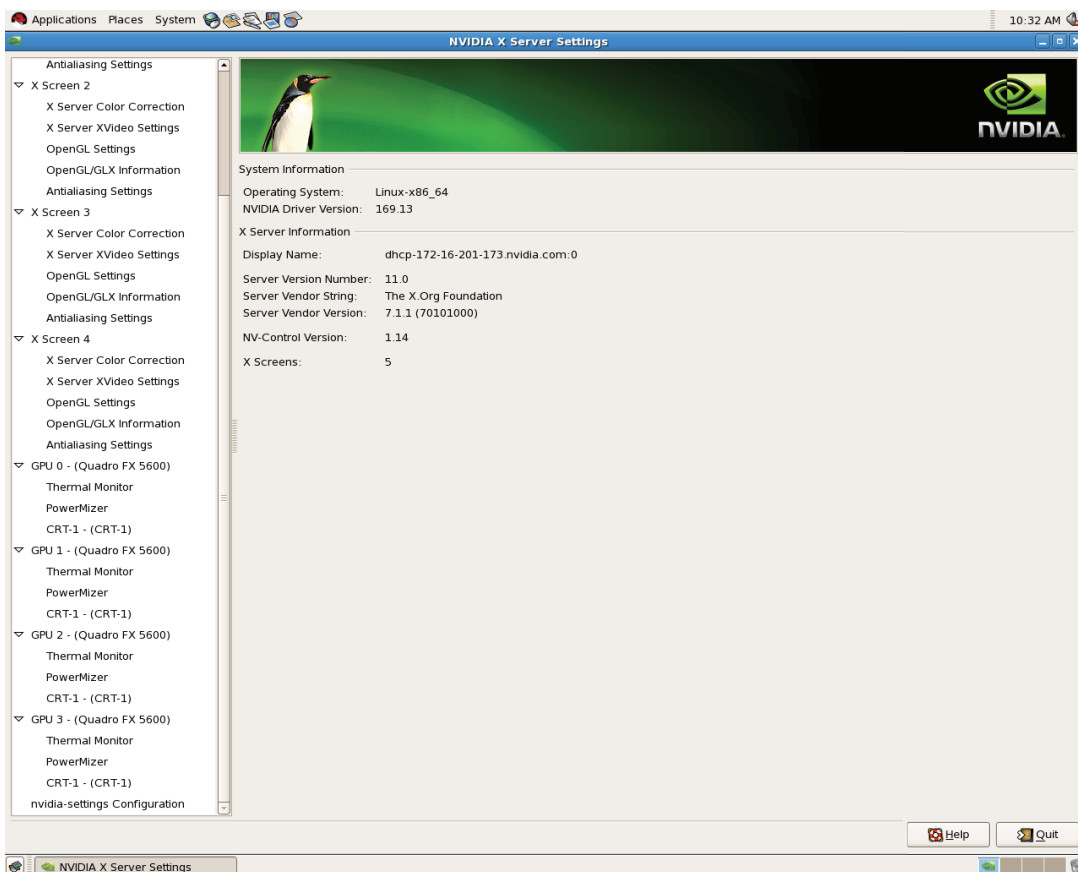
9. Installation is complete.

Note: The X server must be restarted for any changes to its configuration file to take effect.
More information about **nvidia-xconfig** can be found in the **nvidia-xconfig** manual page by running:
% man nvidia-xconfig

Verifying Linux Installation

Verifying Linux Installation if Running X Server

1. Run **nvidia-settings** to displays the Server Settings window.
2. Run an application to verify your Quadro Plex system is working.



Verifying Linux Installation if Not Running X Server

After typing **lspci** at the root when the Quadro Plex S4 is correctly connected to the host system, you should see the same output as follows. For Quadro Plex S4, there are 2 GPUs per PCI Express connection.

```
09:00.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)
0a:00.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)
0a:01.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)
0a:02.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)
0a:03.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)
0c:00.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)
0d:00.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)
0d:01.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)
0d:02.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)
0d:03.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)
0f:00.0 3D controller: nVidia Corporation G80 [Quadro FX 5600] (rev a2)
11:00.0 3D controller: nVidia Corporation G80 [Quadro FX 5600] (rev a2)
14:00.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)
15:00.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)
15:01.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)
15:02.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)
```

Quadro Plex S4 Visualization System Installation Guide

15:03.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)

17:00.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)

18:00.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)

18:01.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)

18:02.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)

18:03.0 PCI bridge: nVidia Corporation Unknown device 05be (rev a2)

1a:00.0 3D controller: nVidia Corporation G80 [Quadro FX 5600] (rev a2)

1c:00.0 3D controller: nVidia Corporation G80 [Quadro FX 5600] (rev a2)

Windows Installation

With the hardware installed, it is now time to install the drivers. NVIDIA recommends installing the drivers using the installation CD included with your Quadro Plex S4 or downloading the most recent drivers available from the NVIDIA web site at www.nvidia.com.

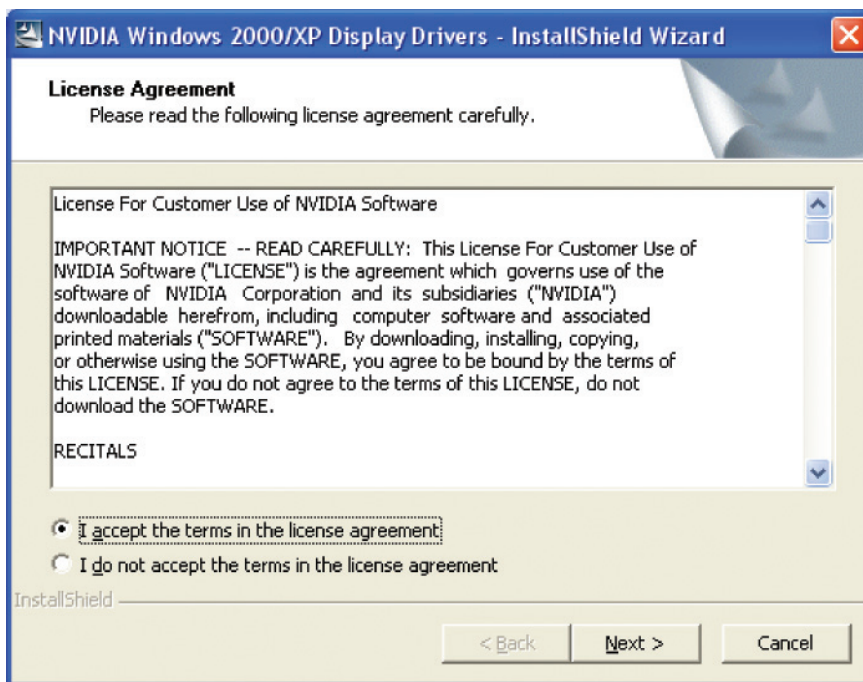
When installing the graphics drivers, the resolution will default to the lowest setting (typically 800 x 600), making your display very large. Adjust accordingly.

Since there are multiple GPU cards installed in your Quadro Plex S4 you will be asked multiple times for all events once the drivers are installed.

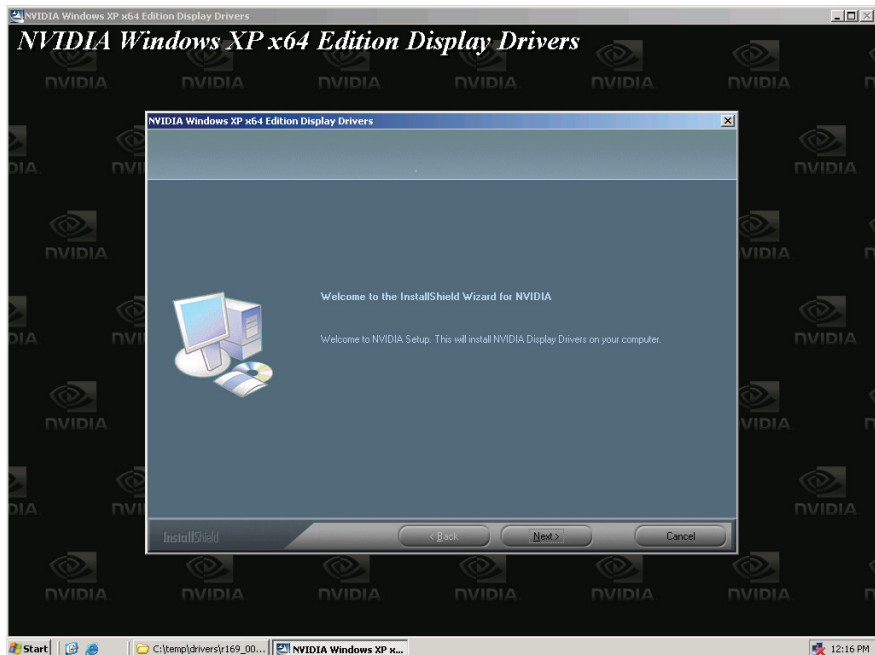
1. Power up your system.
2. Click **Cancel** each time the **Windows Found New Hardware Wizard** window displays. It will display one or more times.



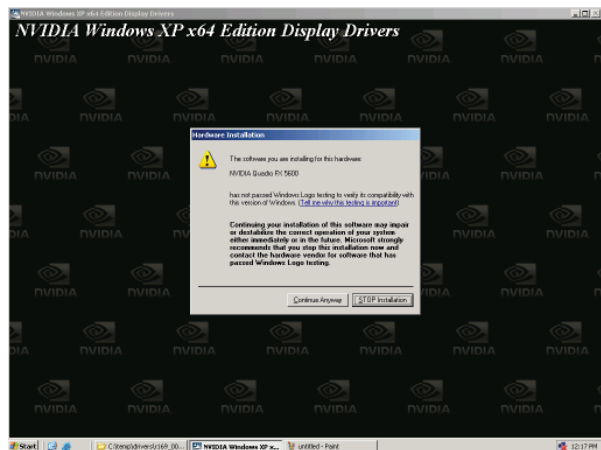
3. Insert the installation CD for the drivers included in the Quadro Plex S4 package. The auto-install takes over and installs the drivers.
4. Right-click on the CD driver and select **AutoPlay** or explore the files on the CD and double click **Launch.exe** if it does not begin to auto play.
5. Click **Install Driver** from the **Quadro Plex Software Installation** screen.
6. Select **I accept the terms of the license agreement**.
7. Click **Next**.



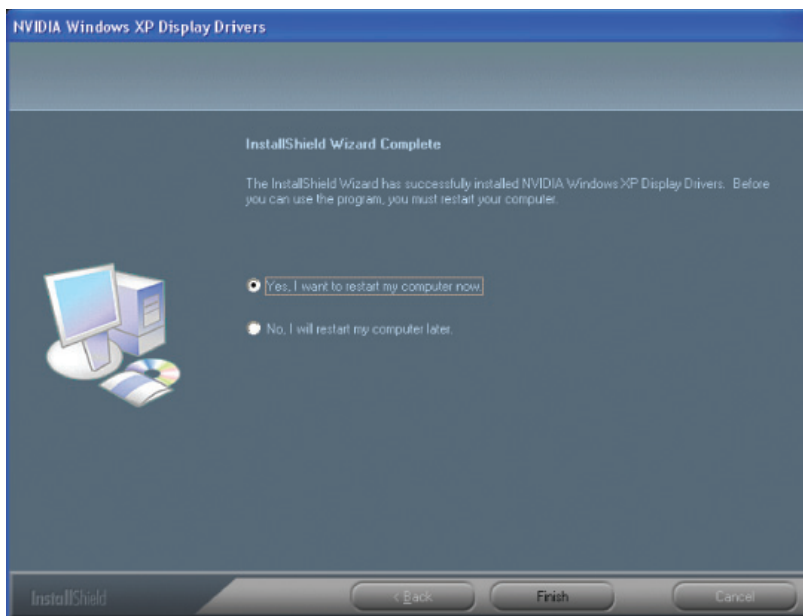
- Click Next when the **Welcome to the InstallShield Wizard** window displays.



- Click **Continue Anyway** when the **Hardware Installation** warning window displays. This warning tells you that the drivers you are about to install have not passed the windows logo testing (WHQL). WHQL is a Microsoft testing procedure that is required before Microsoft approves the software. Clicking **Continue Anyway** will not harm your system. These drivers are currently under WHQL testing. If you do not see this warning, the drivers have passed the testing requirements.



10. Select **Yes, I want to restart my computer now.**



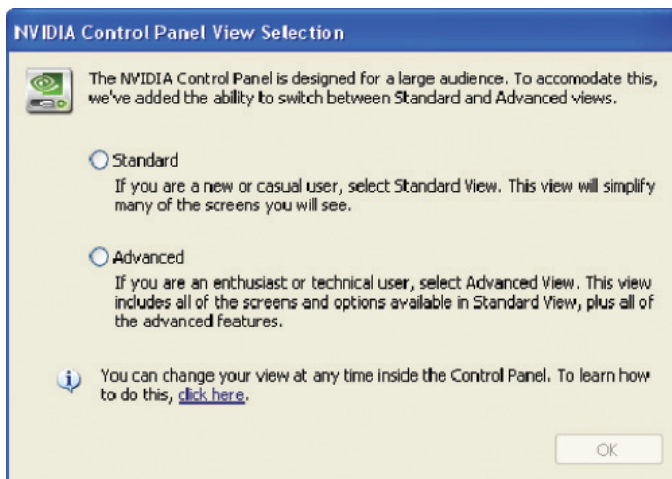
11. Click **Finish** to complete the installation and restart your system.

Windows 2003 Server 64-Bit Control Panel Set Up

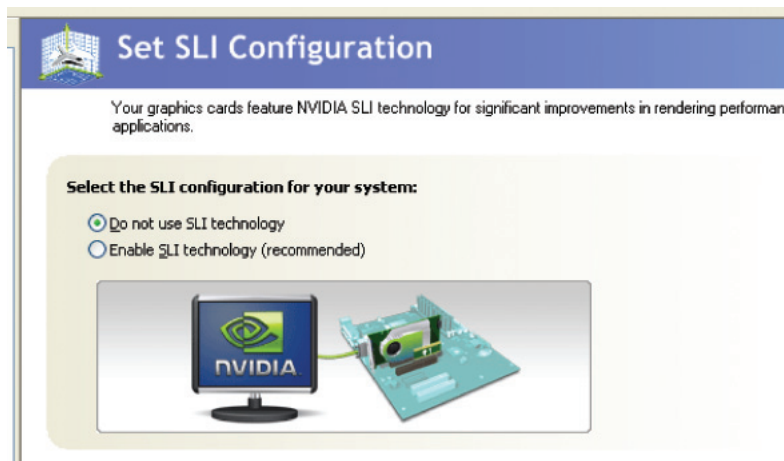
1. Go to **Control Panel > Settings > Advanced > Troubleshoot > slider to full** to set hardware acceleration to full.
2. Select **OK** or **Apply**.
3. Go to **Control Panel > Settings**.
4. Select 1st grayed out icon (marked 2).
5. Check **Extend my Windows desktop onto this monitor**.
6. Select **OK** or **Apply**. Repeat for all Quadro Plex S4 cards, usually arrange to right of icon 1 (which is the primary monitor and should not be changed).
7. Go to **Control Panel > Settings > Color quality** .
8. Select **Highest** to verify that the color quality is set to 32-bit (the highest).
9. Select **OK** or **Apply**.

NVIDIA Control Panel Set Up

1. Select **Standard or Advanced** views depending on your preference for the control panel view selection. The Advanced view allows the user to select and modify application profiles through the control panel.



2. Select **Do not enable SLI technology** at this point in the installation, if an SLI system is detected.



Verifying Windows Installation

It is recommended that you verify your installation by going to the NVIDIA Control Panel and verifying that the boards have been installed correctly and are recognized by the drivers.

Use the following procedure to verify the installation of the boards:

1. Go to **Start > Control Panel**.
2. Select **NVIDIA Control Panel**.
3. Go to **Help > System Info** in the menu bar
4. Select **Display** tab.
5. Highlight the **Quadro Plex S4** in the list of componenets.



References and Resources

Getting Driver Updates

During NVIDIA software installation, the installation wizard provides an option to check for updated software online. You can also download software updates by visiting: www.nvidia.com.



Registration, Support and Warranty

Registering Your Quadro Plex System

After you register your Quadro Plex S4, you have priority access to NVIDIA Customer Care by using your assigned user ID and password to log on. You can also elect to receive automatic notification of special promotions and software updates through e-mail to ensure that your Quadro Plex system continues to operate optimally.

Warranty and Support

- NVIDIA offers a thirty-six (36) month warranty.
- NVIDIA warranty and support (Customer Care) information is available at:
www.nvidia.com/support
www.nvidia.com/warranty
- You may also access these sites from NVIDIA's main web site at:
www.nvidia.com
- Upon registration, you will receive an acknowledgement e-mail that includes sign-on information for NVIDIA Customer Care and other information.
- The NVIDIA support site allows you to search our extensive knowledge base.



Compliance and Certifications

- Bureau of Standards, Metrology, and Inspection (BSMI)
- Australian Communications Authority (C-Tick)
- Conformité Européenne (CE)
- Federal Communications Commission (FCC) - Class B
- Industry Canada Interference-Causing Equipment Standard (ICES)
- Ministry of Information and Communication (MIC)
- Underwriters Laboratories (UL, CUL)
- Voluntary Control Council for Interference (VCCI)

Regulatory Compliance Statement

The following Regulatory Compliance statements apply to the products documented by this installation guide.

U.S. Federal Communications Commission Compliance

- Title 47 of Code of Federal Regulation (CFR) part 15 - Radio frequency devices; Subpart B - Unintentional Radiator

CAUTION: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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 not installed and used in accordance with the instruction manual, 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.

Canada Compliance

- Industry Canada
- ICES-003 - Digital Apparatus: Spectrum Management and Telecommunications Policy; Interference-Causing Equipment Standard

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.

Australia and New Zealand Compliance

- C-Tick Mark - The Australian Communications Authority (ACA) and the Radio Spectrum Management Group (RSM) of New Zealand
- AS/NZS CISPR 22:2004 standard – Information technology equipment-Radio disturbance characteristics-limit and methods of measurement

ATTENTION: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Japan Compliance

- VCCI Mark - Voluntary Control Council for Interference by Information Technology Equipment
- • V-1/93.11: Agreement of Voluntary Control Council for Interference by Information Technology Equipment
- • V-2/97.04: Rules for Voluntary Control Measures
- • V-3/97.04: Normative Annex 1 Technical Requirements
- • V-4/97: Normative Annex 1-1 Supplementary Test Conditions for Equipment under Test

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

Korea Compliance

- MIC Mark - Ministry of Information and Communication
- • KN 22 (CISPR 22): Information technology equipment-Radio disturbance characteristics - limit and methods of measurement
- • KN 24 (CISPR 24): Information technology equipment - immunity characteristics-limit and methods of measurement

“Class A” Equipment (Business purpose info/telecommunications equipment)

Warning: This is a Class A device and is registered for EMC requirements for industrial use. The seller or buyer should be aware of this. If this type was sold or purchased by mistake, it should be replaced with a residential-use type.

A급 기기 (업무용 정보통신기기)

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약 잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

Taiwan Compliance

- BSMI Mark - Bureau of Standards, Metrology and Inspection
- CNS 13438 (CISPR 22): Information technology equipment-Radio disturbance characteristics-limit and methods of measurement
- CNS 14336 (IEC 60950-1): Information Technology Equipment – Safety - Part 1: General Requirement

This is a Class A Information Product, when used in residential environment, it may cause radio frequency interference, under such circumstances, the user may be requested to take appropriate countermeasures.

警告使用者：

此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此種情況下，使用者會被要求採取某些適當的對策。

European Union Compliance

- CE Mark - European Conformity (Conformite Europeene)
- Product comply with both the EMC Directive (80/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.
- Compliance with these directives implies conformity to the following European Norms

(The equivalent international standards are in parenthesis)

- EN-56022 (CISPR 22): Information technology equipment-Radio disturbance characteristics - limit and methods of measurement
- EN 55024 (IEC 61000-4-2, 3, 4, 5, 6, 8, 11): Information technology equipment - immunity characteristics- limit and methods of measurement
- EN 61000-3-2 (IEC 61000-3-2): Electromagnetic compatibility (EMC)-Part 3-2: Limits-Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
- EN 61000-3-3 (IEC 61000-3-3): Electromagnetic compatibility (EMC)-Part 3-3: Limits-Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection)
- EN 60950-1 (IEC 60950-1): Information Technology Equipment-Safety-Part 1: General Requirement

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to make adequate measures.

Important Safety Information

NVIDIA products are designed to operate safely when installed and used according to the product instructions and general safety practices. The guidelines included in this document explain the potential risks associated with computer operation and provide important safety practices designed to minimize these risks. By carefully following the information contained in this document and the specific instructions provided with your product, you can protect yourself from hazards and create a safer computer work environment.

The product is designed and tested to meet IEC-60950, the Standard for the Safety of Information Technology Equipment. This also covers the national implementation of IEC-60950 based safety standards around the world e.g. UL-60950. These standards reduce the risk of injury from the following hazards:

- **Electric shock:** Hazardous voltage levels contained in parts of the product.
- **Fire:** Overload, temperature, material flammability.
- **Mechanical:** Sharp edges, moving parts, instability.
- **Energy:** Circuits with high energy levels (240 volt-amperes) or potential as burn hazards.
- **Heat:** Accessible parts of the product at high temperatures.
- **Chemical:** Chemical fumes and vapors.
- **Radiation:** Noise, ionizing, laser, ultrasonic waves
- **Neutral Fusing:** CAUTION - DOUBLE POLE/NEUTRAL FUSING

To reduce the risk of bodily injury, electric shock, fire and damage to the equipment, observe all precautions included in this guide.

Symbols on Equipment



This symbol in conjunction with any of the following symbols indicates the presence of a potential hazard. The potential for injury exists if warnings are not observed. Consult your documentation for specific details.



This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades and servicing to qualified personnel.



This symbol indicates the presence of electric shock hazards. The area contains no user or field service able parts. Do not open for any reason.

WARNING: To reduce risk of injury from electric shock hazards, do not open this enclosure.



This symbol indicates the presence of a hot surface or hot component. If this surface is contacted the potential for injury exists.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching.



This symbol indicates that the component exceeds the recommended weight for one individual to handle safely.

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety require and guidelines for manual material handling.



This symbol indicates the presence of a sharp edge or object that can cause cuts or other bodily injury.

WARNING: To prevent cuts or other bodily injury, do not contact sharp edge or object.



This symbol indicates the presence of mechanical parts that can result in pinching, crushing or other bodily injury.

WARNING: To avoid risk of bodily injury, keep away from moving parts.



This symbol indicates the presence of a potential tip over hazard that can result in bodily injury.

WARNING: To avoid risk of bodily injury, follow all instructions for maintaining stability of the equipment during transport, installation.

General Precautions

To reduce the risk of personal injury or damage to the equipment:

- Shut down the product and disconnect all AC power cords and cables before installation.
- Do not connect or disconnect any cables when performing installation, maintenance, or reconfiguration of this product during an electrical storm.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Place the product away from radiators, heat registers, stoves, amplifiers, or other products that produce heat.
- Never use the product in a wet location.
- Use only with a rack, cart, stand, tripod, or bracket recommended by NVIDIA, or sold with the product. Or it will cause serious bodily injury and serious damage to the product.
- Avoid inserting foreign objects through openings in the product.
- Do not use conductive tools that could bridge live parts.
- Do not make mechanical or electrical modifications to the equipment.
- Use the product only with approved equipment.
- Follow all cautions and instructions marked on the equipment. Do not attempt to defeat safety interlocks (where provided).

If the product sustains damage requiring service, disconnect the product from the AC electrical outlet and refer servicing to an NVIDIA authorized service provider. Examples of damage requiring service include:

- The power cord, extension cord or plug has been damaged.
- Liquid has been spilled on the product or an object has fallen into the product.
- The product has been exposed to rain or water.
- The product has been dropped or damaged.
- There are noticeable signs of overheating.

Precautions for Installation, Maintenance and Servicing

To reduce the risk of electric shock or damage to the equipment when installing, maintaining or servicing products, observe the following precautions.

Installation

- Follow the Pre/Post-installation procedures in other parts of the manual.
- Follow the installation and configuration instructions in the manual.
- In some geographical areas it may be advisable to install lightning protection for product.
- Ensure reliable grounding of rack mounted equipment have been maintained.

Maintaining and Servicing:

- Product contains power supplies that are capable of producing hazardous energy levels. The installation of internal options and routine maintenance and service of this product should be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with equipment containing hazardous energy levels.
- Do not exceed the level of repair specified in the procedures in the product documentation. All troubleshooting and repair procedures are detailed to allow only subassembly or module-level repair. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard.

- Verify that the AC power supply branch circuit that provides power to the rack is not overloaded. This will reduce the risk of personal injury, fire, or damage to the equipment. The total rack load should not exceed 80 percent of the branch circuit rating. Consult the electrical authority having jurisdiction over your facility wiring and installation requirements.
- The covers should remain locked during normal operation.
- The system should be installed in a controlled access location where only qualified personnel have access to the system.
- Upon completion of any services or repairs to the product, have your authorized service provider perform any safety checks required by the repair procedure or by local codes to determine that the product is in proper operating condition.
- Power down the equipment and disconnect all AC power cords and cable before removing any access covers.
- Do not replace components while power is applied to the product. First, shut down the product and disconnect all AC power cords.
- Allow the product to cool before removing covers and touching internal components.
- Move products with casters carefully. Avoid quick stops and uneven surfaces.
- Do not block the opening used for ventilation, since these ensure reliable operation of product and protect it from overheating. And opening should be kept free of dust and debris.
- Allow sufficient air circulation around and prevent direct exposure to radiant heat sources.
- Before cleaning, unplug the product from the power source. Use a damp cloth for cleaning. Do not use liquid cleaners or aerosol cleaners.

Precautions for Power Connection

Power Cords

To reduce the risk of electric shock or damage to the equipment:

- Use power cables provided with this product.
- If you have to change the power cords for any reason, use an approved power cord.
- Not all power cords have the same current ratings. If you have questions about the type of power cord to use, contact an authorized service provider.
- You must use a power cord rated for your product and for the voltage and current marked on the electrical ratings label of the product. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.
- Make sure that the total amper rating of all products plugged into an extension cord or power strip does not exceed 80 percent of the ampere ratings limit for the extension cord or power strip.
- The product is equipped with a three-wire electrical grounding type plug which has a third pin for ground. This plug only fits into a grounded electrical power outlet.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
 - For Finland: Laite on liitettävä suojamaadoitus-koskettimilla varustettuun pistorasiaan
 - For Norway: Apparatet må tilkoples jordet stikkontakt
 - For Sweden: Apparaten skall anslutas till jordat uttag
- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Do not place objects on AC power cords or cables. Arrange them so that no one may accidentally step on or trip over them.

- Do not pull on a cord or cable. When unplugging from the electrical outlet grasp the cord by the plug.
- When possible, use one hand only to connect or disconnect cables.
- Do not modify power cables or plugs. Consult a licensed electrician or your power company for site modifications.

Power Supply

- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label. If you have the question about the type of power source to use, contact your authorized service.
 - 100 - 240 VAC, 50/60 Hz, 16 A
- Connect to a properly wired and grounded electrical outlet, always follow your local/national wiring rules.
- The socket-outlet shall be installed near the equipment and shall be easily accessible.
- If want to help protect your system from sudden, transient increases and decreases in electrical power, a surge suppressor, line conditioner and so on could be used.
- This system is suitable for connection to an IT power system.

Precautions for Communication Cable

To reduce the risk of exposure to shock hazard from communication cable:

- Do not connect communication cable during a lightning storm. There may be a remote risk of electric shock from lightning.
- Do not connect or use communication cable in a wet location.
- Disconnect the communication cable before opening a product enclosure, touching or installing internal components.

Precautions for Installing System Unit in Racks

Stability

To reduce the risk of personal injury or damage to the equipment be sure that:

- The rack is properly stabilized and supported before installing.
- The leveling jacks are extended to the floor.
- The full weight of the rack rests on the leveling jacks.
- The stabilizing feet are attached to the rack if it is a single-rack installation.
- The racks are coupled together in multiple-rack installations.
- Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.
- You load the rack from the bottom up and load the heaviest item into the rack first.
- You do not attempt to move a fully loaded equipment rack. Remove equipment from the rack before moving the rack.
- Make sure that the product is properly mated with the rails. Products that are improperly mated with the rails may be unstable.
- Do not place any objects on top of a rack mounted device.
- Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- Reliable earthing of rack mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (for example, use of a power strip).

Manual Material Handling

To reduce the risk of personal injury or damage to the equipment:

- Observe local occupational health and safety requirements and guidelines for manual materials handling.
- Obtain adequate assistance to lift and stabilize the product during installation or removal. Do not move large racks by yourself.
- Remove all pluggable power supplies and modules to reduce the weight of the product.
- Use caution when pressing the component rail release latches and sliding a component into the rack. The slide rails could pinch your fingers.
- Do not extend the components from the rack too quickly as the moving weight may damage the supporting rails.
- Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

Notice

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS, AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS." NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY, OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NON INFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE.

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Product Handling

Do not spill liquid over the circuit board, expose it to fire, submerge it in water, or tamper with it. Keep the board out of reach of children. Dispose this product in accordance with relevant national or local laws.

Trademarks

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