



# NVIDIA Quadro Professional Drivers ***Release 181 Notes***

**Version 181.20**

**For Windows Vista 32-bit  
and Windows Vista 64-bit**

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# Table of Contents

## 1. Introduction to *Release 181*

### Notes

Structure of the Document . . . . .	1
Changes in this Edition . . . . .	1

## 2. Release 181 Driver Changes

Version 181.20 Highlights . . . . .	4
What's New in Release 181 . . . . .	4
What's New in Version 181.20 . . . . .	5
Limitations in This Release. . . . .	6
Special Instructional Notes for this Release . . . . .	7
NVIDIA Application Configuration Engine (ACE)	7
Changes in Version 181.20 . . . . .	8
Fixed Issues—Windows Vista 32-bit . . . . .	8
Fixed Issues—Windows Vista 64-bit . . . . .	8
Open Issues in Version 181.20 . . . . .	11
Windows Vista 32-bit Issues . . . . .	11
Windows Vista 64-bit Issues . . . . .	12
Not NVIDIA Issues . . . . .	13
Windows Vista Limitations . . . . .	13
Unsupported Features . . . . .	13
OpenGL Application Issues . . . . .	15
Application Issues . . . . .	16
Known Product Limitations . . . . .	18
SLI Connector Requirement on NVIDIA Quadro	
SLI Cards . . . . .	18
Image Sharpening Control not Available with	
Quadro FX 4600 and later GPUs. . . . .	18
Driver Reports 256 MB Memory on NVIDIA	
Quadro FX 330 Cards . . . . .	19
Applying Workstation Application Profiles . . . . .	19
Gigabyte GA-6BX Motherboard . . . . .	19

## 3. The Release 181 Driver

Hardware and Software Support . . . . .	21
Supported Operating Systems . . . . .	21
Supported NVIDIA Products . . . . .	22
Supported Languages . . . . .	23
Driver Installation . . . . .	24
Minimum Hard Disk Space . . . . .	24
Before You Begin. . . . .	24
Installation Instructions. . . . .	24

## A. Mode Support for Windows

General Mode Support Information . . . . .	26
Default Modes Supported by GPU . . . . .	27
Understanding the Mode Format . . . . .	27
NVIDIA Quadro FX 4400/4000/1400/550/540	
and NVS 440/285 Family of GPUs. . . . .	28
NVIDIA Quadro FX 5600/4600/4700 X2/3700	
Family of GPUs . . . . .	30
NVIDIA Quadro FX 1700/570/470/370 and NVS	
290 Family of GPUs . . . . .	33
NVIDIA Quadro CX GPUs. . . . .	35
NVIDIA Quadro FX 5800/4800 Family of GPUs	
37	
NVIDIA Quadro FX 5500/4500/3500/560/350	
Family of GPUs . . . . .	39
TV-Out Modes Supported by TV Encoders . . . . .	41



# List of Tables



<b>Table 3.1</b>	Supported NVIDIA Workstation Products . . . . .	22
<b>Table A.1</b>	Modes Supported for High Resolution Displays . . . . .	26
<b>Table A.2</b>	Non-standard Modes Supported . . . . .	26
<b>Table A.3</b>	Mode Support for S-Video and Composite Out . . . . .	41
<b>Table A.4</b>	Mode Support for Component YPrPb Out and DVI Out . . . . .	41

## CHAPTER

## 1

# INTRODUCTION TO *RELEASE 181 NOTES*

This edition of *Release 181 Notes* describes the Release 181 Quadro Professional Drivers for Microsoft® Windows® Vista. NVIDIA provides these notes to describe performance improvements and bug fixes in each documented version of the driver.

## Structure of the Document

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This document is organized in the following sections:

- “[Release 181 Driver Changes](#)” on [page 3](#) gives a summary of changes, and fixed and open issues in this version.
- “[The Release 181 Driver](#)” on [page 21](#) describes the NVIDIA products and languages supported by this driver, the system requirements, and how to install the driver.
- “[Mode Support for Windows](#)” on [page 25](#) lists the default resolutions supported by the driver.

## Changes in this Edition

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This edition of the *Release 181 Notes* for Windows Vista includes information about NVIDIA graphics driver version 181.20, and lists changes made to the driver since version 178.46. These changes are discussed beginning with the chapter “[Release 181 Driver Changes](#)” on [page 3](#).



## CHAPTER

## 2

# RELEASE 181 DRIVER CHANGES

This chapter describes open issues for version 181.20, and resolved issues and driver enhancements for versions of the Release 181 driver up to version 181.20. The chapter contains these sections:

- “Version 181.20 Highlights” on page 4
- “Changes in Version 181.20” on page 8
- “Open Issues in Version 181.20” on page 11
- “Not NVIDIA Issues” on page 13
- “Known Product Limitations” on page 18

## Version 181.20 Highlights

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This section provides highlights of version 181.20 of the NVIDIA Release 181 Driver for Windows Vista.

- [What's New in Release 181](#)
- [What's New in Version 181.20](#)
- [Limitations in This Release](#)
- [Special Instructional Notes for this Release](#)

### What's New in Release 181

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- Added support for the following NVIDIA products:
  - NVIDIA Quadro FX 470
  - NVIDIA Quadro CX
  - NVIDIA Quadro FX370 Low Profile
  - NVIDIA Quadro FX4800
  - NVIDIA Quadro FX5800
  - NVIDIA Quadro VX 200
  - NVIDIA Quadro NVS 450
- As of version 178.46, the NVIDIA nView Desktop Manager utility is included with the driver installation, and is accessible from the Windows Control Panel.

## What's New in Version 181.20

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- Added support for the following NVIDIA products:
  - NVIDIA Quadro FX 370 Low Profile
  - NVIDIA Quadro FX 4800
  - NVIDIA Quadro FX 5800
  - NVIDIA Quadro VX 200
  - NVIDIA Quadro NVS 450
- See [“Changes in Version 181.20”](#) on page 8 for a list of resolved issues under Windows Vista.

## Limitations in This Release

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The following are features that are not currently supported or have limited support in this driver release:

- **NVIDIA SLI Antialiasing**

This driver does not support NVIDIA SLI antialiasing.

- **SDI**

This driver does not support the Serial Display Interface (a standard for driving high color depth displays).

- **Genlock/Frame Lock**

This driver does not support the ability to synchronize multiple display outputs with an external signal.

## Features Not Yet Available in the NVIDIA Control Panel

Support for the following control panel features is under development and not yet available under Windows Vista:

- **Display Category**

The Graph tab on the Adjust Desktop Color Settings page is not available.

- **Workstation Category**

The Workstation category page is not available with this driver version.

## Special Instructional Notes for this Release

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This section clarifies instructions for successfully accomplishing the following tasks:

### Turning Off V-Sync to Boost Performance

To get the best benchmark and application performance measurements, turn V-Sync off as follows:

- 1 Open the NVIDIA Control Panel and enable Advanced View.
- 2 In the 3D Settings Category, click Manage 3D Settings.
- 3 From the Global presets pulldown menu, select **Custom** and then click **Apply**.
- 4 From the Settings listbox, select **Vertical sync** and change its value to **Force off**, then click **Apply**.
- 5 From the Global presets pulldown menu, select **3D App - Default Global Settings** (the driver's default profile) or use the application profile that matches the application you are testing, then click **Apply**.

*Be sure to close the NVIDIA Control Panel completely* —leaving it open will affect benchmark and application performance.

### NVIDIA Application Configuration Engine (ACE)

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This driver includes the NVIDIA Application Configuration Engine (ACE), which automatically detects the workstation application and configures the appropriate profile settings in the NVIDIA Control Panel.

See the *NVIDIA Quadro Professional Drivers: NVIDIA Control Panel Quick Start Guide* for more information about this feature.

## Changes in Version 181.20

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The following sections list the changes made and issues resolved since driver version 178.46.

- “Fixed Issues–Windows Vista 32-bit” on page 8
- “Fixed Issues—Windows Vista 64-bit” on page 8

The NVIDIA bug number and driver module are provided for reference.

### Fixed Issues–Windows Vista 32-bit

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#### Single-GPU Fixed Issues

- Allplan BIM 2008 is significantly slower compared to previous version (Allplan (2006).
- Maya 2009: driver versions and configurations need to be defined for the application in order to properly run in stereo.
- KOMPAS-3D V9 SP1 –the CAD software runs faster on a GeForce card when compared to a Quadro card.
- MediaPlayer video becomes choppy when multiple 3D demos are run.
- Quadro FX 4800: Poser/Poser Pro exits with an access violation in nvoglv32.dll.
- Quadro FX 4600: The SLI option is missing from the NVIDIA Control Panel.
- Quadro FX 1800: DisplayPort output is corrupted in Dualview mode
- Quadro FX 1700: Blue-screen crash occurs when running power management sleep/wake tests.
- Quadro NVS 290: Blue-screen crash occurs when running the Vista-enabled RGS extensions with Vista Aero-glass enabled and other 3-D applications, such as Google Earth, running.
- Quadro FX 1500: The GPU fan stays on at full speed after resume from Hibernate.

#### Multi-GPU Issues

- Dual NVIDA Quadro FX 4500: `wglEnumGpusNV( )` enumerates only one GPU.

### Fixed Issues—Windows Vista 64-bit

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#### Single-GPU Issues

- KOMPAS-3D V9 SP1 –the CAD software runs faster on a GeForce card when compared to a Quadro card.

- MediaPlayer video becomes choppy when multiple 3D demos are run.
- Quadro FX 5800: The driver crashes when entering Standby or Hibernate modes.
- Quadro FX 4800: Poser/Poser Pro exits with an access violation in nvoglv32.dll.
- Quadro FX 4800: GLView –the VSync function runs slowly.
- Quadro FX 3700/3500: Maya 2009–there is no 3D stereo profile for the application.
- Quadro FX 3700: Stereo clone mode does not work.
- Quadro FX 1800: DisplayPort output is corrupted in Dualview mode
- Quadro FX 1500: The GPU fan stays on at full speed after resume from Hibernate.

### **Multi-GPU Issues**

- Dual NVIDIA Quadro FX 4500: `wglEnumGpusNV()` enumerates only one GPU.



## Open Issues in Version 181.20

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As with every released driver, version 181.20 of the Release 181 driver has open issues and enhancement requests associated with it. This section includes lists of issues that are either not fixed or not implemented in this version. Some problems listed may not have been thoroughly investigated and, in fact, may not be NVIDIA issues. Others may have workaround solutions.

- [“Windows Vista 32-bit Issues” on page 11](#)
- [“Windows Vista 64-bit Issues” on page 12](#)

### Windows Vista 32-bit Issues

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#### Single-GPU Issues

- Gamma ramps are inconsistent between one and two-headed systems
- A random 200ms glitch occurs when using the NVIDIA DDC API to communicate with the Dome E3 Panel.
- In Dualview mode with each display running at different refresh rates, there is tearing in OpenGL windows, indicating that the driver is not sync'ing to V-blank.
- ArchiCAD12–OpenGL speed is half as fast on Vista than on XP.
- Quadro FX 4800: With desktop color-depth set to 16-bit, video playback of DVD, AVI, or MPEG files using Media Player lags.
- Quadro FX 3700: SOCET GXP–on monochromatic images, a right-click pop-up menu remains flashing over the image even after the pop-up window is invoked.
- Quadro FX 3700: SOCET GXP–menus that overlap the stereo imagery cause the stereo panel to change to mono until the menu is gone.
- Quadro FX 1700: 3ds Max 2009–the performance drops when applying a scene effect.

## Windows Vista 64-bit Issues

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### Single-GPU Issues

- MediaComposer–polygons are drawn in the wrong color after disabling shaders.
- Quadro FX 5600: Polygons are drawn in the wrong color after disabling shaders.
- Quadro FX 4800: With desktop color-depth set to 16-bit, video playback of DVD, AVI, or MPEG files using Media Player lags.
- Quadro FX 4500/3500: Maya–cpvTransparencyTest no longer renders properly with Cg2.0+.

## Not NVIDIA Issues

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This section lists issues that are not due to the NVIDIA driver as well as features that are not meant to be supported by the NVIDIA driver for Windows Vista.

- “Windows Vista Limitations” on page 13
- “Unsupported Features” on page 13
- “OpenGL Application Issues” on page 15
- “Application Issues” on page 16

## Windows Vista Limitations

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These are behaviors that may be different from Windows XP and are related directly to the Windows Vista operating system.

- World of Warcraft – there is a 60% drop in performance when running the game in windowed mode with SLI or multi-GPU mode enabled.

*This is due to a limitation of the Windows Vista operating system and affects all multi-GPU systems. NVIDIA is investigating a workaround for this performance problem.*

## Unsupported Features

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The following are features and functionality that were available in driver releases supporting Windows XP, but are not available in driver releases for Windows Vista:

- **High resolution scaling desktop (HRSD)**
- **MultiView Display Mode** (for NVIDIA Quadro NVS graphics cards)
- **NVKeystone**
- **Unified back buffer (UBB) controls**
- **OpenGL Video Overlays**

This is an operating system limitation.

Vista window manager features will provide new ways of accomplishing overlays, but will require application porting.

- **Overclocking**

GPU overclocking is no longer supported in the default GPU driver control panel. This feature is available in the NVIDIA nTune 5.05 software, which you can download from [NVIDIA.com](http://NVIDIA.com).

- **GPU Temperature Monitoring**

Temperature monitoring is no longer supported in the default GPU driver control panel. This feature is available in the NVIDIA nTune 5.05 software, which you can download from [NVIDIA.com](http://NVIDIA.com).

### **AGP Settings Adjustment**

- **Full-screen Video Mirror**
- **Video Zoom**
- **Pan & Scan** - the process of panning across the desktop in order to display a desktop on a monitor with lower resolution
- **Per-display Desktop Color Setting Adjustments**

For Clone mode, the desktop color setting adjustments through the NVIDIA Control Panel can only be made across all displays in a system, and not on a per-display basis.

- **Per-display Video Color Setting Adjustments**

For Dualview mode, the video color setting adjustments through the NVIDIA Control Panel can only be made across all displays in a system, and not on a per-display basis.

- **nView Horizontal and Vertical Span Modes**

Due to architectural changes in the new Windows Vista Window Display Driver Model (WDDM), span mode cannot be supported in NVIDIA graphics drivers. NVIDIA recommends using the built-in Windows Vista multi-display modes.

- **Edge Blending**
- **Run display optimization wizard**
- **Run multiple display wizard**
- **Run television setup wizard**
- **Display/Connection Wizard** (such as was provided with Windows Media Center Edition)
- **DVD/MPEG Extensions** (such as was provided with Windows Media Center Edition)
- **Audio Extensions** (such as was provided with Windows Media Center Edition)
- **Windowed quad-buffered stereo**

This is an operating system limitation.

## OpenGL Application Issues

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The following are known compatibility issues for OpenGL applications developed under Windows XP:

- Mixed GDI and OpenGL rendering does not work.

A number of applications use GDI to render UI components and object highlighting. This is not supported in the Windows Vista driver model.

NVIDIA recommends converting GDI rendering to OpenGL.

The following are some applications that are known to have this issue:

- Maya 7.01
- OneSpace Designer Modeling
- Applications, Tools, and Benchmarks not supported under Windows Vista
  - GLperf
  - 3ds max 8 (later releases may be supported)
  - CATIA V5R15 (V5R16 is supported)
  - PTC's CDRS 2001
- Front buffered rendering may be slow, especially when DWM is enabled.

Flushing the rendering queue while rendering to the front buffer may cause the window manager to recomposite. Applications should therefore minimize the frequency with which they flush the rendering queue.

## Application Issues

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- **General Antialiasing Problem with Top Games**

We have found that some games running under Windows Vista enable 16x coverage sampling antialiasing (CSAA) when 4xAA is selected in the game menu, resulting in deflated performance on the latest NVIDIA Quadro FX cards.

The problem occurs with NVIDIA Vista drivers 100.54 and later.

The same effect will occur in future "Release 100" Windows XP drivers.

Affected applications found to date include:

- Battlefield 2
- Battlefield 2142
- Sin Episodes
- Half-Life 2
- Half-Life 2 Lost Coast

To set standard 4xAA in these applications, please set 4xAA in the game, and also enable "Enhance the application" antialiasing mode with a 4x antialiasing setting in the NVIDIA graphics driver control panel.

We are working with developers to implement better in-game CSAA support. You can see CSAA menu selections in Half-Life 2: Episode One and Supreme Commander.



## Known Product Limitations

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This section describes problems that will not be fixed. Usually, the source of the problem is beyond the control of NVIDIA. Following is the list of problems and where they are discussed in this document:

- “SLI Connector Requirement on NVIDIA Quadro SLI Cards” on page 18
- “Image Sharpening Control not Available with Quadro FX 4600 and later GPUs” on page 18
- “Driver Reports 256 MB Memory on NVIDIA Quadro FX 330 Cards” on page 19
- “Applying Workstation Application Profiles” on page 19
- “Gigabyte GA-6BX Motherboard” on page 19

### SLI Connector Requirement on NVIDIA Quadro SLI Cards

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The SLI connector that links two SLI cards is needed for proper SLI operation. However, the connector can be removed if you do not intend to enable SLI mode. If you remove the connector, then you must make sure that SLI mode is disabled from the NVIDIA control panel. Enabling SLI mode without the SLI connector installed will result in video corruption.

### Image Sharpening Control not Available with Quadro FX 4600 and later GPUs

---

With Quadro FX 4600 and later graphics cards, the **Image sharpening** slider on the NVIDIA Control Panel-> Display->Adjust Desktop Color Settings page is grayed out.

This control is intentionally disabled because image sharpening is not supported on Quadro FX 4600 and later GPUs.

## Driver Reports 256 MB Memory on NVIDIA Quadro FX 330 Cards

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- **Problem**

When a 64 MB NVIDIA Quadro FX 330 card is installed, the driver reports that the card needs 256 MB, causing 256 MB of address space to be consumed.

- **Explanation**

*This is not a bug but a product limitation.*

The NVIDIA Quadro FX 330 GPU has some limitations that prevent the card from addressing less than 256 MB of system memory.

## Applying Workstation Application Profiles

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- **Background**

The workstation application profiles are software settings used by the NVIDIA Display Drivers to provide optimum performance when using a selected application. The profile also works around known application issues and bugs.

If there is an available setting for an application, it should be used, otherwise incorrect behavior or reduced performance is likely to occur.

- **Issues**

Configuration changes require that you restart the application.

Once an application is running, it does not receive notification of configuration changes. Therefore, if you change the configuration while the application is running, you must exit and restart the application for the configuration changes to take effect.

## Gigabyte GA-6BX Motherboard

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This motherboard uses a Linfinity regulator on the 3.3-V rail that is rated to only 5 A—less than the AGP specification, which requires 6 A. When diagnostics or applications are running, the temperature of the regulator rises, causing the voltage to the NVIDIA chip to drop as low as 2.2 V. Under these circumstances, the regulator cannot supply the current on the 3.3-V rail that the NVIDIA chip requires.

This problem does not occur when the graphics board has a switching regulator or when an external power supply is connected to the 3.3-V rail.



## CHAPTER

## 3

# THE RELEASE 181 DRIVER

This chapter covers the following main topics:

- “Hardware and Software Support” on page 21
- “Driver Installation” on page 24

## Hardware and Software Support

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### Supported Operating Systems

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The Release 181 driver, version 181.20, has been tested with Microsoft Windows® Vista RTM OS builds version 6000 or higher, and supports both 32-bit and 64-bit versions of Windows Vista Editions:

- Windows Vista Home Basic
- Windows Vista Home Premium
- Windows Vista Business
- Windows Vista Enterprise Edition
- Windows Vista Ultimate

## Supported NVIDIA Products

Table 3.1 lists the NVIDIA products supported by the Release 181 driver.

**Table 3.1** Supported NVIDIA Workstation Products

Product	Windows Vista 32-bit	Windows Vista 64-bit
NVIDIA Quadro FX 5800	X	X
NVIDIA Quadro FX 5600	X	X
NVIDIA Quadro FX 5500	X	X
NVIDIA Quadro FX 4800	X	X
NVIDIA Quadro FX 4700 X2	X	X
NVIDIA Quadro FX 4600	X	X
NVIDIA Quadro FX 4500 X2	X	X
NVIDIA Quadro FX 4500	X	X
NVIDIA Quadro FX 4400	X	X
NVIDIA Quadro FX 4400G	X	X
NVIDIA Quadro FX 4000	X	X
NVIDIA Quadro FX 3700	X	X
NVIDIA Quadro FX 3500	X	X
NVIDIA Quadro FX 3450	X	X
NVIDIA Quadro FX 3400	X	X
NVIDIA Quadro FX 1700	X	X
NVIDIA Quadro FX 1500	X	X
NVIDIA Quadro FX 1400	X	X
NVIDIA Quadro FX 570	X	X
NVIDIA Quadro FX 560	X	X
NVIDIA Quadro FX 550	X	X
NVIDIA Quadro FX 540	X	X
NVIDIA Quadro FX 470	X	X
NVIDIA Quadro FX 370	X	X
NVIDIA Quadro FX 370 low profile	X	X
NVIDIA Quadro FX 350	X	X
NVIDIA Quadro VX 200	X	X
NVIDIA Quadro CX	X	X
NVIDIA Quadro NVS 450	X	X
NVIDIA Quadro NVS 440	X	X
NVIDIA Quadro NVS 290	X	X
NVIDIA Quadro NVS 285	X	X

## Supported Languages

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The Release 181 Quadro Professional Drivers supports the following languages in the main driver Control Panel:

English (USA)	German	Portuguese (Euro/Iberian)
English (UK)	Greek	Russian
Arabic	Hebrew	Slovak
Chinese (Simplified)	Hungarian	Slovenian
Chinese (Traditional)	Italian	Spanish
Czech	Japanese	Spanish (Latin America)
Danish	Korean	Swedish
Dutch	Norwegian	Thai
Finnish	Polish	Turkish
French	Portuguese (Brazil)	

# Driver Installation

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## Minimum Hard Disk Space

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The hard disk space requirement for 32-bit is minimum 73.1 MB for English-only, and 102 MB for International.

The hard disk space requirement for 64-bit is minimum 90.9 MB for English-only, and 119 MB for International.

## Before You Begin

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If you have previously installed NVIDIA nTune, NVIDIA recommends that you uninstall nTune before installing this driver. After the driver install is complete, you can reinstall NVIDIA nTune.

## Installation Instructions

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- 1 Follow the instructions on the NVIDIA .com Web site driver download page to locate the appropriate driver to download, based on your hardware and operating system.
- 2 Click the driver download link.
- 3 The license agreement dialog box appears.
- 4 Click **Accept** if you accept the terms of the agreement, then either open the file or save the file to your PC and open it later.
- 5 Extract the zip files to a temporary folder on your PC.
- 6 Open the NVIDIA driver installation .EXE file to launch the NVIDIA InstallShield Wizard.
- 7 Follow the instructions in the NVIDIA InstallShield Wizard to complete the installation.

**Note:** After the driver installation, Windows may default to 16-bpp color and disable the Desktop Window Manager (DWM). To work around this issue, set the color to 32-bpp and then reboot the PC.

## APPENDIX



## MODE SUPPORT FOR WINDOWS

This chapter details the Windows modes supported by the Release 181 driver for NVIDIA products. It contains these sections:

- “General Mode Support Information” on page 26
- “Default Modes Supported by GPU” on page 27
- “TV-Out Modes Supported by TV Encoders” on page 41

## General Mode Support Information

---

The NVIDIA graphics driver includes a standard list of display modes that are supported by default. These modes are listed in the section “[Default Modes Supported by GPU](#)” on page 27.

The actual modes available depend on the capabilities of the display. In addition, the NVIDIA graphics driver has a “dynamic EDID detection” capability and will make available *additional* modes that are listed in the display EDID, provided the graphics hardware can support it.

The NVIDIA graphics driver also supports the high resolutions available with the displays listed in [Table A.1](#) as well as the non-standard modes listed in [Table A.2](#).

**Table A.1** Modes Supported for High Resolution Displays

Display	Maximum Resolution	Hardware Requirements
HP LP3065 Flat Panel Monitor (Dual-link DVI)	2560×1600 @ 60 Hz	<ul style="list-style-type: none"> <li>All high-end NVIDIA Quadro FX graphics solutions.</li> </ul>
Apple 30" Cinema HD Display (Dual link DVI)	2560×1600 @ 60 Hz	<ul style="list-style-type: none"> <li>All high-end NVIDIA Quadro FX graphic solutions.</li> </ul>
Dell WFP 3007 (Dual Link DVI)	2560×1600 @ 60 Hz	<ul style="list-style-type: none"> <li>All High-end NVIDIA Quadro FX graphic solutions.</li> </ul>

**Table A.2** Non-standard Modes Supported

Resolution
1680 x 1050
1366 x 768

## Default Modes Supported by GPU

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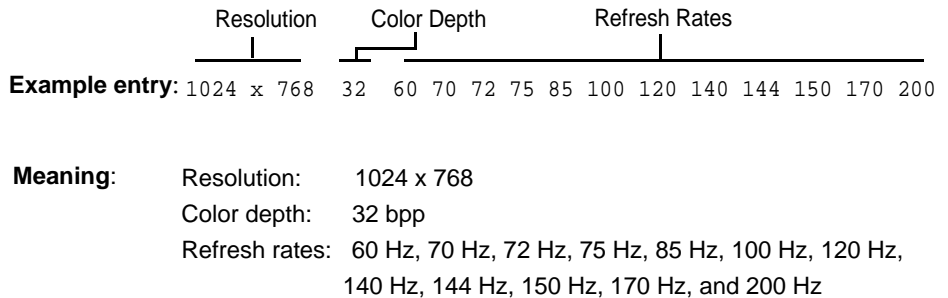
This section lists the modes that are included by default in the driver INF for the following product families:

- “NVIDIA Quadro FX 4400/4000/1400/550/540 and NVS 440/285 Family of GPUs” on page 28
- “NVIDIA Quadro FX 5600/4600/4700 X2/3700 Family of GPUs” on page 30
- “NVIDIA Quadro FX 1700/570/470/370 and NVS 290 Family of GPUs” on page 33
- “NVIDIA Quadro CX GPUs” on page 35
- “NVIDIA Quadro FX 5800/4800 Family of GPUs” on page 37
- “NVIDIA Quadro FX 5500/4500/3500/560/350 Family of GPUs” on page 39

### Understanding the Mode Format

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Figure A.1 gives an example of how to read the mode information presented in this section.



**Figure A.1** Mode Format

**Note:**

- Horizontal spanning modes of 3840x1080 and above, and vertical spanning modes of 1920x2160 and above generally require at least 32 MB of video memory at 32 bpp.
- An “i” next to the refresh rate indicates an interlaced refresh rate.

## NVIDIA Quadro FX 4400/4000/1400/550/540 and NVS 440/285 Family of GPUs

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This sections lists the supported display resolutions, color depths, and refresh rates for the following products:

- NVIDIA Quadro FX 3400/4400
- NVIDIA Quadro FX 4000
- NVIDIA Quadro FX 3450/4000 SDI
- NVIDIA Quadro FX 1400
- NVIDIA Quadro NVS 440
- NVIDIA Quadro FX 550
- NVIDIA Quadro FX 540
- NVIDIA Quadro NVS 285
- NVIDIA Quadro NVS 210S

### Standard Modes

640 x 480	8	60 70 72 75 85 100 120 140 144 150 170 200 240
720 x 480	8	60
720 x 576	8	50 60
800 x 600	8	60 70 72 75 85 100 120 140 144 150 170 200 240
848 x 480	8	60 70 72 75 85 100 120 140 144 150 170 200 240
960 x 600	8	60 70 72 75 85 100 120 140 144 150 170 200 240
1024 x 768	8	60 70 72 75 85 100 120 140 144 150 170 200 240
1152 x 864	8	60 70 72 75 85 100 120 140 144 150 170 200
1280 x 720	8	60 70 72 75 85 100 120 140 144 150 170
1280 x 768	8	60 70 72 75 85 100 120 140 144 150 170 200 240
1280 x 1024	8	70
1440 x 900	8	60
1600 x 1200	8	70
1680 x 1050	8	60
1920 x 1440	8	60 70 72 75 85 100
2048 x 1536	8	60 70 72 75 85 100

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640 x 480	16	60 70 72 75 85 100 120 140 144 150 170 200 240
720 x 480	16	60
720 x 576	16	50 60

800 x 600	16	60	70	72	75	85	100	120	140	144	150	170	200	240
848 x 480	16	60	70	72	75	85	100	120	140	144	150	170	200	240
960 x 600	16	60	70	72	75	85	100	120	140	144	150	170	200	240
1024 x 768	16	60	70	72	75	85	100	120	140	144	150	170	200	240
1152 x 864	16	60	70	72	75	85	100	120	140	144	150	170	200	
1280 x 720	16	60	70	72	75	85	100	120	140	144	150	170		
1280 x 768	16	60	70	72	75	85	100	120	140	144	150	170	200	240
1280 x 1024	16	70												
1440 x 900	16	60												
1600 x 1200	16	70												
1680 x 1050	16	60												
1920 x 1440	16	60	70	72	75	85	100							
2048 x 1536	16	60	70	72	75	85	100							

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640 x 480	32	60	70	72	75	85	100	120	140	144	150	170	200	240
720 x 480	32	60												
720 x 576	32	50	60											
800 x 600	32	60	70	72	75	85	100	120	140	144	150	170	200	240
848 x 480	32	60	70	72	75	85	100	120	140	144	150	170	200	240
960 x 600	32	60	70	72	75	85	100	120	140	144	150	170	200	240
1024 x 768	32	70												
1152 x 864	32	60	70	72	75	85	100	120	140	144	150	170	200	
1280 x 768	32	60	70	72	75	85	100	120	140	144	150	170		
1280 x 1024	32	70												
1440 x 900	32	60												
1600 x 1200	32	70												
1680 x 1050	32	60												
1920 x 1440	32	60	70	72	75	85	100							
2048 x 1536	32	60	70	72	75	85	100							

## NVIDIA Quadro FX 5600/4600/4700 X2/3700 Family of GPUs

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This sections lists the supported display resolutions, color depths, and refresh rates for the following products:

- NVIDIA Quadro FX 5600
- NVIDIA Quadro FX 4600
- NVIDIA Quadro FX 4700 X2
- NVIDIA Quadro FX 3700

### Standard Modes

640 x 480	8		60	72	75	85	100													
720 x 480	8		60																	
720 x 576	8		50	60																
800 x 600	8		60	72	75	85	100													
1024 x 768	8		60	70	72	75	85	100												
1152 x 864	8		60	70	72	75	85	100	120	140	144	150	170	200						
1280 x 720	8		60	70	72	75	85	100												
1280 x 768	8		60	70	72	75	85	100												
1280 x 800	8		60	70	72	75	85	100												
1280 x 960	8		60	70	72	75	85	100												
1280 x 1024	8		60	70	72	75	85	100												
1360 x 768	8		60	70	72	75	85	100												
1440 x 900	8		60																	
1600 x 1200	8		60	70	72	75	85	100												
1680 x 1050	8		60																	
1920 x 1080	8	30i																		
1920 x 1200	8		60	72	75	85	100													
1920 x 1440	8		60	70	72	75	85	100												
2048 x 1536	8		60	70	72	75	85	100												
-----																				
640 x 480	16		60	72	75	85	100													
720 x 480	16		60																	
720 x 576	16		50	60																
800 x 600	16		60	72	75	85	100													
1024 x 768	16		60	70	72	75	85	100												
1152 x 864	16		60	70	72	75	85	100	120	140	144	150	170	200						

1280 x 720	16		60	70	72	75	85	100
1280 x 768	16		60	70	72	75	85	100
1280 x 800	16		60	70	72	75	85	100
1280 x 960	16		60	70	72	75	85	100
1280 x 1024	16		60	70	72	75	85	100
1360 x 768	16		60	70	72	75	85	100
1440 x 900	16		60					
1600 x 1200	16		60	70	72	75	85	100
1680 x 1050	16		60					
1920 x 1080	16	30i						
1920 x 1200	16		60		72	75	85	100
1920 x 1440	16		60	70	72	75	85	100
2048 x 1536	16		60	70	72	75	85	100

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640 x 480	32		60		72	75	85	100
720 x 480	32		60					
720 x 576	32	50	60					
800 x 600	32		60		72	75	85	100
1024 x 768	32		60	70	72	75	85	100
1152 x 864	32		60	70	72	75	85	100 120 140 144 150 170 200
1280 x 720	32		60	70	72	75	85	100
1280 x 768	32		60	70	72	75	85	100
1280 x 800	32		60	70	72	75	85	100
1280 x 960	32		60	70	72	75	85	100
1280 x 1024	32		60	70	72	75	85	100
1360 x 768	32		60	70	72	75	85	100
1440 x 900	32		60					
1600 x 1200	32		60	70	72	75	85	100
1680 x 1050	32		60					
1920 x 1080	32	30i						
1920 x 1200	32		60		72	75	85	
1920 x 1440	32		60	70		75	85	100
2048 x 1536	32		60	70		75	85	100

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640 x 480	64		60		72	75	85	100
720 x 480	64		60					
720 x 576	64	50	60					
800 x 600	64		60		72	75	85	100
1024 x 768	64		60	70	72	75	85	100

1152 x 864	64		60 70 72 75 85 100 120 140 144 150 170 200
1280 x 720	64		60 70 72 75 85 100
1280 x 768	64		60 70 72 75 85 100
1280 x 800	64		60 70 72 75 85 100
1280 x 960	64		60 70 72 75 85 100
1280 x 1024	64		60 70 72 75 85 100
1360 x 768	64		60 70 72 75 85 100
1440 x 900	64		60
1600 x 1200	64		60 70 72 75 85 100
1680 x 1050	64		60
1920 x 1080	64	30i	
1920 x 1440	64		100
2048 x 1536	64		100

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## NVIDIA Quadro FX 1700/570/470/370 and NVS 290 Family of GPUs

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This sections lists the supported display resolutions, color depths, and refresh rates for the following products:

- NVIDIA Quadro FX 370
- NVIDIA Quadro FX 570
- NVIDIA Quadro FX 1700
- NVIDIA Quadro NVS 290
- NVIDIA Quadro FX 470

### Standard Modes

640 x 480	8	60	70	72	75	85	100	120	140	144	150	170	200	240
720 x 480	8	60												
720 x 576	8	50	60											
800 x 600	8	60	70	72	75	85	100	120	140	144	150	170	200	240
848 x 480	8	60	70	72	75	85	100	120	140	144	150	170	200	240
960 x 600	8	60	70	72	75	85	100	120	140	144	150	170	200	240
1024 x 768	8	60	70	72	75	85	100	120	140	144	150	170	200	240
1152 x 864	8	60	70	72	75	85	100	120	140	144	150	170	200	
1280 x 720	8	60	70	72	75	85	100	120	140	144	150	170		
1280 x 768	8	60	70	72	75	85	100	120	140	144	150	170	200	
1280 x 1024	8	70												
1440 x 900	8	60												
1600 x 1200	8	70												
1680 x 1050	8	60												
1920 x 1440	8	60	70	72	75	85	100							
2048 x 1536	8	60	70	72	75	85	100							
-----														
640 x 480	16	60	70	72	75	85	100	120	140	144	150	170	200	240
720 x 480	16	60												
720 x 576	16	50	60											
800 x 600	16	60	70	72	75	85	100	120	140	144	150	170	200	240
848 x 480	16	60	70	72	75	85	100	120	140	144	150	170	200	240
960 x 600	16	60	70	72	75	85	100	120	140	144	150	170	200	240
1024 x 768	16	60	70	72	75	85	100	120	140	144	150	170	200	240
1152 x 864	16	60	70	72	75	85	100	120	140	144	150	170	200	
1280 x 720	16	60	70	72	75	85	100	120	140	144	150	170		

1280 x 768	16		60 70 72 75 85 100 120 140 144 150 170 200
1280 x 1024	16		70
1440 x 900	16		60
1600 x 1200	16		70
1680 x 1050	16		60
1920 x 1440	16		60 70 72 75 85 100
2048 x 1536	16		60 70 72 75 85 100
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640 x 480	32		60 70 72 75 85 100 120 140 144 150 170 200 240
720 x 480	32		60
720 x 576	32	50	60
800 x 600	32		60 70 72 75 85 100 120 140 144 150 170 200 240
848 x 480	32		60 70 72 75 85 100 120 140 144 150 170 200 240
960 x 600	32		60 70 72 75 85 100 120 140 144 150 170 200 240
1024 x 768	32		70
1152 x 864	32		60 70 72 75 85 100 120 140 144 150 170 200
1280 x 768	32		60 70 72 75 85 100 120 140 144 150 170 200
1280 x 1024	32		70
1440 x 900	32		60
1600 x 1200	32		70
1680 x 1050	32		60
1920 x 1440	32		60 70 72 75 85 100
2048 x 1536	32		60 70 72 75 85 100
-----			
640 x 480	64		60 70 72 75 85 100 120 140 144 150 170 200 240
720 x 480	64		60
720 x 576	64	50	60
800 x 600	64		60 70 72 75 85 100 120 140 144 150 170 200 240
848 x 480	64		60 70 72 75 85 100 120 140 144 150 170 200 240
960 x 600	64		60 70 72 75 85 100 120 140 144 150 170 200 240
1024 x 768	64		70
1152 x 864	64		60 70 72 75 85 100 120 140 144 150 170 200
1280 x 768	64		60 70 72 75 85 100 120 140 144 150 170 200
1280 x 1024	64		70
1440 x 900	64		60
1600 x 1200	64		70
1680 x 1050	64		60
1920 x 1440	64		100
2048 x 1536	64		100

## NVIDIA Quadro CX GPUs

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This sections lists the supported display resolutions, color depths, and refresh rates for the following products:

- NVIDIA Quadro CX

### Standard Modes

640 x 480	8	60
800 x 600	8	60 70 75 85 100
848 x 480	8	60 70 75 85 100
960 x 600	8	60 70 75 85 100
1024 x 768	8	60 70 75 85 100
1152 x 864	8	60 70 75 85 100
1280 x 768	8	60
1280 x 800	8	60
1280 x 960	8	60 70 75 85 100
1280 x 1024	8	60 70 75 85 100
1360 x 768	8	60
1600 x 1200	8	60 70 75 85 100
1680 x 1050	8	60
1920 x 1200	8	60
1920 x 1440	8	60 70 75 85 100
2048 x 1536	8	60 70 75 85 100

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640 x 480	16	60
800 x 600	16	60 70 75 85 100
848 x 480	16	60 70 75 85 100
960 x 600	16	60 70 75 85 100
1024 x 768	16	60 70 75 85 100
1152 x 864	16	60 70 75 85 100
1280 x 768	16	60
1280 x 800	16	60
1280 x 960	16	60 70 75 85 100
1280 x 1024	16	60 70 75 85 100
1360 x 768	16	60
1600 x 1200	16	60 70 75 85 100
1680 x 1050	16	60

1920 x 1200	16	60					
1920 x 1440	16	60	70	75	85	100	
2048 x 1536	16	60	70	75	85	100	

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640 x 480	32	60					
800 x 600	32	60	70	75	85	100	
848 x 480	32	60	70	75	85	100	
960 x 600	32	60	70	75	85	100	
1024 x 768	32	60	70	75	85	100	
1152 x 864	32	60	70	75	85	100	
1280 x 768	32	60					
1280 x 800	32	60					
1280 x 960	32	60	70	75	85	100	
1280 x 1024	32	60	70	75	85	100	
1360 x 768	32	60					
1600 x 1200	32	60	70	75	85	100	
1680 x 1050	32	60					
1920 x 1200	32	60					
1920 x 1440	32	60	70	75	85	100	
2048 x 1536	32	60	70	75	85	100	

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640 x 480	64	60					
800 x 600	64	60	70	75	85	100	
848 x 480	64	60	70	75	85	100	
960 x 600	64	60	70	75	85	100	
1024 x 768	64	60	70	75	85	100	
1152 x 864	64	60	70	75	85	100	
1280 x 768	64	60					
1280 x 800	64	60					
1280 x 960	64	60	70	75	85	100	
1280 x 1024	64	60	70	75	85	100	
1360 x 768	64	60					
1600 x 1200	64	60	70	75	85	100	
1680 x 1050	64	60					
1920 x 1200	64	60					
1920 x 1440	64	60	70	75	85	100	
2048 x 1536	64	60	70	75	85	100	

## NVIDIA Quadro FX 5800/4800 Family of GPUs

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This section lists the supported display resolutions, color depths, and refresh rates for the following products:

- NVIDIA Quadro FX 5800
- NVIDIA Quadro FX 4800

### Standard Modes

640 x 480	8	60
800 x 600	8	60 70 75 85 100
848 x 480	8	60 70 75 85 100
960 x 600	8	60 70 75 85 100
1024 x 768	8	60 70 75 85 100
1152 x 864	8	60 70 75 85 100
1280 x 768	8	60
1280 x 800	8	60
1280 x 960	8	60 70 75 85 100
1280 x 1024	8	60 70 75 85 100
1360 x 768	8	60
1600 x 1200	8	60 70 75 85 100
1680 x 1050	8	60
1920 x 1200	8	60
1920 x 1440	8	60 70 75 85 100
2048 x 1536	8	60 70 75 85 100

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640 x 480	16	60
800 x 600	16	60 70 75 85 100
848 x 480	16	60 70 75 85 100
960 x 600	16	60 70 75 85 100
1024 x 768	16	60 70 75 85 100
1152 x 864	16	60 70 75 85 100
1280 x 768	16	60
1280 x 800	16	60
1280 x 960	16	60 70 75 85 100
1280 x 1024	16	60 70 75 85 100
1360 x 768	16	60
1600 x 1200	16	60 70 75 85 100

1680 x 1050	16	60					
1920 x 1200	16	60					
1920 x 1440	16	60	70	75	85	100	
2048 x 1536	16	60	70	75	85	100	

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640 x 480	32	60					
800 x 600	32	60	70	75	85	100	
848 x 480	32	60	70	75	85	100	
960 x 600	32	60	70	75	85	100	
1024 x 768	32	60	70	75	85	100	
1152 x 864	32	60	70	75	85	100	
1280 x 768	32	60					
1280 x 800	32	60					
1280 x 960	32	60	70	75	85	100	
1280 x 1024	32	60	70	75	85	100	
1360 x 768	32	60					
1600 x 1200	32	60	70	75	85	100	
1680 x 1050	32	60					
1920 x 1200	32	60					
1920 x 1440	32	60	70	75	85	100	
2048 x 1536	32	60	70	75	85	100	

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640 x 480	64	60					
800 x 600	64	60	70	75	85	100	
848 x 480	64	60	70	75	85	100	
960 x 600	64	60	70	75	85	100	
1024 x 768	64	60	70	75	85	100	
1152 x 864	64	60	70	75	85	100	
1280 x 768	64	60					
1280 x 800	64	60					
1280 x 960	64	60	70	75	85	100	
1280 x 1024	64	60	70	75	85	100	
1360 x 768	64	60					
1600 x 1200	64	60	70	75	85	100	
1680 x 1050	64	60					
1920 x 1200	64	60					
1920 x 1440	64	60	70	75	85	100	
2048 x 1536	64	60	70	75	85	100	

## NVIDIA Quadro FX 5500/4500/3500/560/350 Family of GPUs

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This sections lists the supported display resolutions, color depths, and refresh rates for the following products:

- NVIDIA Quadro FX 4500
- NVIDIA Quadro FX 350
- NVIDIA Quadro FX 5500
- NVIDIA Quadro FX 3500
- NVIDIA Quadro FX 1500
- NVIDIA Quadro FX 4500 X2
- NVIDIA Quadro FX 560

### Standard Modes

640 x 480	8	60 70 72 75 85 100 120 140 144 150 170 200 240
720 x 480	8	60
720 x 576	8	50 60
800 x 600	8	60 70 72 75 85 100 120 140 144 150 170 200 240
848 x 480	8	60 70 72 75 85 100 120 140 144 150 170 200 240
960 x 600	8	60 70 72 75 85 100 120 140 144 150 170 200 240
1024 x 768	8	60 70 72 75 85 100 120 140 144 150 170 200 240
1152 x 864	8	60 70 72 75 85 100 120 140 144 150 170 200
1280 x 720	8	60 70 72 75 85 100 120 140 144 150 170
1280 x 768	8	60 70 72 75 85 100 120 140 144 150 170
1280 x 1024	8	70
1440 x 900	8	60
1600 x 1200	8	70
1680 x 1050	8	60
1920 x 1200	8	60 70 72 75 85 100
1920 x 1440	8	60 70 72 75 85 100
2048 x 1536	8	60 70 72 75 85 100
-----		
640 x 480	16	60 70 72 75 85 100 120 140 144 150 170 200 240
720 x 480	16	60
720 x 576	16	50 60
800 x 600	16	60 70 72 75 85 100 120 140 144 150 170 200 240

848 x 480	16	60 70 72 75 85 100 120 140 144 150 170 200 240
960 x 600	16	60 70 72 75 85 100 120 140 144 150 170 200 240
1024 x 768	16	60 70 72 75 85 100 120 140 144 150 170 200 240
1152 x 864	16	60 70 72 75 85 100 120 140 144 150 170 200
1280 x 720	16	60 70 72 75 85 100 120 140 144 150 170
1280 x 768	16	60 70 72 75 85 100 120 140 144 150 170
1280 x 1024	16	70
1440 x 900	16	60
1600 x 1200	16	70
1680 x 1050	16	60
1920 x 1200	16	60 70 72 75 85 100
1920 x 1440	16	60 70 72 75 85 100
2048 x 1536	16	60 70 72 75 85 100

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640 x 480	32	60 70 72 75 85 100 120 140 144 150 170 200 240
720 x 480	32	60
720 x 576	32	50 60
800 x 600	32	60 70 72 75 85 100 120 140 144 150 170 200 240
848 x 480	32	60 70 72 75 85 100 120 140 144 150 170 200 240
960 x 600	32	60 70 72 75 85 100 120 140 144 150 170 200 240
1024 x 768	32	70
1152 x 864	32	60 70 72 75 85 100 120 140 144 150 170 200
1280 x 768	32	60 70 72 75 85 100 120 140 144 150 170
1280 x 1024	32	70
1440 x 900	32	60
1600 x 1200	32	70
1680 x 1050	32	60
1920 x 1200	32	60 70 72 75 85 100
1920 x 1440	32	60 70 72 75 85 100
2048 x 1536	32	60 70 72 75 85 100

## TV-Out Modes Supported by TV Encoders

Table A.3 and Table A.4 list the NTSC, PAL, and HDTV TV-Out modes supported by the NVIDIA driver.

**Table A.3** Mode Support for S-Video and Composite Out

Resolution	Bit depth	Comments
320x200	8, 16, 32	DirectDraw mode; not selectable as a Windows desktop
320x240	8, 16, 32	DirectDraw mode; not selectable as a Windows desktop
640x400	8, 16, 32	DirectDraw mode; not selectable as a Windows desktop
640x480	8, 16, 32	
720x480	8, 16, 32	Overscans (for video)
720x576	8, 16, 32	Overscans (for video)
800x600	8, 16, 32	
1024x768	8, 16, 32	Conexant 25871 only

**Table A.4** Mode Support for Component YPrPb Out and DVI Out

Resolution	Comments
480i (SDTV)	Supported on graphics boards with Conexant 875 or Philips 7108 TV encoders and compatible connectors, and compatible GeForce 6 Series, GeForce 7 Series, and GeForce 8 Series GPUs.
480p (EDTV)	
720p (HDTV)	
1080i (HDTV)	
576i (PAL)	
576p (PAL)	

The driver supports manual overscan correction for component and DVI outputs. See the *ForceWare Graphics Driver User's Guide* for instructions on how to use the overscan correction features in the control panel.