



Release 256 Graphics Drivers for Windows - Version 257.21

RN-W25721-01v01 | June 15, 2010

Release Notes



TABLE OF CONTENTS

1 Introduction to Release Notes	1
Structure of the Document	1
Changes in this Edition	1
2 Release 256 Driver Changes	2
Version 257.21 Highlights	3
What's New in Release 256	3
What's New in Version 257.21	5
Limitations in This Release	5
Special Instructional Notes	6
Changes in Version 257.21	7
Windows Vista/Windows 7 32-bit Issues	7
Windows Vista/Windows 7 64-bit Issues	8
Open Issues in Version 257.21	9
Windows Vista/Windows 7 32-bit Issues	9
Windows Vista/Windows 7 64-bit Issues	11
Not NVIDIA Issues	14
Windows Vista Considerations	14
Windows 7 Considerations	14
Unsupported Features	15
OpenGL Application Issues	16
Application Issues	17
Operating System Issues	22
Known Product Limitations	23
Understanding the DirectX Version Shown in the NVIDIA System Information Window	23
Using HDMI/DisplayPort Audio with Displays that have a High Native Resolution	24
Using HDMI/DisplayPort Displays that do not Support Audio	24
Using HDMI/DisplayPort Audio in Dualview or Clone Mode Configurations	25
Flat Panel Scaling Controls are Non-functional for Some TV Modes for Some Displays	25
GPU Runs at a High Performance Level (full clock speeds) in Multi-display Modes	26
GeForce GTX 295 Fan Control and NVIDIA Control Panel Performance	

TABLE OF CONTENTS

Group version 6.03.06.00.....	26
1280x1024 @ 60 Hz not Available on BenQ FP241W Monitors.....	26
Image Sharpening Control not Available with GeForce 8 Series and later GPUs.....	26
Gigabyte GA-6BX Motherboard.....	26
3 The Release 256 Driver.....	27
About the Release 256 Driver.....	27
Hardware and Software Support.....	28
Supported Operating Systems.....	28
Supported NVIDIA Desktop Products.....	29
Supported NVIDIA Notebook Products.....	33
Supported Languages.....	36
Driver Installation.....	36
Minimum Hard Disk Space.....	36
Before You Begin.....	37
Installation Instructions.....	37
Appendix A: Mode Support for Windows.....	38
General Mode Support Information.....	39
Understanding the Mode Format.....	40
GeForce 400, 300, 200, 100, 9 Series, 8 Series, 7 Series, 6 Series, and nForce 7xx/6xx GPUs.....	41
GeForce 9M, 8M, 100M, 200M and Quadro NVS and Quadro FX Notebook GPUs.....	43
Modes Supported by TV Encoders.....	45

LIST OF TABLES

Table 3.1 Supported NVIDIA Desktop GPUs	29
Table 3.2 Supported NVIDIA Notebook GPUs	33
Table 3.3 Supported NVIDIA Quadro NVS M GPUs.....	35
Table 3.4 Supported NVIDIA Quadro FX M GPUs.....	35
Table A.1 Modes Supported for High Resolution Displays	39
Table A.2 Non-standard Modes Supported	39
Table A.3 Mode Support for S-Video and Composite Out.....	45
Table A.4 Mode Support for Component YPrPb Out and DVI Out.....	45

01 INTRODUCTION TO RELEASE NOTES

This edition of *Release Notes* describes the Release 256 family of graphics drivers (versions 256.xx to 259.xx) for Microsoft® Windows® Vista/Windows 7. NVIDIA provides these notes to describe performance improvements and bug fixes in each documented version of the driver.

Structure of the Document

This document is organized in the following sections:

- ▶ [“Release 256 Driver Changes”](#) on page 2 gives a summary of changes, and fixed and open issues in this version.
- ▶ [“The Release 256 Driver”](#) on page 27 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 38 lists the default resolutions supported by the driver.

Changes in this Edition

This edition of the *Release Notes* for Windows Vista/Windows 7 includes information about NVIDIA graphics driver version 257.21, and lists changes made to the driver since the Release 197 driver versions 197.16, 197.45, and 197.75. These changes are discussed beginning with the chapter [“Release 256 Driver Changes”](#) on page 2.

02 RELEASE 256 DRIVER CHANGES

This chapter describes open issues for version 257.21, and resolved issues and driver enhancements for versions of the Release 256 driver up to version 257.21. The chapter contains these sections:

- ▶ “Version 257.21 Highlights” on page 3
- ▶ “Changes in Version 257.21” on page 7
- ▶ “Open Issues in Version 257.21” on page 9
- ▶ “Not NVIDIA Issues” on page 14
- ▶ “Known Product Limitations” on page 23

Version 257.21 Highlights

This section provides highlights of version 257.21 of the NVIDIA Release 256 Driver for Windows Vista/Windows 7.

- ▶ [What's New in Release 256](#)
- ▶ [What's New in Version 257.21](#)
- ▶ [Limitations in This Release](#)
- ▶ [Special Instructional Notes](#)

What's New in Release 256

The section summarizes the following driver changes in Release 256:

Product Support

- ▶ Added support for the following GPUs:
 - GeForce GTX 480
 - GeForce GTX 470
 - GeForce GTX 465
 - GeForce 315
 - GeForce 310
 - GeForce 9100

NVIDIA Control Panel Updates

Display Category

- ▶ **Adjust Desktop Color Settings** page
 - Added the ability to select the **content type reported to the (HDMI) display**. Some HDMI displays can automatically adjust its settings to present the content with the best image quality.
 - Gamma slider: The gamma range is increased to 0.3—2.8, but the range available to the slider may be limited, depending on the Brightness and Contrast settings.
- ▶ **Adjust Desktop Size and Position** page
 - Added the ability to select the **desktop resizing mode reported to the display**. Some HDMI displays can use the information to properly present the content onto the screen with minimal overscan or borders.

3D Settings Category

► Set SLI and PhysX pages

Changed and improved the controls for configuring SLI and PhysX:

- SLI choices now reflect use - Maximize 3D performance, activate all displays, or disable SLI.
- Visual diagram shows which displays are connected and active, how GPUs are grouped in SLI configurations, which GPU is used for PhysX, and the displays that are PhysX accelerated.
- Added the ability to dedicate a GPU for PhysX.
- The SLI focus display is the primary display as specified in the *Set Up Multiple Displays* page.

► Manage 3D Settings page

Removed the following Global and Program Settings

- Antialiasing full screen gamma
- Conformant texture clamp
- Error reporting
- (OpenGL) Extension limit
- Force Mipmaps
- HDR lighting
- Maximize texture memory
- Stereo - SLI rendering mode
- Texture color depth

Added new Global and Program Settings

- **CUDA-GPUs** lets you specify which GPUs to use for CUDA applications.
- **Deep color for 3D applications** lets 3D OpenGL applications be displayed in a color depth higher than what is supported by the Windows desktop, depending on application and display support.

OpenGL

- Added support for OpenGL 4.0 for GeForce GTX 400 series GPUs.

CUDA

- Added support for CUDA 3.1 toolkit

Notebook

- Added support for NVIDIA Optimus™ technology notebooks (Windows 7 only).

What's New in Version 257.21

- ▶ This driver package installs NVIDIA PhysX System Software v9.10.0223.
NVIDIA PhysX acceleration is available on all GeForce 8-series, 9-series, 100-series, 200-series, and 400-series GPUs with a minimum of 256MB dedicated graphics memory and a minimum of 32 processor cores.
- ▶ This driver package installs the HD audio driver, version 1.0.9.1.
- ▶ See [“Changes in Version 257.21” on page 7](#) for a list of changes and resolved issues in this driver version.

Limitations in This Release

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

- ▶ **NVIDIA Control Panel Display Category**

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

Special Instructional Notes

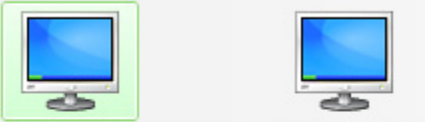
Help for Resizing Your HDTV Desktop

After resizing the HDTV desktop, the new custom resolution created is now added to the list of available resolutions for that display, and also added to the resolution list within the game or application.

In Release 190 and later drivers, the method for resizing the HDTV desktop has changed to provide better image quality when applying underscan. This method results in a new custom resolution being created which needs to be selected from games or applications to apply the resizing.

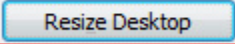
In the example displayed in the following screen shot, the underscan has created a new resolution (1216x682). Although this resolution looks different, it is still in HD format. Remember to select this resolution in your game or other application in order to take advantage of it.


1. Select the display you would like to change.



2. When the desktop is displayed on my HDTV...

To adjust the size of your desktop, click the Resize Desktop button.



 New resolution 720p, 1216 × 682 applied and added to the [Change resolution](#) screen.
Select this resolution from your application to achieve the most desired viewing



Note: Some games or applications may not support the new resolution.

Changes in Version 257.21

The following sections list the important changes and the most common issues resolved since Release 197 drivers 197.16, 197.45 and 197.75. This list is only a subset of the total number of changes made in this driver version. The NVIDIA bug number is provided for reference.

Windows Vista/Windows 7 32-bit Issues

Single GPU Issues

- ▶ 3D Vision—the 3D Vision installation screen reads "Windows Vista" when installed on a Windows 7 system. [652401]
- ▶ Half Life 2: Episode 2—the in-game brightness is greatly reduced if Enhanced or Override AA is enabled from the NVIDIA Control Panel. [429254]
- ▶ GeForce 400 Series: Aliens vs. Predator 3—frame rate sometimes drops to 4 fps when switching to windowed mode and then back to full-screen mode. [658089]
- ▶ GeForce 200 Series: Flat panel scaling options are missing with the Samsung 2233RZ LCD. [649823]
- ▶ GeForce G 102M: 32: Intermittently, the displays are blank after resuming from a lid-close triggered Standby/Hibernate state. [566852]
- ▶ GeForce 9800 GX2: Sid Meier's Railroads—the RADAR graphic becomes corrupt after changing the in-game antialiasing level while in a game. [569877]
- ▶ GeForce 9800 GTX: 576i/480i format cannot be applied to HDTV + DVI displays connected in Clone mode. [591628]
- ▶ GeForce 8800: Default custom resolutions cannot be created when using the DVI connection. [446476]
- ▶ GeForce 8M Series: The desktop cannot be resized for HD signal formats. [643580]

Multi-GPU Issues

- ▶ [SLI], GeForce GTX 295: The NVIDIA Control Panel PhysX option is disabled after installing the driver.[614202]
- ▶ [3-way SLI], GeForce GTX 280, nForce 980a/780a: Blue-screen crash occurs when attempting to rotate the display.[636099]
- ▶ [Hybrid SLI], GeForce 9400M: The Resize HDTV desktop settings are not preserved after resuming from Standby/Hibernate mode right after switching to Hybrid Save power mode. [576168] (Fixed unknown)
- ▶ [SLI], GeForce 7600 GS: Bioshock—there is horizontal corruption in the intro video while running the game with SLI enabled. [635173]

Windows Vista/Windows 7 64-bit Issues

Single GPU Issues

- ▶ GeForce 400 Series: With Dualview or Clone mode enabled and the display resolution set to 1920x1080 or 1280x730, the primary display cannot be switched. [671719]
- ▶ GeForce 200 Series: BioShock 2—there is corruption in the water scenes when the NVIDIA Control Panel antialiasing is enabled.[653694]
- ▶ GeForce 200 Series, NVIDIA Control Panel: After installing the driver, the preview animation (NVIDIA spinning logo) is missing from the Adjust Image Settings with Preview page, the screen flickers when navigating to another page, and Windows Aero cannot be enabled.[566196]

The issue does not occur after you reboot the system.

- ▶ GeForce 200 Series: When entering custom resolution values from the Manage Custom Resolutions page, the values are not validated. [524691]
- ▶ GeForce GTX 295: Settings on the "Adjust desktop color settings" page are at 0% for the secondary Clone or Dualview mode display. [514218]
- ▶ GeForce GT 230: System performance drops after switching to the "Windows Basic" theme. [597358]
- ▶ GeForce 9800 GTX: 576i/480i format cannot be applied to HDTV + DVI displays connected in Clone mode. [591628]
- ▶ GeForce 8800 GT/GTX: Default custom resolutions cannot be created when using the DVI connection. [446476]

Multi-GPU Issues

- ▶ [SLI]: Color depth switches to 8-bpp when selecting 1080p or 720p resolution for the DVI-to-HDMI connection. [650825]
- ▶ [SLI], GeForce 400 Series: Heaven Benchmark 2.0—the system hangs with a black screen with resolution set to 2560x1600. [669738]
- ▶ [SLI], GeForce 400 Series: With SLI mode enabled across GPUs and both displays set to 1920x1080 or 1280x72, the displays switch to single-display after enabling SLI mode. [663628]
- ▶ [SLI], GeForce GTX 2xx, GeForce 9600 GS: Under Dualview mode, the SLI focus display cannot be changed.[559380]
- ▶ [3-way SLI], GeForce 8 Series: Napoleon:Total War—the SLI visual indicator shows the wrong SLI AA value. [655035]

Open Issues in Version 257.21

As with every released driver, version 257.21 of the Release 256 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.

For notebook computers, many of these issues are system-specific and may not be seen on your particular notebook.

- ▶ “Windows Vista/Windows 7 32-bit Issues” on page 9
- ▶ “Windows Vista/Windows 7 64-bit Issues” on page 11

Windows Vista/Windows 7 32-bit Issues

Single GPU Issues

All GPUs

- ▶ After creating a custom resolution with refresh rate of 59 Hz, the new resolution appears in the Add Resolutions page at 60 Hz and the corresponding check box is not checked. [571459]
- ▶ Gothic 1/Gothic 2 –there is corruption and the game crashes. [621170]

GeForce 400 Series

- ▶ GeForce 400 Series: Star Trek Online–the game pauses on and off. [677159]

GeForce 200 Series

- ▶ GeForce GTX 280: Assassin's Creed (DirectX 10)–the game hangs at the main menu screen when Ambient Occlusion is activated from the NVIDIA Control Panel. [545516]

GeForce G 100M Series

- ▶ GeForce G 105M: After playing a Blu-ray disk on the external display, the display output does not switch to the internal panel after disconnecting the external display. [572547]
- ▶ GeForce G 102M: After installing the driver, with an HDMI display connected and resolution set to 1080p, the NVIDIA Control Panel Resize HDTV Desktop page is corrupted. [572622]

GeForce 9 Series

- ▶ GeForce 9800 GX2: After overinstalling the graphics driver without rebooting the system, the driver vanishes/unloads while trying to disable multi-GPU mode from the NVIDIA Control Panel. [626740]

The driver reappears after you reboot the system.

- ▶ GeForce 9600 GT: With a DVI-HDMI connection, the HD resolution [1080p, 1920x1080(native)] switches to 800x600 after clicking Resize Desktop from the NVIDIA Control Panel->Adjust desktop size and position page. [559435]

GeForce 9M Series

- ▶ GeForce 9600M GT: With Clone mode enabled and the LVDS set to “Do not scale”, the LVDS resolution cannot be changed.[469380]
- ▶ GeForce 9600M GT: HD resolutions 1080p, 1080i, and 576p cannot be applied. [616739]
- ▶ GeForce 9400M G: The settings on the “Change Flat Panel Scaling” page are not updated properly after resizing the desktop and then restoring the default settings. [510854]

GeForce 8 Series GPUs

- ▶ GeForce 8600: HD resolutions higher than 720p are not available.[308627]

GeForce 8M Series

- ▶ GeForce 8400M GS: FarCry2—with the in-game antialiasing set to 4x or higher, the screen goes black when moving the mouse to the right side of the intro video. [574515]

Quadro FX M Series

- ▶ Quadro FX 3700M: Brightness slider does not work. [687640]
- ▶ Quadro FX 3700M: Blue-screen crash occurs when hot-plugging the DisplayPort panel. [663922]
- ▶ Quadro FX 2700M:With Dualview mode enabled, video frame drops and sluggish playback occurs when playing Blu-ray discs. [653611]
- ▶ Quadro FX 1600M: With the notebook connected to a docking station, the DVI display is not detected when hot-plugged. [657660]

Multi-GPU Issues

GeForce 400 Series GPUs

- ▶ [SLI], GeForce 400 Series: Age of Conan—some objects flicker after switching modes when SLI mode is enabled. [672158]

GeForce 9 Series GPUs

- ▶ [SLI], GeForce 9800 GTX: Mass Effect—there is a band of corruption on the edge of the screen when switching from a high resolution to a lower resolution. [433929]
- ▶ [SLI], nForce 980a/780a: With two displays connected in Dualview mode, the primary and secondary displays cannot be switched a second time. [588038]
- ▶ [SLI], GeForce 9800 GX2: World in Conflict—grass textures flicker. [544657]
- ▶ [SLI], GeForce 9500 GT: With SLI enabled and two displays enabled on the primary GPU, the display output cannot be switched to a display connected to the secondary GPU. [587206]

GeForce 8M Series

- ▶ [SLI], With component connection enabled in Clone mode, there is no display on the component TV. [599855]
- ▶ [SLI], GeForce 8800M: After rolling back the driver (to 195.62), the Set SLI and PhysX configuration page is missing. [665439]
- ▶ [SLI], GeForce 8800M GTX: Far Cry 2 (DirectX 10)–sky textures show flickering corruption when changing the in-game resolution during gameplay. [492934]
- ▶ [SLI], GeForce 8800M GTX: Crysis: Warhead–the screen stutters when V-Sync is ON and the scaling option is set to “Do not scale”. [522792]

Windows Vista/Windows 7 64-bit Issues

Single GPU Issues

- ▶ Gothic 1/Gothic 2 –there is corruption and the game crashes. [621170]
- ▶ Half Life 2: Episode 2–the in-game brightness is greatly reduced if Enhanced or Override AA is enabled from the NVIDIA Control Panel. [429254]
- ▶ ION: Several DirectX games (e.g. RUSE or Assassin’s Creed) are not rendered properly when played at 1600x900 resolution. [681809]
- ▶ ION: The HDMI display turns blank after rotating the desktop. [667944]

GeForce 400 Series

- ▶ GeForce 400 Series: Arma2–there is corruption in the game, along with a drop in performance. [667575]
- ▶ GeForce 400 Series: Company of Heroes–there are thin yellow lines of corruption when played in DirectX 10 mode with Transparency AA enabled. [679697]
- ▶ GeForce 400 Series: Star Trek Online–the game pauses on and off. [677159]

GeForce 200 Series

- ▶ GeForce 210: When changing the resolution from 1920x1080 to another resolution, the video disappears from WinDVD Blu-ray disc playback. [640883]
- ▶ GeForce GTX 280: The NVIDIA Control Panel becomes unresponsive if Alt+Tab is pressed while on the 3D Vision Setup page. [591546]
- ▶ GeForce GTX 280: Assassin's Creed (DirectX 10)–the game hangs at the main menu screen when Ambient Occlusion is activated from the NVIDIA Control Panel. [545516]

GeForce 1/2/3M Series

- ▶ GeForce 210M: Multi-display configuration changes after closing and then opening the lid even when Lid Event is set to “Do nothing”. [687849]
- ▶ GeForce GT 240M: The Dualview primary display assignment is switched from the LVDS to the external HDMI after changing the display resolution. [679548]

- ▶ GeForce GTS 250M: With Dualview mode enabled and the desktop set to either portrait or portrait-flipped rotation, the primary display cannot be changed. [662136]
- ▶ GeForce G 105M: After playing a Blu-ray disk on the external display, the display output does not switch to the internal panel after disconnecting the external display. [572547]

GeForce 9 Series

- ▶ GeForce 9800 GT: Lineage 2—the game world is extremely dark. [531486]
- ▶ GeForce 9600 GT: With a DVI-HDMI connection, the HD resolution [1080p, 1920x1080(native)] switches to 800x600 after clicking Resize Desktop from the NVIDIA Control Panel->Adjust desktop size and position page. [559435]

GeForce 9M Series

- ▶ GeForce 9400M G: The settings on the “Change Flat Panel Scaling” page are not updated properly after resizing the desktop and then restoring the default settings. [510854]

GeForce 8 Series

- ▶ GeForce 8800 GTX, NVIDIA Control Panel: The user is unable to select Resize my Desktop while playing an HD DVD. [357674]

Quadro FX M Series

- ▶ Quadro FX 3700M: Brightness slider does not work. [687640]

Multi-GPU Issues

- ▶ [SLI]: The NVIDIA Control Panel takes a long time to open [673062]

GeForce 400 Series

- ▶ [SLI], GeForce 400 Series: When switching primary displays where each display is connected to a different GPU, it takes a long time for the switch to complete. [680642]
- ▶ [3-way SLI], GeForce 400 Series: The Antialiasing-Setting value in the Manage 3D Settings page erroneously switches to “Custom” after switching the SLI mode from enabled to disabled. [671842]

GeForce 200 Series

- ▶ [SLI], GeForce 200 Series: When adding a display in extended mode, it automatically becomes the primary display. [583031]
- ▶ [Quad SLI], GeForce GTX 295: Flight Simulator X—the SLI visual indicator does not appear in the game. [630328]
- ▶ [Quad-SLI], GeForce GTX 295: On a Quad-SLI system, the NVIDIA Control Panel shows an Enable Multi-GPU option instead of Enable Quad SLI. [638635]

- ▶ [Quad SLI], GeForce GTX 295: Call of Duty: Modern Warfare 2 –“Driver not responding” error occurs after switching to windowed mode and then changing the resolution with Quad SLI mode enabled. [630312]
- ▶ [3-way SLI], GeForce GTX 280: FarCry2–there are black patches of corruption with SLI enabled at 2560x1600 resolution. [535524]
- ▶ [SLI], GeForce GTX 260, nForce 790 Ultra SLI: When enabling an extended display on a different GPU than the primary display, the extended display becomes the primary display. [547403]

GeForce 9 Series

- ▶ [3-way SLI], GeForce 9800 GTX: Crysis (64-bit) (DirectX 9)– there is a lengthy pause or the system freezes when firing a weapon. [450562]
This issue does not occur with the DirectX 10 version of the game, which is the recommended version.
- ▶ [3-way SLI], GeForce 9800 GTX: World in Conflict-Soviet Assault, Lost Planet-Extreme Condition–the games flicker after switching to windowed mode. [591023]
- ▶ [SLI], GeForce 9600 GT: The display resolution switches to 800x600 from 1920x1200 after enabling SLI mode. [592469]
- ▶ [SLI], GeForce 9600 GT, GeForce 8500/8400/8300: Changes made from the Resize HDTV Settings page are not saved after enabling SLI mode. [529759]
- ▶ [SLI], GeForce 9600 GS: HDTV name on the Set up multiple displays page changes to TV after enabling SLI in single-display mode. [591498]

GeForce 8 Series

- ▶ [SLI], GeForce 8800M GTX: Multi-display mode is not preserved between users after performing a Fast User Switch. [541252]

Not NVIDIA Issues

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 Considerations” on page 14
- ▶ “Windows 7 Considerations” on page 14
- ▶ “Unsupported Features” on page 15
- ▶ “OpenGL Application Issues” on page 16
- ▶ “Application Issues” on page 17
- ▶ “Operating System Issues” on page 22

Windows Vista Considerations

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

▶ NVIDIA TurboCache

Windows Vista now controls the allocation of system memory to the GPU for TurboCache functions. The Windows Vista Display Properties pages show the shared system memory (SSM), or how much memory is allocated for NVIDIA GPUs to use for TurboCache.

For more information on graphics memory reporting under Windows Vista, visit <http://www.microsoft.com/whdc/device/display/graphicsmemory.mspx>.

Windows 7 Considerations

Hotplug Action

Unlike the hotplug activity under Windows Vista, the default settings are not applied when a new display is hotplugged, and there is no message balloon alert stating that a new display was detected. Under Windows 7, all display connection and detection events are handled through the Windows 7 Connecting and Configuring Displays (CCD) mechanism.

NVIDIA Control Panel Rotate Display Page

The rotation radio button labels are changed slightly under Windows 7 to be consistent with the Microsoft panel

Table 2.1 NVIDIA Control Panel Rotation Page Radio Buttons

Clockwise Rotation	Windows 7 Label	Windows Vista Label
0 degrees	Landscape	No rotation (Landscape)
90 degrees	Portrait	90 degrees to the right (Inverted Portrait)
180 degrees	Landscape (flipped)	180 degree rotation (Inverted landscape)
270 degrees	Portrait (flipped)	90 degrees to the left (Portrait)

Limitation

- ▶ When switching the refresh rate from 59 Hz to 60Hz, the refresh rate remains at 59 Hz.
See the Microsoft KB article KB2006076 at <http://support.microsoft.com/kb/2006076>.

Unsupported Features

The following are features and functionality that were available in driver releases supporting Windows XP, but are not—and will not be—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 System Tools software, which you can download from 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 System Tools software, which you can download from NVIDIA.com.

- ▶ **AGP Settings Adjustment**
- ▶ **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.
- ▶ **Edge Blending**
- ▶ **Run display optimization wizard**
- ▶ **Run multiple display wizard**
- ▶ **Run television setup wizard**
- ▶ **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.
- ▶ **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)
- ▶ **NVIDIA nView Desktop Manager**
The nView Desktop Manager will not be included in drivers for GeForce products.

OpenGL Application Issues

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
- ▶ **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

- ▶ GeForce 400 Series: Dirt 2—the game does not show any 3D-rendered objects when multisample antialiasing is increased to 16xCSAA or higher. [644651]
- ▶ GeForce 400 Series: Aliens vs Predator (DirectX 11)—there is ghosting in the sky textures.[660817]
- ▶ GeForce 400 Series: S.T.A.L.K.E.R Clear Sky—there is flickering in the background when Sun Shadow is enabled. [667627]
- ▶ Dirt2—distant terrain is clipped. [644821]
- ▶ Dark Void—if you experience issues playing Dark Void, NVIDIA recommends the following steps:
- a Install all game patches.

Retail box owners can get the patch here: http://download.nvidia.com/downloads/nZone/patches/DarkVoid_PhysX_Update_Patch.exe
 - b From the Windows Control Panel->Add/Remove programs, uninstall **NVIDIA Game System Software 2.8.1**.
 - c From the Windows Control Panel->Add/Remove programs, right-click **NVIDIA PhysX** and then click **Repair**.
- If you still experience problems after performing these steps, then either enable V-Sync or skip the cut-scenes by pressing [**Enter**] twice at the cut-scene.
- ▶ Operation Flashpoint:Dragon Rising—the game crashes to the desktop when it starts to load.
- This is an issue in the application—the problem does not occur if you disconnect your internet cable.*
- ▶ World of Warcraft—if you have run the 3D Vision setup wizard, then the game automatically enables 3D stereo even after you disable it.
- To work around this issue, you must uninstall the 3D Vision driver.*
- ▶ Counter Strike—the application crashes to the desktop if the resolution or bit-depth is changed from the in-game video options menu. [416582]
- This is an application issue, but the problem does not occur if you change the resolution or bit-depth from the game's main menu and not while in a game.*

- ▶ Star Wars: Knights Of The Old Republic 2—the game fails to launch, and an “application has stopped working” error message appears. [420115]
This occurs because the application is not able to interpret the driver version correctly.
- ▶ Tiger Woods PGA Tour 2007—Fly-by shot before each hole blacks-out textures. [274697]
NVIDIA is working with the developer to resolve this issue.
- ▶ City of Heroes—The mouse cursor does not display. [259256]
This is an application issue that can be worked around in full-screen mode by adding “compatible cursors 1” to the City of Heroes desktop shortcut.
NVIDIA is pursuing a fix with the application developer.
- ▶ Sims 2—“Smooth Edges (AA)” option is not available with Release 100 drivers. [272477]
This occurs because of an incorrect driver version check in the application.
NVIDIA has worked around this issue in the operating system by changing the way the driver version is reported to this application.
- ▶ Warhammer 40k Dawn of War (all versions) does not run with Release 100 drivers. [273154]
This occurs because of an incorrect driver version check in the application.
NVIDIA has worked around this issue in the operating system by changing the way the driver version is reported to this application.
- ▶ Need for Speed Carbon—After upgrading with patch 1.3, the game crashes when launched. [290506]
This is an issue with the application patch under Windows Vista.
- ▶ Nascar Simracing—the game crashes when launched. [270792]
This is an issue with the application under Windows Vista.
- ▶ Call of Duty 2—Only solid colors render during game play when 4xAA is enabled. [257454]
The application is not applying antialiasing properly. Please try selecting 2x AA, disabling antialiasing, or using NVIDIA Enhanced application or Override antialiasing modes.
NVIDIA is pursuing a fix with the application developer
- ▶ Age of Empires III—the game has rendering artifacts, such as textured squares for smoke. [258036]
- ▶ Flight Simulator X—pressing Alt+Tab to switch to the desktop does not work. [293729]
- ▶ Everquest 2— with NVIDIA driver versions 100.xx, the following error message appears: [273346]
"You currently have a (7.15.11.120) video card installed. We recommend that you download version 7772 drivers before playing Everquest."

This occurs because the application is not checking the driver version correctly, but this does not affect game play. Please select "Continue Anyway" to launch the game. The problem does not occur with a previous Release 95 driver (xx.xx format).

NVIDIA is pursuing a fix with the application developer.

- ▶ Windows Vista 64-bit, [PhysX]: TheGameCreators PhysX Screen Saver doesn't get installed properly. [491613]

This is not an NVIDIA issue, but a bug in Vista 64-bit OS that affects the installation of many screen savers. To work around, locate the corresponding.scr file for the screen saver, then right-click and select Install.

Note: *PhysXscreensaver.scr is located in \windows\SysWOW64.*

- ▶ GeForce 9800 GTX: Flight Simulator Acceleration (DirectX 10) - the sky box does not render correctly when zoomed all the way out. [436158]

This is not an NVIDIA bug, but rather an application issue.

- ▶ GeForce 9800 GTX: Flight Simulator Acceleration (DirectX 10) - there is no antialiasing preview window. [436156]

- ▶ GeForce 9800 GX2: Fury (DirectX 10)–the character names flicker. [384917]

This is not an NVIDIA bug, but rather an application issue.

- ▶ GeForce 9600 GT, GeForce 9800 GX2, GeForce 8800 GTX/Ultra/GTS/GT: Assassin's Creed: Directors Cut - the shadow flickers. [400541]

This is not an NVIDIA bug, but rather an application issue.

- ▶ GeForce 9600 GT: Crysis (DirectX 9) - there is corruption in the game. [399261]

This is not an NVIDIA bug, but rather an issue with the application issue. To avoid this issue, use the DirectX 10 option of the game.

- ▶ GeForce 8800 GTX: Tabula Rasa–there is ghosting on the game character while standing below the drop ship after enabling refraction from the game control panel. [357271]

This is not an NVIDIA bug, but rather an application issue.

- ▶ GeForce 8800 GT: Company of Heroes DirectX10 - the application crashes when MSAA is enabled. [346495]

This is a Fraps 2.9.2 issue.

- ▶ GeForce 8 Series: Quake 4–there are white flashing artifacts. [273476]

- ▶ GeForce 8800: City of Heroes–there are corrupted textures in certain missions.[290659]

This has been fixed with the latest patch for the game.

- ▶ GeForce 8800: Ghost Recon - Advanced Warfighter–the gadget side bar bleeds through on the right side of the screen during game play. [281304]

- ▶ GeForce 8800 GTX: Star Wars Battle front 2–screen corruption occurs at 2560x1600 resolution. [325457]

- ▶ GeForce 8800 GTX, GeForce 7900 GTX: Neverwinter Nights 2–the mini map loses its background when the resolution is changed. [273788]

- ▶ GeForce 8800 GTX: Civilization 4—setting in-game 16x antialiasing AA disables all antialiasing.[303283]
 - ▶ GeForce 8800 GTX: Flight Simulator—the terrain changes to low resolution when switching from Air Traffic-controlled to player-controlled airplane.[304840]
 - ▶ GeForce 8800 GTX: Scarface—corruption during the game.[290007]
 - ▶ GeForce 8800 GTX: Neverwinter Nights 2—only overlays render when switching to 2560x1600 using 8xAA. [302061, 314148]
 - ▶ GeForce 8800 GTX: Command & Conquer:Tiberium Wars—the game crashes at 2560x1600 resolution, with 8x antialiasing enabled, and when in-game settings are set to the highest levels. [308248/316633]
 - ▶ GeForce 8800 GT/GTX: Crysis (DirectX 10) - game performance drops after switching to a higher resolution and then switching back to the lower resolution. [368740]
 - ▶ GeForce 7900: Flight Simulator X – rendering becomes corrupted after pressing the Windows key. [293727 296232]
 - ▶ GeForce 7600: Rainbow Six Vegas – antialiasing is not applied when setting antialiasing override mode in the NVIDIA Control Panel. [294215]
- Antialiasing is supported in this application only on GeForce 8 series and higher GPUs.*
- ▶ GeForce 8500/8400/8300: Corruption occurs while running MicroSoft SDK Basic HLSL sample application. [302209]
 - ▶ GeForce 8500/8400/8300: Dark Messiah of Might and Magic—an application error occurs when quitting the game. [300980]
- This is an issue with the application.*
- ▶ GeForce 8500/8400/8300: Elder Scrolls IV: Oblivion—the game crashes after restoring from minimization. [296725]
 - ▶ GeForce 7900 GTX: CPU usage is extremely high during H.264 playback of Blu-ray disc, resulting in dropped frames. [304480]
 - ▶ GeForce 7300GS: Rainbow Six Vegas—the display turns black at 1600x1200 resolution.[302319]
 - ▶ GeForce 7300 GT: Far Cry—geometry is corrupted during rendering of blood.[304348]
 - ▶ GeForce 7300 GT: Company Of Heroes—the shadows are corrupt at the default game settings with SLI mode enabled. [346746]
- This is an issue with the application.*
- ▶ 322008 GeForce 8600 GT: Battlefield 2—the game crashes to desktop when set to 1900x1440 resolution 8x antialiasing.
- This problem occurs only when you have FRAPS 2.6.4 installed. It does not occur with FRAPS 2.8.2*
- ▶ 316403 GeForce 8 Series, GeForce 7 Series: NV SDK 9.5 Mandelbrot set fails to render fractal.
- This is an issue with the NV SDK and will be fixed in a newer build.*

- ▶ GeForce 8 Series: Prince of Persia—half the screen turns black and the other half turns white during resolution changes. [299484]
This is an issue with the application.
- ▶ GeForce 8800 GTX: Company of Heroes (DirectX 10)—the game crashes when the maximum settings are applied at 2560x1600 with 8xAA enabled. [321631]
This is an issue with the application.
- ▶ GeForce 7 Series: Risen [GM]—there is fog corruption. [606532]
This is an issue with the application.
- ▶ GeForce 7950 GX2: Flight SimX – water has artifacts. [292168]
- ▶ GeForce 6600: Stars Wars Battlefront2—blue-screen crash occurs when High settings are used.[302213]
- ▶ GeForce 6200: Call of Juarez—there is corruption at all resolutions. [356711]
- ▶ GeForce 6100/6150: Gothic—there is flickering with a white screen when using the default settings.[303552]
- ▶ GeForce 6200: Star Wars Empire at War—the game menu buttons are corrupt. [357713]
- ▶ GeForce 8600M GT: Warmonger 2.1—the game intermittently stops responding after changing in-game resolution. [482889]
- ▶ GeForce 8600M GT: Dead Space - a “your graphics card does not meet Dead Space minimum requirement” error message appears after launching the game. [491410]
This is a limitation of the application, and only occurs if your monitor does not support 60 Hz refresh rate.
- ▶ GeForce 8600M GT: MPEG1 and MPEG2 playback using iTunes is choppy. [537550]
The application does not use hardware acceleration.

Application Issues Under SLI Mode

- ▶ [SLI], GeForce 200 Series: BioShock 2—artifacts appear in the game when SLI mode is enabled. [653303]
This is an application multi-GPU compatibility issue.
- ▶ [SLI]: NVIDIA SLI scaling on some applications under Windows Vista may not be as much as under Windows XP. Some applications include "S.T.A.L.K.E.R., Half-Life 2: Lost Coast, Company of Heroes, Battlefield 2142, Call of Duty 2, Hitman: Blood Money, and Far Cry. [302534 290803]
This is an application issue which has been resolved with the latest Steam patch.
- ▶ [SLI], GeForce 9800 GX2: The Witcher—a blooming light shines through objects with SLI mode enabled. [396736]
This is not an NVIDIA bug, but rather an application issue.
- ▶ [Quad SLI], GeForce 9800 GX2: Test Driver Unlimited—there is pausing/hitching during the cut scene transitions. [395207]

- ▶ [SLI], GeForce 8800 GTX, GeForce 8600, GeForce 6 Series: Company of Heroes—there is corruption in the ground textures. [294118]

This is an application issue, and has been fixed with the latest patch for the game.

- ▶ [SLI], GeForce 8800 GTX: Battlefield 2 and Battlefield 2142—the games crash when exiting back to the menu after being played at 2048x1536 using 8xAA or higher. [301985]

This is an issue with the application.

- ▶ [SLI], GeForce 7900 GTX: Chess Titans—with Aero-glass enabled, there is blanking when resizing the game window. [346775]

This is an issue with the application.

- ▶ [SLI], GeForce 8800: While uninstalling driver the driver, the error message "Windows host process (Rundll32) has stopped working" appears. [294219 280920]

- ▶ [SLI], GeForce 8800: Splinter Cell Double Agent – the game crashes when minimized and then invoked again. [294205]

- ▶ [SLI], GeForce 8800: Battlefield 2142 – 8xAA cannot be set from the game control panel.[294231]

- ▶ [SLI], GeForce 7900:Microsoft Flight simulator X – corruption and flickering occur while flying close to land objects. [293882]

Operating System Issues

- ▶ Direct-X diagnostics tool (DXDIAG) may report an unexpected value for the display adapter's memory. [673360]

See the Microsoft KB article <http://support.microsoft.com/kb/2026022>.

- ▶ [SLI], GeForce 8800 GTX: While installing the graphics driver, the message "Incompatible display adapter has been disabled" appears and the display turns blank. [318173]

This issue is resolved in Windows 7.

- ▶ When S-video and DVI displays are set up in Clone mode and rotated 90 degrees, the screen turns black.[304267, 283546]

This is an issue with DirectX.

- ▶ GeForce 8300 GS: With Aero-glass enabled, the screen flickers after rotating the display 90 degrees with S-Video as the primary display. [317347]

This issue is resolved in Windows 7.

Known Product Limitations

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:

- ▶ “Understanding the DirectX Version Shown in the NVIDIA System Information Window” on page 23
- ▶ “Using HDMI/DisplayPort Audio with Displays that have a High Native Resolution” on page 24
- ▶ “Using HDMI/DisplayPort Displays that do not Support Audio” on page 24
- ▶ “Using HDMI/DisplayPort Audio in Dualview or Clone Mode Configurations” on page 25
- ▶ “Flat Panel Scaling Controls are Non-functional for Some TV Modes for Some Displays” on page 25
- ▶ “GPU Runs at a High Performance Level (full clock speeds) in Multi-display Modes” on page 26
- ▶ “GeForce GTX 295 Fan Control and NVIDIA Control Panel Performance Group version 6.03.06.00” on page 26
- ▶ “1280x1024 @ 60 Hz not Available on BenQ FP241W Monitors” on page 26
- ▶ “Image Sharpening Control not Available with GeForce 8 Series and later GPUs” on page 26
- ▶ “Gigabyte GA-6BX Motherboard” on page 26

Understanding the DirectX Version Shown in the NVIDIA System Information Window

The System Information window—accessed by clicking **System Information** at the bottom left corner of the NVIDIA Control Panel—provides technical information about the NVIDIA graphics cards and driver installed in the system.

It also provides information about the Windows version that is installed as well as the DirectX version that is supported *by the combination of the operating system and graphics driver*.

However, in order to use the version of DirectX reported in the System Information window, the NVIDIA graphics card must also support that DirectX version.

For example, driver version 197.45 and Windows Vista (with available patch) support DirectX 11. But only NVIDIA graphics cards based on the Fermi architecture released in 2010 support DirectX 11. So your system must have one of these cards installed in order to take advantage of DirectX 11 performance.

Using HDMI/DisplayPort Audio with Displays that have a High Native Resolution

To use HDMI/DisplayPort audio with some displays that have a native resolution higher than 1920x1080, you must set the display to a lower HD resolution.

Some HDMI TV's have a native resolution that exceeds the maximum supported HD mode. For example, TVs with a native resolution of 1920x1200 exceed the maximum supported HD mode of 1920x1080.

Applying this native mode results in display overscan which cannot be resized using the NVIDIA Control Panel since the mode is not an HD mode.

To avoid this situation and provide a better user experience, the driver treats certain TVs—such as the Viewsonic VX2835wm and the Westinghouse LVM- 37w3—as a DVI monitor when applying the native mode. Because the driver does not treat the TV as an HDMI in this case, the HDMI audio is not used.

Using HDMI/DisplayPort Displays that do not Support Audio

Some HDMI/DisplayPort displays do not support audio, or have issues with current NVIDIA graphics cards.

The NVIDIA driver attempts to identify such displays and automatically disables the audio. For example, the NVIDIA driver disables HDMI audio for all Philips HDMI TVs, as these have been identified as having issues with current NVIDIA graphics cards.

There may be cases where either the driver disables audio even though there is no problem, or does not disable the audio when in fact the audio does not work. The following sections describe these situations and provides guidance for handling them.

Corrupted video and no audio

The driver has not disabled audio and the display's audio signal is incompatible with the graphics card, causing video corruption.

With a different display connected in order to establish video, disable audio for the HDMI display using the NVIDIA Control Panel-> Change Resolution page. From the connector list, select **HDMI-HDTV (Audio Disabled)**.

Video but no audio

- ▶ Check the connector list on the NVIDIA Control Panel->Change Resolution page.
- ▶ If **HDMI-HDTV (Audio Disabled)** is selected and you want to test whether your HDMI audio does, in fact, work, then select **HDMI-HDTV (Audio Enabled)** and the driver will prompt you with instructions for testing HDMI audio with the display.

- ▶ If **HDMI-HDTV (Audio Enabled)** is selected, then the driver has not successfully detected that an incompatible display is connected.
Future drive versions will properly identify such displays and disable audio.
- ▶ If there is no HDMI connector option in the NVIDIA Control Panel->Change Resolution page, the display does not support audio and has properly reported this to the NVIDIA driver.

Using HDMI/DisplayPort Audio in Dualview or Clone Mode Configurations

Two Audio-enabled Ports

In a multi-display configuration where both HDMI/DisplayPort audio ports are enabled, only the primary display will provide the audio.

One Audio-enabled Port

In a multi-display configuration where only one audio port is enabled, such as when one display is a DVI display, then the HDMI/DisplayPort display can provide the audio whether is it the primary or secondary display.

Flat Panel Scaling Controls are Non-functional for Some TV Modes for Some Displays

The NVIDIA Control Panel flat panel scaling controls on the "Adjust Desktop Size & Position" page are not intended to be used for TV modes, and normally the controls are not available for TV or HDTV displays.

However, Microsoft requires that certain TV/HDTV modes be available for all digital displays, including DVI and HDMI, even if they are not HDTV.

While the NVIDIA flat panel scaling controls are available for those displays, they will not be functional for the TV modes that appear in compliance with the Microsoft requirements. The affected modes are as follows:

- ▶ 1920x1080i @50/59.94/60 Hz
- ▶ 1280x720p @50/59.94/60 Hz
- ▶ 720x480p @ 59.94/60 Hz
- ▶ 720x576p @ 50 Hz

GPU Runs at a High Performance Level (full clock speeds) in Multi-display Modes

This is a hardware limitation and not a software bug. Even when no 3D programs are running, the driver will operate the GPU at a high performance level in order to efficiently drive multiple displays. In the case of SLI or multi-GPU PCs, the second GPU will always operate with full clock speeds; again, in order to efficiently drive multiple displays. Today, all hardware from all GPU vendors have this limitation.

GeForce GTX 295 Fan Control and NVIDIA Control Panel Performance Group version 6.03.06.00

The GeForce GTX 295 fan control does not function properly when using the NVIDIA Control Panel Performance Group version 6.03.06.00. For proper fan control, use version 6.03.12.00 or later.

1280x1024 @ 60 Hz not Available on BenQ FP241W Monitors

Even though the monitor EDID lists 1280x1024 @ 60 Hz, the screen turns blank when using an HDMI connection. This is an issue with the monitor and not the NVIDIA driver.

Because of this issue with the monitor, the NVIDIA driver blocks the problem mode (1280x1024 @ 60 Hz) and makes it unavailable.

Image Sharpening Control not Available with GeForce 8 Series and later GPUs

With GeForce 8 Series 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 GeForce 8 series and later GPUs.

Gigabyte GA-6BX Motherboard

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.

03 THE RELEASE 256 DRIVER

This chapter covers the following main topics:

- ▶ “About the Release 256 Driver” on page 27
- ▶ “Hardware and Software Support” on page 28
- ▶ “Driver Installation” on page 36

About the Release 256 Driver

This driver release is from the Release 256 family of drivers (versions 256.xx to 259.xx). This driver package supports GeForce 6, 7, 8, 9, 100, 200, 300, and 400-series desktop GPUs as well as ION desktop GPUs.

The notebook driver is part of the NVIDIA Verde Notebook Driver Program, and can be installed on supported NVIDIA notebook GPUs. However, please note that your notebook original equipment manufacturer (OEM) provides certified drivers for your specific notebook on their website. NVIDIA recommends that you check with your notebook OEM about recommended software updates for your notebook. OEMs may not provide technical support for issues that arise from the use of this driver.

Hardware and Software Support

- ▶ “Supported Operating Systems” on page 28
- ▶ “Supported NVIDIA Desktop Products” on page 29
- ▶ “Supported NVIDIA Notebook Products” on page 33
- ▶ “Supported Languages” on page 36

Supported Operating Systems

The Release 256 driver, version 257.21, has been tested with

- ▶ Microsoft Windows® 7, and supports both 32-bit and 64-bit versions.
- ▶ Microsoft Windows® Vista, 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 Desktop Products

The following table lists the NVIDIA products supported by the Release 256 driver, version 257.21:

Table 3.1 Supported NVIDIA Desktop GPUs

Consumer Products
ION
ION LE
GeForce GTX 480
GeForce GTX 470
GeForce GTX 465
GeForce GTX 295
GeForce GTX 285
GeForce GTX 280
GeForce GTX 275
GeForce GTX 260
GeForce GTS 250
GeForce GTS 240
GeForce GT 340
GeForce GT 330
GeForce GT 320
GeForce GT 240
GeForce GT 220
GeForce G210
GeForce 210
GeForce 205
GeForce GT 140
GeForce GT 130
GeForce GT 120
GeForce G100
GeForce 9800 GX2
GeForce 9800 GTX+
GeForce 9800 GTX
GeForce 9800 GT
GeForce 9600 GT
GeForce 9600 GS
GeForce 9600 GSO

Table 3.1 Supported NVIDIA Desktop GPUs

Consumer Products
GeForce 9500 GT
GeForce 9500 GS
GeForce 9400 GT
GeForce 9400
GeForce 9300 GS
GeForce 9300 GE
GeForce 9300
GeForce 9200
GeForce 8800 Ultra
GeForce 8800 GTX
GeForce 8800 GTS 512
GeForce 8800 GTS
GeForce 8800 GT
GeForce 8800 GS
GeForce 8600 GTS
GeForce 8600 GT
GeForce 8600 GS
GeForce 8500 GT
GeForce 8400 GS
GeForce 8400 SE
GeForce 8400
GeForce 8300 GS
GeForce 8300
GeForce 8200
GeForce 8100 / nForce 720a
nForce 780a SLI
nForce 760i SLI
nForce 750a SLI
nForce 730a
GeForce 7950 GX2
GeForce 7950 GT
GeForce 7900 GTX
GeForce 7900 GT/GTO
GeForce 7900 GS
GeForce 7800 SLI

Table 3.1 Supported NVIDIA Desktop GPUs

Consumer Products
GeForce 7800 GTX
GeForce 7800 GT
GeForce 7800 GS
GeForce 7650 GS
GeForce 7600 GT
GeForce 7600 GS
GeForce 7600 LE
GeForce 7500 LE
GeForce 7350 LE
GeForce 7300 SE
GeForce 7300 LE
GeForce 7300 GT
GeForce 7300 GS
GeForce 7200 GS
GeForce 7100 GS
GeForce 7150 / NVIDIA nForce 630i
GeForce 7100 / NVIDIA nForce 630i
GeForce 7050 / NVIDIA nForce 620i
GeForce 7050 / NVIDIA nForce 610i
GeForce 7100 / NVIDIA nForce 620i
GeForce 7050 PV / NVIDIA nForce 630a
GeForce 7050 PV / NVIDIA nForce 630a
GeForce 7025 / NVIDIA nForce 630a
GeForce 6800 XT
GeForce 6800 XE
GeForce 6800 Ultra
GeForce 6800 Series GPU
GeForce 6800 LE
GeForce 6800 GT
GeForce 6800 GS/XT
GeForce 6800 GS
GeForce 6800
GeForce 6700 XL
GeForce 6610 XL
GeForce 6600 VE

Table 3.1 Supported NVIDIA Desktop GPUs

Consumer Products
GeForce 6600 LE
GeForce 6600 GT
GeForce 6600
GeForce 6500
GeForce 6250
GeForce 6200SE TurboCache™
GeForce 6200 TurboCache™
GeForce 6200 LE
GeForce 6200 A-LE
GeForce 6200
GeForce 6150SE nForce 430
GeForce 6150 LE
GeForce 6150
GeForce 6100 nForce 420
GeForce 6100 nForce 405
GeForce 6100 nForce 400
GeForce 6100

Supported NVIDIA Notebook Products

The following tables list the NVIDIA notebook products supported by the Release 256 driver, version 257.21:



Note:

Hybrid Power technology with Intel chipsets is not supported by this release.

Sony VAIO notebooks are not supported at this time (please contact Sony for driver support).

Table 3.2 Supported NVIDIA Notebook GPUs

Consumer Products
ION
ION LE
GeForce GTS 360M
GeForce GTS 350M
GeForce GTS 250M
GeForce GT 335M
GeForce GT 330M
GeForce GT 325M
GeForce 310M
GeForce 305M
GeForce GTX 285M
GeForce GTX 280M
GeForce GTX 260M
GeForce GT 240M
GeForce GT 230M
GeForce GT 220M
GeForce GTS 160M
GeForce GT 130M
GeForce GT 120M
GeForce G 210M
GeForce G 110M
GeForce G 107M
GeForce G 105M

Table 3.2 Supported NVIDIA Notebook GPUs

Consumer Products
GeForce G 103M
GeForce G 102M
GeForce 9800M GTX
GeForce 9800M GTS
GeForce 9800M GT
GeForce 9800M GS
GeForce 9700M GTS
GeForce 9700M GT
GeForce 9650M GT
GeForce 9650M GS
GeForce 9600M GT
GeForce 9600M GS
GeForce 9500M GS
GeForce 9500M G
GeForce 9400M G
GeForce 9400M
GeForce 9300M GS
GeForce 9300M G
GeForce 9200M GS
GeForce 9200M GE
GeForce 9100M G
GeForce 8800M GTX
GeForce 8800M GTS
GeForce 8800M GS
GeForce 8700M GT
GeForce 8600M GT
GeForce 8600M GS
GeForce 8400M GT
GeForce 8400M GS
GeForce 8400M G
GeForce 8200M G

Table 3.3 Supported NVIDIA Quadro NVS M GPUs

Consumer Products
Quadro NVS 3100M
Quadro NVS 5100M
Quadro NVS 320M
Quadro NVS 160M
Quadro NVS 150M
Quadro NVS 140M
Quadro NVS 135M
Quadro NVS 130M

Table 3.4 Supported NVIDIA Quadro FX M GPUs

Consumer Products
Quadro FX 3800M
Quadro FX 3700M
Quadro FX 3600M
Quadro FX 2800M
Quadro FX 2700M
Quadro FX 1800M
Quadro FX 1700M
Quadro FX 1600M
Quadro FX 880M
Quadro FX 770M
Quadro FX 570M
Quadro FX 380M
Quadro FX 370M
Quadro FX 360M

Supported Languages

The Release 256 Graphics 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

Minimum Hard Disk Space

The hard disk space requirement for 32-bit is minimum 150 MB for English-only, and 185 MB for International.

The hard disk space requirement for 64-bit is minimum 185 MB for English-only, and 230 MB for International.

Before You Begin

nTune

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.

Notebooks

- ▶ Check to make sure that your notebook has a supported GPU and is not listed in the exclusion list (see [“Supported NVIDIA Notebook Products” on page 33](#)).
- ▶ It is recommended that you back up your current system configuration.
- ▶ If you own a Dell Inspiron 1420, Dell XPS M1330, or Dell XPS M1530, or Dell LatitudeD630 or D630c, it is highly recommended that you first install this [Dell software update](#).

Installation Instructions

- 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.
The license agreement dialog box appears.
- 3 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.
- 4 Open the NVIDIA driver installation .EXE file to launch the NVIDIA InstallShield Wizard.
- 5 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 A MODE SUPPORT FOR WINDOWS

This chapter details the Windows modes supported by the Release 256 driver for NVIDIA products. It contains these sections:

- ▶ “General Mode Support Information” on page 39
- ▶ “Default Modes Supported by GPU” on page 40
- ▶ “Modes Supported by TV Encoders” on page 45

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 40.

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
Apple 30” Cinema HD Display (Dual link DVI)	2560x1600 @ 60 Hz
Dell WFP 3007 (Dual Link DVI)	2560x1600 @ 60 Hz
HP LP3065 dual-link DVI flat panel	2560x1600 @ 60Hz.

Table A.2 Non-standard Modes Supported

Resolution		
1680 x 1050		
1366 x 768		

Default Modes Supported by GPU

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

- ▶ “GeForce 400, 300, 200, 100, 9 Series, 8 Series, 7 Series, 6 Series, and nForce 7xx/6xx GPUs” on page 41
- ▶ “GeForce 9M, 8M, 100M, 200M and Quadro NVS and Quadro FX Notebook GPUs” on page 43

Understanding the Mode Format

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

Resolution	Color Depth	Refresh Rates
1024 x 768	32	60 70 72 75 85 100 120 140 144 150 170 200

Example entry:

Meaning:

Resolution:	1024 x 768
Color depth:	32 bpp
Refresh rates:	60 Hz, 70 Hz, 72 Hz, 75 Hz, 85 Hz, 100 Hz, 120 Hz, 140 Hz, 144 Hz, 150 Hz, 170 Hz, and 200 Hz

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.

GeForce 400, 300, 200, 100, 9 Series, 8 Series, 7 Series, 6 Series, and nForce 7xx/6xx GPUs

This sections lists the supported display resolutions, color depths, and refresh rates for the the products listed in [“Supported NVIDIA Desktop Products”](#) on page 29.

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
800 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
1280 x 768	8	60 70 72 75 85 100 120 140 144 150 170
1280 x 800	8	60 70 72 75 85 100 120 140 144 150 170
1280 x 960	8	60 70 72 75 85 100 120 140 144 150 170
1280 x 1024	8	60 70 72 75 85 100 120 140 144 150 170
1360 x 768	8	60 70 72 75 85 100 120 140 144 150 170
1600 x 900	8	60 70 72 75 85 100 120 140 144 150
1600 x 1024	8	60 70 72 75 85 100 120
1600 x 1200	8	60 70 72 75 85 100 120
1680 x 1050	8	60
1920 x 1080	8	60
1920 x 1200	8	60 70 72 75 85 100
1920 x 1440	8	60 70 72 75 85
2048 x 1536	8	60

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
800 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
1280 x 768	16	60 70 72 75 85 100 120 140 144 150 170
1280 x 800	16	60 70 72 75 85 100 120 140 144 150 170
1280 x 960	16	60 70 72 75 85 100 120 140 144 150 170
1280 x 1024	16	60 70 72 75 85 100 120 140 144 150 170
1360 x 768	16	60 70 72 75 85 100 120 140 144 150 170
1600 x 900	16	60 70 72 75 85 100 120 140 144 150
1600 x 1024	16	60 70 72 75 85 100 120
1600 x 1200	16	60 70 72 75 85 100 120
1680 x 1050	16	60
1920 x 1080	16	60

1920 x 1200	16		60 70 72 75 85 100
1920 x 1440	16		60 70 72 75 85
2048 x 1536	16		60

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	
800 x 600	32		60 70 72 75 85 100 120 140 144 150 170 200 240
1024 x 768	32		60 70 72 75 85 100 120 140 144 150 170 200 240
1152 x 864	32		60 70 72 75 85 100 120 140 144 150 170 200
1280 x 720	32		60
1280 x 768	32		60 70 72 75 85 100 120 140 144 150 170
1280 x 800	32		60 70 72 75 85 100 120 140 144 150 170
1280 x 960	32		60 70 72 75 85 100 120 140 144 150 170
1280 x 1024	32		60 70 72 75 85 100 120 140 144 150 170
1360 x 768	32		60 70 72 75 85 100 120 140 144 150 170
1600 x 900	32		60 70 72 75 85 100 120 140 144 150
1600 x 1024	32		60 70 72 75 85 100 120
1600 x 1200	32		60 70 72 75 85 100 120
1680 x 1050	32		60
1920 x 1080	32		60
1920 x 1200	32		60 70 72 75 85 100
1920 x 1440	32		60 70 72 75 85
2048 x 1536	32		60

GeForce 9M, 8M, 100M, 200M and Quadro NVS and Quadro FX Notebook GPUs

This section lists the supported display resolutions, color depths, and refresh rates for the products listed in “Supported NVIDIA Notebook Products” on page 33.

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
800 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
1280 x 768	8	60 70 72 75 85 100 120 140 144 150 170
1280 x 800	8	60 70 72 75 85 100 120 140 144 150 170
1280 x 960	8	60 70 72 75 85 100 120 140 144 150 170
1280 x 1024	8	60 70 72 75 85 100 120 140 144 150 170
1360 x 768	8	60 70 72 75 85 100 120 140 144 150 170
1600 x 900	8	60 70 72 75 85 100 120 140 144 150
1600 x 1024	8	60 70 72 75 85 100 120
1600 x 1200	8	60 70 72 75 85 100 120
1680 x 1050	8	60
1920 x 1080	8	60
1920 x 1200	8	60 70 72 75 85 100
1920 x 1440	8	60 70 72 75 85
2048 x 1536	8	60

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
800 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
1280 x 768	16	60 70 72 75 85 100 120 140 144 150 170
1280 x 800	16	60 70 72 75 85 100 120 140 144 150 170
1280 x 960	16	60 70 72 75 85 100 120 140 144 150 170
1280 x 1024	16	60 70 72 75 85 100 120 140 144 150 170
1360 x 768	16	60 70 72 75 85 100 120 140 144 150 170
1600 x 900	16	60 70 72 75 85 100 120 140 144 150
1600 x 1024	16	60 70 72 75 85 100 120
1600 x 1200	16	60 70 72 75 85 100 120
1680 x 1050	16	60
1920 x 1080	16	60

1920 x 1200	16	60 70 72 75 85 100
1920 x 1440	16	60 70 72 75 85
2048 x 1536	16	60

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
800 x 600	32	60 70 72 75 85 100 120 140 144 150 170 200 240
1024 x 768	32	60 70 72 75 85 100 120 140 144 150 170 200 240
1152 x 864	32	60 70 72 75 85 100 120 140 144 150 170 200
1280 x 720	32	60
1280 x 768	32	60 70 72 75 85 100 120 140 144 150 170
1280 x 800	32	60 70 72 75 85 100 120 140 144 150 170
1280 x 960	32	60 70 72 75 85 100 120 140 144 150 170
1280 x 1024	32	60 70 72 75 85 100 120 140 144 150 170
1360 x 768	32	60 70 72 75 85 100 120 140 144 150 170
1600 x 900	32	60 70 72 75 85 100 120 140 144 150
1600 x 1024	32	60 70 72 75 85 100 120
1600 x 1200	32	60 70 72 75 85 100 120
1680 x 1050	32	60
1920 x 1080	32	60
1920 x 1200	32	60 70 72 75 85 100
1920 x 1440	32	60 70 72 75 85
2048 x 1536	32	60

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
800 x 600	64	60 70 72 75 85 100 120 140 144 150 170 200 240
1024 x 768	64	60 70 72 75 85 100 120 140 144 150 170 200 240
1152 x 864	64	60 70 72 75 85 100 120 140 144 150 170 200
1280 x 720	64	60
1280 x 768	64	60 70 72 75 85 100 120 140 144 150 170
1280 x 800	64	60 70 72 75 85 100 120 140 144 150 170
1280 x 960	64	60 70 72 75 85 100 120 140 144 150 170
1280 x 1024	64	60 70 72 75 85 100 120 140 144 150 170
1360 x 768	64	60 70 72 75 85 100 120 140 144 150 170
1600 x 900	64	60 70 72 75 85 100 120 140 144 150
1600 x 1024	64	60 70 72 75 85 100 120
1600 x 1200	64	60 70 72 75 85 100 120
1680 x 1050	64	60
1920 x 1080	64	60
1920 x 1200	64	60 70 72 75 85 100
1920 x 1440	64	60 70 72 75 85
2048 x 1536	64	60

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 8 Series and later GPUs.
480p (EDTV)	
720p (HDTV)	
1080i (HDTV)	
576i (PAL)	
576p (PAL)	

The driver supports manual overscan correction for component and DVI outputs. See the online NVIDIA Control Panel Help for instructions on how to use the overscan correction features.

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 NONINFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE.

Information furnished is believed to be accurate and reliable. However, NVIDIA Corporation assumes no responsibility for the consequences of use of such information or for any infringement of patents or other rights of third parties that may result from its use. No license is granted by implication of otherwise under any patent rights of NVIDIA Corporation. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all other information previously supplied. NVIDIA Corporation products are not authorized as critical components in life support devices or systems without express written approval of NVIDIA Corporation.

HDMI

HDMI, the HDMI logo, and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC.

Macrovision Compliance Statement

NVIDIA Products that are Macrovision enabled can only be sold or distributed to buyers with a valid and existing authorization from Macrovision to purchase and incorporate the device into buyer's products.

Macrovision copy protection technology is protected by U.S. patent numbers 5,583,936; 6,516,132; 6,836,549; and 7,050,698 and other intellectual property rights. The use of Macrovision's copy protection technology in the device must be authorized by Macrovision and is intended for home and other limited pay-per-view uses only, unless otherwise authorized in writing by Macrovision. Reverse engineering or disassembly is prohibited.

OpenCL Notice

Portions of the NVIDIA system software contain components licensed from third parties under the following terms:

Clang & LLVM:

Copyright (c) 2003-2008 University of Illinois at Urbana-Champaign.

All rights reserved.

Portions of LLVM's System library:

Copyright (C) 2004 eXtensible Systems, Inc.

Developed by:

LLVM Team

University of Illinois at Urbana-Champaign

<http://llvm.org>

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal with the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimers.

Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimers in the documentation and/or other materials provided with the distribution.

Neither the names of the LLVM Team, University of Illinois at Urbana-Champaign, nor the names of its contributors may be used to endorse or promote products derived from this Software without specific prior written permission.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE CONTRIBUTORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS WITH THE SOFTWARE.

Trademarks

NVIDIA, the NVIDIA logo, NVIDIA nForce, GeForce, NVIDIA Quadro, NVDDVD, NVIDIA Personal Cinema, NVIDIA Soundstorm, Vanta, TNT2, TNT, RIVA, RIVA TNT, VOODOO, VOODOO GRAPHICS, WAVEBAY, Accuview Antialiasing, Detonator, Digital Vibrance Control, ForceWare, NVRotate, NVSensor, NVSync, PowerMizer, Quincunx Antialiasing, Sceneshare, See What You've Been Missing, StreamThru, SuperStability, T-BUFFER, The Way It's Meant to be Played Logo, TwinBank, TwinView and the Video & Nth Superscript Design Logo are registered trademarks or trademarks of NVIDIA Corporation in the United States and/or other countries. Other company and product names may be trademarks or registered trademarks of the respective owners with which they are associated.

Copyright

© 2009, 2010 NVIDIA Corporation. All rights reserved.