



# Release 310 Graphics Drivers for Windows - Version 310.70

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Windows Vista / Windows 7 / Windows 8

## Release Notes



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# 01 INTRODUCTION TO RELEASE NOTES

This edition of *Release Notes* describes the Release 310 family of graphics drivers (versions 310.xx to 312.xx) for Microsoft® Windows® Vista/Windows 7/Windows 8. 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 310 Driver Changes”](#) on page 2 gives a summary of changes, and fixed and open issues in this version.
- ▶ [“The Release 310 Driver”](#) on page 38 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 51 lists the default resolutions supported by the driver.

## Changes in this Edition

This edition of the *Release Notes* for Windows Vista/Windows 7/Windows 8 includes information about NVIDIA graphics driver version 310.70, and lists changes made to the driver since the Release 304 driver version 306.97. These changes are discussed beginning with the chapter [“Release 310 Driver Changes”](#) on page 2.

## 02 RELEASE 310 DRIVER CHANGES

This chapter describes open issues for version 310.70, and resolved issues and driver enhancements for versions of the Release 310 driver up to version 310.70.

The chapter contains these sections:

- ▶ “Version 310.70 Highlights” on page 2’
- ▶ “Changes and Fixed Issues in Version 310.70” on page 10
- ▶ “Changes and Fixed Issues in Version 310.54” on page 11
- ▶ “Changes and Fixed Issues in Version 310.33” on page 12
- ▶ “Open Issues in Version 310.70” on page 13
- ▶ “Not NVIDIA Issues” on page 18
- ▶ “Known Product Limitations” on page 27

### Version 310.70 Highlights

This section provides highlights of version 310.70 of the NVIDIA Release 310 Driver for Windows Vista/Windows 7/Windows 8.

- ▶ What’s New in Version 310.70
- ▶ What’s New in Release 310
- ▶ Limitations in This Release
- ▶ Advanced Driver Information

## What's New in Version 310.70

See also [“What's New in Release 310”](#) on page 4.

### Game Highlights

- ▶ Improves performance in *Far Cry 3* by up to 38%.
- ▶ Previously released R310 driver optimizations:
  - Up to 26% faster performance in *Call of Duty: Black Ops 2*
  - Up to 18% faster performance in *Assassin's Creed III*.
  - Smooth, shimmer-free graphics with NVIDIA TXAA antialiasing in *Call of Duty: Black Ops 2* and *Assassin's Creed III*.
  - Up to 16% improved performance in other top games like *Battlefield 3*, *The Elder Scrolls V: Skyrim*, and *StarCraft II*.

### NVIDIA PhysX System Software

- ▶ This driver package installs NVIDIA PhysX System Software v9.12.1031.

This version fixes a bug that caused some applications, including *Unreal Tournament III*, *Trine*, and *Metro 2033*, not to launch.

NVIDIA GPU PhysX acceleration is available only on systems with GeForce 8-series and later GPUs with a minimum of 256MB dedicated graphics memory.

NVIDIA GPU PhysX acceleration is not available if there is a non-NVIDIA graphics processor in the system, even if it is not used for rendering.

### HD Audio Driver

This driver package installs the HD audio driver, version 1.3.18.0.

### NVIDIA SLI Technology

- ▶ Added or updated the following SLI profiles:
  - *Far Cry 3 - updated SLI profile*
  - *Call of Duty: Black Ops 2 - updated SLI profile*

### Fixed Issues

- ▶ See [“Changes and Fixed Issues in Version 310.70”](#) on page 10 for a list of other changes and resolved issues in this driver version.



## What's New in Release 310

The section summarizes the driver changes in Release 310:

### Stereoscopic 3D

#### ► **Windowed 3D Stereo**

Added support for windowed 3D stereo for all DirectX 9 games, Silverlight streaming, YouTube 3D, NVIDIA Photoviewer, NVIDIA Video Player, and 3D Blu-ray applications. *Windows 8 only*

#### ► **HDMI Checkerboard**

Added **HDMI Checkerboard** to the list of Stereoscopic 3D display types for users who want to see stereoscopic 3D using checkerboard 3D format.

### NVIDIA Control Panel

#### ► **Framebuffer Bandwidth Reporting**

The System Information dialog in the NVIDIA Control Panel now reports the framebuffer bandwidth for NVIDIA GPUs. *Windows Vista and later*

### OpenGL®

► Added support for OpenGL 4.3 for GeForce 400-series and later GPUs.

### NVIDIA CUDA

Includes support for applications built using CUDA 5 or earlier versions of the CUDA Toolkit. For more information, visit <http://developer.nvidia.com/cuda-toolkit>.

### Performance Boost

Increases performance for GeForce 400/500/600 Series GPUs in several PC games when compared to the GeForce 306.97 drivers.

### Power Efficiency Optimizations

Release 310 drivers introduce power-optimizing enhancements. As a result of these enhancements, you may notice that GPU core clock speeds are different with this driver. For example, the GPU core clock might be faster when the GPU is in idle mode than in previous drivers. Or you may notice higher GPU core clock speeds after closing or opening certain games than in previous drivers.

This is because the reported GPU core clock frequency is no longer correlated to GPU power-saving states. Instead of lowering the GPU core clock frequency, the hardware and software use other methods to put the GPU into a low power state when the GPU is

idle or in response to changing application requirements. This ensures optimum power use while continuing to provide high graphics performance.

## NVIDIA SLI Technology

► Added or updated the following SLI profiles:

- Far Cry 3 - *updated SLI profile*
- Call of Duty: Black Ops 2 - *updated SLI profile*
- Dirt: Showdown - *updated SLI profile*
- Dota 2 - *updated SLI profile*
- Dou Zhan Shen - *updated SLI profile*
- F1 2012 - *added SLI profile*
- FIFA 13 - *added SLI profile*
- Red Orchestra 2: Heroes of Stalingrad - *updated SLI profile*
- Hawken - *added SLI profile*
- Hitman: Absolution - *added SLI profile*
- Natural Selection 2 - *added SLI profile*
- Primal Carnage - *added SLI profile*

## NVIDIA 3D Vision

► Added or updated the following 3D Vision profiles:

- 007 Legends - *rated Fair*
- Assassin's Creed III - *rated Not Recommended*
- Bloody Good Time - *rated Good*
- Bullet Run - *rated Fair*
- Bunch of Heroes - *rated Good*
- CABAL2 - *rated Good*
- Call of Duty Black Ops 2 - *rated Good*
- Carrier Command: Gaea Mission - *rated 3D Vision Ready*
- Dark Souls - *rated Fair*
- Dishonored - *rated Fair*
- Euro Truck Simulator 2 - *rated Excellent*
- FIFA 13 - *rated Good*
- Hawken - *rated 3D Vision Ready*

- Hitman: Absolution - *rated Fair*
- I Am Alive - *rated Fair*
- Lucius - *rated Fair*
- Mabinogi Heroes - *rated Fair*
- Medal of Honor: Warfighter - *rated Fair*
- Metro: Last Light - *rated Good*
- MLB 2K12 - *rated Fair*
- NBA 2K12 - *rated Good*
- NBA 2K13 - *rated Good*
- Need for Speed: Most Wanted - *rated Fair*
- Of Orcs and Men - *rated Fair*
- Painkiller: Hell & Damnation - *rated Fair*
- Planetside 2 - *rated Not Recommended*
- Prepar3D - *rated Good*
- Sniper Elite V2 - *rated Poor*
- Sniper: Ghost Warrior 2 - *rated Poor*
- The Amazing Spider-Man rated - *Not Recommended*
- Tiny Troopers - *rated Fair*
- Tony Hawk's Pro Skater HD - *rated Good*
- Total War Battles: SHOGUN - *rated Good*
- Unmechanical - *rated Good*
- War of the Roses - *rated Fair*
- World Rally Championship 3 - *rated Good*

## Other Profile Updates

- Updated NVIDIA Control Panel ambient occlusion support for *Counter-strike: Global Offensive*
- Added NVIDIA Control Panel ambient occlusion support for *Cross Fire*
- Updated NVIDIA Control Panel ambient occlusion support for *Darksides 2*
- Added NVIDIA Control Panel ambient occlusion support for *Dragon Nest*
- Updated NVIDIA Control Panel ambient occlusion support for *Guild Wars 2*
- Updated NVIDIA Control Panel ambient occlusion support for *Mechwarrrior Online*
- Added NVIDIA Control Panel ambient occlusion support for *Meng San Guo*

## NVIDIA SSAA

- ▶ Added negative LOD adjustments for NVIDIA's full-screen sparse grid supersampling mode to improve image sharpness.

## Limitations in This Release

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

- ▶ **Surround Gaming with 3-way SLI**

Surround gaming is not supported on a 3-way SLI system using GeForce GTX 200 series GPUs. [681228/683943]

- ▶ **NVIDIA Control Panel Display Category**

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

- ▶ **Negative LOD Bias Clamp**

Negative LOD bias clamp for DirectX applications is not supported on Fermi-based GPUs and later.

- ▶ **Hybrid Power**

Support for Hybrid Power, a Hybrid SLI technology, is discontinued and not available with this driver.

- ▶ **Legacy Support for GeForce 6-series and GeForce 7-series GPUs**

GeForce 6-series and GeForce 7-series GPUs have moved to legacy support with the GeForce Release 304 drivers. These products are no longer supported beginning with the GeForce Release 310 drivers.

- ▶ **3D Vision Legacy Support Notification for Windows Vista**

Support for 3D Vision under Windows Vista will be discontinued beginning with the Release 313 drivers (after Release 310). 3D Vision and 3DTV Play functionality will not be available with these drivers.

NVIDIA will continue to support basic 3D Vision and 3DTV Play functionality for Windows Vista with Release 310 or earlier drivers. Basic functionality includes full-screen viewing of 3D games, pictures, and movies on 3D Vision monitors, notebooks, and 3D TVs (with 3DTV Play software installed).

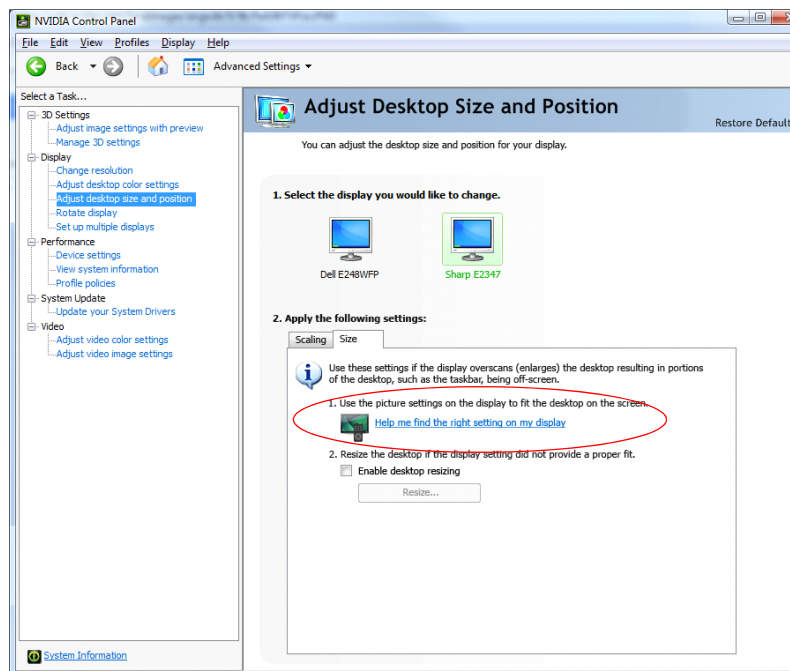
## Advanced Driver Information

This section contains the following additional information about the driver:

- ▶ [Help for Resizing Your HDTV Desktop](#)
- ▶ [Dynamic GPU Performance Mode](#)
- ▶ [Power Efficiency Optimizations](#)

### Help for Resizing Your HDTV Desktop

The best way to resize the screen in order to view the entire content is to use the controls provided by the display hardware. Click the link on the Size tab to view a guide to changing the settings on your display hardware.

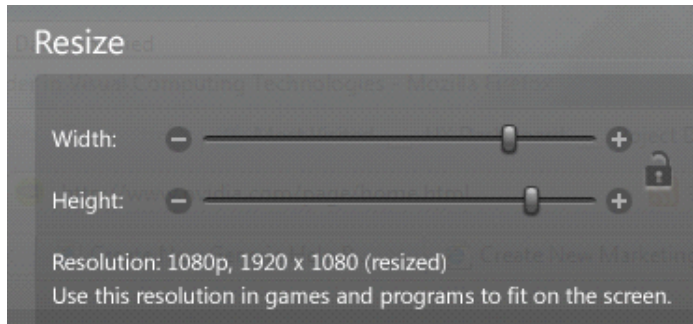


The resize controls on the NVIDIA Control Panel are provided in case satisfactory results cannot be achieved using the controls on the display.

After resizing the HDTV desktop using the NVIDIA Control Panel Resize controls, 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.



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

## Dynamic GPU Performance Mode

With the Release 280 drivers, NVIDIA GPU clock speeds will increase more quickly in response to increased graphics demands. Conversely, with lower graphics use the GPU clock speed slows down more quickly, conserving as much power as possible.

In the Release 280 drivers, some users reported a noticeable fluctuation in clock speeds while engaging in various tasks on the PC. With the Release 285 and later drivers, adjustments have been made to reduce the sensitivity to levels similar to the R275 driver.

## Power Efficiency Optimizations

Release 310 drivers introduce power-optimizing enhancements. As a result of these enhancements, you may notice that GPU core clock speeds are different with this driver. For example, the GPU core clock might be faster when the GPU is in idle mode than in previous drivers. Or you may notice higher GPU core clock speeds after closing or opening certain games than in previous drivers.

This is because the reported GPU core clock frequency is no longer correlated to GPU power-saving states. Instead of lowering the GPU core clock frequency, the hardware and software use other methods to put the GPU into a low power state when the GPU is idle or in response to changing application requirements. This ensures optimum power use while continuing to provide high graphics performance.

## Changes and Fixed Issues in Version 310.70

The following sections list the important changes and the most common issues resolved since version 310.64. 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

- ▶ [Assassin's Creed 3]: Shadows flicker in the game. [1179668]
- ▶ [GeForce 500/600 series][Battlefield 3 Multiplayer]: The game may crash to the desktop with the message "bf3.exe stopped working". [1175853]
- ▶ [GeForce GTX 570/580][Call of Duty: Black Ops 2]: "Driver Not Responding" error occurs in the second half of the first level of the game, when the gamer's helicopter is shot by a rocket. [1175576]
- ▶ [GeForce GTX 650 Ti][Hitman: Absolution]: "Driver Not Responding" error may occur after a few minutes of game play when Global Illumination and Tessellation game settings are set to ON. [1171386]
- ▶ [GeForce GTX 680][Final Fantasy XIV Online]: The game crashes with a message that the DirectX device was lost. [964641]
- ▶ [Quad SLI][Surround][GeForce GTX 690]: The system locks up when playing games in Surround mode. [1166919]
- ▶ [SLI][Far Cry 3]: EXE names for Far Cry 3 need to be updated in the NVIDIA profiles. [1184031]

### Windows 8

- ▶ [SLI][Far Cry 3]: EXE names for Far Cry 3 need to be updated in the NVIDIA profiles. [1184031]

## Changes and Fixed Issues in Version 310.54

The following sections list the important changes and the most common issues resolved since version 310.33. 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

- ▶ [3DTV Play]: Added support for the following displays:
  - Samsung UN46ES8000
  - Acer LG 42LM6700 TV
  - Acer H6510BD
- ▶ [GeForce GT 320M]: F1 and F2 brightness keys do not have any effect on the screen brightness. [1168492]
- ▶ [Quad SLI][Surround][GeForce GTX 690]: The system locks up when playing games in Surround mode. [1166919]

### Windows 8

- ▶ [GeForce 540M]: Blue-screen crash occurs after installing the driver. [1169185]



## Changes and Fixed Issues in Version 310.33

The following sections list the important changes and the most common issues resolved since version 306.97. 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

- ▶ [Diablo III]: There is no antialiasing in the game when the NVIDIA Control Panel ->Manage 3D Settings->Override Antialiasing setting is applied. [1021147]
- ▶ [3DTV Play]: Added support for the Sony VPL-VW95ES Projector. [1047344]
- ▶ [3DVision]: "Hardware Test Failed" error appears when running the 3D Vision Setup Wizard on Mitsubishi WD-60C9. [950725]
- ▶ [GeForce GTX 600M series][Optimus notebook][BioShock 2]: The game fails to start when set to run on the NVIDIA GPU. [1028527]
- ▶ [SLI][GeForce 600 series]: There is green overlay flickering when playing flash videos. [1040984]
- ▶ [Quad-SLI][Surround][GeForce GTX 690][World of Warcraft]: While in Surround mode, the game performance under Quad-SLI is lower than the performance under 2-way SLI. [1045799]
- ▶ [Quad-SLI][GeForce GTX 690][Crysis 2, Battlefield 3]: Game performance drops with R304 drivers compared to R302 drivers. [1046612]

### Windows 8

- ▶ When installing the driver on pre-release versions of Windows 8, the installer will request a reboot to complete the installation. [992553]
 

*This was not an NVIDIA driver issue, but rather an interim workaround under pre-released versions of Windows 8 to verify successful installation of the driver without the end user being logged out in certain scenarios.*
- ▶ [3DVision]: "Hardware Test Failed" error appears when running the 3D Vision Setup Wizard on Mitsubishi WD-60C9. [950725]

## Open Issues in Version 310.70

As with every released driver, version 310.70 of the Release 310 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, issues can be system-specific and may not be seen on your particular notebook.*

- ▶ “Windows Vista/Windows 7 32-bit Issues” on page 13
- ▶ “Windows Vista/Windows 7 64-bit Issues” on page 14
- ▶ “Windows 8 32-bit Issues” on page 16
- ▶ “Windows 8 64-bit Issues” on page 16

## Windows Vista/Windows 7 32-bit Issues

### Single GPU Issues

- ▶ [PhysX]: After installing the driver, occasionally the PhysX processor selection in the NVIDIA Control Panel is set to **CPU** instead of **AutoSelect (Recommended)**, resulting in PhysX games running slowly. [1049752]  
*To correct this, set the PhysX processor to **Auto Select (Recommended)**.*
- ▶ [Video][Notebook] [Internet Explorer][Stage Video]: Stage Video picture-in-picture content cannot be played within Internet Explorer. [999929]

### GeForce 500 Series

- ▶ [GeForce 500 series] [Need for Speed: The Run]: During the race the sun flickers and there are bright blips and black patches. [909577]
- ▶ [GeForce 500 Series]: Metro 2033–light bloom increases and decreases throughout the game at light sources such as bulbs, lanterns, or fire. [846214]

### GeForce 200 Series GPUs

- ▶ GeForce 200/200M series (notebook and desktop): DVD playback flickers and is not in stereoscopic 3D when using the NVIDIA 3D Vision player. [862445]

### GeForce 8 Series GPUs

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

### Multi-GPU Issues

- ▶ [Quad SLI] [GeForce GTX 295]: “SLI connector is missing” balloon pops up even if the SLI bridge connector is attached.[919269]

- ▶ [SLI], GeForce GTX 200M series: When one of the GPUs is dedicated to PhysX, the NVIDIA Control Panel still indicates that SLI is enabled. [890342]

## Windows Vista/Windows 7 64-bit Issues

### Single GPU Issues

- ▶ [Guild Wars 2]: Ambient Occlusion effect disappears at different camera angles and when using supersampling. [1023202]
- ▶ [Guild Wars 2]: Corruption is seen when launching the game with Ambient Occlusion enabled. [1169563]
- ▶ [PhysX]: After installing the driver, occasionally the PhysX processor selection in the NVIDIA Control Panel is set to **CPU** instead of **AutoSelect (Recommended)**, resulting in PhysX games running slowly. [1049752]

*To correct this, set the PhysX processor to **Auto Select (Recommended)**.*

### GeForce 600 Series

- ▶ [GeForce GTX 690][Hitman: Absolution]: The game crashes. [1179319]

### GeForce 500 Series

- ▶ [GeForce 500 series] [Stereoscopic 3D][Two World 2]: The application crashes when switching to windowed mode with stereoscopic 3D enabled. [909749]
- ▶ [GeForce 500 series] [Need for Speed: The Run]: During the race the sun flickers and there are bright blips and black patches. [909577]
- ▶ GeForce 500M series (Notebook), 3D Vision: Battlefield-Bad Company 2—when played with stereoscopic 3D enabled, there is a drop in performance going from full-screen to windowed mode. [880762]
- ▶ GeForce 500 series: Deus Ex: Human Revolution—some objects have a grainy texture when in-game antialiasing is set to MLLAA. [861713]
- ▶ GeForce 500 series: Deus Ex—there is corruption on the ground in later levels of the game. [871486]
- ▶ GeForce 500 Series: Metro 2033—light bloom increases and decreases throughout the game at light sources such as bulbs, lanterns, or fire. [846214]
- ▶ GeForce GTX 580: HAWX—during the game, an outline of an air plane appears in the upper left corner of the screen after pressing Alt+Tab. [746186]
- ▶ GeForce 400 series: Total War: Shogun 2 —the sun and surrounding area within the game flickers. [807036]

### GeForce 200 Series

- ▶ GeForce 200/200M series (notebook and desktop): DVD playback flickers and is not in stereoscopic 3D when using the NVIDIA 3D Vision player. [862445]

### GeForce 8/9 Series

- ▶ [GeForce 9800 GTX] [Battlefield 3]: With ambient occlusion set to SSAO and Deferred AA set to 2x or 4x AA in the in-game settings, there is grayish-black textured shadow corruption in the game. [919427]

### NVS Series

- ▶ NVS 4200M, Optimus: F1 2011—the game hangs while selecting "Quit To Main Menu" during gameplay. [879537]

### Multi-GPU Issues

- ▶ [SLI], [Company of Heroes: Tales of Valor]: With SLI enabled, there is heavy flickering in the game after switching from windowed mode to full-screen mode. [892264]
- ▶ [3D Surround, SLI][Far Cry 2 DirectX 10]: The ambient occlusion effect is misplaced in the game when in-game antialiasing is set to 4x or higher and ambient occlusion, stereoscopic 3D and Surround are enabled from the NVIDIA Control Panel. [986112]

### GeForce 500 Series

- ▶ [SLI] [GeForce 500 series]: With SLI enabled, the secondary Dualview display may go blank after hot-plugging the DisplayPort monitor and then rebooting the system. [906810]
- ▶ [3D Surround, SLI], GeForce 500 Series: With Surround enabled, all displays may not be activated when selecting **Activate All Displays** from the NVIDIA Control Panel->*Set SLI Configuration* page. [905544]

*To work around, activate the desired displays using the NVIDIA Control Panel->Set Up Multiple Displays page.*

- ▶ [3D Surround], 3xGeForce 500/400 Series: When sending output to a fourth display outside of the GPU Surround group, the Surround resolution (3-wide) switches to a non-Surround resolution (single display). [736859]
- ▶ [SLI], GeForce 500 Series: Dragon Age II (DirectX 11)—shadows flicker in the cutscene when SLI is enabled. [849235]
- ▶ [SLI], GeForce GTX 580: Call of Duty: Black Ops—with SLI and AA enabled, high frequency flickering occurs when viewing the in-game sun. [760596]

### GeForce 400 Series

- ▶ [SLI] [3D Vision] [GeForce 400M series, notebook] [Civilization V- DirectX 11]: With SLI enabled, the 3D Vision left eye goes blank when running the game in DirectX 11 mode. [956630]
- ▶ [SLI], GeForce 400 series, Surround gaming: Dragon Age Origins—the game does not render single monitor resolutions correctly when Surround gaming is enabled. [663802]

## GeForce 200 Series

- ▶ [Quad SLI] [GeForce GTX 295]: "SLI connector is missing" balloon pops up even if the SLI bridge connector is attached. [919269]
- ▶ [Quad SLI/Multi-GPU], [GeForce 200 series] [Batman: Arkham City DirectX 9]: Game performance drops when Quad-SLI or Multi-GPU mode is enabled. [891613/966120]
- ▶ [SLI], [GeForce 200 series]: The display may go blank for close to 30 seconds while disabling SLI. [922557]
- ▶ [SLI], GeForce 200 Series, Surround gaming: Medusa—the game doesn't span completely across the monitors if any resolution other than the native resolution is set. [670390]

## Windows 8 32-bit Issues

### Single GPU Issues

- ▶ [PhysX]: After installing the driver, occasionally the PhysX processor selection in the NVIDIA Control Panel is set to **CPU** instead of **AutoSelect (Recommended)**, resulting in PhysX games running slowly. [1049752]  
*To correct this, set the PhysX processor to **Auto Select (Recommended)**.*
- ▶ [Video][Notebook] [Internet Explorer]
  - [YouTube]: The NVIDIA Control Panel video color settings have no effect on YouTube flash video playback within Internet Explorer 10. [999485]
  - [Stage Video]: Stage Video picture-in-picture content cannot be played within Internet Explorer. [999929]
- ▶ [Video][Notebook] [Hulu Desktop]: When attempting to play videos using Hulu Desktop, there is audio but no video. [1000017]

## Windows 8 64-bit Issues

### Single GPU Issues

- ▶ [Surround]: The NVIDIA Control Panel may crash when attempting to configure Surround gaming. [1179291]
- ▶ [Guild Wars 2]: Ambient Occlusion effect disappears at different camera angles and when using supersampling. [1023202]
- ▶ [Guild Wars 2]: Corruption is seen when launching the game with Ambient Occlusion enabled. [1169563]
- ▶ [PhysX]: After installing the driver, occasionally the PhysX processor selection in the NVIDIA Control Panel is set to **CPU** instead of **AutoSelect (Recommended)**, resulting in PhysX games running slowly. [1049752]  
*To correct this, set the PhysX processor to **Auto Select (Recommended)**.*

- ▶ [3D Vision Video Player][3D Vision Photo Viewer]: There is screen corruption after pressing the Windows key while viewing content in stereoscopic 3D. [1173832]

*To eliminate the corruption, press the Windows key a second time.*

## 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 7.

- ▶ “Windows Vista Considerations” on page 18
- ▶ “Windows 7 Considerations” on page 18
- ▶ “Unsupported Features” on page 19
- ▶ “OpenGL Application Issues” on page 20
- ▶ “Application Issues” on page 21
- ▶ “Operating System Issues” on page 26

## 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/Windows 7:

- ▶ **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](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 System Tools software, which you can download from [NVIDIA.com](http://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

- ▶ Adobe Flash 10.x/11.x–1080p video content stutters during browser playback in full-screen mode.

*The issue is resolved with Flash 11.0.1.83 and later.*

- ▶ GeForce 500 Series: Crysis 2 (DirectX 11 mode)–with 16x Anisotropic filtering set using the NVIDIA Control Panel, there is LOD distortion and other issues with AF. [848406]
- ▶ GeForce 400 Series: Dirt 2–the game does not show any 3D-rendered objects when multisample antialiasing is increased to 16xCSSAA 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](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 <system root>\ \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 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 8600 GT: Battlefield 2–the game crashes to desktop when set to 1900x1440 resolution 8x antialiasing. [322008]  
*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: 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 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, Surround gaming: Pacific Fighters—the game fails to switch to Surround gaming resolutions even though they are listed in the game menu. [670389]

- ▶ [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 8800: While uninstalling 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]

## Operating System Issues

### Windows Vista

- ▶ 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.*

- ▶ Windows Vista, 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.*

### Windows 8 Issues

- ▶ When upgrading from Windows 7 to Windows 8, the system fails to retrieve the installed WHQL display driver. [1024416]

See the Microsoft KB article KB2743349 <http://support.microsoft.com/kb/2743349>.



## 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:

- ▶ “Flickering Black Screen After Installing R310 Drivers on Windows 8” on page 28
- ▶ “Total Available Graphics Memory Reported Incorrectly” on page 29
- ▶ “Increasing 4-way SLI/Multi-GPU Performance” on page 30
- ▶ “3D Vision USB Driver Does Not Get Installed” on page 30
- ▶ “No PhysX Acceleration Using the GPU” on page 31
- ▶ “NVIDIA PhysX System Software Cannot be Installed or Uninstalled in Windows Safe Mode” on page 31
- ▶ “3DMark 11 Does not Run in Stereoscopic 3D Mode” on page 31
- ▶ “Previous Driver Files Remain After Overinstalling with Release 256 or Earlier Drivers” on page 32
- ▶ “Do not Use Windows Rollback for Graphics Drivers” on page 32
- ▶ “Uninstalling Drivers Using Device Manager is not Supported” on page 32
- ▶ “Changing the Primary Display Across SLI GPUs Takes Longer than Expected” on page 33
- ▶ “Understanding the DirectX Version Shown in the NVIDIA System Information Window” on page 33
- ▶ “Using HDMI Audio with Displays that have a High Native Resolution” on page 34
- ▶ “Using HDMI Displays that do not Support Audio” on page 34
- ▶ “Using HDMI/DisplayPort Audio in Dualview or Clone Mode Configurations” on page 35
- ▶ “Flat Panel Scaling Controls are Non-functional for Some TV Modes for Some Displays” on page 35
- ▶ “GPU Runs at a High Performance Level (full clock speeds) in Multi-display Modes” on page 36
- ▶ “GeForce GTX 295 Fan Control Does not Function With NVIDIA Control Panel Performance Group version 6.03.06.00” on page 36
- ▶ “1280x1024 @ 60 Hz not Available on BenQ FP241W Monitors” on page 36
- ▶ “GeForce 6 and 7 Series Cards Cannot Output Interlaced Signals in SLI Mode [251457]” on page 36
- ▶ “Image Sharpening Control not Available with GeForce 8 Series and later GPUs” on page 37
- ▶ “Gigabyte GA-6BX Motherboard” on page 37



## Flickering Black Screen After Installing R310 Drivers on Windows 8

### Issue

After installing the R310 driver on Windows 8, the subsequent reboot results in a black or flickering screen.

### Root Cause

This occurs because Windows Update performed a background installation of a Release 304 driver, which requires a reboot to complete the installation. After installing the Release 310 driver and then rebooting the system, installation of both the Release 304 as well as the Release 310 is completed, resulting in conflicting driver binaries and the black/flickering screen.

### Workaround - Prevention

To avoid the issue, reboot the system before installing the Release 310 driver.

Alternately, you can check the driver status under the Device Manager and perform the reboot if the Device Manager indicates that a restart is needed. Then install the driver.

### Workaround - Recovery

If you did not perform the necessary reboot prior to installing the driver and now encounter the black screen, do the following:

- 1 Reboot in Safe Mode.
- 2 Uninstall the driver.
- 3 Disconnect from the internet and then restart the system.
- 4 In normal mode, install the new driver.

## Total Available Graphics Memory Reported Incorrectly

### Background-TAG Memory

In the Windows Display Driver Model (WDDM), Total Available Graphics (TAG) memory is reported as the sum of

- Dedicated Video Memory (video memory dedicated for graphics use)
- Dedicated System Memory (system memory dedicated for graphics use), and
- Shared System Memory (system memory shared between the graphics subsystem and the CPU).

The values for each of these components are computed according to WDDM guidelines when the NVIDIA Display Driver is loaded.

### Issue

Some TAG-reporting APIs represent video memory using 32-bits instead of 64-bits, and consequently do not properly report available graphics memory when the TAG would otherwise exceed 4 gigabytes (GB). This results in under reporting of available memory and potentially undesirable behavior of applications that rely on these APIs to report available memory.

The under reporting can be extreme. For example, 6 GB might be reported as 454 MB, and 8 GB might be reported as 1259 MB.

### Driver Action for GeForce-based Graphics Systems

On graphics systems with less than 2.75 GB of advertized physical memory, the NVIDIA display driver typically limits the Shared System Memory to maintain a TAG memory value of less than 4 GB<sup>1</sup>.

- ▶ This results in reliable reporting of sub-4 GB TAG memory on systems with less than 2.75 GB of advertized physical memory.
- ▶ On systems with 2.75 GB or more of advertized physical memory, you may see different reported TAG memory values between the NVIDIA Control Panel and other reporting APIs.

1. The WDDM guidelines dictate minimum and maximum values for the components, but the display driver may further constrain the values that are reported (within the allowed minimum and maximum).

## Increasing 4-way SLI/Multi-GPU Performance

### Issue

With some games and applications, you may experience little to no performance gain or even a performance drop with 4-way SLI or multi-GPU configurations.

### Resolution

- 1 Open the NVIDIA Control Panel, then click **Manage 3D Settings** from the navigation pane.
- 2 Click the *Global Settings* tab, then scroll to the *Power management mode* feature, click the corresponding list arrow and select **Prefer maximum performance**, then click **Apply**.

## 3D Vision USB Driver Does Not Get Installed

### Issue

After installing the NVIDIA graphics driver, if the 3D Vision USB emitter was not plugged in, the 3D Vision USB Controller driver does not get installed. If you plug in the emitter after installing the driver, the indicator light on the emitter will flash red and will not turn green.

### Resolution

To fix this issue, NVIDIA recommends performing a driver re-install with the 3D Vision USB emitter connected. Please download the latest drivers and follow these steps:

- 1 Plug in the 3D Vision USB emitter.
- 2 Re-install the NVIDIA driver.  
Select **Custom (Advanced)** and then select **Perform a clean Installation** during the driver installation.
- 3 Reboot.

## No PhysX Acceleration Using the GPU

If after installing the PhysX System Software you find that there is no PhysX acceleration on supported applications, repeat the PhysX setup as follows:

- 1 Reboot the PC.
- 2 Open the NVIDIA Control Panel and then, under 3D Settings, click **Set PhysX configuration** to open that page.
- 3 Under **Select a PhysX processor**, verify that either **auto-select** or a specific NVIDIA GPU is selected.
- 4 Click **Apply**.

## NVIDIA PhysX System Software Cannot be Installed or Uninstalled in Windows Safe Mode

### Issue

Beginning with Release 280, the NVIDIA PhysX System Software is not included in the NVIDIA driver installation/uninstallation under safe mode.

### Explanation

The NVIDIA PhysX System Software installer is not compatible with Microsoft's policy for Windows safe Mode. Consequently, installation or uninstallation of the PhysX System Software under safe mode would fail. To allow installation or uninstallation of the graphics driver under safe mode, the NVIDIA PhysX System Software is blocked from the process.

## 3DMark 11 Does not Run in Stereoscopic 3D Mode

### Issue

When attempting to run 3DMark 11 with NVIDIA 3D Vision enabled, the benchmark may hang, present a black screen, or in other ways not appear correctly.

### Explanation

3DMark 11 is not compatible with running in stereoscopic 3D. To facilitate running the benchmark, recent drivers will run it in monoscopic mode, even with 3D Vision enabled.

## Previous Driver Files Remain After Overinstalling with Release 256 or Earlier Drivers

### Issue

When installing a Release 256 or earlier driver over a Release 260 or later driver, some of the previous driver files remain on the hard disk, resulting in potential conflicts.

### Workaround

After installing a Release 260 or later driver, you must uninstall the driver first before installing a Release 256 or earlier driver.

## Do not Use Windows Rollback for Graphics Drivers

To reinstall a previous or older NVIDIA graphics driver, do not use the Windows rollback feature. This method will not reliably restore all the previous driver files.

Instead, use the Windows Add and Remove programs to remove the current driver, and then install the older driver using setup.exe.

## Uninstalling Drivers Using Device Manager is not Supported

### Issue

On all supported versions of Microsoft Windows, uninstalling the NVIDIA driver using the Windows Device Manager may not remove associated files or applications.

### Explanation

Microsoft has confirmed that this behavior is by design. If you wish to uninstall the NVIDIA driver, it is recommended that you do so using Add and Remove programs.

See the [Microsoft KB article 2278714](#).

## Changing the Primary Display Across SLI GPUs Takes Longer than Expected

### Issue

On an SLI system, switching the primary (or SLI focus) display when each display in the SLI group is connected to a different GPU takes longer than expected.

### Explanation

On an SLI system with each SLI GPU driving a display, the display connected to the slave GPU is the primary display (also the SLI focus display). In order to switch the primary display to the one connected to the other GPU, the master and slave GPU configuration must also switch. In order to reassign which GPU is the master and which is the slave, the driver must be reloaded. It the process of reloading the driver that takes the additional time.

## 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 as well as the DirectX version that is installed.

*However, in order to use the version of DirectX reported in the System Information window, the NVIDIA GPU and graphics driver 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 Audio with Displays that have a High Native Resolution

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

Some HDMI displays have a native resolution that exceeds the maximum supported HD mode. For example, displays 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 Displays that do not Support Audio

*Some HDMI displays do not support audio, or have issues with GeForce 9 series and earlier, and GeForce GTX 200-series 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 GeForce 9 series and earlier, and GeForce GTX 200-series 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-> Set Up Digital Audio page. Click the arrow for the problem display and then click **Turn off audio**.

### Video but no audio

- Check the display list for the problem connection on the NVIDIA Control Panel->Set Up Digital Audio page.

- ▶ If **Turn off audio** is selected and you want to test whether your HDMI audio does, in fact, work, then click the list arrow and select the name of the display.

The driver will prompt you with instructions for testing HDMI audio with that display.

- ▶ If the display name is selected, then the driver has not successfully detected that an incompatible display is connected.

*Future driver versions will properly identify such displays and disable audio.*

## 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 with desktop and older notebook GPUs, and not a software bug. When multiple displays are connected and active, the GPU will always operate with full clock speeds in order to efficiently drive multiple displays—even when no 3D programs are running.



**Note:** NVIDIA notebook GeForce 5xxM series and later GPUs do not have this limitation. For those GPUs the driver can adjust the performance level, depending on demand, even when driving multiple displays.

## GeForce GTX 295 Fan Control Does not Function With 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.

## GeForce 6 and 7 Series Cards Cannot Output Interlaced Signals in SLI Mode [251457]

- **Problem**

Rendering problems and instability occur when outputting interlaced modes (480i, 576i and 1080i) over the Y Pr Pb component and DVI outputs.

- **Explanation**

This is a hardware limitation in SLI mode only and cannot be fixed via a driver update.

- **Resolution**

Due to this issue, starting in driver version 162.22 in Windows Vista, the driver will automatically disable SLI mode when using the 480i, 576i and 1080i modes over all connectors on the GeForce 6 and 7 series GPUs.

To re-enable SLI mode, you must choose a non-interlaced output mode and reboot your computer.

- GeForce 8 series GPUs do not have this hardware limitation and you can output all HDTV interlaced and progressive scan outputs in SLI mode.
- The 480p, 576p, 720p, and 1080p progressive scan modes do not have this issue in SLI mode and are not affected by this change.

## 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 310 DRIVER

This chapter covers the following main topics:

- ▶ “About the Release 310 Driver” on page 38
- ▶ “Hardware and Software Support” on page 39
- ▶ “Driver Installation” on page 48

### About the Release 310 Driver

This driver release is from the Release 310 family of drivers (versions 304.xx to 306.xx). This driver package supports the GeForce 8, 9, 100, 200, 300, 400, 500, and 600-series desktop GPUs as well as ION desktop GPUs. See “[Supported NVIDIA Desktop Products](#)” on page 39 for the list of specific products supported in this release.

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 39
- ▶ “Supported NVIDIA Desktop Products” on page 39
- ▶ “Supported NVIDIA Notebook Products” on page 43
- ▶ “Supported Languages” on page 48

## Supported Operating Systems

This Release 310 driver includes drivers designed for the following Microsoft® operating systems:

- ▶ Microsoft Windows® 8, and supports both 32-bit and 64-bit versions.
- ▶ Microsoft Windows® 7, and supports both 32-bit and 64-bit versions.
- ▶ Microsoft Windows® Vista, and supports both 32-bit and 64-bit versions.

## Supported NVIDIA Desktop Products

The following table lists the NVIDIA products supported by the Release 310 driver, version 310.70:

Table 3.1 Supported NVIDIA Desktop GPUs

Consumer Products
ION
ION LE
GeForce GTX 690
GeForce GTX 680
GeForce GTX 670
GeForce GTX 660 Ti
GeForce GTX 660
GeForce GTX 650 Ti
GeForce GTX 650
GeForce GT 645
GeForce GT 640
GeForce GT 630
GeForce GT 620
GeForce GT 610
GeForce 605
GeForce GTX 680

Table 3.1 Supported NVIDIA Desktop GPUs

Consumer Products
GeForce GTX 680
GeForce GTX 590
GeForce GTX 580
GeForce GTX 570
GeForce GTX 560 SE
GeForce GTX 560
GeForce GTX 560 Ti
GeForce GTX 555
GeForce GTX 550 Ti
GeForce GTX 480
GeForce GTX 470
GeForce GTX 465
GeForce GTX 460 SE and 460 SE v2
GeForce GTX 460 v2
GeForce GTX 295
GeForce GTX 285
GeForce GTX 280
GeForce GTX 275
GeForce GTX 260
GeForce GTS 450
GeForce GTS 250
GeForce GTS 240
GeForce GTS 150
GeForce GT 545
GeForce GT 530
GeForce GT 520
GeForce GT 430
GeForce GT 340
GeForce GT 330
GeForce GT 320
GeForce GT 240
GeForce GT 220
GeForce G210
GeForce 405
GeForce 210

Table 3.1 Supported NVIDIA Desktop GPUs

Consumer Products
GeForce 205
GeForce GTS 150
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
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

Table 3.1 Supported NVIDIA Desktop GPUs

Consumer Products
GeForce 8200
GeForce 8100 / nForce 720a

## Supported NVIDIA Notebook Products

The following tables list the NVIDIA notebook products supported by the Release 310 driver, version 310.70:



### Note:

Hybrid Power technology is no longer supported.

The following Sony VAIO notebooks are supported: Sony VAIO F Series with NVIDIA GeForce 310M, GeForce 315M (All-in-One system), GeForce GT 330M, GeForce GT 425M, GeForce GT 520M, or GeForce GT 540M (All-in-One system). Other Sony VAIO notebooks are not supported at this time (please contact Sony for driver support).

Fujitsu notebooks are not supported by this release (Fujitsu Siemens notebooks are supported).

Table 3.2 Supported NVIDIA Notebook GPUs

Consumer Products
ION
ION LE



Table 3.2 Supported NVIDIA Notebook GPUs (continued)

Consumer Products
GeForce GTX 680M
GeForce GTX 675M
GeForce GTX 670M
GeForce GTX 660M
GeForce GT 650M
GeForce GT 640M LE
GeForce GT 640M
GeForce GT 635M
GeForce GT 630M
GeForce GT 620M
GeForce GT 610M
GeForce GTX 580M
GeForce GTX 570M
GeForce GTX 560M
GeForce GT 555M
GeForce GT 550M
GeForce GT 540M
GeForce GT 525M
GeForce GT 520MX
GeForce GT 520M
GeForce GTX 485M
GeForce GTX 480M
GeForce GTX 470M
GeForce GTX 460M
GeForce GT 445M
GeForce GT 435M
GeForce GT 425M
GeForce GT 420M
GeForce GT 415M
GeForce 610M
GeForce 410M

Table 3.2 Supported NVIDIA Notebook GPUs (continued)

Consumer Products
GeForce GTS 360M
GeForce GTS 350M
GeForce GTS 250M
GeForce GT 335M
GeForce GT 330M
GeForce GT 325M
GeForce GT 320M
GeForce 320M
GeForce 315M
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 105M
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

Table 3.2 Supported NVIDIA Notebook GPUs (continued)

Consumer Products
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
GeForce 8200M

Table 3.3 Supported NVIDIA NVS and Quadro NVS M GPUs

Consumer Products
NVS 5400M
NVS 5200M
NVS 5100M
NVS 4200M
NVS 3100M
NVS 2100M
Quadro NVS 320M
Quadro NVS 160M
Quadro NVS 150M
Quadro NVS 140M
Quadro NVS 135M
Quadro NVS 130M

Table 3.4 Supported NVIDIA Quadro M and Quadro FX M GPUs

Consumer Products
Quadro 5010M
Quadro 5000M
Quadro 4000M
Quadro 3000M
Quadro 2000M
Quadro 1000M
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 310 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 200 MB for English-only, and 275 MB for International.

The hard disk space requirement for 64-bit is minimum 270 MB for English-only, and 365 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 (see [“Supported NVIDIA Notebook Products”](#) on page 43).
- ▶ 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 From the driver download page, click the **Download** button.  
The *Download Confirmation* page appears.
- 3 If you agree to the "License For Customer Use of NVIDIA Software", click the **Agree & Download** button to begin the download.  
The *File Download* dialog appears.
- 4 Either click **Save** to save the file and then run it from your PC, or click **Run**.  
An extraction path dialog appears prompting you to specify where on your PC you want the driver files to be installed.
- 5 Click **OK** to use the default location, or click the folder icon and specify an alternate location to install the driver files.  
The files are extracted and then the NVIDIA Installer is launched automatically.
- 6 At the *License Agreement* page of the Installer, click **Agree and Continue**.

## 7 Follow the instructions in the NVIDIA Installer to complete the installation.



**Note:** The driver presents game screenshots while the driver is installing. If you are not connected to the internet during the installation, you may see a "Navigation to the webpage was cancelled" message instead. The message can be ignored and does not affect the installation. The message won't appear if the browser cache is cleared.



**Note:** The NVIDIA PhysX System Software will not be included in the installation if the same version or a later version is already installed.



**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.

See also the installation/uninstallation considerations explained in [“Known Product Limitations”](#) on page 27.

# APPENDIX A MODE SUPPORT FOR WINDOWS

This chapter details the Windows modes supported by the Release 310 driver for NVIDIA products. It contains these sections:

- ▶ “General Mode Support Information” on page 52
- ▶ “Default Modes Supported by GPU” on page 53
- ▶ “Modes Supported by TV Encoders” on page 58



## 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 53.

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 600, 500, 400, 300, 200, 100, 9 Series, and 8 Series GPUs” on page 54
- ▶ “GeForce 9M, 8M, 100M, 200M, 300M, 400M, 500M, 600M Series, and Quadro NVS and Quadro FX Notebook GPUs” on page 56

## Understanding the Mode Format

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

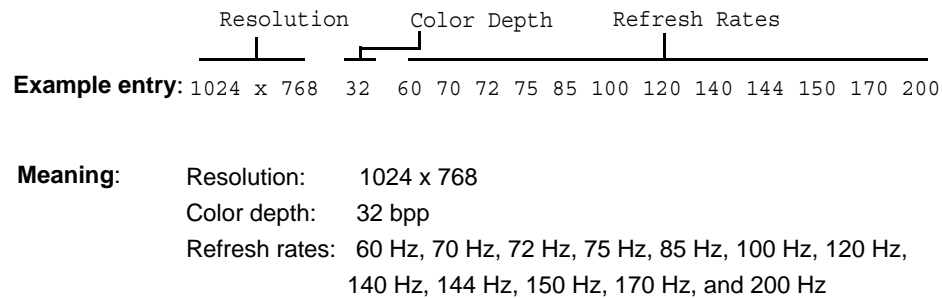


Figure A.1 Mode Format

### 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.

## GeForce 600, 500, 400 , 300, 200, 100, 9 Series, and 8 Series GPUs

This sections lists the supported display resolutions, color depths, and refresh rates for the products listed in [“Supported NVIDIA Desktop Products”](#) on page 39.

### 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, 300M, 400M, 500M, 600M Series, 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 43.

### 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.

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