



NVIDIA Quadro Professional Drivers ***Release 186 Notes***

Version 186.18

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

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CHAPTER

1

INTRODUCTION TO *RELEASE 186 NOTES*

This edition of *Release 186 Notes* describes the Release 186 Quadro Professional Drivers for Microsoft® Windows® Vista. NVIDIA provides these notes to describe performance improvements and bug fixes in each documented version of the driver.

Structure of the Document

This document is organized in the following sections:

- “[Release 186 Driver Changes](#)” on [page 3](#) gives a summary of changes, and fixed and open issues in this version.
- “[The Release 186 Driver](#)” on [page 19](#) describes the NVIDIA products and languages supported by this driver, the system requirements, and how to install the driver.
- “[Mode Support for Windows](#)” on [page 25](#) lists the default resolutions supported by the driver.

Changes in this Edition

This edition of the *Release 186 Notes* for Windows Vista includes information about NVIDIA graphics driver version 186.18, and lists changes made to the driver since version 182.65. These changes are discussed beginning with the chapter “[Release 186 Driver Changes](#)” on [page 3](#).

CHAPTER

2

RELEASE 186 DRIVER CHANGES

This chapter describes open issues for version 186.18, and resolved issues and driver enhancements for versions of the Release 186 driver up to version 186.18. The chapter contains these sections:

- “Version 186.18 Highlights” on page 4
- “Changes in Version 186.18” on page 9
- “Open Issues in Version 186.18” on page 10
- “Not NVIDIA Issues” on page 11
- “Known Product Limitations” on page 16

Version 186.18 Highlights

This section provides highlights of version 186.18 of the NVIDIA Release 186 Driver for Windows Vista.

- [What's New in Release 186](#)
- [What's New in Version 186.18](#)
- [Limitations in This Release](#)
- [Special Instructional Notes for this Release](#)

What's New in Release 186

Release 186 includes several changes in the following areas:

- [NVIDIA Control Panel Updates](#)
- [Display Driver Updates](#)
- [Video Updates](#)
- [CUDA Updates](#)
- [OpenGL Updates](#)

NVIDIA Control Panel Updates

3D Settings Pages

- **Ambient Occlusion** setting (*new* in the Manage 3D Settings page)
Ambient occlusion enhances depth perception and adds realism to 3D scenes by providing a soft shadow effect to objects based on their placement in the scene.
- **SLI Antialiasing** (*new* in the Manage 3D Settings page)
Now available under Windows Vista and Windows 7 as well as Windows XP.
- **Workstation/Quad-buffered 3D Stereo** (*new* Stereo-Display mode settings in the Manage 3D Settings page)
Added support for the following stereoscopic 3D hardware and modes:
 - GeForce 3D Vision hardware—generic active stereo, via on-board DIN connector, passive (Clone mode) modes, and 3D DLP display
 - Generic active stereo
 - Horizontal interlaced stereo displays

- Texas Instruments 3D Ready DLP® (Digital Light Processing technology) displays

Display Pages

- **Set up Multiple Displays** (*revised* under Windows Vista and applicable to Windows 7)

In Release 185, when SLI mode is enabled (2-way and Quad SLI), users can now select a display from different GPUs as long as the GPUs are in the same SLI group.

- Displays must still be connected to the same GPU under Clone mode.
- Quad SLI: When using GeForce X2, Quadro X2, or the GeForce GTX 295 graphics cards, only GPUs that have two display connectors can be used to drive displays. Typically, display connectors lined up on the same slot position are connected to the same GPU.
- 3-way SLI: Multiple displays across different GPUs are not supported in 3-way SLI mode. To use more than one display, they must be connected to the same GPU.
- NVIDIA recommends connecting displays to the same GPU to shorten the driver reload time on the initial setup.
- **Adjust Desktop Color Settings** page (*revised* under Windows Vista and applicable to Windows 7)
Applications now have the option of controlling the desktop color settings.

Video & Television Pages

- **HDCP Status**

New page for verifying whether the system is HDCP-capable

- **Adjust TV Color Settings** page (*revised* under Windows Vista and applicable to Windows 7)

Applications now have the option of controlling the TV color settings.

Display Driver Updates

Device Support

Added support for EDID-like devices.

Hotplug Behavior

When hotplugging or hot-unplugging a digital display, the driver detects the display and then configures the multi-display mode and display resolution based on the recent record of the displays connected. If no record exists, then the driver applies default settings. A popup message appears at the system notification tray to alert the user of the change.

The automatic display configuration also occurs upon powering on the computer and booting into Windows Vista if the driver detects a change in display connections since the last Windows session.

Video Updates

- Compute-based DVD upscaling
- CUDA Video Encoder 1.1: Added support for CUDA-enabled GPUs with less than 32 cores to the NVIDIA Video Encoding library.

CUDA Updates

- CUDA 2.2
- CUDA Video Encoder V1.1: Added support for CUDA-enabled GPUs with less than 32 cores to the NVIDIA Video Encoding library.

OpenGL Updates

- Support for OpenGL 3.0
- Implemented NVX_shader_buffer_load (OpenGL Shading Language).

What's New in Version 186.18

- See [“Changes in Version 186.18”](#) on page 9 for the list of fixed issues.

Limitations in This Release

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

- **SDI**

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

- **Genlock/Frame Lock**

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

- **NVIDIA Control Panel Display Category**

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

- **Workstation Category**

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

Special Instructional Notes for this Release

This section clarifies instructions for successfully accomplishing the following tasks:

Turning Off V-Sync to Boost Performance

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

- 1 Open the NVIDIA Control Panel and make sure that *Advanced Settings* is selected from the control panel tool bar.
- 2 From the *Select a Task* pane, under 3D Settings, click **Manage 3D Settings**, then click the Global Settings tab.
- 3 From the Global presets pulldown menu, select **Base profile**.
- 4 From the Settings listbox, select **Vertical sync** and change its value to **Force off**, then click **Apply**.
- 5 From the Global presets pulldown menu, select **3D App - Default Global Settings** (the driver's default profile) or use the application profile that matches the application you are testing, then click **Apply**.

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

NVIDIA Application Configuration Engine (ACE)

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

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

SLI Multi-OS – GPU Assignment in System Virtualization

On systems with two supported graphics cards installed, this driver supports a system virtualization tool's ability to directly assign a GPU to a guest virtual machine (VM). This direct assignment allows the host and guest VM to each run on their own operating system and with their own GPU and driver.

- **Supported Virtualization Software:** Parallels Workstation Extreme

- **Supported Graphics Cards**

Up to two different models can be used in a system, from among the following:

- Quadro FX 5800
- Quadro FX 4800
- Quadro FX 3800

- **Video BIOS Requirement**

- The graphics card assigned to the guest VM needs video BIOS version 62.00.39.00.00 or later.

For a list of SLI Multi-OS certified workstations, virtualization software, and OS combinations, please see http://www.nvidia.com/object/sli_multi_os.html .

Changes in Version 186.18

The following sections list the changes made and issues resolved since driver version 182.65.

- “Fixed Issues–Windows Vista 32-bit” on page 9
- “Fixed Issues–Windows Vista 64-bit” on page 9

Fixed Issues–Windows Vista 32-bit

Single-GPU Fixed Issues

- Quadro FX cards: V17—the application crashes when using OpenGL graphics engine and with “Use VBO” turned on.

Multi-GPU Fixed Issues

- [SLI]: Maya 2008—horizontal pixels are missing from drawings in the certification test.

Fixed Issues–Windows Vista 64-bit

Single-GPU Fixed Issues

- Applications crash in VirtualAlloc in a memory segment which was already reserved.

Open Issues in Version 186.18

As with every released driver, version 186.18 of the Release 186 driver has open issues and enhancement requests associated with it. This section includes lists of issues that are either not fixed or not implemented in this version. Some problems listed may not have been thoroughly investigated and, in fact, may not be NVIDIA issues. Others may have workaround solutions.

- [“Windows Vista 32-bit Issues” on page 10](#)
- [“Windows Vista 64-bit Issues” on page 10](#)

Windows Vista 32-bit Issues

Single-GPU Issues

- In Dualview mode with each display running at different refresh rates, there is tearing in OpenGL windows, indicating that the driver is not syncing to V-blank.
- Quadro FX 3700: SOCET GXP—on monochromatic images, a right-click pop-up menu remains flashing over the image even after the pop-up window is invoked.
- Quadro FX 3700: SOCET GXP—menus that overlap the stereo imagery cause the stereo panel to change to mono until the menu is gone.
- Quadro FX 3700/1700: 3ds max—frame rate slows down when navigating objects using four-viewport layout.

Windows Vista 64-bit Issues

Single-GPU Issues

- Animator4—the animation hangs when using unlit polygons.
- Monitor hot plug does not work properly—the list of refresh rates for a hot-plugged monitor is not correct.
- Quadro FX 4800 X2, Quadro FX 3500: 3ds max—DirectX viewport initialization fails.
- Quadro FX 4600: Maya 2009—installation of the application fails.
- Quadro FX 3700: SoftImage—polygon internal edges are not updated when moved.
- Quadro FX 1100/550: Random driver crashes occur when opening and closing multiple OpenGL contexts.

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 Limitations” on page 11
- “Unsupported Features” on page 11
- “OpenGL Application Issues” on page 13
- “Application Issues” on page 14

Windows Vista Limitations

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

- Gamma ramps are inconsistent between single and two-headed systems.
- World of Warcraft – there is a 60% drop in performance when running the game in windowed mode with SLI or multi-GPU mode enabled.

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

Unsupported Features

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

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

This is an operating system limitation.

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

- **Overclocking**

GPU overclocking is no longer supported in the default GPU driver control panel. This feature is available in the NVIDIA nTune 5.05 software, which you can download from NVIDIA.com.

- **GPU Temperature Monitoring**

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

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

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

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

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

- **nView Horizontal and Vertical Span Modes**

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

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

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

- **General Antialiasing Problem with Top Games**

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

The problem occurs with NVIDIA Vista drivers 100.54 and later.

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

Affected applications found to date include:

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

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

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

- ArchiCAD12–OpenGL speed is half as fast on Windows Vista than on Windows XP.
- Quadro FX 3700/4600/5600: MediaComposer–polygons are drawn in the wrong color after disabling shaders.
- Quadro FX 1700: 3ds max–fuzzy black shading appears on object faces at certain camera angles and orientation.
- Quadro FX 1700: SolidWorks 09–large areas of the screen do not refresh.
- Quadro FX 1400: AutoDesk Inventor 2009 SP1–the application crashes.
- Quadro FX 4500/3500: Maya–cpvTransparencyTest no longer renders properly with Cg2.0+.

Other Issues

- Quadro FX 4600/1800/580: Upon rebooting the system after installing the driver, the driver fails to load.

All older drivers from other vendors must be uninstalled first.

- The Windows Vista display mode switches from Aeroglass to Basic from when a quad-buffer for stereo is created

Quadbuffered windowed stereo is only supported with Aeroglass turned off.

- The NVIDIA Control Panel->Set Up Multiple Displays page does not provide the capability of setting the dual monitor order under Windows Vista as it does under Windows XP.

This capability is provided through the Windows Vista Display Properties Settings page.

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:

- “1280x1024 @ 60 Hz not Available on BenQ FP241W Monitors” on page 16
- “Aero Must be Enabled for Windowed SLI AFR Mode Under Vista” on page 16
- “SLI Connector Requirement on NVIDIA Quadro SLI Cards” on page 16
- “Image Sharpening Control not Available with Quadro FX 4600 and later GPUs” on page 17
- “Driver Reports 256 MB Memory on NVIDIA Quadro FX 330 Cards” on page 17
- “Applying Workstation Application Profiles” on page 17
- “Gigabyte GA-6BX Motherboard” on page 18

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.

Aero Must be Enabled for Windowed SLI AFR Mode Under Vista

Windows Vista Aero-glass must be enabled in order to achieve SLI acceleration using windowed AFR mode.

SLI Connector Requirement on NVIDIA Quadro SLI Cards

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

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

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

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

Driver Reports 256 MB Memory on NVIDIA Quadro FX 330 Cards

- **Problem**

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

- **Explanation**

This is not a bug but a product limitation.

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

Applying Workstation Application Profiles

- **Background**

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

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

- **Issues**

Configuration changes require that you restart the application.

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

Gigabyte GA-6BX Motherboard

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

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

CHAPTER

3

THE RELEASE 186 DRIVER

This chapter covers the following main topics:

- “Hardware and Software Support” on page 19
- “Driver Installation” on page 23

Hardware and Software Support

Supported Operating Systems

The Release 186 driver, version 186.18, has been tested with Microsoft Windows® Vista RTM OS builds version 6000 or higher, and supports both 32-bit and 64-bit versions of Windows Vista Editions:

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

Supported NVIDIA Products

Table 3.1 and Table 3.2 lists the NVIDIA products supported by the Release 186 driver.

Table 3.1 Supported NVIDIA Workstation Products

Product	Windows Vista 32-bit	Windows Vista 64-bit
NVIDIA Quadro FX 5800	X	X
NVIDIA Quadro FX 5600	X	X
NVIDIA Quadro FX 5500	X	X
NVIDIA Quadro FX 4800	X	X
NVIDIA Quadro FX 4700 X2	X	X
NVIDIA Quadro FX 4600	X	X
NVIDIA Quadro FX 4500 X2	X	X
NVIDIA Quadro FX 4500	X	X
NVIDIA Quadro FX 4400	X	X
NVIDIA Quadro FX 4400G	X	X
NVIDIA Quadro FX 4000	X	X
NVIDIA Quadro FX 3800	X	X
NVIDIA Quadro FX 3700	X	X
NVIDIA Quadro FX 3500	X	X
NVIDIA Quadro FX 3450	X	X
NVIDIA Quadro FX 3400	X	X
NVIDIA Quadro FX 1800	X	X
NVIDIA Quadro FX 1700	X	X
NVIDIA Quadro FX 1500	X	X
NVIDIA Quadro FX 1400	X	X
NVIDIA Quadro FX 580	X	X
NVIDIA Quadro FX 570	X	X
NVIDIA Quadro FX 560	X	X
NVIDIA Quadro FX 550	X	X
NVIDIA Quadro FX 540	X	X
NVIDIA Quadro FX 470	X	X
NVIDIA Quadro FX 380	X	X
NVIDIA Quadro FX 370	X	X
NVIDIA Quadro FX 370 low profile	X	X
NVIDIA Quadro FX 350	X	X
NVIDIA Quadro VX 200	X	X
NVIDIA Quadro CX	X	X
NVIDIA Quadro NVS 450	X	X
NVIDIA Quadro NVS 440	X	X
NVIDIA Quadro NVS 420	X	X
NVIDIA Quadro NVS 295	X	X

Table 3.1 Supported NVIDIA Workstation Products (continued)

Product	Windows Vista 32-bit	Windows Vista 64-bit
NVIDIA Quadro NVS 290	X	X
NVIDIA Quadro NVS 285	X	X

Table 3.2 Supported NVIDIA Quadro Blade/Embedded Graphics Board Series

Product	Windows Vista 32-bit	Windows Vista 64-bit
NVIDIA Quadro FX 3600M	X	X
NVIDIA Quadro FX 1600M	X	X
NVIDIA Quadro FX 770M	X	X
NVIDIA Quadro FX 560M	X	X
NVIDIA Quadro FX 370M	X	X
NVIDIA Quadro NVS 120M	X	X

Supported Languages

The Release 186 Quadro Professional Drivers supports the following languages in the main driver Control Panel:

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

Driver Installation

Minimum Hard Disk Space

The hard disk space requirement for 32-bit is minimum 120 MB for English-only, and 185 MB for International.

The hard disk space requirement for 64-bit is minimum 170 MB for English-only, and 230 MB for International.

Before You Begin

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

Installation Instructions

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

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

APPENDIX



MODE SUPPORT FOR WINDOWS

This chapter details the Windows modes supported by the Release 186 driver for NVIDIA products. It contains these sections:

- “General Mode Support Information” on page 26
- “Default Modes Supported by GPU” on page 27
- “TV-Out Modes Supported by TV Encoders” on page 30

General Mode Support Information

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

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

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

Table A.1 Modes Supported for High Resolution Displays

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

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:

- “NVIDIA Quadro FX/CX/VX and Quadro NVS Family of GPUs” on page 28

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

Example entry: 1024 x 768 32 60 70 72 75 85 100 120 140 144 150 170 200

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.

NVIDIA Quadro FX/CX/VX and Quadro NVS Family of GPUs

This sections lists the supported display resolutions, color depths, and refresh rates for the the products listed in [Table 3.1 on page 20](#) and [Table 3.2 on page 21](#).

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
848 x 480	8		60 70 72 75 85 100 120 140 144 150 170 200 240
960 x 600	8		60 70 72 75 85 100 120 140 144 150 170 200 240
1024 x 768	8		60 70 72 75 85 100 120 140 144 150 170 200 240
1088 x 612	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
848 x 480	16		60 70 72 75 85 100 120 140 144 150 170 200 240
960 x 600	16		60 70 72 75 85 100 120 140 144 150 170 200 240
1024 x 768	16		60 70 72 75 85 100 120 140 144 150 170 200 240
1088 x 612	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

```

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640 x 480 32      60 70 72 75 85 100 120 140 144 150 170 200 240
720 x 480 32      60
720 x 576 32      50
800 x 600 32      60 70 72 75 85 100 120 140 144 150 170 200 240
848 x 480 32      60 70 72 75 85 100 120 140 144 150 170 200 240
960 x 600 32      60 70 72 75 85 100 120 140 144 150 170 200 240
1024 x 768 32     60 70 72 75 85 100 120 140 144 150 170 200 240
1088 x 612 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

```

TV-Out Modes Supported by TV Encoders

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

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

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

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

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

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