



# NVIDIA Quadro Professional Drivers ***Release 169 Notes***

**Version 169.39**

For Windows XP / 2000

Windows XP Professional x64 Edition

Windows Server 2003 x64 Edition

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## CHAPTER

## 1

# INTRODUCTION TO *RELEASE 169 NOTES*

This edition of *Release 169 Notes* describes the Release 169 ForceWare Graphics Drivers for Microsoft® Windows® Vista. NVIDIA provides these notes to describe performance improvements and bug fixes in each documented version of the driver.

## Structure of the Document

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This document is organized in the following sections:

- “Changes in the Release 169 Driver for Windows XP” on page 3 gives a summary of changes, and fixed and open issues in this version.
- “The Release 169 Driver for Windows XP” on page 25 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 33 lists the default resolutions supported by the driver.

## Changes in this Edition

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This edition of the *Release 169 Notes* for Windows Vista includes information about NVIDIA ForceWare graphics driver version 169.39, and lists



## CHAPTER

## 2

# CHANGES IN THE RELEASE 169 DRIVER FOR WINDOWS XP

This chapter describes open issues for version 169.39, and resolved issues and driver enhancements for versions of the Release 169 driver up to version 169.39. The chapter contains these sections:

- “Version 169.39 Highlights” on page 4
- “Special Instructional Notes for this Release” on page 5
- “Changes in Version 169.39” on page 8
- “Open Issues in Version 169.39” on page 11
- “Known Product Limitations” on page 17

## Version 169.39 Highlights

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This section provides highlights of version 169.39 of the NVIDIA Release 169 Driver.

### What's New in Release 169

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#### New Features

- Added support for 3-way SLI technology.
- Improved compatibility and performance for NVIDIA SLI™ technology on Microsoft® DirectX® 9.0c and OpenGL® 2.1 applications.

### What's New in Version 169.39

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#### New Features

- Added driver support for the following NVIDIA Quadro products:
  - NVIDIA Quadro FX 3700

#### Resolved Issues for Windows Vista

See [“Changes in Version 169.39” on page 8](#) for a list of resolved issues.

## Special Instructional Notes for this Release

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This section clarifies certain features and controls.

### Turning Off V-Sync to Boost Performance

---

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

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

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

### NVIDIA Application Configuration Engine (ACE)

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Driver versions 162.67 and higher for Windows XP include the NVIDIA Application Configuration Engine (ACE)<sup>1</sup>. This feature enables the driver to automatically detect the workstation application and configure the appropriate profile settings—the user no longer needs to manually select a profile from the NVIDIA Control Panel.

#### Auto-detected profiles:

The following applications are automatically detected. The settings appear in the Manage 3D Settings page-> Program Settings tab:

- "Adobe After Effects"
- "Altair HyperWorks"
- "ANSYS applications"
- "Autodesk 3ds Max"
- "Autodesk AutoCAD"
- "Autodesk Inventor"

1. ACE has been supported under Window Vista in previous driver releases.

- "Avid Deko"
- "Avid SOFTIMAGE|3D"
- "Avid SOFTIMAGE|XSI"
- "Bentley Systems MicroStation"
- "Cast Software WYSIWYG / Vivien"
- "Cimatron CimatronE"
- "CoCreate OneSpace"
- "Dassault Systemes CATIA"
- "Dassault Systemes SolidWorks"
- "DataSolid CADdy++"
- "Delcam applications"
- "ESRI ArcGIS / ArcView"
- "Hummingbird Exceed"
- "InnovMetric PolyWorks"
- "Intergraph SmartPlant"
- "IronCAD applications"
- "MSC Nastran / Patran"
- "Nemetschek Allplan"
- "NewTek LightWave 3D"
- "PTC CDRS" - default
- "PTC DIVISION MockUp / ProductView"
- "PTC Pro/ENGINEER Wildfire"
- "RTT DeltaGen / DeltaView"
- "Schlumberger Petrel"
- "Think3 thinkdesign / thinkiD"
- "UGS I-DEAS"
- "UGS NX"
- "UGS Solid Edge"
- "UGS Teamcenter"
- "Unisys applications"
- "Vizrt applications"
- "Yamaha ESPri"

**Not automatically detected:**

The applications listed below cannot be detected automatically and need to be manually selected through their profile in the NVIDIA Control Panel:

- "Abaqus CAE / Viewer"
- "Autodesk AliasSTUDIO"
- "Autodesk Combustion"
- "Autodesk Maya"
- "AVEVA VANTAGE PDMS / Review"
- "Brainstorm applications"
- "DENSO NADAMS"
- "ICEM Surf"
- "ISD HiCAD"
- "MAXON CINEMA 4D" B
- "MICROCADAM Helix"
- "RainStorm"
- "Overwatch Systems RemoteView"
- "PTC 3DPaint"
- "PTC Pro/ENGINEER"
- "Siemens Medical syngo"
- "Toyota TOGO"

## Changes in Version 169.39

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The following sections list the changes made and issues resolved since driver version 162.67.

- “Fixed Issues–Windows XP 32-bit” on page 8
- “Fixed Issues–Windows XP x64” on page 9

The NVIDIA bug number is provided for reference.

### Fixed Issues–Windows XP 32-bit

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#### Single-GPU Fixed Issues

- The driver now supports nView Spanning modes on native portrait displays.
- Blits from the FBO to the backbuffer fail.
- Modulo versions of shaders do not compile correctly.
- Ccreate - opening context menus over a graphic causes the graphic to disappear.
- AliasStudio - hardware overlays are enabled erroneously.
- NVIDIA Control Panel pages, such as the Change Resolution page, do not show Dualview displays connected to an MXM.
- NVIDIA Quadro FX 5600: Frame rates drop when VBO is enabled.
- NVIDIA Quadro FX 5600: RTT DeltaGen - hardware antialiasing quality is poor compared to the Quadro FX 4500.
- NVIDIA Quadro FX 4600: 3D Stereo becomes disabled after enabling triple buffering.
- NVIDIA Quadro FX 4600: After selecting Multiple Display Performance Mode from the NVIDIA Control Panel Manage 3D Settings page, texture images do not appear on the secondary Dualview display.
- NVIDIA Quadro FX 4600: Maya SPECapc - graphics performance is not better than Quadro FX 4500.

- NVIDIA Quadro FX 4600: Sourcing from a PBO using `GL_UNPACK_SKIP_PIXELS` with odd-width pixels truncates the texture.
- NVIDIA Quadro FX 4600: Cinema 4D application freezes when an attempt is made to rotate an object.
- NVIDIA Quadro FX 4500/5500: AutoCAD - the application crashes when performing OpenGL operations with buffers allocated in stack memory.
- NVIDIA Quadro FX 3500/4400/4500/5500: Realizer - the driver crashes after loading and drawing a model on the screen.
- NVIDIA Quadro FX 3500: AliasStudio crashes in Dualview mode with Cintiq monitor.
- NVIDIA Quadro FX 1700/4600: Catia R17 - the application crashes after clicking the Offset command under DMU Optimizer.
- NVIDIA Quadro FX 4400: Open Inventor - the application crashes when using wireframe mode.
- NVIDIA Quadro FX 1600M/NVS 120M: nView Clone mode settings are not saved after rebooting the system.

## Multi-GPU Fixed Issues

- [SLI], NVIDIA Quadro FX 4600: SLI mode cannot be enabled with Harpertown CPUs that do not have the "Processor Type" ID string in the BIOS.

## Fixed Issues—Windows XP x64

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### Single-GPU Fixed Issues

- Windows Server 2003: Triangles flicker or the system pauses when running a reproducer application in a multithreading environment.
- Cocreate - opening context menus over a graphic causes the graphic to disappear.
- AliasStudio - hardware overlays are enabled erroneously.

- NVIDIA Quadro FX 1700: Catia V5R17 - CoreDump process does not work as expected.

## **Multi-GPU Fixed Issues**

- [SLI], NVIDIA Quadro FX 4600: SLI mode cannot be enabled with Harpertown CPUs that do not have the "Processor Type" ID string in the BIOS.

## Open Issues in Version 169.39

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As with every released driver, version 169.39 of the Release 169 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 will have workaround solutions.

They are listed in the following sections:

- “NVIDIA Recommendations” on page 11
- “Windows XP x86 Issues” on page 12
- “Multi-GPU Issues” on page 15

### NVIDIA Recommendations

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- Single display modes such as TV only, DFP/LCD only or CRT only provide the best performance and quality from Windows Media Center Edition.

*Dual display modes such Dualview and nView Clone and Span modes are not recommended.*

- When using the trial version of WinDVD 6 from InterVideo.com, you may experience TV or DVD playback problems in Windows Media Center if you change resolutions during video playback. This is most often seen when switching from windowed to full screen mode.

*This problem does not occur with the latest full OEM versions of WinDVD or with other Windows Media Center qualified DVD decoders.*

- If you perform a clean driver installation (no previous NVIDIA drivers installed), **you must reboot your computer**. If you do not reboot, the predefined application profiles will not be activated and you may experience application stability problems.

## Windows XP x86 Issues

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This section includes issues that occur under the Windows XP or Windows 2000:

### Single-GPU Issues

- DVI display is blurry with normal display timing settings.  
*The blurriness does not occur if “Treat as HDTV” is selected and then CVT advanced timings are used.*
- NVIDIA Control Panel->Workstation-> Frame Sync: The View Status Page does not detect which is the first and which is the second display attached to the GPU.
- There may be intermittent application compatibility issues with dual core CPUs.

*If you experience this issue, you can work around it by toggling off multi-thread optimizations using the following instructions:*

- 1 Launch **regedit** and determine the current primary display card by looking in

```
HKey_Local_Machine\Hardware\DeviceMap\Video
```

and note the GUID (global unique identifier assigned by Windows), which is the long string in brackets { } at the end of the entry

```
"\device\video0".
```

- 2 Look in

```
HKey_Local_Machine\SYSTEM\CurrentControlSet\Control\Video\{GUID}\0000
```

where {GUID} is the number derived from the previous step.

- 3 Open the "0000" directory and create a new DWORD called **OpenGL\_ThreadControl** and give it a value of **2**.

This will disable multithreading in the driver for all OpenGL applications.

- 4 If you want to disable driver multithreading for all Direct3D applications—  
In the same "0000" directory, create a new DWORD called **WTD\_EXECMODEL** and give it a value of **0**.

- Video color-space range for DVI-only<sup>1</sup> outputs is erroneously set to standard mode (16-235) instead of extended mode (0-255).

1. “DVI-only” means only one display is connected, and it is to the DVI output.

*A new detection feature to apply Standard CSC mode to TV outputs (including NTSC, PAL, 480i, and 576i), included DVI-only outputs by mistake.*

**Note:** *The driver correctly applies extended mode to analog outputs, and standard mode to TV outputs (including NTSC, PAL, 480i, and 576i).*

*A future driver release will correct this and apply the extended-mode color space to DVI-only outputs.*

*You can work around this issue by forcing either standard or extended mode as follows:*

- 1 Launch **regedit** and determine the current primary display card by looking in

**HKey\_Local\_Machine\Hardware\DeviceMap\Video**

and note the GUID (global unique identifier assigned by Windows), which is the long string in brackets { } at the end of the entry

"\device\video0".

- 2 Look in

**HKey\_Local\_Machine\SYSTEM\CurrentControlSet\Control\Video\{GUID}\0000**

where {GUID} is the number derived from the previous step.

- 3 Open the "0000" directory and create a new DWORD called **VMRCCSStatus** and give it a value of

**0x3** - to force use of the standard YUV range of 16-235

**0x1** - to force use of the extended YUV range of 0-255

- The `GL_UNSIGNED_INT_10_10_10_2` format performance is slow.
- `WGL_NV_gpu_affinity` extension does not work under Dualview mode.
- Workstation 3D Stereo: After enabled 3D stereo "Force stereo stuttering" and then closing an OpenGL application, the desktop shows corruption.
- In Dualview mode, with Multiple Display Performance Mode from the NVIDIA Control Panel Manage 3D Settings page selected, rendering errors occur when using p-buffers.
- In Dualview mode, with Multiple Display Performance Mode from the NVIDIA Control Panel Manage 3D Settings page selected, tile ray-tracing renders incorrectly.
- The pixel-buffer object transfer rate is slow.

- Hardware antialiasing does not work when initialized from a p-buffer.
- OpenGL application freezes when running two threads that both use FBOs.
- Pixel Buffer objects are not shared between contexts.
- Avid Media Composer - there is texture corruption when rendering an effect with multi-threading
- Avid Media Composer, Avid DS, Side Effects Houdini - application profiles are needed for this applications.
- Avid Softimage XSI - The NVIDIA Control Panel application profile downgrades OpenGL to 1.2.
- Boris FX—the application cannot render FBOs offscreen to multiple displays.
- EditMax - a list of additional binaries needs to be added to the application profiles to enable Direct3D texture performance enhancements.
- Fusion Learning 5.21 - the application crashes when creating and closing files (`wglMakeCurrent()`).
- NVIDIA Quadro FX 5600: The timings for high custom resolutions, such as 4096x1080, are incorrect until the NVIDIA Control Panel is opened.
- NVIDIA Quadro FX 5600: The NVIDIA Control Panel custom resolution settings behave inconsistently.
- NVIDIA Quadro FX 5600: PBO transfer rate is slow.
- NVIDIA Quadro FX 4600: CADMEISTER performance is slower than when run on an NVIDIA Quadro FX 1500.
- NVIDIA Quadro FX 4600/5600: Multigen Vega Prime - performance drops compared to previous cards.
- NVIDIA Quadro G-Sync II, Quadro FX 4600: Black frame occurs every 8 seconds when using a video time-base as the sync source.
- NVIDIA Quadro FX 4500: Maya 6.5 SPECapc - there is a performance drop compared to 91.91 driver.
- NVIDIA Quadro 4400: OpenGL hardware acceleration is disabled after enabling three monitors.

- NVIDIA Quadro FX 3700: The driver is not allocating textures contiguously in video memory.
- NVIDIA Quadro FX 1700/3700: dCoder 2.0 - the application crashes when opening a QuickTime movie.
- NVIDIA Quadro FX 3500: Maya 2008 -the driver stops responding temporarily while running the performance tests.
- NVIDIA Quadro FX 3500: Poser 7–performance is poor with OpenGL hardware shading enabled.
- NVIDIA Quadro FX 3500/350: SolidWorks 2008 - model edges are not depth buffered when RealView shadows are disabled.
- Dual NVIDIA Quadro FX 1700: Four displays cannot be configured.
- NVIDIA Quadro FX 1300: ArchiCAD 11 - in Dualview mode, trace reference does not rotate smoothly in the Navigator View Map.

## Multi-GPU Issues

- [SLI]: With SLI mode enabled, the NVIDIA Control Panel->Workstation->View Status page does not the correct monitor connections.
- [SLI], NVIDIA Quadro FX 4600/5600: Virtual Reality Editor - under SLI-AFR mode, the application's advanced mode rendering flickers.

## Windows XP x64 Issues

---

- The pixel-buffer object transfer rate is slow.
- Windows Server 2003: Fast-DMA patch cannot be executed on GPUs that do not have a monitor connected.
- Hardware OpenGL performance slower than software OpenGL performance for glBitmap in Femap.
- NVIDIA Quadro FX 5600: PBO transfer rate is slow.
- NVIDIA Quadro FX 5600: CST Microwave Studio - blue-screen crash and runtime errors related to virtual memory occur after multiple simulation runs.
- NVIDIA Quadro FX 5600: Side Effects Houdini - primitive colors draw slower than randomly-assigned point colors.
- NVIDIA Quadro FX 4600/5600: Maya - the display does not refresh properly.

- NVIDIA Quadro FX 4600: Maya SPECapsC benchmark - the system hangs or restarts when running the benchmark.
- NVIDIA Quadro FX 3400: Memory use increases when rendering to p-buffers.
- NVIDIA Quadro FX 1700: Autodesk AliasSTUDIO - Per-pixel shading does not work properly.
- NVIDIA Quadro FX 1700: The system hangs when DDC calls are used to access the display.
- NVIDIA Quadro FX 570/1700: HP TCD: 169.32: Catnap corrupts the projection matrix for the Reflect OpenGL Demo.
- NVIDIA Quadro NVS 290: Driver installation fails with a “32 bit version of NVIDIA uninstaller on a 64 bit system” error message.

## 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:

- “SLI Connector Requirement on NVIDIA Quadro SLI Cards” on page 17
- “DVD Playback Issues with Dual NVIDIA Quadro NVS Cards” on page 18
- “PowerDVD 5.0 Does Not Display Correctly in nView Span Mode” on page 18
- “DirectX Fails When Detaching/Reattaching Displays in Dualview Mode” on page 18
- “OpenGL Viewport Scaling Problem in Horizontal Span Mode” on page 18
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- “Desktop Manager Does Not Re-Center Logon Screen” on page 24
- “Issues with Video Mirror–Windows XP/2000” on page 24

### 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.

## DVD Playback Issues with Dual NVIDIA Quadro NVS Cards

---

With both AGP and PCI NVIDIA Quadro NVS cards installed in the system, when attempting to play DVDs in full-screen mode on the display connected to the PCI card, the screen is blank.

*This is not an NVIDIA bug, but rather a problem with older point releases of PowerDVD and WinDVD.*

## PowerDVD 5.0 Does Not Display Correctly in nView Span Mode

---

With nView Horizontal Span mode enabled, when the PowerDVD 5.0 playback window is dragged to the second display and then stretched to fill the display, the right area of the display is corrupted.

*This is not an NVIDIA bug, but a problem with PowerDVD.*

## DirectX Fails When Detaching/Reattaching Displays in Dualview Mode

---

This problem can be duplicated as follows:

- 1 Enable both displays in Dualview mode.
- 2 Detach monitor 2 and apply settings.
- 3 Reattach monitor 2 and apply settings.

DirectX runtime fails on monitor 1.

*This is not an NVIDIA bug, but a limitation in the operating system where DirectX does not enumerate the second device. DirectX can be restored to both displays by rebooting the system*

## OpenGL Viewport Scaling Problem in Horizontal Span Mode

---

With nView Horizontal Span mode enabled, when opening an OpenGL model in a viewport, the model image is scaled too large to fit in the viewport. The problem occurs with such applications as Maya 5.0 and 3D Studio MAX 4.26.

*This is not an NVIDIA bug, but a limitation in the application's ability to properly maintain the aspect ratio in Horizontal Span mode.*

## 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.

## Video Playback in nView Clone and Span Modes

---

- **Problem**

With nView Clone or Span mode enabled, video playback appears on only one display under the following conditions:

- Under nView Clone mode, when full-screen video mirror is not used.
- Under nView Span mode, when full-screen video mirror is not used and the video is positioned to span across both monitors.

- **Explanation**

With applications that render using the hardware overlay—such as DirectX applications—the default driver behavior is to enable the hardware overlay when nView Clone or Span mode is enabled.

*Because the driver supports only one hardware overlay, the video appears on only one display.*

## Monitor Ordering in the Windows Settings Page

---

### Monitor Ordering on a Single GPU

- **Issue**

The monitor order in the Display Properties Settings page is not consistently matched with the connectors on the graphics card.

- **Explanation**

The driver does not distinguish connector positions, but instead distinguishes the display type, and consequently assigns monitor numbers according to the display type and not according to the connector.

## Monitor Ordering on a Multiple GPU System

- **Issue**

When four monitors are connected to a system with multiple PCI GPUs, such as a NVIDIA Quadro NVS 400 graphics card, and enabled in Dualview mode, many customers expect the monitor ordering in the Display Properties Settings page to conform to the following:

| Connector Position     | Monitor Number |
|------------------------|----------------|
| Primary GPU—Output 1   | 1              |
| Primary GPU—Output 2   | 2              |
| Secondary GPU—Output 1 | 3              |
| Secondary GPU—Output 2 | 4              |

The monitor ordering, in fact, does not conform to this scheme.

- **Explanation**

The monitor ordering is not controlled by the driver, but rather by the Windows OS method of enumerating PCI devices. The Windows enumeration results in the following monitor numbering:

| Connector Position     | Monitor Number |
|------------------------|----------------|
| Primary GPU—Output 1   | 1              |
| Secondary GPU—Output 1 | 2              |
| Primary GPU—Output 2   | 3              |
| Secondary GPU—Output 2 | 4              |

**Considerations for nView Span Modes:** Outputs from the same GPUs are grouped together in nView Span modes, resulting in the desktop spanning across monitors 1 and 3, or across 2 and 4.

## Applying Workstation Application Profiles

---

- **Application Profiles Should be Used**

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.

- **Applying Application Profiles**

If you make a configuration change while the application is open, you must exit and then re-open the application for the change to take effect.

When an application is running it does not receive notification of configuration changes.

## No Antialiasing of 3DMark03 Image Quality Screen Captures

---

- **Problem**

After enabling antialiasing from the NVIDIA Properties page, 3DMark03 screen captures—obtained using the application’s screen capture function—might not be antialiased.

- **Explanation**

This is not an NVIDIA bug, but rather a result of different methods used to render antialiased images.

Depending on a combination of factors, the driver may take advantage of the NVIDIA hardware’s ability to bypass the front buffer while rendering an antialiased image. In this case, the front buffer does not contain antialiased data, so if an application takes data from the front buffer—as is the case with 3DMark03’s Image Quality screen captures—then the resulting image is not antialiased.

To accommodate applications that request use of the front buffer, the NVIDIA software can provide the antialiased data in a buffer to the application. Since this negates the advantages of the NVIDIA hardware capability, this support is enabled only when antialiasing is enabled within the application, and not from the NVIDIA control panel.

*In all cases when antialiasing is enabled, screen images as well as screen captures obtained using the Print Screen key are always antialiased.*

## Medal of Honor Under Windows XP / Windows 2000

---

- **Problem**

The Electronic Arts game Medal of Honor uses a hard coded buffer to parse the OpenGL extension string. This can cause a system crash under Windows XP and Windows 2000.

- **Workaround**

NVIDIA has implemented Medal of Honor application detection to work around this extension string crash.

## Windows XP/2000 Issue with Settings Tab Monitor Positioning

---

- **Problem**

In the Windows **Display Properties > Settings** tab, the secondary monitors cannot be positioned directly above monitor #1 without snapping horizontally to a position diagonal to monitor #1.

- **When the Problem Occurs**

The problem occurs when four monitors are connected to the graphics adapter card, but only two of them are enabled.

- **Cause and Workaround**

This is a Microsoft—not an NVIDIA—bug, and there is no workaround to correct the positioning of the monitor icons. However, the actual positioning of the displays on the desktop can be corrected using the nView Desktop Manager window as follows:

- 1 Under the Tools tab in the Desktop Manager windows, make sure Automatically Align Displays is checked.
- 2 In the Settings tab, position the appropriate monitor icon above monitor #1, then click **Apply**.

The mouse cursor movement between monitor desktops will correspond to a vertical orientation of the monitors, even though the monitor icons in the Settings tab are diagonal to each other.

**Note:** This will be the case even if the monitor icons are deliberately positioned diagonal to each other.

## Antialiasing Problems With Certain Applications

---

Antialiasing in the NVIDIA Direct3D driver requires each new frame to be rendered from scratch. This requirement adversely affects applications that render only that portion of the content that has changed since the last frame. A common symptom of this problem is geometric structures that incorrectly disappear and re-appear as the scene shifts.

## Poor Quality S-Video Output on Some TVs

---

NVIDIA drivers differentiate an S-video TV from a composite TV by searching for 75-Ohm loads on the chrominance and luminance lines. If the driver detects only one such load, it assumes that it has a composite TV and drives both chroma and luma onto that line. This approach allows both types of TV to display in color.

Unfortunately, some S-video TVs do not apply the correct load to both lines, causing the driver to detect an S-video TV as a composite. The driver, in turn, sends the lower quality signal to the S-video TV. To work around this problem, use the Control Panel to override the **Auto-select** feature. This can be done following these steps:

- 1 In the **Settings** tab of the **Display Properties** Control Panel, click **Advanced**.
- 2 In the **nView** tab, click **Device Settings** and click **Select Output Device**.
- 3 In the **Device Selection** tab, click the **TV** option.
- 4 Change the **Video output format** to **S-video**.

## AGP and PCI-E Programs May Hang With AMD K7 and K8 Processors

---

- **Issue**

Microsoft® Windows® 2000 and Windows XP systems using AMD K7 and K8 processors can hang when an AGP or PCI-E program is used.

- **Root Cause**

There is a known problem with Microsoft® Windows® 2000 and Windows XP systems using AMD K7 and K8 CPUs that results in the Microsoft operating system allocating overlapping 4M cached pages with 4k write-combined pages. This condition results in undefined behavior and data corruption, and is explicitly disallowed by the AMD CPU manual.

This problem can affect any device driver in the system that allocates write-combined system memory, but is usually most easily reproduced with graphics drivers since graphics drivers generally make heavy use of write-combined system memory for performance reasons.

- **Resolution**

Microsoft has a knowledge base article on the issue, the text of which is unfortunately quite outdated. While the article only mentions Windows 2000, AGP, and K7, both the root cause and resolution also apply to Windows 2000 or Windows XP, AGP or PCI-E, and AMD K7 or K8. The article can be found at <http://support.microsoft.com/?id=270715>.

The issue is resolved by applying an operating system registry key as described in the referenced article that instructs the Microsoft operating system to not use the 4M pages, thus avoiding the conflict.

The registry key is automatically applied by installation of the latest NVIDIA nForce platform driver package (including 4.57 SMBUS or later). It is imperative for the package to be installed or for the registry key to be applied

before the NVIDIA graphics driver or any other device drivers are installed. The registry key takes effect only after an operating system reboot.

## **Desktop Manager Does Not Re-Center Logon Screen**

On Windows XP multi-display systems that are set to nView Span mode, the Windows logon screen is centered on the extended desktop. This usually causes it to be split across two displays, which users may find annoying. Although users can normally use the Desktop Manager to restrict a window's appearance to one display, security restrictions in the operating systems prevent this in the case of the logon screen.

## **Issues with Video Mirror—Windows XP/2000**

Table 2.1 lists current known issues with NVIDIA Video Mirror functionality.

**Table 2.1** Known Issues with Video Mirror

|  |
|--|
| Video Mirror is not yet implemented for applications using Video Port Extensions (VPE).  |
| If Video Mirror is enabled but a full-screen display does not appear, one of the following problems may have occurred:   |
| Video Mirror can only function when overlay is being used. The video player may not be able to create an overlay if another application is using the overlay, or the desktop display resolution is too high. You can lower the desktop resolution, pixel depth, or refresh rate. |
| Video Mirror requires some extra memory to run. Try closing other DirectX or OpenGL applications that may be running.  |
| You may need to close and restart your video application for Video Mirror enabling or disabling to take effect.  |
| Some video players that cannot detect the presence of Video Mirror stop playing if they are minimized or completely obscured by another window. For example, Media Player can exhibit this problem.  |

## CHAPTER

## 3

# THE RELEASE 169 DRIVER FOR WINDOWS XP

This chapter covers the following main topics:

- “Hardware and Software Support” on page 25
- “Driver Installation” on page 28
- “NVIDIA Driver History” on page 31

## Hardware and Software Support

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### Supported Operating Systems

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This Release 169 driver includes drivers designed for the following Microsoft® operating systems:

- Microsoft Windows® XP
  - Windows XP Professional
  - Windows XP Home Edition
  - Windows XP Professional x64 Edition
- Microsoft Windows Server 2003 x64 Edition<sup>1</sup>
- Microsoft Windows 2000

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1. SLI mode is not supported under Microsoft Windows Server 2003 x64.

## Supported NVIDIA Products

Table 3.1 through Table 3.4 lists the NVIDIA workstation products supported by this Release 169 driver.

**Table 3.1** Supported NVIDIA Workstation Products

| <b>Product</b>              | <b>Windows XP 32-bit<br/>Windows 2000</b> | <b>Windows XP<br/>Professional x64</b> |
|-----------------------------|---|--|
| NVIDIA Quadro FX 5600       | X   | X                                      |
| NVIDIA Quadro FX 5500       | X   | X                                      |
| NVIDIA Quadro FX 4600       | X   | X                                      |
| NVIDIA Quadro FX 4500 X2    | X   | X                                      |
| NVIDIA Quadro FX 4500       | X   | X                                      |
| NVIDIA Quadro FX 4400       | X   | X                                      |
| NVIDIA Quadro FX 4400G      | X   | X                                      |
| NVIDIA Quadro FX 4000       | X   | X                                      |
| NVIDIA Quadro FX 3700       | X   | X                                      |
| NVIDIA Quadro FX 3500       | X   | X                                      |
| NVIDIA Quadro FX 3450       | X   | X                                      |
| NVIDIA Quadro FX 3400       | X   | X                                      |
| NVIDIA Quadro FX 3000       | X   | X                                      |
| NVIDIA Quadro FX 2000       | X   | X                                      |
| NVIDIA Quadro FX 1700       | X   | X                                      |
| NVIDIA Quadro FX 1500       | X   | X                                      |
| NVIDIA Quadro FX 1400       | X   | X                                      |
| NVIDIA Quadro FX 1300       | X   | X                                      |
| NVIDIA Quadro FX 1100       | X   | X                                      |
| NVIDIA Quadro FX 1000       | X   | X                                      |
| NVIDIA Quadro FX 700        | X   | X                                      |
| NVIDIA Quadro FX 500/FX 600 | 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 370        | X   | X                                      |
| NVIDIA Quadro FX 350        | X   | X                                      |
| NVIDIA Quadro FX 330        | X   | X                                      |
| NVIDIA Quadro NVS 440       | X   | X                                      |
| NVIDIA Quadro NVS 290       | X   | X                                      |
| NVIDIA Quadro NVS 285 PCI-E | X   | X                                      |
| NVIDIA Quadro NVS 280       | X   | X                                      |

**Table 3.2** Supported NVIDIA Quadro G-Sync Products

| Product                  | Windows XP 32-bit<br>Windows 2000 | Windows XP<br>Professional x64 |
|--------------------------|-----------------------------------|--------------------------------|
| NVIDIA Quadro FX 5500    | X                                 | X                              |
| NVIDIA Quadro FX 4500 X2 | X                                 | X                              |
| NVIDIA Quadro FX 4500    | X                                 | X                              |

**Table 3.3** Supported NVIDIA Quadro G-Sync II Products

| Product               | Windows XP 32-bit<br>Windows 2000 | Windows XP<br>Professional x64 |
|-----------------------|-----------------------------------|--------------------------------|
| NVIDIA Quadro FX 5600 | X                                 | X                              |
| NVIDIA Quadro FX 4600 | X                                 | X                              |

**Table 3.4** Supported NVIDIA Quadro Plex Products

| Product                           | Windows XP | Windows XP<br>Professional x64 |
|-----------------------------------|------------|--------------------------------|
| NVIDIA Quadro Plex 1000 Model I   | X          | X                              |
| NVIDIA Quadro Plex 1000 Model II  | X          | X                              |
| NVIDIA Quadro Plex 1000 Model III | X          | X                              |
| NVIDIA Quadro Plex 1000 Model IV  | X          | X                              |
| NVIDIA Quadro Plex 1000 Model S4  | X          | X                              |

## Supported Languages

---

The Release 169 ForceWare 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

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## System Requirements

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The hard disk space requirement is minimum 62.9 MB for English-only, and 79 MB for International.

## Installation Instructions

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### Before You Begin

- If you do not have System Administrator access privileges, it is assumed that the appropriate person with System Administrator access in your organization will set up and install the NVIDIA graphics driver software on your computer.
- The installation process copies all necessary files for operation into the appropriate directories.
- The nView system files are copied to your **Windows\System** directory.
- nView Desktop Manager Profile files (\*.tvp) are saved in the **Windows\Nview** directory.

Depending on the version of the NVIDIA driver previously installed, profiles may also be located in the **Documents and Settings\All Users\Application Data\nView\_Profiles** directory.

- As part of the install process, an uninstall is registered in your system.
- Under Windows XP, the NVIDIA driver is installed in "Dualview mode" display. However, note that the second display is not activated by default, but must be enabled.

## Preserving Settings Before Upgrading Your Software

Before uninstalling or installing software, you can preserve your nView Desktop Manager and/or NVIDIA Display settings by using the nView Desktop Manager Profiles features.

**Note:** Follow the steps below and/or refer to the *NVIDIA nView Desktop Manager User's Guide* for details. Under Windows XP/2000 and Windows NT 4.0, you must have, at least, **Power User** access privileges in order to create or save a profile. (Refer to Windows Help if you need an explanation of Power User access rights.)

Follow the steps below and/or refer to the *NVIDIA nView Desktop Manager User's Guide* for details.

- 1 Open the nView Desktop Manager Profiles page (Figure 4.1).
- 2 To preserve your current settings, you can use either the **Save** or the **New** option from the nView Desktop Manager Profiles page:
  - If you want to overwrite the currently loaded profile with your changed settings, use the **Save** option. Notice that a warning message indicates that you are about to overwrite the selected profile.
  - If you want to retain the currently loaded profile and want to save your changed settings to a new file, click the **New** option. Enter a name and description of the profile in the New Profile dialog box. For example, you can name this profile **My Settings**.
- 3 If you are an “advanced” user and want to customize certain settings in the saved profile, click **Advanced** << to expand the dialog box (Figure 4.2).
- 4 To customize the settings, you can select or clear any of the settings check boxes.
- 5 Click **Save** to return to the main Profiles page.

If you created a new profile, you will see the name of the newly created profile in the profiles list.

If you overwrote a current profile, the same profile name is retained in the list.

**Note:** nView Desktop Manager profile (.tvp) files are saved in the **Windows\nView** directory. Depending on the version of the NVIDIA driver previously installed, profiles may also be saved in the **Documents and Settings\All Users\Application Data\ nView\_Profiles** directory.

- 6 Now you can uninstall your current driver for a driver upgrade.
- 7 After you restart your computer following an NVIDIA new driver install, you can easily load the saved profile from the Profiles page of nView Desktop Manager.

## About Using Saved Profiles in Another Computer

You can easily use any saved profile (.tvp file in the **Windows\nView** directory) from one computer and use it in another computer, if you want. You'll need to copy it to the **Windows\nView** directory of a computer that has the NVIDIA ForceWare graphics display driver, etc. installed properly. Then

this profile can be loaded from another computer from the nView Desktop Manager Profiles page just as it can from your original computer.

## Uninstalling the NVIDIA Display Driver Software

*Note: It is highly recommended that you follow the steps in this section to completely uninstall the NVIDIA Display Driver software before updating to a new version of the software.*

To uninstall the nView software, follow these steps:

- 1 From the Windows taskbar, click **Start > Settings > Control Panel** to open the Control Panel window.
- 2 Double-click the **Add/Remove Programs** item.
- 3 Click the **NVIDIA Display Driver** item from the list.
- 4 Click **Change/Remove**.
- 5 Click **Yes** to continue.

A prompt appears asking whether you want to delete all of the saved nView profiles.

- If you click **Yes**, all of the nView software and all of your saved profiles will be deleted.
- If you click **No**, the nView software is removed, but the profile files are saved in the `Windows\nView` directory on your hard disk.

Your system now restarts.

## Installing the NVIDIA ForceWare Graphics Drivers

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

## NVIDIA Driver History

---

Release 169 is the latest NVIDIA driver available. [Table 3.1](#) contains a summary of some previous driver releases and the versions associated with them. Some versions listed may not have been released outside of NVIDIA.

**Table 3.1** NVIDIA Drivers for Windows

| Driver      | Name               | Versions                                | Comments |
|-------------|--------------------|---|----------|
| Release 169 | ForceWare          | 169.39, 169.61                          |          |
| Release 162 | ForceWare          | 162.50, 162.62,<br>162.65, 162.67       |          |
| Release 160 | ForceWare          | 160.02                                  |          |
| Release 95  | ForceWare          | 95.97,<br>96.02,97.78                   |          |
| Release 90  | ForceWare          | 91.36, 91.85,                           |          |
| Release 80  | ForceWare          | 81.67, 84.26,                           |          |
| Release 75  | ForceWare          | 77.37, 77.56                            |          |
| Release 70  | ForceWare          | 71.84, 71.89                            |          |
| Release 65  | ForceWare          | 66.77, 66.93,<br>67.02, 67.03,<br>67.66 |          |
| Release 60  | ForceWare          | 61.76, 61.77                            |          |
| Release 55  | ForceWare          | 56.64, 56.72,<br>57.30                  |          |
| Release 50  | ForceWare          | 52.16, 53.04                            |          |
| Release 40  | Detonator FX       | 44.03–45.xx                             |          |
| Release 40  | Detonator 40       | 40.60–44.02                             |          |
| Release 35  | Detonator 35       | 35.60–37.80                             |          |
| Release 25  | Detonator 25       | 26.00–32.90                             |          |
| Release 20  | Detonator XP       | 21.83–23.xx                             |          |
| Release 10  | Detonator 3 v1x.xx | 10.00–17.xx                             |          |



## A P P E N D I X



## MODE SUPPORT FOR WINDOWS

This chapter details the Windows modes supported by the Release 169 driver for NVIDIA products. It contains these sections:

- “General Mode Support Information” on page 34
- “Default Modes Supported by GPU for Windows XP” on page 35
- “TV-Out Modes Supported by TV Encoders” on page 49

## 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 for Windows XP](#)” on page 35.

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

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

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

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

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

| Resolution  |
|-------------|
| 1680 x 1050 |
| 1366 x 768  |

## Default Modes Supported by GPU for Windows XP

---

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

- “NVIDIA Quadro FX Family of High End GPUs” on page 36
- “NVIDIA Quadro FX Family of GPUs” on page 43

### Understanding the Mode Format

---

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

|                       |             |   |
|-----------------------|-------------|---|
| Resolution            | Color Depth | Refresh Rates                                 |
|                       |             |   |
| -----                 |             |   |
| <b>Example entry:</b> | 1024 x 768  | 32 60 70 72 75 85 100 120 140 144 150 170 200 |

|                 |                |  |
|-----------------|----------------|--|
| <b>Meaning:</b> | Resolution:    | 1024 x 768   |
|                 | Color depth:   | 32 bpp   |
|                 | Refresh rates: | 60 Hz, 70 Hz, 72 Hz, 75 Hz, 85 Hz, 100 Hz, 120 Hz,<br>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 Family of High End GPUs**

---

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

- NVIDIA Quadro FX 5600
- NVIDIA Quadro FX 4600
- NVIDIA Quadro FX 5500
- NVIDIA Quadro FX 4500 X2
- NVIDIA Quadro FX 4500
- NVIDIA Quadro FX 3400 / Quadro FX 4400
- NVIDIA Quadro FX 4400G
- NVIDIA Quadro FX 4000
- NVIDIA Quadro FX 3700
- NVIDIA Quadro FX 3500
- NVIDIA Quadro FX 3450 / Quadro FX 4000 SDI
- NVIDIA Quadro FX 1300/3000
- NVIDIA Quadro FX 1700
- NVIDIA Quadro FX 1500
- NVIDIA Quadro FX 1400
- NVIDIA Quadro FX 700
- NVIDIA Quadro FX 570
- NVIDIA Quadro FX 560
- NVIDIA Quadro FX 550
- NVIDIA Quadro FX 540
- NVIDIA Quadro FX 370
- NVIDIA Quadro NVS 440
- NVIDIA Quadro NVS 290
- NVIDIA Quadro NVS 285
- NVIDIA Quadro Plex 1000 Model I
- NVIDIA Quadro Plex 1000 Model II
- NVIDIA Quadro Plex 1000 Model III

- NVIDIA Quadro Plex 1000 Model IV
- NVIDIA Quadro Plex 1000 Model S4

//

### Standard Modes

|             |   |     |  |
|-------------|---|-----|--|
| 640 x 480   | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 720 x 480   | 8 |     | 60   |
| 720 x 576   | 8 | 50  | 60   |
| 800 x 600   | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 848 x 480   | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 960 x 600   | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1024 x 768  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1152 x 864  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1280 x 720  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 1280 x 768  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 1280 x 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         |
| 1440 x 900  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1600 x 900  | 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 | 30i | 60 70 72 75 85 100                             |
| 1920 x 1200 | 8 |     | 60 70 72 75 85 100                             |
| 1920 x 1440 | 8 |     | 60 70 72 75 85                                 |
| 2048 x 1536 | 8 |     | 60 70 72 75 85                                 |

-----

|            |    |    |  |
|------------|----|----|--|
| 640 x 480  | 16 |    | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 720 x 480  | 16 |    | 60   |
| 720 x 576  | 16 | 50 | 60   |
| 800 x 600  | 16 |    | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 848 x 480  | 16 |    | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 960 x 600  | 16 |    | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1024 x 768 | 16 |    | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1152 x 864 | 16 |    | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1280 x 720 | 16 |    | 60 70 72 75 85 100 120 140 144 150 170         |

APPENDIX A: Mode Support for Windows Default Modes Supported by GPU for Windows

|             |    |     |  |
|-------------|----|-----|--|
| 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         |
| 1440 x 900  | 16 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1600 x 900  | 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 | 30i | 60 70 72 75 85 100                             |
| 1920 x 1200 | 16 |     | 60 70 72 75 85 100                             |
| 1920 x 1440 | 16 |     | 60 70 72 75 85                                 |
| 2048 x 1536 | 16 |     | 60 70 72 75 85                                 |
| -----       |    |     |  |
| 640 x 480   | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 720 x 480   | 32 |     | 60   |
| 720 x 576   | 32 | 50  | 60   |
| 800 x 600   | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 848 x 480   | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 960 x 600   | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1024 x 768  | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1152 x 864  | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1280 x 720  | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 1280 x 768  | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 1280 x 800  | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 1280 x 960  | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 1280 x 1024 | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 1360 x 768  | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 1440 x 900  | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1600 x 900  | 32 |     | 60 70 72 75 85 100                             |
| 1600 x 1200 | 32 |     | 60 70 72 75 85 100                             |
| 1680 x 1050 | 32 |     | 60   |
| 1920 x 1080 | 32 | 30i | 60 70 72 75 85                                 |
| 1920 x 1200 | 32 |     | 60 70 72 75 85                                 |
| 1920 x 1440 | 32 |     | 60 70 72 75 85                                 |
| 2048 x 1536 | 32 |     | 60 70 72 75 85                                 |

## Horizontal Spanning Modes

|             |   |     |  |
|-------------|---|-----|--|
| 1280 x 480  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1600 x 600  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1696 x 480  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1920 x 600  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 2048 x 768  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 2304 x 864  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 2560 x 720  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 2560 x 768  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 2560 x 800  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 2560 x 960  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 2560 x 1024 | 8 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 2720 x 768  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 2880 x 900  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 3200 x 900  | 8 |     | 60 70 72 75 85 100 120                         |
| 3200 x 1200 | 8 |     | 60 70 72 75 85 100 120                         |
| 3360 x 1050 | 8 |     | 60   |
| 3840 x 1080 | 8 | 30i | 60 70 72 75 85 100                             |
| 3840 x 1200 | 8 |     | 60 70 72 75 85 100                             |
| 3840 x 1440 | 8 |     | 60 70 72 75 85                                 |
| 4096 x 1536 | 8 |     | 60 70 72 75 85                                 |

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|             |    |  |  |
|-------------|----|--|--|
| 1280 x 480  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1600 x 600  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1696 x 480  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1920 x 600  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 2048 x 768  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 2304 x 864  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 2560 x 720  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170         |
| 2560 x 768  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170         |
| 2560 x 800  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170         |
| 2560 x 960  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170         |
| 2560 x 1024 | 16 |  | 60 70 72 75 85 100 120 140 144 150 170         |
| 2720 x 768  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170         |
| 2880 x 900  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 3200 x 900  | 16 |  | 60 70 72 75 85 100 120                         |
| 3200 x 1200 | 16 |  | 60 70 72 75 85 100 120                         |
| 3360 x 1050 | 16 |  | 60   |

|             |    |     |  |
|-------------|----|-----|--|
| 3840 x 1080 | 16 | 30i | 60 70 72 75 85 100                             |
| 3840 x 1200 | 16 |     | 60 70 72 75 85 100                             |
| 3840 x 1440 | 16 |     | 60 70 72 75 85                                 |
| 4096 x 1536 | 16 |     | 60 70 72 75 85                                 |
| -----       |    |     |  |
| 1280 x 480  | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1600 x 600  | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1696 x 480  | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1920 x 600  | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 2048 x 768  | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 2304 x 864  | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 2560 x 720  | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 2560 x 768  | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 2560 x 800  | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 2560 x 960  | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 2560 x 1024 | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 2720 x 768  | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 2880 x 900  | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 3200 x 900  | 32 |     | 60 70 72 75 85 100                             |
| 3200 x 1200 | 32 |     | 60 70 72 75 85 100                             |
| 3360 x 1050 | 32 |     | 60   |
| 3840 x 1080 | 32 | 30i | 60 70 72 75 85                                 |
| 3840 x 1200 | 32 |     | 60 70 72 75 85                                 |
| 3840 x 1440 | 32 |     | 60 70 72 75 85                                 |
| 4096 x 1536 | 32 |     | 60 70 72 75 85                                 |

## Vertical Spanning Modes

|             |   |  |  |
|-------------|---|--|--|
| 640 x 960   | 8 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 800 x 1200  | 8 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 848 x 960   | 8 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 960 x 1200  | 8 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1024 x 1536 | 8 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1152 x 1728 | 8 |  | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1280 x 1440 | 8 |  | 60 70 72 75 85 100 120 140 144 150 170         |
| 1280 x 1536 | 8 |  | 60 70 72 75 85 100 120 140 144 150 170         |
| 1280 x 1600 | 8 |  | 60 70 72 75 85 100 120 140 144 150 170         |

|             |   |     |  |
|-------------|---|-----|--|
| 1280 x 1920 | 8 |     | 60 70 72 75 85 100 120 140 144 150 170     |
| 1280 x 2048 | 8 |     | 60 70 72 75 85 100 120 140 144 150 170     |
| 1360 x 1536 | 8 |     | 60 70 72 75 85 100 120 140 144 150 170     |
| 1440 x 1800 | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200 |
| 1600 x 1800 | 8 |     | 60 70 72 75 85 100 120                     |
| 1600 x 2400 | 8 |     | 60 70 72 75 85 100 120                     |
| 1680 x 2100 | 8 |     | 60   |
| 1920 x 2160 | 8 | 30i | 60 70 72 75 85 100                         |
| 1920 x 2400 | 8 |     | 60 70 72 75 85 100                         |
| 1920 x 2880 | 8 |     | 60 70 72 75 85                             |
| 2048 x 3072 | 8 |     | 60 70 72 75 85                             |

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|             |    |     |  |
|-------------|----|-----|--|
| 640 x 960   | 16 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 800 x 1200  | 16 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 848 x 960   | 16 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 960 x 1200  | 16 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1024 x 1536 | 16 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1152 x 1728 | 16 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1280 x 1440 | 16 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 1280 x 1536 | 16 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 1280 x 1600 | 16 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 1280 x 1920 | 16 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 1280 x 2048 | 16 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 1360 x 1536 | 16 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 1440 x 1800 | 16 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1600 x 1800 | 16 |     | 60 70 72 75 85 100 120                         |
| 1600 x 2400 | 16 |     | 60 70 72 75 85 100 120                         |
| 1680 x 2100 | 16 |     | 60   |
| 1920 x 2160 | 16 | 30i | 60 70 72 75 85 100                             |
| 1920 x 2400 | 16 |     | 60 70 72 75 85 100                             |
| 1920 x 2880 | 16 |     | 60 70 72 75 85                                 |
| 2048 x 3072 | 16 |     | 60 70 72 75 85                                 |

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|             |    |  |  |
|-------------|----|--|--|
| 640 x 960   | 32 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 800 x 1200  | 32 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 848 x 960   | 32 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 960 x 1200  | 32 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1024 x 1536 | 32 |  | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1152 x 1728 | 32 |  | 60 70 72 75 85 100 120 140 144 150 170 200     |

APPENDIX A: Mode Support for Windows Default Modes Supported by GPU for Windows

|             |    |     |  |
|-------------|----|-----|--|
| 1280 x 1440 | 32 |     | 60 70 72 75 85 100 120 140 144 150         |
| 1280 x 1536 | 32 |     | 60 70 72 75 85 100 120 140 144 150         |
| 1280 x 1600 | 32 |     | 60 70 72 75 85 100 120 140 144 150         |
| 1280 x 1920 | 32 |     | 60 70 72 75 85 100 120 140 144 150         |
| 1280 x 2048 | 32 |     | 60 70 72 75 85 100 120 140 144 150         |
| 1360 x 1536 | 32 |     | 60 70 72 75 85 100 120 140 144 150         |
| 1440 x 1800 | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200 |
| 1600 x 1800 | 32 |     | 60 70 72 75 85 100                         |
| 1600 x 2400 | 32 |     | 60 70 72 75 85 100                         |
| 1680 x 2100 | 32 |     | 60   |
| 1920 x 2160 | 32 | 30i | 60 70 72 75 85                             |
| 1920 x 2400 | 32 |     | 60 70 72 75 85                             |
| 1920 x 2880 | 32 |     | 60 70 72 75 85                             |
| 2048 x 3072 | 32 |     | 60 70 72 75 85                             |

## NVIDIA Quadro FX Family of GPUs

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

- NVIDIA Quadro FX 2000
- NVIDIA Quadro FX 1000
- NVIDIA Quadro NVS 280 PCI
- NVIDIA Quadro FX 500/FX 600
- NVIDIA Quadro FX 1100
- NVIDIA Quadro FX 330

### Standard Modes

|             |    |     |    |    |    |    |    |     |     |     |     |     |     |     |     |
|-------------|----|-----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 640 x 480   | 8  |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 720 x 480   | 8  |     | 60 |    |    |    |    |     |     |     |     |     |     |     |     |
| 720 x 576   | 8  |     | 50 | 60 |    |    |    |     |     |     |     |     |     |     |     |
| 800 x 600   | 8  |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 848 x 480   | 8  |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 960 x 600   | 8  |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 960 x 1200  | 8  |     |    | 61 |    |    |    |     |     |     |     |     |     |     |     |
| 1024 x 768  | 8  |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 1152 x 864  | 8  |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 |     |
| 1280 x 720  | 8  |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 |     |     |
| 1280 x 768  | 8  |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 |     |     |
| 1280 x 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 |     |     |     |     |     |     |
| 1600 x 1200 | 8  |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 |     |     |     |     |     |     |
| 1920 x 1080 | 8  | 30i | 60 | 70 | 72 | 75 | 85 | 100 |     |     |     |     |     |     |     |
| 1920 x 1200 | 8  |     | 60 | 70 | 72 | 75 | 85 | 100 |     |     |     |     |     |     |     |
| 1920 x 1440 | 8  |     | 60 | 70 | 72 | 75 | 85 |     |     |     |     |     |     |     |     |
| 2048 x 1536 | 8  |     | 60 | 70 | 72 | 75 | 85 |     |     |     |     |     |     |     |     |
| -----       |    |     |    |    |    |    |    |     |     |     |     |     |     |     |     |
| 640 x 480   | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 720 x 480   | 16 |     | 60 |    |    |    |    |     |     |     |     |     |     |     |     |



|             |    |     |    |             |
|-------------|----|-----|----|-------------|
| 1920 x 1080 | 32 | 30i | 60 | 70 72 75 85 |
| 1920 x 1200 | 32 |     | 60 | 70 72 75 85 |
| 1920 x 1440 | 32 |     | 60 | 70 72 75 85 |
| 2048 x 1536 | 32 |     | 60 | 70 72 75 85 |

### Horizontal Spanning Modes

|             |   |     |    |   |
|-------------|---|-----|----|---|
| 1280 x 480  | 8 |     | 60 | 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1600 x 600  | 8 |     | 60 | 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1696 x 480  | 8 |     | 60 | 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1920 x 600  | 8 |     | 60 | 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1920 x 1200 | 8 |     | 61 |   |
| 2048 x 768  | 8 |     | 60 | 70 72 75 85 100 120 140 144 150 170 200 240 |
| 2304 x 864  | 8 |     | 60 | 70 72 75 85 100 120 140 144 150 170 200     |
| 2560 x 720  | 8 |     | 60 | 70 72 75 85 100 120 140 144 150 170         |
| 2560 x 768  | 8 |     | 60 | 70 72 75 85 100 120 140 144 150 170         |
| 2560 x 800  | 8 |     | 60 | 70 72 75 85 100 120 140 144 150 170         |
| 2560 x 960  | 8 |     | 60 | 70 72 75 85 100 120 140 144 150 170         |
| 2560 x 1024 | 8 |     | 60 | 70 72 75 85 100 120 140 144 150 170         |
| 2720 x 768  | 8 |     | 60 | 70 72 75 85 100 120 140 144 150 170         |
| 3200 x 900  | 8 |     | 60 | 70 72 75 85 100 120                         |
| 3200 x 1200 | 8 |     | 60 | 70 72 75 85 100 120                         |
| 3840 x 1080 | 8 | 30i | 60 | 70 72 75 85 100                             |
| 3840 x 1200 | 8 |     | 60 | 70 72 75 85 100                             |
| 3840 x 1440 | 8 |     | 60 | 70 72 75 85                                 |
| 4096 x 1536 | 8 |     | 60 | 70 72 75 85                                 |

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|             |    |  |    |   |
|-------------|----|--|----|---|
| 1280 x 480  | 16 |  | 60 | 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1600 x 600  | 16 |  | 60 | 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1696 x 480  | 16 |  | 60 | 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1920 x 600  | 16 |  | 60 | 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1920 x 1200 | 16 |  | 61 |   |
| 2048 x 768  | 16 |  | 60 | 70 72 75 85 100 120 140 144 150 170 200 240 |
| 2304 x 864  | 16 |  | 60 | 70 72 75 85 100 120 140 144 150 170 200     |
| 2560 x 720  | 16 |  | 60 | 70 72 75 85 100 120 140 144 150 170         |
| 2560 x 768  | 16 |  | 60 | 70 72 75 85 100 120 140 144 150 170         |
| 2560 x 800  | 16 |  | 60 | 70 72 75 85 100 120 140 144 150 170         |
| 2560 x 960  | 16 |  | 60 | 70 72 75 85 100 120 140 144 150 170         |

|             |    |     |    |    |    |    |    |     |     |     |     |     |     |     |     |
|-------------|----|-----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2560 x 1024 | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 |     |     |
| 2720 x 768  | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 |     |     |
| 3200 x 900  | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 |     |     |     |     |     |     |
| 3200 x 1200 | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 |     |     |     |     |     |     |
| 3840 x 1080 | 16 | 30i | 60 | 70 | 72 | 75 | 85 | 100 |     |     |     |     |     |     |     |
| 3840 x 1200 | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 |     |     |     |     |     |     |     |
| 3840 x 1440 | 16 |     | 60 | 70 | 72 | 75 | 85 |     |     |     |     |     |     |     |     |
| 4096 x 1536 | 16 |     | 60 | 70 | 72 | 75 | 85 |     |     |     |     |     |     |     |     |
| -----       |    |     |    |    |    |    |    |     |     |     |     |     |     |     |     |
| 1280 x 480  | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 1600 x 600  | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 1696 x 480  | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 1920 x 600  | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 1920 x 1200 | 32 |     |    | 61 |    |    |    |     |     |     |     |     |     |     |     |
| 2048 x 768  | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 |     |
| 2176 x 612  | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 |     |
| 2304 x 864  | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 |     |
| 2560 x 720  | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 |     |     |     |
| 2560 x 768  | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 |     |     |     |
| 2560 x 800  | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 |     |     |     |
| 2560 x 960  | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 |     |     |     |
| 2560 x 1024 | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 |     |     |     |
| 2720 x 768  | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 |     |     |     |
| 3200 x 900  | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 |     |     |     |     |     |     |
| 3200 x 1024 | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 |     |     |     |     |     |     |     |
| 3200 x 1200 | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 |     |     |     |     |     |     |     |
| 3840 x 1080 | 32 | 30i | 60 | 70 | 72 | 75 | 85 |     |     |     |     |     |     |     |     |
| 3840 x 1200 | 32 |     | 60 | 70 | 72 | 75 | 85 |     |     |     |     |     |     |     |     |
| 3840 x 1440 | 32 |     | 60 | 70 | 72 | 75 | 85 |     |     |     |     |     |     |     |     |
| 4096 x 1536 | 32 |     | 60 | 70 | 72 | 75 | 85 |     |     |     |     |     |     |     |     |

## Vertical Spanning Modes

|             |   |  |    |    |    |    |    |     |     |     |     |     |     |     |     |
|-------------|---|--|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 640 x 960   | 8 |  | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 800 x 1200  | 8 |  | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 848 x 960   | 8 |  | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 960 x 1200  | 8 |  | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 1024 x 1536 | 8 |  | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |

|             |   |     |    |    |    |    |    |     |     |     |     |     |     |     |
|-------------|---|-----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|
| 1152 x 1728 | 8 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 |
| 1280 x 1440 | 8 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 |     |
| 1280 x 1536 | 8 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 |     |
| 1280 x 1600 | 8 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 |     |
| 1280 x 1920 | 8 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 |     |
| 1280 x 2048 | 8 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 |     |
| 1360 x 1536 | 8 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 |     |
| 1600 x 1800 | 8 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 |     |     |     |     |     |
| 1600 x 2400 | 8 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 |     |     |     |     |     |
| 1920 x 2160 | 8 | 30i | 60 | 70 | 72 | 75 | 85 | 100 |     |     |     |     |     |     |
| 1920 x 2400 | 8 |     | 60 | 70 | 72 | 75 | 85 | 100 |     |     |     |     |     |     |
| 1920 x 2880 | 8 |     | 60 | 70 | 72 | 75 | 85 |     |     |     |     |     |     |     |
| 2048 x 3072 | 8 |     | 60 | 70 | 72 | 75 | 85 |     |     |     |     |     |     |     |

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|             |    |     |    |    |    |    |    |     |     |     |     |     |     |     |     |
|-------------|----|-----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 640 x 960   | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 800 x 1200  | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 848 x 960   | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 960 x 1200  | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 1024 x 1536 | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 1152 x 1728 | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 |     |
| 1280 x 1440 | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 |     |     |
| 1280 x 1536 | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 |     |     |
| 1280 x 1600 | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 |     |     |
| 1280 x 1920 | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 |     |     |
| 1280 x 2048 | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 |     |     |
| 1360 x 1536 | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 |     |     |
| 1600 x 1800 | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 |     |     |     |     |     |     |
| 1600 x 2400 | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 |     |     |     |     |     |     |
| 1920 x 2160 | 16 | 30i | 60 | 70 | 72 | 75 | 85 | 100 |     |     |     |     |     |     |     |
| 1920 x 2400 | 16 |     | 60 | 70 | 72 | 75 | 85 | 100 |     |     |     |     |     |     |     |
| 1920 x 2880 | 16 |     | 60 | 70 | 72 | 75 | 85 |     |     |     |     |     |     |     |     |
| 2048 x 3072 | 16 |     | 60 | 70 | 72 | 75 | 85 |     |     |     |     |     |     |     |     |

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|             |    |  |    |    |    |    |    |     |     |     |     |     |     |     |     |
|-------------|----|--|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 640 x 960   | 32 |  | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 800 x 1200  | 32 |  | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 848 x 960   | 32 |  | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 960 x 1200  | 32 |  | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 | 240 |
| 1024 x 1536 | 32 |  | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 |     |
| 1088 x 1224 | 32 |  | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 |     |

APPENDIX A: Mode Support for Windows Default Modes Supported by GPU for Windows

|             |    |     |    |    |    |    |    |     |     |     |     |     |     |     |
|-------------|----|-----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|
| 1152 x 1728 | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 | 170 | 200 |
| 1280 x 1440 | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 |     |     |
| 1280 x 1536 | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 |     |     |
| 1280 x 1600 | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 |     |     |
| 1280 x 1920 | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 |     |     |
| 1280 x 2048 | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 |     |     |
| 1360 x 1536 | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 | 140 | 144 | 150 |     |     |
| 1600 x 1800 | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 | 120 |     |     |     |     |     |
| 1600 x 2048 | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 |     |     |     |     |     |     |
| 1600 x 2400 | 32 |     | 60 | 70 | 72 | 75 | 85 | 100 |     |     |     |     |     |     |
| 1920 x 2160 | 32 | 30i | 60 | 70 | 72 | 75 | 85 |     |     |     |     |     |     |     |
| 1920 x 2400 | 32 |     | 60 | 70 | 72 | 75 | 85 |     |     |     |     |     |     |     |
| 1920 x 2880 | 32 |     | 60 | 70 | 72 | 75 | 85 |     |     |     |     |     |     |     |
| 2048 x 3072 | 32 |     | 60 | 70 | 72 | 75 | 85 |     |     |     |     |     |     |     |

## 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 and GeForce 7 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.