



NVIDIA Quadro Professional Drivers ***Release 178 Notes***

Version 178.49

For Windows XP / 2000

Windows XP Professional x64 Edition

Windows Server 2003 x64 Edition

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CHAPTER

1

INTRODUCTION TO *RELEASE 178 NOTES*

This edition of *Release 178 Notes* describes the Release 178 Quadro Professional Graphics Drivers for Microsoft® Windows® XP. 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:

- [“Changes in the Release 178 Driver for Windows XP” on page 3](#) gives a summary of changes, and fixed and open issues in this version.
- [“The Release 178 Driver for Windows XP” on page 13](#) 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 29](#) lists the default resolutions supported by the driver.

Changes in this Edition

This edition of the *Release 178 Notes* for Windows XP includes information about NVIDIA Quadro Professional graphics driver version 178.49, and lists changes made to the driver since version 162.73 and 165.42. These changes are discussed beginning with the chapter [“Changes in the Release 178 Driver for Windows XP” on page 3](#).

CHAPTER

2

CHANGES IN THE RELEASE 178 DRIVER FOR WINDOWS XP

This chapter describes open issues for version 178.49, and resolved issues and driver enhancements for versions of the Release 178 driver up to version 178.49. The chapter contains these sections:

- “Version 178.49 Highlights” on page 4
- “Special Instructional Notes for this Release” on page 6
- “Changes in Version 178.49” on page 7
- “Open Issues in Version 178.49” on page 9
- “Not NVIDIA Issues” on page 12
- “Known Product Limitations” on page 21

Version 178.49 Highlights

This section provides highlights of version 178.49 of the NVIDIA Release 178 Driver.

What's New in Release 178

- Added support for the following NVIDIA products¹:
 - NVIDIA Quadro FX 5800 and SDI II Option Card
 - NVIDIA Quadro FX 5800 and G-Sync II Option Card
 - NVIDIA QuadroPlex 2200 D2
 - NVIDIA QuadroPlex 2100 D4
 - NVIDIA QuadroPlex 2200 S4
 - NVIDIA Quadro FX 470
 - NVIDIA Quadro CX
 - NVIDIA Quadro FX370 Low Profile
 - NVIDIA Quadro FX 4800
 - NVIDIA Quadro FX 5800
 - NVIDIA Quadro VX 200
 - NVIDIA Quadro NVS 450
- Added support for DDC-Ci/MCCS over the DisplayPort AUX channel.
- Added 10-bits per color (10bpc) DisplayPort support for full-screen applications on supported products such as the Quadro FX 470 or Quadro CX.
- Removed Full-screen video mirror controls from the NVIDIA Control Panel.

1. See [“Supported NVIDIA Products”](#) on page 14 for a list of products supported by driver Version 178.49.

What's New in Version 178.49

- Added support for the following NVIDIA products:
 - NVIDIA Quadro FX 5800 and SDI II Option Card
 - NVIDIA Quadro FX 5800 and G-Sync II Option Card
 - NVIDIA QuadroPlex 2200 D2
 - NVIDIA QuadroPlex 2100 D4
 - NVIDIA QuadroPlex 2200 S4

Resolved Issues for Windows Vista

See [“Changes in Version 178.49” on page 7](#) for a list of resolved issues.

Special Instructional Notes for this Release

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)

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

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

Changes in Version 178.49

The following sections list the changes made and issues resolved since driver version 162.73 and 165.42.

- “Fixed Issues–Windows XP 32-bit” on page 7
- “Fixed Issues–Windows XP x64” on page 8

The NVIDIA bug number is provided for reference.

Fixed Issues–Windows XP 32-bit

Single-GPU Fixed Issues

- The NVIDIA Control Panel Run Display Optimization Wizard back button does not work.
- 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.
- The NVIDIA Control Panel Run Display Optimization Wizard back button does not work.
- Workstation 3D Stereo: After enabled 3D stereo “Force stereo stuttering” and then closing an OpenGL application, the desktop shows corruption.
- NVIDIA Quadro SDI: When using the APIs, the dual-single-link output doesn’t match the single-link-output.
- The Apply and Cancel buttons are sometimes missing from the NVIDIA Control Panel Send Graphics to SDI page.
- NVIDIA Quadro SDI: Under Dualview mode, there is no SDI output after selecting RGB 4:4:4 SDI output format.
- Quadro FX 5500: ArchiCAD12—the application disables antialiasing due to “insufficient video card resources”

Multi-GPU Fixed Issues

- NVIDIA Quadro G-Sync, NVIDIA Quadro Plex 1000 Model II: During initial driver installation, the driver does not get installed on all GPUs when using two Quadro Plex model IIs in a single system.
- [SLI], QuadroPlex 2200 D2, Quadro FX 5800/4800: SLI bridge connector affects swap barriers.]
- QuadroPlex 2200 D2: The NVIDIA Control Panel View system topology page gives incorrect hardware status.

- QuadroPlex 2200 D2: Display corruption occurs when enabling two dual-link displays on a single QuadroPlex system.]
- [SLI], G-sync, QuadroPlex 2100D4: Only two displays are available to view SLi rendered content, when four active displays are attached.
- [Quad SLI], G-sync, QuadPlex 2100 D4: Blue-screen crash or system hang occurs when running master frame lock demo using SLI AFR mode.

Fixed Issues—Windows XP x64

Multi-GPU Fixed Issues

- QuadroPlex 2200 D2: The NVIDIA Control Panel View system topology page does not detect the connected hardware.
- [SLI], G-Sync, 2 x QuadroPlex 2200 D2: On the View System Topology page, both systems can be set as the server.
- [SLI], G-sync, 2 x QuadroPlex 2100 D4: Server and clients are not in sync when running a frame lock demo.
- QuadroPlex 2200D2: SLI Mosaic mode is slow.
- G-sync, QuadroPlex 2200 D2: Quadroplex performance mode is shown when it shouldn't be available on the Manage Quadroplex settings page.

Open Issues in Version 178.49

As with every released driver, version 178.49 of the Release 178 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 9
- “Windows XP x86 Issues” on page 10
- “Windows XP x64 Issues” on page 11

NVIDIA Recommendations

- 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

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

Single-GPU Issues

- All GPUs: When adding Custom Resolutions, the user is not allowed to select the "monitor scaling" option.
- The online Help does not include information about workstation features.
- Rendering speed remains slow after closing resource-intensive applications.
- Maya 2009: driver versions and configurations need to be defined for the application in order to properly run in stereo.
- KOMPAS-3D V9 SP1 –the CAD software runs faster on a GeForce card when compared to a Quadro card.
- 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.
- Video color-space range for DVI-only¹ outputs is erroneously set to standard mode (16-235) instead of extended mode (0-255).

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.

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

- 3 Open the "0000" directory and create a new DWORD called **VMRCCSSStatus** 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
- G-Sync, QuadroPlex 2200 D2: With Stereo enabled, blue-screen crash sometimes occurs after setting the G-sync client/servers.
 - NVIDIA Quadro SDI: The SDI Output format drop down box in the SDI Signal Settings dialog is sometimes blank.
 - NVIDIA Quadro SDI: The View System Topology page sometimes incorrectly indicates that the graphics card is not locked to the external sync signal.
 - Quadro FX 5600: The NVIDIA Control Panel custom resolution settings behave inconsistently.
 - Quadro FX 5500: ArchiCAD12–Rotating Gradient fill while zooming is erroneous.
 - Quadro FX 4600: Intergraph Microstation v8 – a horizontal “ripple” or tear flows from the top to the bottom when using ISSD application profile.

Multi-GPU Issues

- NVIDIA Control Panel: When two graphics cards are installed, after changing properties from the NVIDIA Control Panel, the Apply button does not work until the system is rebooted.
- [SLI]: With SLI mode enabled, the NVIDIA Control Panel->Workstation->View Status page does not the correct monitor connections.
- [Multi-GPU]: There is no application scaling when using `glReadPixels()` with GPU affinity.

Windows XP x64 Issues

Single-GPU Issues

- SolidEdge (32-bit)–the application cannot determine the driver version under a non-administrator account.
- FlightSimulator–lines (from a cloud pattern) show only in FSAA 8xMS mode, and not in 4xMS or 8xMS/8xCS antialiasing modes.
- KOMPAS-3D V9 SP1 –the CAD software runs faster on a GeForce card when compared to a Quadro card.

Not NVIDIA Issues

This section lists issues that are not due to the NVIDIA driver.

- Linear interpolation on a 3D texture with format GL_RGBA32F_ARB produces banding.

This is not an NVIDIA driver bug, but a normal result of the filtering methods used by the hardware.

- CATIA V5R18—there are no "Enable OpenGL Shader" options.

This is not an NVIDIA bug, but rather an issue with Windows XP SP2.

- Windows Vista 64-bit: XSI - the application viewport doesn't refresh properly.

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

- CATIAV5R18— Draft Analysis images are displayed incorrectly.

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

CHAPTER

3

THE RELEASE 178 DRIVER FOR WINDOWS XP

This chapter covers the following main topics:

- “Hardware and Software Support” on page 13
- “Driver Installation” on page 16
- “NVIDIA Driver History” on page 19

Hardware and Software Support

Supported Operating Systems

This Release 178 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 Edition¹
- Microsoft Windows 2000

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

Supported NVIDIA Products

The following tables list the NVIDIA workstation products supported by this Release 178 driver.

Table 3.1 Supported NVIDIA Quadro SDI Products

Product	Windows XP 32-bit Windows 2000	Windows XP Professional x64
NVIDIA Quadro FX 5800 SDI II	X	X
NVIDIA Quadro FX 5600 SDI	X	X
NVIDIA Quadro FX 5500 SDI	X	X
NVIDIA Quadro FX 4600 SDI	X	X
NVIDIA Quadro FX 4000 SDI	X	X

Table 3.2 Supported NVIDIA Quadro G-Sync Products

Product	Windows XP 32-bit Windows 2000	Windows XP 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 Windows 2000	Windows XP Professional x64
NVIDIA Quadro FX 5800	X	X
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 Professional x64
NVIDIA Quadro Plex 2100 S4	X	X
NVIDIA Quadro Plex 2200 S4	X	X
NVIDIA Quadro Plex 2100 D4	X	X
NVIDIA Quadro Plex 2200 D2	X	X
NVIDIA Quadro Plex Model I	X	X
NVIDIA Quadro Plex Model III	X	X
NVIDIA Quadro Plex Model IV	X	X

Supported Languages

The Release 178 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

System Requirements

The hard disk space requirement is minimum 55.0 MB for English-only, and 92.5 MB for International.

Installation Instructions

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 178 is the latest NVIDIA driver available. [Table 3.2](#) 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 3.2 NVIDIA Drivers for Windows

Driver	Name	Versions	Comments
Release 178	Quadro	178.26, 178.46, 178.49	
Release 176	Quadro	176.04, 176.15	
Release 175	Quadro	175.51	
Release 169	ForceWare	169.39, 169.61, 169.96	
Release 162	ForceWare	162.50, 162.62, 162.65, 162.67	
Release 160	ForceWare	160.02	
Release 95	ForceWare	95.97, 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, 67.02, 67.03, 67.66	
Release 60	ForceWare	61.76, 61.77	
Release 55	ForceWare	56.64, 56.72, 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	

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 22
- “Image Sharpening Control not Available with Quadro FX 4600 and later GPUs” on page 22
- “DVD Playback Issues with Dual NVIDIA Quadro NVS Cards” on page 22
- “PowerDVD 5.0 Does Not Display Correctly in nView Span Mode” on page 22
- “DirectX Fails When Detaching/Reattaching Displays in Dualview Mode” on page 23
- “OpenGL Viewport Scaling Problem in Horizontal Span Mode” on page 23
- “Video Playback in nView Clone and Span Modes” on page 24
- “Monitor Ordering in the Windows Settings Page” on page 24
- “Applying Workstation Application Profiles” on page 25
- “No Antialiasing of 3DMark03 Image Quality Screen Captures” on page 26
- “Windows XP/2000 Issue with Settings Tab Monitor Positioning” on page 27
- “Antialiasing Problems With Certain Applications” on page 27
- “Poor Quality S-Video Output on Some TVs” on page 27
- “AGP and PCI-E Programs May Hang With AMD K7 and K8 Processors” on page 28
- “Desktop Manager Does Not Re-Center Logon Screen” on page 28

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.

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.

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

Connector Position	Monitor Number
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.

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.

APPENDIX



MODE SUPPORT FOR WINDOWS

This chapter details the Windows modes supported by the Release 178 driver for NVIDIA products. It contains these sections:

- “General Mode Support Information” on page 30
- “Default Modes Supported by GPU for Windows XP” on page 31
- “TV-Out Modes Supported by TV Encoders” on page 57

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 31.

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 graphic solutions.
Apple 30" Cinema HD Display (Dual link DVI)	2560x1600 @ 60 Hz	
Dell WFP 3007 (Dual Link DVI)	2560x1600 @ 60 Hz	

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 4000 Family of GPUs” on page 32
- “NVIDIA Quadro FX 5600 and 4600 Family of GPUs” on page 38
- “NVIDIA Quadro FX 5500 and 4500 Family of GPUs” on page 44
- “NVIDIA Quadro FX 5800 Family of GPUs” on page 50

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 4000 Family of GPUs

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

- NVIDIA Quadro FX 4000 SDI

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 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		
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 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 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

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

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 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

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 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
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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 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 2400	8	60 70 72 75 85 100

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

1920 x 2880	8	60 70 72 75 85
2048 x 3072	8	60 70 72 75 85

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 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

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
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 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 5600 and 4600 Family of 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

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 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
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 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 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

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

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 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

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 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

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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 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

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Vertical Spanning Modes

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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

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

1680 x 2100	8	60	
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	

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 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	

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	
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 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 5500 and 4500 Family of GPUs

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

- NVIDIA Quadro FX 5500
- NVIDIA Quadro FX 4500

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 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
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 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 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 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

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 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 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

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

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 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

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 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

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
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 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 5800 Family of GPUs

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

- NVIDIA Quadro FX 5800

Standard Modes

320 x 200	8		60 70 72 75
320 x 240	8		60 70 72 75
400 x 300	8		60 70 72 75
480 x 360	8		60 70 72 75
512 x 384	8		60 70 72 75
640 x 400	8		60 70 72 75
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
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 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 85 100 120 140 144 150
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	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

320 x 200	16		60 70 72 75
320 x 240	16		60 70 72 75
400 x 300	16		60 70 72 75
480 x 360	16		60 70 72 75
512 x 384	16		60 70 72 75
640 x 400	16		60 70 72 75
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
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 70 72 75 85 100 120 140 144 150 170
1280 x 768	16		60 70 72 75 85 100 120 140 144 150 170
1280 x 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	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

320 x 200	32		60 70 72 75
320 x 240	32		60 70 72 75
400 x 300	32		60 70 72 75
480 x 360	32		60 70 72 75
512 x 384	32		60 70 72 75
640 x 400	32		60 70 72 75
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
1088 x 612	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
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
1600 x 900	32		60 70 72 75 85 100 120
1600 x 1024	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
2176 x 612	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 85 100 120 140 144 150
3200 x 1024	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

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
2176 x 612	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 85 100 120 140 144 150
3200 x 1024	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
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
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
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
1088 x 1224	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 85 100 120 140 144 150
1600 x 2048	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

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
1088 x 1224	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 85 100 120 140 144 150
1600 x 2048	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

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
1152 x 1728	32		60 70 72 75 85 100 120 140 144 150 170
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
1680 x 2100	32		60
1920 x 2160	32	30i	60 70 72 75 85
1920 x 2400	32		60 70 72 75 85

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

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.