



ForceWare Graphics Drivers ***Release Notes***

Version 61.76

**Windows XP 64-bit Edition for 64-Bit Extended Systems
Windows Server 2003 SP1 for 64-Bit Extended Systems**

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Table of Contents

1. Introduction to *Release Notes*

Structure of the Document	1
Changes in this Edition	1

2. Release 60 Driver Issues

Open Issues in Version 61.74	3
Issues Resolved in Version 61.74	5
Known Product Limitations	6
Advanced Timing Adjustment Limitations	7
No Antialiasing of 3DMark03 Image Quality Screen Captures	7
Medal of Honor Under Windows XP / Windows 2000	8
Hide Modes Check Box Cannot be Cleared	8
Windows 2000 Issue with Settings Tab Monitor Positioning	9
Gigabyte GA-6BX Motherboard	9
Controlling Windows 9x TV Tuner Scaling Artifacts	9
Quake III Arena malloc() Error on TNT2	10
Windows Media Player Hangs Playing MPEG Files	10
AVI Playback Problems With Older Intel Indeo Codecs	11
Antialiasing Problems With Certain Applications 11	
VIA KX133 and 694X Chipsets With AGP 2X	11
Irongate Chipsets With AGP 1X	11
Poor Quality S-Video Output on Some TVs	12
GLQuake Crash and Version 5.16 (or Later) Drivers	12
Windows 98 and Windows Me MultiMon Support 12	
AGP Programs May Hang With Athlon Processor	13
Desktop Manager Does Not Re-Center Logon Screen	13
Issues with Video Mirror	13

3. The Release 60 Driver

Hardware and Software Support	15
Supported Operating Systems	15
Supported NVIDIA Products	16
Supported Languages	17
Driver Installation	18

System Requirements	18
Installation Instructions	19

4. NVIDIA Driver History

Driver Release History	24
Release 60 Enhancements	24
Latest GPU Support	24
PCI Express Support	24
Enhancements in Driver Performance	25
3D Graphics API Enhancements	25
Release 55 Enhancements	26
PCI Express Support	26
PAE Support	26
nView Desktop Manager Enhancements	26
User Interface Enhancements	26
Video Support Enhancements	26
3D Graphics API Enhancements	27
Release 50 Enhancements	27
64-Bit Support	27
Dynamic Memory Mapping	27
NVIDIA Unified Compiler	27
Display Driver Changes and New Features	28
Video—New Features	28
PowerMizer—New Features	28
User Interface Changes	29
nView	29
DirectX Graphics	30
OpenGL	30
Release 40 Enhancements	31
Enhanced Display Driver, DirectX, and Video Capabilities	31
New Graphical User Interface	32
Enhanced nView Desktop Manager Features	32
OpenGL Enhancements	33
Release 35 Enhancements	33
Release 25 Enhancements	34
Release 20 Enhancements	35
Release 10 Enhancements	35

A. Mode Support for Windows

Modes Supported by GPU	38
Mode Format	38
TNT2 Products	39
Vanta Products	41
GeForce FX and GeForce 6 Products	43

Quadro FX High End Products	49
GeForce, GeForce2, GeForce3, and Quadro Products	55
GeForce2 MX, GeForce4 MX, Quadro4, GeForce4 Ti Product, and GeForce4 Integrated Families	58
Integrated GeForce2 Product	64
Quadro4 9xx / 7xx XGL Products	66
Quadro FX / Quadro NVS Products	72
Modes Supported by DACs and TV Encoders .	78
External DAC Mode Support	78
TV-Out Mode Support	79



List of Tables



Table 2.1	Known Issues with Video Mirror	13
Table 3.1	Supported NVIDIA GPU-Based Products.	16
Table 3.2	Hard Disk Space Requirements—English	18
Table 3.3	Hard Disk Space Requirements—Non-English Languages	18
Table 3.4	Hard Disk Space Requirements—Full International Package	18
Table 3.5	Additional Operating System Requirements	19
Table 4.1	NVIDIA Drivers for Windows	24
Table A.1	External DAC Modes (Fairchild FMS3815).	78
Table A.2	External DAC Modes (Analog Devices ADV-7123).	78
Table A.3	Mode Support for TV-Out.	79



CHAPTER

1

INTRODUCTION TO *RELEASE NOTES*

This edition of *Release Notes* describes the Release 60 Drivers for Microsoft® Windows® and provides information applicable to all NVIDIA® drivers. NVIDIA provides these notes to describe performance improvements and bug fixes in each documented version of the driver.

Structure of the Document

This document is organized in the following sections:

- [“Release 60 Driver Issues” on page 3](#) gives a summary of
 - Issues that are open in this version
 - Issues that have been resolved in this version.
 - Known limitations of the driver
- [“The Release 60 Driver” on page 15](#) describes the NVIDIA products and languages supported by this driver, the system requirements, and how to install the driver.
- [“NVIDIA Driver History” on page 23](#) describes the new features included in the Release 60 driver as well as information on previous driver releases.
- [“Mode Support for Windows” on page 37](#)

Changes in this Edition

This edition of *Release Notes* includes information about version 61.76 of the Release 60 driver. It discusses changes made to the driver since version 57.30. These changes are discussed beginning with the chapter [“Release 60 Driver Issues” on page 3](#).

CHAPTER

2

RELEASE 60 DRIVER ISSUES

This chapter describes open issues for version 61.76, and resolved issues and driver enhancements for versions of the Release 60 driver up to version 61.76. The chapter contains these sections:

- [“Open Issues in Version 61.76” on page 3](#)
- [“Issues Resolved in Version 61.76” on page 5](#)
- [“Known Product Limitations” on page 7](#)

Open Issues in Version 61.76

As with every released driver, version 61.76 of the Release 60 driver has open issues and enhancement requests associated with it. What follows is a list 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.

- GeForce FX 5950 Ultra, Windows XP 64-bit Edition: Far Cry crashes on startup.
- GeForce4 MX, Windows XP 64-bit Edition: The system hangs when enabling displays 2, 3, and 4 using the Microsoft Control Panel.
- GeForce2, GeForce2 MX, Windows XP 64-bit Edition: Billboard application stutters when toggling to full screen mode.
- Quadro NVS 280 PCI, Windows XP 64-bit Edition: Rotation causes blue-screen crash when playing an MPEG in DualView mode.
- Windows XP 64-bit: Unreal Tournament 2004 crashes with the Direct3 render service selected in ut2004.ini.
- GeForceFX 5950 Ultra, Windows XP 64-bit Edition: Need for Speed Underground halts when attempting to leave a race.

- Windows XP 64-bit Edition: Apocalyptica heads up displays and menus are missing textures.

This is not an NVIDIA bug.

Issues Resolved in Version 61.76

Significant issues resolved in driver version 61.76 are listed below:

- Quadro FX 1100, Windows XP 64-bit Edition: Hidden Line performance with Studio Tools V11 (32bit).
- GeForce FX 5950 Ultra, Windows XP 64-bit Edition: Halo crashes to the desktop when changing resolution.
- GeForce FX 5950 Ultra, Windows XP 64-bit Edition: Rendering corruption in Deus Ex2: Invisible War Demo.
- Windows XP 64-bit Edition: 3DMark slower in Win64 than Win32.
- GeForce FX 5950 Ultra, Windows XP 64-bit Edition: Texture flickering/flashing in Far Cry.

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:

- “Advanced Timing Adjustment Limitations” on page 8
- “No Antialiasing of 3DMark03 Image Quality Screen Captures” on page 8
- “Medal of Honor Under Windows XP / Windows 2000” on page 9
- “Hide Modes Check Box Cannot be Cleared” on page 9
- “Windows 2000 Issue with Settings Tab Monitor Positioning” on page 10
- “Gigabyte GA-6BX Motherboard” on page 10
- “Controlling Windows 9x TV Tuner Scaling Artifacts” on page 10
- “Quake III Arena malloc() Error on TNT2” on page 11
- “Windows Media Player Hangs Playing MPEG Files” on page 11
- “AVI Playback Problems With Older Intel Indeo Codecs” on page 12
- “Antialiasing Problems With Certain Applications” on page 12
- “VIA KX133 and 694X Chipsets With AGP 2X” on page 12
- “Tringate Chipsets With AGP 1X” on page 12
- “Poor Quality S-Video Output on Some TVs” on page 13
- “GLQuake Crash and Version 5.16 (or Later) Drivers” on page 13
- “Windows 98 and Windows Me MultiMon Support” on page 13
- “AGP Programs May Hang With Athlon Processor” on page 14
- “Desktop Manager Does Not Re-Center Logon Screen” on page 14
- “Issues with Video Mirror” on page 14

Advanced Timing Adjustment Limitations

- **Problem**

The Advanced Timing page—accessed from the NVIDIA Display Properties Change Resolution page—is not available for some cards using the DVI connector.

- **Explanation**

DVI timing adjustment is supported for NV3x-based cards only if they have an external TMDS, such as the SiliconImage 164.

If the card uses the internal TMDS, then the page is not accessible. However, cards with an internal TMDS can support refresh rates less than 60 Hz in this driver.

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.

Hide Modes Check Box Cannot be Cleared

- **Background**

One of the NVIDIA display property page dialog boxes contains the check box labelled "Hide modes that this monitor cannot display". It is checked by default, indicating that only the refresh rates supported by the monitor are listed in the refresh rate drop down list.

The check box appears in the Device Adjustments->Monitor Settings page.

- **Problem**

If you clear the check box, click **Apply**, and then close the dialog box, the check box is still checked when the page is re-opened.

- **Explanation**

This function is no longer controlled by the NVIDIA driver, but has not been removed from the control panel in order to maintain consistency with driver designs that are currently being shipped to OEMs.

Windows 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.

Gigabyte GA-6BX Motherboard

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

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

Controlling Windows 9x TV Tuner Scaling Artifacts

Bus-mastering TV tuners that do not flip leave artifacts when they are scaled. On Windows 9x, this problem is addressed by setting the local DirectDraw™ registry value `VideoBusMasterMode` to 1. This setting causes the DirectDraw driver to look for flips occurring within half-second intervals. If none are found, an overlay automatically starts flipping at 30 fps. This setting works with only Windows 9x.

Quake III Arena `malloc()` Error on TNT2

- **Problem**

Running the application Quake III Arena in a continuous loop results in an application failure after several hours.

Typical failure modes include either a `malloc()` error (such as `Z_malloc: failed on allocation of xxxxxxxx bytes`) or the Microsoft error dialog stating that “the application has experienced a problem and must now be closed”.

- **Explanation**

The problem is not an NVIDIA bug, but is caused by a memory leak in Quake III Arena. The extent of the problem depends on the method used for looping the application:

- **Using a .CFG File**

Using a `.cfg` file actually performs an infinite recursion, which causes a memory leak in Quake III Arena, leading to the failure.

- **Running Quake III as a Local Server**

Another method for using Quake III Arena as an OpenGL stress test is to run Quake III as a local server and then either follow or spectate a bot server. The failure can also occur using this method, depending on the Quake III Arena version. For example, the problem has been seen with point release 1.15c but not with point release 1.17.

Windows Media Player Hangs Playing MPEG Files

On systems using the InterVideo WinDVD player (including ones that don't contain NVIDIA components), Windows Media Player 6.4 halts if the slider is adjusted while an MPEG clip is playing. The problem also occurs if Active Movie or the Movie Player on the Windows 98 CD is used instead of Media Player 6.4.

There are two ways to work around this problem:

- **Under Display Properties > Settings > Advanced... > Performance, set Graphics Hardware acceleration to None.**
- **Uninstall the WinDVD player.**

This is not an NVIDIA bug.

AVI Playback Problems With Older Intel Indeo Codecs

Some Intel Indeo® video codecs prior to 5.x (notably 3.2) do not correctly play AVI files that contain IF09 (YUV9) data. Symptoms include distorted images and the failure of the Overlay Color Control function. These codecs come installed on many Windows 9x and Windows NT 4.0 systems.

The problem can be resolved by downloading a release 5.x or later Indeo codec from the Intel Web site.

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.

VIA KX133 and 694X Chipsets With AGP 2X

On Athlon motherboards with the VIA KX133 or 694X chipset, such the ASUS K7V motherboard, NVIDIA drivers default to AGP 2X mode to work around insufficient drive strength on one of the signals.

- **On Windows 9x systems, the registry key**

```
HKEY_LOCAL_MACHINE\Software\NVIDIA Corporation\Global\System\
EnableVia4X
```

can be created to force NVIDIA drivers to use AGP 4X transfers.

- **On Windows NT 4.0 and Windows 2000 systems, the registry key is**

```
HKLM\System\CurrentControlSet\Services\nv4\DeviceN\ EnableVia4X
```

where the N in DeviceN is the system-determined number indicating the current NVIDIA device. This number is normally 0.

These registry keys should only be used if there is reason to believe that the motherboard has the appropriate drive strength.

Irongate Chipsets With AGP 1X

AGP 1X transfers are used on Athlon motherboards with the Irongate chipset to work around a problem with the signal integrity of the chipset.

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.

GLQuake Crash and Version 5.16 (or Later) Drivers

GLQUAKE.EXE crashes when it is run with the `-condebug` command-line option on a GeForce 256 or a GeForce2 GTS that uses NVIDIA driver version 5.16 or later.

GLQuake uses `glGetString(GL_EXTENSIONS)` to find the NVIDIA OpenGL extensions string and tries to dump the result into a fixed-length, 1024-byte buffer. With the advent of NVIDIA driver version 5.16 and its additional OpenGL capabilities, the extensions string now exceeds 1024 bytes. GLQuake does not truncate the OpenGL extensions string to the length of the buffer, thereby writing past the end of the buffer. The data lost in this process eventually causes the application to crash.

Windows 98 and Windows Me MultiMon Support

When running in MultiMon configuration, the Windows 98 and Windows Me operating systems force resolutions to be multiples of eight; for example, a resolution of 1600x900 pixels is changed to 1600x896.

Prior to setting a mode on the secondary display under MultiMon, these operating systems first validate the mode on the primary display and change the resolution of the primary display to 1600x896. Because the 1600x896 resolution is not in the NVIDIA master mode list, the NVIDIA driver would normally reject this resolution, which would prevent the operating systems from validating it and would prevent them from setting the secondary display's mode.

To work around this problem, the driver silently accepts the 1600x896 resolution, allowing this resolution to be validated by the operating systems in MultiMon configuration.

AGP Programs May Hang With Athlon Processor

Windows 2000 systems using AMD Athlon processors can hang when an AGP program such as 3D WinBench 2000 is used. The problem can occur whether or not an NVIDIA video adaptor is installed.

The solution is to edit the registry to prevent the Memory Manager from using the processor's Page Size Extension feature. For a more complete explanation see <http://support.microsoft.com/support/kb/articles/Q270/7/15.ASP>

Desktop Manager Does Not Re-Center Logon Screen

On Windows NT 4.0, Windows 2000, and 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

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

Table 2.1 Known Issues with Video Mirror

Issues	Windows XP/2000	Windows NT 4.0	Windows 9x
Video Mirror is not yet implemented for applications using Video Port Extensions (VPE).	x		x
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.	x		x
Video Mirror requires some extra memory to run. Try closing other DirectX or OpenGL applications that may be running.	x		x
You may need to close and restart your video application for Video Mirror enabling or disabling to take effect.	x		x
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.	x		x

CHAPTER

3

THE RELEASE 60 DRIVER

This chapter covers the following main topics:

- “Hardware and Software Support” on page 15
- “Driver Installation” on page 18

See the chapter “Release 60 Enhancements” on page 110 for a summary of Release 60 features and enhancements.

Hardware and Software Support

Supported Operating Systems

This Release 60 driver includes drivers designed for the following Microsoft® operating systems:

- Microsoft Windows® XP
 - Windows XP Media Center Edition 2004
 - Windows XP Professional
 - Windows XP Home Edition
 - Windows XP 64-bit Edition for 64-Bit Extended Systems
 - Windows Server 2003 SP1 for 64-Bit Extended Systems
- Microsoft Windows 2000 and Windows NT® 4.0
- Microsoft Windows 98 and Windows Millennium Edition (Me), collectively called Windows 9x in this document

Supported NVIDIA Products

Table 3.1 lists the NVIDIA products supported by the Release 60 driver. The products are listed in the approximate order of their performance.

Table 3.1 Supported NVIDIA GPU-Based Products

NVIDIA Desktop Products	NVIDIA Workstation Products
nForce TM 2 S nForce2 ST nForce2 G nForce2	
nForce 420/420D nForce 220/220D	
GeForce 6800 Ultra GeForce 6800 GeForce 6800 GT GeForce 6800 LE	Quadro FX 4000 Quadro FX 3400
GeForce FX 5950 Ultra	Quadro FX 1300
GeForce FX 5700 Ultra GeForce FX 5700 GeForce FX 5700LE GeForce PCX 5750	Quadro FX 1100 Quadro FX 330
GeForce FX 5900 GeForce FX 5900 Ultra GeForce FX 5900XT GeForce FX 5900ZT GeForce PCX 5900	Quadro FX 3000
GeForce FX 5200 Ultra GeForce FX 5200 GeForce FX 5500 GeForce FX 5100 GeForce PCX 5300	Quadro FX 500 Quadro NVS 280 PCI
GeForce FX 5600 Ultra GeForce FX 5600 GeForce FX 5600XT	
GeForce FX 5800 Ultra GeForce FX 5800	Quadro FX 2000 Quadro FX 1000 Quadro FX 700
GeForce4 Ti 4800 GeForce4 Ti 4800 SE GeForce4 Ti 4200 w/AGP 8x	Quadro4 980 XGL Quadro4 780 XGL
GeForce4 Ti 4600 GeForce4 Ti 4400 GeForce4 Ti 4200	Quadro4 900 XGL Quadro4 750 XGL Quadro4 700 XGL
GeForce3 GeForce3 Ti 500 GeForce3 Ti 200	Quadro DCC

Table 3.1 Supported NVIDIA GPU-Based Products (continued)

NVIDIA Desktop Products	NVIDIA Workstation Products
GeForce4 MX 440 w/AGP 8x GeForce4 MX 440 SE w/AGP 8x	Quadro4 580 XGL Quadro NVS 280 Quadro4 380 XGL
GeForce4 MX 460 GeForce4 MX 440 GeForce4 MX 440-SE GeForce4 MX 420	Quadro4 550 XGL Quadro NVS 200 Quadro NVS 400
GeForce2 Ti GeForce2 Ultra GeForce2 Pro GeForce2 GTS	Quadro2 Pro
GeForce2 MX GeForce2 MX400 GeForce2 MX200 GeForce2 MX100	Quadro2 MXR Quadro2 EX
GeForce 256	Quadro
RIVA TNT2™ Ultra RIVA TNT2 Pro RIVA TNT2 RIVA TNT2 M64 NVIDIA Vanta NVIDIA Vanta LT	

Supported Languages

The Release 60 Drivers for Windows 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

- “Minimum Hard Disk Space” on page 18
- “Additional Operating System Requirements” on page 19

Minimum Hard Disk Space

The minimum hard disk space requirement for each operating system are listed in [Table 3.2](#), [Table 3.3](#), and [Table 3.4](#):

Table 3.2 Hard Disk Space Requirements—English

Operating System	Minimum Hard Disk Space
Windows XP (all editions)	21.1 MB
Windows 2000	19.2 MB
Windows NT 4.0	15.0 MB
Windows Me	18.7 MB
Windows 98	19.3 MB
Windows 95	19.3 MB

Table 3.3 Hard Disk Space Requirements—Non-English Languages

Operating System	Minimum Hard Disk Space
Windows XP (all editions)	24.9 MB
Windows 2000	24.9 MB
Windows NT 4.0	24.8 MB
Windows Me	24.8 MB
Windows 98	24.8 MB

Table 3.4 Hard Disk Space Requirements—Full International Package

Operating System	Minimum Hard Disk Space
Windows XP (all editions)	34.2 MB
Windows 2000	34.2 MB
Windows NT 4.0	29.4 MB
Windows Me	33.0 MB
Windows 98	33.0 MB

Additional Operating System Requirements

The operating systems in [Table 3.5](#) require the additional packages listed in order to be supported by NVIDIA.

Table 3.5 Additional Operating System Requirements

Operating System	Additional Requirements
Windows NT 4.0	Service Pack 4
Windows 98	Microsoft DirectX™ 5

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 Me and 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.
- Under Windows 2000, the NVIDIA Display Driver is installed in Span mode. See the instructions in the *ForceWare Graphics Drivers User’s Guide* for instructions on how to install nView DualView mode.

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.

CHAPTER

4

NVIDIA DRIVER HISTORY

This chapter provides the driver release history and summarizes the features and enhancements that have been introduced in each release. It contains these sections:

- “Driver Release History” on page 24
- “Release 60 Enhancements” on page 24
- “Release 55 Enhancements” on page 26
- “Release 50 Enhancements” on page 27
- “Release 40 Enhancements” on page 31
- “Release 35 Enhancements” on page 33
- “Release 25 Enhancements” on page 34
- “Release 20 Enhancements” on page 35
- “Release 10 Enhancements” on page 35

Driver Release History

Release 60 is the latest NVIDIA driver available. [Table 4.1](#) 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 4.1 NVIDIA Drivers for Windows

Driver	Name	Versions	Comments
Release 60	ForceWare	61.76	
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	

Release 60 Enhancements

Latest GPU Support

The ForceWare Release 60 graphics drivers support the newest generation of NVIDIA GPUs, including

- **Improved vertex and pixel compilers**
- **Video shaders**

PCI Express Support

ForceWare Release 60 offers 2D and 3D graphics driver support for the PCI Express I/O, including

- **DirectX support**
- **Enhanced OpenGL support**

Improved texture memory management and bandwidth utilization

Enhancements in Driver Performance

- **Enhanced Robustness**

The ForceWare Release 60 graphics driver offers more robust stability and compatibility in DirectX support, antialiasing, and desktop rotation.

- **Reduction of OCA issues**

- **Dynamic Video Memory**

Streamlines OS system resources for large frame buffer configurations

3D Graphics API Enhancements

Direct3D

- DirectX 9.0c Support

OpenGL

- New drivers for the OpenGL ARB shading language (GLSL)
- Enhanced support for Windows XP 64-Bit Edition and IA32-E.
- New extensions
 - GL_NV_fragment_program2
 - GL_EXT_blend_equation_separate
 - NV_vertex_program3
 - ATI_draw_buffers
 - ATI_texture_float
 - ATI_texture_mirror_once
 - GL_ARB_texture_non_power_of_two
 - GL_NVX_centroid_sample
 - GL_NVX_conditional_render

Release 55 Enhancements

The Release 55 driver offers new features not found in previous releases of the NVIDIA Driver for Windows. The following highlights the new features in Release 55:

PCI Express Support

2D and 3D graphics drivers support the PCI Express I/O.

PAE Support

2D and 3D graphics driver support systems that utilize physical address extensions (PAE)¹.

nView Desktop Manager Enhancements

- Seamless nView support between 32-bit and 64-bit processes on Windows 64-bit Edition
- Dual NVKeystone support for independent keystone trapezoids under nView Span modes.
- Per-display Desktop Management

User Interface Enhancements

- New application profiles capability lets you associate a collection of driver settings—such as antialiasing and display quality settings—with an application.
- Easy access standalone panel, independent of the Microsoft Display Properties window.
- Improved multi-adapter support.
- Improved TV and HDTV Controls

Video Support Enhancements

- Advanced de-interlacing and inverse 3:2 pull-down capability
- Enhanced HDTV and Media Center support

1. PAE is an extension that enables Intel compatible computers to address more than 4 GB of physical memory.

3D Graphics API Enhancements

Direct3D

- Improved antialiasing performance
- Improved shaders

OpenGL

New extension: `GL_NV_pixel_buffer_object`

Release 50 Enhancements

The Release 50 driver offers new features not found in previous releases of the NVIDIA Driver for Windows.

64-Bit Support

Driver Release 50 offers AMD64 and IA64 OS support.

Dynamic Memory Mapping

Dynamic memory mapping adds support for 256 MB graphics cards for video, display, and OpenGL drivers.

NVIDIA Unified Compiler

As today's GPUs become more and more programmable they are entering a similar era to that of the CPU. For CPUs, it is common for developers to implement code paths specifically optimized for AMD or Intel (e.g MMX and 3DNow!). Programmable GPUs are no different. Because architectures vary, it makes sense that one common assembly language can't cover all the nuances of specific GPU micro-architectures. In fact, different code paths make different GPUs go faster. As a result with the GeForce FX architecture, NVIDIA has implemented a GPU-specific compiler that can be used to optimize application performance.

Display Driver Changes and New Features

- **Rotation support**

Added to Windows Me/9x.

- **Custom resolutions**

Provides the user with the ability to construct new modes via the NVIDIA control panel.

- **Screen editing**

Allows removing infrequently used screens by dragging them from the NVIDIA screen menu to a list. Screens can be restored by simply clicking the **Restore Defaults** option or by dragging them back to the menu.

- **Dynamic EDIDs**

Updates the master mode list with new modes contained in the connected device's EDID.

- **Support for special panels and devices**

- Large panels
- Wide panels
- Seamless Span modes in the mode list to support T221 style large panels
- Interlaced modes for HDTV
- DVI device hot plugging

- **Frame Lock functionality**

Enables synchronizing applications across multiple displays for Quadro FX series of GPUs.

- **Edge Blend functionality**

Enables blending the adjacent edges of overlapped displays on projection systems for Quadro FX series of GPUs.

Video—New Features

Video Mixing Renderer (VMR) support

VMR support is provided for full-screen video and Microsoft's DirectX Video Acceleration (DXVA).

PowerMizer—New Features

- **Dynamic peak power control**
- **Thermal Protection version 2.0**

User Interface Changes

New Features

- **Dualview**

This feature is available and supported as a single-step process from the nView Display Modes panel and APIs. Switching in and out of all driver modes is possible with several choices for display device pairs:

- Analog display + digital display
 - Digital display + analog display
 - TV + digital display
 - Other combinations
- **Change Resolution panel**
 - **Improved Color Correction panel with enhanced Gamma**
 - **HDTV support**

Improvements

- **Menus for NVIDIA user components**
- **Easy access to nView Display Mode or Windows Display Properties Settings through the NVIDIA Settings taskbar utility**
- **Panel access for non-administrator users**
- **Tool tips for the scroll bar on the NVIDIA menu**
- **Improved Performance and Quality Settings panel**
- **Improved TV-Out settings panel**
- **Improved device selection (display pairs)**
- **Separate Overlay Controls panel**
- **Separate Full Screen Video settings panel**

nView

- **Action Toolbar**
- **Kinematic mouse actions**
- **Resolution per Desktop support**
- **Application monitor exclusions and inclusions**

- **Internet Explorer pop-up prevention**
- **Monitor grids**
- **Keystone luma compensation**
- **Multiview support**
- **nViewCmd**
- **NVManagement**
- **Faster Desktop switching**
- **Integrated control panels**
- **New Setup Wizard**
- **Driver independence**

DirectX Graphics

- **Floating point render targets**
- **Multi-element textures**
- **Improved antialiasing compatibility**
- **Improved shader handling and stability**
- **Improved render-to-texture performance**

OpenGL

- **Windows 9x Rotation support**
- **New supported extension:** `GL_ARB_occlusion_query`
- **Faster Vertex Processing Pipeline**
Improved geometry processing and display list support provided.
- **Faster vertex and fragment program compilers**
- **Improved support for** `ARB_vertex_buffer_object` **extension (vbo)**
- **Improved stability during mode switches, antialiasing, and UBB**
- **Faster texture downloads**

Release 40 Enhancements

The Release 40 driver offers new features not found in previous releases of the NVIDIA Driver for Windows.

Enhanced Display Driver, DirectX, and Video Capabilities

- **Windows XP SP1**

- Release 40 supports Windows XP SP1, Windows Media Center edition, and Windows XP Tablet PC.
- Release 40 provides support for bugcheck EA callbacks, enabling OCA EA failures to be resolved more quickly while assisting to identify failure causes—such as due to chip instability or overclocking.

- **Rotation support**

Release 40 supports the NVRotate™ desktop rotation² feature, which allows the user to rotate the desktop by 90, 180, or 270 degrees.

- **DirectX 9 support**

With Microsoft's release of DirectX 9 runtime, Release 40 version 42.51 and later provides support for DirectX 9, which includes the new vertex shaders, antialiasing modes, and multi-display device support.

- **Video enhancements**

- Flip Sync functionality support
- Support for multiple Macrovision clients
- Simplified Video Mirror controls

- **TV Overscan support**

Depending on the TV encoder used, Release 40 supports TV overscan—allowing the user to eliminate the black borders around the TV display screen. This option is accessible through the NVIDIA display properties control panel.

2. Rotation is not supported on graphics cards based on the TNT, TNT2 or Vanta product families.

New Graphical User Interface

- **Media Center Tray application**

The Media Center Tray is a new application that replaces QuickTweak, and contains menu items that provide access to all NVIDIA user interface software applications.

- **New Display Properties panel**

The NVIDIA control panel has been redesigned to make navigating easier and to improve control over the display adapter settings.

Enhanced nView Desktop Manager Features

- **Additional OS support**

NVIDIA nView supports Windows NT 4.0, Windows 9x/Me, and Windows 2000/XP.

- **Zoom support**

New fixed-frame zoom and bi-directional zoom editing capability added.

- **NV-Switcher**

Improved ALT+TAB switcher which also supports Desktop switching and is expandable to other NVIDIA features.

- **Color-keyed windows**

Allows the user to color key windows for easy identification when activating them on the desktop.

- **Taskbar and menu transparency**

- **New window actions and application settings.**

- **Keystone support³**

3. Keystone is not supported on graphics cards based on the TNT, TNT2 or Vanta product families.

OpenGL Enhancements

- **OpenGL 1.4 ICD with NVIDIA extensions**

New extension includes ARB_vertex_program, which co-exists with NV_vertex_program.

- **Enhancements for workstation applications**

- NV1x line stipple enhancements, and NV2x 2-sided lighting optimizations
- Immediate mode optimizations for Solid Edge, and display list tuning for UGv17.

- **Multi-monitor improvements**

New accelerated spanning mode is enabled by default.

- **Reduced power consumption**

Release 40 utilizes CPU cycles more efficiently, resulting in reduced power consumption without sacrificing performance.

- **Dynamic AGP/Video memory management**

Release 35 Enhancements

The Release 35 driver offers new features not found in previous releases of the NVIDIA Driver for Windows.

- **NVRotate™**

The NVRotate feature lets you view your Windows desktop in Landscape or Portrait mode. You can rotate desktop by 90, 180 and 270 degrees.

- **Improved and expanded NVIDIA nView Desktop Manager application**

nView Desktop Manager has now been redesigned with a convenient user interface and many new features and utilities designed to solve specific problems for users. Utilities such as anti-keystoning support and flat panel monitor calibration screens and utilities have been designed to improve windows multi-display usability.

For example, NVKeystone can be set to compensate for keystoning effects on your windows display, allowing you to fix distorted projection images. This feature is primarily for laptop (mobile) computers.

Note: For further details on NVKeystone and many new nView Desktop Manager features, see the *NVIDIA nView Desktop Manager User's Guide*.

Release 25 Enhancements

The Release 25 driver offers new features not found in previous releases of the NVIDIA Driver for Windows.

- **nView**

The latest multi-monitor technology encompassing driver support, multi-monitor GPU architecture, and desktop management support. nView consists of two main modules:

- nView Display Manager

New support for multi-monitor functionality, including Clone modes, and Horizontal and Vertical spanning modes.

- nView Desktop Manager

A control panel and desktop management engine for application window management and extension of functions, and support for multiple desktops.

- **Dualview support for Windows 2000**

- **Improved DirectX Video Acceleration (DXVA)**

- **Special support for NVIDIA NV25 capabilities**

- IDCT support for DirectX VA
 - Improved antialiasing compatibility and performance
 - Support for NV25 hardware overlays under OpenGL

- **Enhanced 3D stereo functionality**

- Support for lenticular lenses on LCDs
 - Stereo DIN connector support
 - VSYNC Off with 3D Stereo
 - Stereo API for developers

- **OpenGL enhancement**

- New `render_to_texture` extension

Release 20 Enhancements

The Release 20 driver offers new features not found in previous releases of the NVIDIA Driver for Windows.

- **OpenGL 1.3 ICD with NVIDIA extensions**
- **OpenGL performance optimizations**
- **Optimized DirectX pipeline with NVIDIA pixel and vertex shaders**
- **Full support for Windows XP, including**
 - Full hardware acceleration for Windows XP GUI features
 - Accelerated Windows XP 3D performance through the NVIDIA XPress Link technology

Release 10 Enhancements

The Release 10 driver offers new features not found in previous releases of the NVIDIA Driver for Windows.

- **Support for Microsoft DirectX 8**
- **Support for Microsoft DirectX VA 1.0**
- **NVIDIA 3D Stereo (requires installation of the optional Stereoscopic driver)**

The driver provides stereoscopic viewing capabilities for games and still images.

- **Special support for NVIDIA GeForce3 capabilities:**
 - Pixel and Vertex Shader support for DirectX 8 and OpenGL[®]
 - Quincunx antialiasing option for enhanced image quality and performance
- **AMD[®] Athlon[™] Processor and Intel Pentium[®] 4 Processor optimizations**
- **Improved TwinView[™] interface**
-

A P P E N D I X



MODE SUPPORT FOR WINDOWS

This chapter details the Windows modes supported by the Release 60 driver for NVIDIA products. It contains these sections:

- [“Modes Supported by GPU” on page 38](#)
- [“Modes Supported by DACs and TV Encoders” on page 78](#)

Modes Supported by GPU

This section lists the supported modes for the following product families:

- “TNT2 Products” on page 39
- “Vanta Products” on page 41
- “GeForce FX and GeForce 6 Products” on page 43
- “Quadro FX High End Products” on page 49
- “GeForce, GeForce2, GeForce3, and Quadro Products” on page 55
- “GeForce2 MX, GeForce4 MX, Quadro4, GeForce4 Ti Product, and GeForce4 Integrated Families” on page 58
- “Integrated GeForce2 Product” on page 64
- “Quadro4 9xx / 7xx XGL Products” on page 66
- “Quadro FX / Quadro NVS Products” on page 72

Mode Format

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

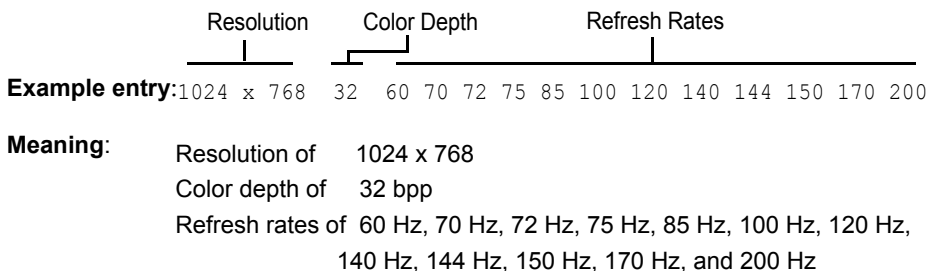


Figure A.1 Mode Format

Note:

- Horizontal spanning modes of 38040x108 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.

TNT2 Products

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

- NVIDIA RIVA TNT2/TNT2 Pro
- NVIDIA RIVA TNT2 Ultra
- NVIDIA RIVA TNT2 Model 64/Model 64 Pro

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	60
800 x 600	8	60 70 72 75 85 100 120 140 144 170 200 240
1024 x 768	8	60 70 72 75 85 100 120 140 144 150 170 200
1152 x 864	8	60 70 72 75 85 100 120 140 144 150 170
1280 x 720	8	60 70 72 75 85 100 120 140 144 150
1280 x 768	8	60 70 72 75 85 100 120 140 144 150
1280 x 960	8	60 70 72 75 85 100 120 140 144 150
1280 x 1024	8	60 70 72 75 85 100 120 140 144 150
1600 x 900	8	60 70 72 75 85 100 120
1600 x 1024	8	60 70 72 75 85 100
1600 x 1200	8	60 70 72 75 85 100
1920 x 1080	8 30i	60 70 72 75 85 100
1920 x 1200	8	60 70 72 75 85
1920 x 1440	8	60 70 72 75
2048 x 1536	8	60

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		60	
800 x 600	16		60 70 72 75 85 100 120 140 144	170 200 240
1024 x 768	16		60 70 72 75 85 100 120 140 144 150	170 200
1152 x 864	16		60 70 72 75 85 100 120 140 144 150	170
1280 x 720	16		60 70 72 75 85 100 120 140 144	150
1280 x 768	16		60 70 72 75 85 100 120 140 144	150
1280 x 960	16		60 70 72 75 85 100 120 140 144	150
1280 x 1024	16		60 70 72 75 85 100 120 140 144	150
1600 x 900	16		60 70 72 75 85 100	120
1600 x 1024	16		60 70 72 75 85	100
1600 x 1200	16		60 70 72 75 85	100
1920 x 1080	16	30i	60 70 72 75 85	100
1920 x 1200	16		60 70 72 75	85
1920 x 1440	16		60 70 72	75
2048 x 1536	16		60	

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		60	
800 x 600	32		60 70 72 75 85 100 120 140 144	170 200 240
1024 x 768	32		60 70 72 75 85 100 120 140 144 150	170
1152 x 864	32		60 70 72 75 85 100 120 140	150
1280 x 720	32		60 70 72 75 85 100	120
1280 x 768	32		60 70 72 75 85 100	120
1280 x 960	32		60 70 72 75 85 100	120
1280 x 1024	32		60 70 72 75 85 100	120
1600 x 900	32		60 70 72 75	85
1600 x 1024	32		60 70 72 75	85
1600 x 1200	32		60 70 72 75	85
1920 x 1080	32	30i	60 70 72	75
1920 x 1200	32		60	70
1920 x 1440	32		60	

Vanta Products

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

- NVIDIA Vanta/Vanta LT

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	60
800 x 600	8	60 70 72 75 85 100 120 140 144 170 200 240
1024 x 768	8	60 70 72 75 85 100 120 140 144 150 170
1152 x 864	8	60 70 72 75 85 100 120 140 144 150
1280 x 1024	8	60 70 72 75 85 100 120
1600 x 1024	8	60 70 72 75 85
1600 x 1200	8	60 70 72 75 85
1920 x 1080	8 30i	60 70 72 75 85
1920 x 1200	8	60 70 72 75

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	60
800 x 600	16	60 70 72 75 85 100 120 140 144 170 200 240
1024 x 768	16	60 70 72 75 85 100 120 140 144 150 170
1152 x 864	16	60 70 72 75 85 100 120 140 144 150
1280 x 1024	16	60 70 72 75 85 100 120
1600 x 1024	16	60 70 72 75 85
1600 x 1200	16	60 70 72 75 85

[illegible]

GeForce FX and GeForce 6 Products

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

- NVIDIA GeForce 6800 / 6800 Ultra
- NVIDIA GeForce 6800LE
- NVIDIA GeForce 6800GT
- NVIDIA GeForce FX 5800 / 5800 Ultra
- NVIDIA GeForce FX 5600 / 5600 Ultra
- NVIDIA GeForce FX 5600XT
- NVIDIA GeForce FX 5200 / 5200 Ultra
- NVIDIA GeForce FX 5200/GeForce PCX 5300
- NVIDIA GeForce FX 5200LE
- NVIDIA GeForce FX 5500
- NVIDIA GeForce FX 5100
- NVIDIA GeForce FX 5900 Ultra
- NVIDIA GeForce FX 5900/GeForce PCX 5900
- NVIDIA GeForce FX 5900XT
- NVIDIA GeForce FX 5950 Ultra
- NVIDIA GeForce FX 5900ZT
- NVIDIA GeForce FX 5700 Ultra/GeForce PCX 5750
- NVIDIA GeForce FX 5700
- NVIDIA GeForce FX 5700LE
- NVIDIA GeForce FX 5700VE

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		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	
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 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	
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		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	
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 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
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		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
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 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
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
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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
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 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
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
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 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
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
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 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
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 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
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
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 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
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
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 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

Quadro FX High End Products

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

- Quadro FX 4000 / Quadro FX 3400
- Quadro FX 3000 / Quadro FX 1300
- Quadro FX 700

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	60		
800 x 600	8	50 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 1200	8	61		
1024 x 768	8	50 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 960	8	60	70 72 75 85 100 120 140 144 150 170	
1280 x 1024	8	50 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	50 60	70 72 75 85 100 120	
1920 x 1080	8 30i	60	70 72 75 85 100	
1920 x 1154	8	50		
1920 x 1200	8	50 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	60	
800 x 600	16	50 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 1200	16	61	
1024 x 768	16	50 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 960	16	60	70 72 75 85 100 120 140 144 150 170
1280 x 1024	16	50 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	50 60	70 72 75 85 100 120
1920 x 1080	16	30i 60	70 72 75 85 100
1920 x 1154	16	50	
1920 x 1200	16	50 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	60	
800 x 600	32	50 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 1200	32		61	
1024 x 768	32	50	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 960	32		60	70 72 75 85 100 120 140 144 150
1280 x 1024	32	50	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	50	60	70 72 75 85 100
1920 x 1080	32	30i	60	70 72 75 85
1920 x 1154	32		50	
1920 x 1200	32	50	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	50	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 1200	8		61	
2048 x 768	8	50	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 960	8		60	70 72 75 85 100 120 140 144 150 170
2560 x 1024	8	50	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	50	60	70 72 75 85 100 120
3840 x 1080	8	30i	60	70 72 75 85 100
3840 x 1154	8		50	

3840 x 1200	8	50 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	50 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 1200	16	61	
2048 x 768	16	50 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 960	16	60	70 72 75 85 100 120 140 144 150 170
2560 x 1024	16	50 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	50 60	70 72 75 85 100 120
3840 x 1080	16	30i 60	70 72 75 85 100
3840 x 1154	16	50	
3840 x 1200	16	50 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	50 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 1200	32	61	
2048 x 768	32	50 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 960	32	60	70 72 75 85 100 120 140 144 150
2560 x 1024	32	50 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		50 60	70 72 75 85 100
3840 x 1080	32	30i	60	70 72 75 85
3840 x 1154	32		50	
3840 x 1200	32		50 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		50 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
1024 x 1536	8		50 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 1920	8		60	70 72 75 85 100 120 140 144 150 170
1280 x 2048	8		50 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		50 60	70 72 75 85 100 120
1920 x 2160	8	30i	60	70 72 75 85 100
1920 x 2308	8		50	
1920 x 2400	8		50 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		50 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
1024 x 1536	16		50 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 1920	16		60	70 72 75 85 100 120 140 144 150 170

1280 x 2048	16		50 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		50 60	70 72 75 85 100 120
1920 x 2160	16	30i	60	70 72 75 85 100
1920 x 2308	16		50	
1920 x 2400	16		50 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		50 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
1024 x 1536	32		50 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 1920	32		60	70 72 75 85 100 120 140 144 150
1280 x 2048	32		50 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		50 60	70 72 75 85 100
1920 x 2160	32	30i	60	70 72 75 85
1920 x 2308	32		50	
1920 x 2400	32		50 60	70 72 75 85
1920 x 2880	32		60	70 72 75 85
2048 x 3072	32		60	70 72 75 85

GeForce, GeForce2, GeForce3, and Quadro Products

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

- NVIDIA GeForce 256
- NVIDIA GeForce DDR
- NVIDIA Quadro
- NVIDIA GeForce2 GTS/GeForce2 Pro
- NVIDIA GeForce2 Ti
- NVIDIA GeForce2 Ultra
- NVIDIA Quadro2 Pro
- NVIDIA GeForce3
- NVIDIA GeForce3 Ti 200
- NVIDIA GeForce3 Ti 500
- NVIDIA Quadro DCC

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	60	
800 x 600	8	60 70 72 75 85 100 120 140 144 170 200 240	
848 x 480	8	60 70 72 75 85 100 120 140 144 170 200 240	
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 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
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

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		60
800 x 600	16		60 70 72 75 85 100 120 140 144 170 200 240
848 x 480	16		60 70 72 75 85 100 120 140 144 170 200 240
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 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
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

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	60	
800 x 600	32	60	70 72 75 85 100 120 140 144 170 200 240
848 x 480	32	60	70 72 75 85 100 120 140 144 170 200 240
1024 x 768	32	60	70 72 75 85 100 120 140 144 150 170 200
1152 x 864	32	60	70 72 75 85 100 120 140 150 170
1280 x 720	32	60	70 72 75 85 100 120 140 150
1280 x 768	32	60	70 72 75 85 100 120 140 150
1280 x 960	32	60	70 72 75 85 100 120 140 150
1280 x 1024	32	60	70 72 75 85 100 120 140 150
1360 x 768	32	60	70 72 75 85 100 120 140 150
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
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 75
2048 x 1536	32	60	

GeForce2 MX, GeForce4 MX, Quadro4, GeForce4 Ti Product, and GeForce4 Integrated Families

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

- NVIDIA GeForce2 MX/MX 400
- NVIDIA GeForce2 MX 100/200
- NVIDIA GeForce4 MX 460
- NVIDIA GeForce4 MX 440
- NVIDIA GeForce4 MX 420
- NVIDIA GeForce4 MX 440-SE
- NVIDIA GeForce MX 4000
- NVIDIA GeForce4 MX Integrated GPU
- NVIDIA GeForce4 Ti 4800
- NVIDIA GeForce4 Ti 4800 SE
- NVIDIA GeForce4 Ti 4600
- NVIDIA GeForce4 Ti 4400
- NVIDIA GeForce4 Ti 4200
- NVIDIA GeForce4 Ti 4200 with AGP8X
- NVIDIA Quadro4 550 XGL
- NVIDIA Quadro2 MXR/EX
- NVIDIA Quadro NVS
- NVIDIA Quadro4 580 XGL
- NVIDIA Quadro4 380 XGL

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		60
800 x 600	8		60 70 72 75 85 100 120 140 144 170 200 240
848 x 480	8		60 70 72 75 85 100 120 140 144 170 200 240
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 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
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

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		60
800 x 600	16		60 70 72 75 85 100 120 140 144 170 200 240
848 x 480	16		60 70 72 75 85 100 120 140 144 170 200 240
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 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
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

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		60
800 x 600	32		60 70 72 75 85 100 120 140 144 170 200 240
848 x 480	32		60 70 72 75 85 100 120 140 144 170 200 240
1024 x 768	32		60 70 72 75 85 100 120 140 144 150 170 200
1152 x 864	32		60 70 72 75 85 100 120 140 150 170
1280 x 720	32		60 70 72 75 85 100 120 140 150
1280 x 768	32		60 70 72 75 85 100 120 140 150
1280 x 960	32		60 70 72 75 85 100 120 140 150
1280 x 1024	32		60 70 72 75 85 100 120 140 150
1360 x 768	32		60 70 72 75 85 100 120 140 150
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
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 75
2048 x 1536	32		60

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 85 100 120 140 144 170 200 240
1696 x 480	8		60 70 72 75 85 100 120 140 144 170 200 240
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 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
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

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 85 100 120 140 144 170 200 240
1696 x 480	16		60 70 72 75 85 100 120 140 144 170 200 240
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 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
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

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 85 100 120 140 144 170 200 240
1696 x 480	32		60 70 72 75 85 100 120 140 144 170 200 240
2048 x 768	32		60 70 72 75 85 100 120 140 144 150 170 200
2304 x 864	32		60 70 72 75 85 100 120 140 150 170
2560 x 720	32		60 70 72 75 85 100 120 140 150
2560 x 768	32		60 70 72 75 85 100 120 140 150
2560 x 960	32		60 70 72 75 85 100 120 140 150
2560 x 1024	32		60 70 72 75 85 100 120 140 150
2720 x 768	32		60 70 72 75 85 100 120 140 150
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 75
4096 x 1536	32		60

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 85 100 120 140 144 170 200 240
848 x 960	8		60 70 72 75 85 100 120 140 144 170 200 240
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 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
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

640 x 960	16		60 70 72 75 85 100 120 140 144 150 170 200 240
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800 x 1200	16		60 70 72 75 85 100 120 140 144	170 200 240
848 x 960	16		60 70 72 75 85 100 120 140 144	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 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	
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	

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	170 200 240
848 x 960	32		60 70 72 75 85 100 120 140 144	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	150 170
1280 x 1440	32		60 70 72 75 85 100 120 140	150
1280 x 1536	32		60 70 72 75 85 100 120 140	150
1280 x 1920	32		60 70 72 75 85 100 120 140	150
1280 x 2048	32		60 70 72 75 85 100 120 140	150
1360 x 1536	32		60 70 72 75 85 100 120 140	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 75	
2048 x 3072	32		60	

Integrated GeForce2 Product

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

- NVIDIA GeForce2 Integrated GPU

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 72 75 85 100
720 x 480	8	60
720 x 576	8	60
800 x 480	8	60 72 75 85 100
800 x 600	8	60 72 75 85 100
1024 x 768	8	60 72 75 85 100
1280 x 768	8	60 72 75 85 100
1280 x 1024	8	60 72 75 85 100
1600 x 900	8	60 72 75 85 100
1600 x 1200	8	60 72 75 85 100
1920 x 1080	8 30i	
1920 x 1200	8	60 72 75 85 100
1920 x 1440	8	60 72 75 85 100
2048 x 1536	8	60 72 75 85 100

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 72 75 85 100
720 x 480	16	60
720 x 576	16	60

800 x 480	16	60	72 75 85 100
800 x 600	16	60	72 75 85 100
1024 x 768	16	60	72 75 85 100
1280 x 768	16	60	72 75 85 100
1280 x 1024	16	60	72 75 85 100
1600 x 900	16	60	72 75 85 100
1600 x 1200	16	60	72 75 85 100
1920 x 1080	16	30i	
1920 x 1200	16	60	72 75 85 100
1920 x 1440	16	60	72 75 85 100
2048 x 1536	16	60	72 75 85 100

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	72 75 85 100
720 x 480	32	60	
720 x 576	32	60	
800 x 480	32	60	72 75 85 100
800 x 600	32	60	72 75 85 100
1024 x 768	32	60	72 75 85 100
1280 x 768	32	60	72 75 85 100
1280 x 1024	32	60	72 75 85 100
1600 x 900	32	60	72 75 85 100
1600 x 1200	32	60	72 75 85 100
1920 x 1080	32	30i	
1920 x 1200	32	60	72 75 85 100
1920 x 1440	32	60	72 75
2048 x 1536	32	60	72

Quadro4 9xx / 7xx XGL Products

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

- NVIDIA Quadro4 900 XGL
- NVIDIA Quadro4 750 XGL
- NVIDIA Quadro4 700 XGL
- NVIDIA Quadro4 980 XGL
- NVIDIA Quadro4 780 XGL

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	60		
800 x 600	8	60	70 72 75 85 100 120 140 144	170 200 240
848 x 480	8	60	70 72 75 85 100 120 140 144	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 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	
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	

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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      60
800 x 600 16      60    70 72 75 85 100 120 140 144      170 200 240
848 x 480 16      60    70 72 75 85 100 120 140 144      170 200 240
960 x 1200 16      61
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 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
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
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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      60
800 x 600 32      60    70 72 75 85 100 120 140 144      170 200 240
848 x 480 32      60    70 72 75 85 100 120 140 144      170 200 240
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Horizontal Spanning Modes

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	170 200 240
1696 x 480	16	60	70 72 75 85 100 120 140 144	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 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	
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	

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	170 200 240
1696 x 480	32	60	70 72 75 85 100 120 140 144	170 200 240
1920 x 1200	32	61		
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	150 170
2560 x 720	32	60	70 72 75 85 100 120 140	150
2560 x 768	32	60	70 72 75 85 100 120 140	150
2560 x 960	32	60	70 72 75 85 100 120 140	150
2560 x 1024	32	60	70 72 75 85 100 120 140	150
2720 x 768	32	60	70 72 75 85 100 120 140	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 75	
4096 x 1536	32	60		

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		170	200	240
848 x 960	8	60	70	72	75	85	100	120	140	144		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 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						
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									

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		170	200	240
848 x 960	16	60	70	72	75	85	100	120	140	144		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 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						
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									

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 85 100 120 140 144 170 200 240
848 x 960	32	60	70 72 75 85 100 120 140 144 170 200 240
1024 x 1536	32	60	70 72 75 85 100 120 140 144 150 170 200
1152 x 1728	32	60	70 72 75 85 100 120 140 150 170
1280 x 1440	32	60	70 72 75 85 100 120 140 150
1280 x 1536	32	60	70 72 75 85 100 120 140 150
1280 x 1920	32	60	70 72 75 85 100 120 140 150
1280 x 2048	32	60	70 72 75 85 100 120 140 150
1360 x 1536	32	60	70 72 75 85 100 120 140 150
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 75
2048 x 3072	32	60	

Quadro FX / Quadro NVS Products

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 / Quadro PCI-E Series
- NVIDIA Quadro FX 500 / Quadro FX 330
- NVIDIA Quadro FX 1100

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	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 1200	8	61	
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 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
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	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	1200	16	61																
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	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										
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	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 1200	32	61	
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 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
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 1200	8	61	
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 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
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	1200	16		61															
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	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									
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	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					
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	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
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 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
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
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 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
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
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 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

Modes Supported by DACs and TV Encoders

This section lists the supported modes and formats for the following:

- “External DAC Mode Support” on page 78
- “TV-Out Mode Support” on page 79

External DAC Mode Support

Fairchild FMS3815 Modes Supported

Table A.1 shows the refresh rates for various resolutions of the Fairchild FMS3815 external DAC, which is commonly used on GeForce2 MX and Quadro2 MXR boards to drive a secondary CRT.

Table A.1 External DAC Modes (Fairchild FMS3815)

Resolution	Supported Rates (Hz)
640x480	60, 70, 72, 75, 85, 100, 120, 140, 144, 150, 170
800x600	60, 70, 72, 75, 85, 100, 120, 140, 144, 150, 170
1024x768	60, 70, 72, 75, 85, 100, 120
1152x864	60, 70, 72, 75, 85
1280x720	60, 70, 72, 75, 85, 100
1280x960	60, 70, 72, 75
1280x1024	60, 70, 72, 75
1360x768	60, 70, 72, 75, 85
1600x900	60, 70
1600x1200	—

Analog Devices ADV-7123 Modes Supported

Table A.2 shows the refresh rates for various resolutions of the Analog Devices ADV-7123 external DAC, which is commonly used on the GeForce2 MX and the Quadro2 MXR boards to drive a secondary CRT.

Table A.2 External DAC Modes (Analog Devices ADV-7123)

Resolution	Supported Rates (Hz)
640x480	60, 70, 72, 75, 85, 100, 120, 140, 144, 150, 170
800x600	60, 70, 72, 75, 85, 100, 120, 140, 144, 150, 170
1024x768	60, 70, 72, 75, 85, 100, 120
1152x864	60, 70, 72, 75, 85, 100
1280x720	60, 70, 72, 75, 85, 100
1280x960	60, 70, 72, 75, 85, 90
1280x1024	60, 70, 72, 75, 85

Table A.2 External DAC Modes (Analog Devices ADV-7123) (continued)

Resolution	Supported Rates (Hz)
1360x768	60, 70, 72, 75, 85, 100
1600x900	60, 70, 75
1600x1200	—

TV-Out Mode Support

[Table A.3](#) lists the NTSC, PAL, and HDTV TV-Out modes supported by the NVIDIA driver.

Table A.3 Mode Support for TV-Out

Resolution	Bitdepth	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
480i (SDTV)	N/A	Supported on graphics boards with Conexant 875 or Philips 7108 TV encoders and compatible connectors.
480p (EDTV)	N/A	Supported on graphics boards with Conexant 875 or Philips 7108 TV encoders and compatible connectors.
720p (HDTV)	N/A	Supported on graphics boards with Conexant 875 or Philips 7108 TV encoders and compatible connectors.
1080i (HDTV)	N/A	Supported on graphics boards with Conexant 875 or Philips 7108 TV encoders and compatible connectors.