



NVIDIA Control Panel Quick Start Guide

User's Guide

Table of Contents

Chapter 1 Introduction.....	1
About the NVIDIA Control Panel.....	2
Overview.....	2
Changes in Release 450.....	2
Supported Operating Systems.....	2
Supported NVIDIA Products	3
Supported Languages.....	3
Getting Support and Information.....	4
Online Help	4
Technical Support	4
System Information.....	4
Chapter 2 Understanding the NVIDIA Control Panel	5
Opening and Closing the New NVIDIA Control Panel.....	5
Opening the NVIDIA Control Panel.....	5
Closing the NVIDIA Control Panel	6
About the NVIDIA Control Panel Interface	7
Using the Main Task Area	8
Using the Select a Task Pane	9
Using the Tool Bar.....	10
Using the Menu Bar	10
Chapter 3 Accomplishing NVIDIA Control Panel Tasks	15
NVIDIA Control Panel Feature List.....	15
NVIDIA Control Panel Groups	23

List of Figures

Figure 2.1 NVIDIA Control Panel (Windows 7 Example)	7
Figure 2.2 NVIDIA Control Panel <i>Select a Task</i> pane	9
Figure 2.3 Navigation History Menu	10

List of Tables

Table 2.1	File Menu Commands	10
Table 2.2	Edit Menu Commands	11
Table 2.3	Desktop Menu Commands	11
Table 2.4	Help Menu Commands	13
Table 2.5	Display Menu Commands	13
Table 2.6	3D Settings Menu Commands	14
Table 2.7	Workstation Menu Commands	14
Table 3.1	NVIDIA Control Panel Features	15

Chapter 1. Introduction

This quick start is addressed to users of the NVIDIA[®] Control Panel software. This guide focuses on getting you up and running with your NVIDIA software.

For technical details on the features and benefits of the NVIDIA Control Panel software and details about supported products, drivers, and other software, refer to the NVIDIA web page — www.nvidia.com.

This chapter discusses the following major topics:

- ▶ “About the NVIDIA Control Panel” on page 2
- ▶ “Getting Support and Information” on page 4

About the NVIDIA Control Panel

Welcome to the NVIDIA Control Panel, designed for Microsoft® Windows® operating systems. You can use NVIDIA Control Panel to control your NVIDIA hardware and access other NVIDIA software installed on your system.

Overview

In addition to setting up basic display configurations such as display resolution, refresh rate, and multiple display use, you can:

- ▶ Tune your 3D settings with real-time preview to maximize performance or image quality
- ▶ Customize how 3D applications work in your system
- ▶ Adjust your screen colors and contrast
- ▶ Set custom timings
- ▶ Control video image settings
- ▶ Change your HDTV format
- ▶ Control special workstation features such as Frame Synchronization.



Note: The NVIDIA Control Panel can be viewed with a desktop DPI scaling set to a maximum of 250%. Setting the DPI higher than 250% may result in some content getting cut off from view.

Changes in Release 450

- ▶ 3D Settings - added **Manage Power and Display Settings** controls
- ▶ **“Run with Preferred Graphics Processor”** selection is not available starting with Windows 10 May 2020 Update.

Supported Operating Systems

NVIDIA Release 450 Graphics drivers are available for the following Microsoft® Windows® operating systems:

- Windows 7 64-bit
- Windows 8 64-bit
- Windows 8.1 64-bit
- Windows 10 64-bit

Supported NVIDIA Products

Refer to the release notes and NVIDIA driver download site for the list of products supported by the driver version that you have installed on your computer.

Supported Languages

The NVIDIA Graphics Driver supports the following languages in the NVIDIA 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)	

Getting Support and Information

Online Help

- ▶ To open the online help, either :
 - Press F1 on your keyboard, or
 - Select Help from the NVIDIA Control Panel menu bar and then select NVIDIA Control Panel Help.
- ▶ Help on various topics can be viewed using the Contents, Index, or Search tabs.

Technical Support

To access the NVIDIA Technical Support web page go the following web address:

<http://www.nvidia.com/page/support.html>

System Information

You can get detailed information about your system and the NVIDIA Control Panel configuration as well as version and copyright information.

- ▶ To view copyright and version information about the NVIDIA Control Panel:

From the Help menu, select About NVIDIA Control Panel.
- ▶ To view detailed system information:

Open the System Information dialog box by either selecting System Information from the Help menu, or by clicking the System Information link at the lower left corner of the NVIDIA Control Panel.

Click any of the tabs in the System Information dialog box.

Chapter 2. Understanding the NVIDIA Control Panel

This chapter describes the NVIDIA Control Panel in the following sections:

- ▶ “Opening and Closing the New NVIDIA Control Panel” on page 5
- ▶ “About the NVIDIA Control Panel Interface” on page 7

Opening and Closing the New NVIDIA Control Panel

Opening the NVIDIA Control Panel



Note: The NVIDIA Control Panel can be viewed with a desktop DPI scaling set to a maximum of 250%. Setting the DPI higher than 250% may result in some content getting cut off from view.

You can open the NVIDIA Control Panel in several ways:

- ▶ Right-click the Windows desktop, then click NVIDIA Control Panel from the context menu, or

Windows 7

- ▶ From the Classic View of the Windows Control Panel, click the NVIDIA Control Panel icon, or

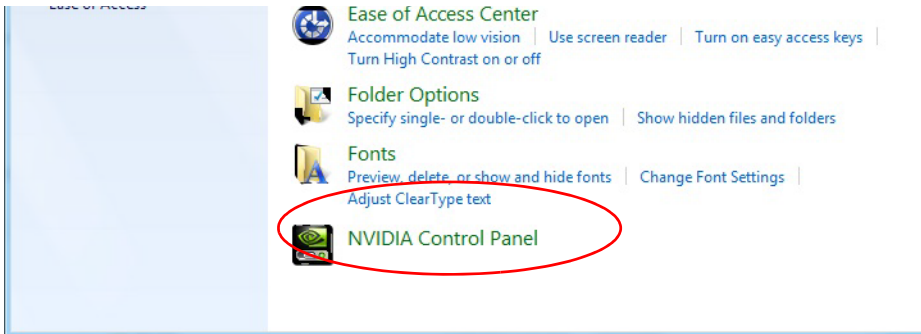


NVIDIA
Control Panel

- ▶ From the Control Panel Home view of the Windows Control Panel, click Additional Options and then click NVIDIA Control Panel from the Additional Options page.

Windows 8

- ▶ From the Desktop, go to Settings->Control Panel->Appearance and Personalization, then click NVIDIA Control Panel.



Windows 10

- ▶ Right-click the desktop, then select NVIDIA Control Panel.

Closing the NVIDIA Control Panel

To close the NVIDIA Control Panel,

- ▶ From the File menu, select Exit, or
- ▶ Click the Close box in the upper right corner of the program window.

About the NVIDIA Control Panel Interface

The NVIDIA Control Panel provides an easy-to-use interface for managing your system.

When you start the program for the first time, the NVIDIA Control Panel opens to the first page listed in the navigation tree. On subsequent visits, the control panel reopens to the last page visited. The NVIDIA Control Panel user interface consists of these main areas, as shown in and Figure 2.1:

- ▶ Main Task Area
- ▶ Select a Task (Navigation tree)
- ▶ Menu bar
- ▶ Toolbar .

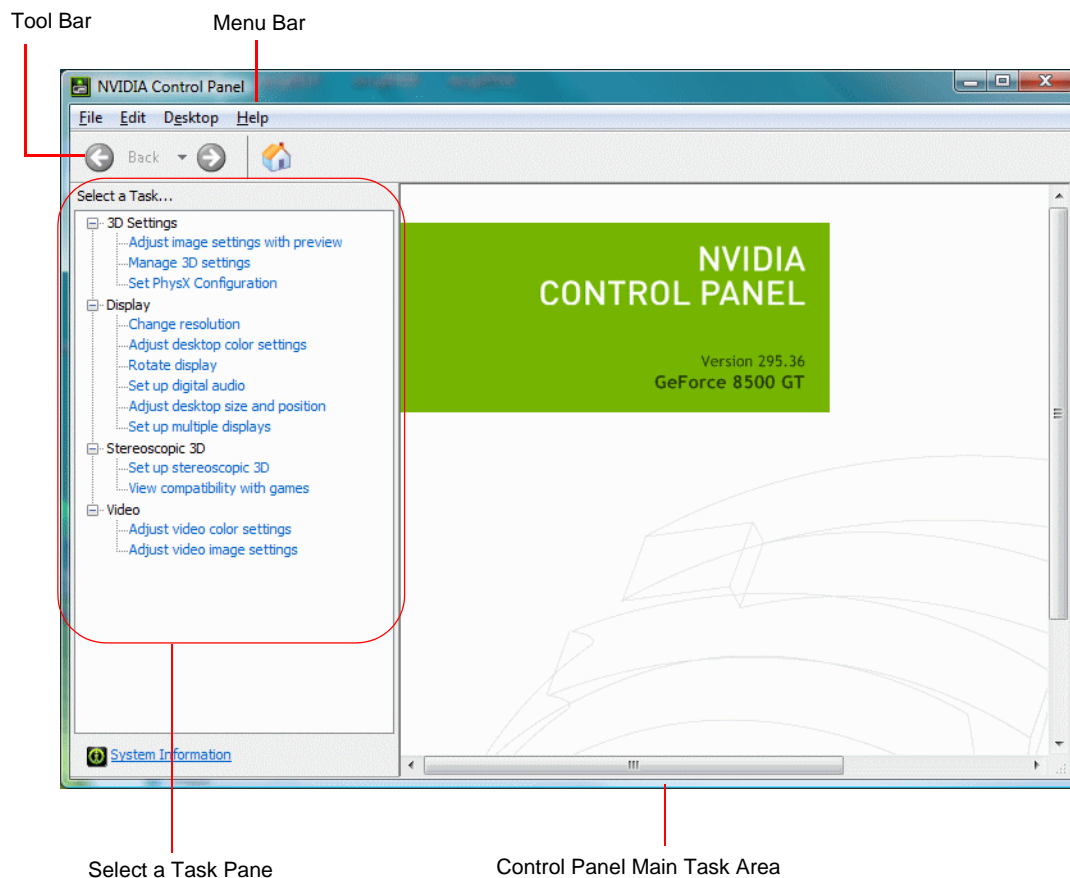


Figure 2.1 NVIDIA Control Panel (Windows 7 Example)

Using the Main Task Area

The main task area, in the right pane, displays the application task pages. This area of the screen is where you will focus most of your attention as you use the NVIDIA Control Panel to accomplish your goals. You can access specific pages using the navigation tree in the Select a Task pane.

Depending on your PC manufacturer, there is a Welcome page that appears the first time you open the NVIDIA Control Panel after installing the driver. On subsequent visits, the control panel reopens to the last page visited.

Using the Select a Task Pane

The navigation tree in the *Select a Task* pane shows all the primary NVIDIA Control pages that are installed on your system.

The pages are grouped according to the same categories that existed in the previous version of the NVIDIA Control Panel.

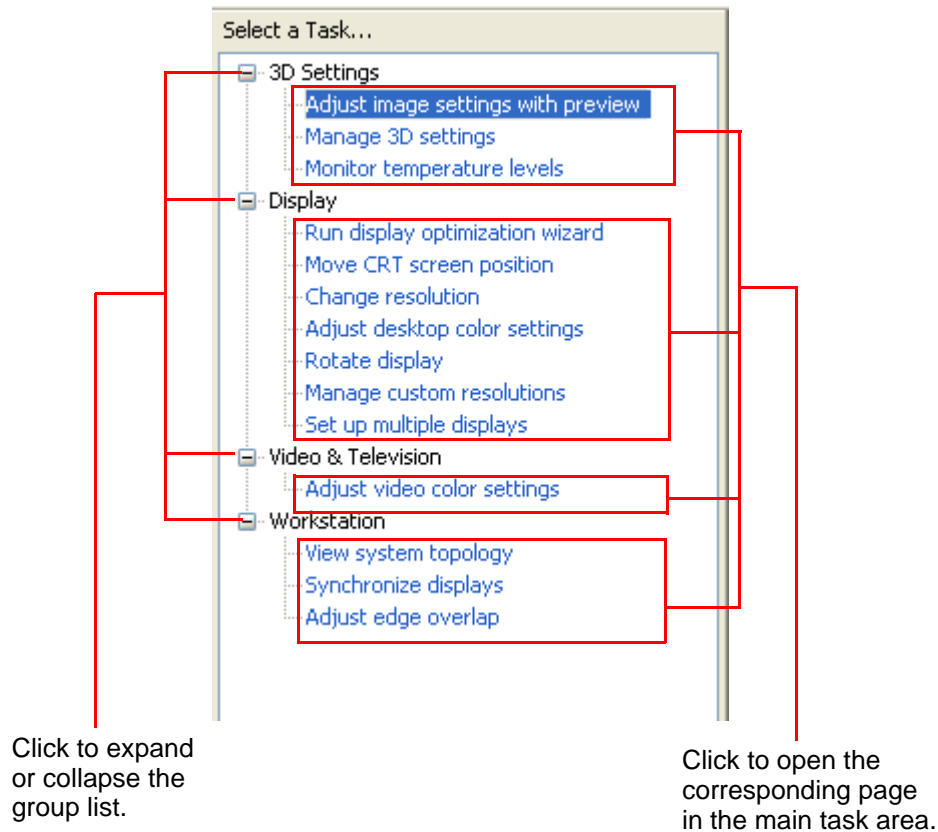


Figure 2.2 NVIDIA Control Panel Select a Task pane

Using the Tool Bar

The *Toolbar* provides quick back and forth navigation between pages. The back and forward buttons let you navigate sequentially among pages that you have visited.

You can also navigate directly to a previously visited page by clicking the list arrow next to the back button. The drop-down menu lists all the previously visited pages in the queue. Click the page that you want.

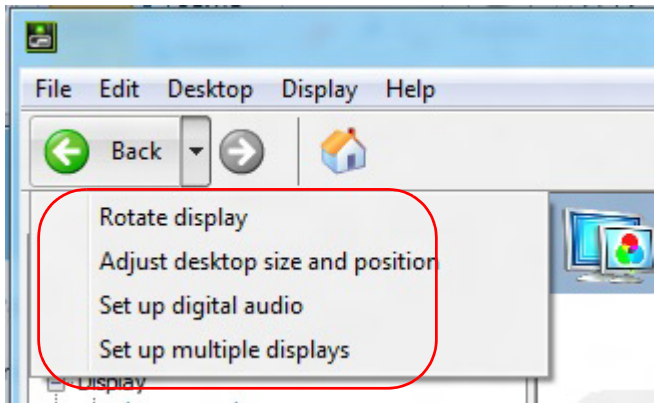


Figure 2.3 Navigation History Menu

Using the Menu Bar

The *Menu bar* contains standard Windows menus and menus specific to the NVIDIA Control Panel, such as the View and Profiles menus.

Menus that are available on the menu bar may vary, depending on the NVIDIA Control Panel group (such as, Display, Mobile, 3D Settings, or other group) you are using.

File Menu

Commands related to printing, applying changes, and exiting the program are available on the File menu.

Table 2.1 File Menu Commands

File Menu Command	Description
Page Setup...	Set up the current task page for printing. This control may not be available.
Print...	Print the current task page. This control may not be available.
Print Preview....	Preview the page before sending it to the printer. This control may not be available.

Table 2.1 File Menu Commands (continued)

File Menu Command	Description
Exit	Close the NVIDIA Control Panel program.

Edit Menu

Commands related to cutting, copying, pasting, and selecting items are available on the Edit menu.

Table 2.2 Edit Menu Commands

Edit Menu Command	Description
Cut	Cut the selected text and place in the clipboard. This control may not be available.
Copy	Copy the selected text and place in the clipboard. This control may not be available.
Paste	Paste the text currently in the clipboard to the location of the Windows cursor. This control may not be available.
Select All	Select all items on the current page. This control may not be available.

Desktop Menu

Commands related to viewing the various pages in the NVIDIA Control Panel application modules are available on the Desktop menu.

Table 2.3 Desktop Menu Commands

View Menu Command	Description
Add Desktop Context Menu	This is selected by default, and adds the NVIDIA Control Panel menu item to the desktop context menu.
Enable Video Editing Mode	Select this option to improve the video playback experience for some video editing applications.

Table 2.3 Desktop Menu Commands (continued)

View Menu Command	Description
Add "Run with graphics processor" Option	<p>Select this option to add "Run with graphics processor" to the program context menu.</p> <p>When this option is selected, you can choose which graphics processor to use when starting a program as follows:</p> <ol style="list-style-type: none"> 1. Right-click the program icon. 2. Click Run with graphics processor and then click the graphics processor to use. <p>The selection applies only at the time the program is launched.</p> <p>NOTE: This menu option appears only with systems using NVIDIA © Optimus™ technology.</p> <p>NOTE: This menu option will not appear with Windows 10 May 2020 Update and later.</p> <p>NOTE: Some programs require elevated user privileges in order to use the "Run on graphics processor" option from the program's right-click menu. A pop-up dialog will let you know if that is the case. In this case, use the controls in the NVIDIA Control Panel->Manage 3D Settings page to select the graphics processor.</p>
Display GPU Activity Icon in Notification Area	<p>Select this option so that the GPU Activity icon appears in the Windows notification area of the taskbar. You can then click the icon to see which programs and displays are using the NVIDIA GPU.</p> <p>NOTE: This menu option appears only with systems using NVIDIA® Optimus™ technology.</p>
Show Notification Tray Icon	<p>Select to show the NVIDIA Control Panel notification tray icon in the Windows taskbar notification area.</p> <p>Clicking the NVIDIA Control Panel notification icon offers a quick way to configure key NVIDIA Control Panel settings.</p>

Help Menu

Commands related to accessing help, system information, and copyright and version information are available on the Help menu.

Table 2.4 Help Menu Commands

Help Menu Command	Description
NVIDIA Control Panel Help	Access the NVIDIA Control Panel online help .
System Information	View detailed information about your system and the NVIDIA Control Panel configuration.
Debug Mode	Select to remove all overclocking performance and power settings.
About NVIDIA Control Panel	View NVIDIA Control Panel version and copyright information.

Group-Specific Menus

These menus appear only when pages from a specific group are open.

Display Menu

This menu item appears only when a Display group page is open.

Table 2.5 Display Menu Commands

Display Menu Command	Description
Identify Displays	Select to identify the displays configured with your system.
Show indicator for G-SYNC	Select to verify that NVIDIA G-SYNC is being used. Depending on the type of monitor connected, the menu item could state Show indicator for G-SYNC, Show indicator for G-SYNC Compatible, or Show indicator for G-SYNC/G-SYNC Compatible

3D Settings Menu

This menu item appears only when a 3D Settings group page is open on an SLI system.

Table 2.6 3D Settings Menu Commands

3D Settings Menu Command	Description
Show SLI Visual Indicator	Select to verify that SLI rendering or SLI antialiasing is enabled and working.
Show Multi-GPU Visual Indicator	Select to verify that multi-GPU rendering or multi-GPU antialiasing is enabled and working.
Show PhysX Visual Indicator	Select to verify the type of PhysX acceleration the game is using - CPU or GPU - or if PhysX acceleration is being used at all.

Workstation Menu

This menu item appears only when a Workstation group page is open.

Table 2.7 Workstation Menu Commands

Workstation Menu Command	Description
Refresh View	Select to refresh the graphical representation of the displays and graphics cards installed on your system.

Chapter 3. Accomplishing NVIDIA Control Panel Tasks

The NVIDIA Control Panel provides an intuitive layout for locating graphics driver controls, including most of the controls that were available with the Classic NVIDIA Control Panel.

- ▶ “NVIDIA Control Panel Feature List” on page 15 lists the current features available in the NVIDIA Control Panel.
- ▶ “NVIDIA Control Panel Groups” on page 23 provides an overview of the NVIDIA Control Panel pages by group.

NVIDIA Control Panel Feature List


 **Note:** With Optimus systems under Windows 10, the Display controls are not available if no display is connected to the NVIDIA GPU. This is because clone mode across display adapters is handled by the Windows OS and not by the NVIDIA driver.

Table 3.1 NVIDIA Control Panel Features

Feature	Values (Default in bold) ^a	Notes
Display/TV Controls		
Mode control		
Resolution	Non-HD display - the native resolution or the highest safe resolution from the monitor EDID is the default. HD display - the highest progressive resolution is the default.	
Refresh rate		

Table 3.1 NVIDIA Control Panel Features

Feature	Values (Default in bold) ^a	Notes
Custom timings/resolutions		
TV Signal Format Selection	M/NTSC, PAL, M/PAL, N/PAL, Select by country	
Connector Selection	Auto-select DVI VGA S-Video - SDTV Component Composite - SDTV HDMI - HDTV (Vista and later) DisplayPort - HDTV (Vista and later) LVDS - laptop display	Available values depend on the actual connection.
Desktop Color depth	Highest (32-bit) Medium (16-bit)	
Output Color Depth	8 bpc 12 bpc	Display dependent
Output Dynamic Range	Full (0–255) Limited (16–235)	
Output Color Format	RGB, YCbCr422	For HDMI and DisplayPort connections
Color Control		
Brightness	0 - 100%, (50%)	
Contrast	0 - 100%, (50%)	
Gamma	0.50 - 1.50, (1.00)	
Digital Vibrance	0 - 100%, (0%)	
Hue	0 - 359 degrees (30)	
Flicker Filter	0 - 100%, (50%)	For analog TVs
Gray border option	Disabled	For analog TVs; presents unused black TV borders as gray
Content type (ITC) reported to the display	Auto select, Desktop programs, Full-screen videos, Photos, Movie, Games	Window 7 and later; Some HDMI displays only - available values dependent on display support

Table 3.1 NVIDIA Control Panel Features

Feature	Values (Default in bold) ^a	Notes
NVIDIA G-SYNC	Enable G-SYNC/G-SYNC Compatible	Windows 10, and Pascal or later GPUs required for G-SYNC Compatible displays.
Rotation	0, 90, 180, 270 degrees	
Desktop Size and Position		
Scaling mode	Aspect ratio Full-screen No scaling Integer scaling	TV, VGA (with EDID), Digital displays, LVDS
Scaling performed on	GPU Display	
Application Scaling override	Off, On	
Resize		TV, Digital displays
Position		TV, VGA
Multi-display Options		
Single-display mode		
Dualview (extended mode)		
nView Clone Mode		
Smart Clone (including Smart Clone Properties)		Windows 7 and later, select Quadro products
Set Up Merged Displays		Windows 10 and later
Video Controls	"Use video player settings" is the default. If "Use NVIDIA settings" is selected, the following values apply.	
Color Settings		
Brightness	0 - 100%, (50%)	
Contrast	0 - 100%, (50%)	
Hue	0 - 100%, (0%)	
Saturation	0 - 100%, (50%)	
Gamma (including separate RGB)	0.3 - 3.00, (1.00)	
Advanced Color Settings		
Dynamic Range	Full (0–255) Limited (16–235)	
Dynamic Contrast Enhancement	Disabled	
Color Enhancement	Disabled	
Image Settings		

Table 3.1 NVIDIA Control Panel Features

Feature	Values (Default in bold) ^a	Notes
Edge Enhancement	0 - 100%, (0%)	
Noise Reduction	0 - 100%, (0%)	
Inverse Telecine option	Disabled	
Internet Video Enhancement option	Disabled	Select GeForce 8 series and later GPUs
Digital Audio		
Verify displays that will appear as audio devices in the Windows Sound Settings	For each audio-capable display, select the display or select "Turn off audio".	Windows 7 and later. For GPUs that support digital audio when an HDMI or DisplayPort connection is made.
Portal to the Windows Sound Settings panel		
HDCP		
Capability verification page		For GPUs that support HDCP.
3D Application Controls		
Preferred graphics processor	High-performance NVIDIA processor, Integrated graphics, Force high-performance NVIDIA processor use, Force integrated graphics use, Auto-select	Optimus systems Not available as of Windows 10 May 2020 Update.
Ambient Occlusion	Off, Performance, Quality	Windows 7 and later
Anisotropic filtering	Application-controlled, Off, card-specific settings	
Antialiasing - Mode	Application-controlled, Off, Enhance the application setting, Override any application setting	
Antialiasing - Setting	Application-controlled, card-specific settings	
Antialiasing - FXAA	Off, On	
Antialiasing line gamma	Off, On	
Antialiasing - gamma correction	Off, On	
Antialiasing - transparency	Off, Multisampling, supersampling	

Table 3.1 NVIDIA Control Panel Features

Feature	Values (Default in bold) ^a	Notes
Buffer-flipping mode	Auto-select, Block transfer	NVIDIA Quadro cards
CUDA - GPUs	[All CUDA-capable GPUs]	
DFR - Factors		
DFR - Smoothness		
Deep color for 3D applications	Allow, disable	
DSR Factors	OFF Available factors depend on system capability. Examples: 1.20x (native resolution) 1.50x (native resolution) 2.00x (native resolution) etc.	Fermi-based and later desktop GPUs. Windows 7 and later
DSR Smoothness	OFF 0 - 100%	Fermi-based and later desktop GPUs. Windows 7 and later
Exported pixel types	8-bpp and/or RGB555 format, None	NVIDIA Quadro cards
Image Sharpening	Off , On: - Sharpen slider; 0-1.0 - Ignore Film Grain slider: 0-1.0 GPU Upscaling check box	
Low Latency Mode	Off, On, Ultra	
Max Frame Rate	Off , On (20-1000)	
Max-Q Dynamic Boost	On, Off	
Monitor Technology	G-SYNC/G-SYNC Compatible, ULMB, Fixed Refresh Rate	
Multi-display/mixed-GPU acceleration	Single, Compatible, or Multiple display performance modes	
Multi-GPU performance mode	single-GPU, alternate frame rendering 1 & 2, split frame rendering, or multi-GPU antialiasing	

Table 3.1 NVIDIA Control Panel Features

Feature	Values (Default in bold) ^a	Notes
Optimize for Compute Performance	Off, On	Windows 10, Maxwell GPUs and later. Offers significant improvement for some Compute applications. Care should be taken when turning this setting ON, as there can be unpredictable effects with some applications and graphics features.
OpenGL Rendering GPU	Auto-select,	NVIDIA Quadro FX or NVS cards
Power management mode	Adaptive, NVIDIA driver controlled, Prefer maximum performance, Prefer consistent performance, Optimal power	Windows 7 and later
Preferred Refresh Rate	Application-controlled, Highest available	Windows 7 and later
Shader Cache	On, Off	
SLI performance modes	single-GPU, alternate frame rendering 1 & 2, split frame rendering, or SLI antialiasing	
Stereo - Display mode	Select to match stereo viewing hardware	NVIDIA Quadro cards
Stereo - Enable	Off, On	NVIDIA Quadro cards
Stereo - Force shuttering	Off, On	NVIDIA Quadro cards
Stereo - Swap eyes	Off, On	NVIDIA Quadro cards
Stereo - Swap mode	Application controlled, Per eye, Per Eye-pair	
Texture filtering - anisotropic mip filter optimization	Off, On	
Texture filtering - anisotropic sample filter optimization	Off, On	
Texture filtering - Negative LOD bias	Allow, Clamp	

Table 3.1 NVIDIA Control Panel Features

Feature	Values (Default in bold) ^a	Notes
Texture filtering - Quality	High quality, Quality, Performance, High performance	Balance between quality and performance
Texture filtering - Trilinear optimization	Off, On	
Threaded optimization	Off, On	For systems with multiple CPUs
Triple buffering	Off, On	Applies only to OpenGL apps
Vertical sync	Use the 3D application setting, Off, On, Adaptive, Adaptive (half refresh rate), Fast	Adaptive settings are available only on Windows 7 and later, and only if Monitor Technology is set to ULMB or Fixed Refresh Rate.
Virtual Reality pre-rendered frames	Use the 3D application setting, 1, 2, 3, 4	Sets the frame pre-rendering
Virtual Reality - Variable Rate Super Sampling	Adaptive, Always On Off	Applies to NVIDIA-profiled applications on NVIDIA Turing GPUs when MSAA is enabled.
Whisper Mode	Off: Disabled by GeForce Experience On: Enabled by GeForce Experience and applied as a Global Setting. Frame rates are capped at 40 or 60 fps, depending on the application. WhisperMode slider: Appears under Program Settings when enabled in GeForce Experience.	Available on Pascal and later GPUs, on single-GPU configurations.
Surround Configuration		For systems with SLI ready GPUs.

Table 3.1 NVIDIA Control Panel Features

Feature	Values (Default in bold) ^a	Notes
PhysX Configuration		For systems with PhysX-capable GPUs, a minimum of 256MB dedicated graphics memory, and a minimum of 32 processor cores
SLI/Multi-GPU Configuration		For systems with SLI or multi-GPU ready GPUs.
3-way SLI Mode		
Quad SLI Mode		

- a. Defaults for the 3D application controls are for the Global Settings tab. Under the Program Settings tab, **Use global setting** is typically the default setting.

NVIDIA Control Panel Groups

This section provides an overview of the NVIDIA Control Panel groups.

- ▶ “Using the Display Pages” on page 23
- ▶ “Using the Video Pages” on page 23
- ▶ “Using the 3D Settings Pages” on page 24
- ▶ “Using the Developer Pages” on page 24
- ▶ “Using the Workstation Pages” on page 24

Using the Display Pages

The actual tasks available on your system depend on your system hardware, such as the number and type of displays connected. Use the Display group pages to:

- ▶ Run the wizard to optimize your display configuration.
- ▶ Change the display resolution.
- ▶ Change the scaling on your flat panel display.
- ▶ Adjust desktop color settings.
- ▶ Rotate the display.
- ▶ Adjust custom timings.
- ▶ Configure multiple displays, including Spanning or Clone modes.
Spanning modes are available only with Windows XP.
- ▶ Adjust your television picture quality and video color settings for the best possible viewing in its environment.
- ▶ Change the position and size of the desktop/video to best fit your television or HDTV (high definition television) screen.
- ▶ Change the signal format to use for your standard television or HDTV as well as change country-specific signal or the HDTV format.
- ▶ Verify the HDCP capability of your system.
- ▶ Access digital audio controls.

Using the Video Pages

The actual tasks available on your system depend on your system hardware, such as whether or not you have a TV connected and enabled. Use the Video page to:

- ▶ Adjust video and image color settings.

Using the 3D Settings Pages

The actual tasks available on your system depend on your system hardware, such as whether or not you have an SLI-ready system. Use the 3D Settings page to:

- ▶ Change the image and rendering settings of your 3D applications and games that utilize Direct3D and OpenGL technology.
- ▶ Assign specific 3D settings to a game so that these settings automatically load when a game is launched (available under Advanced view).
- ▶ Set up your SLI or multi-GPU configuration as well as PhysX configuration.

GPU temperature monitoring and GPU overclocking features are not included in the 3D Settings page. To use this functionality you must install NVIDIA nTune software.

Using the Developer Pages

Use the Developer pages to control settings specific to developers who need to use NVIDIA developer tools.

Using the Workstation Pages

The Workstation group is available if you have an NVIDIA Quadro FX graphics card installed.

The actual tasks available depend on which NVIDIA Quadro FX product you have installed. Use the Workstation page to:

- ▶ Synchronize your displays using frame sync or genlock technology.
- ▶ View a graphical representation of the displays and graphics cards installed on your system.
- ▶ Manage serial digital interface (SDI) output (requires NVIDIA Quadro FX SDI solution.)
- ▶ Configure Mosaic mode to combine multiple displays into a larger virtual canvass.
- ▶ Overlap the edges of adjacent displays.
Display edge blending is no longer available.

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