



# **NVIDIA Control Panel Quick Start Guide**

User's Guide

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# 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](http://www.nvidia.com).

This chapter discusses the following major topics:

- > [About the NVIDIA Control Panel](#)
- > [Getting Support and Information](#)

## 1.1 About the NVIDIA Control Panel

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

### 1.1.1 Overview

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

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



**Caution:** 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.

## 1.1.1 Supported Operating Systems

NVIDIA Release 545 Game Ready Drivers and NVIDIA Studio Drivers are available for the following Microsoft® Windows® operating systems:

1. Windows 10 64-bit
2. Windows 11

Refer to the release notes for specific operating system support for individual driver versions.

## 1.1.2 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.

## 1.1.3 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)	

# 1.2 Getting Support and Information

## 1.2.1 Online Help

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

## 1.2.2 Technical Support

To access the NVIDIA Technical Support webpage, go the following:

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

## 1.2.3 System Information

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

1. To view copyright and version information about the NVIDIA Control Panel:

From the **Help** menu, select **About NVIDIA Control Panel**.

2. 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.

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# Chapter 2. Understanding the NVIDIA Control Panel

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

- > [Opening and Closing the NVIDIA Control Panel](#)
- > [About the NVIDIA Control Panel Interface](#)

## 2.1 Opening and Closing the NVIDIA Control Panel

### 2.1.1 Opening the NVIDIA Control Panel



**Caution:** 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.

To open the NVIDIA Control Panel, right-click the desktop and then select **NVIDIA Control Panel** from the context menu.

### 2.1.2 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.

## 1.2 About the NVIDIA Control Panel Interface

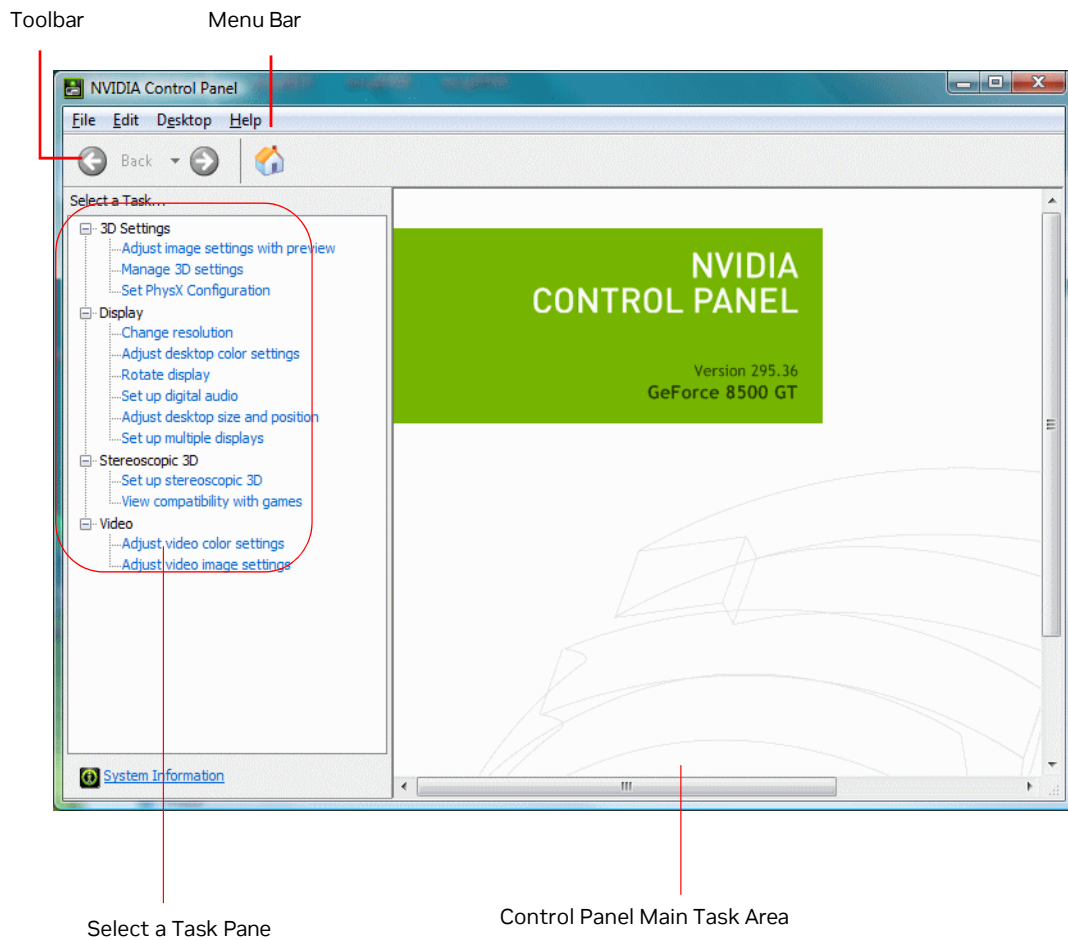
The NVIDIA Control Panel provides an easy-to-use interface for managing your system.

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 Figure 1:

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

Figure 1. NVIDIA Control Panel



## 2.2.1 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.

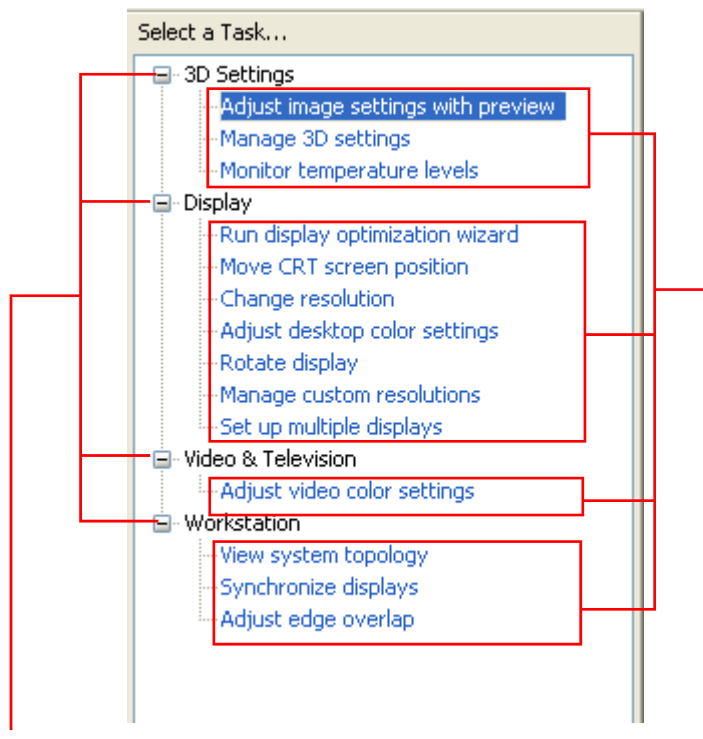


## 2.2.2 Using the Select a Task Pane

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. NVIDIA Control Panel Select a Task Pane**



Click to expand or collapse the group list.

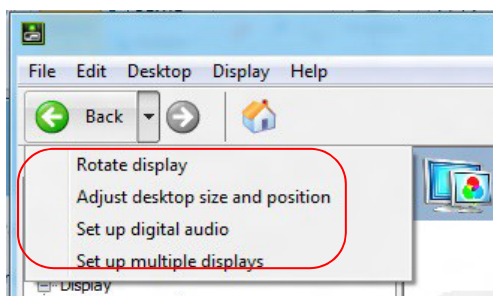
Click to open the corresponding page in the main task area.

## 2.2.3 Using the Toolbar

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 to open.

Figure 3. Navigation History Menu



## 2.2.4 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 another group) you are using.

### 2.2.4.1 File Menu

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

Table 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.
Exit	Close the NVIDIA Control Panel program.

### 2.2.4.2 Edit Menu

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

Table 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.

Edit Menu Command	Description
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.

### 2.2.4.3 Desktop Menu

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

**Table 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 <b>Desktop Context</b> menu.
Enable Video Editing Mode	Select this option to improve the video playback experience for some video editing applications.
Add the <b>Run with graphics processor</b> Option	<p>Select this option to add <b>Run with graphics processor</b> to the program context menu. 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"> <li>1. Right-click the program icon.</li> <li>2. Click <b>Run with graphics processor</b> and then click the graphics processor to use. The selection applies only at the time the program is launched.</li> </ol> <div style="background-color: #f0f0f0; padding: 5px; margin-top: 10px;"> <p> <b>Note:</b> This menu option appears only with systems using NVIDIA® Optimus™ technology.</p> </div> <div style="background-color: #f0f0f0; padding: 5px; margin-top: 10px;"> <p> <b>Note:</b> This menu option will not appear with Windows 10 May 2020 Update and later.</p> </div> <div style="background-color: #f0f0f0; padding: 5px; margin-top: 10px;"> <p> <b>Note:</b> Some programs require elevated user privileges to use the <b>Run on graphics processor</b> 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 <b>NVIDIA Control Panel -&gt; Manage 3D Settings</b> page to select the graphics processor.</p> </div>
Display <b>GPU Activity</b> Icon in Notification Area	<p>Select this option so that the <b>GPU Activity</b> icon appears in the <b>Windows</b> notification area of the taskbar. You can then click the icon to see which programs and displays are using the NVIDIA GPU.</p> <div style="background-color: #f0f0f0; padding: 5px; margin-top: 10px;"> <p> <b>Note:</b> This menu option appears only with systems using NVIDIA® Optimus™ technology.</p> </div>

View Menu Command	Description
Show Notification Tray Icon	Select to show the NVIDIA Control Panel notification tray icon in the Windows taskbar notification area. Clicking the NVIDIA Control Panel notification icon offers a quick way to configure key NVIDIA Control Panel settings.
Enable Developer Settings	Select this option to expose the Developer help module. Deselect this option to hide the Developer help module.

## 2.2.4.4 Help Menu

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

**Table 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	Removes all overclocking performance and power settings.
About NVIDIA Control Panel	View NVIDIA Control Panel version and copyright information.

## 2.2.4.5 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 5. Display Menu Commands**

Display Menu Command	Description
Identify Displays	Select to identify the displays configured with your system.
Show G-SYNC Visual Indicator	Select to verify that NVIDIA G-SYNC is being used. Depending on the type of monitor connected, the menu item could state: <ul style="list-style-type: none"> <li>Show indicator for G-SYNC,</li> <li>Show indicator for G-SYNC Compatible, or</li> <li>Show indicator for G-SYNC/G-SYNC Compatible</li> </ul>

## 3D Settings Menu

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

**Table 6. 3D Settings Menu Commands**

<b>3D Settings Menu Command</b>	<b>Description</b>
Show SLI Visual Indicators	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 7. Workstation Menu Commands**

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

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# 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](#) details the current features available in the NVIDIA Control Panel.
- > [NVIDIA Control Panel Groups](#) provides an overview of the NVIDIA Control Panel pages by group.

## 3.1 NVIDIA Control Panel Feature List



**Caution:** 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 8. NVIDIA Control Panel Features

Feature	Values (Default in bold) <sup>a</sup>	Notes
<b>Display/TV Controls</b>		
Mode control Resolution	<ul style="list-style-type: none"><li>• Non-HD display - the native resolution or the highest safe resolution from the monitor EDID is the default.</li><li>• HD display - the highest progressive resolution is the default.</li></ul>	
Refresh rate		
Custom timings/resolutions		
TV Signal Format Selection	M/NTSC, PAL, M/PAL, N/PAL, Select by country	

Feature	Values (Default in bold) <sup>a</sup>	Notes
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) HDR (64-bit) WCG (64-bit) SDR (30-bit color) SDR (24-bit color)	
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
<b>Color Control</b>		
Color Accuracy Mode (read only)	<b>Reference (can be forced via check box)</b> Accurate Enhanced	
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)	For GeForce 8 series and later GPUs
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	Some HDMI displays only - available values dependent on display support
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	
<b>Desktop Size and Position</b>		
Move CRT screen position		For VGA displays
Scaling mode	Aspect ratio Full-screen No scaling Integer scaling	TV, VGA (with EDID), Digital displays, LVDS

Feature	Values (Default in bold) <sup>a</sup>	Notes
Scaling performed on	GPU Auto (Display/GPU combination)	
Application Scaling override	Off, On	
Resize		TV, Digital displays
Position		TV, VGA
<b>Multi-display Options</b>		
Single-display mode		
Dualview (extended mode)		
nView Clone Mode		
Smart Clone		
Set Up Merge Displays		Windows 10 and later
<b>Video Controls</b> Use <b>video player settings</b> is the default. If <b>Use NVIDIA settings</b> is selected, the following values apply.		
<b>Color Settings</b>		
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)	
<b>Advanced Color Settings</b>		
Dynamic Range	Full (0—255) Limited (16—235)	
Dynamic Contrast Enhancement	Disabled	
Color Enhancement	Disabled	
<b>Image Settings</b>		
Edge Enhancement	0 - 100%, (0%)	
Noise Reduction	0 - 100%, (0%)	
Inverse Telecine option	Disabled	
Internet Video Enhancement option	Disabled	
<b>Digital Audio</b>		
Verify displays that will appear as audio devices in the Windows Sound Settings.	For each audio-capable display, select the display or select <b>Turn off audio</b> .	For GPUs that support digital audio when an HDMI or DisplayPort connection is made.
Portal to the Windows Sound Settings panel.		
<b>HDCP</b>		
View HDCP Status (Capability verification page)		For GPUs that support HDCP.
<b>3D Application Controls - Manage 3D Settings</b>		
Preferred graphics processor	High-performance NVIDIA processor,	Optimus systems.



Feature	Values (Default in bold) <sup>a</sup>	Notes
	Integrated graphics, Force high-performance NVIDIA processor use, Force integrated graphics use, Auto-select	Not available as of Windows 10 May 2020 Update.
Ambient Occlusion	Off, Performance, Quality	
Anisotropic filtering	Application-controlled, Off, card-specific settings	
<b>3D Application Controls - Manage 3D Settings</b>		
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	
Background Application Max Frame Rate	Range: 20-200	
Buffer-flipping mode	Auto-select, Block transfer	
CUDA - GPUs	[All CUDA-capable GPUs]	
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.	
DSR Smoothness	OFF 0 - 100%	
Dynamic Boost	On, Off	
Enable overlay	<b>Off</b> On	
Exported pixel types	8-bpp and/or RGB555 format, None	
Image Sharpening	<b>Sharpening Off</b> , Sharpening 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	<b>Off</b> , On (slider range 20-1000 fps)	
Monitor Technology	G-SYNC/G-SYNC Compatible, ULMB, Fixed Refresh	

Feature	Values (Default in bold) <sup>a</sup>	Notes
<b>3D Application Controls - Manage 3D Settings</b>		
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	
OpenGL Rendering GPU	Auto-select,	NVIDIA NVS cards
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.
Power management mode	Adaptive, NVIDIA driver controlled, Prefer maximum performance, Prefer consistent performance, Optimal power	<b>NVIDIA Driver controlled</b> GPUs
Preferred Refresh Rate	Application-controlled, Highest available	
Shader Cache Size	Disabled, Limited, 128MB, 256MB, 512MB, 1GB, 5GB, 10GB, 100GB	
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	
Stereo - Enable	Off, On	
Stereo - Force shuttering	Off, On	
Stereo - Swap eyes	Off, On	
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	
<b>3D Application Controls - Manage 3D Settings</b>		
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

Feature	Values (Default in bold) <sup>a</sup>	Notes
Triple buffering	Off, On	
Vertical sync	Use the 3D application setting, Off, On, Adaptive, Adaptive (half refresh rate), Fast	Adaptive settings are available 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
Whisper Mode	<p><b>Off:</b> Disabled by GeForce Experience</p> <p><b>On:</b> Enabled by GeForce Experience and applied as a Global Setting. Frame rates are capped at 40 or 60 fps, depending on the application.</p> <p><b>WhisperMode slider:</b> Appears under Program Settings when enabled in GeForce Experience.</p>	Available on Pascal and later GPUs, on single-GPU configurations.
<b>3D Application Controls - Special Features</b>		
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.
Manage Power and Display Settings - Power Mode	Power Balanced Quiet	For certain enterprise-class notebooks based on the NVIDIA Turing GPU architecture, such as the NVIDIA Quadro RTX 6000 notebook.
Manage Power and Display Settings - Display Multiplexer	Internal display multiplexer type External display multiplexer type	

- 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.

## 3.2 NVIDIA Control Panel Groups

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

- > [Using the Display Pages](#)
- > [Using the Video Pages](#)
- > [Using the 3D Settings Pages](#)
- > [Using the Licensing Pages](#)
- > [Using the Developer Pages](#)
- > [Using the Workstation Pages](#)

## 3.2.1 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 Clone modes.
- > 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.

## 3.2.2 Using the Video Pages

The actual tasks available on your system depend on your system hardware, such as whether you have a TV connected and enabled. Use the Video page to:

- > Adjust video and image color settings.

## 3.2.3 Using the 3D Settings Pages

The actual tasks available on your system depend on your system hardware, such as whether 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.

## 3.2.4 Using the Developer Pages

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

## 3.2.5 Using the Workstation Pages

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

The actual tasks available depend on which NVIDIA Quadro 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.
- > Configure Mosaic mode to combine multiple displays into a larger virtual canvass.
- > Configure ECC control on supported GPUs.
- > Overlap the edges of adjacent displays. Display edge blending is no longer available.

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