



## NVIDIA® NVS™ 510 RAISING THE BAR FOR BUSINESS GRAPHICS

### Reliably visualize any data across four displays with the energy-efficient NVIDIA NVS 510 business graphics solution.

The NVIDIA NVS 510 gives you the latest graphics and display technologies—plus industry-leading, multi-display management capabilities—in an energy-efficient, low-profile form factor. This makes it the ideal graphics solution for professionals who need to visualize and digest a great deal of information in the financial trading, command and control, and digital-signage markets.

The NVIDIA NVS 510 features four compact mini DisplayPort connectors with a custom built-in retention mechanism, delivering ultra-high resolutions up to 3840x2160 @ 60 Hz. It also supports advanced DisplayPort 1.2 features like Multi Stream Technology and Stream Cloning<sup>1</sup>, which enables efficient cable management, as well as cost-effective multi-display installations.

The NVS 510 is based on the latest NVIDIA Kepler™ GPU technology and configured with 2 GB of dedicated high-performance graphics memory. This means you get more than 3x the performance of previous-generation NVS solutions, without increasing overall power consumption.

Along with NVIDIA's Unified Driver Architecture (UDA) and suite of enterprise management tools, the NVS 510 offers a highly reliable solution for seamless wide-scale deployment and simplified resource management. Its ultra-quiet active-cooling technology and low-profile form factor give IT administrators the freedom to fit multiple NVS 510 cards into space- and power-constrained systems or existing installations.



#### Product Specifications

NVIDIA® CUDA® Parallel-Processing Cores	<b>192</b>
Frame Buffer Memory	<b>2 GB DDR3</b>
Memory Interface	<b>128-bit</b>
Memory Bandwidth	<b>28.5 GB/s</b>
Max Power Consumption	<b>35 W</b>
Graphics Bus	<b>PCI Express 2.0 x16</b>
Display Connectors	<b>4x mini DisplayPort</b>
Form Factor	<b>2.7" H x 6.3" L Single Slot</b>
Thermal Solution	<b>Active</b>

# KEY FEATURES AND BENEFITS

FEATURES	BENEFITS
<b>Quad Display Support<sup>2</sup></b>	The all-new NVS 510 display engine drives up to four displays simultaneously and fully supports the next generation DisplayPort 1.2 standard capable of resolutions up to 3840x2160 @60 Hz. When used with the NVIDIA nView® Desktop Software utility, this makes it easy to deploy multiple displays across a desktop or build an expansive digital-signage wall.
<b>DisplayPort 1.2 Features</b>	The integrated DisplayPort 1.2 engine produces crisp image quality while driving ultra-high-resolution panels (up to 3840 x 2160 @ 60 Hz). NVS 510 also supports advanced DisplayPort 1.2 features like multi-stream technology (MST) and stream cloning. MST lets you drive up to four independent displays simultaneously from any one display port output, while stream cloning enables NVS 510 to clone up to four instances of each display output to drive a maximum of 16 displays.
<b>NVIDIA Enterprise Management Tools</b>	Exhaustive enterprise-management tools maximize your system uptime by enabling seamless wide-scale deployment. This allows remote query and control of graphics and display settings for systems spread across installations.
<b>Low-Profile and Flexible Form Factor</b>	Its profile simplifies IT administration and deployment throughout an enterprise. Regardless of desktop system (standard tower PC, workstation, small form-factor system) or the display type (LCD, DLP, plasma), NVS 510 fits into any existing installation without being disruptive.

## TECHNICAL SPECIFICATIONS

### Mechanical Specifications

- > Low-profile 2.7" x 6.3" single-slot board (low-profile and ATX brackets available)
- > Four mini DisplayPort connectors with built-in retention mechanism
- > Use included latched mini-DisplayPort to DisplayPort cables to securely connect to your displays
- > Ultra-quiet Active Fansink
- > 35 W max power

### Supported Platforms

- > Microsoft Windows 8 (64-bit and 32-bit)
- > Microsoft Windows 7 (64-bit and 32-bit)
- > Microsoft Windows Vista (64-bit and 32-bit)
- > Microsoft Windows XP (64-bit and 32-bit)
- > Linux® - Full OpenGL implementation, complete with NVIDIA and ARB extensions (64-bit and 32-bit)

### NVIDIA NVS 510 Architecture

- > Integrated DisplayPort (ver 1.2)
- > PCI Express 2.0 support
- > 12 pixels per-clock rendering engine
- > NVIDIA CUDA technology-capable
- > Scalable geometry architecture
- > Hardware tessellation engine
- > NVIDIA GigaThread™ Engine
- > Shader Model 5.0 (OpenGL 4.3, DirectX 11)
- > Decode acceleration for MPEG-2, MPEG-4 Part 2 Advanced Simple Profile, H.264, MVC, VC1, DivX (version 3.11 and later), and Flash (10.1 and later)
- > Blu-ray dual-stream hardware acceleration (supporting HD picture-in-picture playback)

- > Dedicated H.264 encoder<sup>3</sup>
- > Compliance with professional OpenGL® and DirectX® applications

### Advanced Display Features

- > Support for any combination of four connected displays
- > DisplayPort outputs natively drive four digital displays natively at resolutions up to 3840x2160 @ 60 Hz<sup>4</sup>
- > Connect to various monitor types using multiple mini-DisplayPort based cable adaptors or widely available standard DisplayPort cable adaptors (when used with the included latched mini DisplayPort to DisplayPort cable)
  - > DisplayPort to DVI-D (Single Link) to drive DVI displays up to 1920x1200 @ 60 Hz
  - > DisplayPort to DVI-D (Dual Link) to drive DVI displays up to 2560 x1600 @ 60 Hz
  - > DisplayPort to HDMI cables to drive HD Displays up to 1920 x1080 @ 60 Hz
  - > DisplayPort to VGA cables to drive analog (VGA) displays up to 1920x1200 @ 60 Hz
- > DisplayPort 1.2, HDMI 1.4, and HDCP support
- > DisplayPort 1.2 Multi-Stream technology: For cable-management benefits, supports driving maximum of four displays up to 1920 x 1200 @ 60 Hz
- > Drive up to 16 displays (four groups of cloned images via each DisplayPort connector) using supported Display Port 1.2 Stream Cloning technology
- > Support for integrated audio via DisplayPort and HDMI
- > Support for multiple display modes including DualView, Span, and Clone modes

### DisplayPort and HDMI Digital Audio

- > Support for the following audio modes:
  - > Dolby Digital (AC3), DTS 5.1, Dual Channel and Multichannel (7.1) LPCM, Dolby Digital Plus
  - > [DD+], and MPEG-2/MPEG-4 AAC
- > Data rates of 44.1 KHz, 48 KHz, 88.2 KHz, 96 KHz, 176 KHz, and 192 KHz
- > Word sizes of 16-bit, 20-bit, and 24-bit

### NVIDIA nView® Desktop-Management Software

- > Boosts productivity by delivering maximum flexibility for single and multi-display setups, and provides unprecedented end-user control of the desktop experience.
- > Seamless integration within the Windows environment
- > Easy-to-use Setup Wizard
- > Extended Windows taskbar to spread the application buttons across displays
- > Get virtual sub-displays with Gridlines to make best use of large display setups
- > Create virtual desktops to maximize work area and reduce application clutter
- > Complete set of Hot Keys
- > User Profiles for easier system deployments

### NVIDIA Mosaic™ Technology<sup>5</sup>

- > Enhance your workspace over multiple displays (up to eight displays when used with multiple NVS 510 graphics cards)
- > Enables seamless taskbar spanning as well as transparent scaling of any application over multiple displays

### NVIDIA Enterprise-Management Tools<sup>6</sup>

- > Monitor, access, and configure graphics and display information of remote machines using industry-standard WMI Interface
- > Scriptable using WMI Command Line interface for integration with system-level management tools
- > Scalable enterprise-class tools to remotely install and configure graphics drivers across your entire organization

### NVIDIA CUDA Parallel Processing Architecture

- > SMX architecture (streaming multi-processor design that delivers greater processing and efficiency)
- > Hyper Q (allows multiple CPU cores to simultaneously utilize a single NVS 510 GPU to execute independent compute kernels)
- > API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran

### Unified Driver Architecture

- > Supports NVS 510, NVS 310, NVS 300, NVS 450, NVS 420, NVS 295, NVS 290
- > Support for the latest applications on previous- and current-generation hardware
- > Continuous performance tuning
- > Microsoft Windows Hardware Qualification Lab (WHQL)-certified for Windows 8, Windows 7, Windows Vista, and Windows XP

To learn more about NVIDIA NVS, go to [www.nvidia.com/nvs](http://www.nvidia.com/nvs)

<sup>1</sup> Stream Cloning enables NVS 510 to clone up-to four instances of each display output

<sup>2</sup> NVS 510 supports a maximum of 4 simultaneous displays in Win7, Win8 and Linux OS's only (maximum of 2 displays in Windows XP)

<sup>3</sup> This feature requires implementation by software applications and is not a stand-alone utility. Please contact [quadrohelp@nvidia.com](mailto:quadrohelp@nvidia.com) for details on availability.

<sup>4</sup> NVS 510 supports up to 2 simultaneous displays in Windows XP

<sup>5</sup> NVIDIA Mosaic Technology is supported in Microsoft Windows 8, Windows 7 and Linux only

<sup>6</sup> Supported in Microsoft Windows 8 and Windows 7 only

