



PROFESSIONAL GRAPHICS PERFECTED NVIDIA® QUADRO® K5000

The NVIDIA Quadro K5000 GPU leverages the new NVIDIA Kepler™ architecture to deliver the world's most compatible and power-efficient solution for accelerating professional applications.

Count on the Quadro K5000 for exceptional design interaction with complex models, richer scene details and effects for content creation, and faster results when processing massive datasets for scientific exploration.

You can now drive up to four displays simultaneously. This makes it easy to deploy multiple displays across a desktop, build an expansive digital signage wall, or create a sophisticated stereoscopic 3D CAVE environment. NVIDIA's latest technologies (Quadro Sync, Quadro Mosaic, and GPUDirect), coupled with a Quadro K5000, give you an easy way to perform image synchronization and resolution scaling of a synchronized display surface with multiple projectors or displays.

The next-generation NVIDIA Kepler architecture is built on a breakthrough streaming multiprocessor (SM) design, called SMX, providing several important architectural changes. These include substantial increases in per-clock throughput of key graphics operations that combine to deliver a new level of performance and power efficiency.

The NVIDIA Kepler architecture also introduces the concept of bindless textures, enabling the GPU to reference textures directly in memory eliminating the limit on the number of unique textures that can be used to render a scene.

Quadro GPUs are designed, built, and tested by NVIDIA specifically for professional workstations powering more than 150 professional applications across a broad range of industries, including manufacturing, media and entertainment, sciences, and energy.

For maximum application performance, add an NVIDIA Tesla® K20 co-processor to your workstation and experience the power of NVIDIA Maximus™ technology.



PRODUCT SPECIFICATIONS

- NVIDIA CUDA® PARALLEL PROCESSING CORES
 - > 1536
- FRAME BUFFER MEMORY
 - > 4 GB GDDR5
- MEMORY INTERFACE
 - > 256-BIT
- MEMORY BANDWIDTH
 - > 173 GB/s
- SINGLE PRECISION COMPUTE PERFORMANCE
 - > 2.1 TERAFLOPS
- MAX POWER CONSUMPTION
 - > 122 W
- GRAPHICS BUS¹
 - > PCI Express 3.0 x16
- DISPLAY CONNECTORS
 - > DVI-I (1), DVI-D (1), DP 1.2 (2),
Optional Stereo (1)
- FORM FACTOR
 - > 4.376" H X 10.5" L Dual Slot
- THERMAL SOLUTION
 - > Active
- NVIDIA 3D VISION® / 3D VISION PRO
 - > Support via 3 Pin Mini DIN
- QUADRO SYNC
 - > Compatible
- HD SDI CAPTURE/OUTPUT
 - > Compatible
- GPU DIRECT FOR VIDEO
 - > Compatible

New NVIDIA Kepler Architecture Features and Benefits for the NVIDIA Quadro K5000

Features	Benefits
QUAD-DISPLAY SUPPORT	All-new display engine drives up to four displays simultaneously and fully supports the next-generation DisplayPort 1.2 standard capable of resolutions up to 3840x2160. This makes it easy to deploy multiple displays across a desktop, build an expansive digital signage wall, or create a sophisticated stereoscopic 3D CAVE environment.
BINDLESS TEXTURES	Dramatically increases the number of unique textures available to shaders at run-time, enabling vastly more materials and richer texture detail in scenes
NVIDIA SMX	Delivers more processing performance and efficiency through a new, innovative streaming multiprocessor design that allows a greater percentage of space to be applied to processing cores versus control logic
NVIDIA FXAA AND TXAA	Reduces visible aliasing and delivers higher image quality without the performance hit by harnessing the power of the GPU's CUDA cores and new film-style anti aliasing techniques

Number of synchronized displays/projectors from a single system with NVIDIA® Mosaic technology:

Up to 4	Up to 8	Up to 12	Up to 16
1 GPU	2 GPUs + SLI or 2 GPUs + Quadro Sync	3 GPUs + Quadro Sync	4 GPUs + Quadro Sync

TECHNICAL SPECIFICATIONS

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)⁴
- > Linux® - Full OpenGL implementation, complete with NVIDIA and ARB extensions (64-bit and 32-bit)

3D GRAPHICS ARCHITECTURE

- > Scalable geometry architecture
- > Hardware tessellation engine
- > NVIDIA® GigaThread™ engine with dual copy engines
- > Shader Model 5.0 (OpenGL 4.3 and DirectX 11)
- > Up to 16K x16K texture and render processing
- > Transparent multisampling and super sampling
- > 16x angle independent anisotropic filtering
- > 128-bit floating point performance
- > 32-bit per-component floating point texture filtering and blending
- > 64x full scene antialiasing (FSAA)/128x FSAA in SLI Mode
- > FXAA and TXAA full scene antialiasing
- > 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)

- > Dedicated H.264 Encoder³
- > Blu-ray dual-stream hardware acceleration (supporting HD picture-in-picture playback)

NVIDIA CUDA® PARALLEL PROCESSING ARCHITECTURE

- > SMX architecture (streaming multiprocessor design that delivers greater processing and efficiency)
- > API support, including:
 - > CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran
- > NVIDIA Parallel DataCache hierarchy (configurable L1 and unified L2 caches)
- > Error-correction codes (ECC) memory²
- > 64 KB of RAM (configurable partitioning of shared memory and L1 cache)
- > Dual Warp Scheduler (schedules and dispatches simultaneously instructions from two independent warps)

ADVANCED DISPLAY FEATURES

- > 30-bit color (10-bit per each red, green, blue channel)
- > Support for any combination of four connected displays
- > Dual DisplayPort 1.2 (supporting resolutions such as 3840x2160 @60 Hz)
- > Dual-link DVI-I/DVI-D outputs (up to 2560 x1600 @ 60 Hz and 1920x1200 @ 120 Hz) Internal 400 MHz DAC DVI-I output (analog display up to 2048x1536 @ 85 Hz)

- > DisplayPort to VGA, DisplayPort to DVI (single-link and dual-link) and DisplayPort to HDMI cables (resolution support based on dongle specifications)
- > DisplayPort 1.2, HDMI, and HDCP support
- > 10-bit internal display processing (hardware support for 10-bit scanout for both windowed desktop and full screen, only available on Windows and Linux with Aero disabled)
- > NVIDIA 3D Vision™ technology, 3D DLP, interleaved, and other 3D stereo format support
- > Full OpenGL quad buffered stereo support
- > Underscan/overscan compensation and hardware scaling
- > NVIDIA nView® multi-display technology
- > Support for large-scale, ultra-high resolution visualization using the Quadro SVS platform which includes Quadro Mosaic, Quadro Sync and Warp/Blend technologies

DISPLAYPORT AND HDMI DIGITAL AUDIO

- > Support for the following audio modes:
 - > Dolby Digital (AC3), DTS 5.1, Multi-channel (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 bits, 20 bits, and 24 bits

To learn more about NVIDIA Quadro, go to www.nvidia.com/quadro

¹ Check with your workstation OEM vendor for system specific configurations and available bandwidth.

² Available on DRAM only

³ This feature requires implementation by software applications and is not a stand-alone utility. Please contact quadrohelp@nvidia.com for details on availability.

⁴ Supported on 2 displays only

