



PNY Quadro 410
Productivity Assurance
at an Exceptional Value



PART NUMBER:
VCQ410-PB

PNY Quadro® 410 GPUs combine outstanding workflow productivity for entry CAD/PLM users, comprehensive professional application certifications, and the peace of mind professionals have come to expect from Quadro products – all at an exceptional value.

Future proof your PC.

The Quadro 410 GPUs are tested, certified, and guaranteed to reliably accelerate all major design and CAD applications – assurance of productivity regardless of how complex your workflow gets.

Outstanding productivity.

Take advantage of improved model interactivity and time savings or take on more complex models. Quadro 410 GPUs deliver almost 90% CAD performance improvement over Quadro FX380LP* and up to 30% gain over Quadro 400**.

Peace of Mind.

With a 2 year lifecycle and 3 year warranty, Quadro 410 GPUs deliver unsurpassed dependability & robustness expected from Quadro products.

Stunning image quality for CAD designers and creative professionals.

New with the Quadro 410 GPUs are stunning image quality improvements from FXAA & TXAA full scene anti-aliasing. Unlike traditional anti-aliasing, this new technology from NVIDIA delivers crisper images without the impact to model interactivity.

Design without distractions.

With its low profile form factor and ultra quiet design, the Quadro 410 GPU is designed for space constrained work environments and lets you focus on turning creativity to reality.



QUADRO 410 - PRODUCT SPECIFICATIONS

CUDA PARALLEL PROCESSING CORES	192
FRAME BUFFER MEMORY	512 MB DDR3
MEMORY INTERFACE	64-bit
MEMORY BANDWIDTH	14 GB/s
DISPLAY CONNECTORS	Dual Link DVI (1) Display Port 1.2 (1)
MAX POWER CONSUMPTION	38 W
GRAPHICS BUS	PCI Express 2.0 x16
FORM FACTOR	69 mm (H) x 176 mm (L) Single slot - Low Profile
THERMAL SOLUTION	Active
3D VISION / 3D VISION PRO	Support via USB



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QUADRO 410 - FEATURES AND BENEFITS

GPU FEATURES

NVIDIA® CUDA® ARCHITECTURE	Parallel-computing architecture that tightly integrates advanced visualization and compute features to significantly accelerate professional workflows.
NVIDIA® SCALABLE GEOMETRY ENGINE	Dramatically improves geometry performance across a broad range of CAD, DCC, and medical applications. This enables you to work interactively with models and scenes that are an order of magnitude more complex than ever before.
FAST 3D TEXTURE TRANSFER	Allows fast transfer and manipulation of 3D textures, resulting in more interactive visualization of large volumetric datasets.
UNIFIED DRIVER ARCHITECTURE (UDA)	The NVIDIA UDA guarantees forward and backward compatibility with software drivers. Simplifies upgrading to a new solution because all Quadro products work with the same driver software.
HARDWARE 3D WINDOW CLIPPING	Hardware accelerated clip regions enable faster data transfer between a window and the frame buffer to improve overall graphics performance.
NVIDIA® PARALLEL DATA CACHE™	Supports a true cache hierarchy combined with on-chip shared memory. L1 and L2 caches drive exceptional throughput, accelerating features such as real-time ray tracing, physics, and texture filtering.
NVIDIA® GIGATHREAD™ ENGINE	Provides up to 10x faster context switching compared to previous-generation architectures, concurrent kernel execution, and improved thread block scheduling.
ULTRA-QUIET DESIGN	Enables acoustics lower than 28db for an ultra-quiet desktop environment.

DISPLAY FEATURES

FULL-SCENE ANTIALIASING (FSAA)	16X FSAA reduces visual aliasing artifacts or "jaggies," resulting in unparalleled image quality and highly realistic scenes.
FXAA AND TXAA	Unlike traditional anti-aliasing techniques, FXAA and TXAA deliver exceptional anti-aliasing image quality without the degradation in performance.
GPU TESSELLATION WITH SHADER MODEL 5.0	Quadro Tessellation Engines automatically generate finely detailed geometry, for cinematic quality environments and scenes, without sacrificing performance.
16K TEXTURE AND RENDER PROCESSING	Provides the ability to texture from and render to 16K x 16K surfaces. Beneficial for applications that demand the highest resolution and quality image processing.
NVIDIA HIGH-PRECISION HIGH DYNAMIC RANGE (HDR) TECHNOLOGY	Sets new standards for image clarity and quality through floating-point capabilities in shading, filtering, texturing, and blending. Enables unprecedented rendered image quality for visual-effects processing.
DISPLAY PORT 1.2 SUPPORT (WITH AUDIO)	Compact and secure DisplayPort 1.2 connectors support Multi-Stream Technology, Stream Cloning and ultra-high-resolution panels (up to 2560 x 1600) – enabling maximum range, resolution, refresh rate, and color depth designed to support the latest display technologies.
HIGH-QUALITY DISPLAY CONNECTIVITY	Drives ultra-high-resolution panels, producing phenomenal image quality. Support two active connectors including, dual-link DVI with up to 3840 x 2400 @ 24Hz on each panel, DisplayPort with up to up to 2560 x 1600, or HDMI for integrated audio and video thru the GPU.
30-BIT COLOR FIDELITY	30-bit color fidelity (10-bits per color) enables billions of color variations for rich, vivid image quality with the broadest dynamic range.
3D VISION AND 3D VISION PRO	Advanced active shutter glasses deliver crystal-clear stereoscopic 3D visualization for the most immersive experience. Infrared (3D Vision) or RF (3D Vision Pro) technology enables a range of immersive environments ranging from your desktop workstation to collaborative work spaces. 3D Vision and 3D Vision Pro sold separately.
OPENGL QUAD BUFFERED STEREO SUPPORT	OpenGL Quad Buffered Stereo offers professional applications the capability of smooth and immersive 3D Stereo experience.

INDUSTRY STANDARD

COMPATIBLE WITH INDUSTRY STANDARD ARCHITECTURES	Compatible with Microsoft and Linux operating systems, and Intel and AMD x86 32- and 64-bit microprocessor architectures.
PCI EXPRESS 2.0 COMPLIANCE	Supports data transfer rates up to 5 GT/sec per lane for an aggregate bandwidth of 16 GB/sec bi-directional (8 GB/sec in each direction)

QUADRO 410 - TECHNICAL SPECIFICATIONS

SUPPORTED PLATFORMS

- >> 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)
- >> Solaris®

3D GRAPHICS ARCHITECTURE

- >> Shader Model 5.0 (OpenGL 4.2 and DirectX 11)
- >> Optimized compiler for Cg and Microsoft HLSL
- >> Up to 16K x 16K texture and render processing
- >> Transparent multisampling and super sampling
- >> 16x angle independent anisotropic filtering
- >> 16x floating point performance
- >> 32-bit per-component floating point texture filtering and blending
- >> 16x full scene antialiasing (FSAA)
- >> Advanced FXAA and TXAA anti-aliasing techniques
- >> 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)

NVIDIA CUDA PARALLEL PROCESSING ARCHITECTURE

API support includes:

- >> CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, or Fortran

ADVANCED DISPLAY FEATURES

- >> 30-bit color (10-bit per each red, green, blue channel)
- >> Support for any combination of two connected displays
- >> DisplayPort 1.2 (up to 3840x2160 @ 60Hz and 2560x1600 @ 120Hz)
- >> Dual-link DVI-I output (up to 2560 x 1600 @ 60Hz and 1920x1200 @ 120Hz)
- >> Internal 400 MHz DAC DVI-I output (analog display up to 2048 x 1536 @ 85Hz)
- >> DisplayPort to VGA, DisplayPort to DVI (single-link and dual-link) and DisplayPort to HDMI cables (resolution support based on dangle specifications)
- >> DisplayPort 1.2, HDMI 1.4, 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
- >> NVIDIA® Mosaic technology

DISPLAY PORT 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+), andMPEG-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

PACKAGE CONTENT:

- ATX Bracket
- DP to DVI (SL) adapter
- DVI to VGA adapter
- Drivers
- Installation Guide

P/N: **GSP-ATXBRA410**
P/N: **GSP-DPDISL**
P/N: **GSP-DVIVGA**



* 89% improvement based on SPEC Viewperf 11 score on Quadro 410 of 17.8 (Xeon 3.3GHz w/5590, 24GB RAM, Win7-64, 295.10 driver) compared to Quadro 380LP score of 37.7 (Xeon 3.3GHz w/5590, 6GB RAM, Win7-64, 260.79).

** 30% improvement based on SPEC Viewperf 11 score on Quadro 410 of 17.8 (Xeon 3.3GHz w/5590, 24GB RAM, Win7-64, 295.10 driver) compared to Quadro 400 score of 13.7 (Xeon 3.3GHz w/5590, 24GB RAM, Win7-64, 295.10). SPEC® and the benchmark name SPECViewperf® are registered trademarks of the Standard Performance Evaluation Corporation. Competitive benchmark results stated above reflect results published on www.spec.org as of 12/8/2010. For the latest SPECViewperf® benchmark results, visit www.spec.org/gwpg.

PNY PROFESSIONAL RANGE OF PRODUCTS

	QUADRO 400	QUADRO 410	QUADRO 600	QUADRO 2000	QUADRO 2000D	QUADRO 4000	QUADRO 4000 MAC	QUADRO 5000	QUADRO 6000
MEMORY	512 Mo DDR3	512 Mo DDR3	1 GB DDR3	1 GB GDDR5	1 GB GDDR5	2 GB GDDR5	2 GB GDDR5	2,5 GB GDDR5	6 GB GDDR5
MEMORY INTERFACE	64-bit	64-bit	128-bit	128-bit	128-bit	256-bit	256-bit	320-bit	384-bit
MEMORY BANDWIDTH	12.3 GB/s	14 GB/s	25.6 GB/S	41.6 GB/S	41.6 GB/S	89.6 GB/S	89.6 GB/S	120 GB/S	144 GB/S
CUDA PARALLEL PROCESSING CORES	48	192	96	192	192	256	256	352	448
DISPLAY CONNECTORS	Dual-Link DVI-I (1) DP (1)	Dual-Link DVI-I (1) DP (1)	DVI-I (1) DP (1)	DVI-I (1) DP (2)	Dual Link DVI-I (2)	DVI-I (1) DP (2)	DVI-I (1) DP (1) Stereo (1)	DVI-I (1) DP (2)	DVI-I (1) DP (2)
INCLUDED ACCESSORIES	DVI to VGA DP to DVI (SL)	DVI to VGA DP to DVI (SL)	DVI to VGA DP to DVI (SL)	DVI to VGA DP to DVI (SL)	DVI to VGA (2)	DVI to VGA DP to DVI (SL) 6-pin power cable	DVI to VGA DP to DVI (SL) 6-pin power cable	DVI to VGA DP to DVI (SL) 6-pin power cable	DVI to VGA DP to DVI (SL) 6-pin power cable
MAXIMUM POWER CONSUMPTION	32 W	38 W	40 W	62 W	62 W	142 W	142 W	152 W	204 W
PHYSICAL DIMENSIONS	69mm (H) x 142mm (L) Single Slot	69 mm (H) x 176 mm (L) Single slot	69mm (H) x 142mm (L) Single Slot	110mm (H) x 178mm (L) Single Slot	110mm (H) x 178mm (L) Single Slot	110 mm (H) x 240 mm (L) Single Slot	110 mm (H) x 240 mm (L) Single Slot	110 mm (H) x 250 mm (L) Dual Slot	110 mm (H) x 250 mm (L) Dual Slot
3D VISION PRO	Support via USB	Support via USB	Support via USB	Support via USB	Support via USB	3-pin mini DIN	3-pin mini DIN	3-pin mini DIN	3-pin mini DIN
GRAPHICS BUS	PCI EXPRESS 2.0 x 16	PCI EXPRESS 2.0 x 16	PCI EXPRESS 2.0 x 16	PCI EXPRESS 2.0 x 16	PCI EXPRESS 2.0 x 16	PCI EXPRESS 2.0 x 16	PCI EXPRESS 2.0 x 16	PCI EXPRESS 2.0 x 16	PCI EXPRESS 2.0 x 16
THERMAL SOLUTION	Active	Active	Active	Active	Active	Active	Active	Active	Active
LOW PROFILE	Yes	Yes	Yes	No	No	No	No	No	No
PART NUMBERS	VCG400-PB	VCG410-PB	VCG600-PB	VCG2000-PB	VCG2000DVI-PB	VCG4000-PB	VCG4000MAC-PB	VCG5000-PB	VCG6000-PB
EAN	3536403339579	3536403341299	3536403338916	3536403338893	3536403339494	3536403338404	3536403338855	3536403338336	3536403338411

	QUADRO G-SYNC	QUADRO SDI CAPTURE	QUADRO SDI OUTPUT
ADD-ON CARD FOR	Quadro 5000 Quadro 6000	Quadro 4000 Quadro 5000 Quadro 6000	Quadro 4000 Quadro 5000 Quadro 6000
BUS TYPE	-	PCI-E 2.0 x8	-
CONNECTORS	2x RJ-45 1x BNC	5x BNC	3x BNC 1x DVI-D In
FEATURES	Genlock Frame Lock Swap Lock Synchronization of several workstations, visualisation clusters, caves, videowalls	4x HD-SDI Capture 1x HD-SDI Output 8-Bit, 10-Bit, 12-Bit Ancillary Data SDI capture and postprocessing in realtime. Genlock Preview output	2x HD-SDI Output 8-Bit, 10-Bit, 12-Bit Ancillary Data SDI output and postprocessing in realtime. Genlock

	TESLA C2075
TOTAL DEDICATED MEMORY	6GB GDDR5
MEMORY SPEED	1.5 GHz
MEMORY INTERFACE	384-bit
# OF CUDA CORES	448
DOUBLE PRECISION FLOATING POINT PERFORMANCE (PEAK)	515 GFlops
SINGLE PRECISION FLOATING POINT PERFORMANCE (PEAK)	1.03 Tflops
POWER CONSUMPTION	225 W
PART NUMBERS	TCSC2075-PB
EAN	3536403340193