

PART NUMBER:
VCQ410-PB

NVIDIA® Quadro® 410 by PNY

Productivity Assurance
at an Exceptional Value



NVIDIA® Quadro® 410 by PNY 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 NVIDIA Quadro products – all at an exceptional value.

Future proof your PC.

The Quadro 410 GPUs by PNY 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 NVIDIA 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 DVH (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



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 DATACACHE™	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 4.4 and DirectX 11)
- >> Optimized compiler for Cg and Microsoft HLSL
- >> 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
- >> 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-DP-DVLSL**
P/N: **GSP-DVIVGA**



* 88% improvement based on SPEC Viewperf 11 score on Quadro 410 of 17.8 (Xeon 3.3GHz w5590, 24GB RAM, Win7-64, 295.10 driver) compared to Quadro 380LP score of 37.7 (Xeon 3.3GHz w5590, 6GB RAM, Win7-64, 260.79).

** 30% improvement based on SPEC Viewperf 11 score on Quadro 410 of 17.8 (Xeon 3.3GHz w5590, 24GB RAM, Win7-64, 295.10 driver) compared to Quadro 400 score of 13.7 (Xeon 3.3GHz w5590, 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/gwp.

PNY PROFESSIONAL RANGE OF PRODUCTS

PNY Professional Solutions	QUADRO 410	QUADRO K600	QUADRO K2000	QUADRO K2000D	QUADRO K4000	QUADRO K5000 MAC	QUADRO K5000	QUADRO K6000
CUDA PARALLEL PROCESSING CORES	192	192	384	384	768	1536	1536	2880
FRAME BUFFER MEMORY	512 Mo DDR3	1 GB DDR3	2 GB GDDR5	2 GB GDDR5	3 GB GDDR5	4 GB GDDR5	4 GB GDDR5	12 GB GDDR5
MEMORY INTERFACE	64-bit	128-bit	128-bit	128-bit	192-bit	256-bit	256-bit	384-bit
MEMORY BANDWIDTH	14 GB/s	29 GB/s	64 GB/s	64 GB/s	134 GB/s	173 GB/s	173 GB/s	288 GB/s
MAX POWER CONSUMPTION	38 W	41 W	51 W	51 W	80 W	122 W	122 W	225 W
GRAPHICS BUS	PCI Express 2.0 x16	PCI Express 2.0 x16	PCI Express 2.0 x16	PCI Express 2.0 x16	PCI Express 2.0 x16	PCI Express 3.0 x16	PCI Express 3.0 x16	PCI Express 3.0 x16
DISPLAY CONNECTORS	(1) DVH (1) DP 1.2	(1) DVH (1) DP 1.2	(1) DVH (2) DP 1.2	(1) DVH (1) DVI-D (1) mDP 1.2	(1) DVH (2) DP 1.2	(1) DVH (1) DVI-D (2) DP 1.2 (1) Optional Stereo	(1) DVH (1) DVI-D (2) DP 1.2 (1) Optional Stereo	(1) DVH (1) DVI-D (2) DP 1.2 (1) Optional Stereo
FORM FACTOR	69 mm (H) x 160 mm (L) Single Slot	69 mm (H) x 160 mm (L) Single Slot	110 mm (H) x 200 mm (L) Single Slot	110 mm (H) x 200 mm (L) Single Slot	110 mm (H) x 240 mm (L) Single Slot	110 mm (H) x 265 mm (L) Dual Slot	110 mm (H) x 265 mm (L) Dual Slot	110 mm (H) x 265 mm (L) Dual Slot
THERMAL SOLUTION	Active	Active	Active	Active	Active	Active	Active	Active
NVIDIA® 3D VISION® & 3D VISION PRO	Support via USB	Support via USB connection to 3D Vision Hub	Support via USB connection to 3D Vision Hub	Support via USB connection to 3D Vision Hub	3D Vision and 3D Vision Pro via USB and optional 3-pin connection to 3D Vision Pro hubs	Support via 3 pin mini DIN	Support via 3 pin mini DIN	Support via 3 pin mini DIN
LOW PROFILE	Yes	Yes	No	No	No	No	No	No
PART NUMBERS	VCG410-PB	VCGK600-PB	VCGK2000-PB	VCGK2000DVI-PB	VCGK4000-PB	VCGK5000MAC-PB	VCGK5000-PB	VCGK6000-PB
EAN	3536403341299	3536403342173	3536403342098	3536403342135	3536403342050	3536403341770	3536403341503	3536403342869

PNY Professional Solutions	QUADRO SYNC	QUADRO SDI CAPTURE	QUADRO SDI OUTPUT
ADD-ON CARD FOR	Quadro K4000 Quadro K5000 Quadro K6000	Quadro K4000 Quadro K5000 Quadro K6000	Quadro K4000 Quadro K5000 Quadro K6000
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

PNY Professional Solutions	TESLA K20 Card	TESLA K40 Card
PEAK DOUBLE PRECISION FLOATING POINT PERFORMANCE	1.17 Tflops	1.43 Tflops
PEAK SINGLE PRECISION FLOATING POINT PERFORMANCE	3.52 Tflops	4.29 Tflops
MEMORY BANDWIDTH (ECC OFF)	208 GB/sec	288 GB/s
MEMORY SIZE (GDDR5)	5 GB	12 GB
CUDA CORES	2496	2880
PART NUMBERS	TCSK20CARD-PB	TCSK40CARD-PB
EAN	3536403341695	3536403343163

PNY PROFESSIONAL SSDs	PREVAIL 3K	PREVAIL 5K	PREVAIL ELITE
120 GB	SSD9SC120GCDA-PB	SSDPREV120G5K01-PB	SSD9SC120GEDA-PB
240 GB	SSD9SC240GCDA-PB	SSDPREV240G5K01-PB	SSD9SC240GEDA-PB
480 GB	SSD9SC480GCDA-PB	SSDPREV480G5K01-PB	SSD9SC480GEDA-PB