



NVIDIA QUADRO[®] FX 4500 SDI

The Integrated Graphics-to-Video Solution for Broadcast, Video, and Film Professionals

NVIDIA Quadro[®] FX 4500 SDI

is the ideal solution for on-air broadcast professionals across many applications such as virtual-sets, sports, and weather news systems to composite live video footage onto virtual backgrounds and send the result to live video for TV broadcast.

Additionally, the solution allows film and video production, post-production, and finishing professionals to preview, in real time on HD broadcast monitors, the result of 3D compositing, editing, and color grading. This graphics-to-video-out solution delivers uncompressed 12-bit SDI from programmable graphics, enabling a direct connection to broadcast monitors, tape decks, or SDI projectors.

NVIDIA Quadro FX 4500 SDI provides two channels, fill or key, of 8-, 10-, or 12-bit uncompressed SDI in 2K, HD, or SD formats, and analog and digital house synchronization. It supports both Microsoft[®] Windows[®] and Linux and works on top of existing applications, or can be easily integrated within a broadcast or video editing application through the NVIDIA API.



Image courtesy VizRT



Image courtesy Brainstorm/VertigoXMedia

NVIDIA Quadro FX 4500 SDI features a revolutionary new architecture with 2x the geometry and fill rate and 4x the hardware pixel read-back performance of previous generation graphics. It supports 512MB ultra-fast GDDR3 memory, and rotated grid full scene antialiasing (RG FSAA) for increased color accuracy and visual quality of edges and lines without compromising performance.

NVIDIA Quadro graphics boards provide the ultimate in quality, precision, performance, and programmability. Broadcast and

DCC applications acquire a new level of interactivity by enabling unprecedented capabilities in programmability and precision. For the first time production rendering becomes an integral function of the design workflow, shortening the production process and enabling stunning on-air 3D graphics.

PRODUCT SPECIFICATIONS

Form Factor	ATX, 4.38" x 9.0"
Frame Buffer Memory	512MB GDDR3
Memory Interface	256-bit
Memory Bandwidth	33.6GB/sec.
Max Power Consumption	114W
Graphics Bus	PCI Express x16
Display Connectors	DVI-I, Stereo, 2 SDI Channels: 2 fill or 1 fill, 1 key
Dual Link DVI	Yes (1)
Auxiliary Power Connectors	Yes (1)
Number of Slots	3
Thermal Solution	Active Fansink
Genlock/Framelock Support	One Analog Genlock, One Digital Genlock

NVIDIA QUADRO FX 4500 SDI Key Features and Benefits

FEATURES

Uncompressed 8-, 10-, or 12-bit SDI Output

BENEFITS

The programmable GPU architecture and the NVIDIA Quadro FX 4500 SDI specific graphic user interface enable configurability of the video channels, color space conversion, and gamma correction. A video backend unit provides full support for outputs in the following 2K, HD, and SD formats through 2 video channels with support for either 2 distinct channels of fill or 1 channel of fill and 1 channel of key:

- 480i 29.94 Hz (SMPTE259) NTSC
- 576i 50.00 Hz (SMPTE259) PAL
- 720p 23.98 Hz (SMPTE296)
- 720p 24.00 Hz (SMPTE296)
- 720p 25.00 Hz (SMPTE296)
- 720p 29.97 Hz (SMPTE296)
- 720p 30.00 Hz (SMPTE296)
- 720p 50.00 Hz (SMPTE296)
- 720p 59.94 Hz (SMPTE296)
- 720p 60.00 Hz (SMPTE296)
- 1035i 59.94 Hz (SMPTE260)
- 1035i 60.00 Hz (SMPTE260)
- 1080i 47.96 Hz (SMPTE274)
- 1080i 48.00 Hz (SMPTE274)
- 1080i 50.00 Hz (SMPTE295)
- 1080i 50.00 Hz (SMPTE274)
- 1080i 59.94 Hz (SMPTE274)
- 1080i 60.00 Hz (SMPTE274)
- 1080PsF 23.976 Hz (SMPTE274)
- 1080PsF 24.00 Hz (SMPTE274)
- 1080PsF 25.00 Hz (SMPTE274)
- 1080PsF 29.97 Hz (SMPTE274)
- 1080PsF 30.00 Hz (SMPTE274)
- 1080p 23.976 Hz (SMPTE274)
- 1080p 24.00 Hz (SMPTE274)
- 1080p 25.00 Hz (SMPTE274)
- 1080p 29.97 Hz (SMPTE274)
- 1080p 30.00 Hz (SMPTE274)
- 2048x1080p 23.976 Hz (SMPTE372)
- 2048x1080p 24.00 Hz (SMPTE372)
- 2048x1080p 25.00 Hz (SMPTE372)
- 2048x1080p 29.97 Hz (SMPTE372)
- 2048x1080p 30.00 Hz (SMPTE372)
- 2048x1080i 47.96 Hz (SMPTE372)
- 2048x1080i 48.00 Hz (SMPTE372)
- 2048x1080i 50.00 Hz (SMPTE372)
- 2048x1080i 59.94 Hz (SMPTE372)
- 2048x1080i 60.00 Hz (SMPTE372)

Genlock (House Synchronization)

One digital and one analog genlock (BNC) connectors provide connectivity to a video sync source for SMPTE standard (digital, black burst, tri-level) synchronization.

Unparalleled Subpixel Precision

12-bit subpixel precision delivers high geometric accuracy, eliminating rasterization anomalies.

Unmatched Color Precision

Full 128-bit precision graphics pipeline enables sophisticated mathematical computations to maintain high accuracy, resulting in unmatched visual quality. Full IEEE 32-bit floating-point precision per color component (RGBA) delivers millions of color variations with the broadest dynamic range.

Next-generation Vertex and Pixel Programmability

NVIDIA Quadro FX 4500 GPUs introduce infinite length vertex programs and dynamic flow control, removing the previous limits on complexity and structure of shader programs. With full support for Vertex and Shader Model 3.0, NVIDIA Quadro FX 4500 GPUs deliver sophisticated effects never before imagined for real-time graphics systems.

Rotated Grid FSAA (RG FSAA)

RG FSAA sampling algorithm introduces far greater sophistication in the sampling pattern, significantly increasing color accuracy and visual quality for edges and lines, reducing "jaggies" while maintaining performance.

NVIDIA PureVideo Technology

NVIDIA® PureVideo™ technology is the combination of high-definition video processors and software that delivers unprecedented picture clarity, smooth video, and accurate color for SD and HD video content. Features include, spatial temporal de-interlacing, inverse telecine, and high quality HD video playback from DVD.

PRODUCT SPECIFICATIONS

Supported Operating Systems

- Microsoft® Windows® XP
- Linux® - Full OpenGL® implementation, complete with NVIDIA and ARB extensions
- AMD64, Intel EM64T

NVIDIA Quadro FX 4500

Architecture

- Unlimited fragment instruction
- Unlimited vertex instruction
- 3D volumetric texture support
- Single-system powerwall
- 12 pixels per clock rendering engine
- Hardware OpenGL overlay planes
- Hardware accelerated:
 - two-sided lighting
 - clipping planes
 - line stippling
- 3rd-generation occlusion culling
- 16 textures per pixel in fragment programs
- Window ID clipping functionality

Shading Architecture

- Fully programmable GPU
- Long fragment and vertex programs (unlimited instructions)

- Looping and subroutines (up to 256 loops per vertex program)
- Dynamic flow control
- Conditional execution

Memory

- High-speed 512MB GDDR3
- 256-bit memory interface
- 33.6GB/sec. memory bandwidth

High Level Shader Languages

- Optimized compiler for Cg, GLSL, and Microsoft® HLSL
- OpenGL 2.0 and DirectX 9.0c support
- Open source compiler

High-Resolution Antialiasing

- 12-bit sub-pixel sampling precision enhances AA quality
- Rotated grid full-scene antialiasing (RG FSAA)

NVIDIA® nView™ Architecture

- Advanced multi-display desktop and application management seamlessly integrated into Microsoft Windows
- Dual Link DVI-I output-drives a digital display at resolutions up to 3840 x 2400 @24Hz

- Internal 400 MHz DAC drives one analog display up to 2048 x 1536 @75Hz

SDI Software Integration

- Transparent Clone and Dualview Modes work on top of existing applications
 - 1 channel fill
 - 8-bit:
 - RGB 4:4:4
 - YCrCb 4:2:2 or 4:4:4
- Extended Mode
 - Integrated into applications using NVIDIA SDI API
 - 2 channel fill or
 - 1 channel fill + 1 channel key
 - 8-, 10-, or 12-bit:
 - RGB 4:4:4
 - YCrCb 4:2:2 or 4:4:4
 - 2x YCrCb 4:2:2+4:2:2
 - YCrCbA 4:2:2:4
 - RGBA 4:4:4:4 (8-bit only)



Where to buy NVIDIA Quadro

NVIDIA Quadro FX 4500 SDI is available through all major US OEMs and PNY Technologies (US and Europe), Leadtek (Asia-Pac), and ELSA Japan. Please visit www.nvidia.com/page/workstation.html for information.

NVIDIA Corporation | 2701 San Tomas Expressway | Santa Clara, CA 95050 | T 408.486.2000 | F 408.486.2200 | www.nvidia.com

NVIDIA

©2006 NVIDIA Corporation. All rights reserved. NVIDIA, the NVIDIA logo, NVIDIA Quadro, nView, and PureVideo are trademarks and/or registered trademarks of NVIDIA Corporation. All company and product names are trademarks and/or registered trademarks of the respective owners with which they are associated. Features, pricing, availability, and specifications are all subject to change without notice.