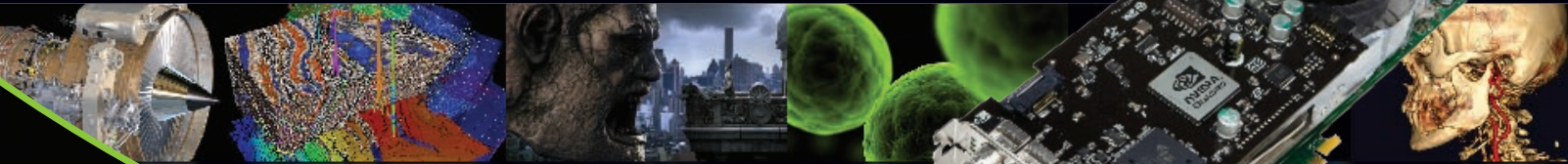


# NVIDIA Quadro FX 5600/4600 SDI



## Revolutionary Visual Computing Solutions

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

NVIDIA Quadro® FX 5600 SDI and the Quadro FX 4600 SDI solutions are ideal for broadcast, video, and film professionals engaged in editing; compositing and color grading of digital intermediates; creation and broadcast of virtual-sets; and compositing high-quality graphics into live sports, weather, and news broadcasts. These graphics-to-video-out solutions deliver uncompressed 12-bit SDI from programmable graphics, enabling a direct connection to standard broadcast equipment such as displays, routers, switchers, VTRs, DDRs, and large-venue SDI projectors.

This latest generation of Quadro SDI solutions provides two fill or key channels of 8-, 10-, or 12-bit uncompressed SDI in standard-definition (SD), high-definition (HD), or 2K formats, plus analog and digital house synchronization. Supporting both Microsoft® Windows® and Linux®, these

Quadro SDI solutions work seamlessly with a number of industry-standard applications. And they can be easily integrated into other broadcast or video editing applications with the NVIDIA® application programming interface (API).

In addition to SDI video-out, the Quadro FX 5600 SDI and 4600 SDI graphics solutions provide unprecedented 3D graphics and computational capabilities. The ground-breaking NVIDIA unified architecture dynamically allocates geometry, shader, and compute processing power to deliver optimized performance for any task. Combining the industry's most advanced feature set, including the largest and fastest frame buffers and a C programming environment, the Quadro FX SDI solutions are a platform for solving the industry's most complex challenges. As the reference standard for Shader Model 4.0, these ultra-high-end solutions enable

ultra-realistic, real-time, visualization applications with unprecedented image quality. The new 64x full-scene antialiasing scheme provides superior quality and resolution, achieving unprecedented levels of color accuracy and visual quality without compromising performance.

NVIDIA Quadro SDI solutions provide the ultimate in quality, precision, performance, and programmability, allowing real-time rendering to become an integral function of the workflow, shortening the production process.

### Product Specifications

GPU	Quadro FX 5600	Quadro FX 4600
Form Factor	ATX, 4.38" x 12.0"	ATX, 4.38" x 9.0"
Frame Buffer Memory	1.5 GB	768 MB
Memory Bandwidth	76.8 GBps	67.2 GBps
Max Power Consumption	178 W	141W

#### Available on both versions

Graphics Bus	PCI Express x16
Display Connectors	DVI-I, 2 SDI Channels (BNC): 2 fill or 1 fill, 1 Key
Dual Link DVI	Yes (2)
Auxiliary Power Connectors	1- HDD SDI
Number of Slots	3
Thermal Solution	Active Fansink
Genlock/Framelock	BNC (1) – Analog or Digital Genlock



Image courtesy of WTVF station and WSI Corporation.

Images courtesy of Flight Hemisphere, Landmark, a brand of the Halliburton Drilling, Evaluation and Digital Solutions, UNPHACTORY, and Vital Images.



## Features and Benefits

<b>Uncompressed 8-, 10-, or 12-bit SDI output</b>	<table border="0"> <tr> <td>720p 23.98 Hz (SMPT296)</td> <td>1080i 47.96 Hz (SMPT274)</td> <td>1080p 23.976 Hz (SMPT274)</td> <td>2048x1080i 47.96 Hz (SMPT372)</td> </tr> <tr> <td>720p 24.00 Hz (SMPT296)</td> <td>1080i 48.00 Hz (SMPT274)</td> <td>1080p 24.00 Hz (SMPT274)</td> <td>2048x1080i 48.00 Hz (SMPT372)</td> </tr> <tr> <td>720p 25.00 Hz (SMPT296)</td> <td>1080i 50.00 Hz (SMPT274)</td> <td>1080p 25.00 Hz (SMPT274)</td> <td>2048x1080i 50.00 Hz (SMPT372)</td> </tr> <tr> <td>720p 29.97 Hz (SMPT296)</td> <td>1080i 59.94 Hz (SMPT274)</td> <td>1080p 29.97 Hz (SMPT274)</td> <td>2048x1080i 59.94 Hz (SMPT372)</td> </tr> <tr> <td>720p 30.00 Hz (SMPT296)</td> <td>1080i 60.00 Hz (SMPT274)</td> <td>1080p 30.00 Hz (SMPT274)</td> <td>2048x1080i 60.00 Hz (SMPT372)</td> </tr> <tr> <td>720p 50.00 Hz (SMPT296)</td> <td>1080PsF 23.976 Hz (SMPT274)</td> <td>2048x1080p 23.976 Hz (SMPT372)</td> <td>487i 59.94 Hz (SMPT259) NTSC</td> </tr> <tr> <td>720p 59.94 Hz (SMPT296)</td> <td>1080PsF 24.00 Hz (SMPT274)</td> <td>2048x1080p 24.00 Hz (SMPT372)</td> <td>576i 50.00 Hz (SMPT259) PAL</td> </tr> <tr> <td>720p 60.00 Hz (SMPT296)</td> <td>1080PsF 25.00 Hz (SMPT274)</td> <td>2048x1080p 25.00 Hz (SMPT372)</td> <td></td> </tr> <tr> <td>1035i 59.94 Hz (SMPT260)</td> <td>1080PsF 29.97 Hz (SMPT274)</td> <td>2048x1080p 29.97 Hz (SMPT372)</td> <td></td> </tr> <tr> <td>1035i 60.00 Hz (SMPT260)</td> <td>1080PsF 30.00 Hz (SMPT274)</td> <td>2048x1080p 30.00 Hz (SMPT372)</td> <td></td> </tr> </table>	720p 23.98 Hz (SMPT296)	1080i 47.96 Hz (SMPT274)	1080p 23.976 Hz (SMPT274)	2048x1080i 47.96 Hz (SMPT372)	720p 24.00 Hz (SMPT296)	1080i 48.00 Hz (SMPT274)	1080p 24.00 Hz (SMPT274)	2048x1080i 48.00 Hz (SMPT372)	720p 25.00 Hz (SMPT296)	1080i 50.00 Hz (SMPT274)	1080p 25.00 Hz (SMPT274)	2048x1080i 50.00 Hz (SMPT372)	720p 29.97 Hz (SMPT296)	1080i 59.94 Hz (SMPT274)	1080p 29.97 Hz (SMPT274)	2048x1080i 59.94 Hz (SMPT372)	720p 30.00 Hz (SMPT296)	1080i 60.00 Hz (SMPT274)	1080p 30.00 Hz (SMPT274)	2048x1080i 60.00 Hz (SMPT372)	720p 50.00 Hz (SMPT296)	1080PsF 23.976 Hz (SMPT274)	2048x1080p 23.976 Hz (SMPT372)	487i 59.94 Hz (SMPT259) NTSC	720p 59.94 Hz (SMPT296)	1080PsF 24.00 Hz (SMPT274)	2048x1080p 24.00 Hz (SMPT372)	576i 50.00 Hz (SMPT259) PAL	720p 60.00 Hz (SMPT296)	1080PsF 25.00 Hz (SMPT274)	2048x1080p 25.00 Hz (SMPT372)		1035i 59.94 Hz (SMPT260)	1080PsF 29.97 Hz (SMPT274)	2048x1080p 29.97 Hz (SMPT372)		1035i 60.00 Hz (SMPT260)	1080PsF 30.00 Hz (SMPT274)	2048x1080p 30.00 Hz (SMPT372)	
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<b>Genlock (House Synchronization)</b>	<p>One genlock (Standard BNC) connector (digital or analog) for SMPTE standard (digital, black burst, tri-level) synchronization. Expanded cross-sync functionality synchronizes a much larger number of video output signal formats to a single incoming house signal.</p>																																								
<b>Ancillary Data Support</b>	<p>Support for ancillary data through the NVIDIA API. This ancillary data can include up to 16 channels of embedded 24-bit digital audio as defined by SMPTE 272M and SMPTE 299M, plus timecode defined by SMPTE RP188.</p>																																								
<b>2D Video Compositing</b>	<p>Composites incoming video with Quadro-rendered images using an alpha, luma, or chroma keys.</p>																																								
<b>Flicker Filter</b>	<p>Built-in flicker filter for high-quality rendering in interlaced formats.</p>																																								
<b>Colorspace Conversion</b>	<p>Full hardware accelerated conversion from RGB to Rec. 601 and Rec. 709 YCrCb colorspaces.</p>																																								
<b>768 MB to 1.5 GB Ultra-Fast Graphics Frame Buffer Memory</b>	<p>Delivers high throughput for interactive visualization of large models, high-performance for real-time processing of large textures and frames, and enables the highest quality and resolution full-scene antialiasing (FSAA).</p>																																								
<b>Unmatched Color Precision</b>	<p>Full 128-bit precision graphics pipeline enables sophisticated mathematical computations for high accuracy and unmatched visual quality. Full IEEE 32-bit floating-point precision per color component (RGBA) delivers millions of color variations with the broadest dynamic range.</p>																																								
<b>Next-Generation Vertex and Pixel Programmability with Shader Model 4.0</b>	<p>Reference standard for Shader Model 4.0, enabling a higher level of performance and ultra-realistic effects for OpenGL and DirectX 10 professional applications.</p>																																								
<b>Rotated-Grid Full-Scene Antialiasing (FSAA)</b>	<p>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.</p>																																								

## Product Specifications

### SUPPORTED PLATFORMS

- Microsoft Windows XP (64-bit and 32-bit)
- Linux®
- Full OpenGL® implementation, complete with NVIDIA and ARB extensions (64-bit and 32-bit)
- AMD64, Intel EM64T

### NVIDIA QUADRO FX ARCHITECTURE

- 128-bit color precision
- Unlimited fragment instruction
- Unlimited vertex instruction
- 3D volumetric texture support
- 12 pixels per clock rendering engine
- Hardware accelerated antialiased points & lines
- Hardware OpenGL overlay planes
- Hardware accelerated two-sided lighting
- Hardware accelerated clipping planes
- 3rd-generation occlusion culling
- 16 textures per pixel in fragment programs
- Window ID clipping functionality
- Hardware accelerated line stippling

### SHADING ARCHITECTURE

- Full Shader Model 4.0 (OpenGL 2.1/DirectX 10 class)
- Long fragment programs (unlimited instructions)
- Long vertex programs (unlimited instructions)
- Looping and subroutines (up to 256 loops per vertex program)
- Dynamic flow control
- Conditional execution

### HIGH LEVEL SHADER LANGUAGES

- Optimized compiler for Cg and Microsoft® HLSL
- OpenGL 2.1 and DirectX 10 support
- Open source compiler

### HIGH-RESOLUTION ANTIALIASING

- 12-bit subpixel sampling precision enhances AA quality
- Rotated Grid Full-Scene Antialiasing (RG FSAA)
- 32x-64x FSAA dramatically reduces visual aliasing artifacts or "jaggies" at resolution up to 1920x1200

### Display Resolution Support

- One dual-link DVI-I output drives one digital display at resolutions up to 3840 x 2400 @ 24Hz
- Internal 400 MHz Dacs- one analog display up to 2048 x 1536 @ 75Hz

### NVIDIA® NVIEW™ ARCHITECTURE

- Advanced multi-display desktop and application management seamlessly integrated into Microsoft Windows

### 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
- Application Programmable Mode
  - Integrated into applications using the NVIDIA SDI API
  - 2 channel fill or 1 channel fill + 1 channel key
  - 8-, 10-, 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)

#### Ancillary data

- Timecode (SMPTE RP188)
- Embedded audio (SMPTE 272M(SD), SMPTE 299M(HD))

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

