NVIDIA® QUADRO®
DIGITAL VIDEO PIPELINE
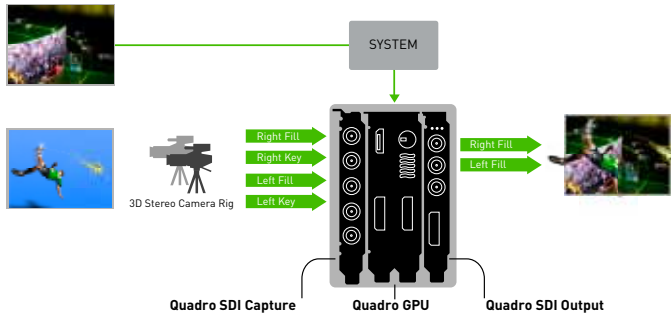### COMPLETE SOLUTIONS FOR BROADCASTING IN 3D

3D in broadcast and film has arrived.

The NVIDIA® Quadro® Digital Video Pipeline simplifies and accelerates the entire 3D production workflow. From live action 3D acquisition, to real-time graphics processing, to delivery of high-resolution video for broadcast and internet streaming, NVIDIA Quadro sets the stage for the future of real-time production.
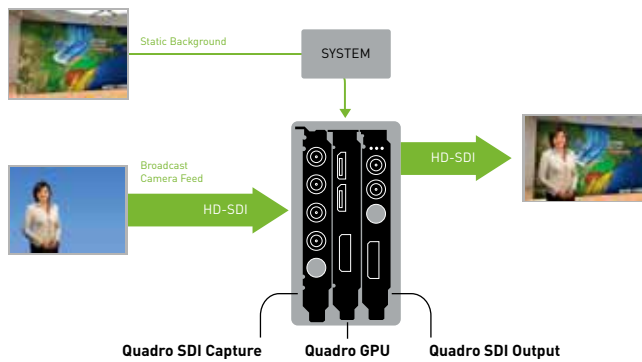
3D BROADCAST

The Quadro Digital Video Pipeline is the leading-edge platform for creating a new dimension in broadcasting. Setting the standard for 3D stereoscopic production and delivery, NVIDIA offers advanced tools and drivers enabling software developers to easily integrate GPU-accelerated 3D into their applications using either OpenGL or DirectX programming interfaces. Then video professionals can preview 3D content directly on stereo 3D displays when driven by Quadro graphics solutions.

SYSTEM

Right Fill
Right Key
Left Fill
Left Key

3D Stereo Camera Rig

Right Fill
Left Fill

Quadro SDI Capture   **Quadro GPU**   **Quadro SDI Output**

3D STEREOSCOPIC PRODUCTION

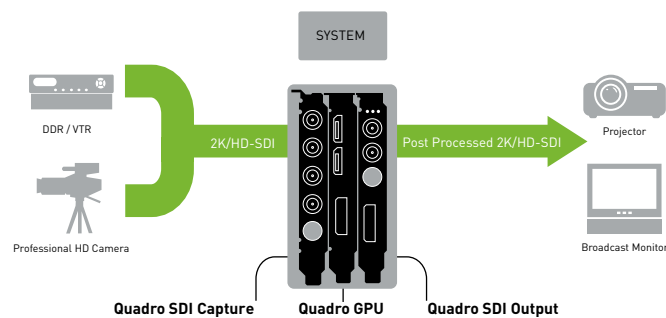The Quadro Digital Video Pipeline is at the center of the 3D stereoscopic production workflow.

> Capture up to four video feeds from multi-camera environments, in real-time, directly to the GPU
> Composite virtual 3D effects or process video directly on the GPU
> Send the final result from the GPU directly to live 3D TV or stream over the internet in 3D

Static Background

SYSTEM

Broadcast Camera Feed

HD-SDI

HD-SDI

Quadro SDI Capture   **Quadro GPU**   **Quadro SDI Output**

DIGITAL BROADCAST AND VIDEO

The Quadro Digital Video Pipeline is the platform for broadcast and video production houses to easily incorporate virtual sets and effects into sportscasts, weather, and news.

> Capture SD, HD, and 3G-SDI video footage in real-time, directly to the GPU
> Composite virtual effects or video processing leveraging the power of the NVIDIA® CUDA™ parallel computing architecture
> Send the final result directly to live TV

SYSTEM

DDR / VTR

2K/HD-SDI

Post Processed 2K/HD-SDI

Projector

Professional HD Camera

Broadcast Monitor

Quadro SDI Capture   **Quadro GPU**   **Quadro SDI Output**

FILM PRODUCTION, POST-PRODUCTION, AND FINISHING

The Quadro Digital Video Pipeline is the choice among film professionals for editing and video production.

> Capture SDI video in up to 12-bit color fidelity, directly to the GPU
> Capture of source content from camera, film scanners, digital data recorders (DDRs), and video tape recorders (VTRs)
> Accurate real-time preview on SDI monitors or projectors

HD-SDI

Encoded Video

SYSTEM

Internet

Quadro SDI Capture   **Quadro GPU**
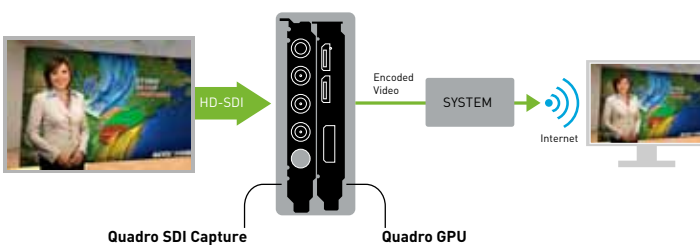
NEW MEDIA MARKETS

The Quadro Digital Video Pipeline offers a high performance platform for video compression.

> Offers the fastest path for capturing broadcast quality video
> Delivers ultra-fast, real-time GPU-based encoding for internet video streaming

ACCELERATING THE ENTIRE PRODUCTION WORKFLOW

The Quadro Digital Video Pipeline is a complete end-to-end solution that integrates the following elements:

NVIDIA® Quadro® SDI Capture

The Quadro SDI Capture card provides real-time acquisition of SD, HD, 2K, and 3G-SDI video footage directly to the GPU memory, enabling professionals to capture up to four HD-SDI single links sources (live action or pre-recorded) simultaneously with support for all SMPTE standard formats.

NVIDIA® Quadro® SDI Output

The Quadro SDI Output card sends composited video for live television broadcast and internet streaming. Delivering uncompressed 8-, 10-, or 12-bit SDI video, the Quadro SDI Output solution enables a direct connection to broadcast monitors, switchers, tape decks, or SDI projectors.

NVIDIA® Quadro® SDI SDK

The Quadro SDI SDK provides ease of programmability and control of the entire Quadro Digital Video Pipeline from acquisition to processing to final delivery. With complete support for both OpenGL and DirectX APIs, developers can easily integrate support into any application.

NVIDIA® Quadro® Professional Graphics Solutions

Quadro professional graphics solutions, with up to 6 GB of graphics memory, provide a range of capabilities designed for video production environments. Featuring NVIDIA® SLI® multi-GPU technology, and the NVIDIA® CUDA™ parallel computing architecture, Quadro solutions deliver a power efficient, full-featured, high-performance experience.

Quadro Solution	Quadro 6000	Quadro 5000	Quadro 4000
Graphics Memory	6 GB	2.5 GB	2 GB
CUDA Parallel Processing Cores	448	352	256
# of Slots	Dual	Dual	Single

Quadro Solution	Quadro FX 5800	Quadro FX 4800	Quadro FX 3800
Graphics Memory	4 GB	1.5 GB	1 GB
CUDA Parallel Processing Cores	240	192	192
# of Slots	Dual	Dual	Single

Quadro SDI Capture Features	
Capture Uncompressed SDI Formats	Capture live video, uncompressed 8-,10-,12-bit SDI directly to graphics memory in SD, HD, 2K, 3G resolutions.
Capture up to 4 SDI Sources Directly to GPU Memory	Quadro SDI input card is the industry's lowest latency capture card for delivering video input to GPU memory.
Ancillary Data Support	Supports the capture ancillary data including: embedded audio, timecode, and custom packets.

Quadro SDI Output Features	
Uncompressed SDI Output	Output live video and graphics to true, uncompressed 8-,10-, 12-bit SDI in SD, HD, or 2K resolutions.
Output up to 2-SDI Video Feeds From GPU Memory	Outputs video directly from GPU memory to deliver the industry's lowest latency SDI output directly from a GPU.
Genlock (House Synchronization)	SMPTE standard (digital, black burst, tri-level) synchronization.
Ancillary Data Support	Supports the insertion of ancillary data including: embedded audio, timecode, and custom packets.

TECHNICAL SPECIFICATIONS

SUPPORTED OPERATING SYSTEMS

> Microsoft® Windows® XP (64-bit and 32-bit)
> Windows® Vista
> Windows 7 support
> Linux® - Full OpenGL implementation, complete with NVIDIA and ARB extensions (64-bit and 32-bit)

QUADRO SDI CAPTURE – PROGRAMMING MODES

> Up to 4 Channel Fill or 2 channel Fill + 2 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)

QUADRO SDI OUTPUT – PROGRAMMING MODES

> 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)

QUADRO SDI OUTPUT - CONTROL PANEL MODES

> 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

QUADRO SDI CAPTURE PROVIDES FULL SUPPORT FOR THE FOLLOWING SD-,HD-,2K-,3G-SDI FORMATS:

> 480i 59.94 Hz (SMPTE259) NTSC
> 576i 50.00 Hz (SMPTE259) PAL
> 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 (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)
> 1080p 23.976 Hz (SMPTE372)
> 1080p 24.00 Hz (SMPTE372)
> 1080p 25.00 Hz (SMPTE372)
> 1080p 29.97 Hz (SMPTE372)
> 1080p 30.00 Hz (SMPTE372)
> 1080i 47.96 Hz (SMPTE372)
> 1080i 48.00 Hz (SMPTE372)
> 1080i 50.00 Hz (SMPTE372)
> 1080i 59.94 Hz (SMPTE372)
> 1080i 60.00 Hz (SMPTE372)
> 1080p 50.00 Hz (SMPTE 424M)
> 1080p 59.64 Hz (SMPTE 424M)
> 1080p 60.00 Hz (SMPTE 424M)

QUADRO SDI OUTPUT PROVIDES FULL SUPPORT FOR THE FOLLOWING SD-, HD-,2K-SDI FORMATS:

> 480i 59.94 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 (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)
> 1080p 23.976 Hz (SMPTE372)
> 1080p 24.00 Hz (SMPTE372)
> 1080p 25.00 Hz (SMPTE372)
> 1080p 29.97 Hz (SMPTE372)
> 1080p 30.00 Hz (SMPTE372)
> 1080i 47.96 Hz (SMPTE372)
> 1080i 48.00 Hz (SMPTE372)
> 1080i 50.00 Hz (SMPTE372)
> 1080i 59.94 Hz (SMPTE372)
> 1080i 60.00 Hz (SMPTE372)

To learn more about NVIDIA Quadro Digital Video Pipeline at **www.nvidia.com/quadro/dvp**