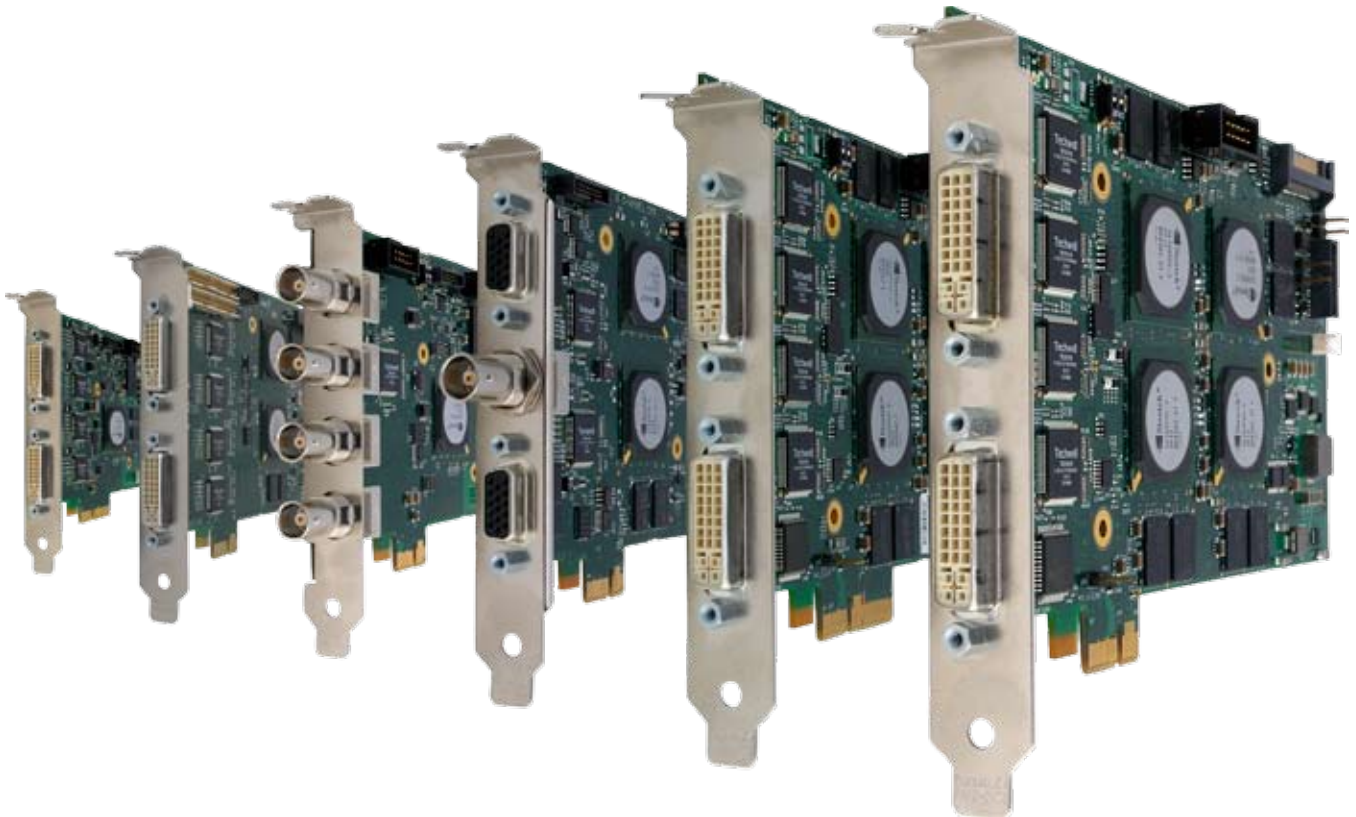# Stretch PCIe DVR Add-in Cards
Complete Solutions for All Your Video Capture, Compression, and Display Needs

VRC6000 and VCC6000 Series

Stretch PCIe DVR add-in cards are available as both DVR cards (with video compression capability) and capture cards. The Stretch VRC6000 Series DVR cards use the compression capabilities and embedded analytics of the Stretch Intelligent Encoder to reduce storage requirements and to maintain constant image quality at minimum bit rate. The Stretch VCC6000 Series capture cards can capture up to 16 channels of high quality video at full resolution and frame rate.

Stretch VRC6016 DVR Add-in Card

Stretch VCC6416 Capture Add-in Card

VRC6000 and VCC6000 Series cards set the standard by which other DVR cards are measured.

Stretch VRC6404HD DVR Add-in Card

... CIF resolutions to the stunning image quality of high definition

Your Choice of Resolution, CIF to HD

VRC6000 and VCC6000 Series cards cover the entire range of video resolutions. From cost-effective CIF resolutions to the stunning image quality of high definition, a solution exists to meet your exact requirements.

Integrating the Stretch DVR and Capture Cards

All VRC6000 and VCC6000 Series cards share the same rich application programming interface (API). Porting existing DVR applications is simply a matter of interfacing code to the Stretch API. Reusing applications speeds deployment of new products and reduces both program risk and support complexity.

... "Video Anywhere" with Stretch H.264 SVC

The Complete VRC6000 and VCC6000 Series

	Video/Audio Inputs	Input Type	Capture or Compression Resolution	Frames per Second	Video Compression	PCIe Width	Video Output	Matrix Video Display Output	Maximum Alarm/Trigger
VRC6404HD	4	BNC Jacks	720p, 1080p	30 @	H.264 AVC, H.264 SVC, MPEG4, MJPEG	x4	HDMI Connector	Yes	16
VRC6004HD	4	BNC Jacks	720p, 1080p	30 @	H.264 AVC, H.264 SVC, MPEG4, MJPEG	x1	HDMI Connector	Yes	16
VRC6416	16	BNC Cable	D1, CIF, DCIF, 4CIF, QCIF	480	H.264 AVC, H.264 SVC, MPEG4, MJPEG	x4	BNC Cable	Yes	16
VRC6016	16	BNC Cable	D1, CIF, DCIF, 4CIF, QCIF	480	H.264 AVC, H.264 SVC, MPEG4, MJPEG	x1	BNC Cable	Yes	16
VRC6016E	16	Headers on Card	D1, CIF, DCIF, 4CIF, QCIF	480	H.264 AVC, H.264 SVC, MPEG4, MJPEG	x1	Headers on Card	Yes	16
VRC6008	8	BNC Cable	D1, CIF, DCIF, 4CIF, QCIF	240	H.264 AVC, H.264 SVC, MPEG4, MJPEG	x1	BNC Jack	No	16
VRC6004	4	BNC Jacks	D1, CIF, DCIF, 4CIF, QCIF	120	H.264 AVC, H.264 SVC, MPEG4, MJPEG	x1	N/A	N/A	16
VRC6016C	16	BNC Cable	D1*, CIF, 2CIF, QCIF	480	H.264 AVC, H.264 SVC, MPEG4, MJPEG	x1	BNC Cable	No	16
VRC6008C	8	BNC Cable	D1*, CIF, 2CIF, QCIF	240	H.264 AVC, H.264 SVC, MPEG4, MJPEG	x1	BNC Jack	No	16
VCC6416	16	BNC Cable	D1, CIF, DCIF, 4CIF, QCIF	480	N/A	x4	N/A	N/A	16
VCC6008	8	BNC Cable	D1, CIF, DCIF, 4CIF, QCIF	240	N/A	x1	N/A	N/A	16
VDC6004	N/A	N/A	N/A	120	H.264 AVC and H.264 SVC decode	x1	BNC Cable	Yes	N/A

* Reduced channel density or frame rate

Stretch has developed a wide variety of reference design kits to provide development platforms for creating highly differentiated products using Stretch technology. These kits contain schematics of the supplied hardware and source code for all the supplied software (the Intelligent Encoder, however, is provided as object code).

All kits are compatible with the Stretch development and debug environment. By selecting the reference design closest to your application requirements, you can expedite product development with minimal program risk.

Reference design kits are available in two versions.

- Evaluation versions let you evaluate Stretch technology and develop application solutions.
- Full reference design kits include hardware design files for the supplied card and a software distribution license. Full reference design kits let you develop your own derivative products and ship complete solutions under your brand name.

... simple transition to new features and standards

The VRC6000 Series of PCIe DVR Add-in Cards

VRC6000 Series cards range from CIF resolution to high definition. All cards use the Stretch Intelligent Encoder to perform full frame video compression using the H.264 Scalable Video CODEC (SVC), H.264 Advanced Video CODEC (AVC), MPEG4, or MJPEG. Embedded analytics are used to optimize the CODEC setting to the dynamics of the captured video, ensuring the lowest possible bit rate. Video preprocessing ensures maximum image quality by applying motion dependent de-interlacing and adaptive noise reduction filtering.

See the Whole Picture

- CIF, D1, and high definition capture and compression in real time
- True H.264 encoding compatible with industry-standard players
- Constant quality encoding, video preprocessing, and embedded analytics

Embedded analytics within the Stretch Intelligent Encoder can be targeted within user-defined regions of interest to trigger alarms when motion is detected. The same alarms can be used to dynamically optimize the encoder to reduce the bit rate of the encoded scene.

The VRC6000 Series delivers everything you need to bring a high performance DVR card to market.

VRC6000 Series add-in cards are completely software programmable, making them field upgradable and future-proof.

PCI▷
EXPRESS

The VRC6000 Series firmware has a rich API, making it fast and easy to reuse existing DVR applications. An available software load contains all the firmware, drivers, and CODECs required to implement a high performance DVR right out of the box.

... no compromise performance with the lowest possible system cost

The VCC6000 Series of PCIe Capture Cards

VCC6000 Series cards were designed to deliver ultimate image quality in an industry-standard PCIe add-in card form factor. With D1 capture and de-interlacing, full frame rate image processing, and video analytics, VCC6000 Series cards provide no compromise performance with the lowest possible system cost.

When Image Is Everything

- Full D1/4CIF capture
- Full resolution upload to the host
- Full frame rate image processing

The VCC6000 Series has extensive video processing capabilities. Captured video can be de-interlaced, color converted, and chroma decimated. Embedded analytics can be applied to the captured video to detect scene changes or motion within user-defined regions of interest. Alarms can be generated as motion thresholds are exceeded.

The VCC6000 Series was designed specifically for surveillance applications where image quality is everything.

PCI
EXPRESS

VCC6000 Series card functionality is controlled through the VRC6000SW firmware load available from Stretch. The software-defined architecture ensures that the card is field-upgradable and future-proof. Integrating the VCC6000 Series is a simple matter of interfacing existing DVR software to the rich API, making deployment of product fast and easy and reducing product support requirements.

... a powerful video decode and display subsystem

The VDC6000 Series of PCIe Decode and Display Cards

VDC6000 Series cards give ultimate access to both encoded and live video streams. The cards provide real-time video decode and extensive video post-processing and captioning capabilities. Live video pass-through mode allows live video feeds to be mixed with decoded feeds from IP sources or from disk storage. With the ability to compose user-defined matrices, VDC6000 Series cards form a powerful video decode and display subsystem.

The Ultimate Display Subsystem

- Multi-channel D1 decode and display in real time
- Live video pass-through for real-time monitoring
- User-defined tiling of live and decoded video
- Multi-CODEC future-proof design

The VDC6000 Series provides high-performance decode and display capabilities for your DVR system

The VDC6000 Series is delivered with a full software load. The simple and intuitive API means that integration with DVR host application software is straightforward and fast.

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Alarm and Trigger Card VRC6008ALM

All members of the VRC6000 and VCC6000 Series are compatible with Stretch's 8-input alarm and trigger cards. These cards provide optically isolated inputs and relay outputs for receiving or generating stimuli in a surveillance system.

... rich API for easy integration and rapid time to market

VRC6000SW and VCC6000SW Software

Complete software packages are available for both the VRC6000 Series and VCC6000 Series DVR add-in cards. Both packages include:

- Card firmware
- Card drivers for both Windows and Linux operating systems
- Software development kit with application programming interface
- Sample DVR application

The VRC6000SW software package also contains CODEC plug-ins for H.264 SVC, H.264 AVC, MPEG4, and MJPEG.

Constant Quality Encoding

The Stretch Intelligent Encoder analyzes video and adjusts the encode parameters of the selected CODEC to maintain a constant quality level. Embedded analytics dynamically control the encoder to use only the bits required to represent the scene at the desired quality level. This reduces the encoded stream's bit rate to the bare minimum for a given quality level and results in dramatically reduced storage consumption.
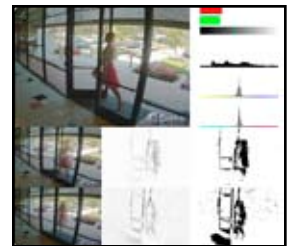
Video and Image Processing

All Stretch DVR add-in cards have extensive video pre- and post-processing capabilities, including:

- Image enhancement and noise reduction
- Motion dependent de-interlacing
- Color space conversion
- User-defined scaling
- Multiple video stream placement
- User-defined tiling schemes
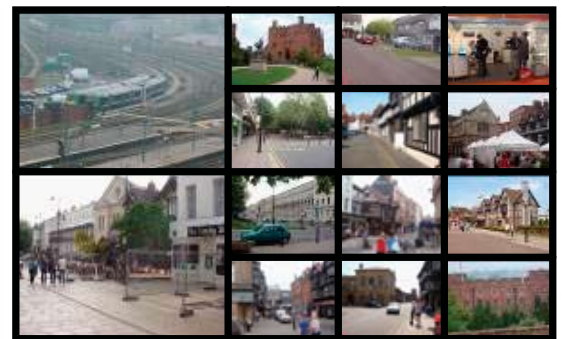
Stretch H.264 Scalable Video CODEC (SVC)

SVC streams can be scaled in real time to meet the bandwidth, storage, or decode requirements of the surveillance system. By simply parsing the encoded stream, frame rate and resolution can be controlled without the need to decode, re-sample, and re-encode the stream. The Stretch SVC Extractor application can be used to extract backward compatible H.264 AVC streams for decode by legacy devices.

H.264 SVC is fully compatible with all cards in the VRC6000 Series. When used in conjunction with VRC6000HD Series cards, it is the perfect compliment to the cards' high definition capabilities, delivering crisp HD video that can be managed over time to cost-effectively retain a long term video archive.

DVR Add-in Card Specifications

Video Input Format	NTSC or PAL
Max Video Input Resolution	D1 (720x480 @ 30fps NTSC) (720x576 @ 25fps PAL) 1080p HDcctv
Encoding Resolution	1080p (1920x1080) 720p (1280x720) D1 (720x480 NTSC) (720x576 PAL) 4CIF (704x480 NTSC) (704x576 PAL) CIF (360x240 NTSC) (360x288 PAL) DCIF (528x320 NTSC) (528x384 PAL) QCIF (180x120 NTSC) (180x144 PAL)
Video Compression Format	H.264 AVC, H.264 SVC, MPEG4, MJPEG
Video Compression Modes	Constant Quality (Quality Level Maintained at User-specified Settings) Constant Bit Rate (Bit Rate Maintained at User-specified Settings) Variable Bit Rate (Bit Rate Averaged Around User-specified Settings)
Recording Rate	30fps NTSC on Every Channel 25fps PAL on Every Channel
Authentication	Stream Authentication Using Digital Signature
Audio Recording Format	G.711
Video Preprocessing	Motion Dependent De-interlacing of NTSC and PAL Sources User-configurable Bilateral Noise Reduction Filter User-defined Captioning of Input Streams
Video Postprocessing	User-defined Scaling and Tiling Alpha Blending of Graphical Overlays
Embedded Analytics	Motion Detection Blind or Tamper Detection Night Detection
Regions of Interest (ROI)	Multi-plane ROIs at Macroblock Resolutions
Privacy Regions	User-defined Privacy Regions
Triggers and Alarms	16 Isolated Inputs Available on Alarm and Trigger Cards 16 Relay Alarm Outputs Available on Alarm and Trigger Cards
Pan / Tilt / Zoom	RS485 Output on Alarm and Trigger Cards
System Integrity	Watchdog Timer and Host Reset Capability
Regulatory and Environmental	
Regulatory	FCC, CE
Operating Temperature	0 to 50 degrees C
Operating Humidity	10% to 90%
Manufacturing	RoHS Compliant
Recommended Host System Requirements	
Processor	P4 Dual Core 2.4GHz or Equivalent for 1 or 2 DVR Cards per System P4 Dual Core 3GHz or Equivalent for 3 or 4 DVR Cards per System
Memory	1GB for 1 or 2 DVR Cards per System 2GB for 3 or 4 DVR Cards per System
Operating System	Windows XP, Vista RHEL 5.2, CentOS 5.2
Chip Set Support	Intel 925, 945G, 975, D975X, X38, P45, G33, 35 family, 5000X, 5400, x38/ich9, q35/ich0, x58/ich10, 975x/ich7 Nvidia Nforce 430, 790i SLI Nforce, 790i Nforce Ultra SLI AMD 970FX

All cards share the same rich application programming interface (API), making them easy to integrate with DVR host applications. The result is efficient reuse of existing code and rapid deployment times.

All VRC6000 and VCC6000 Series cards connect with up to two VRC6008ALM alarm and trigger cards, providing 16 trigger inputs and 16 alarm outputs.

Table 1

	VRC6404HD: 4 Lane PCIe 4 Channel HD DVR Card	VRC6004HD: 1 Lane PCIe 4 Channel HD DVR Card	VRC6416: 4 Lane PCIe 16 Channel DVR Card	VRC6016: 1 Lane PCIe 16 Channel DVR Card	VRC6016E: 1 Lane PCIe 16 Channel Embedded DVR Card
Video Inputs	4 Channels	4 Channels	16 Channels	16 Channels	16 Channels
Video Connector	4x BNC Sockets	4x BNC Sockets	17x BNC to DVI-D Cable	17x BNC to DVI-D Cable	Headers on Card
Video Output	1 Analog Rolling SMO or Tiled SMO on HDMI	None	1 Analog Rolling SMO or Tiled SMO on BNC Cable	1 Analog Rolling SMO or Tiled SMO on BNC Cable	1 Analog Rolling SMO or Tiled SMO on BNC Cable
Audio Inputs	4 Channels	4 Channels	16 Channels	16 Channels	16 Channels
Audio Connector	BNC Connectors	BNC Connectors	16x BNC to DVI-D Cable	16x BNC to DVI-D Cable	Headers on Card
PCIe Interface	4 Lane PCIe 1.1 @ 1GB/S	1 Lane PCIe 1.1 @ 250MB/S	4 Lane PCIe 1.1 @ 1GB/S	1 Lane PCIe 1.1 @ 250MB/S	1 Lane PCIe 1.1 @ 250MB/S
Ordering Codes	OEM Card: VRC6404HD Reference Design Kit: HW-RDK-VRC6404HD Evaluation Kit: HW-EVK-VRC6404HD	OEM Card: VRC6004HD Reference Design Kit: HW-RDK-VRC6004HD Evaluation Kit: HW-EVK-VRC6004HD	OEM Card: VRC6416 Reference Design Kit: HW-RDK-VRC6416 Evaluation Kit: HW-EVK-VRC6416	OEM Card: VRC6016 Reference Design Kit: HW-RDK-VRC6016 Evaluation Kit: HW-EVK-VRC6016	OEM Card: VRC6016E Reference Design Kit: HW-RDK-VRC6016E Evaluation Kit: HW-EVK-VRC6016E

Table 2

	VRC6008: 1 Lane PCIe 8 Channel DVR Card	VRC6004: 1 Lane PCIe 4 Channel DVR Card	VRC6016C: 1 Lane PCIe 16 Channel CIF DVR Card	VCC6416: 4 Lane PCIe 16 Channel DVR Capture Card	VDC6004: 1 Lane PCIe DVR Decode and Display Card
Video Inputs	8 Channels	4 Channels	16 Channels	16 Channels	None
Video Connector	8x BNC to DB15HD Cable	4x BNC Sockets	17x BNC-to-DVI Cables	16x BNC to DVI Cables	4x BNC to DB15HD Cable
Video Output	1 Analog Rolling SMO on BNC Socket	None	1 Analog Rolling SMO or Tiled SMO on BNC Cable	None	1 Analog Rolling SMO or Tiled SMO on BNC Cable
Audio Inputs	8 Channels	4 Channels	16 Channels	16 Channels	None
Audio Connector	8x BNC to DB15HD Cable	Header on Board	16x BNC -to-DVI Cables	16x BNC-to-DVI Cables	4x BNC to DB15HD Cable
PCIe Interface	1 Lane PCIe 1.1 @ 250MB/S	1 Lane PCIe 1.1 @ 250MB/S	1 Lane PCIe 1.1 @ 250MB/S	4 Lane PCIe 1.1 @ 1GB/S	1 Lane PCIe 1.1 @ 250MB/S
Ordering Codes	OEM Card: VRC6008 Reference Design Kit: HW-RDK-VRC6008 Evaluation Kit: HW-EVK-VRC6008	OEM Card: VRC6004 Reference Design Kit: HW-RDK-VRC6004 Evaluation Kit: HW-EVK-VRC6004	OEM Card: VRC6016C Reference Design Kit: HW-RDK-VRC6016C Evaluation Kit: HW-EVK-VRC6016C	OEM Card: VCC6416 Reference Design Kit: HW-RDK-VCC6416 Evaluation Kit: HW-EVK-VCC6416	OEM Card: VDC6004 Reference Design Kit: HW-RDK-VDC6004 Evaluation Kit: HW-EVK-VDC6004