

# Product Selector Guide 2012

Version 1.5





## About Stretch

Stretch is the pioneer and world leader in the field of software configurable processors. Using the extreme processing performance of S7000 family processors, Stretch has designed a range of PCIe DVR add-in cards, cameras and standalone DVRs. These products set a new performance standard against which other designs are measured.

### Software Configurable Processors (SCP)

Software configurable processors combine traditional RISC processors and programmable logic, extracting the benefits of both. Tight coupling of RISC processors to a programmable compute fabric embedded directly inside the processor's data path provides unprecedented performance for embedded computing. Stretch's patented Instruction Set Extension Fabric (ISEF) is a software configurable compute fabric that lets system designers extend the processor instruction set and define new instructions. These "extension instructions" are defined in C/C++ and then automatically synthesized, placed, and routed into the ISEF—providing computational acceleration for any algorithm that can be expressed in C/C++.

Stretch's third generation S7000 family devices deliver unprecedented compute capability to demanding video applications. In addition to a high performance software configurable engine, all S7000 family devices include a rich collection of I/O interfaces, peripherals, and an integrated ARM9 host processor. This reduces system component counts and reduces costs.

Stretch S7000 family devices are available in a variety of package, speed grade, and temperature options to allow developers to choose the device best suited to their application.

#### S7000 Family Devices

Ordering Code	Maximum Frequency				DDR3 (bits/speed)				Data Ports	PCI Express				AIM	Ethernet MAC	Peripherals	IP Camera Performance		D1 DVR Channels	
	1.225V	1.2V	1.075V	1.0V	1.225V	1.2V	1.075V	1.0V		1.225V	1.2V	1.075V	1.0V				1.2V	1.0V	1.2V	1.0V
S7100PH-C4	400	383	267	200	32/1067	32/1067	32/800	32/667	4 10-bit	4	4	0	0	4	1G	SD, USB	1080p60	1080p30+	16	8
S7100PH-HC4	400	383	267	200	32/1067	32/1067	32/800	32/667	4 10-bit	4	4	n/a	n/a	4	1G	SD, USB	1080p60	n/a	16	n/a
S7100PH-C3 S7100PH-I3	n/a	333	n/a	167	n/a	32/800	n/a	32/400	4 10-bit	4	4	0	0	4	1G	SD, USB	1080p60	1080p30+	12	6
S7100PH-HC3 S7100PH-HI3	n/a	333	n/a	n/a	n/a	32/800	n/a	n/a	4 10-bit	4	4	n/a	n/a	4	1G	SD, USB	1080p60	n/a	12	n/a
S7100PH-C2	n/a	267	n/a	133	n/a	32/800	n/a	32/400	4 10-bit	4	4	0	0	4	1G	SD, USB	1080p30+	1.3MP30	11	5
S7100PH-HC2	n/a	267	n/a	n/a	n/a	32/800	n/a	n/a	4 10-bit	4	4	n/a	n/a	4	1G	SD, USB	1080p30+	n/a	11	n/a
S7110PB-C3	n/a	333	267	183	n/a	32/800	32/800	32/667	2 8-bit 1 14-bit	2	2	0	0	2	1G	SD, USB	1080p60	1080p30+	12	7
S7110PB-HC3 S7110PB-HE3	n/a	333	267	183	n/a	32/800	32/800	32/667	2 8-bit 1 14-bit	2	2	n/a	n/a	2	1G	SD, USB	1080p60	n/a	12	n/a
S7110PB-C2 S7110PB-I2	n/a	267	n/a	133	n/a	32/667	32/800	32/400	2 8-bit 1 14-bit	2	2	0	0	2	1G	SD	1080p30+	1.3MP30	10	5
S7110PB-HC2 S7110PB-HI2	n/a	267	n/a	n/a	n/a	32/667	n/a	n/a	2 8-bit 1 14-bit	2	2	n/a	n/a	2	1G	SD	1080p30+	n/a	10	n/a
S7120PB-C2 S7120PB-I2	n/a	300	267	183	n/a	16/800	16/800	16/667	1 8-bit 1 14-bit	0	0	0	0	0	1G	SD	1080p30+	1080p30	6	6

Operating Temperature: Commercial = T<sub>j</sub> 0°C – 100°C, Industrial = T<sub>j</sub> -40°C – 125°, Extended = T<sub>j</sub> 0°C – 125°C

Package: S7100 = 23x23 FCBGA 1.0mm Pitch, S7110 = 17x17 FBGA 0.8mm Pitch, S7120 = 14x14 FBGA 0.65mm Pitch



## Reference Designs

*... complete solutions for fast time to market*

Stretch reference designs leverage the capabilities of S7000 family of software configurable processors to achieve unprecedented performance. Designs are available for PCIe DVR add-in cards, HDcctv and IP cameras, and for hybrid standalone DVRs.

Reference designs are available as production-ready OEM units, as Evaluation Reference Design Kits (EVK), or as Full Reference Designs Kits (RDK). A Software Development Kit (SDK), common across all Stretch reference designs, makes porting of application code quick and straight forward, speeding time to market.

### OEM Production Ready Units

*Production ready units, simply supply your own application software*

Complete firmware load for the Stretch product and the Stretch Software Development Kit (SDK) for easy porting of host application software.



VRC7016L



### EVK Evaluation Kits

*Evaluate video quality, performance, and ease of integration*

Complete firmware load (with source code) for the reference design,<sup>1</sup> demonstration applications, and a complete SDK for customer evaluations.

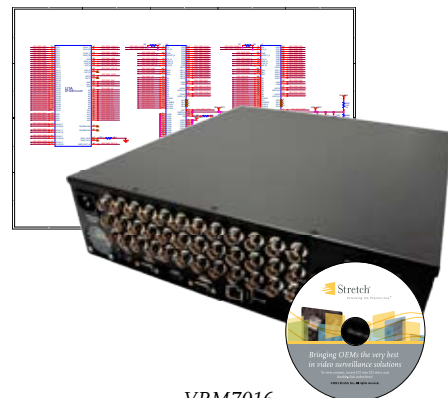


IPCAM7120

### RDK Reference Design Kits

*Everything you need to design your own highly differentiated product*

The complete EVK kit, plus the hardware design files needed to build derivative products. RDKs also include a distribution license for the Stretch Intelligent Encoder.



VRM7016

<sup>1</sup> Intelligent Encoder is supplied as object code

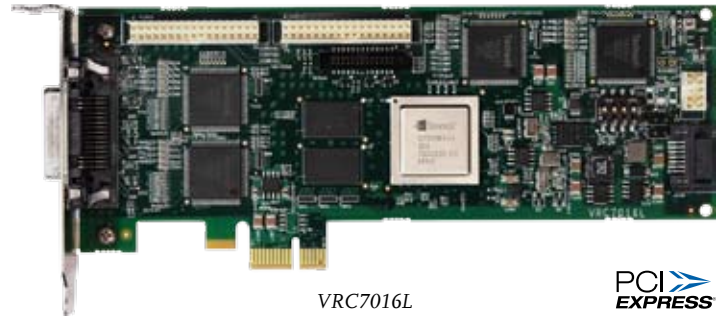


## S7000 PCIe Add-in Cards

... surveillance industry's best video quality

### VRC7000 Series Encoding Cards

VRC7000 cards are available in channel densities from 4 to 32 channels and at resolutions ranging from standard definition up to high definition HDcctv. These cards feature the Stretch Intelligent Encoder and have multi-stream, multi-CODEC capability, including Stretch H.264 Scalable Video CODEC (SVC) and Stretch H.264 High Profile CODEC. These CODECs produce the surveillance industry's best video quality, its lowest bit rates, and produce streams that can be managed with unprecedented ease.



### VDC7000 Series Decode and Display Cards

VDC7000 series cards provide a high performance and versatile video decode and display sub-system. They have universal decode capability, decoding streams from any video source including IP Cameras and standalone DVRs. Output video interface options include high definition HDMI, HDcctv, and standard definition CVBS. Extensive video post processing, scaling, and captioning allow multiple streams of decoded or raw video to be displayed in user-defined configurations.



Stretch VRC7000 and VDC7000 series cards feature the Stretch eAIM interface to allow cards within a system to communicate without host processor intervention. This high bandwidth interface reduces host processing requirements and reduces system costs.

Ordering Codes	Form Factor	S7 Devices	Encoding /Decoding	Display	eAIM	Connectivity
EVK-VRC7032 RDK-VRC7032	Full Height Short Form	3 S7100	32 D1 Encode	2 CVBS	2 Port	BNC breakout adapter cable, Embedded I/O headers
EVK-VRC7016LX RDK-VRC7016LX	Low Profile Short Form	2 S7110	16 D1 Encode	2 CVBS	1 Port	BNC breakout adapter cable, Embedded I/O headers
EVK-VRC7016L RDK-VRC7016L	Low Profile Short Form	1 S7100	16 D1 Encode	None	1 Port	BNC breakout adapter cable, Embedded I/O headers
EVK-VRC7008L RDK-VRC7008L	Low Profile Short Form	1 S7100	8 D1 Encode	1 CVBS	1 Port	BNC breakout adapter cable, Embedded I/O headers
EVK-VRC7004HD RDK-VRC7004HD	Full Height Short Form	2 S7100	4 1080P30 Encode	None	2 Port	BNC connector on back panel
EVK-VDC7002LHDMI RDK-VDC7002LHDMI	Low Profile Short Form	1 S7100	16 D1 Decode	2 HDMI	2 Port	HDMI
EVK-VDC7002LHDCCTV RDK-VDC7002LHDCCTV	Low Profile Short Form	1 S7100	2 1080p30 Decode or 16 D1 Decode	2 HDcctv	2 Port	BNC connectors on back panel
EVK-VDC7004L RDK-VDC7004L	Low Profile Short Form	1 S7100	16 D1 Decode	4 CVBS	2 Port	BNC breakout adapter cable



## VRM7000 Standalone DVR Reference Designs ... *true hybrid capability*

Stretch VRM7000 Series designs are available in channel densities from 8 to 16 channels and with resolutions ranging from standard definition to high definition HDcctv. They use the power and flexibility of the S7000 family of processors to provide full duplex operation, and universal decode ensures true hybrid capability for compatibility with any IP camera. All VRM7000 Series designs are compatible with the full range of Stretch CODECs, including the H.264 High Profile and Scalable Video CODECs (SVC), and use the rich API standard in all Stretch products.

VRM7000 Series reference designs feature spot monitor video outputs as well the ability to send stored video via a network to remote monitoring clients. The flexibility and scalability built into these reference designs ensure that derivative products can be easily designed in a range of channel densities and with a wide variety of features.



VRM7016

High levels of integration afforded by the S7000 family of software configurable processors ensure very low system material costs. Host application software can be easily ported to run under Linux on the ARM processor present in each S7000 family device.

Ordering Codes	S7 Devices	Encode Capability	Input Video	Output Video	Storage
EVK-VRM7016 RDK-VRM7016	2 S7100	H.264 High Profile and H.264 SVC	16 Channels D1	HDMI, CVBS, VGA	Up to 10 SATA Ports
EVK-VRM7008 OEM-VRM7008	1 S7110	H.264 High Profile and H.264 SVC	8 Channels D1	CVBS, VGA	1 SATA Port
EVK-VRM7008HD RDK-VRM7008HD	5 S7100	H.264 High Profile and H.264 SVC	8 Channels HDcctv	HDMI, VGA, HDcctv	Up to 9 SATA Ports



## S7000 Cameras

... flexible image signal processing

### S7000 Series Camera Reference Design Kits

Stretch S7000 series camera reference design kits feature Stretch software configurable processors and are available in a selection of resolution and output options. These single-chip designs feature state-of-the-art technology for ultimate video quality and are available with either Internet Protocol (IP) or HDcctv outputs.

Stretch S7000 series camera kits use an integrated Image Signal Processing (ISP) engine to process raw image data from the sensor and to perform a wide array of algorithms including Color Filter Array (CFA) interpolation, defective pixel and black level correction, Wide Dynamic Range (WDR) tone mapping, color and gamma correction, and image enhancement. To optimize camera settings for the best possible image, the ISP also provides control for automatic exposure, focus, and white balance. ISP parameters are controlled through a rich API, and elements can be replaced with customer-specific algorithms when required. The Stretch ISP removes the need for a separate ISP device, so total system costs are reduced.

Using Stretch's H.264 High Profile CODEC combined with the advanced image processing of the Stretch ISP provides the industry's best image quality and lowest compressed bit rate. Stretch IPCAM7100 and IPCAM7120 reference designs can also perform video compression using the Stretch H.264 Scalable Video CODEC (SVC) to provide ultimate scalability and stream management capabilities. The Stretch HDCCTVCAM outputs pristine quality high definition 1920 x 1080 progressive scan video at 30 frames per second over an HDcctv-compatible interface. The result is low latency, high quality video in a platform that is easy to deploy using existing installed infrastructure.

Stretch IP cameras feature a PSIA server running on the S7000 family processor's embedded ARM9 processor. This makes the designs easy to install and configure using industry standard PSIA clients.



IPCAM7100



IPCAM7120

Ordering Codes	Maximum Resolution at Full Frame Rate	Interface Options	Encoding Capability	Control Protocols
EVK-IPCAM7100 RDK-IPCAM7100	1080p60 5MP	Ethernet, CVBS Analog Monitor, HDcctv Local Monitor	H.264 High Profile, H.264 Scalable Video CODEC, MPEG4	PSIA and ONVIF
EVK-IPCAM7110 RDK-IPCAM7110	1080p60 4MP	Ethernet, CVBS Analog Monitor	H.264 High Profile, MPEG4	PSIA and ONVIF
EVK-IPCAM7120 RDK-IPCAM7120	1080p30 720p60	Ethernet, CVBS Analog Monitor	H.264 High Profile, H.264 Scalable Video CODEC, MPEG4	PSIA and ONVIF
EVK-HDCCTVCAM RDK-HDCCTVCAM	1080p30	HDcctv	None	HDcctv



# Stretch Software Development Kit (SDK) ... performance of hardware, simplicity of C

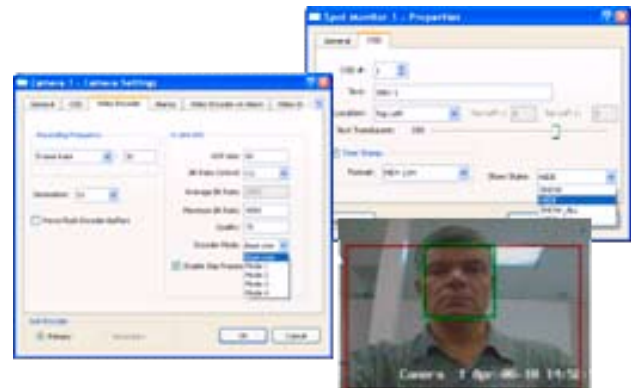
## S7000 Software

All Stretch board products—IP camera reference designs, PCIe DVR add-in cards, and standalone DVR systems—are compatible with the same SDK. This ensures maximum code reuse and speeds time to market. The Stretch SDK provides a rich collection of CODECs, video processing algorithms, and system management functions. All SDK features can be accessed through an extensive collection of Application Programming Interface (API) calls, making host application software development straightforward and intuitive.



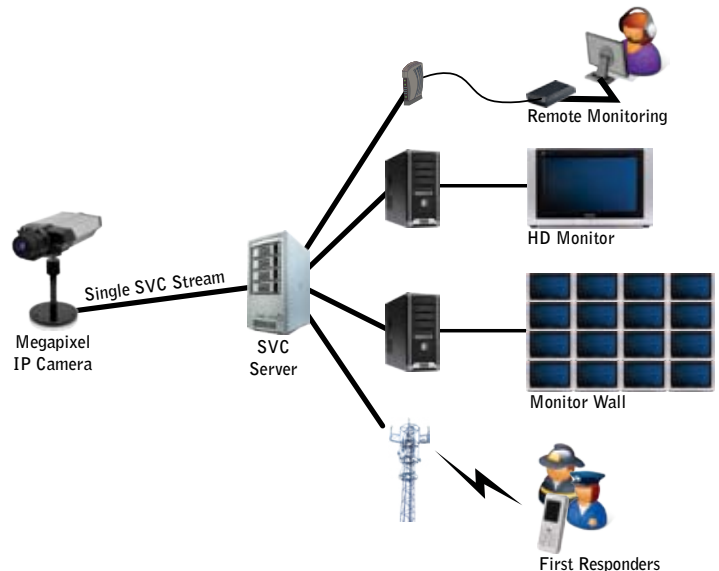
## The Stretch H.264 High Profile CODEC

This Stretch H.264 High Profile CODEC is standard in the SDK and is available to all Stretch platforms. Its highly efficient design produces compressed video at half the bit rate of competing products, reducing storage requirements and slashing operating costs. For a given bit rate, the Stretch H.264 High Profile CODEC produces the surveillance industry's best video quality.



## The Stretch H.264 Scalable Video CODEC (SVC)

The Stretch H.264 SVC CODEC produces compressed streams that can be decoded to produce video at different frame rates and resolutions. By parsing the encoded stream, bandwidth and decode compute requirements can be changed in real time. In this way, SVC streams can transit networks with constrained bandwidth and be decoded by low-complexity client devices. Recorded SVC streams can be parsed to lower their frame rate and resolution, reducing their storage requirements to regain valuable storage resources. This reduces costs while allowing operators to retain a valid video archive for longer periods.





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