

SDI-to-Ethernet Bridge

Uncompressed or JPEG2000

- SD, HD, 3G-SDI
- Barco Silex high quality **JPEG2000** codec
- **MPEG-2 TS** for transport of JPEG2000
- Xilinx **SMPT2022-1,2,5,6**
- 10Gb and 1 Gb Ethernet

High performance

- High resolution: UHD 4K, HD1080i, 1080p
- High frame rate: up to 60 fps
- Optimized solution: **multi-channel** support, low latency, low resource usage

Maximize interoperability

- Compliant with JPEG2000 broadcast profile
- Compliant with MPEG-2 TS for transport of JPEG2000
- Support for the industry standard SMPT2022-1,2,5,6
- VSF TR-01 interoperable profile for broadcast
- VSF TR-01 ULL profile for Ultra Low Latency

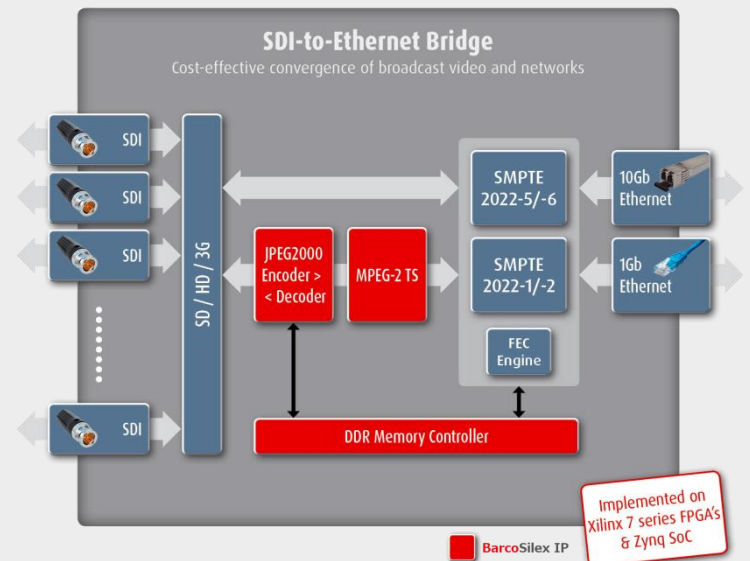
Accelerated productivity

- Ready to use reference design
- Customization available
- Electronic Design Services

Available on Artix-7, Kintex-7, Virtex-7, Zynq

Barco Silex and Xilinx partnered to provide an innovative Video Over IP System.

“A flexible SDI-to-Ethernet Bridge that leads to a cost-effective convergence of broadcast video and networks”







The platform is able to encapsulate and de-encapsulate up to four high definition streams, to compress or decompress those four streams with JPEG 2000, and to transport them over 1Gb/s (compression) or 10 Gb/s (uncompressed) Ethernet. The JPEG 2000 compressed video path is guaranteed by Barco Silex JPEG 2000 high quality codec and Xilinx SMPT2022-1/2 LogiCORE™ IP cores for real-time video transport over IP at 1Gb/s. The video platform also runs Xilinx SMPT2022-5/6 LogiCORE™ IP cores to implement multi-channel uncompressed high bit rate media transport over IP networks at 10 Gb/s with forward error correction. Integrated in the platform as well, is the JPEG 2000 codestream wrapping in MPEG-2 TS, compliant with the VSF (Video Services Forum) technical recommendation “Transport of JPEG 2000 Broadcast profile video in MPEG-2 TS over IP”.

This flexible platform, **a complete JPEG2000 video streaming over IP solution in a single FPGA or programmable SoC**, confirms that Barco Silex and Xilinx are leaders in innovation, shaping the current technological environment with unique solutions.

Barco Silex is leader in complex FPGA design and in JPEG 2000 compression. Video over IP transport is widely adopted in applications such as broadcast, local video distribution, medical...

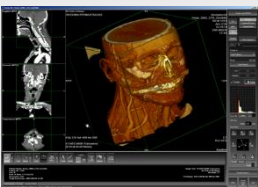
Unrivaled JPEG 2000 solutions

1080i 1080p UHDTV			2K 3D 4K 3D
Broadcast Profile			DCI Profile
Ultra low Latency			Lossless
High Quality			Multi Channel

Full set of configurations

- Multi-purpose
- Digital cinema DCI
- Broadcast multi-channel HD
- Ultra-compact
- Ultra-high resolution 8K
- Sub-frame latency
- Multi-quality layered
- Mathematically lossless

Unique market expertise



Barco Silex offers a comprehensive range of high quality solutions for JPEG 2000 applications. Our JPEG2000 portfolio covers a full set of IP cores, reference designs, acceleration boards and design integration services.

The Barco Silex JPEG 2000 encoder and decoder IP cores achieve unequalled quality and high-speed performance and are available on the latest generation FPGA's as well as on legacy platforms.

These remarkably flexible IP cores deliver real-time encoding or decoding of high-resolution and multi-channel video streams such as **DCI 2K, 4K and 8K, HD 1080i and 1080p, UHDTV.**

The unique architecture of our JPEG 2000 cores provides the highest standards of quality, flexibility, performance, compactness and reliability.

Performance

- Real-time with multiple channels, high resolution and frame-rate.

Quality

- Support of untiled images for 1080p, 2K, 4K and 8K with multiple layers and first-rate picture quality.

Flexibility

- Support for the widest spectrum of JPEG 2000 options, configurable frame size and easy to integrate interface.
- Upgradable during lifetime to new performance requirements or to a new generation of FPGA technology and footprint.
- Optimized and tailored cores to any application.

Compactness

- Cost-effective, single FPGA solution.
- Best trade-off between features, performance and footprint.

Reliability

- Extensive market-adopted solution (live streaming and cinema theaters).

The Barco Silex JPEG 2000 cores overcome the requirements of demanding applications such as **acquisition, archiving, production, wireless video, contribution, digital cinema** and have been widely adopted by the industry.

Technical features: Video over IP

SDI

- Xilinx Triple-Rate SDI IP Core
- SD, HD and 3G support

Barco Silex JPEG 2000 IP cores

- Multi-channel support
- MPEG-2 TS layer
- SDI to Video bridge

Network

- 10G GEMAC IP with XGMII interface
- 1G TEMAC with GMII interface

Barco Silex DDR controller

- High efficiency memory controller
- Combine compressed and uncompressed path

SMPTE 2022

- Multi-channel support
- SMPTE 2022-1/2: Constant Bit Rate
- SMPTE 2022-5/6: (Uncompressed) High Bit Rate
- Forward Error Correction (FEC)
- Transport Stream (TS) encapsulation
- Supports Level A and Level B FEC operations

Reference design

- Running on KC705 & Zynq-SoC development board

MicroBlaze microcontroller or SoC processor for setting parameters and reading status

Technical features: JPEG 2000

Single-chip solution for multi-channel

- HD: 720p30/60, 1080i, 1080p30/60, UHDTV
- DCI: 2K, 2K-3D, 4K, 4K-3D, 8K
- Custom frame sizes

Adjustable compressed bit rate

- Up to 8 Gbps
- Lossless

Color spaces

- XYZ – RGB – YUV
- Optional ICT/RCT color transform

Color sub-sampling

- 4:4:4 - 4:2:2 - 4:2:0

Support a wide range of JPEG 2000 parameters

- Wavelet filters
 - 9/7 (lossy) and 5/3 (lossless)
 - 0 to 6 decomposition levels
- Full-frame processing (no tiling)
- Reduced latency (with tiling)
- Up to 16 bits per color sample
- Rate control with 3 selectable regulation modes
 - Quality control with quantization and weights
- Multiple Quality Layers

Optimized memory controller for high efficiency

Electronic Design Services

- ASIC
- FPGA
- Embedded Software
- Board/System



Video Platforms

- Viper OEM 4K HDMI over IP Board
- Video in/out (SDI/HDMI/Display Port/DVB ASI)
- Transport (SMPTE2022/RTP ...)
- Network interface (1Gb/10Gb ...)
- High efficiency memory controllers
- PCIe DMA for Video applications

Video compression IP cores

- JPEG 2000
- VC-2 HQ
- JPEG
- MPEG-2

Security Platforms

- Key generation, Encryption & Authentication
- Secure Boot
- OpenSSL and Linux CryptoAPI support

Crypto IP cores

- Public Key engine (RSA, ECC, ...)
- AES multi-purpose (ECB, CTR, CBC/CMAC, OFB, CFB)
- AES-CCM (wireless, IPsec...)
- AES-GCM (MACsec, IPsec...)
- AES-XTS (disc storage ...)
- Hash & 3-DES core
- TRNG, DRBG (NIST800-90 compliant)

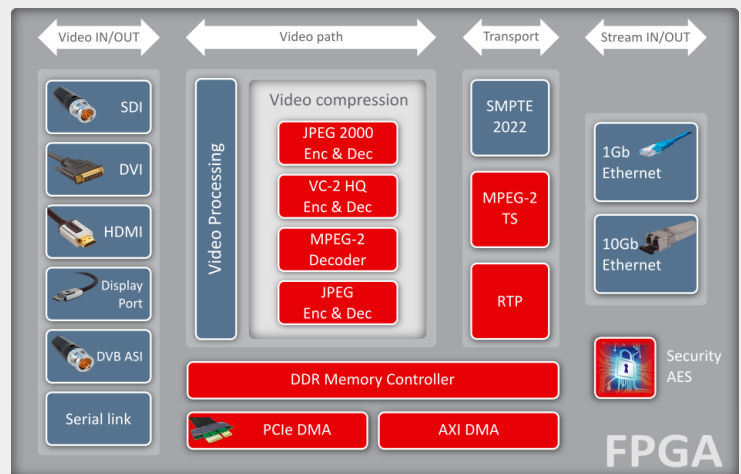
About Barco Silex

Barco Silex provides **image processing** and **security solutions** as well as electronic design services (**ASIC, FPGA, DSP, embedded software, Board**).

Barco Silex can interact at different stages in the development cycle of your products: from providing IP cores, reference designs and platforms, support on part of your integrated design to the delivery of full turnkey projects.

The unique combination of Barco Silex's image processing expertise and top-notch **electronic design** skills enabled many customers to accelerate their video product developments with leading-edge and cost-effective solutions. We are recognized for our state-of-the-art expertise in complex and high-speed design, for our project management skills and for our reliable design methodology.

Barco Silex's **video platforms** and **reference designs** integrate a full-range of compression and networking modules. They benefit equipment OEM's who need to accelerate the development of video solutions that can adapt to changes in critical standards, specifications and protocols.



Barco Silex also provides **security platforms** and silicon-proven **security IP cores** (AES, Public Key, Hash...), which are valued by the market for their world leading ultra-high-speed performance and compact footprint. They have been integrated in products for applications such as digital cinema media block, video streaming, secure payment, communication, storage...