Our EMMY® award-winning IP core solution can encode or decode JPEG 2000 images and video with unrivalled quality, high-speed and compact footprint and compliant with the ISO/IEC 15444-1 specification. It has been successfully integrated by market leaders in digital cinema, broadcast, defense, storage and video surveillance applications.
**JPEG 2000 - MAXIMUM PERFORMANCE**

**Ideal for ASIC & FPGA**
- Real-time with multiple channels, high resolution and frame-rate.

**100% Image Quality**
- Support of untiled images for 1080p, 2K, 4K and beyond.
- Optimized rate allocation.
- Optional use of visual weighting for improved visual perception.

**Flexible**
- Support for the widest spectrum of JPEG 2000 options.
- Optimized and tailored cores to any application.

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

**Reliable**
- Extensive market-adopted solution (live streaming, cinema theaters and defense).

**Easy integration**
- Use of standard interfaces like AXI.

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**Did you know?**
JPEG 2000 is an image coding system that uses state-of-the-art compression techniques based on wavelet technology and offers an extremely high level of scalability and accessibility. Content can be coded once at any quality, up to lossless, but accessed and decoded at a potentially very large number of other qualities and resolutions and/or by region of interest, with no significant penalty in coding efficiency. The standard supports up to 16384 components, with dimensions running into the thousands of terapixels, and precisions as high as 38 bits/sample, with or without tiling, and with a variety of interchangeable data progressions and random access capabilities. (source: jpeg.org)

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**CODEC COMPARISON**

<table>
<thead>
<tr>
<th>Feature</th>
<th>JPEG 2000</th>
<th>VC-2 HQ</th>
<th>HEVC/H265</th>
<th>MPEG4- AVC-intra</th>
<th>MPEG4- AVC/H264</th>
<th>MPEG2</th>
<th>JPEG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Cinema, Broadcast, AV over IP</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latency critical applications, Compressed frame buffer</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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</tr>
<tr>
<td>DVD, DVB, IPTV</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
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<tr>
<td>Production</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Still picture</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
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</tr>
</tbody>
</table>

- ✔ = Ideal
- ✔ = Good

**Compression efficiency with Intra-Frame coding**: ✔ ✔ ✔ ✔ ✔

**Low latency**: ✔ ✔ ✔ ✔ ✔

**Scalability**: ✔ ✔ ✔ ✔ ✔

**Graceful degradation**: ✔ ✔ ✔ ✔ ✔

**Multigeneration robustness**: ✔ ✔ ✔ ✔ ✔

**Lossless compression**: ✔ ✔ ✔ ✔ ✔

**No DDR required**: ✔ ✔ ✔ ✔ ✔

**Error resilience**: ✔ ✔ ✔ ✔ ✔

**Region of interest**: ✔ ✔ ✔ ✔ ✔

**Inter-Frame coding**: ✔ ✔ ✔ ✔ ✔

**Encoder simplicity**: ✔ ✔ ✔ ✔ ✔

**Decoder simplicity**: ✔ ✔ ✔ ✔ ✔

**Compression ratio**: 20:1 ✔ ✔ ✔ ✔ ✔

8:1 ✔ ✔ ✔ ✔ ✔

100:1 ✔ ✔ ✔ ✔ ✔

20:1 ✔ ✔ ✔ ✔ ✔

50:1 ✔ ✔ ✔ ✔ ✔

30:1 ✔ ✔ ✔ ✔ ✔

10:1 ✔ ✔ ✔ ✔ ✔

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IDEAL USE CASES FOR JPEG 2000

Digital Cinema (DCI)
Our DCI JPEG 2000 IP cores are compliant with the DCI recommendation. It supports high-performance coding of large DCI frame formats: 2K up to 120fps, 2K-3D up to 120fps/eye, 4K up to 60fps, 4K-3D up to 60fps/eye.

Broadcasting
The broadcast JPEG 2000 IP cores are compliant with the Broadcast Profile. Ready for use according to VSF TR-01 recommendation, including Ultra-Low Latency (ULL).

AV over IP
The JPEG 2000 IP cores can be used for latency critical applications like AV over IP while keeping an outstanding picture quality. It enables an end-to-end latency less than a frame for use cases like 4K60 over 1 GbE.

Aerial & Geospatial Imagery
The configurability of our IP cores allows to support any picture resolution. This is useful when processing the output of the widest picture sensors. 24K wide pictures already done!

SOME OF MANY GREAT FEATURES IN JPEG 2000

SUPERIOR PICTURE QUALITY
JPEG 2000 is widely used in all areas as it has close to zero artefacts and does not create blocks at high compression ratios, like JPEG and many other codecs.

SCALABILITY
From a single compressed file, it is possible to extract different resolution versions or different quality versions. Resolution scalability enables for example extracting an HD version from an UHD stream.
WHEN HIGH-QUALITY VIDEO CODEC MATTERS

JPEG 2000 for ASIC and FPGA

Features:
• Highly scalable codec (configurable to fit any requirement)
• Single chip solution for multi-channel
• Rate control with visual weights for optimized quality
• Ultra low latency
• Watermarking interface for Digital Cinema applications
• Region Of Interest / Activity Zone coding
• Multiple quality / resolution layers
• Provided with our high efficiency memory controller (for FPGA)
• Easy integration thanks to the use of standard interfaces (AXI)

Supports the following video parameters and encoding modes
• Unrestricted resolution including SD, HD, 2K, 4K, 8K
• 4:4:4, 4:2:2, 4:2:0 and 4:0:0 color subsampling
• RGB - YUV - XYZ color spaces with optionnal color transform
• Up to 16 bits per color sample
• 9-7 and 5-3 wavelet filters
• Up to 6 decomposition levels
• CBR or capped VBR (VBR with a max value)
• CPRL, LRCP progression orders
• Lossy and lossless encoding modes
• Parameters update on a frame per frame basis

Intellectual Property & Licensing
Royalty-free

For additional information, please contact your local sales representative or visit our website www.silexinsight.com

Viper – Custom OEM board for 4K HDMI AV over IP

Silex Insight has designed and developed a fully integrated board that is perfectly suited for JPEG 2000 and ultra-low latency audio/video over IP. The transmit and receive boards are production-ready and reduce the development cost of the system. Viper features high resolutions up to 4K/UHD over 1Gb, 2.5Gb or 10Gb Ethernet cable. The HDMI video is transported over Ethernet after compression with the JPEG 2000 (or VC-2 HQ or another codec) video compression.

Global sales offices
Worldwide customer base
Founded in 1991

Silex Insight = Silicon experts with know-how
Expertise on PCB design, FPGA and ASIC
Design Services to fully develop to your needs

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Expertise on PCB design, FPGA and ASIC
Design Services to fully develop to your needs