TicoXS

IP cores & SDK

The lightweight low latency image coding standard

Standardized as JPEG XS (ISO/IEC 21122), the new revolutionary coding standard can be applied in every application or which a perfect image quality, a microsecond latency, with low power and efficient video bandwidth are crucial.

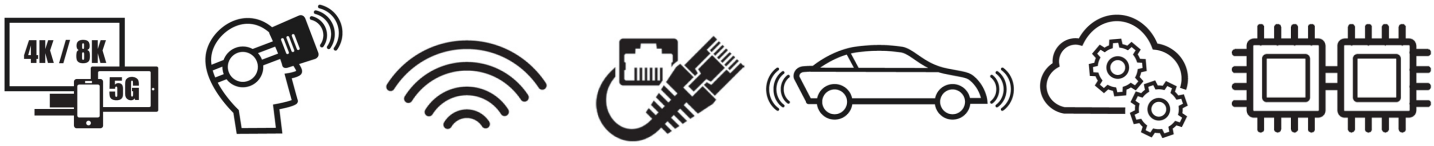
TicoXS is the intoPIX JPEG XS solution for AV over IP, live broadcast production, TVs and mobile devices, AR/VR systems, gaming, automotive (ADAS), wireless systems, cloud & software video applications or digital cinema workflows.

Designed as a solution for (replacing) uncompressed image and video in many devices and applications, it outperforms all popular video codecs offering the world's best lightweight low-latency coding capabilities:

- **PERFECT IMAGE QUALITY FOR BOTH HUMAN & MACHINE VISION**
  - Extensive bit depth support up to 16bit.
  - No degradation over multiple generations of encoding.
  - Fully transparent to uncompressed quality down to 3bpp (= 10:1 for 444 10bit).
  - Visually lossless down to 1.5bpp on media & natural video content (= 20:1 for 444 10bit).
- **BETTER PIXELS WITH COST SAVINGS, BETTER CONNECTIVITY**
  - For storage and connectivity within a device or within a complete workflow or ecosystem.
  - It enables users to perfectly handle much more pixels (HD, 4K, 8K,...), higher bit depth, higher frame rates, at the cost of baseband HD or even lower.
- **LOW COMPLEXITY in ASIC, FPGA, CPU, GPU**
  - Cross-platform capable, JPEG XS offers various levels of parallelism to scale easily. It is the only international coding standard designed with such revolutionary approach.
  - Extremely small in ASIC & FPGA (low logic & low memory).
  - Highly parallelizable for CPU & GPU.
- **MICROSECOND LATENCY & LOW POWER**
  - Compared to other popular and high complexity codecs, JPEG XS offers microsecond-latency thanks to an innovative line-by-line processing. JPEG XS is also extremely low power. The technology does not need any external memory, it just requires few internal SRAMs to operate.
- **OPTIONAL FLAWLESS IMAGING PROFILE**
  - Quality beyond the operating range of JPEG XS, 20:1 for KVMs, desktop and AVoIP. Discover our new TicoXS FIP.

Where can TicoXS be implemented?

Wherever you need it as hardware IP core or software!



TV & mobile devices | **VR/AR HMD** | **Wireless 60GHz/5G/Wifi-6/-7** | **Wired AV over IP** | **ADAS Iot** | **Cloud processing & storage** | **Chip-to-chip Chip-to-memory**

- Support more pixels (high resolution, bit depth, frame rates, more streams) using existing systems & infrastructures.
- Reduce your internal video bandwidth (and power!) or cost-effectively increase your video buffer and storage capacity.
- Reduce your bandwidth for real-time wired or wireless transmission without affecting the latency and quality.
- Build an efficient hardware & software based ecosystem without using expensive and power consuming processing, bandwidth, latency and storage capacity.

intoPIX

Specifications and implementations

		TicoXS ENCODER & DECODER IP cores & SDKs
IMAGE/VIDEO	**Color format**	RGB, YCbCr, Monochrome
	Color subsampling	4:4:4, 4:2:2, 4:2:0, 4:0:0 (Monochrome)
	Bit depth	8 / 10 / 12 / 14 / 16 bits per component
	Resolution	Any up to 10240 x 4320 pixels (Even more on request)
	Frame rates	Any (depending on IP core or FastTicoXS Developer SDK configuration)
CODING	**Compliancy**	JPEG XS standard (ISO/IEC 21122-1 – High/Main / MLS12 profiles) for TicoXS + additional options (such as TDC profile - see TicoXS FIP Codec)
	Quality **Rate control** **Latency**	Full transparency to uncompressed, down to 3bpp (according to ISO flicker test), Visually lossless down to 1bpp, depending on type of content Line-based latency CBR (constant bit rate) operation - Adjustable down to 36:1 (1bpp)
	Proxy mode	Optional secondary proxy stream generation (1K resolution) in the encoder Embedded downscaler in decoder available (decode 1/4, 1/16 proxies)

		TicoXS IP cores	FastTicoXS SDK
IMPLEMENTATION	**Platform**	FPGA: Xilinx AMD, Intel & Lattice ASIC like TSMC 12, 16, 28, 40 nm	GPU: Cuda (Nvidia) & OpenCL (Intel, AMD) CPU: x86-64 (Intel, AMD), ARM 64 OS: Windows, Linux, macOS
	Low complexity & fast processing	Small footprint / Low memory (No external DDR) Various configurations	Highly parallelized GPU SDK processing Intel compatible CPU SDK (SSE 4.1 or newer)
	Real-time operation	Latency selectable from 2 lines to 15 lines	Latency selectable from 30 lines to 1 frame/field
	Add-on	IPX-SDI-MAP-TX/-RX : XS over SDI IPX-RTP-TX/RX : XS over RTP/2110-22 IPX-MPEG2-TS : XS over TS IPX-AES: AES128 Encryption	FFmpeg patch Nvidia Rivermax integration intoPIX Titanium Streaming SDK

IP core typical configurations

	VIDEO FORMATS			
REFERENCE IP CORES	**Max resolution**	**Max FPS**	**Color sampling**	**Bit depth**
IPX-TICO-XS-HD-60-444-12 **Enc or Dec**	1920 x 1080	60	4:2:2 4:4:4	8, 10, 12
IPX-TICO-XS-UHD4K-60-444-12 **Enc or Dec**	4096 x 2160	60	4:2:2 4:4:4	8, 10, 12
IPX-TICO-XS-UHD8K-60-444-12 **Enc or Dec**	7680 x 4320	60	4:2:2 4:4:4	8, 10, 12

CONTACT INTOPIX FOR YOUR CUSTOM IP CORE & SDK CONFIGURATION

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