

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.

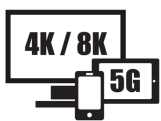
Designed as a solution for (replacing) uncompressed image and video in many devices and applications, it outperforms all popular video codecs offering the world's best lightweight low-latency coding capabilities:

- **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



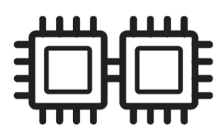
Wired AV over IP



ADAS lot



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.



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	
	Compliance	JPEG XS standard (ISO/IEC 21122-1 - High/Main / MLS12 profiles) for TicoXS + additional options (such as the Flawless Imaging Profile)
	Quality	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)
	Rate control	
	Latency	
	Proxy mode	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
	Low complexity & fast processing	GPU: Cuda (Nvidia) & OpenCL (Intel, AMD) CPU: x86-64 (Intel, AMD), ARM 64 OS: Windows, Linux, macOS
	Real-time operation	Small footprint / Low memory (No external DDR) Various configurations
	Add-on	Highly parallelized GPU SDK processing Intel compatible CPU SDK (SSE 4.1 or newer)
		Latency selectable from 30 lines to 1 frame/field
		Latency selectable from 2 lines to 15 lines
		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

REFERENCE IP CORES	VIDEO FORMATS			
	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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