TicoXS FIP

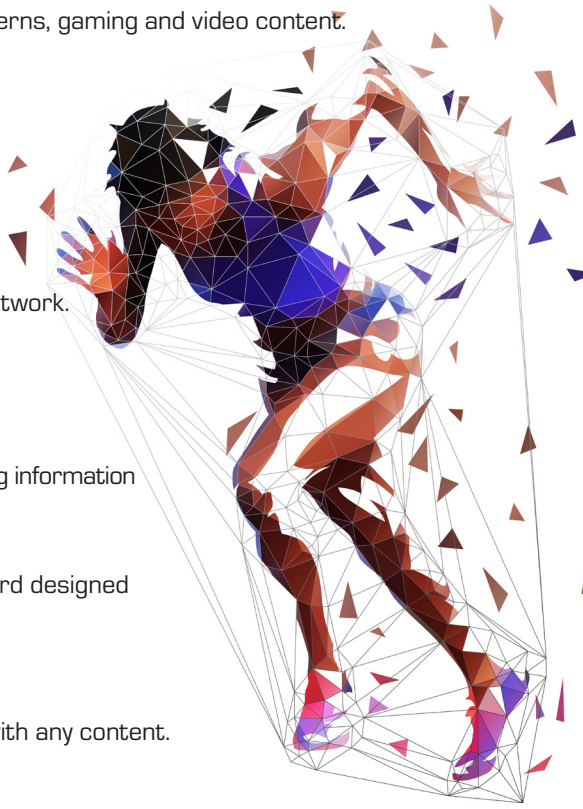
IP cores & SDK

The JPEG XS Codec with Flawless Imaging Profile

TicoXS FIP combines JPEG XS with an advanced Flawless Imaging Profile to deliver more compression efficiency on any content guaranteeing the best AV over IP experience using 1 Gigabit Network infrastructure. The technology can be leveraged in many HD, 4K and 8K AV applications including: AV over IP, KVMs and desktop sharing, HDMI over IP, low-latency WiFi, videowall and control room management.

With FIP, the JPEG XS mezzanine codec standard can be applied wherever uncompressed video is currently used. It maintains lossless quality on the most complex desktop and natural content with line based latency and high compression ratios. Delivering the best performance in terms of quality, reliability, and user experience, users can now build more sustainable products and AV workflows. The technology and associated products are covered by one or more patent claims, rewarding intoPIX's hard work and innovation.

- **PERFECT IMAGE QUALITY WITH ANY CONTENT, WITH COST-EFFECTIVE BITRATE**
  - Compress the most demanding graphics, excel spreadsheets, test patterns, gaming and video content.
  - At low bitrate, down to 36:1.
- **INTEROPERABILITY FOR PRO-AV & MEDIA PRODUCTION**
  - AVoIP Interoperability thanks to the use of open specifications (IPMX, SMPTE 2110, JPEG XS).
- **BETTER PIXELS WITH COST SAVINGS, BETTER CONNECTIVITY**
  - Using 1 Gigabit Ethernet network, the video bandwidth is low enough to carry video, audio and data over the same wire.
    - » 8K : down to 800Mbps to go over Cat5e & 1GbE or 2.5GbE network.
    - » 4K : down to 400Mbps to go over Cat5e & 1GbE.
  - Re-use billions of deployed Cat5e cables.
- **ERROR CONCEALMENT : ROBUST TO HEAVY PACKET LOSS**
  - Ideal for unpredictable network transmission such as WiFi-6/-7.
  - Detect any error (from network packet loss, bit-flip...) and conceal any missing information to ensure the best visual experience.
- **LOW COMPLEXITY in ASIC, FPGA, CPU, GPU**
  - Cross-platform capable, JPEG XS is the only international coding standard designed with low complexity in mind.
  - Extremely small in ASIC & FPGA & highly parallelizable for CPU & GPU.
- **WITH THE SMALLEST LATENCY**
  - Less than 1 millisecond with perfect image quality in any situation and with any content.
  - Frame accurate switching capability.



Where can TicoXS FIP be implemented?

KVM | MULTIVIEW | AV OVER IP | GAMING | WIRELESS AV

- Support more pixels (high resolution, bit depth, frame rates, more streams) using existing systems & infrastructures.
- 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-hungry processing, excessive bandwidth, long-latency or large storage requirements.

Specifications and implementations

		TicoXS FIP ENCODER & DECODER IP cores & SDKs
IMAGE/VIDEO	**Color format**	RGB, YCbCr
	Color subsampling	4:4:4, 4:2:2, 4:2:0
	Bit depth	8 / 10 / 12 / 14 / 16 bits per component
	Resolution	Implementation range up to 10K
	Frame rates	Up to 240fps depending on the video formats
CODING	**Compliancy**	JPEG XS High Profile (ISO/IEC 21122-2) JPEG XS TDC Profile (for FIP)
	Quality	Lossless transparency down to 0.8 bpp to fit in ONE Gigabit network for HD, 4K, 8K HDR support Error Concealment (EC) option for any type of error and network packet loss
	Rate control	Constant bit rate operation (CBR) - adjustable down to 36:1 (0.8 bpp)
	Latency	(Sub-) intra frame: line-based & fixed latency (microsec.) whatever the compression rate applied
	Scaling	Proxy Generation : Optional secondary proxy stream (1K resolution) in the encoder Embedded scaler in decoder for multiviewer & videowall options

		TicoXS FIP IP cores	FastTicoXS FIP 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 Various configurations	Highly parallelized GPU SDK processing Intel compatible CPU SDK (SSE 4.1 or newer)
	Real-time operation	10 video lines to encode or decode	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**	**Min frequency**
IPX-TICO-XSFIP-4K-30-444	4096 x 2160	30 (4:4:4) 60 (4:2:2/4:2:0)	4:4:4 / 4:2:2 / 4:2:0	8, 10, 12	120 MHz
IPX-TICO-XSFIP-4K-60-444	4096 x 2160	60	4:4:4 / 4:2:2 / 4:2:0	8, 10, 12	240 MHz
IPX-TICO-XSFIP-4K-120-444	4096 x 2160	120	4:4:4 / 4:2:2 / 4:2:0	8, 10, 12	240 MHz
IPX-TICO-XSFIP-8K-30-444	7680x4320	30 (4:4:4) 60 (4:2:2/4:2:0)	4:4:4 / 4:2:2 / 4:2:0	8, 10, 12	240 MHz
IPX-TICO-XSFIP-8K-60-444	7680x4320	60	4:4:4 / 4:2:2 / 4:2:0	8, 10, 12	240 MHz

CONTACT INTOPIX FOR YOUR CUSTOM IP CORE & SDK CONFIGURATION

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