The new disruptive visually lossless light video compression, Extremely Tiny in FPGA

A technology serving the global AV industry

TICO compression is new patent-pending visually lossless compression specifically designed for the industry. This revolutionary technology is extremely tiny in FPGA fitting the smallest Altera Cyclone devices, robust for real-time operation with no latency.

Up to now, image and video are sent or stored uncompressed into many displays and systems such as cameras, video servers or recorders. TICO is a smart upgrade path to manage higher resolutions (4K, 8K …) and frame rates while assuring visual quality, keeping power and bandwidth at a reasonable budget and reducing significantly the complexity and cost of the system.

**Technology benefits**

- Visually Lossless quality up to 4:1.
- Robust over multiple generations.
- Fixed latency: down to microseconds Selectable from 1 to x pixel lines.
- Small complexity and ultra-compact codec: easy to implement in low-cost FPGA. Limited internal memory - no external memory required.
- Powerful, Real-time or faster than real-time in CPU.
- Compatible with different resolutions, from mobile, HD to 4K/8K UHDTV, via multiple usual transport schemes.
- Designed to be a standard for industry-wide support: TICO compression technology is available on multiple software and hardware technologies. Code, hardware IP-cores and software libraries are licensable from intoPIX.
TICO is a smart solution to

- Support Higher data stream using existing systems & infrastructures (HD/4K/8K/HFR).
- Increase the number of streams or the stream resolution
- Reduce the internal video bandwidth (and power!!)
- Cost effectively increase video buffer and storage capacity.
- Reduce the number of lanes needed to transport a stream at a display interface or at an image sensor to save power, cost or both.

**TICO**

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**Image features**

- Color modes: 422, 444, RGB, YCbCr, XYZ.
- Bit Depth: 8, 10, or 12.
- Resolutions: Any up to 8K (8192 x 8192).
- Frame Rates: Any (depending on intoPIX IP-core configuration).

**Compression**

- (Sub) Intra-frame.
- Real-time operation guaranteed (no overflow or underflow).
- Fixed latency - Selectable from 1 to X lines.

**Quality and Bit Rate Control**

- Adjustable compression rate for Lossy/Visually lossless/Math. lossless.
- CBR (constant bit rate) operation (optional capped VBR model).

**FPGA**

- Low cost implementation in any Altera FPGAs: very low FPGA logic and internal RAM usage.
- Fit in the smallest Altera Cyclone FPGAs.
- Encoder and decoder have approximately the same complexity.

**IP-Cores releases**

**ALTERA FPGA implementation**

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**Typical applications from HD to Ultra HD**

- Digital Video Recorders.
- Video Servers, mixers, routers and switchers.
- Cameras (high-res, real-time or high speed).
- Video monitor and displays.
- Frame grabbers and video capture devices.
- Video over IP systems (ST2022, AVB,...).
- Industrial and surveillance.
- Cable extenders.
- UHD/4K over 3G-SDI.

**IPX-TICO UHD-4K ENC/DEC**

**IPX-TICO MLS**

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