MJPEGOIP-HDE

Motion JPEG Over IP – HD Video Encoder Subsystem

This Video Over IP Subsystem employs JPEG compression and RTP/UDP/IP encapsulation to enable the rapid development of complete motion JPEG video streaming products. Hardware reference designs and customization services complete the solution.

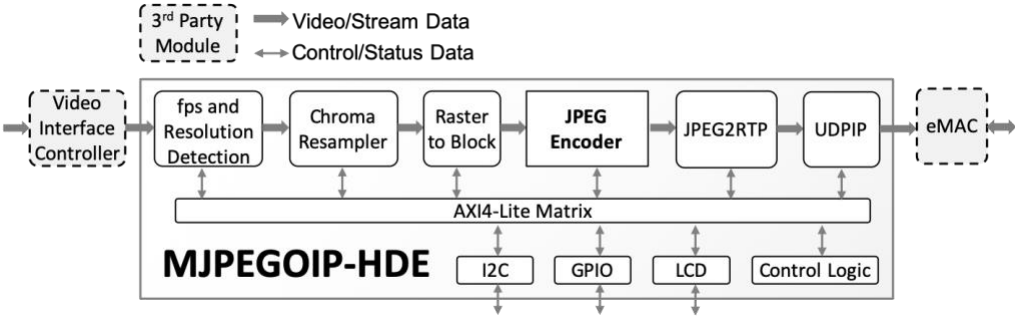
The subsystem uses CAST's JPEG-E-S, JPEG2RTP, and UDPIP IP cores. Flexible interfaces allow easy integration of video and network controllers; the cores' AMBA® AXI4-Lite™ slave interfaces allow a host processor to access all control and status registers. An optional custom logic module allows standalone, processor-free operation and provides access to control and status registers via UDP packets. Video and stream data are transferred among the subsystem's modules using AXI-Stream, making removing or adding modules straightforward.

The produced stream can be decoded using Motion JPEG-compatible software viewers (e.g. VLC).

Applications

The MJPEGOIP-HDE Subsystem is suitable for live streaming in broadcasting, surveillance, industrial, defense, and medical applications. The platform consumes significantly less energy than software-based solutions, making it ideal as a compression coprocessor in battery-operated devices with video streaming capabilities.

Block Diagram



FEATURES

Complete subsystem streams 1080p video with lower latency, less power consumption, and fewer silicon resources than hardware video codecs or software compression.

- Motion-JPEG Video Compression
  - Ultra-low, sub-frame latency capable
  - No frame buffering, eliminates the need for external DRAM
  - Quality equivalent to video compression for compression ratios up to 20:1
- RTP encapsulation according to RFC 2435
  - Compressed stream decodable by compliant software decoders/viewers such as VLC
- Host interface via AXi4-Lite or processor-free UDP-controlled operation
- AXI4-ST bus for Video & Stream

Customization Options

- Integration with Video-In Controllers (e.g., DVI, HDMI, MIPI-CSI, or SDI)
- Integration with IP-based MAC controllers (e.g., Ethernet or 802.11 WiFi)
- Multiple video channels, different video preprocessing modules, or different compression algorithms

Reference Designs

A turnkey reference design for Xilinx's Kintex-7 FPGA KC705 Evaluation Kit is readily available. The reference design integrates the MJPEGOIP-HDE Subsystem with Xilinx's Ethernet MAC, and uses an HDMI receiver daughter-card for video input.

FPGA Family/Platform	Video-In	Stream Out	3rd Party Cores	Video Formats
Xilinx Kintex-7/KC705	HDMI (AES-FMC-IMAGEON-G card)	1G Ethernet	Xilinx TEMAC controller	720p25/30/50/60 & 1080p@30

Customization Services

CAST can integrate the MJPEGOIP-HDE subsystem with your choice of video-in and network controllers, and map it to Xilinx or Intel FPGA boards offering sufficient resources. We can also modify the subsystem to support multiple video channels, or different CAST compression cores.

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