

OEM Board for 4K HDMI AV over IP

The Viper boards are fully integrated boards that enable the development of ultra-low latency audio/video over IP products. The transmit and receive boards are production-ready and reduce the development cost of the system. Viper features high resolutions up to 4K/UHD over a single 1 Gb Ethernet cable. The HDMI video is transported over Ethernet after compression with the VC-2 HQ or JPEG 2000 video compression.



Applications

- Residential and Commercial Audio/Video distribution
- KVM
- Digital signage
- Video wall
- Video conferencing
- HDMI extender
- HDMI capture and transmission to server
- VC-2 HQ or JPEG 2000 encoding/decoding

Key Features

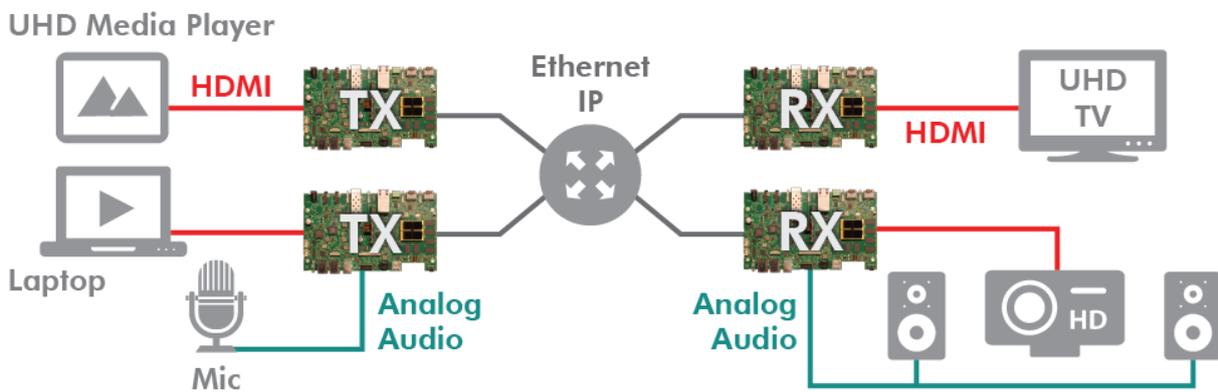
- Networked audio/video distribution over standard IT infrastructure
- Ultra-low latency 4K/UHD Video transport over 1G Ethernet
- Flexible network: point-to-point unicast or multicast distribution
- Fully integrated/validated solution, production-ready for OEM
- Visually lossless compression with VC-2 HQ (SMPTE 2042) or JPEG 2000
- Open standard transport with AES67 and SMPTE ST 2110

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Viper Networked AV over IP Use Cases

Flexible networking capabilities for video and audio

The Viper boards can be used to efficiently transport audio/video streams over an IP network. The TX board is used to interface the HDMI source to the network, while one or multiple RX boards can be used to receive the audio/video stream. Several TX boards can be used on the same network in order to share the content of multiple HDMI sources. Each RX board can select the channel to receive.

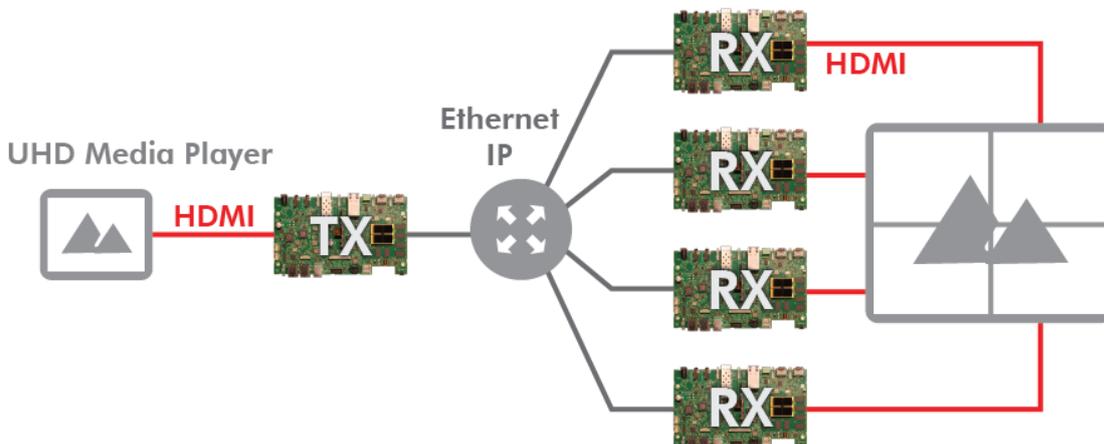


Analog audio embedding/de-embedding

The boards are also equipped with analog audio input and output in addition to the HDMI audio. Each input audio stream is routed individually and the receiver can be configured to output the audio over the HDMI or analog audio connector.

4K Video Wall with image split over 4 displays

Viper boards can be used to drive a **video wall** from a single source thanks to the IP multicast streaming and video processing functions. Each Viper receiver can decode a part of the image, and output it over the HDMI cable.



HDMI to IP transmitter/receiver specifications

Audio/Video Networking

	JPEG 2000 version	VC-2 HQ version
AV connectivity	HDMI 2.0 with HDCP 1.4/2.2	
Video format	All resolutions and frame rates up to 4096x2160 at 60fps 8-bit, 10-bit and 12-bit, 4:4:4, 4:2:2 and 4:2:0 HDR10 and HLG	
Max video format	4K60 4:4:4	4K60 4:2:0
Video codec	JPEG 2000	VC-2 HQ (SMPTE 2042)
Video processing	Upscaler/downscaler at receive side Cropping, padding, logo and text insertion	
Audio	Up to 8 channels, all sampling rates including High Bit-Rate Audio (HBR) LPCM, DTS, and Dolby formats (incl. Atmos) External analog audio embedding/de-embedding AES67	
Latency	15 ms end-to-end (encoder + decoder)	5 ms end-to-end (encoder + decoder)
Security	AES encryption, HDCP 1.4/2.2, , 802.1x authentication	
Reliability	Forward Error Correction (FEC) and Quality of Service (QoS)	
Clock Synchronization	Precision Time Protocol (PTP) IEEE 1588-2008, slave/master	
AV transport protocols	IP (unicast/multicast), UDP, RTP, RTCP, SAP/SDP, SMPTE ST 2110	
Network protocols	DHCP, mDNS, IGMP, TCP/IP, ARP	

Configuration

Network-based	Web-based configuration manager (GUI) JSON API over WebSocket, Secure Remote System console
COM port	Command line interface
Upgrade	Firmware field upgradable

Interfaces

Audio/Video	HDMI 2.0 Input (encoder only) HDMI 2.0 Output (decoder only) 3.5mm jack (TRS) analog audio input (encoder only), and output (decoder only)
Communication	1Gb Ethernet RJ45 Serial RS-232
USB	Keyboard and mouse support for KVM application
Others	I ² C, SPI, GPIO for additional interfaces (LED, IR, button, display...)

Other specifications

Temperature	Operating: 0° C to +55° C	
Dimensions (L x W x H)	200 x 116 x 23 mm (7.9 x 4.6 x 0.9 in)	
Power supply	12 V DC – Power connector	
Power over Ethernet	PoE+ (IEEE 802.3at)	PoE (IEEE 802.3af)
Power consumption	15 W typical	12 W typical

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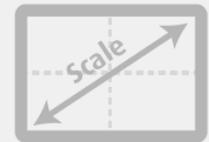
Secure and reliable audio/video transmission

The transmission of the audio and video from the encoder to the decoder board can be protected with AES encryption in order to guarantee confidentiality of the streamed content. Additionally, forward error correction (FEC) provides a reliable audio/video transmission in case of packet loss or corruption. The Viper device can be authenticated on the network with 802.1x protocol.



Advanced image processing and Video Wall capabilities

The Viper boards also support upscaling/downscaling and cropping of the video to match the receiving display. The administrator can easily insert a logo, image or scrolling text on top of the video content. The Video Wall mode enables to spread the video source over an array of displays. Its configuration is very flexible supporting many different layouts of displays.



AES67 and SMPTE ST 2110

Viper is based on open standard including the audio/video transport over IP (SMPTE ST 2110). This also includes the transport of uncompressed audio with the AES67 protocol. The AES67 protocol adds interoperability with many other audio devices.

AES67
SMPTE 2110

Power over Ethernet (PoE)

With the Power-over-Ethernet feature, networking communication and power supply can be provided over a single Ethernet cable. The external power supply is not required anymore. The Viper boards are compliant with the IEEE 802.3af/at.

PoE

Customization



The Viper products can also be tailored to your needs. The on-board SoC FPGA is an extremely flexible solution. The video/audio path is processed in real-time within the FPGA fabric while the processor is handling all the control and configuration of the board. Both the FPGA firmware and the CPU software can be changed to match your needs.

Please contact our sales team to discuss your specific requirements. The expertise of Silex Insight in high-end video technology is the guarantee for a fast time-to-market with a high quality product.

Viper versions

The Viper 4K HDMI over IP product family includes 4 variants.

Part Number	Description
HV4K2-TX	Transmitter HDMI over IP 4K with VC-2 HQ compression
HV4K2-RX	Receiver HDMI over IP 4K with VC-2 HQ compression
HJ4K2-TX	Transmitter HDMI over IP 4K with JPEG 2000 compression
HJ4K2-RX	Receiver HDMI over IP 4K with JPEG 2000 compression

For more information, please contact us.

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