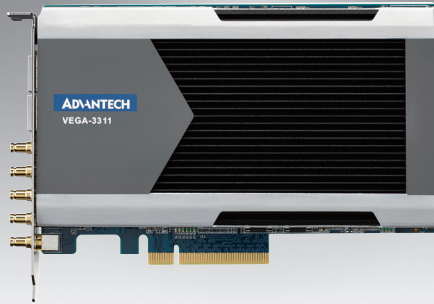


# VEGA-3311

## 4K HEVC/AVC Broadcast Video Encoding/Decoding Card

Preliminary



### Features

- 1-ch 4Kp60 or 4-ch 1080p60 real-time 4:2:2 10-bit HEVC, AVC & MPEG-2 encode & decode
- AIMS roadmap support including SMPTE 2110 & VSF TR-03/-04 w/ AES67 audio & SMPTE 2059 sync
- Optional TICO compression
- 4K video capture over built-in, 4-ch SDI-3G or 1-ch SDI-12G (SDI only, VEGA-3311-S)
- 4K video capture over built-in, 4-ch SDI-3G or 1-ch SDI-12G and 2x 10GbE (VEGA-3311-I)
- Simple-to-use API and example code for FFmpeg and GStreamer multimedia frameworks

## Introduction

VEGA-3311 enables HEVC, AVC, MPEG2 real-time 1-ch 4K UltraHD (2160p60) and 4-ch FHD (1080p60) encode and decode. It is particularly relevant for 4K UltraHD transmission which requires a much higher stream capacity.

VEGA-3311 is tailored for professional media processing and are capable of performing professional grade 4Kp60 Main10 profile HEVC encoding and decoding at less than 35W power consumption. The VEGA-3311 adapter additionally features 4K video capture over built-in 4-ch SDI-3G or 1-ch SDI-12G video inputs for acquisition-based encoding and 4-ch SDI-3G video outputs for acquisition-based decoding in contribution workflows. VEGA-3311 can also support low latency transmission of uncompressed or lightly compressed video over standard IP networks according to industry agreed standards. This card feature a simple-to-use API and example code for FFmpeg and GStreamer multimedia frameworks to streamline product development and their integration into existing applications.

## Specification

Live Video Input/Output - SDI-3G/SDI-12G & 10G	Video Encoding	H.265/HEVC	Resolution (x1ch)	3840x2160 / 1920x1080 / 1280x720 / 720x480
			Resolution (Multi-channel more than x2ch)	1920x1080 / 1280x720 / 720x480
			Frame rate/Scan mode	60p/59.94p/50p/30p/29.97p/25p/24p / 59.94i/50i
			Bit depth	8, 10 bits
			8-bit encoding from 10-bit raw data	Supported
			Chroma Sampling	4:2:0 / 4:2:2
			Rate control	CBR / Capped VBR
			GOP structure	I picture only / IPPP / Closed GOP/Open GOP / Adaptive GOP (Scene change)
			CPB delay control	3s, 1s, 0.5s
			Filter	De-blocking filter / Fixed strength
	Low latency	5,6 frame (GOP = IBBB)		
	Ultra low-latency	< 1 frame		
	HDR	Supported		
	H.264/AVC	Resolution (x1ch)	3840x2160 / 1920x1080 / 1280x720 / 720x480	
		Resolution (Multi-channel more than x2ch)	1920x1080 / 1280x720 / 720x480	
		Frame rate/Scan mode	60p/59.94p/50p/30p/29.97p/25p/24p / 59.94i/50i	
		Bit depth	8, 10 bits	
		8-bit encoding from 10-bit raw data	Supported	
		Chroma Sampling	4:2:0 / 4:2:2	
		Rate control	CBR / Capped VBR	
GOP length		One Picture (I only) / 0.5sec / 1 sec		
GOP structure		I picture only / IPPP / IBB/IBBB / Closed GOP/Open GOP / Adaptive GOP (Scene change)		
CPB delay control		1s, 0.5s		
Filter	De-blocking filter / Fixed strength			
Low latency	5,6 frame (GOP = IPPP)			

## Specifications (Cont.)

Live Video Input/ Output - SDI-3G/SDI- 12G & 10G	Video Decoding	H.265/HEVC	Resolution (x1ch)	3840x2160 /1920x1080 / 1280x720 /720x480			
			Frame rate/Scan mode	60p/59.94p/50p/30p/29.97p/25p/24p / 59.94i/50i			
			Bit depth	8 / 10 bits			
					Chroma Sampling	4:2:0 / 4:2:2	
				H.264/AVC	Resolution (x1ch)	3840x2160 /1920x1080 / 1280x720 /720x480	
					Frame rate/Scan mode	60p/59.94p/50p/30p/29.97p/25p/24p / 59.94i/50i	
					Bit depth	8, 10 bits	
					Chroma Sampling	4:2:0 / 4:2:2	
				MPEG-2	Resolution (x1ch)	1920x1080 / 1280x720 /720x480	
			Frame rate/Scan mode		30p/29.97p/25p/24p / 59.94i/50i		
		Bit depth	8 bits				
	Audio Encoding	Control	Single ch	Supported			
	Audio Decoding	Control	Single ch	Supported			
	Video Capture	Control	Pixel Format	NV12 / YV12 / I420 / P010 / NV16 / YV16 / YUY2/ P210			
				Resolution	3840x2160 /1920x1080 / 1280x720 /720x480		
				Frame Rate	60p/59.94p/50p/30p/29.97p/25p/24p / 59.94i/50i		
	Audio Capture	Control	Sample Frequency	48KHz / 96KHz			
				Sampling Depth	16 bit / 24 bit		
				Channel Layouts	8-ch / 16-ch		
File Based Video Input (PCI Express)	Video Encoding	H.265/HEVC	Resolution (x1ch)	3840x2160 /1920x1080 / 1280x720 /720x480			
			Resolution (Multi-channel more than x2ch)	1920x1080 /1280x720 /720x480			
			Frame rate/Scan mode	60p/59.94p/50p/30p/29.97p/25p/24p / 59.94i/50i			
			Bit depth	8, 10 bits			
			8-bit encoding from 10-bit raw data	Supported			
			Chroma Sampling	4:2:0 / 4:2:2			
			Rate control	CBR / Capped VBR			
			GOP structure	I picture only / IPPP / Closed GOP/Open GOP / Adaptive GOP (Scene change)			
			CPB delay control	3s, 1s, 0.5s			
			Filter	De-blocking filter / Fixed strength			
			Low latency	5,6 frame (GOP = IBBB)			
			Ultra low-latency	< 1 frame			
			HDR	Supported			
					H.264/AVC	Resolution (x1ch)	3840x2160 /1920x1080 / 1280x720 /720x480
						Resolution (Multi-channel more than x2ch)	1920x1080 /1280x720 /720x480
						Frame rate/Scan mode	60p/59.94p/50p/30p/29.97p/25p/24p / 59.94i/50i
						Bit depth	8, 10 bits
						8-bit encoding from 10-bit raw data	Supported
			Chroma Sampling	4:2:0 / 4:2:2			
			Rate control	CBR / VBR / Capped VBR			
			GOP structure	I picture only / IPPP /IBB/IBBB / Closed GOP/Open GOP / Adaptive GOP (Scene change)			
			CPB delay control	1s, 0.5s			
			Filter	De-blocking filter / Fixed strength			
			Low latency	5,6 frame (GOP = IPPP)			
		Video Decoding	H.265/HEVC	Resolution (x1ch)	3840x2160 /1920x1080 / 1280x720 /720x480		
					Frame rate/Scan mode	60p/59.94p/50p/30p/29.97p/25p/24p / 59.94i/50i	
					Bit depth	8, 10 bits	
				Chroma Sampling	4:2:0 / 4:2:2		
			H.264/AVC	Resolution (x1ch)	3840x2160 /1920x1080 / 1280x720 /720x480		
				Frame rate/Scan mode	60p/59.94p/50p/30p/29.97p/25p/24p / 59.94i/50i		
				Bit depth	8, 10 bits		
				Chroma Sampling	4:2:0 / 4:2:2		
			MPEG-2	Resolution (x1ch)	1920x1080 / 1280x720 /720x480		
		Frame rate/Scan mode		30p/29.97p/25p/24p / 59.94i/50i			
		Bit depth		8 bits			
			Chroma Sampling	4:2:0			
	Audio Encoding	Control	Single ch	Supported			
	Audio Decoding	Control	Single ch	Supported			

Feature	Operating System	Windows Server 2012 & 2012 R2 (64-bit), Windows Server 2008 R2 (64-bit) Linux Kernel 3.13.0 (64-bit)
	Development Kits	Ffmpeg 3.4.1, Microsoft DirectShow
Physical Characteristic	Networking Interface	2x 10Gbps Ethernet port (VEGA-3311-I)
	Forward Error Correction	Level A and Level B FEC (steam basis)
	Connectors	SFP+ Module
	Internet protocol	Support IPV4 static IP setting
	Streaming Protocols Input	RTSP/RTMP/RTP/TS over IP (UDP) / HTTP
	Streaming Protocol (output)	RTSP/RTMP/RTP/TS over IP (UDP)/HTTP
	Video-over-IP	SMPTE 2110 & VSF TR-03/-04 w/ AES67 audio & SMPTE 2059 sync Optional TICO compression
	Video Input Interfaces	PCIexpressGen3 x8 4x SDI-3G (Level A/B) or 1x SDI-12G 1x Tri-sync
	Video Output Interface	PCI express Gen3 x8 4x SDI-3G (VIF) / (PCIe--> SDI) or 1x SDI-12G (VIF) / (PCIe)
	Power Consumption	<35W
Environmental	Dimensions	PCI Express Half Length Full Height 167.65 x 111.15 mm
	Operating Temperature	-10 to 70 degrees Celsius
	Non-operating Temperature	-40 to 85 degrees Celsius
	Operating Humidity	50 to 95% (non-condensing)
	Non-operating Humidity	50 to 95% (non-condensing)

## Ordering Information

Part number	Description
VEGA-3311-S0M0	4Kp60 HEVC/AVC Broadcast Video Encoding / Decoding Card w/ SDI only
VEGA-3311-A0M0	4Kp60 HEVC/AVC Broadcast Video Encoding / Decoding Card, File base