

**Preliminary**

## UHD Encoder 4Kp30 HEVC



### Technical specification EMU-9504 /08 /12

<b>Input</b>	4/8/12 HDMI (1.4) inputs	
<b>Video</b>	Encoding Format	HEVC/ H.265 or MPEG 4 AVC/H.264
	Resolution	UHD 3840×2160-30P, 3840×2160-29.97P; <b>Limitation:</b> (Encoding <b>2 CH per module</b> for H.265, and encoding <b>1 CH for H.264</b> ) 1920×1080-60P, 1920×1080-59.94P, 1920×1080-50P, (Encoding 4 CH per module for H.265, and encoding 2 CH for H.264) 1280×720-60P, 1280×720-59.94P, 1280×720-50P (Encoding 4 CH per module for H.264 and H.265)
	Chroma	4:2:0
	Bitrate	0.5Mbps...20Mbps (each channel)
	Rate Control	CBR/VBR
<b>Encoding</b>	GOP Structure	IBBP, IPPP
	Advanced picture correction	De-interlacing, Noise Reduction, Sharpening
	Encoding Format	MPEG-1 Layer 2, LC-AAC, HE-AAC, HE-AAC V2, AC3 Passthrough
	Sampling rate	48KHz
	Bitrate (for each channel)	48Kbps...384Kbps (MPEG-1 Layer 2 & LC-AAC) 24 Kbps...128 Kbps (HE-AAC) 18 Kbps...56 Kbps (HE-AAC V2)
Audio Encoding	Audio Gain	0...255 adjustable
<b>Stream Output</b>	IP (1 MPTS and maximum 4 SPTS per Module) output over UDP/RTP/RTSP, 1000M/100M Base-T Ethernet interface (unicast/ multicast); IPv4, IPv6 output; IP null packet filter	
<b>System</b>	Web based management in English	
	Firmware upgrade by Web-IF	
<b>Miscellaneous</b>	Dimension (W× L× H)	482mm×328mm×44mm
	Weight	Ca. 5kg
	Temperature range	0...45°C (operation), -20...80 (in Storage)
	Power	AC 100V-220V±10%, 50/60Hz

## HEVC/H.265 encoder advantages

### 1. Providing smooth TS for IPTV and modulators

HEVC/H.265 encoder adopts Fujitsu chip which offers stable bitrate with lower fluctuation compared with other encoding chips, so it provides smooth TS for modulators. It is widely used in variety of digital distribution systems such as CATV digital head-end, satellite and terrestrial digital TV, etc.

### 2. Encoding with highest compression format—B frame (IBBP)

#### What is B Frame?

There are 3 major picture types used in the different video algorithms, they are I, P and B.

They are different in the following characteristics:

I frames are the least compressible but don't require other video frames to decode.

P frames can use data from previous frames to decompress and are more compressible than I frames.

B frames can use both previous and forward frames for data reference to get the highest amount of data compression.

Frame Type	Byte of data/KB	Compression Ratio
I	18	7:1
P	6	20:1
B	2.5	50:1

In one word, B frame is the highest compression format which makes it possible to process HD video at low bit rate. HEVC/H.265 encoder is not able to save bandwidth unless it is with B frame. In encoder parameters, B frame is often described in GOP (Group of Pictures) structure, like "IBBP".