

# KulaByte **KB**

Internet Encoder



Intelligent IP Video

## KULABYTE INTERNET ENCODER Broadcast Quality H.264 for Live Internet Video

The KulaByte™ Internet encoder is ideal for streaming live events to Dynamic Flash and Adaptive HTTP Live Streaming networks. 100% software-based, the KulaByte encoder provides the most efficient use of uplink bandwidth due to extremely high quality to bitrate performance and tight bitrate control. The KulaByte encoder is ideal for streaming live events including high action live sports, music and entertainment, house of worship, distance learning, and mobile news gathering and delivering streams tailored for PCs, mobile devices, and set top boxes.

**Every Source, Every Screen, Over-the-Top.** The KulaByte encoder is perfectly suited for today's and tomorrow's live Internet Over-the-Top (OTT) streaming challenges and enables content owners to capture the value of what video over IP promises. The KulaByte encoder is based on the highly efficient H.264 compression standard and natively supports both Adobe's Flash™ streaming protocol (RTMP) with the largest global penetration of playback devices and Apple's HTTP Live Streaming (HLS) protocol supported by iPhone™ and iPad™ devices as well as set top boxes such as the Roku™ streaming player. Paired with capture cards from Blackmagic, AJA, or Osprey, the KulaByte encoder supports HD inputs up to 1080p, as well as standard NTSC and PAL formats over HDS DI, composite, component, or HDMI. With this array of compatibility, the KulaByte encoder superbly addresses Internet streaming needs from all common video sources, through the most common delivery methods and Content Delivery Networks, to the most playback devices.

**Easy to Deploy.** The KulaByte encoder is delivered as a turnkey encoder solution in portable and server based configurations, but is also available as a software-based encoding solution. The KulaByte encoder server based configurations offer densities of up to 8 input streams in 2RU and portable configurations including a rugged, lunchbox style encoder that can be easily carried from event to event. Additionally, the KulaByte encoder software can be installed on most Windows based systems offering tremendous flexibility in deploying the highest quality Internet video encoder available.

The significant benefits of the KulaByte encoder are:

- KB** Native output to Flash (RTMP) and iPhone/iPad (HLS) services
- KB** Software based encoder providing flexible deployment options
- KB** Up to 8 dynamic output renditions per input channel
- KB** High quality H.264/AAC encoding with tight bitrate control



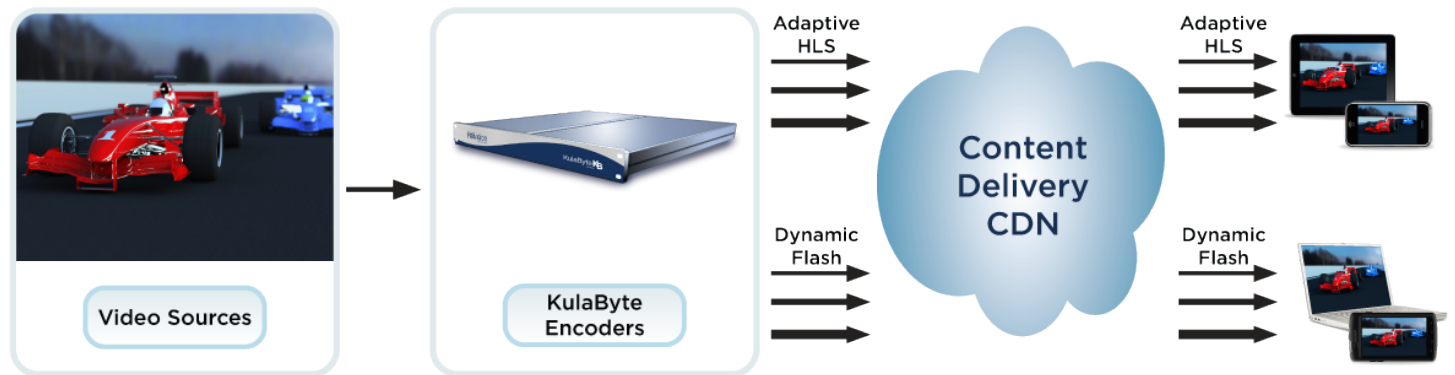
**Easy to Use.** The KulaByte encoder is delivered with an easy to use graphical interface for managing the encoding of individual input streams on one server. With preset selection, video preview, audio gain adjustment, archive file chaptering control, status monitor for all output streams, and the ability to independently stop and start output streams, the KulaByte encoder UI provides all key capabilities needed for on-location live event streaming.

One or more KulaByte encoders can be managed easily with the Hydra Web-Based encoder Management System. Hydra provides a single interface to simply manage all of the encoding and streaming capabilities of multiple KulaByte encoders each having multiple baseband inputs and full cascade outputs associated with each input. Hydra also provides status of all encoding pipelines and associated systems..

**Open & Standards Based.** The KulaByte encoder fully supports H.264 video compression and AAC audio compression, Adobe Dynamic Streaming for Flash (RTMP), and Apple Adaptive HTTP Live Streaming for iPhone/iPad (HLS) - industry standards that have been adopted throughout the Internet streaming ecosystem. End-to-end solutions rely on seamless interoperability. Haivision’s applications and development teams have the deep expertise in Internet streaming workflows to ensure interoperability throughout the ecosystem. The KulaByte encoder is interoperable with any device supporting live Flash playback including desktops, laptops, and Android mobile devices and also natively streams to devices supporting HLS including Apple iPhone/iPad, Apple QuickTime on OS X, Roku set top boxes, and select Android devices that support HLS playback. The KulaByte encoder is compatible with the most prevalent streaming servers in the Internet streaming ecosystem, including Flash Media Server from Adobe and Wowza Media Server from Wowza, as well as the top tier content delivery networks including Akamai – Flash and Akamai HD™, Limelight Networks, EdgeCast, StreamGuys, and more.

**Experience & Maturity.** Currently on its third major release, the KulaByte encoder is used on a regular basis by the professional broadcasting community for highly challenging live content, such as American football, golf, auto racing, as well as news and commentary. Additionally, the KulaByte encoder is widely deployed in military operations and throughout the House of Worship community. The KulaByte encoder has also earned a reputation for quality in live event streaming circles having been used for events as varied as Operation MySpace from Kuwait, the Nobel Peace Prize Awards from Oslo, South by Southwest Music Festival, the Newport Folk Festival, and Extreme Sports events throughout Europe.

### Over-the-Top Media Delivery



## ENCODING SPECIFICATIONS

#### VIDEO ENCODING

Compression Standard: H.264 (MPEG-4 AVC part 10)  
Configurable Profile, Level, GOP, Frame Rate  
Bit Rates: SD/HD from 0 Kbps to 8 Mbps  
Rate Control: CBR  
Video Sampling: 4:2:2

#### AUDIO ENCODING

Compression Standard: MPEG-4 AAC-LC ISO/IEC 14496-3  
Audio Channels: 2 per video channel  
Bit Rates: 64 Kbps, 96 Kbps, 128 Kbps per audio pair  
Audio Sampling: 48 kHz, 24 bit

## SYSTEM SPECIFICATIONS

### KulaByte 1 Input Baseband SD/HD Pilot Encoding Server (S-KB-HD1-K4-PILOT)

#### Analog Video (Inputs):

- 1 x Component analog on 3 BNC's
- 1 x S-Video video on S-Video connector
- 1 x Composite NTSC/PAL on 1 BNC

#### Digital Video (Inputs):

- 1 x SD/HD-SDI on 1 BNC

#### Analog Audio (Input):

- 1 x Two channels balanced analog audio via 1/4"
- 1 x Two channels unbalanced AES/EBU on 1 BNC

#### Digital Audio (Input):

- 1 x Two channels embedded in SD/HD SDI

#### Sync (Input):

- 1 x Blackburst or Tri-Sync on 1 BNC

#### Stream Renditions by Output Profile<sup>6</sup>:

- |                             |                             |
|-----------------------------|-----------------------------|
| 1 x SD Cascade <sup>3</sup> | 1 x HD Cascade <sup>2</sup> |
| 1 x SD Hi/Lo <sup>5</sup>   | 1 x HD Hi/Lo <sup>4</sup>   |
| 1 x 480p                    | 1 x 720p                    |

### KulaByte 1 Input Baseband SD/HD Rugged "Traveler" Encoding System (S-KB-HD1-K4-TRVL)

#### Analog Video (Inputs):

- 1 x Component analog on 3 BNC's
- 1 x S-Video video on S-Video connector
- 1 x Composite NTSC/PAL on 1 BNC

#### Digital Video (Inputs):

- 1 x SD/HD-SDI on 1 BNC
- 1 x HDMI type A connector (no HDCP decryption)

#### Analog Audio (Input):

- 1 x Two channels balanced analog audio via 1/4"
- 1 x Two channels unbalanced AES/EBU on 1 BNC

#### Digital Audio (Input):

- 1 x Two channels embedded in SD/HD SDI
- 1 x Two channels embedded in HDMI

#### Sync (Input):

- 1 x Blackburst or Tri-Sync on 1 BNC

#### Stream Renditions by Output Profile<sup>6</sup>:

- |                             |                             |
|-----------------------------|-----------------------------|
| 1 x SD Cascade <sup>3</sup> | 1 x HD Cascade <sup>2</sup> |
| 1 x SD Hi/Lo <sup>5</sup>   | 1 x HD Hi/Lo <sup>4</sup>   |
| 1 x 480p                    | 1 x 720p                    |

### KulaByte 2 Input Baseband SD Encoding Server (S-KB-SD2-K4-1U)

#### Digital Video (Inputs):

- 2 x SD/HD-SDI on 1 BNC

#### Digital Audio (Input):

- 2 x Two channels embedded in SD/HD SDI

#### Sync (Input):

- 1 x Blackburst or Tri-Sync on 1 BNC

#### Stream Renditions by Output Profile<sup>6</sup>:

- |                             |          |
|-----------------------------|----------|
| 2 x SD Cascade <sup>3</sup> | 2 x 480p |
| 2 x SD Hi/Lo <sup>5</sup>   |          |

### KulaByte 4 Input Baseband SD Encoding Server (S-KB-SD4-K12-1U)

#### Digital Video (Inputs):

- 4 x SD/HD-SDI on 1 BNC

#### Digital Audio (Input):

- 4 x Two channels embedded in SD/HD SDI

#### Sync (Input):

- 2 x Blackburst or Tri-Sync on 1 BNC

#### Stream Renditions by Output Profile<sup>6</sup>:

- |                             |          |
|-----------------------------|----------|
| 4 x SD Cascade <sup>3</sup> | 4 x 480p |
| 4 x SD Hi/Lo <sup>5</sup>   |          |

### KulaByte 8 Input Baseband SD Encoding Server (S-KB-SD8-K12-2U)

#### Digital Video (Inputs):

- 8 x SD/HD-SDI on 1 BNC

#### Digital Audio (Input):

- 8 x Two channels embedded in SD/HD SDI

#### Sync (Input):

- 4 x Blackburst or Tri-Sync on 1 BNC

#### Stream Renditions by Output Profile<sup>6</sup>:

- |                             |          |
|-----------------------------|----------|
| 8 x SD Cascade <sup>3</sup> | 8 x 480p |
| 8 x SD Hi/Lo <sup>5</sup>   |          |

### KulaByte 2 Input Baseband SD/HD Encoding Server (S-KB-HD2-K12-1U)

#### Digital Video (Inputs):

- 2 x SD/HD-SDI on 1 BNC

#### Digital Audio (Input):

- 2 x Two channels embedded in SD/HD SDI

#### Sync (Input):

- 1 x Blackburst or Tri-Sync on 1 BNC

#### Stream Renditions by Output Profile<sup>6</sup>:

- |                             |                             |
|-----------------------------|-----------------------------|
| 2 x SD Cascade <sup>3</sup> | 2 x HD Cascade <sup>2</sup> |
| 2 x SD Hi/Lo <sup>5</sup>   | 2 x HD Hi/Lo <sup>4</sup>   |
| 2 x 480p                    | 2 x 720p                    |

### KulaByte 4 Input Baseband SD/HD Encoding Server (S-KB-HD4-K12-1U)

#### Digital Video (Inputs):

- 4 x SD/HD-SDI on 1 BNC

#### Digital Audio (Input):

- 4 x Two channels embedded in SD/HD SDI

#### Sync (Input):

- 2 x Blackburst or Tri-Sync on 1 BNC

#### Stream Renditions by Output Profile<sup>6</sup>:

- |                             |                             |
|-----------------------------|-----------------------------|
| 4 x SD Cascade <sup>3</sup> | 3 x HD Cascade <sup>2</sup> |
| 4 x SD Hi/Lo <sup>5</sup>   | 4 x HD Hi/Lo <sup>4</sup>   |
| 4 x 480p                    | 4 x 720p                    |

### KulaByte 8 Input Baseband SD/HD Encoding Server (S-KB-HD8-K12-2U)

#### Digital Video (Inputs):

- 8 x SD/HD-SDI on 1 BNC

#### Digital Audio (Input):

- 8 x Two channels embedded in SD/HD SDI

#### Sync (Input):

- 4 x Blackburst or Tri-Sync on 1 BNC

#### Stream Renditions by Output Profile<sup>6</sup>:

- |                             |                             |
|-----------------------------|-----------------------------|
| 8 x SD Cascade <sup>3</sup> | 3 x HD Cascade <sup>2</sup> |
| 8 x SD Hi/Lo <sup>5</sup>   | 6 x HD Hi/Lo <sup>4</sup>   |
| 8 x 480p                    | 7 x 720p                    |

#### Video Resolutions<sup>1</sup>:

- |                        |                           |
|------------------------|---------------------------|
| 1920x1080i 59.94/50 Hz | 720x480i/576i 59.94/50 Hz |
| 1280x720p 59.94/50 Hz  |                           |

<sup>1</sup> Additional resolutions available via preset file customization, interlaced shown in fields per second

<sup>2</sup> HD Cascade = 720p+480p+360p+270p+180p

<sup>3</sup> SD Cascade = 480p+360p+270p+180p

<sup>4</sup> HD Hi/Lo = 720p+180p

<sup>5</sup> SD Hi/Lo = 480p+180p

<sup>6</sup> Tested under worst case conditions, additional streams possible

### KulaByte 1 Input Baseband SD/HD Pilot Encoding Server

#### Dimensions w/o Bezel :

- 42.6 H x 431 W x 393.7 D mm
- 1.67" H x 17.1" W x 15.5" D in

#### Power:

- 100-240VAC 250W internal power supply

#### OS:

- Windows Server 2008R2 64-bit, Web Edition

### KulaByte 2 Input Baseband SD Encoding Server

#### Dimensions w/o Bezel :

- 42.4 H x 434.0 W x 610 D mm
- 1.67" H x 17.10" W x 24" D in

#### Power:

- 100-240VAC Redundant 400W internal power supplies

#### OS:

- Windows Server 2008R2 64-bit, Web Edition

### KulaByte 4 Input Baseband SD Encoding Server

### KulaByte 2 Input Baseband SD/HD Encoding Server

### KulaByte 4 Input Baseband SD/HD Encoding Server

#### Dimensions w/o Bezel :

- 42.6 H x 424.0 W x 758.3 D mm
- 1.68" H x 16.69" W x 29.85" D

#### Power:

- 100-240VAC Redundant 570W internal power supplies

#### OS:

- Windows Server 2008R2 64-bit, Web Edition

### KulaByte 8 Input Baseband SD Encoding Server

### KulaByte 8 Input Baseband SD/HD Encoding Server

#### Dimensions w/o Bezel :

- 86.4 H x 443.1 W x 704.2 D mm
- 3.40" H x 17.44" W x 27.72" D in

#### Power:

- 100-240VAC Redundant 570W internal power supplies

#### OS:

- Windows Server 2008R2 64-bit, Web Edition

#### Temperature Specification for All Server

##### Operating:

- 10° to 35°C (50° to 95°F)

##### Non-operating:

- 40° to 65°C (-40° to 149°F)

### KulaByte 1 Input Baseband SD/HD Rugged Encoder

#### Dimensions:

- 356.9 H x 418.1 W x 176.8 D mm
- 14.05" H x 16.46" W x 6.96" D

#### Weight:

- 18.7 lbs

#### Power:

- 100-240VAC 400W internal power supply

#### OS:

- Windows 7 Pro 64-bit

#### Operating Temperature:

- 0° to 50°C (32° to 122°F)

#### Non-operating Temperature:

- 40° to 85°C (-40° to 185°F)

### Ordering Information (please obtain complete system quotations from Haivision or an authorized Haivision integration partner)

- |                          |   |
|--------------------------|---|
| <b>S-KB-HD1-K4-TRVL</b>  | <b>KulaByte 1 Input Baseband SD/HD Rugged "Traveler" Encoding System</b> - Core i7 Ruggedized PC, Soft carry case, 1 Composite, Component, HDMI, & HDSDI input with embedded audio, AES audio, or balanced/unbalanced analog audio, Up to 8 encode output profiles to Flash, iPhone/iPad, and local .mp4. |
| <b>S-KB-HD1-K4-PILOT</b> | <b>KulaByte 1 Input Baseband SD/HD Pilot Encoding Server - 1RU</b> - Xeon Server, 1 Composite, Component & HDSDI input with embedded audio, AES audio, or balanced/unbalanced analog audio, Up to 8 encode output profiles to Flash, iPhone/iPad, and local .mp4.   |
| <b>S-KB-SD2-K4-1U</b>    | <b>KulaByte 2/4/8 Input Baseband SD Encoding Server - 1RU/1RU/2RU</b> - Xeon Server with redundant power supply and redundant RAID hard drives, 2/4/8 HDSDI Inputs, HD downscaled to SD, Up to 8 encode output profiles (up to 480p) per input to Flash, iPhone/iPad, and local .mp4                      |
| <b>S-KB-SD4-K12-1U</b>   |   |
| <b>S-KB-SD8-K12-2U</b>   |   |
| <b>S-KB-HD2-K12-1U</b>   | <b>KulaByte 2/4/8 Input Baseband SD/HD Encoding Server - 1RU/1RU/2RU</b> - Xeon Server with redundant power supply and redundant RAID hard drives, 2/4/8 HDSDI Input, Up to 8 encode output profiles per input to Flash, iPhone/iPad, and local .mp4  |
| <b>S-KB-HD4-K12-1U</b>   |   |
| <b>S-KB-HD8-K12-2U</b>   |   |

