

Quad Input 4K Capture & Encode Appliance

# CES-400

PanoTek's CES-400 H.264 encode unit is a powerful new appliance-style solution for capturing and encoding up to 4 channels of digital video and audio at up to 4K resolution. A high degree of control over stream parameters is provided, including transport protocol, resolution, frame rate and GOP structure. Significantly, it is possible to generate multiple streams from each source signal, with each stream having its own unique stream parameters.



Simultaneous quad 4K/UHD and Full HD capture, encode, stream, and record from a single stand-alone appliance. Benefit from up to 4K/UHD 4:4:4 sub-sampling support plus H.264 capability for best-in-breed encoding—all using standard 1 Gigabit Ethernet networks.

Powerful software supports multi-protocol and multi-bitrate streaming, Chroma sub-sampling, picture-in-picture (PIP) and quadrant composite options, and more. The multi Chroma sub-sampling feature delivers 4:4:4, 4:2:2, 4:2:0, and 4:0:0 options, to best balance quality and bandwidth demands. Our technology promises unprecedented quality, without necessarily needing a dedicated distribution network; we use existing infrastructure and expand its capabilities.

## Key Features

- Quad channel @ 4K
- Capture, encode, stream & record
- 4:4:4 colour support
- Fully flexible encode parameters

# Specifications

## Performance

- Maximum Capture Resolution**
  - 2x 3840x2160 @60Hz or 2x 4096x2160 @60Hz<sup>1</sup>
  - 4x 3840x2160 @30Hz or 4x 4096x2160 @30Hz
- Color Space Capture**
  - RGB and YUV 8- and 10-bit support
  - Color space conversion support

## Encoding

- Formats (Codecs)**
  - Video: H.264/MPEG-4 Part 10 (AVC)
  - Audio: MPEG-4 AAC-LC/HEV1/HEV2
- Chroma Sub-Sampling**
  - 4:0:0, 4:2:0 (8-bit and 10-bit)
  - 4:2:2 (8-bit), 4:4:4 (8-bit)
- Maximum Encoding Capability**<sup>2</sup>
  - 2x 3840x2160 @60Hz 4:2:0
  - 2x 4096x2160 @60Hz 4:2:0
  - 4x 3840x2160 @30Hz 4:2:0
  - 4x 4096x2160 @30Hz 4:2:0
  - 1x 3840x2160 @30Hz 4:4:4
  - 3x 1920x1080 @60Hz 4:4:4
  - 3x 1920x1200 @60Hz 4:4:4
- Profiles**
  - Baseline (BP), main (MP), high (HiP), high 10 (Hi10P), high 4:2:2 (Hi422P), high 4:4:4 predictive profile separate plane (Hi444PP), CAVLC 4:4:4 intra (44)
- Encoding Level**
  - Up to 5.2
- Bitrate Range (Per Stream)**
  - 50 Kbps to 120 Mbps<sup>3</sup>
  - 15 Mbps (default)
- Rate Control**
  - CBR, VBR, favor quality (optimize for desktop or latency), adjustable GOP size
- Audio Sample Frequency**
  - 32 kHz, 44.1 kHz, and 48 kHz
- Audio Bit Rates**
  - Up to 576 Kbps (AAC-LC), 288 Kbps (AAC-HEV1), 144 Kbps (AAC-HEV2)
- Video Compositing**
  - Yes, fixed formats including PIP, PBP, quadrant
- Scaling**
  - Yes

## Recording

- File Format**
  - .mp4
- Programmability**
  - Start date and time, duration, maximum file length, file frequency
- Recording Locations**
  - Shared network drive or NAS
  - Local USB ports for USB flash drive and external hard drive<sup>4</sup>

## Networking Interface

- Streaming Protocols**
  - RTSP/RTCP/RTP (all required), RTP, RTMP, MPEG2.TS over UDP
- Command & Control**
  - HTTP/HTTPS over TCP, UPnP
- Network Standard**
  - 100/1,000 base-T Ethernet, auto speed, half/full duplex
- IP Addressing**
  - IPv4, DHCP (default)/static IP address support
- IP Stream Support**
  - Unicast, multi-unicast, multicast

## Software

- Software Interface**
  - PanoStream Control (free download)
- Command & Control**
  - Network discovery
  - Multi-encoding and recording management
  - Multi-protocol management
  - Frame rate management
  - Resolution control
  - Administrator and user credential management
  - Scaling management
  - SNMP support
- Supported Operating Systems**
  - Microsoft® Windows® 10 (64-bit), Server® 2012 R2, Windows 8.1 (32-bit, 64-bit), Windows Server 2012, Windows 7 (32-bit, 64-bit), Windows Server 2008 R2

## Connectivity

- Network Connector**
  - 2x RJ45 with status LED indicators
  - 1x control and stream
  - 1x stream only
- Video Input**
  - 4x HDMI (Type A) with audio support
- Video Output/Pass-Through**
  - 4x HDMI (Type A) with audio support
- Video Monitoring Output**<sup>4</sup>
  - 1x DisplayPort 1.1
- Audio Input**
  - 4x HDMI digital LPCM two-channel stereo audio
  - 4x 3.5 mm analog stereo audio
  - 1x 3.5 mm stereo mic in
- Audio Output**
  - 4x HDMI digital LPCM two-channel stereo audio
  - 1x 3.5 mm headphones out
  - 2x USB 2.0 (front)
  - 1x USB 3.0 (back)

## Hardware

- Power Supply**
  - 100-240 VAC in, 12 VDC out, 60W
  - DIN4 locking power connector
- Power Cords Included**
  - US, EU, UK, Aus/NZ
- Product Dimensions**
  - 8.53 x 7.45 x 1.68 in (21.7 x 18.9 x 4.3 cm)
- Form Factor**
  - Standalone appliance
  - Rack-mountable (1U dual-density)
- Part Number**
  - PAN-CES-400-00

1. Requires specific source timings; contact PanoTek for more details.

2. Each encoding capability is independent of the others listed, and excludes any additional processing such as compositing, scaling, etc. Content can affect results.

3. Maximum operational bitrate per stream is dependent on number of streams and features enabled.

4. Maximum resolution: 2560x1600.

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