

Streambox[®] Chroma[™]

Chroma HD Solutions Brief

Executive Summary

Designed for Contribution, Production, and Collaboration, Chroma HD advanced performance encoder/decoder provides near lossless video quality, and secure, real-time, remote, collaborative workflows. Chroma HD supports HD resolutions, along with High Dynamic Range color standards to create streaming content for broadcasting, enterprises, and post production by providing low latency video in HD formats over public and private IP networks with an upgrade path to 2K and 4K systems.

The software-defined Streambox Chroma HD Encoder / Decoder rackmount with its modular design offers flexibility and upgradability, minimal latency, and integrated reliable LDMP media transport technology that simplifies streaming workflows over Internet and MPLS networks. Chroma provides high-quality, superb color, low-bandwidth video that can be seamlessly transported where mission critical media is required. Real-time transport assures an efficient solution for video contribution, live event streaming, multi-location video distribution, and remote offline and online editorial collaboration.



Overview

Streambox Chroma HD systems provide simplified workflows with real-time transport and creation of HD content even with HDR for broadcasters, enterprise organizations, and post-production professionals. In addition to high quality contribution, the minimal latency characteristics of the system offers reliable media streaming and collaboration over different types of IP networks.

Chroma provides optimized performance using the unique Advanced Compression Technology Level 3 and Level 5 (ACT L3/L5) profile codec that supports the most advanced color profiles, color spaces, and color depths, along with 16 channel and 5.1/7.1 surround sound audio.

Specialized Low Delay Multi-Path Protocol (LDMP)

integrated into Chroma provides intelligent utilization of available network paths to achieve higher rates of transport and playback with minimal end-to-end latency even over public internet networks.

Workflow integration includes delivery of content to Streambox NODE, Pro, and Mobile Media Players for real-time collaboration, as well as sending to Enterprise Server and Streambox Cloud Services for contribution, archiving, and playing of live streams to and from remote locations.

End-to-end encryption with a symmetric key, forms a protective shield around the transport of valuable video content with no increase in stream latency and permits playout on various software and hardware media players.



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Benefits

- **Lower OpEX Networking Costs**
Use Reliable Low Cost Public Internet and/or Fiber Networking for Remote Sessions
- **Ease of Use**
Web Interface for 30 Minute Networking Setup and Use for Playout Management
- **Secure**
End to End Content Security with Encryption
- **Production Transparency**
Low Latency, Real-Time Communications and Collaboration
- **High Quality, Color Accurate Video**
Limited quality color for post production with support for HDR and 10-bit YCrCb/ RGB
- **Modular Rackmount**
Software Upgradable to 2K

Challenges

Live Event Contribution and Distribution

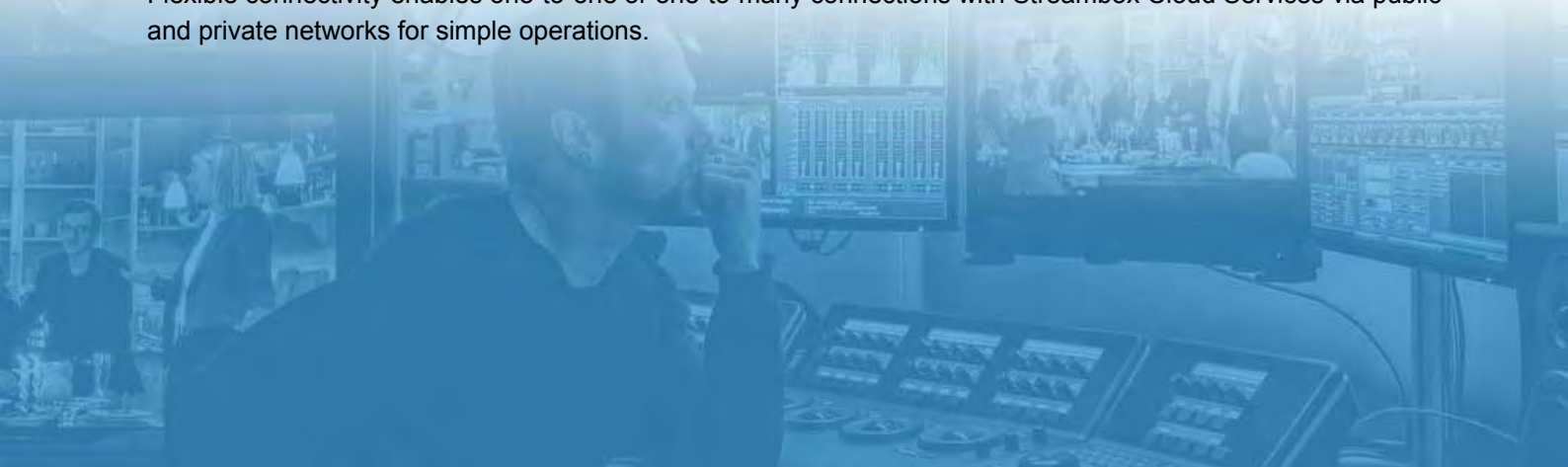
Broadcasters and content providers need to capture and preserve the highest possible quality video when acquiring content from news, sports, and other live events. The Streambox Chroma Advanced Encoder / Decoder platform is ideal for IP-based UHD and HD including HDR support video contribution from studios, bureaus, and affiliates over low cost Internet networks. Users can stream secure live media from the field locations to multiple destinations with automated routing. Chroma also integrates easily into outside broadcast vehicles to remotely manage and distribute streaming video.

Newsgathering and Live News Production

For critical application such as a live two-way interview, reliable performance is crucial. Chroma offers high quality UHD and HD video along with up to 16 channels of audio, coupled to robust, high speed transport with minimal latency over a variety of existing networks or by using integrated Streambox Cloud Services.

Impact

- Performance requirements are met with superior quality, and support for a range of advanced formats and standards used in production.
- Achieving high rates of transport and playback with minimal end-to end latency even over public internet networks between locations that enables production transparency helps reduce operating expenses.
- System grows with changing requirements by providing upgrade paths to add more functionality, and helps manage capital expenditures.
- Reliable network integration makes playing of live streams to and from remote locations easy and cost-effective.
- Robust security protects valuable content for playout on various software and hardware media players.
- Flexible connectivity enables one-to-one or one-to-many connections with Streambox Cloud Services via public and private networks for simple operations.



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Features



ACT-L3/L5Codec for Superior Video Quality and Delivery

- High-quality, 12-bit* 4:4:4, or 8/10-bit 4:2:2 video with support for HDR over public and private IP networks
- Low Delay Multi-path Protocol (LDMP) reliable video transport
- 0.5 to 2 second end-to-end latency over IP networks
- Scalable bitrates from 2 up to 120 Mbps with near lossless quality
- Adaptive bitrate encoding / decoding
- Streaming bitrates from 4 to 80 Mbps



Security for Protection of Content

- A protective shield around the transport of valuable media content
- One-to-one or one-to-many encrypted collaboration via private network or Streambox Cloud Services
- Optimized ACT-L3/L5 codec adds security
- End-to-end AES 128-bit video encryption (optional)
- AES 256-bit encryption is available with added restrictions (optional)
- Encryption with no increase in stream latency
- Payout on software and hardware Media Players



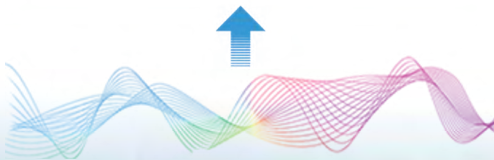
Simplified Workflows and Payout

- Low Delay Multi-path Protocol (LDMP) reliable video transport
- Workflow support from capture to playback with either a hardware decoder or media player
- Integration with Streambox Enterprise Server and Cloud Services for video routing of live streams
- Supports file-based streaming from Streambox Enterprise Server or Cloud Services to decoder or media player
- Stream high quality live video over Internet connections and MPLS networks



Upgrade Options

- AES 128-bit encryption
- 2K encoder and decoder upgrade
- 12G-SDI I/O with 12-Bit, 4:4:4 RGB/XYZ, and support for 4 channel encoder configuration



* requires 12G-SDI option



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VIDEO INTERFACE

- Video IN/OUT: BNC 6G HD-SDI, 10-bit HD with embedded 8 channel SDI audio operating as either encoder or decoder
- 12G OPTION: Dual link BNC 12G/6G/3G/HD-SDI, 12/10-bit HD, and 4 channel encode configuration
- HDMI-in/out option
- Simultaneous encoder and decoder operation option
- HDMI 2.0a with Rec.2020, HDR-10 Metadata support on decoder with option
- REFERENCE: BNC Tri-sync for HD

VIDEO FORMATS

- HD: 1920x1080p, 1920x1080PsF, 1920x1080i, 1440x1080i, 1280x1080i, 960x1080i, 1280x720p, 960x720p, 800x720p, 640x720p

ENCRYPTION

- AES 128-bit encryption with symmetric key option
- AES 192-bit and AES 256-bit options available as a restricted option
- HTTPS option for web control available

PHYSICAL

- Size: 1 Rack Unit: W48.2cm x D28.2cm x H44.0cm (19in x 11in x 1.7in)
- Weight: 4.7kg (10.5lbs)
- Power: 100-240 VAC, 160 W

OPERATING SYSTEM

- Linux

VIDEO TRANSPORT

- Streambox LDMP 2.0 with network bonding
- UDP unicast, broadcast or multicast
- Adjustable Forward Error Correction
- Embedded Metadata
- Compatible with Streambox Cloud and Enterprise Servers

COMPRESSION

- Audio Codec: 8-ch PCM and AAC, CELP, GSM frequency up to 48 KHz
- Bitrate: 2 to 120 Mbps
- Color: RGB, YUV 4:4:4* in 2K modes, 4:2:2 and 4:2:0 in all modes
- Bit Depth: 12*, 10, 8

* requires 12G-SDI option

MANAGEMENT CONTROL

- Web UI for secure local or remote access
- Customizable presets
- Live Video preview via Web UI
- Front LCD with keypad
- USB and video ports

POST PROCESSING

- Advanced post filtering

NETWORK INTERFACES

- Two Ethernet ports RJ45: 1G/100M/10M