

# Electra™ XOS

LIVE VIDEO PROCESSOR



## Electra™ XOS is a high-performance live video processor designed for broadcast and OTT delivery.

It is powered by the Harmonic PURE Compression Engine™, a software-based solution that is continually updated with the latest technology innovations. This enables broadcasters and cable operators to pack more SD, HD and UHD channels into a limited amount of bandwidth.

Artificial intelligence, deep tuning for Intel® processors and a strong expertise in video algorithms enable the Electra XOS processor to deliver exceptional video quality in applications where bandwidth is limited.

Electra XOS includes a vanguard feature set, including UHD with statistical multiplexing, HDR processing, uncompressed IP inputs, and integrated packaging, simplifying live video workflows. It can be deployed as a software application on standard IP infrastructure or on a standard server with optional SDI interfaces.

### Top Business Benefits

#### Optimize cost of ownership

With Electra XOS, you improve your cost of ownership through the use of standard IT servers, as well as Electra's unparalleled function integration. In addition to its market-leading compression engine, Electra XOS integrates a broad range of audio codecs including Dolby® AC-4, an advanced video pre-processing engine and an extended support for data insertion.

#### Application versatility

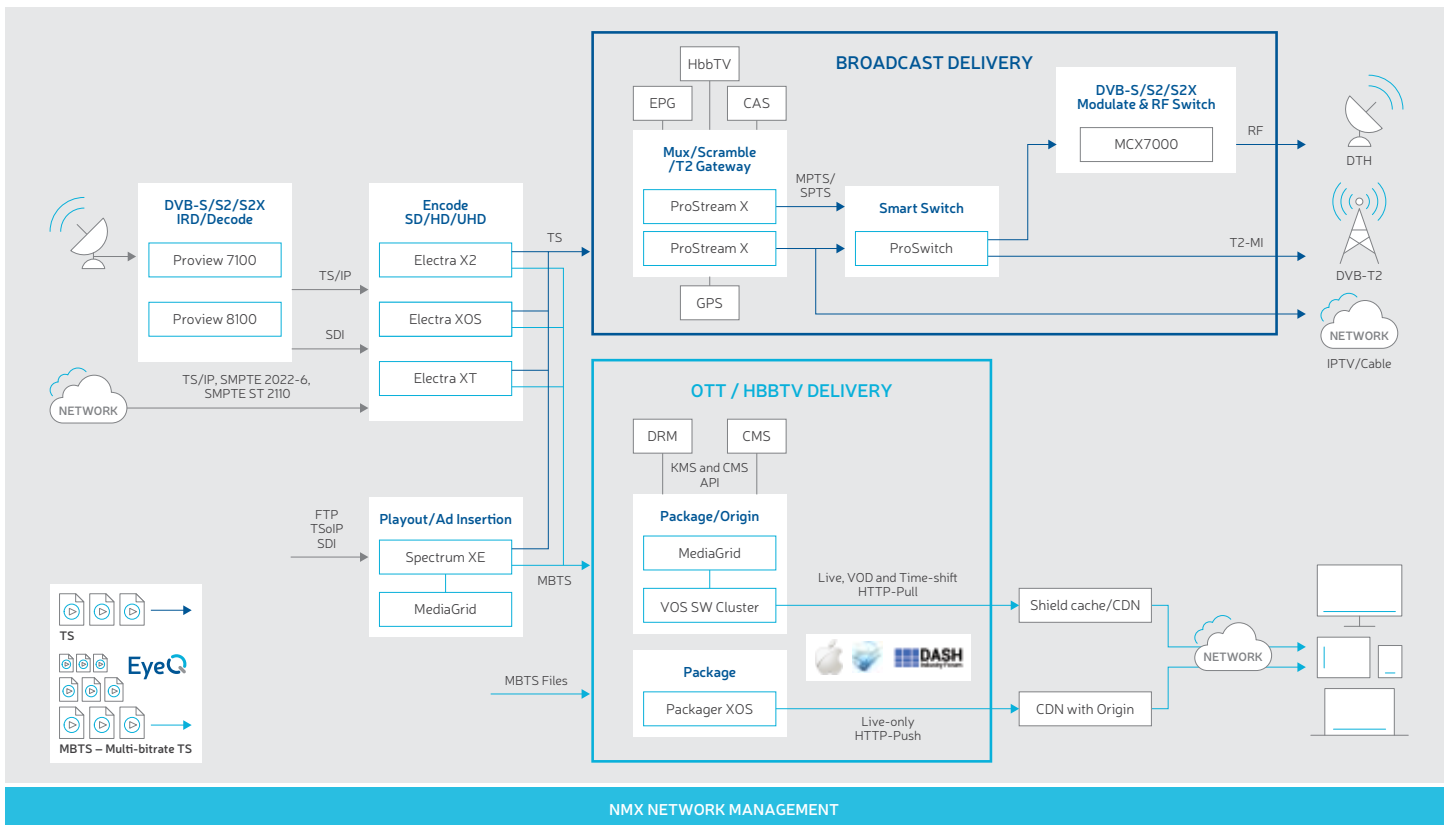
Electra XOS can be used for broadcast and OTT delivery applications, and is easily adaptable to multiple deployment environments. Electra XOS addresses legacy infrastructures with SDI support and also full IP architectures without any single point of failure and hitless source redundancy. It supports compressed formats and the latest SMPTE 2110 standard with or without mezzanine compression.

#### Future-proof solution

Electra XOS features a common software architecture that is shared with the cloud so that you can rapidly respond to market needs and immediately benefit from performance increases.

## HIGHLIGHTS

- Harmonic Pure Compression Engine and EyeQ™ content-aware encoding provide market-leading video quality at low bit rates
- Pristine UHD support, including HDR processing
- Best-in-class OTT packager supporting fragmented HLS, low latency and CMAF
- Extensive redundancy schemes
- Harmonic Hub to enable a smooth transition to the cloud
- Ready for full IP workflows with uncompressed video over IP



## Unique Features

### Video Compression Excellence

Powered by our PURE Compression Engine, Electra XOS delivers excellent picture quality at any bit rate and optimizes CPU power consumption. Relying on AI-based algorithms, Electra XOS reduces bit rates, even for existing MPEG-2 applications.

### Flawless UHD

Electra XOS allows you to support multiple UHD 10-bit transcoding in a single 1-RU server in addition to SD and HD encoding for multi-profile encoding. Additionally, Electra XOS performs statistical multiplexing for optimal bandwidth usage on cable, terrestrial and satellite networks.

With Electra XOS, you can simplify conversions between SDR and the different HDR formats and color spaces, including HDR-10, HLG, BT.709, BT.2020. Feeding legacy networks requiring SDR from a HDR source is easy, as is maintaining a constant output SDR/HDR format from sources with various dynamic ranges.

### Innovative OTT

On Electra XOS you can elect to use EyeQ technology, which reduces your OTT delivery costs and improves viewer experiences. Our EyeQ content-aware encoding is fully compatible with standard protocols and players. Electra XOS simplifies OTT architectures with its built-in OTT push packager supporting DASH and fragmented HLS to reach standard broadcast latencies in OTT applications (CMAF).

### Prep for the Cloud Transition

Connect your Electra XOS video processor to the Harmonic Hub for instant access to our experts, faster software upgrades, direct connection to Harmonic DevOps, and immediate extension of your platform for new services or disaster recovery.

## SPECIFICATIONS

(contact Harmonic for availability)

### VIDEO INPUT/OUTPUTS

Live Inputs	MPEG-2 TS over IP IGMP v2 & v3 MPTS and SPTS SDI (SD, HD, 3G, UHD as 4x3G) Uncompressed over IP (SMPTE 2022-6, 2110) Embedded audio and ancillary data Visually lossless over IP Source redundancy
Broadcast Live Outputs	MPEG-2 TS over IP CBR and VBR
Multiscreen Outputs	ABR encoding support MPEG-2 TS over IP (with EBP) Adobe RTMP Apple HLS (including fragmented HLS) Microsoft Smooth Streaming MPEG DASH

### VIDEO PROCESSING

Features	Broadcast & Mobile/Web encoding Content-aware encoding with EyeQ
<b>Encoding Profiles</b>	
MPEG-2	MP @ ML MP @ HL
MPEG-4 AVC	BP @ L3 MP @ L3 HP @ L4
HEVC	High 422@L4.1 Main @L5.1 (main tier) Main10 @L5.1 (main tier)
<b>Decoding Profiles</b>	
MPEG-2	MP @ ML MP @ HL
MPEG-4 AVC	MP @ L3 HP @ L4
HEVC	High 422@L4.1 Main @L5.1 up to 100 Mbps Main10 @L5.1 up to 100 Mbps
Sony LLVC	HD UHD
<b>Resolutions and Frame Rates</b>	Up to 3840x2160p @ 50/60 fps Up to 1920x1080i @ 25/30 fps
Frame Rate Adjustment	1-60 fps
Processing Capabilities	Picture resizing (up/down) Smart deinterlacing Noise reduction Logo and slate overlays Frame rate conversion PIP encoding
HDR & WCG Capabilities	HDR signaling: HDR-10, HLG, Dolby Vision WCG signaling: BT.2020, BT.709, BT.601 Tone mapping (HDR-10/HLG -> SDR) Tone expansion (SDR -> HDR-10/HLG) Dynamic HDR metadata generation
Broadcast Subtitles	Teletext passthrough Closed-caption passthrough DVB subtitles passthrough ARIB passthrough
Ad Insertion	SCTE35 passthrough ESAM compliant
Multiscreen Content Protection	AES scrambling Apple HLS encryption Microsoft PlayReady® DRM

### AUDIO PROCESSING

Features	Any-to-any audio transcoding Stereo and multi-channel support
<b>Encoding Profiles</b>	MPEG-1 Layer II AAC-LC/HE-AAC v1/v2 AC-3 (Dolby Digital) E-AC-3 (Dolby Digital Plus) Dolby AC-4
<b>Decoding Profiles</b>	MPEG-1 Layer II AAC-LC/HE-AAC v1/v2 AC-3 E-AC-3 Dolby E with auto switch
Automatic Loudness Control	EBU R128 A-weighting
Processing Capabilities	Resampling Stereo/mono conversion Surround down mixing Static gain adjustment Delay adjustment

### MANAGEMENT

User Interfaces	Harmonic NMX Standalone web-based Interface
API	RESTful API SNMP
Redundancy	Unit based 1+1 N+M

### DEPLOYMENT OPTIONS

Appliances	1-RU server Hot swappable dual AC power supplies Dual Intel Xeon (various models depending on requested processing capacity) Up to 16 HD-SDI/8-3G-SDI Up to 8 Gig Ethernet interfaces Up to dual 10 Gig interfaces
Software Application	Compatible with COTS servers Available as bare-metal, VM, Docker containers