Spectrum XE

PLAYOUT SYSTEM

Combining a full channel-in-a-box system with a premium-quality software encoder, the Harmonic Spectrum™ XE defines a new breed of IT-based playout solution tailored for HD/SD broadcast and multiscreen channel origination, manipulation and delivery.

In today's complex media environment, TV broadcasters and operators must support ever-larger channel lineups, including regional or international variants of existing channels, new thematic linear programs, and over-the-top (OTT) versions of established channels. The Spectrum XE addresses this challenge with integrated playout, encoding and rendering, as well as high scalability and availability. With Spectrum XE's innovative IT-based design, operators can define flexible playout workflows in either the compressed or the uncompressed domain.

Spectrum XE provides a complete array of channel-in-a-box (CiaB) features to control and deliver new channels — and meet broadcasters' requirements for easy-to-deploy, easy-to-operate and easy-to-monitor facilities. It's the perfect solution for originating channels for both broadcast and multiscreen delivery, and for cost-effectively regionalizing downstream programs (with ad replacement and branding).

Flexible Multichannel Playout

With a heritage based on the widely deployed Sapphire™ video server, Spectrum XE extends playout to the uncompressed domain with premium re-encoding capabilities and advanced audio/video processing. The platform runs on a next-generation video operating system, which provides a library of audio/video processing software modules that can be assembled in a near-infinite variety of playout workflows.

Spectrum XE enables uncompressed channel playout via a complete, dynamic decode and re-encode workflow. By operating in the uncompressed domain, the system delivers significant advantages. Various input file or live formats can be combined, and numerous advanced audio and video processing operations (such as HD/SD up- and down-conversion or audio loudness control) can be applied before playout. Graphics overlay capabilities are expanded, with the ability to add static bitmaps, animations and text crawls, and to apply powerful video effects such as fade in/out and squeezeback.

Spectrum XE can re-encode a channel in a wide variety of formats (HD, SD and multiscreen), and make it available over ASI or IP networks. The integrated software encoder delivers premium video quality in MPEG-2, MPEG-4 AVC and HEVC formats, and supports CBR encoding as well as on-board statistical multiplexing.

With Spectrum XE, operators can also remain in the compressed domain. This playout mode is dedicated to splicing MPEG-2, MPEG-4 AVC and HEVC transport streams and brings two main advantages: it keeps the quality of the incoming live or file sources intact, and offers high channel density. Of course, Spectrum XE can operate multiple independent channels simultaneously in both uncompressed and compressed playout modes.

HIGHLIGHTS

- Multiple MPEG interfaces
  - SDI, IP, ASI inputs
  - IP, ASI outputs
- Multiple user-selectable playout modes
  - Compressed domain splicing
  - Baseband switching with dynamic decoding and re-encoding

- Multiple A/V processing features
  - SD/HD up/down-conversion
  - Audio loudness control
- Advanced graphics overlays
  - Logo, animation, text crawl
  - Video effects (fade, squeezeback, etc.)
- Built-in automation with advanced playlist controls

- Media asset management
- Premium-quality MPEG-2/MPEG-4 AVC/HEVC software encoder
- CBR, statistical multiplexing, remultiplexing and streaming
- Advanced transport stream content acquisition capabilities

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Intuitive Automation

Spectrum XE comes with built-in automation, which manages all channel schedules frame-accurately and provides powerful control and monitoring utilities. The automation system drives each channel with one or more playlists that define live or file-based events, as well as graphics overlays, as either primary or secondary events. Spectrum XE supports multiple types of event triggers such as time scheduling, SCTE 35 in-band cue tones, GPI signals and input signal loss.

The Spectrum XE graphical user interface includes intuitive playlist editing and control features, and a set of advanced monitoring views for reporting the status of multiple, simultaneous channels, including timelines, video thumbnail mosaics, bitrate charts and transport stream snapshots. Spectrum XE automation can also interface with external traffic and billing or master control systems via a BXF-standard interface. BXF defines detailed event information through the use of a comprehensive structure that supports multiple scheduling actions.

Transport Stream Content Acquisition

Spectrum XE is able to record incoming transport stream (TS) feeds in a very flexible and reliable way. A record list registers any kind of TS or on-demand program. The built-in automation of the Spectrum XE uses these record lists to schedule the recording of events. TS files, generated by dynamic re-encoding, become immediately available in the media library for editing or play-back.

By combining its playout and record capabilities, Spectrum XE is the perfect fit for time-delay, disaster recovery or censorship in a compressed domain.

Smart Asset Manager

Possessing the ability to ingest compressed transport streams and baseband streams over SDI, Spectrum XE also allows transport-stream file provisioning through an FTP interface. The Spectrum XE Media Library makes all these sources available for editing and playback, and also receives all overlay graphics.

In addition, Spectrum XE features a native Smart Asset Manager tool that handles video clip provisioning according to the channel schedules. The system automatically detects any missing asset from a channel playlist and then accordingly initiates video file transfers from external storage for on-time provisioning of assets.

Reliable and Scalable

Spectrum XE runs on a best-of-breed, IT-based 1-RU server featuring a secure dual RAID system, hot-swappable redundant power supplies, and scalable storage consisting of high-reliability hard drives. Optional gigabit Ethernet ASI and SDI physical interfaces are available.

World-Class Service and Support

Harmonic stands behind the Spectrum XE playout system with comprehensive service and support programs, including system design, service deployment, technical support and network maintenance. World-class service plans and a global network of flexible and responsive support professionals help ensure your ability to deliver outstanding "anytime, anywhere, any-device" customer experiences.

SPECIFICATIONS

INPUT/OUTPUT

Input Interfaces	Up to four TS-over-ASI ports Up to two TS-over-IP ports Up to four SDI ports
Output Interfaces	Up to four TS-over-ASI ports Up to two TS-over-IP ports

INPUT/OUTPUT

Video Processing Capabilities	HEVC SD/HD decoding MPEG-2 SD/HD decoding MPEG-4 AVC SD/HD decoding SD/HD up/down-conversion Internal statistical multiplexing
Video Encoding	MPEG-2 SD/HD 4:2:0 MPEG-4 AVC SD/HD 4:2:0 HEVC 4:2:0 8/10-bit
Audio Processing Capabilities	MPEG-1 Layer II decoding Dolby® Digital Plus (E-AC-3) decoding AAC-LC/HE-AAC decoding Up/down-mixing Audio loudness control
Audio Encoding	MPEG-1 Layer II E-AC-3 AAC-LC/HE-AAC v1/v2

STORAGE

Dual RAID system
Extensible storage capacity
FTP TS file provisioning

PLAYOUT

Live and TS file playback
Uncompressed switching
Compressed splicing

GRAPHICS & BRANDING

Static bitmaps
Animations
Dynamic text crawls
In/out effects
Squeezeback
EAS
Video (PiP)

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SPECIFICATIONS

CONTENT ACQUISITION

Continuous or event-based capture from TS feeds
Advanced time-delay capabilities
Clip editing, trimming and concatenation

AUTOMATION

Primary and secondary events
Time-scheduling
SCTE 35 and GPI triggering
Playlist and record-list editing and control
BXF native interface

CONTROL & COMMAND INTERFACES

SNMP agent
SOAP API
Web-Based Graphical User Interface

ORDERING INFORMATION

BASE SYSTEM

Part Number	Description
SPC-XE-1U-2CPU-2XC	Spectrum XE 1-RU server
SPC-XE-SW-VOSFLEX	Next-generation video OS license

INTERFACES

Part Number	Description
SPC-XE-HW-1U-ASISDI	SDI in and ASI in/out card

STORAGE

Part Number	Description
SPC-XE-HW-1U-HDD-XGB	Media storage volume HDD (X GB)
SPC-XE-OPT-ADD-XGB	Additional HDD (X GB)

PLAYOUT & RECORD LICENSES

Part Number	Description
SPC-XE-LIC-PLAYOUT	Channel playout
SPC-XE-LIC-GRAPHIC	Graphic overlay
SPC-XE-LIC-RECORD	Recording one program in a TS, or a whole MPTS
SPC-XE-LIC-DELAY	Delaying 1 channel (or 1 multiplex)

DECODING LICENSES

Part Number	Description
SPC-XE-LIC-DEC-HEVCHD	HEVC HD decoding
SPC-XE-LIC-DEC-HEVCSD	HEVC SD decoding
SPC-XE-LIC-DEC-HD	MPEG-2/H264 HD decoding
SPC-XE-LIC-DEC SD	MPEG-2/H264 SD decoding
SPC-XE-LIC-DEC-HD-MEZZA	HD mezzanine decoding
SPC-XE-LIC-DEC-SD-MEZZA	SD mezzanine decoding
SPC-XE-LIC-DEC-AUD20	MPEG-1/AAC 2.0 stereo decoding
SPC-XE-DEC-AAC51	MPEG-1/AAC multichannel 5.1 decoding
SPC-XE-LIC-DEC-DD51	E-AC-3 5.1 surround decoding

ENCODING LICENSES

Part Number	Description
SPC-XE-LIC-ENC-HEVCHD	HEVC HD encoding
SPC-XE-LIC-ENC-HEVCSD	HEVC SD encoding
SPC-XE-LIC-ENC-HEVCQVGA	HEVC QVGA encoding
SPC-XE-LIC-ENC-MP4HD	MPEG-4 AVC (H.264) HD encoding
SPC-XE-LIC-ENC-MP4SD	MPEG-4 AVC (H.264) SD encoding
SPC-XE-LIC-ENC-MP4QVGA	MPEG-4 AVC (H.264) QVGA encoding
SPC-XE-LIC-ENC-MP2HD	MPEG-2 HD encoding
SPC-XE-LIC-ENC-MP2SD	MPEG-2 SD encoding
SPC-XE-LIC-ENC-AUD20	MPEG-1/AAC 2.0 stereo encoding
SPC-XE-LIC-ENC-AAC51	MPEG-1/AAC multichannel 5.1 encoding
SPC-XE-LIC-ENC-DD51	E-AC-3 2.0 5.1 surround encoding
SPC-XE-LIC-FILE	File Encoding

ADVANCED FEATURES

Part Number	Description
SPC-XE-LIC-ALC20	2.0 stereo audio loudness control
SPC-XE-LIC-ALC51	5.1 surround audio loudness control
SPC-XE-LIC-FLX	Internal Flexstream
SPC-XE-LIC-SAM	Smart Asset Manager agent
SPC-XE-LIC-EAS	EAS interface

EXTERNAL CONTROL

Part Number	Description
57730	External device providing 12 x GPI input ports
EBOX	External device for interface (GPI + RS232) to EAS legacy unit

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