Spectrum™ X

ADVANCED MEDIA SERVER SYSTEM

harmonic

The Harmonic Spectrum™ X advanced media server system brings new levels of efficiency, simplicity and reliability to broadcast ingest, production and playout workflows.

Designed for mission-critical production and playout applications, Spectrum X combines file, baseband and transport stream ingest with comprehensive integrated channel playout (ICP) capabilities, including graphics, branding, DVE, and live switching of baseband and compressed IP sources. By reducing the number of discrete devices required to produce and distribute branded programming, Spectrum X lowers capital expenditures, simplifies workflows and reduces operational costs. The system's high density, low power consumption and rock-solid reliability further reduce operating expenses while providing high availability.

The software-based Spectrum X supports a broad range of SD and HD formats up to 1080p (3G) and Ultra HD. It can operate as a true channel-in-a-box (CiaB) or as part of a Spectrum shared storage infrastructure that includes everything from simple ingest and playout to feature-rich ICP capabilities. All functionality is available via software license keying, resulting in a highly flexible system that allows the easy addition of new codecs, CiaB functionality, IP I/O and other advanced features to baseband I/O when needed.

Fully compatible with Spectrum MediaDirector and MediaCenter servers, and Harmonic Polaris™ playout management systems, Spectrum X fits seamlessly into existing broadcast infrastructures. By integrating SDI and IP I/O on the same chassis, Spectrum X also eases the migration to IP playout workflows, allowing broadcasters to transition away from baseband at their own pace.

The highly scalable Spectrum X system is ideal for a wide range of applications, including:

- CiaB and ICP workflows
- Integrated master control room (iMCR) workflows
- Studio production
- News production
- Hybrid baseband and IP playout environments
- Disaster recovery

As a next-generation media server system, Spectrum X offers a new approach to production and channel playout. With its function integration, workflow flexibility and cost-efficiency, this next-generation server powers new revenue-generating services while delivering low total cost of ownership.

HIGHLIGHTS

- Easy-to-deploy ingest and playout system for baseband and IP workflows
- Supports a broad range of SD, HD and Ultra HD formats
- Integrates SDI and IP I/O on the same chassis to ease migration to IP workflows

- Adaptable to all production and playout applications, including integrated channel playout, channel-in-a-box and integrated master control
- Integrated video graphics and branding, using industry-standard authoring tools
- Single and dual integrated DVEs for sophisticated content presentation

- Plug and play compatibility with Harmonic Spectrum media servers and Harmonic MediaGrid shared storage
- Open control architecture makes CIAB/ICP available to Harmonic Polaris and third-party automation systems
- Compact 1-RU chassis saves rack space and power

SPECIFICATIONS

FEATURE SUMMARY

Branding & Graphics	Adobe® Creative Cloud compatibility Integrated DVE; single and dual 2D DVE mode Independent branding for each primary and simulcast channel Up to eight layers of graphics per channel Static and animated graphics, logo, full-screen slate, rolls, crawls, voice-over
Graphics Formats	PNG, JPG, TIFF, GIF, FLV, Targa, WEBM, MP4, and SWF files
Master Control Switching (MCS)	1-6 live inputs (configurable) Switch between live and recorded clips Key + fill support
Typefaces	All standard font formats are supported
Automation Support	Polaris Play, Polaris Live All Oxtel protocol automation systems (Ethernet or RS-422) Clip playback control via Spectrum API or VDCP (RS-422)
Audio Watermarking	Kantar® Media Watermarking
Delay Service	Realtime program delay capability
Captions & Subtitles	Localized and customized open captions File-based open- and closed-caption insertion
EAS Support (U.S. only)	Text and audio sourced from customer's EAS equipment.
Loop Record Service	Continuously records short clip segments from an incoming video feed

CODECS

SD
MPEG-2	3-24.9 Mbps LGOP; 25-50 Mbps I-frame
DV	DV 25, DVCPRO25, DVCPRO50

HD 1.5 G (1080i 50/60, 720p 50/60)
MPEG-2	18-85 Mbps LGOP; 50-100 Mbps I-frame
DV	DVCPRO HD
XDCAM HD	18, 25, 35, 50 Mbps
RP 2027 Class 50/100 (Generic)*	Class 100, 1920x1080i (25/29.97 Hz); 1280x720p (50/59.94 Hz)
AVC-Ultra (Panasonic)	Class 50 and Class 100, 1920x1080i (25/29.97 Hz); 1280x720p (50/59.94 Hz)
XAVC-I Class 100 (Sony)	Class 100, 1920x1080i (25/29.97 Hz); 1280x720p (50/59.94 Hz)
XAVC-L	High 422, Level 4, 25, 50 Mbps
AVC-LongG	Record: 25, 50 Mbps; Playback: 12, 25, 50 Mbps
VC-3 (SMPTE 2019-1)	120, 145, 220 Mbps
ProRes	122, 147, 220 Mbps; SQ and HQ modes

HD 3G (1080p 50/60)
AVC I-Frame	XAVC-I, AVC-Intra , AVC-I RP 2027 Class 100 (generic)
XAVC-L	XAVC, High 422, Level 4.2, up to 50 Mbps
AVC-LongG	35, 40, 45, 50 Mbps
AVCU-LongG	12, 25, 50 Mbps
VC-3 (SMPTE 2019-1)	190, 220, 367, 440 Mbps, HQX mode
ProRes	440 Mbps, LT mode

UHD
XAVC	I-Frame, Class 300, 422, 10-bit, 50p/60p
AVCU	I-Frame, Level 5.2, 422, 10-bit, 50p/60p
VC-3 (SMPTE 2019-1)	145-180 Mbps, LB mode

RASTER

SD	525i @ 29.97 fps 625i @ 25 fps
HD 1.5 G	1080i @ 25, 29.97 fps 720p @ 50, 59.94 fps
HD 3G	1080p @ 50, 59.94 fps
UHD 4 x 3G	2160p @ 50, 59.94 fps

MEDIA STORAGE OPTIONS

- Choice of four internal 3.5" 2-, 4-, or 6-TB HDDs or 1.9-TB SSDs
- 3+1 modified RAID 4 (single parity)
- Connect to Spectrum MediaCenter (MCP-2200 series) via GbE
- Connect to Spectrum SAN (MediaDirector, MCP-2250 series) via GbE
- Ingest to Harmonic MediaGrid as MXF OP1a wrapped media
- Preview from Harmonic MediaGrid via GbE

AUDIO PROCESSING

Channels	SMPTE 299M/272M, up to 16 embedded per video channel
Formats	Uncompressed: 16, 24, PCM @ 48 kHz Compressed: audio pass-through, Dolby® encode and decode
Features	Audio down-mix Audio track swapping; track tagging, language rules Audio mix effects; VO insertion

DATA

Closed, Open, Live Captions	EIA-608, EIA-708
Ancillary Data	VBI, VANC
Reference	Analog black with color burst

CONNECTIVITY

SDI Input	Up to four SD/HD channels, one UHD channel Up to two Live inputs in standard channel mode Up to six Live inputs in combined channel mode
SDI Output	Up to four SD/HD channels, one UHD channel Up to two simulcast outputs per channel Independently configurable up/down/crossconversion
IP I/O	Quad 1GE ports for TS ingest Optional dual 10GE ports for 2022-6 / 2110 IP I/O
Connectors	RS-422, AES, LTC and GPIO (multi-pin connector; available adapter cable) Two 1GE ports for connection to the Server, SystemManager, file transfer or API control
Server Interface	Private, point-to-point, non-switchable gigabit Ethernet to MediaDirector or MediaCenter Server

POWER

Power Supplies	Dual, hot-swappable Platinum efficiency
Power Consumption	505 W (max)

PHYSICAL

Dimensions (W x H x D)	17.67 in x 1.7 in x 27.75 in (1 RU) 44.9 cm x 4.32 cm x 70.5 cm
Weight	37.5 lbs/17.0 kg (with HDDs) 29.5 lbs/13.4 kg (without HDDs)