

# Spectrum™ ChannelPort

INTEGRATED CHANNEL PLAYOUT SYSTEM



**Broadcasters, content creators and service providers of all sizes are under intense pressure to deliver new programming and services more quickly than ever. But launching new channels to meet this demand can be time-consuming, complex and expensive. Harmonic's Spectrum™ ChannelPort integrated channel playout module offers a flexible option that circumvents these obstacles and helps you get to air fast—and inexpensively.**

ChannelPort speeds the cost-effective deployment of new SD and HD television channels by integrating branding and master control switching with clip playback on the industry's most trusted media server platform. Possessing powerful channel-in-a-box (CIAB) capabilities, the high-density ChannelPort module enables the keying of multilayer graphics and dynamic text over playback or live video to produce rich on-air looks. Support for leading automation systems offers customers the freedom to choose the workflow solution that best fits their needs.

Fully compatible with Spectrum™ MediaDirector, MediaCenter and MediaDeck 7000 servers, ChannelPort modules fit seamlessly into existing production and playout infrastructures, reducing complexity, conserving rack space, and cutting the time it takes to launch new services. Adding new channels is as simple as plugging in a new component. By reducing the number of discrete devices required to produce and distribute branded programming, capital expenditures are dramatically lowered. ChannelPort's industry-leading channel density, low power consumption and reliability also reduce operating expenses.

Highly scalable, a ChannelPort-enabled Spectrum solution is ideal for a wide range of users, including:

- Single-channel broadcasters that may not have added channel-in-a-box capabilities because of high equipment costs and workflow complexity.
- Large, multi-channel content providers desiring a cost-effective, expedient solution for distributing fully branded turnaround channels.
- Managed service providers with incumbent multi-channel automation systems desiring a flexible approach to launching new branded channels.
- Disaster recovery operations.

## HIGHLIGHTS

- Integrated clip playback, branding and master control switching
- Up to six switchable live inputs per channel
- Up to four HD playout channels plus four simulcast channels per RU
- Plug-and-play compatibility with Harmonic Spectrum media servers
- Choice of Onboard Playout Control with Media Fetch or third-party automation
- AVC-Intra, ProRes 422 and PitchBlue format support
- Dual integrated DVEs for sophisticated graphics presentation
- Independent branding of simulcast channels
- Branded preview functionality
- Integrated voice-over
- Open/burn-in captions
- Optional up/down/cross-conversion
- Fast channel deployment
- Low power consumption

## Business Benefits

### Simplicity

ChannelPort reduces the complexity of broadcast workflows by merging multiple capabilities onto a single component, including:

- Clip playout
- Branding and regulatory marks
- Frame-accurate switching between live inputs and prerecorded clips
- Voice-over recording
- Onboard subtitle insertion
- Emergency Alert System (EAS) support
- Clip and graphics preview tools

This intelligent function integration not only enables faster deployment of new playout services, it simplifies day-to-day operations by allowing processes to be controlled from a single interface. Plug-and-play compatibility with Spectrum server components offers additional advantages: It allows ChannelPort modules to be installed into existing Spectrum systems at any time—and scale out as requirements evolve.

### Flexibility

ChannelPort exemplifies Harmonic's open approach to production and playout by employing industry-standard media wrappers (including QuickTime and MXF) and networking protocols (including FTP, AFP and CIFS) to enable direct access to content by any file-based media application. ChannelPort users can opt to deploy a hybrid Integrated Channel Playout (ICP) workflow with their preferred automation system, or a complete CIAB solution that includes integrated storage and Spectrum Onboard Playout Control (OPC) with Media Fetch. This system-wide flexibility gives users the freedom to choose from the widest range of best-of-breed applications, resulting in end-to-end solutions that work the way the customer wants.

### Reliability

ChannelPort is built for the trusted Spectrum production and playout platform. Because Spectrum server components operate independently, the system offers maximum reliability and fault tolerance. Component failures are contained and don't affect operation of other parts of the system, improving overall availability. If replacement is needed, components can be removed and installed while the rest of the system remains operational.

### Performance

Competing ICP and CIAB options force users to make tradeoffs between system capabilities and overall usability, stability and scalability—even video quality. As an award-winning innovator in video processing, compression, playout and media storage, Harmonic has integrated industry-leading functionality into ChannelPort, no compromises required.

### Affordability

ChannelPort's impressive performance includes high-density playout of four HD channels per RU with SD simulcast—twice as much as the closest competitor—and low power consumption of just 100 W per channel. The ability to add branding and automation capabilities via license eliminates the need to purchase the additional infrastructure previously required to link dedicated devices for these functions. It also fosters a "Pay as You Grow" upgrade path, so customers pay only for the capabilities they need when they need them. The bottom line is that CAPEX and OPEX are reduced as opportunities to generate higher revenue are increased.

### Channel Branding

ChannelPort makes it easy to add rich branding elements to video playout using standard graphics packages such as Adobe® Creative Suite®. These familiar applications allow graphic designers to develop unique on-air looks without having to learn new tools—and also help to keep per-seat licensing costs to a minimum. All standard image formats (PNG, JPG, TIFF, GIF) and sequences (Targa, FLV) are supported, as are standard typefaces.

The final on-air look of content is built using templates authored in Adobe Flash® Professional and can be previewed with Harmonic's Preview Tool application. Up to eight graphics and audio layers are supported, and graphics elements can be shared across all distribution channels, including mobile devices and the web. Independent branding of simulcast channels allows operators to create unique looks for a channel that airs in both HD and SD.

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The diagram illustrates the 'Enhanced Channel' option. It features a central image of a woman smiling next to a red car. The image is overlaid with several graphics: a 'Westaun Play of the Game' logo with the Westaun logo and website, and a 'Vesta ALL NEW REDESIGNED 2013 VESTA SPORT' logo with a red car image. Three callout boxes with arrows point to different parts of the image: 'Advertisement plays here' points to the top right, 'Live feed plays here' points to the bottom left, and 'Background slate shows additional ad information' points to the bottom right. Below the image, a text box states: 'With ChannelPort's Enhanced Channel option, you can play out an advertisement and live feed simultaneously, with additional advertiser information skinned onto the playout channel.'

Dual DVE functionality further empowers the design process. Available with ChannelPort's Enhanced Channel mode, dual DVE enables the simultaneous playout of two clips or live feeds (or one of each) on any single layer. Use this capability to reinforce your on-air branding, such as squeezing back one program's end credits while previewing an upcoming show, and for generating new revenue streams via "double-box" advertising opportunities, in which a live feed is squeezed back into a small box while a national or regional advertisement runs in a larger box. A "graphic avail" can also be offered to advertisers, in which a background slate is used to convey additional company information while their ad plays.

## One Module, Many Capabilities

### Flexible Playout

A choice of two ChannelPort modules—CPT-8100 and CPT-8200—allows the building of an ICP or CIAB solution that best fits your operational requirements. The CPT-8100 module possesses six SDI ports (two in, four out); the CPT-8200 has eight bidirectional SDI mini-DIN ports. Both modules can operate in either Standard Channel or Enhanced Channel mode. Enhanced Channel unlocks the advanced graphics features of ChannelPort, specifically dual DVE and external key and fill support. When the CPT-8200 module is used in Enhanced Channel mode, it can support live input in addition to external key and fill.

With either module or either mode, ChannelPort provides broad support for multiple production and playout formats—including AVC-Intra, ProRes and PitchBlue®—as well as audio and ancillary data. Playout channels can perform up-, down- and cross-conversion without channel-count or performance penalties, as well as play back any mix of SD and HD content on a single timeline. SD/HD simulcast and independent branding are also available on every channel.

### Automation Options

ChannelPort is compatible with the industry's leading automation systems. Branding and master control events are managed using the Oxtel protocol over either serial or IP connections, and clip playback can be controlled via VDCP/BVW over RS-422, or via a network using the native Spectrum API. For manual control, GPIOs are available for last-minute changes and master-control operator intervention.

Also available for ChannelPort is Spectrum OPC, which functions as a cost-effective embedded playlist automation layer. OPC consolidates ChannelPort video, audio, switching and graphics capabilities. The feature allows users to import and manage playlists from leading traffic applications, and interactively edit the playlist as it is running. Controls also allow manual override of currently playing content. The addition of Media Fetch, which locates clips in online storage before they're required by OPC, enables "lights-out" operations without the need for external automation software.

The Spectrum ScheduleTool enables playlists to be created or edited without consuming a channel resource. Accessed via browser, primary and secondary content can be browsed, selected and inserted, or modified. Once completed, the list can be sent to OPC for execution. The Spectrum PlayoutTool provides an interactive operator console to monitor and manage list execution on multiple channels.

### Rich Audio Tools

Audio capabilities in ChannelPort include an Integrated Voice-Over tool for adding VO tracks directly to the playout channel. All audio in ChannelPort is treated as an individual layer, making it easy to revise a program's VO without disrupting the workflow. With ChannelPort's Dynamic Audio Shuffle capability, audio channel mapping can be specified on the fly as the clip is played out, enabling, for instance, language track order to be decided at attach time. An Audio Down-Mix feature allows primary or secondary audio content to be played out on an SD output channel. Duck, mix or shuffle of live, clip and graphics audio sources can be applied to simulcast HD and SD channels independently.

## CONFIGURATION OPTIONS

ChannelPort modules can be configured with multiple Spectrum components to meet a variety of workflow requirements:

### ChannelPort + MediaDeck 7000

Adds up to four channels of branded playout to the MediaDeck 7000 integrated media server. Ideal for broadcasters and content providers with modest channel counts or operations where channels with independent content storage and control are desirable.

### ChannelPort + MediaCenter

Adds four to 12 channels of branded playout to the MediaCenter server controller with integrated storage. Ideal for growing content and service providers, and disaster recovery operations.

### ChannelPort + MediaDirector

Adds up to 72 channels of branded playout to a fully configured Spectrum media server system managed via MediaDirector server controllers. Ideal for large multi-channel content or service providers.

*ChannelPort modules can also co-exist in the same chassis with any MediaPort 7000 I/O module, and can be freely mixed with MediaPort 5000 and MediaPort 7000 products in existing Spectrum deployments. No other integrated branding solution offers this degree of configuration flexibility.*

## EAS Support

For broadcasters in North America, ChannelPort can source data and AES audio directly from the user's EAS decoder. Linked via RS-422, ChannelPort employs GPI triggers to enter EAS mode, then automatically silences audio on the currently running program and selects predefined slates to present the necessary emergency alert information.

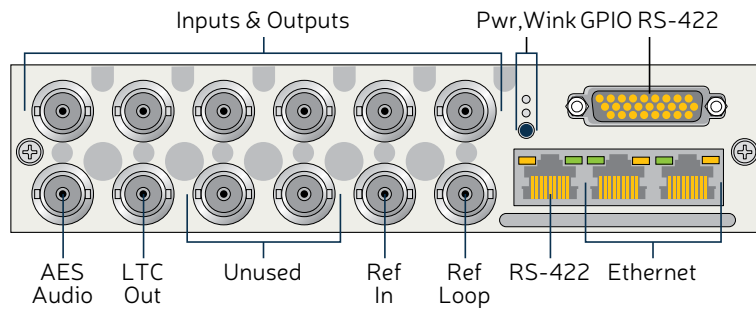
## Onboard Subtitling

ChannelPort supports onboard file-based caption/subtitle insertion for both Open and Closed modes. Open caption screen presentation can be fully localized and customized. ChannelPort provides simultaneous support for file insertion of multiple closed language services, plus one open caption and previously bound binary captions, either ANC (HD) or VBI (SD).

## Monitor Out Capability

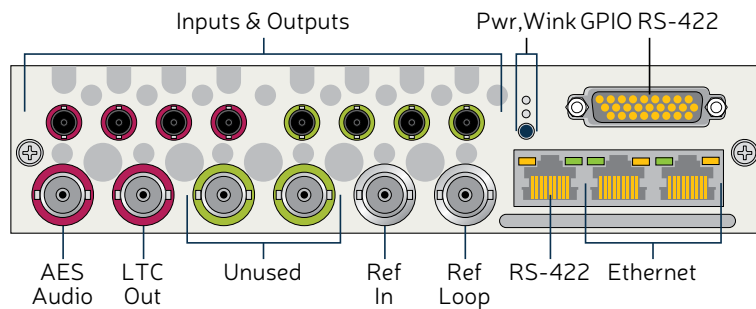
For production usage ChannelPort provides Monitor Out mode, which overlays the player's timeline state on a simulcast output. Monitor Out screen presentation can be fully localized and customized.

### CPT-8100



Six SDI I/O ports: two inputs, four outputs

### CPT-8200



Eight bidirectional mini-DIN SDI I/O ports; internal switching eliminates the need for external routing

## SPECIFICATIONS

### FEATURE SUMMARY

Branding & Graphics	Eight keyers (graphics layers) Background layer (clip or live) Single layers from clip or live inputs Dual DVE for playout of two clips or live inputs Independent branding for simulcast channels Dynamic text substitution from automation or external source GPI control (layer fade up/down, graphics off/on)
Graphics Formats	PNG, JPG, TIFF, GIF, Targa and FLV files
Typefaces	All standard font formats are supported
Automation Support	All Oxtel protocol automation systems (Ethernet or RS-422) Clip playback control via Spectrum API or VDCP/BVW (RS-422) Onboard Playout Control Media Fetch
Master Control Switching (MCS)	Frame-accurate switching between live and recorded clips
Captions & Subtitles	Localized and customized open captions File-based closed-caption insertion
EAS Support (U.S. only)	GPI triggers EAS mode Selects predefined EAS template Data and audio sourced from customer's EAS equipment
Clip and Graphic Preview	Preview Tool Interactive control of graphics layers and MCS
Audio	Integrated voice-over Independent duck-mix-shuffle of SD/HD live, clip and graphics audio sources

### AUDIO

Channels	SMPTE 299M/272M Up to 16 embedded per video channel
<b>Formats</b>	
Uncompressed	16, 24, 32-bit PCM @ 48 kHz
Compressed	Audio passthrough

### VIDEO

Module CPT-8100	
Inputs	SD-SDI (SMPTE-259M)/HD-SDI (SMPTE 292M) BNC female, 75 Ω Two live inputs per channel
Outputs	SD-SDI (SMPTE-259M)/HD-SDI (SMPTE-292M) BNC female, 75 Ω Four outputs
Module CPT-8200	
Inputs/Outputs	SD-SDI (SMPTE-259M)/HD-SDI (SMPTE-292M) Mini-DIN female, 75 Ω Eight bidirectional (up to six live inputs) per channel
<b>Formats</b>	
SD MPEG-2	3-24.9 Mbps long GOP; 25-50 Mbps I-frame
HD MPEG-2	18-85 Mbps long GOP; 50-100 Mbps I-frame
SD DV	DV 25, DVCPRO 25, DVCPRO 50
HD DV	DVCPRO HD
XDCAM HD	18, 25, 35, 50 Mbps
AVC-Intra	Class 50 and Class 100
VC-3 (SMPTE 2019-1)	120, 145 Mbps
ProRes 422	122, 147 Mbps; Standard Quality mode
PitchBlue Support	Transport stream demultiplexing and H.264 decoding Native playout of up to two channels of 4:2:0 8-bit H.264 Simultaneous ingest/demultiplex up to two transport streams on growing files Can drop multiple streams, but only two will trans-wrap at a time

### VIDEO (CONT)

Up-Conversion	Configurable pillarbox, crop, anamorphic EIA-608 captions translated to EIA-708 Line 21 OP-42 subtitles translated to OP-47
Down-Conversion	Configurable letterbox, crop, anamorphic EIA-608 compatibility bytes extracted from EIA-708 data to create EIA-608 captions OP-47 subtitles translated to line 21 OP-42
Cross-Conversion	720p to 1080i 1080i to 720p
SD Resolutions and Frame Rates	720 x 486i @ 29.97 fps 720 x 576i @ 25 fps
HD Resolutions and Frame Rates	1280 x 720p @ 50 & 59.94 fps 1920 x 1080i @ 25 & 29.97 fps 1920 x 1080p @ 25 & 29.97 fps (carried as PsF in HD-SDI; limited to AVC-I)

### POWER

Input Voltage Range	90-260 V
Line Frequency	45-63 Hz
Power Consumption	115 W (one module) 175 W (two modules)
Amps	.974 A (one module) 1.52 A (two modules)

### PHYSICAL

Chassis Dimensions (W x H x D)	17.5 in x 1.75 in x 26.5 in (1 RU) 44.4 cm x 4.4 cm x 67.3 cm
Chassis Weight	23.6 lbs/10.7 kg (one module) 26.9 lbs/12.2 kg (two modules)

### ENVIRONMENTAL

Operating Temperature	+5° to +40° C
Operating Humidity	10% to 85% non-condensing
Electromagnetic Compliance	US: FCC 15 Class A Japan: VCCI Class A Australia, New Zealand, EU: CISPR 22 Class A Taiwan: CNS 13438 Class A Canada: ICES-003 Class A EU: EN 55022 Class A Korea: KN22 Class A
Safety	UL 60950-1 2nd Edition CSA C22.2 Information Technology Equipment - Safety - Part 1: General Requirements