HD-XSP

High-Definition 7.1 Surround Sound Processor

- True 7.1 surround sound processing for commercial and residential applications
- All of the needed features and performance — none of the complexity or cost
- DTS HD®, Dolby® True-HD, and Dolby Digital® Plus decoding
- HDMI®, SPDIF (optical and coaxial), and stereo analog inputs
- Source input compensation and 80 ms lip sync adjustment per input
- Balanced analog 7.1 surround sound line outputs
- DSP with 9-band graphic or parametric EQ, delay, crossover, and compression
- Support for systems without a center speaker or subwoofer
- High-definition 3D video pass-through via HDMI
- Balanced stereo or mono downmix output
- Balanced stereo mix input
- Built-in noise generator
- Advanced HDCP management for trouble-free handling of copy-protected digital content
- QuickSwitch HD™ technology for fast, reliable switching
- CEC pass-through from a control system for device control via HDMI
- Color LCD front panel for basic setup and operation
- Native Crestron® system integration
- 10/100 Ethernet communications
- Front panel USB port for installer setup
- Simplified setup via front panel or software
- Single-space rack mountable

The HD-XSP from Crestron® answers the call for a truly professional surround sound solution that's simple and affordable to implement. The HD-XSP provides the features and performance necessary to enable high-definition 7.1 channel audio for virtually any commercial environment. It fits easily in a crowded equipment rack and integrates cleanly with other AV and control equipment. It supports the essential 7.1 digital formats including Dolby® True-HD, Dolby Digital® Plus, and DTS HD®, with advanced HDCP management for trouble-free handling of all your digital HD content. Professional DSP and input/output mixing is even built in to streamline integration as part of a complete multimedia presentation system.

The HD-XSP is also useful for many residential applications, providing a cost-effective, compact surround sound processor that’s well suited for integration as part of a total home automation and entertainment system.

Complete Connectivity

The HD-XSP includes full input connectivity for all types of digital and analog sources including Blu-ray Disc® players, HDTV receivers, game consoles, computers, media servers, and mobile devices. Additional specialized inputs and outputs are provided to facilitate integration with system switchers, matrix routers, microphone mixers, DSPs, and teleconferencing codecs.

- **HDMI® Input** — The HDMI input provides the essential interface for handling high-definition 7.1 digital surround sound and HDCP protected content. It can also handle Dual-Mode DisplayPort signals using an appropriate adapter. Easy HDMI input expansion is possible using a Crestron HD-MD6X2-4K-E switcher[1]. CEC signals can even be passed through from a control system to control the source device right through the HDMI connection.
- **SPDIF Inputs** — A combination of one optical input and two coaxial inputs provides connectivity for SPDIF digital audio sources.
- **Stereo Analog Inputs** — Two stereo audio inputs are included to handle analog signals from line-level sources such as laptop computers, media players, and mobile devices.
- **Surround Sound Outputs** — A total of eight balanced line-level outputs are provided to drive a multichannel power amplifier feeding up to seven speakers and a subwoofer. The HD-XSP can be configured to work with systems up to 7.1 channels, including those without a discrete center speaker or subwoofer. Each output channel includes a 9-band graphic or parametric EQ plus trim, delay, and crossover adjustments. Additional controls are provided for main volume, bass, treble, loudness, compression, and LFE.
- **Downmix Output** — This balanced output provides a stereo or mono downmix of the surround sound signal to feed a separate speaker zone, assistive listening system, codec, or recording device. It includes controls for volume, bass, treble, loudness, and balance.
- **Mix Input** — This balanced stereo input is designed to connect to the output of a microphone mixer or teleconferencing codec. This input
HD-XSP High-Definition 7.1 Surround Sound Processor

bypasses all internal signal processing and surround sound decoding, mixing with the main program signal at the Front Left/Right and/or Downmix outputs.

**HDMI Output** – An HDMI output is included to pass the HDMI input signal through to a display device. The HDMI output passes Full HD 1080p60 video and WUXGA computer signals with HDCP, Deep Color, and 3D. It also passes audio with the option to select a straight pass-through from the HDMI input, or a stereo downmix of the main surround signal. It can even pass CEC signals from a control system to control the display device.

Each HDMI, SPDIF, and stereo input includes an input compensation adjustment to match the average level between sources. Each of these inputs also includes up to 80 ms of lip-sync delay.

**Easy Integration**

By design, the HD-XSP fits seamlessly into just about any AV presentation or distribution system. It is rack-mountable and occupies just one rack space. It contains no fans, ensuring silent operation. Via Ethernet, it can communicate with a Crestron control system, allowing simplified operation using your choice of touch screen, handheld remote, or mobile device.

The HD-XSP provides an ideal solution for adding surround sound processing to a Crestron DMPS3 Series DigitalMedia™ Presentation System or any DM® Switcher. It can even be located remotely and interfaced using a DM transmitter and/or receiver. Or, via its SPDIF or analog inputs, it can be added to a Sonnex® Multiroom Audio System to provide surround sound processing for a single room zone.

Via its Mix input and Downmix output, the HD-XSP solves a lot of problems that other processors just don’t address. The Mix input allows the signal from a microphone mixer to be passed through unprocessed and mixed with the program signal at the output. This allows live speech and surround sound signals to coexist and function simultaneously through the same speaker system. The Downmix output converts the full audio presentation into a stereo or mono signal, perfect for feeding a remote listening zone, an assistive listening system, or a recording device.

For teleconferencing and web streaming applications, the HD-XSP serves as a cost-effective surround sound downmixer to allow participants at the far end to experience the full audio presentation. Simultaneously, it mixes the incoming signal from the far end with the local surround sound audio and sends it to the local room speakers.

To drive all the room speakers, Crestron AMP Series Commercial Power Amplifiers offer a high-performance, custom-configurable multichannel amplifier solution for boardrooms, auditoriums, and custom theaters of any configuration — even systems using 70 or 100 Volt ceiling speakers. Or, for the ultimate in performance, choose a PROCISE® High-Definition Professional Surround Sound Amplifier.

**SPECIFICATIONS**

**Audio – General**

**Features:** 6 selectable source inputs plus built-in noise generator, 7.1 Dolby Digital® & DTS® surround sound decoder, 7.1 multi-channel signal processing and steering, 9-band graphic or parametric EQ, 80 ms lip-sync delay, 20 ms speaker delay, unprocessed “Direct” mode, stereo or mono downmix output, stereo mix input (post surround decoder/processor), HDCP management, Crestron QuickSwitch HD

**Input Signal Types:** HDMI (Dual-Mode DisplayPort compatible), S/PDIF (coaxial and optical), analog 2-channel

**Output Signal Types:** Analog 7.1 channel, analog 2-channel downmix, HDMI pass-through or 2-channel downmix

**Analog-To-Digital Conversion:** 24-bit 96 kHz

**Digital-To-Analog Conversion:** 24-bit 96 kHz (192 kHz in Direct mode)

**Audio – Surround Sound Output**

**Frequency Response:** 20 Hz to 20 kHz ±0.5 dB

**THD+N:** <0.002% digital in, <0.003% balanced in, <0.003% unbalanced in (at 1 kHz across balanced analog out)

**S/N Ratio:** >108 dB digital in, >103 dB balanced in, >103 dB unbalanced in (A-Weighted at full output across balanced analog out)

**Decoding Modes:** None, Stereo, Dolby Pro Logic IIx Movie, Dolby Pro Logic IIx Music, DTS Neo:6 Cinema, DTS Neo:6 Music, Two Channel Steering – Surround, Two Channel Steering – Rear, Multi-Channel Stereo (Party), Dolby Digital, Dolby Digital EX, Dolby Digital Plus, Dolby TrueHD, DTS, DTS-ES Matrix, DTS-ES Discrete, DTS 96/24, DTS-HD Master Audio, PCM Multi-Channel

**Speaker Trims:** ±12 dB per output (Front L/R, Surround L/R, Back L/R, Center, Sub)

**Speaker Delay:** 0 to 20 ms per output
Crossover Frequency: Large (full range), 40, 50, 60, 70, 80, 90, 100, 120, 150, or 200 Hz per output (excluding sub)
Low Frequency Effects (LFE): -10.0 to 0.0 dB
Main Volume Level: -80 to +20 dB, adjustable from 0% to 100%, plus mute
Bass Control: ±12.0 dB
Treble Control: ±12.0 dB
EQ Modes: 9-band graphic (per output) or 9-band parametric (per output)
GEQ Center Frequencies: 63, 125, 250, 500, 1k, 2k, 4k, 8k, 16k Hz
GEQ Gain: ±12.0 dB per band
PEQ Center Frequency: 10 to 20,000 Hz per band
PEQ Gain: ±12.0 dB per band
PEQ Bandwidth: 0.1 to 3.5 octaves per band
Loudness Compensation: on/off
Compression: none, Crestron DRC (Heavy, Medium, Light), Dolby/DTS DRC (Heavy, Medium, Light), Dolby TrueHD Auto
DTS Neo:6 Music Settings: Center Gain 0.0 to 1.0, Standard or Wide mode
Dolby Pro Logic IIx Music Settings: Dimension ±7, Center Width 0 to 7, Standard or Panorama
Audio – Downmix Output
Frequency Response: 20 Hz to 20 kHz ±0.5 dB
THD+N: <0.002% digital in, <0.004% balanced in, <0.004% unbalanced in (at 1 kHz across balanced analog out)
S/N Ratio: >107 dB digital in, >103 dB balanced in, >102 dB unbalanced in (A-Weighted at full output across balanced analog out)
Downmix Volume Level: -80 to +20 dB, adjustable from 0% to 100%, plus mute
Bass Control: ±12.0 dB
Treble Control: ±12.0 dB
Loudness Compensation: on/off
Balance: ±50%
Summing: Stereo or mono selectable
Audio – Program Inputs
Input Compensation: ±10.0 dB per input
Lip-Sync Delay: 0.0 to 80.0 ms per input
Audio – Mix Input
Main Volume: -80.0 to 0.0 dB plus mute, feeds front left/right outputs
Downmix Volume: -80.0 to 0.0 dB plus mute, feeds downmix output
Video
Features: audio breakaway, HDCP management, resolution management, Crestron QuickSwitch HD
Input Signal Types: HDMI w/Deep Color & 3D (Dual-Mode DisplayPort compatible [2])
Output Signal Types: HDMI (DVI compatible [2])
Input Resolutions, Progressive: 640x480@60Hz, 720x480@60Hz (480p), 720x576@50Hz (576p), 800x600@60Hz, 848x480@60Hz, 852x480@60Hz, 854x480@60Hz, 1024x768@60Hz, 1024x852@60Hz, 1280x720@50Hz (720p50), 1280x720@60Hz (720p60), 1280x768@60Hz, 1280x800@60Hz, 1280x960@60Hz, 1280x1024@60Hz, 1360x768@60Hz, 1365x1024@60Hz, 1366x768@60Hz, 1400x1050@60Hz, 1440x900@60Hz, 1600x900@60Hz, 1600x1200@60Hz, 1680x1050@60Hz, 1920x1080@24Hz (1080p24), 1920x1080@25Hz (1080p25), 1920x1080@50Hz (1080p50), 1920x1080@60Hz (1080p60), 1920x1200@60Hz, 2048x1080@24Hz, 2048x1152@60Hz, plus any other resolution allowed by HDMI up to 165 MHz pixel clock
Input Resolutions, Interlaced: 720x480@30Hz (480i), 720x576@25Hz (576i), 1920x1080@25Hz (1080i25), 1920x1080@30Hz (1080i30), plus any other resolution allowed by HDMI up to 165 MHz pixel clock
Output Resolutions: Matched to inputs
Communications
Ethernet: For control & setup; 10/100 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, DHCP
USB: USB client for setup
HDMI: Passes CEC and EDID, CEC control system pass-through to HDMI input and output, supports HDCP control
Connectors
HDMI IN: (1) HDMI Type A connector, female; HDMI digital audio/video input; (Dual-Mode DisplayPort compatible [2])
HDMI OUT: (1) HDMI Type A connector, female; HDMI digital audio/video output; (DVI compatible [2])
INPUT, DIGITAL 2: (1) JIS F05 female (TOSLINK) optical fiber connector; S/PDIF optical digital audio input
INPUT, DIGITAL 3 – 4: (2) RCA connectors, female; S/PDIF coaxial digital audio inputs; Input Impedance: 75 Ohms nominal
INPUT, L/R 5 – 6: (4) RCA connectors, female; Comprises (2) unbalanced line-level stereo audio inputs; Input Impedance: 10k Ohms; Maximum Input Level: 2 Vrms
INPUT, MIX L/R BALANCED: (1) 5-pin 3.5 mm detachable terminal block; Balanced/unbalanced line-level stereo audio input; Input Impedance: 24k Ohms balanced, 12k Ohms unbalanced; Maximum Input Level: 4 Vrms balanced, 2 Vrms unbalanced
OUTPUT, FRONT L/R, SURROUND L/R, BACK L/R, CENTER C, SUB S: (4) 6-pin 3.5 mm detachable terminal blocks; Balanced/unbalanced line-level 7.1 surround sound audio output; Output Impedance: 200 Ohms balanced, 100 Ohms unbalanced; Maximum Output Level (Front, Surround, Back, Center): 4 Vrms balanced, 2 Vrms unbalanced; Maximum Output Level (Sub): 12.6 Vrms balanced, 6.3 Vrms unbalanced
OUTPUT, DOWNMIX L/R: (1) 6-pin 3.5 mm detachable terminal block; Balanced/unbalanced line-level stereo audio output; Output Impedance: 200 Ohms balanced, 100 Ohms unbalanced; Maximum Output Level: 4 Vrms balanced, 2 Vrms unbalanced
LAN: (1) 8-pin RJ45 connector, female; 10Base-T/100Base-TX Ethernet port

24VDC 2.0A: (1) 2.1 x 5.5 mm DC power connector; 24 Volt DC power input; PW-2420RU power supply included

G: 6-32 screw; Chassis ground lug

COMPUTER (front): (1) USB Type B connector, female; USB computer console port (cable included); For setup only

Controls & Indicators

PWR: (1) Green LED, indicates operating power supplied via power pack
RESET: (1) Recessed pushbutton for hardware reset
VOL ▲, ▼: (2) Pushbuttons for volume adjustment
MUTE: (1) Pushbuttons for audio mute
Display: (1) 2 inch (52 mm) diagonal, 220 x 176 pixels, 16-bit TFT active matrix color LCD, displays audio settings and setup parameters
▲, ▼, ◄, ►: (4) Pushbuttons, for 4-way LCD menu navigation and parameter adjustment
SELECT: (1) Pushbutton, used to select or execute the highlighted menu item or value
HOME: (1) Pushbutton, returns to the home menu
BACK: (1) Pushbutton, steps menu back one level
LAN (rear): (1) Green and (1) amber LEDs, green indicates Ethernet link status, amber indicates Ethernet activity

Power

Power Pack (included): Input: 100-240 Volts AC, 50/60 Hz
Output: 2 Amps @ 24 Volts DC
Model: PW-2420RU

Power Consumption: 19 Watts

Environmental

Temperature: 41° to 104° F (5° to 40° C)
Humidity: 10% to 90% RH (non-condensing)
Heat Dissipation: 65 BTU/hr

Enclosure

Chassis: Metal with black finish, vented sides
Front Panel: Metal with black finish and polycarbonate label overlay
Mounting: Freestanding or 1 RU 19-inch rack-mountable (feet and rack ears included)

Dimensions

Height: 1.72 in (44 mm) without feet
Width: 19.00 in (483 mm), 17.32 in (440 mm) without rack ears
Depth: 10.23 in (260 mm)

Weight

4.2 lb (1.9 kg)

MODELS & ACCESSORIES

Available Models

HD-XSP: High-Definition 7.1 Surround Sound Processor

Included Accessories

PW-2420RU: Desktop Power Pack, 24VDC, 2.5A, 2.1mm, Universal

Available Accessories

AMP Series: Commercial Power Amplifiers
PROAMP Series: PROCISE® High-Definition Surround Sound Amplifiers
HD-MD6X2-4K-E: 6x2 4K HDMI® Switcher
CBL Series: Crestron® Certified Interface Cables

Notes:
1. Item(s) sold separately.
2. HDMI connections require an appropriate adapter or interface cable to accommodate a DVI or Dual-Mode DisplayPort signal.

This product may be purchased from an authorized Crestron dealer. To find a dealer, please contact the Crestron sales representative for your area. A list of sales representatives is available online at www.crestron.com/salesreps or by calling 800-237-2041.

The specific patents that cover Crestron products are listed online at: patents.crestron.com.

Certain Crestron products contain open source software. For specific information, please visit www.crestron.com/opensource.

Crestron, the Crestron logo, DigitalMedia, DM, PROCISE, QuickSwitch HD, and Sonnex are either trademarks or registered trademarks of Crestron Electronics, Inc. in the United States and/or other countries. Blu-ray Disc is either a trademark or registered trademark of the Blu-ray Disc Association in the United States and/or other countries. Dolby, Dolby Digital, and the double-D symbol are either trademarks or registered trademarks of Dolby Laboratories in the United States and/or other countries. DTS, DTS HD, and the DTS logo are either trademarks or registered trademarks of DTS, Inc. in the United States and/or other countries. HDMI and the HDMI Logo are either trademarks or registered trademarks of HDMI Licensing LLC in the United States and/or other countries. Other trademarks, registered trademarks, and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Crestron disclaims any proprietary interest in the marks and names of others. Crestron is not responsible for errors in typography or photography. Specifications are subject to change without notice. ©2017 Crestron Electronics, Inc.