

# 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® TrueHD, 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



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<sup>[1]</sup>. 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

Today's modern boardrooms and auditoriums are more than just places to meet and speak to an audience — they're high-tech presentation environments where groups gather to share ideas, inspire thought and motivate action through the use of dynamic, interactive multimedia. In an age where the televisions in our homes are commonly supplemented by some kind of surround sound enhancement, it's only logical that we should expect the same aural experience in any corporate, government, hospitality, or educational presentation space. But, while specifying a large screen display has become as simple as choosing paint, adding high-quality surround sound still relies on wedging consumer grade components into an otherwise professional system. The result is typically complicated, expensive, and ultimately unsatisfactory.

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® TrueHD, Dolby Digital® Plus, and DTS HD®, with advanced HDCP management for trouble-free handling of all your digital HD content.

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HD-XSP – Front & Rear Views

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.<sup>[1]</sup>

## 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<sup>[2]</sup>), 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

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**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, 1024x1024@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, provides HDCP key management

## 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

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**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](http://www.crestron.com/salesreps) or by calling 800-237-2041.

The specific patents that cover Crestron products are listed online at: [patents.crestron.com](http://patents.crestron.com).

Certain Crestron products contain open source software. For specific information, please visit [www.crestron.com/opensource](http://www.crestron.com/opensource).

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