HD-XSP

7.1 High-Definition Professional 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 Master Audio™, 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-thru via HDMI*
- *Balanced stereo or mono downmix output*
- *Balanced stereo mix input*
- *Built-in noise generator*
- *Advanced HDCP management for trouble-free handling of all digital content*
- *QuickSwitch HD® technology for fast, reliable switching*
- *CEC pass-through from a control system enables control of display and source devices over HDMI*
- *Color LCD front panel for setup and basic 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*

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 latest 7.1 digital formats including Dolby® TrueHD, Dolby Digital® Plus and DTS-HD Master Audio™, 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, 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 DisplayPort Multimode signals using an appropriate adapter. Easy HDMI input expansion is possible using a Crestron HD-MD8X1 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 and two coaxial SPDIF digital audio inputs provides connectivity for digital sources without HDMI.
- **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

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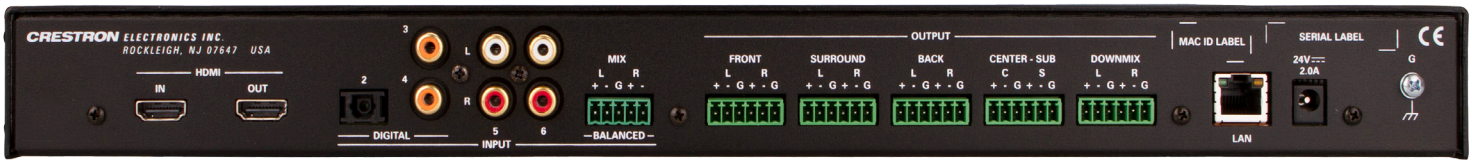
HD-XSP – Front View



HD-XSP – Rear View

output of a microphone mixer or teleconferencing codec. This input 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 either 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.

Via its HDMI input and output, the HD-XSP provides an ideal solution for adding surround sound processing to a Crestron DMPS 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.[1]

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® supporting HD lossless multi-channel up to 7.1 with HDCP, DisplayPort Multimode[2], S/PDIF (coaxial and optical), analog 2-channel

Output Signal Types: Analog 7.1 channel, analog 2-channel downmix, HDMI w/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)

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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: -80dB to +20dB, 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, DisplayPort Multimode[2]
Output Signal Types: HDMI
Formats: HDMI w/Deep Color & 3D, HDCP content protection support
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 165MHz 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 165MHz 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) 19-pin Type A HDMI female;
HDMI digital audio/video input

HDMI OUT: (1) 19-pin Type A HDMI female;
HDMI digital audio/video output

INPUT, DIGITAL 2: (1) JIS F05 female (TOSLINK) optical fiber connector;
S/PDIF optical digital audio input

INPUT, DIGITAL 3 – 4: (2) RCA female;
S/PDIF coaxial digital audio inputs;
Input Impedance: 75 Ohms nominal

INPUT, L/R 5 – 6: (4) RCA female comprising (2) unbalanced line-level stereo audio inputs;
Input Impedance: 10k Ohms;
Maximum Input Level: 2 Vrms

INPUT, MIX L/R BALANCED: (1) 5-pin 3.5mm 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

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OUTPUT, FRONT L/R, SURROUND L/R, BACK L/R, CENTER C, SUB S: (4) 6-pin 3.5mm 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 3.5mm 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-wire RJ45 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 female;
USB computer console port (cable included);
For setup only

Display

Display Type: 16-bit TFT active matrix color LCD
Size: 1.8 inch (45 mm) diagonal
Resolution: 220 x 176 pixels
Functions: Displays audio settings and setup parameters

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
▲,▼,◀,▶: (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 Requirements

Power Pack: 2 Amps @ 24 Volts DC;
100-240 Volts AC, 50/60 Hz power pack, model PW-2420RU included

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 1U 19-inch rack-mountable (feet and rack ears included)

Dimensions

Height: 1.72 in (44 mm) without feet
Width: 19.0 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

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Included Accessories

PW-2420RU: Power Pack, Desktop, 24VDC, 2A (50 Watts), Regulated, US/International (Qty. 1 included)

Available Accessories

AMP-Series: Commercial Power Amplifiers
PROAMP-Series: PROCISE® High-Definition Professional Surround Sound Amplifiers
HD-MD8X1: QuickSwitch HD® 8x1 HDMI® Switcher
CBL-Series: Crestron® Certified Interface Cables

Notes:

1. Item(s) sold separately.
2. HDMI requires an appropriate adapter or interface cable to accommodate a DisplayPort Multimode 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.

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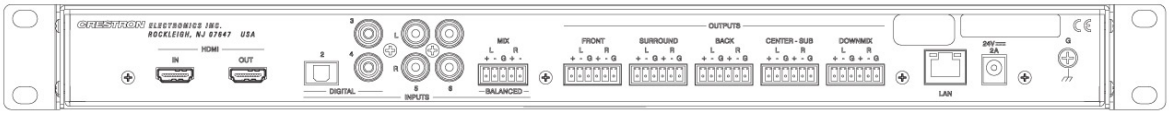

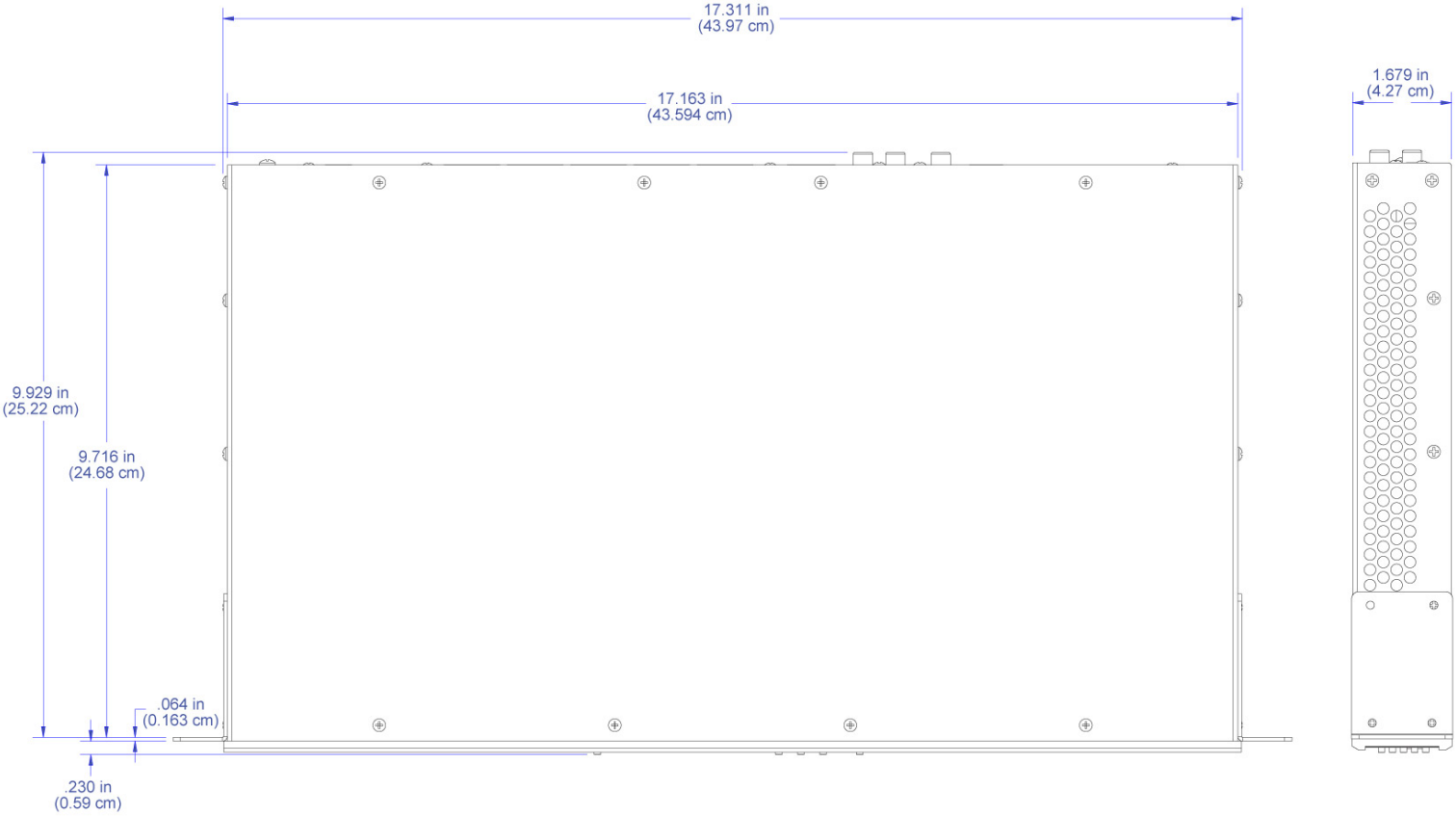

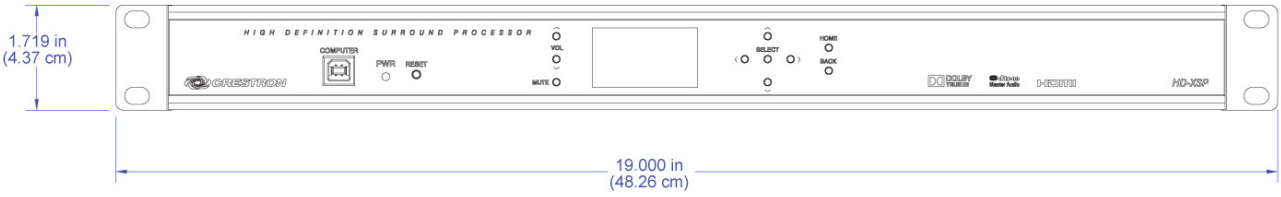

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