Complete AV Switching and Processing in One Box

IN1608

EIGHT INPUT HDCP-COMPLIANT SCALING PRESENTATION SWITCHER WITH TWISTED PAIR INPUTS AND OUTPUT

- Integrates HDMI, HDTV, RGB, video, and audio sources into presentation systems
- Inputs: Two Extron DTP 230 twisted pair, four HDMI, two universal analog video
- Outputs: One Extron DTP 230 twisted pair, two HDMI
- Two mic/line mix inputs with 48 volt phantom power and ducking
- HDMI audio embedding and de-embedding
- Optional integrated stereo or mono Class D power amplifiers
The Extron IN1608 is an HDCP-compliant scaling presentation switcher with four HDMI inputs, two universal analog video inputs, and dual HDMI outputs. It also features two Extron DTP 230 twisted pair inputs and a DTP 230 output for extending HDMI, audio, and bidirectional control signals to DTP 230 transmitters and receivers, each over a single CATx cable up to 230 feet (70 meters). The IN1608 provides the convenience of supporting local and remote sources and displays, with fast and reliable source switching, and a high performance scaling engine that converts all HDMI and analog sources to the optimal resolution. Selectable output resolutions are available up to 1920x1200, including 1080p and 2K. The two universal analog video inputs are configurable for RGB computer-video, HDTV, component video, S-video, or composite video. The IN1608 also includes a host of audio switching and processing features, available power amplification, flexible control options, and more, providing complete AV system integration capabilities.

Integrated Digital Twisted Pair Extension
The two DTP 230 twisted pair inputs can receive signals from remote DTP 230 transmitters in areas such as a conference table, lectern, or wall for connecting a guest laptop. The DTP 230 twisted pair output can be used to transmit from an IN1608 in a rack to a DTP 230 receiver behind a flat-panel display on a wall, above a ceiling-mounted projector, or any other remote location. DTP 230 transmitters and receivers are available in compact, low-profile enclosures or Decora® wallplate versions.

The DTP 230 twisted pair inputs and output include additional convenient, integrator-friendly features designed to help simplify installation. Bidirectional RS-232 and IR signals can be inserted from a control system and transmitted over the single CATx cable together with the video and audio, enabling control of a source or display. Additionally, the IN1608 can send power to each of the DTP 230 transmitters and receiver over the same CATx cable, streamlining system design and installation.

Built for Digital Video Integration
To simplify integration of HDMI sources and displays, and to help ensure optimal system performance and dependability, the IN1608 features three Extron-exclusive technologies: EDID Minder®, Key Minder®, and SpeedSwitch™. EDID Minder manages EDID communication between the display devices and input sources to ensure that the correct video formats are displayed reliably. For HDMI signals with protected content, Key Minder authenticates and maintains continuous HDCP encryption between input and output devices to ensure quick and reliable switching. With SpeedSwitch Technology, the IN1608 delivers exceptional, virtually instantaneous switching speeds for HDCP-encrypted content.

High Performance Video Processing
The IN1608 features an advanced scaling engine that can scale HDMI, RGB, component, and standard definition video signals to a common high resolution output. It provides high performance 1080i deinterlacing and Deep Color processing for optimal image quality. Additionally, the color space and chroma subsampling of the HDMI output can be automatically set to ensure compatibility with a connected DVI or HDMI display. The IN1608 accepts and outputs signals up to 1920x1200, including HDTV 1080p/60 and 2K or 2048x1080.

Audio Integration Capabilities with Available Power Amplification
In addition to video switching and processing, the IN1608 can serve as the central component for audio system integration. It includes eight-input audio switching, two mic/line inputs, HDMI audio embedding and de-embedding, and several audio processing features for mixing, ducking, tone adjustments, and more.

Two IN1608 models feature integrated power amplifiers. The IN1608 SA delivers stereo power amplification with 50 watts rms per channel into 4 ohms and 25 watts rms per channel into 8 ohms, while the IN1608 MA provides mono 70 volt amplification with 100 watts rms output. Both of these models feature an Extron exclusive Class D amplifier design with patented CDRS™ - Class D Ripple Suppression technology that provides a smooth, clean audio waveform, as well as an improvement in signal fidelity over conventional Class D amplifier designs.
COMPATIBLE WITH ALL EXTRON DTP 230 TRANSMITTERS AND RECEIVERS

The IN1608 includes two DTP 230 twisted pair inputs and one DTP 230 output that support transmission of HDMI, stereo audio, and bidirectional RS-232 and IR signals over a single CATx cable up to 230 feet (70 meters). They can be mixed and matched with DTP 230 transmitters and receivers, available in low-profile enclosures and Decora wallplate models for HDMI or DVI. The IN1608 can conveniently power these devices over the same CATx cable, and directly interface with control systems for sending RS-232 and IR control to remote devices. These capabilities allow system integrators to create flexible yet efficient system designs serving local and remote source and display locations in a variety of presentation environments.

ADVANCED AUDIO CAPABILITIES

The IN1608 provides many advanced audio features in a presentation switcher that allow for complete audio system integration. They include an integrated eight-input audio switcher, two mic/line inputs with flexible mixing and ducking capabilities, HDMI audio embedding and de-embedding, tone controls, input and output gain adjustments, and options for serving multiple audio destinations. Audio configuration features and options can easily be accessed through the internal Web pages, with an intuitive GUI that provides access to all available adjustments and settings. AV integrators and technicians can fine-tune gain controls using the graphical sliders. Real-time meters are available at all inputs and outputs, including audio embedding for the HDMI outputs, to set proper gain structure for the audio system.
COMPREHENSIVE ON-SCREEN MENUS

The IN1608 features intuitive on-screen menus for setup, operation, and monitoring using the front panel controls. Key parameters such as input and output video formats and resolutions are conveniently grouped on the initial Quick Setup screen, while additional screens provide full control over the scaler’s other functions and settings.

BUILT-IN WEB INTERFACE FOR INTUITIVE SETUP AND OPERATION

The Web interface integrated into the IN1608 is a user-friendly GUI that is very easy to navigate, allowing for expedited setup and configuration, as well as real-time operation and monitoring. Users can view details about the current input and output, such as signal format, resolution, and HDCP status. In addition to input switching, picture and audio settings are available, such as image brightness, contrast, positioning, sizing, and more. The intuitive user-interface also offers preset management and makes it easy to set EDID for any input, providing the option to select factory default EDID, EDID captured from connected output devices, or a custom EDID uploaded to the unit.
Overview

**HDCP Compliant**
Worry-free display of protected content from digital video sources.

**Advanced Scaling**
High-quality graphics and video upscaling and downscaling, 1080i deinterlacing, and HDMI Deep Color processing.

**Signal Presence and HDCP Status LEDs**
Provide simple, real-time verification of signal activity and HDCP status for all inputs and outputs.

**User-Friendly Interface**
Direct access buttons, adjustment controls, on-screen menu navigation, and volume control simplify system setup and operation.

**HDMI Inputs and Universal Analog Inputs**
Ensure compatibility with a wide variety of video sources.

**Inputs and Output for DTP 230 Extension**
Support digital signal transmission up to 230 feet (70 meters) over a single twisted pair cable.

**Three Simultaneous Outputs**
Two HDMI outputs and one DTP 230 output can drive three displays.

**HDMI Audio Embedding and De-Embedding**
The IN1608 can embed analog input audio signals onto the HDMI outputs, and extract embedded two-channel audio from HDMI inputs.

**Mic/Line Inputs with 48 V Phantom Power and Ducking**
Two mic/line inputs are available for mixing microphones or line level sources into the audio outputs.

**Ethernet and RS-232 Control**
The IN1608 can be controlled and monitored using serial commands or over Ethernet.

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**Optional Integrated Power Amplifier**
Two models are available with efficient Class D amplifiers: a stereo power amplifier with 50 watts rms output per channel into 4 ohms, and a mono 70 volt power amplifier with 100 watts rms output.
Features

Four HDMI Inputs and Two Universal Analog Video Inputs
The IN1608 allows for switching between HDMI and analog video sources. Two universal analog inputs accept all standard analog video formats, including RGB, RGBcvS, HD component video, S-video, and composite video signals.

Two Simultaneous HDMI Outputs
Two simultaneous HDMI outputs are available for driving two displays.

Compatible with DTP HDMI 230 and DTP DVI 230 Transmitters and Receivers
The IN1608 supports DTP 230 twisted pair input and output signal transmission of HDMI or DVI, analog audio, control, and remote power up to 230 feet (70 meters) over a single CATx cable. The IN1608 is compatible with all Extron DTP 230 transmitters and receivers.

Compatible with CAT 5e, CAT 6, and CAT 7 Twisted Pair Cable
Extron XTP DTP 24 Shielded Twisted Pair Cable Recommended
XTP DTP 24 cable is highly recommended for optimum signal transmission between the IN1608 and DTP 230 transmitters and receivers.

Bidirectional RS-232 and IR Insertion
Bidirectional RS-232 control and IR signals can be transmitted alongside video and audio over DTP 230 twisted pair, allowing a remote source or display to be controlled without the need for additional cabling. These signals can be directly inserted from a control processor, eliminating the need for control system wiring to remote devices.

Two Mic/Line Inputs with 48 Volt Phantom Power and Ducking
Two mic or line level audio sources can be independently mixed with program audio and embedded onto the HDMI outputs. Selectable 48 volt phantom power allows the use of condenser microphones.

HDMI Audio Embedding
Analog input audio signals can be embedded onto the HDMI output signals.

HDMI Audio De-Embedding
Embedded HDMI two-channel PCM audio can be extracted to the analog outputs, or multi-channel bitstream formats can be passed to the HDMI outputs.

Selectable Output Rates
Available output rates include computer-video up to 1920x1200, HDTV rates up to 1080p/60, and 2K or 2048x1080.

Advanced Scaling Engine with 30-bit Processing and 1080i Deinterlacing
Image scaling and video format conversion are performed at 30-bit precision for enhanced color accuracy and picture detail. High performance deinterlacing for 1080i signals from HD sources delivers optimized image quality.

HDCP Compliant
The IN1608 fully supports HDCP-encrypted sources, with selectable authorization for unencrypted content.

Supported HDMI Specification Features Include Data Rates up to 6.75 Gbps, Deep Color, and HD Lossless Audio Formats

Key Minder
Authenticates and maintains continuous HDCP encryption between input and output devices to ensure quick and reliable switching in professional AV environments.

EDID Minder
Automatically manages EDID communication between connected devices. EDID Minder ensures that all sources power up properly and reliably output content for display.

SpeedSwitch Technology
Provides exceptional switching speed for HDCP-encrypted content.

Aspect Ratio Control
The aspect ratio of the video output can be controlled by selecting a FILL mode, which provides a full screen output, or a FOLLOW mode, which preserves the original aspect ratio of the input signal.

HDCP Visual Confirmation
When processing HDCP-encrypted content, the IN1608 outputs a full-screen green signal on any video output connected to a non-HDCP compliant display for immediate visual confirmation that protected content cannot be viewed on the display.

HDMI to DVI Interface Format Correction
Automatically enables or disables embedded audio and infoframes, and sets the correct color space for proper connection to HDMI and DVI displays.

Auto-Image Setup
When activated, the unit automatically detects the resolution of an incoming analog video signal and sets the total pixels, active pixels, active lines, and the horizontal and vertical starting points. This saves time and effort in setting up a newly connected source.

Auto Input Memory
When activated, the IN1608 automatically stores size, position, and picture settings based on the incoming signal. When the same signal is detected again, these image settings are automatically recalled from memory.

Output Standby Mode
The unit can be set to automatically mute video and sync output to the display device when no active input signal is detected. This allows the projector or flat-panel display to automatically enter into standby mode to save energy and enhance lamp or panel life.

Power Save Mode
The IN1608 can be placed in a low power standby state to conserve energy when not in use.

Automatic 3:2 and 2:2 Pulldown Detection
Advanced film mode processing techniques that help maximize image detail and sharpness for NTSC, PAL, and HDTV 1080i sources that originated from film.

Quad Standard Video Decoding
A temporal, 3D adaptive comb filter provides advanced decoding of composite NTSC 3.58, NTSC 4.43, PAL, and SECAM for integration into systems worldwide.

Internal Test Patterns for Calibration and Setup
The IN1608 offers a crop pattern, grayscale, color bars, alternating pixels, blue mode, and audio pink noise.

Ethernet, USB, and RS-232 Control
The IN1608 provides multiple control and monitoring options in addition to the front panel.

Rack Mountable, Full Rack Width Metal Enclosure
CONFERECE ROOM

The IN1608 can serve as the central integration component for source switching, supporting wall and table locations for connecting devices, microphone audio mixing, and optimizing source video to the display. The IN1608 is housed within a credenza, together with a variety of resident sources connected via HDMI. The DTP 230 twisted pair inputs and output go into CATx cable runs to the conference table and a wallplate for guest laptops, and a wallplate behind the flat-panel display. The IN1608 mixes input signals from two conference table microphones into a mono output for a sound reinforcement system, while sending program audio via DTP 230 to the flat-panel display.

TRAINING ROOM

For this 50 x 40 foot (15.2 x 12.2 m) training room, an IN1608 can provide source switching, support for remote device locations, audio mixing and processing, sound reinforcement, and scale source signals to the native resolution of the displays. An IN1608 MA is installed in a lectern, together with local resident sources. Despite the size of this room, the DTP 230 transmission capabilities are sufficient to reach a wallplate at the rear of the room, as well as a student presentation station and a ceiling-mounted projector. The integrated 100 watt mono amplifier feeds the 70 volt speaker system to provide ample sound reinforcement. Speech and program audio mixing, mic ducking, and gain controls with metering are available within the IN1608, allowing an AV technician to perform proper sound system setup. As an additional integration convenience, the projector can be controlled via RS-232, with the IN1608 transmitting signals inserted from a control processor.
## Specifications

### VIDEO INPUT

<table>
<thead>
<tr>
<th>Number/signal type</th>
<th>2 RGB, RGBcvS, component video (YUV) or YUVp(HDTV), S-video, composite video</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connectors</td>
<td>2 female 15-pin HD, 4 female HDMI, 2 female RJ-45 connectors</td>
</tr>
</tbody>
</table>

### VIDEO OUTPUT

<table>
<thead>
<tr>
<th>Number/signal type</th>
<th>2 HDMI (HDCP-compliant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connectors</td>
<td>2 female HDMI, 1 female RJ-45 connector</td>
</tr>
</tbody>
</table>

### AUDIO

**INPUT**

- Number/signal type: 8 stereo line level balanced or unbalanced, 2 mono mic/line level balanced or unbalanced (with available phantom power), 4 stereo, de-embedded from HDMI (PCM only)
- Connectors: (6) 3.5 mm, 5 pole captive screw connectors for line, (2) 3.5 mm, 3 pole captive screw connector for mic/line, 4 female HDMI type A, (2) RJ-45 connectors
- Maximum level: Line inputs: +21 dBu balanced, +15 dBu unbalanced, Mic/line inputs: +12 dBV (2 Vrms) when gain is set to 0 dB
- DC phantom power: +48 VDC ±10% (can be switched on or off per mic/line input)

**OUTPUT**

- Number/signal type: 1 balanced or unbalanced stereo (variable), 1 balanced or unbalanced stereo; can be configured as stereo or two independently mixed mono channels, 2 HDMI embedded
- Connectors: (2) 3.5 mm captive screw connectors, 5 pole, 2 female HDMI, 1 RJ-45 connector
- Maximum level (Hi-Z): >+12 dBu balanced, >+6 dBu unbalanced

### AUDIO OUTPUT — POWER AMPLIFIER (AMPLIFIER MODELS ONLY)

<table>
<thead>
<tr>
<th>Number/signal type</th>
<th>IN1608 SA</th>
<th>IN1608 MA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 stereo (default) or 2 mono (2 channels total)</td>
<td>1 mono, 70 V line</td>
</tr>
</tbody>
</table>

### Connectors

- (1) 5 mm screw lock captive screw connector, 4 pole
- (2) 3.5 mm captive screw connectors, 5 pole

### Load impedance

- IN1608 SA: 4 ohms minimum
- IN1608 MA: 50 ohms minimum

### Output power

- IN1608 SA: 25 watts per channel, 8 ohms, 1 kHz, 0.1% THD
- IN1608 MA: 100 watts (rms) @ 70 V, 1 kHz, 1% THD

### Protection

- Clip limiting, thermal, short circuit, DC output

### CONTROL/REMOTE

- Serial control port: 1 bidirectional RS-232, 3.5 mm captive screw connector, 3 pole (rear panel)
- USB control ports: 1 front panel female mini USB B
- Ethernet control port: 1 female RJ-45 connector

### CONTROL/REMOTE — EXTERNAL DEVICE (PASS-THROUGH, UNIDIRECTIONAL OR BIDIRECTIONAL) (RS-232/IR OVER DTP)

- Serial control pass-through ports: IN1608 input/DTP Tx, RS-232 via (2) 3.5 mm, 5 pole captive screw connectors (shared with IR ports)
- IN1608 output/DTP Rx, RS-232 via (1) 3.5 mm, 5 pole captive screw connector (shared with IR port)
- IR pass-through control ports: TTL level (0 to 5 V) modulated infrared control from 30 kHz up to 60 kHz

### GENERAL

- Power supply: Internal
- Input: 100-240 VAC, 50-60 Hz
- Mounting: Rack mount Yes, with included, pre-installed brackets
- Enclosure dimensions:
  - IN1608: 1.75" H x 17.5" W x 9.5" D (1U high, full rack wide)
  - IN1608 SA, IN1608 MA: 3.5" H x 17.5" W x 9.5" D (2U high, full rack wide)
- Regulatory compliance:
  - Safety: CE, c-UL, UL
  - EMI/EMC: CE, C-tick, FCC Class A, IES, VCCI
  - Environmental: Complies with the appropriate requirements of RoHS, WEEE
- Warranty: 3 years parts and labor

**NOTE:** All nominal levels are at ±10%.

<table>
<thead>
<tr>
<th>Model</th>
<th>Version Description</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN1608</td>
<td>Standard Version</td>
<td>60-1238-01</td>
</tr>
<tr>
<td>IN1608 SA</td>
<td>2x50 Watt Stereo Power Amplifier</td>
<td>60-1238-02</td>
</tr>
<tr>
<td>IN1608 MA</td>
<td>100 Watt 70 Volt Mono Power Amplifier</td>
<td>60-1238-03</td>
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</table>

For complete specifications, please go to www.extron.com
Specifications are subject to change without notice.