

IN1606

SIX INPUT HDCP-COMPLIANT SCALING PRESENTATION SWITCHER

Complete Video and Audio Switching
and Processing for Professional
Environments

- ▶ Integrates HDMI, HDTV, RGB, and video sources into presentation systems with audio switching
- ▶ Four HDMI inputs and two universal analog inputs
- ▶ Two simultaneous HDMI outputs
- ▶ Two mic/line inputs with 48 volt phantom power and ducking
- ▶ HDMI audio embedding and de-embedding
- ▶ Selectable output rates from 640x480 to 1920x1200, including HDTV 1080p/60 and 2K



Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

Introduction

The Extron **IN1606** is a six input, HDCP-compliant video scaler with four HDMI inputs, two universal analog video inputs, and two simultaneous HDMI outputs. The IN1606 accepts a wide variety of video formats including HDMI, HDTV, RGB, and standard definition video. It features an advanced video scaling engine with 1080i deinterlacing and 30-bit processing to deliver uncompromised picture quality for output resolutions up to 1920x1200, including 1080p and 2K. Enhanced audio features include six stereo inputs, two variable stereo outputs, two mic/line inputs with ducking, plus HDMI audio embedding and de-embedding. Designed for professional AV integration, the IN1606 offers flexible control options including Ethernet, RS-232, and USB. The IN1606 provides a complete AV switching system in one rack-mountable enclosure.

Six Input Multi-Format Video Switcher

To accommodate a variety of sources, the IN1606 features four HDMI inputs plus two universal analog video inputs that can scale RGB computer video, HDTV, component video, S-video, and composite video. The IN1606 provides the capability to integrate digital and analog devices, with HDCP compliance.

Built to Handle Digital Video

To enhance and simplify integration of HDMI sources and displays, the IN1606 features two exclusive Extron technologies: EDID Minder® and Key Minder®. EDID Minder manages EDID communication between the display devices and input sources, while Key Minder manages HDCP negotiation to ensure quick and reliable switching. When receiving an HDCP-encrypted HDMI input source, the IN1606 outputs a full-screen green signal on any video

output connected to a non-HDCP compliant display. This provides immediate visual confirmation that the protected content cannot be viewed on this display. Real-time verification of the HDCP status for each HDMI input and output offers valuable feedback to system operators and helpdesk support staff. The IN1606 also features SpeedSwitch® Technology that delivers exceptional switching speed for HDCP-encrypted content.

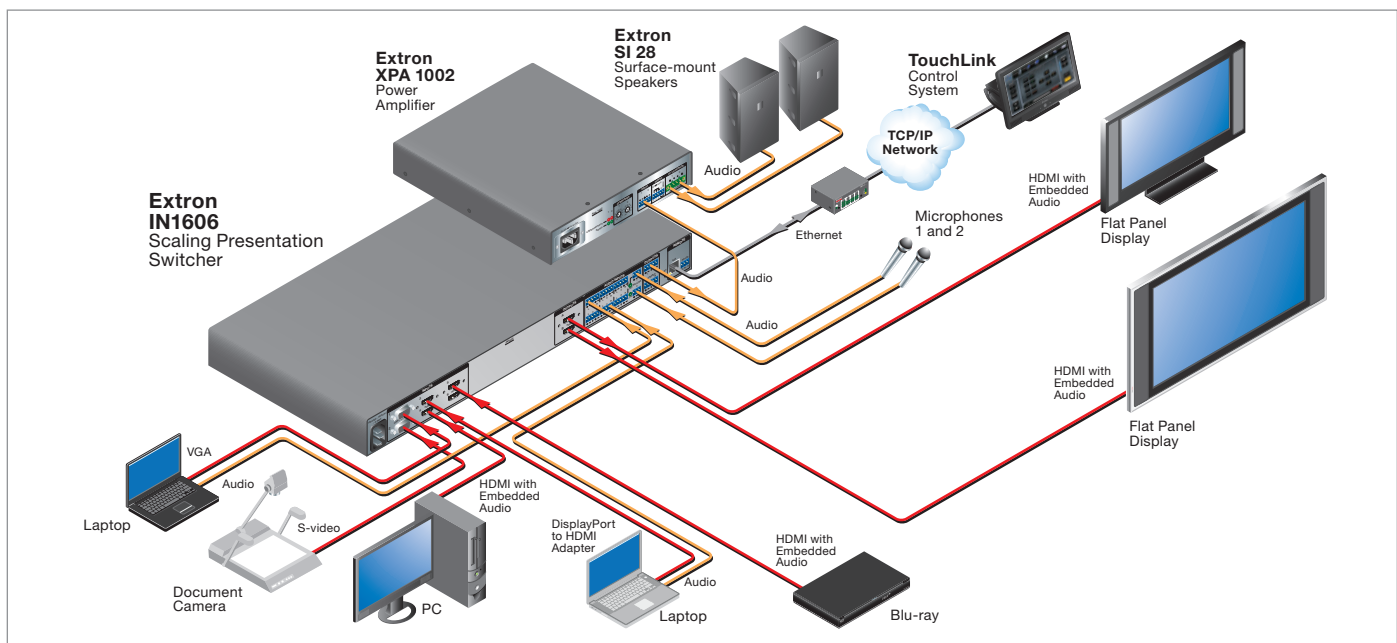
High Performance Video Processing

The IN1606 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 IN1606 accepts and outputs signals up to 1920x1200, including HDTV 1080p/60 and 2048x1080. It offers two simultaneous HDMI outputs to drive two displays.

Multiple Options for Control and Operation

The IN1606 features front panel controls and intuitive on-screen menus for quick access to functions. Remote configuration and control are available via USB, RS-232, and Ethernet. The IN1606 is ideal in boardrooms where superior performance is essential, video routing applications where automatic features help simplify system design and keep costs down, and instructional environments for complete integration of digital and analog AV sources and displays.



Features

Four HDMI inputs and two universal analog video inputs

The IN1606 allows for switching between HDMI and analog video sources. Two universal analog inputs accept all standard analog video formats, including RGB, HD component video, S-video, and composite video signals.

Two simultaneous HDMI outputs

Two simultaneous HDMI outputs are available for driving two displays.

Two mic/line inputs with 48 volt phantom power

Two mic or line level audio sources can be independently mixed with program audio and embedded onto the HDMI output. Selectable 48 volt phantom power allows the use of condenser microphones.

Mic ducking

Automatically reduces program audio when a microphone signal is detected.

Auto-switching between inputs

HDMI audio embedding

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

HDMI audio de-embedding

Embedded HDMI two-channel PCM audio can be extracted to the analog outputs or 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 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 IN1606 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 verification

Provides real-time verification of HDCP status for each digital video input and output. This allows for simple, quick, and easy signal and HDCP verification through front panel LEDs, RS-232, or Ethernet, providing valuable feedback to a system operator or helpdesk support staff.

HDCP Visual Confirmation

When processing HDCP-encrypted content, the IN1606 outputs a full-screen green signal on any video output connected to a non-HDCP compliant display. This provides 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.

Seamless switching

Seamless cut through black and fade through black transition effects are available to enhance presentations by eliminating distractions during switching.

Image freeze control

A live image can be frozen using RS-232 serial control, USB, or Ethernet control.

Auto-Image™ setup

When activated, the unit automatically detects the resolution of the incoming video signal and sets the total pixels, active pixels, and active lines, as well as the horizontal and vertical starting points. This can save time and effort in setting up a newly connected source.

Auto Input Memory

When activated, the IN1606 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 Muting Control

Provides the capability to mute one or all outputs at any time. This allows content to be viewed on a local monitor prior to appearing on the main presentation display.

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 IN1606 can be placed in a low power standby state to conserve energy when not in use.

Picture controls and user presets

Multiple image adjustments are available including brightness, contrast, color, tint, and detail, as well as horizontal and vertical positioning, and sizing. Memory presets are available for each input to store and recall optimized image settings.

Automatic 3:2 and 2:2 pulldown detection

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 IN1606 offers a crop pattern, grayscale, color bars, alternating pixels, blue mode, and audio pink noise.

Audio switching transitions

The audio output level automatically ramps down and then ramps up to match the video during switching transitions.

Front panel security lockout

Ethernet, USB, and RS-232 control

Rack mountable 1U, full rack width metal enclosure

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.

User-friendly interface

Direct access buttons, adjustment controls, LED status indicators, on-screen menu navigation, and volume control simplify system setup and operation.



IN1606 - Front



IN1606 - Back

HDMI and universal analog inputs

HDMI and universal analog inputs ensure compatibility with a wide variety of video sources.

Simultaneous outputs

Two HDMI outputs can drive two displays simultaneously.

HDMI audio embedding and de-embedding

The IN1606 can embed analog input audio signals onto the HDMI outputs or extract embedded HDMI audio.

Mix inputs with phantom power and ducking

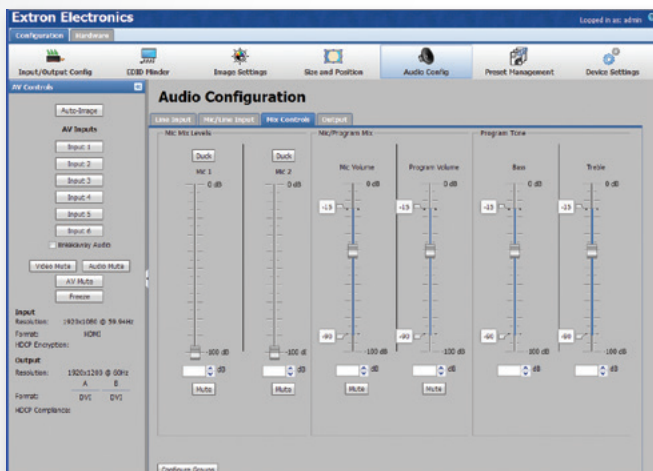
Two mix inputs are available for combining microphones or line level sources onto the audio output.

Ethernet and RS-232 control

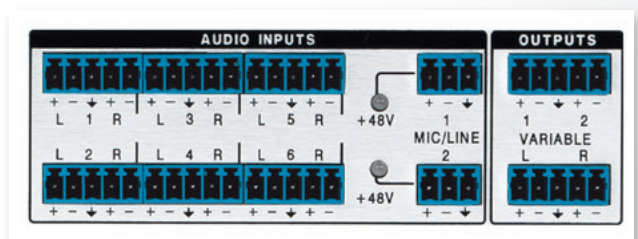
The IN1606 can be controlled and proactively monitored using serial commands or over Ethernet. An intuitive Web interface enables full operation and control.

ADVANCED AUDIO CAPABILITY

The IN1606 features sophisticated audio functionality, including HDMI audio embedding and de-embedding. To suit the needs of the application, the IN1606 can embed analog input audio signals onto the HDMI outputs or extract embedded HDMI audio. Audio breakaway enables separation of analog audio channels from the corresponding video signals, so that the analog audio channels can operate as an independent switcher. To support integration into presentation environments, the IN1606 features two mic/line inputs with mixing, ducking, and 48 volt phantom power. The IN1606 also provides full control of advanced audio configuration settings, such as audio input and output gain, attenuation, mixing, and ducking parameters, through an intuitive Graphical User Interface.



IN1606 audio control Web page



IN1606 audio connections

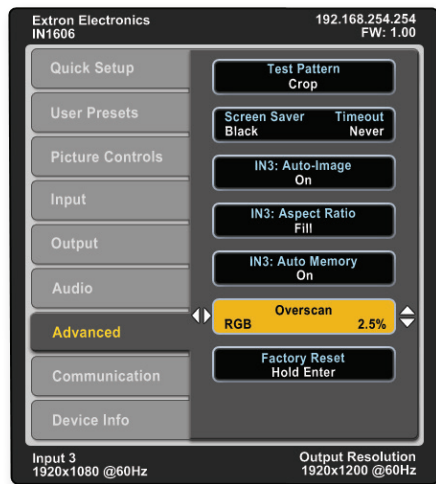
IN1606 User Interface

COMPREHENSIVE ON-SCREEN MENUS

The IN1606 features intuitive on-screen menus for setup 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.



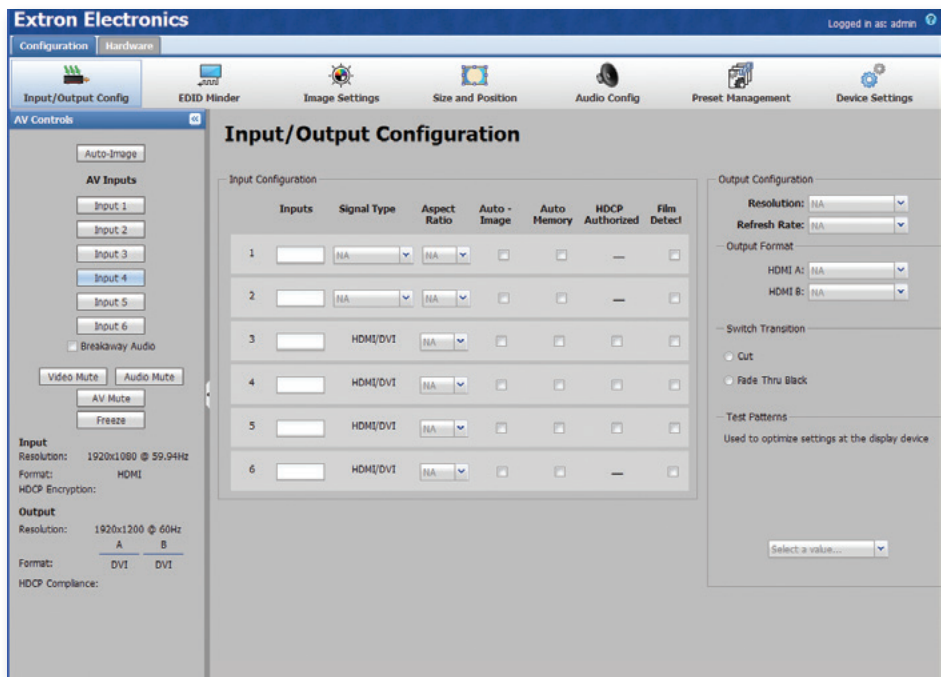
IN1606 Quick Setup on-screen display



IN1606 Advanced on-screen display

FULL CONTROL WITH BUILT-IN WEB PAGES

When connected through Ethernet, built-in Web pages are available to simplify setup and troubleshooting with a user-friendly interface. Users can view details about the current input and output, such as signal format, resolution, and HDCP status. In addition to input selection and Auto-Image, 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, giving users the option to choose factory default EDID, EDID captured from connected output devices, or custom loaded EDID. These options can also be accessed when connected through RS-232, Ethernet, or USB using available control software.



Specifications

VIDEO INPUT	
Number/signal type	2 RGB, RGBcV, component video (YUVi or YUVp/HDTV), S-video, composite video 4 HDMI digital video (HDCP compliant)
Connectors	2 female 15-pin HD 4 female HDMI
Resolution range	640x480 to 1600x1200 and 1920x1200* NTSC, PAL, SECAM, 480p, 576p, 720p, 1080i, 1080p, and 2k *reduced blanking
VIDEO PROCESSING	
Decoder	12 bit digital (3D-adaptive comb filter)
Analog sampling	12 bits per color; 13.5 MHz standard (video) 170 MHz standard (RGB)
Digital pixel data bit depth	8, 10, or 12 bits per channel; 165 MHz pixel clock (HDMI)
VIDEO OUTPUT	
Number/signal type	2 HDMI (HDCP)
Connectors	2 female HDMI
Scaled resolution	640x480 ^{6,8,9} , 800x600 ^{6,8,9} , 852x480 ^{6,8,9} , 1024x768 ^{6,8,9} , 1024x852 ^{6,8,9} , 1024x1024 ^{6,8,9} , 1280x768 ^{6,8,9} , 1280x800 ^{6,8,9} , 1280x1024 ^{6,8,9} , 1360x768 ^{6,8,9} , 1360x768 ^{6,8,9} , 1365x768 ^{6,8,9} , 1365x1024 ^{6,8,9} , 1366x768 ^{6,8,9} , 1400x1050 ^{6,8} , 1440x900 ^{6,8,9} , 1600x900 ^{6,8} , 1600x1200 ^{6,8} , 1680x1050 ^{6,8} , 1920x1200 ^{6,8} HDTV 480p ^{7,8} , 576p ⁸ , 720p ^{3,4,5,6,7,8} , 1080i ^{6,7,8} , 1080p ^{1,2,3,4,5,6,7,8} , 2048x1080 ^{1,2,3,4,5,6,7,8} ¹ = at 23.98 Hz, ² = at 24 Hz, ³ = at 25 Hz, ⁴ = at 29.97 Hz, ⁵ = 30 Hz, ⁶ = at 50 Hz, ⁷ = at 59.94 Hz, ⁸ = at 60 Hz, ⁹ = at 75 Hz
AUDIO	
Gain	Unbalanced output: -6 dB; balanced output: 0 dB
Frequency response	Lineout: 20 Hz to 20k Hz, ±0.5 dB
THD + Noise	<0.1%, 20 Hz to 20k Hz at nominal level
S/N	>90 dB at rated max. output (unweighted)
Crosstalk	≤80 dB @ 1 kHz fully loaded
Stereo channel separation	>80 dB @ 1 kHz
AUDIO INPUT	
Number/signal type	6 stereo line balanced or unbalanced; 2 mono mic/line balanced or unbalanced (with available phantom power)
Connectors	(6) 3.5 mm, 5 pole captive screw connectors for line (2) 3.5 mm, 3 pole captive screw connector for Mic/Line
Impedance	10k ohms unbalanced, 20k ohms balanced
Nominal level	-60 dBV, +4 dBu, -10 dBV, adjustable
Maximum level	+12 dBV (2 Vrms) when gain is set to 0 dB
Input gain adjustment	-53 dB to +9 dB, 1 dB steps adjustable per input

AUDIO OUTPUT – LINEOUT		
Number/signal type	1 balanced or unbalanced stereo (variable) 1 balanced or unbalanced stereo; can be configured as stereo or two independently mixed mono	
Connectors	(2) 3.5 mm captive screw connectors, 5 pole	
Impedance	50 ohms unbalanced, 100 ohms balanced	
Gain error	±0.5 dB channel to channel	
Maximum level (Hi-Z)	>+12 dBu, balanced >+6 dBu, unbalanced	
Output volume range	0 to -100 dB in 1 dB steps	
CONTROL/REMOTE		
Serial control port	1 bidirectional RS-232: 1 rear panel 3.5 mm captive screw connector, 3 pole	
USB control ports	1 front panel female mini USB B	
Ethernet control port	1 female RJ-45 connector	
GENERAL		
Power supply	Internal Input: 100-240 VAC, 50-60 Hz	
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing	
Cooling	Passive, side and top vents	
Mounting		
Rack mount	Yes, with included, pre-installed brackets	
Enclosure dimensions	1.75" H x 17.5" W x 10.5" D (1U high, full rack wide) (4.4 cm H x 44.4 cm W x 26.7 cm D) (Depth excludes connectors and knobs. Width excludes rack ears.)	
Regulatory compliance		
Safety	CE, c-UL, UL	
EMI/EMC	CE, C-tick, FCC Class A, ICES, VCCI	
Environmental	Complies with the appropriate requirements of RoHS, WEEE.	
Warranty	3 years parts and labor	
NOTE: All nominal levels are at ±10%.		
Model	Version Description	Part number
IN1606	HDCP-Compliant Scaling Switcher	60-1081-01

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

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