

# IN1604

## FOUR INPUT HDCP-COMPLIANT SCALER



Comprehensive AV Signal Processing  
in a Compact Enclosure

- ▶ Integrates HDMI, analog video, and audio sources into presentation systems
- ▶ Three HDMI inputs and one universal analog video input
- ▶ Available DTP® or HDMI output
- ▶ Auto-switching between inputs
- ▶ High performance scaling engine with 30-bit precision processing and motion-adaptive deinterlacing for signals up to 1080i



# Introduction

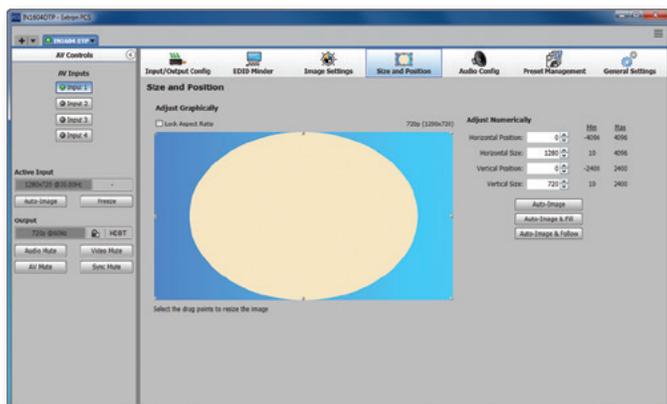
The Extron **IN1604 DTP** and **IN1604 HD** are HDCP-compliant scalers with three HDMI inputs, a universal analog video input, and an Extron DTP® or HDMI output, in a compact 1U, half rack enclosure. The IN1604 is ideal for installation beneath conference tables and in lecterns to provide localized switching support for sources such as presenter devices. The IN1604 DTP allows signal extension up to 330 feet (100 meters) over shielded CATx cable to reach a wall or ceiling-mounted display. Both IN1604 models provide the convenience of fast and reliable switching, along with a high performance scaling engine for HDMI and analog video sources. The universal analog input is configurable for RGB, HDTV, component video, S-video, or composite video. Also included are a host of audio processing features and many versatile options for control.

## Built for Digital Video Integration

To simplify integration of HDMI sources and displays, and to help ensure optimal system performance and dependability, the IN1604 features three Extron-exclusive technologies: EDID Minder®, Key Minder®, and SpeedSwitch®. EDID Minder and Key Minder automatically manage EDID communication and HDCP key negotiation between input and output devices to ensure reliable operation. With SpeedSwitch Technology, the IN1604 delivers exceptional switching speeds for HDCP-encrypted content.

## High Performance Video Processing

The IN1604 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 deinterlacing of all interlaced signals up to 1080i, and Deep Color processing to deliver optimal image quality. The IN1604 accepts and outputs signals up to 1920x1200, including 1080p/60 and 2K.



**Extron Product Configuration Software allows for expedited setup and commissioning, as well as real-time operation and monitoring.**



**The IN1604 features intuitive on-screen menus for setup, operation, and monitoring using the front panel controls.**

## Integrated Digital Twisted Pair Extension

The IN1604 DTP twisted pair output can extend video, audio, and bidirectional control signals up to 330 feet (100 meters) to a DTP 330 receiver, or up to 230 feet (70 meters) to a DTP 230 receiver in a remote location. The IN1604 DTP can also send power to the DTP receiver over the same shielded CATx cable, streamlining system design and installation. DTP 230 and DTP 330 receivers are available in compact, low-profile enclosures or decorator-style wallplate versions to suit installation requirements.

## HDBaseT-Compatible Output

The IN1604 DTP can be configured for compatibility with an HDBaseT-enabled display to send digital video and embedded audio, plus bidirectional RS-232 and IR signals up to 330 feet (100 meters) over a shielded CATx cable.

## Audio Integration Capabilities

The IN1604 delivers essential audio integration capabilities, including HDMI audio embedding and de-embedding, and flexible audio switching with two individually assignable analog audio inputs. Audio configuration settings include gain and attenuation for each analog input, output volume, and selectable audio muting.

## Multiple Options for Control and Configuration

The IN1604 features front panel controls and on-screen menus for quick access to functions. It also features automatic switching between inputs to streamline system operation when the unit is installed in a lectern or under a conference table. Remote configuration and control are available via USB and RS-232, plus contact closure with tally for input switching. The IN1604 can be configured using PCS, which allows for expedited setup and commissioning, as well as real-time operation and monitoring.

# Features

## Three HDMI inputs and one universal analog video input

The IN1604 allows for switching between digital and analog video sources. The universal analog video input accepts all standard analog video formats, including RGB, HD component video, S-video, and composite video.

## DTP or HDMI output

The IN1604 DTP supports digital signal transmission of video, analog audio, and control up to 330 feet (100 meters) over a single shielded CATx cable. The DTP receiver can be remotely powered over the twisted pair connection. The IN1604 HD is equipped with an HDMI output.

### IN1604 DTP Features

**Compatible with all DTP Series receivers and DTP-enabled products**

**Compatible with CATx shielded twisted pair cable**

**Extron XTP DTP 24 shielded twisted pair cable is strongly recommended for optimal performance**

**Bidirectional RS-232 and IR insertion for AV device control**

**DTP output is compatible with HDBaseT-enabled devices**

The IN1604 DTP can be configured to send video and embedded audio, plus bidirectional RS-232 and IR signals to an HDBaseT-enabled display.

## Auto-switching between inputs

Allows for simple, unmanaged installation in locations such as in a lectern or under a conference table.

## Selectable output rates

Available output rates include computer and video up to 1920x1200, including 1080p/60 and 2K.

## Advanced scaling engine with 30-bit precision processing

## Motion-adaptive deinterlacing for signals up to 1080i

## Audio integration and processing

The IN1604 delivers essential audio integration capabilities, including flexible audio switching with two individually assignable analog audio inputs, switching

transitions, gain and attenuation adjustments for each analog input, output volume control, and audio muting.

## HDMI audio embedding

Analog audio signals can be embedded onto the DTP or HDMI output.

## 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 DTP or HDMI output.

## HDCP compliant

This ensures display of content-protected media and interoperability with other HDCP-compliant devices.

## User-selectable HDCP authorization

This allows individual inputs to appear HDCP compliant or non-HDCP compliant to the connected source, which is beneficial if the source automatically encrypts all content when connected to an HDCP-compliant device. Protected material is not passed in non-HDCP mode.

## Supported HDMI specification features include data rates up to 6.75 Gbps, Deep Color, and HD lossless audio formats

## Extron-exclusive digital video technologies

The IN1604 includes EDID Minder, Key Minder, and SpeedSwitch to simplify integration of HDMI source and display devices, and to help ensure optimal system performance and dependability.

## HDCP Visual Confirmation

When processing HDCP-encrypted content, the IN1604 outputs a full-screen green signal when the video output is connected to a non-HDCP compliant display, providing immediate visual confirmation that protected content cannot be viewed.

## 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.

## 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.

## Seamless switching

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

## Auto-Image™ Setup

When activated, the unit automatically optimizes the image by analyzing and adjusting to the video input signal. This saves time and effort in setting up a newly connected source.

## Auto Input Memory

When activated, the IN1604 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 IN1604 can be placed in a low power standby state to conserve energy when not in use.

## Picture controls for brightness, contrast, color, tint, detail, as well as horizontal and vertical positioning, and sizing

## 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 video test patterns and pink noise generator

## USB, RS-232, and contact closure remote control with tally output

## Compact 1U, half rack width metal enclosure

The IN1604 can be installed underneath a conference table or in a lectern. Extron UTS Series and MBU 123 mounting hardware are available separately to facilitate under-table and surface mounting.

# Overview

**Advanced scaling**  
High quality graphics and video upscaling and downscaling, 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 the output.

**User-friendly interface**  
Direct access buttons, adjustment controls, and on-screen menu navigation simplify system setup and operation.

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

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

**HDMI audio embedding and de-embedding**  
The IN1604 can embed analog audio signals onto the digital video output, and extract embedded two-channel audio from HDMI inputs.

**Available with DTP or HDMI output**  
The IN1604 DTP supports digital signal transmission up to 330 feet (100 meters) over a single shielded twisted pair cable to a DTP receiver. The IN1604 HD is equipped with an HDMI output.

**Compatible with HDBaseT-enabled devices**  
The IN1604 DTP can be configured to send video, embedded audio, and control signals to an HDBaseT-enabled display.

**RS-232 and contact closure control with tally output**  
The IN1604 can be controlled over RS-232, and configured using Extron PCS - Product Configuration Software. The contact closure port and tally output can be used for external control of source switching.

## COMPATIBLE WITH EXTRON DTP SYSTEM PRODUCTS

**DTP SYSTEMS** The IN1604 DTP includes a DTP output that supports transmission of video with embedded audio, and bidirectional RS-232 and IR signals over a single shielded CATx cable up to 330 feet (100 meters). It may be paired with a DTP 230 or DTP 330 receiver, available in low-profile enclosures and decorator-style wallplate models. In addition, the IN1604 DTP can conveniently power the receiver over the same shielded CATx cable, and directly interface with control systems for sending RS-232 and IR control to display devices.

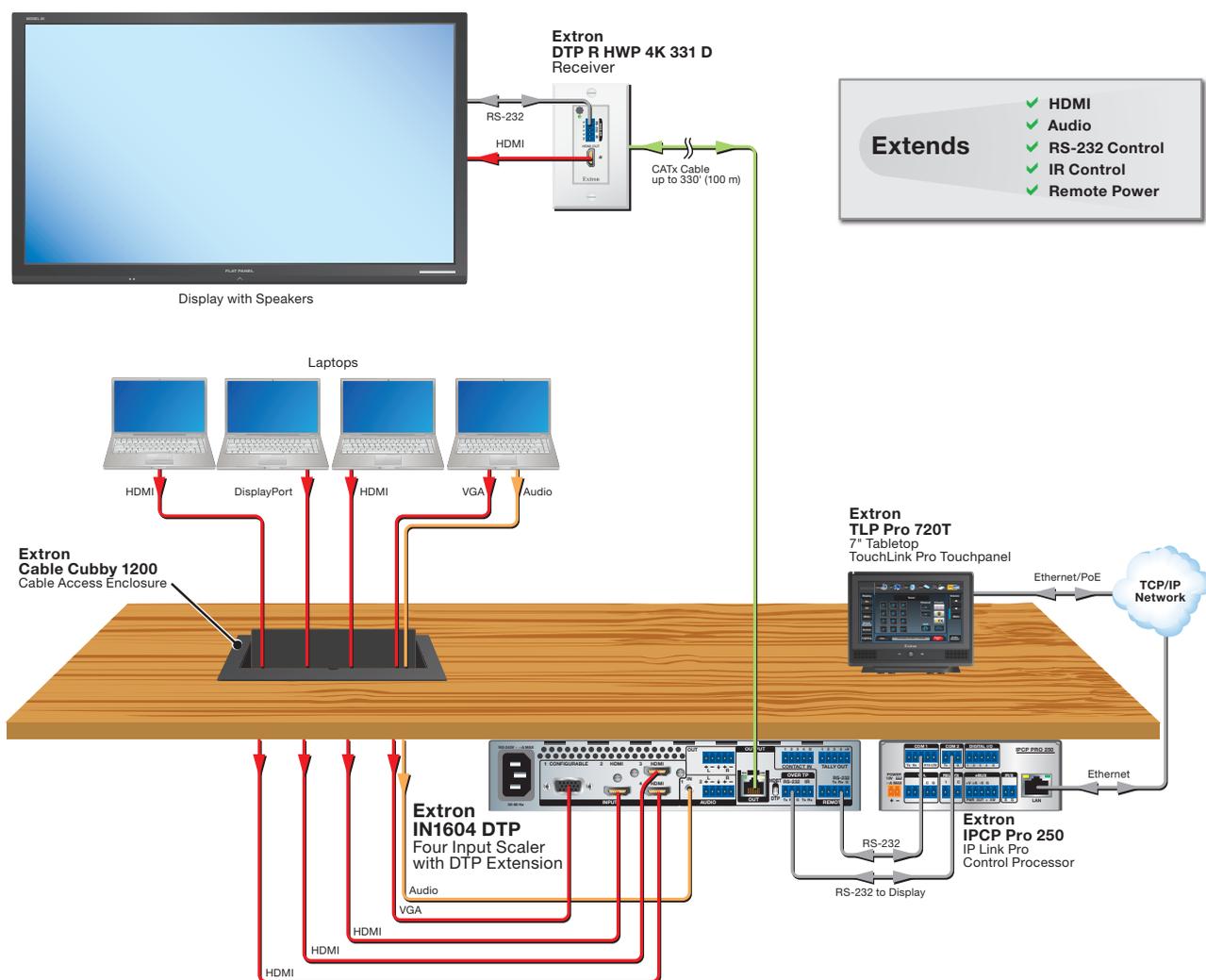
Additionally, the IN1604 DTP is ideal for integration as a sub-switching solution into a larger DTP-enabled switcher or matrix switcher, such as the Extron IN1608 or DTP CrossPoint Matrix Switcher.



# Application

## MEETING ROOM

The IN1604 DTP can serve as the central integration component for switching AV sources and optimizing video for a meeting room display. The compact enclosure of the IN1604 DTP allows convenient and inconspicuous placement under the conference table with Extron mounting accessories. At the table, the scaler supports several guest laptops connected via HDMI, a DisplayPort adapter, and VGA. In addition, the IN1604 DTP can automatically switch between inputs for simple, unmanaged operation. The IN1604 DTP scales the video inputs to match the native resolution of the flat-panel display and the DTP twisted pair output sends the AV signals over a shielded CATx cable to a wallplate receiver behind the display, simplifying the system design. As an additional integration convenience, the display can be controlled via RS-232, with the IN1604 DTP transmitting signals inserted from a control processor.



# Specifications

VIDEO INPUT	
Connectors	1 female 15-pin HD 3 female HDMI type A
VIDEO PROCESSING	
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	
Connectors	IN1604 DTP 1 female RJ-45 IN1604 HD 1 female HDMI
Digital bit depth	8 or 10 bit, automatic
INTERCONNECTION BETWEEN IN1604 DTP AND DTP/HDBASET RECEIVER (IN1604 DTP ONLY)	
Connectors	1 female RJ-45
Termination standard	TIA/EIA-T568B
Signal transmission distance	DTP 330 Up to 330' (100 m) using shielded twisted pair cable or XTP DTP 24 STP cable DTP 230 Up to 230' (70 m) using shielded twisted pair cable or XTP DTP 24 STP cable
Cable requirements	Solid conductor, 24 AWG or better
Cable recommendations	400 MHz bandwidth, STP (shielded twisted pair)
NOTE:	Extron XTP DTP 24 shielded twisted pair cable is strongly recommended for optimal performance.
AUDIO	
Frequency response	20 Hz to 20 kHz, ±0.5 dB
THD + Noise	< 0.1% @ 1 kHz, 20 Hz to 20 kHz bandwidth (at nominal level)
S/N	>90 dB, at maximum output (unweighted)
AUDIO INPUT	
Connectors	(1) 3.5 mm stereo jack; tip (L), ring (R), sleeve (ground) (1) 3.5 mm captive screw connector, 5 pole 3 female HDMI type A
CMRR	70 dB @ 1 kHz
AUDIO OUTPUT	
Number/signal type	
NOTE:	Remote analog audio output is not available in HDBaseT mode.
Connectors	IN1604 DTP (1) 3.5 mm captive screw connector, 5 pole 1 female RJ-45 IN1604 HD (1) 3.5 mm captive screw connector, 5 pole 1 female HDMI
NOTE:	System gain for the analog DTP receiver output is rated at -12 dB (unbalanced) and -6 dB (balanced).
COMMUNICATIONS — SCALING PRESENTATION SWITCHER	
Serial control port	
IN1604 DTP	1 bidirectional RS-232, 3.5 mm captive screw connector, 5 pole (rear panel, uses 3 poles)
IN1604 HD	1 bidirectional RS-232, 3.5 mm captive screw connector, 3 pole (rear panel)

Contact closure	4 contact closure inputs on (1) 3.5 mm captive screw connector, 5-pole	
Tally output	4 tally outputs on (1) 3.5 mm captive screw connector, 5-pole	
USB control port	1 front panel female mini USB B	
COMMUNICATIONS		
External device (pass-through, unidirectional or bidirectional) (RS-232/IR over TP for the IN1604 DTP only)		
Serial control pass-through port	"Over TP" output RS-232 via (1) 3.5 mm captive screw connector, 5 pole (shared with IR port)	
IR pass-through control port	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	
Remote power capability	IN1604 DTP only: supports one DTP Rx endpoint device	
NOTE:	Remote power is not available in HDBaseT mode.	
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	Fan, air flows front to rear, vents on front and rear	
Mounting	Rack mount Yes, with optional rack shelf Furniture mount Yes, with optional under-desk or through-desk mounting kit	
Enclosure dimensions	1.75 H x 8.75" W x 8.5" D (1U high, half rack wide) (4.4 cm H x 22.2 cm W x 21.6 cm D) (Depth excludes connectors.)	
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%.	
<b>Model</b>	<b>Version Description</b>	<b>Part number</b>
IN1604 DTP	Four Input Scaler with DTP Output	60-1457-01
IN1604 HD	Four Input Scaler with HDMI Output	60-1457-02
<b>Optional Accessories</b>		
<b>Model</b>	<b>Version Description</b>	<b>Part number</b>
Half Rack Shelf System	Half-Rack Width Rack Shelf and Accessories	60-1251-xx
MBU 123	Low-Profile Mount Kit	70-212-01
UTS Series	Under Table Shelf System	70-1028-0x

For complete specifications, please go to [www.extron.com](http://www.extron.com)  
Specifications are subject to change without notice.

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