Extron

Specifications

IN1608 Series

Video input

Number/signal type	
Local inputs (all models)	2 RGB, RGBcvS, component video (YUVi/YUVp/HDTV), S-video, composite 4 HDMI/DVI
Remote inputs	2 DTP 230 (60-1238-0x only) 2 DTP 330 (all other models)
Connectors	2 female 15-pin HD 4 female HDMI type A 2 female RJ-45 connectors
HDMI equalization	Automatic
HDMI input cable length	Up to 75' (22.9 m) for all supported input rates
Nominal level	1 Vp-p for Y of component video and S-video, and for composite 0.7 Vp-p for RGB and for R-Y and B-Y of component video 0.3 Vp-p for C of S-video
Minimum/maximum levels	Analog: 0.0 V to 1.0 Vp-p with no offset at unity gain
Impedance	75 ohms
Horizontal frequency	15 kHz to 100 kHz
Vertical frequency	24 Hz to 75 Hz
Resolution range	640x480 to 1600x1200 and 1920x1200* NTSC, PAL, SECAM, 480i, 480p, 576i, 576p, 720p, 1080i, 1080p, and 2K *reduced blanking
Return loss	>30 dB @ 5 MHz
DC offset (max. allowable)	1.5 V
Standards	NTSC 3.58, NTSC 4.43, PAL, SECAM, DVI 1.0, HDMI 1.3, HDCP 1.4

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)
Colors	1 billion (10 bit processing)

Video output

Number/signal type	
Local outputs (all models)	2 HDMI/DVI
Remote output	1 DTP 230 (60-1238-0x only) 1 DTP 330 (60-1238-1x, 60-1238-5x only) 1 HDBT (60-1238-7x only)
Connectors	2 female HDMI type A 1 female RJ-45 connector
HDMI peripheral device power	200 mA per output
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], 1360x765[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[6], 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] = at 30 Hz, [6] = at 50 Hz, [7] = at 59.94 Hz, [8] = at 60 Hz, [9] = at 75 Hz
Standards	DVI 1.0, HDMI 1.3, HDCP 1.4

Sync

Input type	RGBHV, RGBS, RGsB, RGBcvS, bi-level or tri-level component video
Input standards	NTSC 3.58, NTSC 4.43, PAL, SECAM
Input level	2.75 V to 5.0 Vp-p for RGBHV or RGBS 0.6 Vp-p for component video with tri-level sync 0.3 Vp-p for component video with bi-level sync or RGsB
Input impedance	Horizontal: 510 ohms Vertical: 510 ohms
Max. input voltage	5.0 Vp-p

Shielded twisted pair interconnection

Connectors	3 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
HDBaseT	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.

NOTE: Output signals:
DTP: HDMI with embedded audio, analog audio, RS-232 and IR, and remote power
HDBaseT: HDMI with embedded audio, RS-232 and IR

Audio

Gain	Unbalanced output: -6 dB; balanced output: 0 dB
Frequency response	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 maximum balanced output (unweighted)
Crosstalk	≤-80 dB @ 1 kHz, fully loaded
Stereo channel separation	>80 dB @ 1 kHz
Bass	+12 dB to -24 dB @ 100 Hz
Treble	+12 dB to -24 dB @ 8 kHz
Supported formats	
Analog de-embedding	LPCM up to 2.0/24-bit/96 kHz
HDMI pass-through	LPCM up to 7.1/24-bit/192 kHz, Dolby Atmos, Dolby TrueHD, and Dolby legacy formats; DTS:X, DTS-HD Master Audio, DTS 96/24, and DTS legacy formats

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) 2 DTP (de-embedded from HDMI [PCM only], or remote balanced/unbalanced, analog)
Connectors	(6) 3.5 mm captive screw connectors, 5 pole for line (2) 3.5 mm captive screw connectors, 3 pole for mic/line 4 female HDMI type A 2 female RJ-45 connectors
Impedance	>10k ohms unbalanced, >20k ohms balanced
Nominal level	Line inputs: +4 dBu, -10 dBV, adjustable Mic/line inputs: -60 dBV, +4 dBu, -10 dBV, adjustable
Maximum level	+21 dBu at rated THD+N when input gain is set to 0 dB
CMRR	>80 dB @ 1 kHz

Input gain adjustment..... Line inputs: -18 dB to +24 dB, 1 dB steps, adjustable per input
Mic/line inputs: -18 dB to +60 dB, 1 dB steps, adjustable per input
LPCM-2Ch: -18 dB to +24 dB, 0.1 dB steps, adjustable per input

NOTE: Unbalanced analog inputs applied at a DTP Tx input have +12 dB of gain applied to bring the signal to a nominal level for balanced operation.

DC phantom power ..... +48 VDC ±10% (can be switched on or off per mic/line input)

Audio output

Number/signal type

Local outputs (all models)..... 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

Remote output ..... 1 DTP (embedded digital, and remote balanced/unbalanced analog) (60-1238-0x, 60-1238-1x, 60-1238-5x only)
1 HDBT (embedded digital) (60-1238-7x only)

Connectors..... (2) 3.5 mm captive screw connectors, 5 pole
2 female HDMI type A
1 RJ-45 connector

Impedance..... 50 ohms unbalanced, 100 ohms balanced

Gain error..... ±0.5 dB channel to channel

Maximum level (Hi-Z)..... >+20 dBu, balanced; >+14 dBu, unbalanced

Output volume range ..... 0 to -100 dB in 1 dB steps

NOTE: System gain for the analog DTP Rx output is rated at -12 dB (unbalanced) and -6 dB (balanced).

Audio output — power amplifier (MA and SA models only)

Number/signal type

Stereo models..... 1 stereo (default) or 2 mono (2 channels total)

Mono models ..... 1 mono, 70 V line

Connectors

NOTE: This connector accepts wires of 22 AWG to 12 AWG.

Stereo models..... (1) 5 mm screw lock captive screw connector, 4 pole

Mono models ..... (1) 5 mm screw lock captive screw connector, 2 pole

Load impedance

Stereo models..... 4 ohms minimum

Mono models ..... 50 ohms minimum

High pass filter — MA models only. 100 Hz, 12 dB/octave roll off

Frequency response

Stereo models..... 20 Hz to 20 kHz, -3 dB to +1 dB @ 1 W

Mono models ..... 100 Hz to 20 kHz, -3 dB to +1 dB @ 1 W

THD + Noise..... <0.1% @ 1 kHz, 3 dB below clipping

S/N..... >90 dB, 20 Hz to 20 kHz, unweighted

Amplifier type..... Class D

Output power

Stereo models..... 25 watts per channel, 8 ohms, 1 kHz, 0.1% THD
50 watts per channel, 4 ohms, 1 kHz, 0.1% THD

Mono models ..... 100 watts (rms) @ 70 V, 1 kHz, 0.1% THD

Protection ..... Clip limiting, thermal, short circuit, DC output

Communications — scaling presentation switcher

Serial control port	1 bidirectional RS-232, 3.5 mm captive screw connector, 3 pole (rear panel)
Baud rate and protocol	9600, 8 data bits, 1 stop bit, no parity (default)
Serial control pin configuration	1 = Tx, 2 = Rx, 3 = Gnd
USB control port	1 front panel female mini USB B
USB standards	USB 2.0, high speed
All models except IPCP models	
Ethernet control port	1 female RJ-45 connector
Ethernet data rate	10/100Base-T, half/full duplex with autodetect
Ethernet protocol	ARP, DHCP, DNS, HTTP (redirect), HTTPS, IEEE 802.1X, ICMP, NTP, SFTP, SMTP, SNMP, SSH, TCP/IP, Telnet, UDP/IP
Ethernet default settings	Link speed and duplex level = autodetected IP address = 192.168.254.254 Subnet mask = 255.255.0.0 Gateway = 0.0.0.0 DHCP = off
Program control	Extron control/configuration program for Windows® Extron Simple Instruction Set (SIS™) Microsoft® Internet Explorer®

Communications — external device (pass-through, unidirectional or bidirectional) (RS-232/IR over DTP or RS-232/IR over HDBT)

NOTE: Protocol is mirrored between the connected twisted pair endpoints and the "Over DTP" or "Over HDBT" ports on the IN1608. Signals from a control device pass into each IN1608 "Over DTP" or "Over HDBT" port, are embedded with the twisted pair signal, and sent to individual twisted pair Tx or Rx endpoints for control of remote sink or source devices.

The "Over DTP" or "Over HDBT" ports are simply pass-through connections to twisted pair endpoints. There is no RS-232 or IR insertion from any IN1608 control port to the “Over DTP” or "Over HDBT" ports.

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/TP Rx	RS-232 via (1) 3.5 mm, 5 pole captive screw connector (shared with IR port)
Baud rates	Up to 115200 baud
Protocol	6 - 8 data bits 1 or 2 stop bits no parity (default) even or odd parity flow control = XON, XOFF, none
Serial control pin configuration	1 = Tx, 2 = Rx, 3 = Gnd
IR pass-through control ports	TTL level (0 to 5 V) modulated infrared control from 30 kHz up to 60 kHz
IN1608 input/DTP Tx	(2) 3.5 mm captive screw connectors, 5 pole (shared with RS-232 ports)
IN1608 output/TP Rx	(1) 3.5 mm captive screw connector, 5 pole (shared with RS-232 port)
IR control pin configuration	3 = Gnd, 4 = IR Tx, 5 = IR Rx

Communications — IPCP Pro 350 control processor — IPCP models only

Memory	
SDRAM	512 MB
Flash	4.5 GB
Software and control options	
Software	Extron Global Configurator Plus and Professional for Windows®
Control options	GlobalViewer®, TouchLink® for Web, TouchLink for iPad®, or TouchLink Pro touchpanels

Ethernet control

- Network interface controllers (NCIs) .. 1
- Network switch ..... 1 unmanaged 3 port switch
- Connectors ..... 3 female RJ-45 connectors
- Data rate ..... 10/100/1000Base-T, half/full duplex with autodetect
- Protocols..... ARP, DHCP, DNS, HTTP (redirect), HTTPS, IEEE 802.1X, ICMP, NTP, SFTP, SMTP, SNMP, SSH, TCP/IP, UDP/IP
- Default settings..... Link speed and duplex level = autodetected
IP address = 192.168.254.250
Subnet mask = 255.255.255.0
Gateway = 0.0.0.0
DHCP = off
DNS: 127.0.0.1

Serial control

- Quantity/type..... 1 bidirectional RS-232, RS-422, RS-485 (port 1)
2 bidirectional RS-232 (ports 2 and 3)
- Connectors ..... (1) 3.5 mm captive screw connector, 5 pole
(2) 3.5 mm captive screw connectors, 3 pole
- Baud rate and protocol..... 300 to 115200 baud (9600 baud = default); 8 (default) or 7 data bits; 1 (default) or 2 stop bits; no parity (default), even, odd, mark, or space parity

NOTE: The 5-pole ports support both hardware and software flow control.
The 3-pole ports support software flow control.
The default for both types of ports is no flow control.

- Pin configurations, serial, 5-pole captive screw
  - RS-232 (default)..... Pin 1 = Tx, 2 = Rx, 3 = Gnd, 4 = RTS, 5 = CTS
  - RS-422..... Pin 1 = Tx-, 2 = Rx-, 3 = Gnd, 4 = Tx+, 5 = Rx+
  - RS-485..... Pins 1 and 2 (tied together) = data-, 3 = Gnd, 4 and 5 (tied together) = data+
- Pin configurations, serial, 3-pole captive screw ..... Pin 1 = Tx, 2 = Rx, 3 = Gnd

Digital I/O control

- Quantity/type..... 4 digital input/output (configurable)
- Connectors ..... (1) 3.5 mm captive screw connector, 5 pole
- Digital inputs
  - Input voltage range..... 0 to 24 VDC, clamped at +30 VDC
  - Input impedance..... 29k ohms
  - Programmable pullup..... 1k ohms to +5 VDC
  - Threshold low to high..... >2.8 VDC
  - Threshold high to low..... <2.0 VDC
- Digital outputs ..... 250 mA sink from 24 VDC max.
- Pin configurations..... 1, 2, 3, 4 = digital I/Os 1, 2, 3, 4; 5 = Gnd

IR/serial control

- Quantity/type..... 2 programmable: unidirectional RS-232 (±5 V), or TTL level (0 to 5 V) infrared (carrier and non-carrier) up to 300 kHz
- Connector ..... (1) 3.5 mm captive screw connector, 5-pole
- Baud rate and protocol (RS-232)..... 300 to 115200 baud (9600 baud = default); 8 (default) or 7 data bits; 1 (default) or 2 stop bits;
no parity (default), even, odd, mark, or space parity
- Pin configurations..... For each port, pin 1 = signal, 2 = Gnd
- IR output carrier frequency ..... 30 kHz to 300 kHz

Relay control
- Quantity/type ..... 4 normally open relays
- Relay control connectors ..... (1) 3.5 mm captive screw connector, 6 pole
- Relay control contact rating ..... 24 VDC, 1 A

General

Power supply ..... Internal
Input: 100-240 VAC, 50-60 Hz

Power consumption
- Full load (amp output at 1/8 power)
  - IN1608, IN1608 HDBT ..... 44 watts
  - All amplifier models except IPCP models ..... 67 watts
  - All IPCP models ..... 77 watts
- Power save mode
  - IN1608, IN1608 HDBT ..... <36 watts
  - All amplifier models except IPCP models ..... <43 watts
  - All IPCP models ..... <55 watts

Remote power capability
- All HDBT models ..... Supports up to two endpoints (two DTP Tx)
- All other models ..... Supports up to three endpoints (two DTP Tx, one DTP Rx)

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 ..... Fans, air flows right to left (as viewed from front panel)

Fan noise ..... <37 dB(A) at 1 m

Thermal dissipation
- Full load (amp output at 1/8 power)
  - IN1608, IN1608 HDBT ..... 108 BTU/hr
  - All amplifier models except IPCP models ..... 147 BTU/hr
  - All IPCP models ..... 161 BTU/hr
- Power save mode
  - IN1608, IN1608 HDBT ..... <86 BTU/hr
  - All amplifier models except IPCP models ..... <111 BTU/hr
  - All IPCP models ..... <129 BTU/hr

Mounting
- Rack mount ..... Yes, with included, pre-installed brackets

Enclosure type ..... Metal

Enclosure dimensions
- IN1608, IN1608 HDBT ..... 1.72" H x 17.5" W x 9.5" D (1U high, full rack wide)
  (44 mm H x 444 mm W x 241 mm D)
  (Depth excludes connectors and knobs. Width excludes rack ears.)
- All other models ..... 3.47" H x 17.5" W x 9.5" D (2U high, full rack wide)
  (8.8 cm H x 44.4 cm W x 24.1 cm D)
  (Depth excludes connectors and knobs. Width excludes rack ears.)

Product weight
- IN1608, IN1608 HDBT ..... 5.0 lbs (2.3 kg)
- All amplifier models except IPCP models ..... 7.4 lbs (3.4 kg)
- All IPCP models ..... 7.9 lbs (3.6 kg)

Regulatory compliance ..... CE, c-UL, UL, C-tick, FCC Class A, ICES, VCCI, RoHS, WEEE

Warranty ..... 3 years parts and labor
Everlast power supply warranty..... 7 years parts and labor

NOTE: All nominal levels are at ±10%.

NOTE: Specifications are subject to change without notice.

NOTE: Shipping weights and dimensions are available at **www.extron.com**.

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