4K@60/HDCP 2.2 HDBaseT Extender with 2 inputs and 3/5 outputs
HDC-TH221UHD/HDC-TH421UHD

The HDC-TH221UHD and HDC-TH421UHD are two-input receivers with EDID emulator for sending HDMI, DVI, and HDBaseT input signals at up to 4K@60 over a Category cable without compression or processing.

Input video signals are converted to HDBaseT format and can be transmitted up to 100 m (328 ft.); 1080p (24 bit) video signals can be sent up to 150 m (492 ft.) in Long reach mode.
The HDC-TH221UHD/HDC-TH421UHD includes one HDMI output and two/four HDBaseT outputs. The HDMI OUT1 enables down conversion outputting 4K input video at 1080p automatically depending on sink device status. The two video inputs can be controlled by the front panel or an external controller.
For video signal that is distributed to an HDMI/DVI and HDBaseT simultaneously, video/audio can be off for each output.

The HDC-TH221UHD/HDC-TH421UHD also features Daisy chain for extending and distributing video, audio, and control signals. In addition, digital audio signals can be de-embedded onto the analog output signals. It supports bidirectional RS-232C communication and LAN transmission.

Internal Web pages provide system status for troubleshooting and device monitoring using a browser.

■ Specification

Item		Description	
		HDC-TH221UHD	HDC-TH421UHD
Input	HDMI/DVI	1 input HDMI (*1)/DVI 1.0 TMDS single link, HDCP 1.4/2.2 HDR (*2), 3D (*3), x.v.Color EDID emulation, CEC (Pass-through) Connector: Female HDMI Type A (19-pin)	
	HDBaseT	1 input HDBaseT (*4) HDCP 1.4/2.2, HDR (*2), 3D (*3), x.v.Color EDID emulation, RS-232C, LAN Connector: RJ-45 (*5) Cable: CAT.5E HDC, Cat5e UTP/STP, Cat6 UTP/STP (T568A/T568B straight-through)	
Output	HDMI/DVI	1 output Video can be distributed to an HDMI/DVI output and HDBaseT outputs simultaneously. HDMI (*1)/DVI 1.0 TMDS single link, HDCP 1.4/2.2 HDR (*2), 3D (*3), x.v.Color, CEC (Pass-through) Connector: Female HDMI Type A (19-pin)	
	HDBaseT	1 x 2 outputs Video can be distributed to an HDMI/DVI output and HDBaseT outputs simultaneously. HDBaseT (*4) HDCP 1.4/2.2, HDR (*2), 3D (*3), x.v.Color, RS-232C, LAN Connector: RJ-45 (*5) Cable: CAT.5E HDC, Cat5e UTP/STP, Cat6 UTP/STP (T568A/T568B straight-through)	1 x 4 outputs Video can be distributed to an HDMI/DVI output and HDBaseT outputs simultaneously. HDBaseT (*4) HDCP 1.4/2.2, HDR (*2), 3D (*3), x.v.Color, RS-232C, LAN Connector: RJ-45 (*5) Cable: CAT.5E HDC, Cat5e UTP/STP, Cat6 UTP/STP (T568A/T568B straight-through)
Format	HDMI/DVI (*6)	VGA to 4K 480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (up to 4K@60 (4:4:4))	
	HDBaseT (*7)	VGA to 4K For WQHD/WQXGA, only Reduced Blanking is supported. 480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (up to 4K@60 (4:2:0))	
Color depth	HDMI	24 bit, 30 bit, 36 bit Deep Color (*6)	
	HDBaseT	24 bit, 30 bit, 36 bit Deep Color (*7)	
Dot clock		25 MHz to 600 MHz	
TMDS clock		25 MHz to 300 MHz	
TMDS data rate		0.75 Gbps to 18 Gbps	
Digital audio input		2 inputs Multi-channel LPCM up to 8 channels Sampling frequency: 32 kHz to 192 kHz, Sample size: 16 bit to 24 bit, Reference level: -20 dBFS, Max. input level: 0 dBFS Connector: Female HDMI Type A (19-pin), RJ-45	
Digital audio output		1 x 3 outputs Audio can be distributed to an HDMI output and HDBaseT outputs simultaneously. Multi-channel LPCM up to 8 channels Sampling frequency: 32 kHz to 192 kHz Sample size: 16 bit to 24 bit Reference level: -20 dBFS Max. output level: 0 dBFS Connector: Female HDMI Type A (19-pin), 2 RJ-45s	1 x 5 outputs Audio can be distributed to an HDMI output and HDBaseT outputs simultaneously. Multi-channel LPCM up to 8 channels Sampling frequency: 32 kHz to 192 kHz Sample size: 16 bit to 24 bit Reference level: -20 dBFS Max. output level: 0 dBFS Connector: Female HDMI Type A (19-pin), 4 RJ-45s
Analog audio output		1 output Unbalanced Stereo LR Output impedance: 50 Ω, Reference level: -10 dBu, Max. output level: +10 dBu Connector: Captive screw (3-pin)	
Maximum transmission distances	Digital input	HDMI/DVI : 98 ft. (30 m) (1080p@60), 39 ft. (12 m) (4K@60) (*8) HDBaseT : 328 ft. (100 m), 492 ft. (150 m) (Long reach mode is used) (*9)	
	Digital output	HDMI/DVI : 98 ft. (30 m) (1080p@60), 39 ft. (12 m) (4K@60) (*8) HDBaseT : 328 ft. (100 m), 492 ft. (150 m) (Long reach mode is used) (*9)	
Control	RS-232C	1 port/captive screw connector (3-pin), full duplex, up to 38.4 kbps	
	LAN	1 port/RJ-45 10Base-T/100Base-TX (Auto Negotiation), Auto MDI/MDI-X	
Functions		WEB browser control, Input channel automatic switching, Anti-snow, Connection Reset (*10), Button security lockout, OUT1 supports down conversion (4K to 1080p), Status notification, Each video output OFF, I/O signal status display, HDBaseT status display	

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Item		Description	
		HDC-TH221UHD	HDC-TH421UHD
General	AC adapter	Input　　: 100 - 240 VAC ±10%, 50 Hz/60 Hz ±3 Hz Output : DC 12 V 3 A 36.0 W (A dedicated AC adapter is provided)	
	Power consumption	About 22 W	About 31 W
	Dimensions	8.3 (W) × 1.7 (H) × 7.9 (D)" (210 (W) × 44 (H) × 200 (D) mm) (Half rack wide, 1U high) (Excluding connectors and the like)	
	Weight	3.5 lbs. (1.6 kg)	3.5 lbs. (1.6 kg)
	Temperature	Operating : 32°F to 104°F (0°C to +40°C) Storage　 : -4°F to +176°F (-20°C to +80°C)	
	Humidity	Operating/Storage: 20% to 90% (Non Condensing)	

*1　ARC and HEC are not supported.
*2　HDR is supported if external EDID is selected while an HDR-supported sink device is connected for EDID setting or if copied EDID of an HDR-supported sink device is selected for EDID setting. Input HDR signal is output from all output connectors.
*3　3D is supported if external EDID is selected while a 3D-supported sink device is connected for EDID setting or if copied EDID of 3D-supported sink device is selected for EDID setting. Input 3D signal is output from all output connectors.
*4　ARC, HEC and CEC are not supported.
*5　RJ-45 (HDBaseT connector) is only for extending digital video and audio signals over a Cat5e/Cat6 cable. Use it with IDK's HDBaseT Products. Do not use for LAN devices.
*6　For 4K format, the following color depths are supported.
　　・24 Hz/25 Hz/30 Hz　　: 24 bit, 30 bit, 36 bit (RGB, YCbCr 4:4:4, YCbCr 4:2:2)
　　・50 Hz/59.94 Hz/60 Hz : 24 bit, 30 bit, 36 bit (YCbCr 4:2:2, YCbCr 4:2:0)
　　　　　　　　　　　　　　: 24 bit (RGB, YCbCr 4:4:4)
*7　For 4K format, the following color depths are supported.
　　・24 Hz/25 Hz/30 Hz　　: 24 bit (RGB, YCbCr 4:4:4, YCbCr 4:2:2)
　　・50 Hz/59.94 Hz/60 Hz : only 24 bit (YCbCr 4:2:0) and CEA-861
*8　The maximum cable distance varies depending on the connected devices and was measured under following conditions:
　　・1080p@60 : When IDK's 24 AWG cable was used and signals of 1080p@60 24 bit/pixel (8 bit/component) was input or output.
　　・4K@60　　 : When IDK's 18 Gbps supported cable was used and signals of 4K@60 24 bit/pixel (8 bit/component) was input or output
　　The maximum cable distance depends on the connected devices. The distance may not be extended with some device combinations, cabling method, or other manufacturer's cable. Video may be disturbed or may not be output even if signals are within the range mentioned above.
*9　The maximum transmission distance was obtained when IDK's CAT.5E HDC cable was used. The distance may not be extended with some device combinations, cabling method, or other manufacturer's cable. Video may be disturbed or may not be output even if signals are within the range mentioned above.
　　The maximum transmission distance is the shorter distance of connected HDBaseT product or sink device's maximum transmission distance.
　　Up to 492 ft. (150 m): 1080p (24 bit) in Long reach mode. For Long reach mode, use IDK's HDBaseT Products that supports 328 ft. (100 m) or longer.
*10 For digital systems, some problems, such as an HDCP authentication error, can often be recovered by physically disconnecting and reconnecting the digital cables. However, the Connection Reset feature will fix these problems automatically without the need to physically plug and unplug the cables. It creates the same condition as if the cable were physically disconnected and reconnected. This feature only works for the HDC's output. If other devices are connected between the HDC's output and sink device, this feature may be invalid.

■ **Front & Rear Panels**

HDC-TH221UHD

HDC-TH421UHD

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[Features]

■ Video
- Up to 4K@60 (4:4:4)
- HDCP 1.4/2.2
- HDR
- 3D
- x.v.Color
- Up to 328 ft. (100 m) 4K@60 over CAT.5E HDC/Cat5e STP/Cat6 STP cable
- Transmission over Cat5e UTP cable[*1]
- Up to 328 ft. (100 m) over Cat6 UTP cable[*2]
- Up to 492 ft. (150 m) in Long reach mode (1080p 60 Hz 24 bit or less)[*3]
- HDMI Transmission distances:
    - Up to 98 ft. (30 m): 1080p@60
    - Up to 39 ft. (12 m): 4K@60 (when cable supporting 18 Gbps transmission is used)
- No virtual delay (10 μs or less/328 ft. (100 m))
- Each video output OFF
- OUT1 supports down conversion (4K to 1080p)
- Daisy chain connection
- Anti-snow

■ Audio
- De-embedding

■ Control input
- Point-to-point (bidirectional) and point-to-multipoint (unidirectional) RS-232C communication
- LAN
- HDBaseT: RS-232C and LAN are supported

■ Others
- WEB browser control
- Status notification
- HDBaseT status display
- I/O signal status display
- Input channel automatic switching
- EDID emulation
- CEC (Pass-through)
- Connection Reset
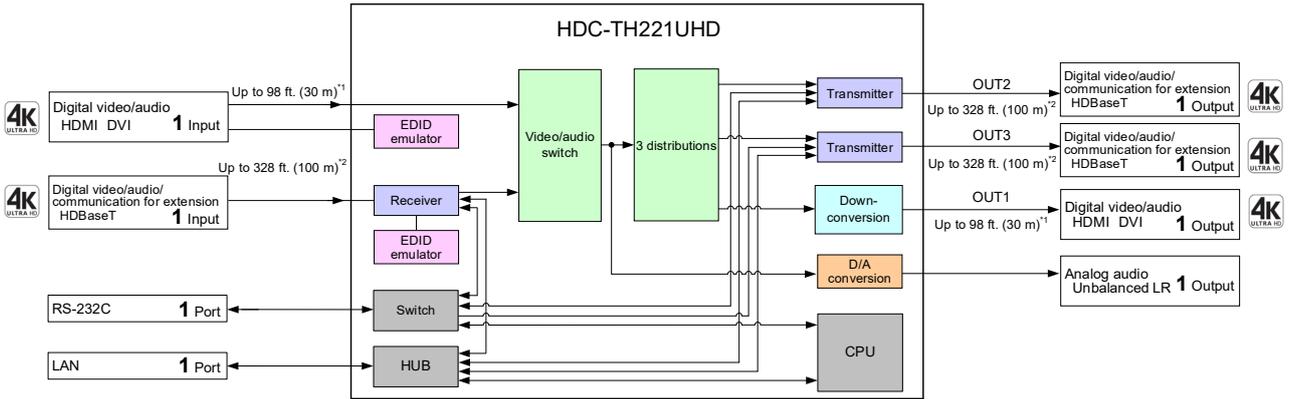- Button security lockout
- AC adapter with locking mechanism

[*1] If exceeding 164 ft. (50 m), CAT.5E HDC, Cat5e STP, and Cat6 UTP/STP cables are recommended.
[*2] If the 4K format exceeds 230 ft. (70 m), CAT.5E HDC, Cat5e STP, and Cat6 STP cables are recommended.
[*3] If exceeding 328 ft. (100 m) in Long reach mode, CAT.5E HDC, Cat5e STP, and Cat6 STP cables are recommended.
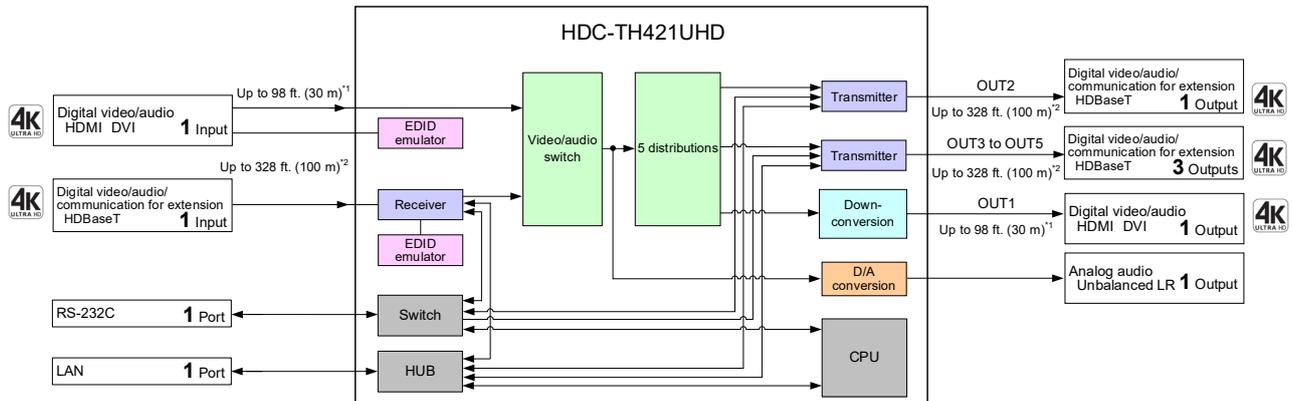
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■ **Diagram**

HDC-TH221UHD

HDC-TH221UHD

- **4K** ULTRA HD | Digital video/audio HDMI DVI **1** Input
- Up to 98 ft. (30 m)*1
- **4K** ULTRA HD | Digital video/audio/communication for extension HDBaseT **1** Input
- Up to 328 ft. (100 m)*2
- RS-232C **1** Port
- LAN **1** Port

EDID emulator / Receiver / EDID emulator / Switch / HUB / Video/audio switch / 3 distributions / Transmitter / Transmitter / Down-conversion / D/A conversion / CPU

- OUT2 — Digital video/audio/communication for extension HDBaseT **1** Output **4K** ULTRA HD
- Up to 328 ft. (100 m)*2
- OUT3 — Digital video/audio/communication for extension HDBaseT **1** Output **4K** ULTRA HD
- Up to 328 ft. (100 m)*2
- OUT1 — Digital video/audio HDMI DVI **1** Output **4K** ULTRA HD
- Up to 98 ft. (30 m)*1
- Analog audio Unbalanced LR **1** Output

*1 Maximum transmission distances
  98 ft. (30 m):1080p@60
  39 ft. (12m) : 4K@60 (when cable supporting 18 Gbps transmission is used)
*2 Maximum transmission distances
  328 ft. (100 m) : 4K@60 (4:2:0)
  492 ft. (150 m) : 1080p (24 bit) in Long reach mode
  For long reach mode, video signals up to 1080p (24 bit) can be transmitted to 492 ft. (150 m) at maximum
  if using with IDK's HDBaseT products supporting 328 ft. (100 m) transmission.

HDC-TH421UHD

HDC-TH421UHD

- **4K** ULTRA HD | Digital video/audio HDMI DVI **1** Input
- Up to 98 ft. (30 m)*1
- **4K** ULTRA HD | Digital video/audio/communication for extension HDBaseT **1** Input
- Up to 328 ft. (100 m)*2
- RS-232C **1** Port
- LAN **1** Port

EDID emulator / Receiver / EDID emulator / Switch / HUB / Video/audio switch / 5 distributions / Transmitter / Transmitter / Down-conversion / D/A conversion / CPU

- OUT2 — Digital video/audio/communication for extension HDBaseT **1** Output **4K** ULTRA HD
- Up to 328 ft. (100 m)*2
- OUT3 to OUT5 — Digital video/audio/communication for extension HDBaseT **3** Outputs **4K** ULTRA HD
- Up to 328 ft. (100 m)*2
- OUT1 — Digital video/audio HDMI DVI **1** Output **4K** ULTRA HD
- Up to 98 ft. (30 m)*1
- Analog audio Unbalanced LR **1** Output

*1 Maximum transmission distances
  98 ft. (30 m):1080p@60
  39 ft. (12m) : 4K@60 (when cable supporting 18 Gbps transmission is used)
*2 Maximum transmission distances
  328 ft. (100 m) : 4K@60 (4:2:0)
  492 ft. (150 m) : 1080p (24 bit) in Long reach mode
  For long reach mode, video signals up to 1080p (24 bit) can be transmitted to 492 ft. (150 m) at maximum
  if using with IDK's HDBaseT products supporting 328 ft. (100 m) transmission.

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