PUV-1H4HPL-AVLC

1x4 HDBaseT™ Splitter with AVLC

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Version 1.1

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SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply.

Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.

- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.

- Never spill liquid of any kind on or into this product.

- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.

- Do not attach the power supply cabling to building surfaces.

- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.

- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person walk on it.

- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.

REVISION HISTORY

VERSION NO.	DATE	SUMMARY OF CHANGE
v1.00	25/07/2019	First release

CONTENTS

1. INTRODUCTION

This 1×4+1 4K UHD HDMI Splitter provides an advanced solution for splitting and distributing a single HDMI input (up to 4K@60Hz w/ HDMI 2.0 & HDCP 2.2) to 4 HDBaseT™ outputs as well as to a single HDMI output with analogue stereo audio breakout. The UHD source may be distributed to any of four HDBaseT Receivers via a single Cat.5e/6/7 cable (up to 70m at 1080p or up to 40m at 4K). Despite HDBaseT's 10.Gbps bandwidth limitation, 4K UHD HDMI video sources, up to and including 4K@60Hz (4:4:4, 8-bit) as well as 10/12-bit sources with HDR, are able to be processed and extended by the use of AVLC (Adaptive Visually Lossless Compression) when connected to compatible AVLC Receivers. If the connected HDBaseT Receiver can't support AVLC, 4K@60Hz RGB/YUV 4:4:4 signals will be converted to YUV 4:2:0 or downscaled to 1080p based on the detected EDID on each output.

This unit provides solid audio support, including bypassing 8 channel LPCM digital audio as well as advanced Bitstream and HD Bitstream audio formats via HDBaseT and HDMI. Additionally, an analogue stereo audio breakout output is available to provide audio to local powered speakers (LPCM 2.0 sources only).

Standard EDID management functionality is included and the PoH (Power over HDBaseT) feature can provide power to compatible receivers, providing greater flexibility in installations. Control is via front panel controls with an OSD and RS-232.

2. APPLICATIONS

- Household entertainment sharing
- Lecture hall & classroom displays
- Showroom displays
- Meeting room presentations

3. PACKAGE CONTENTS

- 1× HDMI to HDBaseT/HDMI Splitter
- 1× 24V/3.75A DC Power Adapter
- 1× 3.5mm to IR Blaster Cable

/// 1× Shockproof Feet (Set of 4)

/// 1× Operation Manual

4. SYSTEM REQUIREMENTS

/// HDMI source equipment such as a media player, video game console or set-top box.

/// Compatible HDBaseT receivers with AVLC and PoH support is recommended.

/// HDMI receiving equipment such as an HDTV, monitor or audio amplifier.

/// The use of Premium High Speed HDMI cables, and industry standard Cat.6, Cat.6a or Cat.7, is highly recommended.

5. FEATURES

/// HDMI 2.0 and HDBaseT 1.0 compatible

/// HDCP 1.x and HDCP 2.2 compliant

/// 1×HDMI input

/// 4×HDBaseT and 1×HDMI outputs

/// Supports up to 4K UHD (18Gbps, 4K@50/60Hz 4:4:4, 8-bit) video input and output

Note: Support of resolutions requiring bandwidth above 10.2Gbps via HDBaseT requires a compatible AVLC receiver.

/// Supports 'Deep Colour' input and output up to 12-bit

/// Supports 10-bit and 12-bit HDR (High Dynamic Range) input/output

/// HDBaseT output transmits video, audio and data over a single Cat.5e/6/7 cable and can reach distances up to 40m/131ft at 4K when using Cat.6a/7

/// HDBaseT feature support: HD Video and Audio, PoH (PSE) and Control (bi-directional RS-232 and IR pass-through)

/// Integrated AVLC (Adaptive Visually Lossless Compression) activates when the bandwidth requirements of the source are beyond 10.2Gbps allowing for support of sources up to 18Gbps with no loss of visual quality

/// Supports automatic 4K@60Hz RGB/YUV 4:4:4 to YUV 4:2:0 conversion or downscaling to 1080p for compatibility with non-AVLC HDBaseT receivers based on the detected EDID on each output

/// Supports pass-through of all standard digital audio formats: 8 channel LPCM, Bitstream, and HD Bitstream

/// High-quality DAC (Digital to Analogue audio Conversion) with local analogue stereo audio breakout (LPCM 2.0 sources only)

/// Comprehensive EDID management options

/// Supports standard PoH from the unit to connected HDBaseT receivers (compatible receivers only)

Note: The PoH function is designed for powering compatible Receiver units only. Non-PoH Receivers will need their own power supply. Receivers from other brands may not be compatible.

/// 1U rack mounted design

/// Control via front panel controls with an OSD and RS-232

6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel
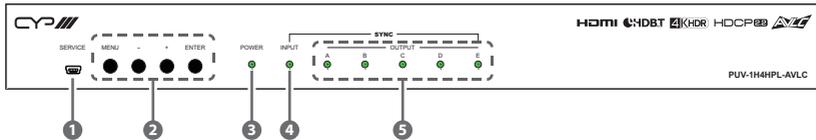
1 SERVICE Port: This port is reserved for firmware update use only.

2 CONTROL BUTTON BLOCK

MENU Button: Press to enter the OSD menu, or to back out from menu items.

- (MINUS) Button: Press to move down or adjust selections within OSD menus.

+ (PLUS) Button: Press to move up or adjust selections within OSD menus.

ENTER Button: Press to confirm a selection within the OSD or to go deeper into a menu item.

3 POWER LED: This LED will illuminate to indicate the unit is on and receiving power.

4 INPUT LED: This LED will illuminate to indicate that a live source has been detected on the input port. When no source is detected the LED will remain off.

5 OUTPUT LEDs: These LEDs will illuminate to indicate when a valid sink has been detected on the associated output port. When no sink is detected the LED will remain off.

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6.2 Rear Panel
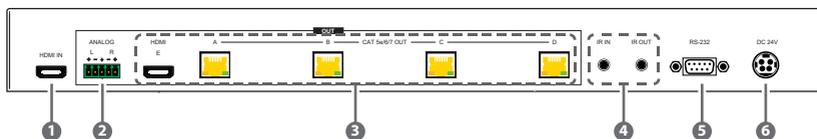
1 HDMI IN Port: Connect to HDMI source equipment such as a media player, game console, or set-top box. DVI sources are supported with the use of an HDMI to DVI adapter.

2 ANALOGUE R/L Terminal Block: Connect to powered speakers or an amplifier for analogue stereo audio output.

3 OUTPUT PORT BLOCK

HDMI OUT E Port: Connect to an HDMI TV, monitor, or amplifier for digital video and audio output.

CAT 5e/6/7 OUT A~D Ports: Connect to compatible HDBaseT receivers with single Cat.5e/6/7 cables for transmission of all data signals. PoH will also be supplied to connected compatible PD Receivers.

4 IR IN Port: Connect to an IR Extender to receive local IR control signals and extend them to devices connected to the other end of all HDBaseT connections. Ensure that the remote being used is within direct line-of-sight of the IR Extender.

IR OUT Port: Connect to the provided IR Blaster to transmit IR signals from the other end of the HDBaseT connection to devices within direct line-of-sight of the IR Blaster.

Note: To help avoid potential simultaneous IR signal conflicts, IR support for each HDBaseT port and the local ports can be configured individually.

5 RS-232 Port: Connect to a PC, laptop, or serial controllable device for the extension of RS-232 signals between this unit and the connected HDBaseT receivers or to send RS-232 commands to control the unit.

Note: Switching between local control and RS-232 extension is configured within the OSD menu.

6 DC 24V Port: Plug the 24V DC power adapter into this port and connect it to an AC wall outlet for power.

6.3 IR Cable Pinouts

IR Blaster Cable

1	Power
2	Infrared
3	Not Used

IR Extender Cable

1	Infrared
2	Power
3	Ground
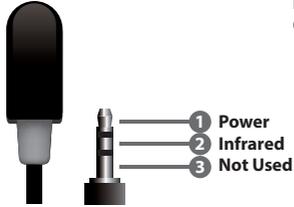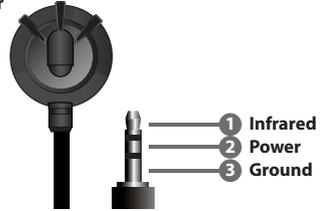
6.4 RS-232 Pinout and Defaults

Serial Port Default Settings	
Baud Rate	19200
Data Bits	8
Parity Bits	None
Stop Bits	1
Flow Control	None

DCD 1
RxD 2
TxD 3
DTR 4
GND 5

DE-9 Female Port

RI 9
CTS 8
RTS 7
DSR 6
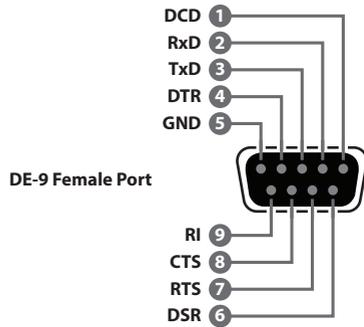
6.5 OSD Menu

All functions of this unit can be controlled by using the OSD (On Screen Display) which is activated by pressing the MENU button on the front of the unit. Use the + (PLUS), − (MINUS), and ENTER buttons to navigate the OSD menu. Press the MENU button to back out from any menu item and then press it again to close the menu.

MAIN MENU
Input Information
Output 4K Converter
Output Information
L/R Audio Control
EDID Control
HDCP Control
RS232 Control
IR Control
Remote Control
OSD Setting
System Setting

The individual functions of the OSD will be introduced in the following section. Items marked in **BOLD** are the factory default settings.

INPUT INFORMATION	
2ND LEVEL	**3RD LEVEL**
Input	
Name	
Fmt	
Reso	
Freq	[Current video source details]
Depth	
Colour	
HDCP	
Audio	
HDR	

1) **Input information:** Shows details about the current HDMI input signal including detected resolution, pixel clock frequency, colour bit depth, colour format, HDCP status, audio format and HDR status.

OUTPUT 4K CONVERTER	
2ND LEVEL	**3RD LEVEL**
All	**AUTO**
	Bypass
	To YUV420
	To 1080p
OUT A~E	**AUTO**
	Bypass
	To YUV420
	To 1080p

1) **All:** Assigns the selected 4K conversion mode to all outputs.

   Note: If any individual output has been configured differently, this will display "Different" as the current status.

   ■ **Auto:** Selecting this allows the unit to automatically select a 4K

conversion method based on each output's EDID.

- ■ **Bypass:** Selecting this will allow the source to go to all outputs without conversion.
- ■ **To YUV420:** Selecting this will automatically convert the colour space of a 4K@50/60Hz source from 4:4:4 to 4:2:0.
- ■ **To 1080p:** Selecting this will automatically scale a 4K source to 1080p while keeping the original refresh rate and bit depth.

2) **OUT A~E:** Assigns the selected 4K conversion mode to each individual output.

Note: This setting will override the "All" setting.

- ■ **Auto:** Selecting this allows the unit to automatically select a 4K conversion method based on each output's EDID.
- ■ **Bypass:** Selecting this will allow the source to go to all outputs without conversion.
- ■ **To YUV420:** Selecting this will automatically convert the colour space of a 4K@50/60Hz source from 4:4:4 to 4:2:0.
- ■ **To 1080p:** Selecting this will automatically scale a 4K source to 1080p while keeping the original refresh rate and bit depth.

OUTPUT INFORMATION	
2ND LEVEL	3RD LEVEL
OUT A~E	[Current status of each output]

1) **Output Information:** Show the connection status, resolution and framerate for each output. If no display is connected it will display "Not Connected", if no HDBaseT receiver is connected it will display "Not Linked".

L/R AUDIO CONTROL	
2ND LEVEL	3RD LEVEL
Mute	On
	OFF
Volume	0~80 **[80]**
L Enhance	0~40 **[0]**

L/R AUDIO CONTROL	
2ND LEVEL	**3RD LEVEL**
R Enhance	0~40 **[0]**
Format	[Current audio source details]
L/R Clock	
Word Length	
Channel Num	

1) **Mute:** Mute or un-mute the analogue audio output.

2) **Volume:** Set the output volume for the analogue audio output in 0.5 dB steps.

3) **L/R Enhance:** Independently increase the output volume of the left or right channel of the analogue audio output in 0.5 dB steps.

4) **Audio Details Block:** Shows detailed information about the current audio signal.

   Note: Some information is not available with bitstream sources.

EDID CONTROL	
2ND LEVEL	**3RD LEVEL**
Mode	**INT FHD 2CH**
	Int FHD MCh
	Int UHD 2Ch
	Int UHD MCh
	Int UHD+ 2Ch
	Int UHD+ MCh
	Int HDR 2Ch
	Int HDR MCh
	User
	Copy Out A~E

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EDID CONTROL	
2ND LEVEL	**3RD LEVEL**
Vndr	
Name	
Reso	
Freq	[Current EDID selection details]
Depth	
YCbCr	
HDR	

1) **Mode:** Select the EDID to send to the HDMI input. This unit provides the following 8 internal EDIDs:

FHD 2Ch	1920×1080p@60Hz (170MHz), 8-bit colour, LPCM 2.0
FHD MCh	1920×1080p@60Hz (170MHz), 8-bit colour, LPCM 7.1 & Bitstream
UHD 2Ch	3840×2160p@30Hz (300MHz), 12-bit Deep Colour, LPCM 2.0
UHD MCh	3840×2160p@30Hz (300MHz), 12-bit Deep Colour, LPCM 7.1 & Bitstream
UHD+ 2Ch	3840×2160p@60Hz (600MHz), 12-bit Deep Colour, LPCM 2.0
UHD+ MCh	3840×2160p@60Hz (600MHz), 12-bit Deep Colour, LPCM 7.1 & Bitstream
HDR 2Ch	3840×2160p@60Hz (600MHz), 12-bit HDR, LPCM 2.0
HDR MCh	3840×2160p@60Hz (600MHz), 12-bit HDR, LPCM 7.1 & Bitstream

Note: In some rare cases it is possible for custom or external EDIDs to cause compatibility issues with certain sources. If this happens, it is recommended to switch to one of the 8 internal EDIDs for maximum compatibility.

2) EDID Details Block: Shows detailed information about the contents of the currently selected EDID.

HDCP CONTROL	
2ND LEVEL	**3RD LEVEL**
Mode	**REFER SINK**
	Refer Source
	Apple Mode
Out A~E	[Current HDCP status of each output]

1) Mode: Set the HDCP behavior of the unit.
- **Refer Sink:** Each output enables HDCP at the highest version supported by each connected display.
- **Refer Source:** The input signal maintains its native HDCP version.
- **Apple Mode:** HDCP support is completely disabled.

2) HDCP Status Block: Shows the current HDCP status of each individual output.

RS232 CONTROL	
2ND LEVEL	**3RD LEVEL**
Mode	**COMMAND**
	Pass Through
Port A~D	**DISABLED**
	Baud 2400
	Baud 4800
	Baud 7200
	Baud 9600
	Baud 14400
	Baud 19200
	Baud 38400

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RS232 CONTROL	
2ND LEVEL	**3RD LEVEL**
	Baud 57600
	Baud 115200
Local	Baud 2400
	Baud 4800
	Baud 7200
	Baud 9600
	Baud 14400
	BAUD 19200
	Baud 38400
	Baud 57600
	Baud 115200

1) **Mode:** Set the operational mode of the RS-232 port on the unit. Selecting "Command" allows direct control of the unit via RS-232. Selecting "Pass Through" allows extension of RS-232 signals to all connected HDBaseT receivers.

2) **Port A~D:** Set the supported baud rate for RS-232 extension over each HDBaseT port. Selecting "Disabled" will block RS-232 from being extended over that port.

   Note: Baud rate conversion will be performed automatically if the local baud rate and destination port baud rate are different.

3) **Local:** Set the baud rate to use on the local RS-232 port.

IR CONTROL	
2ND LEVEL	**3RD LEVEL**
Ch A~D	**ENABLE BIDIRECT**
	Disabled
	Enable Emitter
	Enable Receiver

IR CONTROL	
2ND LEVEL	3RD LEVEL
Local	**ENABLE BIDIRECT**
	Disabled
	Enable Emitter
	Enable Receiver

1) **Ch A~D:** Configure the IR extension behavior of each HDBaseT port.

- **Enable Bidirect:** Enables support for bi-directional extension of IR signals over the specified HDBaseT port.

- **Disabled:** Disables all IR extension over the specified HDBaseT port.

- **Enable Emitter:** Enables transmission of IR signals to the receiver connected to the specified HDBaseT port, but disables receiving IR signals from it.

- **Enable Receiver:** Enables reception of IR signals from the receiver connected to the specified HDBaseT port, but disables transmitting IR signals to it.

2) **Local:** Configure the IR extension behavior of the local IR ports.

- **Enable Bidirect:** Enables both IR ports on the unit.

- **Disabled:** Disables both IR ports on the unit.

- **Enable Emitter:** Enables the IR OUT port on the unit and disables the IR IN port.

- **Enable Receiver:** Enables the IR IN port on the unit and disables the IR OUT port.

REMOTE CONTROL	
2ND LEVEL	3RD LEVEL
Link With	Off
	Out A
	Out B
	Out C
	Out D

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REMOTE CONTROL	
2ND LEVEL	3RD LEVEL
	OUT E
[RED] Button:	Menu
[GREEN] Button:	Minus (-)
[YELLOW] Button:	Plus (+)
[BLUE] Button:	Enter

1) **Link With:** Select the display to accept CEC remote control commands from to control the unit or disable the functionality. The selected display's remote control can be used to navigate this unit's OSD menu using the remote's red, green, yellow and blue buttons.

   Note: Requires a compatible remote control and display. The selected display must have CEC device control activated.

2) **[Colour] Buttons:** Lists the unit's remote control functionality that is mapped to each coloured button.

   Note: Not all displays support all CEC command types, please check the display's documentation to see if it supports remote CEC device control via the coloured remote buttons.

OSD SETTING	
2ND LEVEL	3RD LEVEL
Timeout	Never
	1 ~ 60 **[30]**
Horizontal	0 ~ 100 **[2]**
Vertical	0 ~ 100 **[3]**
Transparency	0 ~ 7 **[3]**
Contrast	0 ~ 1 **[0]**
Panel Colour	Red
	Green
	Blue

OSD SETTING	
2ND LEVEL	**3RD LEVEL**
	GREY
Font Colour	Black
	White
	Red
	Green
	BLUE
	Yellow
	Cyan
	Magenta
Free Run	No
	Red
	Green
	BLUE
	Black
	Colour
Default	Yes
	NO

1) **Timeout:** Set the display timeout for the OSD Menu in seconds. Selecting "Never" will disable the timeout.

2) **Horizontal:** Set the horizontal position of the OSD Menu.

3) **Vertical:** Set the vertical position of the OSD Menu.

4) **Transparency:** Set the transparency level of the box behind the OSD menu.

5) **Contrast:** Switch between contrast modes for the OSD menu.

    Note: Selecting the lower contrast option "1" may improve visibility when overlaid on HDR sources.

6) **Panel Colour:** Set the colour of the box behind the OSD menu.

7) **Font Colour:** Set the colour of the OSD menu's text.

8) **Free Run:** Set the Free Run colour to display when no source is detected. Selecting "Colour" will show a colour bar pattern. Selecting "No" will disable the Free Run function.

9) **Default:** Reset the OSD settings to their factory default values.

SYSTEM SETTING	
2ND LEVEL	**3RD LEVEL**
VID	[System details]
PID	
SN	
FW Ver	
Factory Reset?	**NO**
	Yes

1) **System Information Block:** Shows the units system ID numbers, serial number and current firmware version.

2) **Factory Reset:** Selecting YES will reset the unit's settings back to their factory defaults.

   Note: The unit will automatically reboot after the factory reset is complete.

6.6 RS-232 Commands

COMMAND
Description and Parameters

<div align="center">System Commands</div>

help
Show the full command list.
help N1
Show help details about command **N1**. **N1** = {Command name}
get model name
Show the unit's model name.
get fw ver
Show the unit's current firmware version.
set system reboot
Reboot the unit.
set description N1
Set the description/name of the unit. **N1** = {Name}　　　　　　　　[64 characters max]
get description
Show the unit's current description/name.
set keylock N1
Enable or disable the front panel key lock. Available values for **N1**: ON　　　　　　　　　　　　[Lock front panel] OFF　　　　　　　　　　　[Unlock front panel]
get keylock
Show the current front panel lock state.
set factory default
Reset the unit to the factory defaults.

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COMMAND
Description and Parameters

Input Commands

get in port number

Report the number of inputs supported by the unit.

get in type list

List the interface type supported by each input.

set in 1 hdcp mode N1

Set the input's HDCP mode.

Available values for **N1**:
0	[Apple mode]
1	[Refer to source]
2	[Refer to sink]

get in 1 hdcp mode

Show the input's current HDCP mode.

set in 1 edid N1

Set the EDID to use on the HDMI input.

Available values for **N1:**
1	[Internal FHD 2CH]
2	[Internal FHD Multi-CH]
3	[Internal UHD 2CH]
4	[Internal UHD Multi-CH]
5	[Internal UHD+ 2CH]
6	[Internal UHD+ Multi-CH]
7	[Internal HDR 2CH]
8	[Internal HDR Multi-CH]
9	[User EDID 1]
10	[Copy output A's EDID]
11	[Copy output B's EDID]
12	[Copy output C's EDID]
13	[Copy output D's EDID]
14	[Copy output E's EDID]

get in 1 edid

Show the EDID currently being used by the input.

COMMAND
Description and Parameters

get in 1 edid data
Show the current contents of the input's EDID as ASCII hex data.

get in 1 edid information
Show English readable details from the EDID assigned to the input.

Output Commands

get out port number
Show the total number of outputs on the unit.

get out type list
List the port type of all outputs on the unit.

set out N1 convert N2
Set the 4K source conversion mode to use on the specified output.

Available values for **N1**:
A	[Output A]
B	[Output B]
C	[Output C]
D	[Output D]
E	[Output E]

Available values for **N2**:
0	[Bypass, no conversion]
1	[Convert colour space to YUV 4:2:0]
2	[Convert resolution to 1080p]
3	[Automatic, based on sink's EDID]

get out N1 convert
Show the current conversion mode used by the specified output.

Available values for **N1**:
A	[Output A]
B	[Output B]
C	[Output C]
D	[Output D]
E	[Output E]

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COMMAND
Description and Parameters

get out N1 edid data

Show the current contents of the specified output's EDID as ASCII hex data.

Available values for **N1**:
A	[Output A]
B	[Output B]
C	[Output C]
D	[Output D]
E	[Output E]

get out N1 edid information

Show English readable details from the EDID provided by the specified output.

Available values for **N1**:
A	[Output A]
B	[Output B]
C	[Output C]
D	[Output D]
E	[Output E]

User EDID Commands

get user edid number

Show the number of User EDIDs supported by the unit.

set user 1 edid data N1

Upload a new EDID (in ASCII hex format) for use as the User EDID.

N1 = {Comma delimited hex pairs} [EDID data]

get user 1 edid data

Show the EDID used by the User EDID as ASCII hex data.

get user 1 edid information

Show English readable details from the User EDID.

COMMAND
Description and Parameters

Analogue Audio Commands

set analog audio mute N1

Enable or disable muting the analogue audio output.

Available values for **N1**:
ON   [Mute the analogue audio output]
OFF   [Un-mute the analogue audio output]

get analog audio mute

Show the current mute state of the analogue audio output.

set analog audio volume N1

Set the volume level of the analogue audio output.

N1 = 0~80   [Volume adjustment in 0.5 dB steps]

get analog audio volume

Show the current volume level of the analogue audio output.

set analog audio left enhance N1

Set the left channel volume enhancement for the analogue audio output.

N1 = 0~40   [Volume adjustment in 0.5 dB steps]

get analog audio left enhance

Show the current left channel volume enhancement for the analogue audio output.

set analog audio right enhance N1

Set the right channel volume enhancement for the analogue audio output.

N1 = 0~40   [Volume adjustment in 0.5 dB steps]

get analog audio right enhance

Show the current right channel volume enhancement for the analogue audio output.

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COMMAND
Description and Parameters
Serial Commands

set uart N1 N2

Enable or disable the RS-232 pass-through function for the specified HDBaseT output or the local port.

Available values for **N1**:
A	[Output A]
B	[Output B]
C	[Output C]
D	[Output D]
E	[Local RS-232]

Available values for **N2**:
ON	[Enable RS-232 pass-through]
OFF	[Disable RS-232 pass-through]

get uart N1

Show the current RS-232 pass-through setting for the specified port.

Available values for **N1**:
A	[Output A]
B	[Output B]
C	[Output C]
D	[Output D]
E	[Local RS-232]

set uart N1 baud rate N2

Set the baud rate of the specified RS-232 port.

Available values for **N1**:
A	[Output A]
B	[Output B]
C	[Output C]
D	[Output D]
E	[Local RS-232]

COMMAND
Description and Parameters

Available values for **N2**:

2400	[2400 baud]
4800	[4800 baud]
7200	[7200 baud]
9600	[9600 baud]
14400	[14400 baud]
19200	[19200 baud]
38400	[38400 baud]
57600	[57600 baud]
115200	[115200 baud]

get uart N1 baud rate

Show the current baud rate of the specified RS-232 port.

Available values for **N1**:

A	[Output A]
B	[Output B]
C	[Output C]
D	[Output D]
E	[Local RS-232]

set uart N1 data length N2

Set the data bits for the specified RS-232 port.

Available values for **N1**:

A	[Output A]
B	[Output B]
C	[Output C]
D	[Output D]
E	[Local RS-232]

N2 = 5~8   [Number of data bits]

get uart N1 data length

Show the current number of data bits of the specified RS-232 port.

Available values for **N1**:

A	[Output A]
B	[Output B]
C	[Output C]
D	[Output D]
E	[Local RS-232]

COMMAND
Description and Parameters

set uart N1 parity N2

Set the parity of the specified RS-232 port.

Available values for **N1**:
A	[Output A]
B	[Output B]
C	[Output C]
D	[Output D]
E	[Local RS-232]

Available values for **N2**:
0	[No parity]
1	[Odd parity]
2	[Even parity]

get uart N1 parity

Show the current parity setting of the specified RS-232 port.

Available values for **N1**:
A	[Output A]
B	[Output B]
C	[Output C]
D	[Output D]
E	[Local RS-232]

IR Commands

set ir N1 emitter N2

Enable or disable the IR output on the specified HDBaseT port's receiver, or on the local unit.

Available values for **N1**:
A	[Output A's receiver's IR output]
B	[Output B's receiver's IR output]
C	[Output C's receiver's IR output]
D	[Output D's receiver's IR output]
E	[Local IR output]

Available values for **N2**:
ON	[Enable IR output]
OFF	[Disable IR output]

COMMAND

Description and Parameters

get ir N1 emitter

Show the current enabled state of the IR output on the specified HDBaseT port's receiver, or on the local unit.

Available values for **N1**:

A	[Output A's receiver's IR output]
B	[Output B's receiver's IR output]
C	[Output C's receiver's IR output]
D	[Output D's receiver's IR output]
E	[Local IR output]

set ir N1 receiver N2

Enable or disable the IR input on the specified HDBaseT port's receiver, or on the local unit.

Available values for **N1**:

A	[Output A's receiver's IR input]
B	[Output B's receiver's IR input]
C	[Output C's receiver's IR input]
D	[Output D's receiver's IR input]
E	[Local IR input]

Available values for **N2**:

ON	[Enable IR input]
OFF	[Disable IR input]

get ir N1 receiver

Show the current enabled state of the IR input on the specified HDBaseT port's receiver, or on the local unit.

Available values for **N1**:

A	[Output A's receiver's IR input]
B	[Output B's receiver's IR input]
C	[Output C's receiver's IR input]
D	[Output D's receiver's IR input]
E	[Local IR input]

CYP///

COMMAND

Description and Parameters

OSD Commands

set osd timeout N1

Set the OSD's timeout value (in seconds) or disable the timeout.

Available values for **N1**:
0	[No timeout]
1~60	[Timeout in seconds]

get osd timeout

Show the current OSD timeout value.

set osd horizontal N1

Set the horizontal position of the OSD.

N1 = 0~100   [Horizontal position]

get osd horizontal

Show the current horizontal position of the OSD.

set osd vertical N1

Set the vertical position of the OSD.

N1 = 0~100   [Vertical position]

get osd vertical

Show the current vertical position of the OSD.

set osd transparency N1

Set the transparency level of the OSD.

Available values for **N1**:
0	[Fully opaque]
1	[Level 1]
2	[Level 2]
3	[Level 3]
4	[Level 4]
5	[Level 5]
6	[Level 6]
7	[Fully Transparent]

COMMAND
Description and Parameters

get osd transparency
Show the current transparency level of the OSD.

set osd contrast N1
Set the contrast mode of the OSD.
Available values for **N1**: 0   [Normal] 1   [Low contrast]

get osd contrast
Show the current contrast mode of the OSD.

set osd panel color N1
Set the colour of the background of the OSD.
Available values for **N1**: 1   [Red] 2   [Green] 3   [Blue] 4   [Gray]

get osd panel color
Show the current colour of the background of the OSD.

set osd font color N1
Set the colour of the font used by the OSD.
Available values for **N1**: 1   [Black] 2   [White] 3   [Red] 4   [Green] 5   [Blue] 6   [Yellow] 7   [Cyan] 8   [Magenta]

get osd font color
Show the current colour of the font used by the OSD.

COMMAND
Description and Parameters
set osd freerun color N1
Set the free run mode and the colour/pattern used when the input signal is lost and free run is active. Available values for **N1:** 0 [Free run is disabled] 1 [Red screen] 2 [Green screen] 3 [Blue screen] 4 [Black screen] 5 [Colour bars]
get osd freerun color
Show the current free run colour setting.
set osd default
Reset the OSD configuration to the factory defaults.

Note: Commands will not be executed unless followed by a carriage return. Commands are not case-sensitive.

7. CONNECTION DIAGRAM

Media Player

Powered Speakers

1.5m
60°

3m 7m 3m
60°

IR Input & Output

HDMI Input

Serial Control Device

RS-232

Cat.5e/6/7 Cable

IR Input & Output

1.5m
60°

3m 7m 3m
60°

1.5m
60°

3m 7m 3m
60°

1.5m
60°

3m 7m 3m
60°

1.5m
60°

3m 7m 3m
60°

UHDTV

IR Input & Output

IR Input & Output

IR Input & Output

| RX | RX | RX | RX |

HDMI Output

HDMI Output

HDMI Output

HDMI Output

RS-232

RS-232

RS-232

RS-232

Serial Controlled Device

Serial Controlled Device

Serial Controlled Device

Serial Controlled Device

UHDTV   **UHDTV**   **UHDTV**   **UHDTV**

8. SPECIFICATIONS

8.1 Technical Specifications

HDMI Bandwidth	18Gbps
HDBaseT Bandwidth	10.2Gbps
Input Ports	1×HDMI (Type-A)
Output Ports	4×HDBaseT (RJ-45)
	1×HDMI (Type-A)
	1×Stereo Audio (5-pin Terminal Block)
Pass-through Ports	1×IR Extender (3.5mm)
	1×IR Blaster (3.5mm)
Control Ports	1×RS-232 (DE-9)
Service Port	1×USB 2.0 (Mini B)
IR Frequency	30 – 50kHz (30 – 60kHz under ideal conditions)
Baud Rate	19200
Power Supply	24V/3.75A DC
	(US/EU standards, CE/FCC/UL certified)
ESD Protection (HBM)	±8kV (Air Discharge)
	±4kV (Contact Discharge)
Dimensions (W×H×D)	432mm×44mm×174mm [Case Only]
	432mm×44mm×180mm [All Inclusive]
Weight	906g
Chassis Material	Metal (Steel)
Chassis Colour	Black
Operating Temperature	0˚C – 40˚C/32˚F – 104˚F
Storage Temperature	−20˚C – 60˚C/−4˚F−140˚F
Relative Humidity	20−90% RH (Non-condensing)
Power Consumption	20.8W

8.2 Video Specifications

Supported Resolutions (Hz)	Input	Output	
	HDMI	HDMI	HDBaseT
720×400p@70/85	✓	✓	✓
640×480p@60/72/75/85	✓	✓	✓
720×480i@60	✓	✓	✓
720×480p@60	✓	✓	✓
720×576i@50	✓	✓	✓
720×576p@50	✓	✓	✓
800×600p@56/60/72/75/85	✓	✓	✓
848×480p@60	✓	✓	✓
1024×768p@60/70/75/85	✓	✓	✓
1152×864p@75	✓	✓	✓
1280×720p@50/60	✓	✓	✓
1280×768p@60/75/85	✓	✓	✓
1280×800p@60/75/85	✓	✓	✓
1280×960p@60/85	✓	✓	✓
1280×1024p@60/75/85	✓	✓	✓
1360×768p@60	✓	✓	✓
1366×768p@60	✓	✓	✓
1400×1050p@60	✓	✓	✓
1440×900p@60/75	✓	✓	✓
1600×900p@60RB	✓	✓	✓
1600×1200p@60	✓	✓	✓
1680×1050p@60	✓	✓	✓
1920×1080i@50/60	✓	✓	✓
1920×1080p@24/25/30	✓	✓	✓

Supported Resolutions (Hz)	Input	Output	
	HDMI	HDMI	HDBaseT
1920×1080p@50/60	✓	✓	✓
1920×1200p@60RB	✓	✓	✓
2560×1440p@60RB	✓	✓	✗
2560×1600p@60RB	✓	✓	✗
2048×1080p@24/25/30	✓	✓	✓
2048×1080p@50/60	✓	✓	✓
3840×2160p@24/25/30	✓	✓	✓
3840×2160p@50/60 (4:2:0)	✓	✓	✓
3840×2160p@24, HDR10	✓	✓	AVLC
3840×2160p@50/60 (4:2:0), HDR10	✓	✓	AVLC
3840×2160p@50/60	✓	✓	AVLC
4096×2160p@24/25/30	✓	✓	✓
4096×2160p@50/60 (4:2:0)	✓	✓	✓
4096×2160p@24, HDR10	✓	✓	✗
4096×2160p@50/60 (4:2:0), HDR10	✓	✓	✗
4096×2160p@50/60	✓	✓	✗

8.3 Audio Specifications

8.3.1 Digital Audio

HDMI Input/Output	
LPCM	
Max Channels	8 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
Supported Formats	Standard & High-Definition

8.3.2 Analogue Audio

Analogue Output	
Max Audio Level	4.2Vrms
THD+N	< −80dB@0dBFS 1kHz (A-wt)
SNR	> 70dB@0dBFS
Frequency Response	< ±3dB@20Hz~20kHz
Crosstalk	< −70dB@10kHz
Impedance	499Ω
Type	Balanced

8.4 Cable Specifications

Cable Length	1080p		4K30	4K60
	8-bit	12-bit	(4:4:4) 8-bit	(4:4:4) 8-bit
High Speed HDMI Cable				
HDMI Input	15m	10m	5m	3m
HDMI Output	15m	10m	5m	3m
Ethernet Cable				
Cat.5e/6	60m		35m	
Cat.6a/7	70m		40m	

Bandwidth Category Examples:

1080p (FHD Video)

- Up to 1080p@60Hz, 12-bit colour
- Data rates lower than 5.3Gbps or below 225MHz TMDS clock

4K30 (UHD Video)

- 4K@24/25/30Hz & 4K@50/60Hz (4:2:0), 8-bit colour
- 4K@50/60Hz (4:4:4, 8-bit) with AVLC active
- Data rates higher than 5.3Gbps or above 225MHz TMDS clock but below 10.2Gbps

4K60 (UHD+ Video)

- 4K@50/60Hz (4:4:4, 8-bit), AVLC required over HDBaseT
- 4K@50/60Hz (4:2:0, 10-bit HDR), AVLC required over HDBaseT
- Data rates higher than 10.2Gbps

8.5 HDBaseT Features

HDBaseT Feature Set	Transmitter
Video & Audio Extension	Supported
LAN Extension	Unsupported
Send power to Receiver	Supported (PoH)
Accept power from Receiver	Unsupported
IR Extension	Supported
RS-232 Extension	Supported
USB 2.0 Extension	Unsupported

9. ACRONYMS

ACRONYM	COMPLETE TERM
ASCII	American Standard Code for Information Interchange
AV	Audio/Video
AVLC	Adaptive Visually Lossless Compression
AVR	Audio/Video Receiver or Recorder
Cat.5e	Enhanced Category 5 cable
Cat.6	Category 6 cable
Cat.6a	Augmented Category 6 cable
Cat.7	Category 7 cable
CEC	Consumer Electronics Control
CLI	Command-Line Interface
DAC	Digital-to-Analogue Converter
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
HD	High-Definition
HDBT	HDBaseT
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDR	High Dynamic Range
HDTV	High-Definition Television
IR	Infrared
LED	Light-Emitting Diode
LPCM	Linear Pulse-Code Modulation
OSD	On-Screen Display
PC	Personal Computer
PD	Powered Device

ACRONYM	COMPLETE TERM
PoH	Power over HDBaseT
PSE	Power Sourcing Equipment
SNR	Signal-to-Noise Ratio
THD+N	Total Harmonic Distortion plus Noise
UHD	Ultra-High-Definition (10.2Gbps)
UHD+	Ultra-High-Definition Plus (18Gbps)
UHDTV	Ultra-High-Definition Television
USB	Universal Serial Bus
VGA	Video Graphics Array
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
XGA	Extended Graphics Array