



# PUV-1660TTX

HDBaseT™ Table-Top Transmitter

**OPERATION MANUAL**



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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.
- Please completely disconnect the power when the unit is not in use to avoid wasting electricity.

## VERSION HISTORY

REV.	DATE	SUMMARY OF CHANGE
RDV1	2019/12/03	Preliminary release

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## 1. INTRODUCTION

This UHD<sup>+</sup> Multi Format to HDBaseT Table Box is an HDMI, Mini-DP, and USB-C switch with audio embedding and HDBaseT output. The table box is designed to be placed on a table, or mounted to any typical table edge using a clamp. This unit can send high definition uncompressed audio/video along with Ethernet over a single cable up to a distance of 100 meters at 1080p@60Hz. The HDMI, Mini-DP, and USB-C inputs all support resolutions up to 4K@60Hz (4:4:4, 8-bit). With the use of the 3.5mm audio input, stereo audio may be embedded into the HDBaseT output as well. Despite HDBaseT's 10.2Gbps bandwidth limitation, high bandwidth 4K UHD<sup>+</sup> HDMI video sources, up to and including 4K@60Hz (4:4:4, 8-bit), can be supported and will be automatically converted to 8-bit colour, or the 4:2:0 colour space when necessary.

Signal management features, such as automatic source switching based on input signal detection, enable convenient hands-free operation. Additional functionality such as advanced EDID management, HDCP management, and basic signal event automation (which can automatically send customised RS-232 or CEC commands to an external device) are also available.

The unit is powered via PoH (Power over HDBaseT) from a compatible HDBaseT receiver, which allows for greater flexibility in installations. The unit can be controlled via the front panel button, WebGUI, and Telnet. When paired with a compatible receiver RS-232 control also becomes available making it exceptionally versatile.

## 2. APPLICATIONS

- /// Household entertainment sharing and control
- /// Lecture halls, auditoriums, and classrooms
- /// Conference rooms and boardrooms
- /// Hotel event spaces

## 3. PACKAGE CONTENTS

- /// 1× UHD<sup>+</sup> 3×1 Multi-Format to HDBaseT Table Box with PoH (PD)
- /// 1× Operation Manual

## 4. SYSTEM REQUIREMENTS

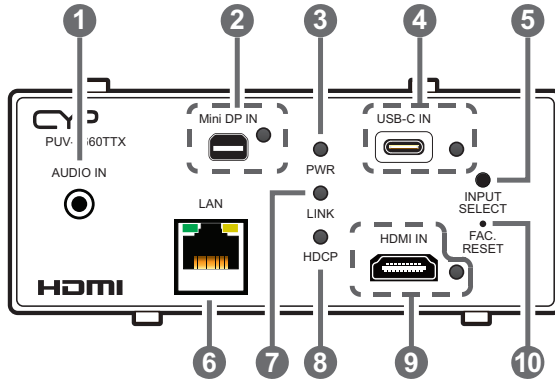
- /// HDMI, DisplayPort, or USB Type-C source equipment such as media players, video game consoles, or set-top boxes.
- /// A compatible HDBaseT receiver with PoH (PSE) support is required.
- /// The use of Premium High Speed HDMI cables, and industry standard Cat.6, Cat.6A, or Cat.7 Ethernet cable is highly recommended.
- /// The use of 30AWG (Gen 2) USB Type-C cable is highly recommended.
- /// The use of DisplayPort 1.2 or higher spec cable is highly recommended.

## 5. FEATURES

- /// HDMI 2.0, DisplayPort 1.4, USB-C, and DVI 1.0 compliant
- /// HDCP 1.x and 2.2 compliant
- /// 1 HDMI, 1 Mini-DisplayPort, 1 USB Type-C video input, and a 3.5mm mini-jack analogue audio input
- /// 1 HDBaseT output
- /// Supports up to 4K UHD<sup>+</sup> (18Gbps, 4K@60Hz 4:4:4, 8-bit) video input
- /// Supports Deep Colour input up to 12-bit
- /// Supports 10-bit and 12-bit HDR (High Dynamic Range) input
- /// HDBaseT output supports resolutions up to 4K@60Hz (4:2:0, 8-bit) with automatic colour space conversion of 4K@50/60Hz (4:4:4, 8-bit) or 4K@any (10/12-bit) sources
- /// Supports pass-through of many audio formats including 8 channel LPCM, Bitstream, and HD Bitstream
- /// Analogue audio may be embedded with all sources
- /// Per-input EDID management with internal or external EDID options
- /// Supports manual input selection or automatic input selection with hot plug detection
- /// Basic signal event automation (via RS-232 or CEC w/ compatible receiver)
- /// Unit is powered via PoH from a compatible HDBaseT receiver
- /// Convenient table box design
- /// Front panel LEDs indicate input selection, power, link, and HDCP status
- /// Controllable via front panel button, WebGUI, Telnet, or RS-232 (w/ compatible receiver only)

## 6. OPERATION CONTROLS AND FUNCTIONS

### 6.1 Front Panel



- 1 AUDIO IN Port:** Connect to the stereo analogue output of a device such as a CD player or PC for embedding into the HDBaseT output.
- 2 Mini-DP IN Port & LED:** Connect to DisplayPort source equipment such as a PC or laptop. The LED will illuminate when the DisplayPort input has been selected.

*Note: For 4K sources, use of cable that supports DisplayPort 1.2 or higher is strongly recommended.*

- 3 USB-C IN Port & LED:** Connect to USB Type-C video source equipment such as a PC or laptop. The LED will illuminate when the USB-C input has been selected.

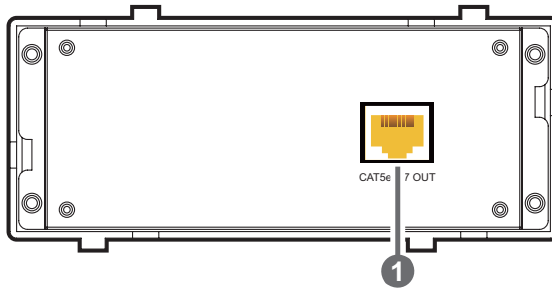
*Note: Not all devices with USB Type-C ports can support video output. Please verify that the device supports video output from the USB Type-C port before connecting it.*

- 4 LAN Port:** Connect directly, or through a network switch, to your PC/laptop to control the unit via Telnet/WebGUI and to extend the network across the HDBaseT connection.
- 5 INPUT SELECT Button:** Press this button to sequentially switch through the available inputs.
- 6 Reset Pinhole:** Press to reset the unit to its factory defaults.



- 7 **HDMI IN Port & LED:** Connect to HDMI source equipment such as a media player, game console, or set-top box. The LED will illuminate when the HDMI input has been selected.
- 8 **PWR LED:** This LED will illuminate to indicate the unit is on and receiving power.
- 9 **LINK LED:** This LED will illuminate when the unit is on, receiving power, and has successfully linked to a compatible receiver.
- 10 **HDCP LED:** This LED will illuminate when HDCP is active on the currently selected input. If no HDCP is present, or authentication has failed, the LED will remain off.

## 6.2 Rear Panel



- 1 **CAT5e/6/7 OUT Port:** Connect to a compatible HDBaseT receiver with a single Cat.5e/6/7 cable for transmission of all data signals. Power via PoH will also be supplied to this unit when connected to a compatible PSE receiver.

### 6.3 RS-232 Defaults

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

*Note: Access to control the table box transmitter's settings is provided via the RS-232 port located on the connected receiver.*

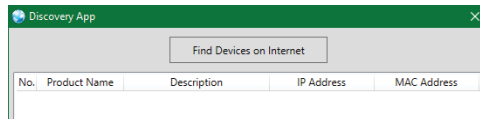
## 6.4 WebGUI Control

### Device Discovery

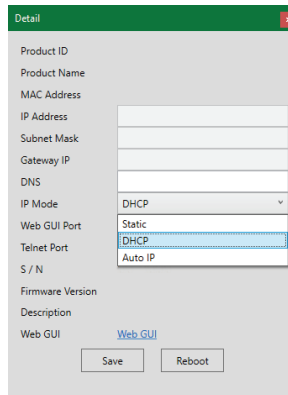
Please obtain the “Device Discovery” software from your authorised dealer and save it in a directory where you can easily find it.

Connect the unit and your PC/Laptop to the same active network and execute the “Device Discovery” software. Click on “Find Devices on Internet” and a list of devices connected to the local network will show up indicating their current IP address.

*Note: This unit’s network defaults to DHCP mode. The current IP address can be verified using RS-232 if the Device Discovery software is not available.*



By clicking on one of the listed devices you will be presented with the network details of that particular device.



- 1) **IP Mode:** If you choose, you can alter the static IP network settings for the device, or switch the unit into DHCP mode to automatically obtain proper network settings from a local DHCP server. To switch to DHCP mode, please select DHCP from the IP mode drop-down, then click “Save” followed by “Reboot”.
- 2) **WebGUI Hotkey:** Once you are satisfied with the network settings, you may use them to connect via Telnet or WebGUI. The network information window provides a convenient link to launch the WebGUI directly.

## WebGUI Overview

After connecting to the WebGUI's address in a web browser, the login screen will appear. Please enter the appropriate user name and password then click "Submit" to log in.

*Note: The default user name and password is "admin".*

A login form with a blue "Login" button at the top left. Below it are two input fields: "Username" and "Password". At the bottom center is a "Submit" button.

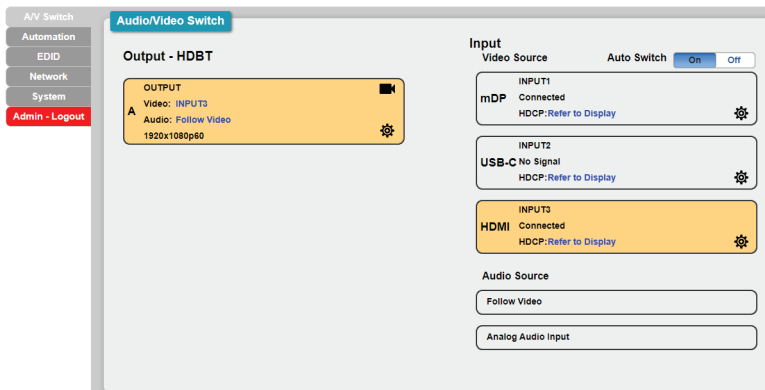
On the left side of the browser you will see the following menu tabs where all primary functions of the unit are controllable via the built in WebGUI. The individual functions will be introduced in the following sections.



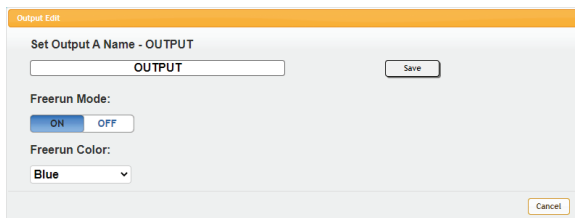
Clicking the red "Logout" tab will automatically log the currently connected user out of the WebGUI and return to login page.

### 6.4.1 A/V Switch Tab

This tab provides video/audio routing control as well as control over HDCP behavior, freerun settings, and naming of the inputs and output. To assign a new video route, please click the output button and then click on the button of the preferred input port to route. Alternately, to change the audio that is paired with the video output, click on the output button on the left, followed by the preferred audio source on the bottom right. As you select each button they will change their colour to orange. The new routing will become active immediately and the routing information displayed on the buttons will change accordingly.

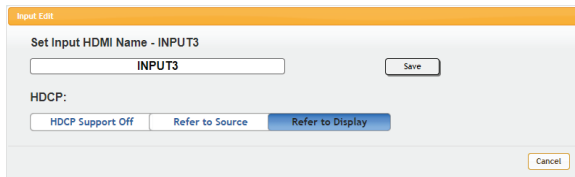


- 1) **Output:** This button displays the output's name and details about the currently selected input. Clicking on the "Edit" icon (⚙️) opens up the Output Edit window. Clicking on the "A/V Mask" icon (🔇) will mute or unmute the audio and video output.
- 2) **Output Edit:** This window provides options to rename the output and configure freerun behavior.



- **Output Name:** Provides a way to change the name of the output port. Click on "Save" to confirm and activate any changes.

- **Freerun Mode:** Enable or disable the video freerun function. When this is enabled, the selected freerun colour will be displayed on the screen if there is no live source on the selected input.
  - **Freerun Colour:** Select the colour to display when freerun is active. Available choices are: Black, White, Red, Green, Blue, Magenta, Yellow, Cyan, Gray, and Colour Bar.
- 3) **Auto Switch:** Automatic input switching may be enabled or disabled by clicking on the On/Off slider to toggle the setting.
  - 4) **Input 1~3:** Buttons for selecting the input to route to the output. To assign a new video route, click the output button followed by the button of the preferred input port to route. The new routing will become active immediately. Details about the input names and current sync/HDCP settings are also displayed here. Clicking on the "Edit" icon (⚙️) opens up the Input Edit window.
  - 5) **Input Edit:** Provides Individual control over the name and the behavior of HDCP on each input.



- **Set Input Name:** To rename an input, type the new name in the space provided in the Edit window. The name can be up to 32 characters long. Click the "Save" button to confirm the change.
  - **HDCP:** The HDCP mode of the each input can be set to "HDCP Support Off", "Refer to Source", or "Refer to Display". Changes made to this setting occur immediately.
- 6) **Audio Source:** Buttons for selecting the behavior of audio routed to the output. Click on the output button on the left, followed by the preferred audio source. The new audio routing will become active immediately.

## 6.4.2 Automation Tab

This tab provides control over the unit's automatic control command broadcast behavior when the specified system Automation Events occur. Automation commands may be sent to 3rd party devices via standard CEC, or customizable RS-232.

*Note: Sending RS-232 commands requires the use of a compatible HDBaseT receiver with an RS-232 port.*

- 1) **Event:** Use the dropdown to select the Automation Event to configure. Available Automation Events are:
  - **Power On:** This unit is powered on.
  - **Out A Source Active:** The currently selected input changes from inactive to active.
  - **Out A Source Lost:** The currently selected input changes from active to inactive.
- 2) **CEC:** Enable or disable sending a CEC command when the currently selected Automation Event is activated.

*Note: CEC support must also be enabled on the connected HDMI display device.*

- **Delay:** Set the length of time, in seconds, that the specified Automation Event must continue to be true before sending the defined CEC command.
- **Wait:** Set the length of time, in seconds, to wait after this Automation Event has been activated before ANY other Automation Event can be detected.
- **CEC Command:** Set the CEC command to send when the specified Automation Event is activated. Click the "Test" button to send the command immediately. Available CEC commands are:

- Power On: Turn on the connected HDMI display device.
- Power Off: Turn off the connected HDMI display device.
- Active Source: Force the connected HDMI display device to switch to the HDMI input that this unit is connected to.
- Power On + Active Source: Turn on the connected HDMI display device and force the connected HDMI display device to switch to the HDMI input that this unit is connected to.

*Note: Not all HDMI devices support all CEC commands.*

**3) RS232:** Enable or disable sending an RS-232 command when the currently selected Automation Event is activated. Click the "Edit" icon (⚙️) to configure the various RS-232 port settings including baud rate, data length, parity and stop bits.

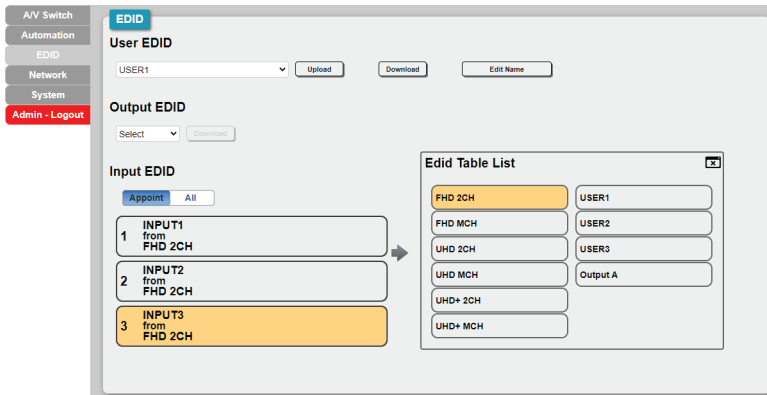
*Note: RS-232 Automation commands will be output via the RS-232 port located on the connected receiver.*

- **Delay:** Set the length of time, in seconds, that the specified Automation Event must continue to be true before sending the defined RS-232 command.
- **Wait:** Set the length of time, in seconds, to wait after this Automation Event has been activated before ANY other Automation Event can be detected.
- **RS232 Command:** Displays the currently defined RS-232 command text. Click on the "Edit" icon (⚙️) to define the RS-232 command to send when the specified Automation Event is activated. Click the "Test" button to send the command immediately.



### 6.4.3 EDID Tab

This tab provides control over the EDID behavior of the unit. There are six internal EDIDs, three customer uploaded EDIDs, and one sink sourced EDID that can be assigned to a single input, or to all 3 as a group. The sink EDID and Customer EDIDs are also available for download to the connected PC.



#### 1) User EDID:

- **Upload:** To upload a User EDID, select the User EDID slot to upload into from the dropdown list and then click the “Upload” button. An EDID Upload window will appear, allowing you to locate and upload the preferred EDID file (\*.bin format) from a local PC. Once the correct file has been selected, please click the “Upload” button in the window, and the file will be transferred to the unit.
- **Download:** To save an existing User EDID to your local PC, select the User EDID slot from the dropdown list and then press the “Download” button. Depending on your browser settings you will either be asked where to save the downloaded file, or the file will be transferred to the default download location on your PC.
- **Edit Name:** Click the “Edit Name” button to open a window that allows changing the name of the currently selected User EDID. Click the “Save” button within the window to confirm the change.

#### 2) Output EDID:

- **Download:** To save the EDID from the connected display to your local PC, select the sink from the dropdown list then press the “Download” button. Depending on your browser settings you will either be asked where to save the downloaded file, or the file will

be transferred directly to the default download location on your PC.

**3) Input EDID:** This section provides controls for assigning a new EDID to one, or all inputs within the system.

- **Appoint/All:** Selecting “All” will allow the assignment of a single EDID to all inputs simultaneously. Selecting “Appoint” allows for a different EDID to be assigned to each HDMI input.

- **EDID Selection:** Click on the input button on the left to open the EDID Table List window. Select the new EDID source to use and the change will occur immediately across all selected inputs.

*Note: In most cases, assigning a new EDID to an input will cause the affected inputs to briefly blink out while the source adapts to the new information.*

This unit provides the following 6 default EDIDs:

Unit's default EDIDs	
<b>FHD 2CH</b>	1920×1080p@60Hz (4.95Gbps), 8-bit colour, LPCM 2.0
<b>FHD MCH</b>	1920×1080p@60Hz (4.95Gbps), 8-bit colour, LPCM 7.1 & Bitstream
<b>UHD 2CH</b>	3840×2160p@30Hz (10.2Gbps), 12-bit Deep Colour, LPCM 2.0
<b>UHD MCH</b>	3840×2160p@30Hz (10.2Gbps), 12-bit Deep Colour, LPCM 7.1 & Bitstream
<b>UHD+ 2CH</b>	3840×2160p@60Hz (18Gbps), 12-bit Deep Colour, LPCM 2.0
<b>UHD+ MCH</b>	3840×2160p@60Hz (18Gbps), 12-bit Deep Colour, 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 6 default EDIDs for maximum compatibility.*

### 6.4.4 Network Tab

This tab provides network configuration options including changing the IP mode, viewing/setting the IP configuration, changing the admin login password, and changing the Web Login timeout.

*Note: This unit's network defaults to DHCP mode.*

- 1) **IP Configuration:** IP Mode may be switched between Static IP or DHCP. In Static IP Mode the IP, netmask and gateway addresses must be manually set. When in DHCP Mode, the unit will attempt to connect to a local DHCP server and obtain IP, netmask and gateway addresses automatically. Please press "Save" after making any changes to the IP configuration or mode.

*Note: If the IP address is changed then the IP address required for WebGUI/Telnet access will also change accordingly.*

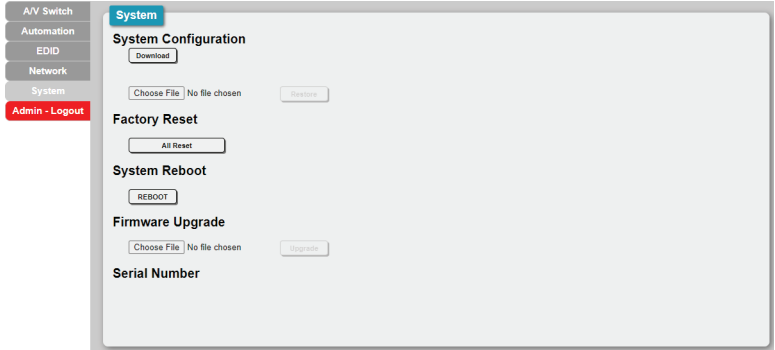
- 2) **Web Login Account:** The WebGUI's admin password can be changed here. Please press "Save" after entering the old and new passwords to enact the change.

*Note: The default password is "admin".*

- 3) **Web Login Timeout:** Select the length of time to wait before logging the user out of the WebGUI due to inactivity. Available range is from 0 to 35970 minutes. Setting it to 0 will disable the timeout function.

### 6.4.5 System Tab

This tab provides system configuration backup/restore options, controls to perform a factory reset or system reboot, firmware update support, as well as displaying the unit's serial number.



#### 1) System Configuration:

- **Download:** The current system configuration, including routing and settings, may be saved as an XML file to a PC. Click the “Download” button to save the current system configuration to your local PC.
- **Restore:** Previously saved system configurations may be restored from a saved XML file. Click the “Choose File” button to locate the saved XML file, then click the “Restore” button to upload and activate the selected configuration.

2) **Factory Reset:** Click this button to reset the unit to its factory default settings.

3) **System Reboot:** Click the “Reboot” button to force the unit to reboot.

4) **Firmware Upgrade:** To update the unit’s firmware, click the “Choose File” button to open the file selection window and then select the firmware update file (\*.bin format) located on your local PC. After selecting the file, click the “Upgrade” button to begin the firmware update process. Once the process completes the unit will automatically reboot.

5) **Serial Number:** Displays the unit’s serial number.

## 6.5 Telnet Control

Before attempting to use Telnet control, please ensure that both the unit and the PC are connected to the same active networks.

Start your preferred Telnet/Console client, or use the built in client provided by most modern computer operating systems. After starting the client, connect by using the current IP address of the unit and port 23 (if the communication port number used by the unit has not been changed previously). This will connect us to the unit we wish to control and commands may now be entered directly.

*Note 1: If the IP address of the unit is changed then the IP address required for Telnet access will also change accordingly.*

*Note 2: This unit's network defaults to DHCP mode. The current IP address can be verified using RS-232 if the Device Discovery software is not available. The default communication port is 23.*

## 6.6 Serial and Telnet Commands

COMMAND	
Description and Parameters	
<b>help</b> ←	Show the full command list.
<b>help N1</b> ←	Show details about the specified command. <b>N1</b> = {Command}
<b>?</b> ←	Show the full command list.
<b>? N1</b> ←	Show details about the specified command. <b>N1</b> = {Command}

COMMAND													
Description and Parameters													
<b>set factory default</b> ↵	Reset the unit to the factory defaults.												
<b>set system reboot</b> ↵	Reboot the unit.												
<b>get fw ver</b> ↵	Show the unit's current firmware version.												
<b>set uart 1 baudrate N1</b> ↵	Set the baud rate of the unit's internal RS-232 port.  Available values for <b>N1</b> : <table border="0"> <tr> <td>4800</td> <td>[4800 baud]</td> </tr> <tr> <td>9600</td> <td>[9600 baud]</td> </tr> <tr> <td>19200</td> <td>[19200 baud]</td> </tr> <tr> <td>38400</td> <td>[38400 baud]</td> </tr> <tr> <td>57600</td> <td>[57600 baud]</td> </tr> <tr> <td>115200</td> <td>[115200 baud]</td> </tr> </table>	4800	[4800 baud]	9600	[9600 baud]	19200	[19200 baud]	38400	[38400 baud]	57600	[57600 baud]	115200	[115200 baud]
4800	[4800 baud]												
9600	[9600 baud]												
19200	[19200 baud]												
38400	[38400 baud]												
57600	[57600 baud]												
115200	[115200 baud]												
<b>get uart 1 baudrate</b> ↵	Show the current baud rate of the unit's internal RS-232 port.												
<b>set uart 1 stop bit N1</b> ↵	Set the number of stop bits for the unit's internal RS-232 port.  Available values for <b>N1</b> : <table border="0"> <tr> <td>1</td> <td>[1 stop bit]</td> </tr> <tr> <td>2</td> <td>[2 stop bits]</td> </tr> </table>	1	[1 stop bit]	2	[2 stop bits]								
1	[1 stop bit]												
2	[2 stop bits]												
<b>get uart 1 stop bit</b> ↵	Show the current number of stop bits of the unit's internal RS-232 port.												

COMMAND									
Description and Parameters									
<b>set uart 1 data bit N1 ↵</b>	<p>Set the data bits for the unit's internal RS-232 port.</p> <p>Available values for <b>N1</b>:</p> <table border="0"> <tr> <td>5</td> <td>[5 data bits]</td> </tr> <tr> <td>6</td> <td>[6 data bits]</td> </tr> <tr> <td>7</td> <td>[7 data bits]</td> </tr> <tr> <td>8</td> <td>[8 data bits]</td> </tr> </table>	5	[5 data bits]	6	[6 data bits]	7	[7 data bits]	8	[8 data bits]
5	[5 data bits]								
6	[6 data bits]								
7	[7 data bits]								
8	[8 data bits]								
<b>get uart 1 data bit ↵</b>	<p>Show the current number of data bits of the unit's internal RS-232 port.</p>								
<b>set uart 1 parity N1 ↵</b>	<p>Set the parity of the unit's internal RS-232 port.</p> <p>Available values for <b>N1</b>:</p> <table border="0"> <tr> <td>0</td> <td>[None]</td> </tr> <tr> <td>1</td> <td>[Odd]</td> </tr> <tr> <td>2</td> <td>[Even]</td> </tr> </table>	0	[None]	1	[Odd]	2	[Even]		
0	[None]								
1	[Odd]								
2	[Even]								
<b>get uart 1 parity ↵</b>	<p>Show the current parity setting of the unit's internal RS-232 port.</p>								
<b>set ip mode N1 ↵</b>	<p>Set the unit's IP address assignment mode.</p> <p>Available values for <b>N1</b>:</p> <table border="0"> <tr> <td>0</td> <td>[Static IP]</td> </tr> <tr> <td>1</td> <td>[DHCP]</td> </tr> </table>	0	[Static IP]	1	[DHCP]				
0	[Static IP]								
1	[DHCP]								
<b>get ip mode ↵</b>	<p>Show the current IP address assignment mode.</p>								
<b>get ipconfig ↵</b>	<p>Show the unit's current IP configuration information.</p>								

COMMAND	
Description and Parameters	
<b>set webgui password N1</b> ←↵	
Set the WebGUI login password.	
<b>N1</b> = {Password}	[ASCII, 16 characters max]
<b>get webgui password</b> ←↵	
Show the current WebGUI login password.	
<b>set webgui port N1</b> ←↵	
Set the unit's WebGUI access port.	
<b>N1</b> = 1~65535	[HTTP port number]
<b>get webgui port</b> ←↵	
Show the unit's current WebGUI access port.	
<b>set telnet username N1</b> ←↵	
Set the Telnet login username.	
<b>N1</b> ={Name}	[20 characters max]
<b>get telnet username</b> ←↵	
Show the current Telnet login username.	
<b>set telnet port N1</b> ←↵	
Set the unit's Telnet access port.	
<b>N1</b> = 1~65535	[HTTP port number]
<b>get telnet port</b> ←↵	
Show the unit's current Telnet access port.	



COMMAND	
Description and Parameters	
<b>set telnet login N1</b> ←	
Enable or disable allowing Telnet logins.	
Available values for <b>N1</b> :	
ON	[ENABLED]
OFF	[DISABLED]
<b>get telnet login</b> ←	
Show the current state of Telnet login allowance.	
<b>set telnet timeout N1</b> ←	
Set the Telnet inactivity timeout value.	
Available values for <b>N1</b> :	
0	[No timeout]
1~120	[Timeout in minutes]
<b>get telnet timeout</b> ←	
Show the current Telnet inactivity timeout value.	
<b>set webgui login timeout N1</b> ←	
Set the WebGUI inactivity timeout value.	
Available values for <b>N1</b> :	
0	[No timeout]
1~35790	[Timeout in minutes]
<b>get webgui login timeout</b> ←	
Show the current WebGUI inactivity timeout value.	

COMMAND	
Description and Parameters	
<b>set in N1 name N2</b> ↵	
Set the name of the specified input.	
Available values for <b>N1</b> :	
1	[Mini-DP Input]
2	[USB-C input]
3	[HDMI input]
<b>N2</b> = {Name}	[ASCII, 32 characters max]
<b>get in N1 name</b> ↵	
Show the current name of the specified input.	
Available values for <b>N1</b> :	
1	[Mini-DP Input]
2	[USB-C input]
3	[HDMI input]
<b>set out A name N1</b> ↵	
Set the name of the HDBaseT output.	
<b>N1</b> = {Name}	[ASCII, 32 characters max]
<b>get out A name</b> ↵	
Show the name of the HDBaseT output.	
<b>set out A route N1</b> ↵	
Route the specified input to the HDBaseT output.	
Available values for <b>N1</b> :	
1	[Mini-DP Input]
2	[USB-C input]
3	[HDMI input]
<b>get out A route</b> ↵	
Show the current input routed to the HDBaseT output.	

COMMAND	
Description and Parameters	
<b>get in name list</b> ↵	List the names of all inputs on the unit.
<b>set out auto mode N1</b> ↵	Set the auto switching behavior of the unit. Available values for <b>N1</b> : 0 [Off] 1 [Auto Switch]
<b>get out auto mode</b> ↵	Show the current auto switching mode of the unit.
<b>get in N1 hactive</b> ↵	Show the horizontal active pixel value of the specified input's current video source. Available values for <b>N1</b> : 1 [Mini-DP Input] 2 [USB-C input] 3 [HDMI input]
<b>get in N1 vactive</b> ↵	Show the vertical active pixel value of the specified input's current video source. Available values for <b>N1</b> : 1 [Mini-DP Input] 2 [USB-C input] 3 [HDMI input]

COMMAND	
Description and Parameters	
<b>get in N1 refresh rate</b> ↵	
Show the refresh rate of the specified input's current video source.	
Available values for <b>N1</b> :	
1	[Mini-DP Input]
2	[USB-C input]
3	[HDMI input]
<b>get in N1 interlace</b> ↵	
Show the interlace state of the specified input's current video source.	
Available values for <b>N1</b> :	
1	[Mini-DP Input]
2	[USB-C input]
3	[HDMI input]
Possible response values:	
0	[Progressive]
1	[Interlaced]
<b>get in N1 sync status</b> ↵	
Show the current sync state of the specified input.	
Available values for <b>N1</b> :	
1	[Mini-DP Input]
2	[USB-C input]
3	[HDMI input]
Possible response values:	
0	[No sync]
1	[Active sync]

COMMAND	
Description and Parameters	
<b>get out A sync status</b> ↵	
Show the current sync state of the HDBaseT output.	
Possible response values:	
0	[No sync]
1	[Active sync]
<b>get in N1 deep color</b> ↵	
Show the detected bit depth of the signal on the specified input.	
Available values for <b>N1</b> :	
1	[Mini-DP Input]
2	[USB-C input]
3	[HDMI input]
Possible response values:	
8	[8-bit]
10	[10-bit]
12	[12-bit]
<b>get out A deep color</b> ↵	
Show the bit depth currently used by the HDBaseT output.	
Possible response values:	
8	[8-bit]
10	[10-bit]
12	[12-bit]
<b>get out A color space</b> ↵	
Show the colour space format currently used by the HDBaseT output.	
Possible response values:	
1	[RGB]
2	[YCbCr]

COMMAND	
Description and Parameters	
<b>set feedback broadcast N1</b> ←	
Enable or disable the broadcast of console command feedback.	
Available values for <b>N1</b> :	
ON	[Enable feedback]
OFF	[Disable feedback]
<b>get feedback broadcast</b> ←	
Show the current console command feedback broadcast state.	
<b>set static ipaddr N1</b> ←	
Set the unit's static IP address.	
<b>N1</b> = X.X.X.X	[X = 0 ~ 255, IP address]
<b>get static ipaddr</b> ←	
Show the unit's current static IP address.	
<b>set static netmask N1</b> ←	
Set the unit's static netmask.	
<b>N1</b> = X.X.X.X	[X = 0 ~ 255, Netmask]
<b>get static netmask</b> ←	
Show the unit's current static netmask.	
<b>set static gateway N1</b> ←	
Set the unit's static gateway address.	
<b>N1</b> = X.X.X.X	[X = 0 ~ 255, Gateway address]
<b>get static gateway</b> ←	
Show the unit's current static gateway address.	

COMMAND	
Description and Parameters	
<b>set automation event N1 uart A N2↵</b>	
Enable or disable the specified Automation Event's RS-232 response.	
Available values for <b>N1</b> :	
1	[Power on]
2	[Output A source active]
3	[Output A source lost]
Available values for <b>N2</b> :	
ON	[Event RS-232 response enabled]
OFF	[Event RS-232 response disabled]
<b>get automation event N1 uart A↵</b>	
Show the current state of the specified Automation Event's RS-232 response.	
Available values for <b>N1</b> :	
1	[Power on]
2	[Output A source active]
3	[Output A source lost]
<b>set automation event N1 uart A command N2↵</b>	
Set the RS-232 command string to send when the specified Automation Event is activated.	
Available values for <b>N1</b> :	
1	[Power on]
2	[Output A source active]
3	[Output A source lost]
<b>N2</b> = {Command}	[ASCII, 64 characters maximum]

COMMAND	
Description and Parameters	
<b>get automation event N1 uart A command</b> ←	
Show the RS-232 command string to be sent when the specified Automation Event is activated.	
Available values for <b>N1</b> :	
1	[Power on]
2	[Output A source active]
3	[Output A source lost]
<b>set automation event N1 uart A delay N2</b> ←	
Set the delay time that the specified Automation Event must continue to be true before sending the defined RS-232 command.	
Available values for <b>N1</b> :	
1	[Power on]
2	[Output A source active]
3	[Output A source lost]
<b>N2</b> = 0~240	[Delay in seconds]
<b>get automation event N1 uart A delay</b> ←	
Show the delay time for the specified Automation Event's RS-232 response.	
Available values for <b>N1</b> :	
1	[Power on]
2	[Output A source active]
3	[Output A source lost]



COMMAND	
Description and Parameters	
<b>set automation event N1 uart A wait N2</b> ↵	
Set the length of time to wait after an Automation Event's RS-232 response has been activated before ANY other Automation Event can be detected.	
Available values for <b>N1</b> :	
1	[Power on]
2	[Output A source active]
3	[Output A source lost]
<b>N2</b> = 0~240	[Wait time in seconds]
<b>get automation event N1 uart A wait</b> ↵	
Show the wait time for the specified Automation Event's RS-232 response.	
Available values for <b>N1</b> :	
1	[Power on]
2	[Output A source active]
3	[Output A source lost]
<b>set automation event N1 cec A N2</b> ↵	
Enable or disable the specified Automation Event's CEC response.	
Available values for <b>N1</b> :	
1	[Power on]
2	[Output A source active]
3	[Output A source lost]
Available values for <b>N2</b> :	
ON	[Event CEC response enabled]
OFF	[Event CEC response disabled]

COMMAND	
Description and Parameters	
<b>get automation event N1 cec A</b> ↵	
Show the current state of the specified Automation Event's CEC response.	
Available values for <b>N1</b> :	
1	[Power on]
2	[Output A source active]
3	[Output A source lost]
<b>set automation event N1 cec A command N2</b> ↵	
Set the CEC command to send when the specified Automation Event is activated.	
Available values for <b>N1</b> :	
1	[Power on]
2	[Output A source active]
3	[Output A source lost]
<b>N2</b> = {CEC data}	[Comma delimited hex pairs]
<b>get automation event N1 cec A command</b> ↵	
Show the CEC command to be sent when the specified Automation Event is activated.	
Available values for <b>N1</b> :	
1	[Power on]
2	[Output A source active]
3	[Output A source lost]

COMMAND	
Description and Parameters	
<b>set automation event N1 cec A delay N2↵</b>	
Set the delay time that the specified Automation Event must continue to be true before sending the defined CEC command.	
Available values for <b>N1</b> :	
1	[Power on]
2	[Output A source active]
3	[Output A source lost]
<b>N2</b> = 0~240	[Delay in seconds]
<b>get automation event N1 cec A delay↵</b>	
Show the delay time for the specified Automation Event's CEC response.	
Available values for <b>N1</b> :	
1	[Power on]
2	[Output A source active]
3	[Output A source lost]
<b>set automation event N1 cec A wait N2↵</b>	
Set the length of time to wait after an Automation Event's CEC response has been activated before ANY other Automation Event can be detected.	
Available values for <b>N1</b> :	
1	[Power on]
2	[Output A source active]
3	[Output A source lost]
<b>N2</b> = 0~240	[Wait time in seconds]

COMMAND	
Description and Parameters	
<b>get automation event N1 cec A wait</b> ←	
Show the wait time for the specified Automation Event's CEC response.	
Available values for <b>N1</b> :	
1	[Power on]
2	[Output A source active]
3	[Output A source lost]
<b>set out A mask N1</b> ←	
Enable or disable the A/V mask setting on the HDBaseT output.	
Available values for <b>N1</b> :	
ON	[Mute A/V]
OFF	[Unmute A/V]
<b>get out A mask</b> ←	
Display the current A/V mask setting for the HDBaseT output.	
<b>set freerun A mode N1</b> ←	
Enable or disable freerun mode on the HDBaseT output.	
Available values for <b>N1</b> :	
ON	[Enable]
OFF	[Disable]
<b>get freerun A mode</b> ←	
Show the current state of the freerun mode on the HDBaseT output.	

COMMAND	
Description and Parameters	
<b>set freerun A type N1</b> ↵	
Set the freerun type to use when freerun is active on the HDBaseT output.	
Available values for <b>N1</b> :	
1	[Black]
2	[White]
3	[Red]
4	[Green]
5	[Blue]
6	[Magenta]
7	[Yellow]
8	[Cyan]
9	[Gray]
10	[Colour Bar]
<b>get freerun A type</b> ↵	
Show the current freerun type used when freerun is active on the HDBaseT output.	
<b>set in N1 hdcp mode N2</b> ↵	
Set the HDCP behavior of the specified input.	
Available values for <b>N1</b> :	
1	[Mini-DP Input]
2	[USB-C input]
3	[HDMI input]
Available values for <b>N2</b> :	
0	[HDCP support disabled]
1	[Refer to source]
2	[Refer to display]

COMMAND	
Description and Parameters	
<b>get in N1 hdcp mode</b> ↵	
Show the current HDCP behavior used by the specified input.	
Available values for <b>N1</b> :	
1	[Mini-DP Input]
2	[USB-C input]
3	[HDMI input]
<b>get in N1 hdcp status</b> ↵	
Show the current HDCP status of the specified input.	
Available values for <b>N1</b> :	
1	[Mini-DP Input]
2	[USB-C input]
3	[HDMI input]
Possible response values:	
0	[No HDCP]
1	[HDCP 1.x]
2	[HDCP 2.2]
<b>get out A hdcp status</b> ↵	
Show the current HDCP status of the HDBaseT output.	
Possible response values:	
0	[No HDCP]
1	[HDCP 1.x]
2	[HDCP 2.2]

## COMMAND

### Description and Parameters

#### **set in N1 edid N2**↵

Set the EDID to use on the specified input.

Available values for **N1**:

1	[Mini-DP Input]
2	[USB-C input]
3	[HDMI input]

Available values for **N2**:

1	[FHD 2CH EDID]
2	[FHD MCH EDID]
3	[UHD 2CH EDID]
4	[UHD MCH EDID]
5	[UHD+ 2CH EDID]
6	[UHD+ MCH EDID]
7	[User EDID 1]
8	[User EDID 2]
9	[User EDID 3]
10	[Sink's EDID]

#### **get in N1 edid**↵

Show the EDID currently being used on the specified input.

Available values for **N1**:

1	[Mini-DP Input]
2	[USB-C input]
3	[HDMI input]

#### **get in edid list**↵

List all available EDID selections.

COMMAND	
Description and Parameters	
<b>set edid N1 name N2</b> ↵	
Set the name for the specified EDID.	
Available values for <b>N1</b> :	
7	[User EDID 1]
8	[User EDID 2]
9	[User EDID 3]
<b>N2</b> = {Name}	[ASCII, 16 characters max]
<i>Note: Only User EDIDs may be renamed.</i>	
<b>get edid N1 name</b> ↵	
Show the name for the specified EDID.	
Available values for <b>N1</b> :	
7	[User EDID 1]
8	[User EDID 2]
9	[User EDID 3]
<b>set user N1 edid data N2</b> ↵	
Upload a new EDID (in hex format) for use as the specified User EDID.	
Available values for <b>N1</b> :	
1	[User EDID 1]
2	[User EDID 2]
3	[User EDID 3]
<b>N2</b> = {EDID data}	[Comma delimited hex pairs]
<b>get user N1 edid data</b> ↵	
Show the current contents of the specified User EDID as hex data.	
Available values for <b>N1</b> :	
1	[User EDID 1]
2	[User EDID 2]
3	[User EDID 3]

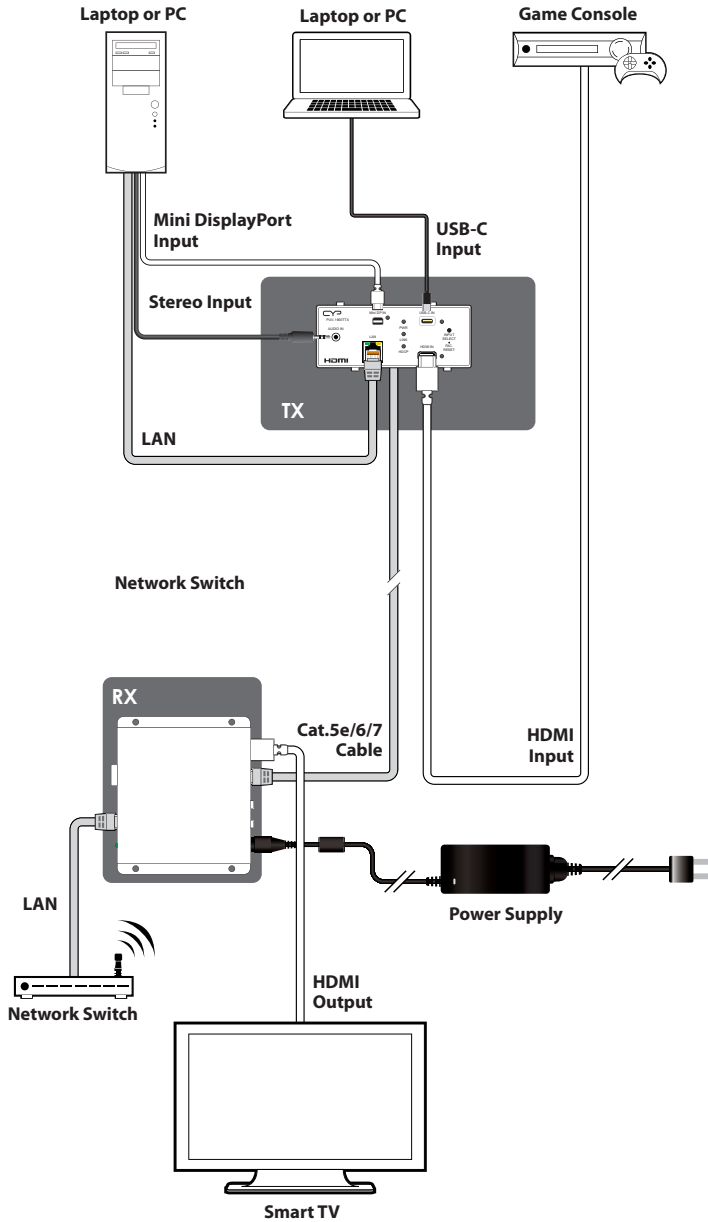


COMMAND																					
Description and Parameters																					
<b>set all in edid mode N1</b> ←																					
<p>Select the EDID management mode to use (All or Appoint) for all inputs.</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>ON</td> <td>[All]</td> </tr> <tr> <td>OFF</td> <td>[Appoint]</td> </tr> </table>		ON	[All]	OFF	[Appoint]																
ON	[All]																				
OFF	[Appoint]																				
<b>get all in edid mode</b> ←																					
<p>Show the current EDID management mode used by all inputs.</p>																					
<b>set all in edid N1</b> ←																					
<p>Set the EDID to use when the “All” EDID mode is active.</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>1</td> <td>[FHD 2CH EDID]</td> </tr> <tr> <td>2</td> <td>[FHD MCH EDID]</td> </tr> <tr> <td>3</td> <td>[UHD 2CH EDID]</td> </tr> <tr> <td>4</td> <td>[UHD MCH EDID]</td> </tr> <tr> <td>5</td> <td>[UHD+ 2CH EDID]</td> </tr> <tr> <td>6</td> <td>[UHD+ MCH EDID]</td> </tr> <tr> <td>7</td> <td>[User EDID 1]</td> </tr> <tr> <td>8</td> <td>[User EDID 2]</td> </tr> <tr> <td>9</td> <td>[User EDID 3]</td> </tr> <tr> <td>10</td> <td>[Sink’s EDID]</td> </tr> </table>		1	[FHD 2CH EDID]	2	[FHD MCH EDID]	3	[UHD 2CH EDID]	4	[UHD MCH EDID]	5	[UHD+ 2CH EDID]	6	[UHD+ MCH EDID]	7	[User EDID 1]	8	[User EDID 2]	9	[User EDID 3]	10	[Sink’s EDID]
1	[FHD 2CH EDID]																				
2	[FHD MCH EDID]																				
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9	[User EDID 3]																				
10	[Sink’s EDID]																				
<b>get all in edid</b> ←																					
<p>Show the current EDID used by the “All” EDID mode.</p>																					
<b>set audio out A route N1</b> ←																					
<p>Set the audio source for the HDBaseT output.</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>1</td> <td>[Audio bypass]</td> </tr> <tr> <td>2</td> <td>[External audio]</td> </tr> </table>		1	[Audio bypass]	2	[External audio]																
1	[Audio bypass]																				
2	[External audio]																				

COMMAND
Description and Parameters
<b>get audio out A route</b> ↵ Show the current audio source for the HDBaseT output.

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

## 7. CONNECTION DIAGRAM



## 8. SPECIFICATIONS

### 8.1 Technical Specifications

<b>HDMI Bandwidth</b>	18Gbps
<b>DisplayPort Bandwidth</b>	21.6Gbps
<b>USB-C Bandwidth</b>	21.6Gbps
<b>HDBaseT Bandwidth</b>	10.2Gbps
<b>Input Ports</b>	1×HDMI (Type-A) 1×DisplayPort (mDP) 1×USB (Type-C) 1×Stereo Audio (3.5mm)
<b>Output Port</b>	1×HDBaseT (RJ-45)
<b>Control/Pass-through Port</b>	1×LAN (RJ-45)
<b>Service Port (Hidden)</b>	1×USB 2.0 (Type-A)
<b>Power Supply</b>	PoH (from Rx)
<b>ESD Protection (HBM)</b>	±8kV (Air Discharge) ±4kV (Contact Discharge)
<b>Dimensions (W×H×D)</b>	170mm×75mm×77mm [Case Only] 170mm×75mm×77mm [All Inclusive]
<b>Weight</b>	400g
<b>Chassis Material</b>	Metal (Aluminum) & Plastic
<b>Chassis Colour</b>	Black/Silver
<b>Operating Temperature</b>	0°C – 40°C/32°F – 104°F
<b>Storage Temperature</b>	-20°C – 60°C/-4°F – 140°F
<b>Relative Humidity</b>	20 – 90% RH (Non-condensing)
<b>Power Consumption</b>	13.97W

## 8.2 Video Specifications

Supported Resolutions (Hz)	Input			Out-put
	HDMI	mDP	USB-C	HDBT
<b>720×400p@70/85</b>	✓	✓	✓	✓
<b>640×480p@60/72/75/85</b>	✓	✓	✗	✓
<b>720×480i@60</b>	✓	✗	✗	✓
<b>720×480p@60</b>	✓	✓	✓	✓
<b>720×576i@50</b>	✓	✗	✗	✓
<b>720×576p@50</b>	✓	✓	✓	✓
<b>800×600p@56/60/72/75/85</b>	✓	✓	✓	✓
<b>848×480p@60</b>	✓	✗	✗	✓
<b>1024×768p@60/70/75/85</b>	✓	✓	✓	✓
<b>1152×864p@75</b>	✓	✓	✓	✓
<b>1280×720p@50/60</b>	✓	✓	✓	✓
<b>1280×768p@60/75/85</b>	✓	✓	✓	✓
<b>1280×800p@60/75/85</b>	✓	✓	✓	✓
<b>1280×960p@60/85</b>	✓	✓	✓	✓
<b>1280×1024p@60/75/85</b>	✓	✓	✓	✓
<b>1360×768p@60</b>	✓	✓	✓	✓
<b>1366×768p@60</b>	✓	✓	✓	✓
<b>1400×1050p@60</b>	✓	✗	✗	✓
<b>1440×900p@60/75</b>	✓	✓	✓	✓
<b>1600×900p@60RB</b>	✓	✓	✓	✓
<b>1600×1200p@60</b>	✓	✗	✗	✓
<b>1680×1050p@60</b>	✓	✓	✓	✓
<b>1920×1080i@50/60</b>	✓	✓	✓	✓

Supported Resolutions (Hz)	Input			Out-put
	HDMI	mDP	USB-C	HDBT
<b>1920×1080p@24/25/30</b>	✓	✓	✓	✓
<b>1920×1080p@50/60</b>	✓	✓	✓	✓
<b>1920×1200p@60RB</b>	✓	✗	✗	✓
<b>2560×1440p@60RB</b>	✓	✗	✗	✓
<b>2560×1600p@60RB</b>	✓	✗	✗	✓
<b>2048×1080p@24/25/30</b>	✓	✗	✗	✗
<b>2048×1080p@50/60</b>	✓	✗	✗	✓
<b>3840×2160p@24/25/30</b>	✓	✓	✓	✓
<b>3840×2160p@50/60 (4:2:0)</b>	✓	✓	✓	✓
<b>3840×2160p@24, HDR10</b>	✗	✗	✗	✗
<b>3840×2160p@50/60 (4:2:0),HDR10</b>	✗	✗	✗	✗
<b>3840×2160p@50/60</b>	✓	✓	✓	✗
<b>4096×2160p@24/25/30</b>	✓	✓	✓	✓
<b>4096×2160p@50/60 (4:2:0)</b>	✓	✓	✓	✓
<b>4096×2160p@24, HDR10</b>	✗	✗	✗	✗
<b>4096×2160p@50/60 (4:2:0),HDR10</b>	✗	✗	✗	✗
<b>4096×2160p@50/60</b>	✓	✓	✓	✗

## 8.3 Audio Specifications

### 8.3.1 Digital Audio

HDMI/DisplayPort/USB-C Inputs	
LPCM	
<b>Max Channels</b>	8 Channels
<b>Sampling Rate (kHz)</b>	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
<b>Supported Formats</b>	Standard & High-Definition

HDBaseT Output	
LPCM	
<b>Max Channels</b>	2 Channels
<b>Sampling Rate (kHz)</b>	48
Bitstream	
<b>Supported Formats</b>	None

### 8.3.2 Analogue Audio

Analogue Input	
<b>Max Audio Level</b>	2Vrms
<b>Impedance</b>	10kΩ
<b>Type</b>	Unbalanced

## 8.4 Cable Specifications

Cable Length	1080p		4K30	4K60
	8-bit	12-bit	(4:4:4) 8-bit	(4:4:4) 8-bit
<b>High Speed HDMI Cable</b>				
<b>HDMI Input</b>	15m	10m	5m	5m
<b>DisplayPort Cable</b>				
<b>DisplayPort Input</b>	2m			
<b>USB-C Cable</b>				
<b>USB-C Input</b>	2m			
<b>Ethernet Cable</b>				
<b>Cat.5e/6</b>	100m		90m	×
<b>Cat.6A/7</b>	100m		100m	×

### 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 (4K UHD Video)

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

#### 4K60 (4K UHD<sup>+</sup> Video)

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



## 8.5 HDBaseT Features

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

## 9. ACRONYMS

ACRONYM	COMPLETE TERM
<b>ADC</b>	Analogue-to-Digital Converter
<b>ASCII</b>	American Standard Code for Information Interchange
<b>Cat.5e</b>	Enhanced Category 5 cable
<b>Cat.6</b>	Category 6 cable
<b>Cat.6A</b>	Augmented Category 6 cable
<b>Cat.7</b>	Category 7 cable
<b>CEC</b>	Consumer Electronics Control
<b>CLI</b>	Command-Line Interface
<b>DHCP</b>	Dynamic Host Configuration Protocol
<b>DP</b>	DisplayPort
<b>DVI</b>	Digital Visual Interface
<b>EDID</b>	Extended Display Identification Data
<b>Gbps</b>	Gigabits per second
<b>GUI</b>	Graphical User Interface
<b>HDBT</b>	HDBaseT
<b>HDCP</b>	High-bandwidth Digital Content Protection
<b>HDMI</b>	High-Definition Multimedia Interface
<b>HDR</b>	High Dynamic Range
<b>IP</b>	Internet Protocol
<b>IR</b>	Infrared
<b>LAN</b>	Local Area Network
<b>LED</b>	Light-Emitting Diode
<b>LPCM</b>	Linear Pulse-Code Modulation
<b>MAC</b>	Media Access Control

<b>ACRONYM</b>	<b>COMPLETE TERM</b>
<b>MHz</b>	Megahertz
<b>PD</b>	Powered Device
<b>PoH</b>	Power over HDBaseT
<b>PSE</b>	Power Sourcing Equipment
<b>TCP</b>	Transmission Control Protocol
<b>TMDS</b>	Transition-Minimised Differential Signaling
<b>4K UHD</b>	4K Ultra-High-Definition (10.2Gbps max)
<b>4K UHD+</b>	4K Ultra-High-Definition (18Gbps max)
<b>USB</b>	Universal Serial Bus
<b>VGA</b>	Video Graphics Array
<b>WUXGA (RB)</b>	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
<b>XGA</b>	Extended Graphics Array
<b>Ω</b>	Ohm



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