CDPS-P313RTX

4×1 Multi-input to HDBT Live Video Streaming Transmitter with Recording

Operation Manual

HIGH-DEFINITION MULTIMEDIA INTERFACE

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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	2020/02/04	Preliminary release

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1. INTRODUCTION

This Video Streaming Transmitter with Recording makes online broadcasting of live video, with a locally stored archive, an easy and simple process. Video sources from cameras, PCs, video game consoles, etc. are a breeze to connect for immediate broadcast and recording. Video content up to 4K UHD (4K@60Hz, 4:2:0, 8-bit) is supported and is automatically scaled to a resolution that is more appropriate for efficient streaming. In addition to the standard HDMI input, DisplayPort, USB-C and VGA (with paired audio) inputs are also supported as sources. Along with the streaming and recording functionality, an HDBaseT output is provided for local, or long distance (up to 70m at 1080p when using Cat.6A), monitoring of the selected input source when connected to a compatible receiver.

All video content is encoded and streamed with minimal latency and high quality making it ideal for live streaming events to a variety of popular online streaming services or within the local network. The video may also be recorded locally (via USB thumb drive) or to a local network drive while it is being streamed.

A trigger input interface is also provided to allow the easy addition of a remote control keypad, or other trigger-supporting products, which can be installed within a podium or within a table in a conference room or classroom. This interface can allow the user to activate functions with the simple press of a button.

Comprehensive EDID management provides improved compatibility with different sink devices. The intuitive WebGUI provides easy control of your live event stream including source selection, resolution, bitrate and more. This unit can be controlled and configured via front panel buttons, an intuitive WebGUI, Triggers, RS-232, or Telnet.

2. APPLICATIONS

- Webcasting
- Social Media Broadcasting
- Live Event Streaming
- Video on Demand Streaming
- Live recording and storage

3. PACKAGE CONTENTS

- 1× 4×1 Multi-input to HDBT Live Video Streaming Transmitter with Recording
- 1× 24V/3.75A DC Power Adapter
- 1× AC Power Cord
- 2× 5-pin Terminal Block
- 2× 4-pin Terminal Block
- 1× IR Blaster Cable
- 1× IR Extender Cable
- 1× Operation Manual

4. SYSTEM REQUIREMENTS

- HDMI, VGA, DisplayPort or USB-C source equipment such as a media player, video game console, PC, or video camera.
- Available streaming server destination such as YouTube or Facebook or a recording storage target such as USB thumb drive or NAS.
- A compatible HDBaseT receiver with PoH(PD) support is recommended.
- The use of Premium High Speed HDMI cables, and industry standard Cat.6, Cat.6A or Cat.7, is highly recommended.
- Video streaming preview support within the WebGUI requires the use of the Chrome, Internet Explorer or Safari browser with the appropriate plugins (VLC for IE and Safari or VXG Player for Chrome) installed.

  Note: The Firefox browser does not currently support the WebGUI's video streaming preview window.
- To view RTSP streams directly on the local network, RTSP stream compatible video player software (such as VLC Media Player or PotPlayer) must be used.

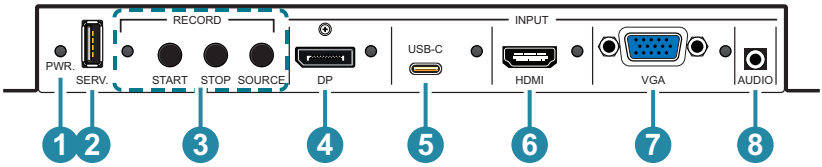
5. FEATURES

- 4 inputs (HDMI, DisplayPort, USB-C, and VGA)
- 1 HDBaseT output
- Digital inputs are HDCP 1.x and HDCP 2.2 compliant

  Note: HDCP encrypted sources cannot be streamed over the Internet or recorded and will be blacked out
- HDMI, DisplayPort, and USB-C inputs support resolutions up to 4K UHD (4K@60Hz, 4:2:0, 8-bit)
- VGA input supports resolutions up to 1080p@60Hz and is paired with an analog stereo audio input
- HDBaseT output supports resolutions up to 4K UHD (4K@60Hz, 4:2:0, 8-bit)
- Advanced H.264 video streaming and recording is provided at QVGA (320×240), VGA (640×480), 720p, or 1080p at up to 60fps
- Recorded video can be stored on a locally inserted USB thumb drive, or to a designated network drive
- Can act as a streaming server (using RTP/RTSP protocols) or streaming client (using the RTMP protocol)
- Trigger Control Keypad support for easy, single-button, function activation (Optional)
- Supports scheduled recording with an internet updated calendar
- Supports text overlays over live broadcasts
- Integrated downscaling function will convert UHD video content (up to 4K@60Hz) down to 1080p or lower for live video broadcast and recording
- Generates 4 simultaneous streams from the same video source (1080p@60fps, 1080p@30fps, VGA@30fps, QVGA@30fps) for easy system integration at multiple bandwidth targets
- Supports automatic input switching
- Advanced EDID management including Internal , External & User configured EDID selections
- Control via front panel buttons, WebGUI, Triggers, Telnet, and RS-232

6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel



1. **PWR. LED:** This LED will illuminate to indicate the unit is on and receiving power.
2. **SERV. Port:** Attach a standard USB thumb drive or external hard drive for storage of recorded video. (Optional)

   *Note: Storage media must be formatted as FAT32 or exFAT. Video files are stored in *.mp4 format.*
3. **RECORD LED:** This LED will blink while video recording is active.

   RECORD START Button: Press this button to immediately start recording to the designated recording target.

   RECORD STOP Button: Press this button to immediately stop any current recording session.

   RECORD SOURCE Button: Press this button to sequentially switch through the available inputs.

   Note: Changing the input source will cause the video stream to restart. Connected stream targets may need to be restarted or reconnected.
4. **DP INPUT Port & LED:** Connect to DisplayPort source equipment such as a PC or laptop. The LED will illuminate amber when a source is detected and green when the source is selected.
5. **USB-C INPUT Port & LED:** Connect to USB Type-C video source equipment such as a PC or laptop. The LED will illuminate amber when a source is detected and green when the source is selected.

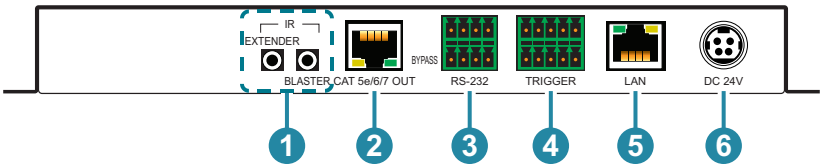
   Note: Not all devices with USB Type-C ports can support video output. Please verify that the device supports video output from the USB Type-C port before connecting it.
6. **HDMI INPUT Port & LED:** Connect to HDMI source equipment such as a media player, game console, or set-top box. The LED will illuminate amber when a source is detected and green when the source is selected.

7 **VGA INPUT Port & LED:** Connect to VGA source equipment such as a PC or laptop. The LED will illuminate amber when a source is detected and green when the source is selected.

8 **AUDIO INPUT Port:** Connect to the stereo analog output of the device connected to the VGA input port.

Note: Audio from this port is embedded with the VGA video source.

6.2 Rear Panel



1. **IR EXTENDER Port:** Connect to an IR Extender to receive IR control signals and extend them to devices connected to the other end of the HDBaseT connection. Ensure that the remote being used is within direct line-of-sight of the IR Extender.

   IR BLASTER Port: Connect to an 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.

2. **CAT.5e/6/7 OUT Port:** Connect to a compatible HDBaseT Receiver with a single Cat.5e/6/7 cable for transmission of all data signals. PoH will also be supplied to a connected compatible PD Receiver.

3. **RS-232 4-pin Terminal Block (Top):** Connect directly to a PC or laptop, or other serial control device with a 3 or 4-pin adapter cable (as appropriate) to send RS-232 commands to control the unit.

   RS-232 BYPASS 4-pin Terminal Block (Bottom): Connect to a PC, laptop, or serial controllable device with a 3-pin adapter cable for the extension of RS-232 signals between both ends of the HDBaseT connection.

4. **TRIGGER 10-pin Terminal Block:** Connect to the Trigger Control Keypad (OPTIONAL) or any device with trigger switch functionality to control assigned functions of the unit.

   Note: A minimum of 5V DC is required to activate a trigger.

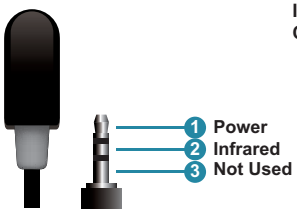
5. **LAN Port:** Connect to a network switch or router for transmission and distribution of streamed video as well as to control the unit via Telnet or WebGUI.

   Note: The maximum number of simultaneous stream connections is limited by available network bandwidth and the unit's CPU load.

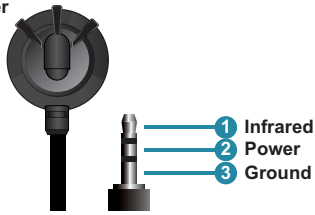
6. **DC 24V Port:** Plug the 24V DC power adapter into this port and connect it to an AC wall outlet for power.

6.3 IR Cable Pinouts

IR Blaster Cable



IR Extender Cable

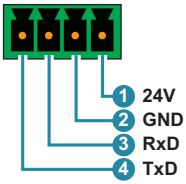


6.4 RS-232 Pinout and Defaults

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

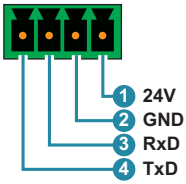
RS-232 Port 1 (Unit Control)

4-pin Terminal Block



RS-232 Port 2 (Bypass)

4-pin Terminal Block



6.5 WebGUI Control

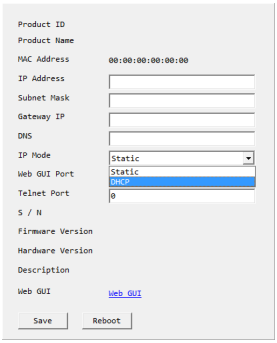
- **Device Discovery**

Please obtain the “Device Discovery” software from your authorized 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 Network” and a list of devices connected to the local network will show up indicating their current IP address.

Note: The unit’s default IP address is 192.168.1.50.

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

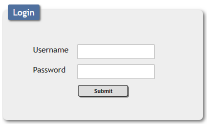


1) **IP Mode:** If you choose, you can alter the static IP network settings for the device, or switch the unit into DHCP mode to automatically obtain proper network settings from a local DHCP server. To switch to DHCP mode, please select DHCP from the IP mode drop-down, then click “Save” followed by “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.

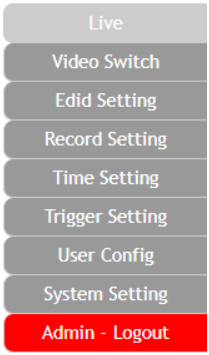
- **WebGUI Overview**

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".



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.

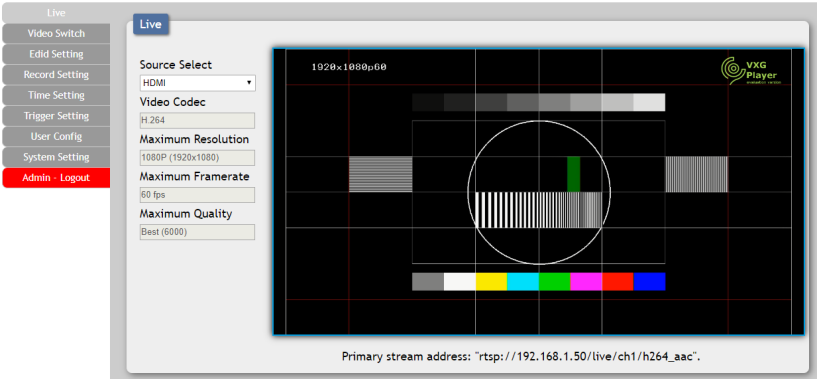


Clicking the red "Logout" tab will automatically log the currently connected user out of the WebGUI and return to login page.

6.5.1 Live Tab

This tab provides viewing access to the first local video stream channel (of 4 channels total) generated by the unit. The video source can be selected here and the stream resolution, framerate and bitrate is also displayed. At the bottom of the page, a connection address for local video stream channel 1 is displayed in the format: “rtsp://xxx.xxx.xxx.xxx/live/ch1/h264_aac” (xxx.xxx.xxx.xxx = the unit’s current IP address). When 3rd party video player software with RTSP streaming support is used to view streams from this unit, this is the URL that should be used to connect. To view streaming channels 2~4, change “ch1” in the address to “ch2”, “ch3”, or “ch4”, as appropriate.

Note: The Channel 1 configuration is set on the “Record Setting” tab. Channels 2~4 contain the same video content presented at different streaming resolutions. Channel 2 is 1920x1080@30fps, Channel 3 is 640x480@30fps, and Channel 4 is 320x240@30fps.



1) **Source Select:** Select the video input (DisplayPort, USB-C, HDMI or VGA) to stream.

   Note: Changing the input here will change it globally across the unit.

2) **Video Codec:** Indicates the video codec used for the video stream.

   Note: Currently, only H.264 is supported.

3) **Maximum Resolution:** Displays the current maximum resolution for streaming channel 1.

4) **Maximum Framerate:** Displays the current maximum framerate for streaming channel 1.

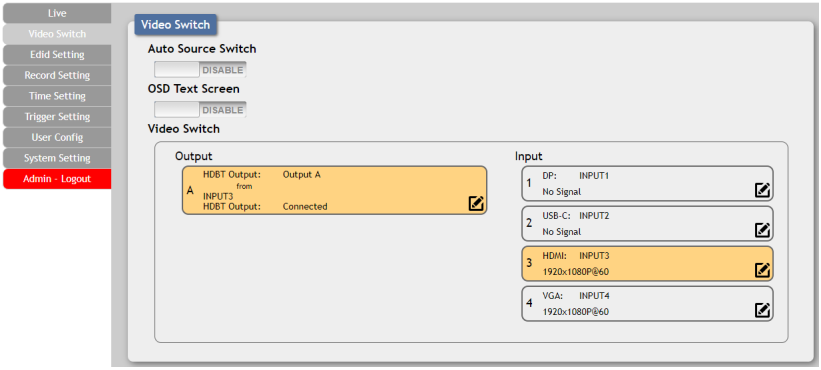
5) **Maximum Quality:** Displays the current maximum bitrate for streaming channel 1.

6) **Video Window:** This video window displays the content of streaming channel 1 and provides the details of a direct connection address that can be used to connect to this stream using 3rd party video player software such as VLC or PotPlayer.

Note: Video streaming preview support within the WebGUI requires the use of the Chrome, Internet Explorer or Safari browser with the appropriate plugins (VLC for IE and Safari or VXG Player for Chrome) installed.

6.5.2 Video Switch Tab

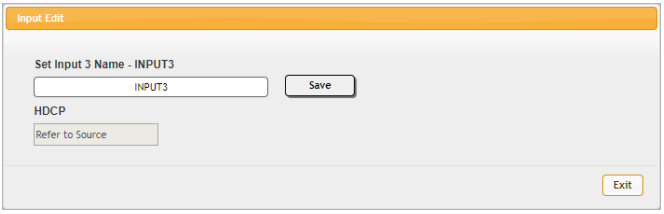
This tab provides input routing control as well as control over input and output names, and OSD Text settings.



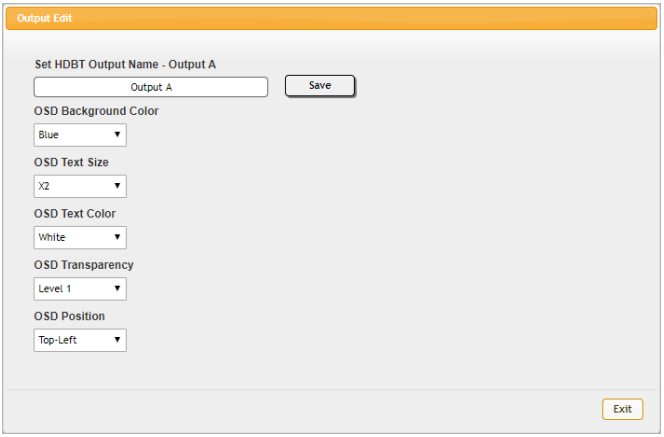
1) **Auto Source Switch:** Enable or disable the automatic input switching feature of this unit. When enabled, the unit will automatically switch to the most recently connected/detected input. If the current input's signal is lost, the unit will automatically switch to the other input.
2) **OSD Text Screen:** The OSD Text Screen can be used when the user wants to display a simple text message on screen while the video plays. It may be enabled or disabled here.

   Note: The text that will be displayed is the current output name text.
3) **Video Switch:** To assign a new video route, please click the output button and then click on the button of the preferred input port to route. As you select each button they will change their color to orange. The new route will become active immediately and the routing information displayed on the buttons will change accordingly.

- **Output:** Click on this button to begin routing selection as detailed above. Click the Edit icon (🖉) to open the Output Edit window and modify additional output settings.
- **Input:** Rename the input or view the current HDCP behavior (Digital inputs only) by clicking on the Edit icon (🖉) to open the editing window. Click on “Save” to confirm and activate any changes made to a name.



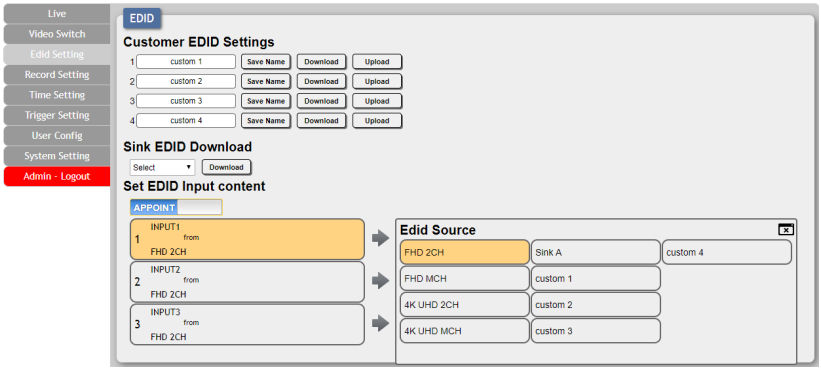
4) **Output Edit:** This window is opened after clicking on the Edit icon (🖉) within the output button and provides options to rename the output, and configure the settings for the OSD Text Screen. Click on “Save” to confirm and activate any changes made to the name. All other changes are immediate.



6.5.3 EDID Setting Tab

This tab provides the option of four standard EDIDs, one sink sourced EDID and four customer uploaded EDIDs that can be assigned to the digital input ports. The names of the four customer uploaded EDIDs can changed if desired.

Note: The EDID used by the VGA port is fixed, and cannot be changed.



1) **Customer EDID Settings**
   - **Save Name:** To change the name of a custom EDID, type the new name in the space provided, then click on the “Save Name” button.
   - **Download:** To save an existing custom EDID to your local PC please press the “Download” button next to the EDID you would like to save. 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.
   - **Upload:** To upload a custom EDID, please click the “Upload” button next to the Customer EDID Settings item you would like to change. 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.
2) **Sink EDID Download:** To save the EDID from the connected HDBaseT 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 to the default download location on your PC.

3) **Set EDID Input Content:** Click on the switch select how to assign EDIDs to the unit's inputs (Appoint/All). Selecting "Appoint" allows for a different EDID to be assigned to each input, selecting "All" allows for a single EDID to be assigned to all inputs. After making the mode selection, click on the input button to open the EDID Source selection window. Select the new EDID source to use, from the choices on the right, and the change will occur immediately.

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

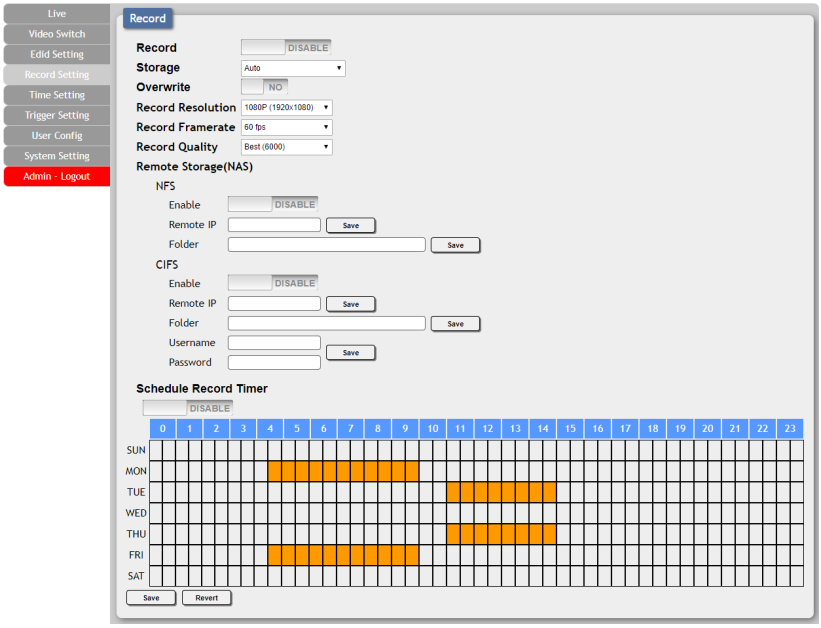
This unit provides the following 4 default EDIDs:

Unit's Default EDIDs	
FHD 2CH	1920×1080p@60Hz (4.95Gbps) & 8-bit color, LPCM 2.0
FHD MCH	1920×1080p@60Hz (4.95Gbps) & 8-bit color, LPCM 7.1 & Bitstream
4K UHD 2CH	3840×2160p@30Hz (10.2Gbps) & Deep Color (8/10/12-bit), LPCM 2.0
4K UHD MCH	3840×2160p@30Hz (10.2Gbps) & Deep Color (8/10/12-bit), 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 4 default EDIDs for maximum compatibility.

6.5.4 Record Setting Tab

This tab provides access to the settings and controls for configuring the channel 1 stream (the same stream viewed on the “Live” tab) and making a recording of it to a local or network storage location. When recording is enabled, the channel 1 video stream is saved as a *.mp4 file, encoded with the H.264 codec, to one of three possible target destinations: USB storage, network storage using NFS, or network storage using CIFS. The file will be placed within an automatically named folder structure based on the current date and time of the recording to facilitate easy sorting and file management. It is also possible to set up automatic daily recording times based on a repeating weekly schedule structure.



1) **Record:** Enable or disable recording the channel 1 video stream. When enabled, recording will begin immediately to the selected storage location.

   Note: HDCP encrypted sources cannot be recorded.

2) **Storage:** Use the drop-down to select the storage target to use when recording. Available choices are: Auto, USB (USB storage), NFS (NFS based network storage), and CIFS (CIFS based network storage). Selecting “Auto” will use the first available valid storage location using the following priority order: NFS > CIFS > USB

3) **Overwrite:** Enables or disables the file overwrite function. When enabled, the unit will automatically delete older recordings, when space runs out on the selected storage location, to make room for new recordings.

4) **Record Resolution:** Select the maximum resolution to use for streaming channel 1. Available resolutions are: 1080p(1920x1080), 720p(1280x720), VGA(640x480), or QVGA(320x240).

   Note: The recording resolution will not exceed the original source’s resolution even if a higher maximum is selected.

5) **Record Framerate:** Select the framerate to use for streaming channel 1. Available framerates are: 25, 30, 50, or 60 frames per second.

6) **Record Quality:** Select the target bitrate for streaming channel 1. Available bitrates are: Best (6000Kbps), High (3000Kbps), or Normal (2000Kbps).

7) **Remote Storage (NAS) NFS:** This section provides a way to configure access to a NAS (Network Attached Storage) device using the NFS protocol.

   - **Enable:** Enable or disable access to the defined NFS based network storage server.
   - **Remote IP:** Enter the IP address of the target NFS based NAS device. After entering the information, press the “Save” button.
   - **Folder:** Enter a valid share name on the target server. The share name cannot contain spaces or special characters. This is where the recording folder structure and video files will be created. After entering the information, press the “Save” button.

     Note: The target folder on the NFS server must, at a minimum, provide anonymous read, write and delete permissions.

8) **Remote Storage (NAS) CIFS:** This section provides a way to configure access to a NAS (Network Attached Storage) device using the CIFS protocol.

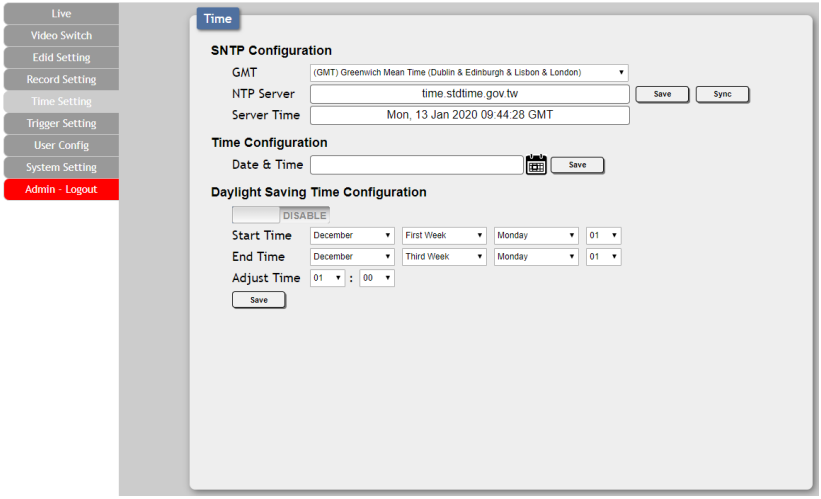
   - **Enable:** Enable or disable access to the defined CIFS based network storage server.
   - **Remote IP:** Enter the IP address of the target CIFS based NAS device. After entering the information, press the “Save” button.
   - **Folder:** Enter a valid share name on the target server. The share name cannot contain spaces or special characters. This is where the recording folder structure and video files will be created. After entering the information, press the “Save” button.

     Note: The target folder on the CIFS server must, at a minimum, provide read, write and delete permissions for the designated user.
   - **Username/Password:** Enter the user name and password required for access to the specified server. After entering both items, press the “Save” button.

9) **Schedule Record Timer:** Enable or disable the scheduled time recording function. Each hour of each day is divided into two half-hour blocks. Currently selected recording times are indicated by orange blocks. Gray blocks indicate that no recording is currently scheduled. Blocks may be activated or deactivated by clicking on them. To easily select multiple blocks, you may click and drag across the preferred range. After setting the preferred recording blocks, press the “Save” button. To undo changes and return to the previous schedule configuration, press the “Revert” button.

6.5.5 Time Setting Tab

The Time Settings tab provides a way to set the system's time, date, and time zone. The system time can be set manually, or automatically using a defined SNTP server. If your country uses DST (Daylight Saving Time) you can enable or disable it here and configure the start and end times/dates so that your scheduled events will always occur at the correct times throughout the year.



1) SNTP Configuration

- **GMT:** Select the preferred time zone from the options in the dropdown.
- **NTP Server:** Enter the address of the network time server to use for automatic time and date configuration. Click the "Save" button to set and store the address in the unit. Click the "Sync" button to force synchronization of the unit's time and date with the defined server.

  Note: Time synchronization occurs automatically when the unit is first powered on, and every 24 hours afterwards, if an NTP server has already been defined. Synchronization requires a live connection to the internet.
- **Server Time:** Shows the unit's current time and date.

2) **Time Configuration**

- **Date & Time:** The unit's time and date can be manually configured here if an internet connection, or NTP server is not available. Click on the calendar icon () to open the time and date configuration screen and select the preferred values. After entering a new time and date, click the "Save" button to store it in the unit and start the clock running.

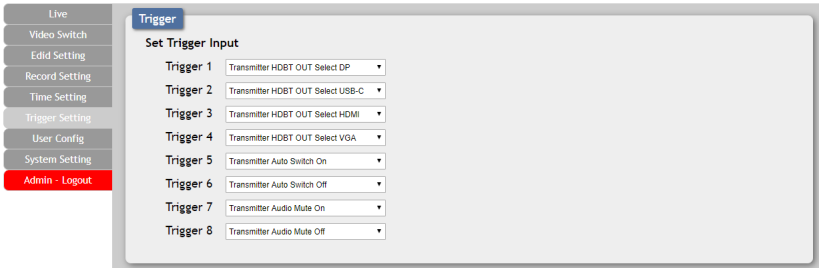
3) **Daylight Saving Time Configuration:** Enable or disable the use of DST adjustments for the unit's time.

Note: Enabling Daylight Saving Time while outside the configured DST range will result in no change to the current time.

- **Start Time:** Set the month, week, day and time for the start of DST in the current time zone.
- **End Time:** Set the month, week, day and time for the end of DST in the current time zone.
- **Adjust Time:** Set the amount of time to add when DST is active.

6.5.6 Trigger Setting Tab

This tab allows user to define the action taken when any of the 8 trigger pins within the Trigger Terminal Block are activated.

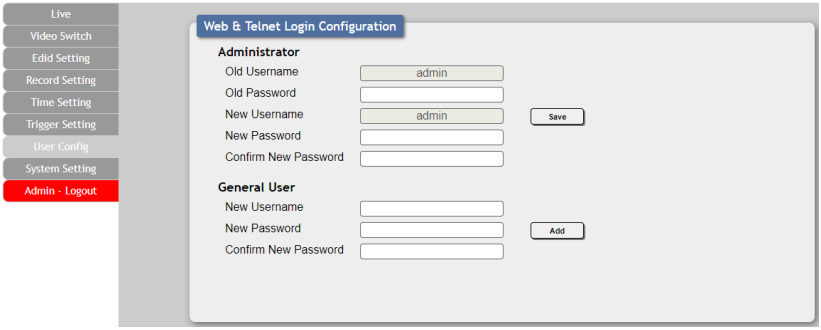


1) **Set Trigger Input:** Use the dropdown next to each Trigger (1~8) to assign an action to perform when that trigger is activated.

AVAILABLE TRIGGER ACTIONS
Transmitter HDBT OUT Select DP
Transmitter HDBT OUT Select USB-C
Transmitter HDBT OUT Select HDMI
Transmitter HDBT OUT Select VGA
Transmitter Auto Switch On
Transmitter Auto Switch Off
Transmitter Audio Mute On
Transmitter Audio Mute Off
Transmitter Video Mute On
Transmitter Video Mute Off
Transmitter Record Start
Transmitter Record Stop
Transmitter Follow Output EDID

6.5.7 User Config Tab

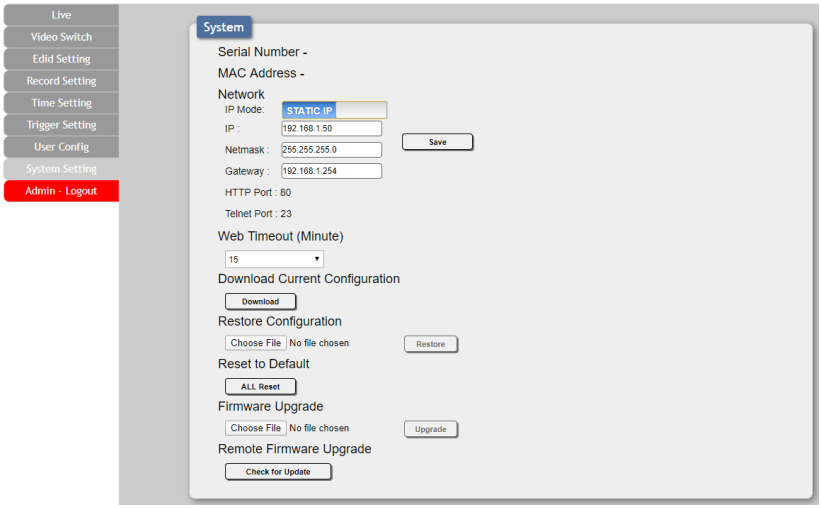
The WebGUI and Telnet username/password are set on this page. Two management levels are available: “Administrator” and “General User”. The administrator username (“admin”) cannot be changed.



The “Administrator” user has access to all tabs and can change all settings. The “General User” only has access to the “Live” tab to allow easy remote video stream viewing.

6.5.8 System Setting Tab

This tab provides system information, network configuration options, system configuration backup/restore/reset, and firmware update functions.



1) **Network:** IP mode may be switched between Static IP or DHCP. In Static IP mode the IP, netmask and gateway addresses may 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: The unit’s default IP address is 192.168.1.50. If the IP address is changed then the IP address required for WebGUI/Telnet access will also change accordingly.

2) **Web Timeout (Minute):** Select the length of time to wait before logging the user out of the WebGUI due to inactivity. Available range is from 1 to 120 minutes, or disabled.

3) **Download Current Configuration:** 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.

4) **Restore Configuration:** 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.

5) **Reset to Default:** Press the “ALL Reset” button to reset the unit to its factory default state. After the reset is complete, the unit will reboot automatically.

6) **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. After the upgrade is complete, the unit will reboot automatically.

7) **Remote Firmware Upgrade:** To update this unit's firmware using our cloud based firmware server, click the “Check for Update” button and it will connect to the cloud server and automatically find the latest official firmware version. You will be told the new firmware version number, and you can then choose whether you wish to update to that version or not. After the upgrade is complete, the unit will reboot automatically.

   Note: The Remote Firmware Upgrade feature requires a live connection to the internet.

6.6 Telnet Control

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

To Access the Command Line Interface (CLI)	
Windows 7	Click **Start**, type “cmd” in the search field, and press **Enter**.
Windows XP	Click **Start** > **Run**, type “cmd”, and press **Enter**.
Mac OS X	Click **Go** > **Applications** > **Utilities** > **Terminal**.

Once in the Command Line Interface (CLI) type “**telnet**” followed by the IP address of the unit (and the port number if it is non-standard) and then hit **“Enter”**. This will connect us to the unit we wish to control.

```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Adminstrator\telnet 192.168.1.50 23
```

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

Note 2: The default IP address is 192.168.1.50.

6.7 Serial and Telnet Commands

COMMAND Description and Parameters
help↵ Show the full command list.
?↵ Show the full command list.
set factory default↵ Reset the unit to the factory defaults.
set factory ipconfig default↵ Reset the unit's network settings to the factory defaults.
set factory out route default↵ Reset the unit's routing to the factory defaults.
set power N1↵ Turn the unit on or place it into stand-by mode. Available values for **N1**: 1 [Power on] 2 [Stand-by mode]
get power↵ Show the unit's current power state.
set system reboot↵ Reboot the unit.
get fw ver↵ Show the unit's current firmware version.
get command ver↵ Show the unit's current command version.
get mac addr↵ Show the unit's MAC address.

COMMAND Description and Parameters
get model name↵ Show the unit's model name.
get model type↵ Show the unit's product type.
get user config↵ List the unit's current configuration information.
get all command index list↵ Show the unit's full console command index list.
set uart 1 reset↵ Reset the unit's RS-232 control port's settings to the factory defaults.
set uart 1 baudrate N1↵ Set the baud rate of the RS-232 control port. Available values for **N1**: 4800 [4800 baud] 9600 [9600 baud] 19200 [19200 baud] 38400 [38400 baud] 57600 [57600 baud] 115200 [115200 baud]
get uart 1 baudrate↵ Show the current baud rate of the RS-232 control port.
get uart list↵ List all available RS-232 ports.
set ip mode N1↵ Set the IP address assignment mode. Available values for **N1**: 0 [Static IP] 1 [DHCP]
get ip mode↵ Show the current IP address assignment mode.

COMMAND Description and Parameters
get ipconfig↵ Show the unit's current IP configuration information
set ip addr N1↵ Set the unit's static IP address. **N1** = X.X.X.X [X = 0~255]
get ip addr↵ Show the unit's current IP address.
set netmask N1↵ Set the unit's static netmask. **N1** = X.X.X.X [X = 0~255]
get netmask↵ Show the unit's current netmask.
set gateway N1↵ Set the unit's static gateway address. **N1** = X.X.X.X [X = 0~255]
get gateway↵ Show the unit's current gateway address.
get telnet maximum user↵ Show the maximum number of users allowed to connect simultaneously via Telnet.
set webgui password N1↵ Set WebGUI administrator password. **N1** = {Password} [16 characters max]
get webgui password↵ Show the current WebGUI administrator password.
get hostname↵ Show the unit's current hostname.

COMMAND Description and Parameters
set webgui login timeout N1↵ Set the WebGUI inactivity timeout value. Available values for **N1**: 0 [No timeout] 1~60 [Timeout in minutes]
get webgui login timeout↵ Show the current WebGUI inactivity timeout value.
set in N1 name N2↵ Set the name of the specified input. Available values for **N1**: 1 [DisplayPort input] 2 [USB-C input] 3 [HDMI input] 4 [VGA input] **N2** = {Name} [8 characters max]
get in N1 name↵ Show the current name of the specified input. Available values for **N1**: 1 [DisplayPort input] 2 [USB-C input] 3 [HDMI input] 4 [VGA input]
get in name list↵ List the names of all inputs on the unit.
set out A name N1↵ Set the name of the output. **N1** = {Name} [8 characters max]
get out A name↵ Show the current name of the output.

COMMAND Description and Parameters
get out name list↵ List the names of all outputs on the unit.
set out auto mode N1↵ Set the auto switching behavior of the unit. Available values for **N1**: 0 [Disabled] 1 [Auto switch]
get out auto mode↵ Show the current auto switching mode of the unit.
get out auto mode list↵ List all available auto mode options.
get in N1 hactive↵ Show the horizontal active pixel value of the specified input's current video source. Available values for **N1**: 1 [DisplayPort input] 2 [USB-C input] 3 [HDMI input] 4 [VGA input]
get in N1 vactive↵ Show the vertical active pixel value of the specified input's current video source. Available values for **N1**: 1 [DisplayPort input] 2 [USB-C input] 3 [HDMI input] 4 [VGA input]

COMMAND Description and Parameters
get in N1 refresh rate↵ Show the refresh rate of the specified input's current video source. Available values for **N1**: 1 [DisplayPort input] 2 [USB-C input] 3 [HDMI input] 4 [VGA input]
get in N1 interlace↵ Show the interlace state of the specified input's current video source. Available values for **N1**: 1 [DisplayPort input] 2 [USB-C input] 3 [HDMI input] 4 [VGA input]
get in N1 sync status↵ Show the current sync state of the specified input. Available values for **N1**: 1 [DisplayPort input] 2 [USB-C input] 3 [HDMI input] 4 [VGA input]
get in N1 timing↵ Show the index number of the current resolution detected on the specified input. Available values for **N1**: 1 [DisplayPort input] 2 [USB-C input] 3 [HDMI input] 4 [VGA input]

COMMAND Description and Parameters
get in N1 uni timing↵ Show the index number of the current resolution detected on the specified input. (Universal index number) Available values for **N1**: 1 [DisplayPort input] 2 [USB-C input] 3 [HDMI input] 4 [VGA input]
get in N1 type list↵ List the port type of all inputs on the unit. Available values for **N1**: 1 [DisplayPort input] 2 [USB-C input] 3 [HDMI input] 4 [VGA input]
get out A type list↵ List the port type of all outputs on the unit.
set out A route N1↵ Select the specified input as the active source. Available values for **N1**: 1 [DisplayPort input] 2 [USB-C input] 3 [HDMI input] 4 [VGA input]
get out A route↵ Show the currently selected input source.
get in port number↵ Show the total number of inputs on the unit.
get out port number↵ Show the total number of outputs on the unit.

COMMAND Description and Parameters
get out A sync status↵ Show the current sync state of the specified output.
get out timing list↵ List all available output resolutions with their local index numbers.
get out uni timing list↵ List all available output resolutions with their universal timing index numbers.
get in N1 hdcp status↵ Show the current HDCP status of the specified input. Available values for **N1**: 1 [DisplayPort input] 2 [USB-C input] 3 [HDMI input]
get out A hdcp status↵ Show the current HDCP status of the specified output.
get out A hdcp ability↵ Show the HDCP compliance level of the display device connected to the specified output.
get in N1 hdcp ability↵ Show the HDCP compliance level of the source connected to the specified input. Available values for **N1**: 1 [DisplayPort input] 2 [USB-C input] 3 [HDMI input]
set out A osd N1↵ Enable or disable the OSD banner. Available values for **N1**: ON [Enabled] OFF [Disabled]

COMMAND Description and Parameters
get out A osd↵ Show the current OSD banner state.
set out A osd banner location N1↵ Set the OSD banner location. Available values for **N1**: 0 [Left top] 1 [Center top] 2 [Right top]
get out A osd banner location↵ Show the current OSD banner location.
set out A banner font size N1↵ Set the font size for the OSD banner. Available values for **N1**: 1 [x1 size] 2 [x2 size] 3 [x4 size]
get out A banner font size↵ Show the current font size for the OSD banner.
set out A banner font color N1↵ Set the color of the font used by the OSD banner. Available values for **N1**: BLACK [Black text] WHITE [White text] RED [Red text] GREEN [Green text] BLUE [Blue text] MAGENTA [Magenta text] YELLOW [Yellow text] CYAN [Cyan text] GRAY [Gray text]
get out A banner font color↵ Show the current color of the font used by the OSD banner.

COMMAND
Description and Parameters
get out banner font color list↵ List all available font colors for the OSD banner.
set out A banner font transparency level N1↵ Set the text transparency level for the OSD banner. **N1** = 1~8 [Transparency level]
get out A banner font transparency level↵ Show the current text transparency level for the OSD banner.
set out A osd background color N1↵ Set the color of the background of the OSD banner. Available values for **N1**: BLACK [Black background] WHITE [White background] RED [Red background] GREEN [Green background] BLUE [Blue background] MAGENTA [Magenta background] YELLOW [Yellow background] CYAN [Cyan background] GRAY [Gray background]
get out A osd background color↵ Show the current color of the background of the OSD banner.
get out osd background color list↵ List all available background colors for the OSD banner.
get sink A edid data↵ Show the EDID from the connected display as hex data.
get in N1 edid data↵ Show the EDID currently used by the specified input as hex data. Available values for **N1**: 1 [DisplayPort input] 2 [USB-C input] 3 [HDMI input]

COMMAND Description and Parameters
get all in edid list↵ List the EDIDs assigned to all inputs.
get internal N1 edid data↵ Show the specified Internal EDID as hex data. Available values for **N1**: 1 [FHD 2CH] 2 [FHD MCH] 3 [4K UHD 2CH] 4 [4K UHD MCH]
set all in edid mode N1↵ Select the EDID management mode to use (All or Appoint) for all inputs. Available values for **N1**: ON [All mode] OFF [Appoint mode]
get all in edid mode↵ Show the current EDID management mode used by all inputs.
set all in edid N1↵ Set the EDID to use when the “All” EDID mode is active. Available values for **N1**: 1 [FHD 2CH] 2 [FHD MCH] 3 [4K UHD 2CH] 4 [4K UHD MCH] 5 [User EDID 1] 6 [User EDID2] 7 [User EDID 3] 8 [User EDID 4] 9 [Sink EDID]
get all in edid↵ Show the current EDID used by the “All” EDID mode.

COMMAND Description and Parameters
get sink A edid info↵ Show English readable details from the EDID of the display connected to the output.
set in N1 edid N2↵ Set the EDID to use on the specified input. Available values for **N1**: 1 [DisplayPort input] 2 [USB-C input] 3 [HDMI input] Available values for **N2**: 1 [FHD 2CH] 2 [FHD MCH] 3 [4K UHD 2CH] 4 [4K UHD MCH] 5 [User EDID 1] 6 [User EDID2] 7 [User EDID 3] 8 [User EDID 4] 9 [Sink EDID]
get in N1 edid↵ Show the EDID currently being used on the specified input. Available values for **N1**: 1 [DisplayPort input] 2 [USB-C input] 3 [HDMI input]
get in edid list↵ List all available EDID selections.

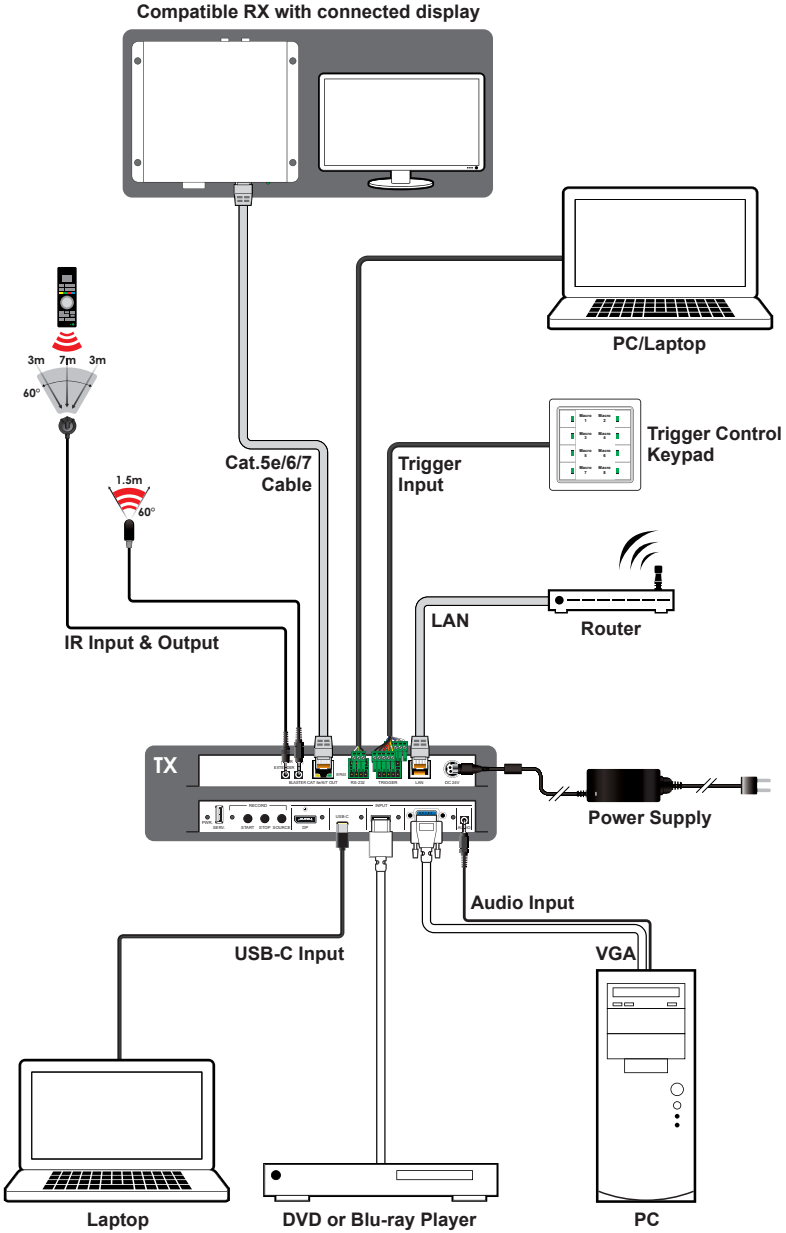
COMMAND
Description and Parameters
set edid N1 name N2↵ Set the name for the specified EDID. Available values for **N1**: 5 [User EDID 1] 6 [User EDID 2] 7 [User EDID 3] 8 [User EDID 4] **N2** = {Name} [16 characters max] *Note: Only User EDIDs may be renamed.*
get edid N1 name↵ Show the current name of the specified EDID. Available values for **N1**: 5 [User EDID 1] 6 [User EDID 2] 7 [User EDID 3] 8 [User EDID 4]
set user N1 edid data N2↵ Upload a new EDID (in hex format) for use as the specified User EDID. Available values for **N1**: 1~4 [User EDID number] **N2** = {EDID data} [Comma delimited hex pairs]
get user N1 edid data↵ Show the current contents of the specified User EDID as hex data. Available values for **N1**: 1~4 [User EDID number]
set record mode N1↵ Start or stop recording video to the designated destination. Available values for **N1**: ON [Start recording] OFF [Stop recording]

COMMAND Description and Parameters
get record mode↵ Show the current recording state.
set record overwrite N1↵ Enable or disable record overwrite support. Available values for **N1**: ON [Enable overwriting] OFF [Disable overwriting]
get record overwrite↵ Show the current state of record overwrite support.
set record media path N1↵ Set the recording target media device. Available values for **N1**: AUTO [Automatic selection] USB [Record to USB] NFS [Record to NFS] CIFS [Record to CIFS]
get record media path↵ Show the currently selected recording target media device.
set schedule record mode N1↵ Enable or disable scheduled recordings. Available values for **N1**: ON [Enable scheduled recordings] OFF [Disable scheduled recordings]
get schedule record mode↵ Show the current state of scheduled recording support.

COMMAND Description and Parameters
set record resolution N1↵ Set the resolution to use when recording (streaming channel 1). Available values for **N1**: 320x240 [QVGA] 640x480 [VGA] 1920x720 [720p] 1920x1080 [1080p]
get record resolution↵ Show the resolution used when recording (streaming channel 1).
set record bitrate N1↵ Set the maximum bitrate (in Kbps) to use when recording (streaming channel 1). **N1** = 1~6000 [Bitrate in Kbps]
get record bitrate↵ Show the current maximum bitrate (in Kbps) used when recording (streaming channel 1).
set record framerate N1↵ Set the frame rate to use when recording (streaming channel 1). **N1** = 1~60 [Frames per second]
get record framerate↵ Show the frame rate used when recording (streaming channel 1).

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

HDMI Bandwidth	10.2Gbps
DisplayPort Bandwidth	10.2Gbps
USB-C Bandwidth	10.2Gbps
VGA Bandwidth	165MHz
HDBaseT Bandwidth	10.2Gbps
Input Ports	1×HDMI (Type-A) 1×DisplayPort 1×USB (Type-C) 1×VGA (HD-15) 1×Analog Stereo (3.5mm)
Output Port	1×HDbaseT (RJ-45)
Control/Streaming Port	1×LAN (RJ-45)
Pass-through Ports	1×IR Extender (3.5mm) 1×IR Blaster (3.5mm) 1×RS-232 (4-pin Terminal Block)
Control Ports	1×RS-232 (4-pin Terminal Block) 1×Trigger (10-pin Terminal Block)
Service Port	1×USB 2.0 (Type-A)
IR Frequency	30 ~ 50kHz (30 ~ 60kHz under ideal conditions)
Baud Rate	19200 (Control) Up to 115200 (Bypass)
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)	231.5mm×25mm×150mm [Case Only] 231.5mm×25mm×158mm [All Inclusive]
Weight	909g
Chassis Material	Metal (Steel)
Chassis Color	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	39.84W

8.2 Video Specifications

8.2.1 Video Inputs

Supported Resolutions (Hz)	Input			
	HDMI	DP	USB-C	VGA
320×240@25/30/50/60	✓	✓	✓	✓
720×400p@70/85	✓	✓	✓	✓
640×480p@25/30/50	✓	✓	✓	✓
640×480p@60/72/75/85	60	60	60	60
720×480i@60	×	×	×	×
720×480p@60	✓	✓	✓	✓
720×576i@50	×	×	×	×
720×576p@50	✓	✓	✓	✓
800×600p@56/60/72/75/85	60	60	60	60
848×480p@60	✓	✓	✓	✓
1024×768p@60/70/75/85	60	60	60	60
1152×864p@75	×	×	×	×
1280×720p@25/30	✓	✓	✓	✓
1280×720p@50/60	✓	✓	✓	✓
1280×768p@60/75/85	60	60	60	60
1280×800p@60/75/85	60	60	60	60
1280×960p@60/85	60	60	60	60
1280×1024p@60/75/85	60	60	60	60
1360×768p@60	✓	✓	✓	×
1366×768p@60	✓	✓	✓	✓

Supported Resolutions (Hz)	Input			
	HDMI	DP	USB-C	VGA
1400×1050p@60	×	×	×	×
1440×900p@60/75	60	60	60	60
1600×900p@60RB	✓	✓	✓	×
1600×1200p@60	✓	×	×	✓
1680×1050p@60	✓	✓	✓	✓
1920×1080i@50/60	×	×	×	×
1920×1080p@24/25/30	✓	✓	✓	✓
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	✓	✓	✓	×
3840×2160p@50/60 (4:2:0),HDR10	✓	✓	✓	×
3840×2160p@50/60	✓	✓	✓	×
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	×	×	×	×

8.2.2 Video Outputs

Supported Resolutions (Hz)	Output	
	HDBaseT	H.264 Stream
320×240@25/30/50/60	✓	✓
720×400p@70/85	✓	×
640×480p@25/30/50	✓	✓
640×480p@60/72/75/85	✓	60
720×480i@60	✓	×
720×480p@60	✓	✓
720×576i@50	✓	×
720×576p@50	✓	✓
800×600p@56/60/72/75/85	✓	60
848×480p@60	✓	✓
1024×768p@60/70/75/85	✓	60
1152×864p@75	✓	×
1280×720p@25/30	×	✓
1280×720p@50/60	✓	✓
1280×768p@60/75/85	✓	60
1280×800p@60/75/85	✓	60
1280×960p@60/85	✓	60
1280×1024p@60/75/85	✓	60
1360×768p@60	✓	✓
1366×768p@60	✓	✓
1400×1050p@60	×	×
1440×900p@60/75	60	60
1600×900p@60RB	✓	✓
1600×1200p@60	✓	×
1680×1050p@60	✓	✓
1920×1080i@50/60	×	×
1920×1080p@24/25/30	✓	25/30

Supported Resolutions (Hz)	Output	
	HDBaseT	H.264 Stream
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	×	×
3840×2160p@50/60 (4:2:0), HDR10	×	×
3840×2160p@50/60	×	×
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, DisplayPort, USB-C Input / HDBaseT Output	
LPCM	
Max Channels	8 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream (HDBaseT bypass only)	
Supported Formats	Standard & High-Definition

Streaming Output	
LPCM	
Max Channels	2 Channels
Sampling Rate (kHz)	44.1, 48
Bitstream	
Supported Formats	None

8.3.2 Analog Audio

Analog Input	
Max Audio Level	2Vrms
Impedance	20kΩ
Type	Unbalanced

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	×
DisplayPort Cable				
DisplayPort Input	15m	10m	2m	×
USB-C Cable				
USB-C Input	2m			×
VGA Cable				
VGA Input	2m		×	
Ethernet Cable				
Cat.5e/6	60m		35m	×
Cat.6A/7	70m		40m	×

Bandwidth Category Examples:

- **1080p (FHD Video)**
  - Up to 1080p@60Hz, 12-bit color
  - 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 color
  - Data rates higher than 5.3Gbps or above 225MHz TMDS clock but below 10.2Gbps
- **4K60 (4K UHD$^+$ Video)**
  - 4K@50/60Hz (4:4:4, 8-bit), AVLC/DSC required over HDBaseT
  - 4K@50/60Hz (4:2:0, 10-bit HDR)
  - 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
ADC	Analog-to-Digital Converter
ASCII	American Standard Code for Information Interchange
Cat.5e	Enhanced Category 5 cable
Cat.6	Category 6 cable
Cat.6A	Augmented Category 6 cable
Cat.7	Category 7 cable
CLI	Command-Line Interface
dB	Decibel
DHCP	Dynamic Host Configuration Protocol
DP	DisplayPort
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
GbE	Gigabit Ethernet
Gbps	Gigabits per second
GUI	Graphical User Interface
HDBT	HDBaseT
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDR	High Dynamic Range
IP	Internet Protocol
IR	Infrared
kHz	Kilohertz
LAN	Local Area Network
LED	Light-Emitting Diode
LPCM	Linear Pulse-Code Modulation
MHz	Megahertz
OSD	On-Screen Display

ACRONYM	COMPLETE TERM
PD	Powered Device
PoH	Power over HDBaseT
PSE	Power Sourcing Equipment
SNR	Signal-to-Noise Ratio
TCP	Transmission Control Protocol
THD+N	Total Harmonic Distortion plus Noise
4K UHD	4K Ultra-High-Definition (10.2Gbps max)
4K UHD+	4K Ultra-High-Definition (18Gbps max)
USB	Universal Serial Bus
VGA	Video Graphics Array
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
Ω	Ohm

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