



# CH-352TX

Dual HDMI to IP Transmitter with USB KVM Extension



Operation Manual



## DISCLAIMERS

The information in this manual has been carefully checked and is believed to be accurate. Cypress Technology assumes no responsibility for any infringements of patents or other rights of third parties which may result from its use.

Cypress Technology assumes no responsibility for any inaccuracies that may be contained in this document. Cypress also makes no commitment to update or to keep current the information contained in this document.

Cypress Technology reserves the right to make improvements to this document and/or product at any time and without notice.

## COPYRIGHT NOTICE

No part of this document may be reproduced, transmitted, transcribed, stored in a retrieval system, or any of its part translated into any language or computer file, in any form or by any means—electronic, mechanical, magnetic, optical, chemical, manual, or otherwise—without express written permission and consent from Cypress Technology.

© Copyright 2018 by Cypress Technology.

All Rights Reserved.

## TRADEMARK ACKNOWLEDGMENTS

All products or service names mentioned in this document are trademarks of the companies with which they are associated.

---



## 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	2020/03/10	Preliminary release



## CONTENTS

<b>1. Introduction</b> .....	<b>1</b>
<b>2. Applications</b> .....	<b>1</b>
<b>3. Package Contents</b> .....	<b>1</b>
<b>4. System Requirements</b> .....	<b>2</b>
<b>5. Features</b> .....	<b>2</b>
<b>6. Operation Controls and Functions</b> .....	<b>3</b>
6.1 Front Panel.....	3
6.2 Rear Panel.....	4
6.3 IR Cable Pinouts.....	5
6.4 RS-232 Pinout and Defaults .....	5
6.5 WebGUI Control .....	6
6.5.1 System Tab.....	8
6.5.2 Network Tab .....	11
6.5.3 Functions Tab .....	12
6.6 Telnet Control .....	14
<b>7. Connection Diagram</b> .....	<b>20</b>
<b>8. Specifications</b> .....	<b>21</b>
8.1 Technical Specifications .....	21
8.2 Video Specifications .....	22
8.3 Audio Specifications .....	24
8.3.1 Digital Audio .....	24
8.3.2 Analog Audio .....	24
8.3.3 AVoIP Audio Availability (Auto Mode).....	25
8.4 Cable Specifications .....	26
<b>9. Acronyms</b> .....	<b>27</b>

---



## 1. INTRODUCTION

This Dual HDMI to IP Transmitter solution is designed to independently extend a pair of HDMI sources to a pair of remote HDMI outputs via a standard Gigabit Ethernet network connection. Both HDMI inputs provide support for resolutions up to 1920x1200@60Hz along with many audio formats including 8 channel LPCM and standard Bitstream. Transmitter 1 also adds support for analog audio, USB 2.0, IR and serial data extension, making it ideal for KVM or touch panel extension projects.

When using standard Ethernet cables, this unit supports the extension of AVoIP signals up to 100 meters and the extension distance can be further extended (up to 100m per segment) by using Gigabit Ethernet network switches. This allows the user to cascade the system without signal loss or introducing delay. Configuration information is provided via On Screen Display (OSD) and control is by WebGUI and Telnet.

## 2. APPLICATIONS

- HDMI, USB, Audio, IR, and RS-232 extension
- Broadcasting dual sources over a standard Ethernet connection
- Touch panel point-of-sale or advertising kiosk extension
- Long distance data and video transmission via cascading
- Remote KVM control of a system

## 3. PACKAGE CONTENTS

- 1× Dual HDMI to IP Transmitter with USB KVM Extension
- 1× 5V/2.6A DC Power Adapter
- 1× Power Cord
- 1× IR Blaster
- 1× Operation Manual

## 4. SYSTEM REQUIREMENTS

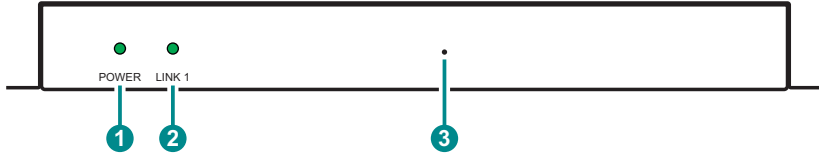
- HDMI source equipment such as media players, video game consoles, PCs or set-top boxes.
- A compatible dual-AVoIP receiver
- Analog audio receiving equipment such as headphones, audio amplifiers or powered speakers.
- A Gigabit Ethernet network switch with jumbo frame support is required. (8K jumbo frames are strongly recommended)
- A Gigabit Ethernet switch with “IGMP snooping” enabled is strongly recommended.

## 5. FEATURES

- HDMI 1.4 compatible, DVI 1.0 compatible with the use of an HDMI-DVI adaptor.
- HDCP 1.x compliant.
- 2 HDMI inputs
- Each HDMI input is connected to an independent AVoIP transmitter
- Video, audio, and control transmission over TCP/IP in Unicast (point-to-point) mode
- Supports video resolutions up to 1080p@60Hz and PC resolutions up to WUXGA (1920×1200@60Hz)
- Supports extension of many audio formats including 8 channel LPCM and standard Bitstream
- External analog audio embedding support for HDMI input 1
- Optional analog audio bypass from receiver to transmitter
- Supports USB keyboard, mouse and storage extension  
*Note: Not compatible with USB hubs or USB 2.0 devices with high power requirements such as external hard drives*
- Supports IR and RS-232 bypass.
- Supports external EDID bypass and an optional internal default EDID
- Controllable via WebGUI or Telnet
- Supports the use of an external control center (IP Master Controller) to provide expanded functionality (Contact your authorized dealer for more information)

## 6. OPERATION CONTROLS AND FUNCTIONS

### 6.1 Front Panel

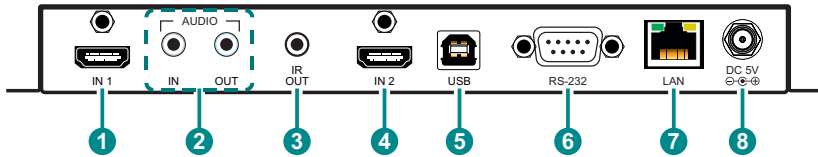


- 1 POWER LED:** This LED will flash while the unit is powering on and will illuminate solidly once it is ready to be used.
- 2 LINK 1 LED:** If the unit has no network connection this LED will not illuminate. While the unit is attempting to establish a connection with a receiver this LED will flash. When the unit has established stable connection with a receiver this LED will illuminate solidly.
- 3 Reset Pinhole:** Press this recessed button to reset the unit's power supply and reboot the unit.

*Note: Settings will not be reset.*



## 6.2 Rear Panel



- 1 OUT 1 Port:** Connect to HDMI source equipment such as a media player, game console or set-top box.

*Note: When paired with it's standard dual HDMI receiver, this input will route directly to the Out 1 port on the connected receiver.*
- 2 AUDIO IN Port:** Connect to the stereo analog output of a device such as a CD player or PC.

*Note: When a live audio source is connected to the Audio In port, it will be automatically embedded into the transmitted signal, and will completely replace any existing HDMI audio when the unit is in "Auto" Audio over IP mode.*

**AUDIO OUT port:** Connect to powered speakers or an amplifier for stereo analog audio output. This will output the audio from the Audio In on the connected receiver.

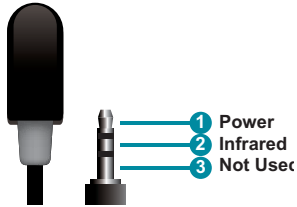
*Note: The Audio In audio channel from the receiver is only active when an analog source is also connected to the Audio In port on the transmitter.*
- 3 IR OUT Port:** Connect to the provided IR Blaster to transmit IR signals sent from the associated receiver to devices within direct line-of-sight of the IR Blaster
- 4 IN 2 Port:** Connect to HDMI source equipment such as a media player, game console or set-top box.

*Note: When paired with it's standard dual HDMI receiver, this input will route directly to the Out 2 port on the connected receiver.*
- 5 USB 2.0 (Type-B) Port:** Connect directly to a PC host to extend its USB functionality to the USB device ports on the connected receiver.
- 6 RS-232 Port:** Connect to a PC, laptop, or serial controllable device for the extension of RS-232 signals.

*Note: The baud rate is configurable, but the default baud rate is 115200.*
- 7 LAN Port:** Connect via a Gigabit Ethernet switch to compatible receiver to transmit video and data, and to a PC/laptop to control the unit via WebGUI or Telnet.
- 8 DC 5V Port:** Plug the 5V DC power adapter into this port and connect it to an AC wall outlet for power.

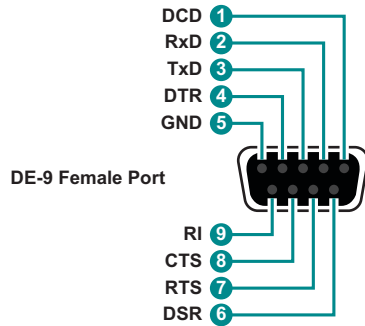
## 6.3 IR Cable Pinouts

IR Blaster  
Cable



## 6.4 RS-232 Pinout and Defaults

Serial Port Default Settings	
Baud Rate	115200
Data Bits	8
Parity Bits	None
Stop Bits	1
Flow Control	None



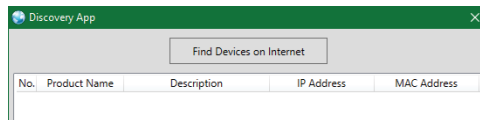
## 6.5 WebGUI Control

### • Device Discovery

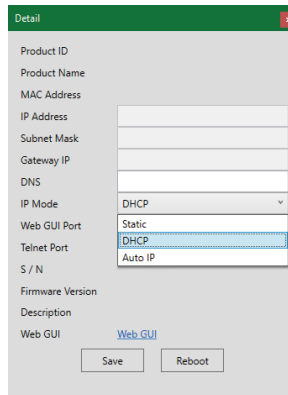
Please obtain the “Device Discovery” software from your authorized dealer and save it in a directory where you can easily find it.

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

*Note: Due to dual AVoIP nature of the unit, each unit will be listed twice, once for each independent webpage/IP address.*



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, switch the unit into DHCP mode to automatically obtain proper network settings from a local DHCP server, or set it to “Auto IP” to automatically select an APIPA address. Select the preferred mode from the IP mode drop-down, then click “Save” followed by “Reboot”.

*Note: If the unit is set to DHCP mode but no DHCP server can be found, the unit will automatically switch into Auto IP mode.*

- 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**

Each unit contains 2 independent AVoIP transmitters, and each of those is controlled by their own WebGUI interface which may be accessed by opening a standard web browser on a PC and typing in the IP address of the unit you wish to connect to. If you do not already know the IP addresses of the units in your system, you can discover the IP addresses by using the Discovery Tool, or by disconnecting the HDMI inputs in a connected system and connecting an HDMI display to each of the receiver's outputs. Once the source is lost, each connected display will output a 640×480 black screen with OSD text at the bottom identifying its own IP address (Local IP), as well as the IP address of the transmitter (Remote IP) that shares the same broadcasting channel with it. After obtaining the IP address information, reconnect the HDMI sources to return the unit to normal operation.

```
FW: 15-Nov-10 4298
Local IP: 169.254.9.180
Remote IP: 169.254.11.173
ID: FFFFFFFF
```

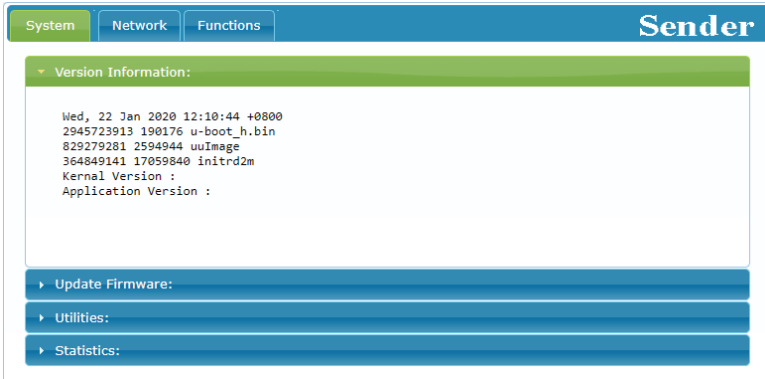
Once you have connected to a unit's WebGUI, you will be presented with a screen containing multiple tabs for each functionality area of the unit. To view the contents of a tab, click on the appropriate button at the top of the window. The individual tabs and functions will be introduced in the following sections.



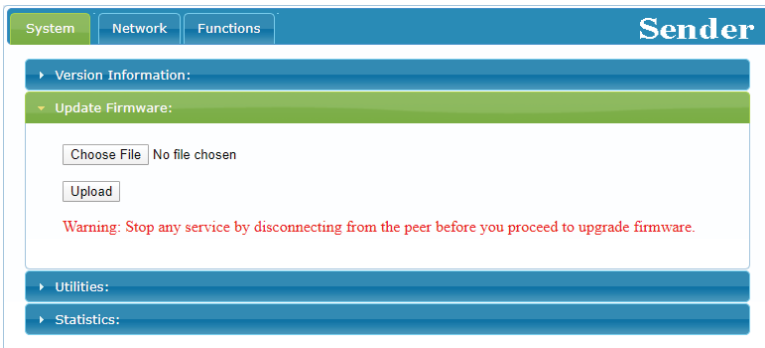
*Note: Audio/Video over IP streaming can use a large amount of bandwidth (especially at higher resolutions) and a Gigabit Ethernet network switch with jumbo frame support and IGMP snooping is required. A professional managed switch with VLAN support is strongly recommended. It is strongly suggested to avoid mixing your regular network traffic with AVoIP streaming traffic and the AVoIP traffic should exist within a separate subnet, at the minimum.*

## 6.5.1 System Tab

The System tab contains four windows that provide access to firmware version information, a firmware update interface, utilities for rebooting and resetting the unit, basic EDID management, Telnet command entry, and a variety of statistics and information about the operational state of the unit.

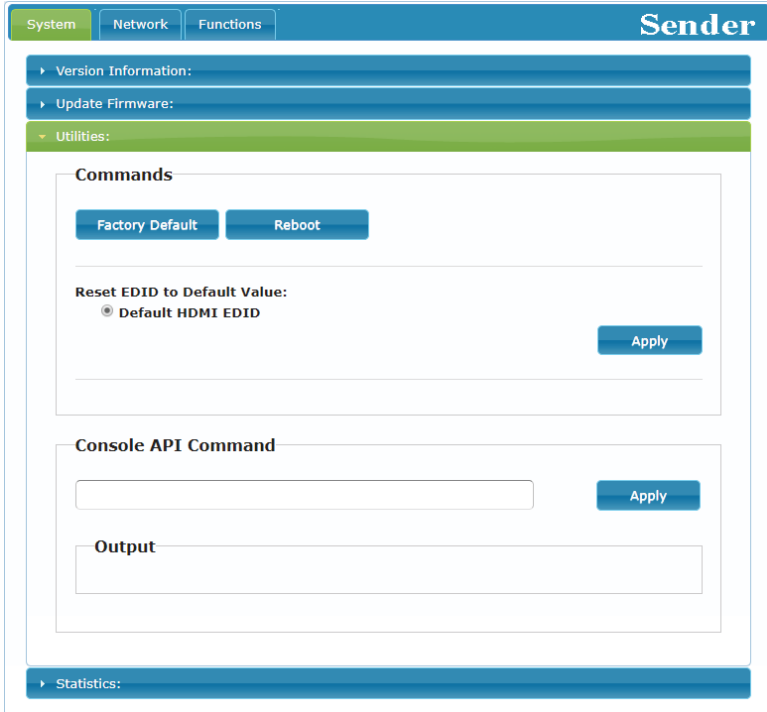


- 1) **Version Information:** This window displays detailed information about this transmitter's current firmware version.

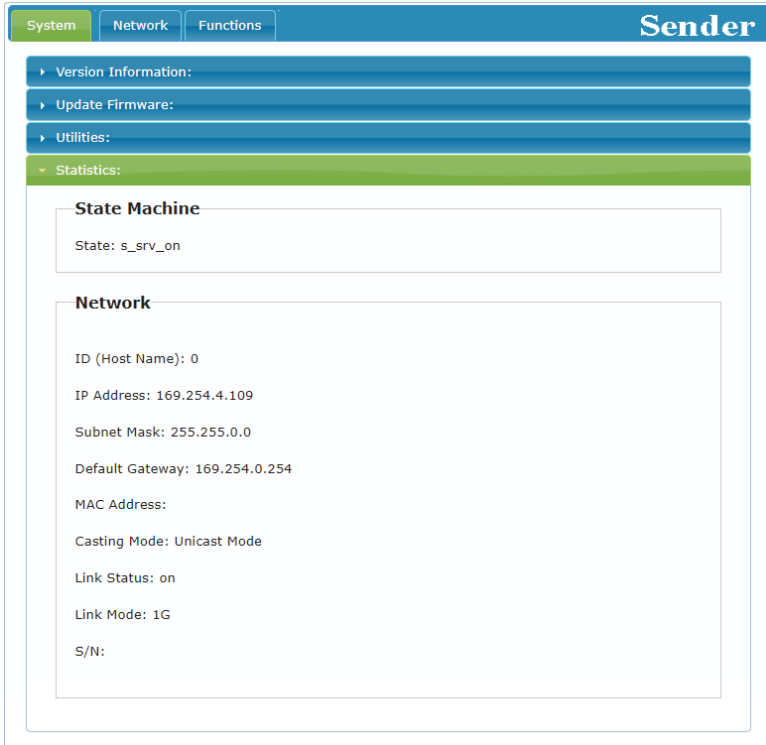


- 2) **Update Firmware:** Provides a way to update this transmitter's firmware. Click "Choose File" to select the firmware update file from the local PC (\*.bin format). After selecting an appropriate file, click the "Upload" button to begin the update process.

*Note: Each of the two transmitters in this unit has independent firmware and only one should be updated at a time. Please wait for the first transmitter to complete updating before updating the second one.*



- 3) **Utilities Window:** The Utilities window provides control over some system-level functions.
- **Factory Default:** Users can reset this transmitter back to the factory defaults by clicking this button.
  - **Reboot:** The unit may be rebooted (without resetting settings) by pressing this button.
  - **Reset EDID to Default Value:** If the EDID received from the connected receiver has compatibility issues with the connected HDMI source, the internal HDMI EDID (up to 1080p w/audio) can be selected by pressing the “Apply” button.
  - **Console API Command:** Individual Telnet commands may be sent to this transmitter by using the text entry field and pressing “Apply”. Any responses from the unit will be displayed in the “Output” field.

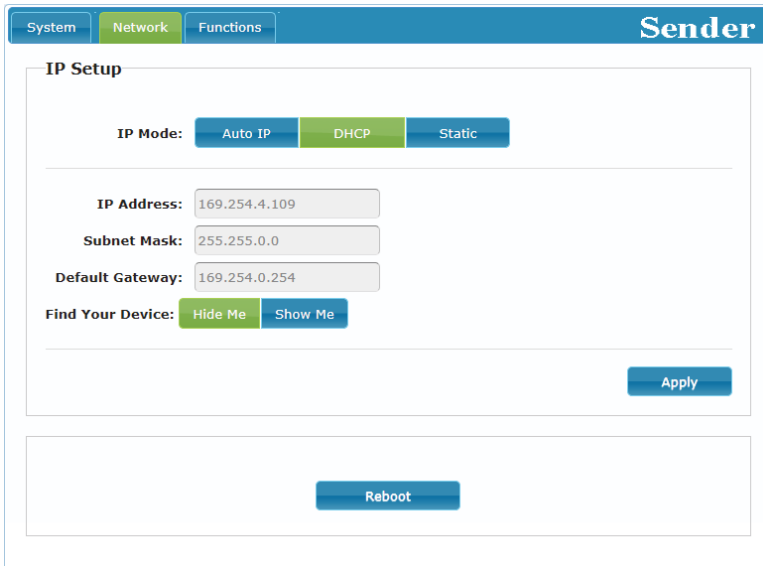


- 4) **Statistics Window:** The Statistics window shows all available information about the operational status of the unit, including current Host ID Name, SN, Ethernet information, MAC address, broadcasting mode, link status and link mode.

## 6.5.2 Network Tab

The Network tab provides control over this transmitter's IP configuration. Changes made to the network settings will require a reboot of the unit. After clicking on "Apply" please follow the reboot instructions in the WebGUI.

*Note: If the IP address is changed then the IP address required for WebGUI and Telnet access will also change accordingly. If the new address is assigned via "Auto IP" or "DHCP" it will be necessary to obtain the newly assigned IP address by checking Device Discovery app, or the unit's OSD display.*



The screenshot shows the "Sender" WebGUI interface with the "Network" tab selected. The "IP Setup" section contains the following elements:

- IP Mode:** Three radio buttons: "Auto IP" (selected), "DHCP", and "Static".
- IP Address:** Text input field containing "169.254.4.109".
- Subnet Mask:** Text input field containing "255.255.0.0".
- Default Gateway:** Text input field containing "169.254.0.254".
- Find Your Device:** Two buttons: "Hide Me" and "Show Me".
- Apply:** A blue button at the bottom right of the IP Setup section.
- Reboot:** A blue button centered at the bottom of the page.

1) **IP Setup:** This section allows for configuration of the IP acquisition mode and Ethernet settings of the unit. It also provides an easy way to find the physical unit when installed with many other similar units.

- **IP Mode & Settings:** The IP mode may be switched between "Auto IP", "DHCP" or "Static IP". When the unit is set to Auto IP mode it will automatically assign itself an APIPA address from the 169.254.xxx.xxx range. When the unit is set to DHCP mode it will attempt to automatically obtain an IP address from a DHCP server. When the IP mode is set to static IP, you can manually set the IP address, netmask and gateway address. Click the "Apply" button to save changes made to the IP Mode or Configuration.

*Note: The default network setting for this unit is "Auto IP". If the unit is set to "DHCP" but no DHCP server can be found, the IP mode will temporarily switch to "Auto IP" until the unit is rebooted.*

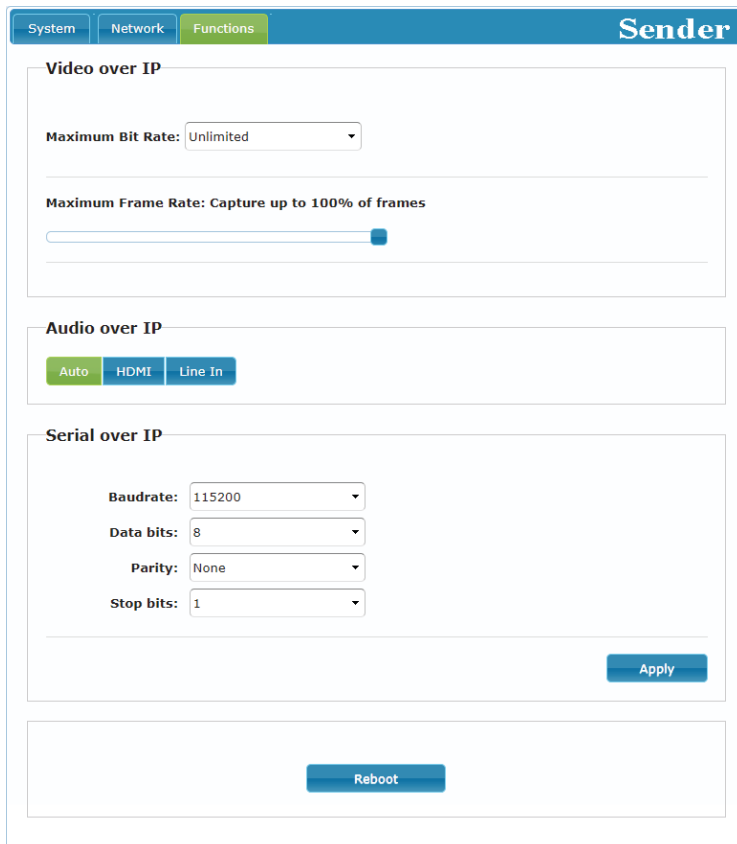


- **Find Your Device:** Selecting “Show Me” will cause the unit to immediately begin flashing the LEDs on the front of the unit to make it easy to find. Selecting “Hide Me” returns the LEDs to their normal behavior. This setting is useful when troubleshooting an installation with a large number of units in a rack.

2) **Reboot:** Pressing this button will force the unit to reboot.

### 6.5.3 Functions Tab

The Functions tab provides control over the transmitter’s AV source management, streaming bandwidth/quality settings, as well as defining how audio and serial signals are handled (transmitter 1 only). The available controls are different depending on whether you are connected to transmitter 1 or 2. Changes made to these settings may require a reboot. Please follow the reboot instructions in the WebGUI, if necessary.



The screenshot shows the 'Sender' WebGUI interface with the 'Functions' tab selected. The interface is divided into three main sections: Video over IP, Audio over IP, and Serial over IP. At the top, there are navigation tabs for 'System', 'Network', and 'Functions', with 'Sender' written in the top right corner. The 'Video over IP' section includes a 'Maximum Bit Rate' dropdown menu set to 'Unlimited' and a 'Maximum Frame Rate' slider set to 'Capture up to 100% of frames'. The 'Audio over IP' section has three buttons: 'Auto' (highlighted in green), 'HDMI', and 'Line In'. The 'Serial over IP' section contains four dropdown menus for 'Baudrate' (115200), 'Data bits' (8), 'Parity' (None), and 'Stop bits' (1). An 'Apply' button is located at the bottom right of the Serial over IP section. A 'Reboot' button is centered at the bottom of the entire Functions tab area.

- 1) **Video over IP:** This section allows control over the streaming bit rate and transmission quality.
  - **Maximum Bit Rate:** Set the maximum bit rate that can be used by the output video stream. Available options are: Unlimited, 400 Mbps, 200 Mbps, 100 Mbps, 50 Mbps. Selecting “Unlimited” will use up to the maximum available bandwidth in order to maintain a full framerate video stream.
  - **Maximum Frame Rate:** Adjusting this slider will set the percentage of frames from the source video to encode (2–100%). This is ideal for reducing the bandwidth requirements of high-resolution, but limited motion, sources such as slide presentations or information screens.

*Note: If the framerate is lowered too far with motion video sources, the video will become noticeably choppy.*
- 2) **Audio over IP (Transmitter 1 Only):** The audio source to embed in the transmitter’s outbound AVoIP stream is selected here. Selecting “HDMI” will always embed HDMI 1’s audio source, selecting “Line In” will always embed the Line In audio source, selecting Auto will embed audio according to the default routing behavior (see section 8.3.3).
- 3) **Serial over IP (Transmitter 1 Only):** This section provides controls for the serial over IP extension functionality, including setting the RS-232 data configuration.
  - **Serial Settings:** Set the desired baud rate, data bits, parity, and stop bit for the RS-232 signal to extend.

*Note: The transmitter and receiver must have the same serial settings.*
- 4) **Reboot:** Pressing this button will force the unit to reboot.

## 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.

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: By default the unit is set to "Auto IP" mode. The current IP address can be obtained by using the Device Discovery app, or by checking the OSD info screen when there is no live video connection. The default communication port is 23.*

## 6.7 Telnet Commands

COMMAND
Description and Parameters
<p><b>help</b>↵</p> <p>Show the full command list.</p>
<p><b>help N1</b>↵</p> <p>Show details about the specified command.</p> <p><b>N1</b> = {Command}</p>
<p><b>get_hardware_version</b>↵</p> <p>Show the transmitter's current hardware version.</p>
<p><b>get_firmware_version</b>↵</p> <p>Show the transmitter's current firmware version.</p>
<p><b>set_device_name N1</b>↵</p> <p>Set the transmitter's device name.</p> <p><b>N1</b> = {Name} [29 characters max]</p>

COMMAND							
Description and Parameters							
<b>get_device_name</b> ↵	Show the transmitter's current device name.						
<b>factory_reset N1</b> ↵	<p>Perform a factory reset on the transmitter and select the IP Mode to use after the reset completes.</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>0</td> <td>[Reset into Static IP mode]</td> </tr> <tr> <td>1</td> <td>[Reset into Auto IP mode]</td> </tr> </table>	0	[Reset into Static IP mode]	1	[Reset into Auto IP mode]		
0	[Reset into Static IP mode]						
1	[Reset into Auto IP mode]						
<b>reboot</b> ↵	Reboot the unit.						
<b>get_ipconfig</b> ↵	Show the transmitter's current IP configuration information.						
<b>set_ip_mode N1</b> ↵	<p>Set the IP address assignment mode.</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>0</td> <td>[Static IP Mode]</td> </tr> <tr> <td>1</td> <td>[DHCP Mode]</td> </tr> <tr> <td>2</td> <td>[Auto IP Mode]</td> </tr> </table>	0	[Static IP Mode]	1	[DHCP Mode]	2	[Auto IP Mode]
0	[Static IP Mode]						
1	[DHCP Mode]						
2	[Auto IP Mode]						
<b>get_ip_mode</b> ↵	Show the current IP address assignment mode.						
<b>set_ip_address N1</b> ↵	<p>Set the transmitter's static IP address.</p> <p><b>N1</b> = X.X.X.X [X = 0~255, IP address]</p>						
<b>get_ip_address</b> ↵	Show the transmitter's current IP address.						
<b>set_netmask N1</b> ↵	<p>Set the transmitter's static netmask.</p> <p><b>N1</b> = X.X.X.X [X = 0~255, Netmask]</p>						

COMMAND	
Description and Parameters	
<b>get_netmask</b> ↵	Show the transmitter's current netmask.
<b>set_gateway N1</b> ↵	Set the transmitter's static gateway address. <b>N1</b> = X.X.X.X [X = 0~255, Gateway address]
<b>get_gateway</b> ↵	Show the transmitter's current gateway address.
<b>set_jumbo_mtu N1</b> ↵	Enable/disable the transmitter's jumbo frame MTU support. Available values for <b>N1</b> : 0 [Disabled] 1 [Enabled]
<b>get_jumbo_mtu</b> ↵	Show the transmitter's current jumbo frame MTU support status.
<b>set_showme N1</b> ↵	Enable/Disable the transmitter's discovery "Show Me" feature. Available values for <b>N1</b> : 0 [Disabled] 1 [Enabled]
<b>get_showme</b> ↵	Show the current state of the transmitter's "Show Me" feature.
<b>set_quality N1</b> ↵	Set the transmitter's picture quality mode. Available values for <b>N1</b> : 0 [Graphic mode] 1 [Video mode]
<b>get_quality</b> ↵	Show the transmitter's current picture quality mode.

COMMAND																					
Description and Parameters																					
<b>set_hdcp_allow N1</b> ↵	<p>Enable/disable HDCP encrypted source support for this transmitter.</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>0</td> <td>[Disabled]</td> </tr> <tr> <td>1</td> <td>[Enabled]</td> </tr> </table>	0	[Disabled]	1	[Enabled]																
0	[Disabled]																				
1	[Enabled]																				
<b>get_hdcp</b> ↵	<p>Show this transmitter's current HDCP support state.</p>																				
<b>set_bandwidth N1</b> ↵	<p>Set the transmitter's broadcast stream bandwidth maximum.</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>0</td> <td>[50 Mbps]</td> </tr> <tr> <td>1</td> <td>[100 Mbps]</td> </tr> <tr> <td>2</td> <td>[200 Mbps]</td> </tr> <tr> <td>3</td> <td>[400 Mbps]</td> </tr> <tr> <td>4</td> <td>[Unlimited]</td> </tr> </table>	0	[50 Mbps]	1	[100 Mbps]	2	[200 Mbps]	3	[400 Mbps]	4	[Unlimited]										
0	[50 Mbps]																				
1	[100 Mbps]																				
2	[200 Mbps]																				
3	[400 Mbps]																				
4	[Unlimited]																				
<b>set_frame_rate N1</b> ↵	<p>Set the frame rate percentage (in 1/60 steps) to use when encoding the source video.</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>0</td> <td>[Frame rate reduction disabled]</td> </tr> <tr> <td>1~60</td> <td>[Frame rate percentage in 1/60 steps]</td> </tr> </table>	0	[Frame rate reduction disabled]	1~60	[Frame rate percentage in 1/60 steps]																
0	[Frame rate reduction disabled]																				
1~60	[Frame rate percentage in 1/60 steps]																				
<b>set_serial_baud N1</b> ↵	<p>Set the serial baud rate.</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>0</td> <td>[300 baud]</td> </tr> <tr> <td>1</td> <td>[600 baud]</td> </tr> <tr> <td>2</td> <td>[1200 baud]</td> </tr> <tr> <td>3</td> <td>[2400 baud]</td> </tr> <tr> <td>4</td> <td>[4800 baud]</td> </tr> <tr> <td>5</td> <td>[9600 baud]</td> </tr> <tr> <td>6</td> <td>[19200 baud]</td> </tr> <tr> <td>7</td> <td>[38400 baud]</td> </tr> <tr> <td>8</td> <td>[57600 baud]</td> </tr> <tr> <td>9</td> <td>[115200 baud]</td> </tr> </table> <p><i>Note: Valid on Transmitter 1 only.</i></p>	0	[300 baud]	1	[600 baud]	2	[1200 baud]	3	[2400 baud]	4	[4800 baud]	5	[9600 baud]	6	[19200 baud]	7	[38400 baud]	8	[57600 baud]	9	[115200 baud]
0	[300 baud]																				
1	[600 baud]																				
2	[1200 baud]																				
3	[2400 baud]																				
4	[4800 baud]																				
5	[9600 baud]																				
6	[19200 baud]																				
7	[38400 baud]																				
8	[57600 baud]																				
9	[115200 baud]																				

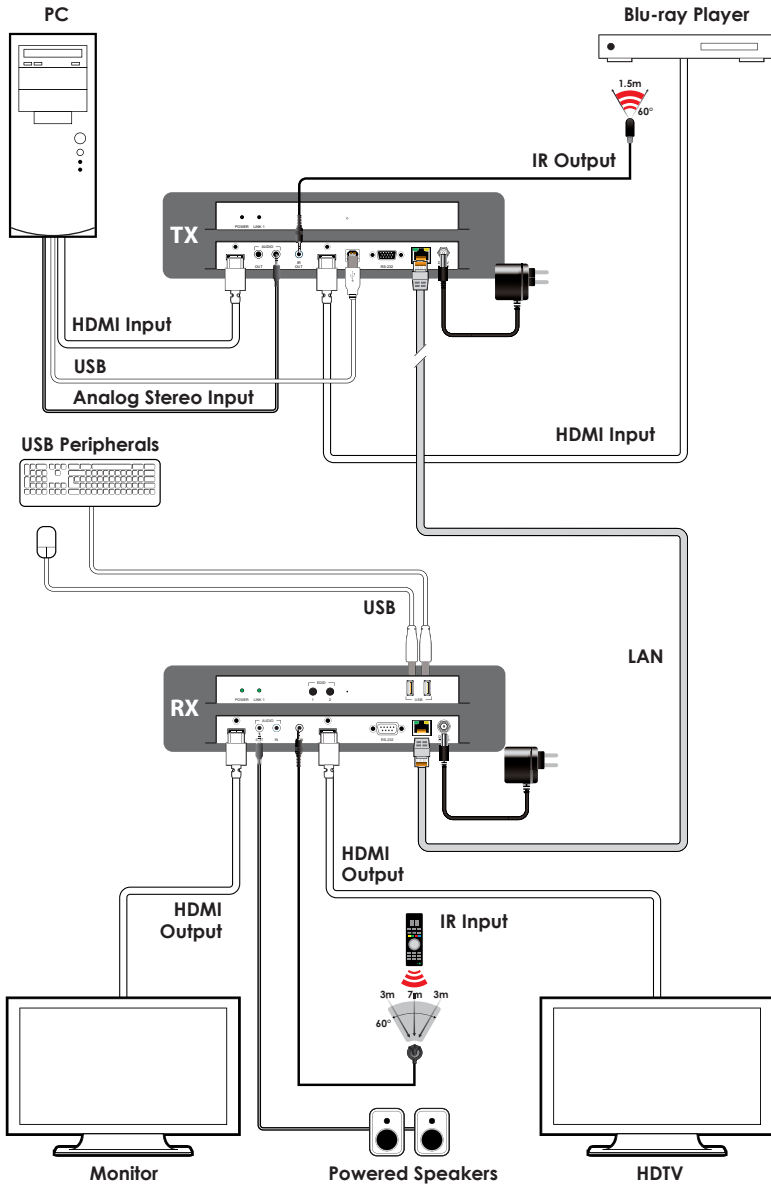
COMMAND									
Description and Parameters									
<b>get_serial_baud</b> ↵	<p>Show the current serial baud rate.</p> <p><i>Note: Valid on Transmitter 1 only.</i></p>								
<b>set_serial_bits N1</b> ↵	<p>Set the number of serial data bits.</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>0</td> <td>[5 bits]</td> </tr> <tr> <td>1</td> <td>[6 bits]</td> </tr> <tr> <td>2</td> <td>[7 bits]</td> </tr> <tr> <td>3</td> <td>[8 bits]</td> </tr> </table> <p><i>Note: Valid on Transmitter 1 only.</i></p>	0	[5 bits]	1	[6 bits]	2	[7 bits]	3	[8 bits]
0	[5 bits]								
1	[6 bits]								
2	[7 bits]								
3	[8 bits]								
<b>get_serial_bits</b> ↵	<p>Show the current number of serial data bits.</p> <p><i>Note: Valid on Transmitter 1 only.</i></p>								
<b>set_serial_parity N1</b> ↵	<p>Set the serial parity bit.</p> <p>Available values for <b>N1</b>:</p> <table> <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> <p><i>Note: Valid on Transmitter 1 only.</i></p>	0	[None]	1	[Odd]	2	[Even]		
0	[None]								
1	[Odd]								
2	[Even]								
<b>get_serial_parity</b> ↵	<p>Show the current serial parity bit setting.</p> <p><i>Note: Valid on Transmitter 1 only.</i></p>								
<b>set_serial_stop N1</b> ↵	<p>Set the number of serial stop bits.</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>0</td> <td>[1 stop bit]</td> </tr> <tr> <td>1</td> <td>[2 stop bits]</td> </tr> </table> <p><i>Note: Valid on Transmitter 1 only.</i></p>	0	[1 stop bit]	1	[2 stop bits]				
0	[1 stop bit]								
1	[2 stop bits]								

COMMAND	
Description and Parameters	
<b>get_serial_stop</b> ↵	
Show the current number of serial stop bits.	
<i>Note: Valid on Transmitter 1 only.</i>	
<b>a N1</b> ↵	
Set the audio input source selection for Transmitter 1.	
Available values for <b>N1</b> :	
D	[HDMI 1 audio]
A	[Line In audio]
AUTO	[Auto select]
<i>Note: Valid on Transmitter 1 only.</i>	
<b>get_a</b> ↵	
Show Transmitter 1's current audio input source selection.	
<i>Note: Valid on Transmitter 1 only.</i>	
<b>set_usb_mouse N1</b> ↵	
Set Transmitter 1's USB mouse mode.	
Available values for <b>N1</b> :	
0	[High Resolution]
1	[Compatibility]
<i>Note: Valid on Transmitter 1 only.</i>	
<b>get_usb_mouse</b> ↵	
Show Transmitter 1's current USB mouse mode.	
<i>Note: Valid on Transmitter 1 only.</i>	

*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>	6.75Gbps
<b>Input Ports</b>	2×HDMI (Type-A) 1×Analog Stereo (3.5mm)
<b>Output Port</b>	1×Analog Stereo (3.5mm)
<b>Output/Control Port</b>	1×LAN (RJ-45)
<b>Pass-through Ports</b>	1×IR Blaster (3.5mm) 1×RS-232 (DE-9) 1×USB (Type-B)
<b>IR Frequency</b>	30 ~ 50kHz (30 ~ 60kHz under ideal conditions)
<b>Baud Rate</b>	Up to 115200
<b>Power Supply</b>	5V/2.6A DC (US/EU standards, CE/FCC/UL certified)
<b>ESD Protection (HBM)</b>	±8kV (Air Discharge) ±4kV (Contact Discharge)
<b>Dimensions (W×H×D)</b>	231.5mm×25mm×108mm [Case Only] 231.5mm×25mm×120mm [All Inclusive]
<b>Weight</b>	636g
<b>Chassis Material</b>	Metal (Steel)
<b>Chassis Color</b>	Black
<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>	10.8W

## 8.2 Video Specifications

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

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

## 8.3 Audio Specifications

### 8.3.1 Digital Audio

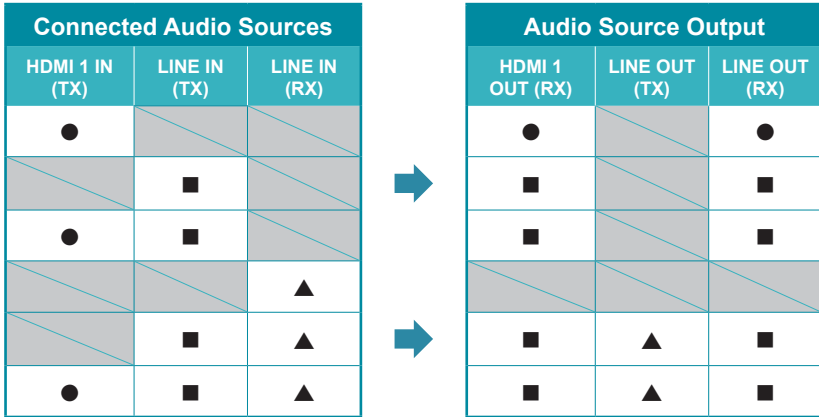
HDMI Input / Streaming Output	
<b>LPCM</b>	
<b>Max Channels</b>	8 Channels
<b>Sampling Rate (kHz)</b>	32, 44.1, 48, 88.2, 96, 176.4, 192
<b>Bitstream</b>	
<b>Supported Formats</b>	Standard

### 8.3.2 Analog Audio

Analog Input	
<b>Max Audio Level</b>	2Vrms
<b>Impedance</b>	10k $\Omega$
<b>Type</b>	Unbalanced

Analog Output	
<b>Max Audio Level</b>	2Vrms
<b>THD+N</b>	< -66dB@0dBFS 1kHz (A-wt)
<b>SNR</b>	> 80dB@0dBFS
<b>Frequency Response</b>	< $\pm$ 25dB@20Hz~20kHz
<b>Crosstalk</b>	< -60dB@10kHz
<b>Impedance</b>	1 $\Omega$
<b>Type</b>	Unbalanced

### 8.3.3 AVoIP Audio Availability (Auto Mode)



Legend:

- = HDMI/DisplayPort audio source.
- = Line In (Transmitter) audio source.
- ▲ = Line In (Receiver) audio source.

*Note: Analog audio is transmitted using the transmitter 1 to receiver 1 connection path. If no video source is connected to HDMI input 1 on the transmitter, analog audio will not be extended.*

## 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	x	
<b>Ethernet Cable</b>				
<b>Cat.5e/6</b>	100m		x	
<b>Cat.6A/7</b>	100m		x	

### 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<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

## 9. ACRONYMS

ACRONYM	COMPLETE TERM
<b>ADC</b>	Analog-to-Digital Converter
<b>AV</b>	Audio/Video
<b>AVoIP</b>	Audio/Video over IP
<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>CLI</b>	Command-Line Interface
<b>DAC</b>	Digital-to-Analog Converter
<b>dB</b>	Decibel
<b>DHCP</b>	Dynamic Host Configuration Protocol
<b>DVI</b>	Digital Visual Interface
<b>EDID</b>	Extended Display Identification Data
<b>GbE</b>	Gigabit Ethernet
<b>Gbps</b>	Gigabits per second
<b>GUI</b>	Graphical User Interface
<b>HD</b>	High-Definition
<b>HDCP</b>	High-bandwidth Digital Content Protection
<b>HDMI</b>	High-Definition Multimedia Interface
<b>HDR</b>	High Dynamic Range
<b>IGMP</b>	Internet Group Management Protocol
<b>IP</b>	Internet Protocol
<b>IR</b>	Infrared
<b>kHz</b>	Kilohertz
<b>KVM</b>	Keyboard/Video/Mouse
<b>LAN</b>	Local Area Network
<b>LED</b>	Light-Emitting Diode
<b>LPCM</b>	Linear Pulse-Code Modulation



<b>ACRONYM</b>	<b>COMPLETE TERM</b>
<b>MJPEG</b>	Motion JPEG
<b>MHz</b>	Megahertz
<b>OSD</b>	On-Screen Display
<b>SNR</b>	Signal-to-Noise Ratio
<b>TCP</b>	Transmission Control Protocol
<b>THD+N</b>	Total Harmonic Distortion plus Noise
<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>VLAN</b>	Virtual LAN
<b>VoIP</b>	Video over IP
<b>WUXGA (RB)</b>	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
<b>XGA</b>	Extended Graphics Array
<b>Ω</b>	Ohm







**CYPRESS TECHNOLOGY CO., LTD.**  
[www.cypress.com.tw](http://www.cypress.com.tw)

---