CH-352RX

IP to Dual HDMI Receiver with USB KVM Extension

HDMI
HIGH-DEFINITION MULTIMEDIA INTERFACE

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

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	2020/03/17	Preliminary release

CONTENTS

1. INTRODUCTION

This IP to Dual HDMI Receiver solution is designed to receive a pair of independently extended HDMI sources via a standard Gigabit Ethernet network connection and output them via dual HDMI outputs. Both HDMI outputs provide support for received resolutions up to 1920x1200@60Hz along with many audio formats including 8 channel LPCM and standard Bitstream. Receiver 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 reception of extended 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
- Receiving dual broadcast sources over a standard Ethernet connection
- Touch panel point-of-sale or advertising kiosk extension
- Long distance data and video reception via cascading
- Remote KVM control of a system

3. PACKAGE CONTENTS

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

4. SYSTEM REQUIREMENTS

- HDMI receiving equipment such as HDTVs, monitors or audio amplifiers.
- A compatible dual-AVoIP transmitter
- 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.

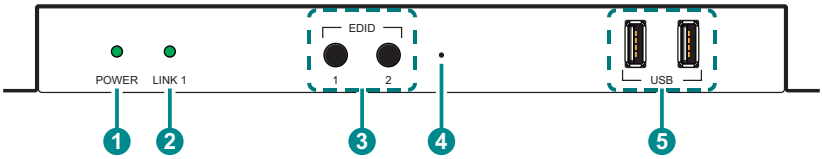
5. FEATURES

- HDMI 1.4 compatible, DVI 1.0 compatible with the use of an HDMI-DVI adaptor.
- HDCP 1.x compliant.
- 2 HDMI outputs
- Each HDMI output is connected to an independent AVoIP receiver
- Video, audio, and control reception 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
- 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
- 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

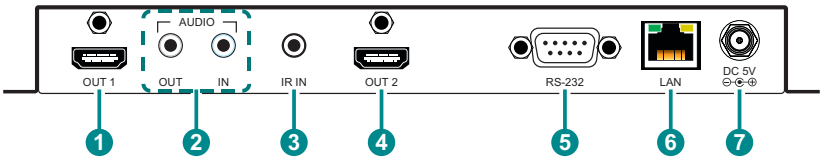


1. **POWER LED:** This LED will flash while the unit is powering on and will illuminate solidly once it is ready to be used.
2. **LINK 1 LED:** If the unit has no network connection this LED will not illuminate. While the unit is attempting to establish a connection with a transmitter this LED will flash. When the unit has established stable connection with a transmitter this LED will illuminate solidly.
3. **EDID 1~2 Buttons:** Press either button force the use of the internal EDID with the associated HDMI input.

   Note: If the unit is power cycled the EDID will return to the default display EDID bypass mode.
4. **Reset Pinhole:** Press this recessed button to reset the unit's power supply and reboot the unit.

   Note: Settings will not be reset.
5. **USB 2.0 (Type-A) Ports:** Connect directly to standard USB 2.0 peripherals such as a mouse, keyboard or flash drive to extend their USB functionality to the connected transmitter.

6.2 Rear Panel



1. **OUT 1 Port:** Connect to an HDMI TV, monitor, or amplifier for digital video and audio output.

   Note: The source will always be the device connected to HDMI input 1 on the connected transmitter.

2. **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 transmitter.

   AUDIO IN Port: Connect to the mono analog output of a device such as a microphone.

   Note: This receiver's Audio In audio channel is only active when an analog source is also connected to the Audio In port on the connected transmitter.

3. **IR IN Port:** Connect to an IR Extender to receive local IR control signals and extend them to the IR Blaster on the connected transmitter. Ensure that the remote being used is within direct line-of-sight of the IR Extender.

4. **OUT 2 Port:** Connect to an HDMI TV, monitor, or amplifier for digital video and audio output.

   Note: The source will always be the device connected to HDMI input 2 on the connected transmitter.

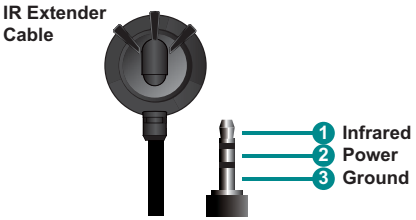
5. **RS-232 Port:** Connect to a PC, laptop, or serial controllable device for the extension of RS-232 signals.

   Note: The baud rate is configurable, but the default baud rate is 115200.

6. **LAN Port:** Connect via a Gigabit Ethernet switch to compatible transmitter to receive video and data, and to a PC/laptop to control the unit via WebGUI or Telnet.

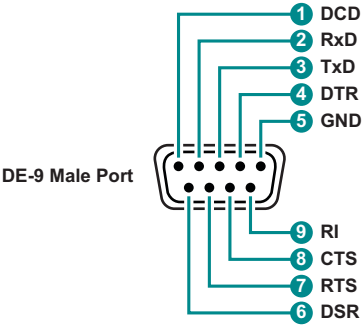
7. **DC 5V Port:** Plug the 5V DC power adapter into this port and connect it to an AC wall outlet for power.

6.3 IR Cable Pinouts



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



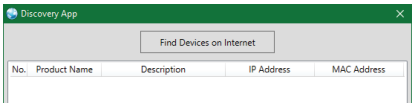
6.5 WebGUI Control

- **Device Discovery**

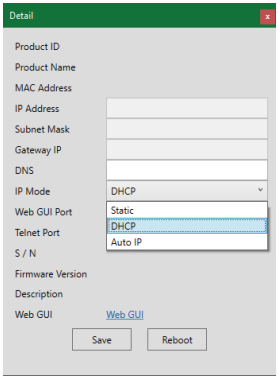
Please obtain the “Device Discovery” software from your authorized dealer and save it in a directory where you can easily find it.

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.



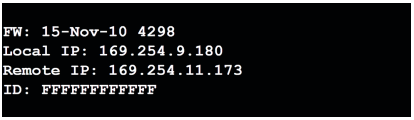
1) **IP Mode:** If you choose, you can alter the static IP network settings for the device, switch the unit into DHCP mode to automatically obtain proper network settings from a local DHCP server, or set it to “Auto IP” to automatically select an APIPA address. Select the preferred mode from the IP mode 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 receivers, 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.

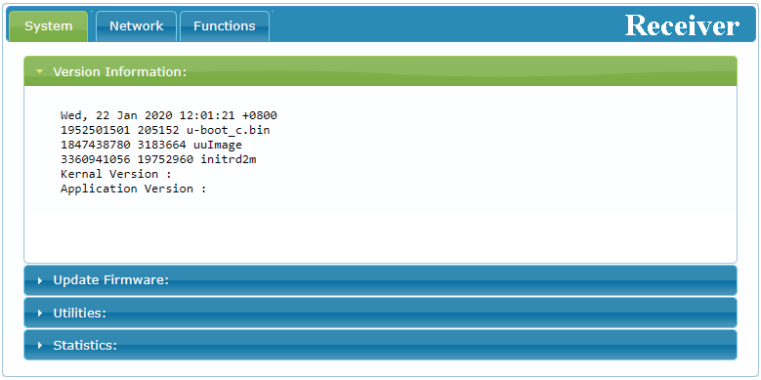


Once you have connected to a unit's WebGUI, you will be presented with a screen containing multiple tabs for each functionality area of the unit. To view the contents of a tab, click on the appropriate button at the top of the window. The individual tabs and functions will be introduced in the following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

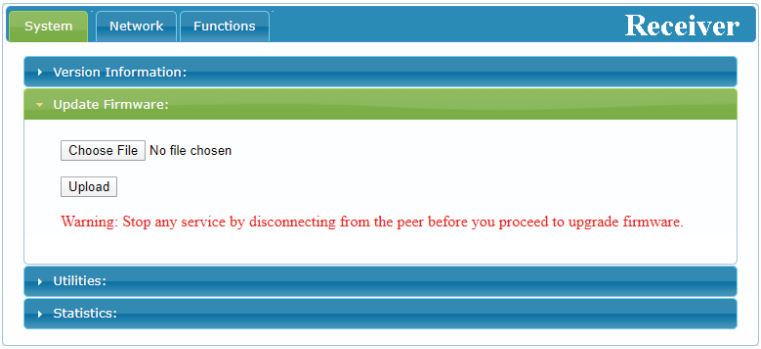
Note: Audio/Video over IP streaming can use a large amount of bandwidth (especially at higher resolutions) and a Gigabit Ethernet network switch with jumbo frame support and IGMP snooping is required. A professional managed switch with VLAN support is strongly recommended. It is strongly suggested to 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, Telnet command entry, and a variety of statistics and information about the operational state of the unit.

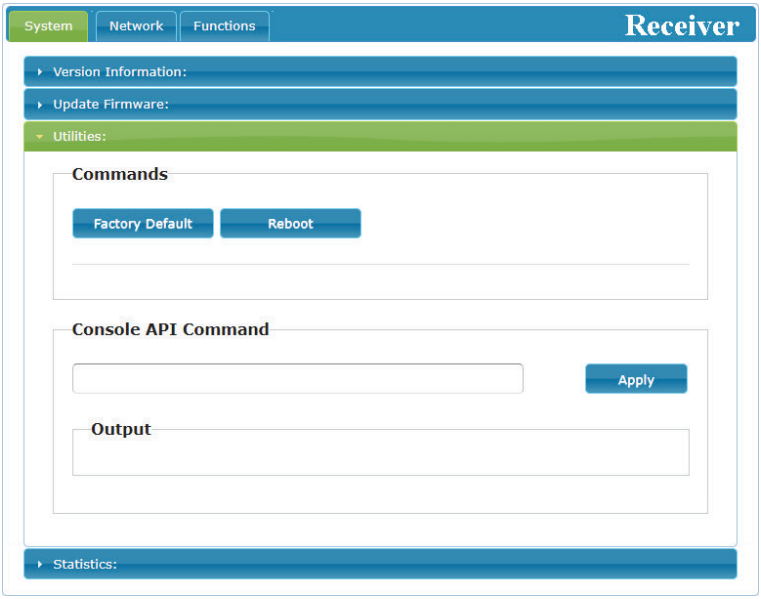


1) **Version Information:** This window displays detailed information about this receiver's current firmware version.



2) **Update Firmware:** Provides a way to update this receiver'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 receivers in this unit has independent firmware and only one should be updated at a time. Please wait for the first receiver 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 receiver back to the factory defaults by clicking this button.
   - **Reboot:** The unit may be rebooted (without resetting settings) by pressing this button.
   - **Console API Command:** Individual Telnet commands may be sent to this receiver 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, broadcast reception mode, link status and link mode.

6.5.2 Network Tab

The Network tab provides control over this receiver'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.

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.

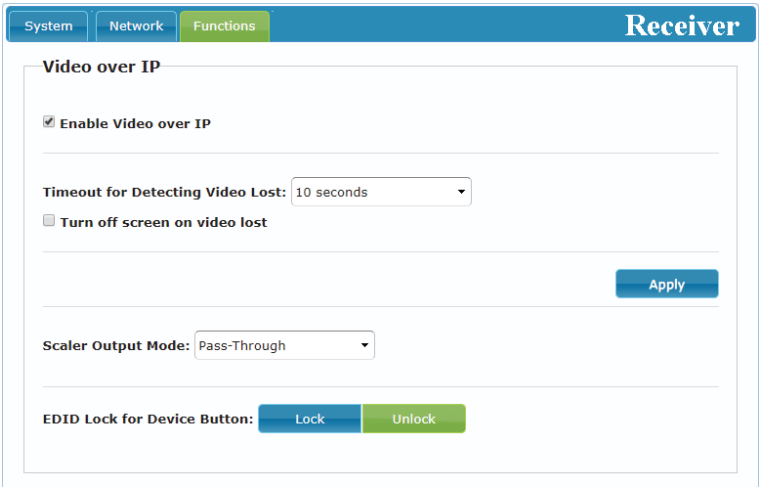
Note: The default network setting for this unit is "Auto IP". If the unit is set to "DHCP" but no DHCP server can be found, the IP mode will temporarily switch to "Auto IP" until the unit is rebooted.

- **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.

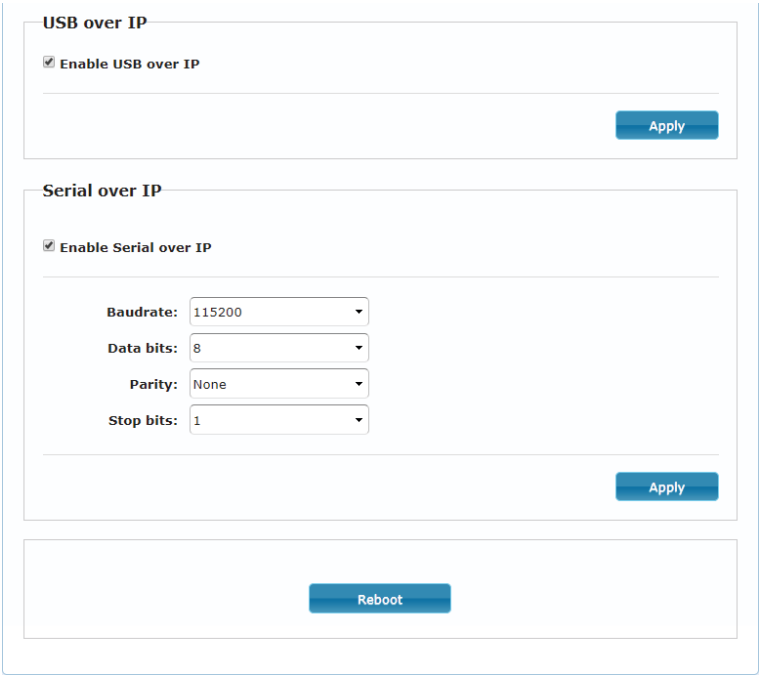
6.5.3 Functions Tab

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



1) **Video over IP:** This section allows control over enabling/disabling the AVoIP stream, the scaler/output resolution, and the behavior upon signal loss.

- **Enable Video over IP:** Unchecking this checkbox will disable the AVoIP stream completely. This option should always remain checked unless troubleshooting is being performed.
- **Video Loss Options:** Use the drop down to set the length of time to wait for a lost source to return before showing the “Link Lost” screen. Available options are: 3, 5, 10, 20, 30, 60 seconds, or Never Timeout. If the “Turn off screen” checkbox is checked, the HDMI output will be completely disabled, including sync, after the timeout time has passed.
- **Scaler Output Mode:** Use the drop down list to select the preferred output resolution for the scaler. Selecting one of the specific resolutions will output all video at that resolution. Selecting “Pass-Through” will output the source video at its original resolution. Selecting “Native” will attempt to scale to the detected native resolution of the display connected to the HDMI output.
- **EDID Lock for Device Button:** Enable or disable the functionality of the front panel EDID buttons**.**



2) **USB over IP (Receiver 1 Only):** This section provides control over the USB over IP extension functionality.
   - Enable USB over IP: Unchecking this checkbox will completely disable support for USB streaming to this unit. This option should generally remain checked, but, if USB support is not required, disabling this feature can save some bandwidth.
3) **Serial over IP (Receiver 1 Only):** This section provides controls for the serial over IP extension functionality, including setting the RS-232 data configuration.
   - **Enable Serial over IP:** Unchecking this checkbox will completely disable support for serial streaming to this unit. This option should generally remain checked, but, if serial support is not required, disabling this feature can save a very small amount of bandwidth.
   - **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
help↵ Show the full command list.
help N1↵ Show details about the specified command. **N1** = {Command}
get_hardware_version↵ Show the receiver's current hardware version.
get_firmware_version↵ Show the receiver's current firmware version.
set_device_name N1↵ Set the receiver's device name. **N1** = {Name} [29 characters max]
get_device_name↵ Show the receiver's current device name.
factory_reset N1↵ Perform a factory reset on the receiver and select the IP Mode to use after the reset completes. Available values for **N1:** 0 [Reset into Static IP mode] 1 [Reset into Auto IP mode]
reboot↵ Reboot the unit.
get_ipconfig↵ Show the receiver's current IP configuration information.

COMMAND Description and Parameters
set_ip_mode N1↵ Set the IP address assignment mode. Available values for **N1:** 0 [Static IP Mode] 1 [DHCP Mode] 2 [Auto IP Mode]
get_ip_mode↵ Show the current IP address assignment mode.
set_ip_address N1↵ Set the receiver's static IP address. **N1** = X.X.X.X [X = 0~255, IP address]
get_ip_address↵ Show the receiver's current IP address.
set_netmask N1↵ Set the receiver's static netmask. **N1** = X.X.X.X [X = 0~255, Netmask]
get_netmask↵ Show the receiver's current netmask.
set_gateway N1↵ Set the receiver's static gateway address. **N1** = X.X.X.X [X = 0~255, Gateway address]
get_gateway↵ Show the receiver's current gateway address.
set_jumbo_mtu N1↵ Enable/disable the receiver's jumbo frame MTU support. Available values for **N1:** 0 [Disabled] 1 [Enabled]

COMMAND Description and Parameters
get_jumbo_mtu↵ Show the receiver's current jumbo frame MTU support status.
set_showme N1↵ Enable/Disable the receiver's discovery "Show Me" feature. Available values for **N1:** 0 [Disabled] 1 [Enabled]
get_showme↵ Show the current state of the receiver's "Show Me" feature.

COMMAND	
Description and Parameters	
set_output_res↵	
Set the receiver's output scaling mode.	
Available values for **N1:**	
0	[640x480 60Hz]
2	[800x600 60Hz]
4	[1024x768 60Hz]
6	[1280x768 60Hz]
7	[1280x800 60Hz]
8	[1280x1024 60Hz]
10	[1360x768 60Hz]
11	[1366x768 60Hz]
12	[1440x900 60Hz]
14	[1400x1050 60Hz]
15	[1600x900 60Hz]
16	[1600x1200 60Hz]
17	[1680x1050 60Hz]
20	[1920x1200 60Hz]
22	[Bypass]
23	[Auto-Detect]
24	[SD (480i) 60Hz]
25	[SD (576i) 50Hz]
26	[SD (480p) 60Hz]
28	[SD (576p) 50Hz]
29	[HD (720p) 60Hz]
31	[HD (720p) 50Hz]
32	[HD (720p) 30Hz]
34	[HD (720p) 25Hz]
35	[HD (1080i) 60Hz]
37	[HD (1080i) 50Hz]
38	[HD (1080p) 60Hz]
40	[HD (1080p) 50Hz]
41	[HD (1080p) 30Hz]
43	[HD (1080p) 25Hz]
44	[HD (1080p) 24Hz]

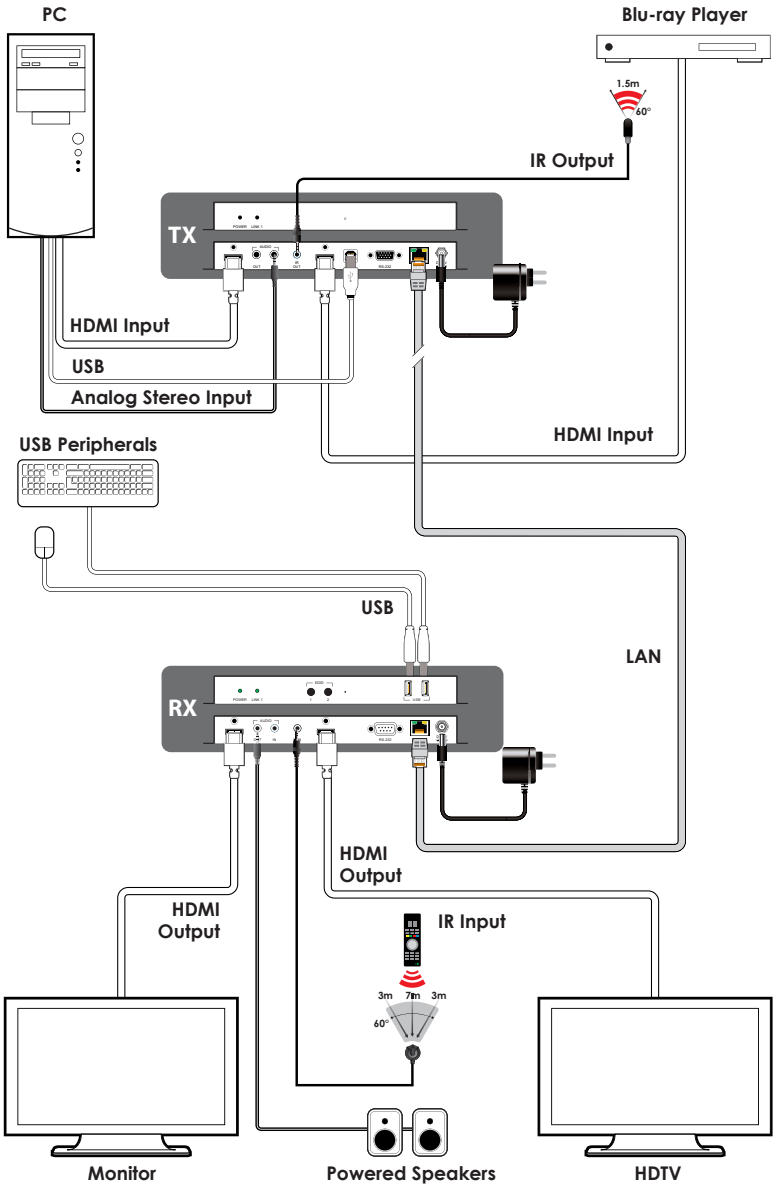
COMMAND Description and Parameters
set_serial_allow↵ Enable/disable serial bypass support. Available values for **N1:** 0 [Disable] 1 [Enable] *Note: Valid on Receiver 1 only.*
get_serial_allow↵ Show the current serial bypass support state. *Note: Valid on Receiver 1 only.*
set_serial_baud N1↵ Set the serial baud rate. Available values for **N1:** 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] *Note: Valid on Receiver 1 only.*
get_serial_baud↵ Show the current serial baud rate. *Note: Valid on Receiver 1 only.*

COMMAND Description and Parameters
set_serial_bits N1↵ Set the number of serial data bits. Available values for **N1:** 0 [5 bits] 1 [6 bits] 2 [7 bits] 3 [8 bits] *Note: Valid on Receiver 1 only.*
get_serial_bits↵ Show the current number of serial data bits. *Note: Valid on Receiver 1 only.*
set_serial_parity N1↵ Set the serial parity bit. Available values for **N1:** 0 [None] 1 [Odd] 2 [Even] *Note: Valid on Receiver 1 only.*
get_serial_parity↵ Show the current serial parity bit setting. *Note: Valid on Receiver 1 only.*
set_serial_stop N1↵ Set the number of serial stop bits. Available values for **N1:** 0 [1 stop bit] 1 [2 stop bits] *Note: Valid on Receiver 1 only.*
get_serial_stop↵ Show the current number of serial stop bits. *Note: Valid on Receiver 1 only.*

COMMAND Description and Parameters
a N1↵ Set the audio input source selection for Receiver 1. Available values for **N1:** D [Transmitter 1's HDMI 1 audio] A [Transmitter 1's Line In audio] AUTO [Auto select] *Note: Valid on Receiver 1 only.*
get_A↵ Show Receiver 1's current audio input source selection. *Note: Valid on Receiver 1 only.*
set_usb_allow N1↵ Enable/disable USB support. Available values for **N1:** 0 [Disabled] 1 [Enabled] *Note: Valid on Receiver 1 only.*
get_usb_allow↵ Show the current USB support state. *Note: Valid on Receiver 1 only.*

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	6.75Gbps
Input Port	1×Analog Mono (3.5mm)
Input/Control Port	1×LAN (RJ-45)
Output Ports	2×HDMI (Type-A) 1×Analog Stereo (3.5mm)
Pass-through Ports	1×IR Extender (3.5mm) 1×RS-232 (DE-9) 2×USB (Type-A)
IR Frequency	30 ~ 50kHz (30 ~ 60kHz under ideal conditions)
Baud Rate	Up to 115200
Power Supply	5V/2.6A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection (HBM)	±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions (W×H×D)	231.5mm×25mm×108mm [Case Only] 231.5mm×25mm×120mm [All Inclusive]
Weight	636g
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	15W

8.2 VIDEO SPECIFICATIONS

Supported Resolutions (Hz)	Input	Output
	Streaming	HDMI
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
	Streaming	HDMI
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

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

8.3.2 Analog Audio

Analog Input	
Max Audio Level	2Vrms
Impedance	10kΩ
Type	Unbalanced

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

8.3.3 AVoIP Audio Availability (Auto Mode)

Connected Audio Sources			Audio Source Output		
HDMI 1 IN (TX)	LINE IN (TX)	LINE IN (RX)	HDMI 1 OUT (RX)	LINE OUT (TX)	LINE OUT (RX)
●			●		●
	■		■		■
●	■		■		■
		▲			
	■	▲	■	▲	■
●	■	▲	■	▲	■

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
High Speed HDMI Cable				
HDMI Input	15m	10m	×	
Ethernet Cable				
Cat.5e/6	100m		×	
Cat.6A/7	100m		×	

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

9. ACRONYMS

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

ACRONYM	COMPLETE TERM
MJPEG	Motion JPEG
MHz	Megahertz
OSD	On-Screen Display
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
VLAN	Virtual LAN
VoIP	Video over IP
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
XGA	Extended Graphics Array
Ω	Ohm

CYPRESS TECHNOLOGY CO., LTD.
www.cypress.com.tw