



IP-7050RX-TG

**1G 4K AV over IP HDMI Receiver with Control Button
Inputs & USB & PoE**

/// OPERATION MANUAL



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Version 1.1

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SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply. Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.
- Do not attach the power supply cabling to building surfaces.
- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.
- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person walk on it.
- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.
- Please completely disconnect the power when the unit is not in use to avoid wasting electricity.

VERSION HISTORY

REV.	DATE	SUMMARY OF CHANGE
RDV1	2022/01/27	Preliminary release
RDV2	2022/06/14	Updated down-conversion details and connection diagram

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1. INTRODUCTION

This unit is part of a 4K UHD Multi-Function Extension system that allows you to extend HDMI or VGA signals along with KVM using the TCP/IP protocol over regular Cat.5e/6/7 network cable. This extender supports the reception of Ultra High-Definition signals (up to 4K@30Hz RGB) with audio and USB up to 100m over a single cable. The transmission distance can be further extended (up to 100m per segment) by using gigabit network switches, allowing the user to cascade the system without signal loss or introducing delay.

When the extension system's units are in multicast mode, a single transmitter's AV signal can be sent to a large number of receivers within the same local network without the additional receivers causing the bandwidth requirements to increase. Additionally, that same multicast signal can be used to create large multi-display video walls with amazing simplicity. When combined with the optional IP Master Controller the functionality of the system expands exponentially. Its centralised web-based interface greatly simplifies control and management of large distributed video matrix or video wall systems adding to their flexibility in large home or commercial installations.

This system also features bi-directional IR and RS-232 pass-through, analogue line level in/out, and a microphone input (on the receiver), providing the user with a variety of audio options. The USB functionality allows the system to act like a remote USB hub which, when combined with the VGA input/output feature, provides a flexible remote KVM platform. Configuration information is provided via On Screen Display (OSD) and control is by WebGUI, IP Master Controller, Telnet, Trigger Buttons, and front panel controls.

2. APPLICATIONS

- /// HDMI, VGA, USB, Audio, IR, and RS-232 extension
- /// Broadcasting a system over a single Cat.5e/6 cable
- /// Multimedia display on a large number of displays via multicast
- /// Hotel or convention center display multi-monitor broadcast
- /// Long distance data and video transmission via cascading
- /// Distributed video matrix system
- /// Distributed video wall system
- /// Remote KVM control of a system

3. PACKAGE CONTENT

- /// 1× UHD Video over IP Receiver
- /// 1× 5V/4A DC Power Adapter
- /// 1× IR Extender Cable
- /// 1× IR Blaster Cable
- /// 1× Power Cord
- /// 1× Operation Manual

4. SYSTEM REQUIREMENTS

- /// HDMI receiving equipment such as an HDTV, monitor, or audio amplifier.
- /// Audio receiving equipment such as headphones, an audio amplifier or powered speakers.
- /// A Gigabit Ethernet network switch with jumbo frame support is required for multi-unit configurations. (8K jumbo frames are strongly recommended.)
- /// A Gigabit Ethernet switch with “IGMP snooping” enabled is required for multicast support.
- /// The use of Premium High Speed HDMI cables, and industry standard Cat.6, Cat.6A, or Cat.7 Ethernet cable is highly recommended.

5. FEATURES

- /// HDMI 2.0 and DVI 1.0 compliant
- /// HDCP 1.4 & 2.2 compliant
- /// 1xHDMI output
- /// Video, audio and control reception over TCP/IP in Unicast (point-to-point) or Multicast (single-to-many) modes
- /// HDMI output resolutions up to 4K@30Hz (RGB, 8-bit)

Note: 4K@50/60Hz (4:2:0) sources are automatically converted to 4K@25/30Hz (RGB) and 4K@50/60Hz (4:4:4) sources are automatically converted to 1080p@50/60Hz (RGB) prior to transmission from the transmitter.

- /// Supports extension of many audio formats including 8 channel LPCM and standard Bitstream

Note: The optical output only supports LPCM 2.0 & Bitstream sources and the Line Out only supports LPCM 2.0 sources.

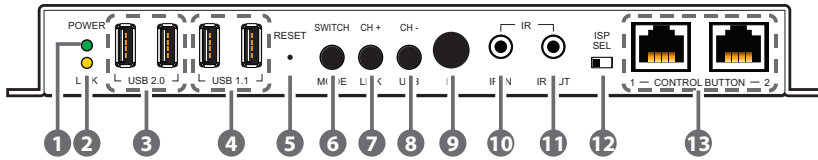
- /// Supports independent breakaway A/V and control matrix routing
- /// Multi-monitor video wall support with 180° and 270° rotation options
- /// The Mic In sends audio directly to the analogue Line Out on the currently routed transmitter

Note: Only available when the transmitter also has its Line In connected.

- /// May be powered directly by PoE when connected to a Gigabit Ethernet switch that provides PoE (802.3af)
- /// Includes 3 LAN ports, allowing multiple receivers to be daisy chained without the need for an external Gigabit Ethernet switch
- /// Supports USB keyboard, mouse and storage extension
- /// Supports IR and RS-232 bypass
- /// Supports the use of 2 external Trigger Buttons to control streaming channel selection (Optional, not included)
- /// Supports the use of an external control center (IP Master Controller) to provide expanded functionality (Contact your authorised dealer for more information)
- /// Basic control via front panel buttons and external Trigger Buttons, or can be fully controlled via WebGUI, IP Master Controller, and Telnet

6. OPERATION CONTROLS AND FUNCTIONS

6.1 Transmitter's 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 LED: If the receiver has no network connection the LINK LED will not illuminate. While the receiver is attempting to establish a connection with a transmitter the LINK LED will flash. When the receiver has established a stable connection with a transmitter the LINK LED will illuminate solidly.

3 USB 2.0 (Type-A) Ports: These 2 USB 2.0 slots provide connections for USB devices requiring higher transfer speeds such as thumb drives.

Note: Isochronous (steady streaming) data devices such as USB cameras and external hard drives are not supported.

4 USB 1.1 (Type-A) Ports: These 2 USB 1.1 slots provide connections for slower USB devices such as keyboards, mice, etc.

Note: Isochronous (steady streaming) data devices such as USB cameras and external hard drives are not supported.

5 RESET Pinhole: Press this recessed button to reset the unit's power supply and reboot the unit

Note: Settings will not be reset.

6 SWITCH/MODE Button: This button controls the following functions:

- **Switch Input:** Press this button momentarily to switch between the available video inputs on the currently routed transmitter.

Note: Due to the nature of streaming video and HDCP, the switch may take up to 6–10 seconds to complete.

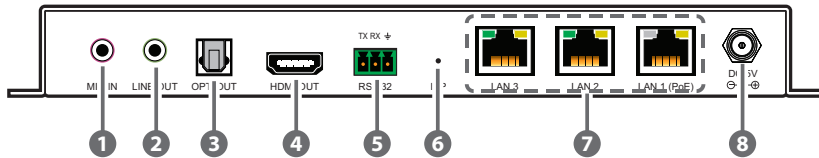
- **Video Mode:** Press this button momentarily to toggle the currently routed transmitter's video data streaming method between "Graphic" and "Video" modes. "Graphic" mode is optimised for high-detail static displays and "Video" mode is optimised for full motion video.

- 7 CH+/LINK Button:** This button controls the following functions:
- **Channel +:** Press this button momentarily to increase the streaming channel to the next available channel on the local network.
Note: If no other channels are detected, the channel number will not change.
 - **Video Link:** Press and hold the button for 3 seconds to enable or disable the Video Link. When the link is disabled and the receiver is connected to a display it will show the system's current IP and firmware information.
 - **Reset to Factory Defaults:** Press and hold this button when powering the unit on until both the POWER and LINK lights are blinking. Once both lights are blinking you can reboot the unit and all settings will be returned to the factory defaults (Including resetting the IP mode to auto, streaming channel to 0, and the streaming mode to multicast). A new IP address will be assigned automatically within the 169.254.xxx.xxx address range.
- 8 CH-/USB Button:** This button controls the following functions:
- **Channel -:** Press this button momentarily to decrease the streaming channel to the previous available channel on the local network.
Note: If no other channels are detected, the channel number will not change.
 - **USB:** Press and hold the button for 3 seconds to enable/disable the USB connection between this receiver and the currently routed transmitter. (Multicast Mode ONLY)
Note: In Multicast Mode is it only possible to provide USB support to a single receiver at a time. Enabling USB on one receiver will disable it on all other multicast receivers on the same channel.
- 9 IR Window:** Accepts IR signals from any standard remote control and sends the signal to the IR Out on the associated transmitter.
- 10 IR IN Port:** Connect to the provided IR Extender to extend the IR control range of remotely located devices. Ensure that the remote being used is within direct line-of-sight of the IR Extender.
- 11 IR OUT Port:** Connect to the provided IR Blaster to transmit IR signals from the associated transmitter to devices within direct line-of-sight of the IR Blaster.
- 12 ISP SEL Switch:** This is for factory use only.

Note: By default this is set to the right (towards the Control Button ports) and allows normal RS-232 functionality. Setting this switch to the left enables ISP engineering mode.

- 13 CONTROL BUTTON 1~2 Ports:** Connect to dedicated Trigger Buttons (Optional, not included) which are used to change the currently selected streaming channel. Pressing button 1 increases the channel and pressing button 2 decreases it.

6.2 Transmitter's Rear Panel



- 1 MIC IN Port:** Connect to an analogue microphone using a 3.5mm plug. This audio will be sent to the analogue audio output on the currently routed transmitter. (Unicast mode ONLY)
Note: The Mic In audio channel back to the transmitter is only active when an analogue source is also connected to the Line In port on the transmitter.
- 2 LINE OUT Port:** Outputs stereo audio from the currently routed transmitter (LPCM 2.0 sources only). Connect to powered speakers or an amplifier for stereo analogue audio output.
- 3 OPT OUT Port:** Outputs audio from the currently routed transmitter (LPCM 2.0 & Bitstream sources only). Connect to powered speakers or an amplifier for stereo analogue audio output.

- 4 HDMI OUT Port:** Connect to HDMI TVs, monitors or amplifiers for digital video and audio output.

- 5 RS-232 3-pin Terminal Block:** Connect to a PC, laptop, or serial controllable device with a 3-pin adapter cable for the extension of RS-232 signals to the currently routed receiver. The baud rate is configurable, but the default baud rate is 115200.

Note: When the transmitter is in multicast mode every connected receiver unit can send RS-232 commands to the transmitter and commands sent from the transmitter side will be sent to all associated receivers.

- 6 ISP Pinhole:** This is for factory use only.

- 7 LAN 1 (PoE) ~3 Ports:** Connect via a Gigabit Ethernet switch to compatible transmitters to receive video and data, or to a PC/laptop to control the unit via WebGUI.

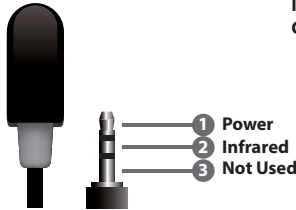
Note: This unit can be powered directly by the connected Gigabit Ethernet switch if it provides PoE (802.3af). Only LAN 1 port supports PoE. Daisy chaining additional receivers using LAN 1, 2, or 3 is also possible.

- 8 DC 5V Port:** Plug the 5V DC power adapter into the unit and connect it to an AC wall outlet for power.

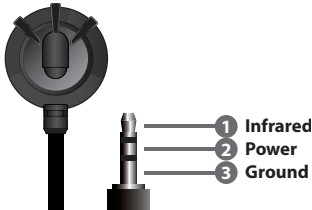
Note: Optional, not needed if the unit is powered via PoE.

6.3 IR Cable Pinouts

IR Blaster Cable



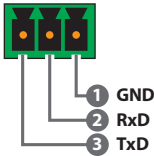
IR Extender Cable



6.4 Serial Pinout and Defaults

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

3-pin Terminal Block



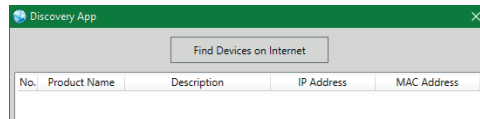
6.5 WebGUI Control

Device Discovery

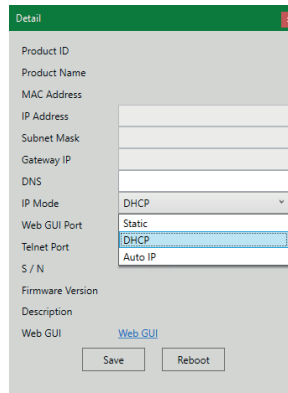
Please obtain the “Device Discovery” software from your authorised dealer and save it in a directory where you can easily find it.

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

Note: This unit defaults to Auto IP mode. The current IP address can be verified via the receiver’s OSD if the Device Discovery software is not available.



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



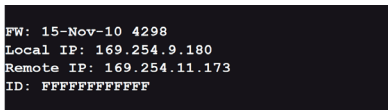
- 1) **IP Mode:** If you choose, you can alter the static IP network settings for the device, or switch the unit into DHCP mode to automatically obtain proper network settings from a local DHCP server. To switch to DHCP mode, please select DHCP from the IP mode drop-down, then click “Save” followed by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

WebGUI Overview

All major functions of the unit, including status, streaming method, streaming channel selection, output resolution, video wall configuration, EDID management, Ethernet settings, and reset/firmware functions are controllable via multiple tabs in the WebGUI interface allowing for reasonably intuitive operation.

Each transmitter, receiver, or transceiver is controlled by its 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. On a transceiver unit, the IP address of a unit can be obtained simply by checking the information screen within the OSD menu, accessed by pressing the menu button.

On stand-alone transmitters/receivers you can discover the IP address by checking the status OSD that is displayed when there is no live video source or no live link. Breaking the link is accomplished by pressing and holding the “LINK” button on the front of the unit for 3 seconds (The LINK light will blink rapidly, then turn off). Once the link is broken, each connected receiver 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 (channel 0 by default). After obtaining the IP address information, press and hold the “LINK” button again for 3 seconds to return the unit to normal operation (The LINK light will light up solid yellow).



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

After connecting to a unit’s WebGUI, you will find a screen containing multiple tabs for each functionality area of the unit. The individual tabs and functions will be introduced in the following sections.

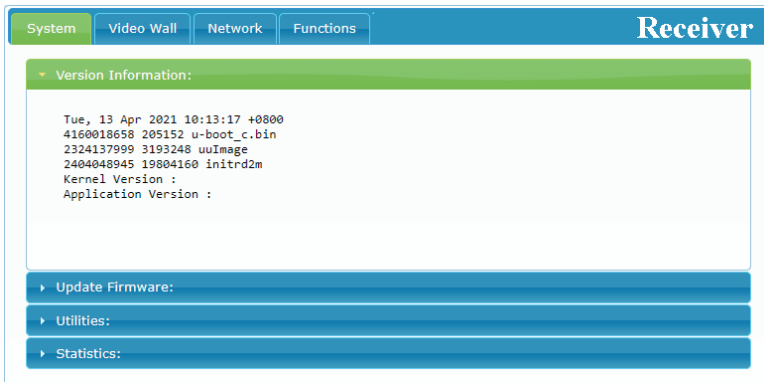
Note: AVoIP streaming uses a large amount of bandwidth (especially at higher resolutions) and a Gigabit Ethernet network switch with jumbo frame support and IGMP snooping is required. A professional managed switch with VLAN support is strongly recommended. Please note that most consumer-grade routers are not able to handle the high traffic rates generated by multicast mode, so using a router directly as your network switch is discouraged. 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.

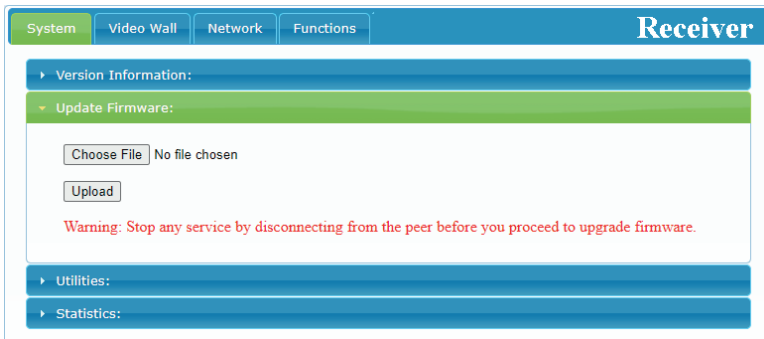
6.5.1 System Tab

The System tab contains 4 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 the current firmware version.



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



- 3) **Utilities:** The Utilities window allows users to reset the unit back to the factory defaults by clicking “Factory Default”. The unit may be rebooted (without resetting settings) by pressing the “Reboot” button.

Note: Enable Log Messages is for troubleshooting purposes and should only be checked if instructed to do so by technical support.

The screenshot displays the 'Receiver' web interface. At the top, there is a navigation bar with tabs for 'System' (highlighted in green), 'Video Wall', 'Network', and 'Functions'. The main content area is titled 'Receiver' and contains several expandable sections: 'Version Information:', 'Update Firmware:', and 'Utilities:'. The 'Utilities:' section is expanded, revealing a 'Commands' area with a checkbox for 'Enable Log Message' and two buttons: 'Factory Default' and 'Reboot'. Below this is a 'Console API Command' section with a text input field and an 'Apply' button. At the bottom of this section is an 'Output' text area. A 'Statistics:' section is partially visible at the very bottom of the interface.

Finally, individual Telnet commands may be sent to the unit by using the “Console API Command” text entry field and pressing “Apply”. Any responses from the unit will be displayed in the “Output” field.

- 4) **Statistics:** The Statistics window shows all available information about the operational status of the unit, including current Host ID Name, serial number, Ethernet information, MAC address, unicast/multicast mode, link status and mode.

SystemVideo WallNetworkFunctionsReceiver

▸ Version Information:

▸ Update Firmware:

▸ Utilities:

▸ Statistics:

State Machine

State: s_srv_on

Network

ID (Host Name):

IP Address: 192.168.10.147

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.10.1

MAC Address:

Casting Mode: Unicast Mode

Link Status: on

Link Mode: 1G

S/N:

6.5.2 Video Wall Tab

The Video Wall tab allows user to design, edit and manipulate a video wall system created using multiple receiver units connected to identical displays. The bezel and video size of the displays being used, as well as the horizontal and vertical monitor count, is defined here. Video stretch and rotation can also be controlled on this tab. Receivers in the video wall's group (all receivers sharing the same channel) can be controlled by any other unit within the same group.

Note: The Video Wall tab is accessible on both transmitters and receivers, however video wall settings may only be applied to receiver units.

System
Video Wall
Network
Functions
Receiver

Basic Setup:

Bezel and Gap Compensation

OW:
0

OH:
0

VW:
0

VH:
0

Apply To: "All" device(s) in the list

All

Apply

Wall Size and Position Layout

Vertical Monitor Count:
2

Horizontal Monitor Count:
2

Row Position:
0

Column Position:
0

Preferences

Stretch Type:
Fit In

Clockwise Rotate:
0

Apply To: "This" device connected by your browser

This

Apply

☐ Show OSD

When saving changes on the Video Wall tab, remember to select the appropriate "Apply To:" target unit before pressing the "Apply" button. To make changes to the unit you are currently connected to, select "This" as the target. Otherwise, select the IP address of the receiver (client) you want to apply changes to from the "Apply To:" drop down or select "All" to send the changes to all receivers in the group.

Note: While it is possible to create small video walls using unicast mode, in order to more efficiently use the available network bandwidth, it is strongly recommended to only use multicast mode when creating video walls.

- 1) Bezel and Gap Compensation:** This section of the Video Wall tab is used to define the physical dimensions of each display being used in the video wall. Accurate measurements are needed of the monitor's outer frame (OW, OH) and the video screen (VW, VH). The measurements may be made using any unit format (inches, mm, cm, etc.) as long as ALL measurements in the same wall are made using the exact same units and the numbers are integers.

Bezel and Gap Compensation

OW:

OH:

VW:

VH:

UNIT: 0.1mm

Apply To: "All" device(s) in the list

All

Apply

- **OW (Outer Width):** This is the horizontal measurement of the display's outer case.
- **OH (Outer Height):** This is the vertical measurement of the display's outer case.
- **VW (Video Width):** This is the horizontal measurement of the display's video screen.
- **VH (Video Height):** This is the vertical measurement of the display's video screen.

Note: Typically all monitors in a video wall are identical and have the same dimensions, but it is possible to use differently sized displays as long as the same measurement units are used to measure each display and the displays are still arranged in a normal rectangular layout with corners meeting at the same place.

- **Apply To:** Select which unit(s) to send updated settings to when “Apply” is pressed.
 - Selecting “All” will direct updates to the video wall settings of all receivers in the current video wall group.
 - Selecting “This” will direct updates to the video wall settings of the unit whose WebGUI you are currently connected to.
 - Selecting an IP address from the “Clients” list will direct updates to the video wall settings of the receiver with that IP address.

- 2) **Wall Size and Position Layout:** This section of the Video Wall tab is used to define the number of displays used in the video wall as well as the location of the specific display within the video wall. A typical video wall consists of an equal number of horizontal and vertical monitors (for example: 2x2 or 3x3), however it is possible to create video walls using this system with a wider variety of dimensions as long as the end result is still a rectangle (for example: 5x1 or 2x3). Both horizontal and vertical dimensions are limited to a maximum of 16 displays.

Wall Size and Position Layout

Vertical Monitor Count:

2

Horizontal Monitor Count:

2

Row Position:

0

Column Position:

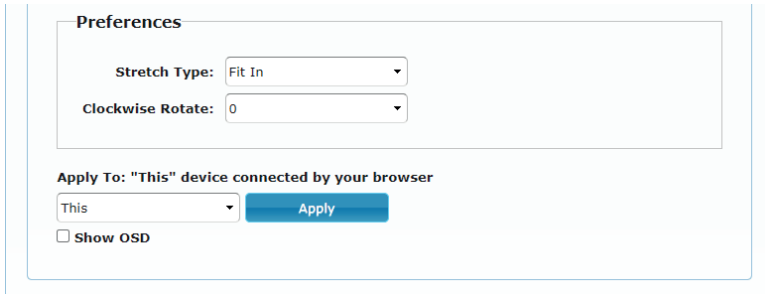
0

UNIT: Panel

- **Vertical Monitor Count:** Define the number of displays in the video wall, measured vertically. (Maximum is 16 displays)
- **Horizontal Monitor Count:** Define the number of displays in the video wall, measured horizontally. (Maximum is 16 displays)
- **Row Position:** Set the vertical location of the currently controlled display. (Counts top to bottom, from 0 to 15)

■ **Column Position:** Set the horizontal location of the currently controlled display. (Counts left to right, from 0 to 15)

- 3) **Preferences:** This section of the Video Wall tab provides additional controls over how the source video is displayed on the video wall as well as providing a drop down to determine which receiver to apply changed settings to.



Preferences

Stretch Type: Fit In

Clockwise Rotate: 0

Apply To: "This" device connected by your browser

This Apply

☐ Show OSD

■ **Stretch Type:** Set the video stretch method.

- Selecting "Fit In" will expand the video to exactly fit the dimensions of the video wall regardless of the source's original aspect ratio.
- Selecting "Stretch Out" will zoom the video until the video wall is filled in all 4 dimensions while maintaining the aspect ratio of the original source.

■ **Clockwise Rotate:** Set the rotation of the video output to 0, 180 or 270 degrees.

■ **Apply To:** Select which unit(s) to send updated settings to when "Apply" is pressed.

- Selecting "This" will direct updates to the video wall settings of the unit whose WebGUI you are currently connected to.
- Selecting an IP address from the "Clients" list will direct updates to the video wall settings of the receiver with that IP address.

■ **Show OSD:** Enables or disables the OSD display of the current channel selection.

Note: When setting up a new video wall, or changing the configuration of an existing one, remember to update the configuration of each receiver in the system.

6.5.3 Network Tab

The Network tab provides controls over the receiver's broadcast reception channel, IP configuration, and network broadcast mode. 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 access will also change accordingly. If the new address is assigned via "Auto IP" or "DHCP" it might be necessary to temporarily disable the Video Link between the receiver and transmitter in order to display the units' new IP addresses on the receiver's HDMI output. Press and hold the LINK button for 3 seconds to enable or disable the Video Link.

SystemVideo WallNetworkFunctionsReceiver

Channel Setup

Channel Selection: 0

Apply

IP Setup

IP Mode: Auto IPDHCPStatic

IP Address: 169.254.xxx.xxx (Auto)

Subnet Mask: 255.255.0.0

Default Gateway: 192.168.1.254

Find Your Device: Hide MeShow Me

Apply

Casting Mode

MulticastUnicast

Apply

Reboot

- 1) **Channel Setup:** Use the dropdown to select the broadcast reception channel for the receiver. The receiver will display the video stream from the transmitter using the selected broadcast channel. The available channel range is from 0 to 255.
- 2) **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”.

■ **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.

- 3) **Casting Mode:** Allows for the selection of the network broadcast mode supported by the receiver. Click the “Apply” button to save changes made to the broadcast mode.

Note: Receivers must be set to the same mode as the transmitter in order to receive video.

■ **Multicast:** This mode sends a single video stream that can be viewed simultaneously by multiple receivers without increasing bandwidth usage. This mode is ideal for video wall or matrixing scenarios. Multicast mode requires a network switch with IGMP snooping enabled.

Note: The 3 port network switch built into the receiver units supports IGMP snooping and may be used to distribute a multicast stream.

■ **Unicast:** This mode uses a discrete video stream for every connected receiver and is ideal for simple, point-to-point, streaming setups. This mode uses considerably more bandwidth than Multicast Mode when multiple receivers are being used, however it does not require a network switch that supports IGMP snooping.

6.5.4 Functions Tab

The Functions tab provides control over the receiver's output resolution, video loss settings, as well as a wide variety of optional features and functions, including USB and serial control extension. Changes made to these settings typically require a reboot of the unit. After clicking on "Apply" please follow the reboot instructions in the WebGUI, if necessary.

- 1) **Video over IP:** This section allows control over many critical functions of the receiver including: enabling/disabling the VoIP stream, controlling the scaler/output resolution, controlling the behavior upon signal loss, and controlling the front panel button locks.

The screenshot shows the 'Receiver' WebGUI interface with the 'Functions' tab selected. The 'Video over IP' section contains the following controls:

- ☒ **Enable Video over IP**
- ☒ **Copy EDID from this Video Output** (Default disabled under multicast mode)
- Timeout for Detecting Video Lost:** 10 seconds (dropdown menu)
- ☐ **Turn off screen on video lost**
- Scaler Output Mode:** HD(1080p)@60 (dropdown menu)
- Video Select Lock for Device Button:** Lock (blue button) / Unlock (green button)
- Video Channel Lock for Device Button:** Lock (blue button) / Unlock (green button)
- Apply** button

- **Enable Video over IP:** Unchecking this checkbox will disable the VoIP stream completely. This option should always remain checked unless troubleshooting is being performed.
- **Copy EDID:** When multiple receivers are connected to a single transmitter in multicast mode, this check box selects which of the receivers should send its EDID to the transmitter for use with the source.

Note: This option is only available in multicast mode. Only one receiver within the same streaming group should have this checked at a time to avoid conflicts.

- **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 receiver's 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.
 - **Front Panel Button Locks:** Locks or unlocks the ability to change the associated functions using their front panel buttons.
- 2) **USB over IP:** This section provides controls for the USB over IP extension functionality, including enabling/disabling USB support, changing the USB operational mode, and enabling special compatibility modes.

USB over IP

☒ **Enable USB over IP**

Operation Mode:

☒ **Auto select mode** (Recommended, choose per network casting mode)
☐ **Active on link** (Unicast network's default mode)
☐ **Active per request** (Multicast network's default mode)

Compatibility Mode:

☐ **K/M over IP** (Uncheck when mouse/keyboard/touch panel not working as expected)

[Apply](#)

- **Enable USB over IP:** Unchecking this checkbox will completely disable support for USB over this stream. This option should generally remain checked, but, if USB support is not required, disabling this feature can save some bandwidth.
- **Operation Mode:** Sets the USB extension mode. Available options are Auto, Active on link (Unicast optimised), and Active per request (Multicast optimised). Auto mode is set by default and will automatically select the correct mode depending on the broadcast mode of the unit.

- **Compatibility Mode:** These troubleshooting options enable specialised optimizations to solve issues when a mouse or touch panel is not responding properly. They should normally be left unchecked.

3) **Serial over IP:** This section provides controls for the Serial over IP extension functionality, including enabling/disabling serial support and setting the RS-232 data configuration.

Serial over IP

☒ Enable Serial over IP

Baudrate: 115200

Data bits: 8

Parity: None

Stop bits: 1

Apply

Reboot

- **Enable Serial over IP:** Unchecking this checkbox will completely disable support for sending RS-232 commands over this stream. 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.

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: This unit defaults to Auto IP mode. The current IP address can be verified via the unit's OSD if the Device Discovery software is not available. The default communication port is 23.

6.7 Telnet Commands

COMMAND	
Description and Parameters	
help ↵	Show the full command list.
help N1 ↵	Show help details about command N1 . N1 = {Any command name}
get_ipconfig ↵	Show the current IP configuration.

COMMAND	
Description and Parameters	
set_ip_mode N1 ↵	
Set the IP configuration mode.	
Available values for N1 :	
0	[Static IP Mode]
1	[DHCP Mode]
2	[Auto IP Mode]
get_ip_mode ↵	
Show the current IP configuration mode.	
set_ip_address N1 ↵	
Set the static IP address.	
N1 = X.X.X.X	[X = 0~255, IP address]
get_ip_address ↵	
Show the current IP address.	
set_netmask N1 ↵	
Set the Ethernet netmask.	
N1 = X.X.X.X	[X = 0~255, Netmask]
get_netmask ↵	
Show the current Ethernet netmask.	
set_gateway N1 ↵	
Set the IP gateway address.	
N1 = X.X.X.X	[X = 0~255, Gateway address]
get_gateway ↵	
Show the current gateway address.	

COMMAND	
Description and Parameters	
set_net_mode N1 ↵	
Set the network broadcast mode.	
Available values for N1 :	
0	[Unicast Mode]
1	[Multicast Mode]
get_net_mode ↵	
Show the current network broadcast mode.	
set_jumbo_mtu N1 ↵	
Enable/disable the jumbo frame MTU.	
Available values for N1 :	
0	[Disabled]
1	[Enabled]
get_jumbo_mtu ↵	
Show the jumbo frame MTU state.	
get_hardware_version ↵	
Show the current hardware version.	
factory_reset N1 ↵	
Perform a factory reset on the unit and select the IP mode after the reset completes.	
Available values for N1 :	
0	[Reset into Static IP mode]
1	[Reset into Auto IP mode]
reboot ↵	
Reboot the unit.	

COMMAND											
Description and Parameters											
set_edid_copy N1↵	Copy and use the EDID of the connected display. Available values of N1: <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]										
get_edid_copy↵	Show the state of the EDID copy function.										
set_rx_channel N1 {N2}↵	Select a content type from the specified AVoIP transmission channel to receive for output or select all content from that channel. N1 = 0~255 [Transmission channel] Available values for N2: <table> <tr> <td>V</td><td>[Video content]</td></tr> <tr> <td>A</td><td>[Audio content]</td></tr> <tr> <td>U</td><td>[USB content]</td></tr> <tr> <td>S</td><td>[Serial data content]</td></tr> <tr> <td>I</td><td>[IR content]</td></tr> </table> <i>Note: If N2 is omitted, all content types will be received.</i>	V	[Video content]	A	[Audio content]	U	[USB content]	S	[Serial data content]	I	[IR content]
V	[Video content]										
A	[Audio content]										
U	[USB content]										
S	[Serial data content]										
I	[IR content]										
get_rx_channel↵	Show the currently selected VoIP transmission channel.										

COMMAND

Description and Parameters

set_output_res N1 ←

Set the output resolution.

Available values for **N1**:

0	[640×480@60Hz]
2	[800×600@60Hz]
4	[1024×768@60Hz]
6	[1280×768@60Hz]
7	[1280×800@60Hz]
8	[1280×1024@60Hz]
10	[1360×768@60Hz]
11	[1366×768@60Hz]
12	[1440×900@60Hz]
14	[1400×1020@60Hz]
15	[1600×900@60Hz]
16	[1600×1200@60Hz]
17	[1680×1050@60Hz]
20	[1920×1200@60Hz]
22	[Bypass]
23	[Auto-Detect]
24	[480i@60Hz]
25	[576i@50Hz]
26	[480p@60Hz]
28	[576p@50Hz]
29	[720p@60Hz]
31	[720p@50Hz]
32	[720p@30Hz]
34	[720p@25Hz]
35	[1080i@60Hz]
37	[1080i@50Hz]
38	[1080p@60Hz]
40	[1080p@50Hz]
41	[1080p@30Hz]
43	[1080p@25Hz]
44	[1080p@24Hz]
47	[2160p@24Hz]

COMMAND	
Description and Parameters	
48	[2160p@25Hz]
49	[2160p@30Hz]
<i>Note: Downscaling is limited to 1/2 of the horizontal/vertical pixels of the source. For example: 3840×2160 (4K) to 1920×1080 (1080p) is OK, but 3840×2160 (4K) to 1280×720 (720p) or 640×480 is not. When outputting to a video wall, the resolution of the entire video wall together (rather than each individual display) should be used for this calculation.</i>	
set_vw N1↵	
Enable/disable video wall functionality.	
Available values for N1 :	
0	[Disable]
1	[Enable]
get_vw↵	
Show video wall functionality status.	
set_vw_osd N1	
Enable/disable video wall OSD to display the target receiver number on the connected display.	
Available value for N1 :	
0	[Disable]
1	[Enable]
get_vw_osd↵	
Show the current video wall OSD state.	
set_vw_layout N1 N2↵	
Set the video wall's total horizontal and vertical display count.	
N1 = 1~16	[Horizontal display count]
N2 = 1~16	[Vertical display count]

COMMAND	
Description and Parameters	
get_vw_layout ↵	Show the video wall's total horizontal and vertical display count.
set_vw_pos N1 N2 ↵	Set the position within the video wall of the display connected to this receiver. (Cannot exceed the video wall's horizontal and vertical display count.) N1 = 0~15 [Row] N2 = 0~15 [Column]
get_vw_pos ↵	Show the position within the video wall of the display connected to this receiver.
set_vw_bc N1 N2 N3 N4 ↵	Set the video wall bezel compensation values for the display connected to this receiver. N1 = 0~99999 [Video width] N2 = 0~99999 [Total display width] N3 = 0~99999 [Video height] N4 = 0~99999 [Total display height]
get_vw_bc ↵	Show the video wall bezel compensation values for the display connected to this receiver.
set_vw_hscale N1 ↵	Set the horizontal zoom amount of the display connected to this receiver. N1 = 0~99999 [Zoom amount in 1 pixel units]

COMMAND									
Description and Parameters									
get_vw_hscale ↵	Show the horizontal zoom amount of the display connected to this receiver.								
set_vw_vscale N1 ↵	Set the vertical zoom amount of the display connected to this receiver. N1 = 0~99999 [Zoom amount in 1 pixel units]								
get_vw_vscale ↵	Show the vertical zoom amount of the display connected to this receiver.								
set_vw_shift N1 N2 ↵	Set the video output shift of the display connected to this receiver. Available values for N1: <table> <tr> <td>U</td><td>[Shift up]</td></tr> <tr> <td>D</td><td>[Shift down]</td></tr> <tr> <td>L</td><td>[Shift left]</td></tr> <tr> <td>R</td><td>[Shift right]</td></tr> </table> N2 = 0~80000 [Pixel shift. Must be in increments of 8]	U	[Shift up]	D	[Shift down]	L	[Shift left]	R	[Shift right]
U	[Shift up]								
D	[Shift down]								
L	[Shift left]								
R	[Shift right]								
get_vw_shift ↵	Show the video output shift of the display connected to this receiver.								
set_vw_delay N1 ↵	Set the video delay of the display connected to this receiver. N1 = 0~99999 [Delay in microseconds]								
get_vw_delay ↵	Show the video delay of the display connected to this receiver.								

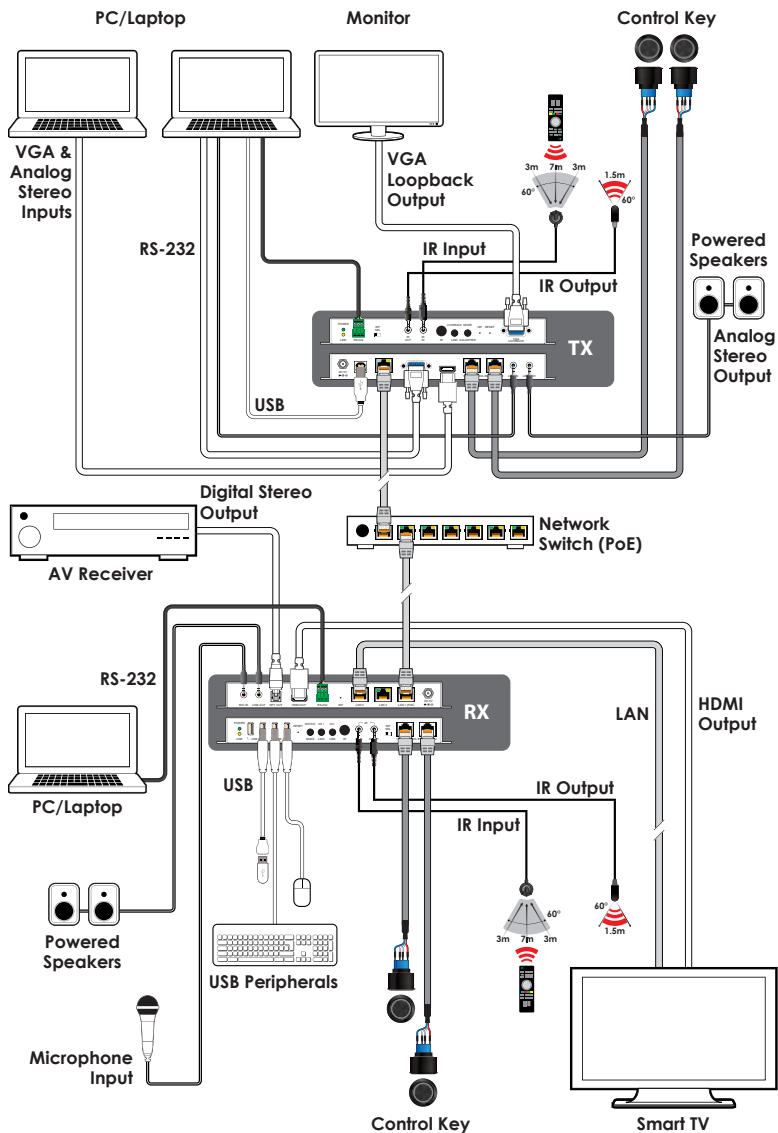
COMMAND	
Description and Parameters	
set_rx_id N1 ↵	
Set the unit's receiver Group ID.	
Available values for N1 :	
0	[Disabled]
1	[Group 1]
2	[Group 2]
get_rx_id ↵	
Show the unit's current receiver Group ID.	
set_serial_allow N1 ↵	
Enable/disable serial bypass support.	
Available values for N1 :	
0	[Disabled]
1	[Enabled]
get_serial_allow ↵	
Show the current serial bypass support state.	
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]

COMMAND	
Description and Parameters	
get_serial_baud ↵	
Show the current serial baud rate.	
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]
get_serial_bits ↵	
Show the current number of serial data bits.	
set_serial_parity N1 ↵	
Set the serial parity bit.	
Available values for N1 :	
0	[None]
1	[Odd]
2	[Even]
get_serial_parity ↵	
Show the current serial parity bit.	
set_serial_stop N1 ↵	
Set the serial stop bits.	
Available values for N1 :	
0	[1 bit]
1	[2 bits]
get_serial_stop ↵	
Show the current serial stop bits.	

COMMAND	
Description and Parameters	
set_usb_allow N1 ↵	
Enable/disable USB support.	
Available values for N1 :	
0	[Disabled]
1	[Enabled]
get_usb_allow ↵	
Show current USB support state.	
video_source_hdmi ↵	
Select HDMI as the video input source for the currently routed transmitter.	
video_source_vga ↵	
Select VGA as the video input source for the currently routed transmitter.	

*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
Input Port	1×Mono Audio (3.5mm)
Input/Bypass/Control Ports	3×LAN (RJ-45)
Output Ports	1×HDMI (Type-A) 1×Stereo Audio (3.5mm) 1×Optical Audio (TOSLINK)
Pass-through Ports	1×IR Extender (3.5mm) 1×IR Blaster (3.5mm) 1×RS-232 (3-pin Terminal Block) 2×USB 2.0 (Type-A) 2×USB 1.1 (Type-A)
Control Ports	2×Control Button (RJ-45)
IR Frequency	30 ~ 50kHz (30 ~ 60kHz under ideal conditions)
Baud Rate	Up to 115200
Power Supply	5V/4A DC (US/EU standards, CE/FCC/UL certified)
PoE Support	802.3af minimum
ESD Protection (HBM)	±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions (W×H×D)	231.5mm×108mm×25mm [Case Only] 231.5mm×115mm×25mm [All Inclusive]
Weight	700g
Chassis Material	Metal (Aluminum)
Chassis Colour	Black
Operating Temperature	0°C – 50°C/32°F – 122°F
Storage Temperature	-20°C – 60°C/-4°F – 140°F
Relative Humidity	20 – 90% RH (Non-condensing)
Power Consumption	21.78W

8.2 Video Specifications

Supported Resolutions (Hz)	Input	Output
	AVoIP	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	✓	✓

Supported Resolutions (Hz)	Input	Output
	AVoIP	HDMI
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	✗	✗

8.3 Audio Specifications

8.3.1 Digital Audio

AV over IP 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

S/PDIF Output	
LPCM	
Max Channels	2 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
Supported Formats	Standard

8.3.2 Analogue Audio

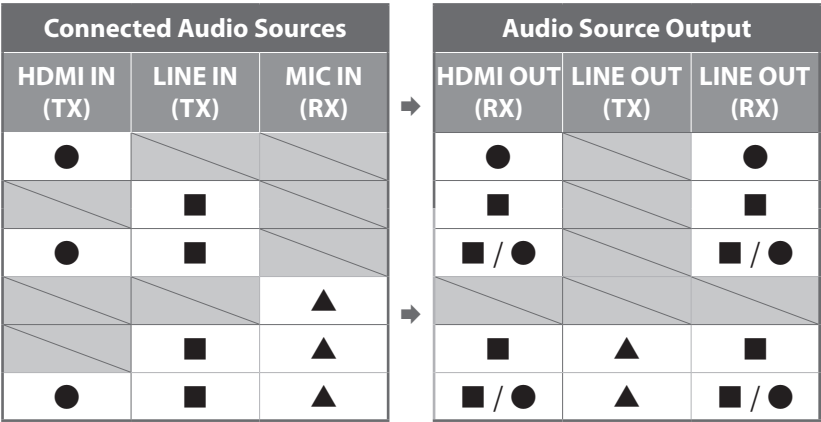
Analogue Input	
Max Audio Level	300Vrms
Impedance	2.2kΩ
Type	Unbalanced

Analogue Output	
Max Audio Level	2Vrms
THD+N	< -80dB@0dBFS 1kHz (A-wt)
SNR	> 80dB@0dBFS
Frequency Response	< ±0.5dB@20Hz~20kHz

Analogue Output	
Crosstalk	< -80dB@10kHz
Impedance	200Ω
Type	Unbalanced

8.3.3 AVoIP Audio Availability

Unicast Data Transmission Mode:



Multicast Data Transmission Mode:

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

Legend:

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

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 Output	15m	10m	5m	×
Ethernet Cable				
Cat.5e/6	100m			×
Cat.6A/7	100m			×

Bandwidth Category Examples:

1080p (FHD Video)

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

4K30 (4K UHD Video)

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

4K60 (4K UHD⁺ 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
4K UHD	4K Ultra-High-Definition (10.2Gbps max)
4K UHD⁺	4K Ultra-High-Definition (18Gbps max)
ADC	Analogue-to-Digital Converter
ASCII	American Standard Code for Information Interchange
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-Analogue 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
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

ACRONYM	COMPLETE TERM
kHz	Kilohertz
KVM	Keyboard/Video/Mouse
LAN	Local Area Network
LED	Light-Emitting Diode
LPCM	Linear Pulse-Code Modulation
MAC	Media Access Control
MJPEG	Motion JPEG
MHz	Megahertz
OSD	On-Screen Display
PoE	Power over Ethernet
SNR	Signal-to-Noise Ratio
TCP	Transmission Control Protocol
THD+N	Total Harmonic Distortion plus Noise
TMDS	Transition-Minimised Differential Signaling
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



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