

BG-UHD-MVS21A

4K60 2x1 Multiviewer Seamless UHD Video Switcher

User Manual







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Statement

Please read these instructions carefully before connecting, operating, or configuring this product. Please save this manual for future reference.

Safety Precaution

- To prevent damaging this product, avoid heavy pressure, strong vibration, or immersion during transportation, storage, and installation.
- The housing of this product is made of organic materials. Do not expose to any liquid, gas, or solids which may corrode the shell.
- Do not expose the product to rain or moisture.
- To prevent the risk of electric shock, do not open the case. Installation and maintenance should only be carried out by qualified technicians.
- Do not use the product beyond the specified temperature, humidity, or power supply specifications.
- This product does not contain parts that can be maintained or repaired by users. Damage caused by dismantling the product without authorization from BZBGear is not covered under the warranty policy.
- Installation and use of this product must strictly comply with local electrical safety standards.



Introduction

The BG-UHD-MVS21A is a 4K@60 2x1 multiviewer and seamless UHD video switcher. It was developed to support high output resolutions such as 4K@60 for multiple sources on a single screen. It can combine two video signals onto a single UHD or HD display. Users can manage each input and create various combinations of the two inputs on a single display as well as adjust the position of either input.

The BG-UHD-MVS21A supports a full range of input video resolutions up to 4K@60 and audio de-embedding via RCA and optical S/PDIF for external audio distribution systems. The unit can be controlled via front panel buttons, IR remote, RS-232 commands.

Features

- HDMI 2.0b, HDCP 2.2 and HDCP 1.x compliant
- 18Gbps video bandwidth
- Input and output resolutions support up to 4K2K@60 4:4:4
- LPCM, AC3, DD+, DTS, DTS-HD, up to 7.1 audio channels
- Seamless switching between input channels and combined multiple images on a single UHD screen.
- Up to 4 display modes: SINGLE, PIP, PBP (1), PBP (2)
- Audio de-embedding via analog and optical fiber audio ports
- Volume control and independent audio selection
- Advanced EDID management
- Control via front panel buttons, IR remote, RS-232 commands
- Compact design for easy and flexible installation

Packing List

- 1x 4K@60 2x1 UHD Video Switcher
- 1x IR Remote
- 1x 3 pin-3.81mm Phoenix Connector (male)
- 1x 38KHz IR Receiver Cable (1.5m)
- 2x Mounting Ears
- 1x 12V/1A Power Adapter
- 4x Machine Screws (KM3*4)
- 1x User Manual



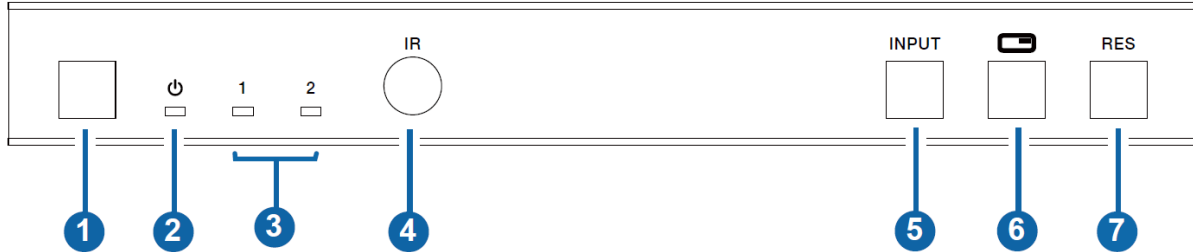
Specifications

Technical	
HDMI Compliance	HDMI 2.0b
HDCP Compliance	HDCP 2.2 / 1.x
Video Bandwidth	18Gbps
Video Resolution	Up to 4K2K@60 4:4:4
IR Level	5Vp-p
IR Frequency	38KHz
Color Space	RGB, YCbCr 4:4:4, YCbCr 4:2:2, YCbCr 4:2:0
Color Depth	8bit
Audio Formats	HDMI: PCM2.0/5.1/7.1CH, Dolby Digital/Plus, DTS, DTS High Res Analog audio [3.5mm L/R]: PCM2.0; SPDIF (OPTICAL): Dolby Digital, DTS 5.1, PCM2.0. Note: It does not support HBR audio.
ESD Protection	Human body model — ±8kV (Air-gap discharge) & ±4kV (Contact discharge)
Connection	
Input ports	2 x HDMI IN [Type A, 19-pin female]
Output ports	1 x HDMI OUT [Type A, 19-pin female] 1 x L/R OUTPUT [RCA] 1 x OPTICAL OUTPUT [S/PDIF]
Control ports	1 x RS-232 [3 pin-3.81mm phoenix connector] 1 x IR EXT [3.5mm Stereo Mini-jack]
Mechanical	
Housing	Metal Enclosure
Color	Black
Dimensions	175mm [W] x 100mm [D] x 30mm [H]
Weight	497g
Power Supply	Input: AC 100 - 240V 50/60Hz Output: DC 12V/1A (US/EU standard, CE/FCC/UL certified)
Power Consumption	4.56W (Max)
Operating Temperature	32 - 104°F / 0 - 40°C
Storage Temperature	-4 - 140°F / -20 - 60°C
Relative Humidity	20 - 90% RH (no-condensing)



Operation Controls and Functions

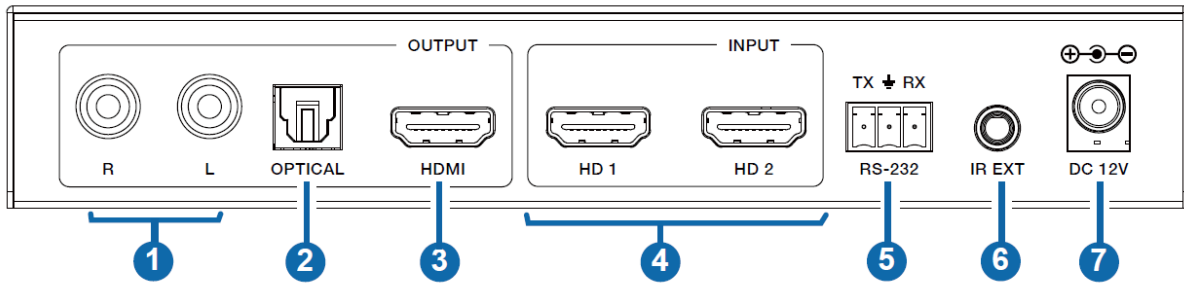
Front Panel



No.	Name	Function Description
1	Power button	<ul style="list-style-type: none"> ▪ Short press this button to power on the device. ▪ Long press this button for (1 second) to enter the standby mode.
2	Power LED	The Power LED will illuminate green when the product is powered on and red when the product is in standby.
3	Input 1-2 LEDs	Input signal indicator lights. When the HD 1/2 port connects to an active source device, the corresponding green LED will illuminate. Note: Only the LED of the selected input channel will illuminate green during single screen display mode; all LEDs will illuminate green when multiview mode is activated.
4	IR Window	IR signal receiving window.
5	INPUT button	Input source switching button, only available during single screen display mode.
6	Multiview button	Multiview display mode switching button. <ul style="list-style-type: none"> ▪ Short press this button to cyclically select: SINGLE - PIP - PBP (1) - PBP (2) . ▪ Long press this button for 3 seconds to select the aspect ratio for PBP (1) / PBP (2)
7	RES button	Output resolution switching button. <ul style="list-style-type: none"> ▪ Short press the RES button to cyclically switch the output resolution of the HDMI OUTPUT port (Please refer to the output resolution list in the “Video & Audio” section of this manual). ▪ Long press the RES button for 3 seconds to switch the output resolution to 720P60.



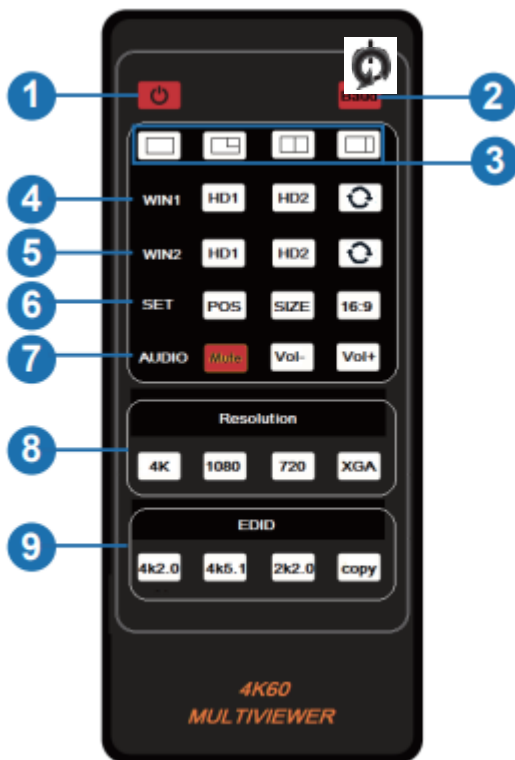
Rear Panel






No.	Name	Function Description
1	L/R port	PCM 2.0 Analog audio output port.
2	OPTICAL port	Optical fiber S/PDIF digital audio output port.
3	HDMI OUTPUT port	Connected to an HDMI display device such as a TV or Monitor with an HDMI cable.
4	HD 1-2 INPUT ports	Connect to HDMI source devices such as Bluray players, Gaming Consoles, or Set-top boxes with HDMI cables.
5	RS-232 port	3-pin phoenix connector, connected to a PC or control system for serial port upgrade or RS-232 command control.
6	IR EXT port	Connect to an IR Receiver cable. If the IR receiving window of the unit is blocked or the unit is installed in a closed area out of infrared line of sight, the IR receiver cable can be inserted to the "IR EXT" port to receive the IR remote signal.
7	DC 12V	DC 12V/1A power input port.



IR Remote



1. **Power on or Standby:** Press this button to power on the unit or set it to standby mode.
2. **Baud:** Press this button to pop up the OSD menu, then cycle through the serial port baud rates: 115200, 57600, 38400, 19200, 9600
3. **Multiview display mode buttons:** Press these buttons to select the display mode: SINGLE - PIP - PBP (1) - PBP (2).
4. **WIN1:** These buttons are available in all modes. On single screen display mode, press **HD1/HD2/**  buttons to directly or cycle select input sources for the WIN1 screen and the corresponding input LED on the front panel will illuminate green. On PIP / PBP(1) / PBP(2) display mode, press **HD1/HD2/**  button to directly or cycle select input sources for the WIN1 screen and both input LEDs on the front panel will illuminate green.
5. **WIN2:** These buttons are unavailable on single screen display modes. On PIP / PBP(1) / PBP(2) mode, press **HD1/HD2/**  button to directly or cycle select input sources for the WIN2 screen and both input LEDs on the front panel will illuminate green.
6. **SET:** On PIP mode, press **POS** to change the position of sub window ; press **SIZE** to zoom in/out the size of sub window. On PBP(1) / PBP(2) mode, press **16:9** to switch the aspect ratio between **16:9** and FULL.
7. **AUDIO:** Press **Mute** to mute / unmute the audio output; Press **VOL-** / **VOL+** to increase / decrease the audio output volume.
8. **Resolution:** Press **4K**, **1080P**, **720P** or **XGA** to select output resolution.
9. **EDID:** Press **4K2.0**, **4K5.1**, **2K2.0** or **COPY** to select EDID mode.



EDID Settings

Users can select following EDID modes via RS-232 commands:

No.	EDID Mode	No.	EDID Mode
1	4K60-2.0CH	10	1920x1200-2.0CH
2	4K60-5.1CH	11	1680x1050-2.0CH
3	4K60-7.1CH	12	1600x1200-2.0CH
4	4K30-2.0CH	13	1440x900-2.0CH
5	4K30-5.1CH	14	1360x768-2.0CH
6	4K30-7.1CH	15	1280x1024-2.0CH
7	1080P-2.0CH	16	1024x768-2.0CH
8	1080P-5.1CH	17	720P-2.0CH
9	1080P-7.1CH	18	AUTO

Video & Audio

The switcher supports multiple resolutions for video input up to 3840x2160@60, and supports multiple audio formats such as LPCM, AC3, DD+, DTS, DTS- HD, up to 7.1 channel pass through functionality via HDMI cable.

User can control the volume of audio in LPCM format.

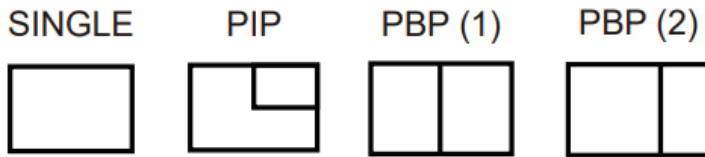
The switcher supports the following video output resolutions:

No.	Output Resolution	No.	Output Resolution
1	4096x2160p 60Hz	8	1920x1080p 60Hz
2	4096x2160p 50Hz	9	1920x1080p 50Hz
3	3840x2160p 60Hz	10	1360x768p 60Hz
4	3840x2160p 50Hz	11	1280x800p 60Hz
5	3840x2160p 30Hz	12	1280x720p 60Hz
6	3840x2160p 25Hz	13	1280x720p 50Hz
7	1920x1200p 60Hz RB	14	1024x768 60Hz



Multiview

The switcher supports 4 categories of multiview display modes: SINGLE, PIP, PBP(1), PBP(2) Users can select different operations for different multiview modes as follows:



User can select multiview modes via IR remote or RS-232 commands.

OSD Menu Navigation

A total of four buttons on the IR Remote are used for audio settings OSD menu navigation including Baud, Mute, VOL-, VOL+.

Menu contents are as follows:

Baud	Baud rate	115200	115200,57600,38400,19200,9600
Mute	Audio Mute	OFF	ON, OFF
VOL-/VOL+	Audio Volume	100	0..100



RS-232 Command

The product also supports RS-232 command control. Connect the RS-232 port of the product to a PC with a 3-pin phoenix connector cable. Then open a Serial Command tool on PC to send ASCII commands to control the product. The ASCII command list is shown below.

ASCII Commands
Serial port protocol: baud rate: 115200(default) Data bits: 8 Stop bits: 1 Check bit: 0
x - Parameter 1; y - Parameter 2; ! - Delimiter

ASCII Commands			
Serial port protocol: baud rate: 115200(default) Data bits: 8 Stop bits: 1 Check bit: 0			
x - Parameter 1; y - Parameter 2; ! - Delimiter			
Command Code	Function Description	Example	Feedback
System Setting			
help!	List all commands	help!	
r type!	Get device model	r type!	2x1 HDMI Multiviewer
r fw version!	Get Firmware version	r fw version!	MCU FW version x.xx.xx SCALER FW version x.xx.xx
power z!	Power on/off the device,z=0~1 (z=0 power off, z=1 power on)	power 1!	Power on System Initializing... Initialization Finished! MCU FW version x.xx.xx SCALER FW version x.xx.xx
r power!	Get current power state	r power!	power on/power off
reboot!	Reboot the device	reboot!	Reboot... System Initializing... Initialization Finished! MCU FW version x.xx.xx SCALER FW version x.xx.xx
reset!	Reset to factory defaults	reset!	Reset to factory defaults System Initializing... Initialization Finished! MCU FW version x.xx.xx SCALER FW version x.xx.xx
Output Setting			
s output res x!	Set Output Resolution (x=1~14) 1. 4096x2160p60, 2. 4096x2160p50, 3. 3840x2160p60, 4. 3840x2160p50, 5. 3840x2160p30, 6. 3840x2160p25, 7. 1920x1200p60RB, 8. 1920x1080p60, 9. 1920x1080p50, 10.1360x768p60, 11.1280x800p60, 12.1280x720p60, 13.1280x720p50, 14. 1024x768p60,	s output res 3!	out resolution: 3840x2160p60



Command Code	Function Description	Example	Feedback
r output res!	Get output resolution	r output res!	out resolution: 3840x2160p60
s output hdcp x!	set output hdcp (x=1~3) 1. HDCP 1.4 2. HDCP 2.2 3. HDCP OFF	s output hdcp 2!	output HDCP: HDCP 1.4
r output hdcp!	Get output hdcp status.	r output hdcp!	output HDCP: HDCP 1.4
s output vka x!	Set output video keep active pattern. (x=1~2) 1. black screen 2. blue screen	s output vka 1!	output VKA pattern: black screen
r output vka!	Get output video keep active pattern.	r output vka!	output VKA pattern: black screen
s output itc x!	Set output video mode (x=1~2) 1: video mode 2: pc mode	s output itc 1!	output ITC: video mode
r output itc!	Get output video mode	r output itc!	output ITC: video mode
EDID Setting			
s input EDID x!	Set HDMI input EDID mode (x=18) 1. 4K2K60_444, Stereo Audio 2.0 2. 4K2K60_444, Dolby/DTS 5.1 3. 4K2K60_444, HD Audio 7.1 4. 4K2K30_444, Stereo Audio 2.0 5. 4K2K30_444, Dolby/DTS 5.1 6. 4K2K30_444, HD Audio 7.1 7. 1080P, Stereo Audio 2.0 8. 1080P, Dolby/DTS 5.1 9. 1080P, HD Audio 7.1 10. 1920x1200, Stereo Audio 2.0 11. 1680x1050, Stereo Audio 2.0 12. 1600x1200, Stereo Audio 2.0 13. 1440x900, Stereo Audio 2.0 14. 1360x768, Stereo Audio 2.0 15. 1280x1024, Stereo Audio 2.0 16. 1024x768, Stereo Audio 2.0 17. 720p, Stereo Audio 2.0 18. copy from HDMI out	s input EDID 1!	input EDID: 4K2K60_444, Stereo Audio 2.0
r input EDID!	Get input EDID mode	r input EDID!	input EDID: 4K2K60_444, Stereo Audio 2.0
Audio Setting			
s output audio x!	Set output audio source (x=0~2) 0. follow window 1 selected source 1. HDMI 1 input audio 2. HDMI 2 input audio	s output audio 0!	output audio: follow window 1 selected source
r output audio!	Get output audio source	r output audio!	output audio: follow window 1 video
s output audio vol+!	Increase output audio volume	s output audio vol+!	output audio volume: 50
s output audio vol-!	Decrease output audio volume	s output audio vol-!	output audio volume: 50
s output audio vol x!	Set output audio volume value (x=0~100)	s output audio vol 30!	output audio volume: 30
r output audio vol!	Get output audio volume	r output audio vol!	output audio volume: 30



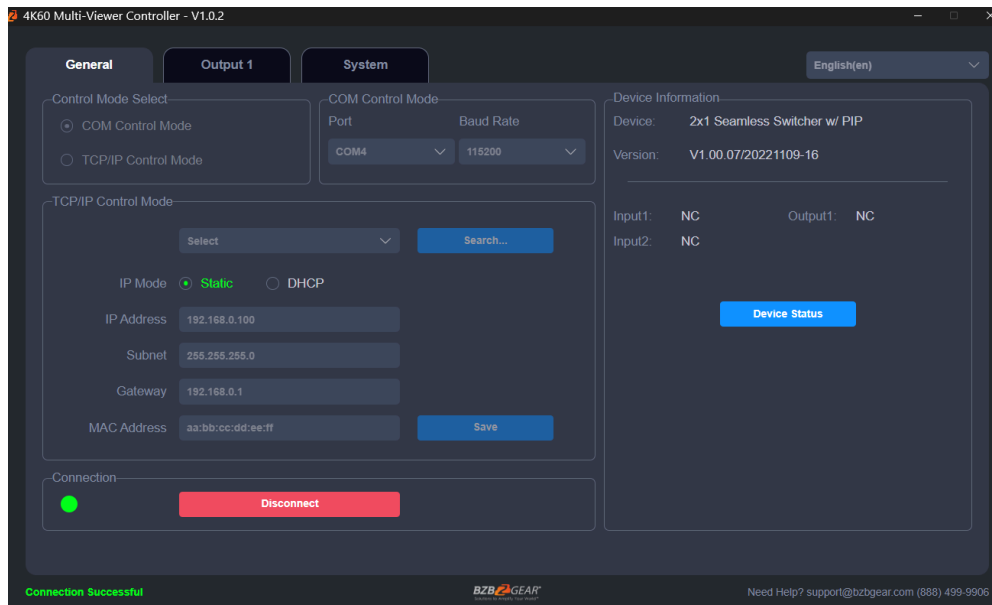
Command Code	Function Description	Example	Feedback
s output audio mute x!	Set output audio mute on/off (x=0~1) 0. mute off 1. mute on	s output audio mute 0!	output audio mute: off
r output audio mute!	Get output audio mute on/off	r output audio mute!	output audio mute: off
Single Screen Mode Setting			
s auto switch x!	Enable/disable auto switch feature(x=0~1) 0. Disable auto switch 1. Enable auto switch	s auto switch 0!	auto switch off
r auto switch!	Get auto switch feature	r auto switch!	auto switch off
s in source x!	Route input source to output (1~2) 1. HDMI 1 2. HDMI 2	s in source 1!	HDMI 1
r in source!	Get output selected input source	r in source!	HDMI 1
Multi-viewer Mode Setting			
s multiview x!	Set multi-viewer display mode (x=1~3) 1. single screen 2. PIP 3. PBP	s multiview 1!	single screen
r multiview!	Get multi-viewer display mode	r multiview!	single screen
s window x in y!	Select one input for one display window for the current Multiview mode. (x=1~2) 1. window 1 2. window 2 (y=1~2) 1. HDMI 1 2. HDMI 2	s window 1 in 1!	window 1 select HDMI 1
r window x in!	Get windows selected input source (x=0~2) 0. ALL 1. window 1 2. window 2	r window 1 in!	window 1 select HDMI 1
s PIP position x!	Set PIP window position (x=1~4) 1. Left Top 2. Left Bottom 3. Right Top 4. Right Bottom	s PIP position 3!	PIP on right top
r PIP position!	Get PIP window position	r PIP position!	PIP on right top
s PIP size x!	Get PIP window size (x=1~3) 1. small 2. middle 3. large	s PIP size 3!	PIP size: large
r PIP size!	Get PIP window size	r PIP size!	PIP size: large
s PBP mode x!	Set PBP windows display mode (x=1~2) 1. PBP mode 1 2. PBP mode 2	s PBP mode 1!	PBP mode 1
r PBP mode!	Get PBP windows display mode	r PBP mode!	PBP mode 1



Command Code	Function Description	Example	Feedback
s PBP aspect x!	Set PBP windows display aspect ratio (x=1~2) 1. Full screen 2. 16:9	s PBP aspect 1!	PBP aspect: full screen
r PBP aspect!	Get PBP windows display aspect ratio	r PBP aspect!	PBP aspect: full screen



Multiviewer Control Software - General Settings



General Interface Operations

You can perform the following operations from the General interface:

1. **Control Mode Selection**

Choose **COM Control Mode** as the control protocol.

- Note: *TCP/IP Control Mode is currently unavailable and therefore disabled.*

2. **COM Control Settings**

Select the appropriate **Port Number** and **Baud Rate** for your device.

3. **Device Information**

View the **device name**, **firmware version**, and **input/output connection status**.

Click **Device Status** to refresh and update the displayed information.

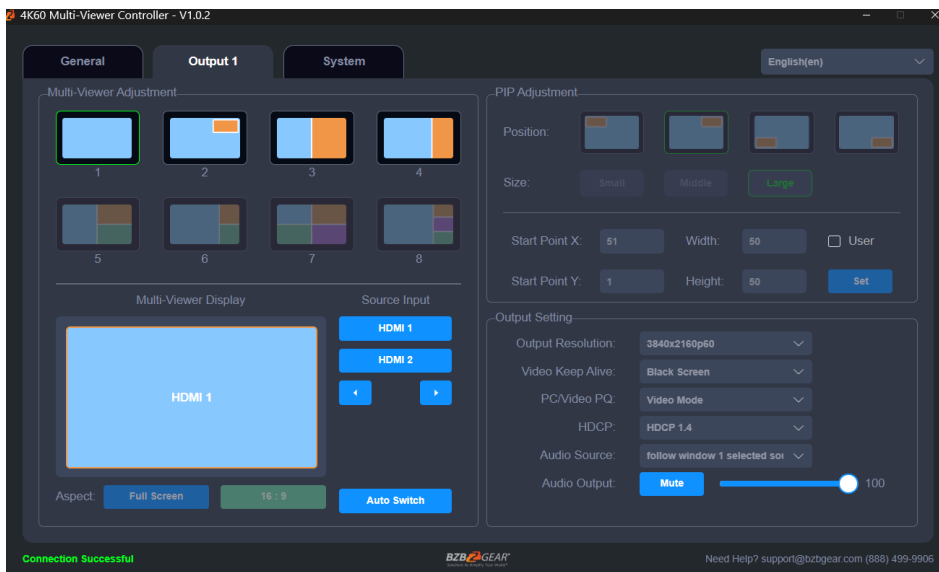
4. **Connection Setup**

Click the **Connection** button to establish or configure the communication link.

5. **Connection Status**

The **Connected** indicator shows the current connection state.

Multiviewer Control Software - Output Settings



Output Page Operations

You can perform the following operations on the Output page:

1. Multi-View Mode Selection

Click to choose your preferred screen display mode. The available options are:

- **SINGLE**
- **PIP (Picture-in-Picture)**
- **PBP(1) (Picture-by-Picture Mode 1)**
- **PBP(2) (Picture-by-Picture Mode 2)**

2. PIP Adjustment

When in PIP mode, you can customize the Picture-in-Picture settings by:

- Changing the position of the PIP window
- Adjusting the size of the PIP window
- Applying user-defined PIP configurations (see table below for details)

Size	Relative Position (Starting Position)	Height and Width of the Inner Frame
Small	Start Point X: 71 Start Point Y: 71	Width: 30 Height: 30
Middle	Start Point X: 61 Start Point Y: 61	Width: 40 Height: 40
Large	Start Point X: 51 Start Point Y: 51	Width: 50 Height: 50
User	Start Point X: 1-100 Start Point Y: 1-100	Width: 1-100 Height: 1-100



3. Multi-Viewer Display:

Use this to view both input and output signals simultaneously.

4. Source Input:

Select the desired input signal source. First, choose a window in the **Multi-Viewer Display**, then click **HDMI 1** or **HDMI 2** under **Source Input** to assign the signal. Alternatively, use the ◀ / ▶ buttons to cycle through the previous or next input source.

5. Aspect Ratio:

Choose between **Full Screen** or **16:9** to adjust the display aspect ratio. Note: Only PBP(1) and PBP(2) modes are supported.

6. Auto Switch:

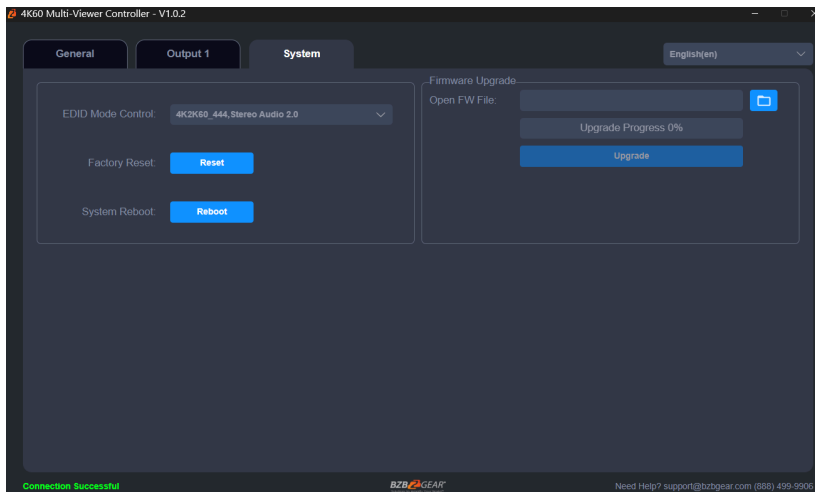
Enable or disable automatic input switching. This feature is only available in **Single** mode.

7. Output Settings:

Configure output resolution, video keep-alive, PC/Video picture quality (PQ), HDCP settings, audio source, and audio output.



Multiviewer Control Software - System Settings

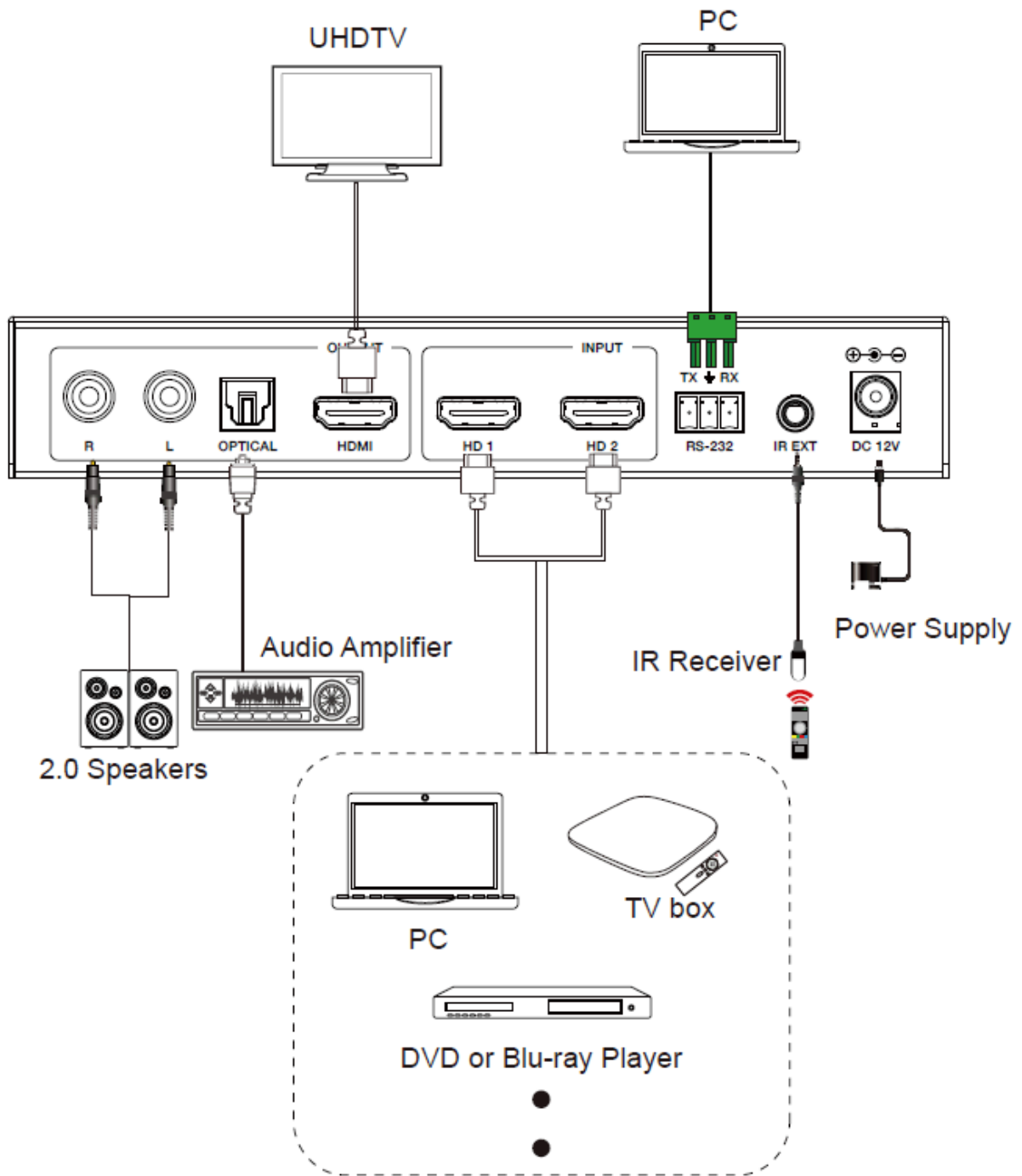


System Interface Operations

1. **EDID Mode Control:** Click the drop-down menu on the right to select the desired EDID mode.
2. **Firmware Upgrade:** Click the folder icon on the right to import the firmware upgrade file. Then, click "Upgrade" to begin the process. A progress bar will appear to indicate the upgrade status. Once the progress bar reaches 100%, the upgrade is complete, and the device will automatically restart.
3. **Factory Reset:** Click "Reset" to restore the device to its factory default settings.
4. **System Reboot:** Click "Reboot" to restart the device.



Application Diagram





Tech Support

Have technical questions? We may have answered them already!

Please visit BZBGear's support page (bzbgear.com/support) for helpful information and tips regarding our products. Here you will find our Knowledge Base (bzbgear.com/knowledge-base) with detailed tutorials, quick start guides, and step-by-step troubleshooting instructions. Or explore our YouTube channel, BZB TV (youtube.com/c/BZBTVchannel), for help setting up, configuring, and other helpful how-to videos about our gear. Need more in-depth support? Connect with one of our technical specialists directly:

Phone

1.888.499.9906

Email

support@bzbgear.com

Live Chat

bzbgear.com

Limited Product Warranty Terms

Pro Line: 5-year warranty from the date of purchase for AV/Broadcasting products bought on or after August 1, 2024.

Essential Line: 3-year warranty from the date of purchase for AV/Broadcasting products bought on or after August 1, 2024.

Cables: Lifetime Limited Product Warranty.

For complete warranty information, please visit bzbgear.com/warranty.

For questions, please call 1.888.499.9906 or email support@bzbgear.com.



Mission Statement

BZBGear is a breakthrough manufacturer of high-quality, innovative audiovisual equipment ranging from AVoIP, professional broadcasting, conferencing, home theater, to live streaming solutions. We pride ourselves on unparalleled customer support and services. Our team offers system design consultation, and highly reviewed technical support for all the products in our catalog. BZBGear delivers quality products designed with users in mind.

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