



BG-8K-24A

**2x4 8K UHD HDMI 2.1 48Gbps Splitter with Auto Downscaling/
HDR-to-SDR Conversion/Audio De-Embedding/RS-232
(8K60/4K120 and VRR/ALLM/QMS/QFT/SBTM Support)**

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-8K-24A is a high-performance 48Gbps HDMI 2.1 2x4 distribution amplifier designed to switch between two HDMI sources and simultaneously distribute the selected signal to up to four HDMI displays. It supports resolutions up to 8K@60Hz and 4K@120Hz, with full compatibility for HDR formats including HDR10, HDR10+, Dolby Vision, and HLG. Each HDMI output can independently downscale video and convert HDR to SDR, ensuring seamless integration with mixed-resolution and legacy displays while maintaining optimal signal quality across all outputs.

In addition to advanced video handling, the BG-8K-24A features comprehensive audio de-embedding, providing digital optical and balanced or unbalanced analog audio outputs with adjustable gain. Built-in EDID management, auto or manual input switching, and an internal HDMI test pattern generator simplify system configuration and troubleshooting. The unit can be controlled via front-panel buttons, IR remote, or RS-232/API commands, making it well suited for professional AV installations, control-system environments, and high-end residential or commercial applications where reliability, flexibility, and future-proof 8K performance are required.

Features

- **48Gbps HDMI 2.1 Bandwidth:** Supports full HDMI 2.1 data rates for uncompromised 8K and high-frame-rate 4K video transmission.
- **2x4 HDMI Distribution Amplifier:** Switches between two HDMI inputs and distributes the selected source to up to four HDMI outputs simultaneously.
- **8K and High Frame Rate Support:** Supports resolutions up to 8K@60Hz (4:2:0) and 4K@120Hz (4:4:4), ideal for next-generation video sources.
- **Advanced HDR Compatibility:** Pass-through support for HDR, HDR10, HDR10+, Dolby Vision, and HLG for enhanced contrast and color performance.
- **Independent Output Downscaling:** Each HDMI output supports independent 8K-to-4K or 8K-to-1080p downscaling for mixed-resolution display environments.
- **HDR to SDR Conversion:** Per-output HDR-to-SDR conversion ensures compatibility with legacy SDR displays.
- **Audio De-Embedding:** Extracts audio from HDMI sources to digital optical (S/PDIF) and balanced or unbalanced analog audio outputs.
- **Adjustable Analog Audio Gain:** Provides gain control for analog audio outputs to optimize audio levels for connected amplifiers or processors.
- **Auto and Manual Input Switching:** Supports automatic input switching via HDMI 5V detection or manual switching via front panel, IR, or control system.
- **Advanced EDID Management:** Built-in EDID presets, pass-through, and user-defined EDID options ensure reliable HDMI handshaking.
- **Internal HDMI Signal Generator:** Integrated test pattern generator simplifies system setup, verification, and troubleshooting.
- **Comprehensive Control Options:** Control via front-panel buttons, IR remote, RS-232, or USB-C service port using ASCII API commands.



- **HDCP 2.3 Compliance:** Fully compliant with HDCP 2.3 for secure playback of protected content.
- **Professional Metal Enclosure:** Durable metal housing designed for reliable operation in professional AV installations.

Packing List

- 1× BG-8K-24A 48Gbps 2×4 HDMI 2.1 Distribution Amplifier
- 1× 12V/1A Locking Power Supply (Multinational)
- 1× IR Remote Control
- 1× IR Wideband Receiver Cable (1.5 m)
- 1× 3-Pin to 3.5 mm Phoenix Connector (RS-232)
- 1× 5-Pin to 3.5 mm Phoenix Connector (Analog Audio)
- 2× Mounting Ears
- 4× Mounting Screws (KM3 × 6)
- 1× User Manual



Specifications

Technical Specifications	
HDMI Compliance	HDMI 2.1
HDCP Compliance	HDCP 2.3
Video Bandwidth	48Gbps
Supported Input	2× HDMI Type-A (19-pin female)
Supported Output	4× HDMI Type-A (19-pin female)
Audio Output	1× Optical (S/PDIF), 1× L/R analog (5-pin 3.5mm Phoenix)
Control Ports	1× RS-232 (3-pin 3.5mm Phoenix), 1× IR IN (3.5mm stereo jack), 1× USB-C (Service)
Max Resolution	Up to 8K@60Hz 4:2:0 12-bit / 8K@30Hz 4:4:4 12-bit / 4K@120Hz 4:4:4 12-bit
Color Depth	8 / 10 / 12-bit
Color Space	RGB, YCbCr 4:4:4 / 4:2:2 / 4:2:0
HDR Support	HDR, HDR10, HDR10+, Dolby Vision, HLG
Audio Formats (HDMI)	LPCM, Dolby Digital/Plus/EX, Dolby TrueHD, Dolby Atmos, DTS formats incl. DTS-HD Master Audio
Optical Audio Output	Up to LPCM / Dolby / DTS 5.1CH
Analog Audio Output	LPCM 2CH (balanced/unbalanced with gain control)
Audio Output Level	8.2 dBu (2 Vrms balanced), 2.2 dBu (1 Vrms unbalanced max)
Frequency Response	20Hz – 20kHz (+0.5 dB / -1 dB)
Audio S/N Ratio	99 dB @ 2 Vrms, 1 kHz (A-weighted)
Audio THD+N	<0.2% @ 0 dBV, 1 kHz
IR Frequency	Wideband 20kHz – 60kHz
IR Input Level	12Vp-p
Mechanical Specifications	
ESD Protection	IEC 61000-4-2: ±8kV air, ±4kV contact



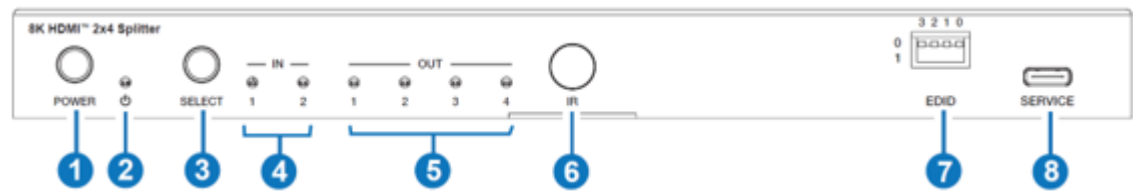
Power Supply	DC 12V / 1A
Power Consumption	6.24W (Max)
Housing	Metal enclosure
Dimensions	220mm × 110mm × 21.5mm
Weight	620g
Operating Temperature	32°F to 104°F / 0°C to 40°C
Storage Temperature	-4°F to 140°F / -20°C to 60°C
Operating Humidity	20%–80% RH (non-condensing)
Storage Humidity	10%–90% RH (non-condensing)



Operation Controls and Functions

Front and Rear Panel

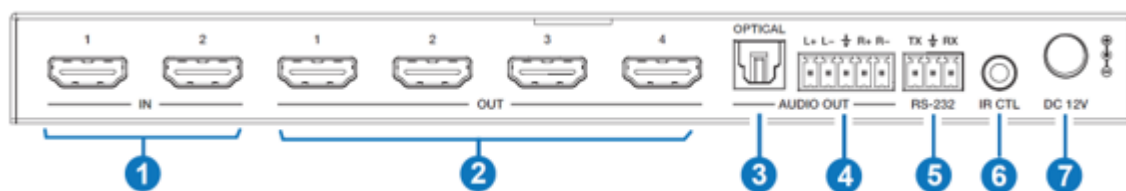
Front Panel



No.	Name	Function Description
1	POWER button	Press to power ON the device. Press and hold to enter standby mode.
2	POWER LED	Indicates power status. Green = ON, Red = Standby.
3	SELECT button	Cycles through HDMI input sources (IN 1 / IN 2).
4	IN LED (1-2)	Indicates the currently selected input source. The corresponding LED turns green.
5	OUT LED (1-4)	Indicates active HDMI output ports. LED lights when a display is detected.
6	IR window	Receives IR signals from the remote control or IR extender.
7	EDID DIP switch	Used to select EDID mode settings based on connected display requirements.
8	SERVICE (USB-C)	USB-C service port used for firmware upgrades and maintenance.



Rear Panel



No.	Name	Function Description
1	IN 1-2 (HDMI)	HDMI input ports for connecting source devices (e.g., Blu-ray player, PC, game console).
2	OUT 1-4 (HDMI)	HDMI output ports for connection to displays such as TVs, monitors, or projectors.
3	OPTICAL (S/PDIF)	Digital audio output for connection to amplifiers, soundbars, or AV receivers.
4	L/R AUDIO OUT	Analog audio output (balanced/unbalanced) with gain control support.
5	RS-232	Serial control port for integration with control systems using API commands.
6	IR CTL	12V IR input port for external IR receiver connection.
7	DC 12V	Power input port for 12V/1A power adapter.



EDID Settings List (DIP Switch Configuration)

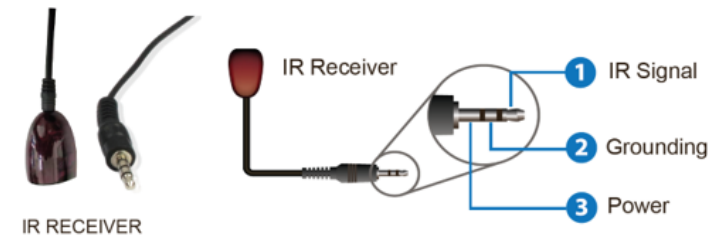
The EDID DIP switch allows selection of predefined EDID profiles to ensure optimal compatibility between source and display devices. Each setting defines resolution, audio format, and advanced video features.

DIP Setting	EDID Mode	Description
0000	Pass-through (Default)	Copies EDID from Sink 1 (connected display).
0001	1080p@60Hz / 2CH PCM	Full HD video with stereo audio.
0010	1080p@60Hz / 5.1 DTS/Dolby	Full HD video with multichannel audio.
0011	4K@60Hz 4:4:4 8-bit / 2CH PCM	UHD resolution with stereo audio.
0100	4K@60Hz 4:4:4 8-bit / 5.1 DTS/Dolby	UHD with multichannel audio.
0101	4K@120Hz 10-bit HDR/Dolby Vision / 2CH PCM	High refresh UHD with HDR support.
0110	4K@120Hz 10-bit HDR/Dolby Vision / 5.1 DTS/Dolby	HDR UHD with surround audio.
0111	4K@120Hz 12-bit HDR/Dolby Vision / 2CH PCM	Enhanced color depth UHD with stereo audio.
1000	4K@120Hz 12-bit HDR/Dolby Vision / 5.1 DTS/Dolby	High-end HDR UHD with surround audio.
1001	8K@60Hz 4:2:0 10-bit HDR/Dolby Vision / 2CH PCM	8K resolution with stereo audio.
1010	8K@60Hz 4:2:0 10-bit HDR/Dolby Vision / 5.1 DTS/Dolby	8K with surround audio support.
1011	8K@60Hz 4:2:0 12-bit HDR/Dolby Vision / 2CH PCM	Higher color depth 8K with stereo audio.
1100	8K@60Hz 4:2:0 12-bit HDR/Dolby Vision / 5.1 DTS/Dolby	Full-feature 8K with surround audio.
1101	8K@60Hz 12-bit HDR with VRR/DSC / 2CH PCM	8K gaming mode with variable refresh support.
1110	8K@60Hz 12-bit HDR with VRR/DSC / 5.1 DTS/Dolby	Advanced gaming + surround audio mode.
1111	User / Custom EDID	Reserved for custom or software-defined EDID settings.



IR Pin Definition

The IR control interface allows the device to receive external IR signals via the IR CTL port or the included IR receiver cable.



Pin	Signal	Description
Tip	IR Signal	Infrared data input (modulated IR signal)
Ring	+12V	Power supply for external IR receiver
Sleeve	GND	Ground reference

IR Input Specification:

- IR input level: 12Vp-p
- IR frequency range: 20KHz – 60KHz (wideband support)
- Transmission distance: up to 3m over HDMI cable (with compatible IR pass-through setup)

IR Remote Control

The included IR remote control allows basic switching and power control of the BG-8K-24A without using front panel buttons or API commands.

 (Switch Button)	Key Functions	
	Button	Function Description
	Power	Turns the device ON or places it into standby mode
	1	Selects HDMI Input 1
	2	Selects HDMI Input 2
		Cycles between Input 1 and Input 2



IR Operation Notes

- The IR remote communicates through the front panel IR receiver window or external IR receiver connected to IR CTL.
- Ensure there is a clear line of sight between the remote and IR receiver for reliable operation.
- If IR control is disabled via API, the remote will not function until re-enabled.
- Multiple button presses will cycle or override current input selection depending on system state.



API Commands

The BG-8K-24A supports ASCII command control via RS-232 (Phoenix port) and USB-C Service port. Commands must be sent using standard serial communication software.

Communication Protocol

Service Port (USB-C Virtual RS-232)

- Baud Rate: 115200 (fixed)
- Data Bit: 8
- Stop Bit: 1
- Parity: None
- Purpose: Internal debugging / firmware service

RS-232 Phoenix Port (Control System Integration)

- Baud Rate: 4800 ~ 115200 (configurable)
- Data Bit: 8
- Stop Bit: 1
- Parity: None

Command Format

- All commands are ASCII strings
- Each command must end with: `<CR><LF>`
- Example: `set input 1<CR><LF>`

Basic System Commands

Command	Function	Example	Feedback
?	List all commands	?	Command list
help	List all commands	help	Command list
get fw version	Get firmware version	get fw version	1.0.0
set power on/off	Power control	set power on	Power ON / OFF status
get power	Get power status	get power	Power On
set reboot	Reboot system	set reboot	Restart message



set reset	Factory reset	set reset	Reset confirmation prompt
get status	System status report	get status	Full system status

IR & Front Panel Control

Command	Function	Example	Feedback
set IR on/off	Enable/disable IR	set IR off	IR On/Off
get IR	IR status	get IR	IR On
set key on/off	Enable/disable front panel buttons	set key off	Key Off
get key	Key status	get key	Key On

Baud Rate Control

Command	Function	Example	Feedback
set baud x	Set RS-232 baud rate	set baud 6	115200
get baud	Get baud rate	get baud	Current baud

Baud Values:

- 1 = 4800
- 2 = 9600
- 3 = 19200
- 4 = 38400
- 5 = 57600
- 6 = 115200



Input Control

Command	Function	Example	Feedback
set input x	Select HDMI input	set input 1	Input HDMI 1
get input	Get active input	get input	Input HDMI 1
get hdmi5v	Detect HDMI 5V	get hdmi5v	HDMI 1: 5V

Auto Switching

Command	Function	Example	Feedback
set autoswitch on/off	Enable auto switching	set autoswitch on	On
get autoswitch	Get auto-switch status	get autoswitch	On

Output Control

Command	Function	Example	Feedback
set output x downscale y	Set scaling mode	set output 0 downscale 0	Auto
get output x downscale	Get scaling mode	get output 0 downscale	Status
set output x display y	Set display mode	set output 0 display 2	AVMUTE / Pattern
get output x display	Get display mode	get output 0 display	Status
set output x HDCP y	Set HDCP mode	set output 0 HDCP 2	Follow source
get output x HDCP	Get HDCP mode	get output 0 HDCP	Status



EDID Control

Command	Function	Example	Feedback
set edid x to y	Set EDID mode	set edid 0 to 0	Applied
get edid x	Get EDID setting	get edid 0	Current EDID
get edid data x	Read EDID data	get edid data 0	HEX data
set user edid x <data>	Set custom EDID	set user edid 1 <data>	Success
get user edid x	Get custom EDID	get user edid 1	Data

Audio Control

Command	Function	Example	Feedback
set analog mute on/off	Mute audio	set analog mute on	On
get analog mute	Get mute status	get analog mute	On/Off
set analog gain x	Set gain (-79dB to 0dB)	set analog gain -10dB	Applied
get analog gain	Get gain value	get analog gain	Value

Signal Generator

Command	Function	Example	Feedback
set generator x y	Set test pattern	set generator 1 1	8K Color Bar
get generator	Get generator status	get generator	Active mode

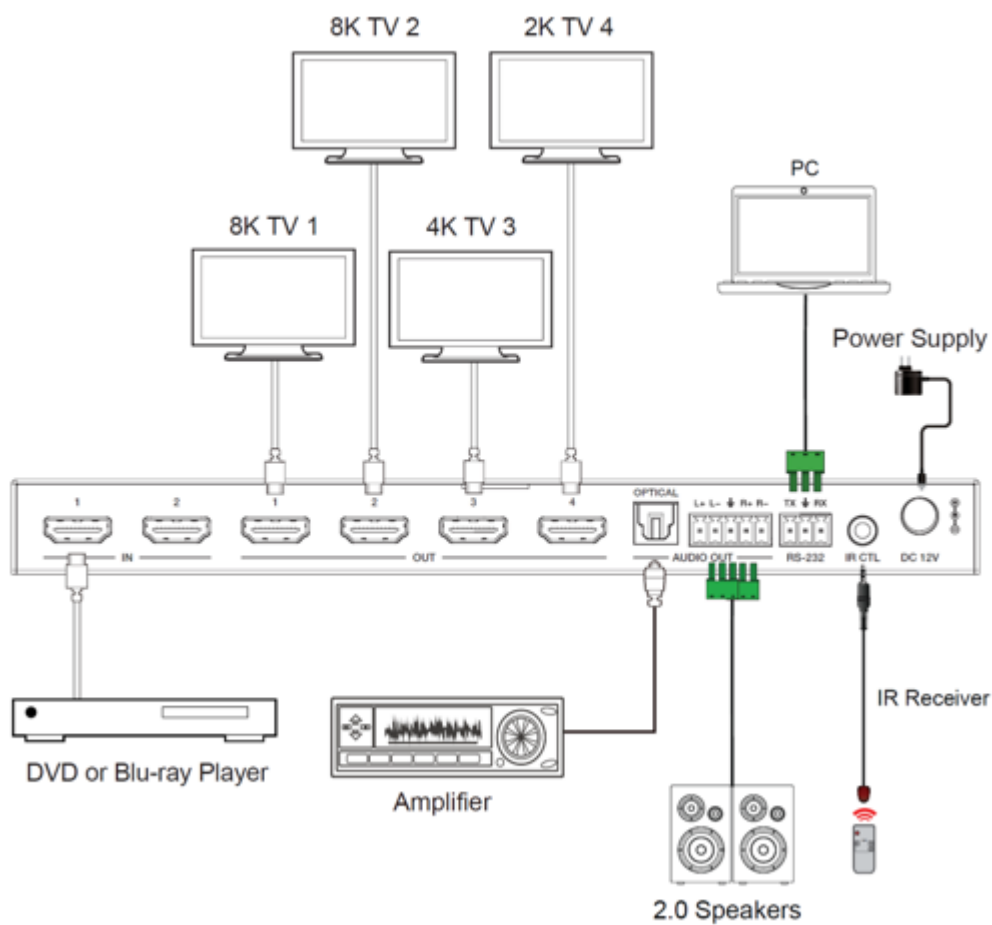


Notes

- All responses are returned as ASCII strings over serial interface
- Each command must end with `<CR><LF>`
- `get status` returns a full multi-line system diagnostic report including:
 - Power state
 - Input selection
 - EDID configuration
 - Output resolution and scaling status
 - HDCP status
 - Cable detection and signal state



Connection Diagram





Troubleshooting

Problems	Causes	Solutions
No Power / All LED off	Power supply not connected, connected fully, or wrong power supply.	Check if the power supply is connected correctly and the output voltage value is within recommended specifications.
No sound or sound issues	The HDMI connection is faulty, the audio format is not supported by the displays, or the source player is set to another port for audio output	Check if the HDMI cables are connected correctly. Check if the audio format is supported by the display and that a user has not changed the supported audio format on the player's audio output. Ensure output settings from the HDMI source device as set correctly.
No picture or picture flickers	The HDMI cable may be faulty or the category cable quality is faulty.	Check if the HDMI and category cable connections are correct and undamaged. Change to another good working HDMI cable or category cable (CAT6 or better cable is recommended).



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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