



BG-8K-28A

**2x8 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-28A is a high-performance 48Gbps HDMI™ 2×8 splitter designed for advanced 8K and high-frame-rate AV distribution environments. It supports HDMI 2.1 features including resolutions up to 8K@60Hz (4:2:0, 12-bit) and 4K@120Hz (4:4:4, 12-bit) with full HDCP 2.3 compliance. The unit provides two HDMI inputs that can be manually or automatically switched and simultaneously distributed to eight HDMI outputs. Comprehensive HDR format support—including HDR10, HDR10+, Dolby Vision, HLG, ALLM, and VRR—ensures compatibility with modern source and display devices.

Each HDMI output supports independent downscaling (8K→4K/1080p) and HDR-to-SDR conversion, making the BG-8K-28A ideal for mixed-resolution display systems. The splitter also features audio de-embedding via optical S/PDIF and balanced/unbalanced analog outputs with adjustable gain. Advanced EDID management, a built-in HDMI signal generator for diagnostics, and robust signal processing with equalization and re-timing provide reliable operation across long cable runs. Control is available via front-panel buttons, IR remote, and RS-232 or USB-C API commands, making the unit suitable for both standalone and fully integrated AV control systems.

Features

- **HDMI 2.1 & HDCP 2.3 Compliance:** Supports the latest HDMI 2.1 features with full HDCP 2.3 content protection.
- **48Gbps Bandwidth:** Delivers up to 48Gbps video bandwidth for uncompressed 8K and high-frame-rate signals.
- **8K & High Frame Rate Support:** Supports up to 8K@60Hz (4:2:0, 12-bit), 8K@30Hz (4:4:4, 12-bit), and 4K@120Hz (4:4:4, 12-bit).
- **HDR Pass-Through:** Supports HDR, HDR10, HDR10+, Dolby Vision, HLG, ALLM, and VRR formats.
- **2×8 HDMI Distribution:** Switches between two HDMI inputs and distributes the selected source to eight HDMI outputs.
- **Independent Output Downscaling:** Each output supports independent 8K-to-4K or 8K-to-1080p downscaling.
- **HDR to SDR Conversion:** Converts HDR content to SDR independently on each output for legacy display compatibility.
- **Audio De-Embedding:** Extracts HDMI audio to optical S/PDIF and balanced/unbalanced analog outputs.
- **Analog Audio Gain Control:** Provides adjustable gain control for analog audio outputs.
- **Auto & Manual Input Switching:** Supports automatic HDMI 5V detection and manual switching via front panel, IR, or API.
- **Built-In Signal Generator:** Includes an internal test pattern generator for signal verification and troubleshooting.



- **Advanced EDID Management:** Provides multiple EDID presets, pass-through, and user-defined EDID options.
- **Signal Conditioning:** Built-in equalization, re-timing, and signal amplification for stable transmission.
- **Multiple Control Interfaces:** Supports front panel buttons, IR remote, RS-232, and USB-C service control.

Packing List

- 1× 48Gbps 2×8 HDMI™ Splitter (BG-8K-28A)
- 1× 12V/2.5A Locking Power Supply (Multinational Plug)
- 1× IR Remote Control
- 1× IR Wideband Receiver Cable (1.5m)
- 1× 3-pin 3.5mm Phoenix Connector
- 1× 5-pin 3.5mm Phoenix Connector
- 2× Rack 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
Video 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 I/O)	LPCM, Dolby Digital/Plus/EX, Dolby TrueHD, Dolby Atmos, DTS, DTS-EX, DTS-96/24, DTS-HD Master Audio, DSD
Optical Audio Output	Up to LPCM / Dolby / DTS 5.1CH
Analog Audio Output	LPCM 2CH
Output Impedance	300 Ohm
Max Output Level	8.2dBu (2Vrms) balanced / 2.2dBu (1Vrms) unbalanced
Frequency Response	20Hz–20kHz (+0.5dB / -1dB)
Audio Sync Delay	0–2.2ms
Signal-to-Noise Ratio	99dB @ 2Vrms, 1kHz, A-weighted
THD+N	<0.2% @ 0dBV, 1kHz
IR Level	12Vp-p
IR Frequency	20–60kHz (wideband)
ESD Protection	±8kV air discharge, ±4kV contact discharge (IEC 61000-4-2)
CONNECTION SPECIFICATIONS	
Input Ports	2× HDMI Type-A (19-pin female)
Output Ports	8× HDMI Type-A (19-pin female)
Optical Output	1× S/PDIF Optical



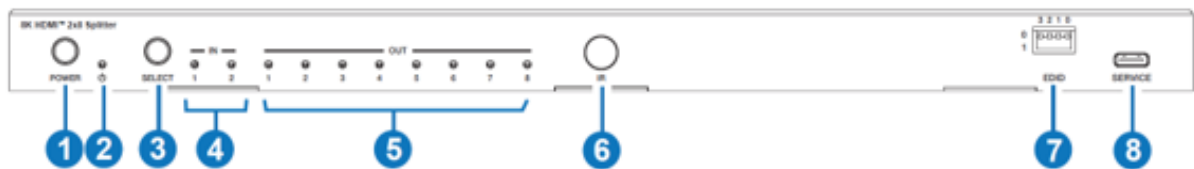
Analog Audio Output	1× L/R (5-pin 3.5mm Phoenix connector)
RS-232 Control	1× 3-pin 3.5mm Phoenix connector
IR Control	1× 3.5mm stereo mini-jack (IR IN)
Service Port	1× USB Type-C (firmware upgrade)
MECHANICAL SPECIFICATIONS	
Housing	Metal enclosure
Color	Black
Dimensions	320mm (W) × 100mm (D) × 21.5mm (H)
Weight	810g
Power Supply	DC 12V / 2.5A
Power Consumption	9.6W (Max)
Operating Temperature	0°C to 40°C / 32°F to 104°F
Storage Temperature	-20°C to 60°C / -4°F to 140°F
Operating Humidity	20%–80% RH (non-condensing)
Storage Humidity	10%–90% RH (non-condensing)



Operation Controls and Functions

Front and Rear Panel

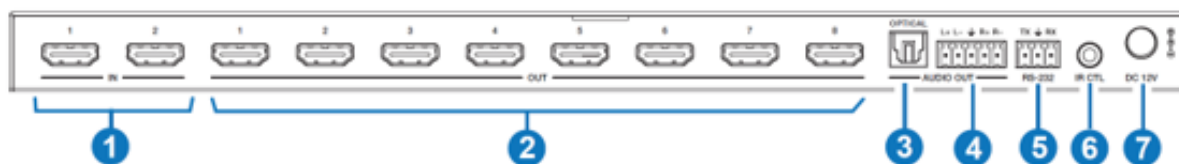
Front Panel



No.	Name	Description
1	POWER Button	Press to power on the unit; press and hold to enter standby mode.
2	POWER LED	Green indicates powered on; red indicates standby mode.
3	SELECT Button	Cycles between HDMI input 1 and input 2.
4	IN LED (1-2)	Indicates the currently selected active HDMI input source.
5	OUT LED (1-8)	Indicates active connection status of each HDMI output port.
6	IR Window	Receives IR remote control signals.
7	EDID DIP Switch	Used to select EDID mode based on predefined DIP settings.
8	SERVICE Port (USB-C)	USB-C service port for firmware updates and maintenance.



Rear Panel



No.	Name	Description
1	IN (1-2)	HDMI input ports for connecting source devices such as PCs, media players, or game consoles.
2	OUT (1-8)	HDMI output ports for connecting displays such as TVs, monitors, or projectors.
3	OPTICAL (S/PDIF)	Digital audio output for connection to amplifiers or audio processors.
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 and API commands.
6	IR CTL	External IR receiver input for extended IR control.
7	DC 12V	Power input connector (12V/2.5A locking power supply).



EDID Settings

The BG-8K-28A features an 8-position EDID DIP switch that allows users to select predefined EDID modes for optimal compatibility between source and display devices. EDID settings determine the supported resolution, audio format, and color depth communicated to the source device.

EDID DIP Switch Configuration

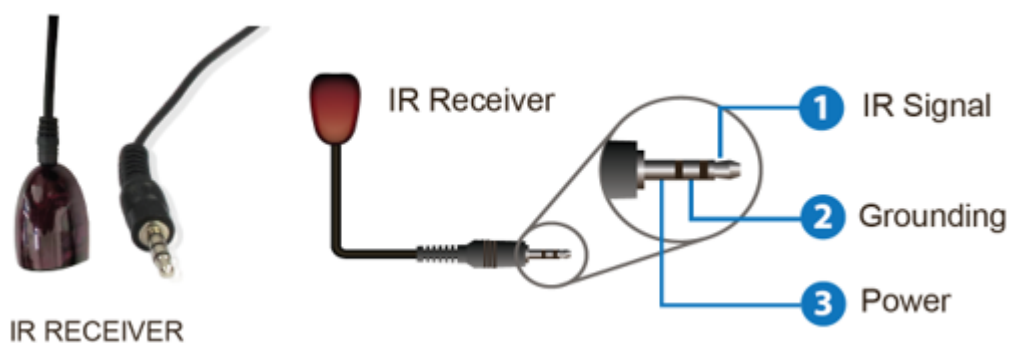
DIP Setting	EDID Mode Description
0000	EDID Pass-Through (Copy from Sink 1) – Default
0001	1080p@60Hz, 2CH PCM Audio
0010	1080p@60Hz, 5.1CH DTS/Dolby Audio
0011	4K@60Hz 4:4:4 8-bit, 2CH PCM Audio
0100	4K@60Hz 4:4:4 8-bit, 5.1CH DTS/Dolby Audio
0101	4K@120Hz 4:4:4 10-bit HDR/DV, 2CH PCM Audio
0110	4K@120Hz 4:4:4 10-bit HDR/DV, 5.1CH DTS/Dolby Audio
0111	4K@120Hz 4:4:4 12-bit HDR/DV, 2CH PCM Audio
1000	4K@120Hz 4:4:4 12-bit HDR/DV, 5.1CH DTS/Dolby Audio
1001	8K@60Hz 4:2:0 10-bit HDR/DV, 2CH PCM Audio
1010	8K@60Hz 4:2:0 10-bit HDR/DV, 5.1CH DTS/Dolby Audio
1011	8K@60Hz 4:2:0 12-bit HDR/DV, 2CH PCM Audio
1100	8K@60Hz 4:2:0 12-bit HDR/DV, 5.1CH DTS/Dolby Audio
1101	8K@60Hz 4:2:0 12-bit HDR/DV with VRR/DSC, 2CH PCM Audio
1110	8K@60Hz 4:2:0 12-bit HDR/DV with VRR/DSC, 5.1CH DTS/Dolby Audio
1111	User Defined EDID / Firmware Defined Mode

Notes on EDID Operation

- EDID settings apply to all input ports unless configured otherwise via API commands.
- Pass-through mode copies EDID directly from Sink 1 (first active display).
- User-defined EDID can be uploaded and selected via API commands for custom configurations.
- Incorrect EDID selection may result in reduced resolution or audio compatibility issues.



IR Pin Definition



The IR IN port supports external infrared receiver connection for extended control range.

Pin	Signal	Description
Tip	IR Signal	Infrared signal input
Ring	Power (12V)	IR receiver power supply
Sleeve	Ground	Ground reference

Note: Use only the provided IR receiver cable to avoid damage or incorrect operation.

IR Remote

The included IR remote allows basic control of input switching and power functions.



- **Power Button:** Turns the device ON or places it into standby mode.
- **Input 1 Button:** Selects HDMI Input 1 as the active source.
- **Input 2 Button:** Selects HDMI Input 2 as the active source.
- **Input Switch Button:** Cycles between HDMI Input 1 and Input 2.

Operation Notes:

- Ensure the IR receiver is properly connected to the IR IN port for remote functionality.
- Direct line-of-sight is recommended for optimal performance.
- Interference from strong lighting or reflective surfaces may reduce IR range.



API Commands

The BG-8K-28A supports ASCII-based API control via RS-232 or USB-C service port. Commands must be terminated with **<CR><LF>**.

Communication Settings

- **Service Port (USB-C Virtual RS-232):** 115200bps, 8 data bits, 1 stop bit, no parity (fixed)
- **RS-232 Port (Phoenix Connector):** 4800–115200bps configurable, 8 data bits, 1 stop bit, no parity
- **Command Termination:** **<CR><LF>**

Basic System Commands

Command	Function	Example	Response
?	List all available commands	?	Command list output
help	List all available commands	help	Command list output
get fw version	Get firmware version	get fw version	1.0.0
set power on/off	Power ON or OFF device	set power on / set power off	Power status message
get power	Get power status	get power	On / Off
set reboot	Reboot system	set reboot	System rebooting message
set reset	Factory reset device	set reset	Reset confirmation prompt
get status	Get full system status	get status	System status report

Control & Interface Commands

Command	Function	Example	Response
set IR on/off	Enable or disable IR control	set IR on	IR On/Off
get IR	Get IR status	get IR	IR On/Off



set key on/off	Enable or disable front panel keys	set key off	Key On/Off
get key	Get front panel key status	get key	Key status
set baud x	Set RS-232 baud rate (1–6)	set baud 6	115200

Input Control Commands

Command	Function	Example	Response
set input x	Select HDMI input (0–2)	set input 1	Input 1 selected
get input	Get active input	get input	Input HDMI 1
get hdmi5v	Check HDMI 5V detection	get hdmi5v	HDMI 1: 5V / HDMI 2: none
set autoswitch on/off	Enable/disable auto switching	set autoswitch on	On/Off
get autoswitch	Get auto-switch status	get autoswitch	On/Off

Output Control Commands

Command	Function	Example	Response
set output x downscale y	Set output scaling mode	set output 0 downscale 1	Applied
get output x downscale	Get output scaling mode	get output 0 downscale	Status list
set output x display y	Set output display mode	set output 0 display 2	Applied
get output x display	Get output display mode	get output 0 display	Status list
set output x HDCP y	Set HDCP mode	set output 0 HDCP 1	Applied
get output x HDCP	Get HDCP status	get output 0 HDCP	Status list

Internal Signal Generator

Command	Function	Example	Response
set generator x y	Set test pattern output	set generator 1 1	8K color bar
get generator	Get generator status	get generator	Resolution + pattern



Generator Modes:

- Resolution selection (x = 1–15): 8K30, 4K120, 4K60, 1080p, etc.
- Pattern selection (y = 1–13): color bar, checkerboard, ramp, PRBS, etc.

Audio Commands

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

EDID Commands

Command	Function	Example	Response
set edid x to y	Set EDID mode	set edid 0 to 3	Applied
get edid x	Get EDID setting	get edid 0	EDID list
get edid data x	Get EDID raw data	get edid data 0	Hex dump
set user edid x	Set custom EDID	set user edid 1	Success
get user edid x	Get user EDID	get user edid 1	EDID data

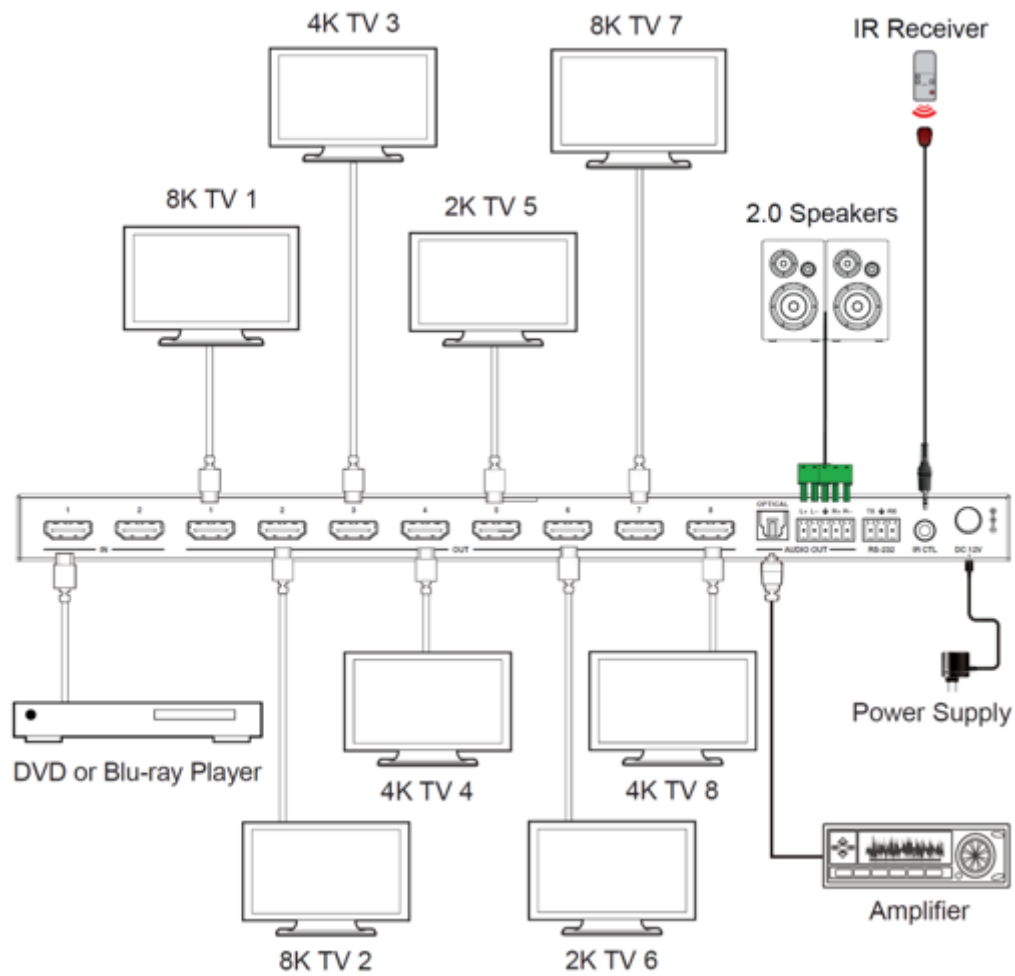
Notes

- All commands are case-sensitive.
- Invalid commands return an error or no response.
- Some settings may require reboot to take effect.

EDID and HDCP changes may temporarily interrupt video output.



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	Email	Live Chat
1.888.499.9906	support@bzbgear.com	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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