



# BG-8K-KVM21A

**8K60 HDMI 2.1 2x1 KVM Switch with USB 3.0, Hotkey Switching & IR Control**

## User Manual







## TABLE OF CONTENTS

Statement	4
Safety Precaution	4
Introduction	5
Features	5
Packing List	6
Specifications	7
Operation Controls and Functions	9
IR Pin Definition	11
IR Remote Control Functions	11
Hotkey Operation	12
Keyboard Hotkey Commands	12
Mouse Hotkey Commands	13
ASCII Command Control (RS-232)	14
Connection Diagram	17
Troubleshooting	18
Tech Support	19
Limited Product Warranty Terms	19
Mission Statement	20
Copyright	20



## Statement

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

## Safety Precaution

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- 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

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The BG-8K-KVM21A 2×1 HDMI 2.1 KVM Switch allows you to control two computers using a single keyboard, mouse, and display while delivering uncompromised performance for high-resolution workflows. It supports ultra-wide resolutions up to 8K@60Hz, 4K@120Hz/144Hz, and 1080p@240Hz, along with USB 3.0 data transmission up to 5Gbps for fast and reliable peripheral sharing. With full support for HDR formats, VRR, and HDCP 2.3, it is ideal for professional AV, content creation, and high-end gaming environments that demand zero latency and seamless switching.

Designed for speed and convenience, the switcher features virtual interaction technology that can automatically wake connected PCs from standby, significantly reducing switching time. Users can switch sources instantly using front-panel buttons, keyboard/mouse hotkeys, or the included IR remote, with no drivers required. Broad OS compatibility—including Windows, macOS, and Linux - combined with EDID emulation and plug-and-play operation ensures reliable performance across a wide range of systems and applications.

## Features

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- **HDMI 2.1 & HDCP 2.3 Compliance:** Ensures full compatibility with next-generation sources and protected content.
- **Ultra-High Resolution Support:** Delivers up to 8K@60Hz, 4K@120Hz/144Hz, and 1080p@240Hz for ultra-wide and high-refresh displays.
- **Advanced HDMI 2.1 Gaming Features:** Supports VRR, ALLM, QMS, QFT, and SBTM for smooth, tear-free, low-latency performance.
- **HDR Pass-Through:** Preserves HDR, HDR10, HDR10+, Dolby Vision, and HLG for accurate color and contrast.
- **2×1 KVM Functionality:** Control two computers using a single keyboard, mouse, and display.
- **USB 3.0 Peripheral Sharing:** Share USB devices such as keyboards, mice, webcams, storage, and printers with data speeds up to 5Gbps.
- **Seamless Fast Switching:** Provides instant video and USB switching with zero latency.
- **Virtual Interaction Technology:** Automatically wakes connected PCs from standby to reduce switching time.
- **Multiple Switching Methods:** Switch sources via front-panel buttons, keyboard/mouse hotkeys, or included IR remote.
- **EDID Emulation per Input:** Maintains stable resolution and display settings for each connected computer.
- **Auto Switching Support:** Automatically switches to the active or newly connected source.
- **Hot-Plug Support:** Safely connect or disconnect devices without powering down the system.
- **Wide OS Compatibility:** Works with Windows, macOS, and Linux with no drivers required.
- **Zero-Latency Hardware Design:** Advanced hardware and firmware ensure real-time video and USB performance.
- **Compact, Install-Friendly Design:** Small form factor with included mounting ears for flexible installation.



## Packing List

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- 1 × 8K60 HDMI 2.1 2×1 KVM Switcher
- 1 × IR Remote
- 1 × Fixed-Frequency 38kHz IR Receiver Cable (1.5 m)
- 2 × HDMI Cables (Male-to-Male, 1.5 m)
- 2 × USB 3.0 Cables (USB-A to USB-B, 1.8 m)
- 2 × Mounting Ears
- 4 × Machine Screws (KM3 × 4)
- 1 × 12V / 1A Multinational Locking Power Supply
- 1 × 3-Pin 3.81 mm Phoenix Connector (Male)
- 1 × User Manual



## Specifications

Technical Specifications	
HDMI Compliance	HDMI 2.1
HDCP Compliance	HDCP 2.3
Video Bandwidth	40Gbps
Audio Latency	No Latency
Video Latency	No Latency
Video Resolution	Up to 8K@60Hz, 4K@120Hz/144Hz, 1080p@240Hz
IR Level	5Vp-p
IR Frequency	Fixed Frequency 38kHz
Color Space	RGB, YCbCr 4:4:4, YCbCr 4:2:2, YCbCr 4:2:0
Color Depth	8 / 10 / 12-bit
HDR Support	HDR, HDR10, HDR10+, Dolby Vision, HLG
CEC	Supported
Audio Formats Specifications	
HDMI IN/OUT	LPCM, Dolby Digital/Plus/EX, Dolby TrueHD, Dolby Atmos, DTS, DTS-EX, DTS-96/24, DTS-HD High Res, DTS-HD Master Audio, DTS:X, DSD
L/R Audio Output	PCM 2.0CH
ESD Protection	
IEC 61000-4-2	±8kV (Air Discharge), ±4kV (Contact Discharge)
Connections	
HDMI Inputs	2 × HDMI Type-A (19-pin, Female)
HDMI Output	1 × HDMI Type-A (19-pin, Female)
Analog Audio Output	1 × L/R Audio (3.5mm Stereo Mini-Jack)
Control Ports	1 × RS-232 (3-Pin 3.81mm Phoenix), 1 × IR EXT (3.5mm)
USB Host	1 × USB Type-B
USB Device Ports	4 × USB Type-A

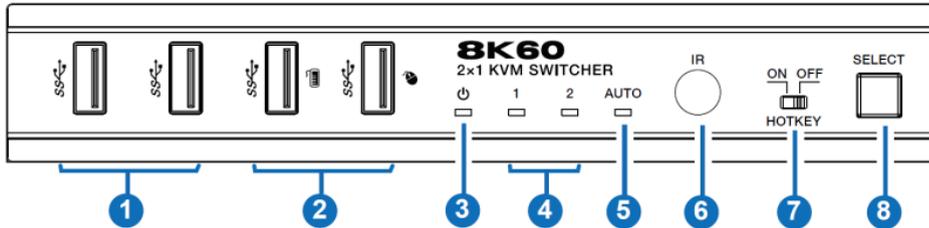


<b>Technical Specifications</b>	
HDMI Compliance	HDMI 2.1
HDCP Compliance	HDCP 2.3
<b>Mechanical Specifications</b>	
Housing	Metal Enclosure
Color	Black
Dimensions (W × D × H)	6.9 × 3.9 × 1.2 in / 175 × 100 × 30 mm
Weight	1.1 lbs / 506 g
<b>Power Specifications</b>	
Power Supply	AC 100–240V, 50/60Hz
Power Output	DC 12V / 1A (US/EU, CE/FCC/UL Certified)
Power Consumption	Typical: 7W / Standby: 0.7W
<b>Environmental Specifications</b>	
Operating Temperature	32–104°F / 0–40°C
Storage Temperature	–4–140°F / –20–60°C
Relative Humidity	20–90% RH (Non-Condensing)
<b>Recommended HDMI Cable</b>	
8K60 / 8K30 / 4K120	Ultra High Speed HDMI 2.1 Cable, up to 2 m (6.6 ft)
4K60	HDMI Cable, up to 5 m (16 ft)
1080p	HDMI Cable, up to 10 m (33 ft)
Cable Recommendation	Premium High Speed HDMI cable highly recommended



## Operation Controls and Functions

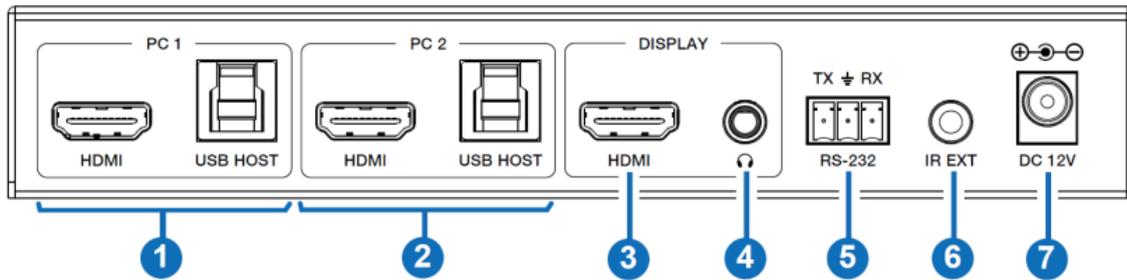
### Front Panel



No.	Name	Function Description
1	USB 3.0 Ports	USB 3.2 Gen 1 device ports for connecting peripherals such as flash drives, cameras, printers, and other USB devices.
2	USB 3.0 Ports (Hotkey Mode)	In Hotkey OFF mode, these ports support USB 3.2 Gen 1 devices. In Hotkey ON mode, these ports support USB 1.1 keyboard and mouse only for hotkey switching.
3	Power LED	Lights green when the unit is powered on and operating; lights red when the unit is in standby mode.
4	Input Channel LEDs (1 / 2)	The corresponding LED lights green when HDMI input 1 or 2 is selected as the active input source.
5	AUTO LED	Lights green when auto-switching is enabled; turns off when auto-switching is disabled.
6	IR Window	Receives signals from the included IR remote control.
7	Hotkey Switch	Enables or disables hotkey switching mode. <b>ON:</b> Connected keyboard and mouse support hotkey switching. <b>OFF:</b> Hotkey switching is disabled.
8	Select Button	Press to manually switch between HDMI input channels.



## Rear Panel

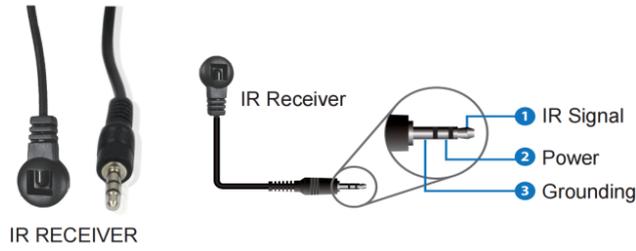


No.	Name	Function Description
1	PC 1 Ports	<b>HDMI:</b> HDMI signal input port for connecting a PC or other HDMI source. <b>USB HOST:</b> USB host port connected to PC 1; also used for firmware upgrades.
2	PC 2 Ports	<b>HDMI:</b> HDMI signal input port for connecting a PC or other HDMI source. <b>USB HOST:</b> USB host port connected to PC 2.
3	Display HDMI Port	HDMI signal output port for connecting an HDMI display such as a TV or monitor.
4	L/R Audio Port	3.5mm analog stereo audio output port.
5	RS-232 Port	3-pin Phoenix connector for connection to a PC or control system; supports serial control and firmware upgrades.
6	IR EXT Port	External IR receiver input for the included 38kHz IR receiver cable; allows IR control when the front IR window is blocked or out of line of sight.
7	DC 12V Power Input	DC 12V / 1A power input port.



## IR Pin Definition

The pin definition for the external IR receiver is shown below:



## IR Remote Control Functions

	Button	Function Description
	<b>Power</b>	Press to power on the switcher or place it into standby mode.
	<b>Auto</b>	Press to enable or disable the auto-switching function.
	<b>1</b>	Press to select <b>HDMI Input 1</b> as the active input; the corresponding front-panel LED lights green.
	<b>2</b>	Press to select <b>HDMI Input 2</b> as the active input; the corresponding front-panel LED lights green.
		Press to cyclically switch between HDMI input channels.



## Hotkey Operation

### Hotkey Switch Function

The **Hotkey switch** on the front panel enables or disables keyboard and mouse hotkey control.

- **Hotkey OFF:**  
Hotkey control is disabled. The two **USB ports (Hotkey Mode)** operate as standard **USB 3.2 Gen 1 ports**, supporting high-speed USB peripherals.
- **Hotkey ON:**  
Hotkey control is enabled. The two **USB ports (Hotkey Mode)** support **USB 1.1 keyboard and mouse only**, allowing input switching via hotkeys.

**Note:** Enable Hotkey mode only when using a keyboard and mouse for switching control.

### Keyboard Hotkey Commands

When Hotkey mode is enabled, use the following keyboard combinations to control the switcher:

Function	Hotkey Combination
Switch to HDMI Input 1	Scroll Lock → Scroll Lock → <b>1</b> or Ctrl → Ctrl → <b>1</b>
Switch to HDMI Input 2	Scroll Lock → Scroll Lock → <b>2</b> or Ctrl → Ctrl → <b>2</b>
Switch to Next Input	Scroll Lock → Scroll Lock → <b>Page Up</b> or Ctrl → Ctrl → <b>Page Up</b>
Switch to Previous Input	Scroll Lock → Scroll Lock → <b>Page Down</b> or Ctrl → Ctrl → <b>Page Down</b>
Enable / Disable Buzzer	Scroll Lock → Scroll Lock → <b>F12</b> or Ctrl → Ctrl → <b>F12</b>



## Mouse Hotkey Commands

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The switcher also supports mouse-based hotkey control when Hotkey mode is enabled:

- **Switch to Next Input:** Double-click the mouse scroll wheel, then click the **right** mouse button

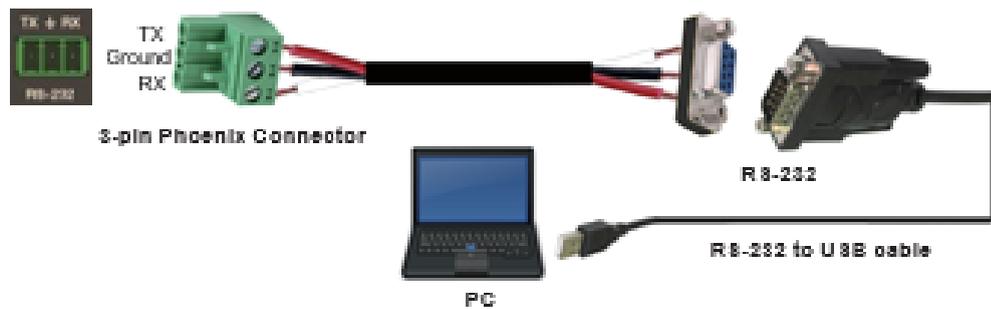
**Switch to Previous Input:** Double-click the mouse scroll wheel, then click the **left** mouse button



## ASCII Command Control (RS-232)

The product supports **ASCII command control** via the **RS-232 interface**, allowing integration with PCs and third-party control systems.

To establish communication, connect the unit's **RS-232 port** to a PC using a **3-pin Phoenix connector cable** and an **RS-232-to-USB adapter**. Ensure the following signal connections are observed:



Once the hardware connection is complete, launch a **serial command/terminal application** on the PC and send ASCII commands to control the unit.

The supported ASCII command set for this product is listed in the table below.

Parameter / Command	Function Description	Example	Feedback	Default Setting
Serial Port Protocol	Baud rate: 115200 (default), Data bits: 8, Stop bits: 1, Check bit: 0	—	—	—
x	Parameter 1	—	—	—
z	Parameter 2	—	—	—
!	Delimiter	—	—	—
help!	List all available commands	help!	—	—
status!	Get device current status	status!	—	—



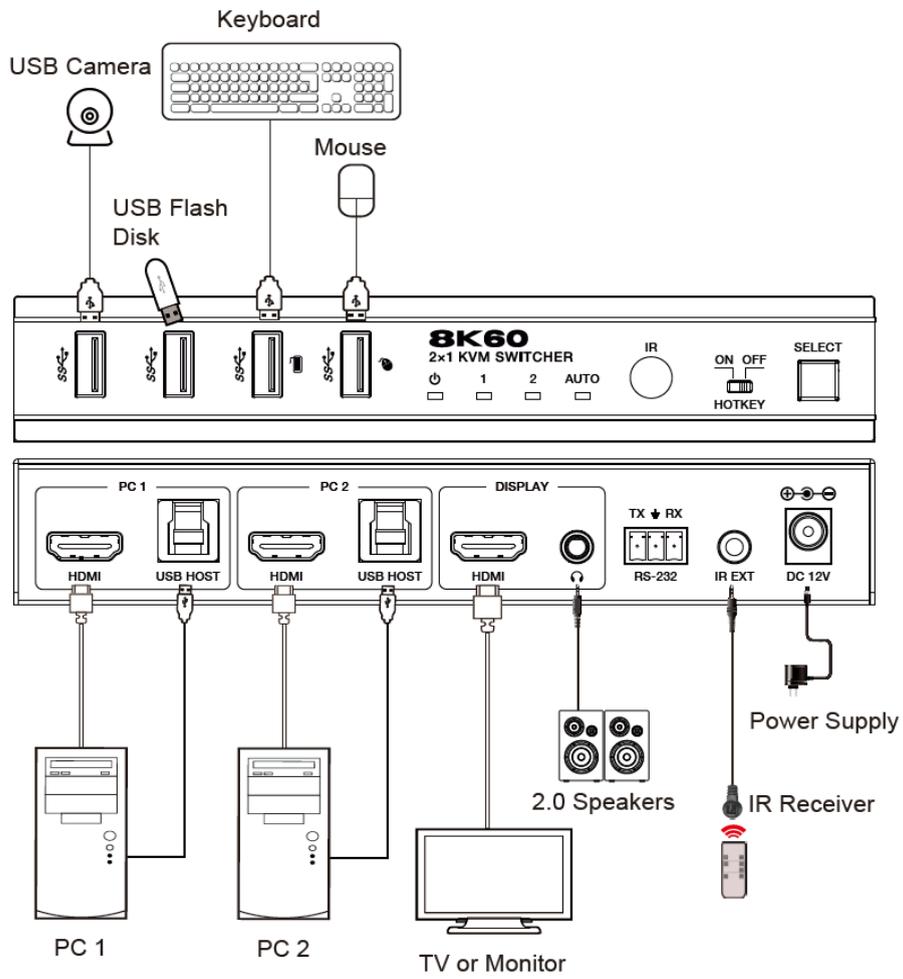
r type!	Get device model	r type!	2x1 KVM HDMI2.1 switcher	—
r fw version!	Get firmware version	r fw version!	MCU FW version: vx.xx.xxKVM FW version: vx.xx.xx	—
power z!	Power on/off the device (z=0~1)	power 1!	power on	power on
r power!	Get current power state	r power!	power on	—
reboot!	Reboot the device	reboot!	reboot...	—
reset!	Reset to factory defaults	reset!	reset to factory defaults	—
s output 1 stream x!	Enable/disable output 1 stream (x=0~1)	s output 1 stream 1!	output 1 stream: enable	output 1 stream: enable
r output 1 stream!	Get output 1 stream status	r output 1 stream!	output 1 stream: enable	—
s auto switch x!	Enable/disable auto switch (x=0~1)	s auto switch 1!	auto switch: enable	auto switch: enable
r auto switch!	Get auto switch status	r auto switch!	auto switch: enable	—
s output 1 in source x!	Route input x to output 1 (x=1~2)1=input12=input2	s output 1 in source 1!	output1 -> input1	—
r output 1 in source x!	Get output 1 selected input source	r output 1 in source!	output1 -> input1	—



s beep z!	Enable/disable buzzer (z=0~1)	s beep 1!	beep on	beep off
r beep!	Get buzzer state	r beep!	beep on	—



# 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

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Have technical questions? We may have answered them already!

Please visit BZBGear's support page ([bzbgear.com/support](https://bzbgear.com/support)) for helpful information and tips regarding our products. Here you will find our Knowledge Base ([bzbgear.com/knowledge-base](https://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](https://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:

<b>Phone</b>	<b>Email</b>	<b>Live Chat</b>
1.888.499.9906	<a href="mailto:support@bzbgear.com">support@bzbgear.com</a>	<a href="https://bzbgear.com">bzbgear.com</a>

## Limited Product Warranty Terms

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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](https://bzbgear.com/warranty).

For questions, please call 1.888.499.9906 or email [support@bzbgear.com](mailto:support@bzbgear.com).



## Mission Statement

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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.

## Copyright

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