![BZBGEAR logo - Solutions to Amplify Your World ™]

BG-UHD-KVM41

4-Port 4K 18Gbps UHD Conference Room HDMI/USB 3.0 KVM

Presentation 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

- Unpack the equipment carefully and save the original box and packing material for possible future shipment.

- Follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.

- To prevent damaging this product, avoid heavy pressure, strong vibration, or immersion during transportation, storage, and installation.

- Do not dismantle the housing or modify the module.

- Using supplies or parts not meeting the products' specifications may cause damage, deterioration or malfunction.

- Do not put any heavy items on the extension cable in case of extrusion.

- Install the device in a place with fine ventilation to avoid damage caused by overheat.

- Do not twist or pull by force ends of the optical cable. It can cause malfunction.

- The housing of this product is made of organic materials. Do not expose to any liquid, gas, or solids which may corrode the shell.

- Unplug this device during lightning storms.

- Do not use liquid or aerosol cleaners to clean this unit. Clean only with a soft dry microfiber cloth.

- Always unplug the power to the device before cleaning.

- If an object or liquid falls or spills on to the housing, unplug the module immediately.

- 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.

- Product specifications may be subject to technical upgrades without further notice.

- Unplug the power cord when left unused for a long period of time.

- Information on disposal for scrapped devices: do not burn or mix with general household waste, please treat them as normal electrical wastes.

Introduction

The BG-UHD-KVM41 is an HDMI 2.0 4x1 switcher which features four HDMI video inputs and one HDMI output. It supports HDMI video resolutions up to 4K2K@60Hz 4:4:4, HDR 10, and Dolby Vision. The switcher provides one stereo audio output for audio de-embedding, and provides four type-B USB ports and three type-A USB ports for KVM management.

Up to four computers can be controlled via one keyboard, mouse, and monitor. The switcher can be controlled via RS232 and front panel buttons. In addition, the switcher features four GR ports which can connect to BG-SC-GRHU table grommets for source selection and blank screen settings.

Features

- 4x1 HDMI 2.0 Switcher with KVM.
- Video resolutions up to 4K2K@60Hz 4:4:4, HDR 10, and Dolby Vision.
- HDCP 2.2 compliant.
- Compatible with Windows, Linux and Mac OS.
- 3.5mm stereo audio output for audio de-embedding.
- Convenient and cost-effective USB 3.0 peripheral sharing.
- Controls four HDMI computers via one keyboard, one mouse and one monitor.
- KVM auto-switching based on TMDS/5V detection.
- Controllable by buttons, RS232 commands, and BG-SC-GRHU table grommets.
- Simplifies wiring for easy installation.

Packing List

- 1 x BG-UHD-KVM41 HDMI 2.0 4x1 Switcher
- 2 x Mounting Ears with 4 Screws
- 4 x Plastic Cushions
- 4 x 3-pin Terminal Blocks

- 1 x RS232 Cable (3-pin to DB9)
- 1 x Power Adapter (12VDC, 2A)
- 1x User Manual
- 1x Quick Start Guide

Technical Specifications

| Video Input	
Input	(4) SOURCE 1~4
Input Connector	(4) Female type-A HDMI
HDMI Input Resolution	Up to 4K2K@60Hz 4:4:4, HDR10, Dolby Vision
HDMI Standard	2.0
HDCP Version	2.2
Video Output	
Output	(1) DISPLAY
Output Connector	(1) Female type-A HDMI
HDMI Output Resolution	Up to 4K2K@60Hz 4:4:4, HDR10, Dolby Vision
HDMI Standard	2.0
HDCP Version	2.2
Audio	
Output	(1) AUDIO OUT
Output Connector	(1) 3.5mm mini stereo audio jack
Audio Format	PCM 2CH
Frequency Response	20Hz to 20KHz, ±1dB
Max Output Level	2.0Vrms ± 0.5dB. 2V = 16dB headroom above -10dBV (316 mV) nominal consumer line level signal.
THD+N	< 0.05%, 20Hz - 20KHz bandwidth, 1KHz sine at 0dBFS level (or max level).
SNR	> 80dB, 20Hz - 20KHz bandwidth.
Crosstalk Isolation	< -80 dB, 10 kHz sine at 0dBFS level (or max level before clipping).
L-R Level Deviation	< 0.05 dB, 1 kHz sine at 0dBFS level (or max level before clipping).
Output Load Capability	1k Ohm and higher (supports 10x paralleled 10k ohm loads).
Noise Level	-80dB
Control	
Control	(1) FW, (4) PC 1~4, (3) DEVICES 1~3, (4) GR 1~4, (1) RS232
Control Connector	(1) Micro-USB, (4) Type-B USB, (3) Type-A USB, (5) 3-pin Terminal Blocks
General	
Bandwidth	18Gbps
Operation Temperature	14°F ~ +131°F / -10°C ~ +55°C
Storage Temperature	-25°F ~ +158°F / -25°C ~ +70°C
Relative Humidity	10%-90%
Type-A USB Power Supply	1A
System Power Supply	Input:100V~240V AC; Output: 12V DC 2A
System Power Consumption	14W(Max)
Dimension (W*H*D)	7.9" x 1.6" x 3.9" [200mm x 40mm x 100mm]
Net Weight	1.5lbs [685g]

Operation Controls and Functions

Front Panel
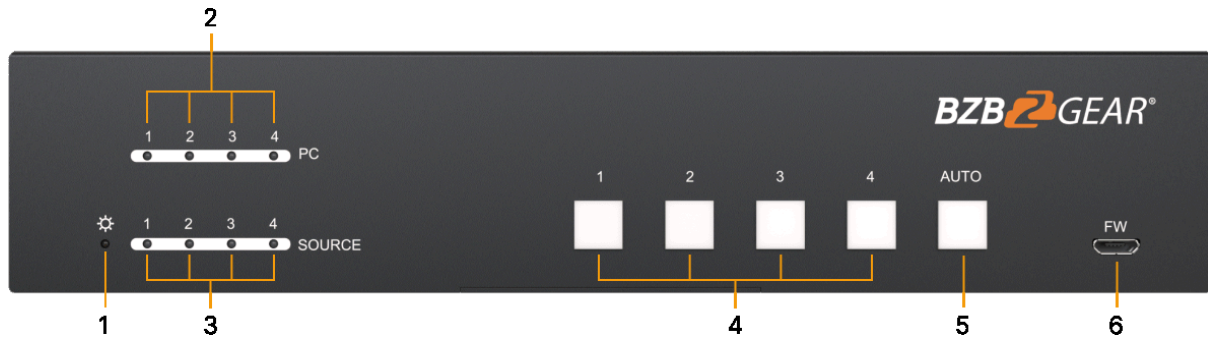
1. **POWER LED**: This LED will illuminate red when the device is connected to the power supply.

2. **PC LEDs 1-4**: Each LED will illuminate blue to indicate its corresponding USB type-B port is connected to an active PC.

3. **SOURCE LEDs 1-4**: Each LED will illuminate blue to indicate its corresponding HDMI port is connected to an active source device.

4. **SOURCE BUTTONS 1-4**: Press buttons 1-4 to select input source. The corresponding button will illuminate blue to indicate which source device is selected.

5. **AUTO**: Select this button to enable auto switching mode. It will illuminate blue when enabled. Press again to exit auto switching mode.

6. **FW**: Micro-USB port for firmware upgrade.

Rear Panel
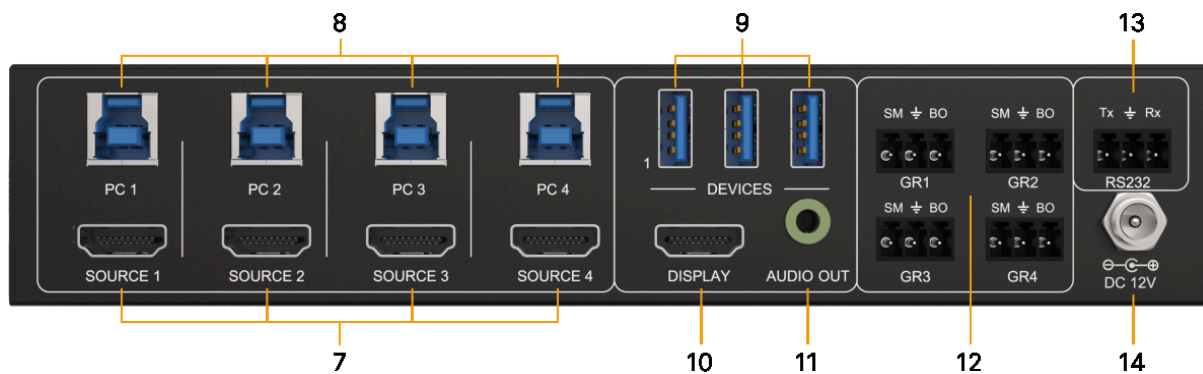
7. **HDMI SOURCE 1-4**: Connect up to 4 HDMI source devices (PC, MAC, etc.).

8. **USB PC 1-4:** Four type-B USB ports to connect PCs. The PC can be a source device connected to the corresponding HDMI input port.

9. **DEVICES 1-3**: Three USB type-A ports to connect USB peripherals devices (keyboard, mouse or camera, etc.). These USB devices are used to control the PC which is connected to the selected HDMI input port and the corresponding type-B USB.

10. **DISPLAY**: Type-A female HDMI output port to connect display devices (e.g. Projector).

11. **AUDIO OUT**: 3-pin terminal block to connect speakers or amplifiers for audio output.

12. **GR1-GR4**: Four 3-pin terminal blocks to connect four BG-SC-GRHU table grommets for source selection and black screen setting.

13. **RS232**: 3-pin terminal blocks to a control device (e.g. PC) to control the switcher.

14. **DC 12V**: Power port for power adapter connection.

Panel Drawing
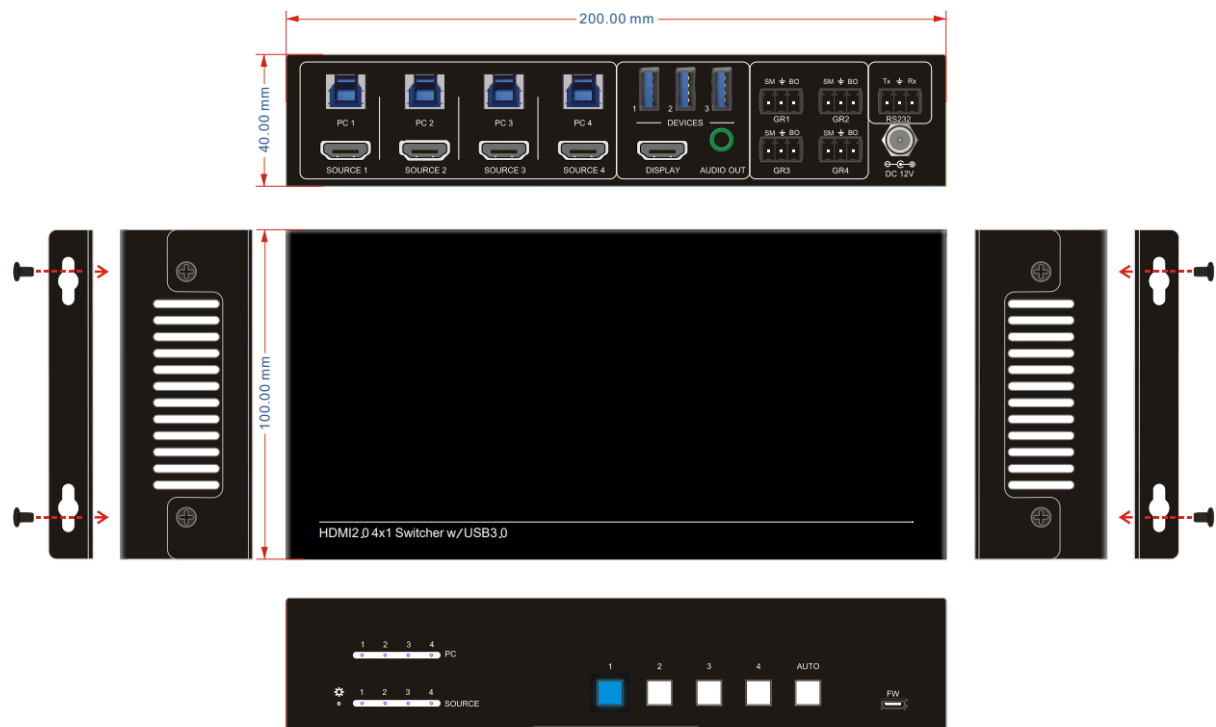
Button Control

Manual-Switching

Press button 1~4 to select the corresponding HDMI input source.

Auto-Switching

Press AUTO button to enable the auto-switching mode and then the button LED will illuminate blue.

When in auto mode, the switcher follows the rules in the circumstances below:

- The switcher will automatically switch to the first available active input starting at input 1 to 4.

- Pressing the source button (1, 2, 3, or 4) can directly change the input source.

- New Input: Upon detecting a new input, the switcher will automatically select the new source.

- Detection input signal source: 5V(Default) or TMDS.

- Reboot: Once power is restored to the switcher, if the last selected source is still available, the switcher will still output this signal, otherwise, the switcher will switch to the first available active input starting at input 1.

- Source Removed: When an active source is removed the switcher will switch to the first available active input starting at input 1.

- Press AUTO again can exit auto switch mode, but the input source will remain the current setting.

Note: The factory default is auto switching mode.

Table Grommet Control

The BG-SC-GRHU table grommet can be used for input source selection and black screen.

Press **Show Me** on table grommet to select HDMI source.

Press **Blank Output** on table grommet to let the display be black screen.

RS232 Control

Connect the switcher to the control device (e.g. PC) with RS232 cable and set the parameters in the right manner, the control device is capable of controlling this switcher by RS232 commands.

RS232 Control Software

- Installation: Copy the control software file to the computer connected with this switcher

- Uninstallation: Delete all the control software files in corresponding file path.

RS232 Command

Communication protocol: RS232 Communication Protocol

Baud rate: 9600   **Data bit**: 8   **Stop bit**: 1   **Parity bit**: none

Note: All commands need to be ended with "<CR><LF>".

Device Control

Command	Description	Command Example and Feedback
#GET_FIRMWARE_VERSION	Get the software version.	@V1.0.0
#SET_KEYPAD_LOCK 0	Unlock the front panel buttons (Factory default).	@FRONT PANEL UNLOCK!
#SET_KEYPAD_LOCK 1	Lock the front panel buttons.	@FRONT PANEL LOCK!
#GET_KEYPAD_LOCK	Get the locking status of front panel buttons.	@FRONT PANEL UNLOCK! @FRONT PANEL LOCK!
#SET_HDMI_DETECTION_MODE 0	Set the detection method of HDMI source input to 5V.	@INPUT_SIGNAL_DETECTION 0!
#SET_HDMI_DETECTION_MODE 1	Set the detection method of HDMI source input to TMDS.	@INPUT_SIGNAL_DETECTION 1!
#GET_HDMI_DETECTION_MODE	Get the detection method of HDMI source input.	@INPUT_SIGNAL_DETECTION 0! @INPUT_SIGNAL_DETECTION 1!
#GET_STATUS	Get the system status.	@RS232 QUERY STATUS! @BG-UHD-KVM41 @V1.0.0 @FRONT PANEL UNLOCK! @HDMI OUT SWITCH TO AUTO MODE! @HDMI IN SWITCH TO 1! @OUTPUT_HDCP 0! @INPUT_SIGNAL_DETECTION 1! @IIS OUT ON! @RS232 BAUDRATE IS 1!
#FACTORY_RESET	Restore factory default	@FACTORY DEFAULT! @BG-UHD-KVM41 @V1.0.0 @HDMI OUT SWITCH TO AUTO MODE! @OUTPUT_HDCP 0! @IIS OUT ON! @INPUT_SIGNAL_DETECTION 0! @HDMI IN SWITCH TO 1! @USB SWITCH MODE TO 0! @RS232 BAUDRATE IS 1!
#REBOOT	Reboot the device.	@REBOOT
#HELP	Get all commands and its usage.	

Signal Switching

Command	Description	Command Example and Feedback
#SET_AV H1	Switch to HDMI source 1.	@HDMI IN SWITCH TO 1!
#SET_AV H2	Switch to HDMI source 2.	@HDMI IN SWITCH TO 2!
#SET_AV H3	Switch to HDMI source 3.	@HDMI IN SWITCH TO 3!
#SET_AV H4	Switch to HDMI source 4.	@HDMI IN SWITCH TO 4!

Command	Description	Command Example and Feedback
#GET_AV	Get the current HDMI source.	@HDMI IN SWITCH TO 1!
#SET_AUTO_SWITCH 1	Enable auto switching (Factory default).	@HDMI OUT SWITCH TO AUTO MODE!
#SET_AUTO_SWITCH 0	Disable auto switching	@HDMI OUT SWITCH TO MANUAL MODE!
#GET_AUTO_SWITCH	Get the auto switching status.	@HDMI OUT SWITCH TO AUTO MODE!
		@HDMI OUT SWITCH TO MANUAL MODE!

Audio Setting

Command	Description	Command Example and Feedback
#SET_IIS 1	Turn on stereo audio output.	@IIS OUT ON!
#SET_IIS 0	Turn off stereo audio output.	@IIS OUT OFF!
#GET_IIS	Get the stereo audio output status.	@IIS OUT ON!
		@IIS OUT OFF!

EDID Management

Command	Description	Command Example and Feedback
#SET_EDID_MODE [PARAM]	[PARAM]= 0000~0011 [PARAM]=0000, set the EDID mode to Pass-through (Factory default). If the source device can't read EDID from display device, it will use the built-in EDID: 3840x2160@60Hz Deep Color Stereo Audio. [PARAM]=0001/0010/0011, set the EDID of source device to user-defined EDID 0001/0010/0011.	#SET_EDID_MODE 0000 @EDID_MODE 0000!
#GET_EDID_MODE	Get the EDID mode.	@EDID_MODE 0000!
#EDIDR [PARAM]	Get the EDID value. [PARAM]= 0000~0011	@EDID HEX STRING OF '0000': 00 FF FF FF FF FF FF 00 41 0C F2 08 50 12 00 00 … …
#UPLOAD_USER_EDID [PARAM]	[PARAM]=0001/0010/0011, upload user-defined EDID. When the command applied, system prompts to upload the EDID file (.bin). Operation will be canceled in 10 seconds.	#UPLOAD_USER_EDID 0001 @PLEASE SEND THE EDID FILE! … … @RECEIVED THE FILE, LENGTH=256! @EDID0001 UPDATE SUCCESSFULLY!

HDCP Setting

Command	Description	Command Example and Feedback
#SET_OUTPUT_HDCP 0	Set the HDCP mode of HDMI output to PASSIVE mode (Factory default). The HDCP of HDMI output automatically follows the HDCP version of source device.	@OUTPUT_HDCP 0!
#SET_OUTPUT_HDCP 1	Set the of HDMI output to ACTIVE mode. If the input video has HDCP content, the HDCP version of HDMI output is HDCP 1.4 for broader video solution. If the input video has no HDCP content, the HDMI output has no HDCP too.	@OUTPUT_HDCP 1
#GET_OUTPUT_HDCP	Get the HDCP mode of HDMI output.	@OUTPUT_HDCP 0!

Baudrate Setting

Command	Description	Command Example and Feedback
#SET_RS232_BAUD 1	Set RS232 baudrate to 9600.	@RS232 BAUDRATE IS 1!
#SET_RS232_BAUD 2	Set RS232 baudrate to 19200	@RS232 BAUDRATE IS 2!
#SET_RS232_BAUD 3	Set RS232 baudrate to 38400	@RS232 BAUDRATE IS 3!
#SET_RS232_BAUD 4	Set RS232 baudrate to 57600	@RS232 BAUDRATE IS 4!
#SET_RS232_BAUD 5	Set RS232 baudrate to 115200	@RS232 BAUDRATE IS 5!
#GET_RS232_BAUD	Get the RS232 baudrate.	@RS232 BAUDRATE IS 1!

Display Control

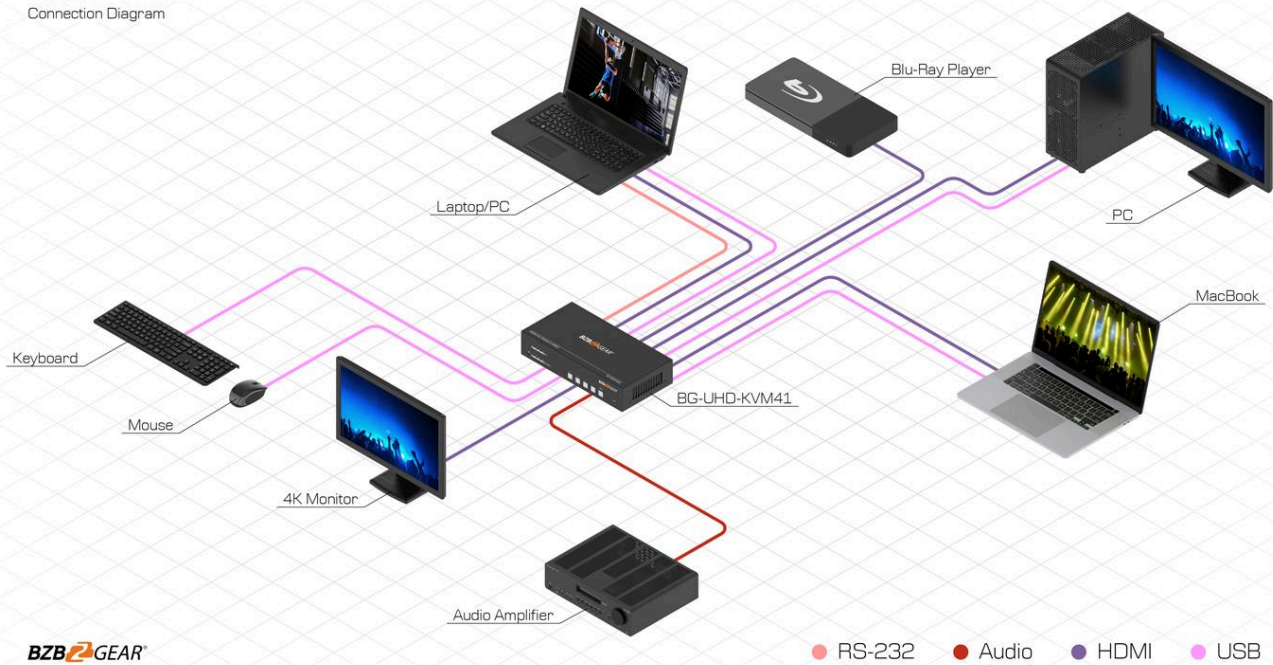| Command	Description	Command Example and Feedback
#SET_THE_DISPLAY_TO 0	Set the display to output black screen, and no audio output.	@THE DISPLAY SIDE SCREEN IS BLACK! @THE DISPLAY IS ALREADY OFF!
#SET_THE_DISPLAY_TO 1	Wake up the display screen.	@WAKE UP THE SCREEN! @THE DISPLAY IS ALREADY ON!
#GET_THE_DISPLAY	Get the status of the display screen.	@THE DISPLAY IS OFF!
		@THE DISPLAY IS ON!

Firmware Upgrade

Please follow the steps as below to upgrade firmware by the FW port on the front panel:

1) Prepare the latest upgrade file (.bin) and rename it as "FW_MERG.bin" on PC.

2) Power off the switcher, and connect the FW port of the switcher to the PC with USB cable.

3) Power on the switcher, and then the PC will automatically detect a U-disk named "BOOTDISK".

4) Double-click the U-disk, a file named of "READY.TXT" would be showed.

5) Directly copy the latest upgrade file (.bin) to the "BOOTDISK" U-disk.

6) Reopen the U-disk to check the filename "READY.TXT" whether automatically becomes "SUCCESS.TXT", if yes, the firmware was updated successfully, otherwise, the firmware updating is fail, the name of upgrade file (.bin) should be confirm again, and then follow the above steps to update again.

7) Remove the USB cable after firmware upgrade.

8) After firmware upgrade, the switcher should be restored to factory default by sending commands.

Application Example

BG-UHD-KVM41
Connection Diagram

Blu-Ray Player

Laptop/PC

PC

MacBook

Keyboard

Mouse

BG-UHD-KVM41

4K Monitor

Audio Amplifier

● RS-232   ● Audio   ● HDMI   ● USB

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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