

# BG-COMMANDER-ULTRA

**4K UHD Serial and IP 4-Channel Production Switcher/Joystick  
Controller Combo with Touchscreen and POE**

## User Manual







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## 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-COMMANDER-ULTRA integrates a 4K HDMI switcher with a PTZ joystick controller. Supporting resolutions up to 4K2K@60Hz with both HDR and SDR capabilities, this device ensures superior video quality and color accuracy. It adheres to HDMI 2.0 standards with an 18Gbps bandwidth, offering secure content protection through HDCP 1.4/2.2. Equipped with 5 HDMI inputs, 4 HDMI outputs, 2 XLR audio inputs, and versatile control ports (RS-232, RS-422, Ethernet), this unit delivers extensive connectivity and flexibility. A standout feature is its embedded video mixer, which allows seamless transitions like wipe, dissolve, and DVE.

The device also supports LPCM audio, with analog stereo output via XLR, ensuring top-tier audio management. For camera control, it enables precise remote adjustments using VISCA, Pelco-D, and Pelco-P protocols over IP and serial connections. The front board offers intuitive navigation between PTZ and switcher modes, managing up to four full-view outputs and a multi-view output. Additionally, the on-screen display (OSD) menu provides easy access to detailed settings and firmware updates via USB.

## Features

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- HDMI 2.0 compliant
- HDCP 1.4/2.2 compliant
- Supports HDR for both inputs or outputs and HDR to SDR conversion.
- 4x HDMI 2.0 inputs and 1x HDMI AUX input
- 4x HDMI 2.0 outputs support 1 multi-view output and 3 full-view outputs
- Resolutions support up to 4K2K@60Hz (4:4:4 8bits).
- Supports remote control of multiple camera settings such as pan, tilt, zoom, iris, focus, shutter, and white balance
- Supports seamless, wipe, DVE, and dissolve switching on full view outputs.
- Supports versatile luma keying, chroma keying, and PIP.
- Supports 4K real-time waveform monitor, vector scope, histogram, and audio bar indicators on the selected input channel.
- Supports SMPTE and the most popular VESA formats.
- Pure unaltered uncompressed 7.1ch digital HDMI
- Supports RS-422, RS-232, and Ethernet control for the camera
- Supports VISCA, VISCA over IP, Pelco-D, and Pelco-P control protocols
- Supports analog stereo through XLR connectors
- Firmware upgradable through USB port to support new features and technology enhancements
- USB-C captures up to 1080P60
- RTMP streaming up to 1080P60
- Integrated Micro SDXC card slot for local recording of the PGM feed



## Packing List

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- 1x BG-COMMANDER-ULTRA
- 1x 12V5A DC Adapter
- 1x User Manual



## Specifications

<b>Technical Specifications</b>	
HDCP Compliance	1.4/2.2
HDMI Compliance	HDMI 2.0
Video Bandwidth	Single-link 600MHz [18Gbps]
HDMI In/Out Video Support	Up to HDR 4K2K@60 (4:2:0 10bits) / 4K2K@60 (4:4:4 8bits)
Video Format Support	HDMI 2.0
Audio Support	LPCM
USB-C Output Resolution	1080P60
RTMP Output Resolution	1080P60
Control	Ethernet/RS-232/RS-422 Control
Embedded Video Mixer	Yes
Input TMDS Signal	1.2 Volts [peak to peak]
ESD Protection	Human body model — ±15kV [air-gap discharge] & ±8kV [contact discharge]
Inputs	5x HDMI + 2x XLR + 2x RJ-45(LAN) + 1x USB (Type A) + 2x RS-232 + 1x Terminal Block (RS-422)
Outputs	4x HDMI+ 1x 3.5mm + 1x USB-C
Storage	Micro SDXC
HDMI Connector	Type A [19-pin female]
USB Connector	USB Type A
RJ-45 Connector	WE/SS 8P8C
<b>Mechanical</b>	
Housing	Metal enclosure
Fixedness	Wall-mounting case
Power Supply	12V5A DC
Operation Temperature	32~104°F / 0~40°C
Storage Temperature	-4~140°F / -20~60°C
Relative Humidity	20~90% RH [no condensation]



## Operation Controls and Functions

### Rear Panel



1. Micro SDXC card Slot
2. USB-C Output Port
3. USB Port (Firmware Upgrade Port)
4. AUX Input
5. HDMI Input 1-4
6. HDMI Output 1-4
7. XLR-L Input
8. XLR-R Input
9. Stereo OUT
10. Ethernet Control Port
11. RS-232 Remote Control
12. RS-422 Remote Control
13. VISCA over IP Remote Control
14. +12V DC
15. Power switch





## Front Panel



1. **LCD Display:** for PGM output image
2. **Knobs:** for PTZ speed adjustment, IRIS on/off, focus adjustment, and R/B GAIN white balance adjustment
3. **LCD Display:** for camera controller OSD menu
4. **Buttons:** zoom tele/wide to control the camera's optical zoom
5. **Buttons:** shortcut buttons for camera selection, alphanumeric keyboard, and additional function buttons
6. **4D Joystick:** up/down/left/right/zoom



## Front Board Button Overview

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### Button “Search” Overview

1. Press the “Search” button to search for IP cameras.
2. The keyboard screen will display "Searching." Please wait.
3. Once the search is complete, the discovered VISCA Over IP cameras will be displayed. Use the joystick or keyboard to select the desired camera.
4. Assign cameras to hotkeys 1–7 for quick access.
5. Press the “Back” button to exit the search list or return to the previous page.

### Button “CAM Menu” Overview

1. Press the "CAM Menu" button to open the camera OSD menu. Navigate the menu using the keyboard or joystick.
2. Use the joystick or the keyboard's up and down keys to browse menu options.
3. Use the joystick or the keyboard's left and right keys to adjust values.
4. Press the top button of the joystick or the “Enter” key to confirm a selection.
5. Press “CAM Menu” to return to the previous page or exit the camera menu.

**Note:** This function is only available with VISCA Over IP and VISCA TCP protocols.

### Keyboard Input

1. Press number keys 0–9 to input settings for the device and IP camera network.
2. Press “Enter” to save the settings, or “Delete” to remove a character.
3. Press “Back” to return to the previous page.
4. Press “Lock” to disable the keyboard and joystick functions. To unlock, press “Lock” again. If in display sleep mode, pressing “Lock” will cancel sleep mode.

### Keyboard OSD Menu Settings

1. Press the "SETTING" button to open the keyboard menu, and press “Back” to exit.
2. Use the joystick to navigate the menu:
  - Move the joystick up and down to scroll.
  - Move the joystick to the right to enter the next menu or switch parameters.
  - Move the joystick to the left to return to the previous menu or switch parameters.
  - Press the "HOME" button on top of the joystick to enter the next menu, save changes, or exit.
3. Press "BACK" to return to the previous page.
4. Use the number keys “2,” “4,” “6,” and “8” as the up, left, right, and down navigation keys, respectively.



## Keyboard Hotkey CAM 1–7

1. Press hotkeys 1–7 to select the camera to be controlled.

## Keyboard HOME

1. Press the “HOME” key to return the camera to its default position. (Works with VISCA, VISCA Over IP, and VISCA TCP protocols)

## Keyboard Auto Focus

1. Press the “Auto FOCUS” key to activate the camera's auto-focus.
2. Turn the rotary switch left or right to manually adjust focus (Far/Near).
3. Press the rotary switch to perform a one-push focus command.

## Keyboard WB Mode

1. Press the “WB Mode” key to switch between Auto, Indoor, Outdoor, One Push WB, ATW, and Manual white balance modes.
2. The rotary switches “R-GAIN” and “B-GAIN” are only functional in Manual mode.

## Keyboard AE Mode

1. Press the “AE Mode” key to select Auto, Manual, Shutter, Iris, or Bright exposure modes.
2. The rotary switch “I/S/G” can be used in Manual, Shutter, Iris, and Bright modes.
3. In Manual mode, press the “I/S/G” rotary switch to cycle through Iris, Shutter, Gain, and back to Iris.

## Keyboard Zoom

1. Press the “Zoom TELE” or “Zoom WIDE” key to control the camera’s optical zoom.
2. Use the rotary switch "PT/Z Speed" to adjust zoom speed (levels 1–8).

## Rotary Switch PT/Z Speed

1. The "PT/Z Speed" rotary switch adjusts the Pan, Tilt, and Zoom speed levels (1–8).

## Setting Preset Positions with “Store,” “Call,” and “Clear” Buttons

1. **STORE Button:**
  1. Move the camera to the desired position.
  2. Press the "STORE" button, then press a number key (0–9) to save the preset position.

**2. CALL Button:**

1. Press the “CALL” button, then press a number key (0–9) to move the camera to the preset position.

**3. CLEAR Button:**

1. Press the “CLEAR” button, then press a number key (0–9) to delete a preset position.

**Note 1:** The preset function is available with VISCA and Pelco protocols.

**Note 2:** Pelco D/P protocols only support Pan, Tilt, Zoom, and preset (CALL, STORE, CLEAR) controls. Optical adjustments are not supported.



## Operation Approach

### Mode Selection

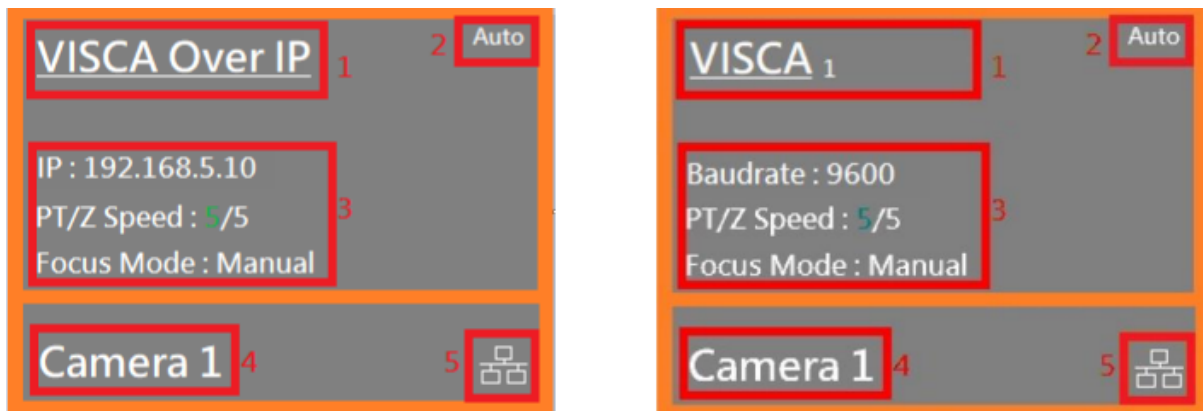
Move the joystick up or down, or press the number button '2' for up or '8' for down to select the "PTZ Camera Controller" or "4 Channel Switcher Mode."

- Press the 'Enter' button to enter the selected mode.

### OSD Menu Settings Overview

- **Hotkey:** Set the device information for CAM1-CAM7 hotkeys
- **Network:** Manage device network settings
- **Keys:** Set up custom functions for buttons F1 and F2 (reserved)
- **Display:** Configure display settings
- **Joystick:** Configure joystick behavior
- **About Device:** Displays device information and allows for device reset

### PTZ Camera Controller Mode Overview



- **Main Page Introduction:**
  - **Control Protocol Display:** Shows the control protocol (e.g., VISCA Over IP)
  - **Operation Record Area:** Displays recent operation records
  - **Device IP Address:** Shows the IP address of the device (e.g., IP: 192.168.5.10)
  - **Control Parameters:** Displays PT/Z Speed, Focus Mode, Camera ID, etc.
  - **Network Connection Indicator:** The icon indicates a successful network connection
  - **Control via Serial Port:** Displays control protocol, device ID, IP address, and baud rate
  - **Device Name Display:** Shows the name of the device being controlled



## Switcher Mode Overview (Front Board Method)



- **PGM CH 1-4:** Set the input 1-4 video as PGM
- **PVW CH 1-4:** Set the input 1-4 video as PVW
- **WFM CAM 1-4:** Analysis of the input 1-4 video by WFM
- **WFM Y MODE:** Show the Y WFM analyzer
- **Histogram:** Show the Histogram WFM analyzer
- **Vector Scope:** Show the Vector Scope WFM analyzer
- **Cut:** Switch the PGM and PVW video
- **Back:** Back to control mode selection page

### **Transition mode selection:**

- MIX: Fade out(transition)
- WIPE: Wipe transition)
- Auto: Do the transition with the selected mode



## Troubleshooting

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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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