



# BG-AVENTO-4K

**4K AI Enabled Dual-Lens NDI PTZ Conference Camera with  
Intelligent Speaker Tracking & Panoramic View**

## User Manual







## TABLE OF CONTENTS

Statement	4
Safety Precaution	4
Introduction	5
Features	5
Packing List	6
Specifications	7
Operation Controls and Functions	9
Installation and Mounting	11
Connection Diagram	13
Camera Operating Modes	13
IR Remote Control	15
Control Over IP Set Up	16
Web GUI Overview	18
Web UI Introduction	18
NDI Settings – Quick Guide	21
Troubleshooting	24
Tech Support	25
Limited Product Warranty Terms	25
Mission Statement	26
Copyright	26



## 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-AVENTO-4K is a cutting-edge 4K dual-lens AI camera designed to elevate collaboration in modern workspaces and educational environments. Featuring a powerful dual-lens system—with a 4K PTZ camera offering optical zoom and a wide-angle panoramic lens—it captures both detailed close-ups and the full room view simultaneously, ensuring every participant is clearly visible.

Integrated with four linear array microphones and advanced AI algorithms, the BG-AVENTO-4K delivers precise sound localization and intelligent speaker tracking, automatically focusing on active participants for a natural and engaging meeting experience. With plug-and-play USB 3.0 connectivity, support for 4K@30fps video, and compatibility with leading video conferencing platforms, it provides professional-quality video and effortless usability in small to medium-sized conference rooms, training facilities, and online classrooms.

## Features

---

- **Dual-Lens System:** Combines a panoramic camera for participant detection with a PTZ camera to capture the optimal view of the room.
- **4K Resolution:** Supports up to 4K@30fps with USB 3.0 connectivity for crisp, high-quality video.
- **PTZ Camera:** 8MP sensor with 3x optical zoom and 110° diagonal field of view (DFOV).
- **Panoramic Camera:** 1080p sensor with 120° diagonal field of view (DFOV) for full-room coverage.
- **Advanced Imaging:** CMOS sensor and ISP algorithm deliver clear, vibrant video with exceptional detail.
- **AI-Powered Features:** Auto framing, speaker tracking, presenter tracking, and individuals gallery view for natural, engaging meetings.
- **Video Compression:** Supports MJPG, NV12, H.265, and H.264 for broad application compatibility.
- **Cross-Platform Compatibility:** Works with Windows 10/11 and macOS systems seamlessly.
- **Conference Integration:** Compatible with Zoom, Microsoft Teams, Skype, Cisco Webex™, and other leading platforms.
- **Easy Installation:** Plug-and-play design allows simple mounting on displays or walls.
- **NDI Output:** Supports NDI output via the LAN port



## Packing List

---

- 1 x BG-AVENTO-4K
- 1 x DC 12V 3A Power Adapter with US Pins
- 1 x 1.8m USB-A to USB-C Cable
- 1 x IR Remote
- 1 x Private Lens Cap (for Panoramic lens)
- 1 x Mounting Bracket (with screws)



## Specifications

Technical Specifications	
<b>Video &amp; Audio</b>	<p><b>Input &amp; Output Port:</b> 1 × USB-C, 1 × HDMI OUT, 1 × USB-A, 1 × DC 12V IN</p> <p><b>USB 3.0/2.0 Resolution Supported:</b> MJPEG/H.265/H.264 – 320×240@30fps, 640×340@30fps, 1280×720@30fps (default), 1920×1080@30fps, 3840×2160@30fps NV12 – 320×240@30fps, 640×340@30fps, 1280×720@30fps (default), 1920×1080@30fps*</p> <p><b>Note:</b> Resolutions above apply only to the main lens. The panoramic lens resolution is fixed at 1080p@30fps (MJPEG).</p> <p><b>Output Video Encoding:</b> MJPEG / H.264 / H.265 / NV12</p> <p><b>USB Protocol:</b> UVC 1.1</p>
<b>Camera</b>	<p><b>Lens:</b> Main Lens – 8MP, 3× optical zoom, DFOV 110°; Panoramic Lens – 2MP, fixed focus, DFOV 120°</p> <p><b>Sensor:</b> Main Lens – 8MP; Panoramic Lens – 2MP</p> <p><b>White Balance:</b> Auto</p> <p><b>Backlight Compensation:</b> Auto</p> <p><b>Digital Noise Reduction:</b> 2D, 3D DNR supported</p> <p><b>PTZ Range:</b> Horizontal ±75°, Vertical ±35°</p> <p><b>HDR:</b> Supported</p> <p><b>Tracking Modes:</b> Auto Framing / Speaker Tracking / Presenter Tracking / Individuals Gallery</p>
<b>Speakerphone</b>	<p><b>Microphone:</b> 4 × linear microphone arrays for human voice detection and audio tracking (not usable as video conference audio source)</p> <p><b>Peripherals:</b> Supports connection with USB peripherals such as speakerphones or third-party audio devices</p>

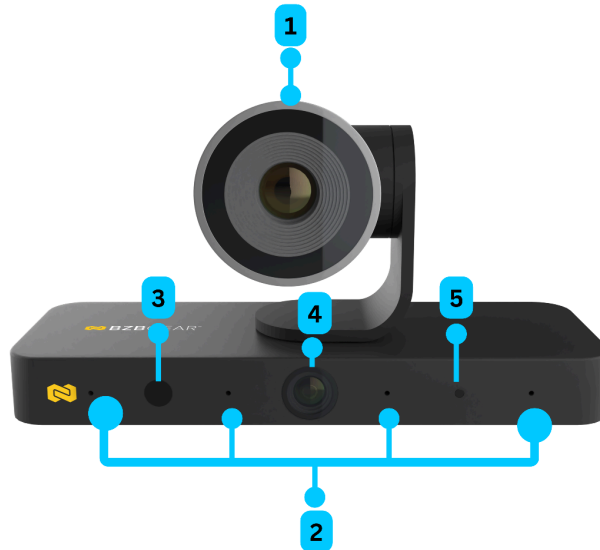


<b>Communication &amp; Control / General</b>	<p><b>Compatible OS:</b> Windows 10/11, macOS 10.10 or above</p> <p><b>HDMI OUT:</b> HDMI 1.4b with 4K@30Hz (no-HDCP). Outputs continuously unless powered off or in standby.</p> <p><b>USB Ports:</b> USB-C 3.0 female; USB-A 2.0 female</p> <p><b>Control Methods:</b> IR Remote, LAN (Telnet &amp; Web UI)</p> <p><b>Operating Temperature:</b> 0°C–40°C (32°F–104°F), 10%–90% non-condensing</p> <p><b>Storage Temperature:</b> -20°C–60°C (-4°F–140°F), 10%–90% non-condensing</p> <p><b>Power Supply:</b> DC 12V, 3A</p> <p><b>Power Consumption:</b> 10.824W (Max)</p> <p><b>Dimensions (W×H×D):</b> 200 × 100.44 × 69 mm / 7.87” × 3.95” × 2.72”</p> <p><b>Net Weight:</b> 0.44 kg / 0.97 lb</p>
--	--



## Operation Controls and Functions

### Front Panel



#	Name	Description
1	Lens	4K optical zoom lens.
2	MIC	4 × Linear mic arrays for sound source localization.
3	IR Window	Receives IR signals from the provided IR remote.
4	Lens	1080p fixed-focus lens.
5	Status LED	<p><b>Lighting white for about 2s, then off:</b> The device is starting up.</p> <p><b>Blinking dark white (breathing):</b> The device is in idle mode. The color can be set to red or off through the web UI.</p> <p><b>Lighting white:</b> The device is active.</p> <p><b>Blinking quickly:</b> The device is being upgraded.</p>



## Rear Panel



#	Name	Description
1	DC 12V	Connect to the provided power adapter.
2	LAN	Connect to the network for web UI, Telnet control, or NDI output.
3	USB-A	USB 2.0 Type-A port. Connect to USB peripherals, such as a speakerphone.
4	HDMI OUT	Connect to an HDMI display, video conference system, projector, or video capture device.
5	USB-C	USB 3.0 Type-C port. Connect to a laptop, room PC, or all-in-one conference device for transmitting audio and camera video signals using the provided USB-A to USB-C cable.
6	RESET	Press once to display the IP address and tracking mode on the connected display. Hold for at least 10 seconds to restore factory defaults.
7	Kensington Lock Slot	Kensington security slot.



## Installation and Mounting

**Note:** Before beginning installation, ensure the device is **disconnected from the power source**.

### Assemble the Camera and Mounting Brackets

1. **Assemble the brackets:**

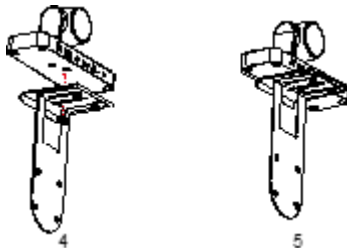
Attach the **base bracket panel** to the **base support bracket** using the **two assembly screws** provided.



**Example:** Base Bracket Panel and Base Support Bracket Installation

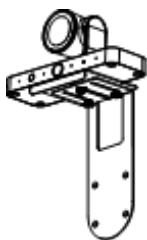
2. **Attach the camera:**

Use the **thumb screw** to secure the **mounting brackets** to the **camera**.



**Example:** Install the Camera on the Mounting Bracket

**Note:** For wall installation, assemble the **base support bracket**.

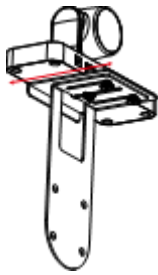


**Example:** Mounting Direction for Wall-Mount Brackets

### Install the Camera on a TV

1. **Adjust the bracket:**

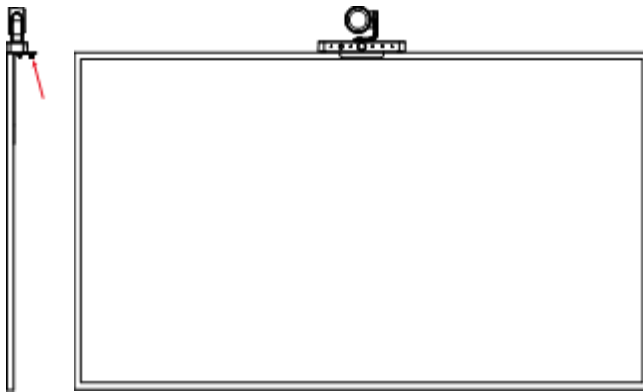
Loosen the **two assembly screws** on the **base support bracket**, then slide the **long baffle** to increase the distance between the two baffles.



**Example:** Loosen Screws and Move the Long Baffle

2. **Mount the camera:**

Place the camera on top of the TV. Adjust it forward or backward to fit the width of the TV between the two baffles.



**Example:** Install the Camera on the TV

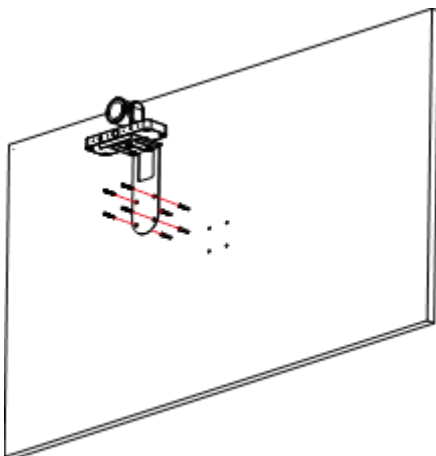
### Install the Camera on a Wall

1. **Prepare the wall:**

Drill holes in the wall, then insert the **plastic expansion anchors** into the holes.

2. **Mount the camera:**

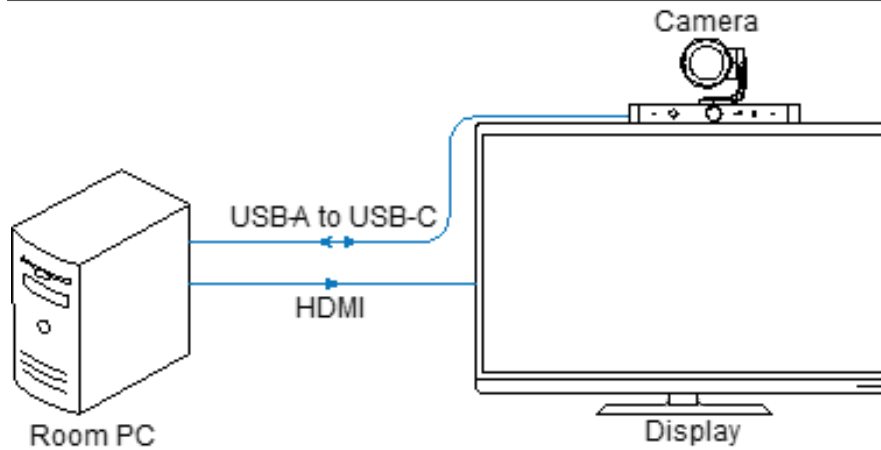
Secure the camera to the wall using the **provided mounting screws**.



**Example:** Install the Camera on the Wall



## Connection Diagram



### Camera Operating Modes

The camera operates in three modes: **Init Mode**, **Idle Mode**, and **Active Mode**.

#### Init Mode

When the camera is powered on, it starts in Init Mode.

- If no UVC signal transmission occurs **and** no HDMI display is connected to the **HDMI OUT** port within **10 seconds** of startup, the camera automatically switches to **Idle Mode**.
- If a UVC channel is opened **or** an HDMI display is connected within **10 seconds** of startup, the camera transitions to **Active Mode**.

#### Idle Mode

In Idle Mode:

- Connecting a USB cable or pressing any button on the IR remote will wake the camera and place it back into **Init Mode**.
- Once the UVC channel is established, the camera will switch to **Active Mode**.

#### Active Mode

In Active Mode:

- If the UVC channel is closed, the camera will return to **Init Mode**.
- If no UVC signal transmission occurs and no HDMI display is connected to the **HDMI OUT** port within **10 seconds**, the camera will transition to **Idle Mode**.



## Notes

- The camera supports receiving commands via the **UVC channel** through **AI mode**, **IR remote**, **web UI**, or third-party applications such as **Zoom**.
- When an **external cascade speakerphone** is connected, only audio signals are transmitted through the cascade device. The **microphone (MIC)** and **speaker (SPK)** of the cascade device will appear in the UC App's menu and remain functional, even if the camera itself is not in Active Mode.



## IR Remote Control



The camera supports IR remote control.

To operate, point the included IR remote directly at the IR sensor located on the front panel of the camera.

### Remote Control Button Functions

Button	Icon	Description
<b>Tracking Mode</b>		Press to toggle between <b>Auto Framing</b> , <b>Presenter Tracking</b> , <b>Individuals Gallery</b> , and <b>Off</b> .
<b>Standby Mode</b>		Press to enter or exit <b>Idle Mode</b> .
<b>Home</b>		<ul style="list-style-type: none"> <li>- Press once to return to the <b>default view</b> (available only when Tracking Mode is off).</li> <li>- Press and hold for about <b>2 seconds</b> to display the current tracking mode and IP address on the screen.</li> </ul>
<b>Navigation Button</b>		Press to control <b>Pan/Tilt</b> movements (available only when Tracking Mode is off).
<b>Zoom</b>		<ul style="list-style-type: none"> <li>- Press + to zoom in / - to zoom out.</li> <li>- Press and hold to adjust the zoom <b>continuously</b>.</li> </ul> <p><i>Note: Available only when Tracking Mode is off.</i></p>
<b>Preset 1 / 2</b>		<ul style="list-style-type: none"> <li>- Press and hold for <b>3 seconds</b> to save the current camera view to <b>Preset 1</b> or <b>Preset 2</b>.</li> <li>- Press once to recall the corresponding preset.</li> </ul> <p><i>Note: Available only when Tracking Mode is off.</i></p>



## Control Over IP Set Up

---

### Obtain IP Address

You can obtain the device's IP address by pressing the RESET button on the front panel or using the IR remote control. For detailed instructions, refer to the "Panel Overview" and "IR Remote Control" sections.

---

### Telnet Control

1. Connect a control PC to the LAN port of the device.
2. Establish a connection between the device and your computer before using Telnet commands.

### Telnet Connection Format:

telnet [IP address] [port]

- IP address: The device's assigned IP address
- Port: The communication port number (default: 23)  
Note: Some Telnet control tools do not require specifying the port number.

### Example:

```
telnet 192.168.11.143
```

---

### Web UI Control

The device includes a built-in Web User Interface (Web UI) that can be accessed through a web browser. Supported browsers include Chrome, Safari, Firefox, Opera, and Internet Explorer 10 or later.

- Default IP mode: DHCP
- Default login credentials:
  - Username: admin
  - Password: admin

### Accessing the Web UI:

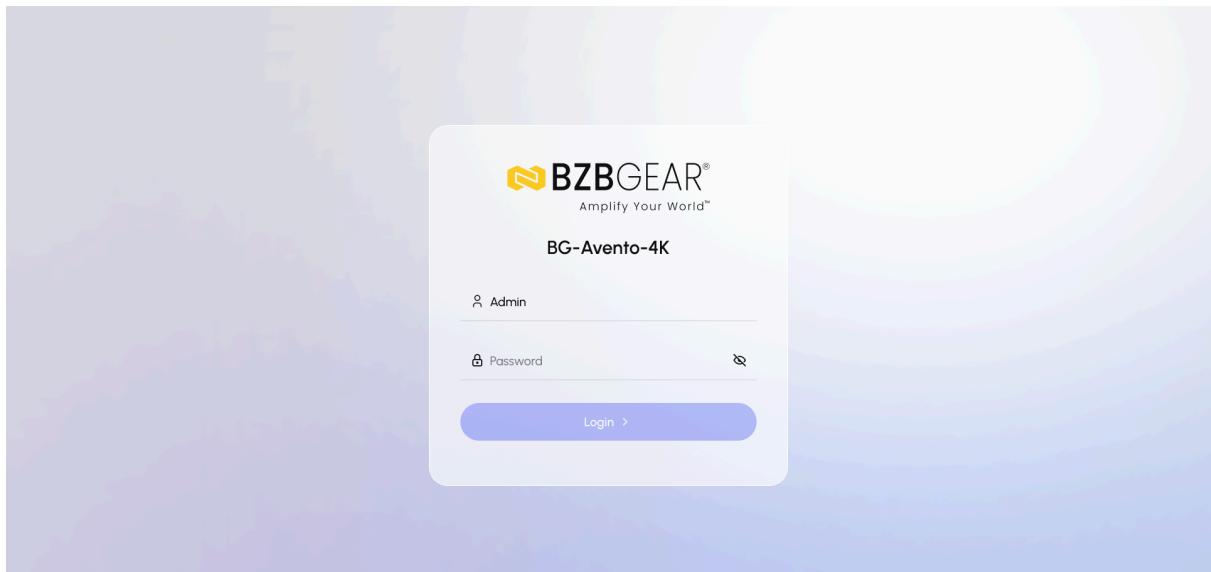
1. Connect the LAN port of the device to an Ethernet switch with an active DHCP server.
2. Connect your PC to the same Ethernet switch.
3. Obtain the device's IP address by:
  - Pressing the Home button on the provided IR remote (see "IR Remote Control" section), or



- Pressing the RESET button on the front panel (see “Panel Description” section).
4. Enter the obtained IP address in your browser’s address bar and press Enter. The login page will appear.
  5. Log in using the default username and password (both “admin”).
  6. When logging in for the first time, you will be prompted to change your password.
    - Enter a new password and click Apply to access the main interface.
    - Passwords must be 4 to 16 characters in length (alphanumeric only).



## Web GUI Overview

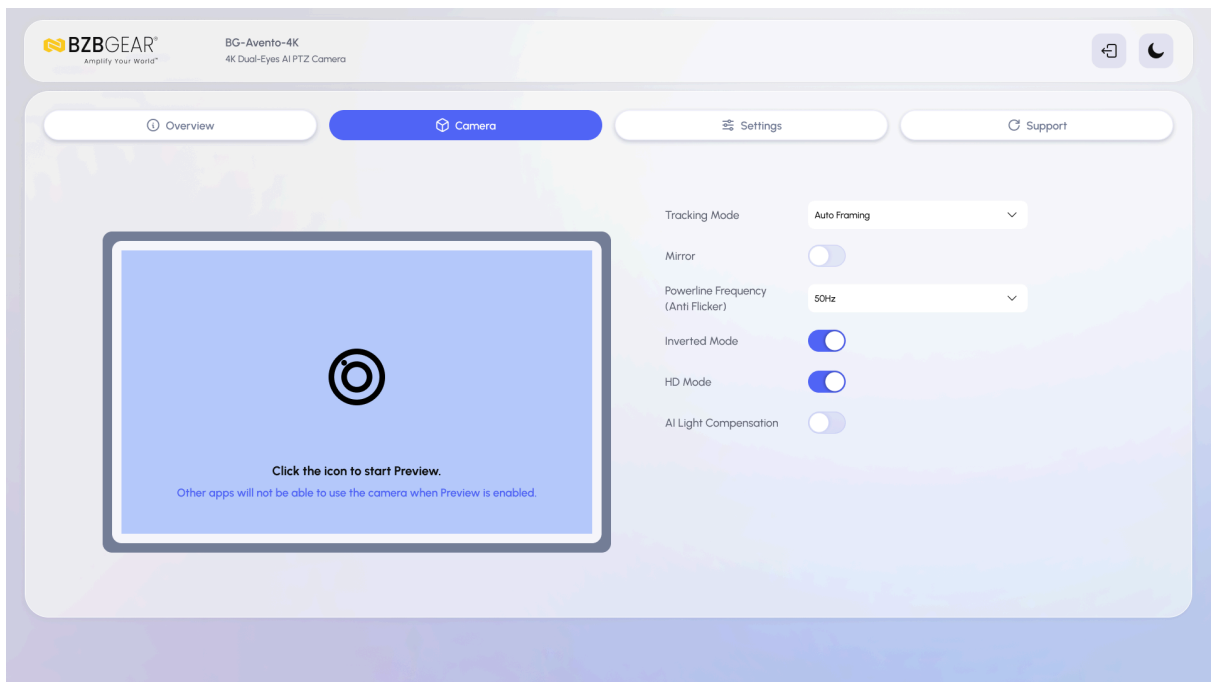


## Web UI Introduction

### Overview

The Web UI displays the device's firmware version, device name, and room name.

### Camera Page



This section allows users to control camera functions.



## Preview

- **Preview Button:** Click to start preview mode. The camera feed will display in real-time.
    - Note: The camera will be unavailable for other software during preview.
    - To exit, move the mouse to the center of the screen and click the black square.
- 

## Tracking Mode

Select a tracking mode from the drop-down menu:

1. **Auto Framing (default)**
    - AI lens tracks individuals in the room, adjusting angles and focal length to keep the subject framed while maintaining facial clarity.
  2. **Speaker Tracking**
    - Locates the speaker by voice and frames them automatically ( $\pm 15^\circ$  left/right).
    - **PIP Mode:** Toggle on/off. When enabled, select a layout. Default: Panorama lens screen on the lower right of AI lens screen.
  3. **Presenter Tracking**
    - Automatically identifies the first presenter and continuously tracks them.
    - **PIP Mode:** Same as Speaker Tracking.
  4. **Individuals Gallery**
    - Detects individuals and creates a multi-view display from left to right.
    - If more than four people are detected, mode automatically switches to Auto Framing.
  5. **Off**
    - Manual control:
      - **Focal Length:** Adjust zoom using the circular slider.
      - **Pan:** Use arrow keys to move the camera.
      - **Reset:** Restore default focal length.
    - **Preset:** Save current view with "Set" and recall with "Load".
    - **PIP Mode:** Same as Speaker Tracking.
-



## Additional Camera Settings

- **Powerline Frequency:** Select 50Hz (default) or 60Hz to prevent flickering.
- **Inverted Mode:** Enable if the camera is installed upside down. Default: Off.
- **Mirror:** Toggle mirror display. Default: Off.
- **HD Mode:** Enable/disable high-definition view (default: On). Changing this setting restarts the device.
- **AI Light Compensation:** Automatically adjusts brightness and contrast using AI (default: Off).

## Settings Page

### General Settings

The screenshot displays the web interface for the BG-Avento-4K camera. At the top, the BZBGear logo and product name 'BG-Avento-4K 4K Dual-Eyes AI PTZ Camera' are visible. The navigation menu includes 'Overview', 'Camera', 'Settings' (highlighted), and 'Support'. Under 'General Settings', the 'Device Name' field contains 'BG-Avento-4k' with a note: 'Note: The device name must be 1 to 20 characters long (letters, numbers, '\_' or '-' only)'. Below this is an 'Apply' button. The 'IP Settings' section shows 'IP Method' set to 'DHCP', 'IP Address' as '192.168.0.100', 'Subnet' as '255.255.255.0', and 'Gateway' as '196.168.61'. A note states: 'Note: LAN Module will automatically reboot after changing Network setting.' An 'Apply' button is also present. At the bottom, 'IP Conflict Detection' is shown as a toggle switch that is currently turned on.

- **Device Name & Room Name:** Enter names (1–20 characters: letters, numbers, “\_” or “-”) and click **Apply**.
- **IP Settings:** Choose between DHCP (automatic) or Static (manual).
  - Click **Apply** to save.
  - Note: For static IP, ensure the PC is on the same network. Reboot may take 2–3 minutes.
- **IP Conflict Detection:** Toggle on/off (default: On).
- **Standby Indicator:** Set the LED color for idle mode (default: White breathing).



## NDI Settings – Quick Guide

---

Use this menu to enable NDI output and configure basic stream settings.

### Enable NDI

- **NDI OUT:** Turn NDI output **ON** or **OFF**  
**Default:** OFF

### Device Identification

- **Group Name:** NDI group name  
**Default:** Public
- **Device Name:** NDI device name  
**Default:** UDHCAM-xxxxxx-Tx
- **Channel Name:** NDI channel name  
**Default:** NDI

**Note:** Names can be up to 64 characters and may include letters, numbers, spaces, underscores (\_), and hyphens (-). Names must start and end with a letter or number.

### Stream Settings

- **Encoder:** Select **H.264** or **H.265**  
**Default:** H.264
- **Resolution**  
Resolution behavior depends on **Low Latency Mode** (General Settings):
  - **Low Latency OFF**
    - Main stream: up to **4K @ 30 fps**
    - Preview stream not supported at 4K @ 30
    - Below 4K @ 30 → Preview stream fixed at **640 × 360 @ 30 fps**
  - **Low Latency ON**
    - Main stream fixed at **1080p @ 60 fps**
    - Preview stream fixed at **640 × 360 @ 30 fps**

### Encoding Controls

- **I-Frame Interval:** 1–150 frames
- **Bitrate**
  - Main Stream: **64–16384**
  - Preview Stream: **64–4096**



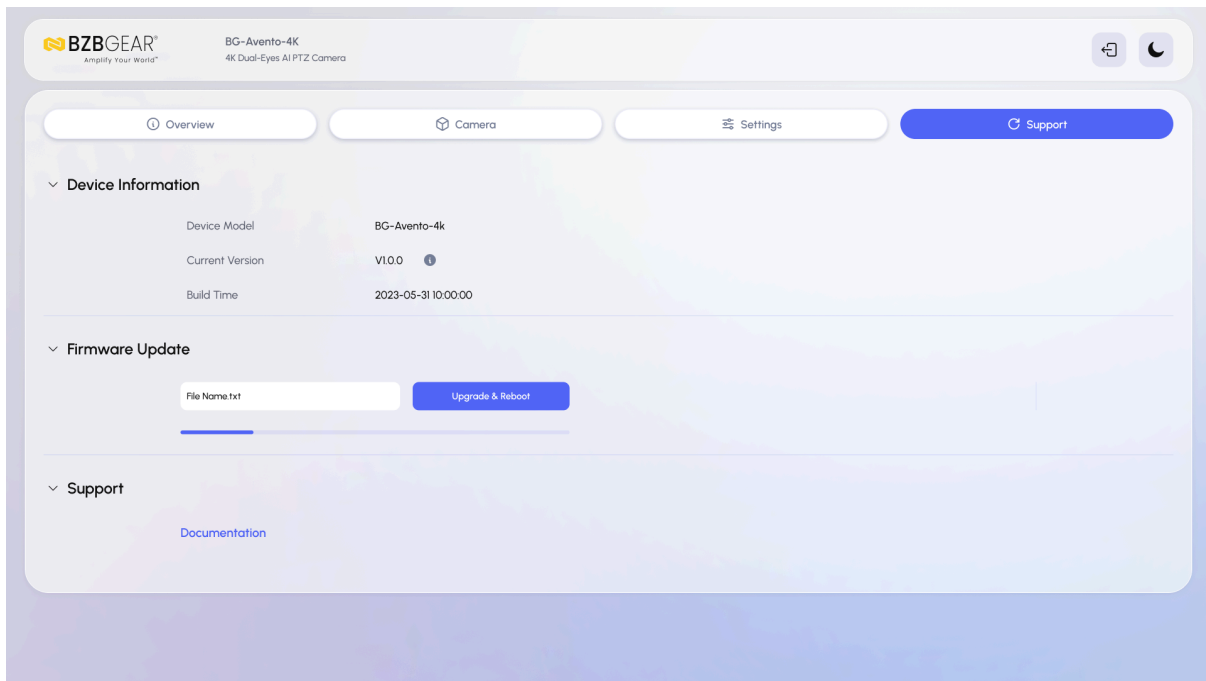
## System Settings

The screenshot shows the BZBGear BG-Avento-4K web interface. At the top, there is a header with the BZBGear logo and the product name 'BG-Avento-4K 4K Dual-Eyes AI PTZ Camera'. Below the header is a navigation bar with four tabs: 'Overview', 'Camera', 'Settings', and 'Support'. The 'Settings' tab is selected. The main content area is titled 'System Settings' and contains two sections: 'Login' and 'System'. The 'Login' section has three input fields for 'Current Password', 'New Password', and 'Verify Password', followed by a note: 'Note: Password must be 4 to 16 characters in length (alphanumeric, dashes, underscores, and periods).', and an 'Apply' button. The 'System' section has three buttons: 'Factory Reset', 'Reboot', and 'Export log'.

- **Login:** Change password (default: admin, 4–16 alphanumeric characters).
- **System:**
  - **Factory Reset:** Restore defaults (wait 40s).
  - **Reboot:** Restart device (wait 40s).
  - **Export Log:** Save log file locally.



## Support



- **Device Information:** Shows model, firmware version, and build time. Hover over the version icon to see module details.
- **Firmware Update:** Upload the latest firmware and click **Upgrade & Reboot**. Do not unplug during upgrade.



## 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](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

---

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

---

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

---

All the contents in this manual and its copyright are owned by BZBGear. No one is allowed to imitate, copy, or translate this manual without BZBGear's permission. This manual contains no guarantee, standpoint expression or other implies in any form. Product specification and information in this manual is for reference only and subject to change without notice.

**All rights reserved.** No reproducing is allowed without acknowledgement.