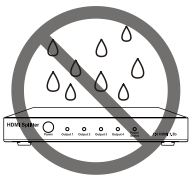
CAM-420-PTZ

4K AI Dual-lens Optical Camera

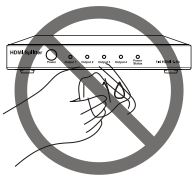
User Manual

Version: V1.0.0

Important Safety Instructions

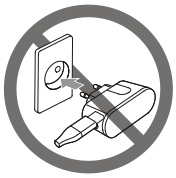


1. Do not expose this apparatus to rain, moisture, dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.

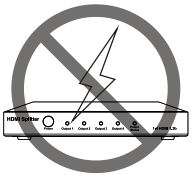


6. Clean this apparatus only with dry cloth.

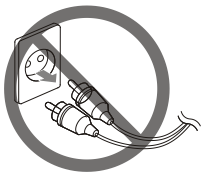
2. Do not install or place this unit in a bookcase, built-in cabinet or in another confined space. Ensure the unit is well ventilated.



7. Unplug this apparatus during lightning storms or when unused for long periods of time.



3. To prevent risk of electric shock or fire hazard due to overheating, do not obstruct the unit's ventilation openings with newspapers, tablecloths, curtains, and similar items.



8. Protect the power cord from being walked on or pinched particularly at plugs.

4. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. Only use attachments / accessories specified by the manufacturer.

5. Do not place sources of naked flames, such as lighted candles, on the unit.

10. Refer all servicing to qualified service personnel.

Introduction

Overview

This product is a 4K optical dual-lens camera with a main lens that boasts a 4K optical zoom capability, and a panoramic lens. Integrated with four linear array microphones, it enables precise sound source localization, facilitating speaker tracking functionality. This product is designed to offer crisp image quality and an enhanced user experience in settings such as small to medium-sized conference rooms, training facilities, and online education environments.

Features

- A powerful built-in dual lens features a panoramic camera for real-time participant detection and a PTZ camera to capture the best view of everyone in the room simultaneously
- Supports resolutions up to 4K@30fps with USB 3.0 connectivity
- Dual-lens system:
  8MP PTZ camera with 3x optical zoom and 110° DFOV
  1080p panoramic camera with 120° DFOV.
- Advanced CMOS image sensor and ISP algorithm deliver crystal-clear video with exceptional clarity.
- AI-powered features include Auto Framing, Speaker Tracking, Presenter Tracking, and Individuals Gallery— making meetings more natural and engaging.
- Supports MJPG, NV12, H.265, and H.264 video compression standards for broad application compatibility.
- Compatible with major operating systems, including Windows 10/11 and macOS.
- Works seamlessly with leading video conferencing platforms such as Zoom, Microsoft Teams, Skype, Cisco Webex™, and more.
- Plug-and-play design; easy installation on displays or walls.

Package Contents

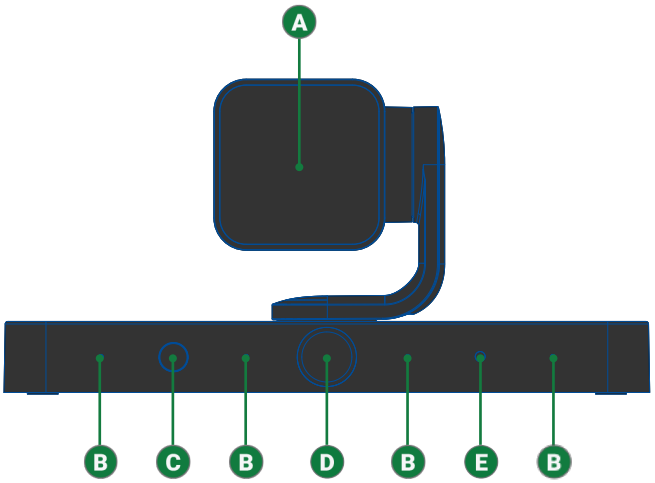
- 1x Camera
- 1x DC 12V/3A Power Adapter with US, UK, EU and AU Pins
- 1x 1.8m USB-A to USB-C Cable
- 1x IR Remote
- 1x Private Lens Cap (for Panoramic lens)
- 1x Mounting Bracket (with screws)

Specifications

Video	
Outputs	1x USB-C Output 1x HDMI Output 1x NDI Output
Video Resolution (Max)	4K@30fps
Output Video Encoding	MJPEG (default) | H.265 | H.264 | NV12
Camera and Sensor	
Sensor	AI lens: 8M effective pixels Panoramic lens: 2M effective pixels
Lens	AI lens: 8MP | 3x optical zoom | DFOV: 110° Panoramic lens: 2MP | DFOV: 120°
Rotation	Horizontal: ±75°| Vertical: ±45°
Smart AI	Auto Framing (default as on) Speaker Tracking Presenter Tracking Individuals Gallery
Auto Exposure	Yes
Auto White Balance	Yes
Auto Digital Noise Reduction	Yes
Audio	
Microphone	4x MEMS mic array Pickup Range: 5m **Note:** Mic for detecting human voices and offers audio tracking, can't use as video conference audio source.
Communication and Control	
USB	1x USB-C: USB 3.1 Gen | Max Bandwidth: 5.0 Gbps | backward compatible with USB 2.0 1x USB-A: USB 2.0 | Max Bandwidth: 480Mbps
USB Protocols	UVC 1.1
Ethernet	1x LAN: 8-pin RJ-45 Female | Web UI | API
Control Methods	Web UI | RCU I Control APP
Power	
Power Supply	12V DC 3A
Environmental	
Operating Temperature	0 to + 45°C (32 to + 113 °F), 10% to 90%, non-condensing
Storage Temperature	-20 to +70°C (-4 to + 158 °F), 10% to 90%, non-condensing
Dimensions and Weight	
Length x Width x Height	200mm/7.87in x 69mm/2.72in x 97mm/3.82in
Regulatory	
Safety and Emission	CE | FCC | RoHS | EAC | UKCA

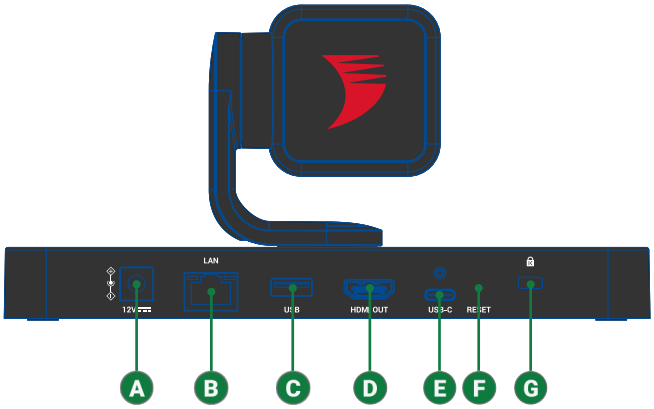
Panel Description

Front Panel



A	**Lens**	4K optical zoom lens
B	**MIC**	4x Linear mic arrays for sound source location
C	**IR Window**	Receive IR signals from the provided IR remote
D	**Lens**	1080p fixed focus lens
E	**Status LED**	• Solid white for about 2s, and then off.: The device is starting up. • Slow blinking: The device is in idle mode, and the color can set to red or off through Web UI. • Solid white: The device is active • Fast blinking: The divice is being upgraded.

Rear Panel



A	**DC 12V**	Connect to the provided power adapter
B	**LAN**	Connect to the network for web UI or telnet control
C	**USB**	USB 2.0 Type-A port. Connect to USB peripherals, such as speakerphones
D	**HDMI OUT**	Connect to a HDMI display, video confernecing system, projector, or video capture device
E	**USB-C**	USB 3.0 Type-C port. Connect to a laptop, room PC or all-in-one conference device fro transmitting audio and camera video signal, using the USB-A to USB-C cable provided
F	**RESET**	• Press once to show IP address and tracking mode on the connected display • Hold and press for at least 5 seconds to set the device to factory defaults
G		Kensington security slot

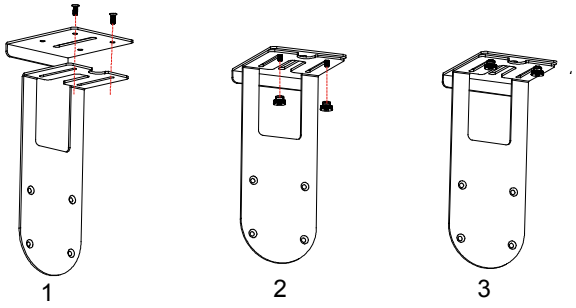
Installation

Installation

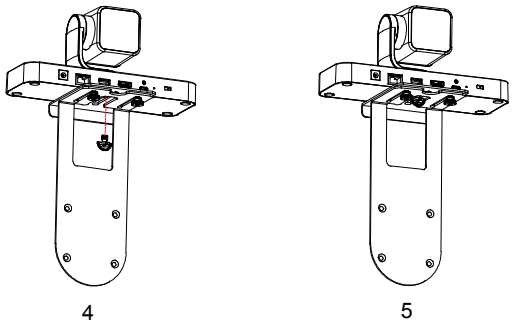
Note: Before installation, please ensure the device is disconnected from the power source.

Assemble the Camera and Mounting Brackets

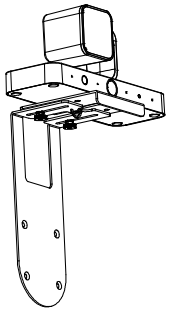
Assemble the base bracket panel and base support bracket using the two bracket assembly screws provided. As shown in the following figures:



Using the thumb screw to fix the mounting brackets to the camera, as shown in figure below.

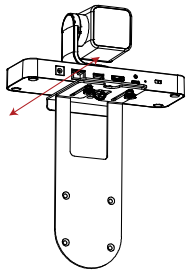


Note: If users want to install the camera on the wall, please assemble the base support bracket as shown in following figure

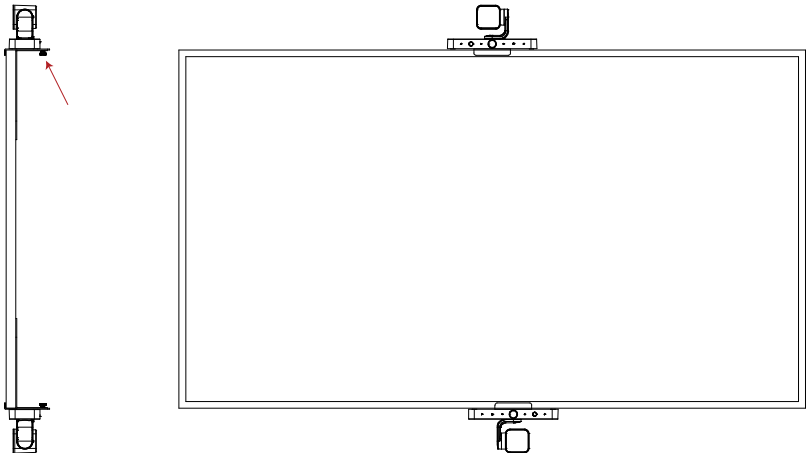


Install the Camera on the TV

Loosen the two bracket assemble screws on the base support bracket, move the long baffle of the base support bracket to increase the distance between the two baffles.

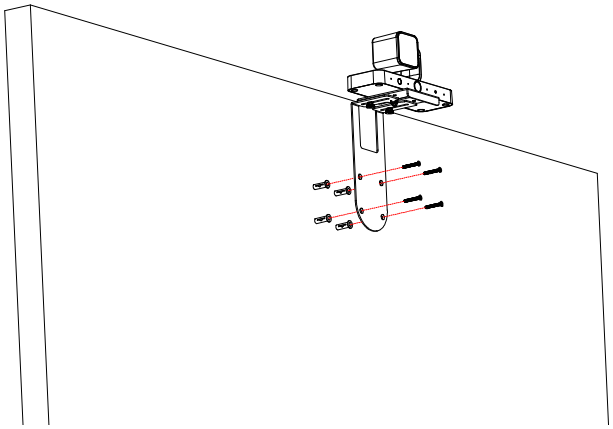


Place the camera on the TV, moved forward and backward to adjust the distance between the two baffles to adapt to the width of different TVs. As shown in the following figure.



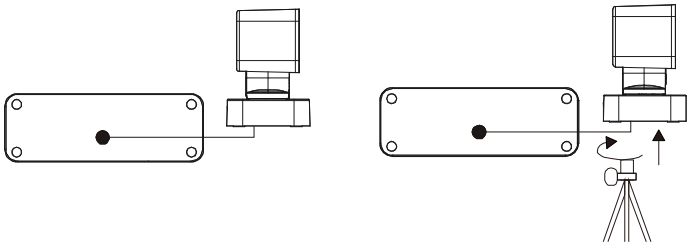
Install the Device on the Wall

1. Drill holes on the wall, then insert the plastic expansion pipes into the holes.
2. Using the provided wall mounting screws to install the camera on the wall. As shown in the figure.



Install the Device on a Tripod

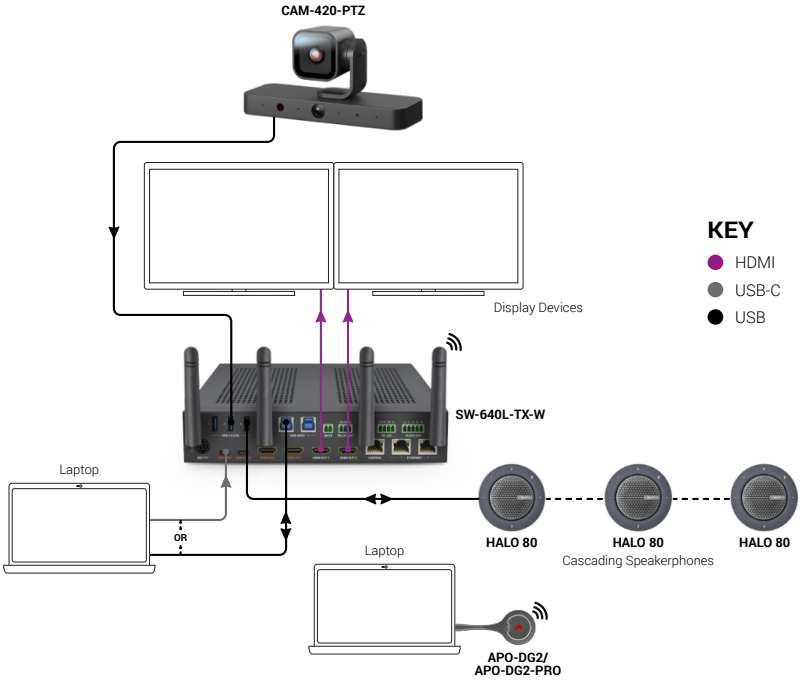
1. Locate the 1/4 inch tripod thread on the bottom of the device.
2. Attach the device to the tripod by gently screwing it into the thread until secure.



3. Position your device and tripod wherever you like to get the optimal framing.

Note: Tripod is not included in the package.

Typical Application



The CAM-420-PTZ operates in three modes:

- **Init Mode**
  - When the camera is powered on, it starts in Init mode.
  - If no UVC signal is transmitted and no HDMI display is connected to the HDMI OUT port within 10 seconds after startup, the camera will switch to Idle mode.
  - If the UVC channel is opened or the HDMI OUT port is connected to a display within 10 seconds after startup, the camera will switch to Active mode.
- **Idle Mode**
  - In Idle mode, inserting a USB cable or pressing any button on the IR remote will switch the camera to Init mode.
  - Once in Init mode, if the UVC channel is opened, the camera will switch to Active mode.
- **Active Mode**
  - If the UVC channel is closed in this mode, the camera returns to Init mode.
  - If no UVC signal is transmitted and no HDMI display is connected to the HDMI OUT port within 10 seconds, the camera will switch to Idle mode.

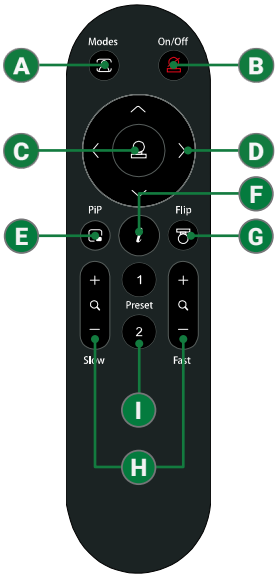
Notes:

• The camera supports receiving commands from the UVC channel through AI mode, the IR remote, Web UI, or third-party applications (e.g., Zoom or Teams).

• When an external cascade speakerphone is connected, it transmits audio only. The microphone and speaker of the cascade device will still appear in the UC app menu and remain operational, regardless of whether the camera is active.

IR Remote Control

The camera supports IR remote control. Point the provided IR remote to the IR window on the front panel of the camera.



	Button	Description
A	**Tracking Mode**	Press to toggle Auto-framing, Speaker tracking, Presenter tracking, Individuals gallery and Off.
B	**Standby Mode**	Press to set idle image on/off
C	**Home**	Press once to return to the default view. Hold it for about 2s, overlay display the current tracking mode information and IP address.
D	**Navigation Button**	Press to perform PTZ (only available when Tracking mode is off).
E	**PiP**	Press to toggle between single picture mode (only from 4K optical zoom lens) and dual-picture mode (from 4K optical zoom lens and 1080P fixed focus lens). **Note:**This setting is only available in Speaker Tracking mode, Presenter Tracking mode and Off mode.
F	**Information**	Press to show the information including tracking mode and IP information on the image of the camera.
G	**Flip**	Press to flip the camera image, useful when the camera is mounted upside down.
H	**Zoom (Slow/Fast)**	Press to adjust the zoom. Press and hold to adjust the zoom continuously. +: Zoom in -: Zoom out **Note:**The function is only available when tracking mode is off.
I	**Preset 1/2**	Press and hold 3s to save current camera view to preset 1 or 2. Press to switch the camera view to preset 1 or 2. **Note:** The function is only available when Tracking mode is off.

LAN Control

The device equips a LAN port for telnet and web UI control.

Obtain IP Address

Users can obtain the device's IP address by pressing the RESET button or using the remote control. For details, please refer to the **"Panel Overview"** and **"IR Remote Control"** sections.

Telnet Control

Connect a control PC to the LAN port of the device. Before you intend to control the device through telnet API, users shall establish connection between this device and your computer.

The form of the command for telnet connection is below:

telnet ip (port)
- ip: The device's IP address.
- port: The device's port number, this is non-required for some Telnet control tools. Default setting is 23.

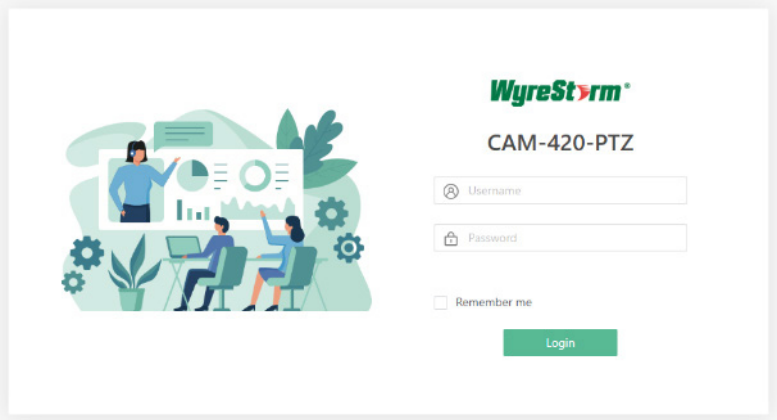
For example, if the device's IP address is 192.168.11.143, the command for telnet connection shall be the following:
telnet 192.168.11.143

Web UI Control

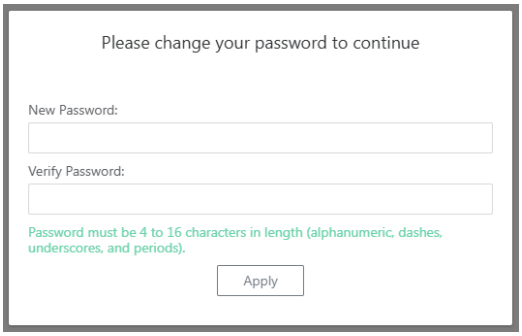
The Web UI designed for the device can be accessed through a browser with latest version, e.g., Chrome, Safari, Firefox, Opera, IE10+, etc.
The default IP mode of the matrix is DHCP. Default login password for Web UI is "admin".

Get Access to Web UI

1. Connect the LAN port of the device to the Ethernet switch with DHCP server, and connect the PC to the same Ethernet switch.
2. Get the IP address through pressing the home button of the provided IR remote (see "IR Remote Control" section to get detail information) or press reset button on front panel of the device (see "Panel Description" section to get detail information).
3. Input the IP address obtained in the last step in the browser and press "Enter" key on keyboard. The following page can be access in:



4. Input the username and password to login the web UI. Both the default user name and password are "admin".
5. When login web UI first time, after clicking "Login", users will enter the following window to change login password. Input new password and click "Apply" to enter the main page.

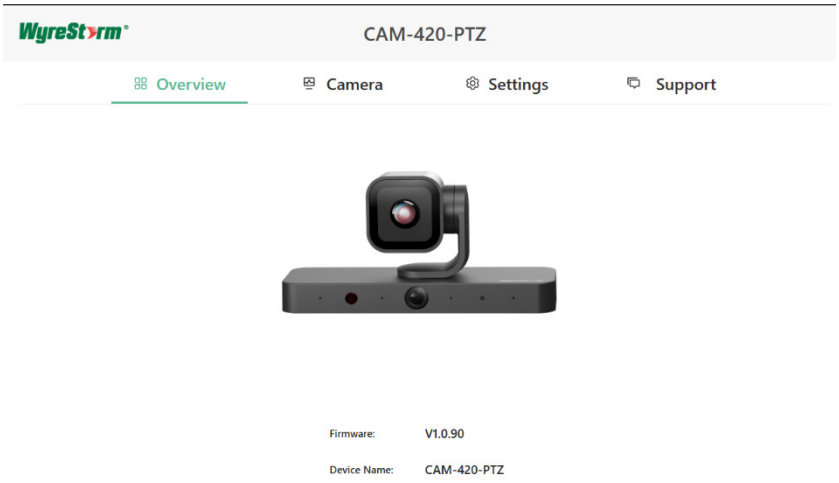


Note: Password must be 4 to 16 characters in length (alphanumeric, dashes, underscores, and periods).

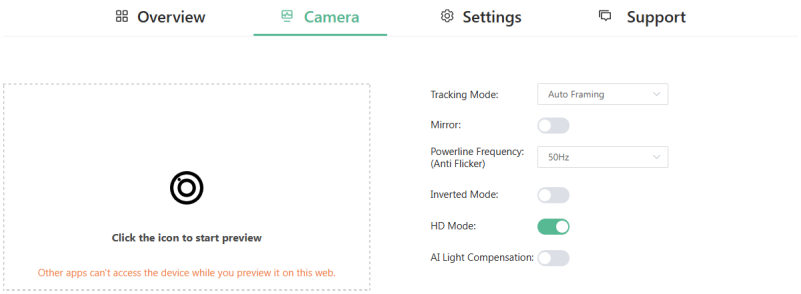
Web UI Introduction

Overview

This section shows the device's firmware version and device name.



Camera



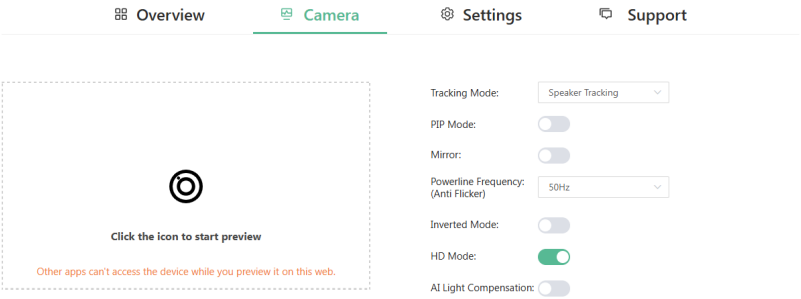
This section allows users to control the camera.

Preview Button ◎: Click to start preview mode, where the video feed from the camera will be displayed in this frame for real-time preview (note that the camera will be unavailable for use in other software during preview). All settings will be reflected live in this view. To exit preview mode, simply move the mouse to the center of the screen and click the black square.

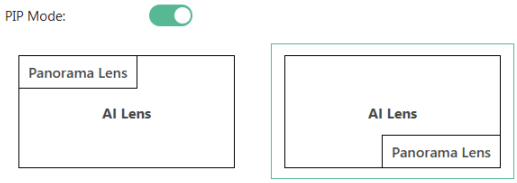
Tracking Mode: Click to select a tracking mode from the drop-down menu, the tracking modes include Auto Framing, Speaker Tracking, Presenter Tracking, Individuals Gallery and Off.

- When Tracking Mode is set to Auto Framing (default): The optical AI lens will monitor in real-time the positional changes of individuals in the meeting venue, automatically adjusting angles and focal lengths to ensure that the target person is framed while maintaining optimal clarity of their facial features.

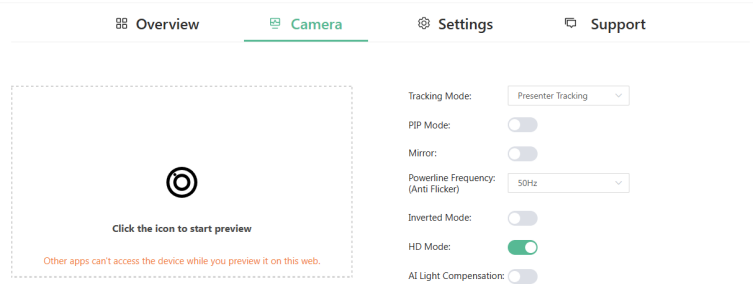
- When Tracking Mode is set to Speaker Tracking: The camera will locate the speaker according to their voice, automatically select and frame the speaker (left/ right: ±15°) , providing a close-up view.



PIP Mode: Click to set PIP mode to on/off. The default setting is off. When set it to on, users can select PIP layout mode through click the corresponding layout diagram. The default layout: the Panorama lens screen is on the lower right corner of the AI lens screen.

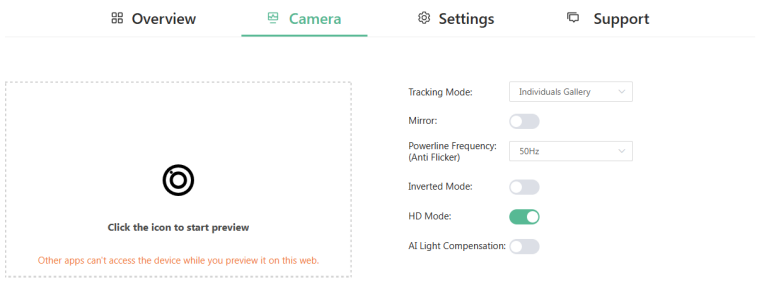


When Tracking Mode is set to **Presenter Tracking:**



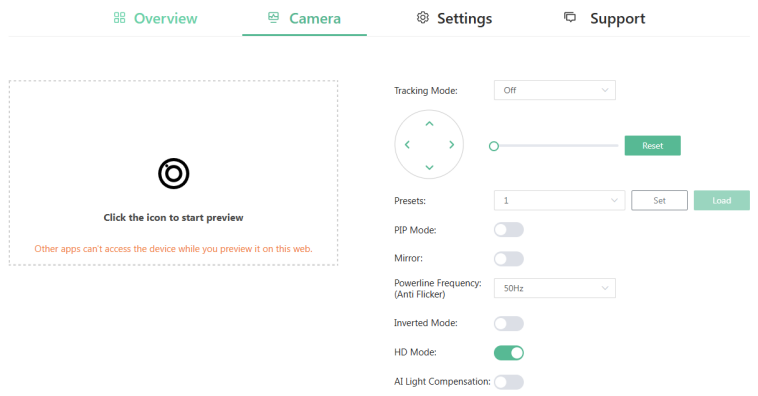
Automatically identifies the first speaker and continuously tracks the presenter in real-time.
PIP Mode: the settings are same as when tracking mode is set to "Speaker Tracking".

When set AI tracking mode to **Individuals Gallery:**



This mode identifies individuals in the frame and generates a multi-view display in left-to-right order. When more than four people are detected in the frame, the tracking mode will automatically switch to "Auto Framing" mode.

When Tracking Mode is set to **Off:**



When tracking mode is off, users can adjust the focal length to zoom in or out of the scene by moving the circular slider. To pan the camera view up, down, left, or right, click the respective arrow keys on the left side.

Reset: Click the button to reset the focal length to default setting.

Preset: Select a preset number and click “Set” to save current camera view to this preset. Click “Load” to upload the saved camera view from the selected preset.

PIP Mode: the settings are same as when tracking mode is set to “Speaker Tracking”.

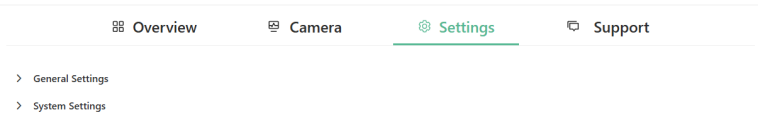
Mirror: Click to set the camera’s mirror display function to on/off. The default setting is off.

Powerline Frequency (Anti Flicker): Set the camera's AC frequency (50Hz or 60Hz, default 50Hz) to match the corresponding environment's frequency, to prevent flickering during recording.

Inverted Mode: Set the camera to enable or disable image flip display (180 degree flip up and down). Default setting: Off. Enable this feature if the camera is installed in an inverted position.

HD Mode: Click to turn on or off the high-definition camera view (default is on). The state change will automatically restart the device to apply the setting.
To ensure better compatibility, users may try turning this feature off.

AI Light Compensation: Click to set AI light compensation to enable or disable. Default setting: Off. When it is set to on, it will automatically adjust image brightness and contrast using AI to enhance visibility under poor or uneven lighting conditions.

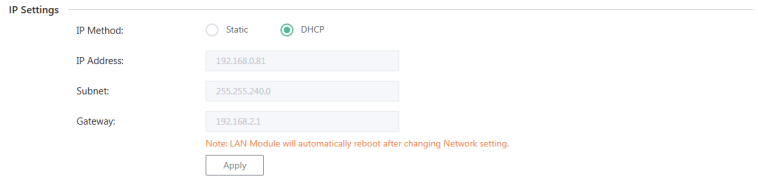


General Settings

Device Name: This section allows users set device name and room name. Input the names and click “Apply” to take effect.

Note: The device name’s length must be 1 to 20 characters (letters, numbers, “_” or “-” only).

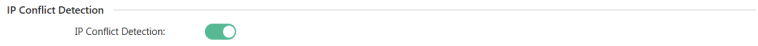
IP Settings: This section is used to set between the static and dynamic IP address.



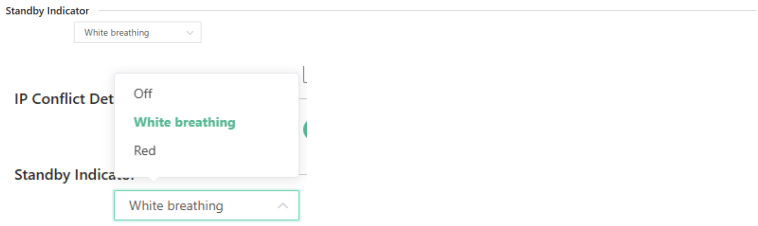
- **DHCP:** When enabled, the IP address of the Matrix is assigned automatically by the DHCP server connected.
- **Static:** When enabled, set up the IP address manually.
- **Apply:** Click to enable the network setting.

Note: When "Static" is selected, please ensure your PC is in the same network segment as the camera. Please wait for 2-3 minutes for the camera's LAN module to reboot and reconnect after the network setting is changed.

IP Conflict Detection: This section allows users to set IP conflict detection function to on/off. The default setting is on.

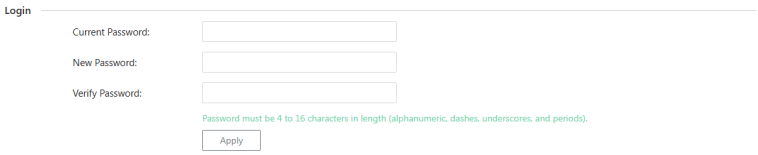


Standby Indicator: This section allows users to set the color of the status LED when the device is in idle mode. Default setting: White breathing.



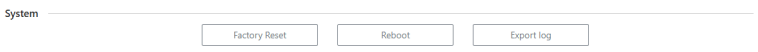
System Settings

Login: This section allows users to change login password. The default password is “admin”



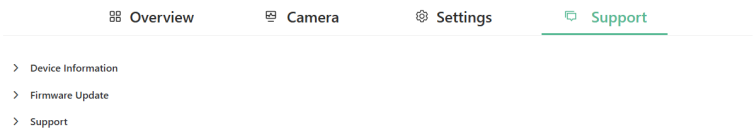
Note: Password must be 4 to 16 characters in length (alphanumeric, dashes, underscores, and periods).

System: This section allows users to set the camera to factory defaults, reboot the camera and export log.

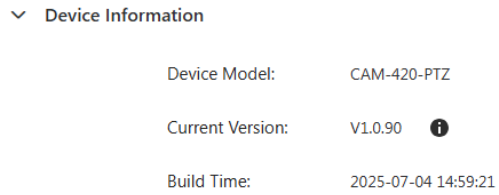


- **Factory Reset:** Click to set the device to factory defaults. Please wait 40s to re-access Web UI by refreshing the browser.
- **Reboot:** Click to reboot the device. Please wait 40s to re-access Web UI by refreshing the browser.
- **Export log:** Click to export the log file to local PC.

Support



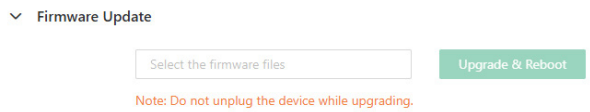
Device Information



This section shows the device's information, including device model, current version and build time.

Move the mouse to the icon in Current Version line, it will show the version of each module.

Firmware Update

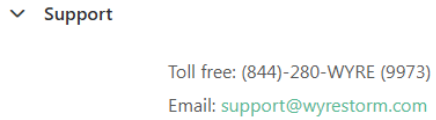


This section allows users to upgrade firmware.

Click "Select the firmware files" bar to upload the upgrade file with latest version from local PC, and then click "Upgrade & Reboot" to upgrade firmware. When the upgrade completes, the device will automatically reboot.

Note: Do not unplug the device during upgrading process.

Support



This section shows support telephone number and email.