



BG-MAESTRO

Educational Auto Tracking ePTZ Camera

User Manual



Attention

This manual introduces functions, installations and operations for this camera in details. Please read this manual carefully before installation and use.

1. Cautions

- 1.1 Avoid damage to product caused by heavy pressure, strong vibration or immersion during transportation, storage and installation.
- 1.2 Housing of this product is made of organic materials. Do not expose it to any liquid, gas or solids which may corrode the shell.
- 1.3 Do not expose the product to rain or moisture.
- 1.4 To prevent the risk of electric shock, do not open the case. Installation and maintenance should only be carried out by qualified technicians.
- 1.5 Do not use the product beyond the specified temperature, humidity or power supply specifications.
- 1.6 Wipe it with a soft, dry cloth when cleaning the camera lens. Wipe it gently with a mild detergent if needed. Do not use strong or corrosive detergents to avoid scratching the lens and affecting the image.
- 1.7 This product contains no parts which can be maintained by users themselves. Any damage caused by dismantling the product by user without permission is not covered by warranty.

2. Electrical Safety

Installation and use of this product must strictly comply with local electrical safety standards. The power supply of the product is $\pm 12V$, the max electrical current is 2A.



3. Install

- 3.1 This product should be placed on a stable desktop or other horizontal surface. Do not install the product obliquely, otherwise it may display inclined image.
- 3.2 Do not power on before completely installation.

4. Magnetic Interference

Electromagnetic fields at specific frequencies may affect the video image. This product is Class A. It may cause radio interference in household application. Appropriate measure is required.

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1. Product Overview

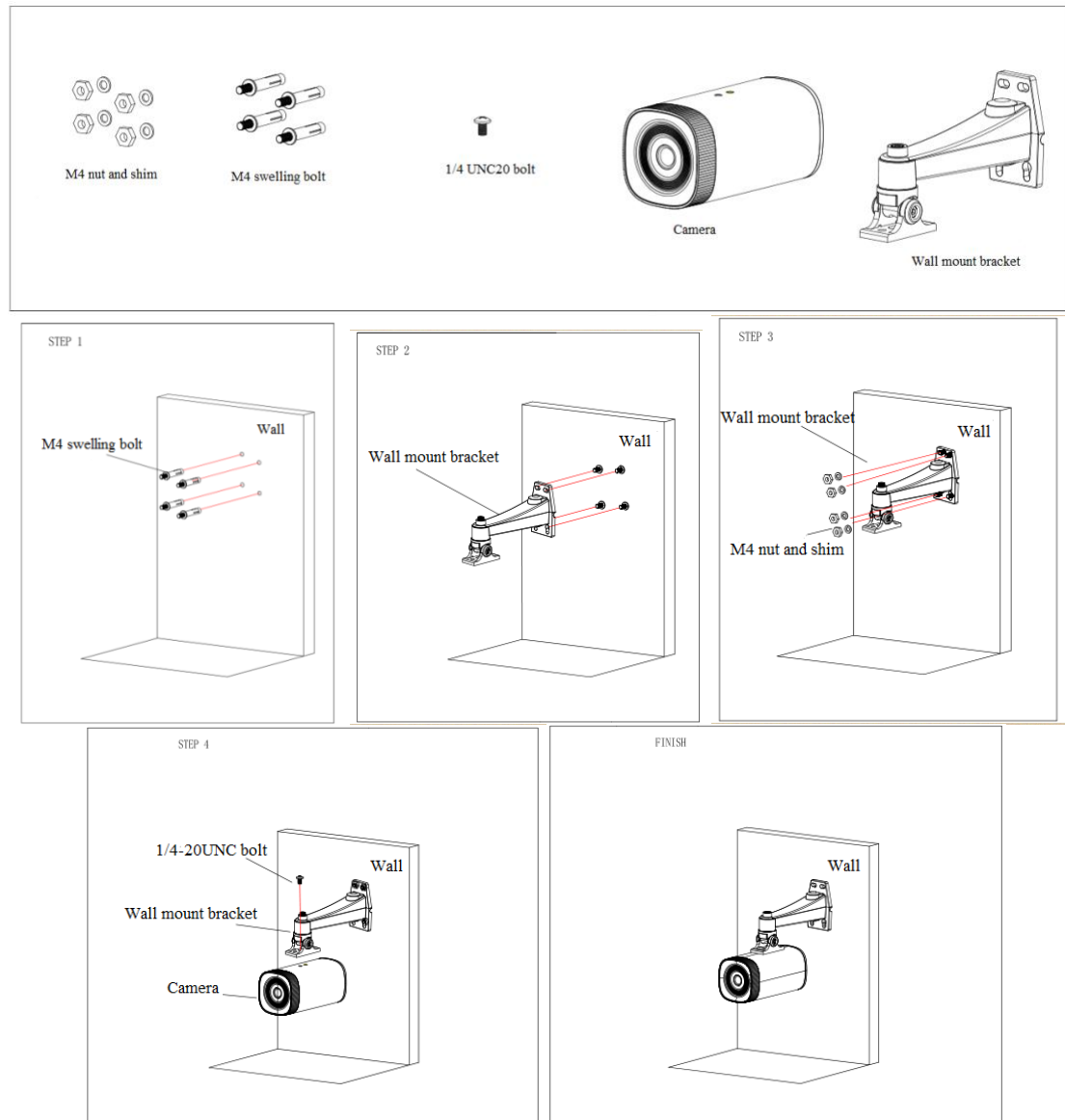
1.1 System Introduction

The BG-MAESTRO combines 4K ultra-definition imaging, video analysis technology and electronic PTZ control technology to enable a single camera to output close-up main stream, close-up sub-stream, panoramic main stream, panoramic sub-stream and blackboard stream simultaneously. This camera can track and detect accurately and quickly, and fully meet the requirements of various scenes of teaching recording and remote interactive teaching.

1.2 Main Features

- **Intelligent lecturer tracking:** Built-in image recognition and tracking algorithm allows the camera to track targets quickly and accurately without the need for auxiliary positioning cameras or a tracking host.
- **Strong anti-interference ability:** Once the tracking target is locked, it is resistant to acquisition of interfering subjects.
- **Smooth tracking:** The sensitivity of action can be adjusted and it will not be affected by target's minor movement or gestures.
- **Strong environmental adaptability:** The tracking performance is not affected by classroom's size, shape or seats layout.
- **Intelligent director:** Built-in intelligent director switching strategy;
- **Multiple tracking modes:** Support multiple tracking modes, including tracking mode, movie mode and area tracking mode.
- **Ultra HD:** 1/2.8 inch high quality 4K CMOS sensor; support 1080P@30fps/25fps image output.
- **Wide view angle and distortion-free lens:** Using ultra wide-angle, distortion-free camera; supports 3X digital zoom and EPTZ control at the same time;
- **Low noise and high SNR:** Low Noise CMOS effectively ensure high SNR of camera video. Advanced 2D/3D noise reduction technology is used to further reduce the noise, while ensuring image sharpness.
- **Multiple video compression:** H.265, H.264, MJPEG;
- **Multiple video outputs:** Supports SDI, USB3.0 and LAN (Gigabit);
- **Multiple streams:** Supports five streams, simultaneously outputs close-up main stream, close-up sub-stream, panoramic stream, panoramic sub-stream and blackboard writing stream;
- **POE support:** A single network cable can support power, control, and video output simultaneously, thus simplifying wiring installation.
- **Multiple installation:** Wall mount and in-ceiling mount for options.
- **Networking control interface:** Controlling via Network can meet different deployment of various scenarios.
- **Wide application:** Lecturer capture, remote interactive teaching etc.

1.3 Mounting Brackets



2. Interface Introduction

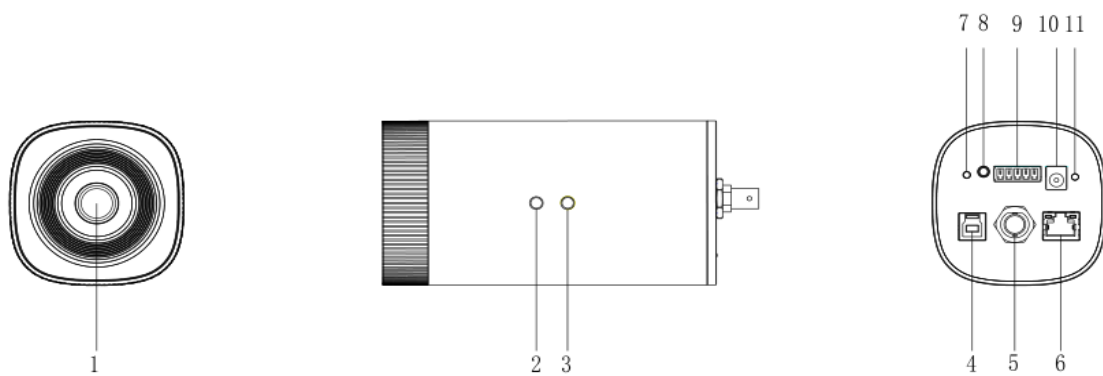


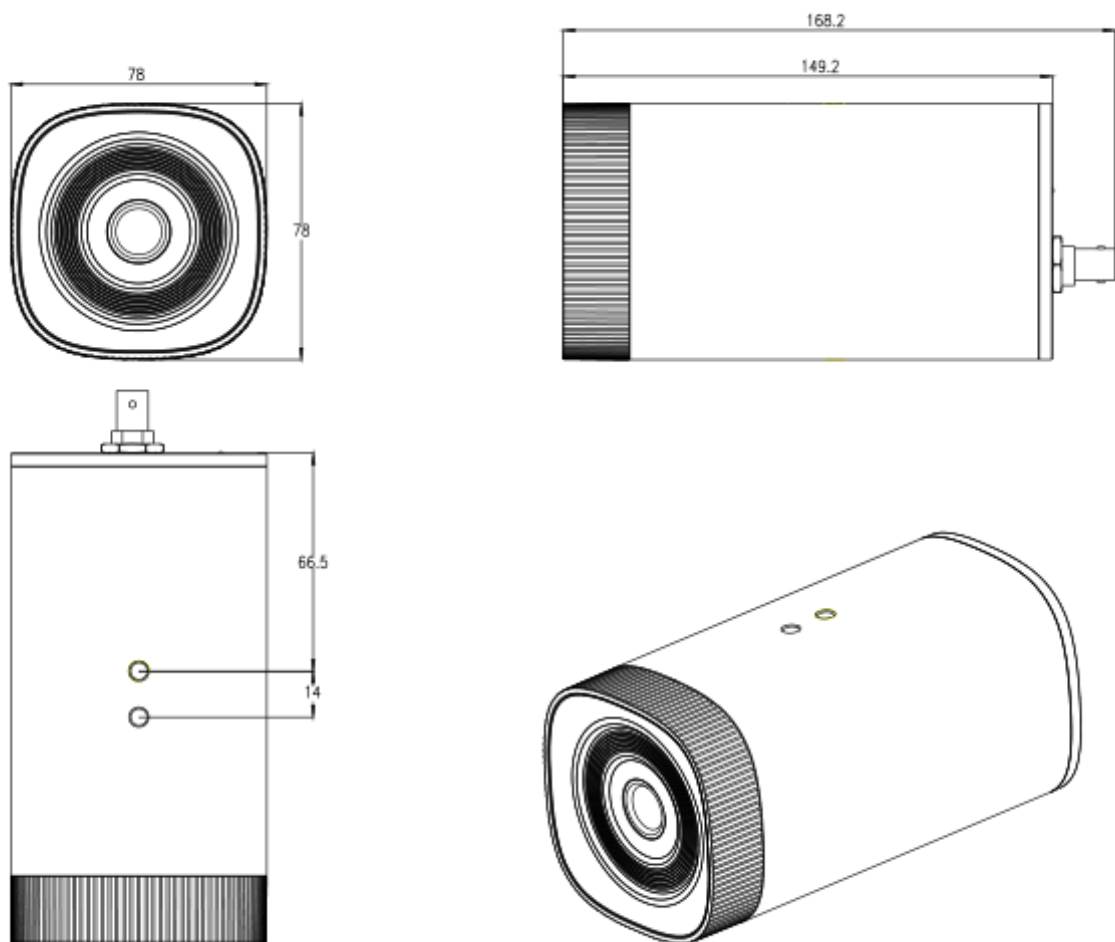
Figure 1.1 Product Interface

- 1. Camera Lens
- 2. Tripod Screw Hole
- 3. Tripod Screw Hole
- 4. USB3.0 Interface

- 5.SDI Interface
- 6. LAN Interface
- 7. Reset button
- 8. A-IN

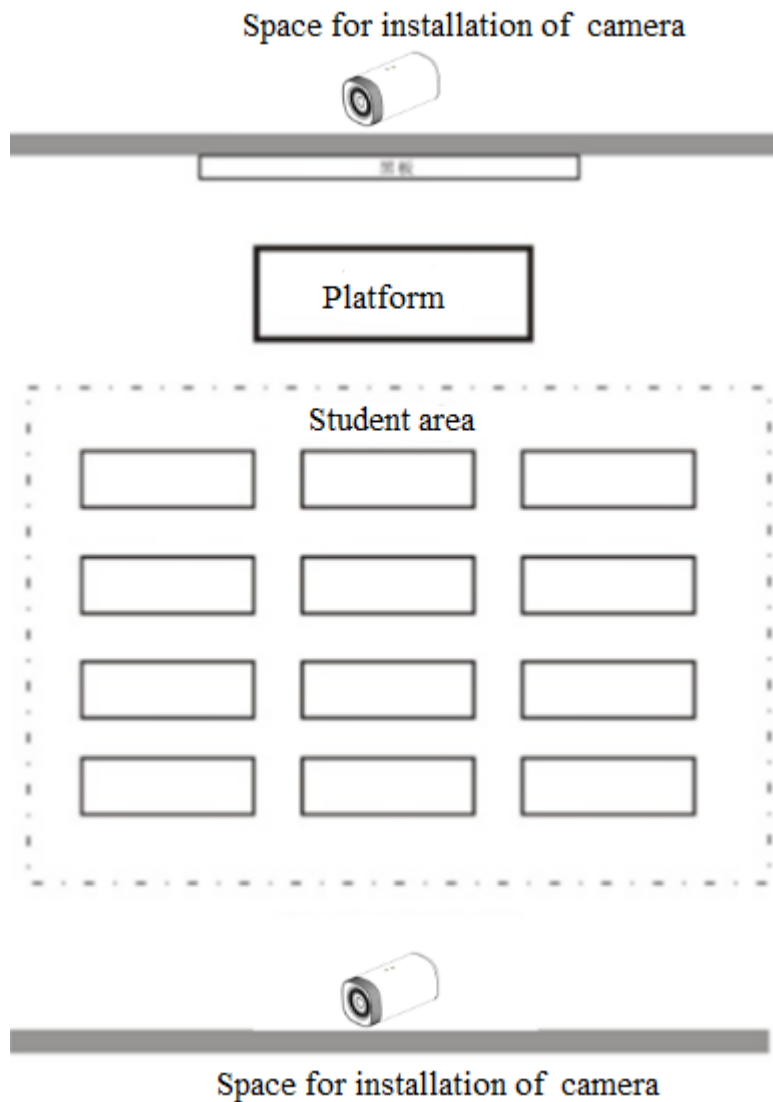
- 9. RS232/ RS485
- 10. Power Interface
- 11. Power Indicator

3. Dimension



4. System Connection

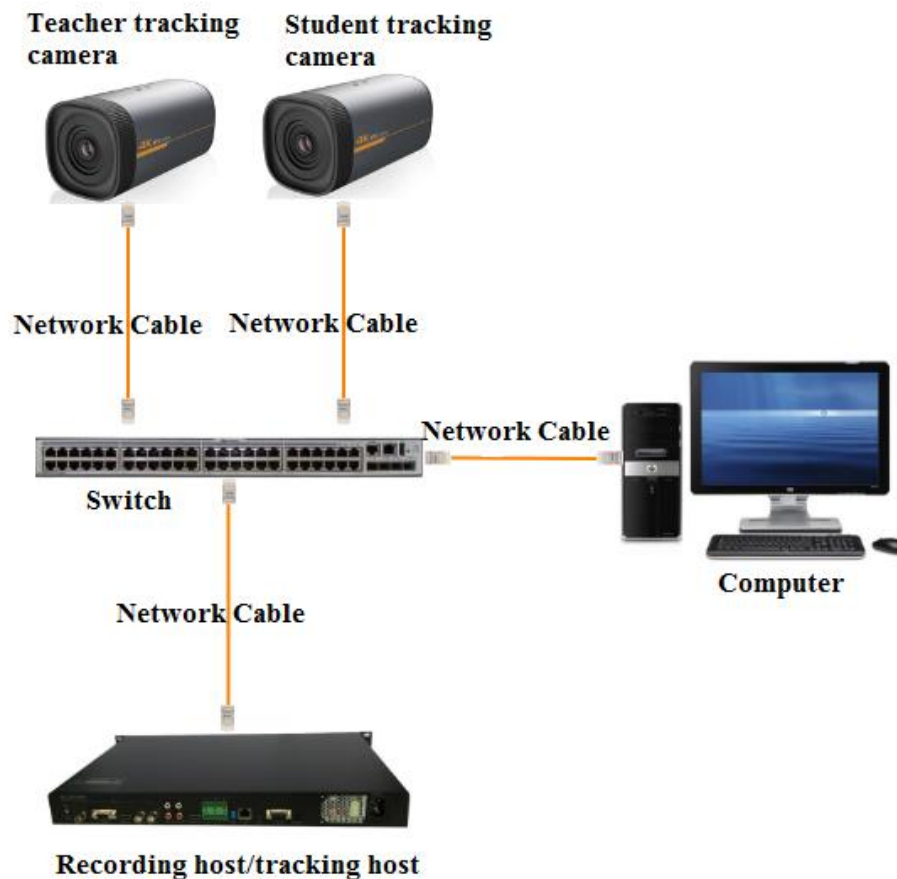
4.1 Installation Layout



Teacher tracking camera is installed at 1.6 – 2.1m (5 – 7 feet) from ground (distance from panoramic lens to ground), and the distance from the blackboard is 5 -9 m (15 – 30 ft). Teacher tracking camera should be installed as close to the center of the classroom as possible to achieve the best result. (Supports ceiling mounting)

4.2 System Wiring

The teaching tracking camera products provide a smart camera solution for education environments, and customers can select all or some products as needed. Different combinations of products meet the demands of customers' in various scenarios.



5. Network Connection

5.1 Connection Mode

Direct connection: Connect the camera directly to the computer by using an ethernet cable.

Internet connection mode: Connect the camera and computer to a router or switch and access via the local area network (LAN).

Note: Ensure power and network connections are secured to prevent video issues caused by poor connection quality.

The computer must be on the same subnet as the camera to connect successfully. The device will not be accessible otherwise. The camera default IP address is 192.168.5.163, therefore the computer must be connected to the 192.168.5.x subnet.

To connect to the camera, open the Local Area Connection Properties on the computer.

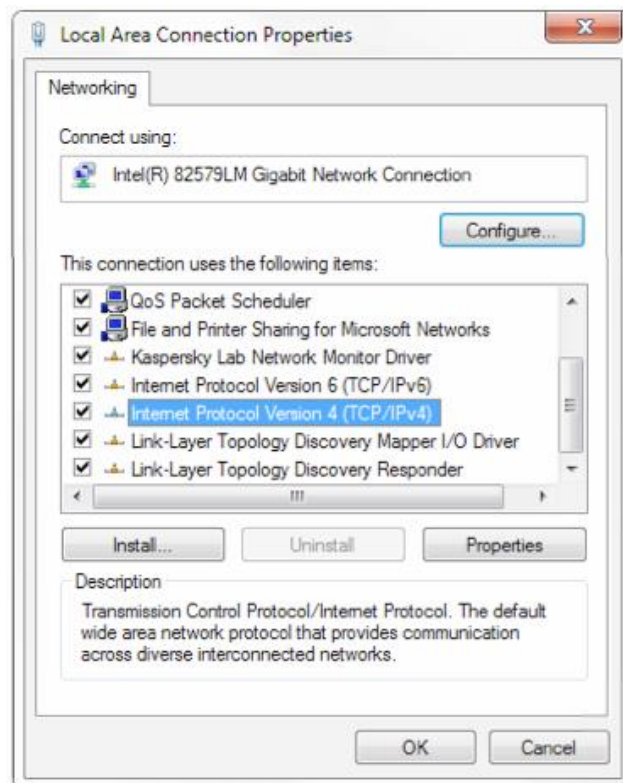
For Windows users right-click on the internet connection in the lower right corner of the desktop.

Select **“Open Network & Internet Settings.”**

Select **“Change Adapter Options.”**

Right-click on your connection (Wi-Fi or Ethernet) and select **“Properties.”**

Select **“Internet protocol version 4 (TCP/IPv4)”** as shown below and click **“Properties.”**



For the following steps refer to the diagram below.

Click on the bubble for **“Use the following IP address.”**

In the IP address field enter a non-conflicting IP address on the same subnet as the camera. If there is another device with the same IP address you will not be able to connect. In the example below we are using 192.168.5.200

In the **Subnet mask** field enter 255.255.255.0

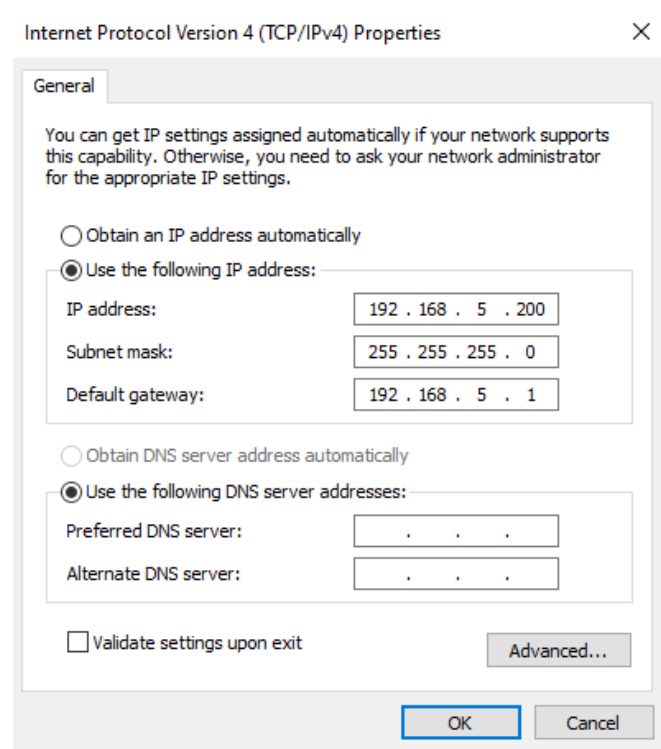
In the **Default gateway** field type 192.168.5.1

You can leave the DNS fields blank.

Click **OK** to apply your settings.

Note: When you are finished configuring the camera you will need to return to this screen and click the bubbles for **“Obtain an IP address automatically”** and **“Obtain DNS server automatically”** to restore internet connectivity to your computer. Also make sure to reconnect any ethernet cables

you may have unplugged.



5.2 Web Browser Login

1) Web Client Login

Enter 192.168.5.163 in the address bar of your internet browser and click Enter. If logged in as administrator (Default Username/Password: admin), users can preview and configure in the Web Client. If logged in as a normal user (Default Username/Password: user1 or user2), users can only preview with no options for configuration.

5.3 Browser Preview

After successful login into the management interface, it enters the video preview interface. In the preview screen, users can: control pan, tilt, zoom, focus, video capture, sound, full screen, set the preset position, run, delete, along with other operations.

1) Login as administrator

Default Username/Password: admin

PTZ control can be carried out, zoom, focus, video capture, sound, zoom, full screen and set the preset position, run, and delete; you can preview, playback, configure, log out.

2) Login as normal user

Default Username/Password: user1 or user2

PTZ control can be carried out, zoom, focus, video capture, sound, zoom, full screen and set the preset position, run, and delete; you can preview, playback, and log out.

Note: There are no configuration rights for normal user login.

5.4 Browser Configuration

Click Configuration to enter into the device parameters setting page

There are the following options: audio configuration, video configuration, network configuration and system configuration, detailed description see the following table.

Menu	Explanation
Audio configure	Including audio compressing format, sampling frequency, sampling precision, compressing code rate settings etc.
Video configure	Including video encoding, stream release, RTP broadcasting ,video parameters, character-overlapping, character size, video output setting etc.
Network configure	Including basic parameters, Ethernet, DNS, GB28181, wireless network setting etc.
System configure	Including equipment property, system time, user management, version update, reset, reboot device settings etc.

5.4.1 Audio Configuration

Switch: Choose to enable the audio or not. (default: off)

Compressing Format: Set audio compressing format and the device will reboot automatically after change (default MP3, AAC, G.711A optional)

Sampling Frequency: Set sampling frequency and the device will reboot automatically after change (default 44100, 8000, 16000, 32000 and 48000 optional)

Sampling Precision: Set sampling precision (default 16bits)

Compressing Code Rate: Set audio compressing code rate (default 64bits, 32, 48, 96, 128bits optional)

Channel type: Set channel type (default mono, stereo optional)

Input Volume: Set the input volume (default 2, 1-10 optional)

Click “Save”, it will remind “Enable has changed. Restart the device to take effect after the success of the save.”, then please reboot the camera to apply the settings.

5.4.2 Video Configuration

1) Video Encoding

Code stream: Different video output mode setting, use different streams. (close-up main stream, close-up sub-stream, panoramic main stream, panoramic sub-stream, and broadcast code stream)

Compression Format: Set the video compression format, save and reboot to take it effect (main / secondary stream default: H.264, H.265 optional)

Profile: Set Profile mode (default HP, BP, MP optional)

Video Size: Set video image resolution, save and reboot to take effect (close-up main stream default 1920*1080, 1280*720, 640*480 optional; close-up sub-stream default 320*180, 320*240, 640*360, 640*480, 1280*720 optional; panoramic main stream default 1920*1080, 1280*720, 640*480 optional; panoramic sub-stream default 320*180, 320*240, 640*360, 640*480, 1280*720 optional; broadcast code stream 1920*1080, 1280*720, 640*480 optional)

Stream Rate control: Set rate control mode, save and reboot to take it effect (close-up main stream, close-up sub-stream, panoramic main stream, panoramic sub-stream and blackboard code stream default variable bit rate, fixed rate is for option).

Image Quality: Set the image quality, image quality can be changed only when rate control is variable bit rate, (main stream defaulted is best, secondary stream default is better, there are best, better, good, bad, worse, worst for options).

Rate (Kb / s): Set the video bit rate (close-up main stream default 4096Kb/s, 64-40960Kb/s optional; close-up sub-stream default 512Kb/s, 64-40960Kb/s optional; panoramic main stream default 4096Kb/s, 64-40960Kb/s optional; panoramic sub-stream default 512Kb/s, 64-40960Kb/s optional; and broadcast code stream default 4096Kb/s, 64-40960Kb/s optional).

Frame rate (F/S): Set the video frame rate (close-up main stream, close-up sub-stream, panoramic main stream, panoramic sub-stream, and broadcast code stream default 25F/S, main stream 5-30F/S optional).

Key frame interval: Set the key frame interval (close-up main stream, close-up sub-stream, panoramic main stream, panoramic sub-stream, and broadcast code stream default 100F, main stream 1-150F optional).

Key frame minimum QP: Set the key frame minimum QP (default 20, 10-51 optional)

Stream Name: When streaming via rtsp or rtmp, user can modify stream name. close-up main stream (default live/av0), close-up sub-stream (default live/av1), panoramic main stream (default live/av2), panoramic sub-stream (default live/av3), and broadcast code stream (default live/av4). Click the "Save" button to display the "saved successfully" message, then settings take effect.

2) Stream Release

Switch: To turn on/off close-up main stream, close-up sub-stream, panoramic main stream, panoramic sub-stream and blackboard code stream.

Protocol: primary / secondary stream applies RTMP protocol.

Host Port: server port number (default 1935, 0-65535 optional)

Host Address: server IP addresses (default 192.168.5.11)

Stream Name: choose a different stream name (live / av0, live / av1, live/av2, live/av3, live/av4 optional).

User: Set the username.

Password: Set the password.

Click on the "Save" button to display the "Save successful" message, then settings take effect.

3) RTP Broadcasting

Switch: To turn on/off close-up main stream, close-up sub-stream, panoramic main stream, panoramic sub-stream and blackboard code stream.

Protocol: RTP or TS

Address: Default 224.1.2.3. It can be edited.

Port: Main Stream Default Port: close-up main stream default 4000, close-up sub-stream default 4002, panoramic main stream default 4004, panoramic sub-stream default 4006, broadcast code stream default 4008.

Visit: Address comes up after setting. Eg ; rtp: //224.1.2.3:4000; udp: //@224.1.2.3:4000

4) Video Parameters

a. Exposure: Exposure mode, exposure compensation, back light compensation, anti-flicker, gain limit, wide dynamic, shutter speed, aperture value and brightness can be set.

Exposure Mode: Set the exposure mode (the default automatic, manual, shutter priority, aperture priority, Brightness priority optional)

Exposure compensation: Exposure compensation setting is active when it is auto status (default is off).

Exposure compensation value: Set the exposure compensation value, valid when it is set for auto (default 0, -7 to 7 optional).

BLC: Set back light compensation, valid when it is auto status (default is off).

Anti-flicker: Set up anti-flicker mode, valid when status of automatic, aperture or brightness priority (default 50Hz, closed, 60Hz optional).

Gain limit: set the gain limits, only valid when exposure mode is automatic, aperture/brightness priority. (default 4, 0-15 optional).

Dynamic range: Set the dynamic range (default 4, 1-8 optional).
Shutter speed: Active when it is status of manual or shutter-priority (default 1/100, 1/25, 1/30, 1/50, 1/60, 1/90, 1/100, 1/120, 1/180, 1/250, 1/350, 1/500, 1/1000, 1/2000, 1/3000, 1/4000, 1/6000, 1/10000 optional).
Aperture value: Set the aperture value, active when it is status of manual or aperture-priority (default close, F1.8, F11, F9.6, F8.0, F6.8, F5.6, F4.8, F4.0, F3.4, F2.8, F2.4, F2.0 optional).
Brightness: Set the brightness value, active when it is a state of brightness priority (default 7, 0-23 optional).

b. Color: White balance, saturation, color, white balance, sensitivity, color temperature, gain red and blue gain can be set.

White balance modes: Set the white balance mode (the default automatic, 2400K-7100K, manual, One-push optional).
Note: Click the "Correction" button when selected the One-push white balance mode.
Red fine-tuning: default 0, -10~10 (only available in automatic mode)
Blue fine-tunable: default 0, -10~10 (only available in automatic mode)
Saturation: Set the saturation (default 60%, 70%, 80%, 90%, 100%, 110%, 120%, 130%, 140%, 150%, 160%, 170%, 180%, 190%, 200% optional).
Chroma: Set the chroma (default 7, 0-14 optional).
White balance sensitivity: Set the white balance sensitivity (default is high, medium, low for options)
Red Gain: Set the red gain, effective when it is manual (default 108, 0-255 optional).
Blue Gain: Sets the Blue gain, effective when it is manual (default 71, 0-255 optional).

c. Image: Brightness, contrast, sharpness, black and white mode, the gamma curve, Horizontal Flip and Vertical Flip can be set.

Brightness: Set the brightness (default 7, 0-14 optional).
Contrast: set the contrast (default 7, 0-14 optional).
Sharpness: Set the sharpness value (default 4, 0-15 optional).
Black and white mode: Set black and white mode (default color, black/white optional).
Gamma: Gamma value setting (default, 0.45, 0.50, 0.55, 0.63 optional).
Dynamic Contrast: set the dynamic contrast (default off, 1~8 optional)
Ultra-low illumination: default off

d. Noise Reduction: 2D noise reduction, 3D noise reduction and dynamic dead pixel correction available.

2D Noise Reduction: Set 2D noise reduction level (default 2, Auto, 1-7 and Off optional).
3D Noise Reduction: Set 3D noise reduction level (default 5, 1-8 and Off optional).
Dynamic dead pixel correction: Set Dynamic dead pixel correction (default Off, 1-5 optional).

e. Style: select the picture style (default, standard, clear, bright, soft optional)

Note: Click "Refresh" to make revision of any video parameters of a, b, c, d, e effective.

4) Character-Overlapping

Display date and time: Set whether to display the time and date (default display).
Display Title: Set whether to display the title (default display).
Font Color of Time: Set font color of time and date (default white, black, yellow, red, and blue optional).
Font Color of Title: Set font color of title (default white, black, yellow, red, and blue optional).
Moving characters: Set the display position of moving date, time and title, click on the "up, down, left, right" buttons to move the corresponding character position.
Title Content: Set title content (default CAMERA1).
Time Content: Set time content (default 1970/01/10 05:36:00)
Click on the "Save" button and display the "Save successful" message, then valid

5) Character Size

Main stream character size: Set the character size of the display, the device will restart Automatically after changed and saved (default 48, 28-200 optional)

Secondary stream character size: Set the character size of the display, the device will restart automatically after changed and saved (default 48, 28-200 optional)

Click on the "Save" button to display "Parameter saved successfully" message, set to take effect.

6) Video output

Output format can be checked by on/off (default off)

Output format: 1080P30, 1080P25, 1080I60, 1080I50, 720P60, 720P50

Click on the "Save" button, it will be valid when display "Save successful".

5.4.3 Network Configuration

1) Network port

Data port: set the data port, the device will restart automatically after changed (default 3000, 0-65535 optional)

Web Port: Set Web port, the device will restart automatically after changed (default is 80, 0-65535 is optional)

Onvif Port: Set Onvif port, the device will restart automatically after changed (default 2000, 0-65535 optional)

Soap Port: Set Soap port (default 1936, 0-65535 optional)

RTMP Port: Set RTMP port (default 1935, 0-65535 optional)

RTSP Port: Set RTSP port, the device will restart automatically after changed (default 554, 0-65535 optional).

Visca Port: Set Visca port, the device will restart automatically after changed (default 1259, 0-65535 optional).

Click on the "Save" button, it will be valid when display "Save successful".

RTSP Obtaining method: rtsp: // device IP address: 554 / live / av0 (av0 close-up main stream, av1 close-up sub-stream, av2 panoramic main stream, av3 panoramic sub-stream, av4 broadcast code stream.)

RTMP Obtaining method: rtmp: // device IP address:1935/live/ av0 (av0 close-up main stream, av1 close-up sub-stream, av2 panoramic main stream, av3 panoramic sub-stream, av4 broadcast code stream.)

2) Ethernet parameters

DHCP: Enable or disable obtain IP automatically can be set. Save changes and reboot the device to takes effect (default: OFF)

IP Address: Set the IP address, save changes and reboot the device to takes effect (default 192.168.5.163). Note: This IP address is the same with the one used to login Web page.

Subnet Mask: Set the subnet mask (default 255.255.255.0).

Default Gateway: Set the default gateway (default 0.0.0.0).

Physical Address: Set the physical address (the parameter is read-only and cannot be modified). Click on the "Save" button, it will be valid when display "Save successful". (Note: To prevent IP conflicts When modify)

3) DNS parameters

Preferred DNS server: set the preferred DNS server. (Default 0.0.0.0).

Alternate DNS server: Alternate DNS server settings. (Default 0.0.0.0).

Click on the "Save" button, it will be valid when display "Save successful".

4) GB28181

Switch: set whether open GB28181, can check

Time Synchronization: whether synchronization time is set, you can check

Stream Type: stream type setting (the default main stream, secondary stream optional)

Sign effective time (in seconds): 3600 Range 5-65535

Heartbeat time (seconds): 60 Range 1-65535

Register ID: 34020000001320000001

Register Username: IPC

Register Password: 12345678

Equipment ownership: Users can add their own

Administrative regions: Users can add their own

Alarm Zone: Users can add their own

Equipment installation address: Users can add their own

Local SIP Port: 5060 Range 0-65535

GB28181 Server Address: IP address of the computer

Server SIP Port: 5060 Range 0-65535

Server ID: 34020000002000000001

Click on the "Save" button, it will be valid when display "Save successful".

5.4.4 System Configuration

1) Device Properties

Device Name: Set the device name (the default Camera1, user can add their own).

Device ID: Set the device ID (default 1, Read-Only).

System Language: Set the system language (default Simplified Chinese, English optional). Need to re-login after modify and save the setting.

Click on the "Save" button, it will be valid when display "Save successful".

2) System Time

Date Format: Set the date format (YYYY-MM-DD default That year - month - day, MM-DD-YYYY namely Month - Day - Year, DD-MM-YYYY date - month - year Optional).

Date separator: set the date separator (default '-', '.', '-' Optional).

Time Zone: Set the time zone (default East eight districts, other time zones optional).

Time Type: Set the time types (default 24 hours, optional 12 hours).

Time setting: Set time mode (to choose the computer time synchronization, NTP server time synchronization, or set manually).

Computer Time: Set the computer synchronization valid.

Update interval: Set the NTP server automatic updated time interval. Valid after setting NTP server synchronization (default one day, 2-10 days Optional).

NTP server address or domain name: Set NTP server address or domain name (default time.nits.gov). Valid after setting NTP server synchronization.

NTP Server Port: Sets the NTP server port (default 123). Valid after setting NTP server synchronization.

Set the time manually, Effective when set manually.

Click on the "Save" button, it will be valid when display "Save successful".

3) User Management

Select users: Set the user type (the default administrator, Common User 1, Common User 2 optional)

Username: set the username (Select User Administrator default admin; select a common user1 default user1; to select a common user 2 default user2; user can modify their own)

Password: Set a password (Select User Administrator default admin; select a common user1 default user1; to select a common user 2 default user2; user can modify their own).

Password confirmation: Confirm the input passwords are the same or not.

Click on the "Save" button to display the "Save successfully" message, then the set is to take effect.

Please note the case-sensitivity of the username and password.

If login page by a common user's name and password, one does not have configuration privileges but can only operate to preview, playback, logout.

4) Version upgrade

Users only read the version information above which is consistent with the menu version but cannot modify. Different types of the machine have different information.

Update file: Click "Browse ..." installation, to select the upgrade file in the pop-up window.

Click on the "Upgrade" button, the upgrade dialog will appear, the device will reboot automatically after update successfully.

(Note: Make sure the power and network remain connected during the process, or the upgrade will fail)

Note: After the version upgrade is complete, you need to restore factory defaults; a. through web to restore the factory default configuration; b. through the recovery menu; c. remote control shortcut * #6;

Choose one of the above three ways. The IP account and password of mode a are also restored to default.

5) Restore factory setting

Click on pop-up "Restore Factory Defaults" button and choose "yes" or "no", then the device will restart automatically and restore factory setting.

6) Reboot

Click on the pop-up "Reboot" button and choose "yes" or "no", then the device will restart automatically.

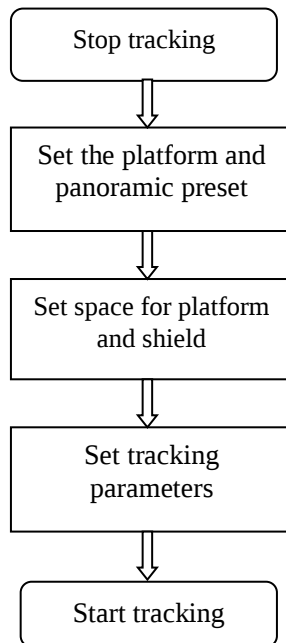
5.5 Logout

Point "Logout" pop-up "Confirmation" dialog; select "Yes" or "No", choose "Yes" to exit the current page and return to the user login interface again.

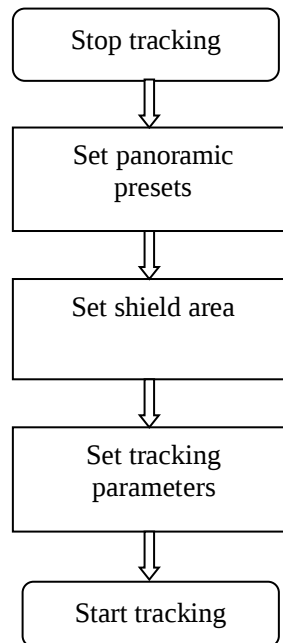
5.6 Configure Tracking Parameter

Set up process

The setup process of teacher tracking



The setup process of student tracking



5.6.1 Teacher Tracking Configuration

The following instructions are given in accordance with the setup flowchart. The main interface of teacher tracking configuration is shown in Figure 5.6-1

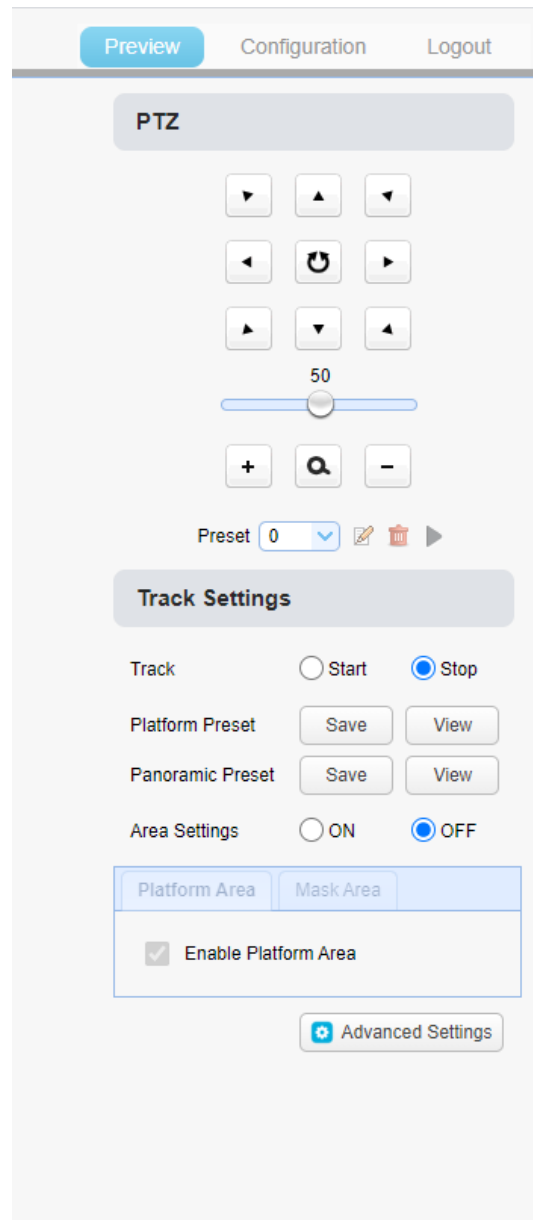


Figure 5.6-1 Operation interface

1. Click stop tracking

2. Preset setting of the platform

The operation interface for setting the preset position is shown in Fig. 5.6-2. By controlling the position and ZOOM value of the PTZ, the camera Angle and position are adjusted to the preset position and saved. The description of the preset position of the podium is as follows.



Figure 5.6-2 Operation interface

Platform preset: Control teacher tracking camera to capture the platform (we suggest that teachers stand in the middle of platform during setup) in camera image, then click and save platform preset. During normal tracking, the size of the teacher's image in the picture uses Platform preset as a reference. When the tracking target disappears, the close-up lens will return to the platform preset.

3. Panoramic preset setting

The operation interface for setting the preset position is shown in Fig. 5.6-3. By controlling the position and ZOOM value of the PTZ, the camera Angle and position are adjusted to the preset position and saved. The panoramic preset settings are described below.

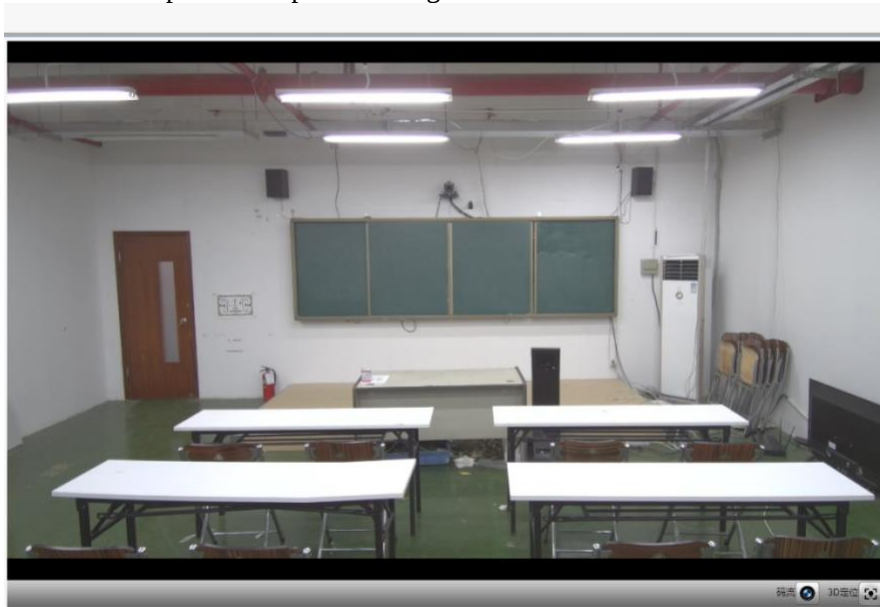


Figure 5.6-3 Operation interface

Panoramic preset: Control teacher tracking camera to capture a panoramic view of the classroom (or any position). When tracking target disappears, the close-up lens will return to panoramic position.

4. Area settings (ON: show the mask area; OFF: hide the mask area)

5. Platform area: It is the area tracked once close-up lens start up tracking. It is usually the blackboard/whiteboard area on the platform. This should be configured so that when teacher is on

platform, their upper body is displayed within the defined area, and it will not exceed the lower margin of platform area when students in the first row sit down. See Figure 5.6-4.

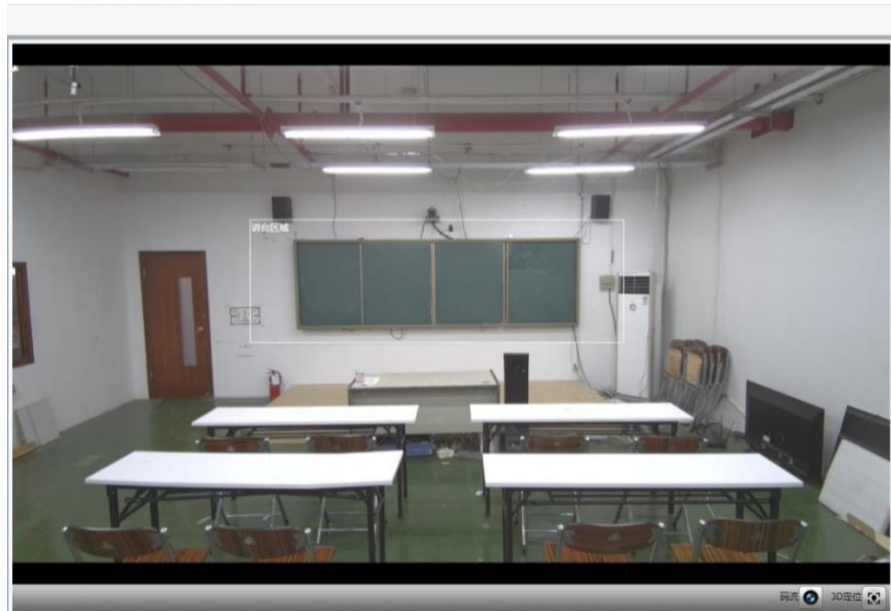


Figure 5.6-4 Operation interface

6. Mask area: Mask area is usually the area which may impact result of teacher tracking, such as places which may have dynamic changes such as TV, projector, doors and windows. See Figure 5.6-5:

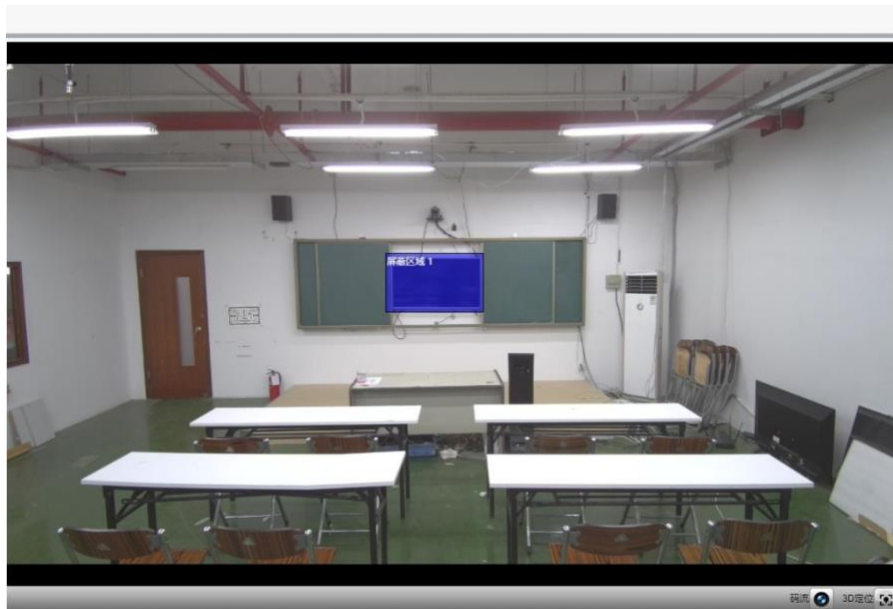


Figure 5.6-5 Operation interface

7. Advanced settings

Target lost: This feature is to make sure that when the target lost, lens will return to the assigned preset. It has 2 modes for option: panoramic preset and close-up preset.

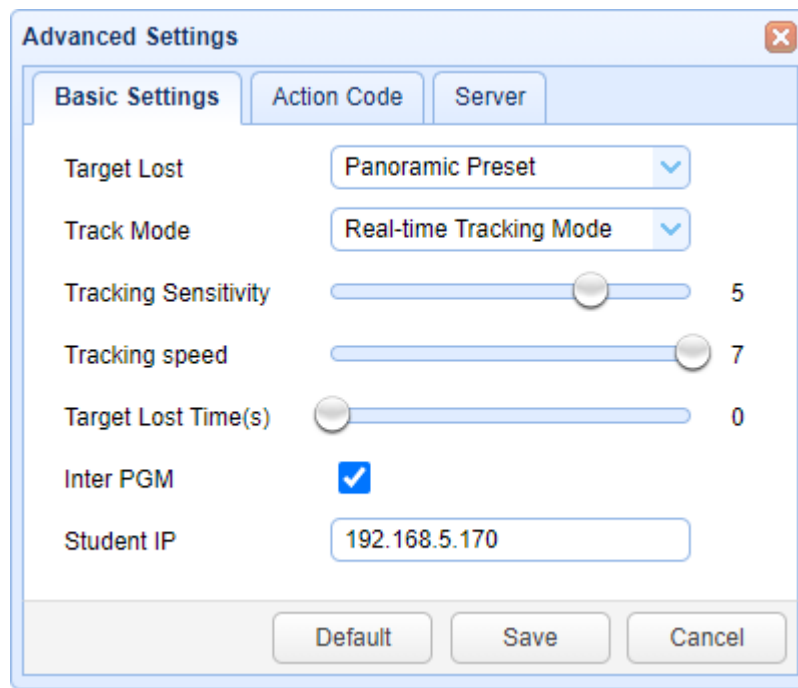


Figure 5.6-6 Operation interface

Tracking modes (Three for option):

Real-time Tracking Mode

Movie Mode

Area Tracking Mode

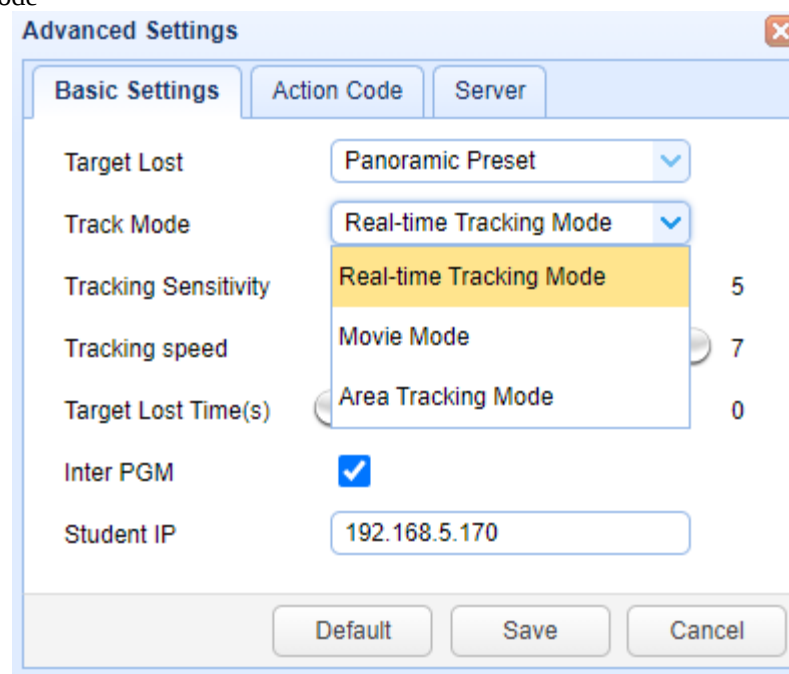


Figure 5.6-7 Operation interface

Tracking sensitivity: In teacher tracking mode, how much action is required to trigger the tracking camera when the tracking target changes from stationary state to motion state. The higher the action sensitivity, the smaller movement of tracking target that will trigger camera's tracking motion.

Tracking speed: Horizontal tracking speed.

Target lost time(s): It means how much time is required (0s by default) for the tracking camera to perform "target lost action" when target is lost (default: return to panoramic preset).

Inter PGM: This should remain checked.

Student IP address: Fill in the IP of the student tracking camera here. When the director stream is obtained, the close-up of the teacher tracking camera and the panoramic switch of the student tracking camera can be realized.

5.6.2 Student Tracking Configuration

The following instructions are given in accordance with the setup flowchart. The main interface of student tracking configuration is shown in Figure 5.6-8.

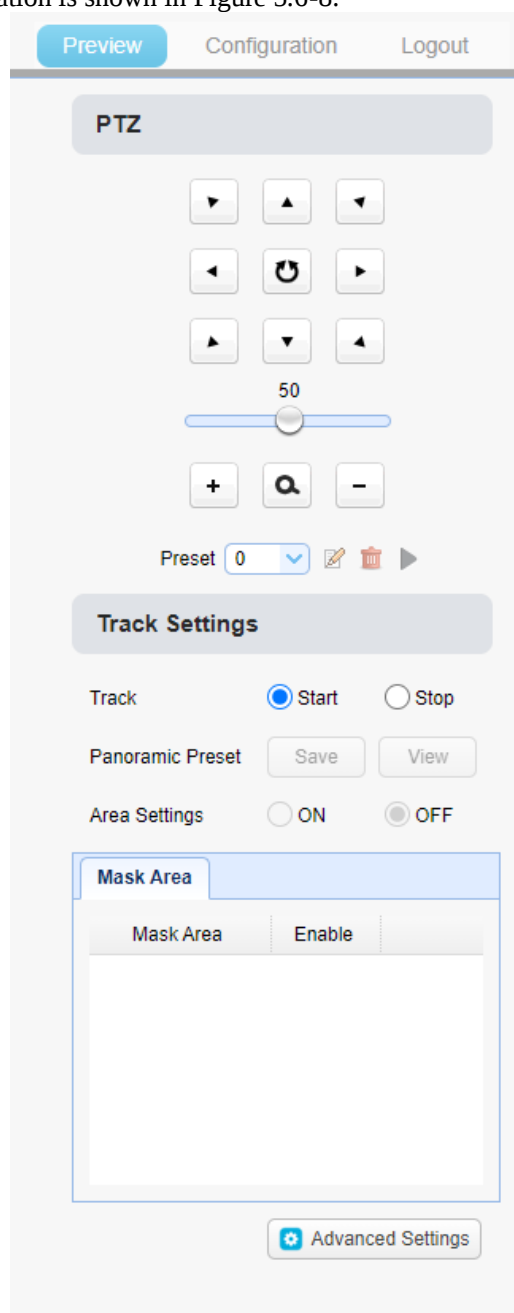


Figure 5.6-8 Operation interface

P.S. For student tracking, mask area setting is the only configuration that needs to be done. Turn the camera faced to the students, click “Start”, no other configuration is needed.

1. Click “Stop” tracking

2. Panoramic preset configuration

The operation interface for setting the preset position is shown in Figure 5.6-9. By controlling the

position and ZOOM value of the PTZ, the camera angle and position are adjusted to the preset position and saved. The panoramic preset settings are described below.

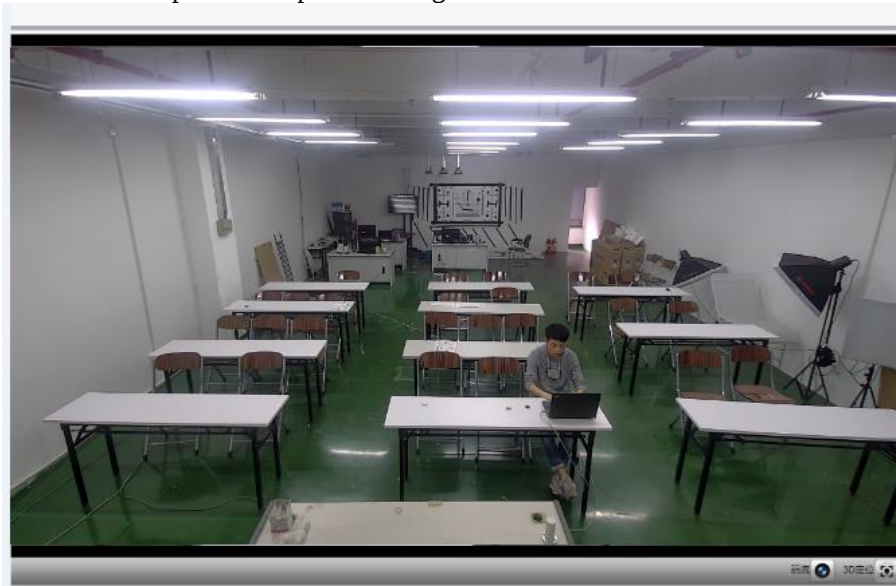


Figure 5.6-9 Operation interface

Panoramic preset: Control student tracking camera to allow camera to have almost a panoramic view of classroom (or any position). When tracking target disappears, it can select to go back to panoramic position.

3. Area settings (ON: show the mask area; OFF: hide the mask area)

4. Mask area: Mask area is usually the area which may impact result of teacher tracking, such as places which may have dynamic changes such as TV, projector, doors and windows. See Figure 5.6-10:

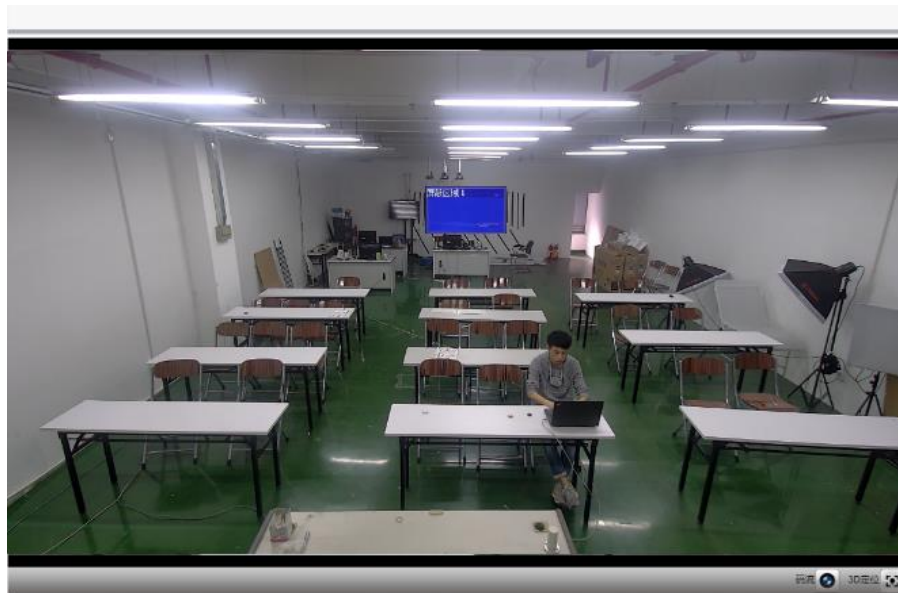


Figure 5.6-10 Operation interface

5. Advanced settings

Target lost: This feature is to make sure when the target is lost, lens will return to the assigned preset, which can be either left in place or the panoramic preset.

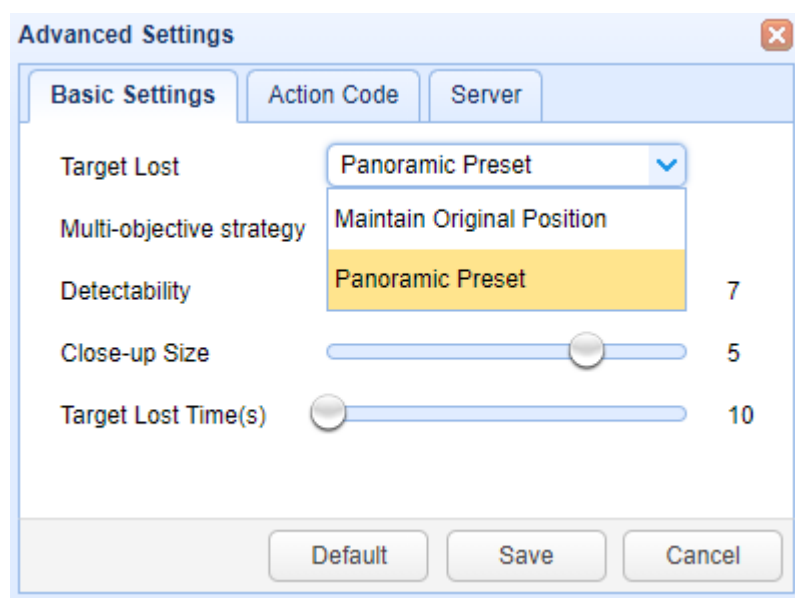


Figure 5.6-11 Operation interface

Multi-targets: When multi-targets are detected, you can choose “Close-up” or “Panoramic”

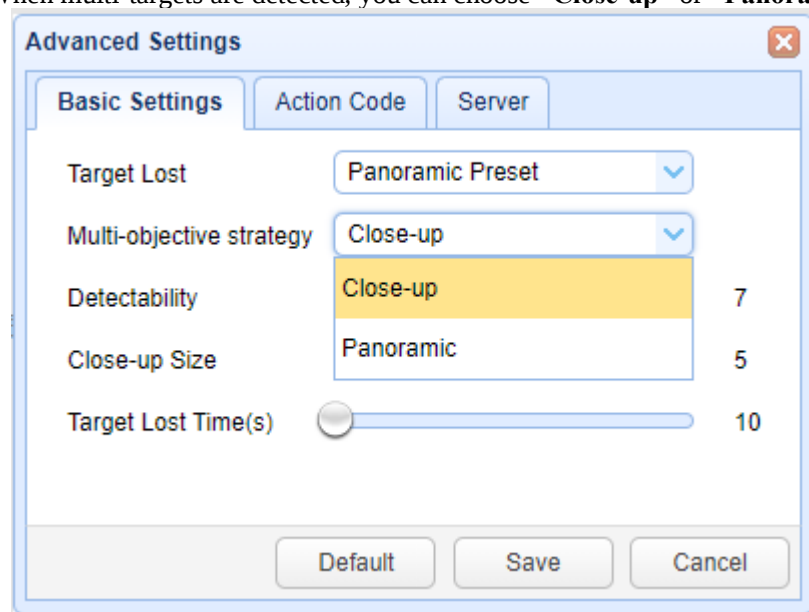


Figure 5.6-12 Operation interface

Tracking sensitivity: It means in student tracking mode, how much the action range is required to trigger tracking camera when the tracking target changes from sit down state to stand up state. The higher the action sensitivity, the smaller movement of tracking target that will trigger camera’s tracking motion.

Student close-up size: It means in student tracking mode, the proportion of close-up image size.

Target lost time(s): It means how much time is required (60s by default) for tracking camera to perform “target lost action” when target is lost (default: return to panoramic preset).

For the setting of the action code, see the chapter "6. Recording and broadcasting host connection instructions".

For the setting of the server, please refer to the chapter "6. Recording host connection instructions". After completing the relevant settings, you need to click Save. According to specific scenarios and customer needs, you can enter the advanced parameter section multiple times to modify the configuration values to achieve the best results.

6. Description of Recording and Broadcasting Host

6.1 Auto Tracking Control

The recording and broadcasting host can send commands by LAN network port and control automatic tracking motion of teacher tracking camera. In auto tracking mode the camera cannot be controlled from the browser or remote control; PTZ functions can only be controlled if auto-tracking mode is stopped.

1. Network receiving address

Teacher auto tracking camera default IP is: 192.168.5.163.

2. Command

Action	Command
Start teacher tracking	0x810x0A 0x08 0x01 0x020xFF
Stop teacher tracking	0x81 0x0A 0x08 0x01 0x03 0xFF

6.2 Action Code Docking

Tracking status of teacher tracking camera will be feedback to recording and broadcasting host in real time via network (UDP transmission mode) in the action code form.

1. Configuration of recording and broadcasting host address

If recording and broadcasting host uses LAN to receive action code, then it needs to configure host address by web browser. Click **Advanced settings** -> **Server**, as shown below:

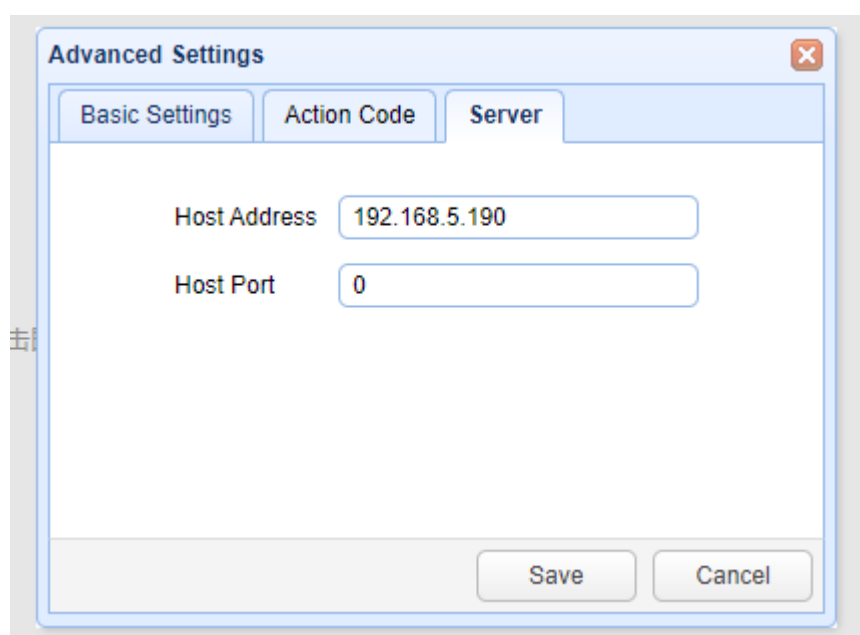


Figure 6.2-1 Operation interface

2. Configuration of action code

Modify action code as needed via web browser. Click Advanced settings -> action code;

After modification, click save, as shown below:

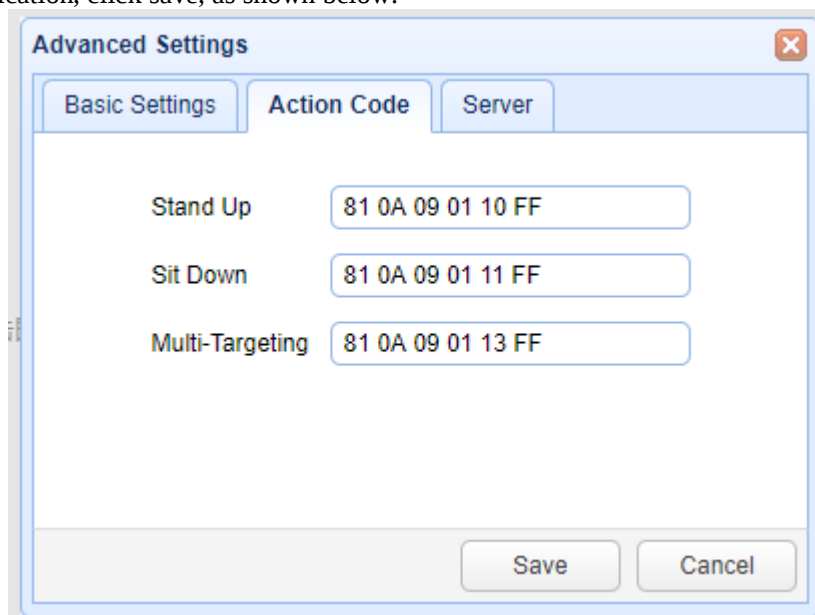


Figure 6.2-2 Operation interface

7. Technical Parameter

Model Number	Teacher Tracking Camera	Student Tracking Camera
Camera/ Lens Parameters		
Image Sensor	1/2.8 inch High Quality 4K CMOS Sensor	
Effective pixels	8.28 megapixel, 16: 9	
Video Format	SDI output: 1080P@30fps/25fps;720P@60fps/50fps/30fps/25fps; U3 output:1920X1080P30 fps /25 fps;1280X720P60 fps /50 fps /30 fps /25 fps ;960X540P30 fps;800X600P30 fps;640X360P30 fps;640X480P30 fps;352X288P30 fps; USB3.0 can be compatible with USB2.0 output	
View Angle	57.2° (D) /47° (H) /36° (V)	94.8° (D) /86.6° (H) /56° (V)
Focus	f=7.23mm	f=3.24mm
Aperture	F2.4+ 5%	F2.10
Digital Zoom	3X	
Minimum Illumination	0.5Lux(F1.8, AGC ON)	
DNR	2D& 3D DNR	
White Balance	Auto / Manual/ One Push/ Specified color temperature (2400K-7100K, step length is 100)	
Focus	Manual	
Exposure	Fixed	
BLC	ON/ OFF	
DNR	>50dB	

Input/Output Interface	
Video Interfaces	1xSDI interface 1xUSB interface 1xLAN interface:10M/100M adaptive Ethernet port (support POE)
Video Compression Format	H.264,H.265,MJPEG,YUY2,NV12
Audio Input Interface	Double track 3.5mm linear Input
Audio Compression Format	AAC,MP3,G.711A

Network protocol	RTSP,RTMP,ONVIF,GB/T28181
Control Interface	RS232,RS485,LAN
Communication Protocol	VISCA, Pelco-D, Pelco-P, support baud rate 115200/38400/9600/4800/2400; Support VISCA Control Protocols
Power Interface	HEC3800 power socket(DC12V)

Other Parameter		
Input Voltage	Power Adapter	12V
	POE Supply	48V
Input Current	Power Adapter	0.42A(max)
	POE Supply	0.104A(max)
Power Consumption	5W(max)	
Stored Temperature	-10℃～+60℃	
Stored Humidity	20%～95%	
Working Temperature	-10℃～+50℃	
Working Humidity	20%～80%	
Dimension (WXHXD)	148.8mm×76mm×76mm	
Weight	Around 0.53kg	
Application	Indoor	
Accessories	User Manual	

8. Maintenance and Troubleshooting

8.1 Camera Maintenance

- 1) Please power off the camera and disconnect the power adapter and socket, if it's not used for a long run.
- 2) Use soft cloth or tissue to clean the camera cover.
- 3) Wipe it with a soft, dry cloth when cleaning the camera lens. Wipe it gently with a mild detergent if needed. Do not use strong or corrosive detergents to avoid scratching the lens and affecting the video quality.

8.2 Troubleshooting

1) No video output

- a. Check whether the camera power supply is connected, the voltage is normal, the power indicator is lit.
- b. Whether the machine could do self-check after restarted.
- c. Check whether the bottom of the DIP switch is the normal operating mode (see Table 2.2 and Table 2.3)
- d. Check whether the video output cable or video display is normal

2) No image sometimes

- a. Check whether the video output cable or video display is normal

3) Video dithering when zoom-in or zoom-out

- a. Check whether the camera installation position is solid
- b. Whether there is shaking machine or objects around the camera

4) Serial port not working

- Check whether the camera serial device protocol, baud rate, address is consistent
- Check whether the control cable is connected properly
- Check whether the camera working mode is the normal operating mode

5) Webpages cannot log in

- Check if the camera outputs video normally by connecting directly to the screen.
- Check whether the network cable is connected properly (Ethernet port yellow light flashes to indicate normal network cable connection)
- Check whether your computer is added the segment and the segment is consistent with the IP address of the camera
- Click "Start" and select "Run" and then type "cmd" in the computer; Click "OK" then turn on a DOS command window to enter ping 192.168.5.163. Press the Enter key to appear message as follows: Description network connection is normal.

```
C:\Users\qq214>ping 192.168.5.163

Pinging 192.168.5.163 with 32 bytes of data:
Reply from 192.168.5.163: bytes=32 time=2ms TTL=64
Reply from 192.168.5.163: bytes=32 time=1ms TTL=64
Reply from 192.168.5.163: bytes=32 time<1ms TTL=64
Reply from 192.168.5.163: bytes=32 time=4ms TTL=64

Ping statistics for 192.168.5.163:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 4ms, Average = 1ms

C:\Users\qq214>_
```

9. Warranty

BZBGear wants to assure you peace of mind. All BZBGear cameras and camera-related products include our Stress-Free Three-Year Warranty.

For complete warranty information, please visit BZBGear.com/warranty.

For questions, please call 1.888.499.9906 or email support@bzbgear.com.

10. Mission Statement

BZBGear manifests from the competitive nature of the audiovisual industry to innovate while keeping the customer in mind. AV solutions can cost a pretty penny, and new technology only adds to it. We believe everyone deserves to see, hear, and feel the advancements made in today's AV world without having to break the bank. BZBGear is the solution for small to medium-sized applications requiring the latest professional products in AV.

We live in a DIY era where resources are abundant on the internet. With that in mind, our team offers system design consultation and expert tech support seven days a week for the products in our BZBGear catalog. You'll notice comparably lower prices with BZBGear solutions, but the quality of the products is on par with the top brands in the industry. The unparalleled support from our team is our way of showing we care for every one of our customers. Whether you're an integrator, home theater enthusiast, or a do-it-yourselfer, BZBGear offers the solutions to allow you to focus on your project and not your budget.

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