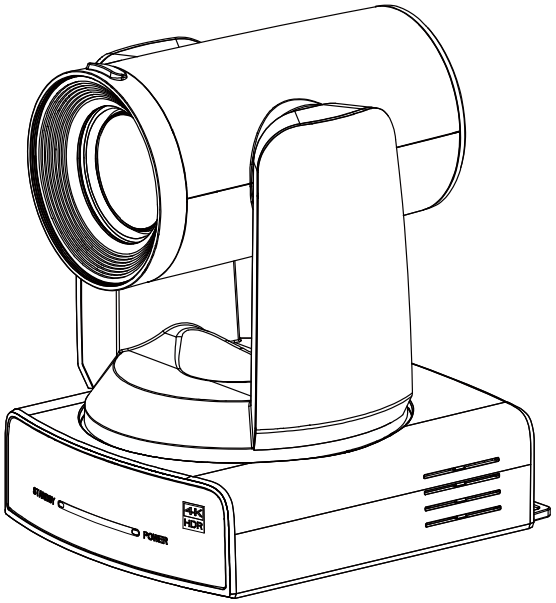
# 4K UHD PTZ Camera




# User Manual

## Limitation of Liability

This manual does not contain any warranties or implied warranties of any kind. The contents of this manual may be updated at any time without notice.

## FCC NOTICE (Class A)

This product complies with Part 15 of the FCC Rules. The operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**Note**

This product has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

**Note**

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user’s authority to operate the equipment.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## Class A ITE

Class A ITE is a category of all other ITE which satisfies the class A ITE limits but not the class B ITE limits. Such equipment should not be restricted in its sale but the following warning shall be included in the instructions for use:

**Warning**

Operating this equipment in a residential environment may cause radio interference.

## European Community Compliance Statement (Class A)

This product is herewith confirmed to comply with the requirements set out in the Council Directives on the Approximation of the laws of the Member States relating to Electromagnetic Compatibility Directive 2014/30/EU.

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# 1 Safety Notes

- During installation and use of the equipment, all electrical safety regulations of the country and region of use must be strictly observed.
- Please use the power adapter that comes standard with this product.
- Do not rotate head of the camera by hand, otherwise it may cause mechanical failure.
- When installing this product on a wall or ceiling, secure the device securely. When installing, make sure that there are no obstacles within the rotation range of the gimbal; do not turn on the power until all installations are completed.
- To avoid heat build-up, keep ventilation around the device smooth.
- If the device emits smoke, smells, or makes noises, please turn off the power immediately and unplug the power cord, and contact the dealer in time.
- This device is not waterproof, please keep the device dry.
- This product has no user serviceable parts, damage caused by disassembly by the user is not covered by the warranty.

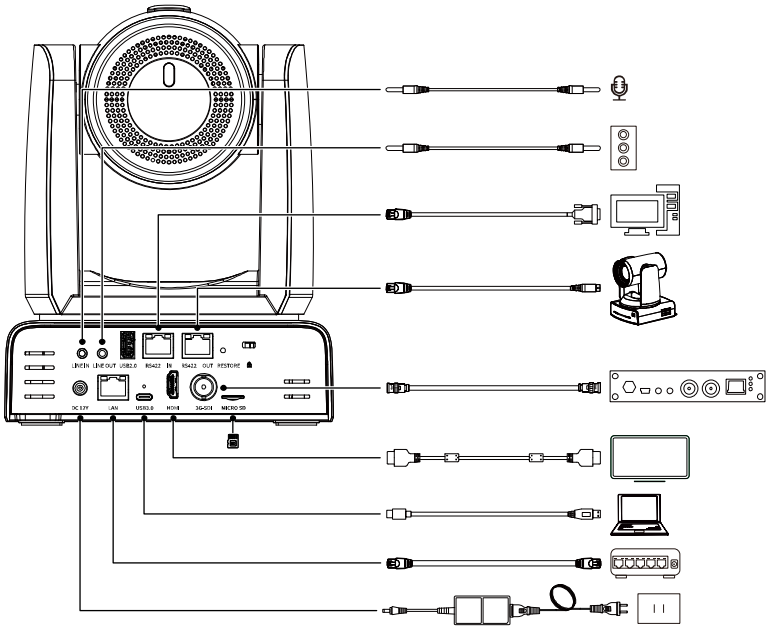
**Notice**

Specific frequencies of electromagnetic field may affect the image of the camera!

# 2 What's in the Box?

| Name | Quantity |
|---|---|
| Camera | 1 |
| Remote Control | 1 |
| Power Adapter | 1 |
| Power Cable | 1 |
| User Manual QR Code | 1 |

# 3 Product Connection



**Note** The schematic diagram is for reference only. Please refer to the actual application scenario for product connection.

After the camera is powered on, it begins initialization. The pan-tilt unit first rotates to the upper right limit position, then returns to the HOME position, completing initialization.
(Note: If preset position 0 is saved, the pan-tilt unit will rotate to preset position 0.)

# 4 About Product

## 4.1 Features

- **HDR10 High Dynamic Colour Standard**

Supports the BT.2020 colour standard, offering a colour gamut twice as wide as BT.709; 10-bit colour depth (capable of displaying approximately 1.07 billion colours), resulting in colour transitions that are more natural to the human eye, and details such as light and shadow gradients and brightness contrasts that are more faithful to the real world, thereby reducing the difficulty of post-production colour grading.

- **50 Million Effective Pixels**

Features the latest generation 1/1.55-inch high-quality CMOS sensor with 50 million effective pixels, delivering cinematic-grade performance in both detail reproduction and colour accuracy. Supports 4KP60 output with backward compatibility for 1080P and 720P resolutions, meeting the demands of high-precision shooting scenarios.

- **120fps High-speed Capture**

Supports 1080P@120fps high frame rate video, smoothly and clearly capturing the details of fast-moving objects. Slow-motion playback is clear and smooth, with stunning visual effects and a more immersive viewing experience.

- **PDAF Millisecond-level Focusing**

Built-in PDAF focusing technology uses phase detection pixels on the sensor to quickly identify the target position. Whether it's the rapid sprint of athletes in sports events or the intense dance moves of singers on a commercial stage, the lens can accurately lock onto the subject in real time, ensuring that the image remains clear and sharp.

- **AI Intelligent Tracking**

Equipped with proprietary RelD and FacelD AI algorithms, the camera accurately identifies and focuses on subjects based on facial features, body shapes, poses, and clothing, ensuring precise tracking and shooting of moving targets in complex environments, keeping the subject in sharp focus and centre stage.

- **Front and Rear Tally Indicator**

The camera features adjustable-brightness Tally lights on both the front and rear, displaying the camera's operational status (e.g., standby or recording) in real time, helping users stay informed about the camera's current status.

- **60° Wide-angle + 20x Optical Zoom**

Features a high-quality, ultra-high-resolution 4K ultra-high-definition telephoto lens with a horizontal field of view of up to 60° and supports up to 20x optical zoom. Combined with high-pixel magnification, it captures detailed images without noise, preserving every precious moment.

- **External ND/CPL Filters**

The camera body has a standard filter mount for quick installation of ND filters and CPL filters, easily handling complex environments such as strong light overexposure and glare interference, achieving dynamic light control and colour depth optimisation to meet the professional demands of complex scenes.

- **NDI6**

Supports the NDI6 transmission protocol, enabling high-quality, low-loss audio and video signals to be transmitted over a network with minimal latency to other devices. Plug-and-play functionality ensures seamless connectivity and simplified deployment.

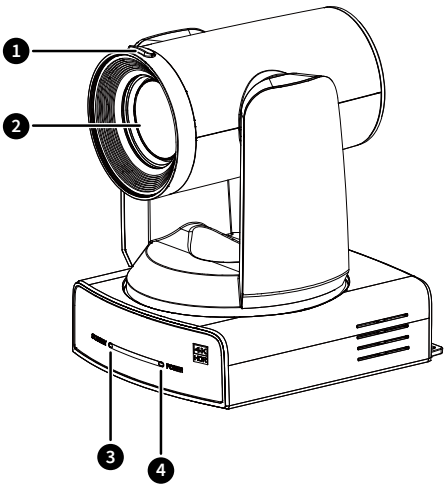
- **Dante AV-H**

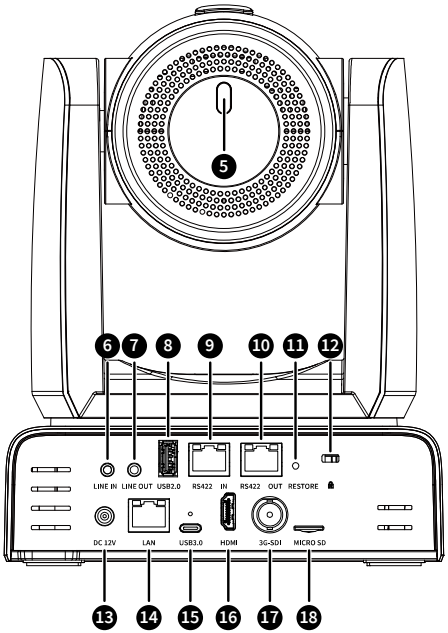
Real-time high-fidelity audio and video streams are transmitted over Ethernet, instantly compatible with a wide range of Dante products on the market. Unified control and management can be achieved through the Dante Controller software. The network time protocol ensures device clock synchronisation, providing flexibility and low-latency audio and video routing.

- **Multiple Interfaces**

Supports simultaneous output of 4 channels of high-definition digital signals via HDMI, 3G-SDI, USB, and LAN interfaces; HDMI and 3G-SDI can directly output uncompressed HD lossless video. Supports camera control via RS422, RS485, LAN, and USB interfaces, meeting the needs of various practical application scenarios.

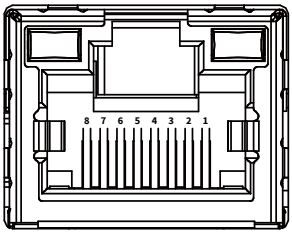
## 4.2 Indicator and Interface



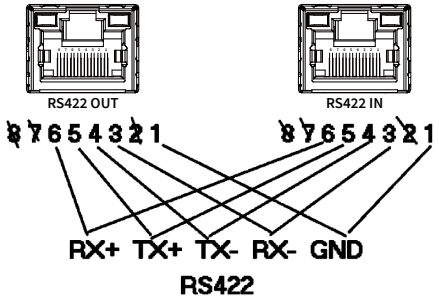

| No. | Name |
|---|---|
| 1 | Tally Indicator |
| 2 | Camera Lens |
| 3 | STANDBY Indicator |
| 4 | POWER Indicator |
| 5 | Tally Indicator |
| 6 | LINE IN Interface |
| 7 | LINE OUT Interface |
| 8 | USB 2.0 Interface |
| 9 | RS422 IN Interface |
| 10 | RS422 OUT Interface |
| 11 | RESTORE Key |
| 12 | Security Lock Slot |
| 13 | DC 12V Interface |
| 14 | LAN Interface |
| 15 | USB 3.0 Interface |
| 16 | HDMI Interface |
| 17 | 3G-SDI Interface |
| 18 | MICRO SD Slot |

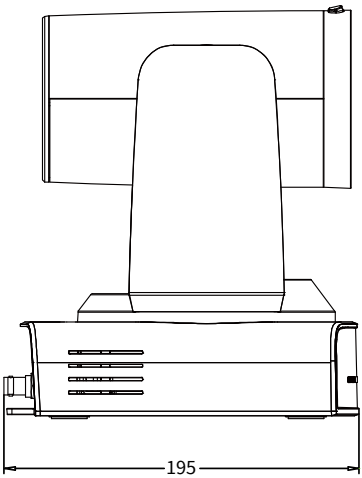
- **RS422 OUT/IN Interface**

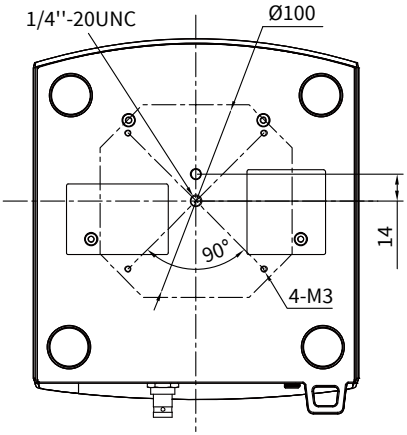



| No. | Function | No. | Function |
|---|---|---|---|
| 1 | GND | 5 | TX+ |
| 2 | NC | 6 | RX+ |
| 3 | RX- | 7 | NC |
| 4 | TX- | 8 | NC |

**Correspondence between RS422 OUT and RS422 IN pins:**

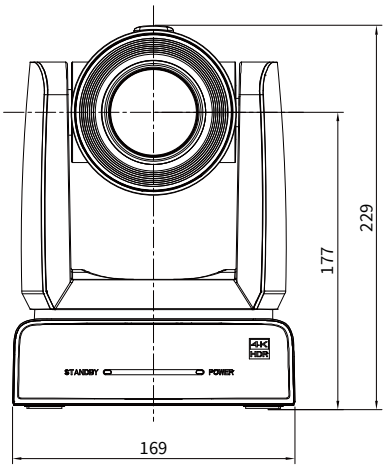


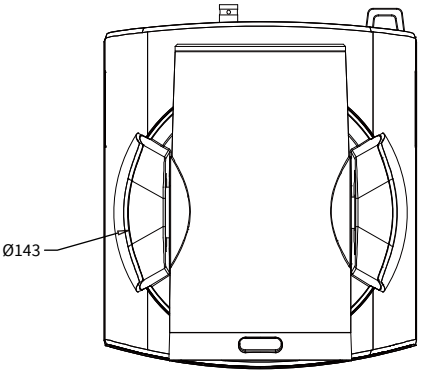




## 4.3 Dimension

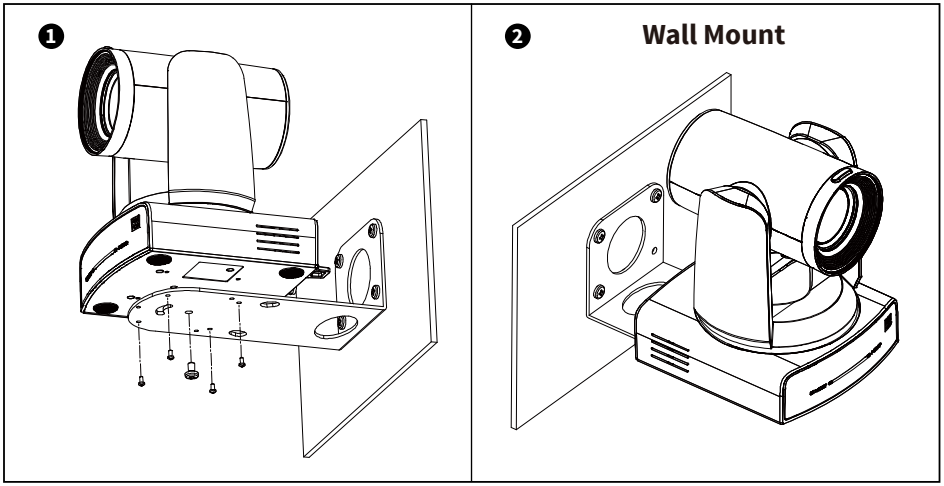
Unit: mm



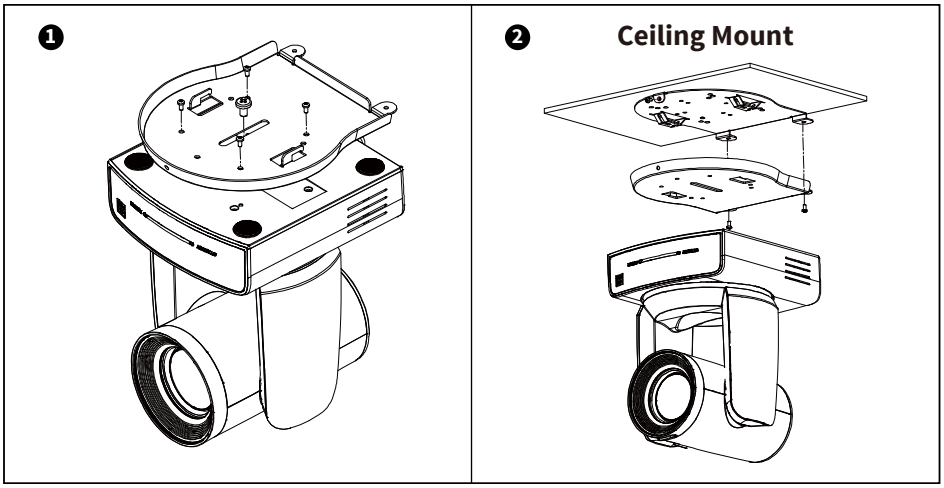



## 4.4 Installation

### 4.4.1 Wall Mount

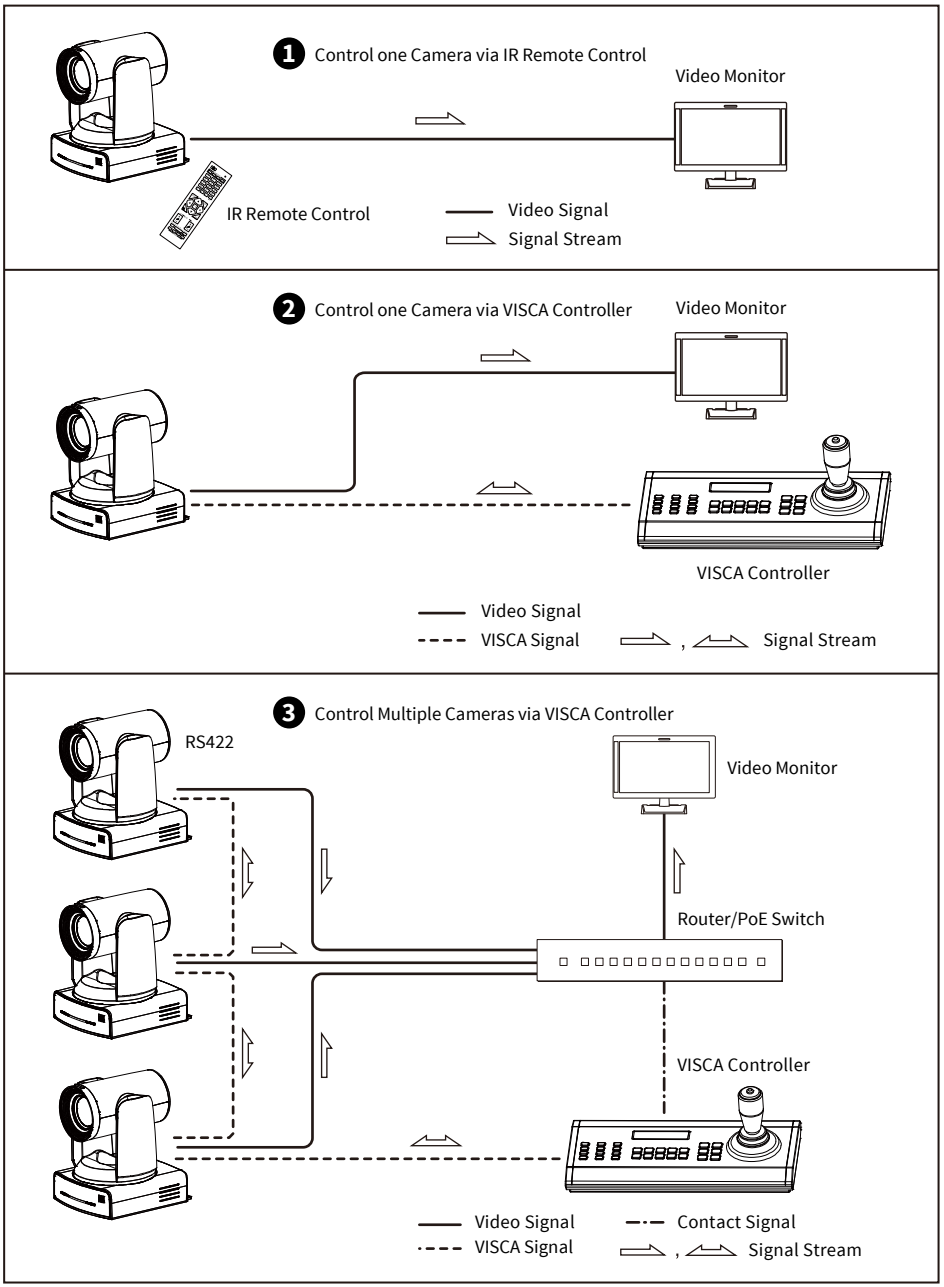



### 4.4.2 Ceiling Mount

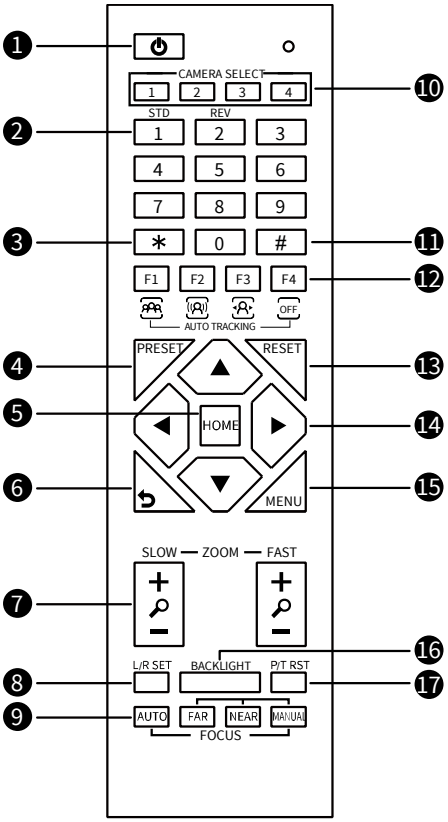



Note The above installation diagram is for reference only, please refer to actual product for the installation accessories.

## 4.5 Control Camera



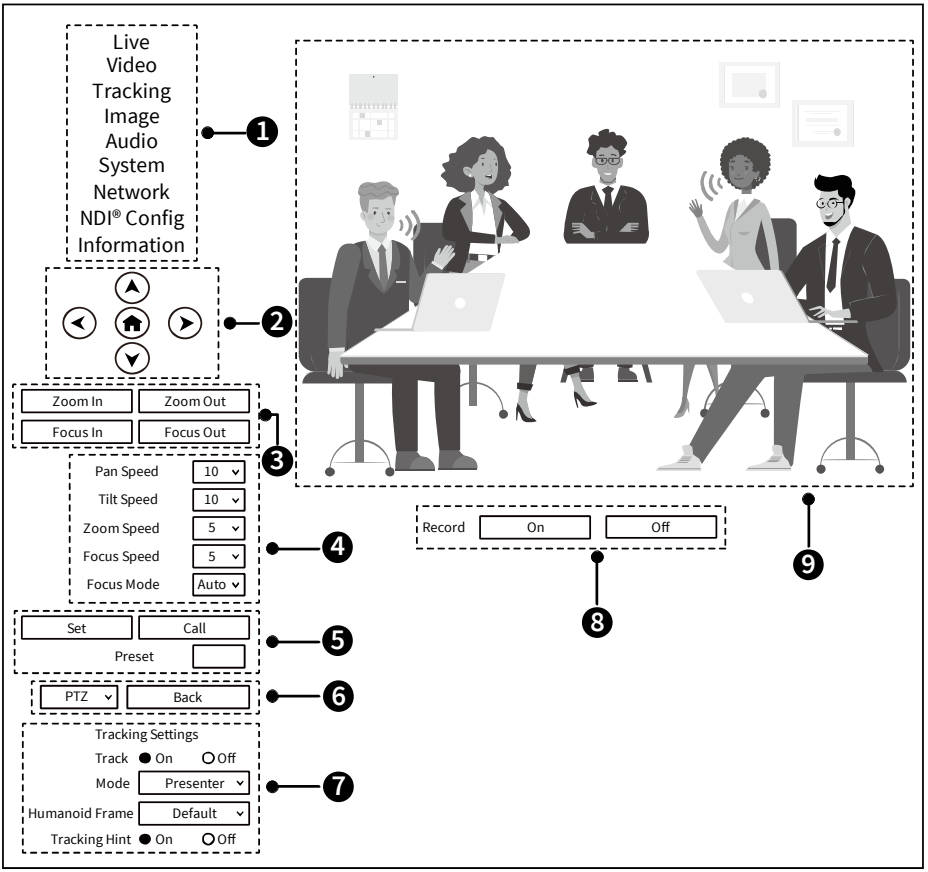
## 4.6 Remote Control




| Key Description |
|---|
| **1. ⏻ (Standby) Key** |
| Press to enter standby mode |
| **2. Number Keys** |
| To set preset or call preset |
| **3. * Key** |
| Use with other keys |
| **4. PRESET Key** |
| Set preset: Successively press [PRESET] + Number key (0-9) |
| **5. HOME Key** |
| Confirm selection or press to turn PTZ back to the middle position |
| **6. ⮌ (Return) Key** |
| Press to return to the previous menu |
| **7. ZOOM Keys** |
| ● SLOW: Zoom In [+] or Zoom Out [-] slowly<br>● FAST: Zoom In [+] or Zoom Out [-] fast |
| **8. L/R SET Key** |
| ● Standard: Simultaneously press [L/R SET] + [1]<br>● Reverse: Simultaneously press [L/R SET] + [2] |
| **9. FOCUS Keys** |
| Auto/Manual/Far-end/Near-end focus |
| **10. CAMERA SELECT Keys** |
| Press to select and control the camera, successively press [*] + [#] + [F1]/[F2]/[F3]/[F4]: Set address of the camera 1/2/3/4. If you want to control, press 1/2/3/4 in “CAMERA SELECT”. |
| **11. # Key** |
| Use with other keys |
| **12. Auto Tracking Keys** |
| [F1]: Disable [F2]: Disable<br>[F3]: Turn On AI Tracking<br>[F4]: Turn Off AI Tracking |
| **13. RESET Key** |
| Clear preset position: Successively press [RESET] + Number key (0-9) |
| **14. PTZ Control Keys** |
| PTZ moved according to the arrow indicates |
| **15. MENU Key** |
| Enter OSD menu or back to the previous menu |
| **16. BACKLIGHT Key** |
| Backlight ON/OFF: Press repeatedly to enable or disable the backlight compensation<br>● Effective only in auto exposure mode<br>● If there is a light behind the subject, the subject will become dark, press the backlight key to enable the backlight compensation. Press again to disable this function. |
| **17. P/T RST (PTZ Reset) Key** |
| Press to preset Pan/Tilt self-test |
| **Shortcut Set** |
| Successively press [#] + [*] + [F4]: Enable or disable the Image Freeze<br>Successively press [*] + [#] + [1]: OSD menu default English<br>Successively press [*] + [#] + [3]: OSD menu default Chinese<br>Successively press [*] + [#] + [4]: Display current IP address<br>Successively press [*] + [#] + [6]: Quickly recover the default<br>Successively press [*] + [#] + [8]: Check the camera version<br>Successively press [*] + [#] + [9]: Quickly set up inversion<br>Successively press [*] + [#] + [MANUAL]: Restore to default IP address and password<br>Successively press [*] + [#] + [RESET]: Clear all preset positions |

# 5 WEB Settings

Access the camera IP in the browser (default camera IP: 192.168.100.88) to pop up the login window, then input username (default: admin) and password (default: admin). After login, it will show as below: (Note: When login the first time, you need to change the initial password. The password must include uppercase and lowercase letters, numbers, special characters, and be at least 9 characters long.)




**1) WEB Configuration Items**

**Live:** Preview camera video image.

**Video:** Set Video Format, Encode Codec, Encode Level, Resolution, Bit Rate, Frame Rate, I Key Frame Interval and Bit Rate Control.

**Tracking:** Set Presenter Tracking.

**Image:** Set Image Exposure, Color, Image, PTZ, Noise Reduction and Style.

**Audio:** Turn On/Off Audio Switch and ADTS Options. Set Audio Type, Sample Rate, Bit Rate and Input Type.

**System:** Set Initialize, User, System Upgrade, Record Settings and SD Flash Disk Information.
**Network:** Set LAN, Port, RTMP(S), SRT, RTSP, ONVIF, Multicast, FreeD, and NTP.
**NDI® Config:** Set NDI and Active NDI License for Camera.
**Information:** View camera information.

**2) Pan and Tilt Control**

Used to control the direction of PTZ rotation (up, down, left, right, HOME position rotation).

**3) Zoom/Focus**

“Zoom In” means to zooming in the lens, “Zoom Out” means to zooming out the lens.
“Focus In” means to focus on a nearby object, “Focus Out” means to focus on a distant object.

**4) PTZ Speeds**

“Pan Speed” can be selected from 1~24, “Tilt Speed” can be selected from 1~20. After selecting the desired speed values, using the pan/tilt direction keys allows for fast or slow movement of the PTZ.
“Zoom Speed” can be selected from 1~7, “Focus Speed” can be selected from 1~7. After selecting the respective speed, using the zoom control area enables fast or slow zoom/focus adjustment of the lens.
“Focus Mode” can be selected Auto/Manual. When be selected “Manual”, “Focus In” and “Focus Out” then will to take effect.
“Focus Mode” can be selected Auto/Manual. When be selected “Manual”, “Focus In” and “Focus Out” then will to take effect.

**5) PTZ Presets**

When the PTZ turns to the position that you would like to return to later, you can set presets for quick recall. Type a number (0~254) into the preset box and click “Set” button to save.
When the PTZ turn to other position, input the preset number and click “Call” button to turn the PTZ back to the preset position.

**6) PTZ/OSD**

When “Menu” is selected, the image preview page enters menu mode, and the OSD menu is displayed in the top left corner of the image preview page. You can use the up and down selection keys in the PTZ direction control area to navigate through the menu. Pressing the HOME key enters a submenu, and the left and right keys modify the submenu. After making modifications in the menu, select “PTZ” in the PTZ/menu selection area to automatically save the settings and exit the menu. The “Back” is only valid in submenu mode and is not effective in PTZ mode or main menu mode.
When “PTZ” is selected, the system enters PTZ mode. The up and down selection keys in the PTZ direction control area control the camera's pan and tilt movements. OSD menu control is not available in PTZ mode and must be controlled using a remote controller for effective operation.

**7) Tracking Settings**

Turn On/Off the Track or Tracking hint. Set Tracking Mode and Humanoid frame.

**8) Record**

Turn On/Off video record.

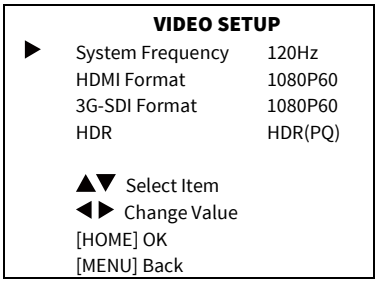
**9) Media Preview Window**

Preview camera video image.

# 6 Set HDR and 120fps

## 6.1 Menu Settings

Move the main menu cursor to [Video Setup], and press [HOME] key enter the video setup page.



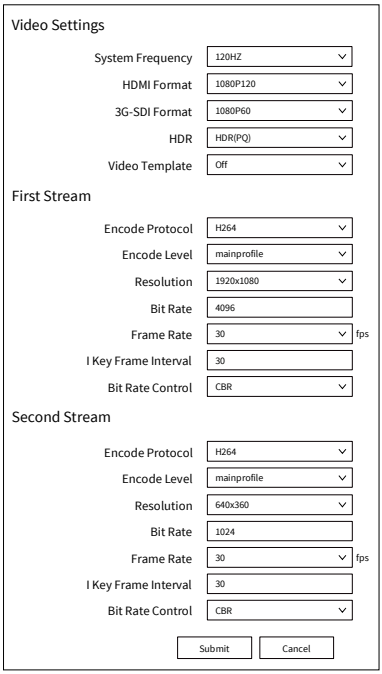

**System Frequency:** 120Hz, 100Hz.

**HDR:** HDR(PQ), HDR(HLG), SDR.

The system frequency can be switched to 120Hz. Press the [HOME] key. After confirmation, the screen will go black for about 14 seconds before the image appears. The video format is 1080P120.

HDR can be switched to HDR (PQ) or HDR (HLG). Press the [HOME] key. After confirmation, the screen will go black for about 14 seconds before the image appears. the system frequency will auto switch to 30Hz, and the video format will switch to 4KP30.

## 6.2 WEB Settings



**System Frequency:** 120Hz, 100Hz.

**HDR:** HDR(PQ), HDR(HLG), SDR.

The system frequency can be switched to 120Hz. Click “Submit”, after the screen goes black for about 14 seconds, the video format will be 1080P120.

HDR can be switched to HDR (PQ) or HDR (HLG). Click “Submit”, after the screen goes black for about 14 seconds, the system frequency will auto switch to 30Hz, and the video format will switch to 4KP30.




HDR mode only supports 30Hz, 25Hz, and 24Hz, and only supports HDMI, network H.265, and USB H.265. To switch to other system frequencies, you must switch to SDR mode.

# 7 AI Tracking

## 7.1 WEB Control

- **Presenter/Human Tracking**

By modifying web interface parameters, different close-up ratios can be obtained, and tracking can be set on/off, so as to display areas and character positions. If necessary, you can also choose whether to display tracking related prompt information.

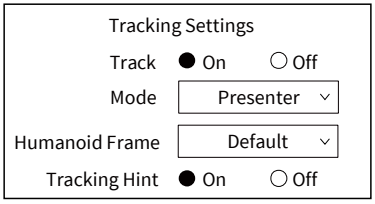
**Operation Steps:**

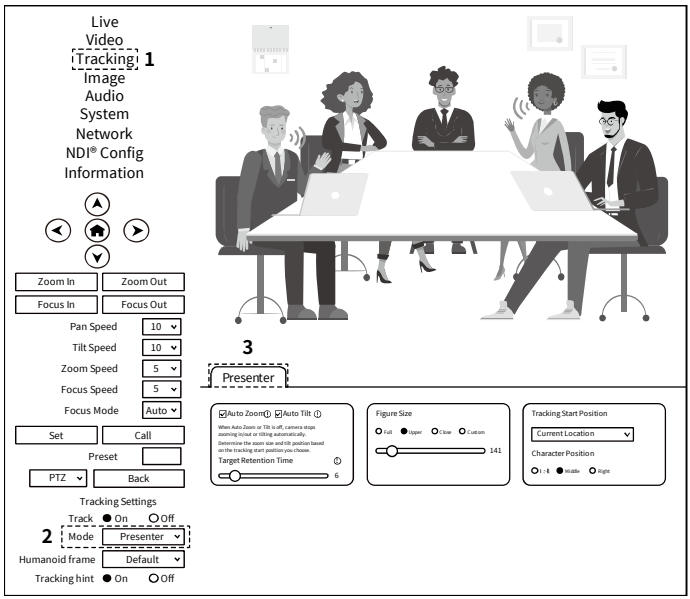
**Step 1** Entering the camera IP address (192.168.100.88) in the browser prompts a login interface. Input the username and password to access the camera WEB interface.

http://192.168.100.88

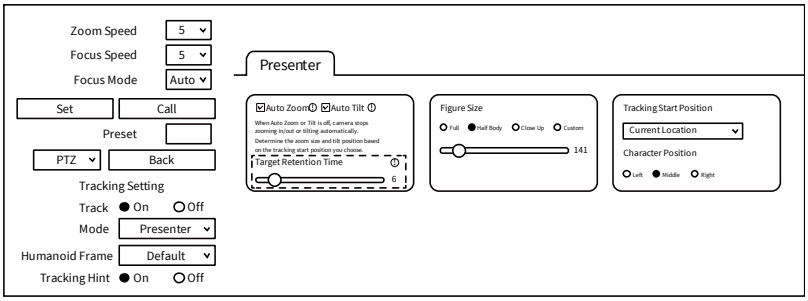
**Step 2** Enter the “Tracking” option, select speaker mode “Presenter”, and set the tracking parameters in the “Track Off” state.

Tracking Mode: Presenter



**Step 3** Set the Target Retention Time, the default value is 6 seconds.




**Auto Zoom:** Usually remains the default. When “Auto Zoom” is turned off, the camera lens can still move, but can only maintain the current magnification and cannot zoom.

**Auto Tilt:** Usually remains default. When “Auto Tilt” is turned off, the camera lens can only move horizontally.

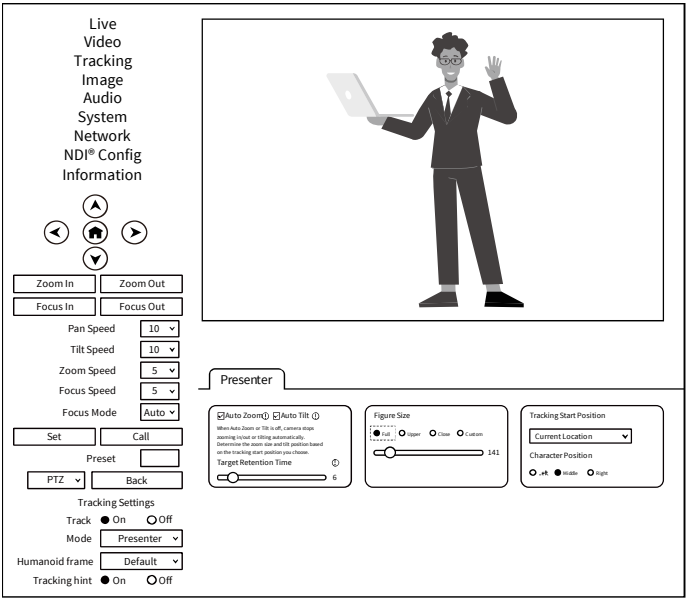
**Target Retention Time:** can remain default. It is an important function to set how long it takes for the camera lens to stay at current position or return to preset position 1 after the tracking target is lost. The modification here takes effect immediately.

**Step 4** Select the desired close-up effect.

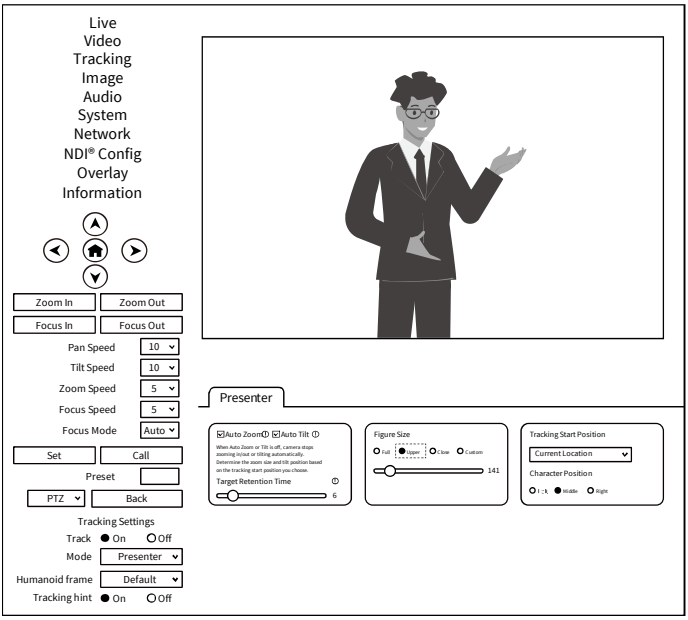
- **Figure Size**

By selecting different modes, users can customize the proportion of characters in the close-up screen, which is a very important feature. The modification here takes effect immediately.

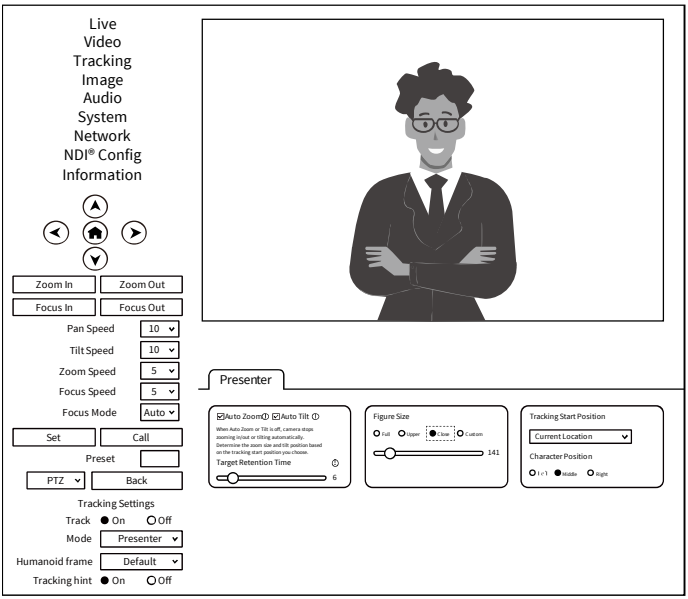
**Full:** The close-up image includes tracking the entire body of the target, as shown in the following figure.



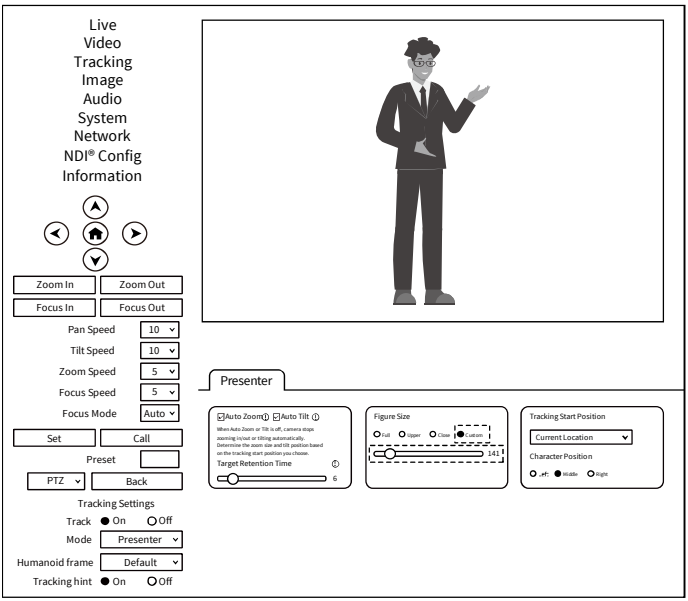
**Half Body:** The close-up image includes tracking the target above the knee, as shown in the following figure.




**Close Up:** The close-up image includes tracking the target above the waist, as shown in the following figure.



**Custom:** Adjust the tracking target proportion size.




**Note**

If the proportion set is large, the proportion of the tracking target in the camera screen will also increase. When the tracking target moves rapidly, the camera may not keep up.

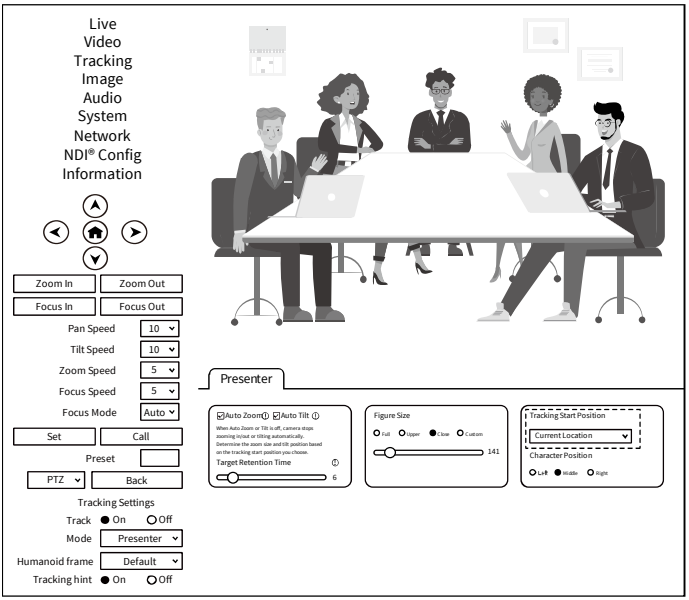
- **Tracking Start Position**

The user can choose the position of the camera lens when starting and stopping tracking.

**Two Mode:** Current Location/Preset 1

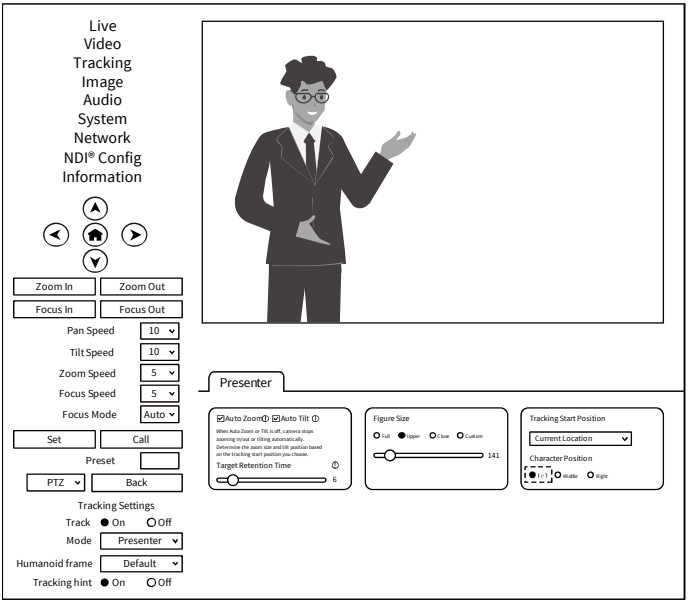
If you choose “Current Location”, the camera position when tracking is turned on is the current position; Similarly, the camera position when stopping tracking will also stop at the current position.

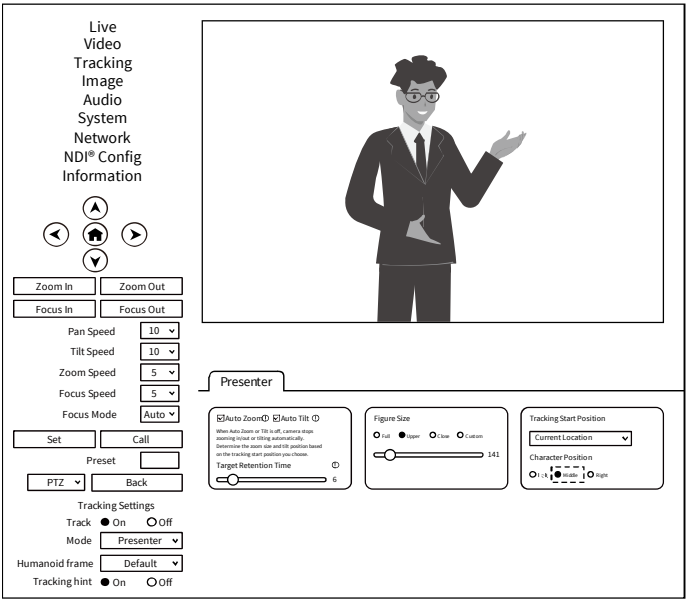
If you choose “Preset 1”, you need to set additional preset position 1 for the camera. When tracking is turned on, the camera will first move to Preset 1. If someone enters the video screen at this time, the camera will automatically track. When the tracking target is lost (exceeding the timeout), the camera will automatically move to Preset 1.

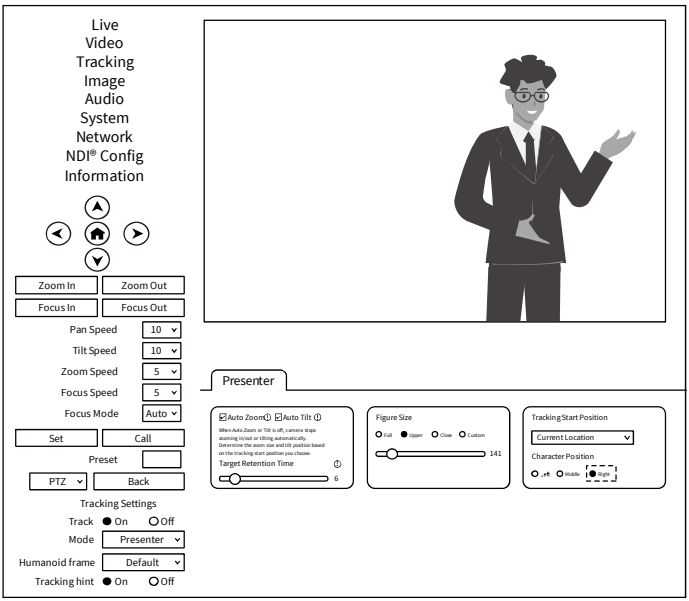



- **Character Position**

**Character Position:** defaults to median. Left or right can be selected by oneself, and this function is mostly used for live streaming scenes.





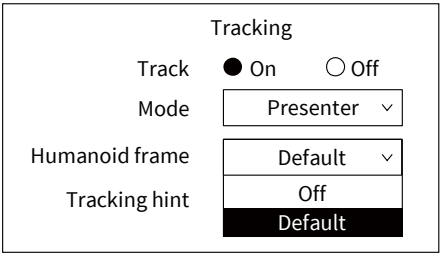




**Step 5** According to the requirements of the application scenario, you can choose whether to require "Humanoid frame" and "Tracking hint".

**Humanoid frame:** Off/Default

**Off:** When selecting a tracking target, the humanoid box is not displayed at all. This feature is suitable for live streaming scenarios.

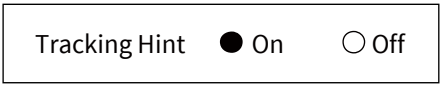
**Default:** After turning on tracking, if there are multiple people in front of the camera and pressing the direction key to select the tracking target, this box will automatically appear. After pressing the HOME key to confirm tracking, this box will disappear and the camera will start tracking.

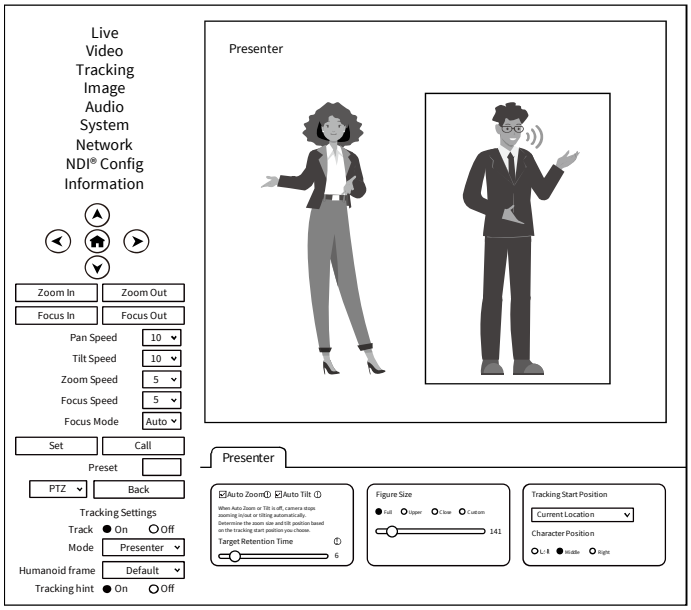


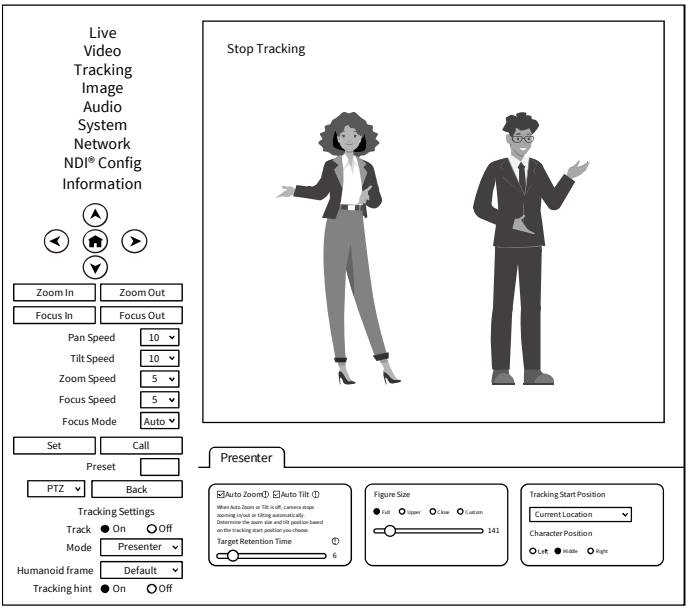

**Tracking Hint:** On/Off

**On:** There will be a prompt in the upper left corner of the video during switch tracking.

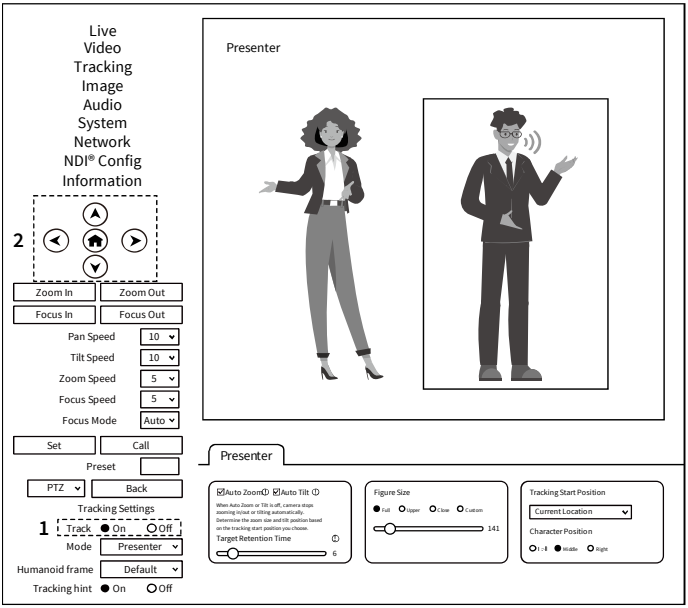
**Off:** There is no prompt in the upper left corner of the video during switch tracking. This function is also applicable to live streaming scenarios.



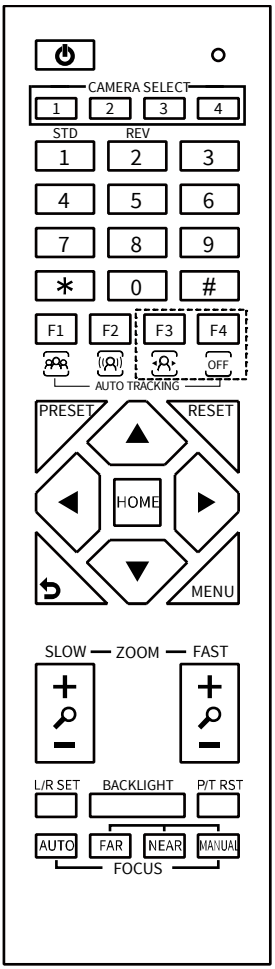



**Step 6** Turn on tracking, press the arrow keys to select the tracking target, and then press Home to confirm.



## 7.2 Remote Control

**[F3]:Turn on Tracking** **[F4]: Turn Off Tracking**



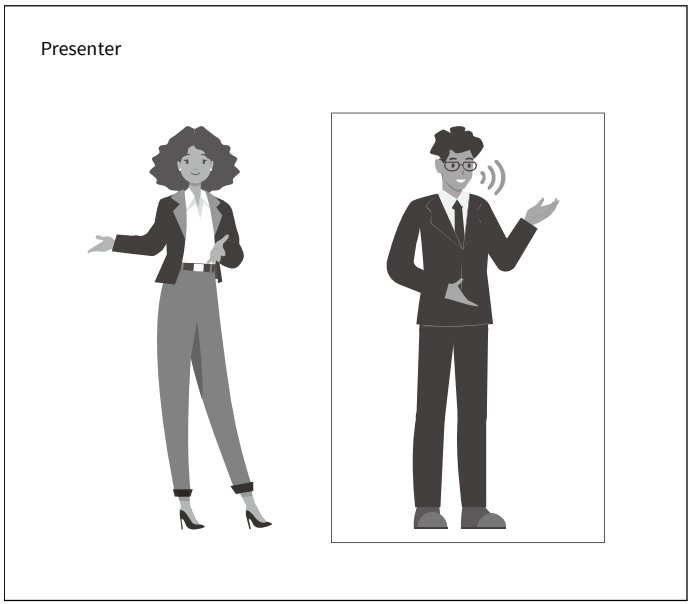
## 7.3 Target Selection

- **Single Person Scenario**

When there is only one person in the scene, enabling tracking through the web or remote control will directly enable tracking and track the target.

- **Multi Person Scenario**

If there are multiple people in the scene, after turning on tracking, you need to manually select the tracking target. You can use the left and right keys on the remote control or WEB to select the tracking target, and then press the HOME key on the remote control or WEB to turn on tracking and select the target. If the tracking target is not selected, the camera will automatically select the person closest to the center of the image as the tracking target.



# 8 Active NDI License for Camera

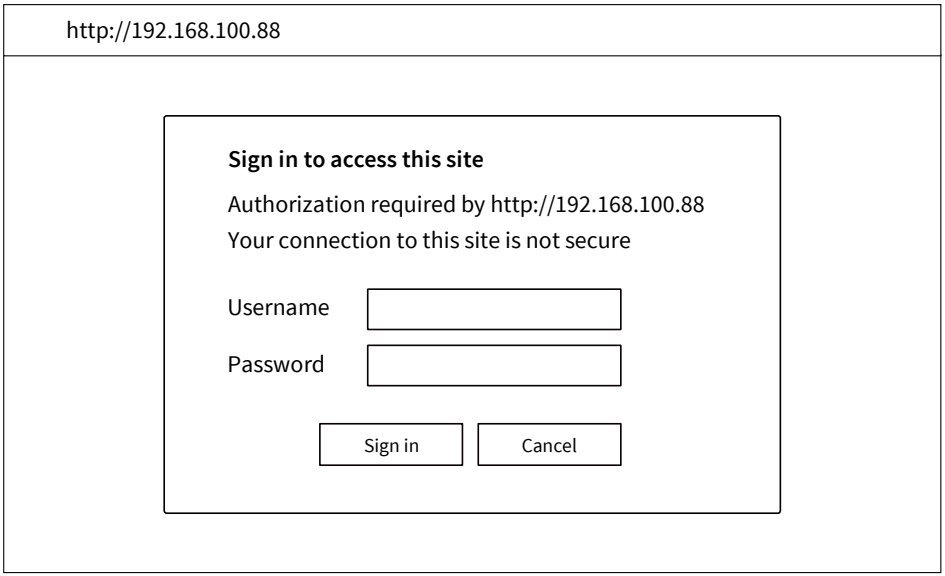
Before you begin, please ensure that you have purchased an exclusive NDI License Key from the product manufacturer. Once you purchase the NDI License Key, you must email the product manufacturer with your camera MAC address and Device Serial Number to receive your license details. Follow the steps below to find this information and active the NDI License for your camera.

**Step 1** Establish a Wired Network Connection for the Camera

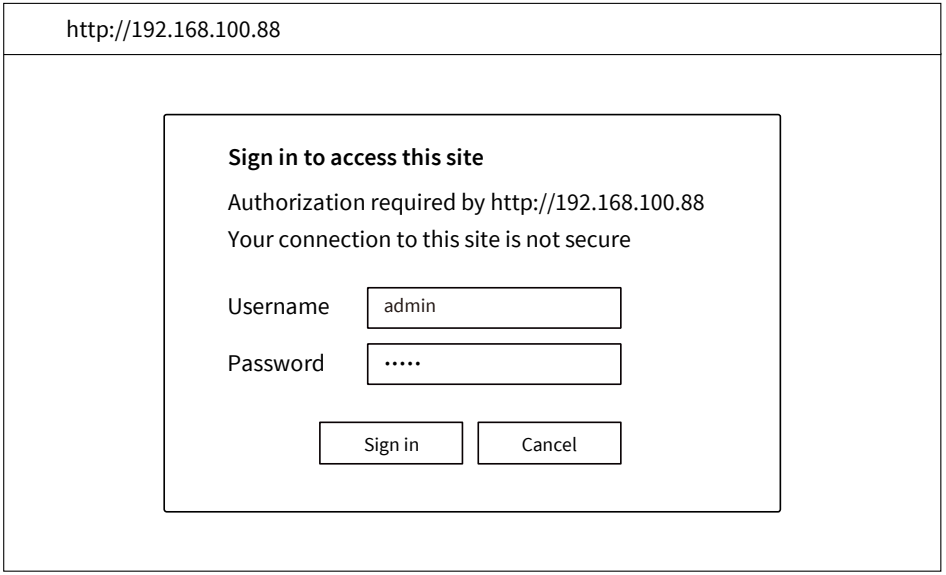
1. Power your camera using the provided power cable and adapter.
2. Connect your camera to an external display using an HDMI cable. Do not plug the camera into a computer using HDMI; the HDMI device must be display only, such as a TV or monitor.
3. Use an Ethernet cable to connect the camera to a router.

**Step 2** Access the Camera via IP Address

1. Once a wired network connection is established, access the camera's IP address by entering the default IP address (192.168.100.88) into your web browser.

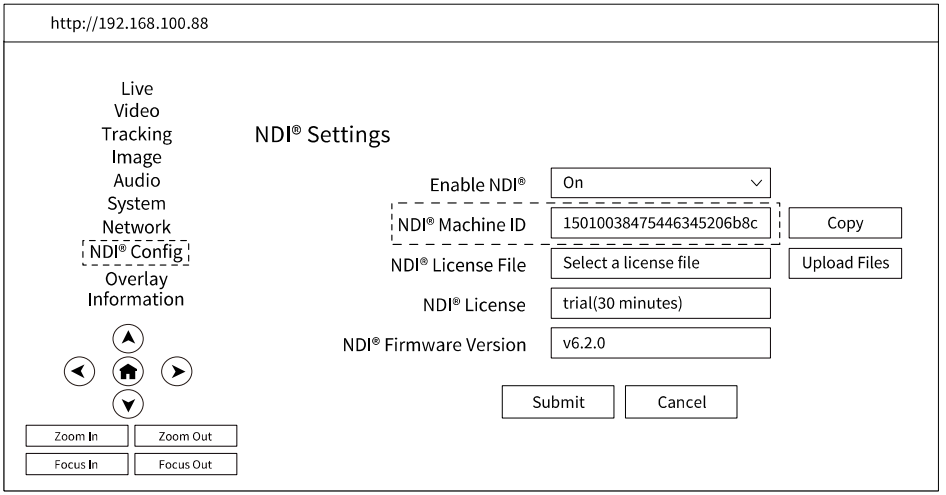


2. Use “admin” for both the username and password to access the camera.



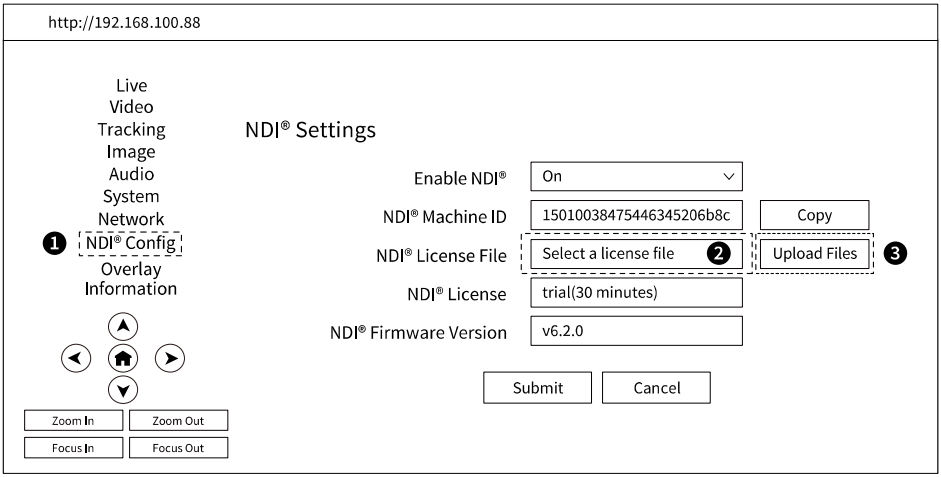

**Step 3** Copy and Send NDI® Machine ID to the product manufacturer

1. After logging in, navigate to the “NDI® Config” page to find the NDI® Machine ID.
2. Copy and Send NDI® Machine ID to the product manufacturer to receive your NDI® License File.




**Step 4** Activate the NDI License

1. After receiving NDI® License File from the product manufacturer, navigate to the “NDI® Config” page.
2. Select your license file in the “NDI® License File” field.
3. After you select license file, click “Upload Files”. Click “OK” in the pop-up Notice dialog box.
   NDI activation will be completed after restarting the camera.

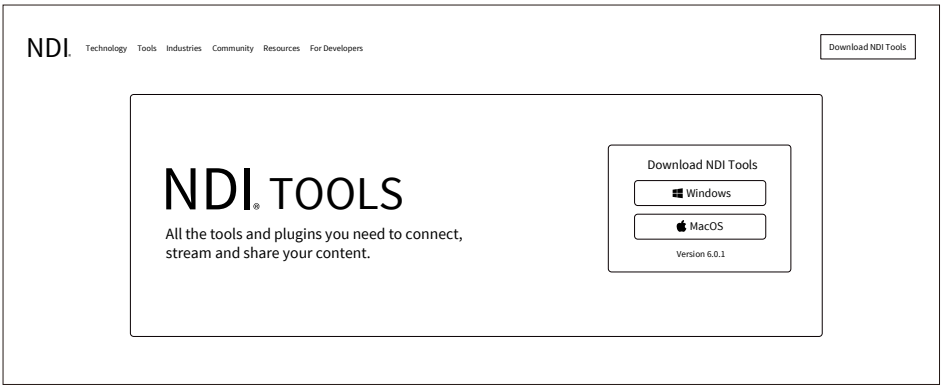



**Step 5** Download and Install NDI Tools

To gain access to ND| tools, including NDI Scan Converter, NDI Studio Monitor and other utilities, you'll need to download the NDI Tools pack from the NewTek website.

1. Go to https://ndi.video/tools/ndi-core-suite/.

2. Under Download NDl Tools, click on either Windows or MacOS to download the right version of the tool for your system.

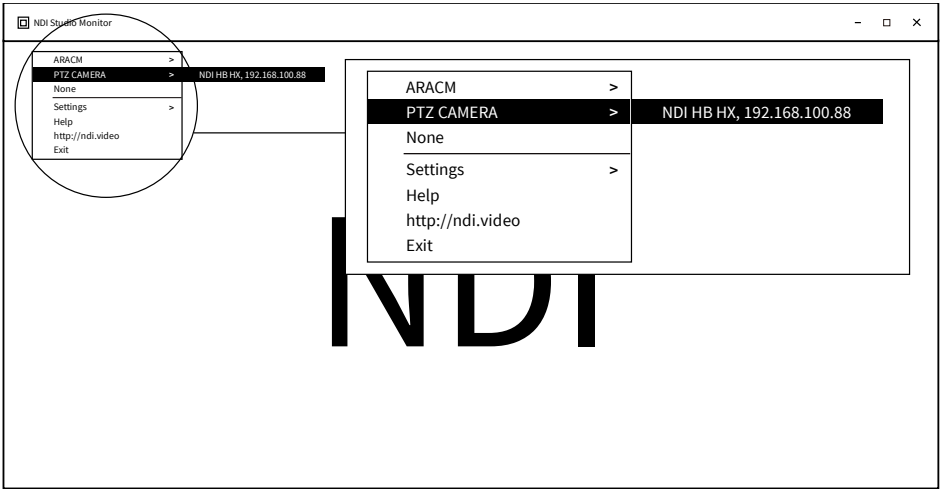



3. Finish installing the NDI Tools on your computer.

**Step 6** Connect NDI Sources

Once you have NDI Tools installed, connecting NDI sources is straightforward.

1. Ensure the camera is on the same local network as your computer.
2. Use the NDI Scan Converter utility to convert the camera signal into an NDI stream.
3. Launch the NDI Studio Monitor app and select your video input.
4. Click on the menu icon and select the NDI source to see the real-time video signal from camera.




5. If you're using streaming tools such as OBS Studio or Vmix, visit their support pages for more information about using the NDI application on their platforms.

# 9 Troubleshooting

**Image**

- The monitor shows no image

1) Ensure that the camera power supply is connected, the voltage is normal, and the power indicator is always on.
2) Turn off the power switch to check that the camera is self-testing.
3) Ensure the cable of video platform and TV that in correct connection.

- Image jitters after the camera is properly connected

1) Ensure that the camera installation is in stable position.
2) Check that any vibrating machinery or object near the camera.

- There is no video image in browser

That do not support IE browser and IE core browser, it is recommended to use Google, Firefox and Edge browsers. The camera video image will be displayed normally.

- Unable to access camera through the browser

1) Using PC to access the network to test that the network access can work properly to eliminate the network fault caused by cable and PC virus until the PC and camera can ping each other.
2) Disconnect the network, connect camera with PC separately and reset the IP address of PC if necessary.
3) Ensure that the IP address, subnet mask and gateway settings is correct.
4) Check that the MAC address is conflicts.
5) Check that the web port is modified, the default setting is 80.

- Forget the IP address or login password

The default IP address is: 192.168.100.88; the default username and password are: admin. If you forget the camera's IP address or password, press the [*] + [#] + [Manual] keys in sequence to restore default settings. After restoring the defaults, you will need to set a strong password again when logging into the web page.

**Control**

- Remote control does not work

1) Check and replace with new batteries.
2) Ensure that the camera working mode is correct.
3) Ensure that the address key of remote control can match the camera.

- Serial port cannot control

1) Ensure that the protocol, address and bit rate of the camera are consistent.
2) Ensure that the control cable is properly connected.



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