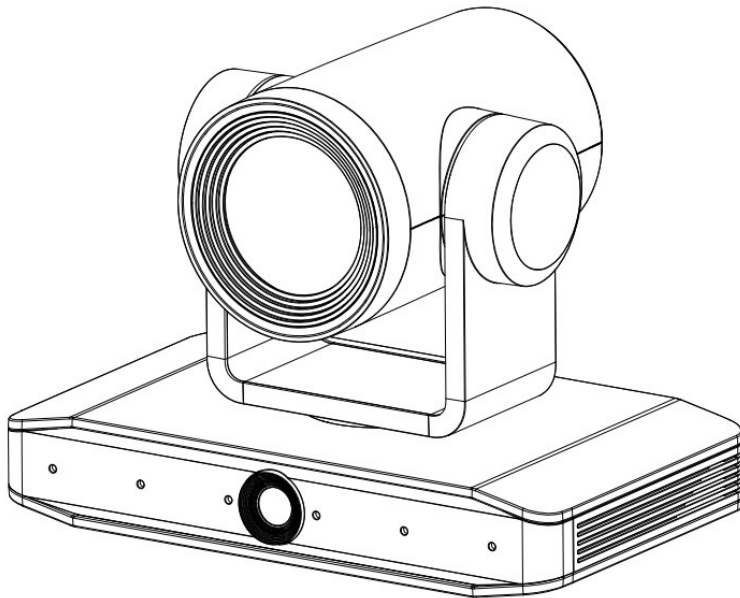


# 4KP12xDVT PTZ Camera

## User Manual

(V1.2)



# Preface




This manual is to ensure that the user can use the product properly and avoid danger while operating. Before using this product, please read the user manual carefully and keep it properly for future reference.

## Overview

This manual is about 4K PTZ camera operation.

## Graphic Symbols

Description of graphic symbols used in this manual.

Symbols	Description
 <b>Illustration</b>	This symbol indicates that the words are clarification or supplement to this article.
 <b>Caution</b>	This symbol indicates that negligence of the instructions may lead to mishandling that may cause injury or property damage.
 <b>Danger</b>	This symbol indicates a risk that may result in damage to this machine or documents. Follow the instructions to avoid property damage.

## Attention

This manual introduces functions, installation, and operations for this product in detail. Please read this manual carefully before installation and use.

### Precautions

To avoid any damage to the camera:

- 1) Do not expose the product to rain or moisture.
- 2) To prevent the risk of electric shock, do not open the case. Installation and maintenance should only be carried out by qualified technicians.
- 3) Do not use the product beyond the specified temperature, humidity or power supply specifications.
- 4) Please use a soft dry cloth to clean the camera. If the camera is very dirty, clean it with diluted neutral detergent; do not use any type of solvents, which may damage the surface.

### Electrical Safety

Installation and use of this product must strictly comply with local electrical safety standards. The power supply of the product is 12VDC. The below drawing shows the polarity of the power supply.



### Transportation

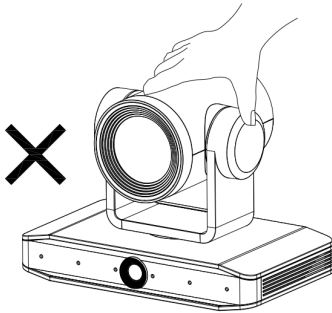
Avoid any stress, vibration, or moisture during transportation, storage, installation and operation.

### Installation

- 1) Do not rotate the camera head violently, otherwise it may cause mechanical failure.
- 2) This product should be placed on a stable desktop or other horizontal surface. Do not install the product on an uneven surface as it may impact the displayed image.

- 3) Ensure there are no obstacles within rotation range of the camera.
- 4) Do not power on before installation has been completed.

Improper operations may damage the product and result in mechanical failure. Please note the following tips:



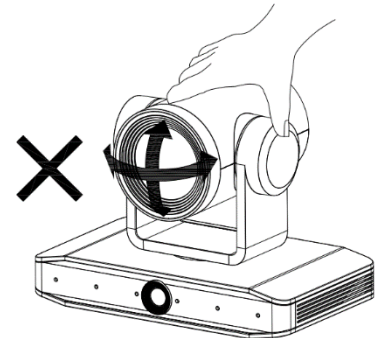
Do not move the camera by grabbing the head.



Move the camera by holding the bottom with one or both hands.



Do not rotate the lens and holder manually. Doing so can damage the camera and result in failure of camera self-check and start up.



### Do Not Dismantle Camera

We are not responsible for any unauthorized modification or dismantling.

### Magnetic Interference

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

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# 1. Quick Start

## 1.1 Interface

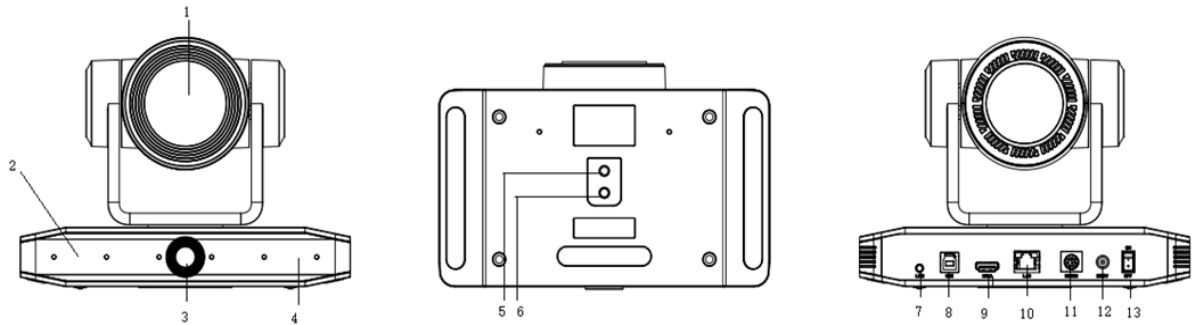


Figure1-1 Interface

### Interface

- |                      |                         |                        |
|----------------------|-------------------------|------------------------|
| 1. Close-up Lens     | 6. Fixation Hole        | 11. RS232 Input        |
| 2. Base              | 7. Audio in (REF Audio) | 12. DC12V Power Socket |
| 3. Panoramic Lens    | 8. USB3.0               | 13. Power Switch       |
| 4. Receiving Light   | 9. HDMI Jack            |                        |
| 5. Tripod Screw Hole | 10. Network Jack        |                        |

**When using the camera, please put the plastic pad on the center bottom of device.**

## 1.2 Power-on Self-Test

### 1.2.1 Power on

Connect device to power socket with 12VDC power adapter.

### 1.2.2 Self-Test

After power on, the receiver light will start flashing and camera will do a brief pan-tilt tour before returning to the home position. When the light stops flashing, the self-test is finished.

## Caution

- Default address of the remote control is 1#. When menu restores default setting, the address of IP remote control will restore 1#.
  - If preset 0 is set, the camera will return to the preset 0 position after self-test
- 

## 1.3 Video Output

This camera can output video through network, HDMI, and USB3.0.

### 1.3.1 Network Output

- A. Network connection: Shown as diagram 1.1 #10
- B. Log in: You can reach the Web Interface by typing in the camera's IP address (default 192.168.5.163) into a web browser. To log in, type in "admin" into the username and password fields. From the Web Interface, you can adjust many of your camera's settings, such as PTZ control, video recording, playback, and configuration setting.

### 1.3.2 HDMI Output

- A. HDMI connection: Shown as diagram 1.1 #9
- B. Connect camera to the display device via HDMI cable.

### 1.3.3 USB3.0 Output

USB3.0 connection: Shown as diagram 1.1 #8. Open video software and select image device to output video.

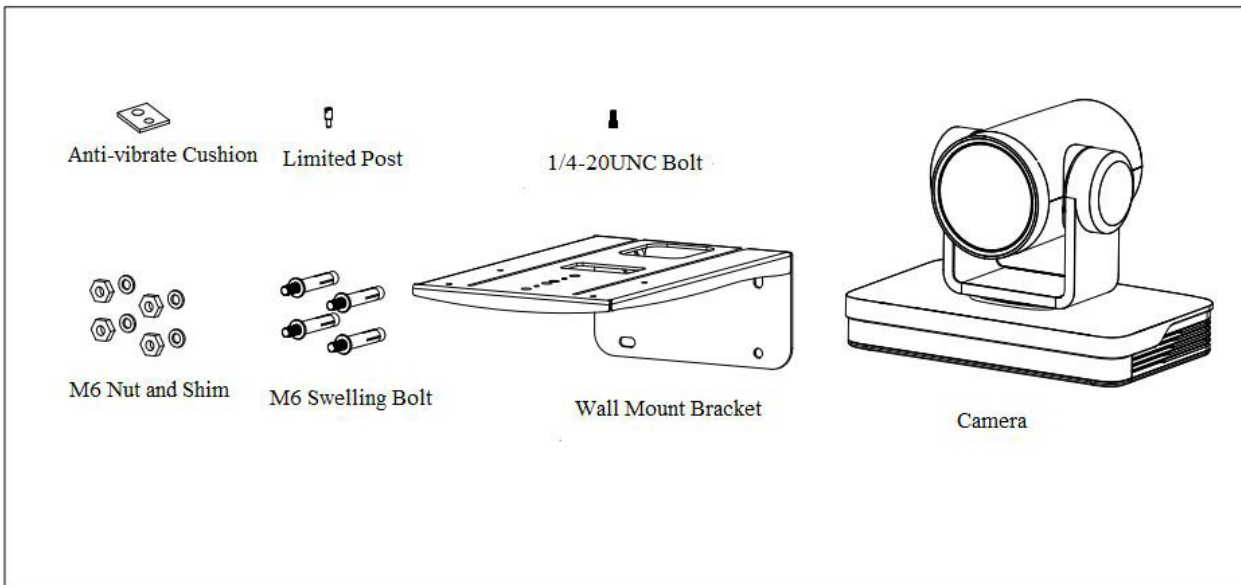


## 1.4 Bracket

### Caution

- Bracket can be wall mounted or upside-down mounted. Ensure that you are using the appropriate anchors for the material of the wall on which the camera is being mounted.
- 

### 1.4.1 Steps of Wall Mount



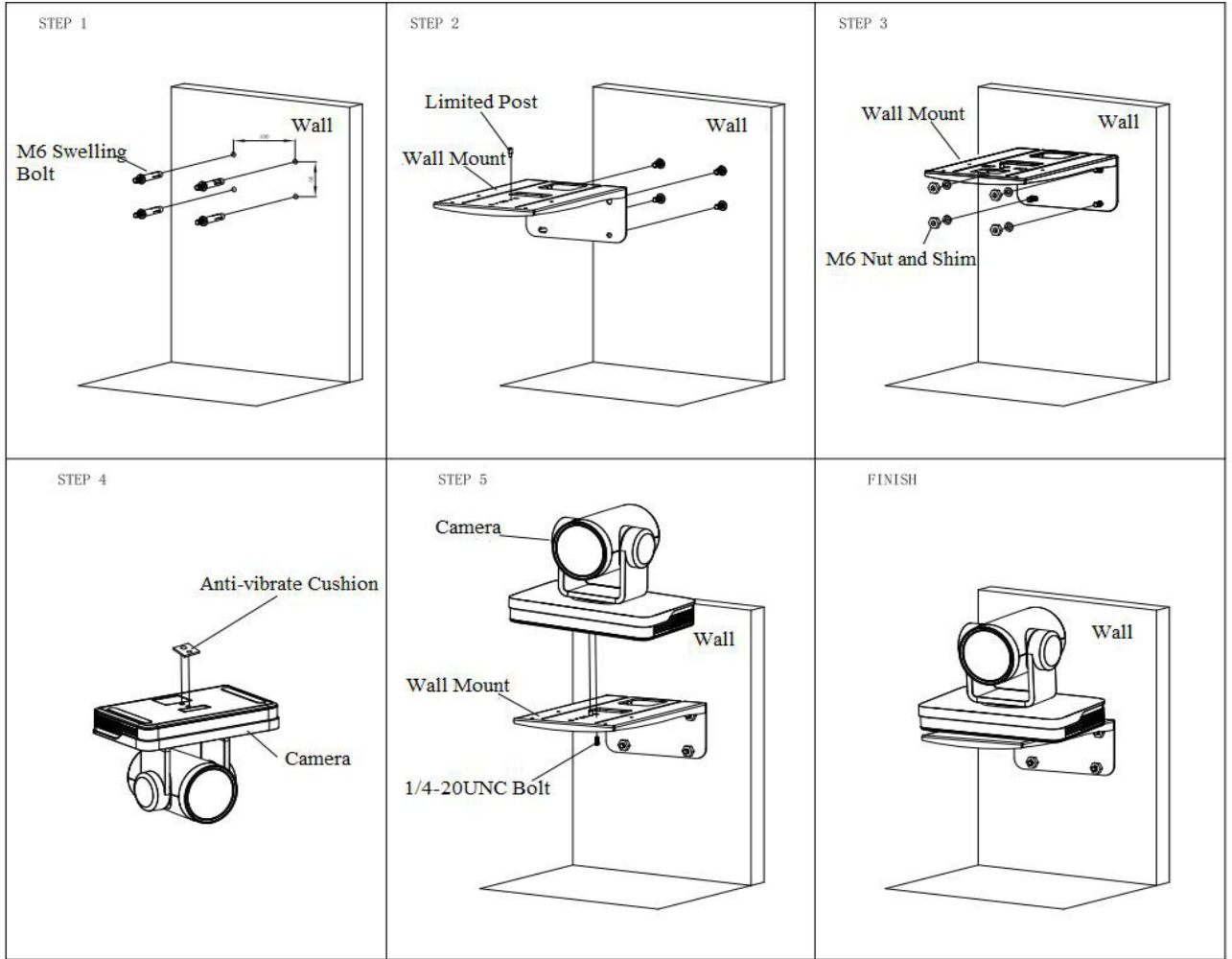


Figure1-2 Steps of Wall Mount

### 1.4.2 Steps of Ceiling Mount

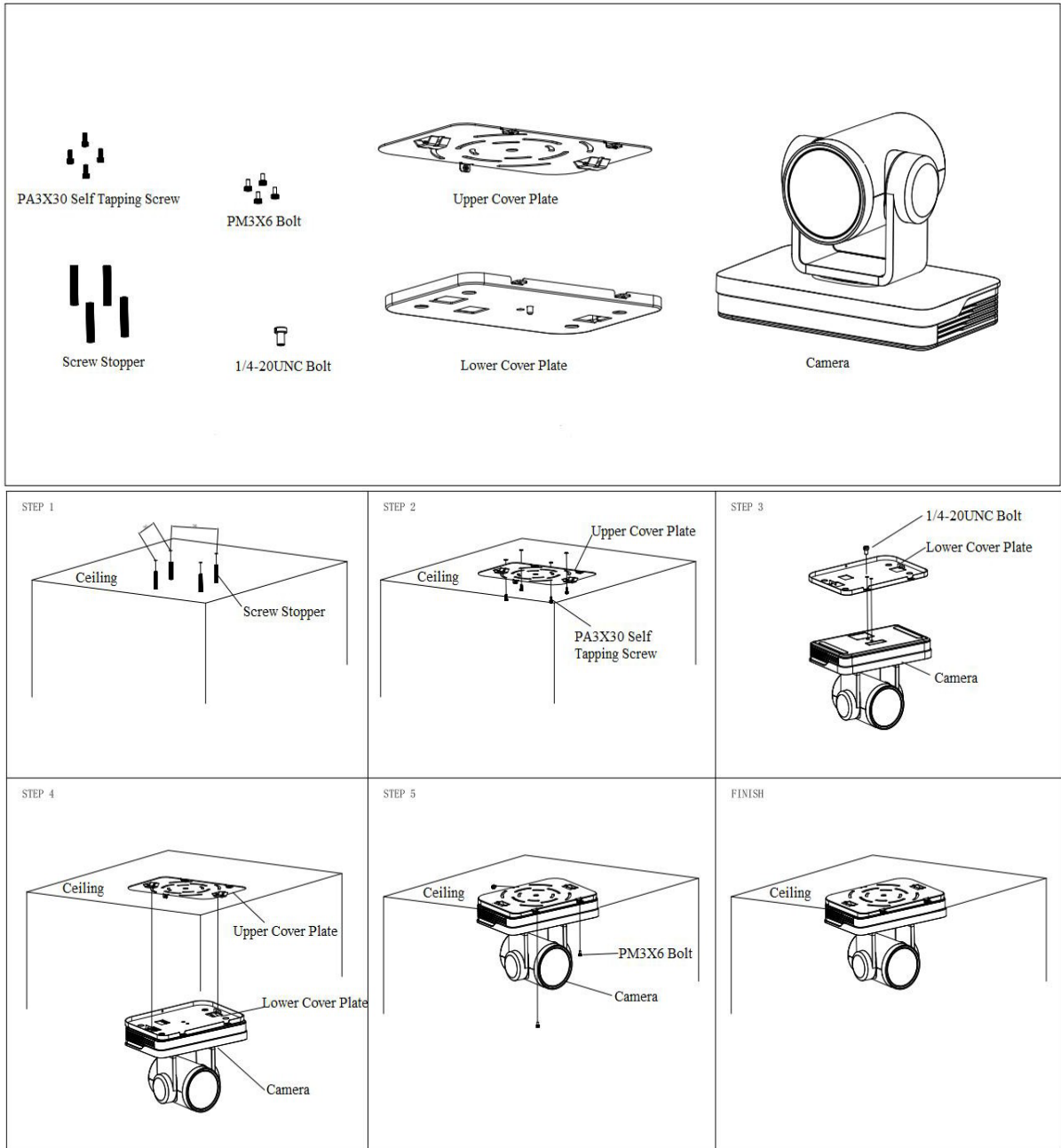


Figure1-3 Steps of Ceiling Mount

## 2. Product Overview

### 2.1 Product Overview

#### 2.1.1 Product Dimensions

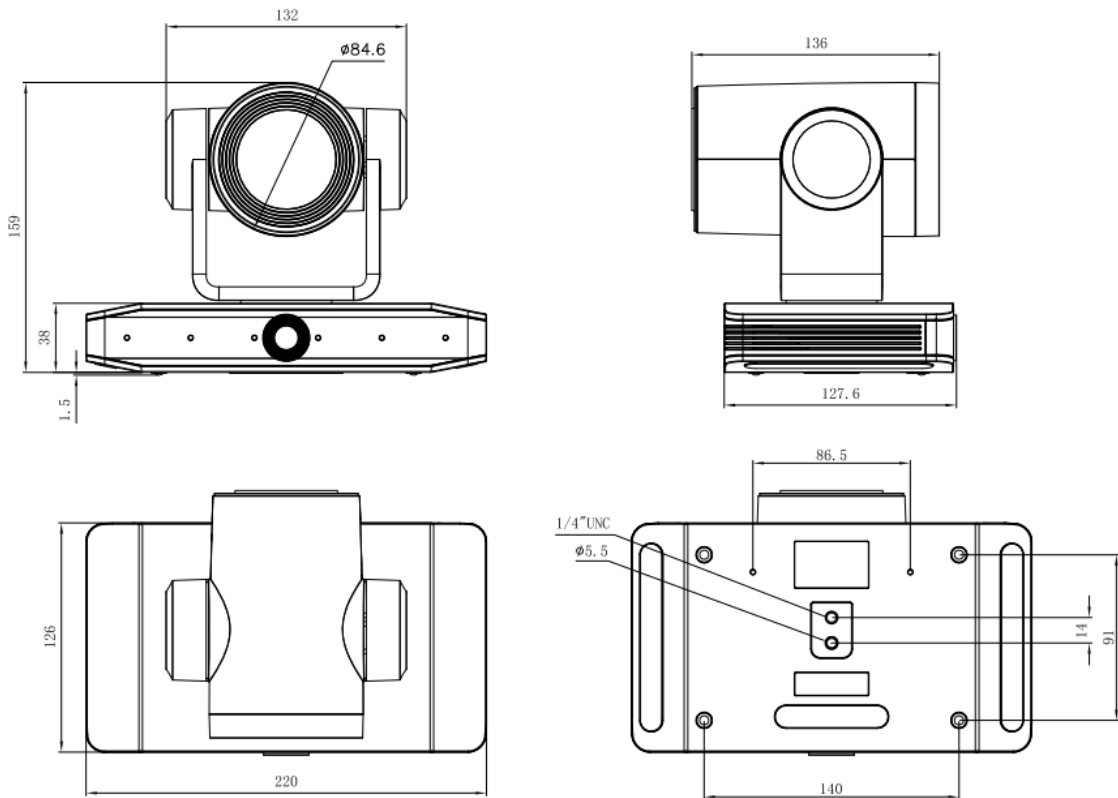


Figure2-1 Product Dimension

#### 2.1.2 Accessories

When opening the package, check that all the supplied accessories are included:

Table2-1 Supplied Accessory

Supplied	Power adapter
	USB3.0 Cable
	User manual
	RS232 cable
	Plastic pad
	IR Remote Control

Optional	Brackets for wall mounting
	Brackets for ceiling mount

## 2.2 Product Feature

This new UHD 4K camera has cutting-edge functionality, superior performance, and rich video output interfaces; Featuring advanced ISP processing algorithms, offering vivid and high resolution video with a strong sense of depth and fantastic color rendition. It supports H.264/H.265 encoding which allows for clear video even under low-bandwidth conditions.

- **4K UHD Resolution:** 8.51M megapixel high quality SONY CMOS sensor. Resolution is up to 4K with frame rate up to 30fps.
- **Optical Zoom Lens:** 12X optical zoom 80.5°wide-angle lens.
- **Leading Auto Focus Technology:** Fast, accurate, and stable auto focusing technology.
- **Low Noise and High SNR:** A super high SNR image is achieved with low noise CMOS. Advanced 2D and 3D noise reduction technology further reduces the noise while ensuring high image clarity.
- **Various video output interfaces:** Supports HDMI, USB3.0, LAN interface; supports POE power supply, USB3.0 supports dual stream.
- **Multiple Audio/Video Compression Standards:** Supports YUY2, MJPEG, H.264, H.265, NV12 video encoding formats, MJPEG, H.264, H.265 support up to 3840×2160 resolution 30fps compression; supports AAC, MP3, G.711A audio compression .
- **Audio Input Interface:** Supports AAC, MP3, G.711A audio compression, AAC and MP3 support 16000, 32000, 44100, 48000 sampling frequency.
- **Built-in Gravity Sensor:** Supports PTZ auto-flip function for easy installation.
- **Multiple Network Protocol:** Supports ONVIF, GB/T28181, RTSP, RTMP,VISCA over IP,IP VISCA,RTMPS,SRT protocols; Supports RTMP push mode, easy to be connected to streaming server (Wowza, FMS); Supports RTP multicast mode.
- **Control Interface:** RS232 input
- **Multiple Control Protocol:** Supports VISCA, PELCO-D, PELCO-P protocols; Supports automatic identification protocols.
- **Quiet Pan / Tilt Movement:** With a high accuracy step-driven motor, camera can pan / tilt extremely quietly and smoothly.

- **Low-power sleep function:** Supports low-power sleep/wake-up. Power consumption during sleep is less than 400mW.
- **Multiple Presets:** Up to 255 presets (10 presets via remote control).
- **Auto Framing:** Built-in high-speed processor and face-detection algorithm automatically detects participants and provides ideal framing.
- **Intelligent voice positioning and tracking:** Six built-in omnidirectional microphone arrays and an intelligent sound source positioning algorithm provide real-time positioning of the speaker. Voice tracking can be set to on or off
- **Multiple Applications:** Online-education, Lecture Capture, Webcasting, Video conferencing, Tele-medicine, Unified Communication, Emergency command and control systems, etc.

## 2.3 Technical Specification

Table2-1 Camera Lens Parameters

Camera Parameter	
<b>Optical Zoom</b>	12X
<b>Sensor</b>	1/2.8 inch SONY CMOS sensor
<b>Effective Pixels</b>	8.29 megapixel 16:9
<b>Video Format</b>	HDMI : 4KP30, 4KP25, 1080P30, 1080P25, 1080P29.97 ; USB3.0: Main stream : YUY2/NV12: 1920 × 1080/1280 × 720/1024 × 576/800 × 600/800 × 448/640 × 360/480 × 270/320 × 180@30/25fps; MJPG/H264: 3840*2160/1920 × 1080/1600 × 896/1280 × 720/1024 × 576/960 × 540/800 × 600/800 × 448/720 × 576/720 × 480/640 × 360/640 × 480/480 × 270/352 × 288/320 × 240@30/25/20/15/10/5fps; Secondary stream : YUY2/NV12:

	<p>1280 × 720/1024 × 576/800 × 600/800 × 448/640 × 360/640 × 480/480 × 270/320 × 180@30/25/20/15/10/5fps;</p> <p>MJPEG/H264:</p> <p>1920 × 1080/1600 × 896/1280 × 720/1024 × 576/960 × 540/800 × 600/800 × 448/720 × 576/720 × 480/640 × 360/640 × 480/480 × 270/352 × 288/320 × 240@30/25/20/15/10/5fps;</p>
<b>Close-up Parameters</b>	12X
<b>Viewing Angle</b>	Horizontal: 7.6° (N) ~80.5° (W)
<b>Iris Value</b>	F1.8 ~ F3.6
<b>Digital Zoom</b>	X15
<b>Minimum Illumination</b>	0.5Lux(F1.8, AGC ON)
<b>DNR</b>	2D & 3D DNR
<b>White Balance</b>	Auto/ Manual/ One Push/ Specified Temperature
<b>Focus</b>	Auto/ Manual/ One Push Focus
<b>Exposure Mode</b>	Auto/ Manual/ Shutter priority/ Aperture priority/ brightness priority
<b>Aperture</b>	F1.8 ~ F3.6, CLOSE
<b>Shutter Speed</b>	1/25~1/20000
<b>BLC</b>	ON/OFF
<b>WDR</b>	OFF/ 1~8
<b>Video Adjustment</b>	Brightness, Color, Saturation, Contrast, Sharpness, B/W mode, Gamma curve
<b>SNR</b>	>50dB
<b>Panoramic lens</b>	Fixed
<b>Viewing Angle</b>	110.2°\101.8°\69.5° (D\H\V)

<b>Aperture</b>	F2.0±5%
<b>Focal Length</b>	F=1.89mm

**Table2-2** Interface Parameters

<b>Interface Parameter</b>	
<b>Video Interfaces</b>	HDMI, LAN (supports POE), USB3.0, LINE-IN, RS232-IN, 12VDC Power Supply, Power Switch
<b>Video Output</b>	HDMI, LAN, USB3.0
<b>Video Compression Format</b>	LAN: H.264, H.265 USB 3.0: MJPG, H.264, YUY2, NV12
<b>Audio Input</b>	Double track 3.5mm linear input;
<b>Audio Output</b>	HDMI, LAN, USB3.0
<b>Audio Compression Format</b>	AAC, MP3, GG.711A
<b>LAN Jack</b>	10M/100M adaptive Ethernet port, supports POE power supply, supports audio and video output
<b>Network Protocols</b>	RTSP/ RTMP, ONVIF, GBT28181, VISCA over IP, IP VISCA、RTMPS, SRT, support remote upgrade, remote restart, remote reset
<b>Control Jacks</b>	RS232-IN
<b>Serial Port Communication Protocols</b>	VISCA/ Pelco-D/ Pelco-P; Support Baudrate: 115200/38400/9600/4800/2400
<b>USB Communication Protocol</b>	UVC ( Video Communication Protocol ) , UAC ( Audio Communication Protocol)
<b>Power Supply</b>	HEC3800 Outlet (12VDC)
<b>Power Adapter</b>	110VAC~220VAC to 12VDC/ 2.5A



<b>Input Voltage</b>	12VDC±10%
<b>Input</b>	<1A
<b>Consumption</b>	<12W

**Table2-3** PTZ Parameters

PTZ Parameter	
<b>Pan Move</b>	-110° ~+110°
<b>Tilt Move</b>	-30° ~+30° °
<b>Pan Speed</b>	0.1°/s~100°/s
<b>Tilt Speed</b>	0.1°/s~70°/s
<b>Preset Speed</b>	Pan: 78.8°/s, Tilt: 31.7°/s
<b>Preset Quantity</b>	Up to 255 preset (10 via remote control)

**Table2-4** Other Parameters

Other Parameter	
<b>Storage Temperature</b>	-10°C ~+60°C
<b>Storage Humidity</b>	20%~95%
<b>Working Temperature</b>	-10°C ~+50°C
<b>Working Humidity</b>	20%~80%
<b>Dimension</b>	220(L)mm*136mm(W)*159mm(H)
<b>Weight</b>	1.7kg
<b>Environment</b>	Indoors

**Table2-5** Accessory Parameters

Accessory	
<b>Supplied Accessory</b>	Power Supply, RS232 Control Cable, USB3.0 Cable, IR Remote Control, User Manual

<b>Optional Accessory</b>	Ceiling / Wall Mount (Extra Cost)
---------------------------	-----------------------------------

Table2-6 AI Functions

AI Function	
<b>Auto Framing</b>	Built-in high-speed processor and face-detection algorithm automatically detects participants and provides ideal framing. The farthest framing distance can reach 6~7 meters.
<b>Intelligent voice positioning and tracking</b>	Six built-in omnidirectional microphone arrays, intelligent sound source positioning algorithm, real-time positioning of the speaker, voice tracking can be set to on or off. The maximum pick-up distance can reach 6~7 meters.

## 2.4 Interface Introduction

### 2.4.1 Interface Diagram

The external interfaces of this product include: HDMI interface, USB3.0 interface, audio input interface, network interface, RS232 input, 12VDC power supply, power switch. The external interface diagram is shown in Figure 2.2.

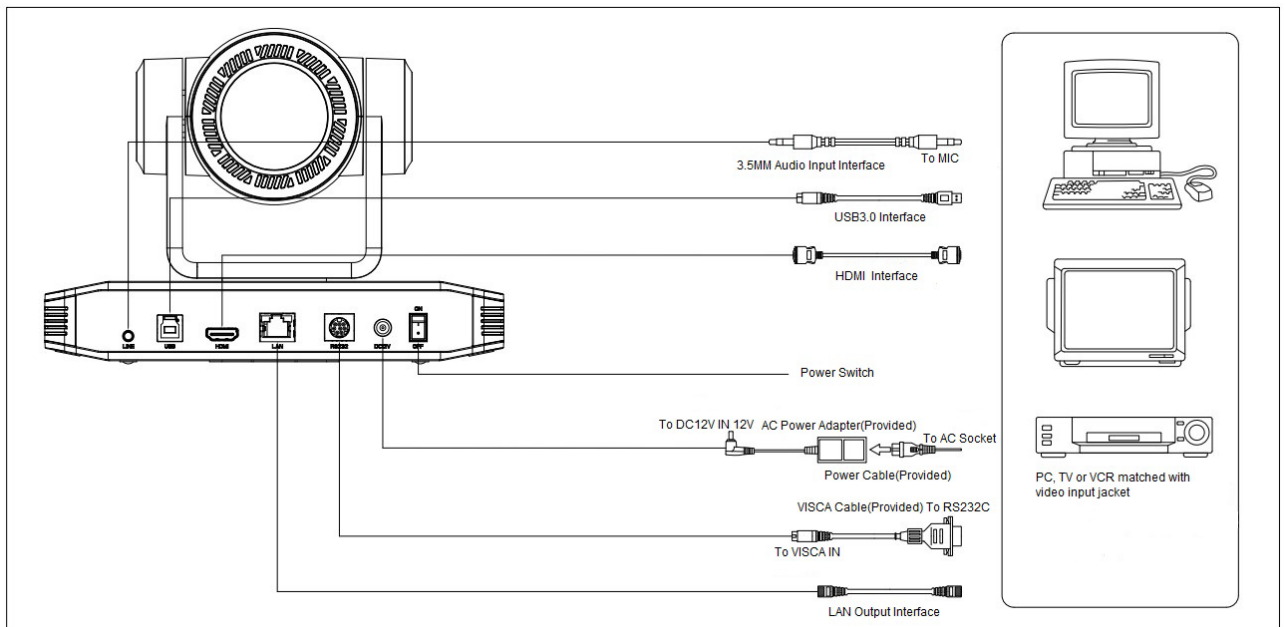


Figure2-2 Interface Diagram

## 2.4.2 RS-232

### 1) RS-232 Diagram

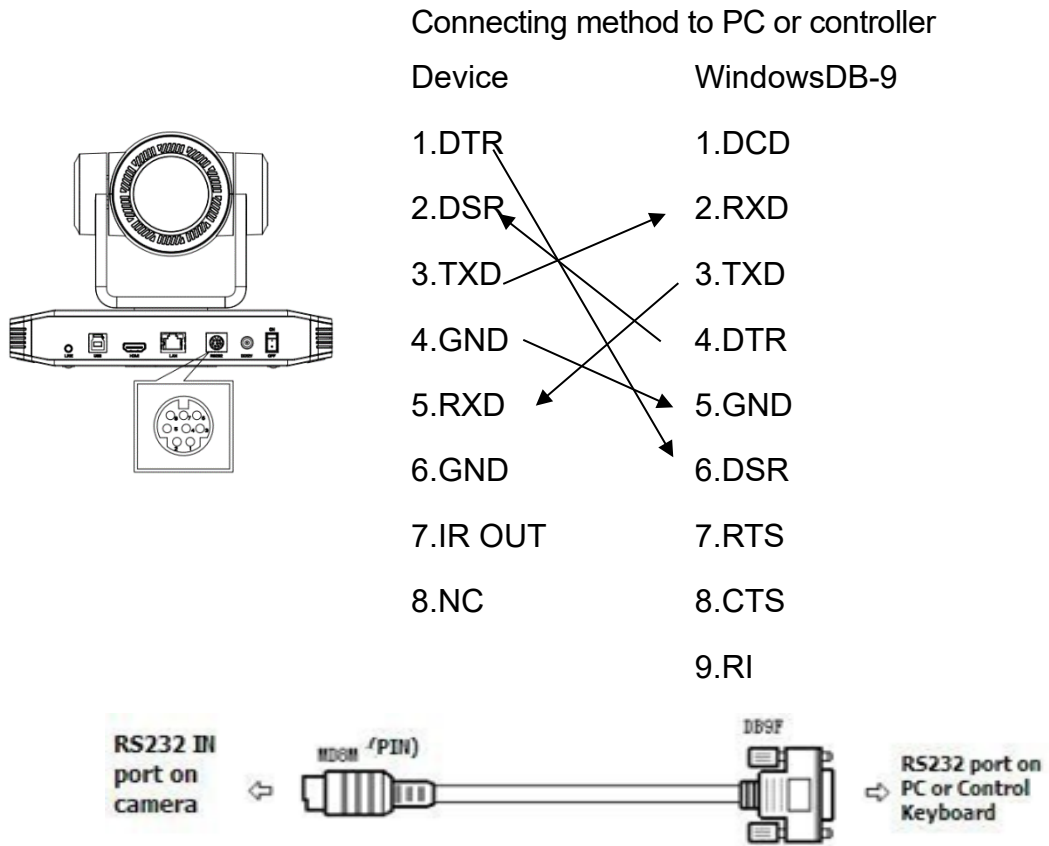
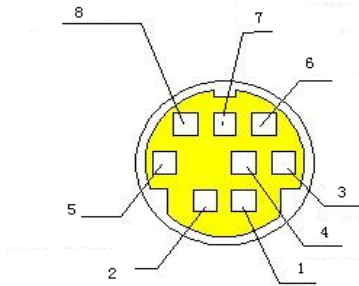


Figure2-3 RS-232 Diagram

### 2) RS-232 Mini-DIN 8-pin Terminal Port Definition

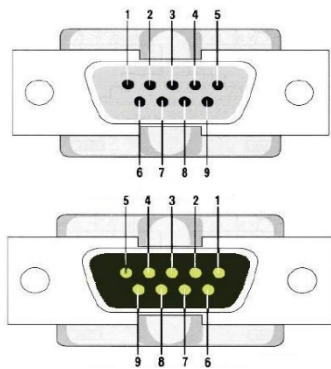
**Table2-7** RS-232 Mini-DIN 8-pin Terminal Port Definition



NO.	Terminal Port	Definition
1	DTR	Data Terminal Ready
2	DSR	Data Set Ready
3	TXD	Transmit Data
4	GND	System Ground
5	RXD	Receive Data
6	GND	System Ground
7	IR OUT	IR Commander Signal IR
8	NC	No Connection

**3) RS232(DB9) Terminal Port Definition**

**Table2-8** RS232(DB9) Terminal Port Definition



NO.	Terminal Port	Definition
1	DCD	Data Carrier Detect
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	System Ground
6	DSR	Data Set Ready
7	RTS	Request to Send
8	CTS	Clear to Send
9	RI	Ring Indicator

**4) VISCA Networking Method**

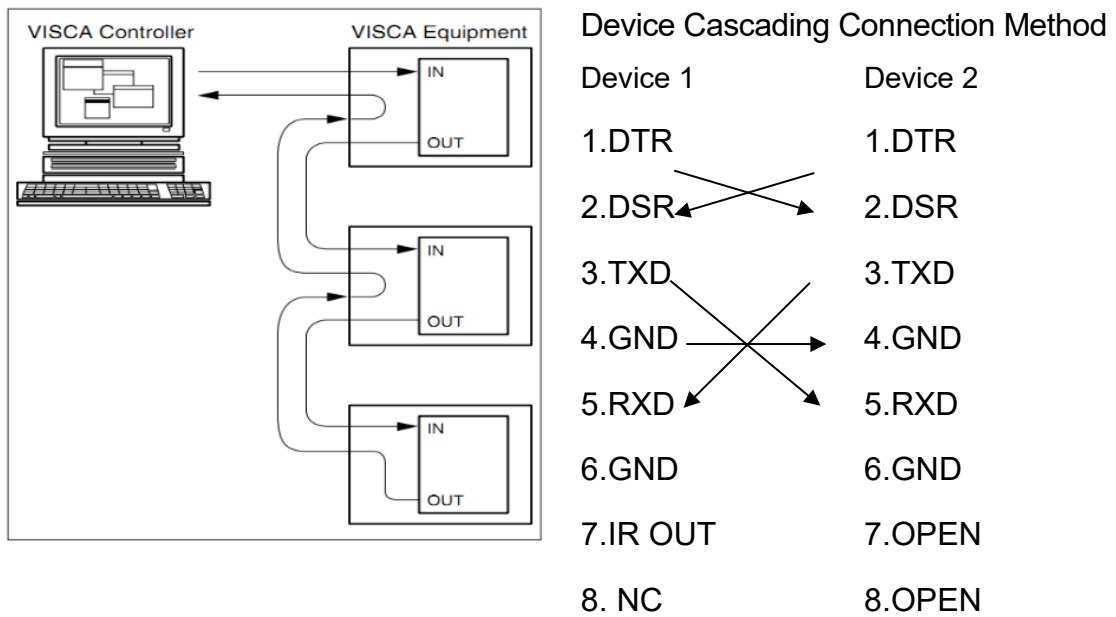


Figure2-4 VISCA Networking Diagram

**! Caution**

- This camera has RS232 Input/Output interface, you can cascade as shown above

## 3. How to Use

### 3.1 Video Output

#### 3.1.1 Power-on Self-test

After powering on, camera will have initial configuration and receiver light will be flashing. Camera will do a brief pan-tilt tour and return to the home position (if preset 0 is set, the camera will return to the preset 0 position).

#### 3.1.2 Video Output

- 1) Network output: Connect this camera to your computer with a network cable, then open a web browser and enter the camera IP address into the address bar (factory default IP is 192.168.5.163). On the login page, input a User Name and Password (factory default is "admin" for both User and Pass). Click on the Preview page to see the live image.

### Caution

- If you forget your User Name, Password, or IP address, you can manually restore the default using the key combination \* # on the remote control.

---

2) HDMI Output: Connect the monitor with the corresponding video output interface.

3) USB3.0 Output: Connect this product with computer USB3.0 interface. Open the Device Manager to confirm there is a camera device recognized by the USB3.0 connection. After the camera is properly identified, open your desired software (Zoom, MS Teams, Google Meets, etc.), choose the device from the camera menu and it will provide video.

## 3.2 Remote Control

Remote control: IR remote control to manage camera settings.

### 3.2.1 IR Remote Control



#### 1. Standby Key

After 3S long press, the camera will go into standby mode.

Long press 3S again, the camera will self-test again and return to HOME position. (Note: If power is turned on, Preset 0 is set, and there is no operation within 12S, the camera will automatically point to the specified preset position.

#### 2. Camera Address Selection

Select the address of the camera to be controlled

#### 3. Number Key

Set or run presets 0-9

#### 4. \*, # Key

Key combination the enter various functions (sections 11 & 12)

#### 5. Focus Control Key

Auto Focus: Enter into auto focus mode.

Manual Focus: The camera focus mode is manual

Switch the camera focus mode to manual focus by pressing [focus +] or [focus -] to adjust.

#### 6. Zoom Control Key

Zoom + :Lens near    Zoom - :Lens far

#### 7. Set or Clear Preset key:

Set Preset: Set preset key + 0-9 number key:

Clear Preset key: Clear preset key + 0-9 number key

#### 8. Pan/Tilt Control Key

Press ▲Key :Up

Press ▼Key :Down

Press ◀Key :Left

Press ▶Key :Right

“HOME” Key: Return to the middle position or enter into the next level menu

#### 9. BLC Control Key

Back Light ON / OFF: Turn on or off the back light

## 10. Menu Setting

Open or close the OSD menu

Enter / exit the OSD menu or return to the previous menu.

## 11. Camera IR Remote Control Address Setting

【\*】 + 【#】 + 【F1】 :Camera Address No.1

【\*】 + 【#】 + 【F2】 :Camera Address No. 2

【\*】 + 【#】 + 【F3】 :Camera Address No. 3

【\*】 + 【#】 + 【F4】 :Camera Address No. 4

## 12. Key Combination Functions

【#】 + 【#】 + 【#】 :Clear all presets

【#】 + 【#】 + 【0】 :Switch the video format to 4KP30

【\*】 + 【#】 + 【6】 :Restore factory defaults

【#】 + 【#】 + 【1】 : Switch the video format to 4KP25

【\*】 + 【#】 + 【3】 :Menu set to Chinese

【#】 + 【#】 + 【2】 :Switch the video format to 1080P30

【\*】 + 【#】 + 【4】 :Menu set to English

【#】 + 【#】 + 【3】 :Switch the video format to 1080P25

【\*】 + 【#】 + 【9】 :Flip switch

【#】 + 【#】 + 【4】 :Switch the video format to 1080P29

【\*】 + 【#】 +Auto: Enter into the aging mode

【#】 + 【\*】 + Auto: Stop into the aging mode

【\*】 + 【#】 +Manual: Restore the default user name, password, and IP address

## 3.2.2 Remote Control Usage

Following initialization, the camera can receive and execute the IR commands. Hold down the remote controller button, the indicator light on the camera will start flashing; release the button, the indicator light will stop flashing. Users can control the pan/tilt/zoom, setting and running preset positions via the IR remote controller.

**Key Instruction:**



1. In this section, “press the key” means a click rather than a long-press, and a special note will be given if a long-press for more than one second is required.
2. When a key-combination is required, it will follow a sequence. For example: **【\*】 + 【#】 + 【F1】** means press **【\*】** first, then press **【#】** , and last press **【F1】** .

## 1) Camera Selection



Select the camera address to control.

## 2) Pan/Tilt Control



Up: press ▲ Down: press ▼

Left: press ◀ Right: press ▶

Return to middle position: press **【HOME】**

Press and hold the up/down/left/right key, the pan/tilt will keep running, from slow to fast, until it runs to the endpoint; the pan/tilt running stops as soon as the key is released.

## 3) Presets Setting, Running, Clearing



1. Preset setting: to set a preset position, the users should press the **【SET PRESET】** key first and then press the number key 0-9 to set a relative preset,

Note: 10 preset positions in total are available using the remote controller.

2. Using Presets: Press a number key 0-9 directly to go to the defined preset.

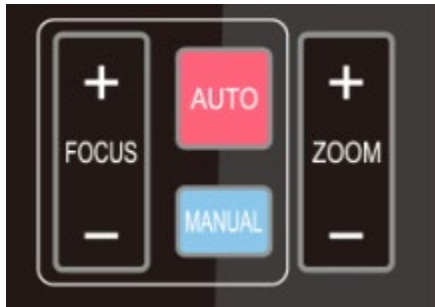


Note: Preset positions must be defined in order for the preset buttons to function.

3. Clearing presets: To clear a preset position, the user can press the **【CLEAR PRESET】** key first, then press the number key 0-9 to clear the assigned preset.

Note: Press the **【#】** key three times in a row to cancel all the presets.

## 4) Zoom Control

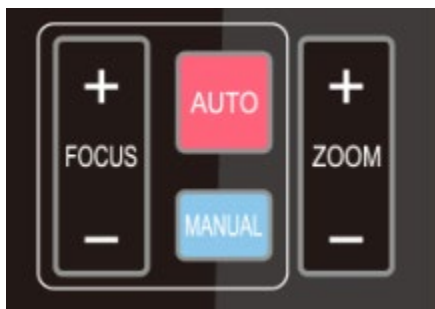


ZOOM IN: press ZOOM ▼ key

ZOOM OUT: press ZOOM ◀ key

By holding the key the camera will continue to zoom in or out, and stops as soon as the key is released.

## 5) Focus Control



Focus (near): Press **【focus+】** key (Only works in manual focus mode)

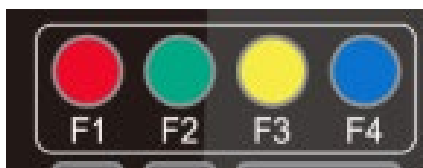
Focus (far): Press **【focus-】** key (Only works in manual focus mode)

Auto Focus: Activates automatic focus

Manual Focus: Activates manual focus

In Manual Focus mode, hold the key and the camera will continue to adjust focus until the key is released.

## 6) Camera Remote Controller Address Setting



**【\*】 + 【#】 + 【F1】** :Camera Address No. 1

**【\*】 + 【#】 + 【F2】** :Camera Address No. 2

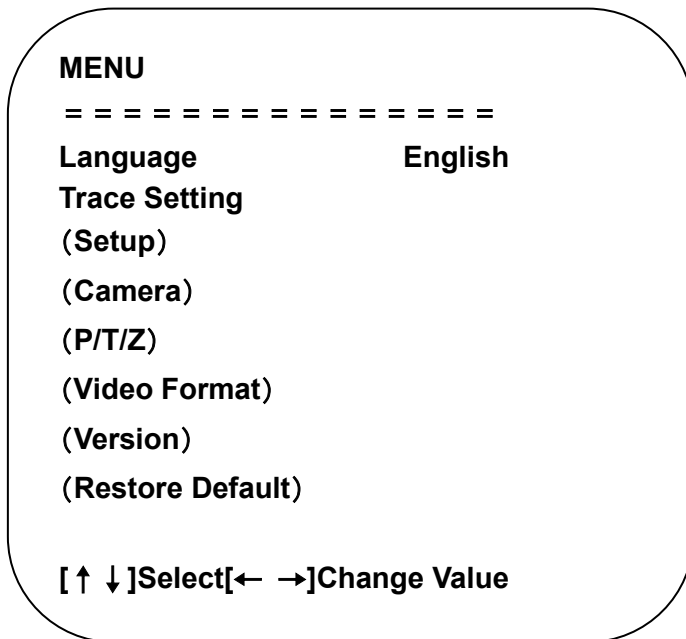
**【\*】 + 【#】 + 【F3】** :Camera Address No. 3

【\*】 + 【#】 + 【F4】 :Camera Address No. 4

### 3.3 Menu Setting

#### 3.3.1 Main Menu

While camera is operating normally, press the **【MENU】** key to display the menu and use the arrow keys to select the menu items.



**Language:** Select Chinese or English

**Trace Setting:** Enter into submenu of trace settings

**Setting :** Enter into submenu of system settings

**Camera Parameter:** Enter into submenu of camera settings

**P/T/Z :** Enter into submenu of PTZ settings

**Version:** Enter into the version submenu

**Restore Factory Default:** Select Yes to restore factory default, otherwise leave as No.

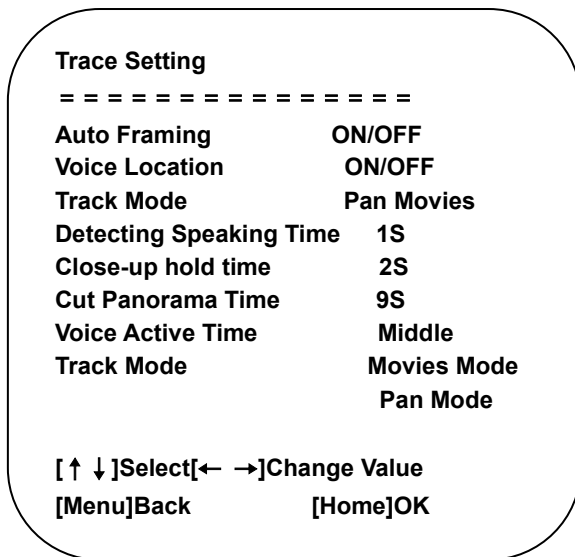
**[↑↓]Select:** Press[↑↓] to Select menu

**[← →]Revise :** Press [← →] to adjust setting

**[Menu]Return:** Press [Menu] to return

**[Home]Confirm:** Press [Home] to confirm

### 3.3.2 Trace Setting



**Auto Framing:** On/Off

**Voice Location:** On/Off

**Detecting Speaking Time:** Defines the time duration a presenter must speak continuously for the camera to determine their position and pan to their location.

**Close-up hold time:** After providing a presenter with a close-up, this defines the duration that the camera will continue to focus on the first presenter before switching to a new presenter.

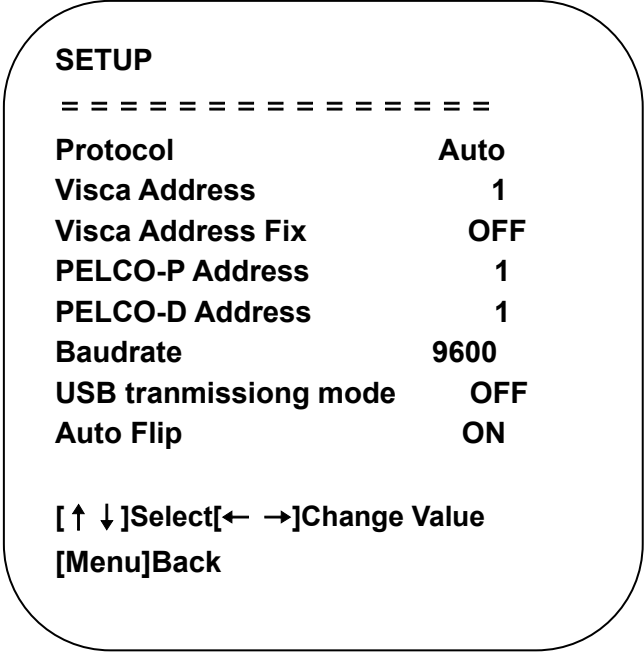
**Cut Panorama Time:** Defines the time duration that must pass before the close-up shot returns to the panoramic shot when no one is speaking. Note: In Movie mode there is a clean cut back to the panoramic shot, Pan mode returns to Home location.

**Movie Mode:** The camera cuts cleanly between panoramic and close-up shots without visible panning or zooming. Note: Only available with sound positioning enabled. Resolution is capped at 1080P so PTZ and panoramic cameras match.

**Pan Mode:** Only the PTZ camera is used, so all motion is visible. The PTZ resolution is 4K as there is no transition between the PTZ and panoramic lenses.

### 3.3.3 System Setting

Highlight the (Setup) option in the Main Menu, then click the **【HOME】** key to enter into the System Setting menu as shown below.



**PROTOCOL:** VISCA/Pelco-/Pelco-D/Auto

**Address:** VISCA=1~7 Pelco-P = 1~255  
 Pelco-D =1~255

**Baudrate:** 2400/4800/9600/115200

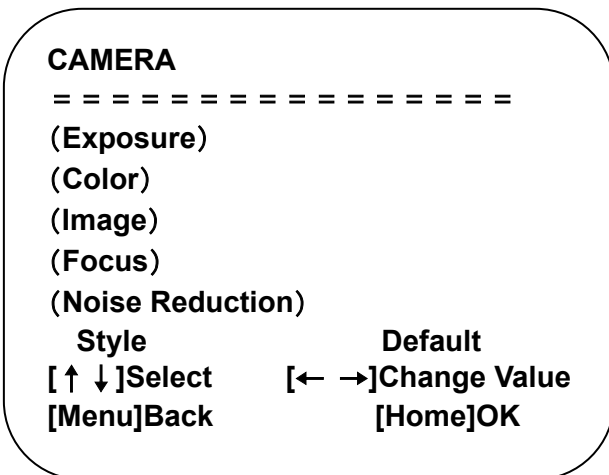
**Visca Address Fix:** On/Off

**USB dual stream:** On/Off

**Auto Flip:** On/Off

### 3.3.4 Camera Parameter Setting

Highlight the (Camera) option in the Main Menu, then click the **【HOME】** key to enter the (Camera) menu as shown below.



**Exposure:** Adjust Exposure setting

**Color:** Adjust color setting

**Image:** Adjust image setting

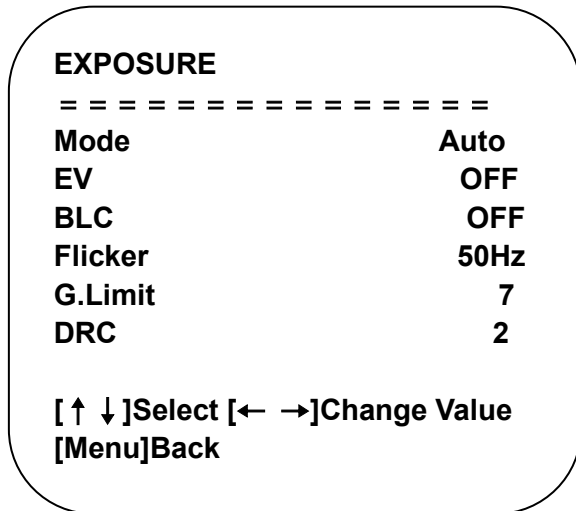
**Focus:** Adjust the focus setting

**Noise Reduction:** Adjust the noise reduction setting

**Style:** Select between default, standard, clear, bright, soft

### 1) Exposure

Highlight the (Exposure) option in the Main Menu, then click the **【HOME】** key to enter the (Exposure) menu as shown below.



**Mode :** Auto, Manual, Shutter priority, Iris priority and Brightness priority.

**EV :** On/Off (only available in auto mode)

**Compensation Level:** -7~7 (only available in auto mode when EV is ON)

**BLC:** ON/OFF for options (only available in auto mode)

**Anti-Flicker:** OFF/50Hz/60Hz for options (only available in Auto/Iris priority/Brightness priority modes)

**Gain Limit:** 0~15(only available in Auto/ Iris priority /Brightness priority mode)

**Dynamic range:** 1~8, off

**Shutter Priority:** 1/25, 1/30, 1/50,1/60, 1/90, 1/100, 1/120, 1/200, 1/250, 1/350, 1/500, 1/1000, 1/2000, 1/3000, 1/4000, 1/6000, 1/10000, 1/20000 (only available in Manual and Shutter priority mode)

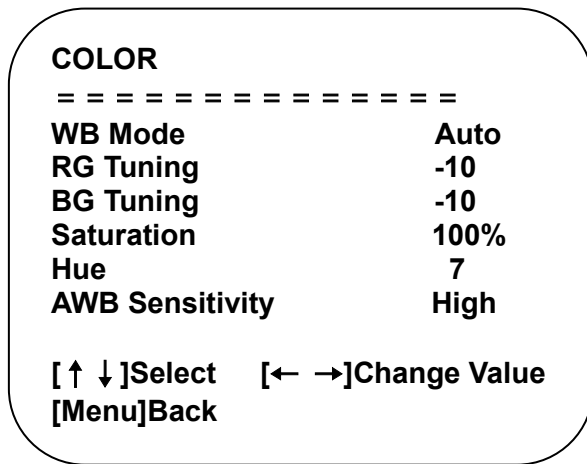
**IRIS :**OFF, F11.0, F9.6, F8.0, F6.8, F5.6, F4.8, F4.0, F3.4, F2.8, F2.4, F2.0, F1.8 (only available in Manual and Iris priority mode)

**Brightness:** 0~20 (only available in Brightness priority mode)

**Gain:** Set the gain level, 0 ~ 15 (Only available in manual mode and shutter priority mode)

### 2) Color

Highlight the (Color) option in the Main Menu, click the **【HOME】** and enter the (Color) menu as shown below.



**WB Mode:** Auto, Manual, One Push, Specified color temperature

**Red Tuning:** -10~10(only available in Auto mode)

**Blue Tuning:** -10~10(only available in Auto mode)

**Red Gain:** 0~255(only available in Manual mode)

**Blue Gain:** 0~127(only available in Manual mode)

**Saturation:** 60%, 70%, 80%, 90%, 100%, 110%, 120%, 130%, 140%, 150%, 160%, 170%, 180%, 190%, 200%

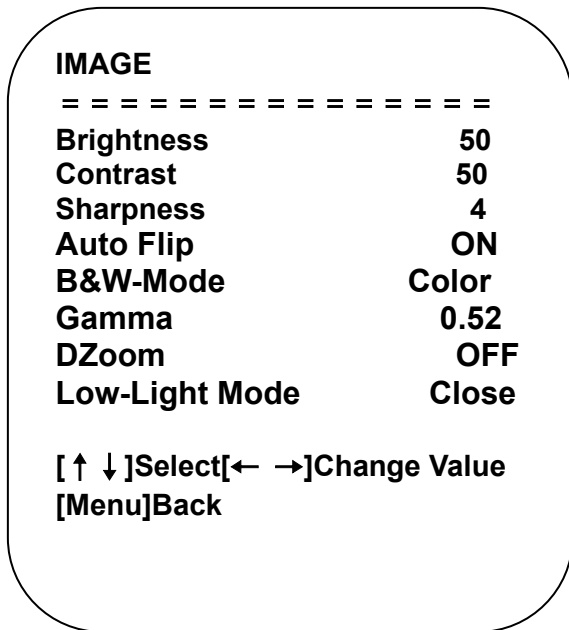
**AWB Sensitivity:** high/ middle/ low (only available in Auto mode)

**Color temperature:** 2400K-7100K (only valid at specified color temperature)

**Chroma:** 0~8

### 3) IMAGE

Highlight the (Image) option in the Menu, click the **【HOME】** key and enter the (Image) menu as shown below.



**Brightness:** 0~100

**Contrast:** 0~100

**Sharpness:** 0~15

**Horizontal Flip:** On/ Off

**Vertical Flip:** On/ Off

**B&W Mode:** Color, black/white

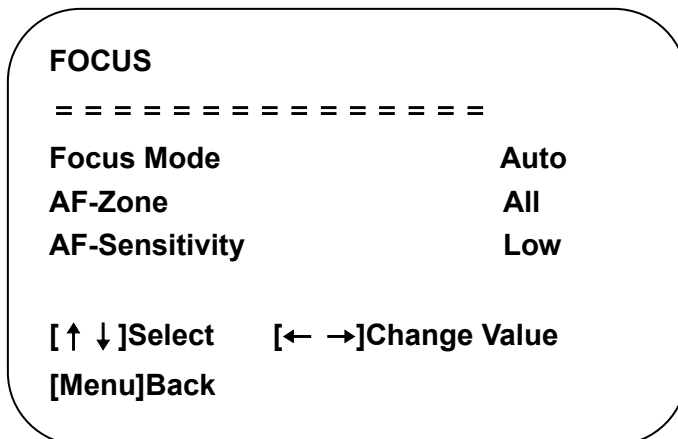
**Gamma:** Default, 0.45, 0.50, 0.55, 0.63

**Digital Zoom:** On/ Off

**Low-Light Mode:** Close/ Open

#### 4) Focus

Highlight the (Focus) option in the Menu, then click the **【HOME】** key to enter the (Focus) as shown below.





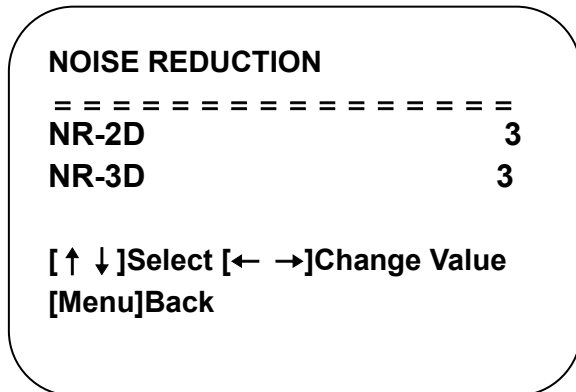
**Focus Mode:** Auto, manual

**AF-Zone:** Up/middle/down

**AF-Sensitivity:** High, middle, low

### 5) Noise Reduction

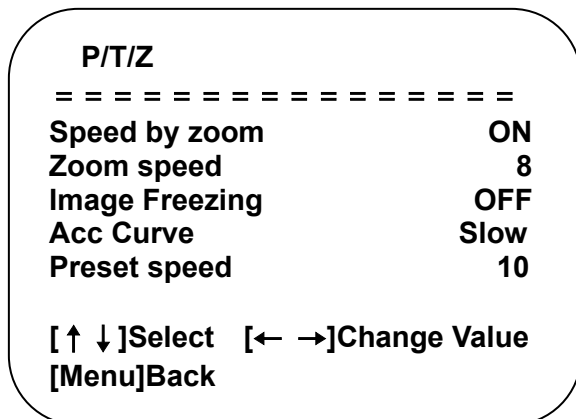
Highlight the (Noise Reduction) option in the Menu, then click the **【HOME】** key to enter the (Noise Reduction) menu as shown below.



**Noise Reduction:** Close, 1~8

### 3.3.5 P/T/Z

Highlight the (P/T/Z) option in the Main Menu, then click the **【HOME】** key to enter the (P/T/Z) menu as shown below.



**Depth of Field:** Only applies to the remote control, On/ Off;

When turned on and zoomed in, the speed of the Pan/Tilt controls on the remote control will be slowed.

**Zoom Speed:** Set the zoom speed for remote control, 1~8

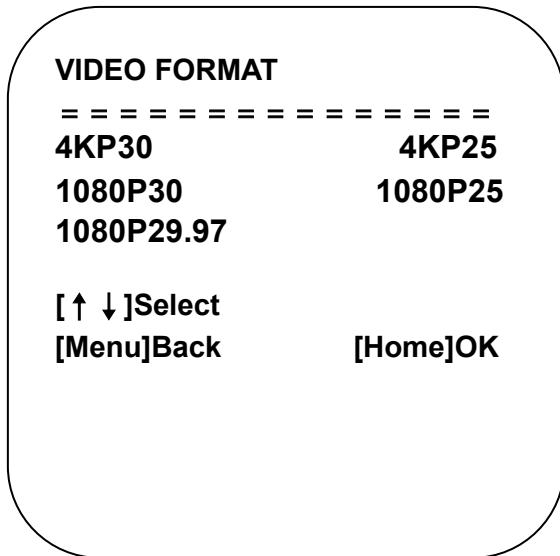
**Image Freezing:** On/Off

**Accelerating Curve:** Fast/slow

**Preset Speed:** 1-10

### 3.3.6 Video Format

Highlight the (Video Format) option in the Menu, then click the **【HOME】** key to enter the (Video Format) menu as shown below.



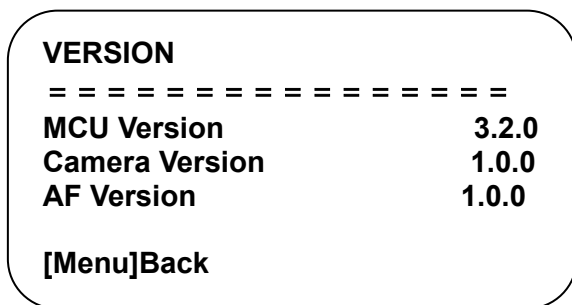
---

 **Caution**

- Exit menu after modifying parameter to save it
- 

### 3.3.7 Version

Highlight the (Version) option in the Main Menu, then click the **【HOME】** key to enter the (Version) menu as shown below.



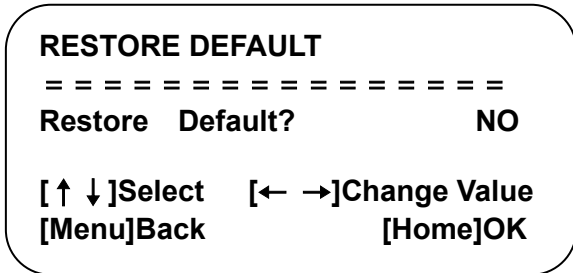
**MCU Version:** Display MCU version information

**Camera Version:** Display camera version information

**AF Version:** Display the focus version information


### 3.3.8 Restore Default

Highlight the (Version) option in the Main Menu, then click the **【HOME】** key to enter the (Version) menu as shown below.



**Restore default:** Yes/ No. Note: The language, color, and video format will not be changed when the default is restored.

---

 **Caution**

- If the address of the camera on the corresponding remote control is not 1 but address 2, 3, or 4, the camera address will revert to 1 upon restoration of default settings. It is recommended that the user change the address of the camera on the remote control to be 1 for ease of normal camera operations.
-

## 4. Network Connection

### 4.1 Connection Method

Direct Connection: Direct connection via cross-over network cable

Connection to LAN: Connection to LAN via CAT cable network switch

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#### Caution

- Please do not put the power and network cables in an easily accessible area. Video quality could be lowered by unstable signal transmission should the cables be unplugged or the contact be otherwise impacted.
- 

Any computer or device that needs to access the camera must be set to the same IP address scheme as the camera. For example, the camera default IP address is 192.168.5.163, so a computer must be set to a similar IP address such as 192.168.5.160. To change the computer's IP on a Windows machine:

Go to Settings, then select Network & Internet. Click Change Adapter Options, then right-click on the Ethernet connection and select the Properties option from the drop-down menu. This will open a window called "Ethernet Properties." Under the Networking tab, locate the item called "Internet Protocol Version 4 (TCP/ IPv4)" and click it to highlight it. With this highlighted, click on the Properties button below it. A new window will open called "Internet Protocol Version 4 (TCP/ IPv4) Properties." Click on the radio button next to "Use the Following IP Address:" and type in the IP address you would like the computer to use as well as the Subnet mask, and the Default Gateway if you know it. The default Subnet Mask of the camera is 255.255.255.0. If the Gateway is unknown, this can be left blank.

---

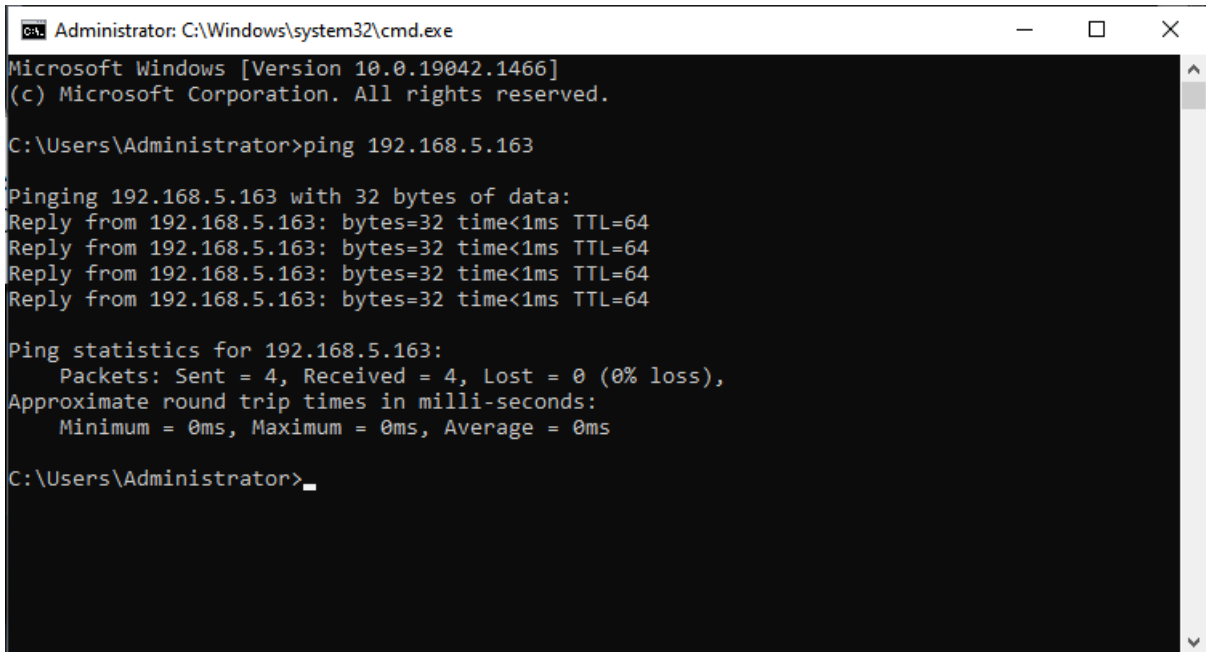
#### Caution

- The IP address must not be a duplicate for the camera's address nor any other devices on the network. If the address is duplicated, it will cause an IP conflict that can prevent connection and can result in either or both devices with the same address to be booted off the network.
- 

Click the Windows Start menu and enter "cmd" into the search bar. This will enable you to open the DOS Command window and ping the camera IP. In the Command window, type "ping 192.168.5.163" then press Enter key. As shown in the below picture, the computer will ping the camera with 32 bytes of data, and if the camera is reachable it will provide a consistent reply. If no data is returned (100% packet loss),

---

then there is no communication with the camera. If there is a partial packet loss (25%, 50%, etc.) the connection is unstable.



```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.19042.1466]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Administrator>ping 192.168.5.163

Pinging 192.168.5.163 with 32 bytes of data:
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<1ms TTL=64
Reply from 192.168.5.163: bytes=32 time<1ms 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 = 0ms, Average = 0ms

C:\Users\Administrator>
```

Figure4-1 Network Connection Screenshot

## 4.2 Camera Web Interface

### 4.2.1 Web Login

#### 1) Web Login

After assigning an IP address to the camera, you can reach the Web Interface by typing in the camera's IP address into a web browser. You can log in this interface as an administrator or user. For an administrator, type in "admin" into the user name and password fields. For a user, type in "user1" or "user2" into the user name and password fields.

Note: It is strongly recommended that you change the password after the initial login.

1. If login as "user", your rights are limited to preview and logout (No configuration right)
2. Browsers that support Web function are Google Chrome, Internet Explorer, MS Edge, and other popular browsers.

**Language Selection:** On the right top of the interface display “中文|English”, click “English”.

### 2) Download Plug-in

When first using a browser to access the web conferencing camera, the login page may present a message stating “Playback plug-in is not installed, please download and install!” Click on this message, download and install MRWebXinstall.exe, following the prompts.

After installing the plugin, enter user name and password, click and Sign In to the Web client management interface. Initial default user name and password are “admin”, users can change the user name and password after initial login.

## 4.2.2 Preview

After a successful login, the initial screen shows the video preview interface. In the preview screen, users can control PTZ, zoom, focus, sound, zoom in, view full screen, set the preset position, run, delete and other operations.

### 1) Login as administrator

User name and default password are both: admin

As an admin, you can control PTZ, zoom, focus, sound, zoom in, view full screen, set run, and delete the preset position.

Can preview, configure, logout.

### 2) Login as user

User name and default password are both either: “user1” or “user2”

As a user, you can control PTZ, zoom, focus, sound, zoom in, view full screen, set run, and delete the preset position.

Can preview and logout.

---

### Caution

- No configuration permission for normal user login.
- 

## 4.2.3 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. For a detailed description see the following table.

**Table4-1** Explanation of Camera Configuration

Menu	Explanation
Video Configuration	Includes video encoding, stream release, multicast/ unicast, video parameters, character-overlapping, character size, video output settings etc.
Network Configuration	Includes network port, Ethernet parameters, wireless network (only with wireless module), SRT, NDI (if available), DNS parameters, GB28181 etc.
System Configuration	Includes equipment properties, system time, user management, version update, Reset, Reboot device settings etc.

## 4.2.4 Video Configuration

### 1) Video Encoding

**Code Stream:** Different video output mode settings using the Main and Secondary streams

**Compression Format:** Set the video compression format, hit save for it to take effect (primary / secondary stream default: H.264, H.265 optional)

**Profile:** Profile Mode Setting (Default HP, BP, MP Optional)

**Video Size:** Set video image resolution, hit save for it to take effect (main stream default 1920 \* 1080, 1280 \* 720, 640\*480, 640\*360 optional; default secondary stream 320\*180, 320 \* 240, 640\*360, 640\*480, 1280 \* 720,1920 \* 1080 optional )

**Stream Rate Control:** Set rate control mode, hit save for it to take effect (Primary / secondary stream default fixed bit rate, variable bit rate is an option).

**Image Quality:** Set the image quality. Image quality can only be changed when rate control is set to variable bit rate. The main stream default quality is best, secondary stream default quality is better. All options are best, better, good, bad, worse, worst.

**Rate (Kb/s):** Set the video bit rate (the main stream default is 4096Kb/s, 64-40960Kb/s is optional; the secondary stream default is 512Kb/s, 64-40960Kb/s is optional).

**Frame rate (F/S):** Set the video frame rate (primary/ secondary stream default 25f/s, primary stream 5-60f/s optional, secondary stream 5-30f/s optional ).

**Key frame interval:** Set the key frame interval (primary/ secondary stream default 75, primary stream 1-150 optional. secondary stream 1-150 optional).

**Minimum QP of key frame interval:** Set minimum QP of key frame interval (default 20, 10-51 optional)

**Stream Name:** When streaming via rtsp or rtmp, user can modify stream name. Main Stream(live/av0), sub stream(live/av1)

Click the "Save" button to display the "Parameter saved successfully" message, then settings take effect.

### 2) Stream Release

**Switch:** To turn the main or secondary streams on or off.

**Protocol:** Primary/ secondary stream applies RTMP protocol, RTSP, SRT

**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 optional).

**User:** Set the user name.

**Password:** Set the password.

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

### 3) RTP Broadcasting

**Main/Sub Stream:** On/off

**Protocol:** RTP, TS, UDP, TCP optional

**Address:** Default 224.1.2.3. This can be edited.

**Port:** The main stream defaults to 4000, the secondary stream defaults to 4002 The main and secondary streams can be changed to ports 0 to 65535.

**Visit:** Address comes up after setting. Eg; rtp://224.1.2.3:4000;  
udp://@224.1.2.3:4000; tcp://@224.1.2.3:4002;

### 4) Video Parameters

**A) Focus:** Focus mode, focus tactic, and focus sensitivity can be set.

**Focus Mode:** Set the focus mode (Default automatic, manual optional, one-push)

**Focus Tactic:** Set the focus tactic (Default Up, middle, Down, and all are optional)

**Focus Sensitivity:** Set the focus sensitivity (Default is low, high, medium optional)

**B) Exposure:** Exposure mode, exposure compensation, backlight compensation, anti-flicker, gain limit, shutter, aperture, brightness, and gain can be set.

**Exposure Mode:** Set the exposure mode (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. Requires Exposure Compensation to be on (default 0,-7 to 7 optional).

**BLC:** Set back light compensation, requires auto status to be turned on (default is off).

**Anti-flicker:** Set anti-flicker compensation, requires automatic exposure mode, iris priority, and brightness priority. (default 50Hz, off, 60Hz optional).

**Gain Limit:** Set the gain limits, requires auto focus, iris priority, and brightness priority.(default 4, 0~15 optional)

**Gain:** Set gain, requires manual exposure mode and shutter priority (default 0, 0~15 optional)

**Dynamic Range:** Set the dynamic range (default: 4, off, 1 to 8 optional).

**Shutter Speed:** Set shutter speed value, requires manual exposure mode and shutter priority. (default 1/100, 1/25, 1/30, 1/50, 1/60, 1/90, 1/100, 1/120, 1/200, 1/250, 1/350, 1/500, 1/1000, 1/2000, 1/3000, 1/4000, 1/6000, 1/10000, 1/20000 optional).

**Aperture Value:** Set the aperture value, requires manual exposure mode and iris priority (default F1.8,close, F11, F9.6, F8.0, F6.8, F5.6, F4.8, F4.0, F3.4, F2.8, F2.4, F2.0, F1.8 optional).

**Brightness:** Set the brightness value, requires brightness priority mode (default 7,0-20 optional).

**C) Color:** White balance, saturation, hue, white balance sensitivity, red fine tuning, blue fine tuning, red gain, blue gain, color temperature can be set.

**White Balance Mode:** Set the white balance mode (Default automatic, manual, one-push white balance, specified color temperature optional). Note: Right click the "Correction" button when selecting the One-push white balance mode.

**Red Fine Tuning:** Set red fine tuning, requires auto white balance mode. (default 0, -10-10 optional).

**Blue Fine Tuning:** Set Blue fine tuning, requires auto white balance mode. (default 0, -10-10 optional).

**Saturation:** Set the saturation (default 36, 0-124 optional).

**Chroma:** Set the chrome (default 4, 0-8 optional).

**White Balance Sensitivity:** Sensitivity Auto white balance settings (default is low, high, medium optional).

**Red Gain:** Set the red gain, requires manual white balance mode (default 45, 0-255 optional).

**Blue Gain:** Sets the Blue gain, requires manual white balance mode (default 45, 0-255 optional).

**Color temperature:** 2400K-7100K (optional under specified color temperature)

**D) Image:** You can set brightness, contrast, sharpness, gamma curve, dynamic contrast, black and white mode, horizontal flip, vertical flip, electronic zoom, lens distortion calibration

**Brightness:** Set the brightness (default 50, 0-10 optional).

**Contrast:** Set the contrast (default 50, 0-10 optional).

**Sharpness:** Set the sharpness value (default 5, 0-15 optional).

**Gamma:** Gamma value setting (default 0.45, 0.50, 0.55, 0.63 optional).

**Black and white mode:** Set black and white mode (default color, black and white optional)

**Horizontal flip:** Set horizontal flip (shown when auto flip is off, default off, on optional)

**Vertical flip:** Set vertical flip (shown when auto flip is off, default off, on optional)

**Electronic zoom:** Set electronic zoom (optional on or off by default)

**Auto flip:** Set image flip (default on, off optional)

**Ultra low illumination:** Set ultra-low illumination (default on, off optional)

**E) Noise Reduction:** 2D&3D noise reduction and dynamic dead pixel correction available.

2D Noise Reduction: Set 2D noise reduction level (default 2, 1-8 and off optional).

3D Noise Reduction: Set 3D noise reduction level (default 4, 1-8 and off optional).

**F) Style: Select image (Default, standard, brightness, clarity, and soft can be set)**

---

### Caution

- Refresh the page after changing above parameters in a, b, c, d, e, f to take effect.

---

### 5) Character Overlapping

**Display Time & Date:** Yes/No

**Display Title:** Yes/No

**Time, Font and Color:** Default white, black, yellow, red and blue optional)

**Title Font Color:** Default white, black, yellow, red, and blue optional)

**Move Character:** Set the location where the time and title are displayed. Click up, down, left, and right buttons to move the character location.

**Title:** Set title on device property (default CAMERA1)

**Time:** Set time on system time (default 1970/01/01 05:36:00)

Click “Save” button, a “parameters are successfully saved” message will pop-up to confirm the new setting has taken effect.

### 6) Character Size

**Automatically Adjust According to the Resolution:** Yes/No

**Main Stream Character Size:** Set the character size of the display, the device will automatically restart after changed (default 48, 28-200 optional)

**Secondary Stream Character Size:** Set the character size of the display, the device will automatically restart after changed (default 48, 28-200 optional)

Click “Save” button, “parameters are successfully saved” message will pop-up to confirm the setting has taken effect.

### 7) Video Output

**Output Format:** Set the video output format, 4KP30, 4KP25, 1080P30, 1080P25, 1080P29.97 optional

Click “Save” button, “parameters are successfully saved” message will pop-up to confirm that the setting has taken effect.

## 4.2.5 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).

**Https Port:** Set https port, the device will restart automatically after changed (default 443, 0-65535 optional).

**WebSocket Port:** Set Visca port, the device will restart automatically after changed (default 8088, 0-65535 optional).

Click on the "Save" button. A "Save successful" message will confirm success.

**RTSP access: RTSP: // equipment IP address: 554/live/av0 (av0 main stream; av1 second stream)**

**RTMP Access: Rtmp://equipment IP address: 1935/live/av0 (av0 main stream; av1 second stream)**

### 2) Ethernet Parameter

**DHCP:** Enable or disable automatic DHCP IP acquisition. Once changed and saved, the device must reboot to take effect (default: OFF)

**IP Address:** Set a static IP address. Once saved, the device must reboot to take effect. Default 192.168.5.163.

**Note: This IP address is also used to log in as an admin/ user. Be sure to keep track of the IP address.**

**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)

Click the "Save" button. A "Save successful" message will confirm success. (Note: Be careful to avoid IP conflicts when modifying).

### 3) DNS parameters

**Preferred DNS Server:** Set the preferred DNS server. (Default 0.0.0.0).

**Alternate DNS Server:** Set alternate DNS server. (Default 0.0.0.0).

Click the "Save" button. A "Save successful" message will confirm success.

### 4) GB28181

**Switch:** Set whether to activate GB28181.

**Time Synchronization:** Enable/Disable time synchronization

**Stream Type:** Set stream type (default main stream, secondary stream optional)

**Signing Time (in seconds):** 3600, range 5-65535

**Heartbeat Time (seconds):** 60, range 1-65535

**Register ID:** 34020000001320000001

**Register User Name:** 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. A message saying "Save successful" will confirm success.

### 5) SRT

**SRT Port:** Set the SRT port (default 9000, 0-65535 optional)

**SRT Password:** Set SRT password

**SRT Password Length:** Set the SRT password length (default 0, 16, 24, 32 optional)

Click the "Save" button. A message will pop up saying "Parameters saved successfully! It will take effect after restarting!"

### 6) RTSP

**Enable RTSP:** Enable/Disable RTSP

**RTSP Authentication:** Set RTSP authentication. Default is off, on is optional.

Click the "Save" button. A message will pop up stating "Save successful! Modify RTSP authentication parameters will take effect after restarting the device!" After setting, restart the camera to take effect.

## 4.2.6 System Configuration

### 1) Device Properties

**Device Name:** Set the device name (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 log back in after modifying and save the setting.

Click on the "Save" button. A message stating "Save successful" will indicate success.

### 2) System Time

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

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

**Time Zone:** Set the time zone (default UTC+08:00, other time zones optional).

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

**Enable NTP:** Enable or disable NTP

**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.

Click on the "Save" button. A message stating "Save successful" will confirm success.

**Time setting:** Set time mode (optional synchronization with computer time, synchronization with NTP server, manual setting)

**Computer time:** Display the computer time (only when the time setting method is synchronized with the computer time), click the "Synchronize" button

**Manual time setting:** Click the calendar icon on the right to manually set the time

### 3) User Management

**Select Users:** Set the user type (default is administrator, User 1, User 2 optional)

**User Name:** Set the user name. Administrator default is admin; User 1 default is user1; User 2 default is user2; user can modify their own.

**Password:** Set a password. Administrator default is admin; User 1 default is user1; User 2 default is user2; user can modify their own).

**Password Confirmation:** Enter the password a second time to confirm it. Click the "Save" button, and if the passwords match, a message stating "Save successful" will appear.

Please note the user name and password are caps sensitive!

---

### Caution

- If you log in to the webpage with the user name and password of an ordinary user, you have no configuration rights and can only perform preview, playback, and logout operations.

---

### 4) Version Update

The version information displayed on the page is read-only and cannot be modified by the user. It is the same as the version information in the menu. The version information of different device models will be different.

**Update File:** Click "Browse..." in the pop-up window and select the upgrade file; click the "Upgrade" button, the upgrade dialog box will pop up. After successfully updating, the device will automatically reboot. (Note: Make sure that the device power remains on and network remains connected during update. If not, the upgrade will fail.)

---

### Caution

- After the version upgrade is completed, you need to restore the factory default values

- a. restore the factory default through web configuration;
- b. restore the factory default value through the menu;
- c. remote control shortcut key \*#6 to restore factory default;

Choose one of the above three methods, in which the IP account and password of "method a" are also restored to the default.

---

### 5) Restore Factory Setting

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

### 6) Reboot

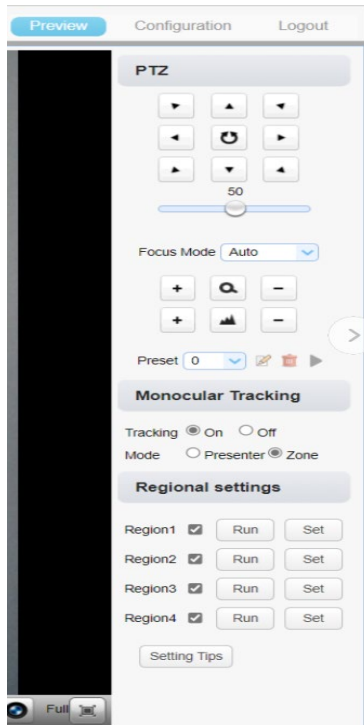
Click "Reboot" button and choose "yes" or "no" on the pop-up window, then the device will restart automatically.

## 4.2.7 Logout

Click "Logout"; and select "Yes" or "No" on pop-up window. If you choose "Yes", you will exit the current page and return to the user login interface.

## 4.2.8 Tracking Function Web Page Configuration

1. After successfully logging in, enter the management interface. Select the tracking interface, and you can set open and close related tracking functions.
2. On the right top is the PTZ control area, in which you can set the preset region of Regional Tracking. On the lower right is the tracking configuration function menu The interface is shown below.



Auto framing: Automatic frame selection function, built-in face detection algorithm, automatically detects participants, and provides ideal framing;

Voice tracking: The voice positioning tracking system can be used to determine the specific location of non-fixed sound sources. In the intelligent teleconferencing system, the camera will pan, tilt, and zoom in the direction of the sound and capture video from the angle of the sound source, thereby capturing the conference presenters in real time.

This model has built-in two screen switching modes.

Movie mode: When the close-up shot is switched from user A to user B, the display cuts cleanly from A to B with no noticeable camera motion. Resolution limited to 1080P to ensure clean transitions between the PTZ and panoramic cameras.

Process: close-up screen A to panoramic screen to close-up screen B

Pan mode: When the close-up is switched from user A to user B, the display follows the pan/tilt/zoom motion of the camera as it aims. Supports full 4K resolution.

Area setting: According to the actual application scene, the user can set the picture-in-picture, shield part of the tracking area (maximum of 10 shielded areas), and set attention. First select the enable check box, then select the setting area (yellow background), and then select the area on the left to take effect.



## 5. Serial Port Communication Control

The camera can be controlled through an RS232 (VISCA IN) cable. The parameters of RS232 are:

Baud rate: 2400/4800/9600/115200/second

Start Bit: 1 bit;

Data Bit: 8 bit;

Stop Bit: 1 bit;

Verification Bit: None.

After power is turned on, the camera will first turn to the bottom left and then back to the center position.

The lens will zoom all the way out to the farthest position, and then zoom back in. Following this, the self-test is complete.

If camera preset 0 has been set, the camera will be automatically go to preset position 0 after the initialization and self-test are completed.

The user is able to use the serial port command to control the device.

### 5.1 VISCA Protocol List

#### 5.1.1 Camera Return Command

Ack/Completion Message		
	Command packet	Remark
ACK	z0 41 FF	Returned when the command is accepted.
Completion	z0 51 FF	Returned when the command has been executed.

z = device address + 8

Error Messages		
	Command packet	Remark
Syntax Error	z0 60 02 FF	Returned when the command format is different or when a command with illegal command parameters is accepted.

Command Buffer Full	z0 60 03 FF	Indicates that two sockets are already being used (executing two commands) and the command could not be accepted when received.
Command Canceled	z0 6y 04 FF(y: Socket No.)	Returned when a command which is being executed in a socket specified by the cancel command is canceled. The completion message for the command is not returned.
No Socket	z0 6y 05 FF(y: Socket No.)	Returned when no command is executed in a socket specified by the cancel command, or when an invalid socket number is specified.
Command Not Executable	z0 6y 41 FF(y: Execution command Socket No. Inquiry command: 0)	Returned when a command cannot be executed due to current conditions. For example, when commands controlling the focus manually are received during auto focus.

### 5.1.2 Camera Control Command

Command	Function	Command Packet	Remark
AddressSet	Broadcast	88 30 0p FF	p: Address setting
IF_Clear	Broadcast	88 01 00 01 FF	I/F Clear
CAM_Power	On	8x 01 04 00 02 FF	Power ON/OFF
	Off	8x 01 04 00 03 FF	
CAM_Zoom	Stop	8x 01 04 07 00 FF	
	Tele(Standard)	8x 01 04 07 02 FF	
	Wide(Standard)	8x 01 04 07 03 FF	
	Tele(Variable)	8x 01 04 07 2p FF	p = 0(low) - 7(high)
	Wide(Variable)	8x 01 04 07 3p FF	
	Direct		8x 01 04 47 0p 0q 0r 0s FF

Command	Function	Command Packet	Remark
CAM_Focus	Stop	8x 01 04 08 00 FF	
	Far(Standard)	8x 01 04 08 02 FF	
	Near(Standard)	8x 01 04 08 03 FF	
	Far(Variable)	8x 01 04 08 2p FF	p = 0(low) - 7(high)
	Near (Variable)	8x 01 04 08 3p FF	
	Direct	8x 01 04 48 0p 0q 0r 0s FF	pqrs: Focus Position
	Auto Focus	8x 01 04 38 02 FF	
	Manual Focus	8x 01 04 38 03 FF	
	One Push mode	8x 01 04 38 04 FF	
	One Push Triger	8x 01 04 18 01 FF	One Push Triger
CAM_Zoom Focus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	pqrs: Zoom Position tuvw: Focus Position
CAM_AF Sensitivity	High	8x 01 04 58 01 FF	Focus sensitivity Setting
	Normal	8x 01 04 58 02 FF	
	Low	8x 01 04 58 03 FF	
CAM_AF Zone	Top	8x 01 04 AA 00 FF	Focus Region Setting
	Center	8x 01 04 AA 01 FF	
	Bottom	8x 01 04 AA 02 FF	
	ALL	8x 01 04 AA 03 FF	
CAM_WB	Auto	8x 01 04 35 00 FF	
	2400K	8x 01 04 35 0C FF	
	2500K	8x 01 04 35 0D FF	
	2600K	8x 01 04 35 0E FF	

Command	Function	Command Packet	Remark
	2700K	8x 01 04 35 0F FF	
	2800K	8x 01 04 35 10 FF	
	2900K	8x 01 04 35 11 FF	
	3000K	8x 01 04 35 01 FF	
	3100K	8x 01 04 35 12 FF	
	3200K	8x 01 04 35 13 FF	
	3300K	8x 01 04 35 14 FF	
	3400K	8x 01 04 35 15 FF	
	3500K	8x 01 04 35 07 FF	
	3600K	8x 01 04 35 16 FF	
	3700K	8x 01 04 35 17 FF	
	3800k	8x 01 04 35 18 FF	
	3900K	8x 01 04 35 19 FF	
	4000k	8x 01 04 35 02 FF	
	4100K	8x 01 04 35 1A FF	
	4200K	8x 01 04 35 1B FF	
	4300K	8x 01 04 35 1C FF	
	4400K	8x 01 04 35 1D FF	
	4500K	8x 01 04 35 08 FF	
	4600K	8x 01 04 35 1E FF	
	4700K	8x 01 04 35 1F FF	
	4800K	8x 01 04 35 21 FF	
	4900K	8x 01 04 35 22 FF	
	5000K	8x 01 04 35 04 FF	

Command	Function	Command Packet	Remark
	5100K	8x 01 04 35 23 FF	
	5200K	8x 01 04 35 24 FF	
	5300K	8x 01 04 35 25 FF	
	5400K	8x 01 04 35 26 FF	
	5500K	8x 01 04 35 09 FF	
	5600K	8x 01 04 35 27 FF	
	5700K	8x 01 04 35 28 FF	
	5800K	8x 01 04 35 29 FF	
	5900K	8x 01 04 35 2A FF	
	6000K	8x 01 04 35 0A FF	
	6100K	8x 01 04 35 2B FF	
	6200K	8x 01 04 35 2C FF	
	6300K	8x 01 04 35 2D FF	
	6400K	8x 01 04 35 2E FF	
	6500K	8x 01 04 35 06 FF	
	6600K	8x 01 04 35 2F FF	
	6700K	8x 01 04 35 30 FF	
	6800K	8x 01 04 35 31 FF	
	6900K	8x 01 04 35 32 FF	
	7000K	8x 01 04 35 0B FF	
	7100K	8x 01 04 35 33 FF	
	One Push mode	8x 01 04 35 03 FF	

Command	Function	Command Packet	Remark
	One Push Trigger	8x 01 04 10 05 FF	One Push WB Trigger(Enabled during One Push WB mode)
	Manual	8x 01 04 35 05 FF	
CAM_AWB Sensitivity	Low	8x 01 04 A9 00 FF	WB Sensitivity Setting
	Normal	8x 01 04 A9 01 FF	
	High	8x 01 04 A9 02 FF	
CAM_RGain	Reset	8x 01 04 03 00 FF	Manual Control of R Gain
	Up	8x 01 04 03 02 FF	
	Down	8x 01 04 03 03 FF	
	Direct	8x 01 04 43 00 00 0p 0q FF	pq: R Gain
CAM_Bgain	Reset	8x 01 04 04 00 FF	Manual Control of B Gain
	Up	8x 01 04 04 02 FF	
	Down	8x 01 04 04 03 FF	
	Direct	8x 01 04 44 00 00 0p 0q FF	pq: B Gain
CAM_AE	Full Auto	8x 01 04 39 00 FF	Automatic Exposure mode
	Manual	8x 01 04 39 03 FF	Manual Control mode
	Shutter priority	8x 01 04 39 0A FF	Shutter Priority Automatic Exposure mode
	Iris priority	8x 01 04 39 0B FF	Iris Priority Automatic Exposure mode
	Bright	8x 01 04 39 0D FF	Bright mode
CAM_Shutter	Reset	8x 01 04 0A 00 FF	Shutter Setting
	Up	8x 01 04 0A 02 FF	

Command	Function	Command Packet	Remark
	Down	8x 01 04 0A 03 FF	
	Direct	8x 01 04 4A 00 00 0p 0q FF	pq: Shutter Position
CAM_Iris	Reset	8x 01 04 0B 00 FF	Iris Setting
	Up	8x 01 04 0B 02 FF	
	Down	8x 01 04 0B 03 FF	
	Direct	8x 01 04 4B 00 00 0p 0q FF	pq: Iris Position
CAM_Gain Limit	Reset	8x 01 04 0C 00 FF	Gain Limit Setting
	Up	8x 01 04 0C 02 FF	
	Down	8x 01 04 0C 03 FF	
	Gain Limit	8x 01 04 2C 0p FF	p: Gain Positon
CAM_Bright	Reset	8x 01 04 0D 00 FF	Bright Setting
	Up	8x 01 04 0D 02 FF	
	Down	8x 01 04 0D 03 FF	
	Direct	8x 01 04 4D 00 00 0p 0q FF	pq: Bright Positon
CAM_ExpCo mp	On	8x 01 04 3E 02 FF	Exposure Compensation ON/OFF
	Off	8x 01 04 3E 03 FF	
	Reset	8x 01 04 0E 00 FF	Exposure Compensation Amount Setting
	Up	8x 01 04 0E 02 FF	
	Down	8x 01 04 0E 03 FF	
	Direct	8x 01 04 4E 00 00 0p 0q FF	pq: ExpComp Position
CAM_Back Light	On	8x 01 04 33 02 FF	Back Light
	Off	8x 01 04 33 03 FF	Compensation
	Reset	8x 01 04 21 00 FF	WDR Level Setting

Command	Function	Command Packet	Remark
CAM_WDRS trength	Up	8x 01 04 21 02 FF	
	Down	8x 01 04 21 03 FF	
	Direct	8x 01 04 51 00 00 00 0p FF	p: WDR Level Positon
CAM_NR	2D	8x 01 04 53 0p FF	P=0-8 0:OFF
	3D	8x 01 04 54 0p FF	P=0-8 0:OFF
CAM_Gamm a		8x 01 04 5B 0p FF	p = 0 – 4 0: Default 1: 0.45 2: 0.50 3: 0.55 4: 0.63
CAM_Low- Light Mode	ON	8x 01 04 2D 01 FF	Low-Light Mode Setting
	OFF	8x 01 04 2D 00 FF	
CAM_Gain		8x 01 04 4C 00 00 0p 0q FF	pq: 0-20
CAM PresetSpeed		8x 01 01 0p FF	p: 1-10
CAM_Flicker	OFF	8x 01 04 23 00 FF	OFF
	50HZ	8x 01 04 23 01 FF	50HZ
	60HZ	8x 01 04 23 02 FF	60HZ
CAM_Apertu re	Reset	8x 01 04 02 00 FF	Aperture Control
	Up	8x 01 04 02 02 FF	
	Down	8x 01 04 02 03 FF	
	Direct	8x 01 04 42 00 00 0p 0q FF	pq: Aperture Gain
CAM_Picture effect	B&W-Mode	8x 01 04 63 04 FF	Picture effect Setting
	OFF	8x 01 04 63 00 FF	



Command	Function	Command Packet	Remark
CAM_Memory	Reset	8x 01 04 3F 00 pq FF	pq: Memory Number(=0 to 254) Corresponds to 0 to 9 on the Remote Commander
	Set	8x 01 04 3F 01 pq FF	
	Recall	8x 01 04 3F 02 pq FF	
CAM_LR_Reverse	On	8x 01 04 61 02 FF	Image Flip Horizontal ON/OFF
	Off	8x 01 04 61 03 FF	
CAM_Picture Flip	On	8x 01 04 66 02 FF	Image Flip Vertical ON/OFF
	Off	8x 01 04 66 03 FF	
CAM_Color Saturation	Direct	8x 01 04 49 00 00 00 0p FF	P=0-E 0:60% 1:70% 2:80% 3:90% 4:100% 5:110% 6:120% 7:130% 8:140% 9:150% 10:160% 11:160% 12:180% 13:190% 14:200%
CAM_IDWrite		8x 01 04 22 0p 0q 0r 0s FF	pqrs: Camera ID (=0000 to FFFF)
SYS_Menu	ON	8x 01 04 06 06 02 FF	Turn on the menu screen
	OFF	8x 01 04 06 06 03 FF	Turn off the menu screen
IR_Receive	ON	8x 01 06 08 02 FF	IR(remote commander)receive On/Off
	OFF	8x 01 06 08 03 FF	
CAM_Setting Reset	Reset	8x 01 04 A0 10 FF	Reset Factory Setting
CAM_Brightness	Direct	8x 01 04 A1 00 00 0p 0q FF	pq: Brightness Position
CAM_Contrast	Direct	8x 01 04 A2 00 00 0p 0q FF	pq: Contrast Position

Command	Function	Command Packet	Remark
CAM_Flip	OFF	8x 01 04 A4 00 FF	Single Command For Video Flip
	Flip-H	8x 01 04 A4 01 FF	
	Flip-V	8x 01 04 A4 02 FF	
	Flip-HV	8x 01 04 A4 03 FF	
CAM_Video System	Set Camera video system	8x 01 06 35 00 pq FF	<p>pq: Video format</p> <p>0x19 : 4KP30</p> <p>0x1A: 4KP25</p> <p>0x06 : 1080P30</p> <p>0x07 : 1080P25</p> <p>0x0D: 1080P29.97</p>
Pan_tiltDrive	Up	8x 01 06 01 VV WW 03 01 FF	<p>VV: Pan speed 0x01 (low speed) to 0x18 (high speed)</p> <p>WW: Tilt speed 0x01 (low speed) to 0x14 (high speed)</p> <p>YYYY: Pan Position</p> <p>ZZZZ: Tilt Position</p>
	Down	8x 01 06 01 VV WW 03 02 FF	
	Left	8x 01 06 01 VV WW 01 03 FF	
	Right	8x 01 06 01 VV WW 02 03 FF	
	Upleft	8x 01 06 01 VV WW 01 01 FF	
	Upright	8x 01 06 01 VV WW 02 01 FF	
	DownLeft	8x 01 06 01 VV WW 01 02 FF	
	DownRight	8x 01 06 01 VV WW 02 02 FF	

Command	Function	Command Packet	Remark
	Stop	8x 01 06 01 VV WW 03 03 FF	
	AbsolutePosition	8x 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	RelativePosition	8x 01 06 03 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	Home	8x 01 06 04 FF	
	Reset	8x 01 06 05 FF	
Pan-tilt LimitSet	Set	8x 01 06 07 00 0W 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	W:1 Up Right 0:DownLeft YYYY: Pan Limit Position(TBD) ZZZZ: Tilt Limit Position(TBD)
	Clear	8x 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF	

### 5.1.3 Inquiry Command

Command	Command Packet	Return Packet	Remark
CAM_PowerInq	8x 09 04 00 FF	y0 50 02 FF	On
		y0 50 03 FF	Off(Standby)
CAM_ZoomPositionInq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_FocusAFModeInq	8x 09 04 38 FF	y0 50 02 FF	Auto Focus
		y0 50 03 FF	Manual Focus
		y0 50 04 FF	One Push mode

Command	Command Packet	Return Packet	Remark
CAM_FocusPosInq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position
CAM_AFSensitivityInq	8x 09 04 58 FF	y0 50 01 FF	High
		y0 50 02 FF	Normal
		y0 50 03 FF	Low
CAM_AFZoneInq	8x 09 04 AA FF	y0 50 00 FF	Top
		y0 50 01 FF	Center
		y0 50 02 FF	Bottom
		y0 50 03 FF	All
CAM_WBModeInq	8x 09 04 35 FF	y0 50 pq FF	Pq=WBMode
CAM_AWBsensitivityInq	8x 09 04 A9 FF	y0 50 00 FF	Low
		y0 50 01 FF	Normal
		y0 50 02 FF	High
CAM_RGainInq	8x 09 04 43 FF	y0 50 00 00 0p 0q FF	pq: R Gain
CAM_BGainInq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: B Gain
CAM_AEModeInq	8x 09 04 39 FF	y0 50 00 FF	Full Auto
		y0 50 03 FF	Manual
		y0 50 0A FF	Shutter priority
		y0 50 0B FF	Iris priority
		y0 50 0D FF	Bright
CAM_ShutterPosInq	8x 09 04 4A FF	y0 50 00 00 0p 0q FF	pq: Shutter Position
CAM_IrisPosInq	8x 09 04 4B FF	y0 50 00 00 0p 0q	pq: Iris Position

Command	Command Packet	Return Packet	Remark
nq		FF	
CAM_Gain LimitInq	8x 09 04 2C FF	y0 50 0p FF	p: Gain Positon
CAM_ BrightPosilnq	8x 09 04 4D FF	y0 50 00 00 0p 0q FF	pq: Bright Position
CAM_ExpCo mpModelnq	8x 09 04 3E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ExpCo mpPosInq	8x 09 04 4E FF	y0 50 00 00 0p 0q FF	pq: ExpComp Position
CAM_Backligh tModelnq	8x 09 04 33 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_WDRStr engthInq	8x 09 04 51 FF	y0 50 00 00 00 0p FF	p: WDR Strength
CAM_NRLeve l(2D) Inq	8x 09 04 53 FF	y0 50 0p FF	P: 2DNRLlevel
CAM_NRLeve l(3D) Inq	8x 09 04 54 FF	y0 50 0p FF	P:3D NRLevel
CAM_FlickerM odelnq	8x 09 04 55 FF	y0 50 0p FF	p: Flicker Settings(0: OFF, 1: 50Hz, 2:60Hz)
CAM_Apertur elnq	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture Gain
CAM_PictureE ffectModelnq	8x 09 04 63 FF	y0 50 00 FF	Off
		y0 50 04 FF	B&W
CAM_Memory Inq	8x 09 04 3F FF	y0 50 0p FF	p: Memory number last operated.
SYS_MenuMo delnq	8x 09 06 06 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_LR_Rev	8x 09 04 61 FF	y0 50 02 FF	On

Command	Command Packet	Return Packet	Remark
erseInq		y0 50 03 FF	Off
CAM_PictureFlipInq	8x 09 04 66 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ColorSaturationInq	8x 09 04 49 FF	y0 50 00 00 00 0p FF	p: Color Gain setting 0h (60%) to Eh (130%)
CAM_IDInq	8x 09 04 22 FF	y0 50 0p FF	p: Camera ID
IR_ReceiveInq	8x 09 06 08 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_BrightnessInq	8x 09 04 A1 FF	y0 50 00 00 0p 0q FF	pq: Brightness Position
CAM_ContrastInq	8x 09 04 A2 FF	y0 50 00 00 0p 0q FF	pq: Contrast Position
CAM_FlipInq	8x 09 04 A4 FF	y0 50 00 FF	Off
		y0 50 01 FF	Flip-H
		y0 50 02 FF	Flip-V
		y0 50 03 FF	Flip-HV
CAM_GammaInq	8x 09 04 5B FF	y0 50 0p FF	p: Gamma setting
CAM_VersionInq	8x 09 00 02 FF	y0 50 ab cd mn pq rs tu vw FF	ab cd : vender ID ( 0220 ) mn pq : model ID rs tu: ARM Version vw: reserve
VideoSystemInq	8x 09 06 23 FF	y0 50 pq FF	pq: Video format

Command	Command Packet	Return Packet	Remark
nq			0x19 : 4KP30 0x1A: 4KP25 0x06 : 1080P30 0x07 : 1080P25 0x0D: 1080P29.97
Pan-tiltMaxSpeedInq	8x 09 06 11 FF	y0 50 ww zz FF	ww: Pan Max Speed zz: Tilt Max Speed
Pan-tiltPosInq	8x 09 06 12 FF	y0 50 0w 0w 0w 0w 0z 0z 0z 0z FF	www: Pan Position zzz: Tilt Position

Note: [x] in the above table represents the address of the device to be operated, [y]=[x + 8].

## 5.2 Pelco-D Protocol Command List

Function	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Up	0xFF	Address	0x00	0x08	Pan Speed	Tilt Speed	SUM
Down	0xFF	Address	0x00	0x10	Pan Speed	Tilt Speed	SUM
Left	0xFF	Address	0x00	0x04	Pan Speed	Tilt Speed	SUM
Right	0xFF	Address	0x00	0x02	Pan Speed	Tilt Speed	SUM
Upleft	0xFF	Address	0x00	0x0C	Pan Speed	Tilt Speed	SUM
Upright	0xFF	Address	0x00	0x0A	Pan Speed	Tilt Speed	SUM
DownLeft	0xFF	Address	0x00	0x14	Pan Speed	Tilt Speed	SUM

Function	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
DownRight	0xFF	Address	0x00	0x12	Pan Speed	Tilt Speed	SUM
Zoom In	0xFF	Address	0x00	0x20	0x00	0x00	SUM
Zoom Out	0xFF	Address	0x00	0x40	0x00	0x00	SUM
Focus Far	0xFF	Address	0x00	0x80	0x00	0x00	SUM
Focus Near	0xFF	Address	0x01	0x00	0x00	0x00	SUM
Stop	0xFF	Address	0x00	0x00	0x00	0x00	SUM
Set Preset	0xFF	Address	0x00	0x03	0x00	Preset ID	SUM
Clear Preset	0xFF	Address	0x00	0x05	0x00	Preset ID	SUM
Call Preset	0xFF	Address	0x00	0x07	0x00	Preset ID	SUM
Query Pan Position	0xFF	Address	0x00	0x51	0x00	0x00	SUM
Query Pan Position Response	0xFF	Address	0x00	0x59	Value High Byte	Value Low Byte	SUM
Query Tilt Position	0xFF	Address	0x00	0x53	0x00	0x00	SUM
Query Tilt Position Response	0xFF	Address	0x00	0x5B	Value High Byte	Value Low Byte	SUM
Query Zoom Position	0xFF	Address	0x00	0x55	0x00	0x00	SUM
Query Zoom Position Response	0xFF	Address	0x00	0x5D	Value High Byte	Value Low Byte	SUM



## 5.3 Pelco-P Protocol Command List

Function	Byte1	Byte2	Byte 3	Byte 4	Byte5	Byte6	Byte 7	Byte 8
Up	0xA0	Address	0x00	0x08	Pan Speed	Tilt Speed	0xAF	XOR
Down	0xA0	Address	0x00	0x10	Pan Speed	Tilt Speed	0xAF	XOR
Left	0xA0	Address	0x00	0x04	Pan Speed	Tilt Speed	0xAF	XOR
Right	0xA0	Address	0x00	0x02	Pan Speed	Tilt Speed	0xAF	XOR
Upleft	0xA0	Address	0x00	0x0C	Pan Speed	Tilt Speed	0xAF	XOR
Upright	0xA0	Address	0x00	0x0A	Pan Speed	Tilt Speed	0xAF	XOR
DownLeft	0xA0	Address	0x00	0x14	Pan Speed	Tilt Speed	0xAF	XOR
DownRight	0xA0	Address	0x00	0x12	Pan Speed	Tilt Speed	0xAF	XOR
Zoom In	0xA0	Address	0x00	0x20	0x00	0x00	0xAF	XOR
Zoom Out	0xA0	Address	0x00	0x40	0x00	0x00	0xAF	XOR
Stop	0xA0	Address	0x00	0x00	0x00	0x00	0xAF	XOR
Focus Far	0xA0	Address	0x01	0x00	0x00	0x00	0xAF	XOR
Focus Near	0xA0	Address	0x02	0x00	0x00	0x00	0xAF	XOR
Set Preset	0xA0	Address	0x00	0x03	0x00	Preset ID	0xAF	XOR
Clear Preset	0xA0	Address	0x00	0x05	0x00	Preset ID	0xAF	XOR
Call Preset	0xA0	Address	0x00	0x07	0x00	Preset ID	0xAF	XOR
Query Pan Position	0xA0	Address	0x00	0x51	0x00	0x00	0xAF	XOR

Query Pan Position Response	0xA0	Address	0x00	0x59	Value High Byte	Value Low Byte	0xAF	XOR
Query Tilt Position	0xA0	Address	0x00	0x53	0x00	0x00	0xAF	XOR
Query Tilt Position Response	0xA0	Address	0x00	0x5B	Value High Byte	Value Low Byte	0xAF	XOR
Query Zoom Position	0xA0	Address	0x00	0x55	0x00	0x00	0xAF	XOR
Query Zoom Position Response	0xA0	Address	0x00	0x5D	Value High Byte	Value Low Byte	0xAF	XOR

## 6. Maintenance and Troubleshooting

### 6.1 Camera Maintenance

- 1) If the camera will not be used for a long time, please turn off the power switch.
- 2) Use a soft cloth or lotion-free tissue to clean the camera body.
- 3) Use a soft dry lint-free cloth to clean the lens. If the camera is very dirty, clean it with a diluted neutral detergent. Do not use any type of solvent or harsh detergent, which may damage the surface.

### 6.2 Troubleshooting

#### ● No image

1. Ensure the power cord is connected, voltage is OK, and POWER LED is lit.
2. Check whether the camera can “self-test” after startup (camera will do a brief pan-tilt tour and return to the home position, or if preset 0 is set, the camera will return to the preset 0 position).
3. Check whether the DIP switch at the bottom is in normal working mode (refer to Table 2-9)
4. Check whether the video output and video display cable are normal

#### ● Abnormal display of image

1. Check whether the video output cable or video display is normal

#### ● Image dithering when zoom-in or zoom-out

1. Ensure the camera installation position is solid
2. Ensure there are no shaking machines or objects around the camera

#### ● Remote control does not work

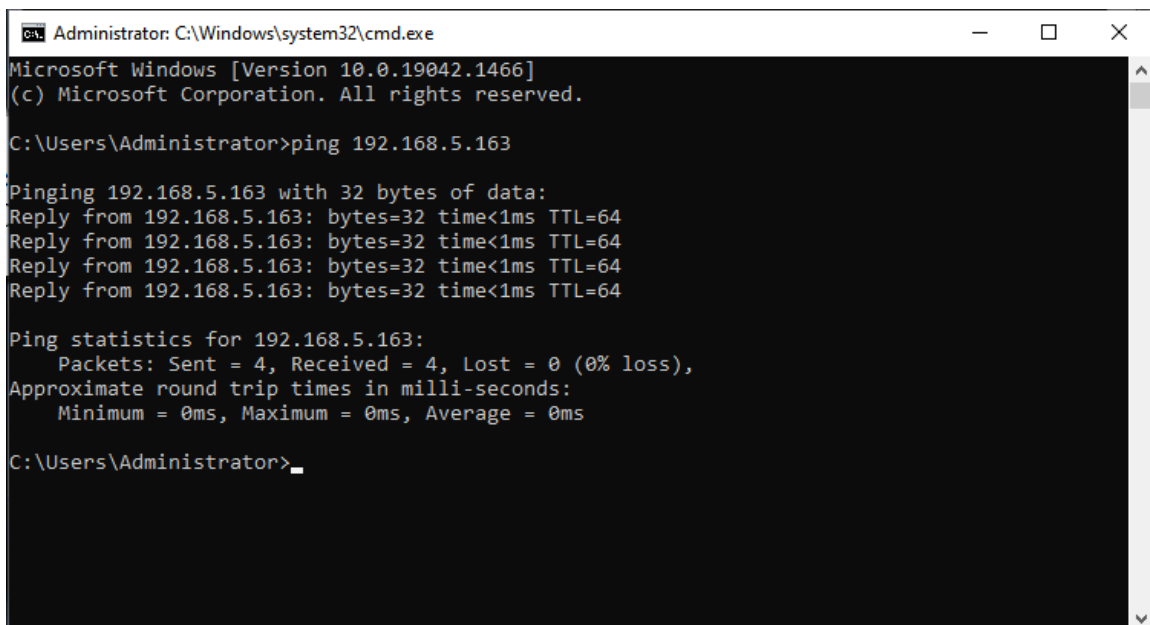
1. Remote control address is set to 1 (if the machine is set back to the factory defaults, the remote control address will be back to address 1 as well).
2. Ensure there are fresh batteries installed in the remote control.
3. Ensure the camera is set to the normal operating mode (see Table 2-9)
4. Be sure to exit the menu. Camera control through remote control is only available after exiting the menu. If video is output from the LAN, the menu will not be displayed. The menu will automatically return after 30s, then it can be controlled by remote control.

### ● Serial port does not work

1. Confirm the camera serial device protocol, baud rate, and address are consistent
2. Confirm that the control cable is connected properly
3. Confirm the camera working mode is the normal operating mode (see Table 2.9)

### ● Cannot log in through a browser

1. Confirm the camera is showing normally.
2. Confirm that the network cable is connected properly (the amber light at the Ethernet port will flash to indicate a normal network cable connection)
3. Confirm that your computer IP address is in a consistent range with the IP address of the camera, but is not an exact duplicate.
4. Click the Windows Start button, search for “cmd” and select "Run." In the DOS command window, enter “ping” followed by the camera IP (default 192.168.5.163). Press Enter to ping the camera and test the connection as shown below.



```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.19042.1466]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Administrator>ping 192.168.5.163

Pinging 192.168.5.163 with 32 bytes of data:
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<1ms TTL=64
Reply from 192.168.5.163: bytes=32 time<1ms 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 = 0ms, Average = 0ms

C:\Users\Administrator>
```

