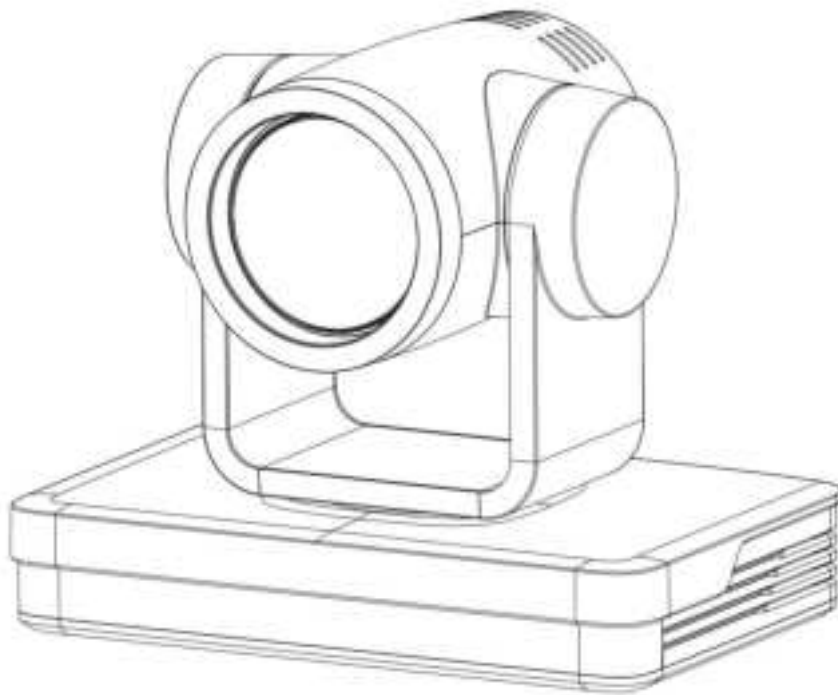


TEKVOX 79068-Ultra

79068-Ultra User Manual

TEKVOX-79068-Ultra



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Version: 79068-Ultra_2025V1.1

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

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Attention

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

Precautions

This product can only be used in the specified conditions in order 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 camera is 12V and the receiver is 24V polarity of the power supply drawing.



Transportation

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

Installation

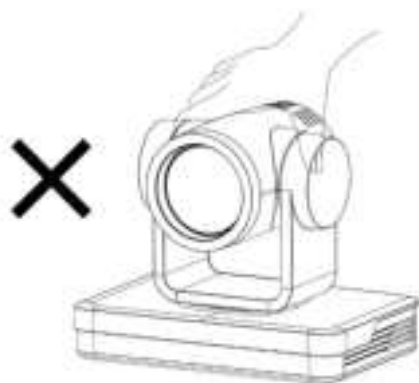
- 1) Do not rotate the camera head violently, otherwise it may cause mechanical failure.
- 2) This product should be placed on a stable desktop or other horizontal surface. Do not install the product obliquely, otherwise it may display an inclined image.

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- 3) Ensure there are no obstacles within rotation range of the holder.
- 4) Do not power on before completely installation.

Improper operations may damage the product structure 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.



Please do not rotate the lens and camera head manually even if the camera is powered off otherwise, it may damage the camera. The Camera must perform a self-check at startup without any interference.



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 a household application. Appropriate measure is required.

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1. Quick Start

1.1 Camera Hardware and Connections

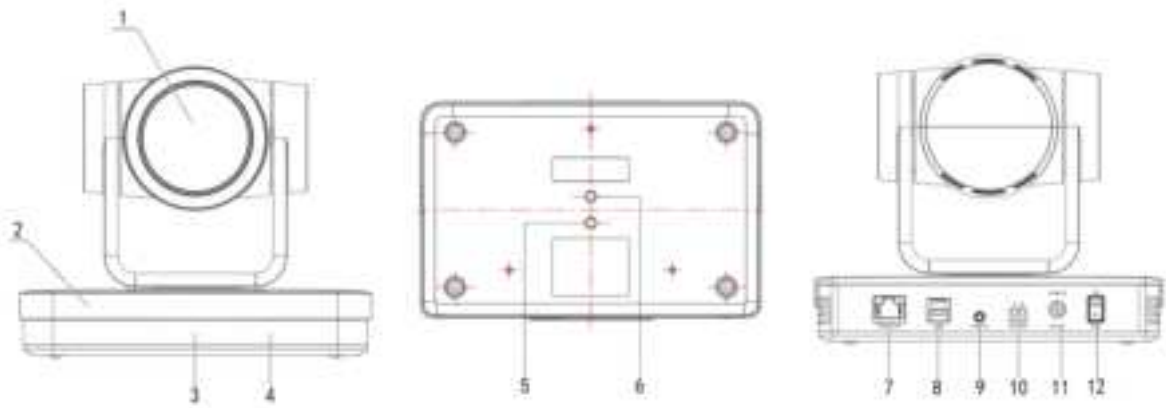


Figure1-1 Camera Hardware

Hardware

- | | | |
|------------------------|----------------------|------------------|
| 1. Lens | 2. Base | 3. IR LED |
| 4. Hole for Dip Switch | 5. Tripod Screw Hole | 6. Fixation Hole |
| 7. HDBT OUT | 8. USB 3.0 (Service) | 9. LINE IN |
| 10. MIC Power (6V) | 11. DC12V | 12. Power Switch |

1.2 Receiver Hardware and Connections

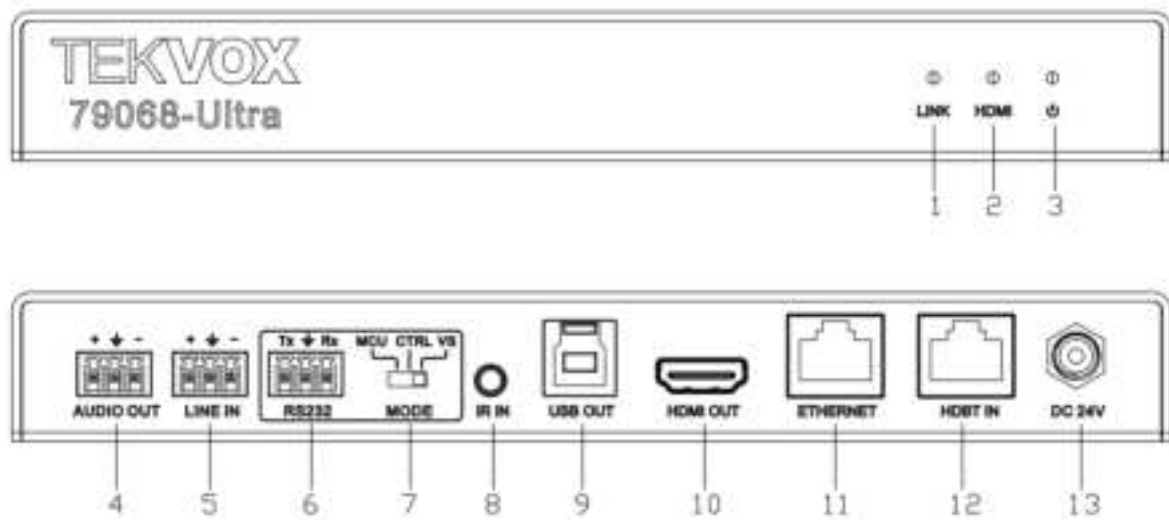


Figure1-2 Receiver Hardware

Hardware

- | | | |
|----------------------|--------------|----------------|
| 1. HDBT LINK LED | 2. HDMI LED | 3. Power LED |
| 4. AUDIO OUT | 5. LINE IN | 6. RS232 |
| 7. RS232 Mode Switch | 8. IR IN | 9. USB 3.0 OUT |
| 10. HDMI OUT | 11. Ethernet | 12. HDBT IN |
| 13. DC IN +24 | | |

1.3 Camera Power-on Self-Test

1.3.1 Power on

Camera can be powered by its own 12V power supply when receiver is not used. Do not connect both power supplies. Best to only use the 24V supply connected to the receiver.

1.3.2 Self-Test

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



- The default address of the remote control is 1#. When using the menu restore 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
-

1.4 Video Output

This camera can output up to 4K video through network, HDBaseT and USB 3.0.

1.4.1 Network Output

Network connection:

Login: 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 via this IP interface, like PTZ control, video recording, playback and configuration setting.

1.4.2 Receiver USB 3.0 Output

USB 3.0 connection: Open video software and select image device to output video.

1.4.3 HDBaseT

This camera is designed to only work with its supplied receiver. The receiver supplies power, network, RS232, and IR to the camera. The camera supplies HDMI video and audio to the receiver.



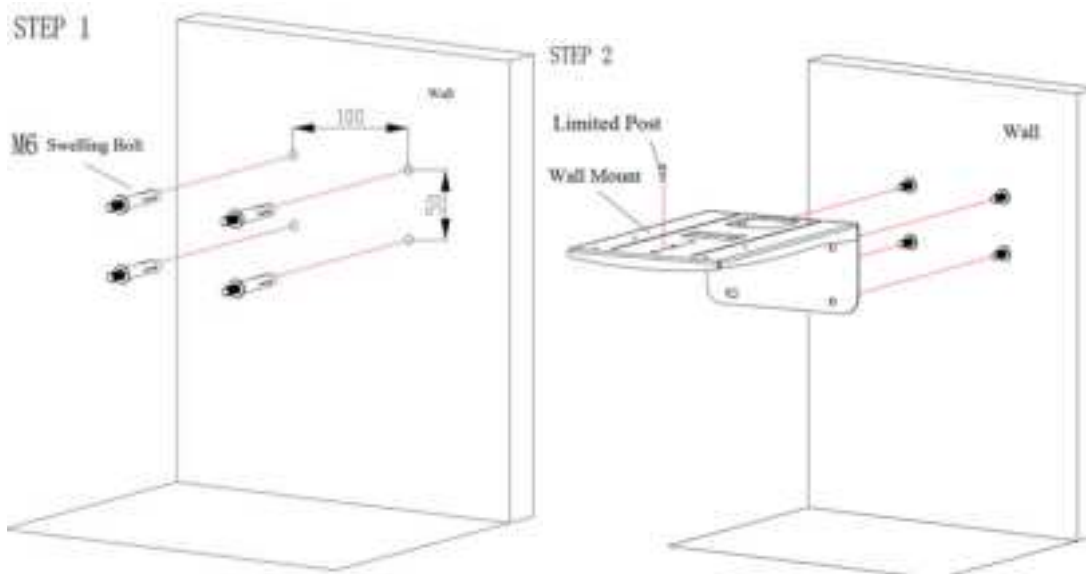
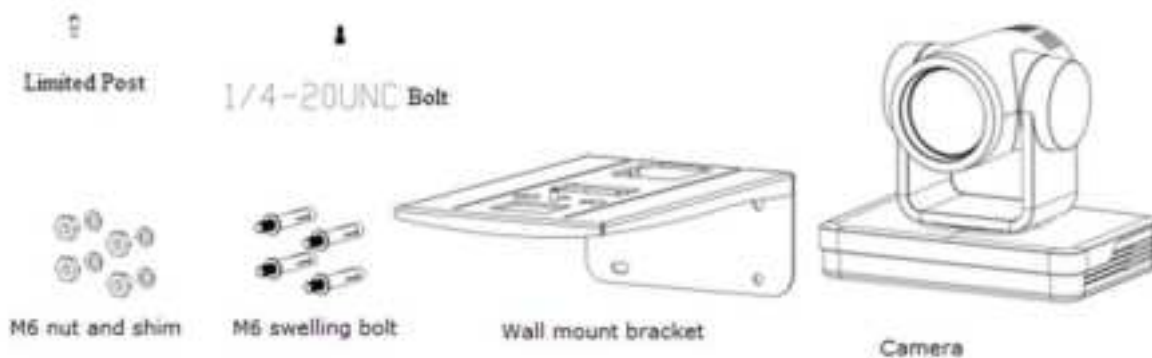
The bottom of the camera does get hot to the touch. This is normal and is used to dissipate the heat of the HDBaseT circuit to the bottom metal of the camera.

1.5 Bracket



- The bracket can only be wall or upside down mounted on a structurally supported wall with proper mounting hardware.

1.5.1 Steps of Wall Mount



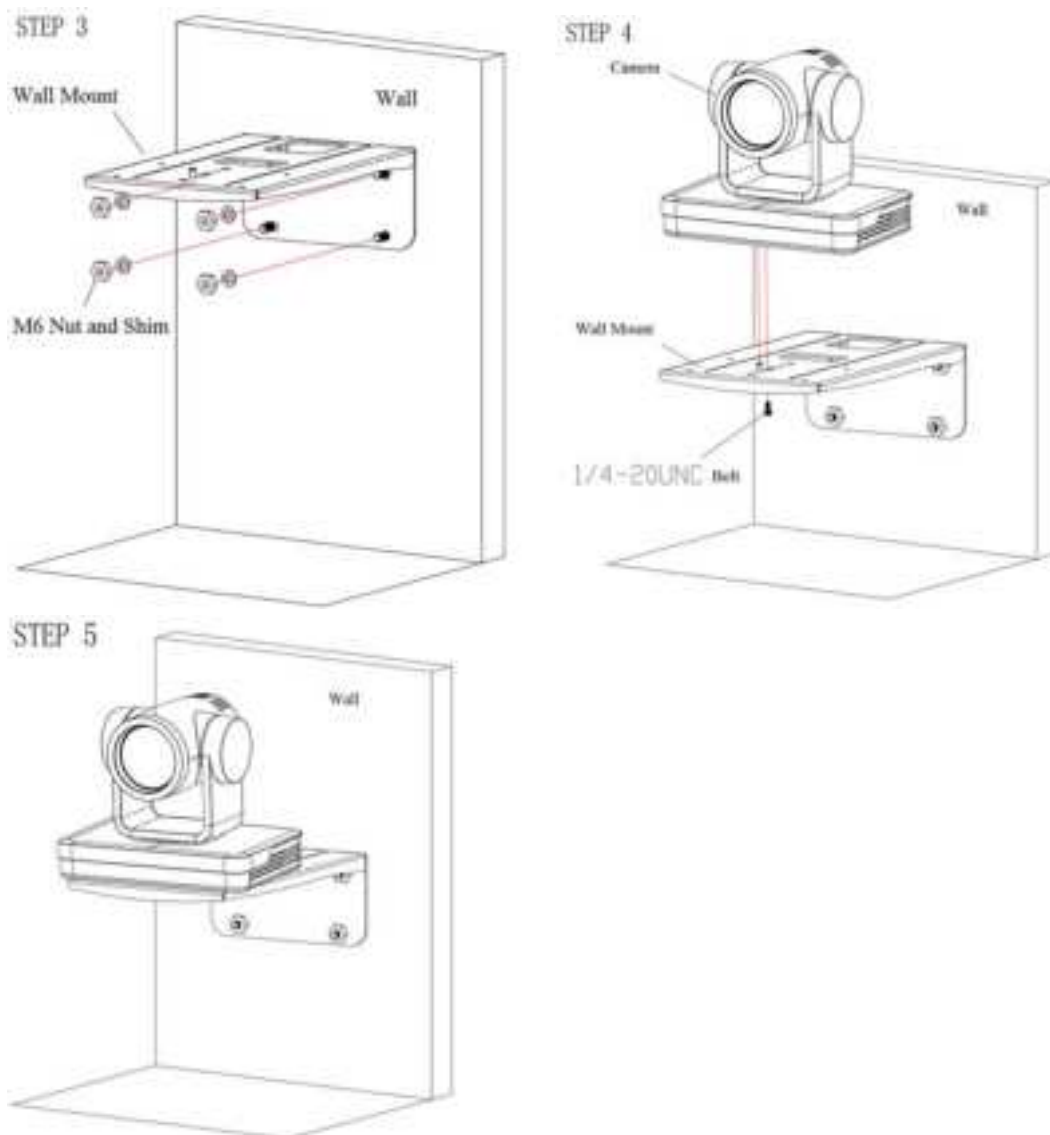


Figure1-3 Steps of Wall Mount

1.5.2 Steps of Ceiling Mount

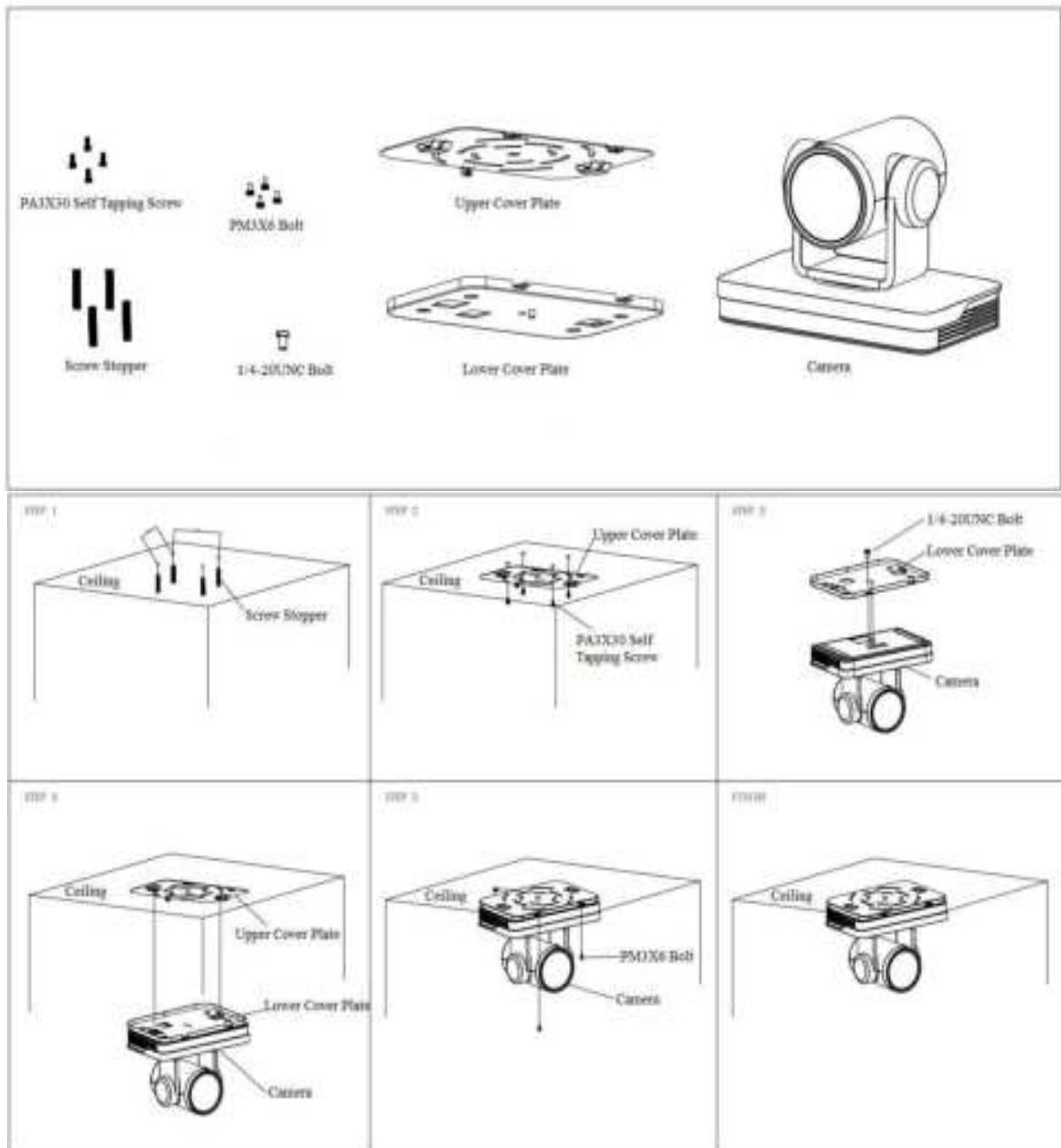


Figure1-4 Steps of Ceiling Mount

2. Product Overview

2.1 Product Overview

2.1.1 Camera Product Dimension

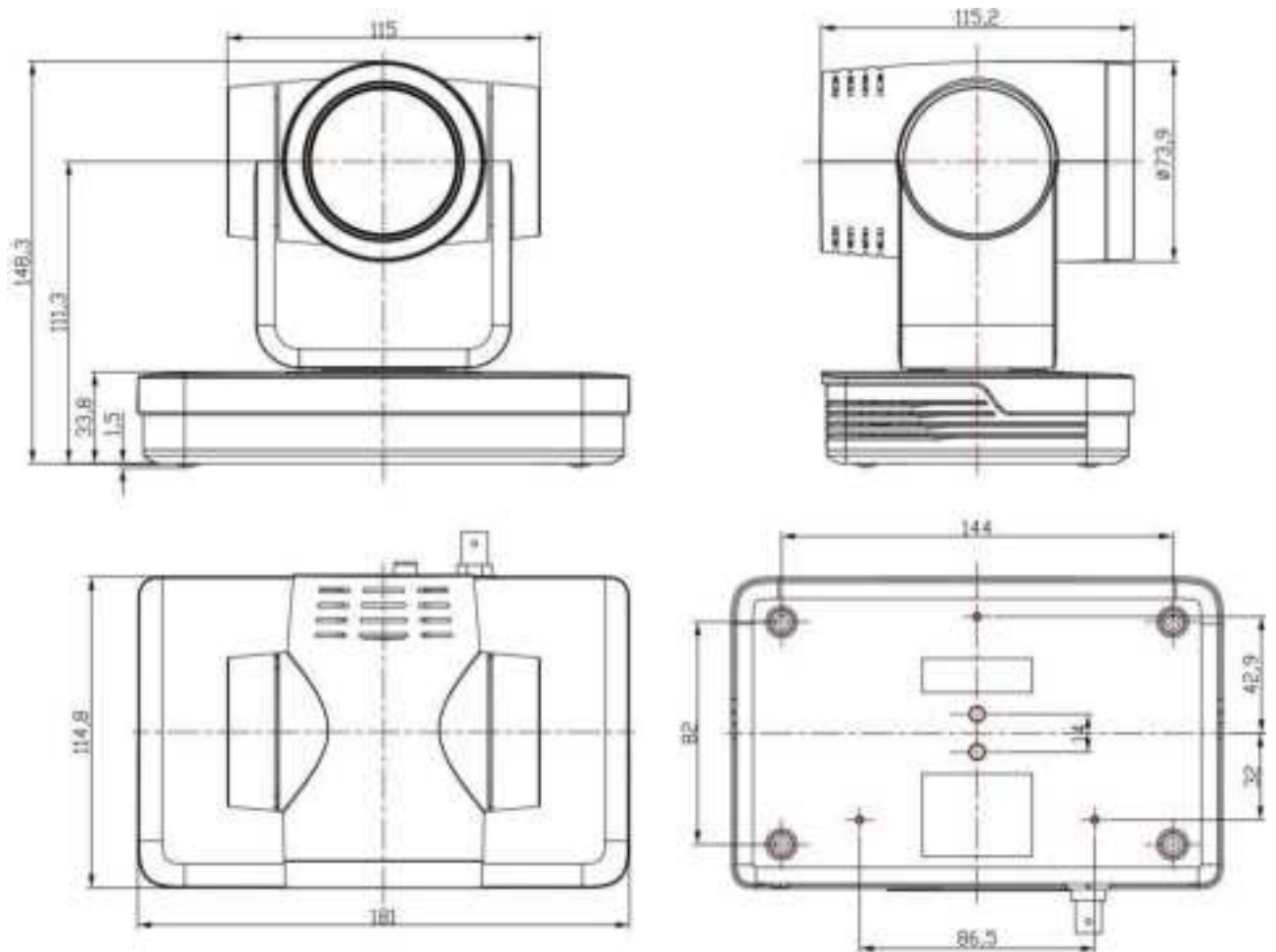


Figure2-1 Camera Product Dimension

2.1.2 Receiver Product Dimension

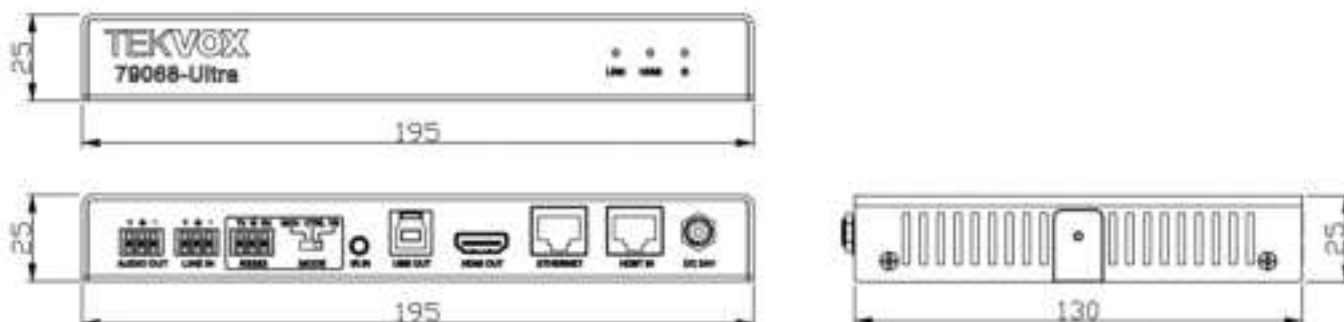


Figure2-2 Receiver Product Dimension

2.1.3 Accessory

When you unpack your package, check that all the supplied accessories are included:

Supplied Accessory	
Supplied	1 * 4K HDBaseT PTZ Camera
	4 * Plastic pad
	1 * HDBaseT Receiver
	1 * DC14V2.7A Power adapter
	1 * US Power Cable
	1 * USB 3.0 Cable
	1 * IR Remote
	1 * IR Receiver
	3 * 3-Pin Terminal Blocks
	2 * Mounting Ears with 2 screws
	1 * User manual
Optional	Wireless remote control
	Brackets for wall mounting
	Brackets for ceiling mount

2.2 Product Feature

The 79068-Ultra is an advanced 4K HDBaseT PTZ auto-tracking camera where we bring all the connections to you with only one Cat cable up to 328'. The camera features 12x optical zoom and supports up to 4K@30Hz resolution and includes both audio in and power for an Acoustic Magic Voice Tracker III microphone. The 79068-Ultra includes a receiver that supports all the connections you need including power, HDMI, USB 3.0, LAN, RS232, IR, and Audio in and out. The camera's sophisticated facial recognition and ISP algorithms deliver fast accurate tracking of a speaker as they move with no setup. All setup and video are provided using HTML5 GUI.

- **4K UHD Resolution:** 8.29M megapixel high quality SONY CMOS sensor. Resolution is up to 4K with frame rate up to 30fps.
- **Optical Zoom Lens:** 12X optical zoom wide-angle lens.
- **Leading Auto Focus Technology:** Fast, accurate and stable auto focusing technology.
- **Low Noise and High SNR:** 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:** Support HDMI, HDBaseT, USB 3.0, LAN interface; support POE power supply, USB 3.0 supports dual stream.
- **Multiple Audio/Video Compression Standards:** Support YUY2, MJPEG, H264, NV12 video encoding formats, MJPEG, H264support up to 3840×2160 resolution 30fps compression; support AAC audio compression.
- **Audio Input Interface:** Support AAC audio compression, AAC support 48000 sampling frequency.
- **Built-in Gravity Sensor:** Support PTZ auto-flip function and easy installation.
- **Multiple Network Protocol:** Support ONVIF, GB/T28181, RTSP, RTMP, VISCA OVER IP, RTMPS, SRT protocols; Support RTMP push mode, easy to be connected to streaming server (Wowza, FMS); Support RTP multicast mode.
- **Control Protocol:** Supports both RS232 and IP VISCA.
- **Quiet Pan / Tilt Movement:** With high accuracy step driving motor, camera can pan / tilt extremely quiet and smooth.
- **Low-power sleep function:** Support low-power sleep/wake-up, and the power consumption during sleep is less than 400mW.
- **Multiple Presets:** Up to 255 presets (10 presets via remote control).

- **AI Human Detection:** Built-in high-speed processor and advanced image processing and analysis algorithm, and real-time tracking and zone tracking modes are available, can switch the tracking object by clicking the person object frame on the webpage.
- **Multiple Application:** Online-education, Lecture Capture, Webcasting, Video conferencing, Tele-medicine, Unified Communication, Emergency command and control systems, etc.
- Extends up to 4K video, audio, LAN, power, RS232, and IR signals up to 328 feet (100m) over signal CAT cable.
- The receiver's line input mixes with the camera's audio and then output from USB and audio output.

2.3 Technical Specification

Table 2-1 Camera Lens Parameter

Camera Parameter	
Sensor	SONY CMOS IMX415 type 1/2.8 (diagonal 6.43mm) 8.46M
Effective Pixels	8.29M 16:9
Video Format	HDMI/HDBaseT: 4KP30,4KP25,1080P60,1080P50,1080P30,1080P25,720P60,720P50,1080P59.94,1080P29.97,720P59.94; USB 3.0: Up to 4K@60 Hz Main stream: YUY2/NV12: 1920×1080/1280×720/1024×576/800×600/800×448/640×360/640×480/480×270/320×180@30/25/20/15/10/5fps; MJPEG/H264: 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; LAN

	Main stream: 3840×2160/2560×1440/1920×1080/1600×896/1280×720/1024 ×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: 1920×1080/1280×720/640×360/640×480/320×240/320×180@3 0/25/20/15/10/5fps;
Optical Zoom	12X
Viewing Angle	Horizontal: 8° (N) ~ 80° (W)
Focal Length	3.5 ~ 42 mm ±5%
Iris Value	F1.8 ~ F3.3±5%
Digital Zoom	15X
Minimum Illumination	0.5 Lux (F1.8, AGC ON)
DNR	2D&3D DNR
White Balance	Auto / Manual/ One Push/ Specified Temperature
Focus	Auto/Manual/One Push Focus
Exposure Mode	Auto/Manual/Shutter priority/Aperture priority/brightness priority
Aperture	F1.8 ~ F1.1, CLOSE
Shutter Speed	1/25 ~ 1/20000
BLC	ON/OFF
WDR	OFF/ 1~8
Video Adjustment	Brightness, Color, Saturation, Contrast, Sharpness, B/W mode, Gamma curve

SNR	>50dB
------------	-------

Table 2-2 Interface Parameter

Interface Parameter	
Video Output	HDMI, HDBaseT, LAN, USB 3.0
Video Compression Format	MJPEG, H264, YUY2, NV12
Audio Input	Double track 3.5mm linear input;
Audio Output	HDMI, HDBaseT, LAN, USB 3.0
Audio Compression Format	AAC
LAN RJ45	10M/100M adaptive Ethernet port, support POE power supply, support audio and video output
Network Protocols	RTSP, RTMP, ONVIF, GB/T28181, VISCA OVER IP, RTMPS, SRT, Support remote upgrade, remote restart, remote reset
HDBaseT	Extend HDMI audio and video signal, Ethernet, infrared, serial signals up to 328' (100m) V2.0
Control Jacks	RS232-IN
Serial Port Communication Protocols	VISCA Support Baud Rate: 115200/38400/ 9600 /4800/2400
USB Communication Protocol	UVC (Video Communication Protocol) , UAC (Audio Communication Protocol)
Power Supply	HEC3800 Outlet (DC12V)
Power Adapter	AC110V~AC220V to DC12V/2.5A
Input Voltage	Camera DC12V±10% (Not needed when using receiver)
Input	<1A

Consumption	<12W
--------------------	------

Table 2-3PTZ Parameter

PTZ Parameter	
Pan Move	-170° ~ +170°
Tilt Move	-30° ~ +90°
Pan Speed	0.1°/s ~ 35°/s
Tilt Speed	0.1°/s ~ 30°/s
Preset Speed	Pan: 35°/s, Tilt: 30°/s
Preset Quantity	Up to 255 preset (10 via remote control)

Table 2-4Other Parameter

Other Parameter	
Storage Temperature	-10℃ ~ +70℃
Storage Humidity	20% ~ 90%
Working Temperature	-10℃ ~ +50℃
Working Humidity	20% ~ 80%
Dimension	181(L)mm*115mm(W)*149mm(H)
Weight	1.2kg
Environment	Indoors

Table 2-5 Accessory Parameter

Accessory	
Supplied Accessory	Power Supply, RS232 Control Cable, USB 3.0 Cable, IR Remote Control, User Manual
Optional Accessory	Ceiling / Wall Mount (Extra Cost)

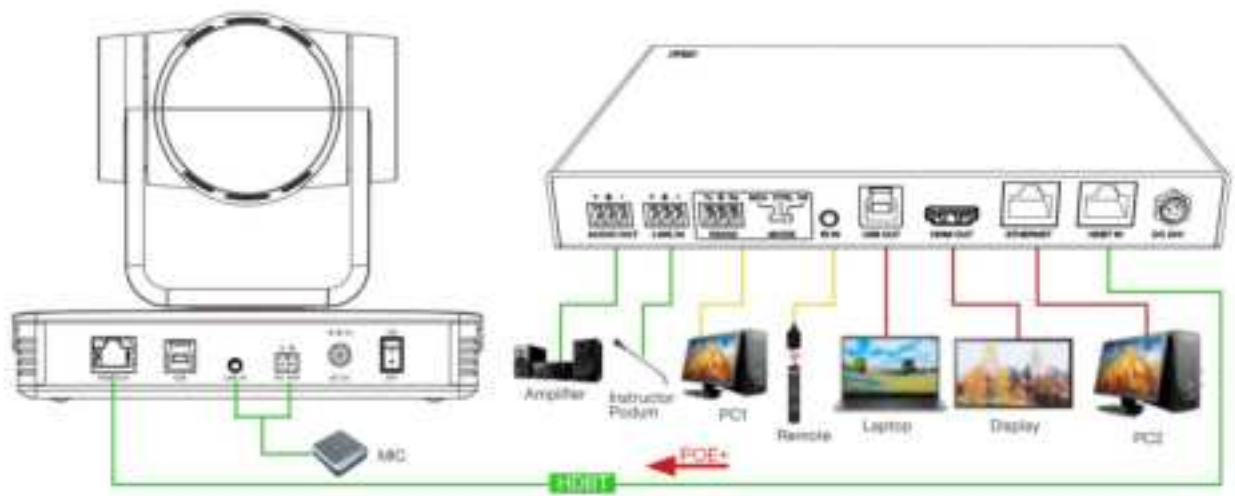
Table 2-6 AI Function

AI Function	
Real-time Tracking Mode	The longest tracking distance can reach 6-7 meters (22'), which can support the speaker to walk at a speed of 3-4 mph
Zone Tracking Mode	4 tracking zones are available, which can be set within -170° ~ +170° in horizontal and -30° ~ +90° in vertical.
Person Selection	Select the tracking object by clicking the people object box on the web page.

Receiver	
Inputs	1 HDBaseT (RJ45, Female) 1 Line In (3-pin Phoenix, balanced mono)
Outputs	1 HDMI (19-pin, Female) 1 USB (USB 3.0 Type-B, Female) 1 Audio Out (3-pin Phoenix, balanced mono)
Output Resolution	HDMI: Up to 4Kx2K @ 30Hz 4:4:4 USB: Up to 4K@60 Hz
Line Level	10dBv with max level of 6dBv
Max Output Level	2.0 ± 0.1Vrms
Total Harmonic Distortion + Noise (THD+N)	< 1%, 20Hz to 20kHz bandwidth, 1kHz sine at 0dBFS level (or max level)
Signal-to-Noise Ratio (SNR)	> 80dB, 20Hz to 20kHz bandwidth

Noise Level	-80dB
Control Ports	1 USB (USB 3.0 Type-B, Female) 1 TCP/IP (RJ45, Female, 1 with PoE) 2 IR (In/Out, 3.5mm mini jack) 1 RS232 (3-pin Phoenix)
Other Parameter	
Maximum Transmission Distance	4Kx2K @ 60Hz 4:2:0 / 1080p @ 60Hz: 328 ft (100m)
Storage Temperature	-10°C ~ +70°C
Storage Humidity	20% ~ 95%
Working Temperature	-10°C ~ +50°C
Working Humidity	20% ~ 80%
Dimension	195mm (7.68')L*130mm(5.12')W*25(0.98')H
Environment	Indoors

2.4 System Connection



3. How to Use

3.1 Video Output

3.1.1 Power-on Self-test

After powering on, the camera will have initial configuration and receiver the light will flash. 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).

3.1.2 Video Output

1) Network output: Connect this product and your computer through network cable, then open the browser, enter the camera IP address (factory default 192.168.5.163) in the address bar and login using the default username and password (factory default are "admin").



- If you forget your username, password, IP address, you can manually restore the default by the remote controller key combination * + # + Manual.
-

2) HDBaseT (Receiver Only), HDMI Output: Connect the monitor with the corresponding video output interface.

3) USB 3.0 Output (Receiver): Connect this product to computer USB 3.0 interface and open USB streaming software like windows Camera or Zoom and select the camera as a video source.

3.2 Remote Control

Please read the following content for operating the IR remote including special button sequence entries.

3.2.1 IR Remote Control



1. Standby Key

After a 3-second-long press, the camera will step into standby mode. Long press again for 3-seconds, the camera will self-test again and back to HOME position. (Note: If power-on mode is turned on and Preset 0 is set, and there is no operation within 12-seconds, it will automatically point to the specified preset position.

2. Camera Address Selection

Select the camera address which wants to be controlled

3. Number Key

Set or run 0-9 presets

4. *# Key

Key combination use

5. Focus Control Key

Auto Focus: Enter auto focus mode.

Manual Focus: The camera focus mode is manual

Switch the camera focus mode to manual focus by pressing

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 camera home position or enter 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 username, password, and IP address

13. AI Function Short Keys



【F1】: Turn off AI Human Detection

【F2】: Turn on AI Human Detection

【F3】: Switch figure tracking mode

【F4】: Chang tracking target on real tracking mode

3.2.2 Remote Control Usage

Users can control the pan/tilt/zoom, setting and running preset positions via the IR remote controller.

Key Instruction:

1. In this instruction, “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, do it in sequence. For example, “ 【 *】 + 【#】 + 【F1】 ” means press“ 【*】 ”first and 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 ▶

Back 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 by remote controller.

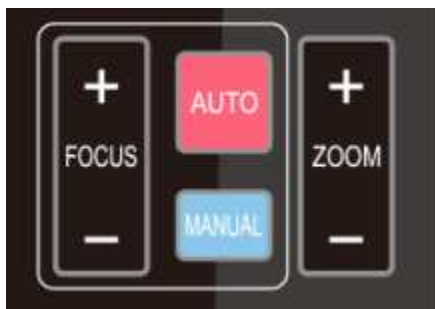
2. Preset Running: Press a number key 0-9 directly to run a relative preset.

Note: There is no action if a relative preset position is not saved.

3. Preset clearing: to clear a preset position, the user can press the “【CLEAR PRESET】” key first and then press the number key 0-9 to clear the relative preset;

Note: Press the “【#】” key three times continually to cancel all the presets.

4) Zoom Control

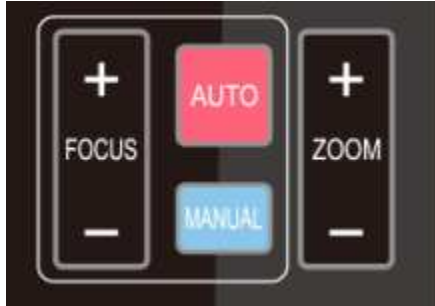


5) Focus Control

ZOOM IN: press “ZOOM ▼” key

ZOOM OUT: press “ZOOM ▲” key

Press and hold the key, the camera will keep zooming in or zooming out and stops as soon as the key is released.



Focus (near): Press “ 【focus+】 ” key (Valid only in manual focus mode)

Focus (far): Press “ 【focus-】 ”key (Valid only in manual focus mode)

Auto Focus: Support

Manual Focus: Support

Press and hold the key, the action of focus will keep continue and stops as soon as the key is released.

6) Camera Remote Controller Address Setting



【*】 + 【#】 + 【F1】 :Camera Address No.1

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

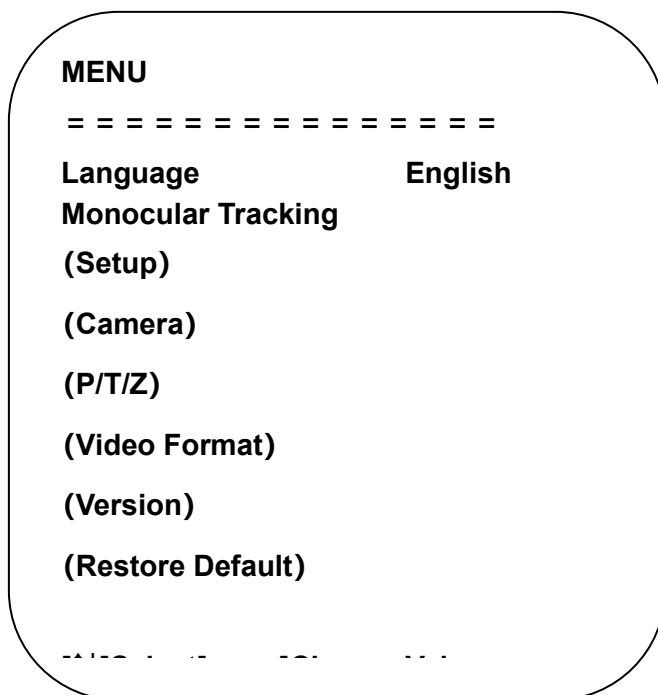
【*】 + 【#】 + 【F3】 :Camera Address No. 3

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

3.3 Menu Setting

3.3.1 Main Menu

In normal working mode, press 【MENU】 key to display the menu, using scroll arrow to point at or highlight the selected items.



Language: Chinese/English

Monocular Tracking: Enter into submenu of system setting

Setting : Enter into submenu of system setting

Camera Parameter: Enter into submenu of camera parameter

P/T/Z : Enter into submenu of PTZ parameter

Version: Enter into submenu of version

Restore Factory Default: Select Yes or No to restore factory default.

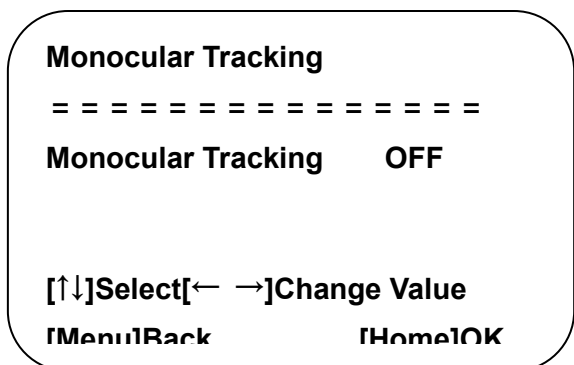
[↑↓]Select: Press [↑↓] to Select menu

[← →]Revise: Press [← →] to revise parameter

[Menu]Return: Press [Menu] to return

[Home]Confirm: Press [Home] to confirm

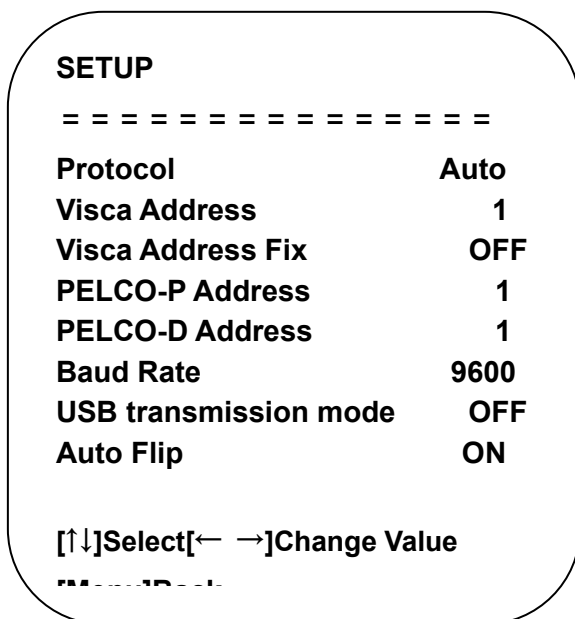
3.3.2 Monocular Tracking



Monocular Tracking: On/Off

3.3.3 System Setting

Move the pointer to the (Setup) in the Main Menu, click the **【HOME】** key and enter the (System Setting) as shown below. PELCO is not supported.



PROTOCOL: VISCA

Address: VISCA=1~7

Baud Rate:
2400/4800/**9600**/38400/115200

Visca Address Fix: On/Off

USB dual stream: On/Off

Auto Flip: On/Off

3.3.4 Camera Parameter Setting

Move the pointer to the (CAMERA) in the Main Menu, click the **【HOME】** key and enter the (CAMERA) as follow

CAMERA
=====

(Exposure)
(Color)
(Image)
(Focus)
(Noise Reduction)

Style **Default**

[↑↓]Select **[← →]Change Value**

Exposure: Enter into Exposure setting

Color: Enter into color setting

Image: Enter into image setting

Focus: Enter into focus setting

Noise Reduction: Enter into noise reduction

Style: Default, standard, clear, bright, soft

1) Exposure

Move the pointer to the (EXPOSURE) in the Main Menu, click the **【HOME】** and enter the (EXPOSURE SET) as follow

EXPOSURE
=====

Mode **Auto**
EV **OFF**
BLC **OFF**
Flicker **50Hz**
G. Limit **3**
DRC **Close**

[↑↓]Select **[← →]Change Value**
[Menu]Back

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, 1/180, 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 :Close,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 size of the gain, 0 ~ 15 (Only available in manual mode and shutter priority mode)

2) Color

Move the pointer to the (COLOR) in the Main Menu, click the **【HOME】** and enter the (COLOR SET) as follow

COLOR	
=====	
WB Mode	Auto
RG Tuning	0
BG Tuning	0
Saturation	40
Hue	4
AWB Sensitivity	High
[↑↓]Select[← →]Change Value	
[Menu]Back	

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: 0~100(only available in Manual mode)

Blue Gain: 0~100(only available in Manual mode)

Saturation: 0~127

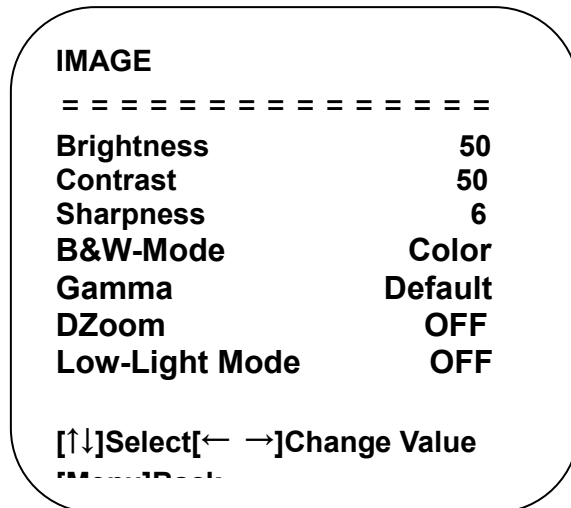
AWB Sensitivity: high/middle/low (only available in Auto mode)

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

Chroma: 0~8

3) Image

Move the pointer to the (IMAGE) in the Menu, click the 【HOME】 and enter the (IMAGE) as follow



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

Move the pointer to the (FOCUS) in the Menu, click the 【HOME】 and enter the (FOCUS) as follow.

FOCUS
=====

Focus Mode	Auto
AF-Zone	All
AF-Sensitivity	Low

[↑↓]Select [← →]Change Value
[Menu]Back

Focus Mode: Auto, manual, one push

AF-Zone: ALL/Top/Center/Bottom

AF-Sensitivity: High, middle, low

5) Noise Reduction

Move the pointer to the (NOISE REDUCTION) in the Menu, click the 【HOME】 and enter the (NOISE REDUCTION) as follow

NOISE REDUCTION
=====

NR-2D	2
NR-3D	5

[↑↓]Select [← →]Change Value
[Menu]Back

Noise Reduction: OFF, 1~8

3.3.5 P/T/Z

Move the pointer to the (P/T/Z) in the Main Menu, click the 【HOME】 and enter the (P/T/Z) as follow

P/T/Z

=====

Speed by zoom	ON
Zoom speed	5
Image Freezing	OFF
Acc Curve	Slow
Preset speed	10

[↑↓]Select [← →]Change Value

MenuBack

Speed by zoom: On/OFF – When settings is on and using the IR remote, the speed of the PTZ is determined by the field of view.

Zoom Speed: Set the zoom speed for IR remote controller and control commands.

Image Freezing: On/OFF - Freezes the image during a preset recall.

Accelerating Curve: Fast/Slow

Preset Speed: 1-10

3.3.6 Video Format

Move the pointer to the (Video Format) in the Menu, click the **【HOME】** and enter the (Video Format) as follow

VIDEO FORMAT
=====

4K30
4K25
1080P60
1080P50
1080P30
1080P25
720P60
720P50
1080P59.94
1080P29.97
720P59.94

[↑↓]Select
[Menu]Back **[Home]OK**



- Exit menu after modifying parameter to save it
-

3.3.7 NETWORK

Move the pointer to (Network Settings) in the main menu and press the **[HOME]** key to enter the version page. The version information varies depending on the specific product.

Dynamic protocol: Set camera network DHCP, on/off

NETWORK settings
=====

DHCP **OFF**
IP Addr: **192.168.5.163**
Subnet Mask: **255.255.255.0**
Gateway: **0.0.0.0**

[↑↓]Select **[← →]Change Value**
[Menu]Back

3.3.8 Version

Move the pointer to the (VERSION) in the Main Menu, click the **【HOME】** and enter the (VERSION) as follow

VERSION
=====

MCU Version	3.2.0
Camera Version	1.0.0
AF Version	1.0.0

[Menu]Back

MCU Version: Display MCU version information

Camera Version: Display camera version information

AF Version: Display the focus version information

3.3.9 Restore Default

Move the pointer to the (VERSION) in the Main Menu, click the **【HOME】** and enter the (VERSION) as follow.

RESTORE DEFAULT
=====

Restore Default?	NO
-------------------------	-----------

[↑↓]Select **[← →]Change Value**
[Menu]Back **[Home]OK**

Restore default: Yes/No (after restoring default, the language, color, and video format won't be restored)



- If the address of former remoter is not 1 but another one from 2,3,4, the corresponding camera address will restore to 1 when all parameters or system parameters are restored. User should change the remoter address to be 1 (press No.1 according to the camera so to get normal operation)
-

4. Network Connection

4.1 Connection Method

Direct Connection: Direct connections via “cross-over” network cable

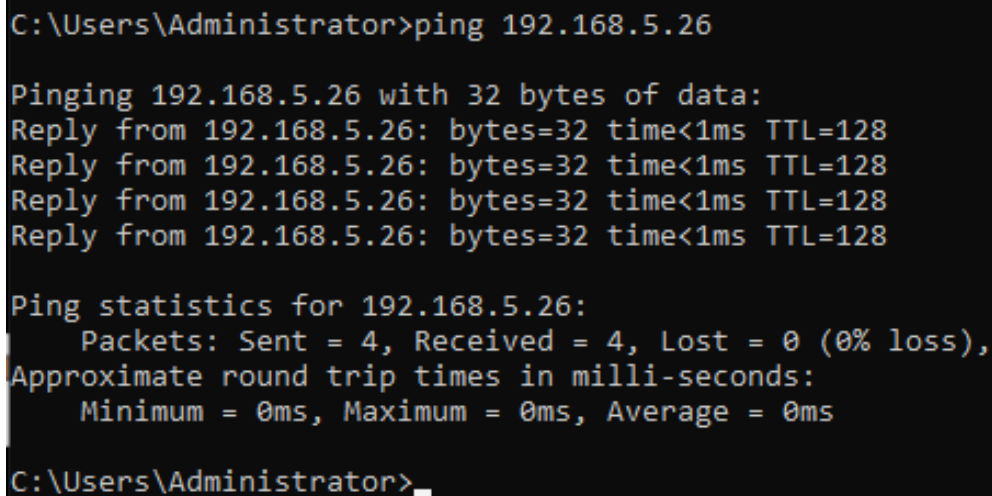
Connection to LAN: Connections to LAN via patch cable to LAN wall jack or LAN switch. The default camera IP is 192.168.5.163.



The computer must be on the same network segment as the camera. The camera's default IP address is 192.168.5.163.

- The computer IP address cannot be same as other computers or devices.
-

Click the “Start” and select “Operation” to input cmd, open DOS command window and input 192.168.5.26, then press Enter key. It will show picture as below, which means network segment has been successfully added.



```
C:\Users\Administrator>ping 192.168.5.26

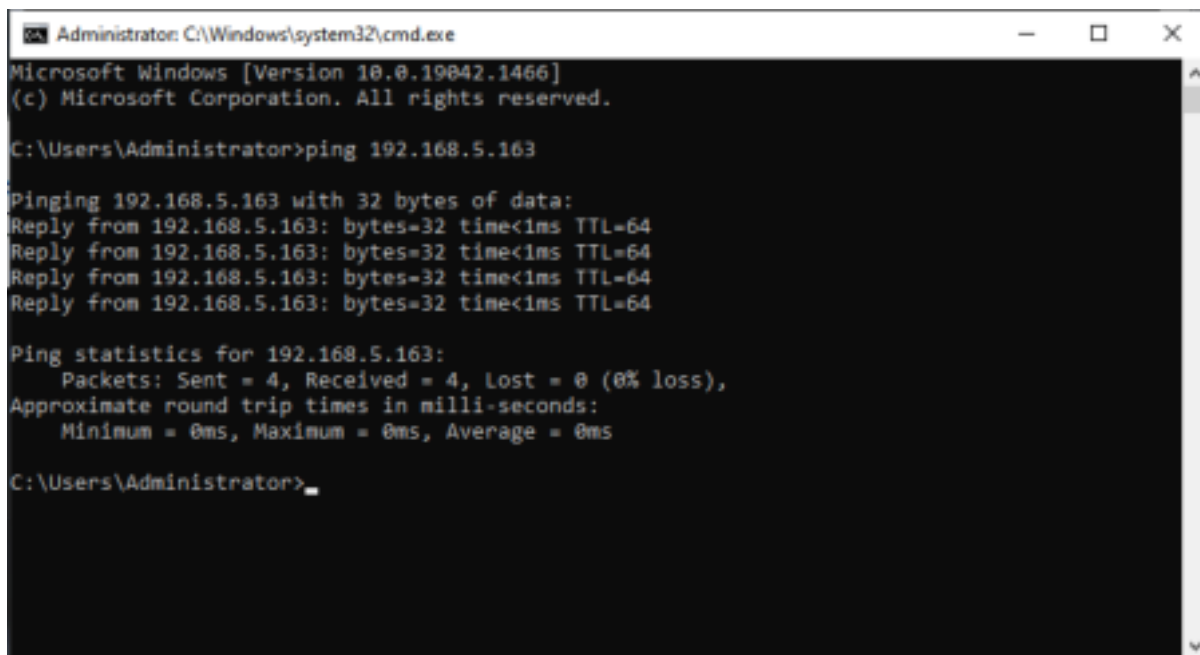
Pinging 192.168.5.26 with 32 bytes of data:
Reply from 192.168.5.26: bytes=32 time<1ms TTL=128
Reply from 192.168.5.26: bytes=32 time<1ms TTL=128
Reply from 192.168.5.26: bytes=32 time<1ms TTL=128
Reply from 192.168.5.26: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.5.26:
    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>
```

Figure 4-1 Network segment successfully added

User can also to verify network connection as steps above mentioned after the finish of camera self-check. If IP is default, open DOS command window and input 192.168.5.163, then press Enter key. It will show message as below: which means network connection is normal.

A screenshot of a Windows Command Prompt window titled "Administrator: C:\Windows\system32\cmd.exe". The window shows the output of a ping command to the IP address 192.168.5.163. The output indicates that the connection is successful, with four packets sent and received, and a 0% loss rate. The round trip times are all 0ms.

```
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>
```

Figure 4-2 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 login to the GUI as administrator or user. If as administrator, type in "admin" into the username and password fields. If as user, type in "user1" or "user2" into the username and password fields.

Note:

1. If login as "user", your rights are limited to preview, playback, and logout (No configuration right)
2. Browsers that support Web function are Google, IE, 360 and other popular browsers.

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

1) Login as administrator

Username and default password: admin

You can control all the features of the camera.



2) Login as user

Username and default password: "user1" or "user2"

You can control PTZ, zoom, focus, sound, zoom in, full screen and set run, and delete the preset position.



- There is no configuration permission for normal user login.
-

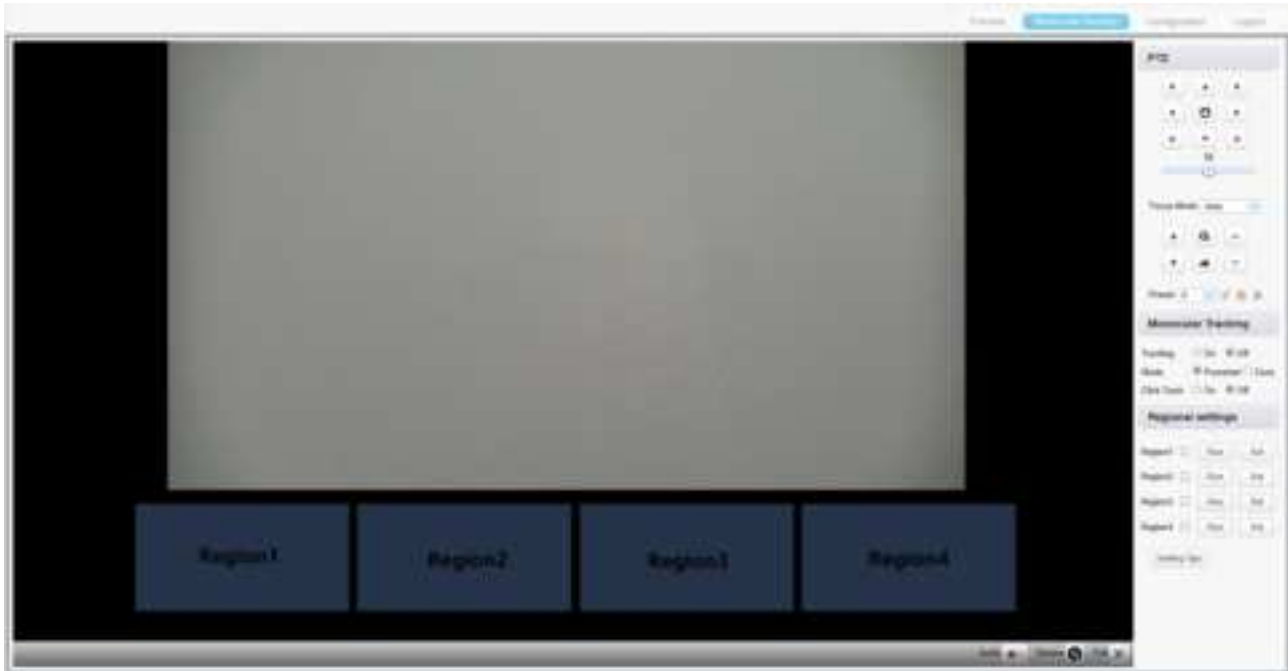
4.2.2 Preview

After successful login into the management interface, it enters the video preview interface. In the preview screen, users can control PTZ, zoom, focus, sound, zoom in, full screen and set the preset position, run, delete and other operations.



4.2.3 Monocular tracking

Clicking the Monocular tracking tab allows setting the Mode, turning on or off Tracking, and turning on or off click tracking.



Caution

- When tracking is on the PTZ and presets do not work.
-

I. Mode

- Presenter – This mode tracks the person while they are moving.
- Zone - This mode is used to create zones where the camera will stop tracking while the person is moving within the set zone.

II. How to set up Presenter auto-tracking

- Set preset 0 to the default area where the camera points to when it loses tracking.
- Set a preset for where tracking should start. This would typically be a podium position where the presenter is at.
- Before enabling tracking, recall the start preset. This way the camera is pointing at the presenter that wants to be tracked.
- Disable tracking when system is off.

III. How to set up Zone auto-tracking

- Set preset 0 to the default area where the camera points to when it loses tracking.
- Set up the regions. These are the areas on the stage where you want the camera to go to when a person walks into that area. The zones will capture the saved image.
- Set a preset for where tracking should start. This would typically be a podium position where the presenter is at.
- Before enabling tracking, recall the start preset. This way the camera is pointing at the presenter that wants to be tracked.
- Disable tracking when system is off.

4.2.4 Configuration

Click Configuration to enter the device parameters setting page.



The following options are available:

Table 4-1 Explanation of Camera Configuration

Menu	Explanation
Audio configuration	Including audio compression format, sampling frequency, sampling precision, compression bit rate and other settings
Video Configuration	Including video encoding, video parameters, character-overlapping, character size, video output settings etc.
Network Configuration	Including network port, Ethernet parameters, wireless network (only with wireless module), DNS parameters, GB28181 etc.
System Configuration	Including equipment property, system time, user management, version update, Reset, Reboot device settings etc.

4.2.5 Audio Configuration



Enable: Choose to enable the audio or not.

Compressing Format: Set audio compressing format and manually reboot the device after change (default AAC optional)

Sampling Frequency: Set sampling frequency and manually reboot the device after change (default 48000 optional)Ms

Sampling Precision: Set sampling precision (default 16bits)

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

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

Input volume: set the input volume (default 4,1-10 optional)

Note Click “SAVE”, it will display “Successfully saved. Restart the device to take effect”.

4.2.6 Video Configuration

1) Video Encoding

Video encoding can be used to stream to a touch panel using the Stream Name.

Stream	Main Stream	Sub Stream
Compressed Format	H.264	H.264
Profile	HP	HP
Image Size	1920*1080	640*360
Rate Control	CBR	CBR
Image Quality	Best	Better
Bit Rate(Kb/s)	4096	512
Frame Rate(F/S)	60	25
I Frame Interval	180	75
I Frame Min QP	20	20
Stream Name	live/av0	live/av1

Compression Format: Set the video compression format, save to take effect (Main / Sub stream default: H.264,H.265 optional)

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

Image Size: Set video image resolution, save to take effect

Main Stream: default 1920 * 1080, 1280 * 720, 640*480, 640*360

Sub Stream: 320*180, 320 * 240, 640*360, 640*480, 1280*720,1920*1080

Stream Rate Control: Set rate control mode as CBR (Constant Bitrate) or VBR (Variable Bitrate) save to take effect.

Image Quality: Set the image quality, this can only be changed when VBR is set.

Bit Rate (Kb / s): Set the video bit rate (Main stream default 4096Kb / s, 64-40960Kb/s optional; Sub stream default 512Kb/s, 64-40960Kb/s optional).

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

Key frame interval: Set the key frame interval (Main stream default 90 / Sub 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: Main Stream(live/av0), Sub stream(live/av1)

Click the "Save" button to display the "Parameter saved successfully" message, then settings take effect. Best to use live/av1 for streaming to touch panels at 640*360.

2) Stream Publish

	Main Stream	Sub Stream
Stream		
Enable	☐	☐
Protocol Type	RTMP	RTMP
Host Address	192.168.5.11	192.168.5.11
Host Port	1935	1935
Stream Name	live/av0	live/av1
Username		
Password		
Password for stream encryption		
Crypto key length in bytes	0	0

Save

Enable: To turn on/off the main / Sub stream.

Protocol: Main / Sub stream applies RTMP protocol, RTSP, SRT

Host Address: server IP addresses (default 192.168.5.11)

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

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

User: Set the username.

Password: Set the password.

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

3) RTP Multicast

Stream	Main Stream	Sub Stream
Enable	☐	☐
Protocol Type	RTP	RTP
Address	224.1.2.3	224.1.2.3
Port	4000	4002
Access Method	rtp://224.1.2.3:4000	rtp://224.1.2.3:4002

Save

Enable: On/Off

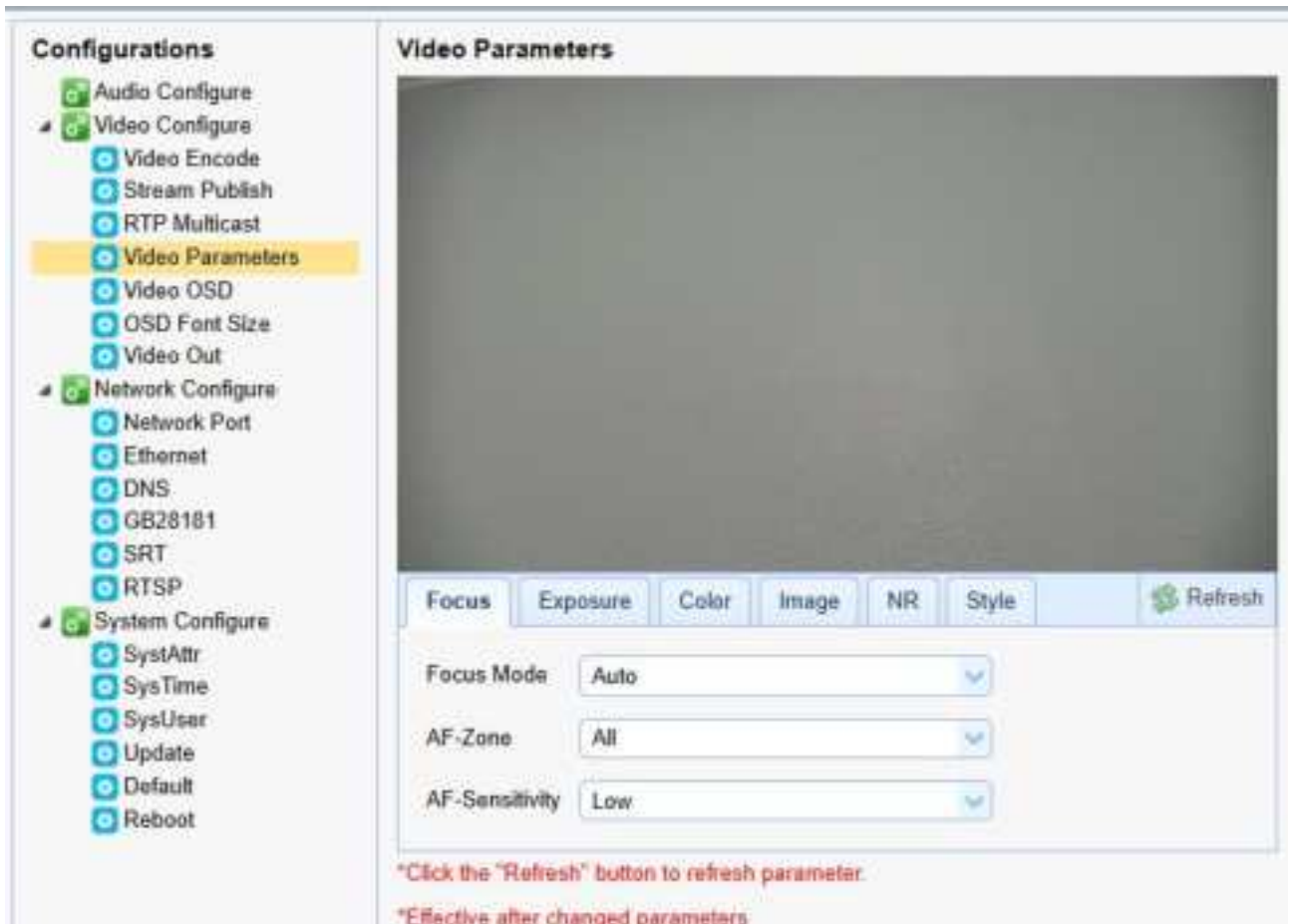
Protocol: RTP, TS optional

Address: Default 224.1.2.3. It can be edited.

Port: The Main stream defaults to 4000, the Sub stream defaults to 4002, and the main/Sub stream is optional from 0 to 65535.

Access Method: Address comes up after setting. Eg; rtp://224.1.2.3:4000;

4) Video Parameters



A) Focus: Focus Mode, AF-Zone, AF-Sensitivity can be set.

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

AF-Zone: Set the focus tactic (Default Up, middle, Down, and all are optional)

AF-Sensitivity: Set the focus sensitivity (Default is low, high, medium optional)

B) Exposure: Exposure Mode, EV (Exposure compensation), BLC (Backlight compensation), Flicker, G Limit (Gain Limit), shutter, aperture, brightness, gain can be set.

Mode: Set the exposure mode (Default automatic, manual, shutter priority, aperture priority, brightness priority optional)

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

EV Level: Set the exposure compensation value, valid when Exposure Compensation is on (default 0,-7 to 7 optional).

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

Flicker: Set anti-flicker compensation, valid in automatic exposure mode, iris priority, and brightness priority. (default 50Hz, off, **60Hz** optional). Set to the country's line rate.

G Limit: Set the gain limits, valid in auto focus, iris priority, and brightness priority. (default 4, off, 0~15 optional)

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

C) Color: WB Mode (White balance), RG Tuning (red gain), BG (blue gain), Saturation, Hue, AVB Sensitivity (white balance).

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

RG Tuning: Set the red gain, valid in manual white balance mode (default 45, 0-100 optional).

BG Tuning: Sets the Blue gain, valid in manual white balance mode (default 45, 0-100 optional).

Saturation: Set the saturation (default 40, 0-127 optional).

Hue: Set the color Hue (default 4, 0-8 optional).

AWB Sensitivity: Auto white balance Sensitivity settings (default is high, low and medium optional).

D) Image: You can be set to adjust brightness, contrast, sharpness, gamma curve, black-and-white mode, horizontal flip, vertical flip, digital zoom, and ultra-low light mode.

Bright: Set the brightness (default 50, 0-100 optional).

Contrast: Set the contrast (default 50, 0-100 optional).

Sharpness: Set the sharpness value (default 6, 0-15 optional).

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

B&W Mode: Set black and white mode (default color, black and white optional)

Auto Flip: Set image flip (default on)

DZoom: Set electronic zoom (default off). Do not use it for auto-tracking.

Low-Light Mode: Set ultra low illumination (default off)

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

2D Noise Reduction: Set 2D noise reduction level (default 2, 1-7 and off optional).

3D Noise Reduction: Set 3D noise reduction level (default 5, 1-7 and off optional).

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



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

5) Video OSD (Not Supported)

6) OSD Font Size (Not Supported)

7) Video Output



Output Format: Selectable video output formats include 3840*2160P30, 3840*2160P25, 1080P60, 1080P50, 1080P30, 1080P25, 720P60, 720P50, 1080P59.94, 1080P29.97, and 720P59.94.

4K output options: Set USB output 4K, network stream 1080P, network stream output 4K, USB1080P optional

Click the "Save" button. A prompt message "(4K output options will take effect after restart)" will appear. The device will automatically restart, and the settings will be applied.

4.2.7 Network Configuration

1) Network Port

Configurations	Network Port
Audio Configure	Port Data: 3000
Video Configure	Port Web: 80
Video Encode	Port Onvif: 2000
Stream Publish	Port Soap: 1936
RTP Multicast	Port RTMP: 1935
Video Parameters	Port Rtsp: 554
Video OSD	Port Visca: 1259
OSD Font Size	Port Https: 443
Video Out	Port WebSocket: 8088
Network Configure	
Network Port	
Ethernet	
DNS	
GB28181	
SRT	
RTSP	
System Configure	
SystAttr	
SysTime	

Save

Port Data: set the data port. (default 3000,0-65535 optional).

Port Web: Set Web port. (default is 80, 0-65535 is optional).

Port Onvif: Set Onvif port. (default 2000, 0-65535 optional).

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

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

RTSP Port: Set RTSP port. (default 554,0-65535 optional).

Port Visca: Set Visca port. (default 1259,0-65535 optional).

Port Https: Set https port. (default 443, 0-65535 optional).

Port WebSocket: Set Web Socket port. (default 8088, 0-65535 optional).

Click on the "Save" button, it will be valid when display "Save successful". **Power cycle or reboot the camera.**

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

The screenshot shows a web-based configuration interface for a device. On the left, a 'Configurations' sidebar lists various settings. Under 'Video Configure', options like 'Video Encode', 'Stream Publish', 'RTP Multicast', 'Video Parameters', 'Video OSD', 'OSD Font Size', and 'Video Out' are listed. Under 'Network Configure', 'Network Port' and 'Ethernet' are listed, with 'Ethernet' currently selected and highlighted in yellow. The main panel, titled 'Ethernet', displays the following settings: 'DHCP' is enabled (checkbox checked), 'IP Address' is set to '192.168.10.121', 'Subnet Mask' is '255.255.255.0', 'Default Gateway' is '192.168.10.1', and 'MAC Address' is 'E4:77:D4:AE:83:6D'. A 'Save' button is located at the bottom right of the main panel.

DHCP: Enable or disable to obtain IP automatically. (default off)

IP Address: Set the IP address. (default 192.168.5.163).

Note: This IP address is the same used to login to Web page.

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

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

MAC Address: Set the physical address (the parameter is read-only)

Click the "Save" button, it will be valid when display "Save successful". (Note: To prevent IP conflicts when modified). **Power cycle or reboot the camera.**

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, it will be valid when display "Save successful".

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, it will be valid when display "Save successful".

5) SRT (Secure Reliable Transport)

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, and the prompt message "Parameters saved successfully! It will take effect after restarting!"

7) RTSP

Enable RTSP: Enable/Disable RTSP

RTSP Authentication: Set RTSP authentication, default off, on optional

Click the "Save" button, and the prompt message "Save successfully! Modify RTSP authentication parameters will take effect after restarting the device!" will be displayed. After setting, restart the camera to take effect.

4.2.8 System Configuration

1) System Attributes

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 English, Chinese optional).

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

2) System Time

Date Format: Set the date format (YYYY-MM-DD default 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/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, it will be valid when display "Save successful".

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 (only the time setting method is manual setting)

3) System User

Authority: Set the user type (the default administrator, User 1, User 2 optional)

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

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

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

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

Please note the capitalization of user name and password



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

4) Update

The version information displayed on the page is read-only version 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 is 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 update, device will automatically reboot. (Note: Make sure that the device power and network can work during update, if not, the upgrade will fail.)



- 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 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.

4.2.9 Logout

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

5. Serial Port Communication Control

Camera control can be through RS232 or the LAN port on the receiver. The parameter of RS232 is as below:

Baud rate: 2400/4800/**9600**/38400/115200/second

Start Bit: 1 bit;

Data Bit: 8 bit;

Stop Bit: 1 bit;

Verification Bit: None.

LAN: TCP/IP port 1259

After a power on, the camera performs a calibration self-test of the lens.

The zoom lens is pulled to the farthest position, and then pulled back, after the self-test is completed.

If the camera has saved preset number 0, the camera will be set to preset position 0 after the initialization is completed.

Allow about 10 seconds before sending control commands.

VISCA Protocol List

Note: There is no need to use the AddressSet and IF_Clear commands. The camera is always set to device address 81.

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 = 81

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	

Command	Function	Command Packet	Remark
	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	pqrs: Zoom Position
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

Command	Function	Command Packet	Remark
	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	
	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	

Command	Function	Command Packet	Remark
	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	
	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	

Command	Function	Command Packet	Remark
	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	
	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

Command	Function	Command Packet	Remark
	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	
	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_ExpComp	On	8x 01 04 3E 02 FF	Exposure Compensation ON/OFF
	Off	8x 01 04 3E 03 FF	

Command	Function	Command Packet	Remark
	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_Backlight	On	8x 01 04 33 02 FF	Back Light Compensation
	Off	8x 01 04 33 03 FF	
CAM_WDR Strength	Reset	8x 01 04 21 00 FF	WDR Level Setting
	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_Gamma		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: 0-15
CAM Preset Speed		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

Command	Function	Command Packet	Remark
	60HZ	8x 01 04 23 02 FF	60HZ
CAM_Aperture	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	
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=0-7F
CAM_IDWrite		8x 01 04 22 0p 0q 0r 0s FF	pqrs: Camera ID (=0000 to FFFF)
CAM_Preset Freeze	ON	8x 01 07 01 02 FF	Freeze image during preset recall
	OFF	8x 01 07 01 03 FF	Freeze image during preset recall
IR_Receive	ON	8x 01 06 08 02 FF	IR(remote commander)receive On/Off
	OFF	8x 01 06 08 03 FF	

Command	Function	Command Packet	Remark
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
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 0p FF	P: 0~E Video format
Pan_Tilt Drive	Up	8x 01 06 01 VV WW 03 01 FF	VV: Pan speed 0x01 (low speed) to 0x18 (high speed) WW: Tilt speed 0x01 (low speed) to 0x14 (high speed) YYYY: Pan Position ZZZZ: Tilt Position
	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	

Command	Function	Command Packet	Remark
	DownRight	8x 01 06 01 VV WW 02 02 FF	
	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 Limit Set	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	
Tracking	Tracking OFF	81 0A 01 32 00 00 03 00 FF	Tracking OFF/ON
	Tracking ON	81 0A 01 32 00 00 02 00 FF	
	Real time tracking mode	81 0A 01 32 00 00 02 00 FF	
	zone tracking mode	81 0A 01 32 00 00 02 01 FF	

5.1.3 Inquiry Command

Command	Command Packet	Return Packet	Remark
CAM_Power Inq	8x 09 04 00 FF	y0 50 02 FF	On
		y0 50 03 FF	Off(Standby)
CAM_Zoom Pos Inq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_Focus AF Mode Inq	8x 09 04 38 FF	y0 50 02 FF	Auto Focus
		y0 50 03 FF	Manual Focus
		y0 50 04 FF	One Push mode
CAM_Focus Pos Inq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position
CAM_AF Sensitivity Inq	8x 09 04 58 FF	y0 50 01 FF	High
		y0 50 02 FF	Normal
		y0 50 03 FF	Low
CAM_AF Zone Inq	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_WB Mode Inq	8x 09 04 35 FF	y0 50 pq FF	Pq=WBMode
CAM_AWB Sensitivity Inq	8x 09 04 A9 FF	y0 50 00 FF	Low
		y0 50 01 FF	Normal
		y0 50 02 FF	High
CAM_RGain Inq	8x 09 04 43 FF	y0 50 00 00 0p 0q FF	pq: R Gain

Command	Command Packet	Return Packet	Remark
CAM_BGain Inq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: B Gain
CAM_AE Mode Inq	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_Shutter Pos Inq	8x 09 04 4A FF	y0 50 00 00 0p 0q FF	pq: Shutter Position
CAM_Iris Pos Inq	8x 09 04 4B FF	y0 50 00 00 0p 0q FF	pq: Iris Position
CAM_Gain Limit Inq	8x 09 04 2C FF	y0 50 0p FF	p: Gain Positon
CAM_Bright Pos Inq	8x 09 04 4D FF	y0 50 00 00 0p 0q FF	pq: Bright Position
CAM_Exp Comp Mode Inq	8x 09 04 3E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_Exp Comp Pos Inq	8x 09 04 4E FF	y0 50 00 00 0p 0q FF	pq: ExpComp Position
CAM_Backlight Mode Inq	8x 09 04 33 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_WDR Strength Inq	8x 09 04 51 FF	y0 50 00 00 00 0p FF	p: WDR Strength
CAM_NR Level(2D) Inq	8x 09 04 53 FF	y0 50 0p FF	P: 2DNRLLevel

Command	Command Packet	Return Packet	Remark
CAM_NR Level(3D) Inq	8x 09 04 54 FF	y0 50 0p FF	P:3D NRLevel
CAM_Flicker Mode Inq	8x 09 04 55 FF	y0 50 0p FF	p: Flicker Settings(0: OFF, 1: 50Hz, 2:60Hz)
CAM_Aperture Inq	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture Gain
CAM_Picture Effect Mode Inq	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_Menu Mode Inq	8x 09 06 06 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_LR Reverse Inq	8x 09 04 61 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_Picture Flip Inq	8x 09 04 66 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_Color Saturation Inq	8x 09 04 49 FF	y0 50 00 00 00 0p FF	p: Color Gain setting 0h (0) to Eh (127)
CAM_ID Inq	8x 09 04 22 FF	y0 50 0p FF	p: Camera ID
IR_Receive Inq	8x 09 06 08 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_Brightness Inq	8x 09 04 A1 FF	y0 50 00 00 0p 0q FF	pq: Brightness Position
CAM_Contrast Inq	8x 09 04 A2 FF	y0 50 00 00 0p 0q FF	pq: Contrast Position
CAM_Flip Inq	8x 09 04 A4 FF	y0 50 00 FF	Off

Command	Command Packet	Return Packet	Remark
		y0 50 01 FF	Flip-H
		y0 50 02 FF	Flip-V
		y0 50 03 FF	Flip-HV
CAM_Gamma Inq	8x 09 04 5B FF	y0 50 0p FF	p: Gamma setting
CAM_Version Inq	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
VideoSystem Inq	8x 09 06 23 FF	y0 50 pq FF	P: 0~C Video format 19:3840x2160P30 1A:3840x2160P25 0:1080P60 1:1080P50 4:720P60 5:720P50 6:1080P30 7:1080P25 A: 1080P59.94 D: 1080P29.97 C: 720P59.9
Pan-Tilt Max	8x 09 06 11 FF	y0 50 ww zz FF	ww: Pan Max Speed

Command	Command Packet	Return Packet	Remark
Speed Inq			zz: Tilt Max Speed
Pan-tilt Pos Inq	8x 09 06 12 FF	y0 50 0w 0w 0w 0w 0z 0z 0z 0z FF	www: Pan Position zzzz: Tilt Position

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

6. Maintenance and Troubleshooting

6.1 Camera Maintenance

- 1) If the camera will not be used for a long time, please remove power.
- 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. Check whether the power cord is connected, voltage is OK, POWER lamp 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 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. Check whether the camera installation position is solid
2. Check whether there is shaking machine or objects around the camera

● Remote controller does not work

1. Remote control address is set to 1 (if the machine is set back to the factory defaults, remote control addresses need to be back to 1 too)

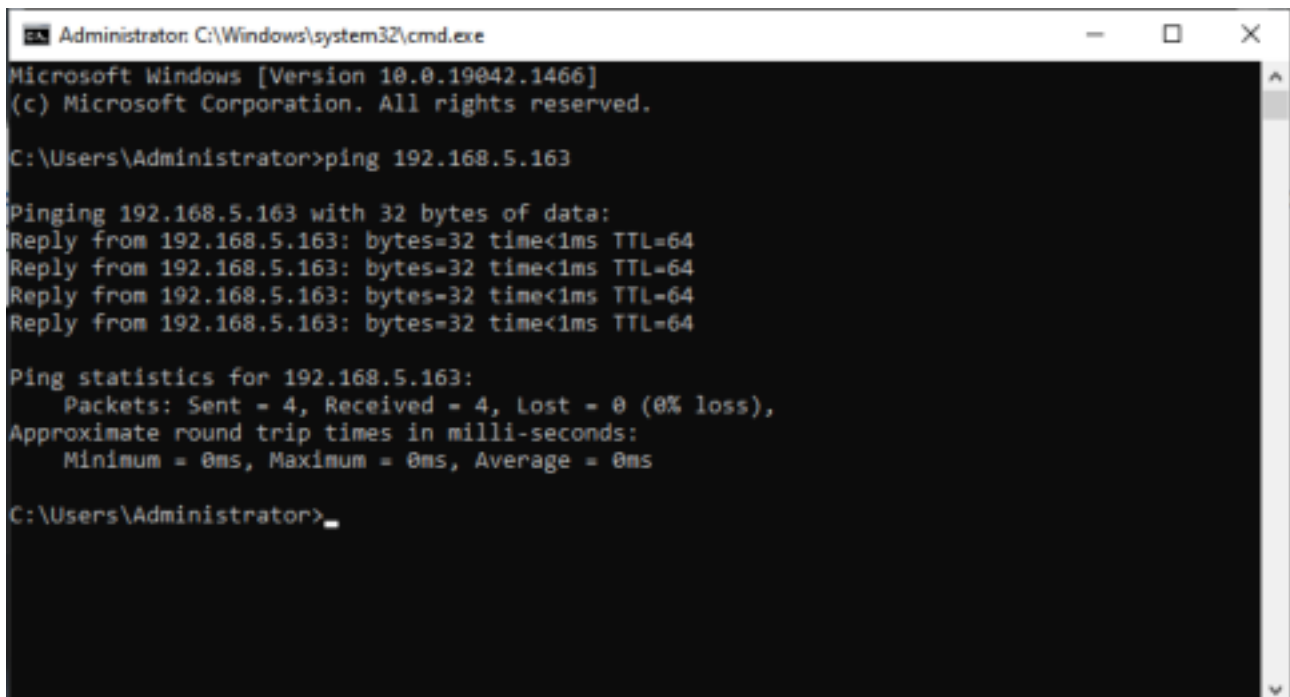
2. Check whether the battery is installed in the remote controller, and it is good.
3. Check that the menu whether it is closed, camera control through remote controller is only available after exiting the menu.

- **Serial port does not work**

1. Check whether the camera serial device protocol, baud rate, address is consistent
2. Check whether the control cable is connected properly

- **Cannot login to Web pages**

1. Check whether the camera is showing normally.
2. Check whether the network cable is connected properly (Ethernet port yellow light flashes to indicate normal network cable connection)
3. Check whether your computer and camera are on the same network and IP range.
4. Click "Start" and select "Run" and then type "cmd" in the computer; Click "OK" then turn on a DOS command window to enter ping 192.168.5.163. Press the Enter key to appear message as follows: Description network connection is normal.



```
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>
```