



PTZ3

User Manual
(V1.0)



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 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.

Attention

This manual introduces functions, installations and operations for this product in details. 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.

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

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 application. Appropriate measure is required.

Content

1. Quick Start	1
1.1 Interface.....	1
1.2 Connection Diagram	2
1.3 Mounting Brackets	3
1.3.1 Wall Mount	3
1.3.2 Ceiling Mount	4
2. Product Overview	6
2.1 Dimension	6
2.2 Accessory	6
2.3 RS-232.....	7
2.4 Rotary Dial.....	10
2.5 Product Feature	10
2.6 Technical Specification	12
3. How To Use	16
3.1 Remote Control.....	16
3.2 IR Remote Control	17
3.2.1 Remote Control Usage	19
3.3 Menu Setting	21
3.3.1 Main Menu.....	21
3.3.2 English Menu	22
4. Network Connection	23
4.1 Connection Method.....	23
4.2 Camera Web Interface	24
4.3 Streaming.....	25
4.4 Software Upgrading.....	27
4.5 Webpage Configuration for Human	28
5. Serial Port Communication Port.....	31
5.1 VISCA Protocol List	31
5.1.1 VISCA Protocol List	31

- 5.1.2 Camera Control Command32
- 5.1.3 Inquiry Command.....40
- 5.2 Pelco-D Protocol Command List44
- 5.3 Pelco-P Protocol Command List.....46
- 6. Maintenance and Troubleshooting49
 - 6.1 Camera Maintenance.....49
 - 6.2 Unqualified Applications49
 - 6.3 Troubleshooting49

1. Quick Start

1.1 Interface

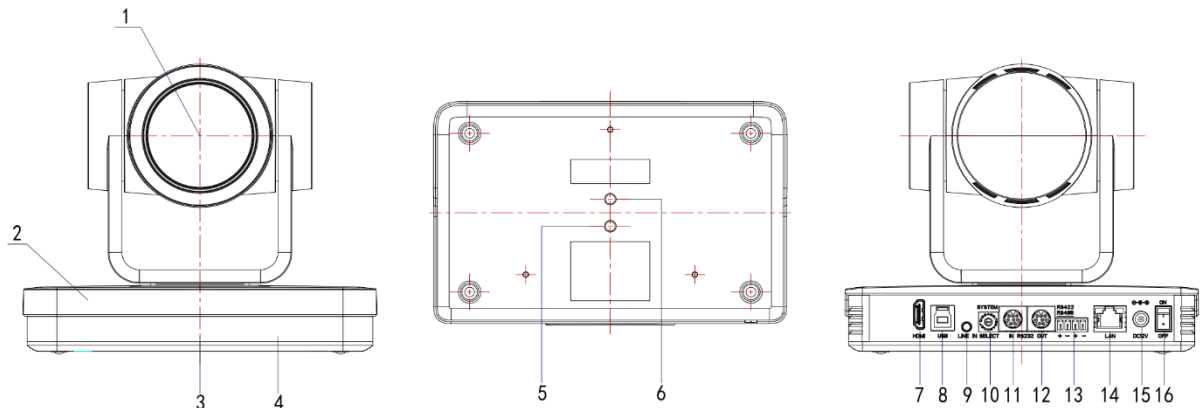


Figure1-1 Interface

Interface Introduction :

1, Lens	7, HDMI Output	13, RS422 Compatible with RS485 Interface
2, Base	8, USB3.0	14. LAN Port
3, Receiving Light	9, Audio Input Interface(LINE-IN)	15, Power Input Socket(DC12V)
4, Infrared Receiver	10, Rotary Dial Switch	16, Power Switch
5, Screw Hole for Tripod	11, RS232 Input	
6, Hole for Installation Fixation	12, RS232 Output	

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

1.2 Connection Diagram

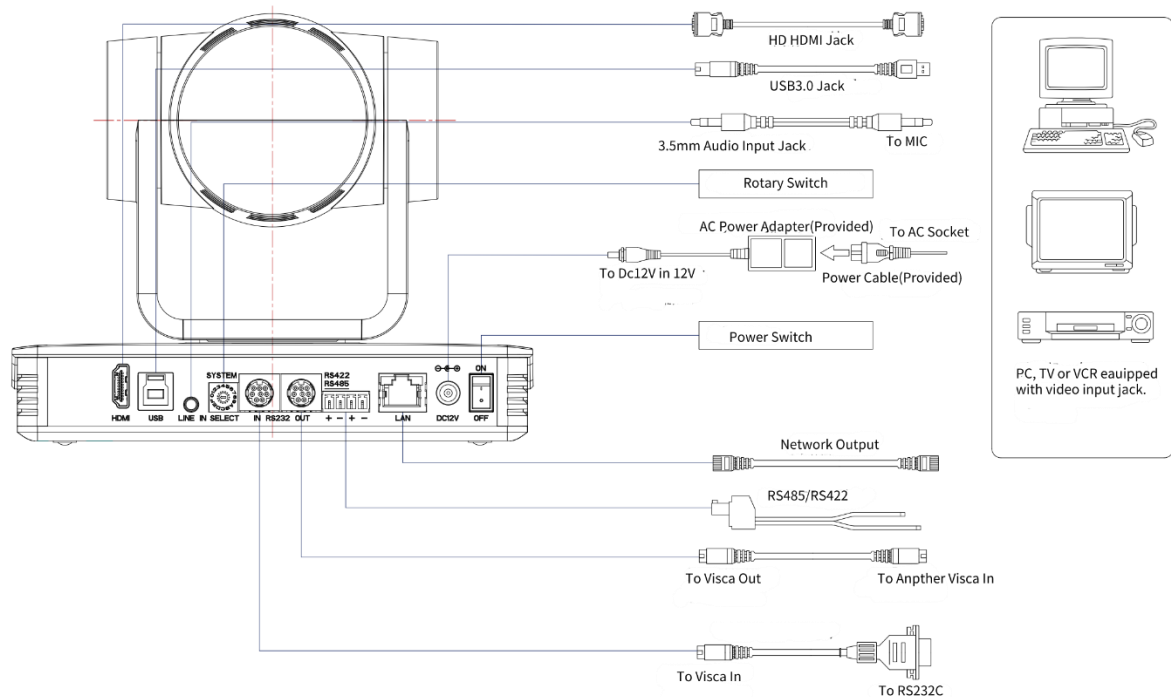


Figure1-2 Connection Diagram

1) After power on and self-check, the camera will automatically return to the preset 0 position if it's pre-set.

2) The default address for the IR remote control is 1#.

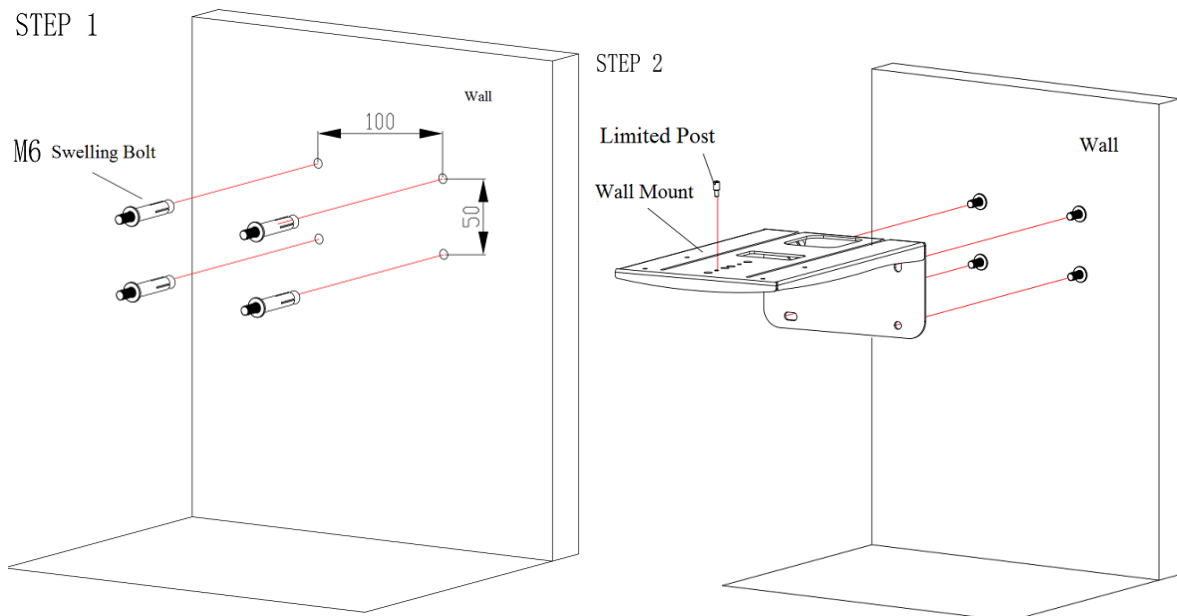
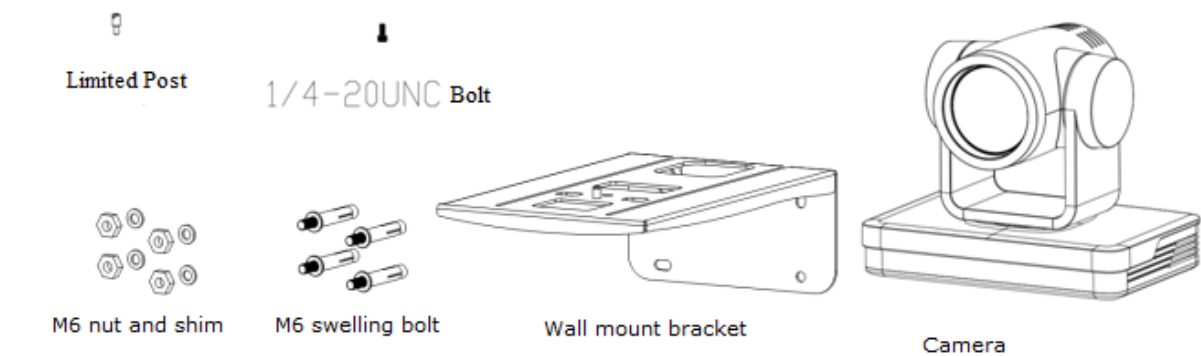
If the menu restored to factory defaults, the remote control default address will restore to 1#.

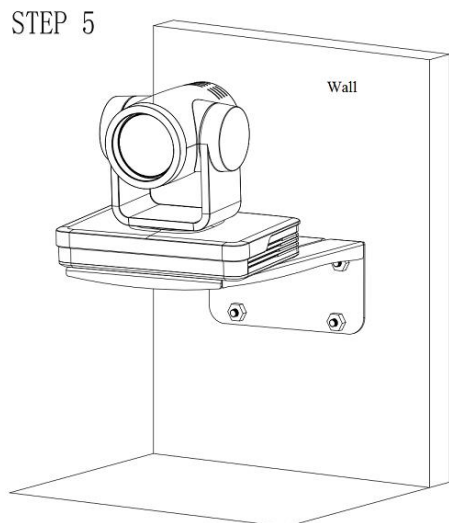
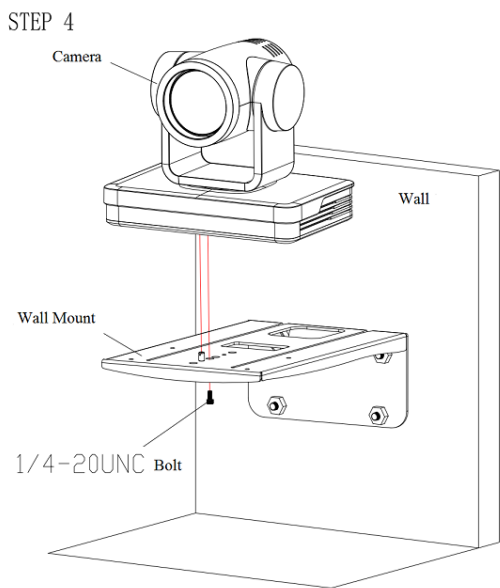
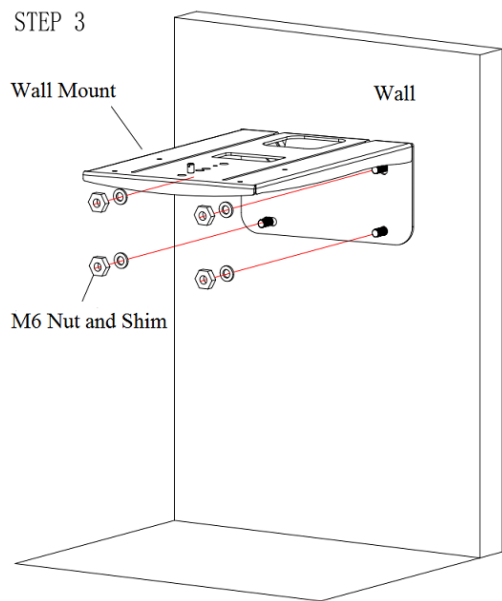
1.3 Mounting Brackets

Caution

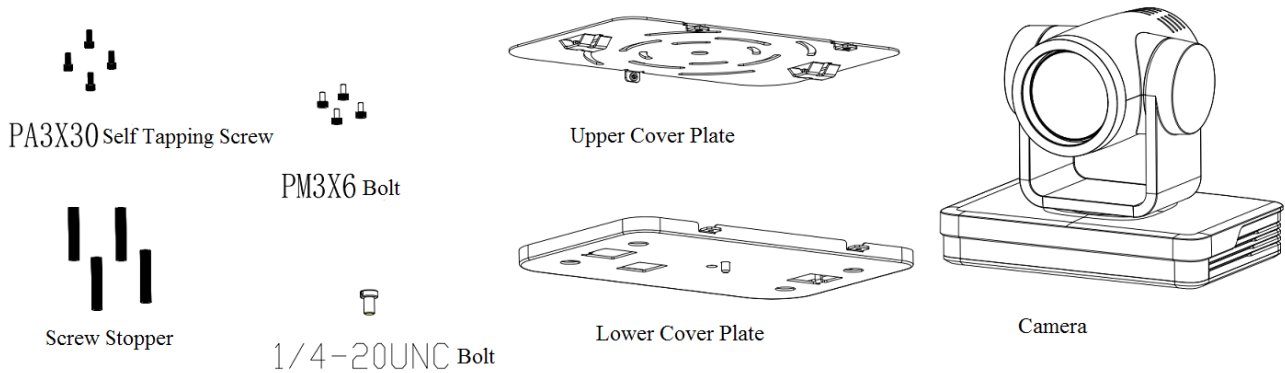
- Ceiling or wall mounting brackets can only be mounted on template and concrete wall. For safety reason, plasterboard is not recommended.

1.3.1 Wall Mount

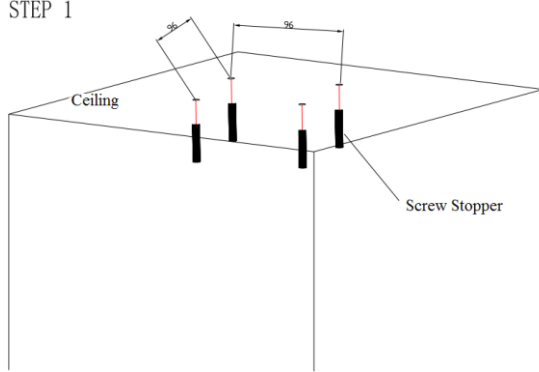




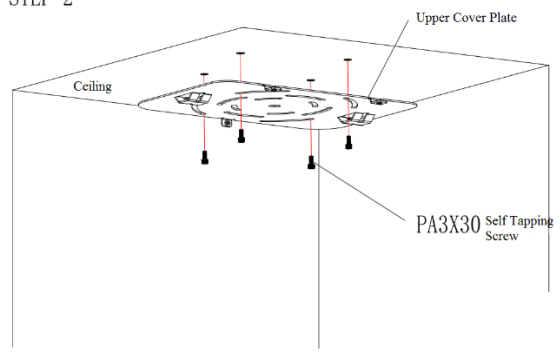
1.3.2 Ceiling Mount



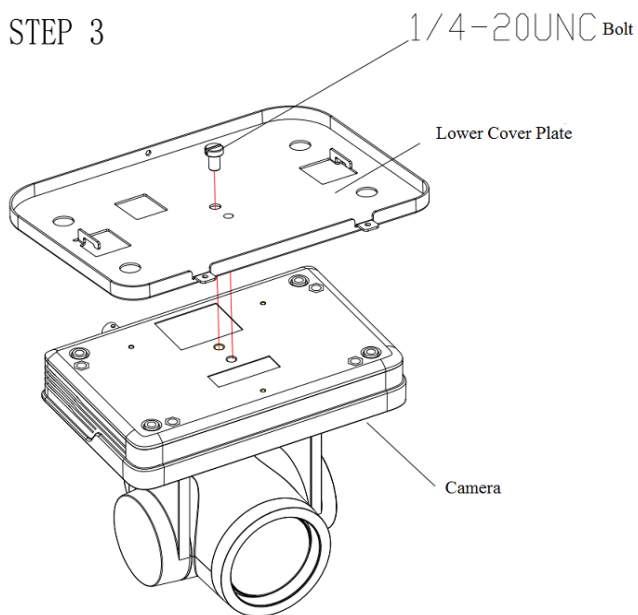
STEP 1



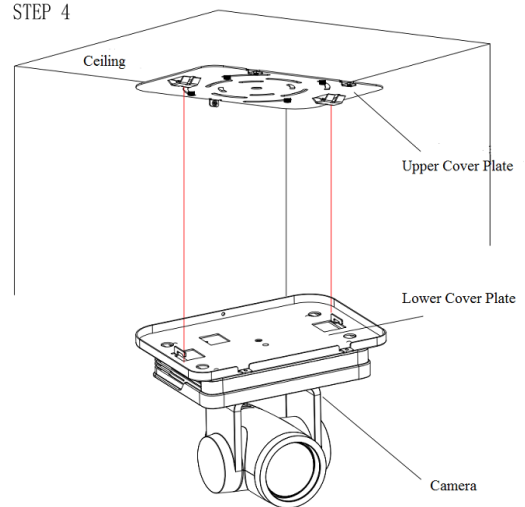
STEP 2



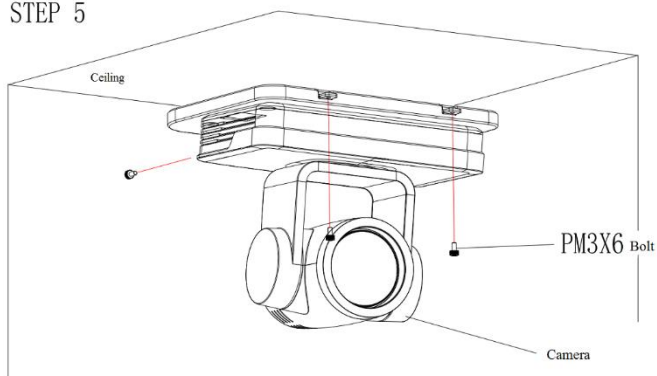
STEP 3



STEP 4



STEP 5



2. Product Overview

2.1 Dimension

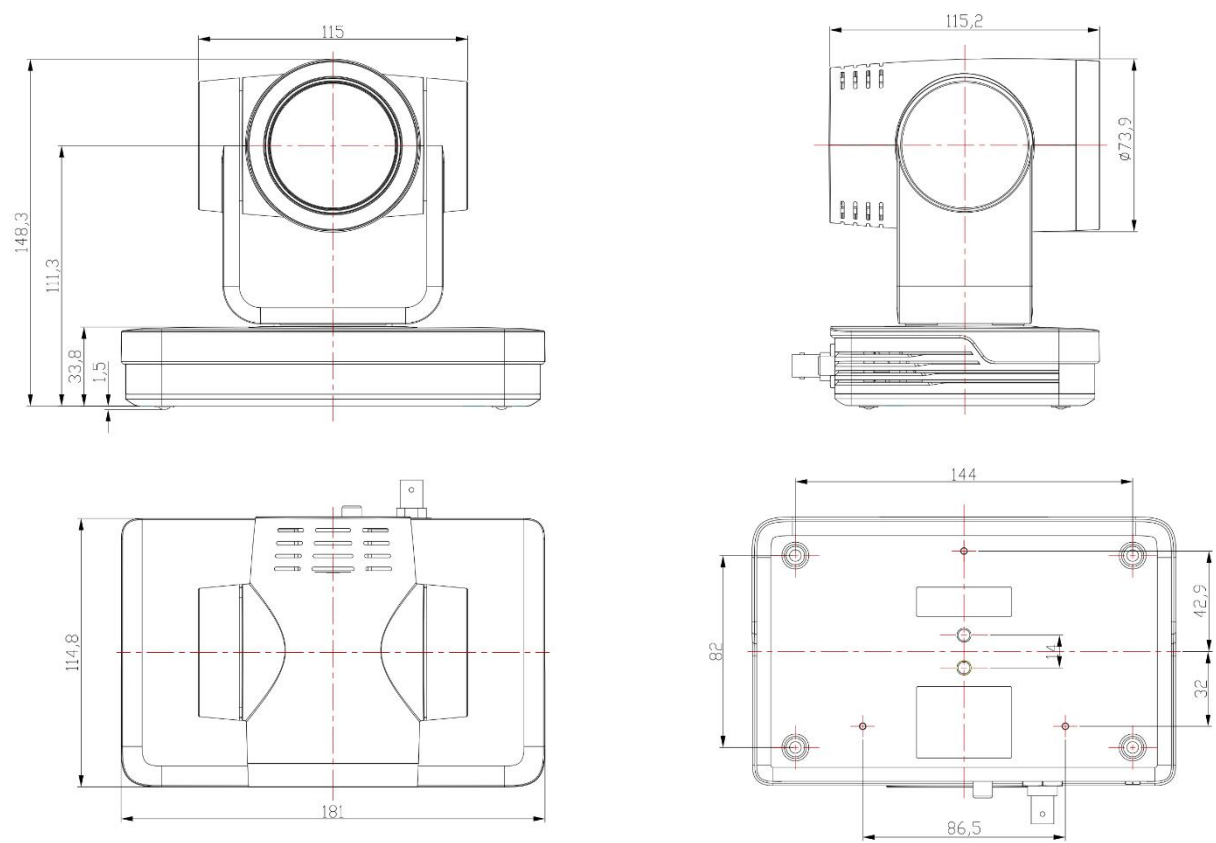


Figure1-3 Product Dimension

2.2 Accessory

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

Table1-1 Supplied Accessory

Supplied	Power adapter
	USB3.0 Cable
	RS232 cable
	User manual

	Plastic pad
Optional	Wireless remote control
	IR Remote Control
	Brackets for wall mounting
	Brackets for ceiling mount
	Cascading Cable

2.3 RS-232

1) RS-232 Jack

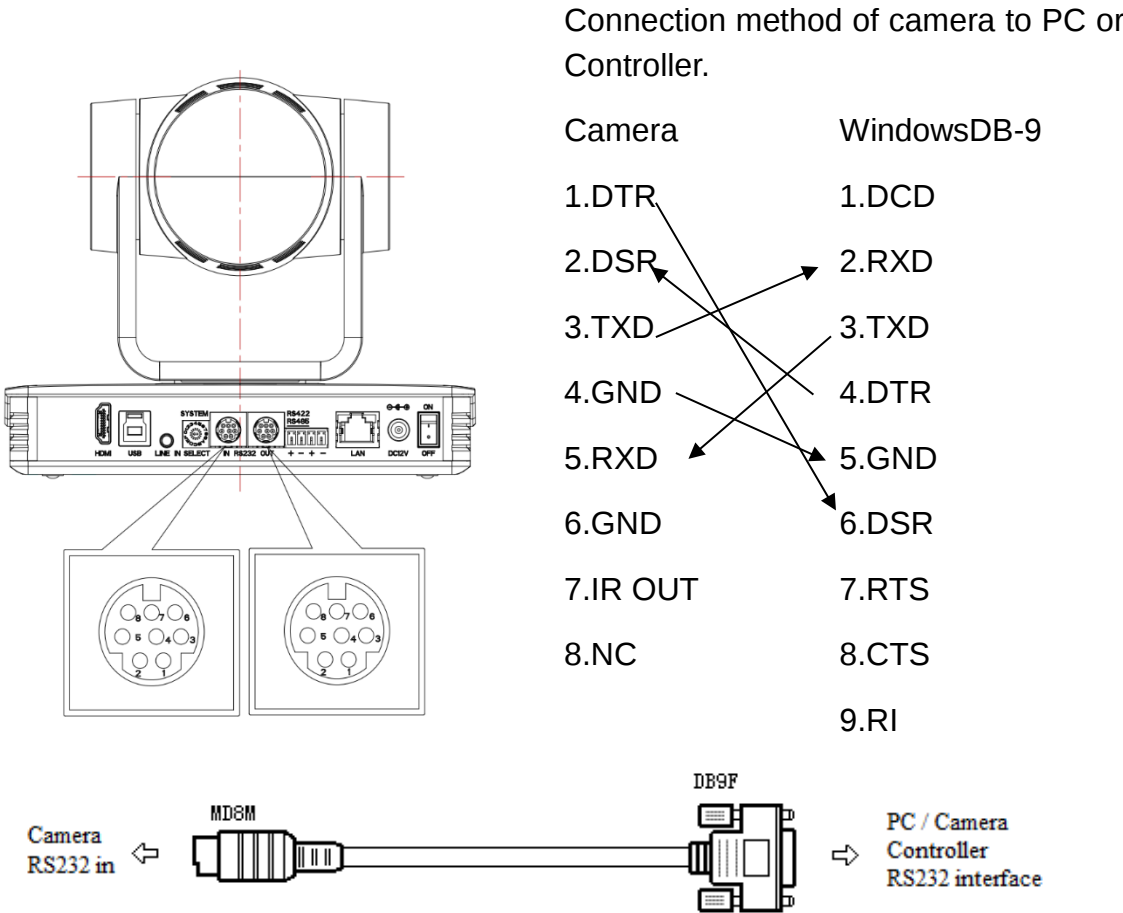
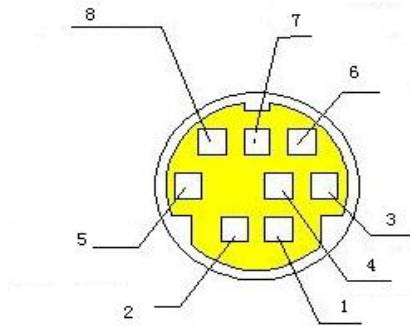


Figure1-4 diagram of RS232 Connection

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



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

Table 1-8 RS-232 Mini-DIN 8-pin Port Definitions

3) RS232(DB9) Port Definition

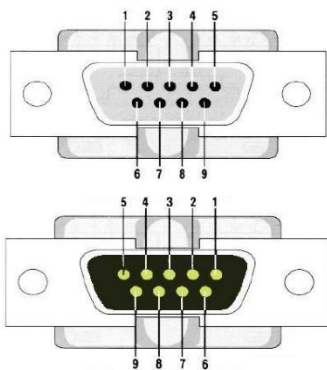
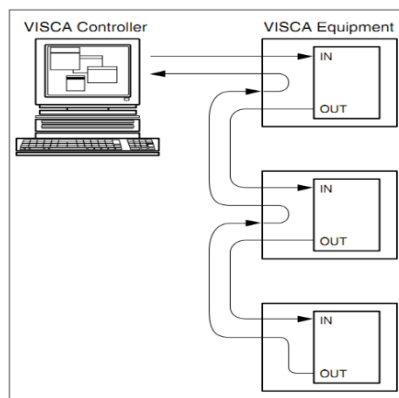


Table 1-9 RS232(DB9) Port Definition

NO.	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



Networking Method

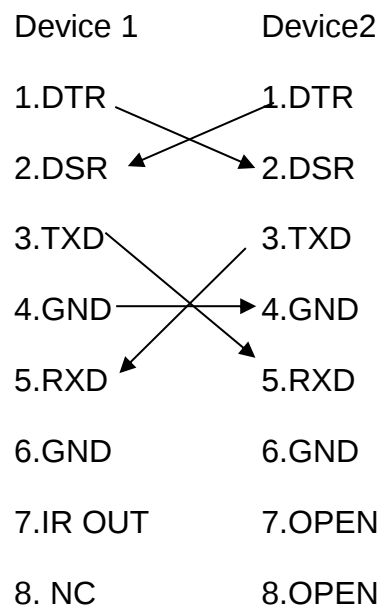


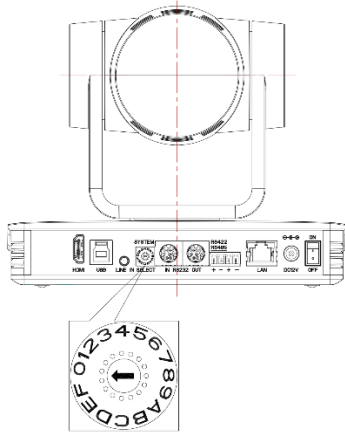
Figure1-5 Diagram of Networking Method

Caution

- The product has RS232 input and output interfaces and can be cascaded in the above manner.
-

2.4 Rotary Dial

Figure1-6 Rotary dial corresponding to video format



Dial	Video Format	Dial	Video Format
0	1080P60	8	720P59.94
1	1080P50	9	-----
2	1080P30	A	-----
3	1080P30	B	-----
4	720P60	C	-----
5	720P50	D	-----
6	1080P59.94	E	-----
7	1080P29.97	F	-----

Caution

- After switching the mode and dialing the code, you need to restart the camera to take effect;
- When the rotary dial is 5-F, the video format item will be displayed in the menu;

2.5 Product Feature

This series camera has perfect functions, superior performance and rich video output interfaces; Featuring with 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 makes motion video more fluent and clear under low bandwidth conditions.

- **Full HD Resolution:** 1/2.8 inch high quality CMOS sensor. Resolution is up to 1920x1080 with frame rate up to 60 fps.
- **Multiple Optical Zoom Lens:** 12X/20X optical zoom 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/3D noise reduction technology further reduces the noise while ensuring high image clarity.
- **Multiple video output interfaces:** HDMI, USB3.0, LAN. Simultaneously output audio and video signal via HDMI, LAN interface support POE, USB 3.0 support dual code stream,
- **USB3.0 Support Dual Coding Stream:** Support main stream and sub –stream, and simultaneous output; support YUY2, MJPEG, H.264, NV12, H.265 video coding format
- **Built-in Gravity Sensor:** Support PTZ auto-flip function and easy installation.
- **Multiple Network Protocol:** Support ONVIF,GB/T28181,RTSP,RTMP,VISCA OVER IP,IP VISCA,RTMPS,SRT protocols; Support RTMP push mode,easy to be connected to streaming server (Wowza,FMS); Support RTP multicast mode;
- **Control Interface:** RS422 is compatible with RS485, RS232-IN, RS232-OUT, and the RS232 interface supports cascading.
- **Multiple Control Protocol:** Support VISCA, PELCO-D,PELCO-P protocols; Support automatic identification protocols.
- **Quiet Pan / Tilt Movement:** With high accuracy step driving motor, camera can pan / tilt extremely quiet and smooth.
- **Various Remote Controls:** Users can choose infrared remote control or wireless remote control according to the environmental conditions used. The 2.4G wireless remote control is not affected by angle, distance, and infrared interference. Support the remote control signal transparent transmission function, which is convenient for back-end equipment to use.
- **AI Human Detection:** Built-in high-speed processor and advanced image processing and analysis algorithms, users can choose real-time tracking and regional tracking according to the environment.
- **Multiple Application:** Online-education, Lecture Capture, Webcasting, Video conferencing, Tele-medicine, Unified Communication, Emergency command and control systems, etc.

2.6 Technical Specification

Table1-2 Camera Lens Parameter

Camera Parameter		
Parameter/Model	12X	20X
Focus	3.9~46.8mm	5.2~98mm
Fov	6.3° (N) 72.5° (W)	3.2° (N) 56° (W)
Aperture Value	F1.8 ~ F2.4	F1.5 ~ F3.0
Effective Pixels	2.07, 1/2.8-inch high-quality CMOS sensor	
Video Format	HDMI Output: 1080P60,1080P50,1080P30,1080P25,720P60,720P50, 1080P59.94,1080P29.97,720P59.94; USB3.0 Output Mainstream: 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; MJPG/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; Substream: 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; MJPG/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	
Minimum Illumination	0.5Lux(F1.8, AGC ON)	
DNR	2D & 3D	

AWB	Automatic, manual, one-key white balance, specified color temperature
Focus Mode	Automatic, manual, one-key focus
Exposure Mode	Auto, manual, shutter priority, aperture priority, brightness priority
Iris Value	F1.8 -- F11,CLOSE
Shutter Speed	1/25 -- 1/10000
BLC	On/off
Dynamic Range	Off, 1-8
Image Adjustment	Brightness, chroma, saturation, contrast, sharpness, black and white mode, gamma curve
SNR	≥50dB
AI Function & Performance	
Real-Time Tracking	Maximum Tracking Range: 6-7 meters. Support speakers to walk at a speed of 1.3-1.7m/s.
Regional Tracking	Maximum Tracking Region: 4. Support set the region within horizontal -170°~+170° and vertical -30°~+90°
Interface	
Input/Output Interface	HDMI, LAN(POE),USB3.0 (TypeB compatible withUSB2.0) , A-IN,RS232-IN, RS232-OUT,RS422 (compatible with RS485) ,rotary switch,DC12V Power,Power Switch
Video Encoding Format	LAN Interface: Support main stream and sub-stream H.265,H.264 USB3.0 Interface: main stream support YUY2,MJPEG,H.264,NV12
Audio Input Interface	Dual channel 3.5mm linear input
Audio Output Interface	HDMI ,LAN,USB3.0
Audio Compression	AAC,MP3,G.711A

LAN Interface	10M/100M adaptive Ethernet port, support POE power supply, support audio and video output
Network Protocol	RTSP,RTMP,ONVIF,GB/T28181,VISCA OVER IP,IP VISCA,RTMPS,SRT Support remote upgrade, remote restart, remote reset
Control Interface	RS232-IN,RS232-OUT,RS422 compatible with RS485
Serial Communication Protocol	VISCA/Pelco-D/Pelco-P; support baud rate 115200/38400/9600/4800/2400
USB Communication Protocol	UVC (video communication protocol) ,UAC (audio communication protocol)
Power Interface	HEC3800 Power socket (DC12V)
Power Adapter	Input AC110V-AC220V; output DC12V/2.5A
Input Voltage	DC12V±10%
Input Currency	<1A
Consumption	<12W

PTZ	
Pan Rotation	-170° -- +170°
Tilt Rotation	-30° -- +90°
Pan Speed	0.1°/s -- 100°/s
Tilt Speed	0.1°/s -- 45°/s
Preset Speed	Pan: 100°/s,Tilt: 45°/s
Preset Quantity	Maximum 255 preset positions can be set(10 via remote controls)

Other Parameter	
Storage Temperature	-10°C -- +70°C
Storage Humidity	20% -- 95%
Working Temperature	-10°C -- +50°C
Working Humidity	20% -- 80%
Dimension	181mm×115mm×149mm
Weight	1.15kg
Environment	Indoor
Accessory	
Standard Accessory	Power adapter, RS232 control line, USB3.0 connection line, remote control, manual, warranty card & certificate
Optional Accessory	Ceiling mounting bracket, wall mounting bracket

3. How To Use

3.1 Remote Control

Remote control using instruction: There are wireless remote control and IR remote control for options.

Steps for wireless remote control usage are as below:

1) Code Pairing

Press the "Settings" + "*" button for 3 seconds, the LED will turn off to flashing, after releasing the button, the LED light will keep flashing to start the code pairing, the receiver is powered on, and the LED will be off when the code pairing is successful; If you use other remote control, you need to clear the code of this remote control, or re-pair the code of the new remote control. If the code pairing has been unsuccessful, the red LED light flashes for 20 seconds and then goes out, stop the code pairing and go to sleep; at this time, press any key to wake up and re-pair the code.

Note: After the code is successfully matched, you need to select the camera address to control it

2) Clear Code Data

Press the "Settings" key + "#" key from light off to flashing, the receiving end is powered off and then powered on. The LED is off, indicating that the paired data is cleared successfully

3) Enter Sleep Mode and Wake Up

If there is no operation in the working state, it will immediately enter the sleep mode, and press any key to wake up.

3.2 IR Remote Control



1. Standby Key

After 3S long press, the camera will step into standby mode. Long press 3S again, 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 12s, 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 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

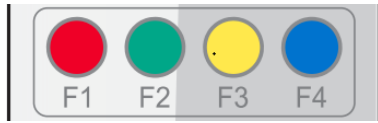
【*】 + 【#】 + 【F3】 :Camera Address No. 3

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

12. Key Combination Functions

- | | |
|---|---|
| 1) 【#】 + 【#】 + 【#】 :Clear all presets | 2) 【*】 + 【#】 + 【6】 :Restore factory defaults |
| 3) 【*】 + 【#】 + 【9】 :Flip switch | 4) 【*】 + 【#】 +Auto: Enter into the aging mode |
| 5) 【*】 + 【#】 + 【3】 :Menu set to Chinese | 6) 【*】 + 【#】 + 【4】 :Menu set to English |
| 7) 【*】 + 【#】 +Manual: Restore the default user name, password, and IP address | 8) 【#】 + 【#】 + 【0】 :Switch the video format to 1080P60 |
| 9) 【#】 + 【#】 + 【1】 : Switch the video format to 1080P50 | 10) 【#】 + 【#】 + 【2】 :Switch the video format to 1080I60 |
| 11) 【#】 + 【#】 + 【3】 :Switch the video format to 1080I50 | 12) 【#】 + 【#】 + 【4】 :Switch the video format to 720P60 |
| 13) 【#】 + 【#】 + 【5】 :Switch the video format to 720P50 | 14) 【#】 + 【#】 + 【6】 :Switch the video format to 1080P30 |
| 15) 【#】 + 【#】 + 【7】 :Switch the video format to 1080P25 | 16) 【#】 + 【#】 + 【8】 :Switch the video format to 720P30 |
| 17) 【#】 + 【#】 + 【9】 :Switch the video format to 720P25 | |

13. AI Function Short Keys



【F1】: Turn off AI Human Detection

【F2】: Turn on AI Human Detection

【F3】: Toggle between real time tracking mode and region tracking mode

【F4】: Chang tracking target on real tracking mode

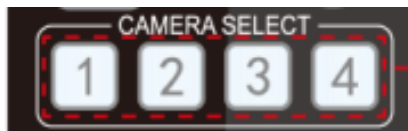
3.2.1 Remote Control Usage

Finishing initialization, it can receive and execute the IR commands. Press the remote controller button, the indicator light is flashing; release the button, the indicator light stops flashing. 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



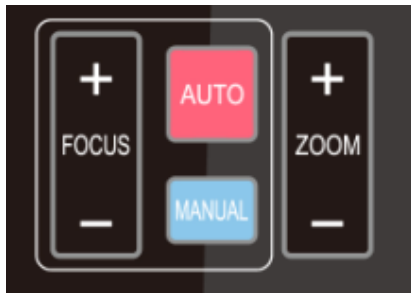
Up: press ▲ Down: press ▼

Left: press ◀ Right: press ▶

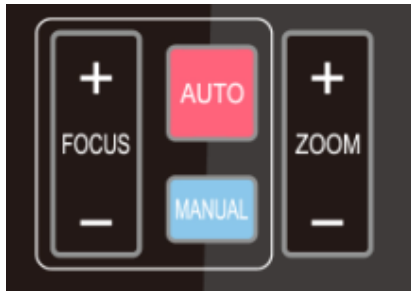
Back to middle position: press “ 【HOME】 ”

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) Zoom Control



4) 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.

5) BLC Setting



BLC ON / OFF: support

6) 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: Action in vain if a relative preset position is not existed.

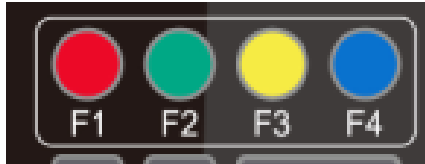
3. Preset clearing : to clear a preset position, the user can press the “【CLEAR PRESET】” key first



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.

7) 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



Caution Note: The modification valid only if exit the menu before save and power off.

3.3.1 Main Menu

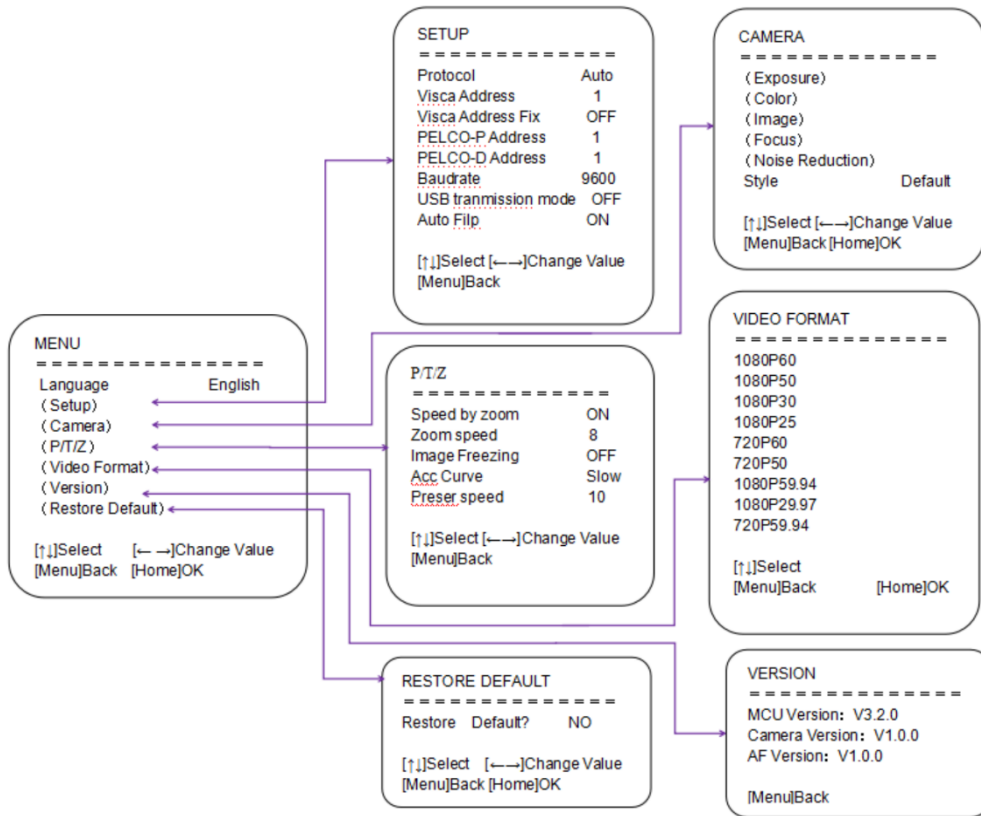
【MENU】 : Enter / exit the OSD menu or return to the previous menu

【HOME】 : Enter next menu

【↑】 【↓】: Choose item

【←】 【→】: Modify values

3.3.2 English Menu



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



Caution

- Please do not put the power and network cable in places where can be easily touched to prevent video quality lowered by unstable signal transmission due to poor contact of cables.

The computer must have the network segment where the camera IP address belongs to. The device will not be accessible if without the segment. I.E. The camera default IP address is 192.168.5.163, then segment 5 must be added in the computer.

Specific steps are as below:

Firstly open the window of Local Area Connection Properties on computer, select the “Internet protocol version 4(TCP/IPv4)” as shown by picture on the left. Double click or click the property “Internet” protocol version 4 (TCP/IPv4)to enter into the Internet Protocol Version 4(TCP/IPv4) Properties window, select “Advanced” to enter into the Advanced TCP/IP Setting and add IP and subnet mask in the IP browser as picture shown below. Click the “Confirm” to finish the adding of IP segment. User can add the corresponding network segment according to the revised IP address of the camera.



Caution

- The IP address to be added cannot be same with that of other computers or devices. The existence of this IP address needs to be verified before adding.

Click the “Start” and select “Operation” to input cmd as picture below to verify if the network segment has been successfully added.

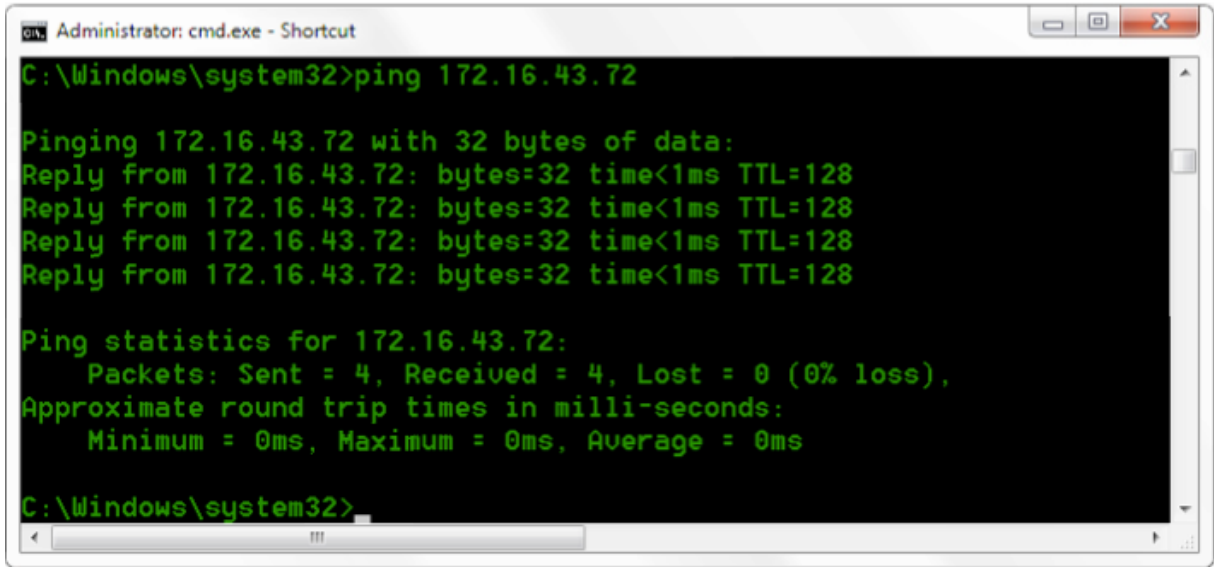


Figure1-7 Network segment successfully added

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.

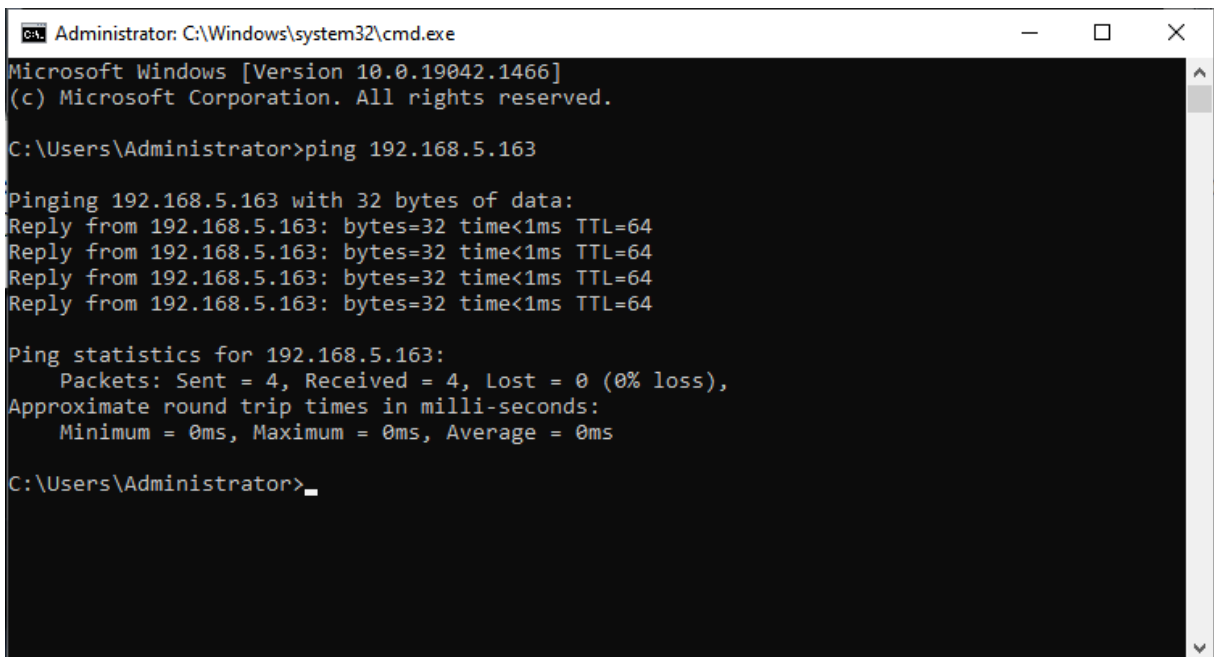


Figure1-8 Network Connection Screenshot

4.2 Camera Web Interface

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 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. From the Web Interface, you can control the camera using the arrows on the left side. You can also adjust many of your camera's settings via this IP interface.

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".

2) Download Plug-in

When first using IE browser to access the web conferencing camera, the login page will appear "Playback plug-in is not installed, please download and install!" Click on this message, download and install MRWebXinstall.exe, according to information prompts.

After installing the plugin, enter user name and password, click and Sign (initial default user name and password: "admin", users can change the user name and password on their own after entering) into the Web client management interface.

4.3 Streaming

1). Video Stream Capture

Configurations -> Video Configure-> Video Encode

Configurations

- Audio Configure
- Video Configure
 - Video Encode**
 - Stream Publish
 - RTP Multicast
 - Video Parameters
 - Video OSD
 - OSD Font Size
 - Video Out
- NetWork Configure
 - Network Port
 - Ethernet
 - DNS
- System Configure
 - SystAttr
 - SysTime
 - SysUser
 - Update
 - Default
 - Reboot

Video Encode

Stream	Main Stream	Sub Stream
Compressed Format	H.264	H.264
Profile	HP	HP
Image Size	1920*1080	320*180
Rate Control	CBR	CBR
Image Quality	Best	Better
Bit Rate(Kb/S)	4096	512
Frame Rate(F/S)	25	25
I Frame Interval	75	75
I Frame Min QP	20	20
Stream Name	live/av0	live/av1

Save

Configure the parameters according to the network environment.

Note: stream name live/av0 (live/ XXX)

For example:

The default IP address of the camera is 192.168.5.163. The way to obtain the RTSP video stream is as below

rtsp://192.168.5.163:554/live/av0 (av0 main stream)

rtsp://192.168.5.163:554/live/av1 (av1 sub stream)

The default IP address of the camera is 192.168.5.163. the way to obtain RTMP video stream is as below

rtmp://192.168.5.163:1935/live/av0 (av0 main stream)

rtmp://192.168.5.163:1935/live/av1 (av1 sub stream)

2). Push Video Stream

Configurations -> Video Configure-> Stream Publish

Stream	Main Stream	Sub Stream
Enable	☐	☐
Protol Type	RTMP	RTMP
Host Address	192.168.5.11	192.168.5.11
Host Port	1935	1935
Stream Name	live/av0	live/av1
User Name		1
Password		

Save

Push RTMP stream to public network server, the stream camera must be on the public network, otherwise it will fail to connect to server.

Host address: server address, which can be either a domain name or an IP address

Host port: server default port number

Stream name: live/test (live/ XXX)

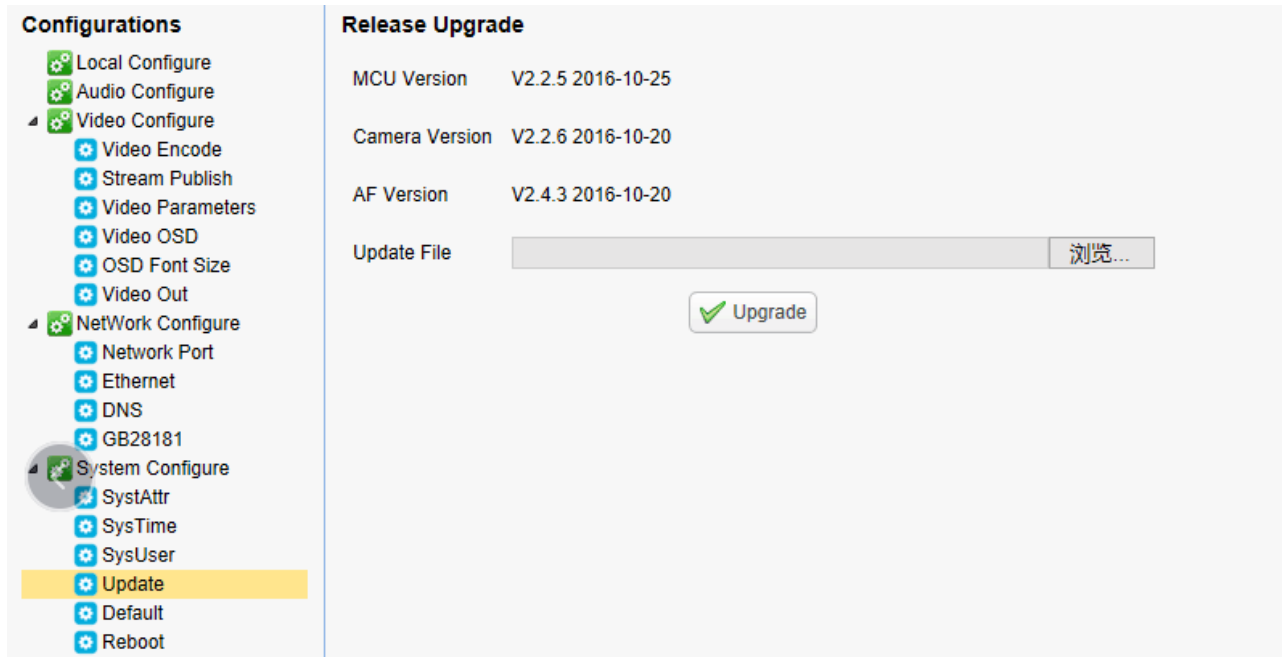
Username and password: the username and password set by the server, or leave it empty

Access url: rtmp://host domain name: host port/live/xxx

Or (rtmp://host IP address: host port/live/xxx)

4.4 Software Upgrading

- 1). Log in to the web page and manage camera settings. The default page is preview interface, where users can PTZ control, record video, preset camera positions and etc.
- 2). Configurations -> System Configure-> Update



3). Click "browse" to select .mrg update file, then click upgrade button to finish software upgrading.

4). Camera reboot after completion of firmware update. It prompts with "successful upgrade".

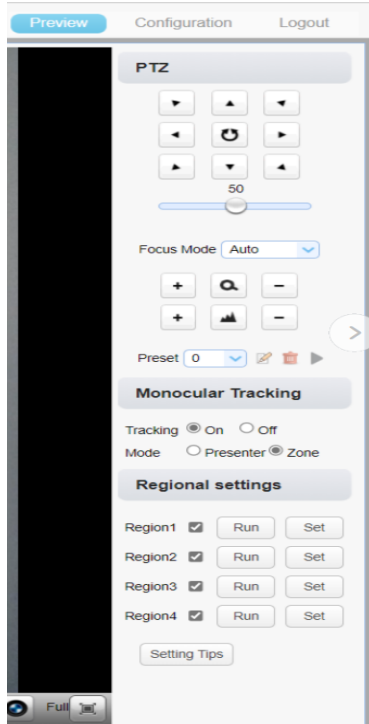
Log in to check the firmware version to make sure software upgrade successful.

Then click "restore factory default", reboot and restore parameters to factory default (default IP 192.168.5.163, user name: admin; password admin).

4.5 Webpage Configuration for Human

1. After login, enter into the management interface and turn on Tracking below "Monocular Tracking"

2. On the right top is PTZ control area, in which you can set the preset region of Regional Tracking. Interface is as below.



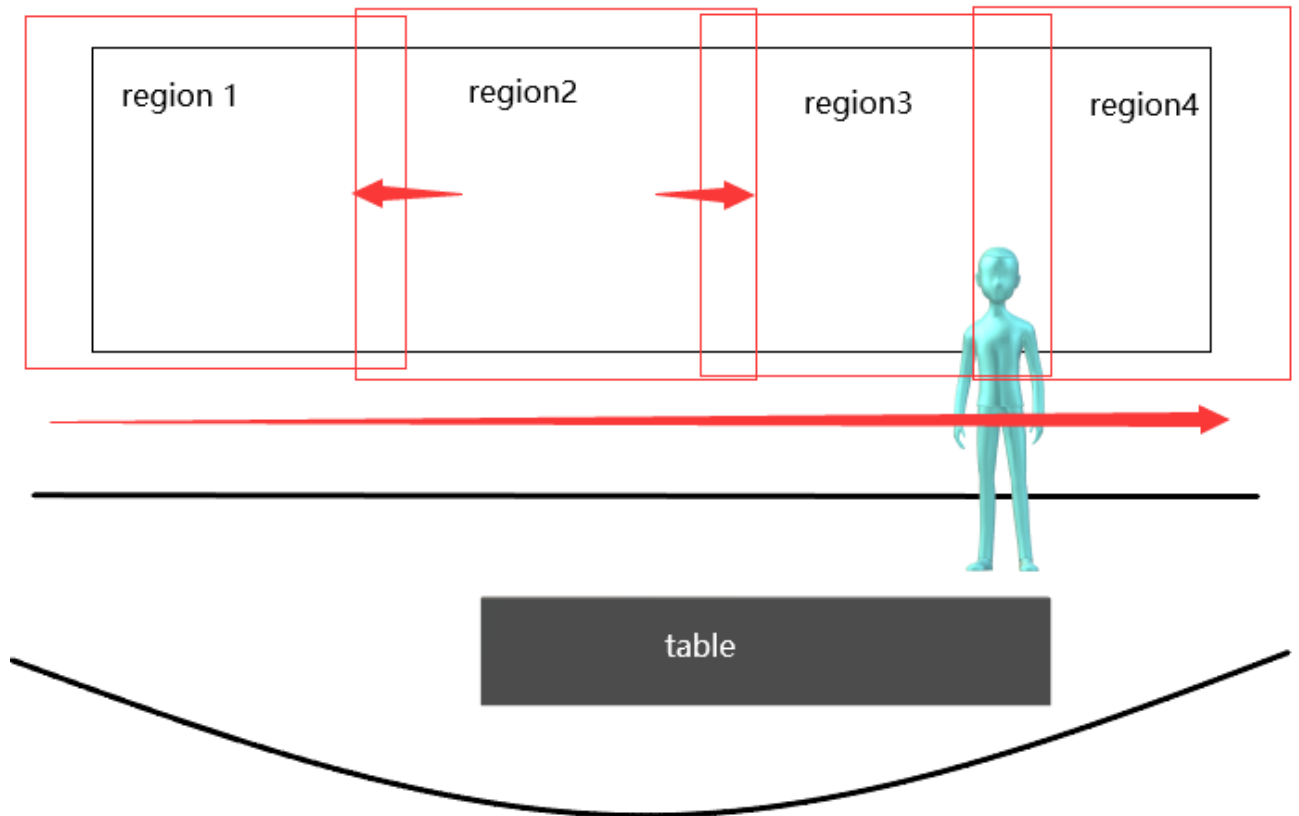
Regional Settings Steps (We take Region1 as an example):

1. On the PTZ Area, adjust image by clicking direction buttons to select one region.
 2. After finishing region1 setting, click “Set” to complete the Region1 Tracking.
- Other region settings are same as region1 setting steps.

You can set 4 different regions, and minimum 2 regions. And the Regional Tracking settings can only be configured through the webpage.

Call out the regional tracking: Click “Run” of corresponding region on the “Regional settings” area.

1. Each preset preview image must be continuous from left to right and overlap when setting the tracking regions.
2. You need to tick next to the region number to save the setting location when you setting the region.



5. Serial Port Communication Port

In normal working state, you can control the camera through RS232/RS485 (VISCA IN) cable. The parameter of RS232 is as below:

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

Start Bit: 1 bit;

Data Bit: 8 bit;

Stop Bit: 1 bit;

Verification Bit: None.

After power on, the camera will have a brief tour and then back to the center position.

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

5.1 VISCA Protocol List

5.1.1 VISCA Protocol List

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	pqrs: Zoom Position
CAM_Focus	Stop	8x 01 04 08 00 FF	
	Far(Standard)	8x 01 04 08 02 FF	

Command	Function	Command Packet	Remark
	Near(Standard)	8x 01 04 08 03 FF	p = 0(low) - 7(high)
	Far(Variable)	8x 01 04 08 2p FF	
	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	
	3000K	8x 01 04 35 01 FF	
	4000k	8x 01 04 35 02 FF	
	One Push mode	8x 01 04 35 03 FF	
	5000k	8x 01 04 35 04 FF	
	Manual	8x 01 04 35 05 FF	
	6500k	8x 01 04 35 06 FF	

Command	Function	Command Packet	Remark
	3500K	8x 01 04 35 07 FF	
	4500K	8x 01 04 35 08 FF	
	5500K	8x 01 04 35 09 FF	
	6000K	8x 01 04 35 0A FF	
	7000K	8x 01 04 35 0B FF	
	One Push Trigger	8x 01 04 10 05 FF	One Push WB Trigger(Enabled during One Push WB mode)
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

Command	Function	Command Packet	Remark
	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	
	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	

Command	Function	Command Packet	Remark
	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
CAM_WDRS trength	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=0-7 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	

Command	Function	Command Packet	Remark
	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_Memor y	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_Re verse	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_ColorS aturation	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_IDWrit e		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	

Command	Function	Command Packet	Remark
CAM_Setting Reset	Reset	8x 01 04 A0 10 FF	Reset Factory Setting
CAM_Brightn ess	Direct	8x 01 04 A1 00 00 0p 0q FF	pq: Brightness Position
CAM_Contra st	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_VideoS ystem	Set Camera video system	8x 01 06 35 00 0p FF	P: 0~E Video format
Pan_tiltDrive	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-tiltLimitSet	Set	8x 01 06 07 00 0W 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	W:1 UpRight 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_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
CAM_FocusPositionInq	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	Front
		y0 50 02 FF	Meeting
		y0 50 04 FF	Moving
		y0 50 05 FF	Middle
CAM_WBModelInq	8x 09 04 35 FF	y0 50 00 FF	Auto
		y0 50 01 FF	3000K
		y0 50 02 FF	4000K
		y0 50 03 FF	One Push Mode
		y0 50 04 FF	5000K
		y0 50 05 FF	Manual
		y0 50 00 FF	6500K
		y0 50 06 FF	6500K

Command	Command Packet	Return Packet	Remark
		y0 50 07 FF	3500K
		y0 50 08 FF	4500K
		y0 50 09 FF	5500K
		y0 50 0A FF	6000K
		y0 50 0B FF	7000K
CAM_AWBSe nsitivityInq	8x 09 04 A9 FF	y0 50 00 FF	Low
		y0 50 01 FF	Normal
		y0 50 02 FF	High
CAM_RGainIn q	8x 09 04 43 FF	y0 50 00 00 0p 0q FF	pq: R Gain
CAM_BGainIn q	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: B Gain
CAM_AEMod elInq	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 PosInq	8x 09 04 4A FF	y0 50 00 00 0p 0q FF	pq: Shutter Position
CAM_IrisPosI nq	8x 09 04 4B FF	y0 50 00 00 0p 0q FF	pq: Iris Position
CAM_Gain LimitInq	8x 09 04 2C FF	y0 50 0p FF	p: Gain Positon
CAM_ BrightPosiInq	8x 09 04 4D FF	y0 50 00 00 0p 0q FF	pq: Bright Position
CAM_ExpCo mpModeInq	8x 09 04 3E FF	y0 50 02 FF	On
		y0 50 03 FF	Off

Command	Command Packet	Return Packet	Remark
CAM_ExpCompPosInq	8x 09 04 4E FF	y0 50 00 00 0p 0q FF	pq: ExpComp Position
CAM_BacklightModelInq	8x 09 04 33 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_WDRStrengthInq	8x 09 04 51 FF	y0 50 00 00 00 0p FF	p: WDR Strength
CAM_NRLevel(2D) Inq	8x 09 04 53 FF	y0 50 0p FF	P: 2DNRLevel
CAM_NRLevel(3D) Inq	8x 09 04 54 FF	y0 50 0p FF	P:3D NRLevel
CAM_FlickerModelInq	8x 09 04 55 FF	y0 50 0p FF	p: Flicker Settings(0: OFF, 1: 50Hz, 2:60Hz)
CAM_ApertureInq	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture Gain
CAM_PictureEffectModelInq	8x 09 04 63 FF	y0 50 00 FF	Off
		y0 50 04 FF	B&W
CAM_MemoryInq	8x 09 04 3F FF	y0 50 0p FF	p: Memory number last operated.
SYS_MenuModelInq	8x 09 06 06 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_LR_ReverseInq	8x 09 04 61 FF	y0 50 02 FF	On
		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

Command	Command Packet	Return Packet	Remark
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 0p FF	P: 0~E Video format 0:1080P60 1:1080P50 2:1080i60 3:1080i50 4:1080P30 5:1080P25 6:720P60

Command	Command Packet	Return Packet	Remark
			7:720P50 8: 1080P59.94 9: 1080i59.94 A: 1080P29.97 B: 720P59.9
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 zzzz: Tilt Position

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 Unqualified Applications

- Do not shoot extremely bright objects for a long period of time, such as sunlight, ultra-bright light sources, etc...
- Do not operate in unstable lighting conditions, otherwise the image may flicker.
- Do not operate close to powerful electromagnetic radiation, such as TV or radio transmitters, etc...

6.3 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 that the HDMI cable is connected correctly.
 1. If HDMI, make sure that the destination device is accessing the HDMI port that you plugged into.
- Abnormal display of image
 1. Check setting of rotary dial on rear of camera. Be sure to use a resolution and refresh rate that is supported by your software.
- Image is shaky or vibrating.
 1. Check whether camera is mounted solidly or sitting on a steady horizontal and level surface.

2. Check the building and any supporting furniture for vibration. Ceiling mounts are often affected by building vibration more than wall mounts.
3. Any external vibration that is affecting the camera will be more apparent when in tele zoom (zoomed in)