



BG-LVPTZ-10XHSP / BG-LVPTZ-12XHSP
BG-LVPTZ-20XHSP / BG-LVPTZ-30XHSP
HD Color Video Camera

User Manual



Warnings

Electrical Safety

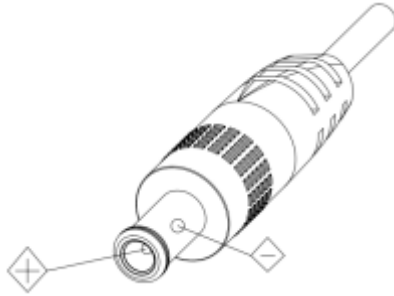
Installation and operation must conform with local electric safety standards.

Use care when moving

Avoid stress, vibration and moisture in transportation, storage and installation.

Polarity of power supply

The power supply of the product is $\pm 12V$, the max electrical current is 2A. Polarity of the power supply drawing.



Use Caution During Installation

Never move the camera by seizing the camera head. **Never** rotate the camera head by hand as mechanical damage may occur. Damage due to mishandling will void your warranty.

This unit must be installed on a smooth and level surface. Unit will not display level image if installed in a non-level position.

Ensure the base is solidly secured to the mounting surface.

Avoid using corrosive or abrasive materials to clean the camera as these may damage the finish.

Ensure that the camera is free of obstacles throughout its range of rotation.

Never power on before installation is completed.

Do not disassemble or open the housing. This will void your warranty!

To prevent the risk of electric shock, do not open the case. Installation and maintenance should only be carried out by qualified technicians. There are no serviceable parts inside the camera. BZB Gear is not responsible for any damage due to unauthorized disassembly.

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1. Quick Installation

1.1 Camera Overview

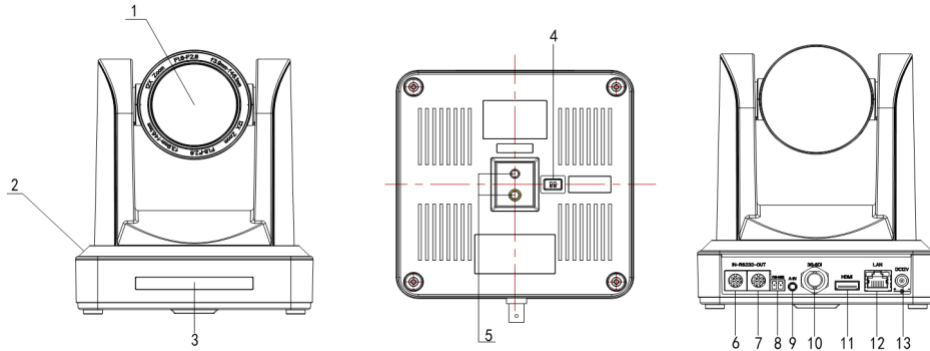


Figure 1.1 Interface

- | | |
|-------------------------------------|-------------------------------------|
| 1. Camera Lens | 8. RS485 Input (left +, right-) |
| 2. Camera Base | 9. Audio Input Interface |
| 3. Remote Controller Receiver Light | 10. 3G-SDI interface |
| 4. Bottom Dial Switch | 11. HDMI Interface |
| 5. Tripod Screw Hole | 12. 10/100M Network Interface |
| 6. RS232 Control Interface (input) | 13. DC12V Input Power Supply Socket |
| 7. RS232 Control Interface (output) | |

1.2 Power on initial configuration

1) Power on: Connect DC12V power supply adapter with power supply socket.

2) Initial configuration: Power on with power indicator light on and remote control receiver light blinking, camera head moves from bottom left to the bottom, and then goes to the HOME position (intermediate position of both horizontal and vertical), while the camera module stretches. When remote control receiver light stops blinking, the self-checking is finished

Note: If you set preset 0, when Power on self-test is completed, the camera automatically moves to the preset 0 position.

1.3 Video Output

This model has video outputs from LAN, HDMI and 3G-SDI.

1) Video Output from LAN

a. Network Cable Connection Port: No.12 in Figure1.1

b. Webpage Login: Open your browser and enter 192.168.5.163 in the address bar (factory default); press Enter to reach the login page; click on "player is not installed, please download and install!" and follow the steps to install the plugin. When complete enter the username *admin* and password *admin* (factory default) and press Enter to reach the preview page. From here users can carry out PTZ control, system configuration and other operations.

2) HDMI Video Output

- HDMI Video Cable Connection: refer to No.11 in Figure1.1.
- Connect the camera and the monitor via HDMI video cable; video output is available after camera self-test.

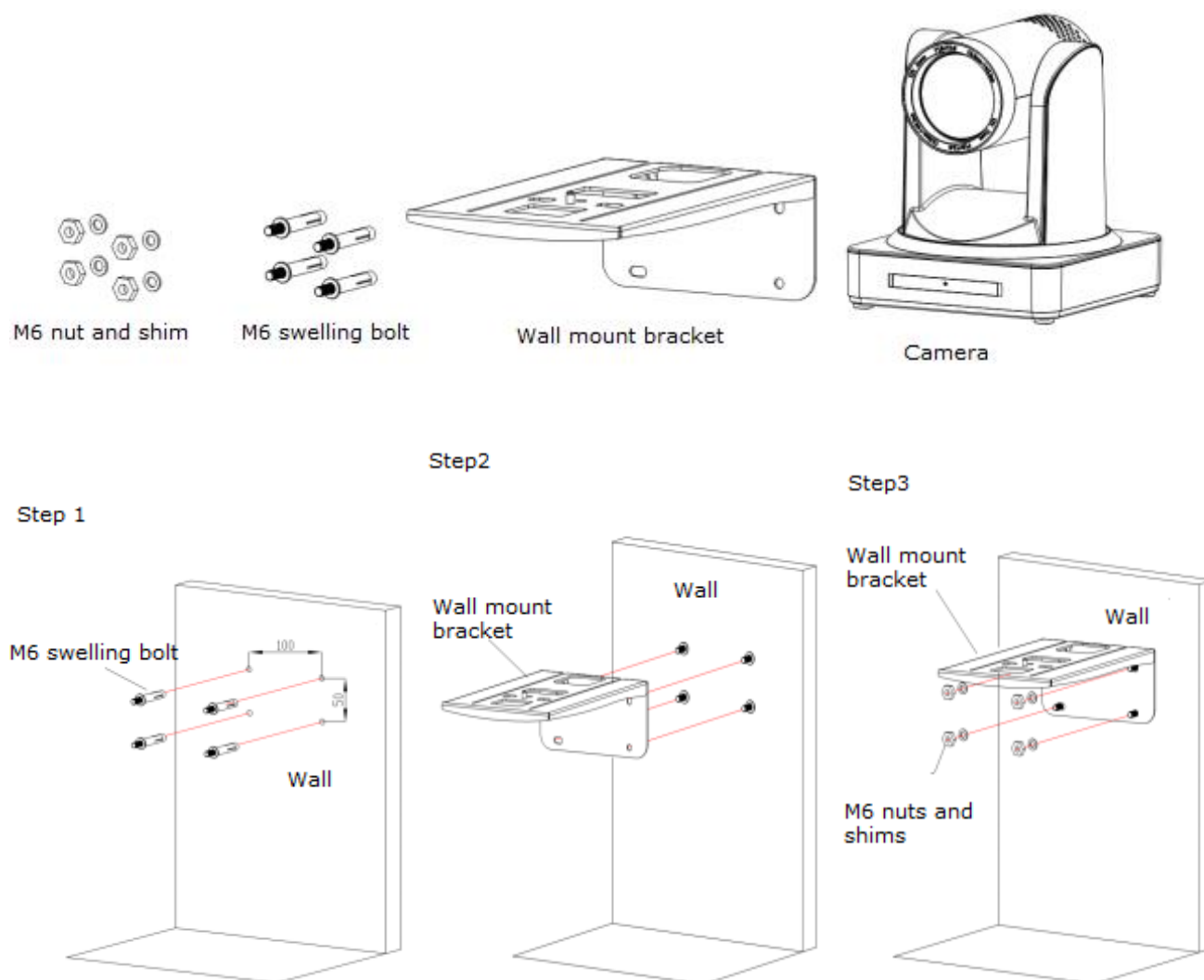
3) 3G-SDI Video Output

- 3G-SDI video cable connection: refer to No.10 in Figure1.1
- Connect the camera and the monitor via 3G-SDI video cable; video output is available after camera self-test.

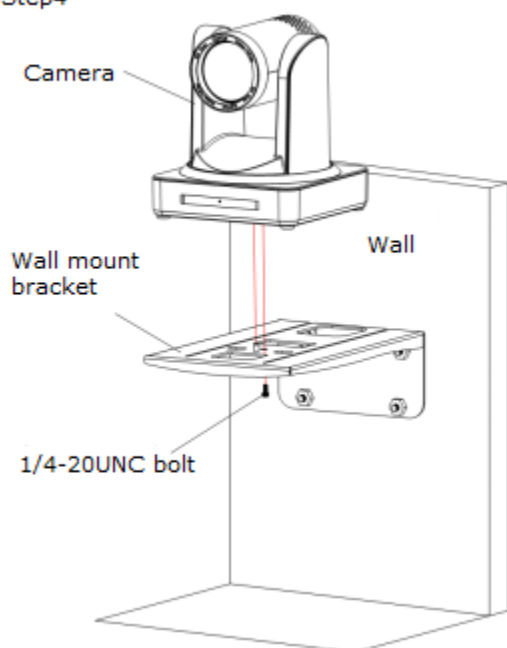
1.4 Bracket mount

Note: Bracket can be wall or ceiling mounted. Ensure bracket is securely fastened to a solid surface such as wood or concrete. **Do not fasten to drywall** or bracket may come loose and damage or destroy the camera.

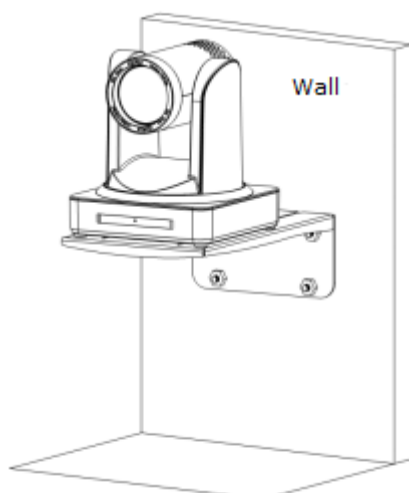
1) Wall mount guide



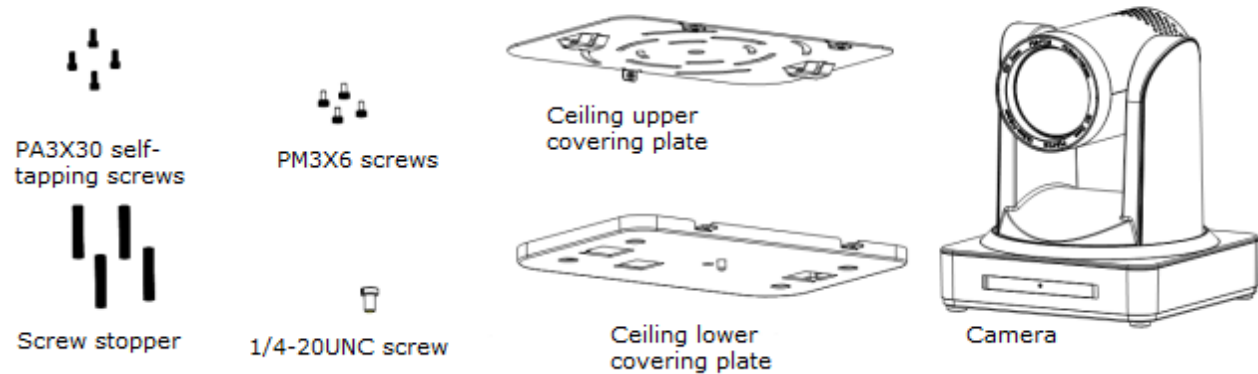
Step4



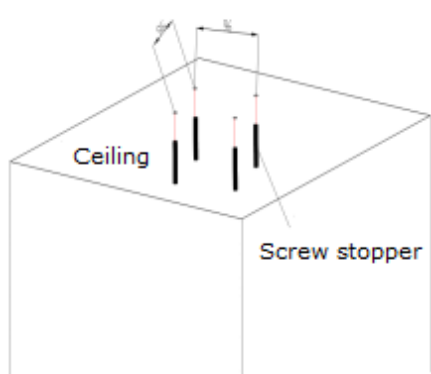
Finish



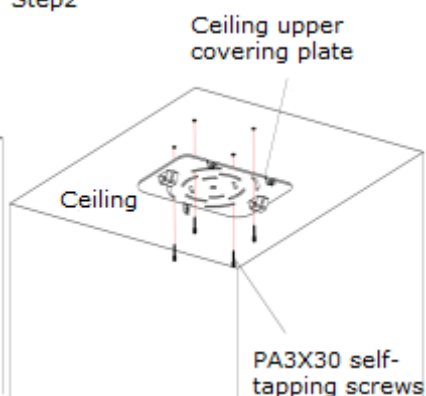
2. Ceiling mount guide



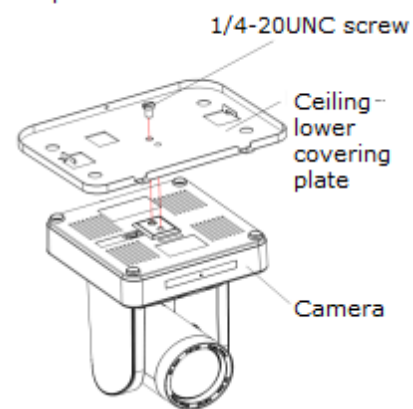
Step1



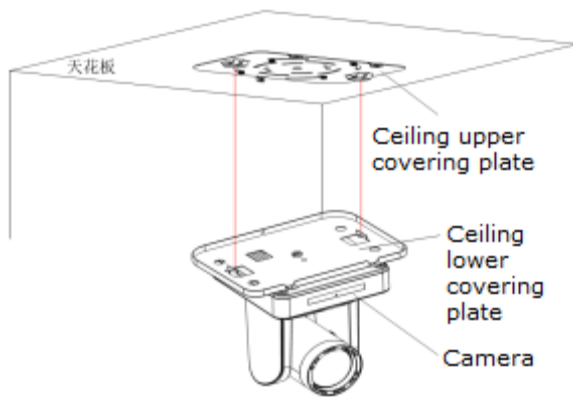
Step2



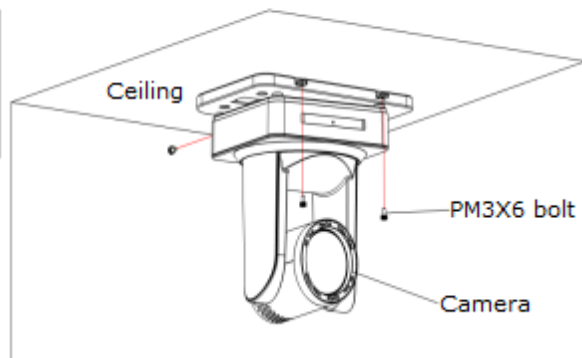
Step3



Step4



Step5



2. Product overview

2.1 Product Introduction

2.1.1 Dimensions

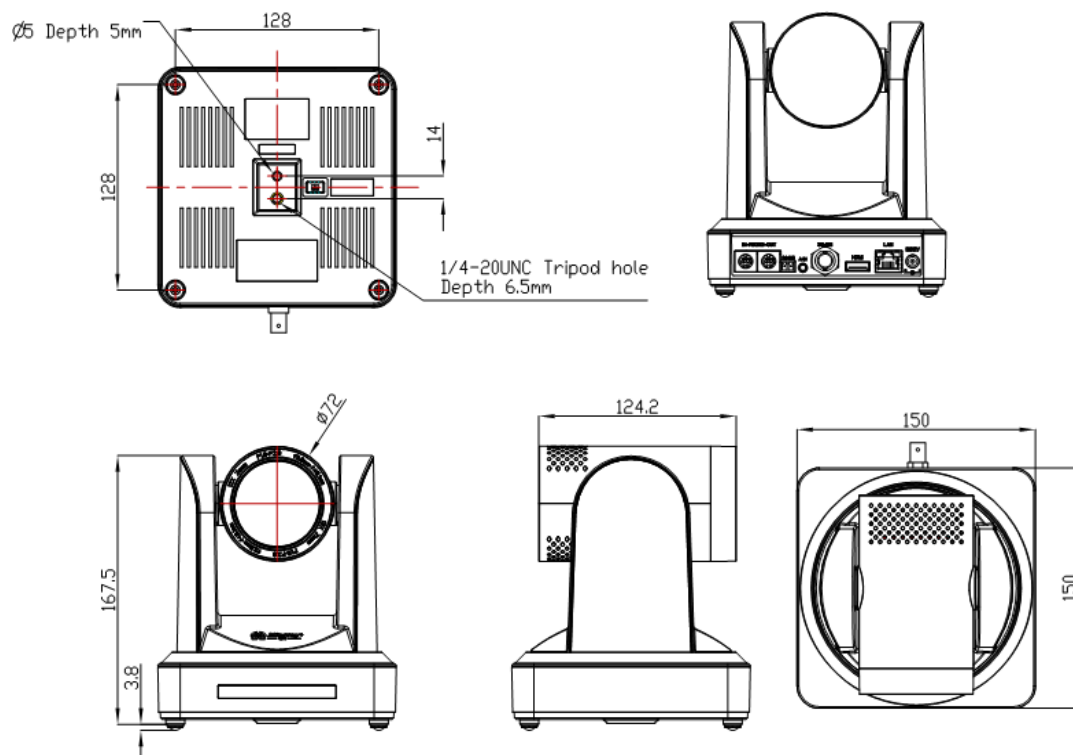


Figure 2.2 Camera Dimensions

2.1.2 Accessories

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

Configuration	Accessories
Standard	Power adapter 1piece
	RS232 cable 1 piece
	User manual 1
	Double-side glue shim 4pcs
	Warranty card 1 piece
Optional	IR Remote controller 1 piece
	Wireless controller 1 piece
	Wall mounting bracket
	Upside-down mounting bracket(optional)
	Cascade cable

2.2 Main Features

2.2.1 Camera Performance

This camera offers superior performance and rich interfaces. The features include advanced ISP processing algorithms to provide vivid images with a strong sense of depth, high resolution and accurate color rendition. It supports H.265/H.264 encoding which makes motion video fluent and clear even with less than ideal bandwidth conditions.

- 1.Superb High-definition Image:** It employs a 1/2.8 inch high quality CMOS sensor. Resolution is up to 1920x1080 with frame rate up to 60 fps.
- 2.Variable Optical Zoom Lens:** It has 10X/12X/20X/30X optical zoom lens for options.
- 3. Auto Focus Technology:** Auto focus algorithm makes allows for fast, accurate, and stable auto-focusing.
- 4. Low Noise and High SNR:** Low Noise CMOS effectively ensures high SNR of camera video.
Advanced 2D/3D noise reduction technology is also used to further reduce the noise, while ensuring image sharpness.
- 5.Quiet PTZ:** By adopting a high accuracy step driving motor mechanism, it works extremely quietly while moving smoothly and quickly to the designated position.
- 6.Multi-Format Video Outputs:** Supports HDMI, 3G-SDI, USB, wired LAN, and wireless LAN interfaces. 3G-SDI provides a 1080p60 signal up to 100m.
- 7.Multiple Remote Controls:** Included IR and optional 2.4G wireless remote controls. The 2.4G wireless remote controller will not be affected by angle, distance or IR interference. Supports transparent transmission function.
- 8.Low-power Sleep Function:** Supports low-power sleep/wake up, consumption is lower than 500mW under sleep mode
- 9.Support Multiple Control Protocol:** Supports VISCA, PELCO-D, and PELCO-P protocols which can be automatically recognized. Supports VISCA control protocol through IP port.
- 10.RS-232 Cascade Function:** supports RS-232 cascade function which is convenient for installing.
- 11.255 Presets Positions:** Up to 255 presets (10 presets by remoter).

2.2.2 Network performance

- 1. Audio Input Interface:** Supports 16000, 32000, 44100, 48000 sampling frequency and AAC, MP3, PCM audio coding.
- 2. Multiple Audio/Video Compression:** Support H.264/H.265 video compression; AAC, MP3 and PCM audio compression; Support compression of resolution up to 1920x1080 with frame rates up to 60 fps and 2 channel 1920x1080p with 30 fps compression.

3. **Multiple network protocol:** Supports NDI, ONVIF, RTSP, and RTMP protocols as well as RTMP push mode making it easy to link streaming media servers. (Wowza, FMS)
4. **5G WIFI function:** If the product contains the 5G module, you can connect and transmit via WiFi.

2.3 Technical Specification

Model	10X	12X	20X	30X
Camera Parameter				
Sensor	1/2.8 inch high quality HD CMOS sensor			
Effective Pixels	16: 9 2.07 megapixel			
Video Format	HDMI/SDI video format 1080P60/50/30/25/59.94/29.97;1080I60/50/59.94;720P60/50/30/25/59.94/29.97			
Optical Zoom	10X f=4.7~47mm	12X f=3.9~46.8mm	20X f=5.5~110mm	30X f=4.3~129mm
View Angle	6.43° (tele) 64.2° (wide)	6.3° (tele) 72.5° (wide)	3.3° (tele) 54.7° (wide)	2.34° (tele) 65.1° (wide)
AV	F1.6 – F3.0	F1.8 – F2.4	F1.6 – F3.5	F1.6– F4.7
Digital Zoom	10X/12X/20X/30X			
Minimum Illumination	0.5Lux (F1.8, AGC ON)			
DNR	2D & 3D DNR			
White Balance	Auto / Manual/ One Push/ 3000K/ 4000K/5000K/6500K			
Focus	Auto/Manual			
Aperture	Auto/Manual			
Electronic Shutter	Auto/Manual			
BLC	ON/OFF			
WDR	OFF/ Dynamic level adjustment			
Video adjustment	Brightness, Color, Saturation, Contrast, Sharpness, B/W mode, Gamma curve			
SNR	>55dB			

Input/Output Interface	
Video Interfaces	BG-LVPTZ-10XHSP / BG-LVPTZ-12XHSP / BG-LVPTZ-20XHSP / BG-LVPTZ-30XHSP: HDMI, 3G-SDI, LAN.
Image code stream	Double streams outputs simultaneously
Video Compression format	H.264, H.265
Control Signal Interface	RS-232 Ring through RS232 output, RS-485
Control Protocol	VISCA/Pelco-D/Pelco-P; Baud Rate: 115200/9600/4800/2400bps
Audio input Interface	Double track 3.5mm linear input;
Audio Compression Format	AAC/MP3/PMC Audio compression
HD IP Interface	100M IP port(100BASE-TX); 5G WiFi (optional), support NDI & IP Visca control protocol
Network Protocol	NDI, RTSP/RTMP, ONVIF
Power Interface	HEC3800 outlet (DC12V)

PTZ Parameter	
Pan Rotation	±170°
Tilt Rotation	-30°~+90°
Pan Control Speed	0.1 -180°/sec
Tilt Control Speed	0.1-80°/sec
Preset Speed	Pan: 60°/sec, Tilt: 30°/sec
Preset Number	255 presets (10 presets by remote controller)
Other Parameters	
Supply Adapter	AC110V-AC220V to DC12V/2A
Input Voltage	DC12V±10%
Input Current	1A(Max)

Consumption	12W (Max)
Store Temperature	-10°C to +60°C
Store Humidity	20% - 95%
Working Temperature	-10°C to +50°C
Working Humidity	20%--80%
Dimension	150mmX150mmX167.5mm
Weight	1.4KG
Working Environment	Indoor
Remote Operation (IP)	Remote Upgrade, Reboot and Reset
Accessory	Power Supply, RS232 Control Cable, Remoter, Manual, Warranty card
Optional Accessory	Bracket

2.4 Connections Overview

2.4.1 External Connections

- 1) External interface: RS232 Input /Output, RS485 Input, Audio Input, 3G-SDI Output, HDMI Output, LAN, DC12V Power Interface.

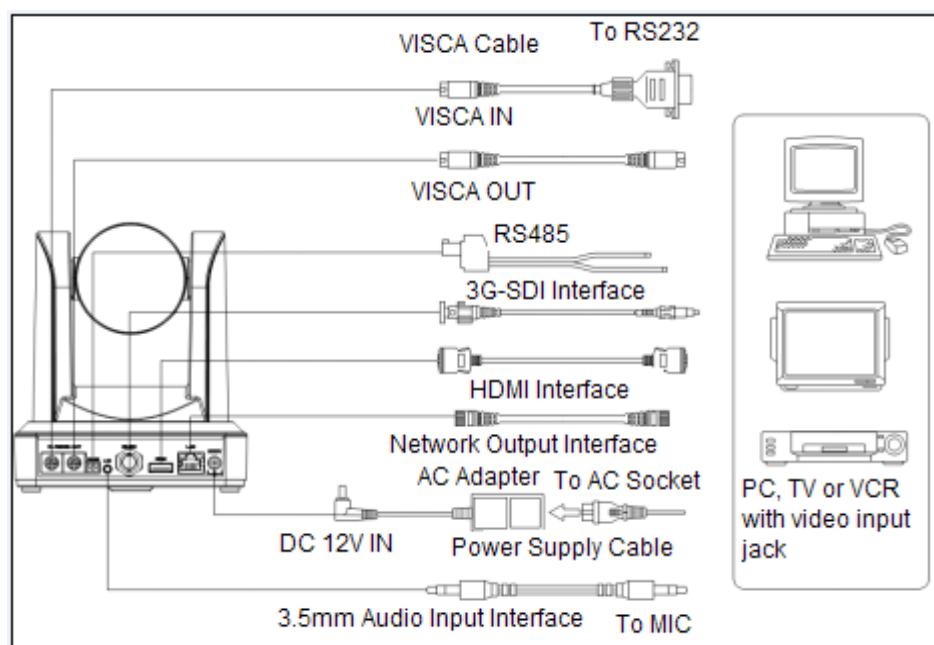


Figure 2.3 external interface diagram

2.4.2 Bottom Dial Switch

Bottom Dial Switch diagram shown in Figure 2.6 and 2.7:

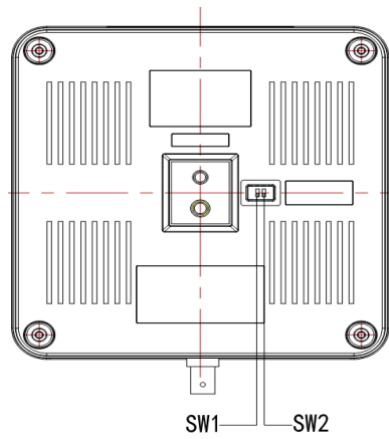


Figure 2.6 Bottom Dial Switch Diagram

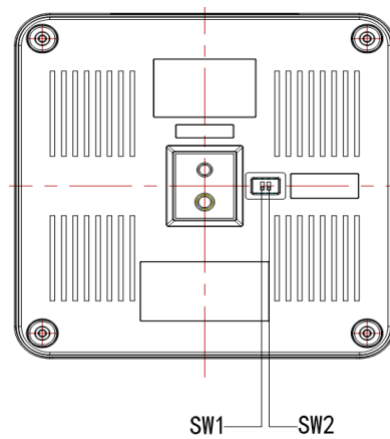


Figure 2.7 Bottom Dial Switch diagram

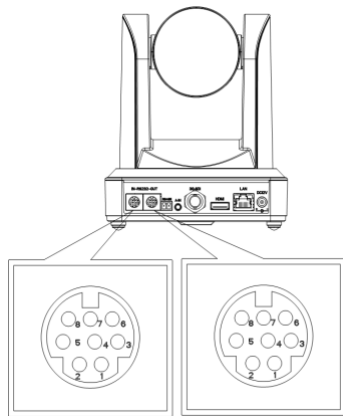
Two DIP switches are set to ON or OFF to select different modes of operation as shown in Table 2.2

Table 2.2 Dial Switch setting

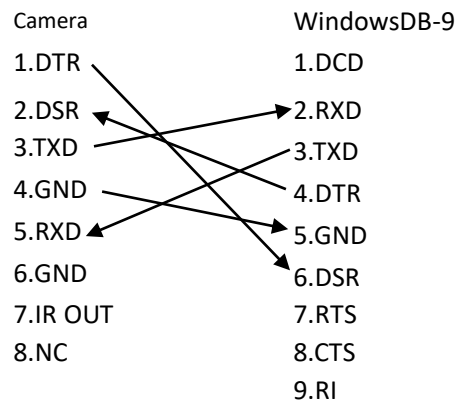
No.	SW1	SW2	Explanation
1	OFF	ON	Working mode
2	ON	OFF	Updating mode

2.4.3 RS-232 Interface

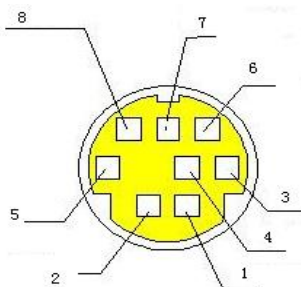
1) RS-232C interface specification as shown below



Computer or keyboard and camera connection method



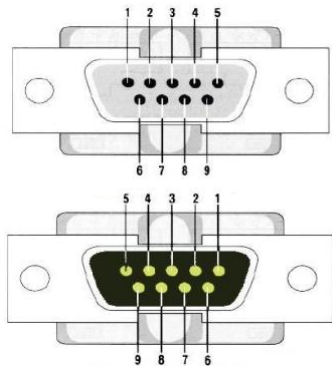
2) RS-232 Mini-DIN 8-pin Port Definition



NO.	Port	Definition
1	DTR	Data Terminal Ready
2	DSR	Data Set Ready
3	TXD	Transmit Data

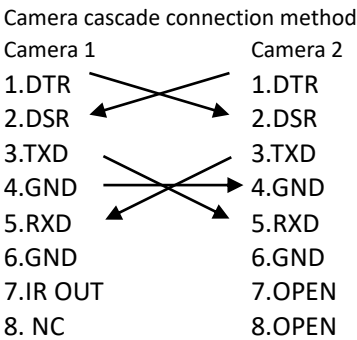
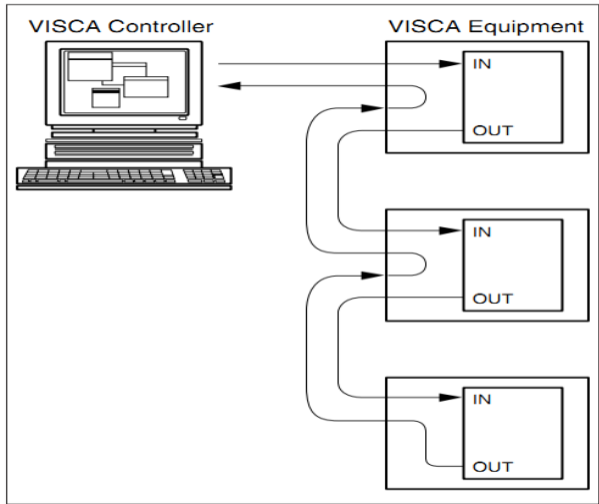
4	GND	System Ground
5	RXD	Receive Data
6	GND	System Ground
7	IR OUT	IR Commander Signal
8	NC	No Connection

3) 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

2) VISCA networking as shown below:



Note: Has RS232 input and output interface allowing for cascading inputs.

3. Operating Instructions

3.1 Video Output

3.1.1 Power-On Initial Configuration

After connecting the power, the camera will initiate self-test mode. The IR indicator light will start flashing. When the camera returns to the HOME position (middle position for P/T) and lens finishes zoom in/out, the self-testing is finished. The IR led will stop flashing. If the preset 0 is set, the camera will rotate to the (0) preset position after initial configuration.

3.1.2 Video Output

Connect the video output cable; this may vary based on camera model and application.

Figure 1.4.1 is for your reference (output interface introduction for each product)

- 1) Network Output: Connect this product and your computer via network cable. Open the browser and enter the camera IP address (factory default 192.168.5.163) in the address bar. On the login page enter username and password - factory default is "admin" for both. Once logged in you will be prompted to download and/or enable manage the plugin, click allow and video will be displayed.

(Note: If you forget your username, password, IP address, you can manually restore the default by the remote controller key combination * #)

- 2) 3G-SDI output or DVI (HDMI) output: Connect the monitor with the corresponding video output interface and the image will be displayed after initial power-on.

3.2 Remote Control

3.2.1 Key Description



1. Power/Standby Key

Press and hold for 3 seconds to place the camera into standby mode. Press and hold for 3 seconds a second time and the camera will self-test again and return to the HOME position. Note: Camera will default to preset 0 if no command is sent within 12 seconds of power on.

2. Camera Select

Select the ID of the camera you wish to control.

3. Number Key

Set or run preset 0-9.

4. * # Key

Used for command modifiers – See tables in sections 11 and 12 below.

5. Focus Control Key

Auto: Activate auto focus mode.

Manual: Activate manual focus mode.

+/-: Adjust focus in manual focus mode.

6. Zoom Control Key

Zoom + : Zoom In

Zoom - : Zoom Out

7. Set or Clear Preset key:

Set Preset: Press and hold while selecting desired number key to record a preset.

Clear Preset key: Press and hold while selecting desired number key to clear a preset.

8. Pan/Tilt Control Key

▲ Tilt camera up

▼ Tilt camera down

◀ Pan camera left

▶ Pan camera right

HOME: Return to the middle position/ confirm on-screen menu selection.

9. BLC ON/OFF

Turn on or off remote control button backlighting.

10. MENU

Enter or exit on-screen menu/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 camera presets

3) 【*】+【#】+【9】: Flip image

5) 【*】+【#】+Manual: Restore default IP address and login

7) 【#】+【#】+【1】: Switch the video format to 1080P50

9) 【#】+【#】+【3】: Switch the video format to 1080I50

11) 【#】+【#】+【5】: Switch the video format to 720P50

13) 【#】+【#】+【7】: Switch the video format to 1080P25

15) 【#】+【#】+【9】:Switch the video format to 720P25

2) 【*】+【#】+【6】:Restore factory defaults

4) 【*】+【#】+【3】: Menu set to Chinese

6) 【*】+【#】+【4】:Menu set to English

8) 【#】+【#】+【0】:Switch the video format to 1080P60

10) 【#】+【#】+【2】:Switch the video format to 1080I60

12) 【#】+【#】+【4】:Switch the video format to 720P60

14) 【#】+【#】+【6】:Switch the video format to 1080P30

16) 【#】+【#】+【8】:Switch the video format to 720P30

3.2.2 Remote Control Operation

Following initialization, the camera can receive and execute the IR commands. The indicator will flash when the camera receives a command. Users can control the pan/tilt/zoom, settings, and run 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, then press “【#】” and last press “【F1】”.





1) Camera Selection



Select the camera address to control.

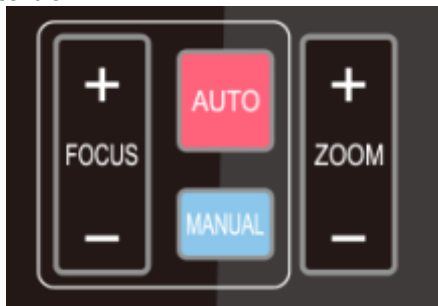
2) Pan/Tilt Control





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

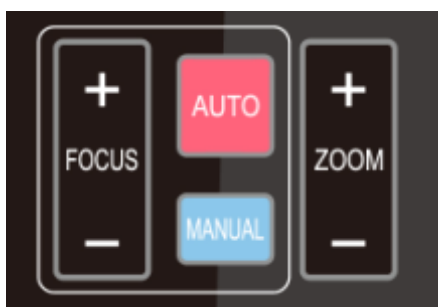


ZOOM IN: press “ZOOM  ” key

ZOOM OUT: press “ZOOM  ” key

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

4) Focus Control



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 record a preset.

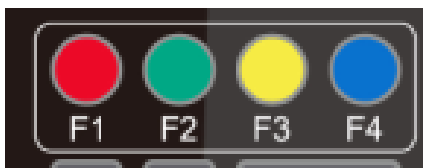
Note: 10 preset positions in total are available by remote controller.

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

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 preset.

Note: press the “【#】” key three times to erase all presets.

7) Camera Remote Controller Address Setting

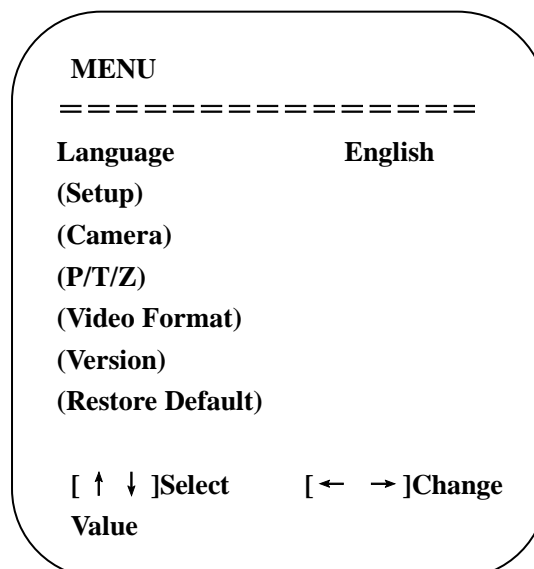


- 【*】 + 【#】 + 【F1】 :Camera Address No.1
- 【*】 + 【#】 + 【F2】 :Camera Address No. 2
- 【*】 + 【#】 + 【F3】 :Camera Address No. 3
- 【*】 + 【#】 + 【F4】 :Camera Address No. 4

3.3 MENU SETTINGS

3.3.1 Main Menu

In normal working mode, press 【MENU】 key to display the menu and use the arrow keys to navigate the options.



LANGUAGE: Language setting, Chinese / English

SETUP: System setting

CAMERA OPTION: Camera setting

PTZ OPTION: Pan tilt setting

VERSION: camera version setting

Restore Default: Reset setting

[↑↓] Select: for selecting menu

[← →] Change Value: for modify parameters

[MENU] Back: Press [MENU] to return

[Home] OK: Press [Home] to confirm

3.3.2 System Setting

Move the pointer to the (Setup) in the Main Menu, click the **【HOME】** key and enter the (System Setting) as shown below.

SETUP

=====

Protocol	Auto
Visca Address	1
Visca Address Fix	OFF
PELCO-P Address	1
PELCO-D Address	0
Baudrate	9600

[↑ ↓]Select [← →]Change Value

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

Visca ADDR: VISCA=1~7 Pelco-P=1~255 Pelco-D = 1~255

Baud rate: 2400/4800/9600/115200

Visca Address Fix: On/Off

3.3.3 Camera Setting

Highlight (CAMERA) in the Main Menu, click the **【HOME】** key to enter camera settings.

CAMERA

=====

(Exposure)

(Color)

(Image)

(Focus)

(Noise Reduction)

[↑ ↓]Select [← →]Change Value

EXPOSURE: Enter Exposure setting

COLOR: Enter color setting

Image: Enter into image setting
Focus: Enter into focus setting
Noise Reduction: Enter noise reduction

1) EXPOSURE SETTING

Highlight (EXPOSURE) in the Main Menu, click the **【HOME】** key to enter exposure settings.

EXPOSURE

=====

Mode	Auto
EV	OFF
BLC	OFF
Anti-Flicker	50Hz
Gain Limit	3
WDR	5

[↑ ↓]Select [← →]Change
Value

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)

WDR: Off,1~8

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

(only available in Manual and Shutter priority mode)

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

Brightness: 0~23 (only available in Brightness **priority** mode)

2) COLOR SETTING

Highlight (COLOR) in the Main Menu and click the **【HOME】** key to enter Color Settings.

COLOR

=====

WB Mode	Auto
Saturation	80%
Hue	7
AWB Sensitivity	High
Color style	Default
Color temp	Low

[↑ ↓]Select [← →]Change
Value

WB Mode: Auto, Manual, One Push

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

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

Saturation: 60%,70%,80%,90%,100%,110%,120%,130%

Hue: 0~14

AWB Sensitivity: high/middle/low

Color Style: Default, style1~4.

Color Temp: high/middle/low

3) IMAGE

Highlight (IMAGE) in the Menu and click the **【HOME】** key to enter Image Settings.

IMAGE

=====

Brightness	6
Contrast	8
Sharpness	7
Flip-H	OFF
Flip-V	OFF
B&W-Mode	Color
Gamma	Default
DZoom	OFF
DCI	Close
[↑ ↓]Select	[← →]Change

Value

Brightness: 0~14

Contrast: 0~14

Sharpness: 0~15

Flip-H: On/Off

Flip-V: On/Off

B&W Mode: color, black/white

Gamma: default, 0.47, 0.50, 0.52, 0.55

DZoom: digital zoom options: On/Off

DCI: Dynamic Contrast: Off,1~8

4) FOCUS

Highlight (FOCUS) in the Menu and click the **【HOME】** key to enter Focus Settings.

FOCUS

=====

Focus Mode	Auto
AF-Zone	Center
AF-Sensitivity	Low
[↑ ↓]Select	[← →]Change

Value

Focus Mode: Auto, manual
AF-Zone: Up, middle, down
AF-Sensitivity: High, middle, low

5) NOISE REDUCTION

Highlight (NOISE REDUCTION) in the Menu and click the **【HOME】** key to enter Noise Reduction Settings.

NOISE REDUCTION

=====

NR-2D	Auto
NR-3D	3
Dynamic Hot Pixel	OFF

[↑ ↓]Select [← →]Change
Value

2D Noise Reduction: Auto, close, 1~7
3D Noise Reduction: Close, 1~8
Dynamic Hot Pixel: Close, 1~5

3.3.4 P/T/Z

Highlight (P/T/Z) in the Main Menu and click the **【HOME】** key to enter P/T/Z Settings.

P/T/Z

=====

Depth of field	ON
Zoom speed	8
Image Freezing	OFF
Acc Curve	Slow

[↑ ↓]Select [← →]Change
Value

Depth of Field: Only effective for remote controller, On/ Off
 *When zoomed in the PT control speed by remote will slow down.
Zoom Speed: Set the zoom speed for remote controller,1~8
Image Freezing: On/Off
Accelerating Curve: Fast/slow

3.3.5 Video Format

Highlight (**Video Format**) in the Menu and click the **【HOME】** key to enter Video Format Settings

VIDEO FORMAT

=====

1080P60	1080P50
1080I60	1080I50
1080P30	1080P25
720P60	720P50
720P30	720P25
1080P59.94	1080I59.94
1080P29.97	720P59.94
720P29.97	

[

↑

↓

]

Select

[Menu]Back

Note: 1. S: 1080P60 Downward Compatibility; M: 1080P30 Downward Compatibility
 2. Exit menu after modifying parameter to save it after powered off

3.3.6 Version

Highlight (VERSION) in the Main Menu and click the **【HOME】** key to enter Version Information.

VERSION

=====

MCU Version	2.0.0.15	2015-12-18
Camera Version	2.0.0.13	2015-12-18
AF Version	2.0.0.6	2015-12-11
Lens	12X(20X)	

[Menu]Back

MCU Version: Display MCU version information

Camera Version: Display camera version information

AF Version: Display the focus version information

Lens: Display the lens zoom

3.3.7 Restore Defaults

Highlight (RESTORE DEFAULT) in the Main Menu and click the **【HOME】** key to enter Restore Default Settings.

RESTORE DEFAULT

=====

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

[

↑

↓

]

Select

[←

→]

Change

Value

Restore default: options: yes/no; after restoring default, the video format will not be restored.

4. Network Connection

4.1 Connection Mode

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

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

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

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

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

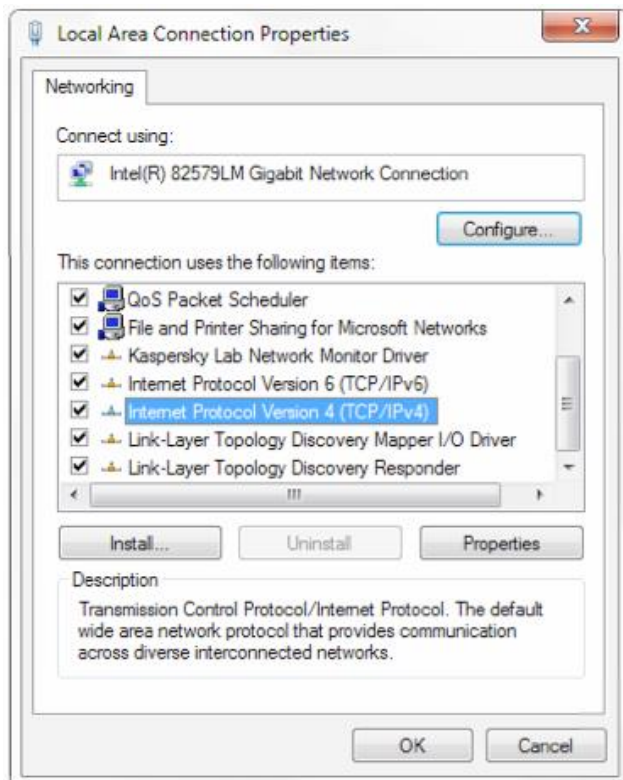
For Windows users right-click on the internet connection in the lower right corner of the desktop.

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

Select **“Change Adapter Options”**.

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

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



For the following steps refer to the diagram below.

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

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

In the **Subnet mask** field enter 255.255.255.0

In the **Default gateway** field type 192.168.5.1

You can leave the DNS fields blank.

Click **OK** to apply your settings.

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

Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

☐ Obtain an IP address automatically

☒ Use the following IP address:

IP address: 192 . 168 . 5 . 200

Subnet mask: 255 . 255 . 255 . 0

Default gateway: 192 . 168 . 5 . 1

☐ Obtain DNS server address automatically

☒ Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

☐ Validate settings upon exit

Advanced...

OK Cancel

4.2 Web Browser Login

4.2.1 Web client

1) Web client Log In

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

2)Download/Manage Plug in

The first time you connect to the camera you will receive a prompt allow the Flash player to run. This is required to display the image in your web browser. (Compatible Browsers, Chrome, Firefox and Safari)

4.2.2 Preview

After successful login into the web UI you will see the video preview interface. From the preview screen users can control PTZ, zoom, focus, sound, focus, and screen size. Additionally, run and delete preset positions and perform other operations.

4.2.3 Configuration

Click **Configuration** access the following settings.

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

4.2.4 Audio Configuration

Checkbox: Select to enable audio.

Encode Type: Set audio compression format

Sample Rate: Set sampling rate

Sample Bits: Set sampling precision

Bit rate: Set audio compression bit rate

Note: After clicking “**SAVE**” you will be prompted to reboot the camera. This is required to apply changes.

4.2.5 Video configuration

1) Video encoding

Stream: Designates which stream the settings apply to.

Compression Format: Set the video compression format; reboot required to apply changes.

Profile: Profile Mode Setting

Image Size: Set video image resolution; reboot required to apply changes.

Stream Rate control: Set rate control mode; reboot required to apply changes.

Image Quality: Set image quality - Can be changed only when rate control is set to variable bit rate (VBR)

Bit Rate (Kb / s): Set the video bit rate

Frame rate (F / S): Set the video frame rate

I frame interval: Set the key frame interval

Stream Name: When streaming via RTSP or RTMP, user can modify stream name.

Click **SAVE** to apply changes.

2) Stream Publish

Checkbox: To turn enable/disable main or secondary stream.

Protocol Type: Primary and secondary streams use RTMP protocol.

Host Port : Server port number.

Host Address: Server IP addresses

Stream Name: Choose a different stream name

Username: Set the username

Password: Set the password

Click **SAVE** to apply changes.

*To use RTSP use the following string in “**Stream Name**”: rtsp:// device IP address: 554 / live / av0 (av0 main stream; av1 secondary stream)

3) RTP Multicast

Checkbox: Click to enable/disable main or secondary stream.

Protocol Type: Select protocol type

Multicast Address: Server IP address

Multicast Port: Server port number

4) Video Parameters

Focus: Focus mode, focus range, focus sensitivity can be set.

Focus Mode: set the focus mode

Focus Range: set the focus range

Focus Sensitivity: Set the focus sensitivity

Exposure: Mode, compensation, back light compensation, anti-flicker, gain limit, and dynamic range compression can be set.

Exposure Mode: Set the exposure mode

Exposure compensation: Enable exposure compensation

BLC: Enable back light compensation

Anti-flicker: Set anti-flicker mode

Gain limit: Set the gain

DRC: Set the dynamic range compression

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

White balance mode: Set the white balance

Red Gain: Set the red gain

Blue Gain: Set the blue gain

Saturation: Set the saturation

Auto white balance sensitivity: Auto white balance settings

Image: Brightness, contrast, sharpness, gamma curve, black and white mode, horizontal/vertical flip can be set.

Brightness: Set the brightness

Contrast: Set the contrast

Sharpness: Set the sharpness

Gamma: Gamma value setting

DCI: Set the DCI level

Black and white mode: Set black and white mode

Flip Horizontal: Set Flip Horizontal

Flip Vertical: Set vertical flip

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

2D Noise Reduction: Set 2D noise reduction level

3D Noise Reduction: Set 3D noise reduction level

Dynamic hot pixel correction: Set Dynamic hot pixel correction

Style: Image style preset can be selected

Video OSD: Video overlay information can be set

Display date and time: Set whether to display the time and date

Display Title: Set whether to display the title

Time Font Color: Set font color of time and date

Title Font Color: Set font color of

Moving characters: Set the display position of date, time, and title

Title Content: Set title content

Time Content: Set time content

OSD Font Size

Main stream OSD font size: Set the character size of the display

Secondary stream character size: Set the character size of the display

Click "Save" to apply changes.

Video output

Video Out Format: Set the video output

Click "Save" to apply changes.

4.2.6 Network configuration

1) Network port

Port Data: Set the data port
Port Web: Set the web port
Port Onvif: Set Onvif port
Port Soap: Set Soap port
Port RTMP: Set RTMP port
Port Rtsp: Set RTSP port
Port Visca: Set Visca
Click **"Save"** to apply changes.

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

2) Ethernet

DHCP: Enable or disable obtain IP automatically
IP Address: Set the camera IP address
Subnet Mask: Set the subnet mask
Default Gateway: Set the default gateway
MAC Address: Displays the camera's MAC address.
Click **"Save"** to apply changes.

3) DNS parameters

Preferred DNS server: set the preferred DNS server
Alternate DNS server: Alternate DNS server settings
Click **"Save"** to apply changes.

4) GB28181

Checkbox: Enable/Disable GB28181
Clock Sync: Enable/Disable clock synchronization
Video Type: Stream type setting
Registration Valid Time (seconds): 3600 Range 5-65535
Heartbeat time (seconds): 60 Range 1-65535
Register ID: 34020000001320000001
Register Name: IPC
Register Password: 12345678
Equipment ownership: Users can add their own
Administrative regions: Users can add their own
Alarm Areas: Users can add their own
Device 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 **"Save"** to apply changes.

4.2.7 System configuration

1) System Attributes

Device Name: Set the device name
Device ID: Shows the device ID
System Language: Set the system language
Click **"Save"** to apply changes.

2) System Time

Date Format: Set the date format
Date separator: Set the date separator
Time Zone: Set the time zone
Hour Type: Set the clock type
NTP Enable: Enable automatic time sync
Update interval: Set the NTP server automatic time update interval
Host URL: Set NTP server address or domain name
Host Port: Sets the NTP server
Click **"Save"** to apply changes.

3) User Management

Authority: Set the user type (Administrator, Common User 1, Common User 2)

Username: Set the username
Password: Set a password
Password confirmation: Confirm the password
Click "Save" to apply changes.

4) Update

MCU version: Displays current firmware version
Camera version: Displays current firmware version
Focus version: Displays current firmware
Update file: Click choose file to browse for firmware update file. Click Upgrade when file is selected.

*** Make sure power and network remain connected during process or the upgrade will fail!**

5) Default

Click on "Restore Factory Defaults" button and choose "yes" or "no"

6) Reboot

Click on the pop-up "Reboot" button and choose "yes" or "no"

4.2.8 Logout

Click "Logout" button; select "Yes" or "No"

4.2.9 Wireless network

If the user's equipment has a wireless network module, the specific configuration is as follows:

1) Network settings

Wireless network configuration:

Network interface enable: Select to enable wireless interface
DHCP: Select to enable DHCP (default is disabled with a static address of 192.168.1.250)
***Note:** Wireless IP address cannot be in the same subnet as wired IP address!

Subnet Mask: Set the wireless IP subnet mask (default 255.255.255.0)
Default Gateway: Set the wireless IP default gateway (default 192.168.1.1)
SSID: The user can modify their own (the default test)
Encryption: Select to enable password entry
Password: Enter Wifi password
Click "Save" to apply changes.

2) WiFi hot link

Click on the "search" button to scan for WIFI hotspots.
Double-click the dialog box after selecting Wifi hotspot, then input password to connect to Wifi.

3) Wireless WiFi login page

Enter IP address of camera to login via browser. Default is 192.168.1.250. Use a network scanning tool to locate your IP address if DHCP was enabled in setup.

5. Serial Communication Control

Under common working conditions the camera can be controlled through RS232/RS485 interface (VISCA), RS232C serial parameter are as follows:

Baud rate: 2400/4800/9600/115200 bits / sec; Start bit: 1; data bits: 8; Stop bit: 1; Parity: None.

After powering on, the camera will perform a self-test. Self-test is finished after the zoom moves to the farthest and then back to the nearest position. If the camera has a "0" preset stored it will return to that position after initialization. At this point, the user can

control the camera by the serial commands.

5.1 VISCA protocol list

5.1.1 Camera return command

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

z = camera address + 8

Error Messages		
	Command packet	Note
Syntax Error	z0 60 02 FF	Returned when the command format is different or when a command with illegal command parameters is accepted
Command Not Executable	z0 61 41 FF	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	Note
AddressSet	Broadcast	88 30 0p FF	p: Address setting
IF_Clear	Broadcast	88 01 00 01 FF	I/F Clear
CommandCancel		8x 21 FF	
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	p = 0(low) - F(high)
	Tele(Standard)	8x 01 04 07 02 FF	
	Wide(Standard)	8x 01 04 07 03 FF	
	Tele(Variable)	8x 01 04 07 2p FF	
	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) - F(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	
CAM_Zoom Focus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	pqrs: Zoom Position tuvw: Focus Position
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	Note
CAM_RGain	Reset	8x 01 04 03 00 FF	Manual Control of R Gain
	Up	8x 01 04 03 02 FF	
	Down	8x 01 04 03 03 FF	
	Direct	8x 01 04 43 00 00 0p 0q FF	pq: R Gain
CAM_Bgain	Reset	8x 01 04 04 00 FF	Manual Control of B Gain
	Up	8x 01 04 04 02 FF	
	Down	8x 01 04 04 03 FF	
	Direct	8x 01 04 44 00 00 0p 0q FF	pq: B Gain
CAM_AE	Full Auto	8x 01 04 39 00 FF	Automatic Exposure mode
	Manual	8x 01 04 39 03 FF	Manual Control mode
	Shutter priority	8x 01 04 39 0A FF	Shutter Priority Automatic Exposure mode
	Iris priority	8x 01 04 39 0B FF	Iris Priority Automatic Exposure mode
	Bright	8x 01 04 39 0D FF	Bright mode
CAM_Shutter	Reset	8x 01 04 0A 00 FF	Shutter Setting
	Up	8x 01 04 0A 02 FF	
	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	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	
	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 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 Position
CAM_NR (2D)		8x 01 04 53 0p FF	P=0-7 0:OFF
CAM_NR (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: 0.47 2: 0.50 3: 0.52 4: 0.55
CAM_Flicker	OFF	8x 01 04 23 00 FF	OFF
	50HZ	8x 01 04 23 01 FF	50HZ

Command	Function	Command packet	Note
	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_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_PictureFlip	On	8x 01 04 66 02 FF	Image Flip Vertical ON/OFF
	Off	8x 01 04 66 03 FF	
CAM_ColorSaturation	Direct	8x 01 04 49 00 00 00 0p FF	P=0-7 0:60% 1:70% 2:80% 3:90% 4:100% 5:110% 6:120% 7:130%
CAM_IDWrite		8x 01 04 22 0p 0q 0r 0s FF	pqrs: Camera ID (=0000 to FFFF)
SYS_Menu	ON	8x 01 04 06 06 02 FF	Turn on the menu screen
	OFF	8x 01 04 06 06 03 FF	Turn off the menu screen
IR_Receive	ON	8x 01 06 08 02 FF	IR (remote commander)receive On/Off
	OFF	8x 01 06 08 03 FF	
IR_ReceiveReturn	On	8x 01 7D 01 03 00 00 FF	IR (remote commander)receive message via the VISCA communication ON/OFF
	Off	8x 01 7D 01 13 00 00 FF	
CAM_SettingReset	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_VideoSystem	Set camera video system	8x 01 06 35 00 0p FF	P: 0~E Video format 0:1080P60 8:720P30 1:1080P50 9:720P25 2:1080i60 A: 1080P59.94 3:1080i50 B: 1080i59.94 4:720P60 C: 720P59.94 5:720P50 D: 1080P29.97 6:1080P30 E: 720P29.97 7:1080P25
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	
	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)

Command	Function	Command packet	Note
	Clear	8x 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF	ZZZZ: Tilt Limit Position (TBD)

5.1.3, Inquiry command

Command	Function	Command packet	Note
CAM_PowerInq	8x 09 04 00 FF	y0 50 02 FF	On
		y0 50 03 FF	Off(Standby)
CAM_ZoomPosInq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_FocusAFModelInq	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_FocusPosInq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position
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
			6500K
CAM_RGainInq	8x 09 04 43 FF	y0 50 00 00 0p 0q FF	pq: R Gain
CAM_BGainInq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: B Gain
CAM_AEModelInq	8x 09 04 39 FF	y0 50 00 FF	Full Auto
		y0 50 03 FF	Manual
		y0 50 0A FF	Shutter priority
		y0 50 0B FF	Iris priority
		y0 50 0D FF	Bright
CAM_ShutterPosInq	8x 09 04 4A FF	y0 50 00 00 0p 0q FF	pq: Shutter Position
CAM_IrisPosInq	8x 09 04 4B FF	y0 50 00 00 0p 0q FF	pq: Iris Position
CAM_Gain LimitInq	8x 09 04 2C FF	y0 50 0p FF	p: Gain Positon
CAM_BrightPosInq	8x 09 04 4D FF	y0 50 00 00 0p 0q FF	pq: Bright Position
CAM_ExpCompModelInq	8x 09 04 3E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
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: 2DNRLLevel
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: Gamma ID
IR_ReceiveInq	8x 09 06 08 FF	y0 50 02 FF	On
		y0 50 03 FF	Off

IR_ReceiveReturn		y0 07 7D 01 04 00 FF	Power ON/OFF
		y0 07 7D 01 04 07 FF	Zoom tele/wide
		y0 07 7D 01 04 38 FF	AF ON/OFF
		y0 07 7D 01 04 33 FF	Camera _Backlight
		y0 07 7D 01 04 3F FF	Camera _Memery
		y0 07 7D 01 06 01 FF	Pan_titleDriver
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 : 0950
			rs tu : ARM Version vw : reserve
VideoSystemInq	8x 09 06 23 FF	y0 50 0p FF	P: 0~E Video format 0:1080P60 8:720P30 1:1080P50 9:720P25 2:1080i60 A: 1080P59.94 3:1080i50 B: 1080i59.94 4:720P60 C: 720P59.94 5:720P50 D: 1080P29.97 6:1080P30 E: 720P29.97 7:1080P25
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

Note: [X] in the above table indicates the camera address to be operated **【y】 = 【x + 8】** .

5.2,Pelco-D protocol command list

Function	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Up	0xFF	Address	0x00	0x08	Pan Speed	Tilt Speed	SUM
Down	0xFF	Address	0x00	0x10	Pan Speed	Tilt Speed	SUM
Left	0xFF	Address	0x00	0x04	Pan Speed	Tilt Speed	SUM
Right	0xFF	Address	0x00	0x02	Pan Speed	Tilt Speed	SUM
Upleft	0xFF	Address	0x00	0x0C	Pan Speed	Tilt Speed	SUM
Upright	0xFF	Address	0x00	0x0A	Pan Speed	Tilt Speed	SUM
DownLeft	0xFF	Address	0x00	0x14	Pan Speed	Tilt Speed	SUM
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
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	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
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
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. Camera Maintenance and Troubleshooting

6.1 Camera Maintenance

- 1) If camera is not used for long time, please turn off power adapter switch and AC plug.
- 2) Use soft cloth or tissue to clean the camera cover.
- 3) Use soft cloth to clean the lens; Use neuter cleanser if bad smeared. No use strong or corrosive cleanser or corrosive cleanser avoiding scuffing.

6.2 Troubleshooting

1) No video output-

- Check whether the camera power supply is connected, the voltage is normal, and the power indicator is lit.
- Check whether the camera performed a self-test after restart.
- Check whether the bottom of the DIP switch is the normal operating mode
- Verify that output cable and display monitor are working properly.

2) Image cuts out-

- Verify that output cable and video display are working properly.

3) Image distorts when camera is moving-

- Check whether the camera installation position is solid
- Check whether there is machinery or objects nearby that could be transmitting vibration to the camera.

4) Remote control does not work-

- Verify remote control address is set to 1
- Check remote control batteries
- Verify the camera is in the normal operating mode
- Verify the OSD has been exited. Camera cannot be controlled while the menu is being displayed.

5) Serial port not working-

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

6) Cannot connect to Web UI

- Check whether the camera output is being displayed normally.
- Check whether the network cable is connected properly (Ethernet port yellow light flashes to indicate normal network cable connection)
- Verify your computer is connected to the same subnet as the camera

7. Warranty

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

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

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

8. Mission Statement

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

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

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