



BG-BPTZ-3XU

BG-BPTZ-10XU

HD Color Video Camera

User Manual



Warnings

Electrical Safety

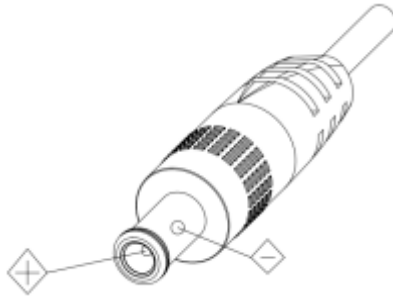
Installation and operation must conform with local electric safety standards.

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 Interface Description

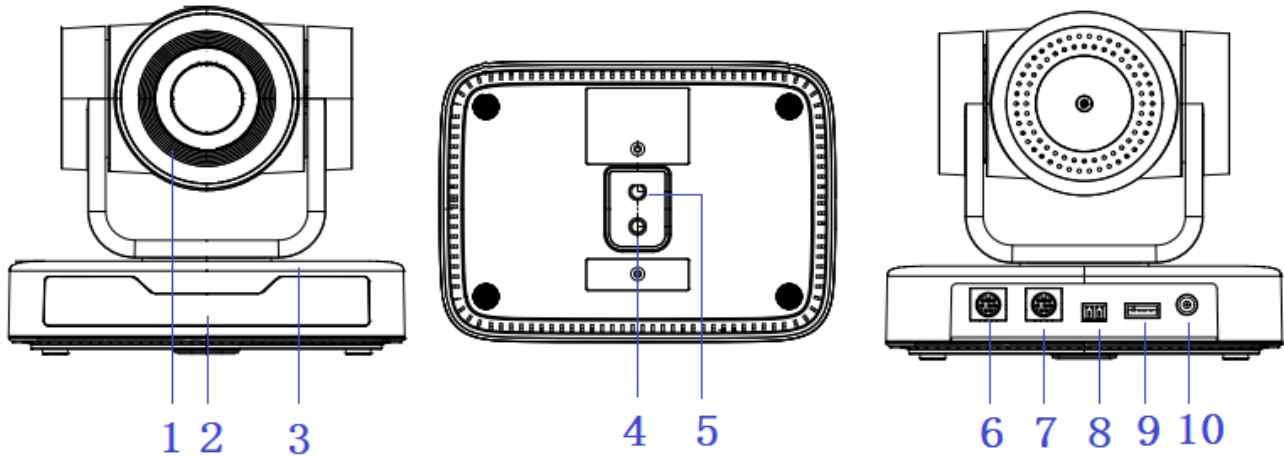


Figure 1.1 Interface

- | | |
|-------------------------------------|-------------------------------------|
| 1. Camera Lens | 6. RS232 Control Interface (output) |
| 2. Remote Controller Receiver Light | 7. RS232 Control Interface (input) |
| 3. Camera Base | 8. RS485 Input (left +, right-) |
| 4. Tripod Screw Hole | 9. USB2.0 Interface |
| 5. Mounting hole | 10. DC12V Input Power Supply Socket |

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

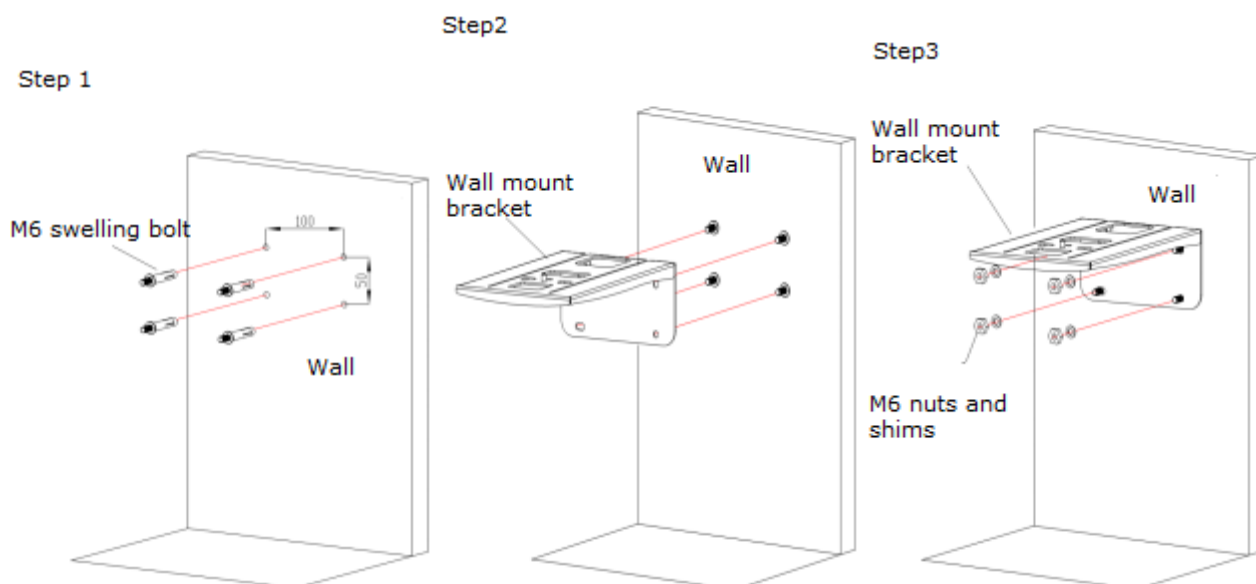
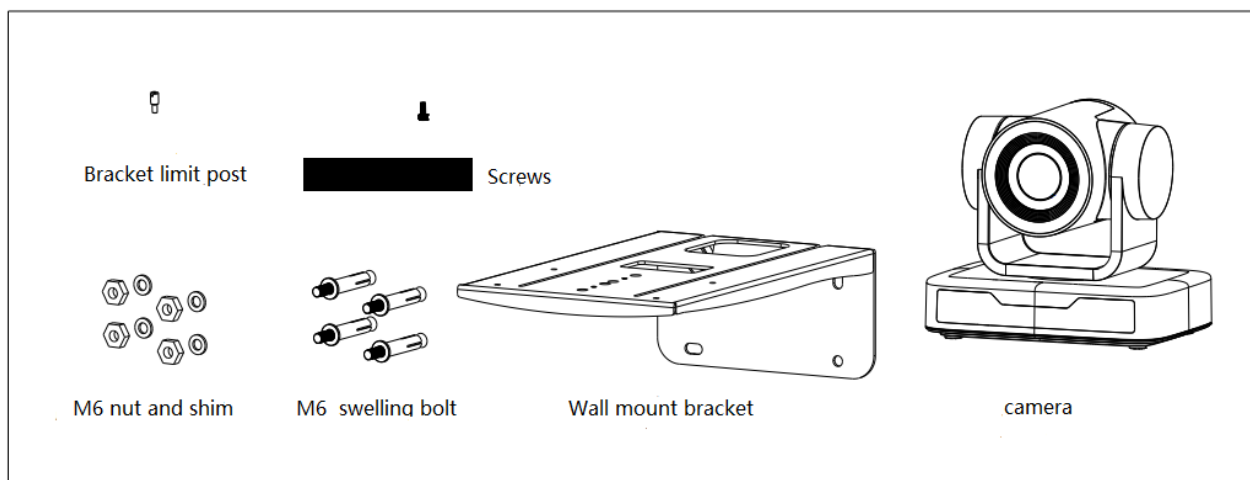
This model supports USB2.0 video output.

Connect camera and computer by USB2.0 cable, choose video conference software for image.

1.4 Bracket mount

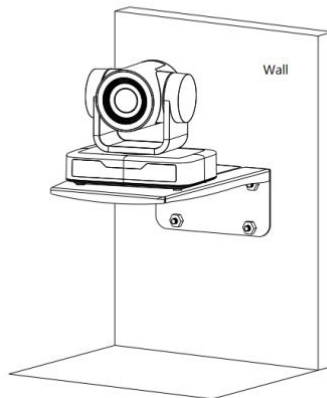
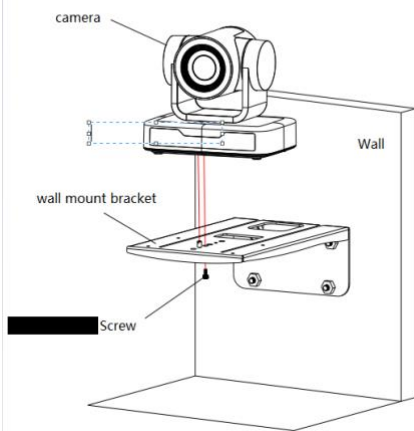
Note: Bracket can only be wall mounted or upside-down mounted on template and concrete wall; cannot be installed on plasterboard.

1) Wall mount step

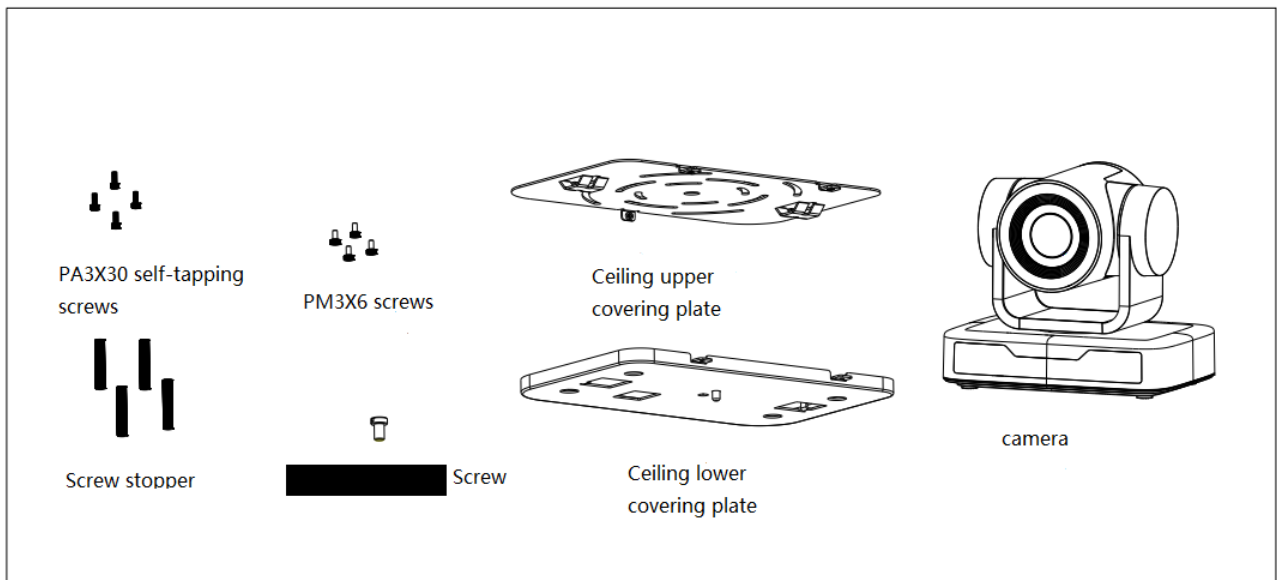


STEP 4

FINISH

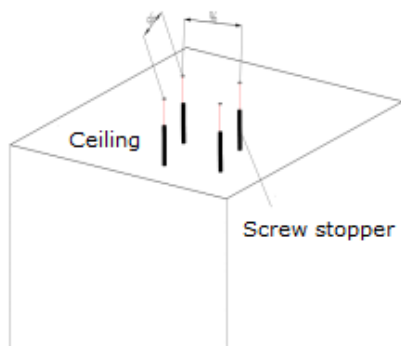


2). Upside down mount step

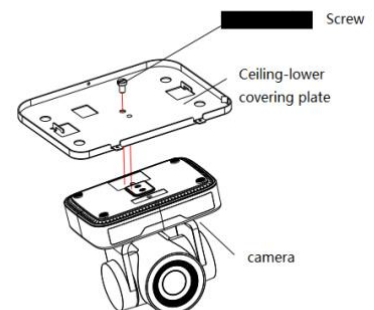
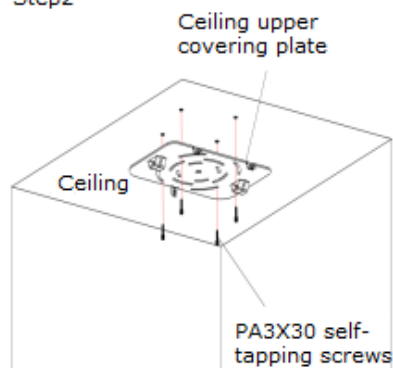


STEP 3

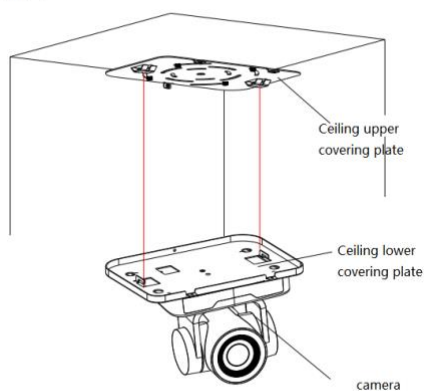
Step1



Step2

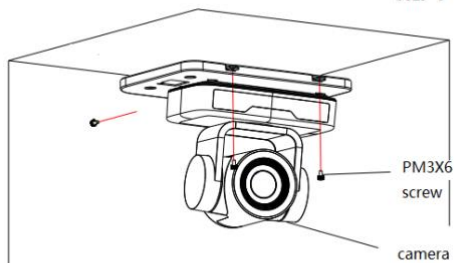


STEP 4



FINISH

STEP 5



2. Product overview

2.1 Product Introduction

2.1.1 Dimensions

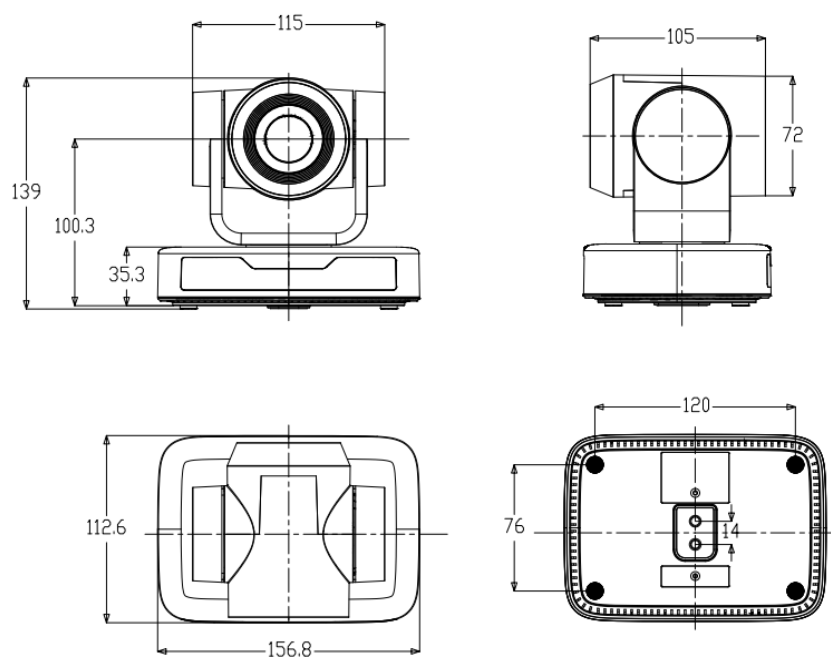


Figure 2.2 Camera dimension

2.1.2 Accessories

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

Model No	Configuration	Accessories
BG-BPTZ-3XU BG-BPTZ-10XU	Standard	Power adapter 1piece
		USB2.0 cable 1 piece
		User manual 1 piece
		IR Remote controller 1 piece
		Rubber pad
		Warranty card 1 piece
	Optional	Wall mount bracket
		Ceiling mount bracket

USB2.0 Video cable: If need USB2.0 cable to provide power but not a power adapter, USB2.0 Video cable with two ports is needed, among which red port is for power supply and black port for transmitting USB video signals. If using a power adapter, the general USB2.0 video cable without power supply function is ok.

2.2 Main Features

- 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.
- **Superb High-definition Image:** This camera employs 1/2.9-inch high quality CMOS sensor. Resolution is up to 1920x1080 with frame rate up to 30 fps.
- **Optical Zoom Lens:** Camera has a 10X optical zoom lens.
- **Leading Auto Focus Technology:** Leading auto focus algorithm allow for fast, accurate and stable auto-focusing.
- **Low Noise and High SNR:** Low Noise CMOS effectively ensure high SNR of camera video.
- **Control Interface:** RS485, RS232, RS232 supports cascade function for convenient installation.
- **Supports Multiple Control Protocol:** Supports VISCA, PELCO-D, PELCO-P protocols which can also be automatically recognized.
- **Quiet PTZ:** By adopting high accuracy step driving motor mechanism, it works extremely quiet and moves smoothly and very quickly to designated position.
- **255 Presets Positions:** Up to 255 presets (10 presets by remoter).
- **Wide Application:** Tele-education, Lecture capture, Webcasting, Videoconferencing, Tele-training, Tele-medicine, Interrogation, and Emergency command systems.

2.3 Technical Specification

Model	3X	10X
Camera Parameter		
Sensor	1/2.9-inch high quality HD CMOS sensor	
Effective Pixels	2.07 megapixel, 16:9	
Video Format	H264/H265/MJPEG: 1920*1080P@30/25/20/15/10/5fps; 1280*720P@30/25/20/15/10/5fps; 960*540@30/25/20/15/10/5fps; 800*600@30/25/20/15/10/5fps; 720*576@30/25/20/15/10/5fps; 720*480@30/25/20/15/10/5fps; 640*480@30/25/20/15/10/5fps; 640*360@30/25/20/15/10/5fps; 352*288@30/25/20/15/10/5fps; 320*240@30/25/20/15/10/5fps; YUY2: 1280*720@10/5fps; 800*600@10/5fps; 640*480@30/25/20/15/10/5fps; 640*360@30/25/20/15/10/5fps;	
View Angle	34.1°~85°	8.8°~ 66°
F Value	f=3.35mm~10.05mm	f=4.34mm~41.66mm
AV	F1.7~3.0	F1.85 – F2.43
Optical Zoom	3X	10X
Minimum Illumination	0.5Lux (F1.8, AGC ON)	
DNR	2D & 3D DNR	
White Balance	Auto / Manual/ One Push/ (2400K~7100K)	
Focus	Auto/Manual	
Aperture	Auto/Manual	
BLC	one/off	
Video adjustment	Brightness, Color, Saturation, Contrast, Sharpness, B/W mode, Gamma curve	
SNR	>55dB	

Input/Output Interface	
Video Interfaces	USB2.0 (type A)
Video Compression Format	YUY2, MJPG, H.264, H.265
Control Signal Interface	RS232, RS485
Control Protocol	VISCA/Pelco-D/Pelco-P;
Power Interface	HEC3800outlrt (DC12V)

USB Features	
Operating system	Windows 7, Windows8, Windows10, Mac osx, Linux
Video Compression Format	MJPG/H264/H265
USB common protocol	UVC

PTZ Parameter	
Pan Rotation	-170°~+170°
Tilt Rotation	-30°~+30°
Pan Control Speed	0.1 ~60°/sec
Tilt Control Speed	0.1~40°/sec
Preset Speed	Pan: 48°/sec, Tilt: 38°/sec
Preset Number	255 presets (10 presets by remote controller)

Other Parameter	
Input Voltage	12V
Input Current	0.42A(max)

Consumption	5W(max)
Store Temperature	-40℃～+70℃
Store Humidity	20%～90%
Working Temperature	-10℃～+50℃
Working Humidity	20%～80%
Dimension	156.8mm×112.6mm×139.5mm
Weight	1kg
Working Environment	Indoor
Accessory	Power Supply, Remote Controller, USB2.0 cable, Manual ,Warranty card, Packing list
Optional Accessory	Bracket

2.4 Interface Instruction

2.4.1 External Interface

1)External interface: RS232 in \out, USB2.0, A-in, DC12V

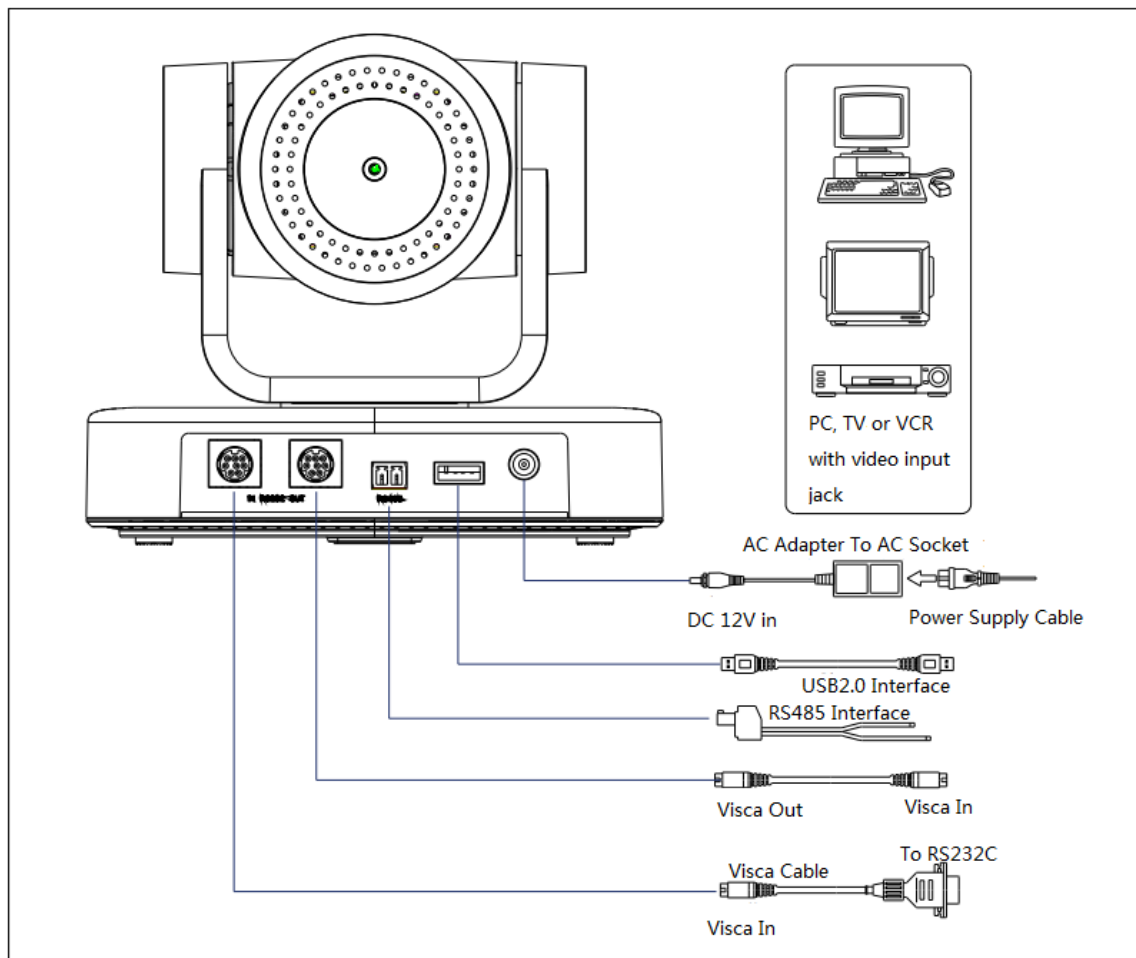
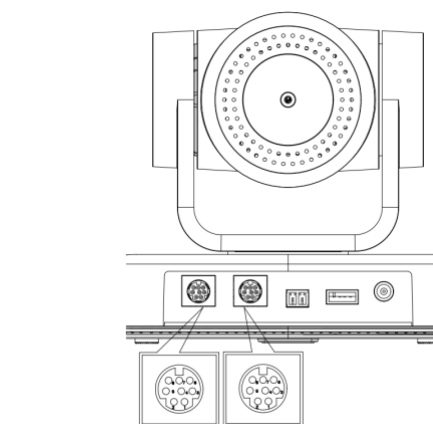


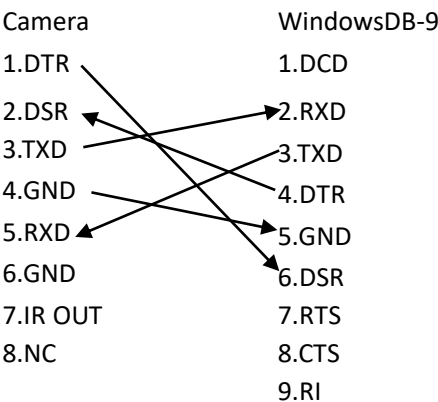
Figure 2.4 external interface diagram

2.4.2 RS-232 Interface

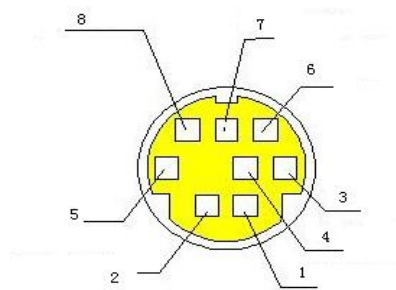
1)RS-232 Interface



Computer or keyboard and camera connection method

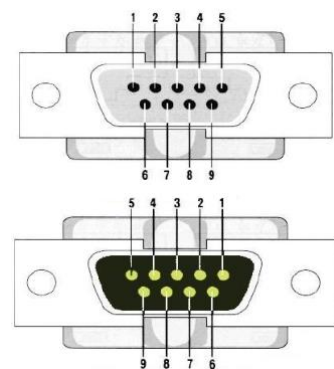


2)RS-232 Mini-DIN 8-pin Port Definition



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

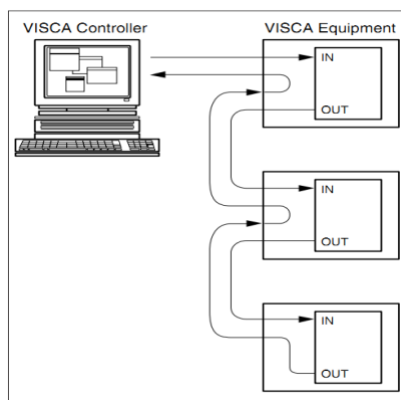
3)RS232(DB9) Port Definition



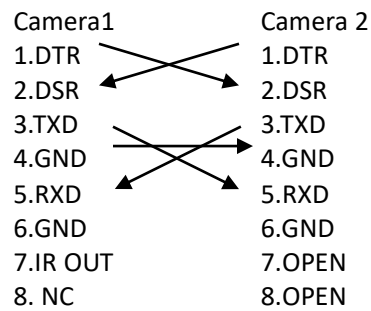
NO.	Port	Definition
1	DCD	Data Carrier Detect
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	System Ground
6	DSR	Data Set Ready

7	RTS	Request to Send
8	CTS	Clear to Send
9	RI	Ring Indicator

4)VISCA networking as shown below:



Camera cascade connection method



Note: this model has RS232 input and output interface, so you can cascade as the above way.

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 according to the interface diagram.

USB2.0 output: Connect this product with computer USB3.0 interface (blue), open the Device Manager to see whether there is an image device and whether the Universal Serial Bus controllers recognize USB3.0 device. After the computer identifies the device an image will be displayed.

3.2 Remote Control

3.2.1 Keys Instruction

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

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

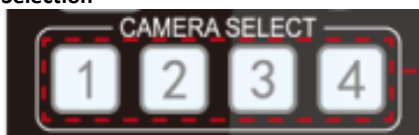
3.2.2 Applications

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 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

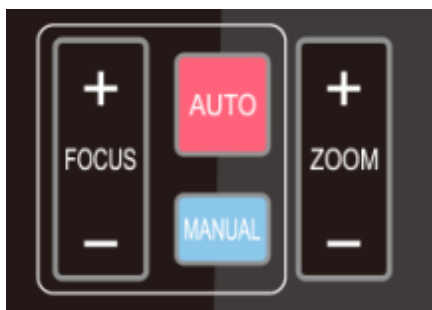


ZOOM IN: press “ZOOM ▼” key

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.

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 set a relative preset,

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

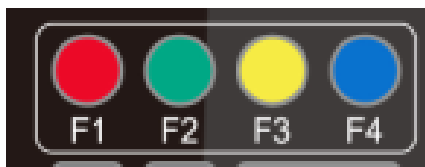
2. **Preset Running:** Press a number key 0-9 directly to run a relative preset.

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

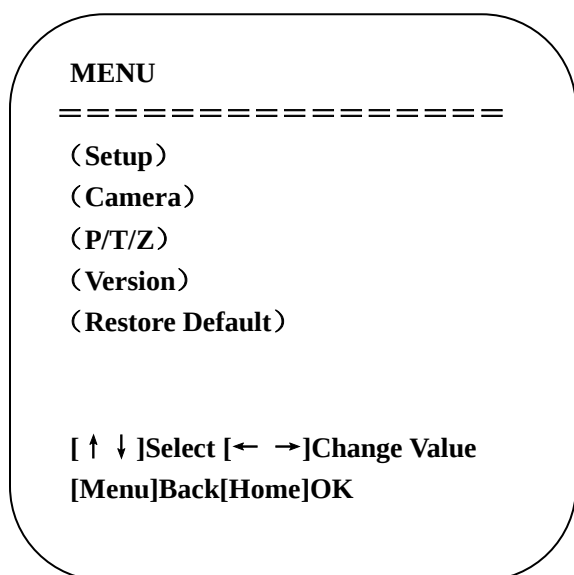
【*】+【#】+【F3】:Camera Address No. 3

【*】+【#】+【F4】:Camera Address No. 4

3. 3 MENU SETTINGS

3. 3. 1 Main Menu

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



- SETUP:** System setting
- CAMERA :** Camera setting
- P/T/Z:** 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

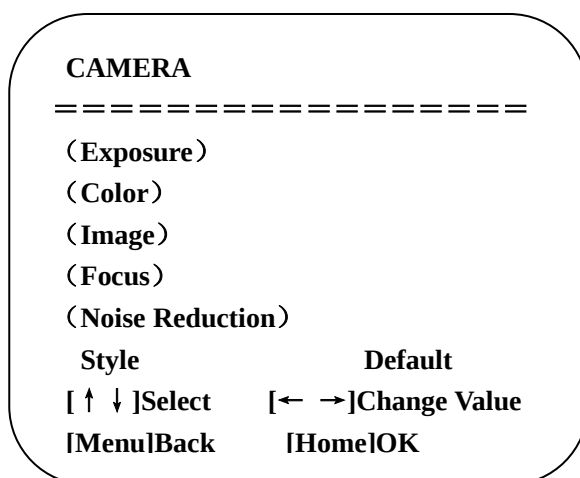
Move the pointer to the (Setup) in the Main Menu, click the **【HOME】** key and enter into the (System Setting) as shown below,

SETUP	
=====	
Protocol	Auto
Visca Address	1
Visca Address Fix	OFF
PELCO-P Address	1
PELCO-D Address	1
Baudrate	9600
Auto Filp	ON
[↑↓]Select [← →]Change Value	

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

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



EXPOSURE: Enter Exposure setting

COLOR: Enter color setting

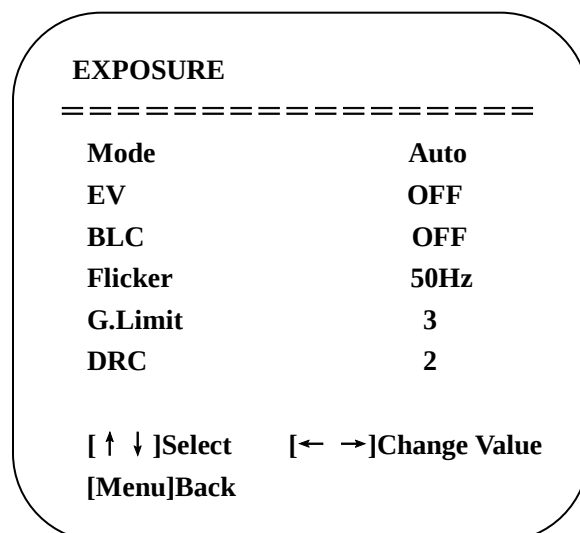
Image: Enter image setting

Focus: Enter focus setting

Noise Reduction: Enter noise reduction

1) EXPOSURE SETTING

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



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

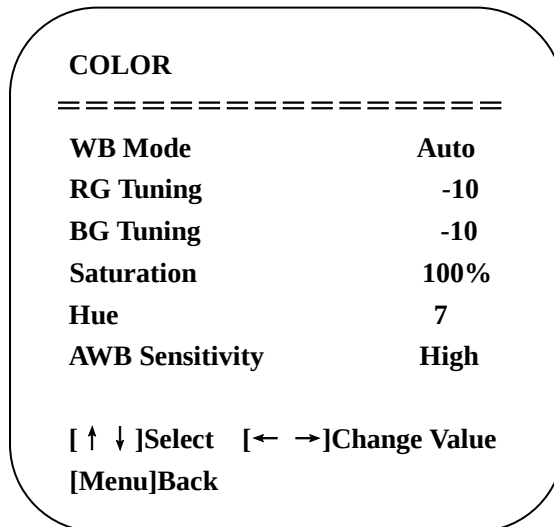
Priority:1/25,1/30,1/50,1/60,1/90,1/100,1/120,1/180,1/250,1/350,1/500,1/1000,1/2000,1/3000,1/4000,1/6000,1/10000(only available in Manual and Shutter priority mode)

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

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



WB Mode: Auto, 3000K, 3500K, 4000K, 4500K, 5000K, 5500K, 6000K, 6500K, 7000K, 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

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

IMAGE	
=====	
Brightness	7
Contrast	8
Sharpness	3
Flip-H	OFF
Flip-V	OFF
B&W-Mode	Color
Gamma	Default
DCI	Close
Low-Light Mode	OFF
[↑ ↓]Select [← →]Change Value	
[Menu]Back	

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

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

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

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

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

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

P/T/Z

=====

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 zoom in, the PT control speed by remoter will become slow),
Zoom Speed: Set the zoom speed for remote controller,1~8
Image Freezing: On/Off
Accelerating Curve: Fast/slow

3.3.5 Version

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

VERSION

=====

MCU Version

3.1.0

2019-09-26

Camera Version

1.0.5

2019-09-27

AF Version

1.0.0

2019-09-07

[↑ ↓]Select

[← →]Change Value

[Menu]Back

[Home]OK

MCU Version: Display MCU version information
Camera Version: Display camera version information
AF Version: Display the focus version information
Lens: Display the lens zoom

3.3.6 Restore Default

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

RESTORE DEFAULT

=====

Restore

Default?

NO

[↑ ↓]Select

[← →]Change Value

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

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

4.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.

4.1 VISCA protocol list

4.1.1 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.

4.1.2 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) pqrs: Zoom Position
	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	
CAM_Focus	Stop	8x 01 04 08 00 FF	p = 0(low) - F(high) pqrs: Focus Position
	Far(Standard)	8x 01 04 08 02 FF	
	Near(Standard)	8x 01 04 08 03 FF	
	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	
	Auto Focus	8x 01 04 38 02 FF	
	One Push Mode	8x 01 04 38 04 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	

Command	Function	Command packet	Note
	5000k	8x 01 04 35 04 FF	
	Manual	8x 01 04 35 05 FF	
	6500k	8x 01 04 35 06 FF	
	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	
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 Position
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 Position
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_WDRStrength	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 0p FF	p: WDR Level Position

Command	Function	Command packet	Note
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
	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	

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

4.1.3 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_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_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
		y0 50 06 FF	6500K
		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_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 Position
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: 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: 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 : model ID ST (0950) U3 (3950) 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】 .

4.2 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

4.3 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

5. Camera Maintenance and Troubleshooting

5.1 Camera Maintenance

- 1) If camera will not be used for an extended period of time, turning off the power can help extend the life of the product.
- 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.

5.2 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 is intermittent-

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. Tech Support

Before contacting tech support, we may have answered your question already! Visit our BZBGear support page at bzbgear.com/support for valuable information on our products.

Here you will find our Knowledge Base (bzbgear.com/knowledge-base) consisting of tutorials, quick start guides, and step-by-step troubleshooting instructions. Also visit our YouTube channel BZB TV at youtube.com/c/BZBTVchannel for help setting up, connecting, and other how-to videos regarding our products

If you still need answers, please call 1.888.499.9906, email support@bzbgear.com, or chat at bzbgear.com.

7. Warranty

BZBGear Pro AV products and Cameras come with a three-year warranty. An extended two-year warranty is available for our Cameras upon registration for a total of five years.

For an extended two-year warranty on our Cameras, follow these steps:

1. Register your Camera within 90 days of purchase by visiting bzbgear.com/warranty.
2. Complete the registration form. Provide all necessary proof of purchase details, including serial number and a copy of your sales receipt.

For complete warranty information, please visit bzbgear.com/warranty or scan the QR code below.



Mission Statement

BZBGear manifests from the competitive nature of the audiovisual and broadcasting industry to innovate while keeping the customer in mind. AV and broadcasting 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.

You'll notice comparably lower prices with BZBGear while the performance and quality are on par with the top brands in the industry. Our team offers system design consultation and expert tech support seven days a week for all BZBGear products. Our unparalleled support is our way of showing we care for every one of our customers. Whether you're an integrator, home theater enthusiast, or a do-it-yourselfer, BZBGear offers solutions allowing you to focus on your project and not your budget.

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