

# **BG-BPTZ-XU**

**1080P Full HD 3X/10X USB 2.0 / RS232**

**Huddle / Conference Room PTZ Camera**

## **User Manual**







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## Statement

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Please read these instructions carefully before connecting, operating, or configuring this product. Please save this manual for future reference.

## Safety Precaution

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- To prevent damaging this product, avoid heavy pressure, strong vibration, or immersion during transportation, storage, and installation.
- The housing of this product is made of organic materials. Do not expose to any liquid, gas, or solids which may corrode the shell.
- Do not expose the product to rain or moisture.
- The product has no power switch. Remove power immediately if camera is not in proper working condition to avoid electrical shock.
- To prevent the risk of electric shock, do not open the case. Installation and maintenance should only be carried out by qualified technicians.
- Installation and use of this product must strictly comply with local electrical safety standards.
- The power supply of the product is  $\pm 12V$ , the max electrical current is 2A.
- Do not use the product beyond the specified temperature, humidity, or power supply specifications.
- This product does not contain parts that can be maintained or repaired by users. Damage caused by dismantling the product without authorization from BZBGear is not covered under the warranty policy.
- Installation and use of this product must strictly comply with local electrical safety standards.
- Do not turn the camera head manually. Doing so may result in mechanical damage. Camera should only be placed on a stable horizontal surface and cannot be installed at an angle.
- Make sure there are no obstacles within the camera's rotational range when installing. Never power on before installation has been completed.



## Introduction

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The BG-BPTZ-XU is a high-quality pan tilt zoom (PTZ) camera that is available in two configurations, the 3x optical zoom and the 10x optical zoom. The 3x optical zoom variant is ideal for smaller spaces, huddle rooms, and wide-angle shots with its 85° field of view. The 10x optical zoom version is a better fit for larger rooms where individual subjects are located further away but still need to fill the frame using its field of view of up to 66°. Both variants of the BG-BPTZ-XU support resolutions up to 1080p@30Hz. The BG-BPTZ-XU has quick and easy plug and play connectivity with USB 2.0 type A for any video conferencing software such as Skype, Zoom, Microsoft Teams, and Google Meet.

## Features

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- **High-definition Images:** This camera employs 1/2.9-inch high quality CMOS sensor. Resolution is up to 1920x1080 with frame rate up to 30 fps.
- **H.265/H.264 encoding:** Makes motion video fluid and clear even with less than ideal bandwidth conditions.
- **Optical Zoom Lens:** either 3x or 10x optical zoom lens.
- **Leading Auto Focus Technology:** Leading autofocus algorithm allows for fast, accurate and stable auto-focusing.
- **Low Noise and High SNR:** Low Noise CMOS effectively ensures high SNR of camera video.
- **Control Interface:** RS485, RS232, RS232 supports cascade function for convenient installation.
- **Supports Multiple Control Protocols:** VISCA, PELCO-D, and PELCO-P protocols which can be automatically recognized.
- **Quiet PTZ:** Utilizing a high accuracy step driving motor ensures its movements are extremely quiet, smooth, and quick.
- **255 Presets Positions:** Up to 255 presets (10 presets by remote).
- **Application Examples:** Tele-education, Lecture recording, Webcasting, Video conferencing, Tele-training, Tele-medicine, and Emergency command systems.

## Packing List

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- 1x BG-BPTZ-XU Camera
- 1x 12V/1.5A Power supply
- 1x Remote Control
- 1x USB 2.0 Cable
- 1x User Manual
- 1x Quick Start Guide



## Technical Specifications

| Model Number                  | BG-BPTZ-3XU  | BG-BPTZ-10XU   |
|-------------------------------|--|--|
| 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  |
| <b>Camera Parameters</b>      |  |  |
| Image Sensor                  | 1/2.9 Inch High Quality CMOS Sensor  |  |
| Effective Pixels              | 2.07MP, 16:9   |  |
| Video Format                  | 1920×1080P@30fps/25fps;<br>960×540P@30fps/25fps;<br>320×176P@30fps/25fps   | 1280×720P@30fps/25fps;<br>800×448P@30fps/25fps;<br>1024×576P@30fps/25fps;<br>640×360P@30fps/25fps; |
| Low Illumination              | 0.5Lux (F1.8, AGC ON)  |  |
| DNR                           | 2D & 3D DNR  |  |
| White Balance                 | Auto/Manual/One Push/3000K/3500K/4000K/4500K/5000K/5500K/6000K/6500K/7000K |  |
| Focus                         | Auto/Manual/One Push   |  |
| 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  |  |
| <b>Interface and Protocol</b> |  |  |
| Video Output                  | USB2.0. Type A   |  |
| Video Compression             | H.265, H.264, MJPEG  |  |
| Control Port                  | RS232 in & out, RS485  |  |
| Control Protocol              | VISCA/Pelco-D/Pelco-P  |  |
| Power Supply                  | HEC3800 Outlet (DC12V)   |  |
| <b>USB characteristics</b>    |  |  |
| Support operating system      | Windows 7, Windows8, Windows10, Mac OS, Linux                              |  |
| Video Compression             | H.265, H.264, MJPEG  |  |
| USB communication protocol    | UVC  |  |
| <b>PTZ Parameter</b>          |  |  |
| Pan/Tilt Rotation             | -170° ~ +170° / -30° ~ +30°  |  |
| Pan/Tilt Controller Speed     | 0.1 ~ 60°/Second, 0.1 ~ 30°/Second   |  |
| Preset Speed                  | Pan: 60°/Second, Tilt: 30°/Second  |  |
| Preset Numbers                | 255 Presets (10 presets on IR Remote)                                      |  |
| <b>Other Parameter</b>        |  |  |
| Working Voltage               | 12V  |  |
| Working current               | 0.25A(max)   |  |
| Power Consumption             | 2.5W(max)  |  |
| Storage Temperature           | -10°C ~ +60°C, 20% ~ 95%   |  |
| Working Temperature           | -10°C ~ +50°C, 20% ~ 80%   |  |
| Dimension                     | 156.8mm×112.6mm×139.5mm  |  |
| Weight                        | 1KG  |  |
| Usage                         | Indoor Only  |  |
| Package                       | Camera, 12V/1.5A Power supply, Remote Controller, Manual, USB 2.0 Cable    |  |
| Optional Accessories          | Wall or Ceiling mounts available   |  |



## Camera Overview

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### Camera Interfaces

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1. **RS-232, RS-422/485:** Connect directly or cascade RS-232 or RS-485 to control the camera(s) with a joystick controller or control software.
2. **USB:** Connect a USB 2.0 type A cable to a PC for plug & play connectivity for any conferencing service like Skype or Zoom, supports resolution up to 1080@30Hz.
3. **Power:** Connect supplied 12V power adapter.



1. Camera Lens
2. Remote Controller Receiver Light
3. Camera Base
4. Mounting hole
5. Tripod Screw Hole

## Power-on Initial Configuration

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- 1) **Power on:** Connect DC12V power supply adapter to the power supply socket.
- 2) **Initial configuration:** Power on the unit and the power indicator light will begin blinking. The camera head will move to the bottom left and then it will return to the HOME position (intermediate position of both horizontal and vertical facing forward). The camera module will zoom out and back in as well as adjust focus near and far. When the remote control receiver light stops blinking, the self-check will be complete.

**Note:** If you set or change preset 0 position, after the Power on self-test is completed the camera will automatically move to the new preset 0 position.

## Video Output

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This model only supports USB 2.0 video output.

Connect the camera to a computer using the provided USB 2.0 cable and then choose your desired video conference software or camera application to view the image.

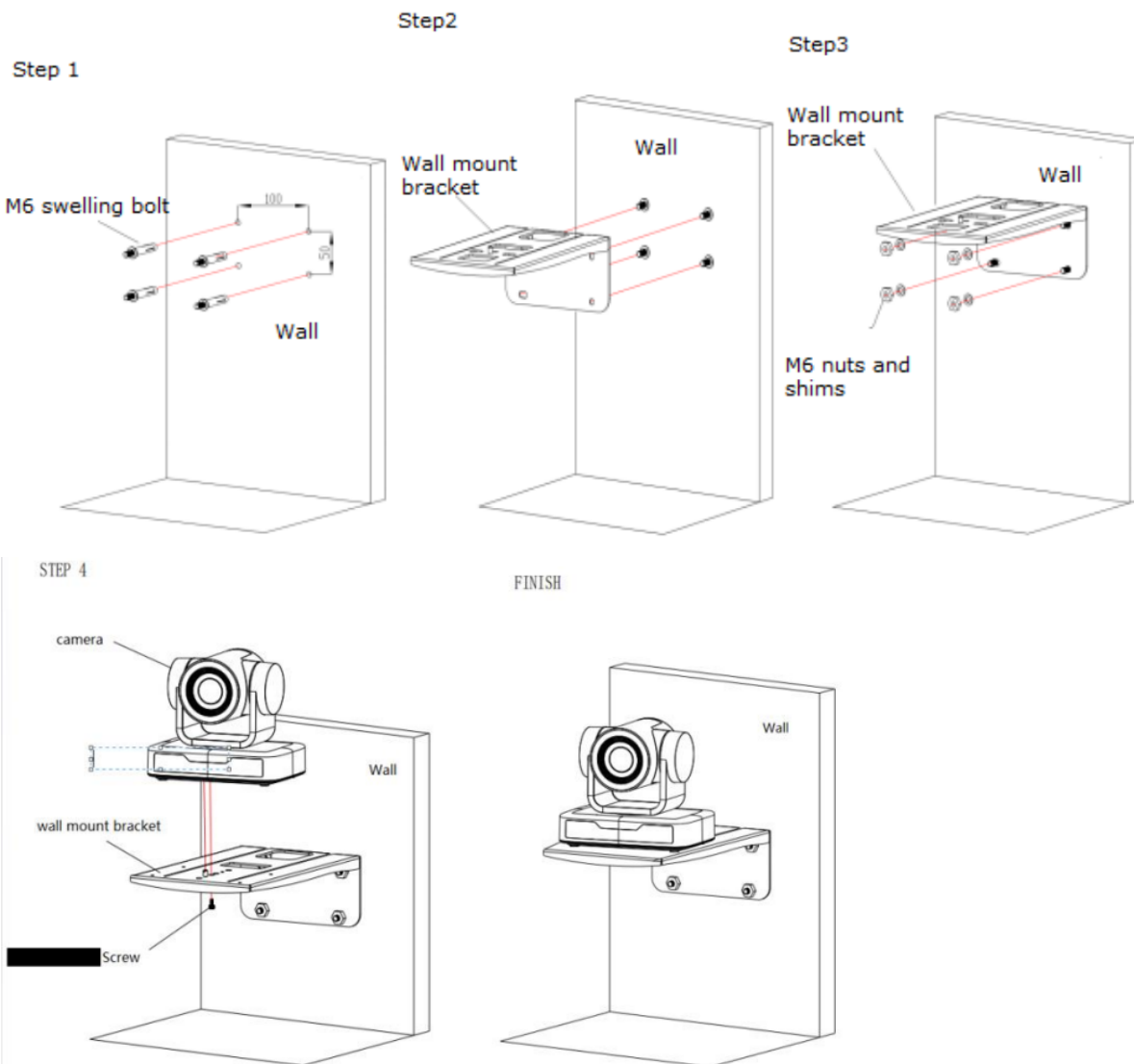
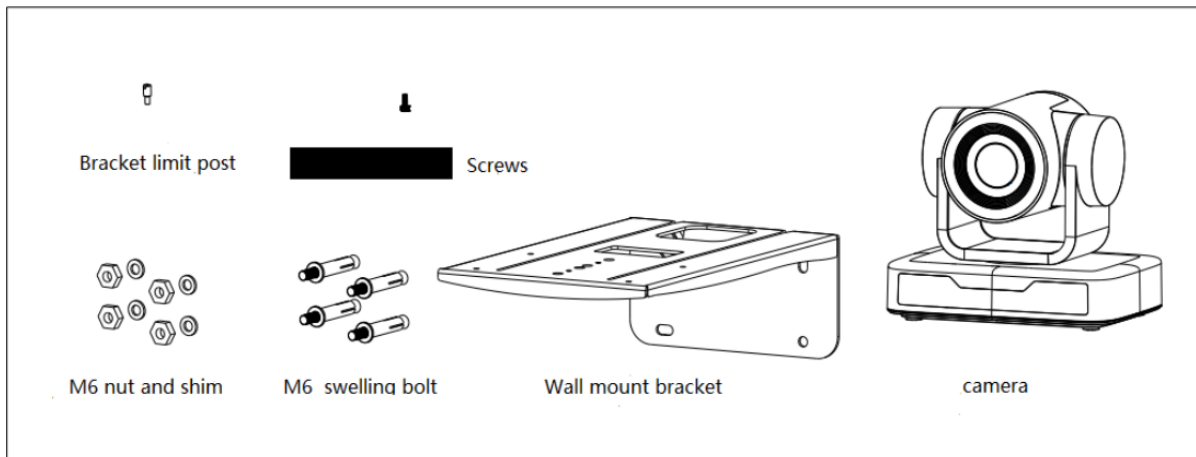




## Mounting Brackets

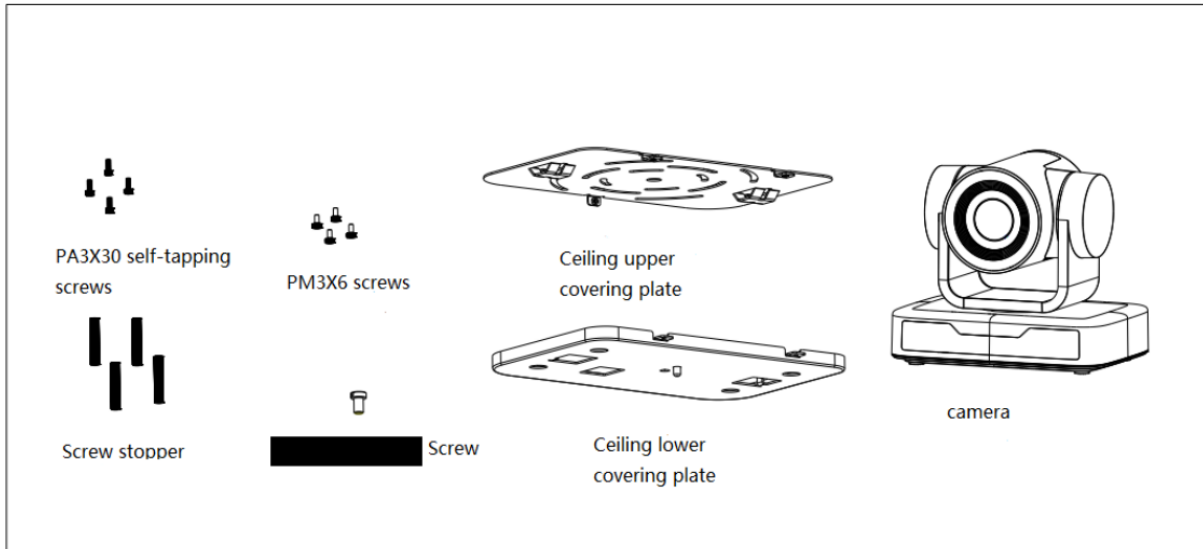
**Note:** Brackets can be wall mounted or upside-down. It is recommended to mount to a wall stud, ceiling joist, and to use proper mounting hardware. It is not recommended to be installed on plasterboard only.

### 1) Wall Mount Setup

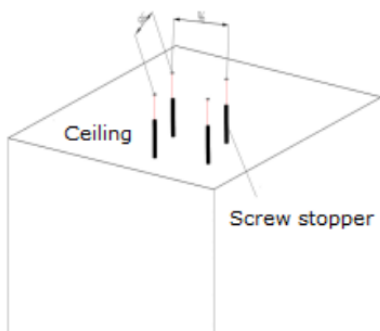




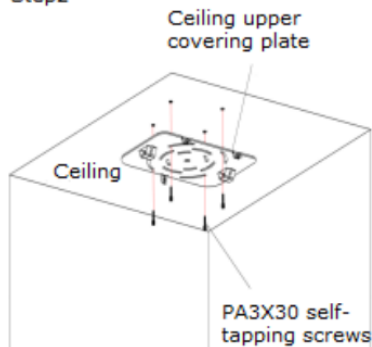
## 2). Ceiling Mount Setup



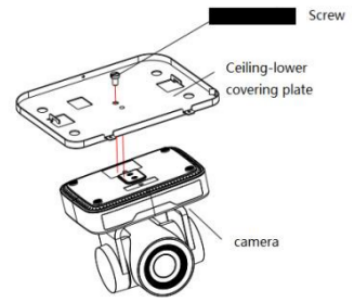
Step1



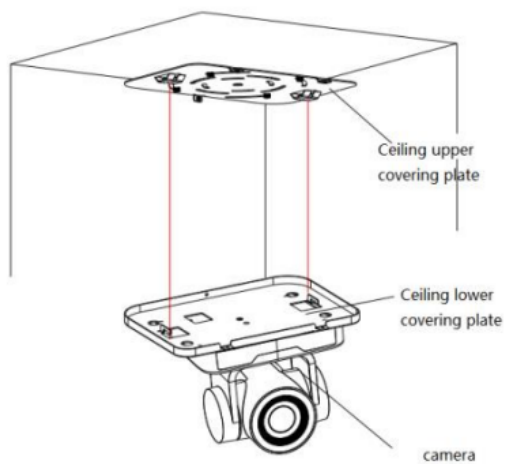
Step2



STEP 3

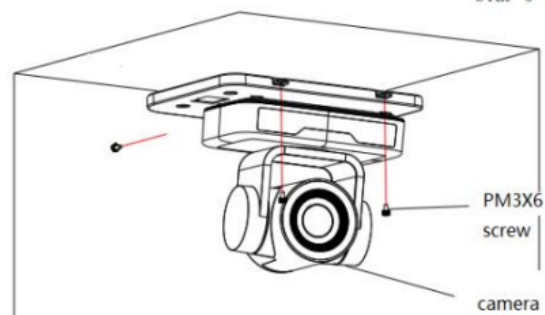


STEP 4



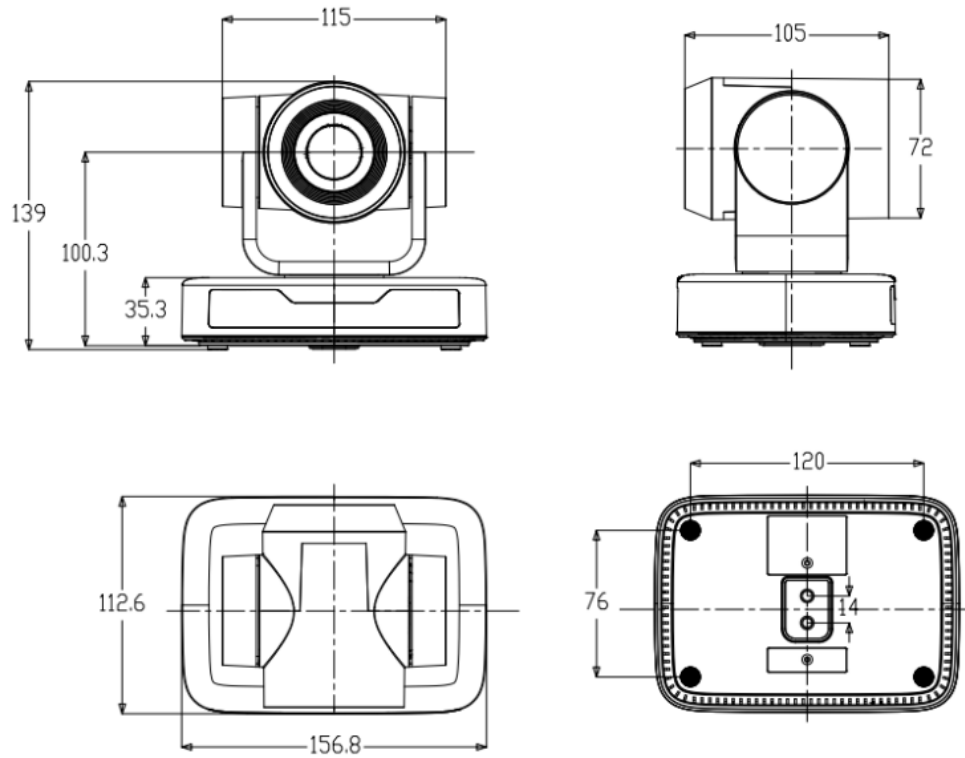
FINISH

STEP 5



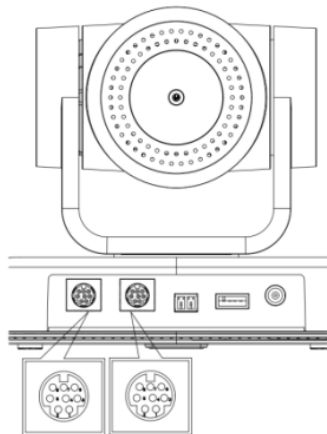


## Product Dimension



## RS-232 Interface

### 1) RS-232 Interface Definition



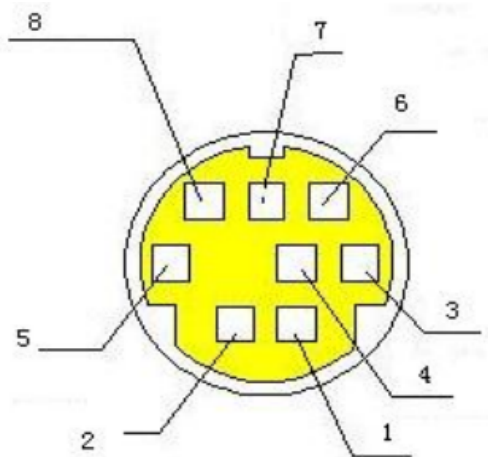
Computer or keyboard and camera connection method

| Camera   | WindowsDB-9 |
|----------|-------------|
| 1.DTR    | 1.DCD       |
| 2.DSR    | 2.RXD       |
| 3.TXD    | 3.TXD       |
| 4.GND    | 4.DTR       |
| 5.RXD    | 5.GND       |
| 6.GND    | 6.DSR       |
| 7.IR OUT | 7.RTS       |
| 8.NC     | 8.CTS       |
|          | 9.RI        |



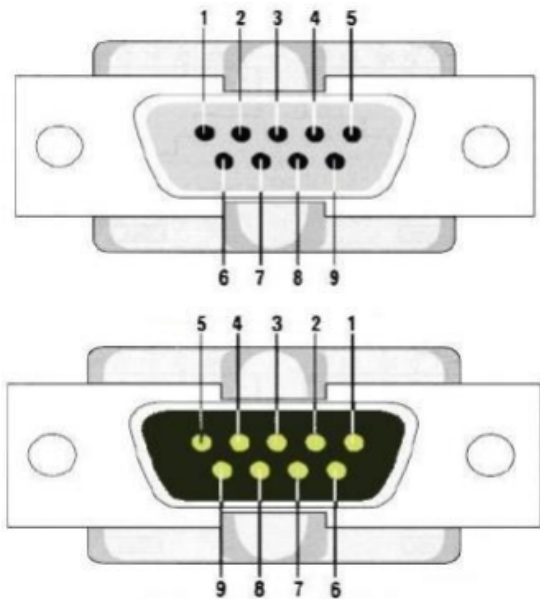


### 2) RS-232 Mini-DIN 8-pin Port Definition



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

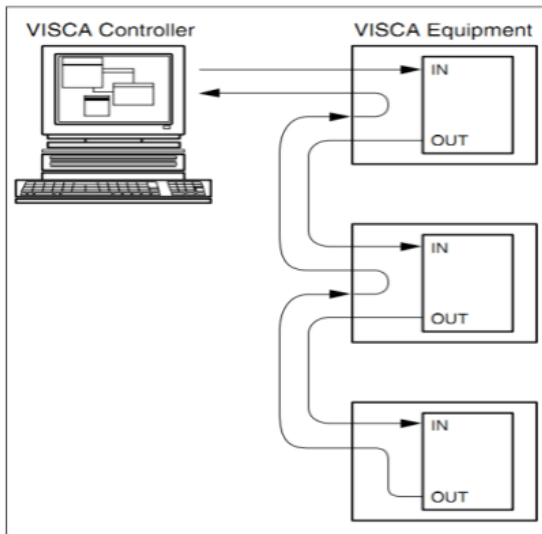
### 3) RS232(DB9) Port Definition



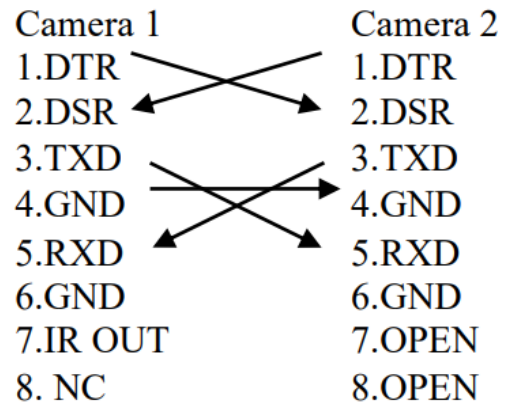
| NO. | Port | Definition          |
|-----|------|---------------------|
| 1   | DCD  | Data Carrier Detect |
| 2   | RXD  | Receive Data        |
| 3   | TXD  | Transmit Data       |
| 4   | DTR  | Data Terminal Ready |
| 5   | GND  | System Ground       |
| 6   | DSR  | Data Set Ready      |
| 7 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



4) VISCA networking as shown below



Camera cascade connection



## Remote Control

### Match Code for Wireless Remote Control



**One-to-One Code Matching:**

Press the "set" and "\*" keys combined for 3 seconds, LED indicator starts flashing. Camera will receive the signal and power on. The LED indicator will turn off if the code matching is successful. The camera can be controlled by the wireless remote control only after one to one code pairing.

If one-to-one code matching fails, the red LED light flashes for 20 seconds and then will go off. The camera will halt code matching and activate sleep mode; Hold the power for 3 seconds to wake the camera up and re-match code.

**Note:** Upon matching code successfully, please select the camera's address to control it.

**Clear Code:**

Press the "set" and "\*" keys combined for 3 seconds, the LED indicator will start flashing. Camera will power off and on and the LED indicator will go off if the code clearing is successful.

**Sleep Mode and Wake Up:**

Press and hold the power button for 3 seconds to wake up the camera from sleep mode.



## Keys Introduction for IR Remote Control

- In this manual, “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.
- When a key-combination is required, do it in sequence. For example, **[\*]+[#]+[F1]** means press “**[\*]**” first and then press “**[#]**” and last press “**[F1]**”.

### 1. Standby Key

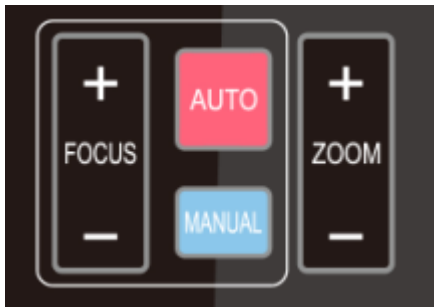
The camera enters standby mode if the power button is pressed for 3 seconds. Press and hold power for 3 seconds to wake up the camera and it will perform the system self-check again and return to the HOME position (If preset (0) position is set, the camera will return to the preset (0) position).

### 2. Camera Selection



Select the camera’s address to control it.

### 3. Focus Control



**Auto:** Auto focus mode

**Manual:** Manual focus mode

**Focus + (near):** Press **[FOCUS +]** key (Valid only in manual focus mode)

**Focus - (far):** Press **[FOCUS -]** key (Valid only in manual focus mode)

Press and hold the keys, focusing will continue and stop based on the key being pressed and released.

### 4. Zoom Control



**ZOOM +:** press **[ZOOM +]** key to zoom in

**ZOOM - :** press **[ZOOM -]** key to zoom out

Press and hold the keys, the action of zoom will continue until the key is released.



### 5. Set and Clear Presets



**Set Preset:** press **[SET PRESET]** button, and then press the number key 0-9 to set preset positions.

**Note:** 10 presets are available via the remote control.

**Call Preset:** Press a number key (0-9) to call a preset position.

**Clear Preset:** Press **[CLEAR PRESET]** and then press the number key 0-9 to clear the preset position.

**Note:** press the **[#]** key three times to clear all presets.

### 6. 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 movements will keep running, from slow to fast, until it runs to the endpoint; the camera will stop as soon as the key is released.

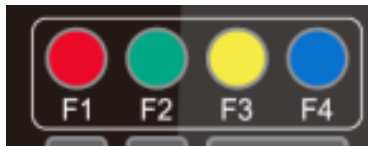
### 7. Menu Setting



**[MENU]:** Open / close the OSD menu  
**[HOME]:** Camera lens back to the middle position;  
 Confirm button; Enter next menu  
**[↑][↓]:** Choose item  
**[←][→]:** Modify values  
**[BLC ON/OFF]:** Turn on or off the back light compensation



## 8. Camera Remote Control Address Setting



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

## 9. Key Combination



- 1) 【#】+【#】+【#】: Clear all presets
- 2) 【\*】+【#】+【6】: Restore factory defaults
- 3) 【\*】+【#】+【3】: Menu set to Chinese
- 4) 【\*】+【#】+【4】: Menu set to English
- 5) 【\*】+【#】+【9】: Flip switch
- 6) 【\*】+【#】+Auto: Enter aging mode
- 7) 【#】+【\*】+Auto: Exit aging mode
- 8) 【\*】+【#】+Manual: Restore the default username, password, and IP address
- 9) 【#】+【#】+【0】: Switch the video format to 1080P60
- 10)【#】+【#】+【1】: Switch the video format to 1080P50
- 11)【#】+【#】+【2】: Switch the video format to 1080I60
- 12)【#】+【#】+【3】: Switch the video format to 1080I50
- 13)【#】+【#】+【4】: Switch the video format to 720P60
- 14)【#】+【#】+【5】: Switch the video format to 720P50
- 15)【#】+【#】+【6】: Switch the video format to 1080P30
- 16)【#】+【#】+【7】: Switch the video format to 1080P25
- 17)【#】+【#】+【8】: Switch the video format to 720P30
- 18)【#】+【#】+【9】: Switch the video format to 720P25

**Note:** If the address of the former remote control is not address 1, the camera will restore to address 1 when the unit is restored to factory defaults. Users need to change the remote control address to address 1 to control the camera again.





## Menu Introduction

### Main Menu

In normal working mode, press the **[MENU]** key to display the On Screen Display (OSD) menu. Use the scrolling arrow to point/highlight items.

**Setup:** System parameter settings

**Camera:** Camera parameter settings

**P/T/Z:** Pan, tilt, and zoom settings

**Version:** Camera firmware version information

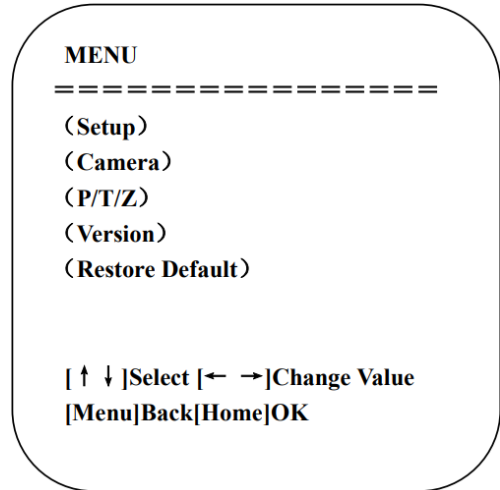
**Restore Default:** Reset the camera to factory default settings. Select YES to confirm or NO to cancel.

**[↑↓] Select:** Use the up and down arrow keys on the remote to select a menu item.

**[← →] Change Value:** Use the left and right arrows keys to modify a setting parameter.

**[MENU] Back:** Press **[Menu]** to go back or return to a previous menu item.

**[Home] OK:** Press **[Home]** to confirm and implement a settings change.



### System Setting

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

**Protocol:** VISCA/Pelco-P/Pelco-D/Auto

**Visca Address:** VISCA=1~7

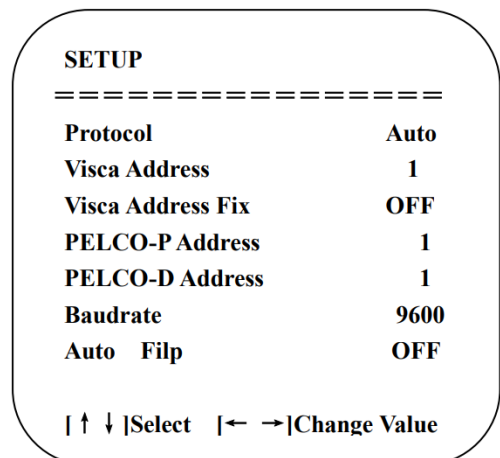
**Visca Address Fix:** On/Off

**Pelco-P:** 1~255

**Pelco-D:** 1~255

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

**Auto Flip:** On/Off





## Camera Setting

Move the pointer to (CAMERA) in the Main Menu, click the **[HOME]** key and enter the (CAMERA) settings as shown below:

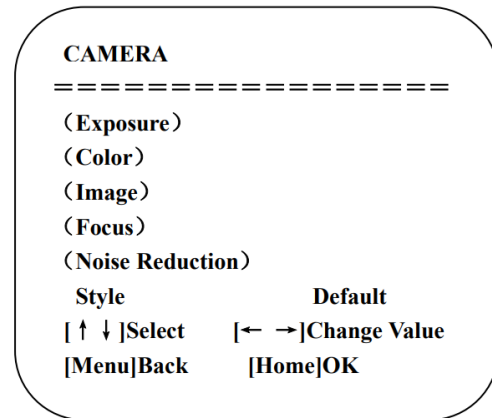
**Exposure:** Enter into Exposure settings

**Color:** Enter into color settings

**Image:** Enter into image settings

**Focus:** Enter into focus settings

**Noise Reduction:** Enter into noise reductions



### 1) Exposure Setting

Move the pointer to (EXPOSURE) in the Main Menu, click the **[HOME]** key and enter into the (Exposure) sub menu as shown below:

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

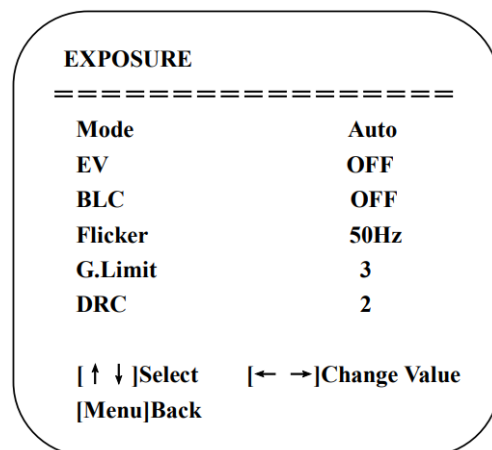
**EV:** On/Off (only available in auto mode)

**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)

**DRC:** Off, 1~8





## 2) Color setting

Move the pointer to (COLOR) in the Main Menu, click the **[HOME]** and enter the (COLOR) sub menu as shown below:

**WB Mode:** Auto, Manual, One Push, 3000K, 3500K, 4000K, 4500K, 5000K, 5500K, 6000K, 6500K, 7000K

**Red fine-tuning:** -10~10 (only available in automatic mode)

**Blue fine-tunable:** -10~10 (only available in automatic mode)

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

**Hue:** 0~14

**AWB Sensitivity:** high/middle/low

| COLOR                           |      |
|---------------------------------|------|
| =====                           |      |
| WB Mode                         | Auto |
| RG Tuning                       | -10  |
| BG Tuning                       | -10  |
| Saturation                      | 100% |
| Hue                             | 7    |
| AWB Sensitivity                 | High |
| [ ↑ ↓ ]Select [← →]Change Value |      |
| [Menu]Back                      |      |

## 3) Image

Move the pointer to (IMAGE) in the Menu, click the **[HOME]** and enter into the (IMAGE) sub menu as shown below:

**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/0.45/0.50/0.55/0.63

**DCI:** Dynamic Contrast: Off/1~8

| 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                      |         |



#### 4) Focus

Move the pointer to (FOCUS) in the Menu, click the **[HOME]** and enter the (FOCUS) menu as shown below:

**Focus Mode:** Auto/manual

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

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

| FOCUS          |                   |
|----------------|-------------------|
| =====          |                   |
| Focus Mode     | Auto              |
| AF-Zone        | Center            |
| AF-Sensitivity | Low               |
| [↑ ↓]Select    | [← →]Change Value |
| [Menu]Back     |                   |

#### 5) Noise Reduction

Move the pointer to (NOISE REDUCTION) in the Menu, click the **[HOME]** key and enter the (NOISE REDUCTION) menu as shown below:

**2D Noise Reduction:** Auto, close, 1~7

**3D Noise Reduction:** Close, 1~8

**Dynamic Hot Pixel:** Close, 1~5

| NOISE REDUCTION   |                   |
|-------------------|-------------------|
| =====             |                   |
| NR-2D             | 3                 |
| NR-3D             | 3                 |
| Dynamic Hot Pixel | 3                 |
| [↑ ↓]Select       | [← →]Change Value |
| [Menu]Back        |                   |

#### P/T/Z

Move the pointer to (P/T/Z) in the Main Menu, click the **[HOME]** and enter the (P/T/Z) sub menu as shown below:

**Depth of Field:** Only effective for the remote controller, On/ Off;

(When zooming in, the PT control speed by remoter will become slow)

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

**Image Freezing:** On/Off

**Accelerating Curve:** Fast/Slow

| P/T/Z          |                   |
|----------------|-------------------|
| =====          |                   |
| Depth of field | ON                |
| Zoom speed     | 8                 |
| Image Freezing | OFF               |
| Acc Curve      | Slow              |
| [↑ ↓]Select    | [← →]Change Value |



## Version

Move the pointer to (VERSION) in the Main Menu, click the **[HOME]** and enter the (VERSION) menu as shown below:

**MCU Version:** Display MCU version information

**Camera Version:** Display camera version information

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

| VERSION        |       |            |
|----------------|-------|------------|
| =====          |       |            |
| MCU Version    | 3.1.0 | 2019-11-23 |
| Camera Version | 1.0.0 | 2019-12-4  |
| AF Version     | 1.0.0 | 2019-08-20 |

## Restore Default

Move the pointer to (RESTORE DEFAULT) in the Main Menu, click the **[HOME]** and enter the (RESTORE DEFAULT) sub menu as shown below:

**Restore default:** YES/NO. Color style and video format cannot be restored to factory default

| RESTORE DEFAULT  |                   |
|------------------|-------------------|
| =====            |                   |
| Restore Default? | NO                |
| [↑ ↓]Select      | [← →]Change Value |
| [Menu]Back       | [Home]OK          |

**Note:** If the address of the camera on a remote was changed to 2, 3, or 4 the camera's address will be restored to address 1 when the factory restore is complete. Users will need to change the remote address back to 1 to control the camera again.



## Serial Port Communication and Control

Under normal working conditions the camera can be controlled through its RS-232/RS-485 interfaces using VISCA, PELCO-D, and PELCO-P protocols by using a RS-232 serial adapter with the following parameter:

Baud rate: 2400/4800/9600/115200 bits / sec;

Start bit: 1;

Data bits: 8;

Stop bit: 1;

Parity: None.

## VISCA Protocol List

### VISCA Protocol 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. |

### VISCA Protocol Control Command

| Command       | Function          | Command packet             | Note  |
|---------------|-------------------|----------------------------|---|
| AddressSet    | Broadcast         | 88 30 0p FF                | p: Address setting                          |
| IFClear       | Broadcast         | 88 01 00 01 FF             | 1/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)<br>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          |   |
| CAM_Focus     | Direct            | 8x 01 04 47 0p 0q 0r 0s FF |   |
|               | Stop              | 8x 01 04 08 00 FF          | p - O(low) - F(high)                        |
|               | Far(Standard)     | 8x 01 04 08 02 FF          |   |
|               | Near(Standard)    | 8x 01 04 08 03 FF          |   |
| Far(Variable) | 8x 01 04 08 2p FF |                            |   |



| Command        | Function          | Command packet                         | Note  |
|----------------|-------------------|--|---|
|                | Near (Variable)   | 8x 01 04 08 3p FF                      |   |
|                | Direct            | 8x 01 04 48 0p 0q 0r 0s FF             | pqrs: Focus Position                        |
|                | Auto Focus        | 8x 01 04 38 02 FF                      |   |
|                | Manual Focus      | 8x 01 04 38 03 FF                      |   |
|                | One Push mode     | 8x 01 04 38 04 FF                      |   |
| CAM_Zoom Focus | Direct            | 8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF | pqrs: Zoom Position<br>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                      |   |
|                | 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                      |   |



| Command             | Function | Command packet             | Note   |
|---------------------|----------|----------------------------|--|
|                     | Direct   | 8x 01 04 4D 00 00 0p 0q FF | pq: Bright Position  |
| CAM_ExpComp         | On       | 8x 01 04 3E02 FF           | Exposure Compensation ON/OFF   |
|                     | Off      | 8x 01 04 3E03 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 |  |
| 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 00 0p FF | p: WDR Level Position  |
| CAM_NR (2D)         |          | 8x 01 04 53 0p FF          | P=0-7<br>0:OFF   |
| CAM_NR (3D)         |          | 8x 01 04 54 0p FF          | P=0-8<br>0:OFF   |
| CAM_Gamma           |          | 8x 01 04 5B 0p FF          | p = 0 - 4<br>0: Default<br>1: 0.45 2: 0.50 3: 0.55 4: 0.63                 |
| 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 3F00 pq FF        | pq: Memory Number(=0 to 254) Corresponds to 0 to 9 on the Remote Commander |
|                     | Set      | 8x 01 04 3F01 pq FF        |  |
|                     | Recall   | 8x 01 04 3F02 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<br>0:60% 1:70% 2:80% 3:90% 4:100%<br>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/Otf   |
|                     | 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 7D01 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  |





| Command          | Function                | Command packet                                  | Note   |
|------------------|-------------------------|---|--|
| CAM_Contrast     | Direct                  | 8x 01 04 A2 00 00 0p 0q FF                      | pq: Contrast Position  |
| CAM_Flip         | OFF                     | 8x 01 04 A4 00FF                                | 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<br>0:1080P60 8:720P30<br>1:1080P50 9:720P25<br>2:1080i60A:1080P59.94<br>3:1080i50B:1080i59.94<br>4:720P60 C:720P59.94<br>5:720P50 D:1080P29.97<br>6:1080P30 E:720P29.97<br>7:1080P25 |
| Pan-tiltDrive    | Up                      | 8x 01 06 01 VV WW03 01 FF                       | VV: Pan speed 0x01 (low speed) to 0x18 (high speed)  |
|                  | Down                    | 8x 01 06 01 VV WW 03 02 FF                      |  |
|                  | Left                    | 8x 01 06 01 VV WW01 03 FF                       | WW: Tilt speed 0x01 (low speed) to 0x14 (high speed)   |
|                  | Right                   | 8x 01 06 01 VV WW 02 03 FF                      |  |
|                  | Upleft                  | 8x 01 06 01 VV WW01 01 FF                       | YYYY: Pan Position   |
|                  | Upright                 | 8x 01 06 01 VV WW02 01 FF                       | ZZZZ: Tilt Position  |
|                  | DownLeft                | 8x 01 06 01 VV WW01 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<br>0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF |  |
|                  | RelativePosition        | 8x 01 06 03 VV WW<br>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<br>0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF | W: 1 UpRight 0: DownLeft<br>YYYY: Pan Limit Position(TBD)<br>ZZZZ: Tilt Limit Position(TBD)  |
|                  | Clear                   | 8x 01 06 07 01 0W<br>07 0F 0F 0F 07 0F 0F 0F FF |  |

**VISCA Protocol Inquiry Command**

| Command             | Command Packet | Return 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               |



| Command                  | Command Packet | Return Packet        | Note   |
|--------------------------|----------------|----------------------|--|
|                          |                | 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  |
| CAM_RGainInq             | 8x 09 04 43 FF | y0 50 0B FF          | 7000K  |
| CAM_BGainInq             | 8x 09 04 44 FF | y0 50 00 00 0p 0q FF | pq: B Gain                                   |
| CAM_AEModeInq            | 8x 09 04 39 FF | y0 50 00 FF          | Full Auto                                    |
|                          |                | y0 50 03 FF          | Manual                                       |
|                          |                | y0 50 0A FF          | Shutter priority                             |
|                          |                | y0 50 0B FF          | Iris priority                                |
|                          |                | y0 50 0D FF          | Bright                                       |
| CAM_ShutterPosInq        | 8x 09 04 4A FF | y0 50 00 00 0p 0q FF | pq: Shutter Position                         |
| CAM_IrisPosInq           | 8x 09 04 4B FF | y0 50 00 00 0p 0q FF | pq: Iris Position                            |
| CAM_GainLimitInq         | 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_ExpCompModeInq       | 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_BacklightModeInq     | 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: 2DNR Level                                |
| CAM_NRLevel(3D)Inq       | 8x 09 04 54 FF | y0 50 0p FF          | p: 3DNR Level                                |
| CAM_FlickerModeInq       | 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_PictureEffectModeInq | 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.              |
| SYSMenuModeInq           | 8x 09 06 06 FF | y0 50 02 FF          | On   |
|                          |                | y0 50 03 FF          | Off  |
| CAM_LRRReverseInq        | 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 Oh (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                                    |



| Command             | Command Packet | Return Packet                 | Note   |
|---------------------|----------------|-------------------------------|--|
|                     |                | y0 07 7D 01 04 33 FF          | Camera Backlight   |
|                     |                | y0 07 7D 01 04 3F FF          | Camera Memory  |
|                     |                | y0 07 7D01 06 01 FF           | Pan title Driver   |
| CAM_BrightnessInq   | 8x 09 04 A1 FF | y0 50 00 00 0p 0q FF          | pq: Brightness Position  |
| CAM_ContrastingInq  | 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 )<br>mn pq : model ID ST ( 0910 )<br>U3 ( 3950 )<br>rs tu : ARM Version<br>vw : reserve   |
| VideoSystemInq      | 8x 09 06 23 FF | y0 50 0p FF                   | P: 0~E Video format<br>0:1080P60 8:720P30<br>1:1080P50 9:720P25<br>2:1080i60 A:1080P59.94<br>3:1080i50 B:1080i59.94<br>4:720P60 C:720P59.94<br>5:720P50 D:1080P29.97<br>6:1080P30 E:720P29.97<br>7:1080P25 |
| Pan-tiltMaxSpeedInq | 8x 09 06 11 FF | y0 50 ww zz FF                | ww: Pan Max Speed<br>zz: Tilt Max Speed  |
| Pan-tiltPosInq      | 8x 09 06 12 FF | y0 50 0w 0w 0w 0w             | www: Pan Position<br>zzzz: Tilt  |
|                     |                | 0z0z0z0zFF                    | Position   |

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

### 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   |
| Stop         | 0xFF  | Address | 0x00  | 0x00  | 0x00      | 0x00       | SUM   |
| Set Preset   | 0xFF  | Address | 0x00  | 0x03  | 0x00      | Preset ID  | SUM   |
| Clear Preset | 0xFF  | Address | 0x00  | 0x05  | 0x00      | Preset ID  | SUM   |



| Function                     | Byte1 | Byte2   | Byte3 | Byte4 | Byte5           | Byte6          | Byte7 |
|------------------------------|-------|---------|-------|-------|-----------------|----------------|-------|
| 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   |

### 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   |
| Stop                         | 0xA0  | Address | 0x00  | 0x00  | 0x00            | 0x00           | 0xAF  | XOR   |
| Focus Far                    | 0xA0  | Address | 0x01  | 0x00  | 0x00            | 0x00           | 0xAF  | XOR   |
| Focus Near                   | 0xA0  | Address | 0x02  | 0x00  | 0x00            | 0x00           | 0xAF  | XOR   |
| Set Preset                   | 0xA0  | Address | 0x00  | 0x03  | 0x00            | Preset ID      | 0xAF  | XOR   |
| Clear Preset                 | 0xA0  | Address | 0x00  | 0x05  | 0x00            | Preset ID      | 0xAF  | XOR   |
| Call Preset                  | 0xA0  | Address | 0x00  | 0x07  | 0x00            | Preset ID      | 0xAF  | XOR   |
| Query Pan Position           | 0xA0  | Address | 0x00  | 0x51  | 0x00            | 0x00           | 0xAF  | XOR   |
| Query Pan Position Response  | 0xA0  | Address | 0x00  | 0x59  | Value High Byte | Value Low Byte | 0xAF  | XOR   |
| Query Tilt Position          | 0xA0  | Address | 0x00  | 0x53  | 0x00            | 0x00           | 0xAF  | XOR   |
| Query Tilt Position Response | 0xA0  | Address | 0x00  | 0x5 B | 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   |



## Camera Maintenance and Troubleshooting

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### Camera Maintenance

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- 1) If the 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 a soft cloth or tissue to clean the camera body.
- 3) Use soft cloth to clean the lens; Use neutral cleanser if needed by applying it to the cloth first. Do not directly spray the camera.

### Troubleshooting

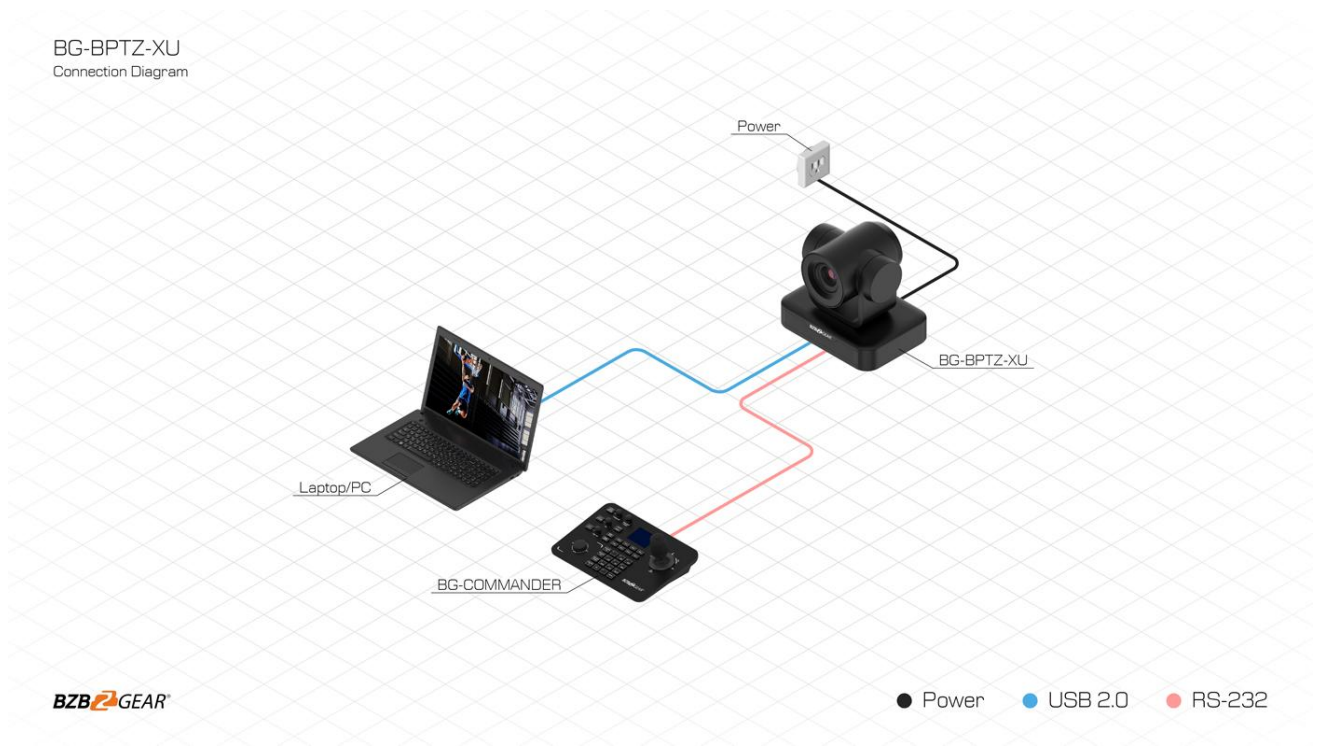
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- 1) **No Video Output:**
  - Check if the camera power supply is connected, the voltage is normal, and the power indicator is lit.
  - Check whether the camera performed a self-test after restart successfully.
  - Check whether the bottom DIP switch is in the normal operating mode.
  - Verify that the output cable and display monitor are working properly.
- 2) **Intermittent Image:**
  - Verify that the output cable and video displays are working properly.
- 3) **Image distorts/is shaky when camera is stationary/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 the remote control address is set appropriately.
  - Check remote control batteries.
  - Verify the camera is in the normal operating mode.
  - Verify the OSD has been exited. The camera cannot be controlled while the menu is being displayed.
- 5) **Serial port not works:**
  - Verify that the camera serial device protocol, baud rate, address is correct.
  - Check whether the control cable is connected properly.
  - Check whether the camera working mode is set to the normal operating mode.



## Application Example

BG-BPTZ-XU  
Connection Diagram





## Tech Support

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Have technical questions? We may have answered them already!

Please visit BZBGear's support page ([bzbgear.com/support](http://bzbgear.com/support)) for helpful information and tips regarding our products. Here you will find our Knowledge Base ([bzbgear.com/knowledge-base](http://bzbgear.com/knowledge-base)) with detailed tutorials, quick start guides, and step-by-step troubleshooting instructions. Or explore our YouTube channel, BZB TV ([youtube.com/c/BZBTVchannel](http://youtube.com/c/BZBTVchannel)), for help setting up, configuring, and other helpful how-to videos about our gear.

Need more in-depth support? Connect with one of our technical specialists directly:

### Phone

1.888.499.9906

### Email

[support@bzbgear.com](mailto:support@bzbgear.com)

### Live Chat

[bzbgear.com](http://bzbgear.com)

## Warranty

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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 complete warranty information, please visit [bzbgear.com/warranty](http://bzbgear.com/warranty).

For questions, please call 1.888.499.9906 or email [support@bzbgear.com](mailto:support@bzbgear.com).

## Mission Statement

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BZBGear is a breakthrough manufacturer of high-quality, innovative audiovisual equipment ranging from AVoIP, professional broadcasting, conferencing, home theater, to live streaming solutions. We pride ourselves on unparalleled customer support and services. Our team offers system design consultation, and highly reviewed technical support for all the products in our catalog. BZBGear delivers quality products designed with users in mind.



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