

# PTZOptics 30x SDI (Gen 2)



## User Manual

Model Nos: PT30X-SDI-GY-G2 & PT30X-SDI-WH-G2

V1.6

(English)

Please check [PTZOPTICS.com](http://PTZOPTICS.com) for the most up to date version of this document

Rev 1.6 8/20

# Preface

Thank you for using the HD Professional Video Conferencing Camera. This manual introduces the function, installation and operation of the HD camera. Prior to installation and usage, please read the manual thoroughly.

# Precautions

This product can only be used in the specified conditions in order to avoid any damage to the camera:

- Don't subject the camera to rain or moisture.
- Don't remove the cover. Removal of the cover may result in an electric shock, in addition to voiding the warranty. In case of abnormal operation, contact the manufacturer.
- Never operate outside of the specified operating temperature range, humidity, or with any other power supply than the one originally provided with the camera.
- Please use a soft dry cloth to clean the camera. If the camera is very dirty, clean it with diluted neutral detergent; do not use any type of solvents, which may damage the surface.

# Note

This is an FCC Class A Digital device. As such, unintentional electromagnetic radiation may affect the image quality of TV in a home environment.

# Warranty

PTZOptics includes a limited parts & labor warranty for all PTZOptics manufactured cameras. Warranty lengths are shown below. The warranty is valid only if PTZOptics receives proper notice of such defects during the warranty period. PTZOptics, at its option, will repair or replace products that prove to be defective. PTZOptics manufactures its hardware products from parts and components that are new or equivalent to new in accordance with industry standard practices.

|         | <b>Serial Number</b> | <b>Warranty</b> |
|---------|----------------------|-----------------|
| (White) | WF1231999 and before | 3 year warranty |
|         | WF0101001 and after  | 5 year warranty |
| (Gray)  | XE1231999 and before | 3 year warranty |
|         | XF0101001 and after  | 5 year warranty |



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## Supplied Accessories

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

- Camera ..... 1
- AC Power Adaptor..... 1
- Power Cord ..... 1
- RS232 Cable ..... 1
- IR Remote Controller ..... 1
- Quick Start Guide ..... 1
- AAA Batteries..... 2

## Notes

### ● Electrical Safety

Installation and operation must be in accordance with national and local electric safety standards. Do not use any power supply other than the one originally supplied with this camera.

### ● Polarity of power supply

The power supply output for this product is 12VDC with a maximum current supply of 2A. Polarity of the power supply plug is critical and is as follows.

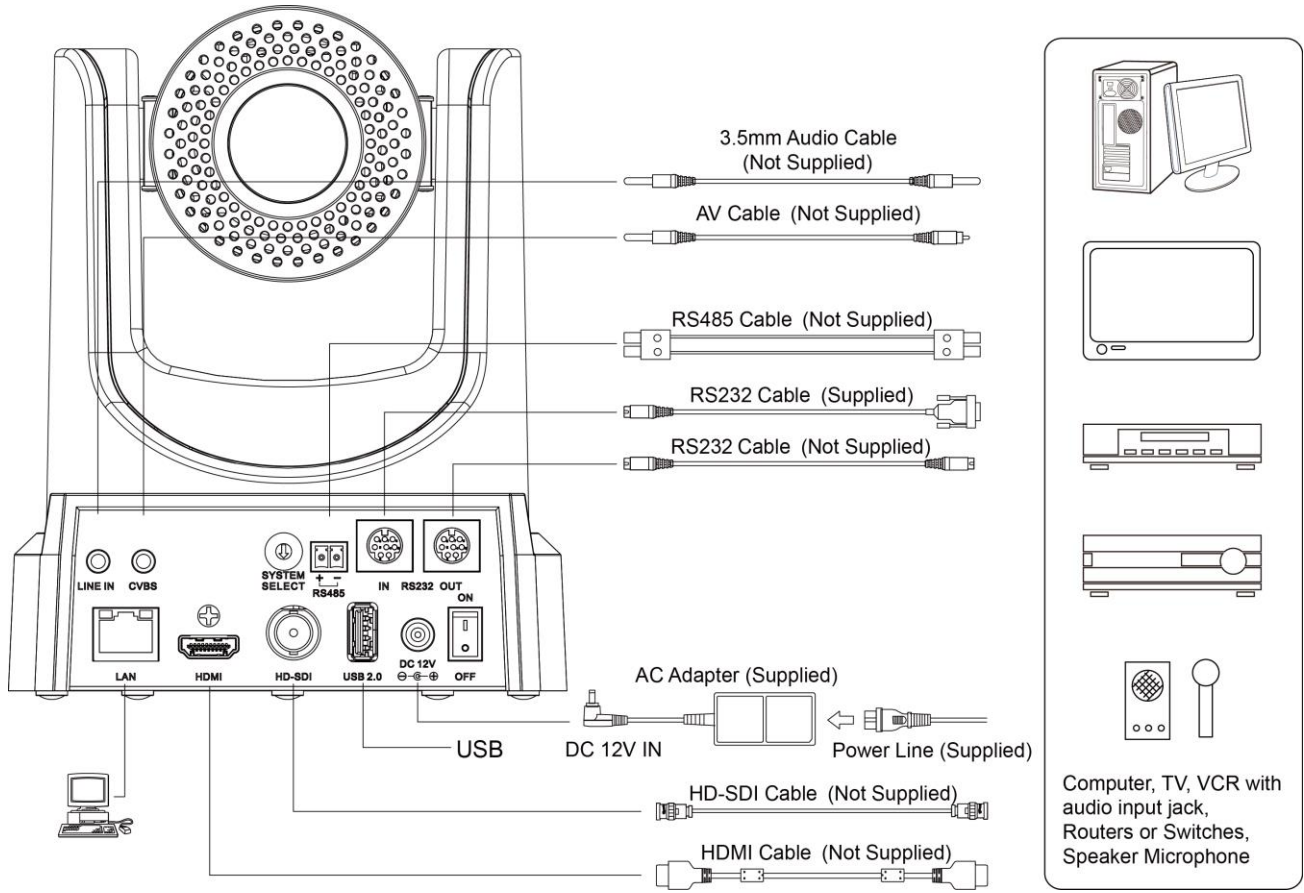


### ● Handling

- Avoid any stress, vibration, or moisture during transportation, storage, installation and operation.
- Do not lift or move the camera by grasping the camera head. Do not turn the camera head by hand. Doing so may result in mechanical damage.
- Do not expose camera to any corrosive solid, liquid, or gas to avoid damage to the cover which is made of a plastic material.
- Ensure that there are no obstacles in the tilt or pan ranges of the camera lens.
- Never power camera on before installation is complete.
- **DO NOT DISMANTLE THE CAMERA** – The manufacturer is not responsible for any unauthorized modification or dismantling.

# Quick Start

**Step1.** Please check that all connections are correct before powering on the camera.



**Step 2.** Set the system select switch for your desired video output resolution and frame rate.  
 For many applications, setting 0 (1080p-60) will provide the best overall performance.  
 For highest possible resolution, use setting 0 (1080p-60) or 6 (1080p-30), however your actual realized frame rate may be limited to a lower value than 60 fps by your software and/or network connection.

**NOTE:** After changing this dial, you need to restart the camera to see the effect. Turn the camera off.

| VIDEO SYSTEM |         |   |            |
|--------------|---------|---|------------|
| 0            | 1080p60 | 8 | 720p30     |
| 1            | 1080p50 | 9 | 720p25     |
| 2            | 1080i60 | A | 1080p59.94 |
| 3            | 1080i50 | B | 1080i59.94 |
| 4            | 720p60  | C | 1080p29.97 |
| 5            | 720p50  | D | 576i       |
| 6            | 1080p30 | E | 480i       |
| 7            | 1080p25 | F | 720p59.94  |

**CAUTION:** After changing the system (rotary) switch, you need to restart the camera to take effect.

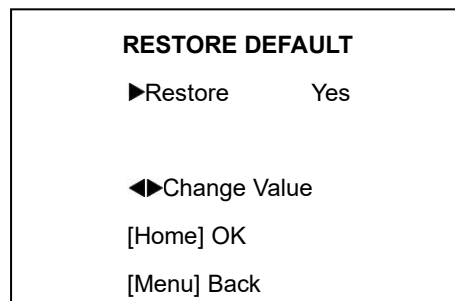
**CAUTION:** A, B, C, & F Broadcast frame rate options are considered BETA features and may not be supported by all platforms

**Step3.** Press the Switch ON button on the rear of the camera, the power lamp will illuminate.

**Step 4.** The Pan-Tilt mechanism will rotate the lens to the maximum position of top right after the camera starts, then it will return to the “center”. The process of initialization is now complete.

(Note: If the position preset 0 has been stored, the position preset 0 will be called up after initialization in lieu of “center”)

**Step 5. (Optional)** If you want to restore the factory default settings, press [MENU] button to display the OSD menu. Select the item [MENU] -> [RESTORE DEFAULT] -> [Restore]. Set the value [Yes], press [HOME] button to restore the factory default settings. Or when using the IR remote, press [\*] + [#] + [6] in succession to restore to factory default settings.



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# Features

- Image Sensor
  - Panasonic 1/2.7", 2.07 million effective pixels, HD CMOS sensor
  - Olympus high quality telephoto lens supporting 30X optical zoom and optional 16X digital zoom
  - Full HD 1920x1080p resolution up to 60 frames per second
  - 2D & 3D noise reduction with our latest "low noise CMOS sensor"
  - 0.05 Lux @ F1.8 AGC On
  - Wide angle 60.7° horizontal field of view
  - Dynamic Range Control (DRC) for higher image quality and detail across simultaneously well lit and shadowed scenes.
  - Image Freeze to temporarily pause the video while calling presets (so viewers won't see camera movement)
  - High SNR (signal to noise ratio) of the CMOS sensor ( $\geq 55\text{dB}$ ), combined with 2D & 3D noise reduction algorithms, effectively reduces noise, even under low illumination conditions.
- Video Outputs
  - Simultaneous IP network streaming, 3G-SDI, and HDMI video outputs.
  - 3G-SDI High Definition video output up to 60 frames per second
  - HDMI 1.3 High Definition video output up to 60 frames per second
  - RTSP, RTMP, & RTMPS streaming using H.264, H.265, & MJPEG
  - Line level audio embedding over IP network stream & HDMI. Uses AAC audio encoding for better sound quality and lower bandwidth usage.
  - Support for ultra-high FPS mode 1280x720p @ 120 frames per second over IP network stream.
  - Supports non-simultaneous CVBS (composite video) output via 3.5mm connector (480i or 576i)
- Control and Settings
  - PTZOptics VISCA over IP
  - IR Remote Control
  - Web-based IP remote control interface
  - RS232 & RS485 VISCA, Pelco-D, & Pelco-P control
- Installation
  - Standard 1/4-20 female thread for camera mounting
  - Power over Ethernet – Supports 802.3af
  - 12VDC 2A Power Supply provided for non-PoE infrastructure
- Warranty
  - 5-year warranty

**\*Please note:** The camera is unable to perform 1080@60 over IP stream & SDI/HDMI simultaneously.

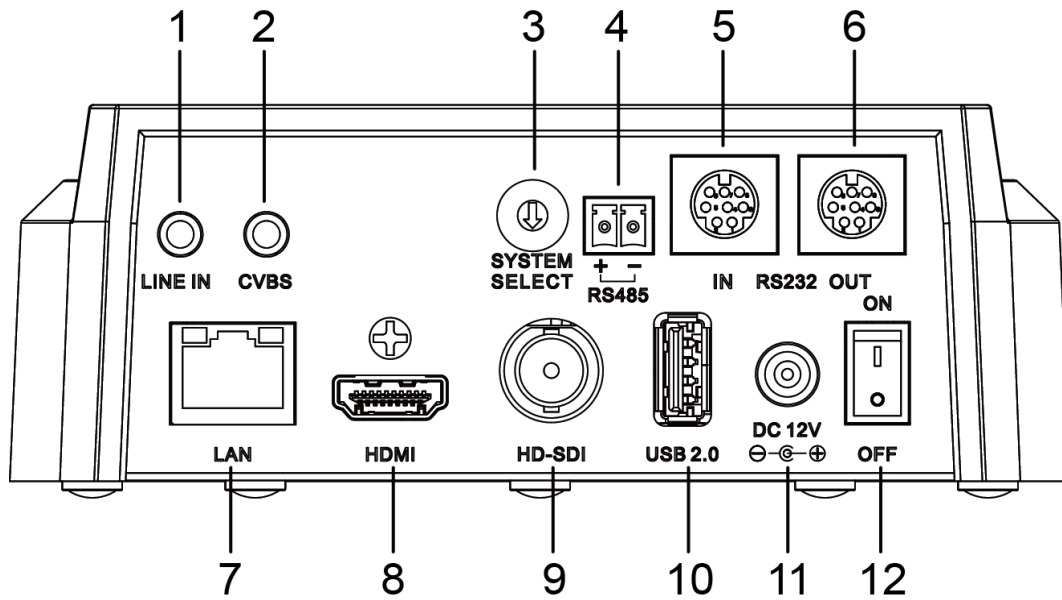
# Technical Specifications

|                               |   |
|-------------------------------|---|
| Model                         | PT30X-SDI-GY-G2 and PT30X-SDI-WH-G2   |
| Type                          | PTZOptics SDI HD 1080p Color Video Camera   |
| <b>Camera</b>                 |   |
| Video System                  | 1080p-60/50/30/25/59.94*/29.97*, 1080i-60/50/59.94*, 720p-60/50/59.94*<br>CVBS: 576i, 480i<br>*Broadcast frame rates are considered BETA features and may not be supported by all platforms<br><b>Please note:</b> The camera is unable to perform 1080p60 over IP stream & SDI/HDMI simultaneously |
| Sensor                        | 1/2.7", CMOS, Effective Pixel: 2.07M  |
| Scanning Mode                 | Progressive   |
| Lens                          | 30x, f4.42mm ~ 88.5mm, F1.8 ~ F2.8  |
| Digital Zoom                  | 16x   |
| Minimal Illumination          | 0.05 Lux (@F1.8, AGC ON)  |
| Shutter                       | 1/30s ~ 1/10000s  |
| White Balance                 | Auto, Indoor, Outdoor, One Push, Manual, VAR  |
| Backlight Compensation        | Support   |
| Digital Noise Reduction       | 2D & 3D Digital Noise Reduction   |
| Video S/N                     | ≥55dB   |
| Horizontal Angle of View      | 2.28° ~ 60.7°   |
| Vertical Angle of View        | 1.28° ~ 34.1°   |
| Horizontal Rotation Range     | ±170°   |
| Vertical Rotation Range       | -30° ~ +90°   |
| Pan Speed Range               | 1.7° ~ 100°/s   |
| Tilt Speed Range              | 1.7° ~ 69.9°/s  |
| Image Flip                    | Support   |
| Image Mirror                  | Support   |
| Image Freeze                  | Support   |
| PoE                           | Support (802.3af)   |
| Face Detection                | Not Supported   |
| Local Storage                 | Not Supported   |
| Number of Preset              | 255   |
| Preset Accuracy               | 0.1°  |
| <b>Input/Output Interface</b> |   |
| HD Output                     | 1 x HDMI: Version 1.3   |
|                               | 1 x 3G-SDI: BNC type, 800mVp-p, 75Ω, Along to SMPTE 424M standard   |
|                               | 1 x RJ45 IP Network streaming 10/100/1000 Ethernet port   |
| SD Output                     | 1 x CVBS: RCA jack, 1Vp-p, 75Ω  |



|                              |   |
|------------------------------|---|
| Network Interface            | 1 x RJ45: 10/100/1000M Adaptive Ethernet ports                                      |
| Audio Input                  | 1-ch 3.5mm audio interface, Line In (IP Network stream only) (Unbalanced stereo)    |
| USB                          | 1 x USB2.0: type A jack   |
| Communication Interface      | 1 x RS-232 IN: 8pin Min DIN, Max Distance: 30m, Protocol: VISCA/Pelco-D/Pelco-P     |
|                              | 1 x RS-232 OUT: 8pin Min DIN, Max Distance: 30m, Protocol: VISCA network use only   |
|                              | 1 x RS-485: 2pin Phoenix port, Max Distance: 1200m, Protocol: VISCA/Pelco-D/Pelco-P |
| Power Jack                   | JEITA type (DC IN 12V)  |
| <b>IP Video Features</b>     |   |
| Video Compression            | H.264 / H.265 / M-JPEG  |
| Video Stream                 | Two (2) IP video output streams available   |
| First Stream Resolutions     | 1920x1080, 1280x720, 1024x576, 960x540, 640x480, 640x360                            |
| Second Stream Resolutions    | 1280x720, 1024x576, 720x480, 720x408, 640x360, 480x270, 320x240, 320x180            |
| Video Bit Rate               | 32Kbps ~ 102400Kbps   |
| Bit Rate Type                | Variable Rate, Fixed Rate   |
| Frame Rate                   | 50Hz: 1 FPS ~ 50 FPS, 60Hz: 1 FPS ~ 60 FPS  |
| Audio Compression            | AAC   |
| Audio Bit Rate               | 96Kbps, 128Kbps, 256Kbps  |
| Supported Protocols          | TCP/IP, HTTP, RTSP, RTMP, DHCP, Multicast, etc.                                     |
| <b>Generic Specification</b> |   |
| Input Voltage                | DC 12V / PoE (802.3af) (optional)   |
| Current Consumption          | 1.0A (Max)  |
| Operating Temperature        | -10°C ~ 40°C (14°F ~ 104°F)   |
| Storage Temperature          | -40°C ~ 60°C (-40°F ~ 140°F)  |
| Operating Humidity           | 10% - 80%   |
| Power Consumption            | 12W (Max)   |
| MTBF                         | >30000h   |
| Size in. (W x D x H)         | 5.6" W x 6.7" D x 6.5" H (7.8" H w/ max tilt)                                       |
| Size mm. (W x D x H)         | 142mm W x 169mm D x 164mm H (168mm H w/ max tilt)                                   |
| Camera Weight                | 3.05 lbs [1.39 kg]  |
| Box Weight                   | 5.4 lbs [2.45 kg]   |

## Back of the Camera



- |  |   |
|--|---|
| 1. Audio LINE IN Interface (HDMI & IP)           | 7. Network (IP streaming & control)               |
| 2. CVBS (composite video SD) Interface           | 8. HDMI (Digital Video Output)                    |
| 3. System select dial (resolution)               | 9. HD-SDI (Serial Digital Video Output)           |
| 4. RS485 jack                                    | 10. USB 2.0 (*no video out* Future - USB Storage) |
| 5. RS232 IN jack                                 | 11. DC 12V power jack                             |
| 6. RS232 OUT jack (pass through for daisy chain) | 12. Power switch                                  |

# IR Remote Controller

## 1. Standby Button

Press this button to enter standby mode. Press it again to enter normal mode.

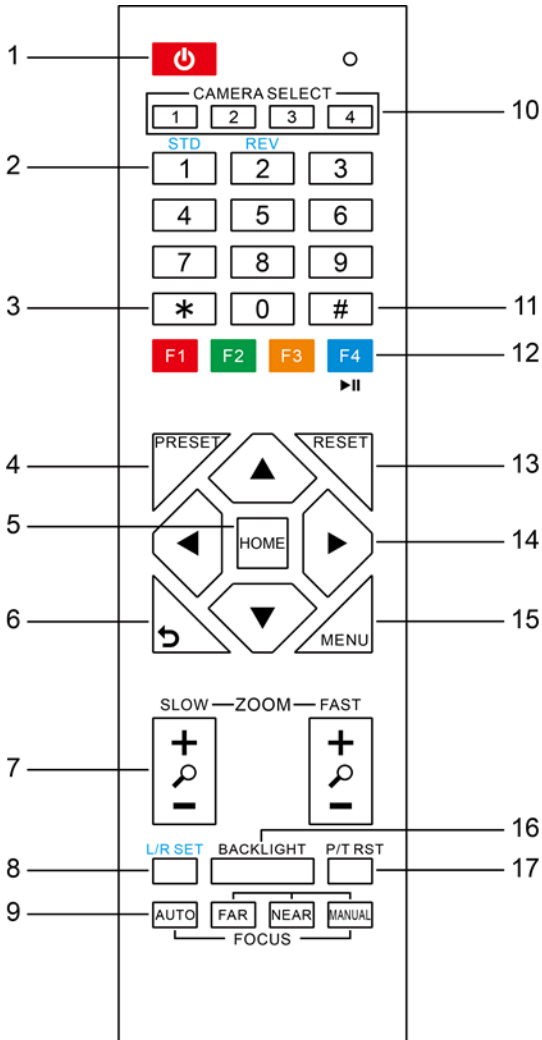
NOTE: Power consumption in standby mode is approximately half of the normal mode.

## 2. Position Buttons

To set preset or call preset.

## 3. \* Button

For multiple function.



## 4&13. Set/Clear Preset Buttons

Set preset: Store a preset position

[PRESET] + Numeric button (0-9): Setting a corresponding numeric key preset position

NOTE: Preset 0 - 9 via remote control and the rest from web, keyboard and the serial port.

Clear preset: Erase a preset position [RESET] + Numeric button (0-9), or: [\*] + [#] + [RESET]: Erase all presets

## 5&14. Pan/Tilt Control Buttons

Press the arrow buttons to perform panning and tilting. Press the [HOME] button to face the camera back to front.

## 6. Return Button

Press the button to back previous menu.

## 7. Zoom Buttons

Zoom+: Zoom In (Slow and fast speed)

Zoom-: Zoom Out (Slow and fast speed)

## 8. L/R Set Button

Set the left & right direction of the remote control.

[L/R Set] + [1]: Normal direction.

[L/R Set] + [2]: Left and right direction will be reversed.

## 9. Focus Buttons

Used for focus adjustment.

Press [AUTO] to adjust the focus on the center of the object automatically.

To adjust the focus manually, press the [MANUAL] button, and adjust it with [Far] (focus on far object) and [Near] (focus on near object).

## 10. Camera Address Select Buttons

Press the button corresponding to the camera which you want to operate with the remote controller.

## 11. # Button

For multiple function.

---

## 12. Multiple Function Buttons

Function 1. Set camera IR address

Press 3 keys contiguously can set camera IR address as follow:

[\*] + [#] + [F1]: Address 1

[\*] + [#] + [F2]: Address 2

[\*] + [#] + [F3]: Address 3

[\*] + [#] + [F4]: Address 4

Function 2. Image freezing function

Press [F4] to start the freeze function. The word "Freeze" displays on the upper left corner. After five seconds, the display disappears automatically (though the freeze feature continues). To cancel the freeze, press the [F4] key the word "Unfreeze" displays on the upper left corner. After five seconds, the display disappears automatically.

## 15. Menu Setting

Menu button: Press this button to enter or exit the OSD menu.

## 16. Backlight Button

Backlight button: Press this button to enable the backlight compensation. Press it again to disable the backlight compensation.

NOTE: Effective only in auto exposure mode.

NOTE: If there is a light behind the subject, the subject will appear dark. In this case, press the backlight ON / OFF button. To cancel this function, press the backlight ON / OFF button.

## 17. P/T RST Button

Press the button to self-calibrate pan and tilt once again.

### Shortcuts for some 'Set' Functions

[\*] + [#] + [1]: Display OSD menu in English

[\*] + [#] + [3]: Display OSD menu in Chinese

[\*] + [#] + [4]: Show IP address

[\*] + [#] + [6]: Quickly restore the default settings

[\*] + [#] + [8]: Show the camera version

[\*] + [#] + [9]: Quickly set mount mode (flip / normal)

[\*] + [#] + [MANUAL]: Resets IP information

[#] + [\*] + [4]: Enable Dynamic IP addressing

[#] + [\*] + [#] + [1]: Sets IP address to 192.168.100.81

[#] + [\*] + [#] + [2]: Sets IP address to 192.168.100.82

[#] + [\*] + [#] + [3]: Sets IP address to 192.168.100.83

[#] + [\*] + [#] + [4]: Sets IP address to 192.168.100.84

[#] + [\*] + [#] + [5]: Sets IP address to 192.168.100.85

[#] + [\*] + [#] + [6]: Sets IP address to 192.168.100.86

[#] + [\*] + [#] + [7]: Sets IP address to 192.168.100.87

[#] + [\*] + [#] + [8]: Sets IP address to 192.168.100.88

[#] + [\*] + [#] + [9]: Sets IP address to 192.168.100.89

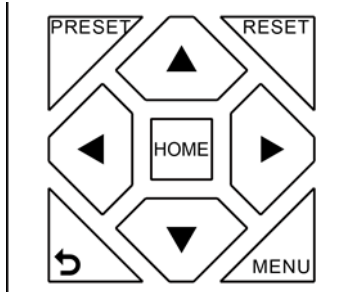
[#] + [\*] + [#] + [0]: Sets IP address to 192.168.100.80

# IR Remote Controller Guide

To perform a command on the IR remote, press and release the button. A special note will be given when you can press and hold the button.

To perform a shortcut, press the buttons in a sequence when a right-angle bracket is shown. (>), or simultaneously when a plus sign (+) is shown.

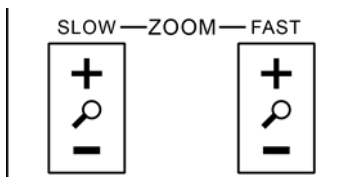
## 1. Pan & Tilt Control



- Tilt Up: Press [▲]
- Tilt Down: Press [▼]
- Pan Left: Press [◀]
- Pan Right: Press [▶]
- Face camera to front: Press [HOME]

**Press and hold** the up/down/left/right buttons, to keep panning or tilting from slow to fast, (until the camera reaches the mechanical limit). The camera stops as soon as the button is released.

## 2. Zoom Control



- Zoom Out: press [+] button under FAST or SLOW
- Zoom In: press [-] button under FAST or SLOW

**Press and hold** the button, to keep zooming in or out (until the lens reaches the mechanical limit). The lens stops as soon as the button is released.

## 3. Focus Control



**AUTO:** Change focus mode to AF, which allows the camera to adjust the focus automatically on the center of the image.

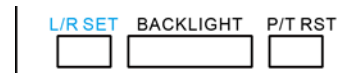
**MANUAL:** Change focus mode to MF, which allows the user to adjust the focus manually (see FOCUS FAR & FOCUS NEAR).

**FOCUS FAR:** Press [FAR] button (NOTE: Effective only in MANUAL focus mode)

**FOCUS NEAR:** Press [NEAR] button (NOTE: Effective only in MANUAL focus mode)

**Press and hold** the FOCUS [FAR] or FOCUS [NEAR] button, allows for continuous adjustment, stopping as soon as the button is released.

## 4. BACKLIGHT. L/R SET and P/T RST Controls




**Reverse Pan controls direction:** Press and hold [L/R SET] button while pressing [1] aka [STD] button for normal pan controls. Press and hold [L/R SET] button while pressing [2] aka [REV] button for reversed pan controls.


**Backlight Compensation Control:** Press [BACKLIGHT] button to enable backlight compensation. Press it again to disable backlight compensation. (Note: Backlight is only effective in full auto exposure mode)

**Pan Tilt Control Self Calibration:** Press [P/T RST] button to recalibrate the Pan and Tilt limits.

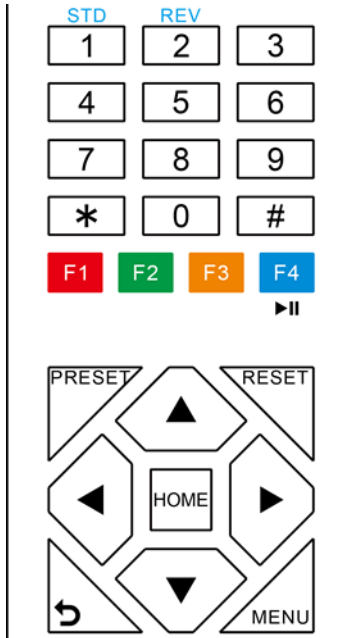
## 5. Standby Control



Press [] button to put camera in 'standby' mode. In

standby mode the camera will provide no image, respond to no commands and use less than half its normal power. Press  button again to put camera in normal mode.

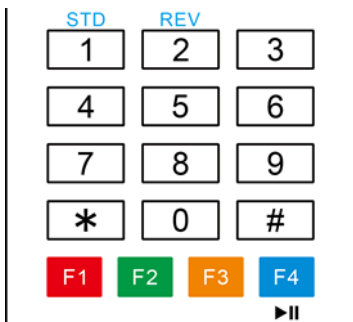
## 6. Presets - Setting and Clearing



- Set Preset: Press [PRESET] > preset number
- Call Preset: Press preset number
- Clear Preset: Press [RESET] > preset number
- Clear ALL Presets: Press [\*] > [#] > [RESET]

*Note: No action will be executed when calling a preset that has not yet been saved.*

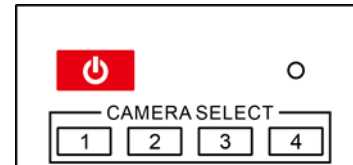
## 7. Recalling Presets



Pressing any of the numeric buttons [0-9] directly will recall a stored preset position and settings.

**Note:** No action will be executed if a specific numeric preset position has not yet been saved.

## 8. Camera Selection



Press the [1-4] button corresponding to the camera with the IR address that you want to operate. This allows for up to 4 cameras to be operated via the same IR remote in the same room.

## 9. Camera IR Address Set




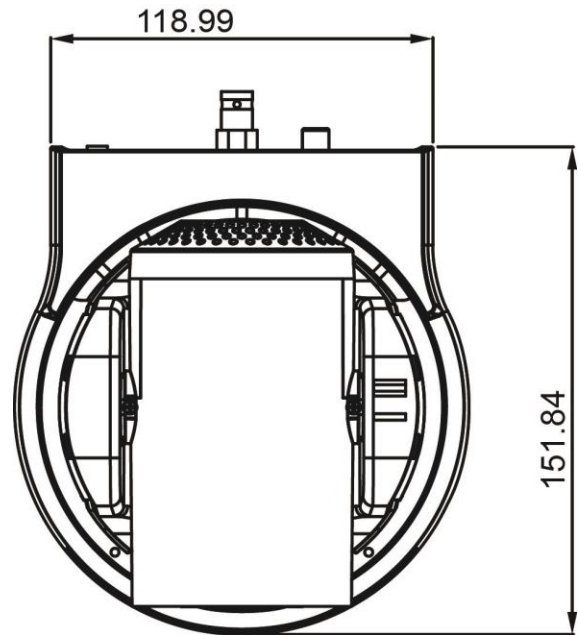
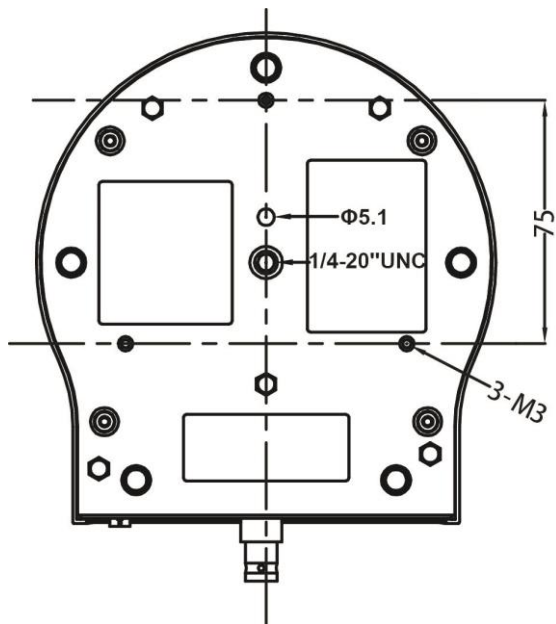
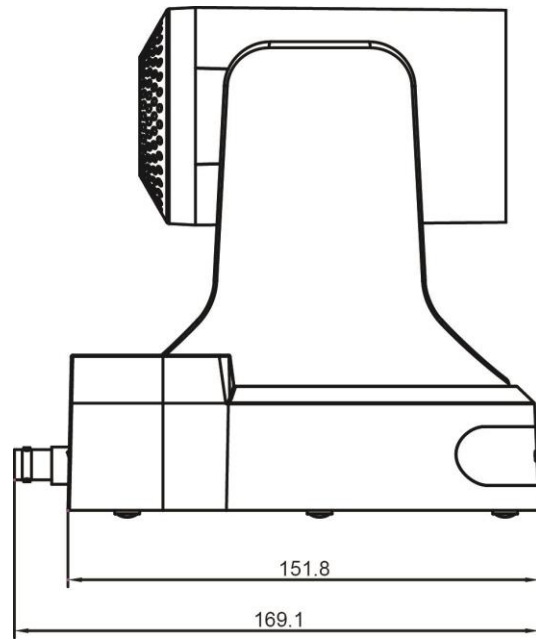
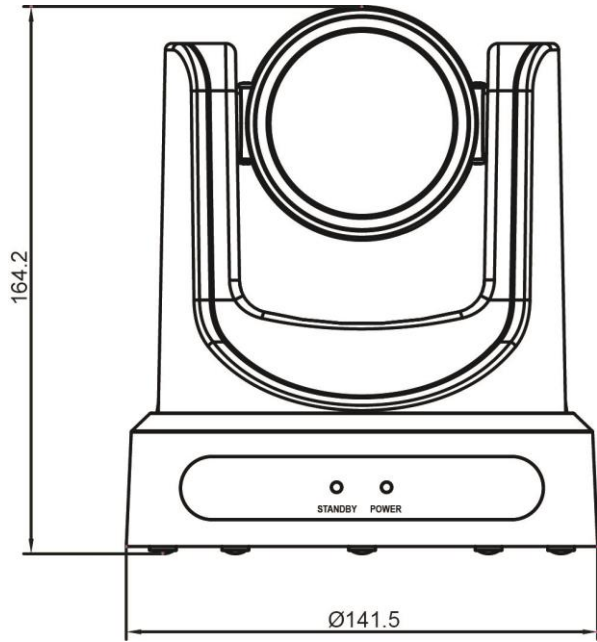
Press 3 buttons in the sequence shown below to set/change the camera's IR address. This allows up to 4 cameras to be controlled from the same IR remote control. Be sure that only one camera is picking up the IR signal when you perform this function. If multiple cameras receive the command, they will all change to the new address.

- Address 1: [\*] + [#] + [F1]
- Address 2: [\*] + [#] + [F2]
- Address 3: [\*] + [#] + [F3]
- Address 4: [\*] + [#] + [F4]

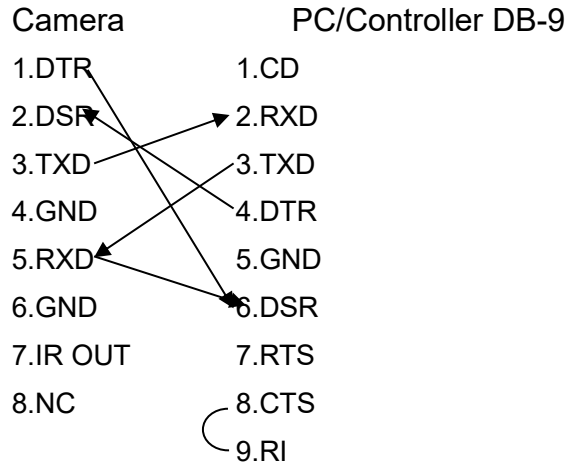
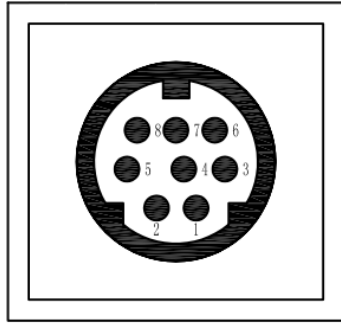
## 10. Image Freeze



Press the  button to freeze or unfreeze the video image. This can be useful while recalling presets to hide camera motion from your viewers.



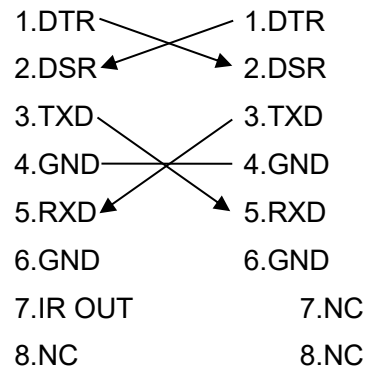
# RS-232 Interface



| No. | Function |
|-----|----------|
| 1   | DTR      |
| 2   | DSR      |
| 3   | TXD      |
| 4   | GND      |
| 5   | RXD      |
| 6   | GND      |
| 7   | IR OUT   |
| 8   | NC       |

## For Control Daisy Chain

1<sup>st</sup> Camera      2<sup>nd</sup> Camera Mini DIN





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## Serial Communication Control

In default working mode, the camera is able to connect to a VISCA controller with an RS232C serial interface.

➤ **RS232 Communication Control**

The camera can be controlled via RS232. The parameters of RS232C are as follows:

Baud rate: 2400, 4800, 9600 or 38400 bps.

Start bit: 1 bit.

Data bit: 8 bits.

Stop bit: 1bit.

Parity bit: none.

➤ **RS485 Communication Control**

The camera can be controlled via RS485, Half-duplex mode, with support for VISCA, Pelco-D or Pelco-P protocol. The parameters of RS485 are as follows:

Baud rate: 2400, 4800, 9600 or 38400 bps.

Start bit: 1 bit.

Data bit: 8 bits.

Stop bit: 1 bit.

Parity bit: none.

# PTZOptics VISCA Command List

## Part 1: Camera-Issued Messages

| ACK/Completion Message  |            |                             |  |
|-------------------------|------------|-----------------------------|--|
| Command                 | Function   | Command Packet              | Comments                                     |
| ACK/Completion Messages | ACK        | z0 4y FF<br>(y: Socket No.) | Returned when the command is accepted.       |
|                         | Completion | z0 5y FF<br>(y: Socket No.) | Returned when the command has been executed. |

| Error Messages |                        |   |  |
|----------------|------------------------|---|--|
| Command        | Function               | Command Packet  | Comments   |
| Error Messages | Syntax Error           | z0 60 02 FF   | Returned when the command format is different or when a command with illegal command parameters is accepted.   |
|                | Command Buffer Full    | z0 60 03 FF   | Indicates that two sockets are already being used (executing two commands) and the command could not be accepted when received.                                  |
|                | Command Canceled       | z0 6y 04 FF<br>(y: Socket No.)                                      | Returned when a command which is being executed in a socket specified by the cancel command is canceled. The completion message for the command is not returned. |
|                | No Socket              | z0 6y 05 FF<br>(y: Socket No.)                                      | Returned when no command is executed in a socket specified by the cancel command, or when an invalid socket number is specified.                                 |
|                | Command Not Executable | z0 6y 41 FF<br>(y: Execution command Socket No. Inquiry command: 0) | Returned when a command cannot be executed due to current conditions. For example, when commands controlling the focus manually are received during auto focus.  |

z = Camera Address + 8

## Part 2: VISCA Command List

| Command       | Function          | Command Packet                | Comments   |
|---------------|-------------------|-------------------------------|--|
| CAM_Power     | On                | 8x 01 04 00 02 FF             | Power ON/OFF   |
|               | Off               | 8x 01 04 00 03 FF             |  |
| CAM_Zoom      | Stop              | 8x 01 04 07 00 FF             |  |
|               | Tele (Standard)   | 8x 01 04 07 02 FF             |  |
|               | Wide (Standard)   | 8x 01 04 07 03 FF             |  |
|               | Tele (Variable)   | 8x 01 04 07 2p FF             | p = 0(low) - 7(high)   |
|               | Wide (Variable)   | 8x 01 04 07 3p FF             |  |
|               | Direct            | 8x 01 04 47 0p 0q 0r<br>0s FF | pqrs: Zoom Position  |
| CAM_Focus     | Stop              | 8x 01 04 08 00 FF             |  |
|               | Far (Standard)    | 8x 01 04 08 02 FF             |  |
|               | Near (Standard)   | 8x 01 04 08 03 FF             |  |
|               | Far (Variable)    | 8x 01 04 08 2p FF             | p = 0(low) - 7(high)   |
|               | Near (Variable)   | 8x 01 04 08 3p FF             |  |
|               | Direct            | 8x 01 04 48 0p 0q 0r<br>0s FF | pqrs: Focus Position   |
|               | Auto Focus        | 8x 01 04 38 02 FF             | AF On/Off  |
|               | Manual Focus      | 8x 01 04 38 03 FF             |  |
|               | Auto/Manual       | 8x 01 04 38 10 FF             |  |
|               | Focus Lock        | 8x 0a 04 68 02 FF             | Prevents any other operation or command from adjusting the current focus state |
|               | Focus Unlock      | 8x 0a 04 68 03 FF             |  |
| CAM_WB        | Auto              | 8x 01 04 35 00 FF             | Normal Auto  |
|               | Indoor mode       | 8x 01 04 35 01 FF             | Indoor mode  |
|               | Outdoor mode      | 8x 01 04 35 02 FF             | Outdoor mode   |
|               | OnePush mode      | 8x 01 04 35 03 FF             | One Push WB mode   |
|               | Manual            | 8x 01 04 35 05 FF             | Manual Control mode  |
|               | Color Temperature | 8x 01 04 35 20 FF             | Color Temperature mode   |
|               | OnePush trigger   | 8x 01 04 10 05 FF             | One Push WB Trigger  |
| 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<br>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<br>0q FF | pq: B Gain   |
| CAM_ColorTemp | Reset             | 8x 01 04 20 00 FF             | Default ColorTemperature setting   |
|               | Up                | 8x 01 04 20 02 FF             |  |
|               | Down              | 8x 01 04 20 03 FF             |  |
|               | Direct            | 8x 01 04 20 0p 0q FF          | pq: Color Temperature position 0x00: 2500K ~                                   |

|                     |                  |                               |  |
|---------------------|------------------|-------------------------------|--|
|                     |                  |                               | 0x37: 8000K  |
| 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(Manual control)                          |
| 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<br>0q FF | pq: Iris Position                                    |
| CAM_Shutter         | Reset            | 8x 01 04 0A 00 FF             | Default Shutter setting                              |
|                     | Up               | 8x 01 04 0A 02 FF             |  |
|                     | Down             | 8x 01 04 0A 03 FF             |  |
|                     | Direct           | 8x 01 04 4A 00 00 0p<br>0q FF | pq: Shutter 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 0D 00 00 0p<br>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<br>0q FF | pq: ExpComp Position                                 |
| CAM_BackLight       | On               | 8x 01 04 33 02 FF             | Back Light Compensation On/Off                       |
|                     | Off              | 8x 01 04 33 03 FF             |  |
| CAM_Flicker         | -                | 8x 01 04 23 0p FF             | p: Flicker Settings (0: Off, 1: 50Hz, 2: 60Hz)       |
| CAM_PictureEffect   | Off              | 8x 01 04 63 00 FF             | Picture Effect Setting                               |
|                     | B&W              | 8x 01 04 63 04 FF             |  |
| CAM_Memory          | Reset            | 8x 01 04 3F 00 pp FF          | pp: Memory Number (=0 to 127)                        |
|                     | Set              | 8x 01 04 3F 01 pp FF          |  |
|                     | Recall           | 8x 01 04 3F 02 pp FF          |  |
| Preset Recall Speed | Preset Speed     | 8x 01 06 01 p FF              | p: speed grade, the values are (0x01~0x18)           |
| 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_ColorGain       | Diret            | 8x 01 04 49 00 00 00<br>0p FF | p: Color Gain setting 0h (60%) to Eh (200%)          |
| Pan_tiltDrive       | Up               | 8x 01 06 01 VV WW 03<br>01 FF | VV: Pan speed 0x01 (low speed) to 0x18 (high speed)  |
|                     | Down             | 8x 01 06 01 VV WW 03          | WW: Tilt speed 0x01 (low speed) to 0x14 (high speed) |

|                    |                  |  |   |
|--------------------|------------------|--|---|
|                    |                  | 02 FF  | speed)  |
|                    | Left             | 8x 01 06 01 VV WW 01<br>03 FF                      | YYYY: Pan Position<br>ZZZZ: Tilt Position                                   |
|                    | Right            | 8x 01 06 01 VV WW 02<br>03 FF                      |   |
|                    | Upleft           | 8x 01 06 01 VV WW 01<br>01 FF                      |   |
|                    | Upright          | 8x 01 06 01 VV WW 02<br>01 FF                      |   |
|                    | DownLeft         | 8x 01 06 01 VV WW 01<br>02 FF                      |   |
|                    | DownRight        | 8x 01 06 01 VV WW 02<br>02 FF                      |   |
|                    | Stop             | 8x 01 06 01 VV WW 03<br>03 FF                      |   |
|                    | AbsolutePosition | 8x 01 06 02 VV WW<br>0Y 0Y 0Y 0Y 0Z 0Z 0Z<br>0Z FF |   |
|                    | RelativePosition | 8x 01 06 03 VV WW<br>0Y 0Y 0Y 0Y 0Z 0Z 0Z<br>0Z FF |   |
|                    | Home             | 8x 01 06 04 FF                                     |   |
|                    | Reset            | 8x 01 06 05 FF                                     |   |
| Pan_tiltLimitSet   | LimitSet         | 8x 01 06 07 00 0W<br>0Y 0Y 0Y 0Y 0Z 0Z 0Z<br>0Z FF | W: 1 UpRight 0: DownLeft<br>YYYY: Pan Limit Position<br>ZZZZ: Tilt Position |
|                    | LimitClear       | 8x 01 06 07 01 0W<br>07 0F 0F 0F 07 0F 0F<br>0F FF |   |
| CAM_Brightness     | Direct           | 8x 01 04 A1 00 00 0p<br>0q FF                      | pq: Brightness Position   |
| CAM_Contrast       | Direct           | 8x 01 04 A2 00 00 0p<br>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_SettingSave    | Save             | 8x 01 04 A5 10 FF                                  | Save Current Setting  |
| CAM_AWBSensitivity | High             | 8x 01 04 A9 00 FF                                  | High  |
|                    | Normal           | 8x 01 04 A9 01 FF                                  | Normal  |
|                    | Low              | 8x 01 04 A9 02 FF                                  | Low   |
| CAM_AFZone         | Top              | 8x 01 04 AA 00 FF                                  | AF Zone weight select   |
|                    | Center           | 8x 01 04 AA 01 FF                                  |   |
|                    | Bottom           | 8x 01 04 AA 02 FF                                  |   |
| CAM_ColorHue       | Direct           | 8x 01 04 4F 00 00 00<br>0p FF                      | p: Color Hue 0h (-14 degrees) to Eh (+14 degrees)                           |

|                   |                      |                               |                   |
|-------------------|----------------------|-------------------------------|-------------------|
| OSD_Control       | Open / Close         | 8x 01 04 3F 02 5F FF          |                   |
|                   | Navigate Up          | 8x 01 06 01 0E 0E 03<br>01 FF |                   |
|                   | Navigate Down        | 8x 01 06 01 0E 0E 03<br>02 FF |                   |
|                   | Navigate Left        | 8x 01 06 01 0E 0E 01<br>03 FF |                   |
|                   | Navigate Right       | 8x 01 06 01 0E 0E 02<br>03 FF |                   |
|                   | Enter                | 8x 01 06 06 05 FF             |                   |
|                   | Return               | 8x 01 06 06 04 FF             |                   |
| CAM_NDIMode       | High                 | 8x 0B 01 01 FF                |                   |
|                   | Medium               | 8x 0B 01 02 FF                |                   |
|                   | Low                  | 8x 0B 01 03 FF                |                   |
|                   | Off                  | 8x 0B 01 04 FF                |                   |
| CAM_MulticastMode | Multicast Mode       | 8x 0B 01 23 0p FF             | p=1: On, p=2: Off |
| CAM_PTZMotionSync | PTZ Motion Sync On   | 8x 0A 11 13 02 FF             |                   |
|                   | PTZ Motion Sync Off  | 8x 0A 11 13 03 FF             |                   |
|                   | MS Lower Speed Limit | 8x 0A 11 14 pq FF             | pq: speed stage   |
| CAM_UACStatus     | Toggle USB Audio     | 8x 2A 02 A0 04 0p FF          | p=2: On, p=3: Off |

### Part 3: PTZOptics VISCA Query Command List

| Inquiry Command List |                |                      |                              |
|----------------------|----------------|----------------------|------------------------------|
| Command              | Command packed | Inquiry Packet       | Comments                     |
| CAM_PowerInq         | 8x 09 04 00 FF | y0 50 02 FF          | On                           |
|                      |                | y0 50 03 FF          | Off (Standby)                |
|                      |                | y0 50 04 FF          | Internal power circuit error |
| CAM_ZoomPosInq       | 8x 09 04 47 FF | y0 50 0p 0q 0r 0s FF | pqrs: Zoom Position          |
| CAM_FocusAFModelnq   | 8x 09 04 38 FF | y0 50 02 FF          | Auto Focus                   |
|                      |                | y0 50 03 FF          | Manual Focus                 |
| 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          | Indoor mode                  |
|                      |                | y0 50 02 FF          | Outdoor mode                 |
|                      |                | y0 50 03 FF          | OnePush mode                 |
|                      |                | y0 50 05 FF          | Manual                       |
|                      |                | y0 50 20 FF          | ColorTemperature Mode        |
| 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_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_Noise2DModelInq              | 8x 09 04 50 FF | y0 50 02 FF                         | Auto Noise 2D                                 |
|                                  |                | y0 50 03 FF                         | Manual Noise 3D                               |
| CAM_Noise2DLevel                 | 8x 09 04 53 FF | y0 50 0p FF                         | Noise Reduction (2D) p: 0 to 5                |
| CAM_Noise3DLevel                 | 8x 09 04 54 FF | y0 50 0p FF                         | Noise Reduction (3D) p: 0 to 8                |
| CAM_FlickerModelInq              | 8x 09 04 55 FF | y0 50 0p FF                         | p: Flicker Settings(0: OFF, 1: 50Hz, 2: 60Hz) |
| CAM_ApertureModelInq (Sharpness) | 8x 09 04 05 FF | y0 50 02 FF                         | Auto Sharpness                                |
|                                  |                | y0 50 03 FF                         | Manual Sharpness                              |
| CAM_ApertureInq (Sharpness)      | 8x 09 04 42 FF | y0 50 00 00 0p 0q FF                | pq: Aperture Gain                             |
| SYS_MenuModelInq                 | 8x 09 06 06 FF | y0 50 02 FF                         | On  |
|                                  |                | y0 50 03 FF                         | Off   |
| CAM_PictureEffectModelInq        | 8x 09 04 63 FF | y0 50 02 FF                         | Off   |
|                                  |                | y0 50 04 FF                         | B&W   |
| CAM_LR_ReverselInq               | 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_ColorGainInq                 | 8x 09 04 49 FF | y0 50 00 00 00 0p FF                | p: Color Gain setting 0h (60%) to Eh (200%)   |
| Pan-tiltPosInq                   | 8x 09 06 12 FF | y0 50 0w 0w 0w 0w<br>0z 0z 0z 0z FF | www: Pan Position<br>zzzz: Tilt Position      |
| CAM_GainLimitInq                 | 8x 09 04 2C FF | y0 50 0q FF                         | p: Gain Limit                                 |
| CAM_AFSensitivityInq             | 8x 09 04 58 FF | y0 50 01 FF                         | High  |
|                                  |                | y0 50 02 FF                         | Normal  |
|                                  |                | y0 50 03 FF                         | Low   |
| 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_AFZone      | 8x 09 04 AA FF | y0 50 00 FF          | Top  |
|                 |                | y0 50 01 FF          | Center   |
|                 |                | y0 50 02 FF          | Bottom   |
| CAM_ColorHueInq | 8x 09 04 4F FF | y0 50 00 00 00 0p FF | p: Color Hue setting 0h (- 14 degrees) to Eh (+14 degrees) |

|                       |                   |             |        |
|-----------------------|-------------------|-------------|--------|
| CAM_AWBSensitivityInq | 8x 09 04 A9 FF    | y0 50 00 FF | High   |
|                       |                   | y0 50 01 FF | Normal |
|                       |                   | y0 50 02 FF | Low    |
| CAM_UACInq            | 8x 2A 02 A0 04 FF | y0 50 02 FF | On     |
|                       |                   | y0 50 03 FF | Off    |

| Block Inquiry Command List |                   |  |  |
|----------------------------|-------------------|--|--|
| Command                    | Command packed    | Inquiry Packet   | Comments   |
| CAM_LensBlockInq           | 8x 09 7E 7E 00 FF | y0 50 0u 0u 0u<br>0u 00 00 0v 0v<br>0v 0v 00 0w 00<br>FF | uuuu: Zoom Position<br>vvvv: Focus Position<br>w.bit0: Focus Mode 1: Auto 0: Manual  |
| CAM_CameraBlockInq         | 8x 09 7E 7E 01 FF | y0 50 0p 0p 0q<br>0q 0r 0s tt 0u<br>vv ww 00 xx 0z<br>FF | pp: R_Gain<br>qq: B_Gain<br>r: WB Mode<br>s: Aperture<br>tt: AE Mode<br>u.bit2: Back Light<br>u.bit1: Exposure Comp.<br>vv: Shutter Position<br>ww: Iris Position<br>xx: Bright Position<br>z: Exposure Comp. Position |
| CAM_OtherBlockInq          | 8x 09 7E 7E 02 FF | y0 50 0p 0q 00<br>0r 00 00 00 00<br>00 00 00 00 00<br>FF | p.bit0: Power 1:On, 0:Off<br>q.bit2: LR Reverse 1:On, 0:Off<br>r.bit3~0: Picture Effect Mode   |
| CAM_EnlargementBlockInq    | 8x 09 7E 7E 03 FF | y0 50 00 00 00<br>00 00 00 00 0p<br>0q rr 0s 0t 0u<br>FF | p: AF sensitivity<br>q.bit0: Picture flip(1:On, 0:Off)<br>rr.bit6~3: Color Gain(0h(60%) to Eh(200%))<br>s: Flip(0: Off, 1:Flip-H, 2:Flip-V, 3:Flip-HV)<br>t.bit2~0: NR2D Level<br>u: Gain Limit                        |

Note: The [x] in the above table is the camera address, [y] = [x + 8].



## Part 4: PTZOptics VISCA over IP Command List

| Command       | Function          | Command Packet             | Comments   |                   |
|---------------|-------------------|----------------------------|--|-------------------|
| CAM_Power     | On                | 81 01 04 00 02 FF          | Power ON/OFF   |                   |
|               | Off               | 81 01 04 00 03 FF          |  |                   |
| CAM_Zoom      | Stop              | 81 01 04 07 00 FF          | p = 0(low) - 7(high)<br>pqrs: Zoom Position              |                   |
|               | Tele (Standard)   | 81 01 04 07 02 FF          |  |                   |
|               | Wide (Standard)   | 81 01 04 07 03 FF          |  |                   |
|               | Tele (Variable)   | 81 01 04 07 2p FF          |  |                   |
|               | Wide (Variable)   | 81 01 04 07 3p FF          |  |                   |
|               | Direct            | 81 01 04 47 0p 0q 0r 0s FF |  |                   |
| CAM_Focus     | Stop              | 81 01 04 08 00 FF          | p = 0(low) - 7(high)<br>pqrs: Focus Position             |                   |
|               | Far (Standard)    | 81 01 04 08 02 FF          |  |                   |
|               | Near (Standard)   | 81 01 04 08 03 FF          |  |                   |
|               | Far (Variable)    | 81 01 04 08 2p FF          |  |                   |
|               | Near (Variable)   | 81 01 04 08 3p FF          |  |                   |
|               | Direct            | 81 01 04 48 0p 0q 0r 0s FF |  |                   |
|               | Auto Focus        | 81 01 04 38 02 FF          |  | AF On/Off         |
|               | Manual Focus      | 81 01 04 38 03 FF          |  |                   |
|               | Auto/Manual       | 81 01 04 38 10 FF          |  |                   |
|               |                   | Focus Lock                 |  | 81 0a 04 68 02 FF |
|               | Focus Unlock      | 81 0a 04 68 03 FF          |  |                   |
| CAM_WB        | Auto              | 81 01 04 35 00 FF          | Normal Auto  |                   |
|               | Indoor mode       | 81 01 04 35 01 FF          | Indoor mode  |                   |
|               | Outdoor mode      | 81 01 04 35 02 FF          | Outdoor mode   |                   |
|               | OnePush mode      | 81 01 04 35 03 FF          | One Push WB mode   |                   |
|               | Manual            | 81 01 04 35 05 FF          | Manual Control mode                                      |                   |
|               | Color Temperature | 81 01 04 35 20 FF          | Color Temperature mode                                   |                   |
|               | OnePush trigger   | 81 01 04 10 05 FF          | One Push WB Trigger                                      |                   |
| CAM_RGain     | Reset             | 81 01 04 03 00 FF          | Manual Control of R Gain                                 |                   |
|               | Up                | 81 01 04 03 02 FF          |  |                   |
|               | Down              | 81 01 04 03 03 FF          |  |                   |
|               | Direct            | 81 01 04 43 00 00 0p 0q FF | pq: R Gain   |                   |
| CAM_Bgain     | Reset             | 81 01 04 04 00 FF          | Manual Control of B Gain                                 |                   |
|               | Up                | 81 01 04 04 02 FF          |  |                   |
|               | Down              | 81 01 04 04 03 FF          |  |                   |
|               | Direct            | 81 01 04 44 00 00 0p 0q FF | pq: B Gain   |                   |
| CAM_ColorTemp | Reset             | 81 01 04 20 00 FF          | Default ColorTemperature setting                         |                   |
|               | Up                | 81 01 04 20 02 FF          |  |                   |
|               | Down              | 81 01 04 20 03 FF          |  |                   |
|               | Direct            | 81 01 04 20 0p 0q FF       | pq: Color Temperature position 0x00: 2500K ~ 0x37: 8000K |                   |
| CAM_AE        | Full Auto         | 81 01 04 39 00 FF          | Automatic Exposure mode                                  |                   |
|               | Manual            | 81 01 04 39 03 FF          | Manual Control mode                                      |                   |
|               | Shutter priority  | 81 01 04 39 0A FF          | Shutter Priority Automatic Exposure mode                 |                   |

|                     |                  |   |  |
|---------------------|------------------|---|--|
|                     | Iris priority    | 81 01 04 39 0B FF                               | Iris Priority Automatic Exposure mode  |
|                     | Bright           | 81 01 04 39 0D FF                               | Bright Mode(Manual control)  |
| CAM_Iris            | Reset            | 81 01 04 0B 00 FF                               | Iris Setting   |
|                     | Up               | 81 01 04 0B 02 FF                               |  |
|                     | Down             | 81 01 04 0B 03 FF                               |  |
|                     | Direct           | 81 01 04 4B 00 00 0p 0q FF                      | pq: Iris Position  |
| CAM_Shutter         | Reset            | 81 01 04 0A 00 FF                               | Default Shutter setting  |
|                     | Up               | 81 01 04 0A 02 FF                               |  |
|                     | Down             | 81 01 04 0A 03 FF                               |  |
|                     | Direct           | 81 01 04 4A 00 00 0p 0q FF                      | pq: Shutter Position   |
| CAM_Bright          | Reset            | 81 01 04 0D 00 FF                               | Bright Setting   |
|                     | Up               | 81 01 04 0D 02 FF                               |  |
|                     | Down             | 81 01 04 0D 03 FF                               |  |
|                     | Direct           | 81 01 04 0D 00 00 0p 0q FF                      | pq: Bright Position  |
| CAM_ExpComp         | On               | 81 01 04 3E 02 FF                               | Exposure Compensation On/Off   |
|                     | Off              | 81 01 04 3E 03 FF                               |  |
|                     | Reset            | 81 01 04 0E 00 FF                               | Exposure Compensation Amount Setting   |
|                     | Up               | 81 01 04 0E 02 FF                               |  |
|                     | Down             | 81 01 04 0E 03 FF                               |  |
|                     | Direct           | 81 01 04 4E 00 00 0p 0q FF                      | pq: ExpComp Position   |
| CAM_BackLight       | On               | 81 01 04 33 02 FF                               | Back Light Compensation On/Off   |
|                     | Off              | 81 01 04 33 03 FF                               |  |
| CAM_Flicker         | -                | 81 01 04 23 0p FF                               | p: Flicker Settings (0: Off, 1: 50Hz, 2: 60Hz)   |
| CAM_PictureEffect   | Off              | 81 01 04 63 00 FF                               | Picture Effect Setting   |
|                     | B&W              | 81 01 04 63 04 FF                               |  |
| CAM_Memory          | Reset            | 81 01 04 3F 00 pp FF                            | pp: Memory Number (=0 to 127)  |
|                     | Set              | 81 01 04 3F 01 pp FF                            |  |
|                     | Recall           | 81 01 04 3F 02 pp FF                            |  |
| Preset Recall Speed | Preset Speed     | 81 01 06 01 p FF                                | p: speed grade, the values are (0x01~0x18)   |
| CAM_LR_Reverse      | On               | 81 01 04 61 02 FF                               | Image Flip Horizontal On/Off   |
|                     | Off              | 81 01 04 61 03 FF                               |  |
| CAM_PictureFlip     | On               | 81 01 04 66 02 FF                               | Image Flip Vertical On/Off   |
|                     | Off              | 81 01 04 66 03 FF                               |  |
| CAM_ColorGain       | Direct           | 81 01 04 49 00 00 00 0p FF                      | p: Color Gain setting 0h (60%) to Eh (200%)  |
| Pan_tiltDrive       | Up               | 81 01 06 01 VV WW 03 01 FF                      | VV: Pan speed 0x01 (low speed) to 0x18 (high speed)<br>WW: Tilt speed 0x01 (low speed) to 0x14 (high speed)<br>YYYY: Pan Position<br>ZZZZ: Tilt Position |
|                     | Down             | 81 01 06 01 VV WW 03 02 FF                      |  |
|                     | Left             | 81 01 06 01 VV WW 01 03 FF                      |  |
|                     | Right            | 81 01 06 01 VV WW 02 03 FF                      |  |
|                     | Upleft           | 81 01 06 01 VV WW 01 01 FF                      |  |
|                     | Upright          | 81 01 06 01 VV WW 02 01 FF                      |  |
|                     | DownLeft         | 81 01 06 01 VV WW 01 02 FF                      |  |
|                     | DownRight        | 81 01 06 01 VV WW 02 02 FF                      |  |
|                     | Stop             | 81 01 06 01 VV WW 03 03 FF                      |  |
|                     | AbsolutePosition | 81 01 06 02 VV WW<br>0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF |  |

|                    |                      |   |   |
|--------------------|----------------------|---|---|
|                    | RelativePosition     | 81 01 06 03 VV WW<br>0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF |   |
|                    | Home                 | 81 01 06 04 FF                                  |   |
|                    | Reset                | 81 01 06 05 FF                                  |   |
| Pan_tiltLimitSet   | LimitSet             | 81 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<br>ZZZZ: Tilt Position |
|                    | LimitClear           | 81 01 06 07 01 0W<br>07 0F 0F 0F 07 0F 0F 0F FF |   |
| CAM_Brightness     | Direct               | 81 01 04 A1 00 00 0p 0q FF                      | pq: Brightness Position   |
| CAM_Contrast       | Direct               | 81 01 04 A2 00 00 0p 0q FF                      | pq: Contrast Position   |
| CAM_Flip           | Off                  | 81 01 04 A4 00 FF                               | Single Command For Video Flip   |
|                    | Flip-H               | 81 01 04 A4 01 FF                               |   |
|                    | Flip-V               | 81 01 04 A4 02 FF                               |   |
|                    | Flip-HV              | 81 01 04 A4 03 FF                               |   |
| CAM_SettingSave    | Save                 | 81 01 04 A5 10 FF                               | Save Current Setting  |
| CAM_AWBSensitivity | High                 | 81 01 04 A9 00 FF                               | High  |
|                    | Normal               | 81 01 04 A9 01 FF                               | Normal  |
|                    | Low                  | 81 01 04 A9 02 FF                               | Low   |
| CAM_AFZone         | Top                  | 81 01 04 AA 00 FF                               | AF Zone weight select   |
|                    | Center               | 81 01 04 AA 01 FF                               |   |
|                    | Bottom               | 81 01 04 AA 02 FF                               |   |
| CAM_ColorHue       | Direct               | 81 01 04 4F 00 00 00 0p FF                      | p: Color Hue 0h (-14 degrees) to Eh (+14 degrees)                           |
| OSD_Control        | Open / Close         | 81 01 04 3F 02 5F FF                            |   |
|                    | Navigate Up          | 81 01 06 01 0E 0E 03 01 FF                      |   |
|                    | Navigate Down        | 81 01 06 01 0E 0E 03 02 FF                      |   |
|                    | Navigate Left        | 81 01 06 01 0E 0E 01 03 FF                      |   |
|                    | Navigate Right       | 81 01 06 01 0E 0E 02 03 FF                      |   |
|                    | Enter                | 81 01 06 06 05 FF                               |   |
|                    | Return               | 81 01 06 06 04 FF                               |   |
| CAM_NDIMode        | High                 | 81 0B 01 01 FF                                  |   |
|                    | Medium               | 81 0B 01 02 FF                                  |   |
|                    | Low                  | 81 0B 01 03 FF                                  |   |
|                    | Off                  | 81 0B 01 04 FF                                  |   |
| CAM_MulticastMode  | Multicast Mode       | 81 0B 01 23 0p FF                               | p=1: On, p=2: Off   |
| CAM_PTZMotionSync  | PTZ Motion Sync On   | 81 0A 11 13 02 FF                               |   |
|                    | PTZ Motion Sync Off  | 81 0A 11 13 03 FF                               |   |
|                    | MS Lower Speed Limit | 81 0A 11 14 pq FF                               | pq: speed stage   |
| CAM_UACStatus      | Toggle USB Audio     | 81 2A 02 A0 04 0p FF                            | p=2: On, p=3: Off   |

## Part 5: VISCA over IP Query Command List

| Inquiry Command List                |                |                      |   |
|-------------------------------------|----------------|----------------------|---|
| Command                             | Command packed | Inquiry Packet       | Comments                                      |
| CAM_PowerInq                        | 81 09 04 00 FF | 90 50 02 FF          | On  |
|                                     |                | 90 50 03 FF          | Off (Standby)                                 |
|                                     |                | 90 50 04 FF          | Internal power circuit error                  |
| CAM_ZoomPosInq                      | 81 09 04 47 FF | 90 50 0p 0q 0r 0s FF | pqrs: Zoom Position                           |
| CAM_FocusAFModelInq                 | 81 09 04 38 FF | 90 50 02 FF          | Auto Focus                                    |
|                                     |                | 90 50 03 FF          | Manual Focus                                  |
| CAM_FocusPosInq                     | 81 09 04 48 FF | 90 50 0p 0q 0r 0s FF | pqrs: Focus Position                          |
| CAM_WBModelInq                      | 81 09 04 35 FF | 90 50 00 FF          | Auto  |
|                                     |                | 90 50 01 FF          | Indoor mode                                   |
|                                     |                | 90 50 02 FF          | Outdoor mode                                  |
|                                     |                | 90 50 03 FF          | OnePush mode                                  |
|                                     |                | 90 50 05 FF          | Manual  |
|                                     |                | 90 50 20 FF          | ColorTemperature Mode                         |
| CAM_RGainInq                        | 81 09 04 43 FF | 90 50 00 00 0p 0q FF | pq: R Gain                                    |
| CAM_BGainInq                        | 81 09 04 44 FF | 90 50 00 00 0p 0q FF | pq: B Gain                                    |
| CAM_AEModelInq                      | 81 09 04 39 FF | 90 50 00 FF          | Full Auto                                     |
|                                     |                | 90 50 03 FF          | Manual  |
|                                     |                | 90 50 0A FF          | Shutter priority                              |
|                                     |                | 90 50 0B FF          | Iris priority                                 |
|                                     |                | 90 50 0D FF          | Bright  |
| CAM_ShutterPosInq                   | 81 09 04 4A FF | 90 50 00 00 0p 0q FF | pq: Shutter Position                          |
| CAM_IrisPosInq                      | 81 09 04 4B FF | 90 50 00 00 0p 0q FF | pq: Iris Position                             |
| CAM_BrightPosInq                    | 81 09 04 4D FF | 90 50 00 00 0p 0q FF | pq: Bright Position                           |
| CAM_ExpCompModelInq                 | 81 09 04 3E FF | 90 50 02 FF          | On  |
|                                     |                | 90 50 03 FF          | Off   |
| CAM_ExpCompPosInq                   | 81 09 04 4E FF | 90 50 00 00 0p 0q FF | pq: ExpComp Position                          |
| CAM_BacklightModelInq               | 81 09 04 33 FF | 90 50 02 FF          | On  |
|                                     |                | 90 50 03 FF          | Off   |
| CAM_Nosise2DModelInq                | 81 09 04 50 FF | 90 50 02 FF          | Auto Noise 2D                                 |
|                                     |                | 90 50 03 FF          | Manual Noise 3D                               |
| CAM_Nosise2DLevel                   | 81 09 04 53 FF | 90 50 0p FF          | Noise Reduction (2D) p: 0 to 5                |
| CAM_Noise3DLevel                    | 81 09 04 54 FF | 90 50 0p FF          | Noise Reduction (3D) p: 0 to 8                |
| CAM_FlickerModelInq                 | 81 09 04 55 FF | 90 50 0p FF          | p: Flicker Settings(0: OFF, 1: 50Hz, 2: 60Hz) |
| CAM_ApertureModelInq<br>(Sharpness) | 81 09 04 05 FF | 90 50 02 FF          | Auto Sharpness                                |
|                                     |                | 90 50 03 FF          | Manual Sharpness                              |
| CAM_ApertureInq<br>(Sharpness)      | 81 09 04 42 FF | 90 50 00 00 0p 0q FF | pq: Aperture Gain                             |
| SYS_MenuModelInq                    | 81 09 06 06 FF | 90 50 02 FF          | On  |
|                                     |                | 90 50 03 FF          | Off   |

|                              |                |                                     |  |
|------------------------------|----------------|-------------------------------------|--|
| CAM_PictureEffectModel<br>nq | 81 09 04 63 FF | 90 50 02 FF                         | Off  |
|                              |                | 90 50 04 FF                         | B&W  |
| CAM_LR_ReverseInq            | 81 09 04 61 FF | 90 50 02 FF                         | On   |
|                              |                | 90 50 03 FF                         | Off  |
| CAM_PictureFlipInq           | 81 09 04 66 FF | 90 50 02 FF                         | On   |
|                              |                | 90 50 03 FF                         | Off  |
| CAM_ColorGainInq             | 81 09 04 49 FF | 90 50 00 00 00 0p FF                | p: Color Gain setting 0h (60%) to Eh (200%)                |
| Pan-tiltPosInq               | 81 09 06 12 FF | 90 50 0w 0w 0w 0w<br>0z 0z 0z 0z FF | www: Pan Position<br>zzz: Tilt Position                    |
| CAM_GainLimitInq             | 81 09 04 2C FF | 90 50 0q FF                         | p: Gain Limit  |
| CAM_AFSensitivityInq         | 81 09 04 58 FF | 90 50 01 FF                         | High   |
|                              |                | 90 50 02 FF                         | Normal   |
|                              |                | 90 50 03 FF                         | Low  |
| CAM_BrightnessInq            | 81 09 04 A1 FF | 90 50 00 00 0p 0q FF                | pq: Brightness Position                                    |
| CAM_ContrastInq              | 81 09 04 A2 FF | 90 50 00 00 0p 0q FF                | pq: Contrast Position                                      |
| CAM_FlipInq                  | 81 09 04 A4 FF | 90 50 00 FF                         | Off  |
|                              |                | 90 50 01 FF                         | Flip-H   |
|                              |                | 90 50 02 FF                         | Flip-V   |
|                              |                | 90 50 03 FF                         | Flip-HV  |
| CAM_AFZone                   | 81 09 04 AA FF | 90 50 00 FF                         | Top  |
|                              |                | 90 50 01 FF                         | Center   |
|                              |                | 90 50 02 FF                         | Bottom   |
| CAM_ColorHueInq              | 81 09 04 4F FF | 90 50 00 00 00 0p FF                | p: Color Hue setting 0h (- 14 degrees) to Eh (+14 degrees) |

|                       |                   |             |        |
|-----------------------|-------------------|-------------|--------|
| CAM_AWBSensitivityInq | 81 09 04 A9 FF    | 90 50 00 FF | High   |
|                       |                   | 90 50 01 FF | Normal |
|                       |                   | 90 50 02 FF | Low    |
| CAM_UACInq            | 81 2A 02 A0 04 FF | 90 50 02 FF | On     |
|                       |                   | 90 50 03 FF | Off    |

## Part 6: 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   |
| 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 |
| Auto Focus                   | 0xFF | Address | 0x00 | 0x2B | 0x00            | 0x01           | SUM |
| Manual Focus                 | 0xFF | Address | 0x00 | 0x2B | 0x00            | 0x02           | 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 |

## Part 7: Pelco-P Protocol Command List

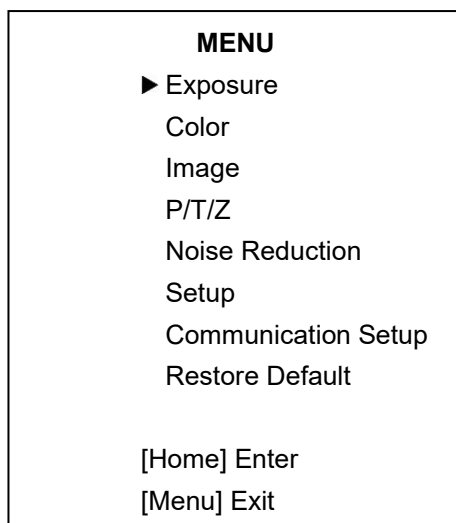
| Function                     | Byte1 | Byte2   | Byte3 | Byte4 | Byte5           | Byte6          | Byte7 | Byte8 |
|------------------------------|-------|---------|-------|-------|-----------------|----------------|-------|-------|
| Up                           | 0xA0  | Address | 0x00  | 0x08  | 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   |
| Zoom In                      | 0xA0  | Address | 0x00  | 0x20  | 0x00            | 0x00           | 0xAF  | XOR   |
| Zoom Out                     | 0xA0  | Address | 0x00  | 0x40  | 0x00            | 0x00           | 0xAF  | XOR   |
| Focus Far                    | 0xA0  | Address | 0x00  | 0x80  | 0x00            | 0x00           | 0xAF  | XOR   |
| Focus Near                   | 0xA0  | Address | 0x01  | 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   |
| Auto Focus                   | 0xA0  | Address | 0x00  | 0x2B  | 0x00            | 0x01           | 0xAF  | XOR   |
| Manual Focus                 | 0xA0  | Address | 0x00  | 0x2B  | 0x00            | 0x02           | 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   |

# On Screen Display Menu

## Main Menu

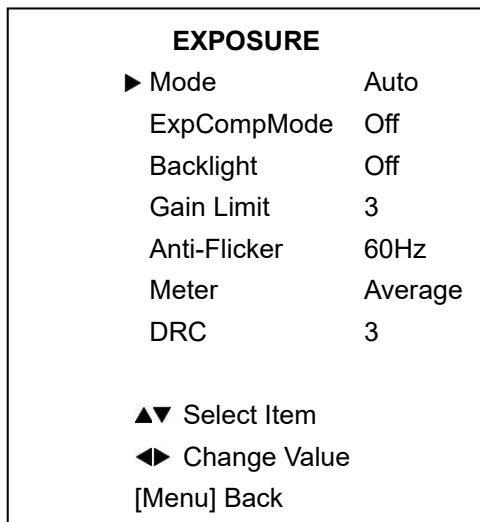
There are many ways to adjust the camera's On Screen Display (OSD) Menu. The following instructions will go over the OSD Menu while using the included IR remote.

Press the [MENU] button to display the OSD Menu. Use the arrow buttons to traverse the OSD menu, the [HOME] button to make selections, and the [RETURN] button to go back a sub menu.



## Exposure

Move the cursor to the "Exposure" option and press the [HOME] button to enter the Exposure page, as shown in the figure below.



**Exposure Mode:** Modes include: Auto, Manual, SAE, AAE, Bright

**ExpCompMode:** Exposure Compensation mode  
Options include: On, Off  
(Only available in Auto mode)

**ExpComp:** Exposure Compensation value.  
Options include: -7 ~ +7  
(Only available once ExpCompMode is On)

**Backlight:** Backlight Compensation mode  
Options include: On, Off  
(Only available in Auto mode)

**Bright:** Brightness Intensity.  
Options include: 0 ~ 17  
(Only available in Bright mode)

**Gain Limit:** Maximum Gain Limit.  
Options include: 0 ~ 15  
(Only available in SAE, AAE, & Bright modes)

**Anti-Flicker:** Anti-Flicker (lighting)  
Options include: Off, 50Hz, 60Hz  
(Only available in Auto, AAE, & Bright modes)

**Iris:** Camera Iris value.  
Options include: Close, F11.0, F9.6, F8.0, F6.8, F5.6, F4.8, F4.0, F3.4, F2.8, F2.4, F2.0, F1.8  
(Only available in AAE & Manual modes)

**Shutter:** Camera Shutter value.  
Options include: 1/30, 1/60, 1/90, 1/100, 1/125, 1/180, 1/250, 1/350, 1/500, 1/725, 1/1000, 1/1500, 1/2000, 1/3000, 1/4000, 1/6000, 1/10000  
(Only available in SAE & Manual modes)

**DRC:** Dynamic Range Control strength.  
Options include: 0 ~ 8

## Color

Move the main menu cursor to [COLOR], and press the [HOME] key to enter the color page, as shown in the following figure.

| COLOR           |      |
|-----------------|------|
| ▶ WB Mode       | Auto |
| RG Tuning       | 0    |
| BG Tuning       | 0    |
| Saturation      | 100% |
| Hue             | 7    |
| AWB Sens        | High |
| ▲▼ Select Item  |      |
| ◀▶ Change Value |      |
| [Menu] Back     |      |

**WB-Mode:** Modes include: Auto, Indoor, Outdoor, One Push, Manual, VAR.

**R Gain:** Red gain, optional items: 0~255  
(Effective only in Manual mode).

**B Gain:** Blue gain, optional items: 0~255  
(Effective only in Manual mode).

**colortemp:** Optional items: 2500K ~ 8000K  
(Effective only in VAR mode).

**RG Tuning:** Red gain tuning, optional items: -10 ~ +10.

**BG Tuning:** Blue gain tuning, optional items: -10 ~ +10.

**Saturation:** optional items: 60% ~ 200%.

**Hue:** Chroma adjustment, optional items: 0 ~ 14.

**AWB Sens:** The white balance sensitivity, optional items: Low, Normal, High.  
(Effective only in Auto & One Push mode)

## Image

Move the main menu cursor to [IMAGE], and press the [HOME] key to enter the image page, as shown in the following figure.

| IMAGE           |         |
|-----------------|---------|
| ▶ Luminance     | 7       |
| Contrast        | 10      |
| Sharpness       | 3       |
| Flip-H          | Off     |
| Flip-V          | Off     |
| B&W-Mode        | Off     |
| Gamma           | Default |
| Style           | Clarity |
| ▲▼ Select Item  |         |
| ◀▶ Change Value |         |
| [Menu] Back     |         |

**Luminance:** Brightness adjustment, optional items: 0 ~ 14.

**Contrast:** Contrast adjustment, optional items: 0 ~ 14.

**Sharpness:** Sharpness adjustment, optional items: 0 ~ 14

**Flip-H:** Image flipped horizontally, optional items: On, Off.

**Flip-V:** Image Flip Vertical, optional items: On, Off.

**Gamma:** Optional items: Default, 0.45, 0.5, 0.56, 0.63.

**Style:** Optional items: Clarity, Norm, 5S, Soft, & Bright

## P/T/Z

Move the main menu cursor to [P/T/Z], and press the [HOME] key to enter the P/T/Z page, as shown in the following figure.



| P/T/Z             |        |
|-------------------|--------|
| ▶SpeedByZoom      | On     |
| AF-Zone           | Center |
| AF-Sense          | High   |
| L/R Set           | STD    |
| Display Info      | On     |
| Image Freeze      | Off    |
| Digital Zoom      | Off    |
| Call Preset Speed | 24     |
| Pre Zoom Speed    | 5      |
| ▲▼ Select Item    |        |
| ◀▶ Change Value   |        |
| [Menu] Back       |        |

| NOISE REDUCTION |
|-----------------|
| ▶ NR2D-Level1   |
| NR3D-Level3     |
| ▲▼ Select Item  |
| ◀▶ Change Value |
| [Menu] Back     |

**SpeedByZoom:** The depth of field scale switch, optional items: On, Off

**AF-Zone:** Interested in focusing area, optional items: Top, Center, Bottom

**AF-Sense:** Automatic focusing sensitivity options, optional items: Low, Normal, High

**L/R Set:** Optional items: STD, REV

**Display Info:** Displays camera information upon startup, optional items: On, Off

**Image Freeze:** Temporarily freeze image during preset call, optional items: On, Off

**Digital Zoom:** Increase zoom level with electronic zoom, optional items: Off, 2x, 4x, 8x, 16x

**Call Preset Speed:** Preset call speed, optional items: 1 ~ 24

**Pre Zoom Speed:** Preset Zoom Speed, optional items: 0 ~ 7

## Noise Reduction

Move the main menu cursor to [NOISE REDUCTION], and press the [HOME] key to enter the noise reduction page, as shown in the following figure.

**NR2D Level:** 2D noise reduction, optional items: Close, Auto, 1 ~ 5.

**NR3D Level:** 3D noise reduction, optional items: Off, 1 ~ 8.

## Setup

**DVIMode:** HDMI Data Transfer type, options include: HDMI, DVI

**Lens:** Optional items: Type1, Type2

**Auto Scan Shoot:** optional items: Off, On

**Auto Focus L:** Lock focus in current position, optional items: Off, On

**OSD TimeOut:** Auto close OSD, optional items: 2.5min, Off

**MotionSync:** Trisynchronous preset call, optional items: Off, On

**Max Speed:** Maximum MotionSync Speed, optional items: 185 – 230 (Effective only when MotionSync is “On”)

## Communication Setup

Move the main menu cursor to [INFORMATION], and press the [HOME] key to enter the communication setup page, as shown in the following figure.

| COMMUNICATION SETUP |        |
|---------------------|--------|
| V_Address           | 1      |
| V-AddrFix           | Off    |
| Net Mode            | Serial |
| Baudrate            | 9600   |
| ▲▼ Select Item      |        |
| ◀▶ Change Value     |        |
| [Menu] Back         |        |

**V\_Address:** Camera VISCA address: optional items: 1 ~ 7

**V-AddrFix:** Fixed VISCA address: optional items: Off, On

**Net Mode:** Optional items: Serial, Paral

**Baudrate:** Optional items: 2400, 4800, 9600, 38400

**P\_D\_Address:** Pelco-D Address, optional items: 0 - 254

**P\_P\_Address:** Pelco-P Address, optional items: 0-31

## Restore Default

Move the main menu cursor to [RESTORE DEFAULT], and press the [HOME] key to enter the restore default page, as shown in the following figure.

| RESTORE DEFAULT    |    |
|--------------------|----|
| ▶Restore?          | No |
| P/T Limit Reset No |    |
| ◀▶Change Value     |    |
| [Home] OK          |    |
| [Menu] Back        |    |

**Restore?:** Confirm restore factory settings, optional items: Yes, No.

**P/T Limit Reset:** Confirm P/T Limit Reset, optional items: Yes, No.

Note: Press [HOME] button to confirm, all parameter restore default, include IR Remote address and VISCA address.

# Network Connection

## 1. Operating Environment

Operating System: Windows 2000 / 2003 / XP / Vista / 7 / 8.1 / 10, Mac Catalina and later

Network Protocol: TCP/IP

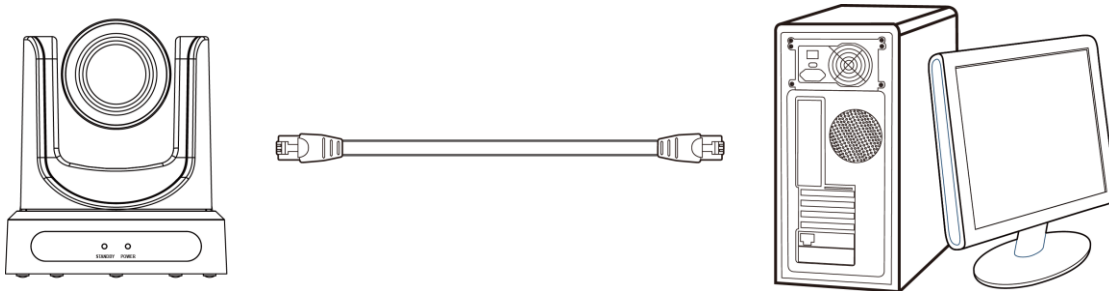
Client PC: P4 / 128M RAM / 40GHD / support for scaled graphics card, support for DirectX8.0 or more advanced version.

## 2. Equipment Installation

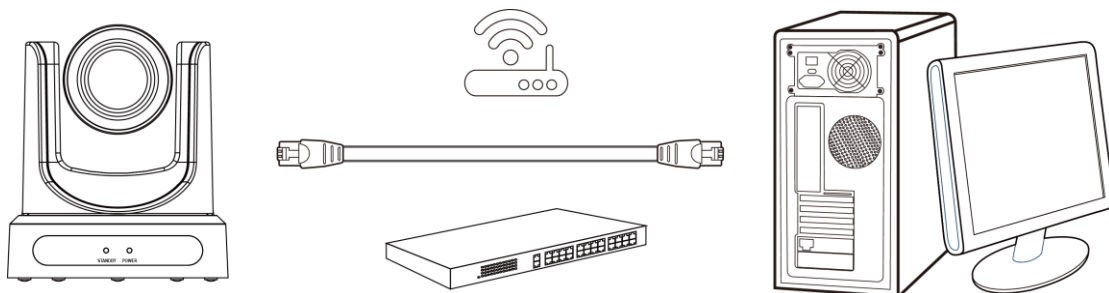
1. Connect the camera to your network via a CAT5 or CAT cable directly to your network switch.
2. Turn on the camera.
3. Once powered on, the orange network light will illuminate and the green light will start flashing.

## 3. Network Connection

Connect the camera & PC to the LAN as shown below.



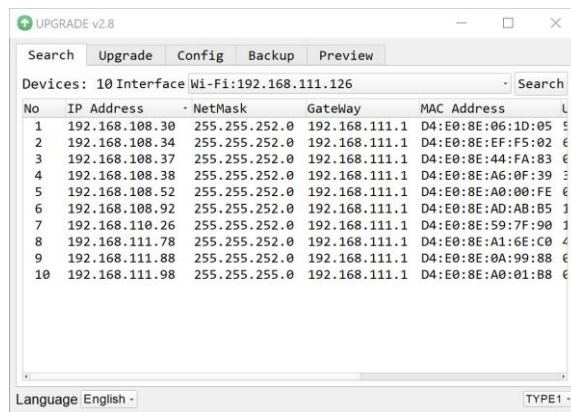
**Picture 1.1 Direct connections via “cross-over” network cable**



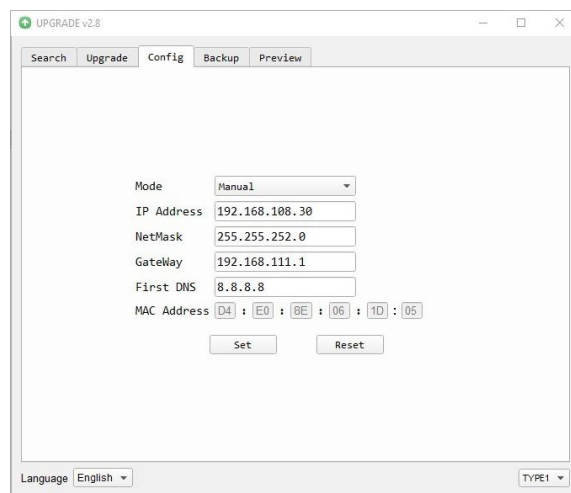
**Picture 1.2 Connections to LAN via patch cable to LAN wall jack or LAN switch**

# Setting up a Network Video Stream

1. The first thing you are going to want to do to get your camera up and streaming on your network is to connect your camera to power, an active network port on your network, and finally, power on the camera.
2. Next, go online and download the IP Address Settings Tool. It's available for Windows & Mac OS at [ptzoptics.com/firmware](http://ptzoptics.com/firmware).
3. Once you complete the download, launch the "Upgrade v2.8C" tool. Select your network connection type from the "Interface" dropdown menu and click "Search".



4. The next thing you would want to do is change your cameras IP address to be in the same range as your network. The camera comes with a default IP address of 192.168.100.88.
  - a. See the "Additional Network Info" section to identify your network scheme.
5. Right-click on the camera you wish to change the IP address of and select "Config".
  - a. You have two (2) options for assigning the IP address of your camera. You can manually assign the IP address by assigning a static IP address, or you can have a DHCP server automatically assign a dynamic IP address to your camera.
  - b. Note: In more complex network environments, you may need to request a static IP address, Network Mask, Default Gateway, & First DNS from your IT department.



6. After assigning an IP address to the camera, you can reach the Web Interface by typing in the camera's IP address into a web browser. To log in, type in "admin" into the username and password fields. From the Web Interface, you have two (2) ways to view the video feed.

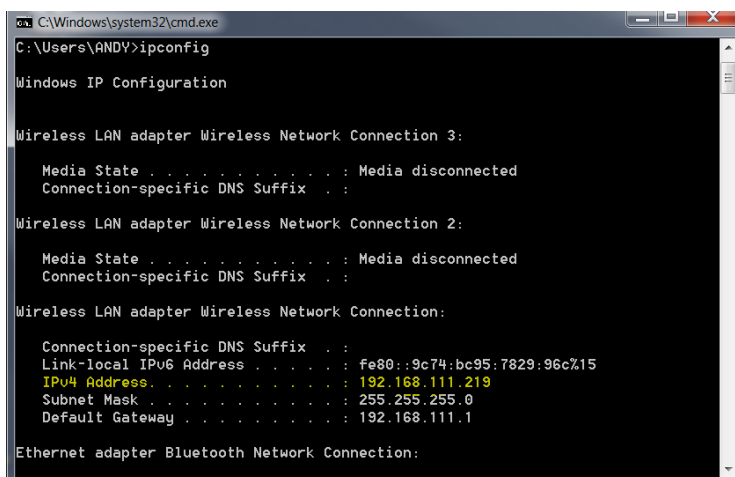
- 
- a. Set the secondary stream to MJPEG.
    - b. Install the PTZOptics ActiveX Plugin and use Internet Explorer.
      - i. For more detail, go to [help.ptzoptics.com](http://help.ptzoptics.com).
  7. From the Web Interface, you can control the camera using the arrows on the left side. You can also adjust many of your camera's settings via this IP interface.
  8. You can now receive an RTSP stream from your camera. To view the RTSP stream, type in "rtsp://[Camera IP address]:554/1" for the first (HD) stream, and "rtsp://[Camera IP address]:554/2" for the second (SD) stream.
  9. You can test the RTSP streaming in VLC Media Player. Once VLC is installed and launched, click the "Media" drop down menu and select "Open Network Stream"

# Discovering your Network Info

You can discover the IP range of your network by using the Command Prompt for Windows, or the Terminal app for Macs and following the steps below.

## Windows

1. Type “CMD” into the search bar in the start menu.
2. Type in “ipconfig” and press “Enter” on your keyboard.
3. Scroll down to “IPv4 Address”. This is your computer’s local IP address.



```
C:\Windows\system32\cmd.exe
C:\Users\ANDY>ipconfig

Windows IP Configuration

Wireless LAN adapter Wireless Network Connection 3:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Wireless Network Connection 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Wireless Network Connection:

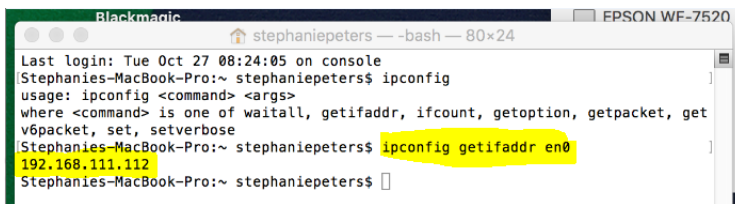
    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : Fe80::9c74:bc95:7829:96c%15
    IPv4 Address. . . . . : 192.168.111.219
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.111.1

Ethernet adapter Bluetooth Network Connection:
```

4. In the example above, the PC’s local address is “192.168.111.219”, making the IP range “192.168.111”.

## Mac

1. Open a new finder window and go to Applications, then Utilities, and select the Terminal program.
2. Type in “IP config get if addr en0” and press “Enter” on your keyboard.



```
Blackmagic
stephaniepeters -- -bash -- 80x24
Last login: Tue Oct 27 08:24:05 on console
Stephanies-MacBook-Pro:~ stephaniepeters$ ipconfig
usage: ipconfig <command> <args>
where <command> is one of waitall, getifaddr, ifcount, getoption, getpacket, get
v6packet, set, setverbose
Stephanies-MacBook-Pro:~ stephaniepeters$ ipconfig getifaddr en0
192.168.111.112
Stephanies-MacBook-Pro:~ stephaniepeters$
```

3. In the example above, the Mac’s local address is “192.168.111.112”, making the IP range “192.168.111”

# Camera Web Interface

The Web Interface allows you to control the camera, view the video feed, and adjust many of the camera's settings.

## Menu

The Menu allows you to traverse the Web Interface. By default, the "Live" option is selected.

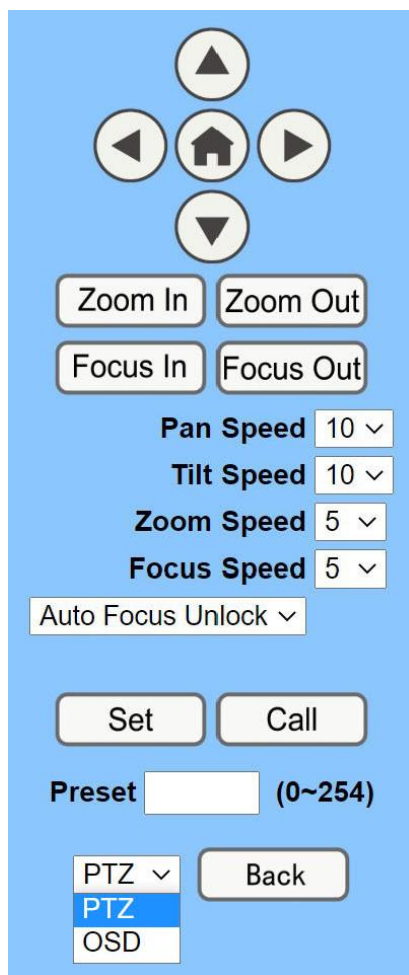
## Live

This tab allows you to view the video feed of the camera.

The status bar below the video feed can be used to pause / play the video feed, adjust the audio level, and switch between full screen and windowed view.

## Directional Arrows

Use the PTZ / OSD dropdown to select how the Directional Arrows behave. While "PTZ" is selected, you will have control over Pan, Tilt, and calling the Home position. When "OSD" is selected, the On Screen Display Menu will open, allowing you to use the Directional Arrows to traverse the OSD Menu.



**Directional Arrows:** Use the Up / Down / Left / Right buttons to Pan / Tilt the camera or traverse the OSD Menu.

**Home Button:** Use the Home Button to send the camera to the Home position, or to make a selection within the OSD Menu.

**Zoom In:** Use the Zoom In button to for narrow (tele) views of the scene.

**Zoom Out:** Use the Zoom Out button for wide views of the scene.

**Focus In/Out:** Use the Focus In and Focus Out buttons to make manual focus adjustments of the scene.

**Speed Control:** Use the Pan, Tilt, Zoom, and Focus Speed dropdowns to adjust the speed at which you control the camera.

**Auto Focus Unlock:** Use the Auto Focus Unlock / Lock dropdown to manually lock the focus in the current position.

**PTZ Presets:** After manually positioning the camera in a position you wish to return to, you can save the position as a PTZ Preset. Type a number between 0~254 into the Preset box and press the "Set" button to save that position. Click the "Call" button to send the camera back to that PTZ Preset position.

**PTZ / OSD Dropdown:** Use the PTZ / OSD Dropdown to select Pan / Tilt / Zoom control, or On Screen Display Menu control.

# Video

**Video Settings**

720p120:  On  Off

Video Format: 60Hz ▾

Encode Level: highprofile ▾

NDI Preset: High ▾

**First stream**

Encode Protocol: H264 ▾

Resolution: 1920x1080 ▾

Bit Rate: 12288 (32~20480) kbps

Frame Rate: 60 ▾ fps

I Key Frame Interval: 120 (2~1200)

Bit Rate Control:  CBR  VBR

Fluctuate Level: 1 ▾

Slice Split Enable:  On  Off

Split Mode:  Fixed blocks  Fixed bytes

Slice Size: 68 blocks/bytes

**Second stream**

Encode Protocol: H264 ▾

Resolution: 640x360 ▾

Bit Rate: 2048 (32~6144) kbps

Frame Rate: 30 ▾ fps

I Key Frame Interval: 60 (2~1200)

Bit Rate Control:  CBR  VBR

Fluctuate Level: 1 ▾

Slice Split Enable:  On  Off

Split Mode:  Fixed blocks  Fixed bytes

Slice Size: 23 blocks/bytes

**720p120:** Allows camera to output 720p at 120 FPS via the IP Network Stream. Set to 'On' or 'Off'. (Note: Setting to 'On' will override and lockout other video settings).

**Video Format:** Supports 50Hz (PAL), 60Hz (NTSC), & Dial Priority formats.

**Encode Level:** Supports baseline, mainprofile, highprofile, & svc-t.

**NDI Preset:** Supports Off, High, Medium, & Low.

**Encode Protocol:** Supports H.264, H.265, and MJPEG protocols.

**Resolution:** The first stream supports: 1920x1080, 1280x720, 1024x576, 960x540, 640x480, 640x360. The second stream supports: 1280x720, 1024x576, 720x480, 720x408, 640x360, 480x270, 320x240, 320x180

**Bit Rate:** Adjust the maximum bit rate of the network video. The higher the bit rate, the clearer the image will be. Bit rates set too high can congest the network and cause the video to not transmit properly, causing the video to appear worse. Range: 32 – 20480 kbps

**Frame Rate:** Adjust the frame rate of the network video. The higher the frame rate the smoother the video will appear.

**I-Key Frame Interval:** Adjust how frequently a keyframe is produced.

**Bit Rate Control:** Supports Constant bit rate (CBR) & Variable bit rate (VBR)

**Fluctuate Level:** Limit the fluctuation magnitude of variable rate. Supports 1 ~ 6.

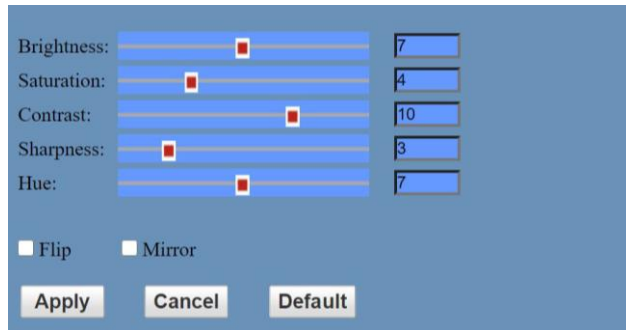
**Split Mode Enable:** Enable / Disable splice split function.

**Split Mode:** Supports Fixed blocks and Fixed bytes.

**Slice Size:** Set the slice size.



# Image



Brightness: [Slider] [7]

Saturation: [Slider] [4]

Contrast: [Slider] [10]

Sharpness: [Slider] [3]

Hue: [Slider] [7]

Flip    Mirror

Apply   Cancel   Default

**Brightness:** Brightness slider. Default: 7

**Saturation:** Saturation slider. Default: 4

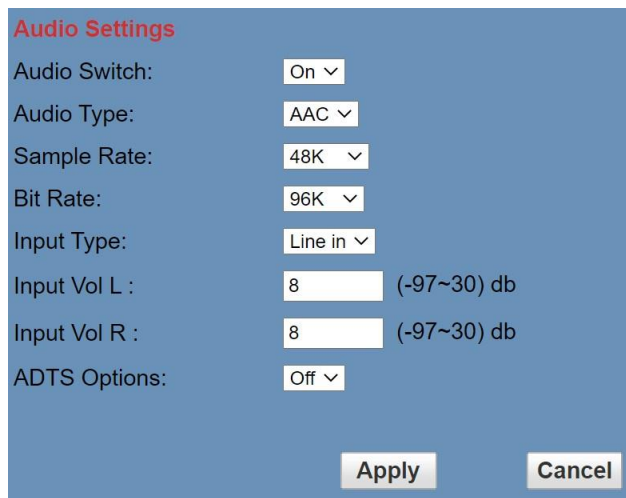
**Contrast:** Contrast slider. Default 10

**Sharpness:** Sharpness slider. Default: 3

**Hue:** Hue slider. Default: 7

**Flip & Mirror:** Check the Flip and/or Mirror buttons to rotate the image accordingly.

# Audio



**Audio Settings**

Audio Switch: [On v]

Audio Type: [AAC v]

Sample Rate: [48K v]

Bit Rate: [96K v]

Input Type: [Line in v]

Input Vol L : [8] (-97~30) db

Input Vol R : [8] (-97~30) db

ADTS Options: [Off v]

Apply   Cancel

**Audio Switch:** Enable / Disable audio embedding

**Audio Type:** AAC

**Sample Rate:** Options include: 44.1K & 48K

**Bit Rate:** Options include: 96K, 128K, & 256K

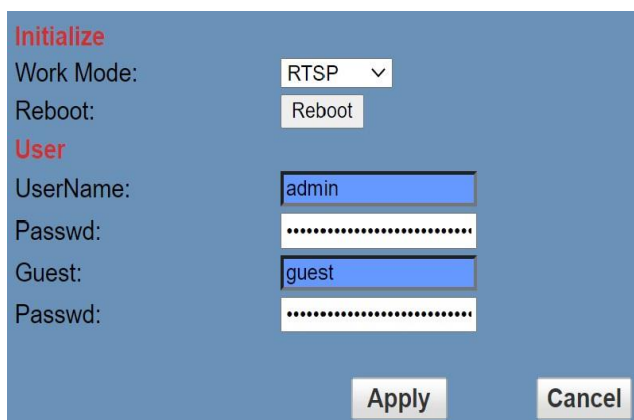
**Input Type:** Line in.

**Input Vol L:** Volume of left channel. -97 ~ 30 db

**Input Vol R:** Volume of right channel. -97 ~ 30 db

**ADTS Options:** Enable / Disable ADTS

# System



**Initialize**

Work Mode: [RTSP v]

Reboot: [Reboot]

**User**

UserName: [admin]

Passwd: [.....]

Guest: [guest]

Passwd: [.....]

Apply   Cancel

**Work Mode:** Options include: RTSP, SDK, & Multicast.

**Reboot:** Used to power cycle the camera

**Username:** Username to login to device. Username: "admin".

**Password:** Password to login to device. Default password: "admin".

**Guest (Username):** Guest username to login to device. Username: "guest".

**Guest (Password):** Guest password to login to device. Default password: "guest".

# Network

The screenshot displays a network configuration interface with the following sections and fields:

- Lan Settings:** IP Configuration Type (Fixed IP Address), IP Address (192.168.108.44), Subnet Mask (255.255.252.0), Gateway (192.168.111.1), DNS Address (192.168.111.1), MAC Address (D4 : E0 : 8E : 01 : A6 : 98). Includes Apply and Cancel buttons.
- Port Settings:** HTTP Port number (80), RTSP Port (554), PTZ Port (5678), UDP Port (1259), Sony Visca (52381).
- SRT Settings:** SRT (On/Off), SRT Port (4578), SRT Encry (Off), SRT Password (1234567891).
- Control Protocol Settings:** Pelco-D Address (0), Pelco-P Address (0).
- RTMP(S) Settings:** First stream (On/Off/Video/Audio), MRL, Second stream (On/Off/Video/Audio), MRL.
- RTSP Settings:** RTSP Auth (On/Off).
- ONVIF Settings:** ONVIF (On/Off), ONVIF Auth (On/Off).
- Multicast Settings:** Multicast (On/Off), Address (224.1.2.3), Port (6688).
- SDK Settings:** Active Connection (On/Off), Address (192.168.100.138), Port (1234).
- NTP Settings:** time zone (GMT-05:00 Eastern Time (US & Canada)), NTP time sync (On/Off), Server address (192.168.100.168), Time interval (1440 minutes), Main time show (On/Off), Position (X 0, Y 0), Sub time show (On/Off), Position (X 0, Y 0). Includes Apply and Cancel buttons.

**LAN Settings:** The Lan Settings section allows you to adjust the IP parameters of the camera. The default IP address of the camera is 192.168.100.99. You cannot change the MAC address.

**IP Configuration Type:** Fixed IP Address (Static) & Dynamic IP Address (DHCP).

**IP Address:** Camera's IP address.

**Subnet Mask:** Network Subnet Mask.

**Gateway:** Network Gateway.

**DNS Address:** Network Domain Name Server address.

**MAC Address:** The camera's MAC address.

**Apply & Cancel Buttons:** Apply or cancel the changes made to the LAN Settings section.

---

**Port Settings:** The Port Settings section allows you to adjust the network ports of the camera.

**HTTP Port:** This port is used for HTTP-CGI control, and for the web application. Default: 80.

**RTSP Port:** This port is used for the RTSP streaming protocol. Default 554.

**PTZ Port:** This port is used for the TCP/IP control protocol. Default: 5678.

**UDP Port:** This port is used for the UDP control protocol. Default: 1259

**Sony VISCA:** This port is used for the Sony VISCA protocol. You cannot change this port number.

**SRT Settings:** The Secure Reliable Transport protocol settings section allows you to adjust the SRT settings of the camera.

**SRT:** Enable / Disable SRT

**SRT Port:** This is the port used for the SRT protocol. Default: 4578.

**SRT Encry:** Enable / Disable SRT Encryption. Options include: Off, AES-128, AES-192, AES-256

**SRT Password:** Change the SRT Password when SRT Encryption is enabled. Default: 1234567891

**Control Protocol Settings:** The Control Protocol Settings section allows you to adjust the Pelco-D & Pelco-P control address.

**Pelco-D Address:** 0 ~ 254

**Pelco-P Address:** 0 ~ 31

**RTMP Settings:** The RTMP(S) Settings section allows you to enable or disable the two (2) RTMPS stream's video and audio sources.

**First Stream:** Enable / Disable Stream 1 Video & Audio

**(First Stream) MRL:** Text field for RTMPS Stream 1's Media Resource Locator (MRL)

**Second Stream:** Enable / Disable Stream 2 Video & Audio

**(Second Stream) MRL:** Text field for RTMPS Stream 2's Media Resource Locator (MRL)

**RTSP Settings:** The RTSP Settings section allows you to enable or disable RTSP Authorization.

**RTSP Auth.:** Enable / Disable RTSP authorization.

**ONVIF Settings:** The ONVIF Settings section allows you to adjust the ONVIF settings of the camera.

**ONVIF:** Enable / Disable ONVIF protocol control.

**ONVIF Auth.:** Enable / Disable ONVIF authorization

**Multicast Settings:** The Multicast Settings section allows you to adjust the Multicast settings of the camera.

**Multicast:** Enable / Disable the Multicast protocol.

**Address:** Adjust the Multicast address.

**Port:** This port is used for the Multicast protocol. Default: 6688.

**SDK Settings:** The SDK Settings section allows you to adjust the Software Development Kit settings of the camera.

**Active Connection:** Enable / Disable the SDK active connection.

**Address:** This is the IP address field of the SDK. Default: 192.168.100.138

**Port:** This is the port used for the SDK. Default: 1234

---

**NTP Settings:** The NTP Settings section allows you to enable / disable the Network Time Protocol of the camera.

**Time Zone:** Adjust the time zone you wish to use with NTP.

**NTP Time Sync:** Enable / Disable NTP Time Sync

**Server Address:** Text field for NTP server.

**Time Interval:** Adjust the Time Interval in minutes. Default: 1440

**Main Time Show:** Enable / Disable Main Time

**Position:** Main Time position

**Sub Time Show:** Enable / Disable Sub Time

**Position:** Sub Time position

**Apply & Cancel Buttons:** Apply or cancel the changes made to the Network Settings section.

## Information

The Information section displays the device information, firmware version, & device friendly name. You can adjust the device friendly name as needed to designate the camera.

## Language

The Language selection dropdown allows you to change the language of the Web Interface. Select either “English”, “Chinese”, or “Russian”.

---

# Network Camera Control Protocol

## Control Notes:

### PTZ over TCP/UDP

The camera currently supports various PTZ control methods, including RS232, RS485, IR remote control, web interface, HTTP-CGI and TCP/UDP protocol.

The camera includes an internal TCP server. The default port number is 5678. When client and server set up a TCP connection, the client sends PTZ command to the internal server and the server will then parse and execute the PTZ commands.

The camera includes an internal UDP server. The default port number is 1259. When client and server set up a UDP connection, the client sends PTZ commands to the internal server and the server will then parse and execute the PTZ commands.

**The command format based on VISCA is shown above in the Serial Communication Control Section**

## HTTP-CGI – Control

### Pan & Tilt

`http://[camera ip]/cgi-bin/ptzctrl.cgi?ptzcmd&[action]&[pan speed]&[tilt speed]`

**[Action]:** up, down, left, right, leftup, rightup, leftdown, rightdown, ptzstop

**[Pan Speed]:** 1 (Slowest) ~ 24 (Fastest)

**[Tilt Speed]:** 1 (Slowest) ~ 20 (Fastest)

### Zoom

`http://[camera ip]/cgi-bin/ptzctrl.cgi?ptzcmd&[action]&[zoom speed]`

**[Action]:** zoomin, zoomout, zoomstop

**[Zoom Speed]:** 1 (Slowest) ~ 7 (Fastest)

### Focus

`http://[camera ip]/cgi-bin/ptzctrl.cgi?ptzcmd&[action]&[focus speed]`

**[Action]:** focusin, focusout, focusstop

**[Focus Speed]:** 1 (Slowest) ~ 7 (Fastest)

### Focus Lock

`http://[camera ip]/cgi-bin/param.cgi?ptzcmd&[action]_mfocus`

**[Action]:** lock, unlock

### Home Position

`http://[camera ip]/cgi-bin/ptzctrl.cgi?ptzcmd&home`

### PT Reset

`http://[camera ip]/cgi-bin/param.cgi?pan_tiltdrive_reset`

### Preset

`http://[camera ip]/cgi-bin/ptzctrl.cgi?ptzcmd&[action]&[position number]`

**[Action]:** posset, poscall

**[Position Number]:** 0 ~ 89, 100 ~ 254

---

## Direct Position Recall

`http://[camera ip]/cgi-bin/ptzctrl.cgi?ptzcmd&[mode]&[pan speed]&[tilt speed]&[pan position]&[tilt position]`

**[Mode]:** abs (Absolute position), rel (Relative position)

**[Pan Speed]:** 1 (Slowest) ~ 24 (Fastest)

**[Tilt Speed]:** 1 (Slowest) ~ 20 (Fastest)

**[Pan Position]:** 0001 ~ 0990 (pan right), FFFE ~ F670 (pan left), 0000 / FFFF (home position)

**[Tilt Position]:** 0001 ~ 0510 (tilt up), FFFE ~ FE51 (tilt down), 0000 / FFFF (home position)

## Direct Zoom Recall

`http://[camera ip]/cgi-bin/ptzctrl.cgi?ptzcmd&zoomto&[zoom speed]&[zoom position]`

**[Zoom Speed]:** 0 (Slowest) ~ 7 (Fastest)

**[Zoom Position]:** 0000 (Full wide) ~ 4000 (Full tele)

## HTTP-CGI – Navigation

### OSD Access

`http://[camera ip]/cgi-bin/param.cgi?navigate_mode&[mode]`

**[Mode]:** OSD, PTZ

### OSD Menu Navigation

`http://[camera ip]/cgi-bin/ptzctrl.cgi?ptzcmd&[action]`

**[Action]:** up, down, left, right

### OSD Menu Selection

`http://[camera ip]/cgi-bin/param.cgi?navigate_mode&[mode]`

**[Mode]:** CONFIRM, OSD\_BACK

## HTTP-CGI – Image Adjustment

### Image Settings

`http://[camera ip]/cgi-bin/param.cgi?post_image_value&[mode]&[level]`

**[Mode]:** bright, saturation, contrast, sharpness, hue

**[Level]:** 0 ~ 14

### Image Orientation

`http://[camera ip]/cgi-bin/param.cgi?post_image_value&[mode]&[state]`

**[Mode]:** flip, mirror

**[State]:** 1 (flip / mirror), 0 (default)

### Default Image Settings

`http://[camera ip]/cgi-bin/param.cgi?get_image_default_conf`

---

# HTTP-CGI – Inquiries

## Video

`http://[camera ip]/cgi-bin/param.cgi?get_media_video`

Network Video Configuration

## Audio

`http://[camera ip]/cgi-bin/param.cgi?get_media_audio`

Network Audio Configuration

## Network

`http://[camera ip]/cgi-bin/param.cgi?get_network_conf`

Network Configuration

## Information

`http://[camera ip]/cgi-bin/param.cgi?get_device_conf`

Camera Information

## Serial Number

`http://[camera ip]/cgi-bin/param.cgi?get_serial_number`

Serial Number            *\*Not always accurate*

---

# Photobooth Functionality

Your PTZOptics camera can quickly and easily take a series of four (4) still image or video files that are stored on the camera and made accessible with a standard web browser on the same network.

## Photos

You have two (2) options to initiate a series of four (4) still images to be captured...

You can enter the following HTTP string into any web browser on the same network as the camera to initiate a series of four (4) still images.

```
http://[camera ip]/cgi-bin/booth.cgi?0&4&[delay]&photo&0
```

In this example, **[Delay]** is utilized to add additional delay, in seconds, between still images being taken. **[Delay]** can have any value from 1 ~ 9 seconds.

You can also press the “[F1]” button on your IR remote to initiate a “quick capture” that has, approximately, a four (4) second delay between four (4) still images being captured.

To retrieve your series of four (4) still images, you will need to open a standard web browser with network access to the camera and use the following HTTP strings to retrieve the still image files as desired.

Image 1: `http://[camera ip]/photo1.jpg`

Image 2: `http://[camera ip]/photo2.jpg`

Image 3: `http://[camera ip]/photo3.jpg`

Image 4: `http://[camera ip]/photo4.jpg`

## Videos

You have two (2) options to initiate a series of four (4) videos being captured...

You can enter the following HTTP string into any web browser on the same network as the camera to initiate a series of four (4) video recordings.

```
http://[camera ip]/cgi-bin/booth.cgi?0&4&[delay]&video&[length]
```

In this example, **[Delay]** is utilized to add additional delay, in seconds, between videos being taken. **[Delay]** can have any value from 1 ~ 9 seconds.

In this example, **[Length]** is utilized to adjust the overall length, in seconds, of each video file. **[Length]** can have any value from 1 ~ 10 seconds.

You can also press the “[F2]” button on your IR remote to initiate a “quick capture” that has, approximately, a four (4) second delay between the four (4) second delay between the four (4) ten (10) second videos being captured.

To retrieve your series of four (4) video files, you will need to open a standard web browser with network access to the camera and use the following HTTP strings to retrieve the still image files as desired.

Video 1: `http://[camera ip]/video1.mp4`

Video 2: `http://[camera ip]/video1.mp4`

Video 3: `http://[camera ip]/video1.mp4`

Video 4: `http://[camera ip]/video1.mp4`



---

*Note: It can take the camera time for the video files to be fully captured and processed. If they are not retrievable, please wait an additional 30 ~ 60 seconds for the process to complete*

# Maintenance and Troubleshooting

## Unqualified Applications

- Do not shoot extremely bright objects for a long period of time, such as sunlight, ultra-bright light sources, etc.
- Do not operate close to powerful electromagnetic radiation, such as TV or radio transmitters, etc.

## Troubleshooting

- No image
  - Check whether the power cord is connected, voltage is OK, & Power LED is illuminated.
  - Check whether the camera can “self-test” after startup (camera will do a brief pan/tilt tour and return to the home position, or preset 0, if that preset is set).
  - Check that the video cable is connected correctly.
    - If SDI, make sure that the destination device is accessing the SDI port that you plugged into.
    - If HDMI, make sure that the destination device is accessing the HDMI port that you plugged into.
  - Check that the lens cap is not installed onto the camera lens.
  - Check that the iris is not closed.
- Abnormal display of image
  - Check the rotary dial on the back of the camera. Be sure to use a resolution and frame rate that is supported by your software / hardware.
- Image is shaky or vibrating
  - Check whether the camera is mounted solidly or sitting on a steady horizontal and level surface.
  - Check the building and any supporting furniture for vibration. Ceiling mounts are often affected by building vibration more than wall mounts.
  - Any external vibration that is affecting the camera will be more apparent when in tele zoom (zoomed in) settings.

## Control

- IR Remote controller does not control the camera
  - Does one of the four (4) “Camera Select” buttons (top row of remote) light up when you press any of the buttons on the remote?
    - If not, change the batteries in the remote
  - Are the camera and remote set to the same IR address? When “Display Info” is enabled (within P/T/Z) in the OSD, the camera will display its IR address upon start up. Set the IR remote to the same IR address to control the camera.
  - Try removing other sources of IR interference (e.g. sunlight, fluorescent lighting, etc.)
- Serial communication does not control the camera
  - Make sure the camera is on and functioning with the IR remote controller.

- 
- Verify that the RS-232/RS-485 cable is connected correctly and using the proper pinout.
  - Verify the communication settings of the control software or device (e.g. joystick).
  - Verify that the communication port on the controlling device is activated (e.g. Com port on PC).
  - Verify that all communication settings in the OSD Setup Menu correlate to the commands being used (e.g. VISCA address).

## Copyright Notice

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