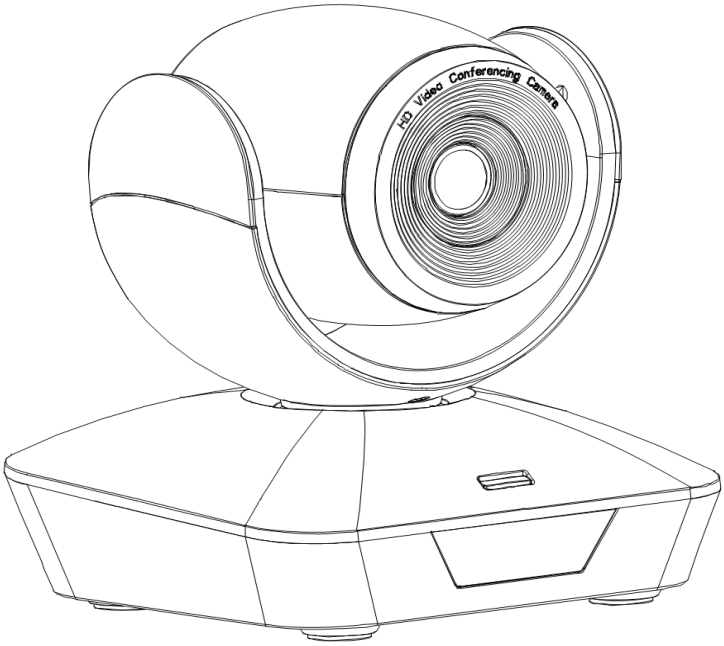
# USB2.0 HD Video Camera
## User Manual




**Version V1.0**
**（English）**

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## SAFETY GUIDES

1.Before operation, please fully read and follow all instructions in the manual. For your safety, always keep this manual with the camera.

2.The camera power input range is 100-240VAC(50-60Hz),ensure the power supply input within this rate before powering on.

3.The camera power voltage is 12VDC, rated currency is 1.5A. We suggest you use it with the original power supply adapter supplied by the factory.

4.Please keep the power cable, video cable and control cable in a safe place. Protect all cables especially the connectors.

5.Operational environment: 0℃-50℃, humidity less than 90%.To avoid any danger, do not put anything inside the camera, and keep away from the corrosive liquid.

6.Avoid stress, vibration and damp during transportation, storage and installation.

7.Do not detetch the camera housing and cover. For any service, please contact authorized technicians.

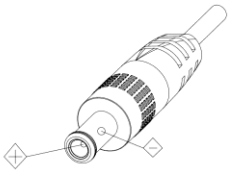
8.RF cable and control cable should be individually shielded, and cannot be substituted with other cables. Do not direct the camera lens towards strong light, such as the sun or the intensive light.

9.Use a dry and soft cloth to clean the camera housing. Applied with neutral cleaning agent when there is need to clean. To avoid damage on the camera lens, never use strong or abrasive cleaning agents on the camera housing.

10.Do not move the camera by holding the camera head. To avoid mechanical trouble, do not rotate the camera head by hand.

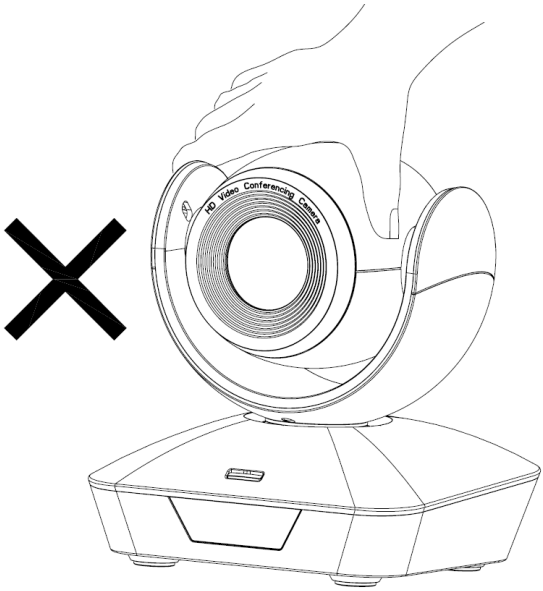
11.Put the camera on fixed and smooth desk or platform, avoid leaned installation.

12. Power Supply Polarity(Drawing)

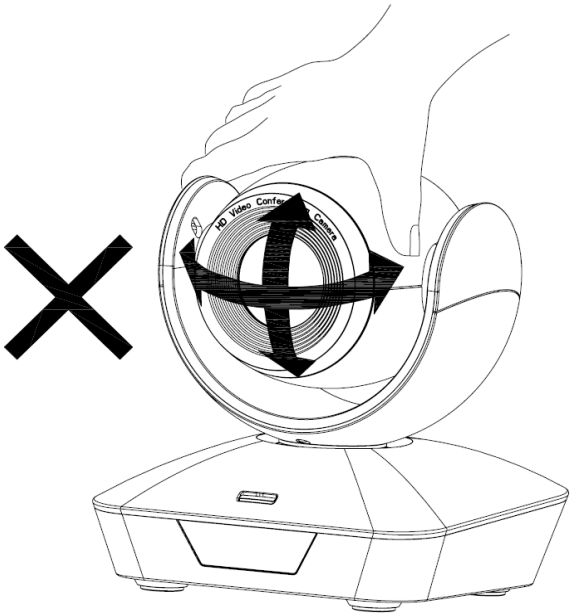


Notice:

The camera video may be affected when the electromagnetic fields is at specific frequency.




⚠DO NOT use hands to take the camera head, otherwise it may damage the camera rotation structure.



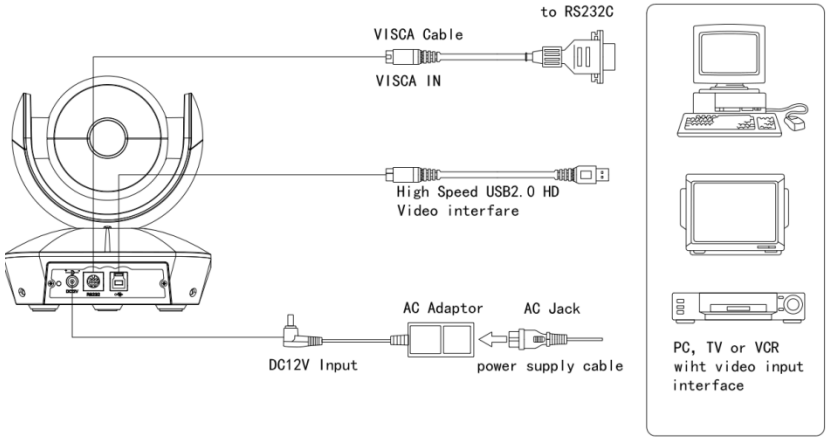

⚠ DO NOT use hands to move the camera head, otherwise it may damage the rotation structure or even broke the driving motor.

## ACCESSORIES

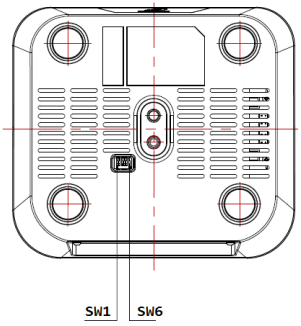
Check all bellow items when open the package:
Camera ……1
Power Adapter ……1
Power Cable ……1
RS232 Control Cable ……1
USB2.0 Cable…… 1
Remote Controller ……1
User Manual ……1
Double-sided Adhesive…….... 1
Quality Certificate……1

## QUICK START

1. 1.Check all cable connections before power on.




2. DIP Switch Setting (at the bottom of the camera):




| Function（ARM） | | | |
|---|---|---|---|
| | SW-1 | SW-2 | Instruction |
| 1 | OFF | / | Updating mode |
| 2 | ON | OFF | Debugging mode |
| 3 | ON | ON | Working mode |

| Function（USB） | | | |
|---|---|---|---|
| | SW-5 | SW-6 | Instruction |
| 1 | OFF | OFF | Working mode |
| 2 | ON | OFF | Updating mode |
| 3 | OFF | ON | Undefined |
| 4 | ON | ON | Undefined |

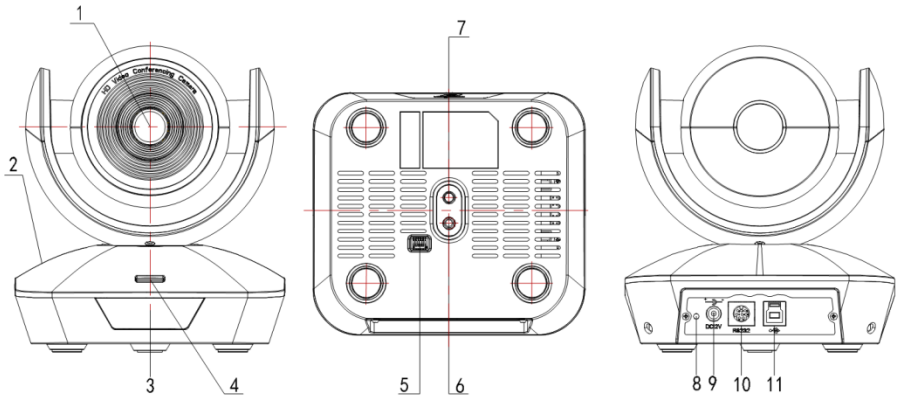
## PRODUCT HIGHLIGHTS

- Adopts advanced DSP，1/2.7 inch 5.1MP image sensor, and high quality 4K wide angle lens
- Smart and fashion design, ideal for cloud-based conferencing
- Wide angle of viewing: 82.5degree, suitable for huddle room application
- Fast switching between different video formats: less than 1 second
- 10X Optical Zoom + 12XDigital Zoom
- Fast and accurate focus performance
- Easy firmware upgrade-(field-upgradable)
- USB2.0 high speed output
- Effective RS232/485 serial control
- Up to 128 presets
- Compatible with the majority of videoconferencing software (UVC1.5 protocol standard)
- With powerful functional remote controller
- IR transfer/IR pass function: except receiving the camera remote controller signal, the camera can also receive other codec's IR remote control signal, and pass these IR control signal to the codec's IR receiver (via VISCA IN port).
- OSD Menu: Chinese, English

## PRODUCT SPEC

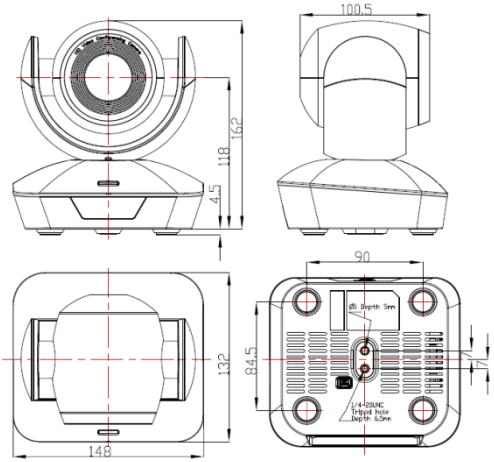
| | | |
|---|---|---|
| Video Format | MJPG/H.264 | 1920x1080P30/25/20/15/10/5; 1280x720P30/25/20/15/10/5; 720x576P30/30/25/20/15/10/5; 640x480P30/25/20/15/10/5; 320x240P30/25/20/15/10/5 |
| Video Port | USB2.0 | |
| Image Sensor | 1/2.7 inch high quality, 5.1MegaPixel CMOS sensor | |
| Lens | F=3mm（fixed）, Aperture F2.1, Field of Viewing: D x H x V = 96.7 °x 84.4 °x 67.9 ° | |
| Zoom | 4xlossless digital zoom | |
| Pan Tilt Angle | Pan: ±170 °; Tilt: -30 °~+90 °; | |
| Pan Tilt Speed | Pan: 6.7 °- 45 °/s; Tilt: 6.7 °-45 °/s | |
| Preset | 10 via remote; 128 via RS232; Preset Accuracy0.2 ° | |
| Control Port | RS232/RS485 , USB2.0 | |
| Minimum Lux | 0.1 Lux | |
| White Balance | Auto/Manual/Manual 2/Tracking/ One Push/ Indoor/Outdoor/ Sodium/Fluorescent | |
| Focus | Fixed Focus | |
| Iris | Fixed Iris | |
| Electronic Shutter | Auto/Manual | |
| WDR | Support | |
| Anti-Flicker | OFF/50Hz/60Hz | |
| Gamma | Support | |
| Up-Side Down | Support | |
| Mirror Image | Support | |
| Night Mode | Support | |
| BLC | Support | |
| 2DNR | Support | |
| 3DNR | Support | |
| Input Voltage | DC12V 1A | |
| Size | 148mm×132mm×161mm | |
| Net Weight | 0.9KGS（2LBS） | |

## CAMERA INTERFACE

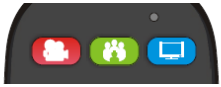



1.Camera Lens
2.Camera Base
3. IR Receive Panel
4.Indicator Light
5.Dial Switch
6.Tripod Screw Hole
7.Installation Hole
8. Power Indicator Light(Red)
9. 12VDC Power Input
10. RS232/485Control Port(Input)
11.USB2.0 Port

## CAMERA DIMENSION(MM)



## IR REMOTE CONTROLLER



### LED Function Instruction

Press any button and shows in red color: Current selection is to control the camera;
Press any button and shows in green color: Current selection is to control the codec;
Press any button and shows in blue color: Current selection is to control the TV;

**Power button**
**Red button**: in normal work mode, short press one time, camera will enter standby mode; short press again, the camera will start self-configuration and go to HOME position; it will go to No.0 preset position if that was set;
**Green button:** Codec power button(need to learn the button coding);
**Blue button:** TV power button( need to learn the button coding);

**Focus (Left): +/-**
Manual focus, only valid under manual focus model;
**Zoom (Right): +/-**
Control the lens zoom rate;
**Navigate : Up/Down/Left/Right**
In normal working mode, use navigate key to control pan/tilt;
**Confirm/Home button:**
In normal working mode, short press to let the camera go back to Home position.

**Menu button:** show the camera version

**Number buttons**
**Set Preset:** Long press(3seconds) the number button to save preset;
**Clear Preset:** Clear+number button to clear the relative preset;
Long press(3seconds) the Clear button to clear all preset;

**Run Preset:** Short press the number button to run the relative preset.

## LEARNING FUNCTION：

1. Press the green button, the LED indicator light will show in green color for 1 second, means switch to video terminal/codec control mode;

2.

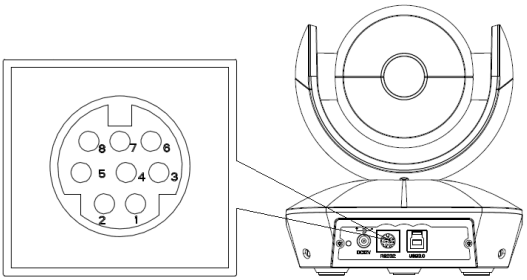
2.**Single Button Coding:** long press(3seconds) Home +number"1" button simultaneously, the green indicator LED will light, enter button learning mode, press the buttons which need to be learned, LED will start flickering(1HZ), now can start button learning: get the codec remote point to the camera remote's infrared tube( about 10cm distance), then press the button which need to be learned, the LED re-flickering when learning finishes ; press other buttons which also need to be learned; Press the Home+"0" buttons simultaneously to exit and save all remote data.
If the button learning fails, the camera will enter normal working mode after 15seconds, LED will extinguish.

3. **All Button Coding:** long press (3seconds) Home+number"2" button simultaneously, the green indicator LED will start flickering(1HZ), to enter all button learning mode: get codec remote point to the camera remote's infrared tube( about 10cm distance), to start all button coding mode, the LED will extinguish when learning finished.
If the button learning fails, the camera will enter normal working mode after 15seconds, LED will extinguish.

4.**All Button Sending Mode:** long press (3seconds) the Menu+ number "3" button simultaneously, the remote will enter all button sending mode.

5. Similar operation for the TV control mode learning.

### VISCA IN (RS232) PORT




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

**VISCA IN &RS485 Connection**

| Camera VISCA IN | | RS485 |
|---|---|---|
| 1 | DTR | |
| 2 | DSR | |
| 3 | TXD | |
| 4 | GND | GND |
| 5 | RXD | |
| 6 | A(+) | A(+) |
| 7 | IR OUT | |
| 8 | B(-) | B(-) |

**VISCA IN &DB9 Connection**

| Camera VISCA IN | | Windows DB-9 | |
|---|---|---|---|
| 1 | DTR | 6 | DSR |
| 2 | DSR | 4 | DTR |
| 3 | TXD | 2 | RXD |
| 4 | GND | 5 | GND |
| 5 | RXD | 3 | TXD |
| 6 | A(+) | | |
| 7 | IR OUT | | |
| 8 | B(-) | | |

## SERIAL PORT CONFIGURATION:

| Parameter | Value | Parameter | Value |
|---|---|---|---|
| Baud rate | 2400/4800/9600/115200 | Stop Bit | 1bit |
| Start Bit | 1 bit | Verify Bit | None |
| Date Bit | 8 bit | | |

## VISCA PROTOCOL

**Part1 Camera Return Command**

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

z = camera adderss+8

| Error Messages | | |
|---|---|---|
| | **Command Packet** | **Note** |
| Syntax Error | z0 60 02 FF | Returned when the command format is different or when a command with illegal command parameters is accepted |
| Command Not Executable | z0 61 41 FF | Returned when a command cannot be executed due to current conditions. For example, when commands controlling the focus manually are received during auto focus. |

**Part2 Camera Control Command**

| Command | Funnation | Command Packet | Note |
|---|---|---|---|
| AddressSet | Broadcast | 88 30 01 FF | Address setting |
| IF_Clear | Broadcast | 88 01 00 01 FF | I/F Clear |
| CAM_Power | On | 8x 01 04 00 02 FF | Power ON/OFF |
| | Off | 8x 01 04 00 03 FF | |
| CAM_DZoom | Stop | 8x 01 04 07 00 FF | |
| | Tele(Standard) | 8x 01 04 07 02 FF | |
| | Wide(Standard) | 8x 01 04 07 03 FF | |
| | Tele(Variable) | 8x 01 04 07 2p FF | p = 0(low)~7(high) |
| | Wide(Variable) | 8x 01 04 07 3p FF | |
| | Direct | 8x 01 04 47 0p 0q 0r 0s FF | pqrs: Zoom Position (0(wide) ~0x4000(tele)) |
| | One Push AF | 8x 01 04 18 01 FF | |
| CAM_WB | Auto | 8x 01 04 35 00 FF | |
| | Indoor | 8x 01 04 35 01 FF | |
| | Outdoor | 8x 01 04 35 02 FF | |
| | OnePush | 8x 01 04 35 03 FF | |

| Command | Funnation | Command Packet | Note |
|---|---|---|---|
| | ATW | 8x 01 04 35 04FF | |
| | Manual | 8x 01 04 35 05 FF | |
| | Sodium Lamp | 8x 01 04 35 08 FF | |
| | Fluorescent lamp | 8x 01 04 35 09 FF | |
| CAM_RGain | Reset | 8x 01 04 03 00 FF | Manual Control of R Gain |
| | Up | 8x 01 04 03 02 FF | |
| | Down | 8x 01 04 03 03 FF | |
| | Direct | 8x 01 04 43 00 00 0p 0q FF | pq: R Gain (0~0xFF) |
| CAM_Bgain | Reset | 8x 01 04 04 00 FF | Manual Control of B Gain |
| | Up | 8x 01 04 04 02 FF | |
| | Down | 8x 01 04 04 03 FF | |
| | Direct | 8x 01 04 44 00 00 0p 0q FF | pq: B Gain (0-0xFF) |
| 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 mode |
| | Iris Priority | 8x 01 04 39 0B FF | Iris Priority mode |
| | Bright | 8x 01 04 39 0D FF | Bright mode(Manual control) |
| CAM_Shutter | Reset | 8x 01 04 0A 00 FF | Shutter Setting |
| | Up | 8x 01 04 0A 02 FF | |
| | Down | 8x 01 04 0A 03 FF | |
| | Direct | 8x 01 04 4A 00 00 0p 0q FF | pq: Shutter Position (0~0x15) |
| CAM_Gain | Reset | 8x 01 04 0C 00 FF | Gain Setting |
| | Up | 8x 01 04 0C 02 FF | |
| | Down | 8x 01 04 0C 03 FF | |
| | Direct | 8x 01 04 0C 00 00 0p 0q FF | pq: Gain Positon (0~0x0E) |
| CAM_Bright | Reset | 8x 01 04 0D 00 FF | Bright Setting |
| | Up | 8x 01 04 0D 02 FF | |
| | Down | 8x 01 04 0D 03 FF | |
| | Direct | 8x 01 04 4D 00 00 0p 0q FF | pq: Bright l Positon () |
| CAM_WDR | On | 8x 01 04 3D 02 FF | WDR ON/OFF |
| | Off | 8x 01 04 3D 03 FF | |
| | Direct | 8x 01 04 D3 0p FF | pq: WDR Position (1~0x06) |
| CAM_BackLight | On | 8x 01 04 33 02 FF | BackLight On |
| | Off | 8x 01 04 33 03 FF | BackLight Off |

| Command | Funnation | Command Packet | Note |
|---|---|---|---|
| CAM_Sharpness | Reset | 8x 01 04 02 00 FF | Sharpness Control |
| | Up | 8x 01 04 02 02 FF | |
| | Down | 8x 01 04 02 03 FF | |
| | Direct | 8x 01 04 42 00 00 0p 0q FF | pq: Aperture Gain (0~0x04) |
| CAM_Preset | Reset | 8x 01 04 3F 00 pp FF | pp: Preset Number(=0 to 127)<br>Corresponds to 0 to 9 on the Remote Commander |
| | Set | 8x 01 04 3F 01 pp FF | |
| | Recall | 8x 01 04 3F 02 pp FF | |
| CAM_LR_Reverse | On | 8x 01 04 61 02 FF | Image Flip Horizontal ON/OFF |
| | Off | 8x 01 04 61 03 FF | |
| CAM_PictureFlip | On | 8x 01 04 66 02 FF | Image Flip Vertical ON/OFF |
| | Off | 8x 01 04 66 03 FF | |
| CAM_MountMode | UP | 8x 01 04 A4 02 FF | Mount Up |
| | Down | 8x 01 04 A4 03 FF | Mount Down |
| CAM_ColorGain | Direct | 8x 01 04 49 00 00 00 0p FF | (0~0x0E) |
| CAM_Saturation | Direct | 8x 01 04 A1 00 00 00 0p FF | (0~0x0E) |
| CAM_2D<br>Noise Reduction | Direct | 8x 01 04 53 0p FF | (0~0x05) |
| CAM_3D<br>Noise Reduction | Direct | 8x 01 04 54 0p FF | (0~0x03) |
| CAM_NewBright | Direct | 81 01 04 A4 00 00 0p 0q FF | (0~0x0F) |
| CAM_Constrast | Direct | 81 01 04 A2 00 00 0p 0q FF | (0~0x0F) |
| CAM_Gamma | Direct | 8x 01 04 5B 0p FF | (0~0x04) |
| FLICK | Off | 81 01 04 23 00 FF | |
| | 50HZ | 81 01 04 23 01 FF | |
| | 60HZ | 81 01 04 23 02 FF | |
| SYS_Menu | Menu On/Off | 8x 01 04 7F 02 FF | Turn on/off the menu |
| | Menu Up | 8x 01 04 07 02 FF | Menu up |
| | Menu Down | 8x 01 04 07 03 FF | Menu down |
| | Menu Left | 8x 01 04 08 02 FF | Menu left |
| | Menu Right | 8x 01 04 08 03 FF | Menu right |
| IR_Transfer | Transfer On | 8x 01 06 1A 02 FF | Receive IR(remote commander) CODE from VISCA communication ON/OFF |
| | Transfer Off | 8x 01 06 1A 03 FF | |
| IR_Receive | On | 8x 01 06 08 02 FF | IR(remote commander)receive ON/OFF |
| | Off | 8x 01 06 08 03 FF | |
| | On/Off | 8x 01 06 08 10 FF | |
| IR_ReceiveReturn | On | 8x 01 7D 01 03 00 00 FF | IR(remote commander)receive |

| Command | Funnation | Command Packet | Note |
|---|---|---|---|
| | Off | 8x 01 7D 01 13 00 00 FF | message via the VISCA communication ON/OFF |
| Pan_tiltDrive | Up | 8x 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(TBD)<br>ZZZZ: Tilt Position(TBD) |
| | Down | 8x 01 06 01 VV WW 03 02 FF | |
| | Left | 8x 01 06 01 VV WW 01 03 FF | |
| | Right | 8x 01 06 01 VV WW 02 03 FF | |
| | Upleft | 8x 01 06 01 VV WW 01 01 FF | |
| | Upright | 8x 01 06 01 VV WW 02 01 FF | |
| | DownLeft | 8x 01 06 01 VV WW 01 02 FF | |
| | DownRight | 8x 01 06 01 VV WW 02 02 FF | |
| | Stop | 8x 01 06 01 VV WW 03 03 FF | |
| | AbsolutePosition | 8x 01 06 02 VV WW<br>0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF | |
| | RelativePosition | 8x 01 06 03 VV WW<br>0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF | |
| | Home | 8x 01 06 04 FF | |
| | Reset | 8x 01 06 05 FF | |
| Pan-tiltLimitSet | Set | 8x 01 06 07 00 0W<br>0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF | W:1 UpRight 0:DownLeft<br>YYYY: Pan Limit Position(TBD)<br>ZZZZ: Tilt Limit Position(TBD) |
| | Clear | 8x 01 06 07 01 0W<br>07 0F 0F 0F 07 0F 0F 0F FF | |

**Part3 Inquiry Command**

| Command | Command Packet | Return Packet | Note |
|---|---|---|---|
| CAM_PowerInq | 8x 09 04 00 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off(Standby) |
| CAM_ZoomPosInq | 8x 09 04 47 FF | y0 50 0p 0q 0r 0s FF | pqrs: Zoom Position |
| CAM_WBModeInq | 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 04 FF | ATW |
| | | y0 50 05 FF | Manual |
| 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_AEModeInq | 8x 09 04 39 FF | y0 50 00 FF | Full Auto |
| | | y0 50 03 FF | Manual |
| | | y0 50 0A FF | Shutter priority |
| | | y0 50 0B FF | Iris priority |
| | | y0 50 0D FF | Bright |
| CAM_ShutterPosInq | 8x 09 04 4A FF | y0 50 00 00 0p 0q FF | pq: Shutter Position |
| CAM_GainPosiInq | 8x 09 04 4C FF | y0 50 00 00 0p 0q FF | pq: Gain Position |
| CAM_ BrightPosiInq | 8x 09 04 4D FF | y0 50 00 00 0p 0q FF | pq: Bright Position |
| CAM_ExpCompModeInq | 8x 09 04 3E FF | y0 50 02 FF | On |

| | | | |
|---|---|---|---|
| | | y0 50 03 FF | Off |
| CAM_ExpCompPosInq | 8x 09 04 4E FF | y0 50 00 00 0p 0q FF | pq: ExpComp Position |
| CAM_ApertureInq | 8x 09 04 42 FF | y0 50 00 00 0p 0q FF | pq: Aperture Gain |
| CAM_MemoryInq | 8x 09 04 3F FF | y0 50pp FF | pp: Memory number last operated. |
| SYS_MenuModeInq | 8x 09 06 06 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_LR_ReverseInq | 8x 09 04 61 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_PictureFlipInq | 8x 09 04 66 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_VersionInq | 8x 09 00 02 FF | y0 50 ab cd<br>mn pq rs tu vw FF | |
| IR_Transfer | 8x 09 06 1A FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| IR_Receive | 8x 09 06 08 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| IR_ReceiveReturn | | y0 07 7D 01 04 00 FF | Power ON/OFF |
| | | y0 07 7D 01 04 07 FF | Zoom tele/wide |
| | | y0 07 7D 01 04 38 FF | AF On/Off |
| | | y0 07 7D 01 04 33 FF | CAM_Backlight |
| | | y0 07 7D 01 04 3F FF | CAM_Memory |
| | | y0 07 7D 01 06 01 FF | Pan_tiltDrive |
| Pan-tiltPosInq | 8x 09 06 12 FF | y0 50 0w 0w 0w 0w<br>0z 0z 0z 0z FF | wwww: PanPosition zzzz: Tilt Position |

**Note:**【x】 means the camera address ;【y】=【x + 8】.

**VISCA PAN TILT ABSOLUTE POSITION VALUE:**

| Pan Angle | VISCA Value | Tilt Angle | VISCA Value |
|---|---|---|---|
| -170 | 0xF670 | -30 | 0xFE50 |
| -135 | 0xF868 | 0 | 0x0000 |
| -90 | 0xFAF0 | 30 | 0x01B0 |
| -45 | 0xFD78 | 60 | 0x0360 |
| 0 | 0x0000 | 90 | 0x510 |
| 45 | 0x0288 | | |
| 90 | 0x0510 | | |
| 135 | 0x0798 | | |
| 170 | 0x0990 | | |

**EXPOSURE PARAMETER SHEET:**

| | | 60/30mode | 50/25mode | | | |
|---|---|---|---|---|---|---|
| Shutter speed | 15 | 1/10000 | 1/10000 | Iris | 0 | close |
| | 14 | 1/6000 | 1/6000 | | 1 | F14 |
| | 13 | 1/4000 | 1/3500 | | 2 | F11 |
| | 12 | 1/3000 | 1/2500 | | 3 | F9.6 |
| | 11 | 1/2000 | 1/1750 | | 4 | F8 |
| | 10 | 1/1500 | 1/1250 | | 5 | F6.8 |
| | 0F | 1/1000 | 1/1000 | | 6 | F5.6 |
| | 0E | 1/725 | 1/600 | | 7 | F4.8 |
| | 0D | 1/500 | 1/425 | | 8 | F4 |
| | 0C | 1/350 | 1/300 | | 9 | F3.4 |
| | 0B | 1/250 | 1/215 | | 10 | F2.8 |
| | 0A | 1/180 | 1/150 | | 11 | F2.4 |
| | 09 | 1/125 | 1/120 | | 12 | F2 |
| | 08 | 1/100 | 1/100 | | 13 | F1.8 |
| | 07 | 1/90 | 1/75 | | | |
| | 06 | 1/60 | 1/50 | | | |
| | 05 | 1/30 | 1/25 | | | |
| | 04 | 1/15 | 1/12 | | | |
| | 03 | 1/8 | 1/6 | | | |
| | 02 | 1/4 | 1/3 | | | |
| | 01 | 1/2 | 1/2 | | | |
| | 00 | 1/1 | 1/1 | | | |
| Gain | 0 | 0dB | | Gain | 8 | 16dB |
| | 1 | 2dB | | | 9 | 18dB |
| | 2 | 4dB | | | 10 | 20dB |
| | 3 | 6dB | | | 11 | 22dB |
| | 4 | 8dB | | | 12 | 24dB |
| | 5 | 10dB | | | 13 | 26dB |
| | 6 | 12dB | | | 14 | 28dB |
| | 7 | 14dB | | | 15 | 30dB |

| | | IRIS | GAIN |
|---|---|---|---|
| Bright | 1B | F1.8 | +28 dB |
| | 1A | F1.8 | +26 dB |
| | 19 | F1.8 | +24 dB |
| | 18 | F1.8 | +22 dB |
| | 17 | F1.8 | +20 dB |
| | 16 | F1.8 | +18 dB |
| | 15 | F1.8 | +16 dB |
| | 14 | F1.8 | +14 dB |
| | 13 | F1.8 | +12 dB |
| | 12 | F1.8 | +10 dB |
| | 11 | F1.8 | +8 dB |
| | 10 | F1.8 | +6 dB |
| | 0F | F1.8 | +4 dB |
| | 0E | F1.8 | +2 dB |
| | 0D | F1.8 | 0 dB |
| | 0C | F2 | 0 dB |
| | 0B | F2.4 | 0 dB |
| | 0A | F2.8 | 0 dB |
| | 09 | F3.4 | 0 dB |
| | 08 | F4 | 0 dB |
| | 07 | F4.8 | 0 dB |
| | 06 | F5.6 | 0 dB |
| | 05 | F6.8 | 0 dB |
| | 04 | F8 | 0 dB |
| | 03 | F9.6 | 0 dB |
| | 02 | F11 | 0 dB |
| | 01 | F14 | 0 dB |
| | 00 | CLOSE | 0 dB |

## PELCO-D PROTOCOL

| Function | Byte1 | Byte2 | Byte3 | Byte4 | Byte5 | Byte6 | Byte7 |
|---|---|---|---|---|---|---|---|
| Up | 0xFF | Address | 0x00 | 0x08 | Pan Speed | Tilt Speed | SUM |
| Down | 0xFF | Address | 0x00 | 0x10 | Pan Speed | Tilt Speed | SUM |
| Left | 0xFF | Address | 0x00 | 0x04 | Pan Speed | Tilt Speed | SUM |
| Right | 0xFF | Address | 0x00 | 0x02 | Pan Speed | Tilt Speed | SUM |
| Upleft | 0xFF | Address | 0x00 | 0x0C | Pan Speed | Tilt Speed | SUM |
| Upright | 0xFF | Address | 0x00 | 0x0A | Pan Speed | Tilt Speed | SUM |
| DownLeft | 0xFF | Address | 0x00 | 0x14 | Pan Speed | Tilt Speed | SUM |
| DownRight | 0xFF | Address | 0x00 | 0x12 | Pan Speed | Tilt Speed | SUM |
| Zoom In | 0xFF | Address | 0x00 | 0x20 | 0x00 | 0x00 | SUM |
| Zoom Out | 0xFF | Address | 0x00 | 0x40 | 0x00 | 0x00 | SUM |
| Set Preset | 0xFF | Address | 0x00 | 0x03 | 0x00 | Preset ID | SUM |
| Clear Preset | 0xFF | Address | 0x00 | 0x05 | 0x00 | Preset ID | SUM |
| Call Preset | 0xFF | Address | 0x00 | 0x07 | 0x00 | Preset ID | SUM |
| Query Pan Position | 0xFF | Address | 0x00 | 0x51 | 0x00 | 0x00 | SUM |
| Query Pan Position Response | 0xFF | Address | 0x00 | 0x59 | Value High Byte | Value Low Byte | SUM |
| Query Tilt Position | 0xFF | Address | 0x00 | 0x53 | 0x00 | 0x00 | SUM |
| Query Tilt Position Response | 0xFF | Address | 0x00 | 0x5B | Value High Byte | Value Low Byte | SUM |
| Query Zoom Position | 0xFF | Address | 0x00 | 0x55 | 0x00 | 0x00 | SUM |
| Query Zoom Position Response | 0xFF | Address | 0x00 | 0x5D | Value High Byte | Value Low Byte | SUM |

## PELCO-P PROTOCOL

| Function | Byte1 | Byte2 | Byte3 | Byte4 | Byte5 | Byte6 | Byte7 | Byte8 |
|---|---|---|---|---|---|---|---|---|
| Up | 0xA0 | Address | 0x00 | 0x08 | Pan Speed | Tilt Speed | 0xAF | XOR |
| Down | 0xA0 | Address | 0x00 | 0x10 | Pan Speed | Tilt Speed | 0xAF | XOR |
| Left | 0xA0 | Address | 0x00 | 0x04 | Pan Speed | Tilt Speed | 0xAF | XOR |
| Right | 0xA0 | Address | 0x00 | 0x02 | Pan Speed | Tilt Speed | 0xAF | XOR |
| Upleft | 0xA0 | Address | 0x00 | 0x0C | Pan Speed | Tilt Speed | 0xAF | XOR |
| Upright | 0xA0 | Address | 0x00 | 0x0A | Pan Speed | Tilt Speed | 0xAF | XOR |
| DownLeft | 0xA0 | Address | 0x00 | 0x14 | Pan Speed | Tilt Speed | 0xAF | XOR |
| DownRight | 0xA0 | Address | 0x00 | 0x12 | Pan Speed | Tilt Speed | 0xAF | XOR |
| Zoom In | 0xA0 | Address | 0x00 | 0x20 | 0x00 | 0x00 | 0xAF | XOR |
| Zoom Out | 0xA0 | Address | 0x00 | 0x40 | 0x00 | 0x00 | 0xAF | XOR |
| Set Preset | 0xA0 | Address | 0x00 | 0x03 | 0x00 | Preset ID | 0xAF | XOR |
| Clear Preset | 0xA0 | Address | 0x00 | 0x05 | 0x00 | Preset ID | 0xAF | XOR |
| Call Preset | 0xA0 | Address | 0x00 | 0x07 | 0x00 | Preset ID | 0xAF | XOR |
| Query Pan Position | 0xA0 | Address | 0x00 | 0x51 | 0x00 | 0x00 | 0xAF | XOR |
| Query Pan Position Response | 0xA0 | Address | 0x00 | 0x59 | Value High Byte | Value Low Byte | 0xAF | XOR |
| Query Tilt Position | 0xA0 | Address | 0x00 | 0x53 | 0x00 | 0x00 | 0xAF | XOR |
| Query Tilt Position Response | 0xA0 | Address | 0x00 | 0x5B | Value High Byte | Value Low Byte | 0xAF | XOR |
| Query Zoom Position | 0xA0 | Address | 0x00 | 0x55 | 0x00 | 0x00 | 0xAF | XOR |
| Query Zoom Position Response | 0xA0 | Address | 0x00 | 0x5D | Value High Byte | Value Low Byte | 0xAF | XOR |

## OSD MENU

1. under working mode, press the menu button on the IR remote, to enter the OSD menu ; press the menu button again to exit and save modified parameters.


2. Use the navigate button to select the main menu. As above picture, once been selected, the main menu will change to grey color background, and the right side will show all parameters under this sub menu :;

3. In the second grade menu, press the up/down navigate button to select the sub menu, use left/right navigate button to set the parameter;


4.Select the last option “return” and press the right navigate button to get back to previous menu;


5. Press OSD button again to exit the menu.;

6.OSD Menu Layout:

| | | | |
|---|---|---|---|
| SYSTEM | LANGUAGE | ENGLISH/CHINESE | |
| | PROTOCOL | VISCA,PELCO-P, PELCO-D | Defaulted: VISCA |
| | ADDRESS | VISCA:1~7 ;PELCO-P/D:0~255 | Defaulted: 1 |
| | BAUD RATE | 2400, 4800, 9600, 19200, 38400, 57600, 115200 | Defaulted: 9600 |
| | RETURN | Back to the main menu | |

| | | | |
|---|---|---|---|
| EXPOSURE | EXP. MODE | AUTO, MANU, IRIS, SHUT, BRI. | Defaulted:AUTO |
| | SHUTTER | Shutter Speed: 1/30~1/10K<br>(Only valid when EXP MODE set to MANU or SHUT mode) | Defaulted:1/100 |
| | IRIS | Invalid for fixed lens | Defaulted:10 |
| | GAIN | Gain value: 0dB~15dB<br>( only valid when EXP MODE set to MANU mode) | Defaulted:0 |
| | BRIGHT | Brightness value:0~27<br>( only valid when EXP MODE set to BRI. mode) | Defaulted:11 |
| | FLICK | OFF/50Hz/60Hz | Defaulted:50Hz |
| | BACKLIGHT | ON/OFF | Defaulted: OFF |
| | GAMMA | 0~63 | Defaulted:30 |
| | RETURN | Back to the main menu | |

| | | | |
|---|---|---|---|
| IMAGE | WB MODE | WHITE BALANCE mode:<br>ATW, MANU, MANU2, SON.FL.AUTO,IDR., ODR.,PUSH | Defaulted:AUTO |
| | B-GAIN | BLUE GAIN level:0~255<br>(only valid when WB MODE set to MANU mode) | Defaulted:52 |
| | R-GAIN | RED GAIN level:0~255<br>(only valid when WB MODE set to MANU mode) | Defaulted:58 |
| | DEFOG | Set image transparency: OFF, 1~15,<br>(suggest to set a lower value) | Defaulted: OFF |
| | RETURN | Back to the main menu | |

| | | | |
|---|---|---|---|
| QUALITY | 2D NR | 2D Noise Reduction: OFF/ON | Defaulted: OFF |
| | 3D NR | 3D Noise Reduction: OFF/AUTO, 1~4 | Defaulted: AUTO |
| | SHARPNESS | Sharpness setting: 0~15;<br>the higher value, the clearer of image shape | Defaulted: 4 |
| | CONSTRAST | Contrast setting: 0~15 | Defaulted: 9 |
| | SATURATION | Saturation setting: 0~15 | Defaulted:8 |
| | BRIGHT | Brightness setting: 0~15 | Defaulted:9 |
| | D-WDR | OFF/1~6 | Defaulted: OFF |
| | RETURN | Back to the main menu | |

| | | | |
|---|---|---|---|
| CTRL | MIRROR | Set Image Left/Right flip: ON/OFF | Defaulted: OFF |
| | FLIP | Set Image Up/Down: ON/OFF | Defaulted: OFF |
| | D/N MODE | Set Day/Night mode: DAY/NIGHT | Defaulted: DAY |
| | GAIN LIMIT | Set auto exposure gain limit | Defaulted: 128 |
| | RETURN | Back to the main menu | |

| | | |
|---|---|---|
| RESET | CAM RESET | Reset image to defaulted value |
| | PTZ RESET | Reset pan tilt zoom to defaulted value |
| | ALL RESET | Reset both camera and pan tilt zoom |
| | RETURN | Back to the main menu |

| | | |
|---|---|---|
| INFO | CONTROL VE | Control firmware version |
| | CONTROL DA | Firmware release date |
| | FORMAT | Current video format |
| | BAUDRATE | Current baud rate |
| | RETURN | Back to the main menu |

## IR TRANSFER(IR PASS)

1 IR transfer( IR Pass) function available by setting the SW3 and SW4( at the bottom of the camera). Currently the camera support NEC code. For customized with other code, pls contact us for adding.

2. Once the camera power on and finish configuration:

if set to NEC code, can enable the IR transfer function via OSD menu or via serial command.

if set non NEC code, then can enable it only via VISCA IN port.

3. Put the targeted remote controller towards to the camera IR receiver, press keys on the remote controller, then the camera will output the received IR code via VISCA IN port.

4. IR Transfer output format: XX XX XX XX: Remote Controller Code FF: End Code

## UVC CONTROL

1. Only run the client software after the camera has completed self-configuration (the IR indicator in blue color and will not flash); otherwise may cause black video issue.

2. Make sure the camera is recognized by the PC Device Manager.

3. Make sure the interval of video format switching more than 1 second, otherwise black video maybe caused.

4. Make sure the interval of control command sending from the server (via USB) to the camera no less than 250ms.

5. Support standard UVC interface.

| **UVC Property** | **Relevant VISCA Command** |
|---|---|
| PU_BACKLIGHT_COMPENSATION_CONTROL | 8x 01 04 33 02 FF |
| CY_FX_UVC_PU_BRIGHTNESS_CONTROL | 8x 01 04 A4 00 00 0p 0q FF |
| CY_FX_UVC_PU_CONTRAST_CONTROL | 8x 01 04 A2 00 00 0p 0q FF |
| CY_FX_UVC_PU_SATURATION_CONTROL | 8x 01 04 A1 00 00 0p 0q FF |
| CY_FX_UVC_PU_SHARPNESS_CONTROL | 8x 01 04 42 00 00 0p 0q FF |
| CY_FX_UVC_PU_GAMMA_CONTROL | 8x 01 04 5B 0p FF |
| CY_FX_UVC_PU_WHITE_BALANCE_TEMPERATURE_CONTROL | 8x 01 04 35 0p FF |
| CY_FX_UVC_PU_BACKLIGHT_COMPENSATION_CONTROL | 8x 01 04 33 0p FF |
| CY_FX_UVC_PU_GAIN_CONTROL | 8x 01 04 49 00 00 0p 0q FF |
| CY_FX_UVC_PU_POWER_LINE_FREQUENCY_CONTROL | 8x 01 04 AA 0p FF |
| PU_GAIN_CONTROL | 8x 01 04 49 00 00 00 0p FF |
| CT_ZOOM_ABSOLUTE_CONTROL | 8x 01 04 47 0p 0q 0r 0s FF |
| CT_PANTILT_ABSOLUTE_CONTROL | 8x 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z F |
| CT_PANTILT_RELATIVE_CONTROL | 8x 01 06 01 pp qq rr ss FF |
| CT_ZOOM_RELATIVE_CONTROL | 8x 01 04 07 pp FF |