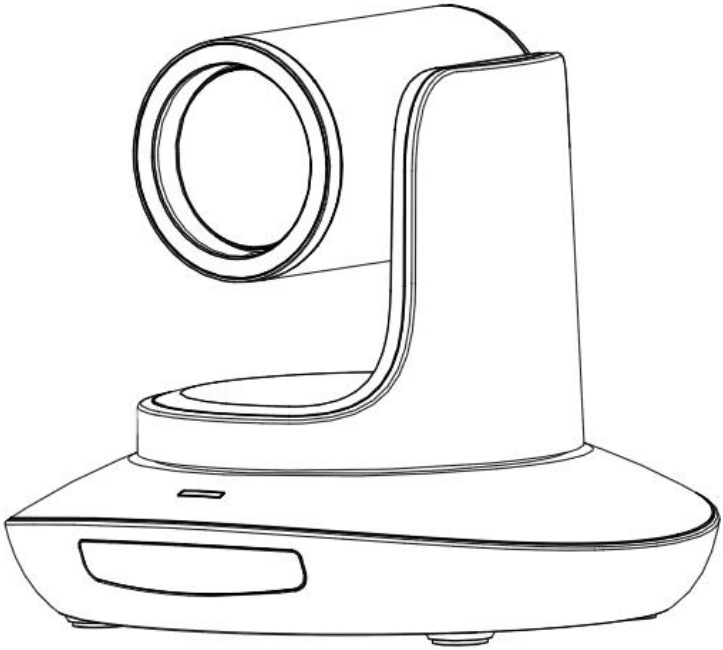
# USB2.0 HD Video Camera

## 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.

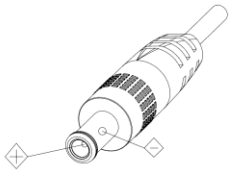
8.RF cable and control cable should be individually shielded, and cannot be substituted with other cables. Do not direct the camera lens towards strong light, such as the sun or the intensive light.

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)



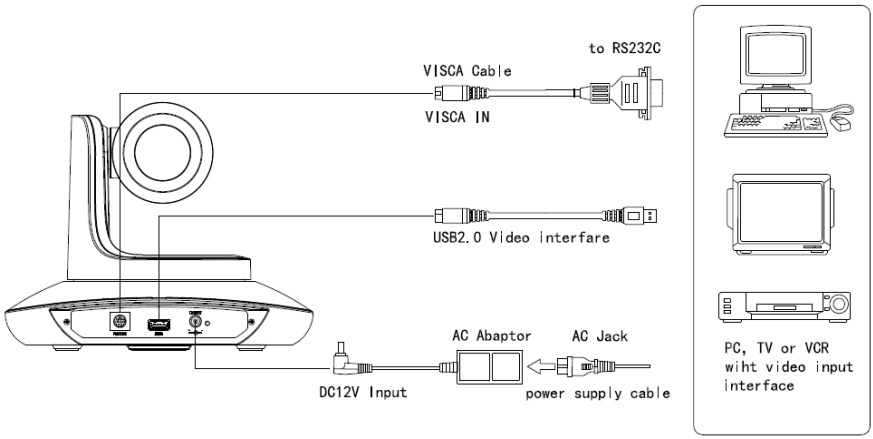
## ACCESSORIES

Check all bellow items when open the package:

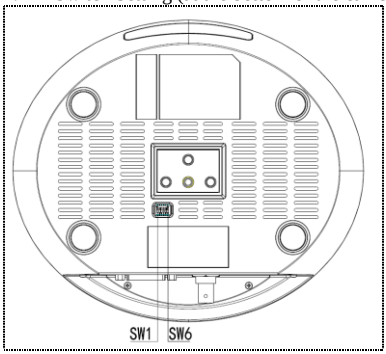
Camera ……1
Power Adapter ……1
Power Cable ……1
RS232 Control Cable ……1
USB2.0 Cable…….. 1
Remote Controller ……1
User Manual ……1
Double-sided Adhesive…….. 1

## QUICK START

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 | OFF | Updating mode |
| 2 | ON | OFF | Debugging mode |
| 3 | OFF | ON | Undefined |
| 4 | ON | ON | Working mode |

| Function （IR CODE TYPE） | | | |
|---|---|---|---|
| | SW-3 | SW-4 | Instruction |
| 1 | OFF | OFF | Off(Close IR receiver) |
| 2 | ON | OFF | Undefined |
| 3 | OFF | ON | SEJIN 4PPM CODE |
| 4 | ON | ON | NEC CODE(standard) |

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

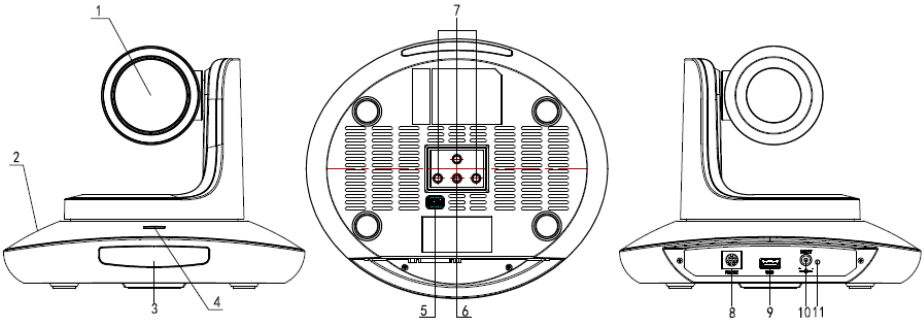
## PRODUCT HIGHLIGHTS

- Smart and fashion design, ideal for cloud-based conferencing
- Adopts advanced Ambarella DSP，1/2.8 inch 5MP image sensor, and high quality 12X 72.5degree FOV optical lens, provides fluent and crystal image quality
- Fast switching between different video formats: less than 1 second
- 12X 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).

**PRODUCT SPEC**

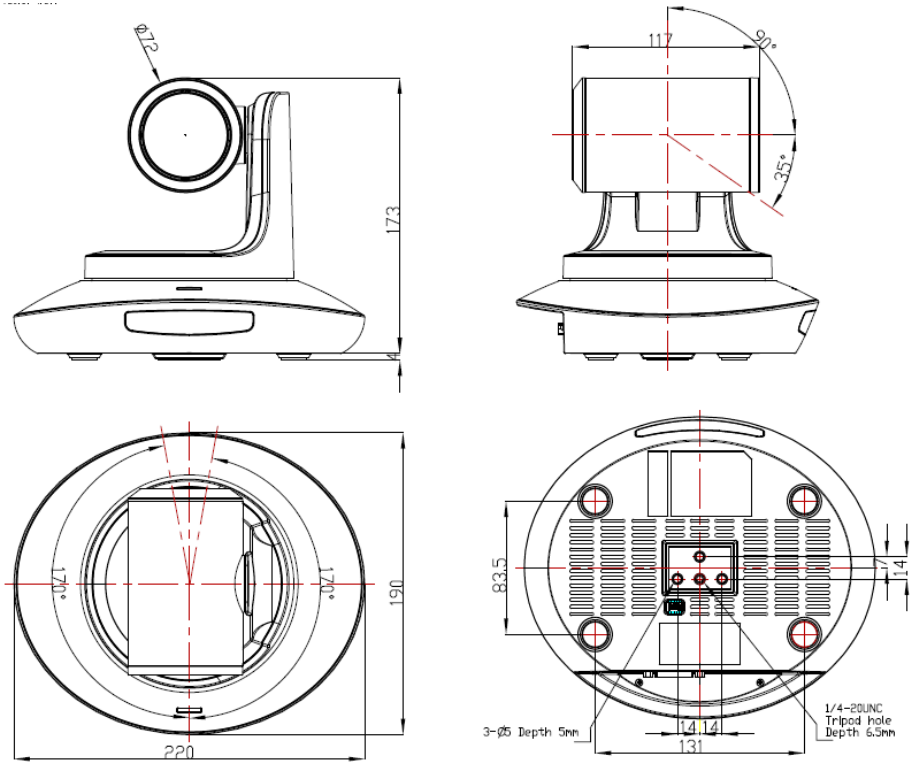
| | | |
|---|---|---|
| Video Format | MJPG | 1080P30, 720P30, 640*480P30 |
| Video Port | USB2.0 | |
| Sensor | 1/2.8 inch high quality 5MP CMOS sensor | |
| Lens | F3.92～47.32mm(12X), F1.8 – 14, Field of view: 72.5°(wide)-6.3°(tele) | |
| Pan/tilt Rotation | Pan:±170°; Tilt:-30°~+90°, support up-side down installation | |
| Pan/tilt Speed | Pan: 0.1°-120°/s; Tilt: 0.1°-80°/s | |
| Preset | 10 via IR remote setting, 128 via VISCA control, preset accuracy :0.1° | |
| Control Port | RS232, RS485, USB2.0 | |
| Min. Lux | 0.01lux | |
| White Balance | Auto/Manual | |
| Focus | Auto/Manual | |
| Iris | Auto/Manual | |
| Shutter | Auto/Manual | |
| WDR | Supported | |
| BLC | Supported | |
| 2D Noise Reduction | Supported | |
| 3D Noise Reduction | Supported | |
| Input Voltage | DC12V | |
| Dimension | 148mm×132mm×161mm | |
| Netweight | 1.25KG（2.8LBS） | |

## CAMERA INTERFACE

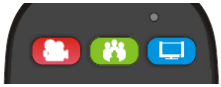



1.Camera Lens
2.Camera Base
3.IR Receiver Panel
4.Indicator Light
5.Dial Switch
6. Tripod Screw Hole
7.Installation Hole
8.RS232(VISCA IN) Port
9.USB2.0 Port
10.DC12V Power Input
11.Power Indicator light（red）

## 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;

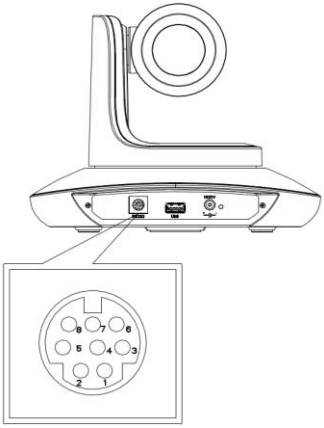
2.**Single Button Coding:** long press(3seconds) Home +number"1" button simultaneously, the green indicator LED will light, enter button learning mode, press the buttons which need to be learned, LED will start flickering(1HZ), now can start button learning: get the codec remote point to the camera remote's 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_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 0s FF | pqrs: Zoom Position (0(wide) ~0x4000(tele)) |
| 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 | |

| Command | Funnation | Command Packet | Note |
|---|---|---|---|
| | Direct | 8x 01 04 48 0p 0q 0r 0s FF | pqrs: Focus Position |
| | One Push AF | 8x 01 04 18 01 FF | |
| CAM_ZoomFocus | Direct | 8x 01 04 47 0p 0q 0r 0s<br>0t 0u 0v 0w FF | pqrs: Zoom Position (0(wide)~ 0x4000(tele))<br>tuvw: Focus Position |
| 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 | |
| | Manual | 8x 01 04 35 05 FF | |
| | Outdoor Auto | 8x 01 04 35 06 FF | |
| | Sodium Lamp Auto | 8x 01 04 35 07 FF | |
| | Sodium Auto | 8x 01 04 35 08 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 |
| | 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_Iris | Reset | 8x 01 04 0B 00 FF | Iris Setting |
| | Up | 8x 01 04 0B 02 FF | |
| | Down | 8x 01 04 0B 03 FF | |
| | Direct | 8x 01 04 4B 00 00 0p 0q FF | pq: Iris Position (0~ 0x11) |
| 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 | |

| Command | Funnation | Command Packet | Note |
|---|---|---|---|
| | 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 |
| CAM_Aperture | Reset | 8x 01 04 02 00 FF | Aperture Control |
| | Up | 8x 01 04 02 02 FF | |
| | Down | 8x 01 04 02 03 FF | |
| | Direct | 8x 01 04 42 00 00 0p 0q FF | pq: Aperture Gain (0~0x04) |
| CAM_Memory | Reset | 8x 01 04 3F 00 0p FF | p: Memory Number(=0 to 127)<br>Corresponds to 0 to 9 on the Remote Commander |
| | Set | 8x 01 04 3F 01 0p FF | |
| | Recall | 8x 01 04 3F 02 0p 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_ColorGain | Direct | 8x 01 04 49 00 00 00 0p FF | (0~0x0E) |
| CAM_2D<br>Noise Reduction | Direct | 8x 01 04 53 0p FF | 0：OFF 1：ON |
| CAM_3D<br>Noise Reduction | Direct | 8x 01 04 54 0p FF | 0:OFF 1：AUTO 2~5：LEVEL |
| FLICK | 50HZ | 81 01 04 23 01 FF | |
| | 60HZ | 81 01 04 23 02 FF | |
| Freeze | Freeze On | 81 01 04 62 02 FF | Freeze On Immediately |
| | Freeze Off | 81 01 04 62 03 FF | Freeze Off Immediately |
| | Preset Freeze On | 81 01 04 62 22 FF | Freeze On When Running Preset |
| | Preset Freeze Off | 81 01 04 62 23 FF | Freeze Off When Running Preset |
| 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 | |
| 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 |
| | Down | 8x 01 06 01 VV WW 03 02 FF | |

| Command | Funnation | Command Packet | Note |
|---|---|---|---|
| | Left | 8x 01 06 01 VV WW 01 03 FF | 0x14 (high speed)<br>YYYY: Pan Position(TBD)<br>ZZZZ: Tilt Position(TBD) |
| | 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_FocusModeInq | 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_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_IrisPosInq | 8x 09 04 4B FF | y0 50 00 00 0p 0q FF | pq: Iris 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_IDInq | 8x 09 04 22 FF | y0 50 0p 0q 0r 0s FF | pqrs: Camera ID |
| 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 |
| Pan-tiltMaxSpeedInq | 8x 09 06 11 FF | y0 50 ww zz FF | ww: PanMaxSpeed zz: Tilt Max Speed |
| 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 | | |

**VISCA PAN TILT SPEED VALUE**

| Pan(degree/second) | | tilt(degree/second) | |
|---|---|---|---|
| 0 | 0.3 | 0 | 0.3 |
| 1 | 1 | 1 | 1 |
| 2 | 1.5 | 2 | 1.5 |
| 3 | 2.2 | 3 | 2.2 |
| 4 | 2.4 | 4 | 3.6 |
| 5 | 2.6 | 5 | 4.7 |
| 6 | 2.8 | 6 | 6 |
| 7 | 3.0 | 7 | 8 |
| 8 | 3.2 | 8 | 10 |
| 9 | 3.4 | 9 | 12 |
| 10 | 3.8 | 10 | 15 |
| 11 | 4.5 | 11 | 18 |
| 12 | 6 | 12 | 23 |
| 13 | 9 | 13 | 30 |
| 14 | 15 | 14 | 39 |
| 15 | 19 | 15 | 48 |
| 16 | 25 | 16 | 59 |
| 17 | 32 | 17 | 69 |
| 18 | 38 | 18 | 80 |

| | | | |
|---|---|---|---|
| 19 | 45 | | |
| 20 | 58 | | |
| 21 | 75 | | |
| 22 | 88 | | |
| 23 | 105 | | |
| 24 | 120 | | |

| | | 60/30mode | 50/25mode | | | |
|---|---|---|---|---|---|---|
| Shutter speed | 21 | 1/10000 | 1/10000 | Iris | 0 | close |
| | 20 | 1/6000 | 1/6000 | | 1 | F14 |
| | 19 | 1/4000 | 1/3500 | | 2 | F11 |
| | 18 | 1/3000 | 1/2500 | | 3 | F9.6 |
| | 17 | 1/2000 | 1/1750 | | 4 | F8 |
| | 16 | 1/1500 | 1/1250 | | 5 | F6.8 |
| | 15 | 1/1000 | 1/1000 | | 6 | F5.6 |
| | 14 | 1/725 | 1/600 | | 7 | F4.8 |
| | 13 | 1/500 | 1/425 | | 8 | F4 |
| | 12 | 1/350 | 1/300 | | 9 | F3.4 |
| | 11 | 1/250 | 1/215 | | 10 | F2.8 |
| | 10 | 1/180 | 1/150 | | 11 | F2.4 |
| | 9 | 1/125 | 1/120 | | 12 | F2 |
| | 8 | 1/100 | 1/100 | | 13 | F1.6 |
| | 7 | 1/90 | 1/75 | | | |
| | 6 | 1/60 | 1/50 | | | |
| | 5 | 1/30 | 1/25 | | | |
| | 4 | 1/15 | 1/12 | | | |
| | 3 | 1/8 | 1/6 | | | |
| | 2 | 1/4 | 1/3 | | | |
| | 1 | 1/2 | 1/2 | | | |
| | 0 | 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 |

## IR TRANSFER(IR PASS)

1. Currently the camera support NEC code format. For customized with other codes, pls contact us.

2. Once the camera finish power configuration, enable the IR transfer function via sending COM command.

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

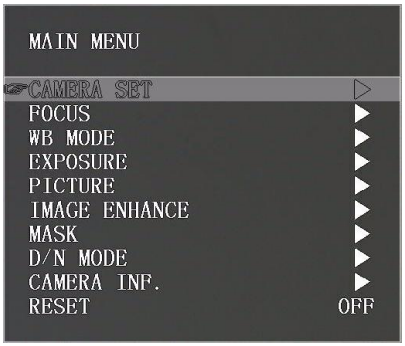
4. IR Transfer output format: XX XX XX XX FF

| XX XX XX XX: Remote Controller Code | FF: End Code |
|---|---|

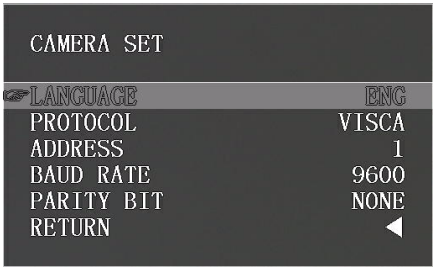
5. The camera can save all setting, no need to re-set after power circle.

## OSD MENU

1.under working mode, press the menu button on the IR remote, to enter the OSD menu ; press the menu butoon 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.

| | | |
|---|---|---|
| CAMERA SET | LANGUAGE | Chinese/English |
| | PROTOCOL | VISCA/PELCO-P/PELCO-D |
| | ADDRESS | 1~7 |
| | BAUD RATE | 2400,9600,115200 |
| | PARITY BIT | NONE |
| | RETURN | Back to the main menu |

| | | |
|---|---|---|
| FOCUS | FOCUS MODE | AUTO/MANUAL/PUSH |
| | SENSITIVITY | LOW/MIDDLE/HIGH |
| | FOCUS LIMIT | 1.5M/2M/3M/6M/10M |
| | D_ZOOM | OFF/ON |
| | ZOOM SPEED | 0-7 |
| | LENS INIT | OFF/5K/10K/15K/20K/EXE |
| | DIS ZOOM RATIO | OFF/ON |
| | POSITION SAVE | OFF/SAVE |
| | RETURN | Back to the main menu |

| | | |
|---|---|---|
| WB MODE | WB MODE | ATW/MANU/MANU2/SON./FL./AUTO/IDR./ODR./PUSH |
| | B_GAIN | 0~255 (Only Valid when WB MODE set to MANU) |
| | R_Gain | 0~255 (Only Valid when WB MODE set to MANU) |
| | RETURN | Back to the main menu |

| | | |
|---|---|---|
| EXPOSURE | EXP MODE | AUTO/MANU/IRIS/SHUT/BRL |
| | SHUT TIME | Shutter time: 1/1~1/10000 Only Valid when EXP MODE set to MANU |
| | IRIS | Iris value: 0-13 Only Valid when EXP MODE set to MANU |
| | AGC | Gain value: 0dB~15dB Only Valid when EXP MODE set to MANU |
| | BRIGHT | Brightness value: 0-27 Only Valid when EXP MODE set to BRI |
| | SLOW SHUT | OFF/ON |
| | FLICK | OFF/50HZ/60HZ |
| | RETURN | Back to the main menu |

| | | |
|---|---|---|
| PICTURE | BRIGHTNESS | 0-15 |
| | SHARPNESS | 0-15 |
| | CONSTRAST | 0-15 |
| | SATURATION | 0-15 |
| | MIRROR | Image 180degree rotation left/right: OFF/ON |
| | PIC FLIP | Image 180degree rotation up/down: OFF/ON |
| | FREEZE | OFF/ON |
| | DEFOG | OFF/1-15 |
| | RETURN | Back to the main menu |

| | | |
|---|---|---|
| IMAGE ENHANCE | 2D NR | OFF/ON； |
| | 3D NR | OFF/AUTO/ 1-4 |
| | D_WDR | OFF/1-6 |
| | GAMMA | 0-4 |
| | BACKLIGHT | OFF/ON |
| | HIGHLIGHT | OFF/ON |
| | RETURN | Back to the main menu |

| | | |
|---|---|---|
| MASK | MASK SWITCH | ON/OFF |
| | COLOUR | WHITE/YELLOW/GRAY/GREEN/VIOLET/RED/ |
| | INDEX | 1-8 |
| | INDEX SWITCH | OFF/ON |
| | ROW START | 0-1919 |
| | ROW END | 1-1920 |
| | LINE START | 0-1079 |
| | LINE END | 1-1080 |
| | RETURN | Back to the main menu |

| | | |
|---|---|---|
| D/N MODE | D/N MODE | DAY/NIGHT/AUTO/ |
| | DAY TO NIGHT | 15-200 |
| | NIGHT TO DAY | 5-190 |
| | SWITCH DELAY | 1-60 |
| | GAIN LIMIT | 2-511 |
| | RETURN | Back to the main menu |

| | | |
|---|---|---|
| CAMERA INF. | IMAGE VER. | PC-V0.0.6 (changes without additional notices) |
| | IMAGE DATE | 16.10.20 (changes without additional notices) |
| | CONTROL VER. | UC V0.1.4 (changes without additional notices) |
| | CONTROL DATE | 17.01.07 (changes without additional notices) |
| | BAUDRATE | 9600 |
| | PARITY BIT | NONE |
| | FRAMERATE | 1080P30 |
| | RETURN | Back to the main menu |

## UVC CONTROL

| | Control Requests | Control Selector |
|---|---|---|
| 1 | Brightness Control | PU_BRIGHTNESS_CONTROL |
| 2 | Contrast Control | PU_CONTRAST_CONTROL |
| 3 | Hue Control | PU_HUE_CONTROL |
| 4 | Saturation Control | PU_SATURATION_CONTROL |
| 5 | Sharpness Control | PU_SHARPNESS_CONTROL |
| 6 | Gamma Control | PU_GAMMA_CONTROL |
| 7 | White Balance Temperature Control | PU_WHITE_BALANCE_TEMPERATURE_CONTROL |
| 8 | Gain Control | PU_GAIN_CONTROL |
| 9 | Power Line Frequency Control | PU_POWER_LINE_FREQUENCY_CONTROL |
| 10 | Zoom (Absolute) Control | CT_ZOOM_ABSOLUTE_CONTROL |
| 11 | Zoom (Relative) Control | CT_ZOOM_RELATIVE_CONTROL |
| 12 | PanTilt (Absolute) Control | CT_PANTILT_ABSOLUTE_CONTROL |
| 13 | PanTilt (Relative) Control | CT_PANTILT_RELATIVE_CONTROL |