USB3.0 HD Video Camera

User Manual
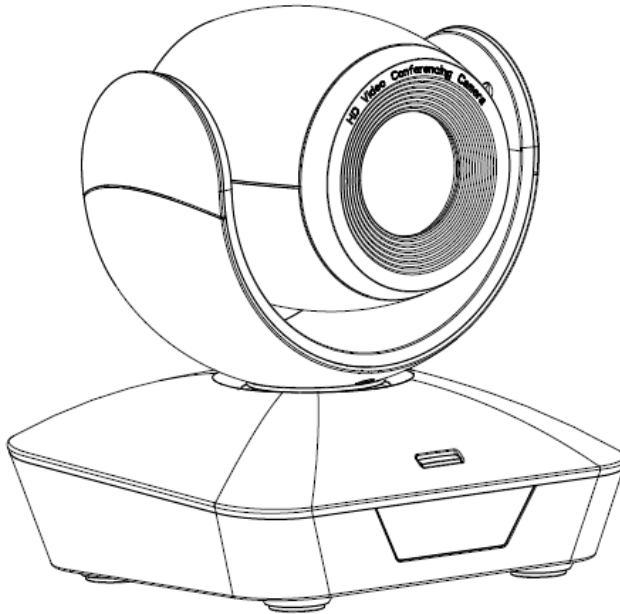
Version V1.1
(English)

CONTENTS

# 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 dismantle 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)
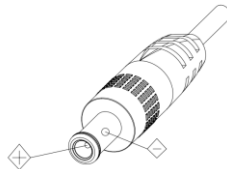
Note:
   The camera video may be affected when the electromagnetic fields is at specific frequency.

ACCESSORIES

Check all bellow items when open the package:
Camera ··· 1
Power Adapter ··· 1
Power Cable ··· 1
RS232 Control Cable······································ 1
USB3.0 Cable…………………………….......… 1
Remote Controller ·· 1
User Manual ··· 1
Double-sided Adhesive…………………….....….. 1

QUICK START

1. Check all cable connections before power on.
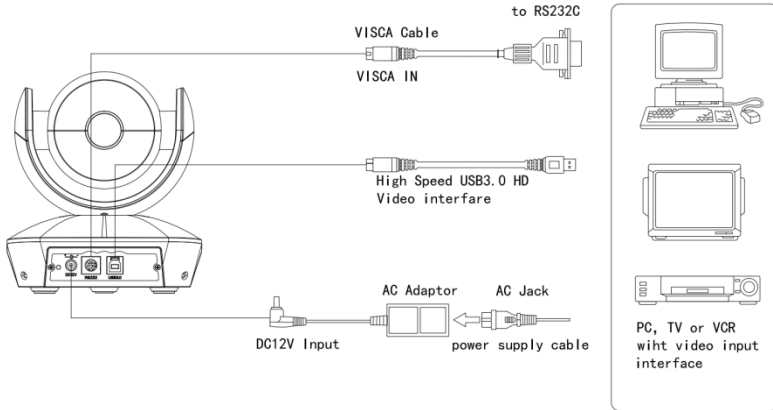
2. DIP Switch Setting (at the bottom of the camera):
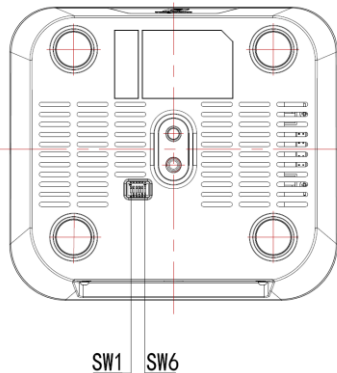
Function(ARM)			
	SW-1	SW-2	Instruction
1	OFF	OFF	Updating mode
2	ON	OFF	Debugging mode
3	OFF	ON	Undefined
4	ON	ON	Working mode

Function			
	SW-3	SW-4	Instruction
1	OFF	OFF	Working mode
2	ON	OFF	Undefined
3	OFF	ON	Undefined
4	ON	ON	Undefined

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

PRODUCT HIGHLIGHTS

- Smart and fashion design, ideal for cloud-based conferencing.
- Adopts advanced DSP, 1/2.8 inch 5MP image sensor, and high quality 10X 62.5degree FOV optical lens, provides fluent and crystal image quality.
- Fast switching between different video formats: less than 1 second.
- 10X Optical Zoom + 12XDigital Zoom.
- Fast and accurate focus performance.
- Easy firmware upgrade-(field-up gradable).
- USB3.0 super speed output, USB2.0 compatible.
- 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).
- Multi-language OSD menu: English, Chinese.

PRODUCT SPEC

Sensor	1/2.8 inch high quality, 5 MP CMOS Sony sensor
Video Resolution	**USB3.0：** YUY2: 1920*1080P60;1280*720P60; 1024*576P60 640*480P60；640*360P60； **USB2.0：** YUY2: 1280*720P25；1024*576P30/25；640*480P50/30/25； 640*360P60/50/30/25
Lens Zoom	10x optical zoom, 12x digital zoom
Focal length	f＝4.7(wide)～47mm(Tele), F1.6~F3.0
View Angle	62.5° (wide)~ 6.43° (Tele)
Vertical viewing angle	40.1° ~ 4.1°
Diagonal viewing angle	69.7° ~ 7.56°
Minimum Object Distance	Wide: 0.5m; Tele: 1m
SNR	>50dB

Image parameter	
Noise Reduction	2D/3D
Minimum LUX	0.7lux (50 IRE Max AGC,1/30,F1.8)
White Balance	Auto/Manual/Indoor/Outdoor/Push/Sodium/Fluorescent
Focus	Auto / Manual
Iris	Auto / Manual
Electronic Shutter	Auto / Manual
BLC	Supported
Mechanism	
Pan Rotation Angle	-170° ~ +170°
Tilt Rotation Angle	-30° ~ +90°
Pan Rotation Speed	0°~120°/s
Titl Rotation Speed	0°~80°/s
Preset	128 presets via RS232, 10 presets via remote controller
Control	RS232/RS485/USB/Remote Controller
Video Port:	USB3.0
General	
Input voltage	5V 1000mA(via USB3.0)/ DC: 12V 2A(via Power Adapter)
Power Consumption	DC: 12V 2A (Pmax=7W)
Operating Temperature	-10℃~ 50℃
Operating Humidity	≤80%
Color	Silver
Camera Dimension	148mm×132mm×162mm
Package Dimension	28x24x24cm
Package Content	Camera, Remote Controller, RS232 cable, USB3.0 cable, Power Supply

CAMERA INTERFACE

1.Camera Lens
2.Camera Base
3.IR Receiver Pane
4.Indicator Light

5.Dial Switch
6. Tripod Screw Hole
7.Installation Hole
8.Power Indicator light（red）

9.12VDC Power Input
10.RS232(VISCA IN) Port
11.USB3.0 Port
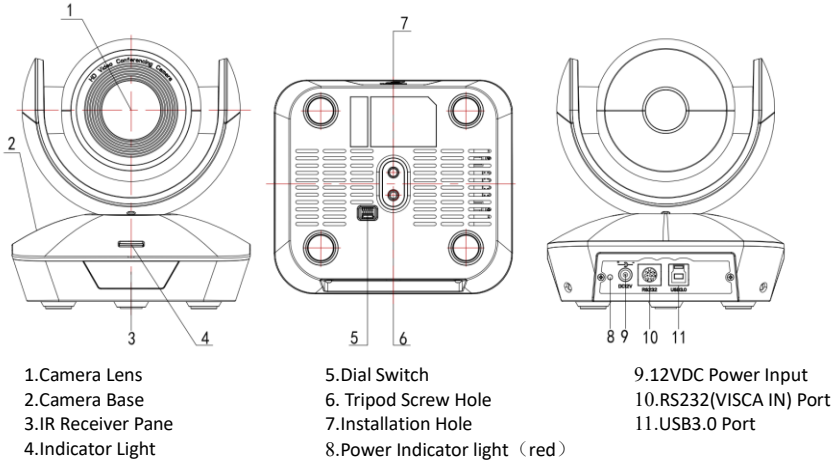
CAMERA DIMENSION(MM)
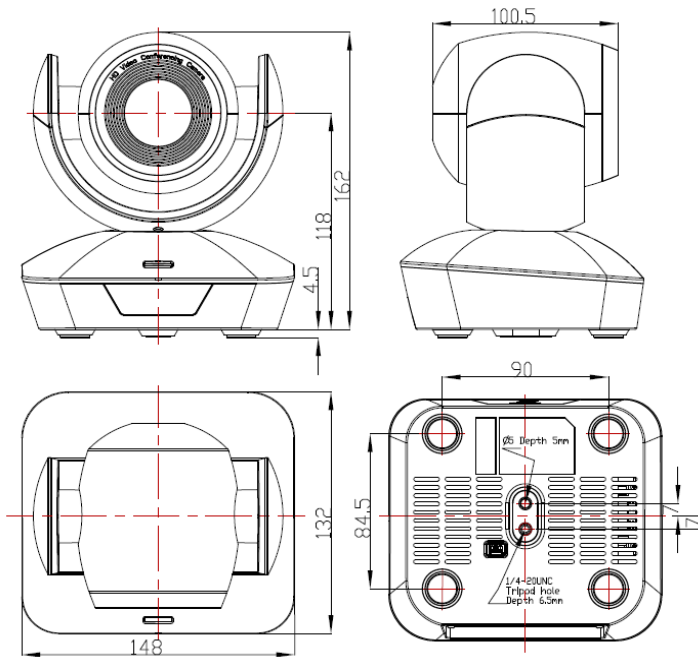
IR REMOTE CONTROLLER

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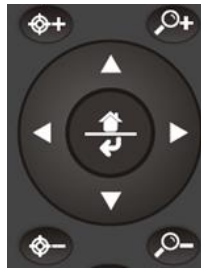
Focus (Left): +/-
Manual focus, only valid under manual focus model.
Zoom (Right): +/-
Control the lens zoom rate.
Navigate : Up/Down/Left/Right
In normal working mode, use navigate key to control pan/tilt.
Confirm/Home button:
In normal working mode, short press to let the camera go back to Home position.

Menu button:
Enter the OSD menu.

Number buttons:
Set Preset: Long press(3seconds) the number button to save preset.

Clear Preset: +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
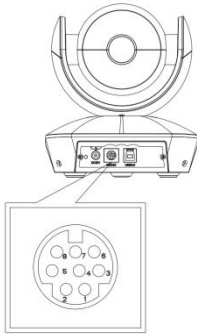
No.	Function
1	DTR
2	DSR
3	TXD
4	GND
5	RXD
6	A
7	IR OUT
8	B

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	Function	Command Packet	Note
Address Set	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	
	Direct	8x 01 04 48 0p 0q 0r 0s FF	pqrs: Focus Position
	One Push AF	8x 01 04 18 01 FF	
CAM_Zoom Focus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	pqrs: Zoom Position (0(wide)~ 0x4000(tele)) 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	

Command	Function	Command Packet	Note
	One Push	8x 01 04 35 03 FF	
	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_R Gain	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_B gain	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_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	
	Direct	8x 01 04 0C 00 00 0p 0q FF	pq: Gain Position (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 Position ()

Command	Function	Command Packet	Note
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_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 0p FF	p: Preset Number(=0 to 127) 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_Picture Flip	On	8x 01 04 66 02 FF	Image Flip Vertical ON/OFF
	Off	8x 01 04 66 03 FF	
CAM_Mount Mode	UP	8x 01 04 A4 02 FF	Mount Up
	Down	8x 01 04 A4 03 FF	Mount Down
CAM_Saturation	Direct	8x 01 04 A1 00 00 00 0p FF	(0~0x0E)
CAM_2D Noise Reduction	Direct	8x 01 04 53 0p FF	(0~0x05)
CAM_3D Noise Reduction	Direct	8x 01 04 54 0p FF	(0~0x03)
CAM_New Bright	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	8x 01 06 06 02 FF	Turn on the menu
	Menu Off	8x 01 06 06 03 FF	Turn off the menu
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	

Command	Function	Command Packet	Note
	On/Off	8x 01 06 08 10 FF	
Pan_tilt Drive	Up	8x 01 06 01 VV WW 03 01 FF	VV: Pan speed 0x01 (low speed) to 0x18 (high speed) WW: Tilt speed 0x01 (low speed) to 0x14 (high speed) YYYY: Pan Position(TBD) 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	
	Up left	8x 01 06 01 VV WW 01 01 FF	
	Up right	8x 01 06 01 VV WW 02 01 FF	
	Down Left	8x 01 06 01 VV WW 01 02 FF	
	Down Right	8x 01 06 01 VV WW 02 02 FF	
	Stop	8x 01 06 01 VV WW 03 03 FF	
	Absolute Position	8x 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	Relative Position	8x 01 06 03 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	Home	8x 01 06 04 FF	
	Reset	8x 01 06 05 FF	
Pan-tilt Limit Set	Set	8x 01 06 07 00 0W 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	W:1 Up Right 0:Down Left YYYY: Pan Limit Position(TBD) ZZZZ: Tilt Limit Position(TBD)
	Clear	8x 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF	

Part3   Inquiry Command

Command	Command Packet	Return Packet	Note
CAM_Power Inq	8x 09 04 00 FF	y0 50 02 FF	On
		y0 50 03 FF	Off(Standby)
CAM_Zoom Pos Inq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_Focus Mode Inq	8x 09 04 38 FF	y0 50 02 FF	Auto Focus
		y0 50 03 FF	Manual Focus
CAM_Focus Pos Inq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position
CAM_WB Mode Inq	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	One Push mode
		y0 50 04 FF	ATW
		y0 50 05 FF	Manual
CAM_R Gain Inq	8x 09 04 43 FF	y0 50 00 00 0p 0q FF	pq: R Gain
CAM_B Gain Inq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: B Gain
CAM_AE Mode Inq	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_Shutter Pos Inq	8x 09 04 4A FF	y0 50 00 00 0p 0q FF	pq: Shutter Position
CAM_Iris Pos Inq	8x 09 04 4B FF	y0 50 00 00 0p 0q FF	pq: Iris Position
CAM_Gain Posi Inq	8x 09 04 4C FF	y0 50 00 00 0p 0q FF	pq: Gain Position
CAM_ Bright Posi Inq	8x 09 04 4D FF	y0 50 00 00 0p 0q FF	pq: Bright Position
CAM_Exp Comp Mode Inq	8x 09 04 3E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_Exp Comp Pos Inq	8x 09 04 4E FF	y0 50 00 00 0p 0q FF	pq: Exp Comp Position
CAM_Aperture Inq	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture Gain
CAM_Memory Inq	8x 09 04 3F FF	y0 50pp FF	pp: Memory number last operated.
SYS_Menu Mode Inq	8x 09 06 06 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_LR_Reverse Inq	8x 09 04 61 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_Picture Flip Inq	8x 09 04 66 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_Version Inq	8x 09 00 02 FF	y0 50 ab cd 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_Receive Return		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_tilt Drive
Pan-tilt Pos Inq	8x 09 06 12 FF	y0 50 0w 0w 0w 0w 0z 0z 0z 0z FF	wwww: Pan Position 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			
	21	1/10000	1/10000		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	Iris	8	F4
	12	1/350	1/300		9	F3.4
Shutter speed	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		16	f2.0
	4	1/15	1/12		17	f1.8
	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

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
Up left	0xFF	Address	0x00	0x0C	Pan Speed	Tilt Speed	SUM
Upright	0xFF	Address	0x00	0x0A	Pan Speed	Tilt Speed	SUM
Down Left	0xFF	Address	0x00	0x14	Pan Speed	Tilt Speed	SUM
Down Right	0xFF	Address	0x00	0x12	Pan Speed	Tilt Speed	SUM
Zoom In	0xFF	Address	0x00	0x20	0x00	0x00	SUM
Zoom Out	0xFF	Address	0x00	0x40	0x00	0x00	SUM
Focus Far	0xFF	Address	0x00	0x80	0x00	0x00	SUM
Focus Near	0xFF	Address	0x01	0x00	0x00	0x00	SUM
Set Preset	0xFF	Address	0x00	0x03	0x00	Preset ID	SUM
Clear Preset	0xFF	Address	0x00	0x05	0x00	Preset ID	SUM
Call Preset	0xFF	Address	0x00	0x07	0x00	Preset ID	SUM
Query Pan Position	0xFF	Address	0x00	0x51	0x00	0x00	SUM
Query Pan Position Response	0xFF	Address	0x00	0x59	Value High Byte	Value Low Byte	SUM
Query Tilt Position	0xFF	Address	0x00	0x53	0x00	0x00	SUM
Query Tilt Position Response	0xFF	Address	0x00	0x5B	Value High Byte	Value Low Byte	SUM
Query Zoom Position	0xFF	Address	0x00	0x55	0x00	0x00	SUM
Query Zoom Position Response	0xFF	Address	0x00	0x5D	Value High Byte	Value Low Byte	SUM

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
Up left	0xA0	Address	0x00	0x0C	Pan Speed	Tilt Speed	0xAF	XOR
Upright	0xA0	Address	0x00	0x0A	Pan Speed	Tilt Speed	0xAF	XOR
Down Left	0xA0	Address	0x00	0x14	Pan Speed	Tilt Speed	0xAF	XOR
Down Right	0xA0	Address	0x00	0x12	Pan Speed	Tilt Speed	0xAF	XOR
Zoom In	0xA0	Address	0x00	0x20	0x00	0x00	0xAF	XOR
Zoom Out	0xA0	Address	0x00	0x40	0x00	0x00	0xAF	XOR
Focus Far	0xA0	Address	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
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.

```
MAIN MENU

CAMERA SET          ▶
VIDEO MODE          ▶
FOCUS               ▶
WB MODE             ▶
EXPOSURE            ▶
PICTURE             ▶
IMAGE ENHANCE       ▶
MASK                ▶
D/N MODE            ▶
CAMERA INF.         ▶
RESET             OFF
```
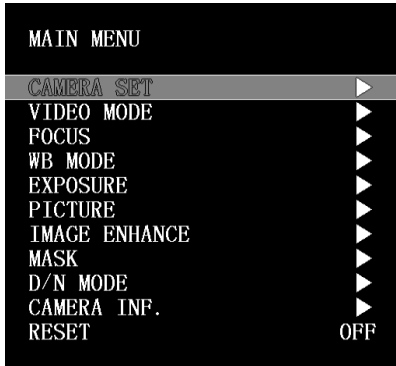
2. Use the navigate button to select the main menu. Once been selected, the main menu will change to grey color

background, and the right side will show all parameters under this sub menu.

3. Press the right navigate button to enter sub menu, use up and down navigate button to select parameter.

4. To return to the previous menu level, use the navigation up and down keys to select the return line, and then press

the navigation right key to return to the previous level.

```
CAMERA SET

LANGUAGE           ENG
PROTOCOL         VISCA
ADDRESS             1
BAUD RATE        9600
PARITY BIT       NONE
RETURN             ◁
```

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

6. OSD Menu List& Defaulted Setting

	LANGUAGE	ENGLISH/CHINESE	
CAMERA SET	PROTOCOL	VISCA/PELCO-P/PELCO-D	VISCA
	ADDRESS	VISCA:1~7 PELCO-P/D:0~255	1
	BAUD RATE	2400/9600/115200	9600
	PARITY BIT	NONE	
	RETURN	Return to previous menu	

VIDEO MODE	**It will cause video freeze if switch video mode via OSD menu;** **Only recommend to change video mode via UVC control.**

	RETURN	Return to previous menu	

	FOCUS MODE	AUTO/MANU/PUSH	AUTO
	SENSITIVITY	Focus Sensitivity setting: LOW/MID/HIGH	MID
	FOCUS LIMIT	The target distance: 1.5M/2M/3M/6M/10M	1.5M
FOCUS	D_ZOOM	Digital Zoom: OFF/ON	OFF
	ZOOM SPEED	Set zoom speed level:0~7	7
	LENS INIT	Lens focus parameter frequency setting, choose EXE to start the lens focus reset	OFF
	DIS ZOOM RATIO	Display zoom value during zooming control	OFF
	RETURN	Return to previous menu	

	WB MODE	Set White Balance mode	ATW
WB MODE	B_GAIN	Set blue gain under manual mode	52
	R_GAIN	Set red gain under manual mode	58
	RETURN	Return to previous menu	

	EXP MODE	AUTO、MANUAL、BRIGHT、SHUTTER、IRIS	AUTO
	SHUT TIME	Set shutter speed: 1/8~1/10000 Only available under MANU or SHUT mode	1/100
	IRIS	Set iris value: 0~13, only available under MANU or IRIS mode	10
EXPOSURE	GAIN	Set gain value: 0~15, only available under MANU mode	0
	BRIGHT	Set bright value: 0~27 , only available under BRI. mode	11
	SLOW SHUT	Slow shutter set: OFF/ON	OFF
	FLICK	50HZ/60HZ/OFF	50Hz
	RETURN	Return to previous menu	

	BRIGHTNESS	Set brightness value: 0~15	6
	SHARPNESS	Set sharpness value：0~15	3
PICTURE	CONSTRAST	Set contrast value: 0~15	7
	SATURATION	Set saturation value: 0~15, the higher value, the stronger color	9

	MIRROR	Left/right flip: ON/OFF	OFF
	PIC FLIP	Up/down flip: ON/OFF	OFF
	FREEZE	ON/OFF	OFF
	DEFOG	Set image permeability	2
	RETURN	Return to previous menu	

	2D NR	ON/OFF	OFF
	3D NR	OFF/AUTO/1~4	AUTO
	D_WDR	Set dynamic level : OFF/1~6	1
IMAGE ENHANCE	GAMMA	Set gamma: 0~4	0
	BACKLIGHT	ON/OFF	OFF
	HIGHLIGHT	ON/OFF	OFF
	RETURN	Return to previous menu	

	MASK SWITCH	Privacy zone function: ON/OFF	OFF
	COLOUR	Set mask zone color: WHITE/YELLOW/GRAY/GREEN/VIOLET/RED	WHITE
	INDEX	Set mask zone number: 1~8	1
	INDEX SWITCH	Set index zone: ON/OFF	OFF
MASK	ROW START	Set current mask zone's row start position	0
	ROW END	Set current mask zone's row end position	479
	LINE START	Set current mask zone's line start position	0
	LINE END	Set current mask zone's line end position	539
	RETURN	Return to previous menu	

	D/N MODE	Set D/N mode: DAY/NIGHT/AUTO	DAY
	DAY TO NIGHT	Set day to night brightness threshold value: 15~200	48
	NIGH TO DAY	Set night to day brightness threshold value: 5~190	8
D/N MODE	SWITCH DELAY	Set switch delay between different mode, to avoid repeat switching under AUTO mode: 1~60s	5
	GAIN LIMIT	Gain limit under low light:2/4/6/8/11/16/32/64/128/256/320/511	511
	RETURN	Return to previous menu	

CAMERA INF.	IMAGE VER.	Image firmware version
	IMAGE DATE	Image firmware release date: YY/MM/DD
	CONTROL VER.	Control firmware version
	CONTROL DATE	Control firmware release date: YY/MM/DD
	BAUDRATE	Current baud rate value
	PARITY BIT	Current control protocol parity bit value
	RETURN	Return to previous menu

RESET	REEST to defaulted value (except the Language): ON/OFF

UVC CONTROL

1. Only run the client software after the USB3.0 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 USB3.0 camera is recognized by the PC Device Manager.

3. Make sure the interval of video format switching more than 1 seconds, 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	Corresponded 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 FF
CT_PANTILT_RELATIVE_CONTROL	8x 01 06 01 pp qq rr ss FF
CT_ZOOM_RELATIVE_CONTROL	8x 01 04 07 pp FF