DVI-I&USB3.0 HD PTZ Camera User Manual



Version V1.0 (English)

CONTENTS

SAFETY GUIDES1
ACCESSORIES2
QUICK START2
PRODUCT HIGHLIGHTS
CAMERA SPEC4
CAMERA INTER FACE
CAMERA DIMENSION
IR REMOTE CONTROLLER
VISCA IN(RS232)PORT
SERIAL PORT CONFIGURATION
VISCA PROTOCOL
PELCO-D PROTOCOL17
PELCO-P PROTOCOL
OSD MENU
IR TRANSFER(IR PASS)
UVC CONTROL

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 2A. 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.

5.0perational environment: 0° C -50 $^{\circ}$ C, 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)



Note: the video quality may be affected by the specific frequencies of electromagnetic filed.

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):



	Dial Switch (ARM)				
	SW-1	SW-2	Instruction		
1	OFF	OFF	Upd ating mode		
2	ON	OFF	Debugging mode		
3	OFF	ON	Undefined		
4	ON	ON	Working mode		

	Dial Switch (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(st and ard)	

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

PRODUCT HIGHLIGHTS

1. Fashionable and smart design, with advanced DSP and 12x optical lens, provides ultra crystal image quality.

2. Fast switching between different video format.

3. Fast and accurate focus.

4. Support remote firm ware update.

5.Daisy chain function: with both Visca in and Visca out port, max 8 cameras can be controlled by RS232 port at Visca protocol.

6. Support 128 presets.

7. Be compatible with major video conferencing terminal, customization offered.

8. IR remote controller offered, video format swtiched by one push.

9 .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).

10. Multi language menu: English, Chinese, Russian, Spanish.

CAMERA SPEC

	DVI/HDMI:1080P60/50/30/25, 720P60/50/30/25, 1080I60/50;		
	USB3.0: 1080P60/50/30/25、720P60/50/30/25、1024*768P30、800*600P30、		
	1024*576P30、960*540P30、704*576P30、640*480P30、576*448P30、768*448P30、		
Video Format	640*360P30、512*288P30、352*288P30、176*144P30		
USB2.0: 720P25、1024*768P30、800*600P30、1024*576P30、96			
	704*576P30、640*480P30、576*448P30、768*448P30、640*360P30、512*288P30、		
	352*288P30、176*144P30		
Video Output	DVI-I (HDMI), USB3.0		
Sensor	1/2.3inch, 500MP high quality HD CMOS sensor		
Lens	F3.92~47.32mm(12X), F1.6~3.58, FOV:72.5 (wide)-6.3 (tele),		
Rotation Angle	Pan: ±1 70 °, Tilt:-30 °+90 °, support up-side down installation		
Rotation Speed	Pan: 0.1 °-120 %s; Tilt: 0.1 °-80 %s		
Pres et	10 via IR remote setting, (128 via COM setting) , preset accuracy :0.1 $^\circ$		
Control Port	RS232, RS485		
Daisy Chain	Supported		
Min. Lux	0.2Lux(Day), 0.005Lux(DSS on)		
White Balance	Auto/M anu al		
Focus	Auto/M anu al		
Iris	Auto/M anu al		
Shutter	Auto/M anu al		
Exposure Compensation	Support ed		
BLC	Supported		
2D/3D Noise Reduction	Supported		
Input Voltage	DC12V		
Dimension	220mm×173mm×117mm		
Net Weight	1.25KGS (2.8LBS)		

CAMERA INTERFACE



CAMERA DIMENSION(MM)







IR REMOTE CONTROLLER





POWER

Under normal working mode, short press POWER key, the camera will enter stand by mode;

Press it again, the camera will do self-configuration, then go back to HOME position.

It will go to preset position if power on model has been set before. **FREE ZE** (Not Supported)

Short press FREEZE key to freeze/ unfreeze the image.

IRT(IR Transfer/IR Pass)

Open or close the IR pass function. Once press the IRT key, the camera will receive and

pass the IR remote control signal to the codec/terminal(via VISCA IN port).



SET 1~SET4 ADDRESS SETTING

Long press for 3seconds until the key light ON, to set camera address. CAM1~CAM4 (CAMERASELECTING)

Short press to select the relative camera.

1	2	3
4	5	6
7	8	9
LEARN	0	CLR PRE

NUMBER KEY(1-9)

Set preset: long press(3 seconds) the number key to set preset. Run preset: Short press the number key to run preset.

CLR PRE (CLEAR PRESET)

CLR PRE+ number key: to clear the relative preset. Long press to clear all preset.

LEARN

Reserved, not available now.







priority exposure mode.



FOCUS KEY(ON THE LEFT)

Manual focus, only valid under manual focus model.

ZOOM KEY(ON THE RIGHT SIDE)

Set the zoom rate

NAVIGATE KEY: UP/DOWN/LEFT/RIGHT

Under working mode, use navigate key to set the pan tilt, and select menu when enter OSD.

OK /HOME KEY

Under working mode, short press OK to make the camera go back to HOME position; and confirm the selection when enter OSD.

AF: Auto Focus

MF: Manual Focus

RESET: Reset camera

MENU: Enter OSD menu

LIMIT L: Set the pan tilt left limit position.

LIMIT R: Set the pan tilt right limit position.

LMT CLR: Clear the limit position.

BLC OFF/ BLC ON: Close/open back light compensation

BRIGHT-/BRIGHT+: Set image brightness, only valid under bright

Video Format Keys:

Long press 3 seconds to select different video format output.

Note: In special environment, due to heavy infrared interfere, (for instance: the camera is put on the screen with infrared touch function or there is strong light iodine-tungsten lamp), the camera IR receival maybe effected to execute wrong command. In this case, turn off IR receival by set 3-4 dial switch on the bottom to be OFF if users don't need IR remote controller.

VISCA IN (RS232 PORT)



No.	Function
1	DTR
2	DSR
3	TXD
4	GND
5	RXD
6	А
7	IROUT
8	В

VISCA IN &RS485 Connection

Camera VIS CA IN		RS485
1	DTR	
2	DSR	
3	TXD	
4	GND	GND
5	RXD	
6	A(+)	A(+)
7	IROUT	
8	B(-)	B(-)

VISCA IN & Mini DIN Connection

Camera VIS CA IN		Mini DIN	
1	DTR	1	DSR
2	DSR	2	DTR
3	TXD	5	RXD
4	GND	4	GND
5	RXD	3	TXD
6	A(+)	6	GND
7	IROUT	7	NC
8	B(-)	8	NC

VISCA IN & DB9 Connection

Camera VIS CA 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	IROUT		
8	B(-)		

VISCA Network Construction:



SERIAL PORT CONFIGURATION

Parameter	Value	Parameter	Value
Baud rate	2400/4800/9600/115200	Stop Bit	1bit
Start Bit	1 bit	Check 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.	
	0		

z = cam era add erss+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 Execut able	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.		

Part 2 Camera Control Command

Co mma nd	Funnation	Command Packet	Note	
AddressSet	Broadcast	88 30 01 FF	Address setting	
IF_Clear	Broadcast	88 01 00 01 FF	I/F Clear	
Com man dCa nce l		8x 21 FF		
CAM Bower	On	8x 01 04 00 02 FF	Power ON/OFF	
CAM_POWER	Off	8x 01 04 00 03 FF	PowerON/OFF	
	Stop	8x 01 04 07 00 FF		
	Tele(Standard)	8x 01 04 07 02 FF		
	Wide(Standard)	8x 01 04 07 03 FF		
CAM_Zoom	Tele(Va ria ble)	8x 01 04 07 2p FF	$n = O(1_{\text{out}}) \propto 7/h_{\text{igh}}$	
	Wide(Variable)	8x 01 04 07 3p FF	$p = O(Iow)^{\sim} /(high)$	
	Dire ct	8x 01 04 47 0p 0q 0r 0s FF	pqrs: Zoom Position (0(wide) ~0x4000(tele))	
	Stop	8x 0 1 0 4 0 8 00 FF		
CAM_Focus	Far(Standard)	8x 01 04 08 02 FF		
	Near(Standard)	8x 01 04 08 03 FF		

Command	Funnation	Command Packet	Note	
	Dire ct	8x 0 1 0 4 4 8 0 p 0 q 0 r 0s FF	pqrs: Focus Position	
	One Push AF	8x 01 04 18 01 FF		
CAM_ZoomFocus	Direct	8x 0 1 0 4 47 0p 0 q 0 r 0s Ot 0 u 0v 0w FF	pqrs: Zoom Position (0(wide)~ 0x4000(tele)) tuvw: Focus Position	
	Auto	8x 0 1 0 4 3 5 00 FF		
	Indoor	8x 01 04 35 01 FF		
	Outdoor	8x 01 04 35 02 FF		
	OnePush	8x 0 1 0 4 3 5 0 3 FF		
CAIM_W B	Manual	8x 01 04 35 05 FF		
	Outdoor A uto	8x 01 04 35 06 FF		
	Sodium Lamp Auto	8x 01 04 35 07 FF		
	Sodium A uto	8x 0 1 0 4 3 5 08 FF		
	Reset	8x01040300FF		
CAM BGain	Up	8x 01 04 03 02 FF	Manual Control of R Gain	
CAM_KGall	Down	8x01040303FF		
	Dire ct	8x 0 1 0 4 4 3 00 00 0p 0 q FF	pq: R Gain (0~0xFF)	
	Reset	8x 0 1 0 4 0 4 00 FF	Manual Control of B Gain	
CAM Brain	Up	8x 0 1 0 4 0 4 0 2 FF		
CAIVI_bgaili	Down	8x01040403 FF		
	Dire ct	8x 0 1 0 4 4 4 00 00 0p 0 q FF	pq: B Gain (0-0xFF)	
	Full Auto	8x 0 1 0 4 3 9 00 FF	Automatic Exposure mode	
CAM_AE	Manual	8x 01 04 39 03 FF	Manual Control mode	
	Bright	8x 01 04 39 0D FF	Bright mode(Manual control)	
	Reset	8x01040A00FF		
CAM Shuttor	Up	8x 0 1 0 4 0 A 0 2 FF	Shutter Setting	
CAM_Shutter	Down	8x 01 04 0A 03 FF		
	Dire ct	8x 0 1 0 4 4 A 00 00 0p 0q FF	pq: Shutter Position (0~0x15)	
	Reset	8x 0 1 0 4 0 B 00 FF		
CAM Iric	Up	8x 01 04 0B 02 FF	Iris Setting	
CAWI_IIIS	Down	8x 01 04 0B 03 FF		
	Dire ct	8x 0 1 0 4 4 B 00 0 0 0 p 0 q FF	pq: Iris Position (0~0x11)	
	Reset	8x01040C00FF		
CAM_Ga in	Up	8x 01 04 0C 02 FF	Gain Setting	
	Down	8x01040C03FF		

Co mma nd	Funnation	Command Packet	Note	
	Dire ct	8x 01 04 0C 00 00 0p 0q FF	pq: Gain Positon (0~0x0E)	
	Reset	8x 01 04 0D 00 FF		
CANA Drinkt	Up	8x 01 04 0D 02 FF	Bright Setting	
CAM_Bright	Down	8x 01 04 0D 03 FF		
	Dire ct	8x 01 04 4 D 00 00 0 p 0 q FF	pq: Bright Positon ()	
	On	8x 01 04 3E 02 FF	Even occurre Common practicen ON/OFF	
	Off	8x 01 04 3E 03 FF		
CANA EvenCome	Reset	8x 01 04 0E 00 FF		
CAM_ExpComp	Up	8x 01 04 0E 02 FF	Exposure Compensation Amount Setting	
	Down	8x 01 04 0E 03 FF		
	Dire ct	8x 01 04 4E 00 00 0p 0q FF	pq: ExpComp Position (0~0x0E)	
CAM Packlight	On	8x 01 04 33 02 FF	BackLight On	
CAIM_BackLight	Off	8x 01 04 33 03 FF	BackLight Off	
	Reset	8x 01 04 02 00 FF		
CANA Aporturo	Up	8x 01 04 02 02 FF	Aperture Control	
CAM_Aperture	Down	8x 01 04 02 03 FF		
	Dire ct	8x 01 04 42 00 00 0p 0q FF	pq: Aperture Gain (0~0x04)	
	Reset	8x 01 04 3F 00 0p FF	p: Memory Number(=0 to 127) Corresponds to 0 to 9 on the Remote	
CAM_Memory(preset)	Set	8x 01 04 3F 01 0p FF		
	Recall	8x 01 04 3F 02 0p FF	Commander	
	On	8x 01 04 61 02 FF	Image Elin Herizontal ON/OEE	
CAIWI_LK_REVEISE	Off	8x01046103FF		
CAM RictureElin	On	8x 01 04 66 02 FF	Image Elin Vertical ON/OEE	
CAM_Picturerip	Off	8x01046603FF		
CAM MountMode	UP	8x 01 04 A4 02 FF	MountUp	
CAIM_INIO UNITIVIOUE	Down	8x 01 04 A4 03 FF	MountDown	
CAM_ColorGain	Dire ct	8x 0 1 0 4 4 9 00 00 00 0p FF	(0~0x0E)	
CAM_2D Noise Reduction	Dire ct	8x 01 04 53 0p FF	(0~0x05)	
CAM_3D Noise Reduction	Dire ct	8x 01 04 54 0p FF	(0~0x03)	
FLICK	50HZ	81 01 04 23 01 FF		
	60HZ	81 01 04 23 02 FF		
	Freeze On	81 01 04 62 02 FF	Freeze On Immediately	
Freeze	Freeze Off	81 01 04 62 03 FF	Freeze Off Imme dia tely	
	Preset Freeze On	81 01 04 62 22 FF	Freeze On When Running Preset	

Command	Funnation	Comma nd Packet	Note	
	Preset Freeze Off	81 01 04 62 23 FF	Freeze Off When Running Preset	
VideoSystem Set		8x 01 06 35 00 pp FF	pp: 0~21 Vide o format 0:1080 P60 1:1080 P50 2:1080160 3:1080150 4:1080 P30 5:1080 P25 6:720 P60 7:720 P50 8:720 P30 9:720 P25 10:1024 *576 P30 13:960 *540 P30 14:704 *576 P30 15:640 *48 0P30 16:576 *448 P30 17:768 *448 P30 18:640 * 360 P30 19:512 * 288 P30 20:352 * 288 P30 21:176 * 144 P30	
CAM_IDWrite		8x 01 04 22 0 p 0 q 0 r 0s FF	pqrs: Camera ID (=0000 to FFFF)	
	Menu O n	8x 01 06 06 02 FF	Turn on the menu	
	Menu Off	8x 01 06 06 03 FF	Turn off the menu	
SYS_Wenu	Menu Back	8x 01 06 06 10 FF	Menu step back	
	Menu Ok	8x 01 7E 01 02 00 01 FF	Menu ok	
IR Transfer	Transfer O n	8x 01 06 1A 02 FF	Receive IR(remote commander) CODE from VISCA communication ON/OFF	
IR_Iransfer	Transfer Off	8x 01 06 1A 03 FF		
	On	8x 01 06 08 02 FF	IR(rem ote comma nde r) rece ive ON/OFF	
IR_Receive	Off	8x 01 06 08 03 FF		
	On/Off	8x 01 06 08 10 FF		
	On	8x017D01030000FF	IR(remote commander) receive	
m_neceivene turn	Off	8x017D01130000FF	communication ON/OFF	
	Up	8x 01 06 01 VV W W 03 01 FF		
	Down	8x 01 06 01 VV W W 03 02 FF		
	Left	8x010601VVWW0103FF		
	Right	8x 01 06 01 VV W W 02 03 FF		
	Upleft	8x010601VV WW0101 FF		
	Upright	8x 01 06 01 VV W W 02 01 FF	VV: Pan speed 0x01 (low speed) to 0x18 (high speed)	
Pan tiltDrive	DownLeft	8x010601VVWW0102FF	WW: Tiltspeed 0x01 (low speed) to	
	DownRight	8x 01 06 01 VV W W 02 02 FF	0x14 (high speed) YYYY: Pan Position(TBD)	
	Stop	8x010601VVWW0303FF	ZZZZ: Tilt Position(TBD)	
	Absolute Position	8x 0 1 0 6 02 VV W W 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF		
	RelativePosition	8x 01 06 03 VV W W 0Y 0Y 0Y 0Y 07 07 07 07 FF		
	Home	8x010604FF		
	Reset	8x 01 06 05 FF		

Command	Funnation	Command Packet	Note
Dan tiltlimit£at	Set	8x 0 1 0 6 0 7 00 0 W 0 Y 0 Y 0 Y 0 Y 0 Z 0 Z 0 Z 0 Z F F	W:1 UpRight 0:DownLeft
Pan-tiltLimitSet	Clea r	8x 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF	ZZZZ: Tilt Limit Position(TBD)

PART 3 INQUIRY COMMAND

Command	Command Packet	Return Packet	Note	
CAM Rowering	8x 09 04 00 EE	y0 50 02 FF	On	
CAW_FOWEIIIIq	8203040011	y0 50 03 FF	Off(Standby)	
CAM_ZoomPosInq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position	
	9y 00 04 29 EE	y0 50 02 FF	Auto Focus	
CAIW_FOCUSIVIO delliq	6X U9 U4 36 FF	y0 50 03 FF	Manual Focus	
CAM_FocusPosInq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position	
		y0 50 00 FF	Auto	
		y0 50 01 FF	Indoor mode	
CAM WBModelpg	8×000425EE	y0 50 02 FF	Outdoor mode	
CAW_W biviodeniq	8803043311	y0 50 03 FF	OnePus h m od e	
		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	
		y0 50 00 FF	Full Auto	
		y0 50 03 FF	Manual	
CAM_AEModeInq	8x 09 04 39 FF	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 4 B F F	y0 50 00 00 0p 0q FF	pq: Iris Position	
CAM_Ga inPosiInq	8x 09 04 4 C F F	y0 50 00 00 0p 0q FF	pq: Gain Position	
CAM_ BrightPosiInq	8x 09 04 4 D FF	y0 50 00 00 0p 0q FF	pq: Bright Position	
	8x 09 04 3E FF	y0 50 02 FF	On	
CAWI_ExpCompivioueinq		y0 50 03 FF	Off	
CAM_ExpCom pPosl nq	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 VersionIng	8x 0 9 0 0 0 7 FF	y050abcd		
	0.0000000000000000000000000000000000000	mn pq rs tu vw FF		
V ideoSystemInq	8x 09 06 23 FF	y0 50 pp FF	pp: 0~21 Vide o format 0:1080P60 1:1080P50 2:1080I60 3:1080I50 4:1080P30 5:1080P25	

			6:720P60	7:720P50
			8:720P30	9:720P25
			10:1024 *768 P30	11:800*600P30
			12:1024*576P30	13:960*540P30
			14:704*576P30	15:640*480P30
			16:576*448P30	17:768*448P30
			18:640*360P30	19:512*288P30
			20:352*288P30	21:176*144P30
IR Transfer	8x 00 06 1A EE	y0 50 0 2 FF	On	
	8X 0 9 0 0 1A 11	y0 50 03 FF	Off	
	8x 09 06 08 FF	y0 50 0 2 FF	On	
IN_Neceive		y0 50 03 FF	Off	
		y0077D010400FF	Power O N/OFF	
		y0077D010407FF	Zoom tele/wide	
		y0077D010438FF	AF On/Off	
IN_NetelvenetuTT		y0077D010433FF	CAM_Backlight	
		y0 07 7 D 01 04 3F FF	CAM_Memory	
		y0077D010601FF	Pan_tiltDrive	
Dan tiltMaySpeeding	8v 00 06 11 EE	10 EO 1004 77 EE	ww: PanMaxSpeed	zz: Tilt Max
Fail-circiviaxSpeeuling	8X U9 U6 11 FF	yu 50 ww 22 FF	Speed	
Pan-tiltPosl ng	8x 09 06 12 FF	y0 50 0w 0w 0w 0w	wwww: PanPosition zzzz: Tilt	
r an tha osing	0.03001211	Oz Oz Oz Oz FF	Position	

Note: [x] means the camera address; [y] = [x+8].

VISCA PAN TILT ABSOLUTE POSITION VALUE

Pan Ang le	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(deg ree/se cond)		tilt(deg	ree/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		

VISCA EXPOSURE VALUE

	21	1/10000		0	close
	20	1/6000		1	f32
	19	1/4000		2	f28
	18	1/3000		3	f24
	17	1/2000		4	f22
	16	1/1500		5	f18
	15	1/1000		6	f14
	14	1/725		7	f11
	13	1/500	Iric	8	f9.6
	12	1/350	1115	9	f6.8
Shutter speed	11	1/250		10	f5.6
Shatter speed	10	1/180		11	f4.8
	9	1/125		12	f4.0
	8	1/100		13	f3.4
	7	1/90		14	f2.8
	6	1/60		15	f2.4
	5	1/30		16	f2.0
	4	1/15		17	f1.8
	3	1/8			
	2	/			
	1	/			
	0	/			
	0	OdB		8	16d B
	1	2dB		9	18d B
	2	4dB		10	20d B
Gain	3	6dB	Gain	11	22d B
Gain	4	8dB	Gain	12	24d B
	5	10d B		13	26d B
	6	12dB		14	28d B
	7	14dB			

ZOOM RATE & ZOOM VALUE

Optica I Zoom		Digita I Zo om		
Zoom Rate	Value	Zoom Rate	Value	
x1(wide)	0x0000	x1	0x4000	
x2	0x1851	x2	0x6000	
x3	0x22 BE	x3	0x6A80	
x4	0x28F6	x4	0x7000	
x5	0x2D45	x5	0x7300	
x6	0x3086	х6	0x7540	
x7	0x3320	х7	0x76C0	
x8	0x3549	x8	0x7800	
x9	0x371E	x9	0x78C0	
x10	0x38B3	x10	0x7980	
x11	0x3A12	x11	0x7A00	
x12	0x3 B42	x12	0x7A C0	
x13	0x3C47			
x14	0x3D25			
x15	0x3DDF			
x16	0x3E7B			
x17	0x3EF B			
x18	0x3F64			
x19	0x3FBA			
x20(tele)	0x4000			

PELCO-D PROTOCOL

Function	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Up	0xFF	Address	0x00	0x08	Pan Speed	Tilt S peed	SUM
Down	0xFF	Address	0x00	0x10	Pan Speed	Tilt S peed	SUM
Left	0xFF	Address	0x00	0x04	Pan Speed	Tilt S peed	SUM
Right	0xFF	Address	0x00	0x02	Pan Speed	Tilt S peed	SUM
Upleft	0xFF	Address	0x00	0x0C	Pan Speed	Tilt S peed	SUM
Upright	0xFF	Address	0x00	0x0A	Pan Speed	Tilt S peed	SUM
DownLeft	0xFF	Address	0x00	0x14	Pan Spee d	T ilt S peed	SUM
DownRight	0xFF	Address	0x00	0x12	Pan Speed	Tilt S peed	SUM
Zoom In	0xFF	Address	0x00	0x20	0x00	0x00	SUM
Zoom O ut	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	PresetID	SUM
Clear Prese t	0xFF	Address	0x00	0x05	0x00	PresetID	SUM
Call Preset	0xFF	Address	0x00	0x07	0x00	PresetID	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 T ilt Position	0xFF	Address	0x00	0x53	0x00	0x00	SUM
Query T ilt 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 Spee d	T ilt S peed	0xAF	XOR
Down	0xA0	Address	0x00	0x10	Pan Spee d	T ilt S peed	0xAF	XOR
Left	0xA0	Address	0x00	0x04	Pan Spee d	T ilt S peed	0xAF	XOR
Right	0xA0	Address	0x00	0x02	Pan Spee d	T ilt S peed	0xAF	XOR
Upleft	0xA0	Address	0x00	0x0 C	Pan Spee d	T ilt S peed	0xAF	XOR
Upright	0xA0	Address	0x00	0x0A	Pan Spee d	T ilt S peed	0xAF	XOR
DownLeft	0xA0	Address	0x00	0x14	Pan Spee d	T ilt S peed	0xAF	XOR
DownRight	0xA0	Address	0x00	0x12	Pan Spee d	T ilt S peed	0xAF	XOR
Zoom In	0xA0	Address	0x00	0x20	0x00	0x00	0xAF	XOR
Zoom O ut	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	PresetID	0xAF	XOR
Call Preset	0xA0	Address	0x00	0x07	0x00	PresetID	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 T ilt Position Response	0xA0	Address	0x00	0x5 B	Value High Byte	Value Low Byte	0xAF	XOR
Query Zoom Position	0xA0	Address	0x00	0x55	0x00	0x00	0xAF	XOR
Query Zoom Position Response	0xA0	Address	0x00	0x5D	Value High Byte	Value Low Byte	0xAF	XOR

OSD MENU

1.Under working mode, press the MENU key on the IR remote controller, to enter the OSD menu as bellow:

	MENU	
SYSTEM	PROTOCAL	< VISCA >
EXPOSUR	ADDRESS	< 0 0 1 >
IMAGE	BAUDRATE	< 9600 >
QUALITY	PTL LOCK	< OFF >
PTZ		
FORMAT		
RESET	TRANSFER	< OFF >
INFO	LANGUAGE	< ENGLISH>

2.After enter the main menu, use the

navigate UP/DOWN key to select the main menu. Once been selected, the main menu will change to blue background, and the right side will show all sub menu options.

3.Press the navigate RIGHT key to enter sub menu; use UP/DONW key to select the sub menu; use LEFT/RIGHT key to select parameter.

4. Press the MENU key again to return to previous menu. Press the MENU key continuously to exit the OSD menu. Before exiting, will show up a window to select whether need to save all settings (use LEFT/RIGHT key to

set). As bellow:

	MENU		
SYSTEM			
EXPOSUR			
IMAGE			
QUALITY	SAVE?	YES	
PTZ			
FORMAT			
RESET			
INFO			

5.OSD Menu Setting List

	PROTOCOL	VISCA, PELC O-P, PELC O-D
	ADDRESS	VISCA:1~7 PELCO-P/D:1~255
	BAUD RATE	2400,4800,9600,115200
OVOTEM	PTL LOCK	Protocol lock: once set, above protocol setting will be locked, to avoid changes
5151 EM	RS485	RS485 ON/OFF (RS485 function is customized)
N T	VGAOUT	VGA output can be YPbPr or VGA output (customized)
	TRANSFER	IR Transfer/IR Pass function
	LANGUAGE	Chinese, English, Spanish, Russian

	EXPOS URE MODE	AUTO, MANUAL, BRIGHT
EXPOS URE	SHUTTER	Shutter speed: 1/8~1/10000, only valid under manual mode
	IRIS	Iris setting:CLOSE~F1.8, only valid under manual mode

GAIN	Gain setting:0dB~28dB, only valid under manual mode
BRIGHT	Bright setting:0~15, only valid under bright priority mode.
EC MODE	Exposure compensation ON/FF
EC POSI	Set exposure compensation lever
BLC	Back light compensation ON/FF

	WR MODE	White Balance: AUTO 、 INDOOR 、 OUTDOOR 、 MANUAL 、
	W B MODE	OUTAUTO $\$ SODIUM LAMP AUTO $\$ SODIUM LAMP
	R GAIN	Red gain level: 0~255, only valid under manual white balance mode.
	B GAIN	Blue gain level:0~255, only valid under manual white balance mode.
IMAGE	COLOR G	Color gain setting: 0~14
	FLICK	Anti-Flick er setting:50/60 HZ, to reduce the video flicker
	FREEZE	Image freeze when run preset (need customization)
	DZOOM	Tum on/off digital zoom
	FOCUS	Select focus mode

	2D NR	2D noise reduction:0~5, the bigger value, the less noise on image, the
		lower resolution
	3D NR	3D noise reduction:0~3, the bigger value, the less motion noise on image.
QUALIT Y	SHARPNESS	Sharpness setting: 0~4, the higher value, the higher resolution.
	CONTRAST	Set contrast: 0-6, the higher value, the higher resolution
	SATURATION	Set saturation.
	TRACK MODE	Absolute position mode selection: PRECISE/FLUENT

	PWR ACT	Set power on action: OFF, PRE1, PRE2
	SPEEDBYZ	Speed by zoom: proportional speed, the bigger zoom, the slower speed.
	MOUNT M	Mount mode: up, down
DT 7	FLIP.HOR	Flip horizont al
PIL	FLIP VER	Flip vertical
	PT SPD	Set pan tilt speed
	ZOOM SPD	Set zoom speed
	MENU MIR	Tum on/off/menu mirror function.

VIDEO FORMAT	1080P60	1080P25	Once selected, press OK key to confirm.
	1080P50	720P60	
	1080160	720P50	
	1080150	720P30	
	1080P30	720P25	

RESET	SYS RESET	System reset
	CAM RESET	Camera reset
	PT RESET	Pan tilt reset
	ALL RESET	All res et

MESSAGE	IR ADDR	Camera IR control address	
	FOCUS	Focus mode	
	CLIENT	Client proto col, can't be changed	
	MODEL NO.	Model number	
	ARM VER	ARM version	
	FPGA VER	FPGA version	
	CAM VER	Camera version	
	RELEASE	Soft ware release date	

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 and SEJIN 4PPM code. For customized with other code, pls contact us for adding:

Dial Switch (IR CODE TYPE)				
	SW-3	SW-4	Note	
1	OFF	OFF	Off (Close IR Transfer)	
2	ON	OFF	Undefined	
3	OFF	ON	SEJIN 4PPM CODE	
4	ON	ON	NEC CODE(st and ard)	

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

5. The camera can save all settingS, no need to re-set after power off and on.

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 casue black video issue.

2. Make sure the USB3.0 camera is recognized by the PC Device Manager.

3. Make sure the interval of video form at switching more than 3 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 VISC A Command
PU_BACKLIGHT_COMPENSATION_CONTROL	8x 01 04 33 02 FF
PU_BRIGHTNESS_CONTROL	8x 01 04 4D 00 00 0p 0q FF
PU_GAIN_CONTROL	8x 01 04 49 00 00 00 0p FF
PU_SHARPNESS_CONTROL	8x 01 04 42 00 00 0p 0q FF
PU_WHITE_BALANCE_TEMPERATURE_CONTROL	8x 01 04 35 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 п ss FF
CT_ZOOM_RELATIVE_CONTROL	8x 01 04 07 pp FF
PU_CONTRAST_CONTROL	8x 01 04 53 0p FF
PU_HUE_CONTROL	8x 01 04 54 0p FF

 Note: different to standard UVC protocol, PU_CONTRAST_CONTROL means 2D noise reduction, not CONTRAST value; PU_HUE_CONTROL means 3D noise reduction, not HUE (chroma) value.