Prestel

Prestel HD-PTZ1HU2

10X HDMI+USB Type C
HD PTZ Camera
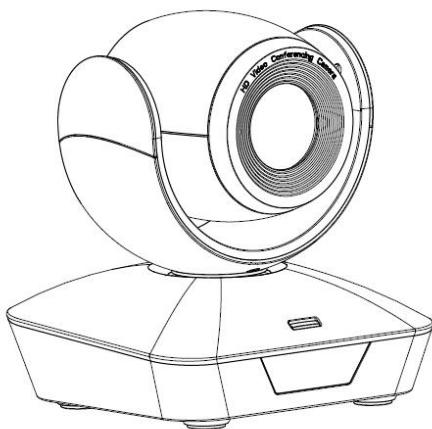
USER MANUAL

▰▰▰▰▰ CONTENT ▰▰▰▰▰

═════ SAFETY GUIDES ═════

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

● The camera power voltage is 12V DC, rated currency is 2A. We suggest you use it with the original power supply adapter supplied by the factory.

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

● Operational environment: -10℃~50℃, humidity less than 80%.

● To avoid any danger, please keep the camera away from the corrosive liquid.

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

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

● Video 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.

● 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.

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

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

● Power Supply Polarity:
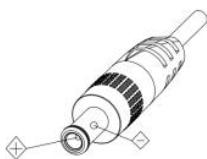
▰▰▰▰▰ SAFETY GUIDES ▰▰▰▰▰

Attention！

▲ The video quality may be affected by the specific frequencies of electromagnetic field.

▲ Never grasp the head of the camera, and never move the camera by hand when it is working, otherwise, mechanism maybe destroyed.
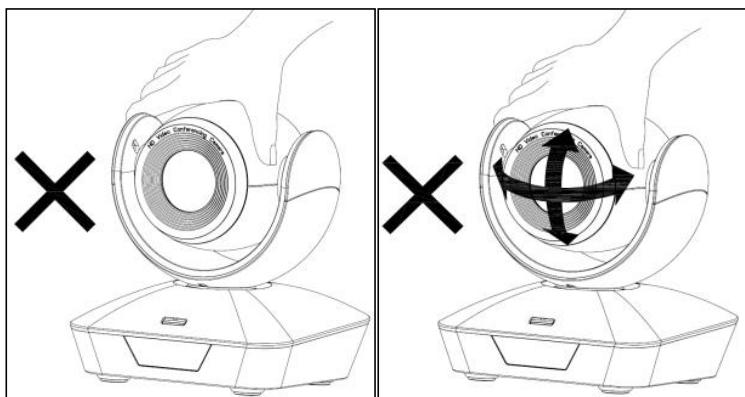
Declaration：

■ Instructional Manual is for reference only. Please refer to the actual product.

■ Please contact Customer Service staff for the latest programs and supplementary documentations.

■ In case of any doubt or dispute in the instruction manual, the final interpretation of the company shall prevail.

▬▬▬▬▬▬ USE CHECK ▬▬▬▬▬▬

PACKING LIST

Check all below items when open the package
Camera ··· 1PCS
Power Adapter·· 1PCS
Power Cable·· 1PCS
Remote Controller······································· 1PCS
USB Type-C Cable······································· 1PCS
RS232 Cable·· 1PCS
User Manual·· 1PCS
QC PASS··· 1PCS

QUICK START
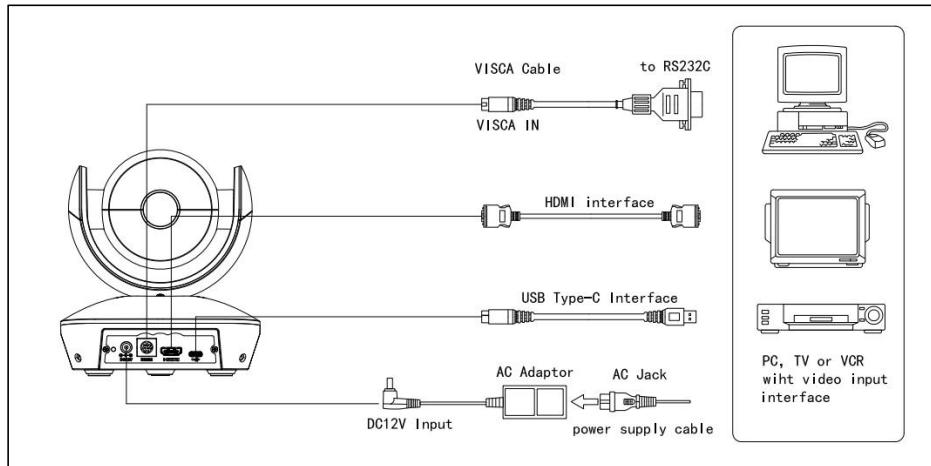
▬▬▬▬▬▬ USE CHECK ▬▬▬▬▬▬

Dial Switch Setting (at the bottom of the camera)
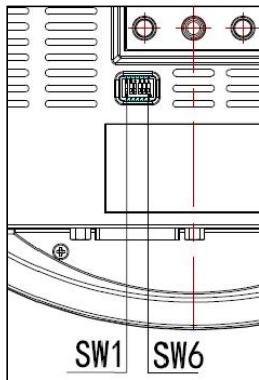
			Dial Switch (ARM)
	SW-1	SW-2	Instruction
1	OFF	OFF	Upgrading mode
2	ON	OFF	Debugging mode
3	OFF	ON	Undefined
4	ON	ON	Working mode

			Dial Switch
	SW-3	SW-4	Instruction
1	OFF	OFF	Reserved
2	ON	OFF	Reserved
3	OFF	ON	Reserved
4	ON	ON	Reserved

			Dial Switch
	SW-5	SW-6	Instruction
1	OFF	OFF	Reserved
2	ON	OFF	Reserved
3	OFF	ON	Reserved
4	ON	ON	Reserved

SW1 SW6

≡≡≡ PRODUCT HIGHLIGHTS ≡≡≡

★With the most advanced HD DSP, 1/2.8-inch 2.4 million image sensor.

★High-quality 10x 62.5-degree wide-angle optical lens, to ensure the smooth and transparent HD images.

★ Independent intellectual property rights of the focus algorithm, fast and accurate focus performance, to ensure that the image remains clear in the process of zooming, focusing process is fast and smooth.

★ USB and HDMI output simultaneously.

★ HDMI maximum resolution support 1920*1080P60 output, suitable for a variety of occasions.

★ USB Type-C multiple compression output, the maximum resolution support MJPG1920*1080P60, suitable for different video software applications.

★USB Type-C support Windows, MAC OS, Android, Linux and other operating systems.

★Using the standard UVC protocol, compatible with most video conferencing software.

★Support image flip function: can be front-mounted, inverted, to meet the requirements of different occasions video framing.

★High-precision motor positioning, quiet and smooth mechanical rotation.

★Support 128 preset bits.

★Support RS232/485 serial port control.

★ Standard Sony Visca and Pelco-P/D control protocol.

★Support WDR wide dynamic, 3D noise reduction function.

★Brightness, contrast, hue, saturation, sharpness, gamma, exposure, white balance, gain and other parameters can be adjusted.

★Support user's own program upgrade.

★Support USB Type-C interface power supply.

★Comes with a multi-functional infrared remote control, easy and fast for users to use.

★Multi-language menu: support Chinese, English, Russian.

CAMERA SPEC

10X HD PTZ Camera		
Sensor	1/2.8inch high quality, 2.4 MP CMOS Sensor	
Video Format	HDMI	1920*1080P60/59.94/50/30/29.97/25/24 1920*1080I60/59.94/50 1280*720P60/59.94/50/30/29.97/25
	USB Type-C	MJPG: 1920*1080P60; 1280*960P60; 1280*720P60; 1024*768P60; 800*600P60; 640*480P30; 320*240P60 YUY2：640*480P30；320*240P30
Video Interface	HDMI, USB Type-C	
Focal Length	4.7mm~47mm	
Aperture	F1.6~3.0	
View Angel	62.5°(Wide)~6.43°(Tele)	
Lens Magnifications	10x optical zoom +12x digital zoom	
Rotation Angle	Pan: ±170°; Tilt: -30°~+90°;	
Rotation Speed	Pan: 0.1°~120°/s; Tilt: 0.1°~80°/s	
Preset	Remote controller: 10; RS232: 128; Accuracy: 0.1°	
Control Port	RS232	
Protocol	Visca Serial, Pelco-P, Pelco-D	
Minimum Lux	0.7lux	
White Balance	Auto / Manual / ATW / Push / Indoor / Outdoor / Color Temperature	
Exposure	Auto / Manual /Shutter / Iris / Bright	
Focus	Auto / Manual	
Iris	Auto / Manual	
Shutter	Auto / Manual	
Gamma select	Supported	
WDR	Supported	
BLC	Supported	

CAMERA SPEC

2D Noise Reduction	Supported
3D Noise Reduction	Supported
Anti-flicker	OFF, 50Hz, 60Hz
Pan Tilt Flip	Supported
Mirroring	Supported
Input Voltage	DC 12V / USB 5V
Dimension	148mm×132mm×162mm
Net Weight	0.9kg(2LBS)
Working Temperature	-10℃~50℃
Working Humidity	≤80%

██ ██ INTERFACE DESCRIPTION ██ ██
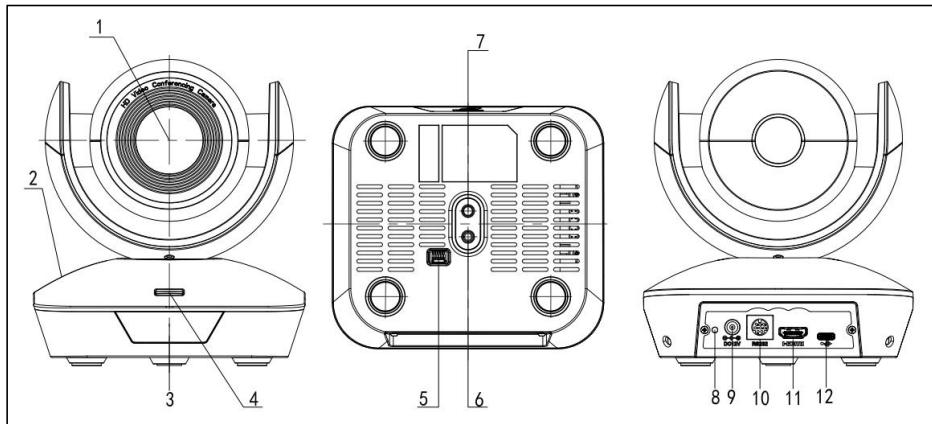
1.Camera Lens   5.Dial Switch   9.DC 12V plug

2.Camera Base   6.Tripod Screw Hole   10.RS232 port

3.IR Receiver Panel   7.Installation Hole   11.HDMI port

4.Power Indicator Light   8.Power Indicator   12.USB Type-C port
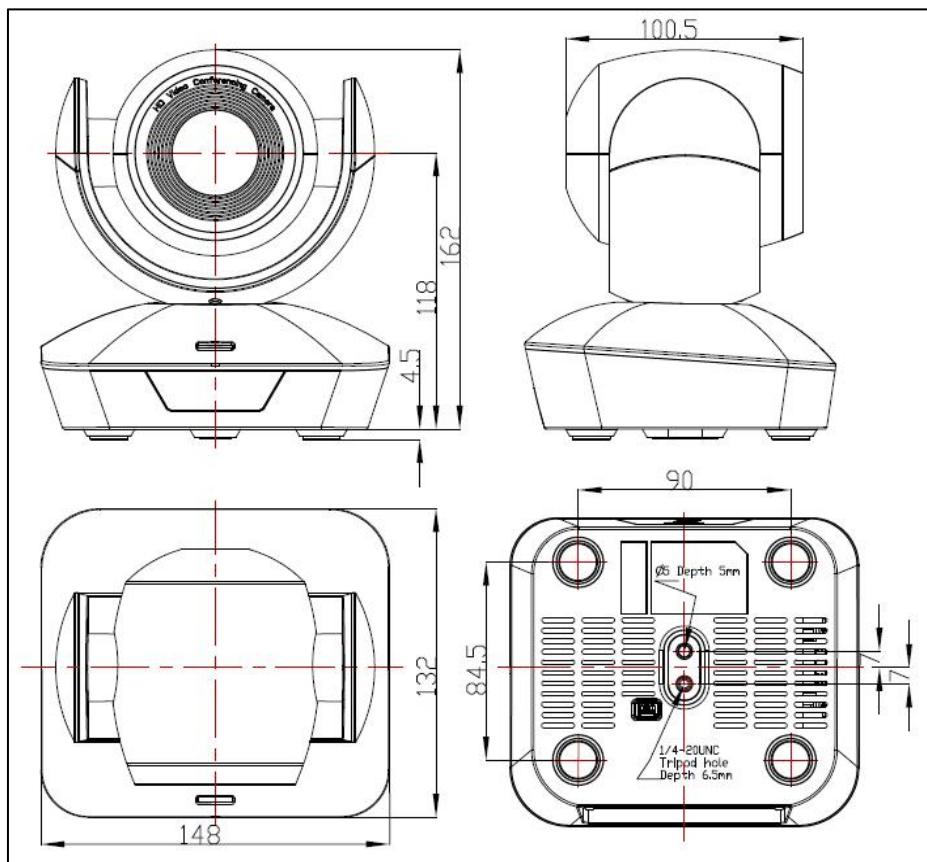
▄▄ ▄▄ IR REMOTE CONTROLLER ▄▄ ▄▄

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.

▬▬ IR REMOTE CONTROLLER ▬▬

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)
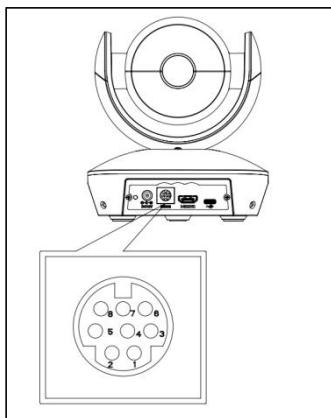
NO.	Functions
1	DTR
2	DSR
3	TXD
4	GND
5	RXD
6	A
7	IR OUT
8	B

VISCA IN 与 Mini DIN

Camera VISCA 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	NC
7	IR OUT	7	NC
8	B(-)	8	NC

VISCA IN 与 DB9 Connection

CameraVISCA 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
Baud rate	2400/4800/9600/115200
Start bit	1bit
Date bit	8bits
Stop bit	1bit
Check bit	None

▰▰▰▰ **VISCA PROTOCOL** ▰▰▰▰

Part1 Camera Return Command

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

Error Messages		
	command	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 type	function	command	
Address Set	Broadcast	88 30 01 FF	Address setting
IF_Clear	Broadcast	88 01 00 01 FF	I/F Clear
Command Cancel		8x 21 FF	
CAM_Power	On	8x 01 04 00 02 FF	Power ON/OFF
	Off	8x 01 04 00 03 FF	Address setting
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))
	Direct with speed	8x 0A 04 47 0t 0p 0q 0r 0s FF	t: spd 0~7 pqrs: Zoom Position (0(wide) ~0x4000(tele))
CAM_DZoom	ON	8x 01 04 06 02 FF	
	OFF	8x 01 04 06 03 FF	
	Combine Mode	8x 01 04 36 00 FF	Combine with optical zoom control
	Separate Mode	8x 01 04 36 01 FF	Separate with optical zoom control
	Stop	8x 01 04 06 00 FF	Enable In separate mode
	Tele (Variable)	8x 01 04 06 2p FF	Enable In separate mode
	Wide (Variable)	8x 01 04 06 3p FF	Enable In separate mode
	Direct	8x 01 04 46 0p 0q 0r 0s FF	Enable In separate mode
CAM_Focus	Stop	8x 01 04 08 00 FF	
	Far(Standard)	8x 01 04 08 02 FF	
	Near(Standard)	8x 01 04 08 03 FF	
	Far (Variable)	8x 01 04 08 2p FF	p=0 (Low) to 7 (High)
	Near (Variable)	8x 01 04 08 3p FF	p=0 (Low) to 7 (High)

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Command type	function	command	
	Direct	8x 01 04 48 0p 0q 0r 0s FF	pqrs: Focus Position
	Auto Focus	8x 01 04 38 02 FF	
	Manual Focus	8x 01 04 38 03 FF	
	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	
	One Push	8x 01 04 35 03 FF	
	ATW	8x 01 04 35 04 FF	
	Manual	8x 01 04 35 05 FF	
	Sodium lamp	8x 01 04 35 08 FF	
	fluorescent	8x 01 04 35 09 FF	
	One Push Trigger	8x 01 04 10 05 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	8x01 04 39 00 FF	Automatic Exposure mode
	Manual	8x 01 04 39 03 FF	Manual Control mode
	Shutter Priority	8x 01 04 39 0A FF	Shutter Priority Automatic Exposure mode
	Iris Priority	8x 01 04 39 0B FF	Iris Priority Automatic Exposure mode
	Bright	8x 01 04 39 0D FF	Bright Mode (Manual control)
CAM_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(0~0xD)
	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 (0~0x0F)
	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 (0~0x1B)

VISCA PROTOCOL

Command type	function	command	
CAM_WDR	On	8x 01 04 3D 02 FF	Exposure Compensation ON/OFF
	Off	8x 01 04 3D 03 FF	
	Direct	8x 01 04 D3 pq FF	pq: ExpComp Position (0~0x6)
CAM_Back Light(BLC)	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	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 (0~0x0F)
CAM_Memory(preset)	Reset	8x 01 04 3F 00 pp FF	pp: Preset Number(=0 to 127) 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_Picture Flip	On	8x 01 04 66 02 FF	Image Flip Vertical ON/OFF
	Off	8x 01 04 66 03 FF	
CAM_RS485Ctl	On	8x 01 06 A5 02 FF	
	Off	8x 01 06 A5 03 FF	
CAM_Saturation	Saturation	8x 01 04 A1 00 00 0p 0q FF	pq:saturation level 0x00~0x0f
CAM_Contrast	Contrast	8x 01 04 A2 00 00 0p 0q FF	pq:Contrast level 0x00~0x0f
CAM_Speed By Zoom	On	8x 01 06 A0 02 FF	
	Off	8x 01 06 A0 03 FF	
CAM_PT Speed	PT Speed	8x 01 04 C1 00 00 0p 0q FF	pq:PT speed 0x05~0x18
CAM_Zoom Speed	Zoom Speed	8x 01 04 D1 00 00 0p 0q FF	pq:Zoom speed 0x01~0x07
CAM_Freeze	Freeze	8x 01 04 75 0p FF	p: Freeze switch 3=OFF, 2=ON
CAM_Preset Freeze Set	Preset Freeze Set	8x 01 04 76 0p FF	p: Preset Freeze switch 3=OFF, 2=ON
CAM_Preset PT Speed Set	Preset PT Speed Set	8x 01 7E 01 0B 00 qq FF	qq:Preset PT Speed 02~24 default:15
CAM_Preset Zoom Speed Set	Preset Zoom Speed Set	81 01 7E 01 2B 00 qq FF	qq:Preset Zoom Speed 01~07 default:5
CAM_Preset Speed Adj	Preset Speed Adj	8x 01 7E 01 1B 0p FF	p: Adjustment of direction 3=down, 2=up
CAM_IR address	IR address	8x 01 06 D8 0p FF	p:IR address 1~4
CAM_Gamma	Gamma set	8x 01 04 5B 0p FF	P:Gamma NO. (0~4)
CAM_2D Noise Reduction	Direct	8x 01 04 A5 0p FF	(0~0x01)
CAM_3D Noise Reduction	Direct	8x 01 04 53 0p FF	(0~0x05)
FLICK	50HZ	8x 01 04 23 01 FF	
	60HZ	8x 01 04 23 02 FF	
	OFF	8x 01 04 23 00 FF	

▰▰▰▰ **VISCA PROTOCOL** ▰▰▰▰

Command type	function	command	
Video System Set(Factory)		8x 01 06 35 00 pp FF	pp: Video format 1080P60　　　0x00 1080P50　　　0x01 1080I60　　　0x02 1080I50　　　0x03 1080P30　　　0x04 1080P25　　　0x05 720P60　　　0x06 720P50　　　0x07 720P30　　　0x08 720P25　　　0x09 1080P59.94　　0x0E 1080I59.94　　0x0F 1080P29.97　　0x10 720P59.94　　0x13 720P29.97　　0x14 1080P24　　　0x11 1080P23.98　　0x12
Video System Set(Sony)		8x 01 04 24 72 0p 0q FF	pq: Video format 1080P60　　　0x2e 1080P50　　　0x2f 1080I60　　　0x01 1080I50　　　0x04 1080P30　　　0x06 1080P25　　　0x08 720P60　　　0x09 720P50　　　0x0c 720P30　　　0x0e 720P25　　　0x11 1080P59.94　　0x13 1080I59.94　　0x02 1080P29.97　　0x07 720P59.94　　0x0a 720P29.97　　0x0f 1080P24　　　0x2a 1080P23.98　　0x2b
CAM_ID Write		8x 01 04 22 0p 0q 0r 0s FF	pqrs: Camera ID (=0000 to FFFF)
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
	Menu Back	8x 01 06 06 10 FF	Menu step back
	Menu OK	8x 01 7E 01 02 00 01 FF	Menu ok
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	
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	

▰▰▰▰ VISCA PROTOCOL ▰▰▰▰

Command type	function	command	
	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
	Clear	8x 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF	

Part3 Camera Inquiry Command

Command type	command	return	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_DZoom On Off Inq	8x 09 04 06 FF	y0 50 0p FF	p: 2: ON 3: OFF
CAM_DZoom Mode Inq	8x 09 04 36 FF	y0 50 0p FF	p: 0:combination mode 1:separate mode
CAM_DZoom Posi Inq	8x 09 04 46 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_Speed By Zoom Inq	8x 09 06 A0 FF	y0 50 0p FF	p: 2: ON 3: OFF
CAM_PT Speed Inq(IR)	8x 09 04 C1 FF	y0 50 pp FF	pp: 0x05~0x18
CAM_Zoom Speed Inq(IR)	8x 09 04 D1 FF	y0 50 0p FF	p:0x00~0x07
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_2D_Inq	8x 09 04 A5 FF	y0 50 03 FF	(0~0x01) p: 0: off 1: on
CAM_3D_Inq	8x 09 04 53 FF	y0 50 03 FF	(0~0x05) p:0:off 1: auto 2~5: noise level
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	OnePush mode
		y0 50 04 FF	ATW
		y0 50 05 FF	Manual
CAM_RGain Inq	8x 09 04 43 FF	y0 50 00 00 0p 0q FF	pq: R Gain
CAM_BGain Inq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: B Gain
CAM_Saturation Inq	8x 09 04 A1 FF	y0 50 00 00 0p 0q FF	pq: saturation
CAM_Contrast Inq	8x 09 04 A2 FF	y0 50 00 00 0p 0q FF	pq: contrast

Command type	command	return	note
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_Flicker Mode Inq	8x 09 04 AA FF	y0 50 0p FF	p: 0: OFF 1: 50HZ 2: 60HZ
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_WDR Mode Inq	8x 09 04 3D FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_WDR Pos Inq	8x 09 04 D3 FF	y0 50 0p FF	p: WDR Position
CAM_Aperture Inq	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture Gain
CAM_Preset Exist Inq	8x 09 04 3F pp FF	y0 50 0q FF	pp: Memory number q: 1=preset exist 0=preset not saved
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_ID Inq	8x 09 04 22 FF	y0 50 0p 0q 0r 0s FF	pqrs: Camera ID
CAM_DHCP Inq	8x 09 04 AE FF	y0 50 pp FF	
CAM_IP Inq	8x 09 04 AB FF	y0 50 0p 0p 0q 0q 0r 0r 0s 0s FF	
CAM_MASK Inq	8x 09 04 AC FF	y0 50 0p 0p 0q 0q 0r 0r 0s 0s FF	
CAM_GATEWAY Inq	8x 09 04 AD FF	y0 50 0p 0p 0q 0q 0r 0r 0s 0s FF	
CAM_Flare Mode Inq	8x 09 04 B6 FF	y0 50 pp FF	
CAM_Flare Bright	8x 09 04 B7 FF	y0 50 pp FF	
CAM_Flare Red	8x 09 04 B8 FF	y0 50 pp FF	
CAM_Flare Green	8x 09 04 B9 FF	y0 50 pp FF	
CAM_Flare Blue	8x 09 04 BA FF	y0 50 pp FF	
CAM_Version Inq	8x 09 00 02 FF	y0 50 ab cd mn pq rs tu vw FF	
Video System Inq(Factory)	8x 09 06 23 FF	y0 50 pp FF	pp: Video format
Video System Inq(Sony)	8x 09 04 24 72 FF	y0 50 0p 0p FF	pp: Video format
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
Pan-tilt Max Speed Inq	8x 09 06 11 FF	y0 50 ww zz FF	ww: Pan Max Speed zz: Tilt Max Speed
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

▰▰▰▰ VISCA PROTOCOL ▰▰▰▰

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		

▰▰▰▰ **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
Up right	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
Stop	0xFF	Address	0x00	0x00	Pan Speed	Tilt Speed	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
Up right	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
Stop	0Xa0	Address	0x00	0x00	Pan Speed	Tilt Speed	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 key on the IR remote controller, to enter the OSD menu as bellow:

MENU				
SYSTEM	PROTOCOL	<	VISCA	>
EXPOSURE	ADDRESS	<	001	>
IMAGE	BAUDRATE	<	9600	>
QUALITY	PROTOCOL LOCK	<	OFF	>
PTZ SETTINGS	RS485	<	ON	>
VIDEO FORMAT	VISCA PATH	<	OVER ALL	>
RESET	LANGUAGE	<	ENGLISH	>
INFORMATIONS				

2. After entering the main menu, use the navigate UP/DOWN key to select the main menu. Once selected, the main menu will change to blue background, and the right side will show sub-menu options.

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

4. Press the MENU key again to return to the previous menu. Press the MENU key continuously to exit the OSD menu.

5. OSD Menu Setting List

	PROTOCOL	Optional: VISCA, PLC.P, PLC.D	Default: VISCA
	ADDRESS	VISCA:: 1~7 PLC-P/D: 0~255	Default: 1
	BAUDRATE	Optional: 2400, 4800, 9600, 115200	Default: 9600
	PROTOCOL LOCK	Optional: OFF, ON	Default: OFF
SYSTEM	RS485	Optional: OFF, ON	Default: ON
	VISCA PATH	Optional: OVER ALL, OVER IP, OVER COM	Default: OVER ALL
	LANGUAGE	Optional: CHINESE, ENGLISH, RUSSIAN	Default: ENGLISH

	EXPOSURE MODE	AUTO, MANUAL, SHUTTER, IRIS, BRIGHT	Default: AUTO
EXPOSURE	SHUTTER	Shutter speed: 1/30~1/10000, only valid under MANUAL and SHUTTER mode	Default: AUTO

▬▬▬▬▬▬ OSD MENU ▬▬▬▬▬▬

	IRIS	Iris setting: CLOSE~F1.8, only valid under MANUAL and IRIS mode	Default: AUTO
	GAIN	Gain setting: 0dB~30dB, only valid under MANUAL mode	Default: AUTO
	EXPOSURE BRIGHT	Bright setting: 0~27, only valid under BRIGHT priority mode.	Default: AUTO
	BRIGHT	0~15	Default: 8
	WIDE DYNAMIC MODE	Optional: OFF, ON	Default: OFF
	WIDE DYNAMIC LEVEL	1~6	Default: 1
	BLC	OFF/ON	Default: OFF

	WHITE BALANCE MODE	Optional: ATW, MANUAL, AUTO, INDOOR, OUTDOOR, PUSH, C.T.	Default: ATW
	RED GAIN	Red gain level: 0~255, only valid under manual white balance mode	Default: AUTO
	BLUE GAIN	Blue gain level:0~255 , only valid under manual white balance mode	Default: AUTO
IMAGE	COLOR TEMPERATURE	Set the color temperature value: 2500~10000 only valid under C.T. mode.	Default: AUTO
	FLICKER	Anti-Flicker setting:50/60HZ/OFF, to reduce the video flicker	Default: 50HZ
	DIGITAL ZOOM	Optional: OFF, ON	Default: OFF
	FOCUS MODE	AUTO, MANUAL	Default: AUTO

	2D NOISE REDUCTION	2D noise reduction: the bigger value is, the less noise on image is, the lower resolution is	Default: OFF
	3D NOISE REDUCTION	3D noise reduction: OFF/AUTO/0~4, the bigger value is, the less motion noise on image is. High value will cause image smear	Default: AUTO
QUALITY	SHARPNESS	Sharpness setting: 0~15, the higher value is, edge of the image will be sharpen	Default: 6
	CONTRAST	Set contrast level: 0~15	Default: 8
	SATURATION	Set saturation level: 0~15	Default: 8
	GAMMA	Select gamma level: 0~15	Default: 8
	IMAGE STYLE	Optional: USER, NORMAL, COLORFULL	Default: USER

PTZ SETTINGS	SPEED BY ZOOM	Optional: OFF, ON	Default: ON
	FLIP HORIZONTAL	Flip horizontal	Default: OFF
	FLIP VERTICAL	Flip vertical	Default: OFF
	PT SPEED	Set Pan Tilt speed: 5~24	Default: 18
	ZOOM SPEED	Set Zoom speed: 1~7	Default: 5
	PRESET FREEZE	Optional: OFF, ON	Default: OFF
	PRESET PT SPEED	Preset head speed: 2~24	Default: 15
	PRESET ZOOM SPEED	Preset zoom speed: 1~7	Default: 5
	PRESET SAVE AE&AW	Optional: OFF, ON	Default: OFF

VIDEO FORMAT	SIZE	1080P, 1080I, 720P
	FRAME RARE	60, 59.94, 50, 30, 29.97, 25, 24, 23.98

RESET	SYSTEM RESET	Reset communication parameter to default
	CAMERA RESET	Reset image parameter to default
	PAN TILI RESET	Reset pan/tilt parameter to default
	ALL RESET	Reset all parameter to default

INFO RMATIONS	IR ADDRESS	Camera IR control address
	CLIENT	VISCA
	MODEL NO.	Model number
	ARM VERSION	ARM firmware version
	ISP VERSION	Camera ISP firmware version
	RELEASE DATE	Software release date

▬▬▬▬▬ 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 properties	VISCA
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