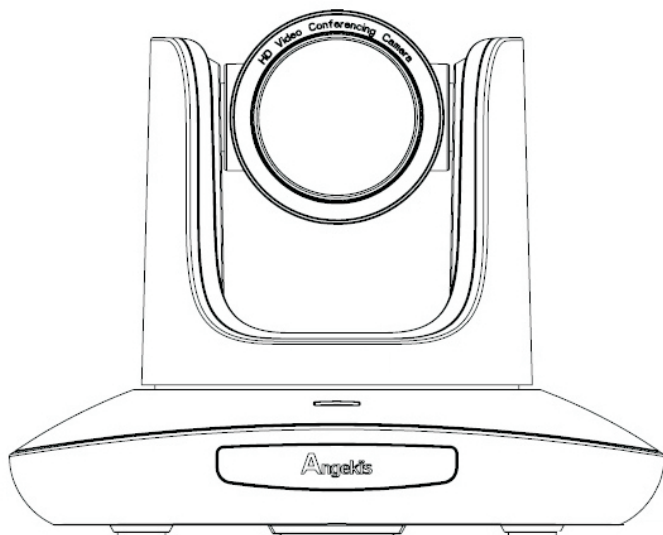


U3D-12FHD6 USB3.0 HD Video Camera



User Manual

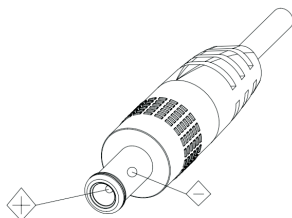
Version V1.1(English)

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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 current 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. Operational environment: 0°C–50°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 detach 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 field.

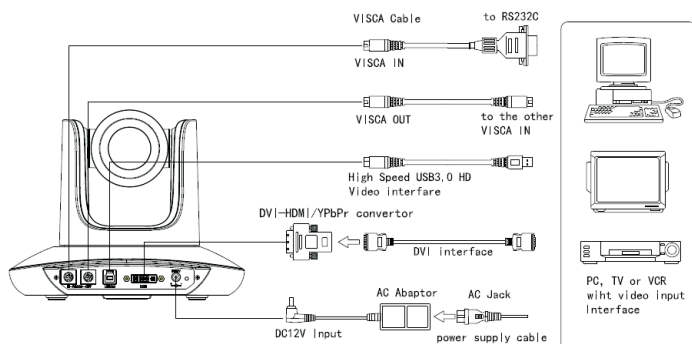
ACCESSORIES

Check all bellow items when open the package:

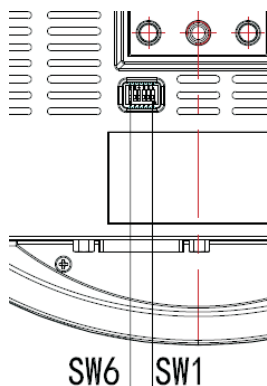
Camera	1
Power Adapter	1
Power Cable	1
RS232 Control Cable	1
USB3.0 Cable	1
Remote Controller	1
User Manual	1
Double-sided Adhesive	1

QUICK START

1. Check all cable connections before power on



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



Dial Switch (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

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

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(standard)

PRODUCT HIGHLIGHTS

Sleek and intelligent design
Crystal clear HD image quality.

Low light ability. Excellent image quality even at low lux of 0.01 lux.
DVI-I (HDMI) & USB3.0 simultaneous output.

Far end camera control via USB3.0 UVC ability based on Codecs FECC
(For example zoom.us)
Desktop app control software included to control the camera and video settings..
Visca control

Utilizing belt drive technology the twin motors of the PTZ are ultra quiet, smooth and provide fast movement.

Larger FOV at 72.5 degree with no video distortion

2D and 3D NR offers the best video quality to adjust to different room lighting.
Fully operational remote control with power off function, setting the camera back to the start position.

Reverse mountable, tripod screw thread at the bottom

CAMERA SPEC

Video Format: USB3 and DVI--1080p59.94/50/29.97/25; 720p59.94/50/29.97/25;

DVI--1080i 59.94/50.

Video Output: USB3.0&DVI-I

Sensor: 1/2.3 inch 4K UHD CMOS sensor

Lens: f3.9~46.1mm(12Xzoom), F1.8 - 2.8

Angle of View: 72.5°

Rotation Angle: Pan rotation: $\pm 170^\circ$; Tilt rotation: $-30^\circ \sim +90^\circ$, support up--side down installation

Rotation Speed: Pan speed: $0.1^\circ \sim 150^\circ /s$; Tile speed: $0.1^\circ \sim 80^\circ /s$

Preset: 10 via IR remote setting, (255 via COM setting) , preset accuracy : 0.2°

Support:Auto/ManualWhiteBalance,Auto/ManualExposure(Iris,Shutter),Auto/ Manual

Control signal port: SB UVC FECC and 8 pin mini DIN--RS232--VISCA/Pelco-D/Pelco-P protocol

Power voltage: DC12V/2.0A; power port: HEC3800.

Max consumption:24W

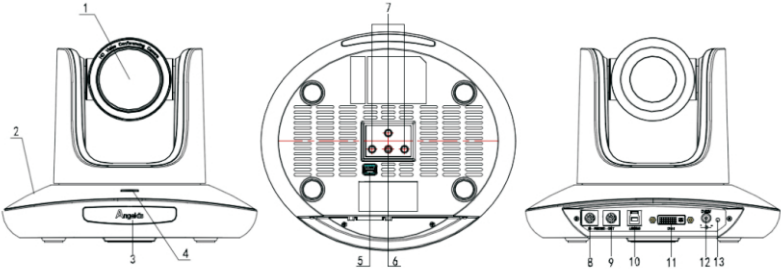
Working temperature: $-5 \sim 45^\circ\text{C}$

Storage temperature: $-20 \sim 60^\circ\text{C}$

Net weight: 1.5KG

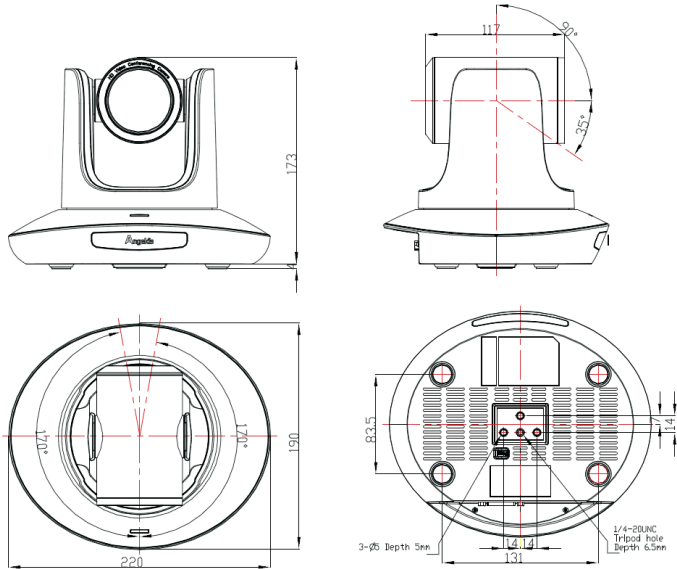
Dimension: 220x190x173 mm

CAMERA INTERFACE

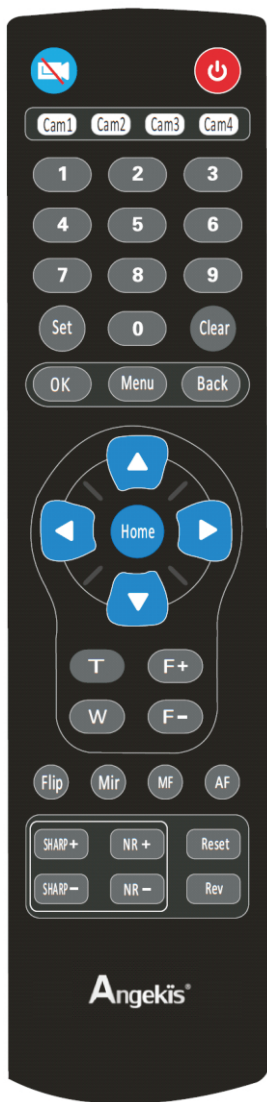


- 1.Camera Lens
2.Camera Base
3.Power Indicator Light
4.IR Receiver Panel
- 5.Dial Switch
6. Tripod Screw Hole
7. Installation Hole
8.VISCA IN port
- 9.VISCA OUT port
10.USB3.0 port
11.DVI-I port
12. Power Input 12VDC

CAMERA DIMENSION(mm)



IR REMOTE CONTROLLER

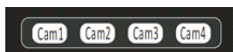


Mute Key

Short press to close the video display and show Mute picture.

Power Key

Under normal working mode, short press Power key to let the camera enter standby mode; Press it again, the camera will do self-configuration and then go back to HOME position; It will go to preset position if the power on mode has been set.



Address/Camera Setting Key

Set+ (Cam1~Cam4): set camera's remote control address.
Short press Cam1~Cam4 to select the camera.



Number Key

Set Preset: Set+ (0~9) to set preset;
Run Preset: short press the (0~9) number key to run preset.

Clear Key

Clear+ (0~9): to clear the relative preset;
Long press to clear all preset.



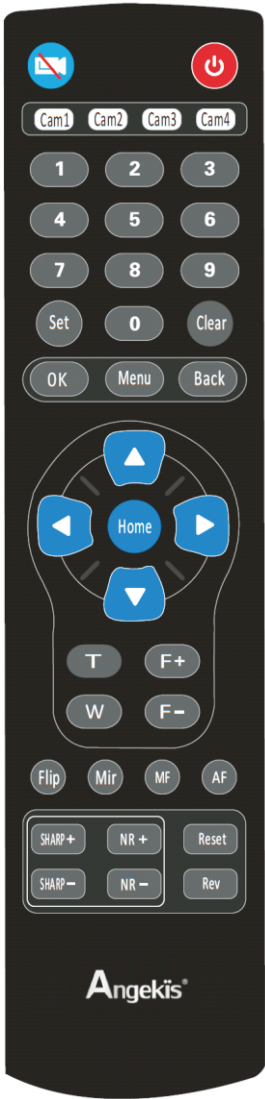
Menu Key

Ok: to confirm the menu selection;

Menu: enter/exit menu;

Back: back to previous menu;

IR REMOTE CONTROLLER



F+/F-:
Set focus by manual, only valid under manual focus mode,

T/W:
Set the lens zoom rate,

Navigate Key: Up/Down/Left/Right
Under normal working mode, use navigate key to set the pan tilt, and select values when enter OSD,

Home Key:
Under normal working mode, short press Home key to let the camera go back to home position.



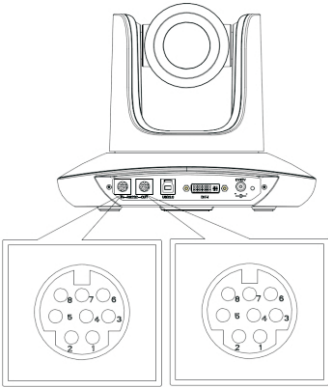
Flip: Enable/Disable the picture up/down flip;
Mir: Enable/Disable the picture left/right flip;
MF: Enable manual focus model;
AF: Enable manual focus model.



SHARP+/-: Set sharpness level;
NR+/-: Set noise reduction level;
Reset: Long press(3S) to reset camera;
Rev: Display camera revision;

Note: under specific environment, due to heavy infrared interfere, (such as if put the camera on a big infrared touch screen, or if there is a strong iodine-tungsten lamp in the room), it may affect the infrared remote receiver performance, which may cause wrong control/movement. In this case, if the user doesn't need to use the remote controller, we suggest to dial the SW3-4 to OFF, to close the infrared signal receiving.

VISCA IN(RS232) PORT



VISCA IN & RS485 Connection

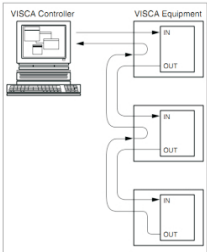
No.	Function	Camera VISCA IN	RS485
1	DTR	1	DTR
2	DSR	2	DSR
3	TXD	3	TXD
4	GND	4	GND
5	RXD	5	RXD
6	A	6	A(+)
7	IR OUT	7	IR OUT
8	B	8	B(-)

VISCA IN & DB9 Connection

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	GND
7	IR OUT	7	NC
8	B(-)	8	NC

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(-)		

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 IN(RS232) PORT

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 address+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.

Part 2 Camera Control Command

Command	Function	Command Packet	Note
AddressSet	Broadcast	88 30 01 FF	Address setting
IF_Clear	Broadcast	88 01 00 01 FF	I/F Clear
CommandCancel		8x 21 FF	
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	p = 0(low)~7(high)
	Tele(Standard)	8x 01 04 07 02 FF	
	Wide(Standard)	8x 01 04 07 03 FF	
	Tele(Variable)	8x 01 04 07 2p FF	
	Wide(Variable)	8x 01 04 07 3p FF	
CAM_Focus	Direct	8x 01 04 47 0p 0q 0r 0s FF	pqrs: Zoom Position (0(wide)~0x4000(tele))
	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_ZoomFocus	Direct	8x 01 04 47 0p 0q 0r 0s	pqrs: Zoom Position (0(wide)~ 0x4000(tele))
		0t 0u 0v 0w FF	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	pg: 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	pg: 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)

VISCA IN(RS232) PORT

Part 2 Camera Control Command

Command	Function	Command Packet	Note
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	pg: 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	pg: 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	pg: 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	pg: Bright Position (0)
CAM_ExpComp	On	8x 01 04 3E 02 FF	Exposure Compensation ON/OFF
	Off	8x 01 04 3E 03 FF	
	Reset	8x 01 04 0E 00 FF	Exposure Compensation Amount Setting
	Up	8x 01 04 0E 02 FF	
	Down	8x 01 04 0E 03 FF	
	Direct	8x 01 04 4E 00 00 0p 0q FF	pg: ExpComp Position (0~0x0E)
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	pg: Aperture Gain (0~0x04)
CAM_Memory	Reset	8x 01 04 3F 00 0p FF	p: Memory Number(=0 to 127)
	Set	8x 01 04 3F 01 0p FF	Corresponds to 0 to 9 on the Remote Commander
	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_MountMode	UP	8x 01 04 A4 02 FF	Mount Up
	Down	8x 01 04 A4 03 FF	Mount Down
CAM_ColorGain	Direct	8x 01 04 49 00 00 0p 0q 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)
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

VISCA IN(RS232) PORT

Part 2 Camera Control Command

Command	Function	Command Packet	Note
<u>VideoSystem Set</u>		8x 01 06 35 00 pp FF	pp: 0~21 Video format 0:1080P59.94 1:1080P50 2:1080I59.94 3:1080I50 4:1080P29.97 5:1080P25 6:720P59.94 7:720P50 8:720P29.97 9:720P25 10:1024*768P30 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
<u>CAM_IDWrite</u>		8x 01 04 22 0p 0q 0r 0s FF	pars: 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_Transfer	Transfer On	8x 01 06 1A 02 FF	Receive IR(remote commander) CODE from
	Transfer Off	8x 01 06 1A 03 FF	VISCA communication ON/OFF
IR_Receive	On	8x 01 06 08 02 FF	IR(remote commander)/receive ON/OFF
	Off	8x 01 06 08 03 FF	
	On/Off	8x 01 06 08 10 FF	
IR_ReceiveReturn	On	8x 01 7D 01 03 00 00 FF	IR(remote commander)/receive message via the
	Off	8x 01 7D 01 13 00 00 FF	VISCA communication ON/OFF
<u>Pan_tiltDrive</u>	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	
	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	
	<u>AbsolutePosition</u>	8x 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	<u>RelativePosition</u>	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	
<u>Pan-tiltLimitSet</u>	Set	8x 01 06 07 00 0W 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	W:1 <u>UpRight</u> 0: <u>DownLeft</u> YYYY: Pan Limit Position(TBD)
	Clear	8x 01 06 07 01 0W 0F 0F 0F 0F 0F 0F 0F 0F FF	ZZZZ: Tilt Limit Position(TBD)

VISCA IN(RS232) PORT

Part 3 Inquiry Command

Command	Command Packet	Return Packet	Note
CAM_PowerInq	8x 09 04 00 FF	y0 50 02 FF y0 50 03 FF	On Off(Standby)
CAM_ZoomPosInq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pgqs: Zoom Position
CAM_FocusModelInq	8x 09 04 38 FF	y0 50 02 FF y0 50 03 FF	Auto Focus Manual Focus
CAM_FocusPosInq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pgqs: Focus Position
CAM_WBModelInq	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	pg: R Gain
CAM_BGainInq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pg: B Gain
CAM_AEModelInq	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	pg: Shutter Position
CAM_IrisPosInq	8x 09 04 4B FF	y0 50 00 00 0p 0q FF	pg: Iris Position
CAM_GainPosInq	8x 09 04 4C FF	y0 50 00 00 0p 0q FF	pg: Gain Position
CAM_BrightPosInq	8x 09 04 4D FF	y0 50 00 00 0p 0q FF	pg: Bright Position
CAM_ExpCompModelInq	8x 09 04 3E FF	y0 50 02 FF y0 50 03 FF	On Off
CAM_ExpCompPosInq	8x 09 04 4E FF	y0 50 00 00 0p 0q FF	pg: ExpComp Position
CAM_ApertureInq	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	pg: Aperture Gain
CAM_MemoryInq	8x 09 04 3F FF	y0 50pp FF	pp: Memory number last operated.
SYS_MenuModelInq	8x 09 06 06 FF	y0 50 02 FF y0 50 03 FF	On Off
CAM_LR_ReverseInq	8x 09 04 61 FF	y0 50 02 FF y0 50 03 FF	On Off
CAM_PictureFlippingInq	8x 09 04 66 FF	y0 50 02 FF y0 50 03 FF	On Off
CAM_IDInq	8x 09 04 22 FF	y0 50 0p 0q 0r 0s FF	pgqs: Camera ID
CAM_VersionInq	8x 09 00 02 FF	y0 50 ab cd mn pq rs tu vw FF	

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

VISCA IN(RS232) PORT

Part 3 Inquiry Command

<u>VideoSystemInq</u>	8x 09 06 23 FF	y0 50 pp FF	pp: 0~21 Video format 0:1080P59.94 1:1080P50 2:1080I59.94 3:1080I50 4:1080P29.97 5:1080P25 6:720P59.94 7:720P50 8:720P29.97 9:720P25 10:1024*768P30 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 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
<u>IR_ReceiveReturn</u>		y0 07 7D 01 04 00 FF	Power ON/OFF
		y0 07 7D 01 04 07 FF	Zoom <u>tele/wide</u>
		y0 07 7D 01 04 38 FF	AF On/Off
		y0 07 7D 01 04 33 FF	<u>CAM_Backlight</u>
		y0 07 7D 01 04 3F FF	CAM_Memory
		y0 07 7D 01 06 01 FF	<u>Pan_tiltDrive</u>
<u>Pan-tiltMaxSpeedInq</u>	8x 09 06 11 FF	y0 50 ww zz FF	<u>ww</u> : Pan Max Speed <u>zz</u> : Tilt Max Speed
<u>Pan-tiltPosInq</u>	8x 09 06 12 FF	y0 50 0w 0w 0w 0w 0z 0z 0z 0z FF	<u>www</u> : Pan Position <u>zzz</u> : Tilt Position

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

VISCA IN(RS232) PORT

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		

Zoom Rate & Zoom Value

Zoom Rate	Value
x1(wide)	0x0
x1.2	0x6D0
x1.5	0x1194
x2	0x1A58
x3	0x2610
x5	0x31D4
x5.8	0x348C
x8.9	0x37A4
x8.2	0x3A9B
x8.9	0x3D9C
x11.8(note)	0x4000

VISCA PanTilt 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		

VISCA Exposure Value

Shutter speed	21	1/10000	Iris	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		8	f9.6
	12	1/350		9	f8.8
	11	1/250		10	f8.6
	10	1/180		11	f8.8
	9	1/125		12	f8.0
	8	1/100		13	f7.4
	7	1/90		14	f7.8
	6	1/80		15	f7.4
	5	1/50		16	f7.0
	4	1/15		17	f1.8
	3	1/8			
	2	/			
	1	/			
	0	/			
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			

PELCO-D PROTOCOL

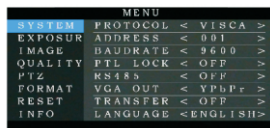
Function	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Up	0xFF	Address	0x00	0x08	Pan Speed	Tilt Speed	SUM
Down	0xFF	Address	0x00	0x10	Pan Speed	Tilt Speed	SUM
Left	0xFF	Address	0x00	0x04	Pan Speed	Tilt Speed	SUM
Right	0xFF	Address	0x00	0x02	Pan Speed	Tilt Speed	SUM
Upleft	0xFF	Address	0x00	0x0C	Pan Speed	Tilt Speed	SUM
Upright	0xFF	Address	0x00	0x0A	Pan Speed	Tilt Speed	SUM
DownLeft	0xFF	Address	0x00	0x14	Pan Speed	Tilt Speed	SUM
DownRight	0xFF	Address	0x00	0x12	Pan Speed	Tilt Speed	SUM
Zoom In	0xFF	Address	0x00	0x20	0x00	0x00	SUM
Zoom Out	0xFF	Address	0x00	0x40	0x00	0x00	SUM
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	Byte 7	Byte 8
Up	0xA0	Address	0x00	0x08	Pan Speed	Tilt Speed	0xAF	XOR
Down	0xA0	Address	0x00	0x10	Pan Speed	Tilt Speed	0xAF	XOR
Left	0xA0	Address	0x00	0x04	Pan Speed	Tilt Speed	0xAF	XOR
Right	0xA0	Address	0x00	0x02	Pan Speed	Tilt Speed	0xAF	XOR
Upleft	0xA0	Address	0x00	0x0C	Pan Speed	Tilt Speed	0xAF	XOR
Upright	0xA0	Address	0x00	0x0A	Pan Speed	Tilt Speed	0xAF	XOR
<u>DownLeft</u>	0xA0	Address	0x00	0x14	Pan Speed	Tilt Speed	0xAF	XOR
<u>DownRight</u>	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 **[Menu]** key on the IR remote controller, to enter the OSD menu as bellow shows:



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/down key to select the sub menu; use left/right key to select parameter.

4. Press the **[Back]** key again to return to previous menu. Press the **[Back]** 1.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:



5.OSD Menu Setting List

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

EXPOSURE	EXPOSURE MODE	AUTO, MANUAL, BRIGHT, SHUTTER, IRIS
	SHUTTER	Shutter speed:1/8~1/10000, only valid under manual/SHUTTER mode
	IRIS	Iris setting:CLOSE~F1.8, only valid under manual/IRIS mode
	GAIN	Gain setting:0dB~28dB , only valid under manual/GAIN mode
	BRIGHT	Bright setting:0~64,
	BLC	Back light compensation ON/FF, only valid under auto exposure mode.
	BLC LEVEL	Set back light compensation level

OSD MENU

IMAGE	WB MODE	White Balance: AUTO,INDOOR,OUTDOOR,MANUAL,ONEPUSH,ATW
	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.
	COLOR G	Color gain setting: 0~14
	FLICK	Anti-Flicker setting:50/60Hz, to reduce the video flicker
	FREEZE	Video freeze setting when running preset(USB3.0 camera doesn't supported)
	D ZOOM	Digital Zoom: ON/OFF
	FOCUS MODE	Focus Mode setting

QUALITY	2D NR	2D noise reduction:0~5, the bigger value, the less noise on image, the lower
	3D NR	3D noise reduction:0~3, the bigger value, the less motion noise on image.
	SHARPNESS	Sharpness setting: 0~6, the higher value, the higher resolution.
	CONTRAST	Set contrast value
	SATURATION	Set saturation value
	TRACK MOD	Track mode:PRECISE/FLUENT
	GAMMA	Set gamma value(not supported)

PTZ	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
	FLIP.HOR	Flip horizontal
	FLIP.VER	Flip vertical
	PT SPD	Set pan tilt speed
	ZOOM SPD	Set zoom speed
	MENU MIR	Menu mirror function

VIDEO FORMAT	1080P60	720P30	576*448P30	Once selected, press OK key to confirm.
	1080P50	720P25	768*448P30	
	1080I60	1024*768P30	640*360P30	
	1080I50	800*600P30	512*288P30	
	1080P30	1024*576P30	352*288P30	
	1080P25	960*540P30	176*144P30	
	720P60	704*576P30		
	720P50	640*480P30		

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

MESSAGE	IR ADDR	Camera IR control address
	FOCUS	Focus mode
	CLIENT	Client protocol, can't be changed
	MODEL NO.	Model number
	ARM VER	ARM version
	FPGA VER	FPGA version
	CAM VER	Camera version
	RELEASE	Software 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(standard)

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:

<u>XX XX XX XX FF</u>	
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 U3D-12FHD6 camera has completed self-configuration(the IR indicator in blue color and will not flash); If run the software before the camera configuration finishes, may cause black video issue.
2. Make sure the USB3.0 camera is recognized by the PC Device Manager. In case the PC does not recognize the camera(with warning of "MFG"), following bellow steps:
 - 1).Go to Device Manager.
 - 2).Right click on the device(yellow warning with "MFG ") and select "Update Driver Software".
 - 3).Next select "Browse my computer for Driver Software" and then select "Let me pick from a list of device drivers on My computer".
 - 4).Next select "USB Composite Driver" and continue install the driver up to over.
 - 5).Then it should come up as "U3D-12FHD6 CAMERA".
3. Make sure the interval of different video format switching more than 3 seconds, otherwise black video maybe caused.
4. Make sure the interval of control command sending from the server(via USB cable) to the camera no less than 250ms.

UVC Property	Corresponded VISCA 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 VVWY 0Y 0Y 0Y 0Z 0Z 0Z F
PU_CONTRAST_CONTROL	8x 01 04 53 0p FF
PU_HUE_CONTROL	8x 01 04 54 0p FF

6. 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.