



DIGITALINX
BY LIBERTY AV SOLUTIONS

Full HD PTZ Camera Quick Guide



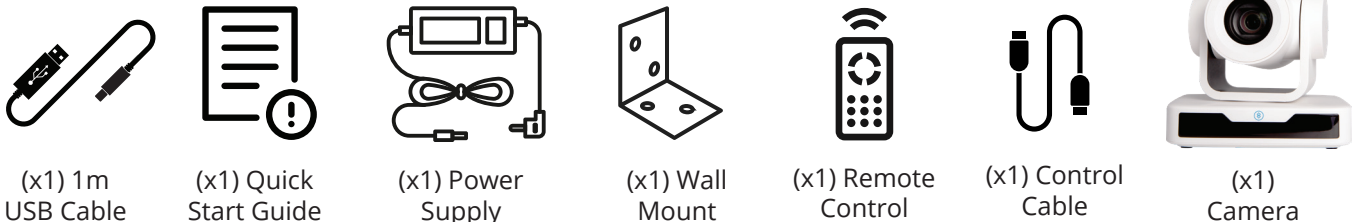
DL-USB-PTZ10-B

Product Overview

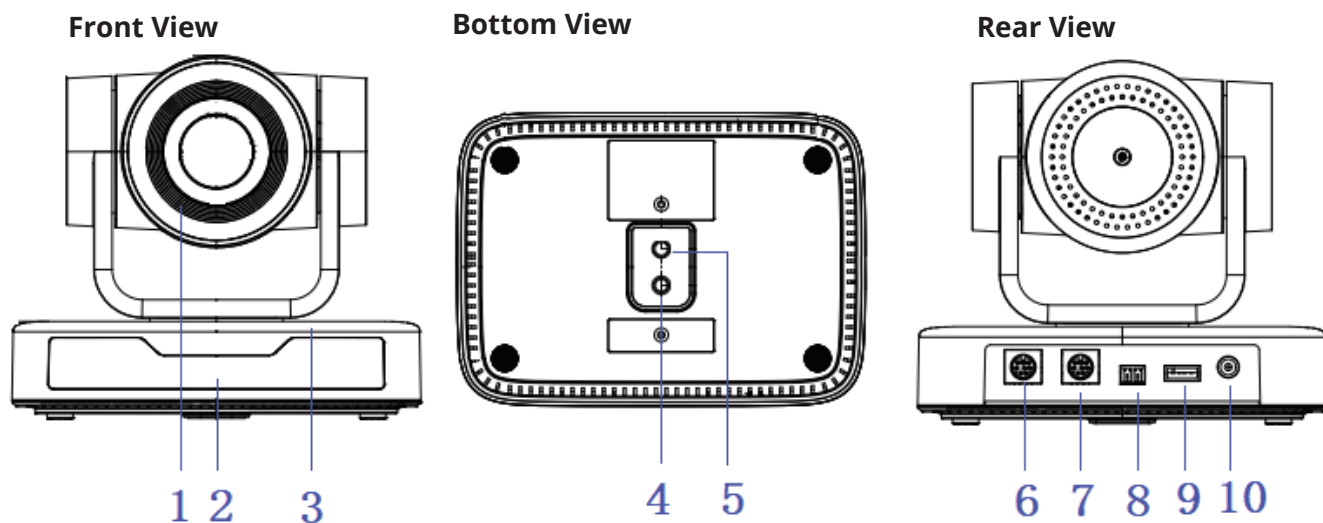
Liberty's DigitalLinx USB PTZ10 Cameras are available in two different color options: black or white. Both camera options share the same features and are designed to capture video for conferencing and other applications such as streaming, webinars, distance learning, lecture capture, and personal chatting. Easy plug-and-play; no driver is required when using software platforms such as Zoom, Teams, YouTube, Facetime, and other messaging applications.

- Supports all Zoom Room features and has been tested to conform with the latest Zoom Certification Program for the highest performance and ultra-reliability.
- Vivid and high resolution video with a strong sense of depth and fantastic color rendition.
- Full HD Resolution: 1/2.9 inch high quality CMOS sensor. Resolution is up to 1920x1080 with frame rate up to 30 fps.
- Optical Zoom Lens: 10X optical zoom lens.
- Leading Auto Focus Technology: Fast, accurate, and stable auto focusing technology.
- Low Noise and High SNR: Super high SNR image is achieved with low noise CMOS. Advanced 2D/3D noise reduction technology further reduces the noise while ensuring high image clarity.
- Control Interface: RS485, RS232 (cascade connection)
- Multiple Control Protocol: Support VISCA, PELCO-D, PELCO-P protocols; support automatic identification protocols.
- Quiet Pan / Tilt Movement: With high accuracy step driving motor, camera can pan / tilt extremely quiet and smooth.
- Multiple presets: Up to 255 presets (10 presets via remote control).
- Multiple Application: Online-education, lecture capture, webcasting, video conferencing, telemedicine, unified communication, emergency command and control systems, etc.
- Choose from multiple mounting options – provided wall mount, optional ceiling mount, or use a tripod with the included tripod thread insert.
- 5-year product warranty, including advanced replacement.

Package Contents



Product Breakdown



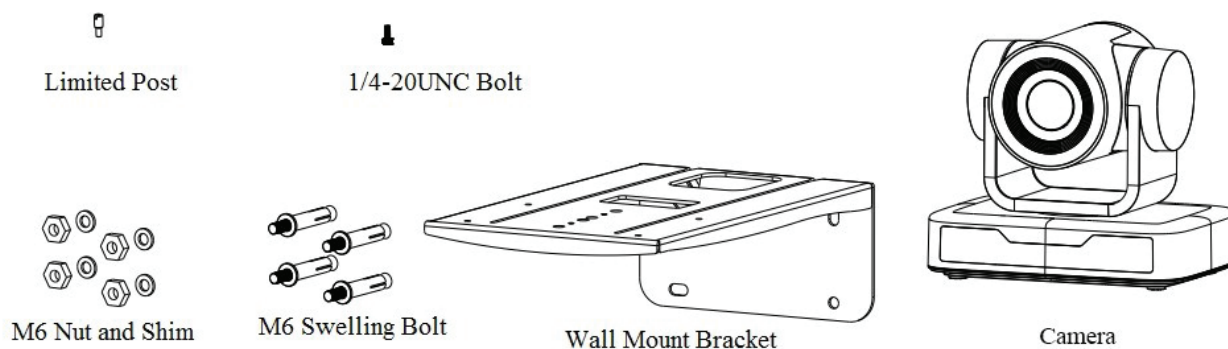
1. Camera Lens
2. Remote Control Receiving Indicator
3. Camera Base
4. Tripod Screw Hole
5. Screw Hole for Tripod

6. RS232 Control Interface (Input)
7. RS232 Control Interface (Output)
8. RS485 Input (left +, right-)
9. USB 2.0 Interface
10. DC12V Input Power Supply Socket

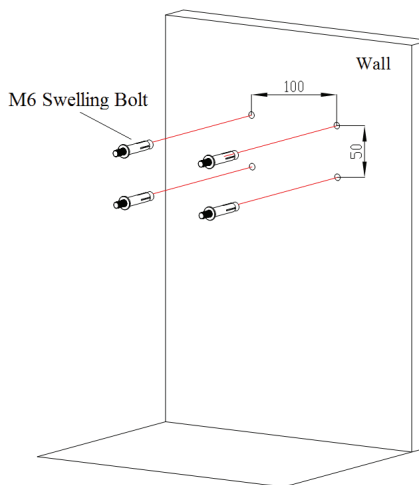
Mounting Options

Wall mounting the camera using the provided wall mount or third party mount.

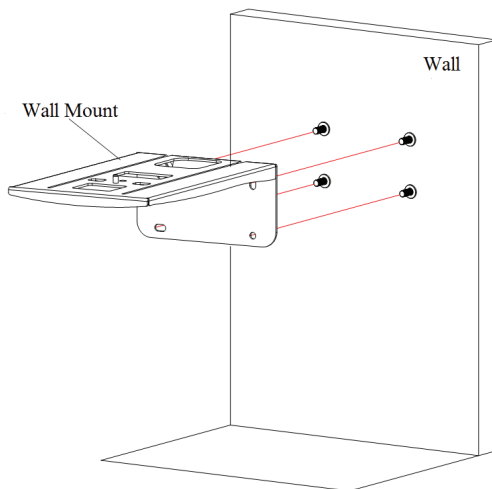
Included Items:



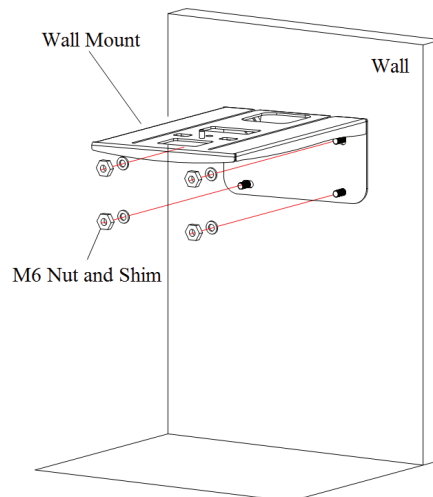
STEP 1



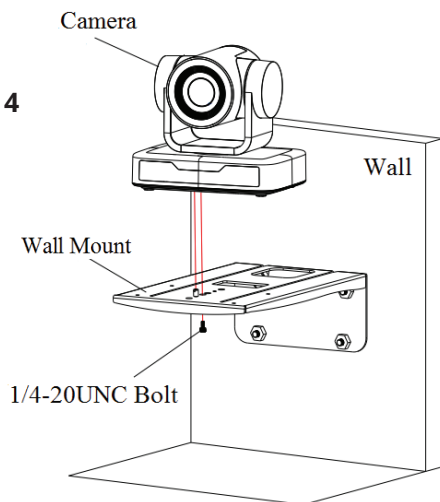
STEP 2



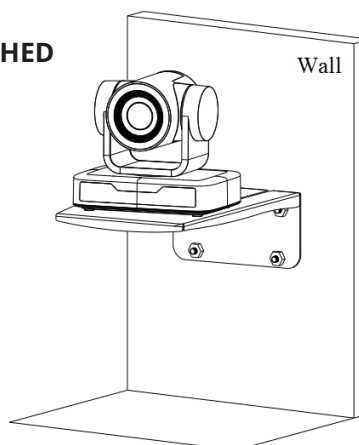
STEP 3



STEP 4

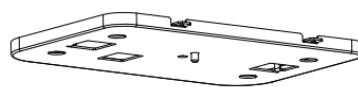
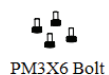


FINISHED

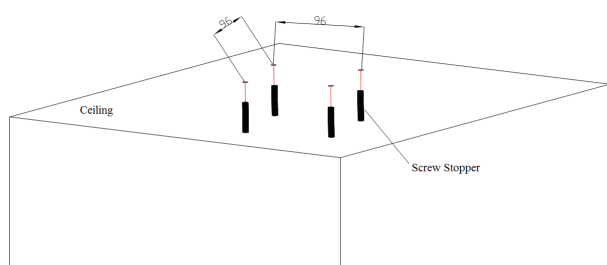


*Optional Ceiling Mount

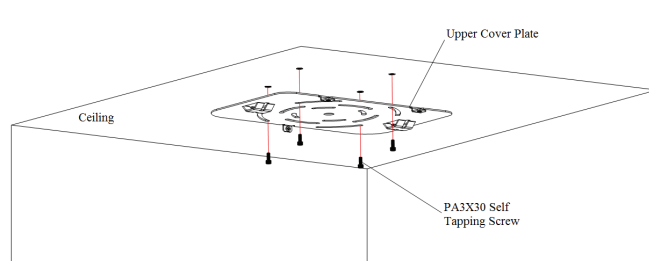
Included Items:



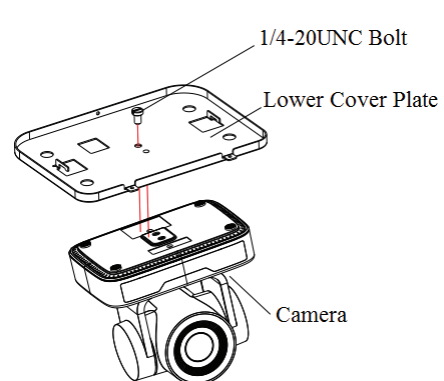
STEP 1



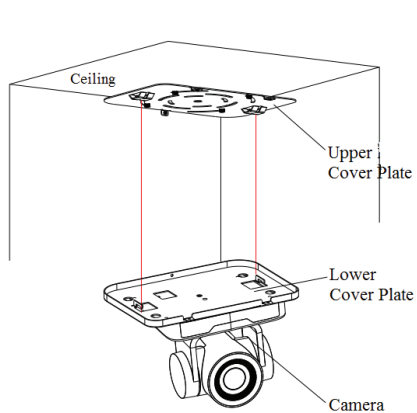
STEP 2



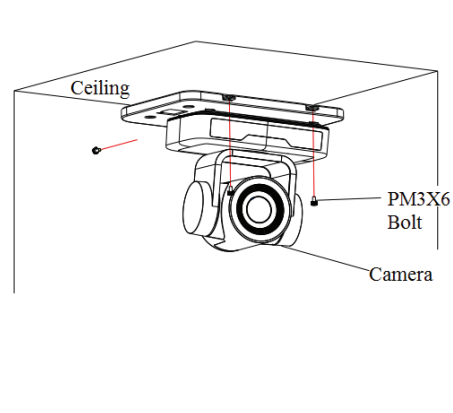
STEP 3



STEP 4



FINISH



Setting Up Your PTZ Camera

Power-on

Connect the external power supply to the camera.

USB 2.0 cable

The provided USB 2.0 cable can provide power in addition to sending video. If the USB signal needs to be extended, this feature may be lost and the external power supply may be needed in supplying sufficient power to the camera.

Initial Configuration

- The remote control receiving indicator will start to flash after the camera has been powered on.
- The camera will pan-tilt and then move to the HOME position (both the horizontal and vertical positions are in the middle). When the remote control's receiving indicator stops flashing, the self-checking is completed.
- After powering on and self-checking, the camera will automatically return to the defined preset 0.
- The default address for the IR remote control is 1#. If the menu has been restored to factory defaults, the remote control default address will restore to 1#.

Requirements - A computer with a USB connections

Install the video conferencing desktop client such as Zoom, Teams, Google meet onto the computer.

Note: Verify your preferred video calling application requirements.

Placement - Reference the mounting options and choose what best fits your needs.

Connectivity - Locate the Digitalinx PTZ Camera and provided USB cable. Plug the cable into the USB port of the computer and camera. If the length of the USB cable is not long enough, use a TYPE A USB 2.0 extension cable, signal extender or USB hub.

Navigation - Go to settings>privacy>camera (or similar) on your PC and turn on "let apps use my camera."

Close all other applications that may use the PTZ Camera.



Maintenance and Troubleshooting

Camera Maintenance

- Power off the camera and disconnect the power adapter and socket, if it's not used for a long period of time.
- Use a soft cloth or tissue to clean the camera cover.
- When cleaning the camera lens, use a soft, dry cloth and wipe it gently with a mild detergent, if needed. Do not use strong or corrosive detergents to avoid scratching the lens and affecting the video quality.
- Do not rotate the camera head violently; otherwise, it may cause mechanical failure.
- This product should be placed on a stable desktop or other horizontal surface. Do not install the product obliquely; otherwise, it may not display a level image.
- Ensure there are no obstacles within rotation range of the holder.
- Do not power on before completing the installation.

Troubleshooting

No video output

- a. Check whether the camera power supply is connected and receiving power.
- c. Check whether the bottom of the DIP switch is switched to normal operating mode.
- d. Check whether the video output cable has been disconnected.
- e. Check whether the camera is selected within the software.

Remote control is not working

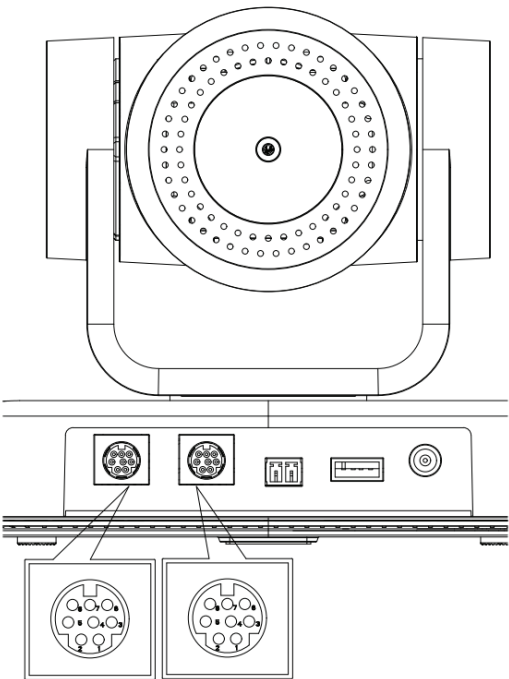
- a. Check if the batteries are installed properly and are new.
- b. Check to see if the remote control address is set to 1. If the machine is set back to the factory defaults, the remote control addresses need to be set back to 1, too.
- c. Make sure the menu setting has been closed out.

Serial port is not working

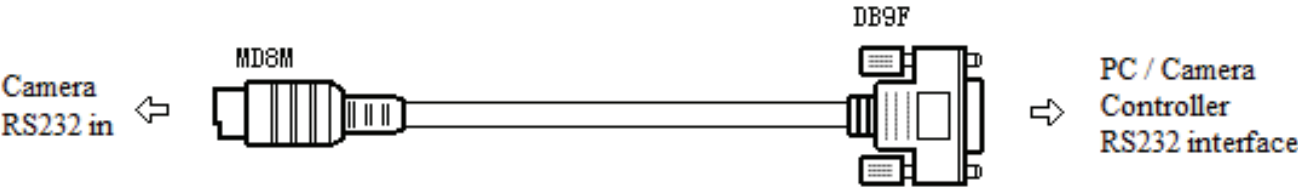
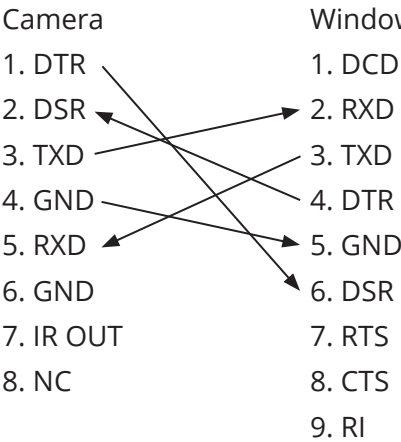
- a. Check whether the camera serial device protocol, baud rate, address is consistent.
- b. Check whether the control cable is connected properly.

Control Interface Pin-Outs

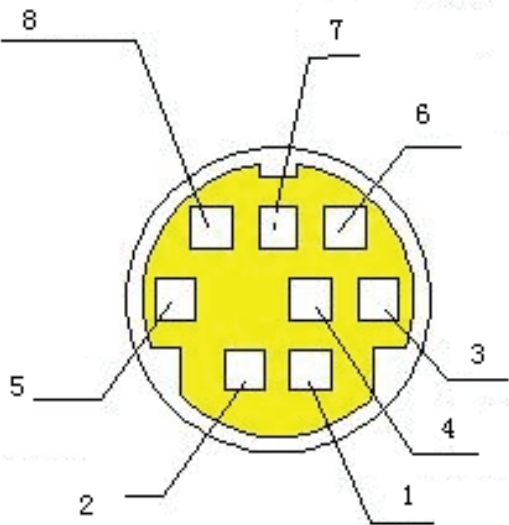
RS-232 Interface



Connection to PC or Camera Controller



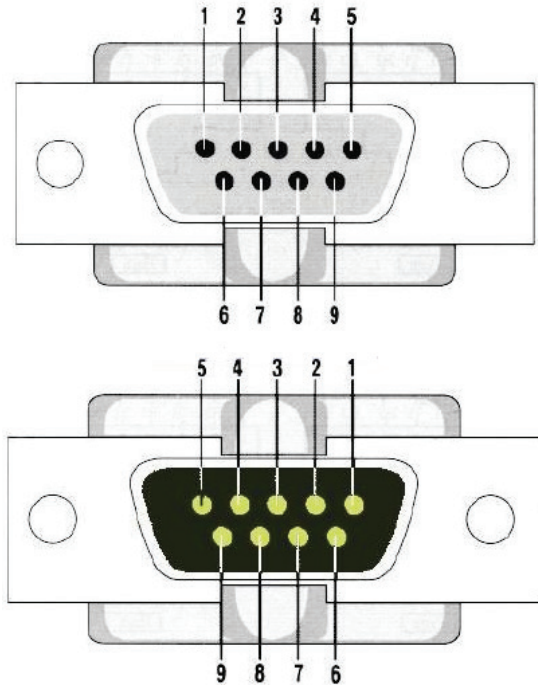
RS-232 Mini-DIN 8-pin



No.	Port	Definition
1	DTR	Data Terminal Ready
2	DSR	Data Set Ready
3	TXD	Transmit Data
4	GND	Signal Ground
5	RXD	Receive Data
6	GND	Signal Ground
7	IR OUT	IR Commander Signal
8	NC	No Connection

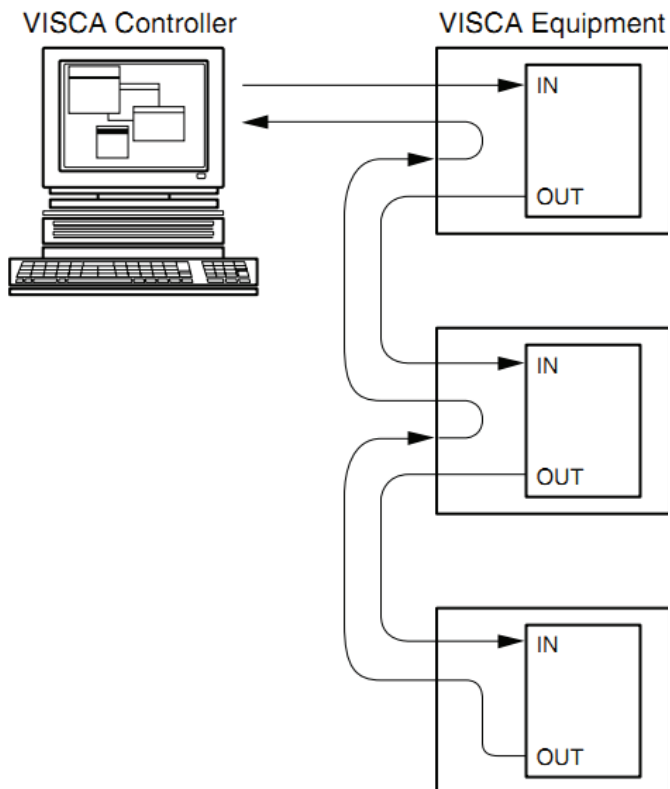
Control Interface Pin-Outs

RS232(DB9) Port

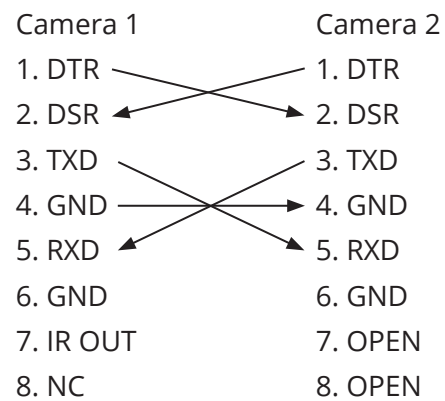


No.	Port	Definition
1	DCD	Data Carrier Detect
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	System Ground
6	DSR	Data Set Ready
7	RTS	Request to Send
8	CTS	Clear to Send
9	RI	Ring Indicator

VISCA



Cascading Cameras



Using the Remote Control



In this quick start guide, “press the key” means a click rather than a long-press, and a special note will be given if a long-press for more than one second is required.

When a key-combination is required, do it in sequence. For example, “[*] + [#] + [F1]” means press “[*]” first and then press “[#]” and last press “[F1]”.

Standby Key

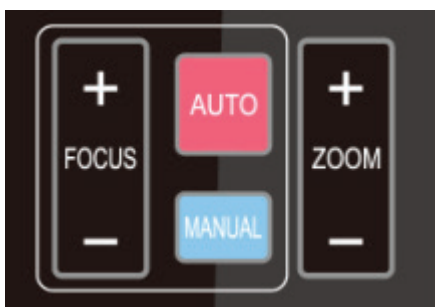
The camera enters standby mode if there is a long-press of 3 seconds on standby key. Do a long-press for 3 seconds again on the standby key. The camera will self check again and return to HOME position. (If the preset 0 position is set, the camera will return to the preset 0 position.)

Camera Selection



Select the camera address you want to control.

Focus



Auto: auto focus mode

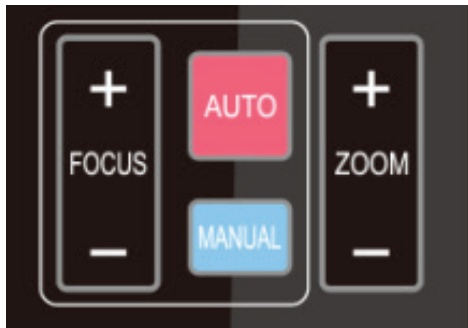
Manual: manual focus mode

Focus + (near): Press **[FOCUS +]** key
(Valid only in manual focus mode)

Focus - (far): Press **[FOCUS -]** key (Valid only in manual focus mode)

Press and hold the keys. The action of focus will keep continue and stop as soon as the key is released.

Zoom Control



Press [Zoom +] key to zoom in.

Press [Zoom -] key to zoom out.

Press and hold the keys. The action of focus will keep continue and stop as soon as the key is released.

Set and Clear Presets



Set Preset: Press [SET PRESET] button, and then press the number key 0-9 to set preset positions.

Note: 10 presets via remote control.

Call Preset: Press a number key 0-9 directly to call a preset position.

Clear Preset: Press [CLEAR PRESET] button, and then press the number key 0-9 to clear preset positions.

Note: Press the [#] key three times continually to clear all presets.



Pan/Tilt Control



Up: Press ▲

Down: Press ▼

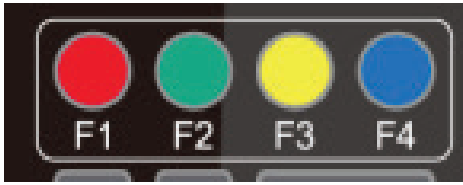
Left: Press ◀

Right: Press ▶

Back to middle position: Press "[HOME]"

Press and hold the up/down/left/right key, the pan/tilt movements will keep running, from slow to fast, until it runs to the endpoint; stop as soon as the key is released.

Camera Remote Control Address Setting



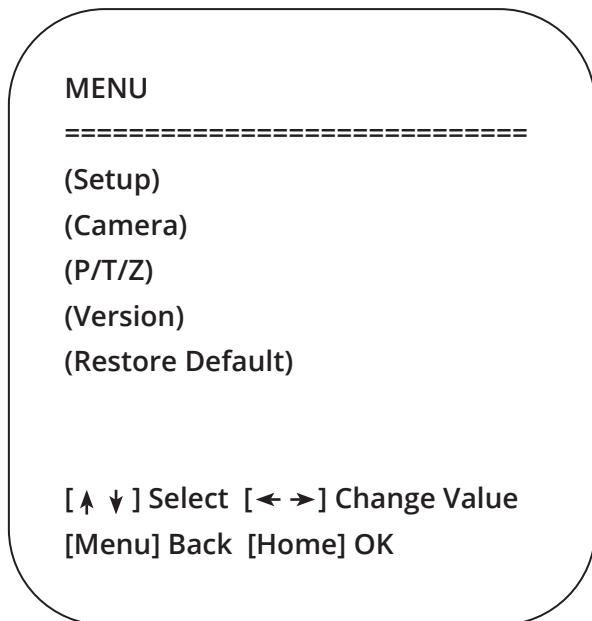
- [*] + [#] + [F1]: Camera Address No. 1
- [*] + [#] + [F2]: Camera Address No. 2
- [*] + [#] + [F3]: Camera Address No. 3
- [*] + [#] + [F4]: Camera Address No. 4

Menu Settings



- [MENU]: Open / close the OSD menu
- [HOME]: Camera lens back to the middle position; Confirm button; Enter next menu
- [↑] [↓]: Choose item
- [←] [→]: Modify values
- [BLC ON/OFF]: Turn on or off the back light compensation

In normal working mode, press [MENU] key to display the menu, using scroll arrows to point at or highlight the selected items.



Setup: System parameter setting

Camera: Camera parameter setting

P/T/Z: Enter into sub menu

Version: Enter into sub menu

Restore Default: Enter into reset setting, select YES or NO to confirm

[↑ ↓] **Select:** For selecting menu

[← →] **Change Value:** For modifying parameters

[MENU] **Back:** Press [Menu] to return

[Home] **OK:** Press [Home] to confirm

System Setting

Move the pointer to the (Setup) in the Main Menu, click the **[HOME]** key and enter into the (System Setting) as shown below.

SETUP

=====

Protocol	Auto
Visca Address	1
Visca Address Fix	OFF
PELCO-P Address	1
PELCO-D Address	1
Baudrate	9600
Auto Filp	ON

[↑ ↓] Select [← →] Change Value

Protocol: VISCA/Pelco-P/Pelco-D/Auto

Visca Address: VISCA=1~7 Pelco-P=1~255
Pelco-D=1~255

Baudrate: 2400/4800/9600/115200

Visca Address Fix: On/Off

Auto Filp: On/Off

Camera Setting

Move the pointer to the (CAMERA) in the Main Menu, click the **[HOME]** key, and enter the (CAMERA) as follows.

CAMERA

=====

(Exposure)

(Color)

(Image)

(Focus)

(Noise Reduction)

Style

Default

[↑ ↓] Select [← →] Change Value

[Menu] Back [Home] OK

Exposure: Enter into Exposure setting

Color: Enter into color setting

Image: Enter into image setting

Focus: Enter into focus setting

Noise Reduction: Enter into noise reduction

Exposure Setting

Move the pointer to the (EXPOSURE) in the Main Menu, click the [HOME] key, and enter into the (Exposure sub menu) as shown below.

EXPOSURE	
=====	
Mode	Auto
EV	OFF
BLC	OFF
Flicker	50Hz
G.Limit	3
DRC	2
[↑ ↓] Select [← →] Change Value	
[Menu] Back	

Mode: Auto, Manual, Shutter priority, Iris priority and Brightness priority.

EV: On/Off (only available in auto mode)

Compensation Level: -7~7 (only available in auto mode when EV is ON)

BLC: ON/OFF for options (only available in auto mode)

Dynamic Range: 1~8, close

Anti-Flicker: OFF/50Hz/60Hz for options (only available in Auto/Iris priority/Brightness priority modes)

Gain limit: 0~15 (only available in Auto/ Iris priority / Brightness priority mode)

WDR: Off, 1~8

Color

Move the pointer to the (COLOR) in the Main Menu, click the [HOME], and enter the (COLOR sub menu) as follows.

COLOR	
=====	
WB Mode	Auto
RG Tuning	-10
BG Tuning	-10
Saturation	100%
Hue	7
AWB Sensitivity	High
[↑ ↓] Select [← →] Change Value	
[Menu] Back	

WB Mode: Auto, Manual, One Push, 3000K, 3500K, 4000K, 4500K, 5000K, 5500K, 6000K, 6500K, 7000K

Saturation: 60%, 70%, 80%, 90%, 100%, 110%, 120%, 130%, 140%, 150%, 160%, 170%, 180%, 190%, 200%

Red fine-tuning: -10~10 (only available in automatic mode)

Blue fine-tunable: -10~10 (only available in automatic mode)

RED GAIN: 0~255 (only available in Manual mode)

BLUE GAIN: 0~255 (only available in Manual mode)

AWB Sensitivity: high/middle/low

Chroma: 0~14

Image

Move the pointer to the (IMAGE) in the Menu, click the [HOME], and enter into the (IMAGE sub menu) as follow,

IMAGE

=====

Brightness	7
Contrast	8
Sharpness	3
Flip-H	OFF
Flip-V	OFF
B&W-Mode	Color
Gamma	Default
DCI	Close
Low-Light Mode	OFF

[↑ ↓] Select [← →] Change Value
[Menu] Back

Brightness: 0~14

Contrast: 0~14

Sharpness: 0~15

Flip-H: On/Off

Flip-V: On/Off

B&W Mode: color, black/white

Gamma: Default/0.45/0.50/0.5/0.63

DCI: Dynamic Contrast: Off/1~8

Minimum Illumination: On/Off

Focus

Move the pointer to the (FOCUS) in the Menu, click the **[HOME]**, and enter the (FOCUS) as follows.

FOCUS

=====

Focus Mode	Auto
AF-Zone	All
AF-Sensitivity	Low

[↑ ↓] Select [← →] Change Value
[Menu] Back

Focus Mode: Auto/manual

AF-Zone: Up/middle/down

AF-Sensitivity: High/middle/low

Noise Reduction

Move the pointer to the (NOISE REDUCTION) in the Menu, click the **[HOME]**, and enter the (NOISE REDUCTION) as follows.

NOISE REDUCTION

=====

NR-2D	4
NR-3D	2
Dynamic Hot Pixel	OFF

[↑ ↓] Select [← →] Change Value
[Menu] Back

2D Noise Reduction: Auto, close, 1~7

3D Noise Reduction: Close, 1~8

Dynamic Hot Pixel: Close, 1~5

P/T/Z

Move the pointer to the (P/T/Z) in the Main Menu, click the **[HOME]**, and enter the (P/T/Z) as follows.

P/T/Z

=====

Speed by zoom	ON
Zoom speed	8
Acc Curve	Slow

[↑ ↓] Select [← →] Change Value
[Menu] Back

Depth of Field: Only effective for the remote controller, On/ Off; (when zooming in, the PT control speed by remoter will become slow)

Zoom Speed: Set the zoom speed for the remote controller, 1~8

Image Freezing: On/Off

Accelerating Curve: Fast/Slow

Version

Move the pointer to the (VERSION) in the Main Menu, click the **[HOME]**, and enter the (VERSION) as follows.

VERSION

=====

MCU Version	3.1.0	2019-09-26
Camera Version	1.0.5	2019-09-27
AF Version	1.0.0	2019-09-07

[↑ ↓] Select [← →] Change Value
[Menu] Back [Home] OK

MCU Version: Display MCU version information

Camera Version: Display camera version information

AF Version: Display the focus version information

Restore Default

Move the pointer to the (RESTORE DEFAULT) in the Main Menu, click the **[HOME]**, and enter the (RESTORE DEFAULT) as follows.

RESTORE DEFAULT

=====

Restore Default?	NO
------------------	----

[↑ ↓] Select [← →] Change Value
[Menu] Back [Home] OK

Restore default: YES/NO. Color style and video format cannot be restored to factory default.

Note: If the address of former remote is not 1 but instead 2, 3, or 4, the corresponding camera address will restore to 1 when all parameters or system parameters are restored. User should change the remote address to 1 (press [1] according to the camera to get normal operation).

Serial Port Communication and Control

The camera can be controlled using a RS232/RS485 interface; RS232C serial parameters are as follows:

- Baud rate: 2400/4800/9600/115200 bits / sec
- Start bit: 1 data bits
- Stop bit: 1
- Parity: None.

After powering on, the camera first goes left, then back to the middle position. Self-test is finished after the zoom moved to the farthest and then back to the nearest position. If the camera saved 0 preset before, it will be back to that position after initialization. At this point, the camera can be controled using the serial commands.

VISCA Protocol 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.

VISCA Protocol Control Command

Command	Function	Command packet	Note
AddressSet	Broadcast	88 30 0p FF	p: 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	
	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) - F(high)
	Wide(Variable)	8x 01 04 07 3p FF	
	Direct	8x 01 04 47 0p 0q 0r 0s FF	pqrs: Zoom Position
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) - F(high)
	Near (Variable)	8x 01 04 08 3p FF	
	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 mode	8x 01 04 38 04 FF	
CAM_Zoom Focus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	pqrs: Zoom Position tuvw: Focus Position
CAM_WB	Auto	8x 01 04 35 00 FF	
	3000K	8x 01 04 35 01 FF	
	4000k	8x 01 04 35 02 FF	
	One Push mode	8x 01 04 35 03 FF	
	5000k	8x 01 04 35 04 FF	
	Manual	8x 01 04 35 05 FF	
	6500k	8x 01 04 35 06 FF	
	3500K	8x 01 04 35 07 FF	
	4500K	8x 01 04 35 08 FF	
	5500K	8x 01 04 35 09 FF	
	6000K	8x 01 04 35 0A FF	
	7000K	8x 01 04 35 0B FF	

Command	Function	Command packet	Note
CAM_RGain	Reset	8x 01 04 03 00 FF	Manual Control of R Gain
	Up	8x 01 04 03 02 FF	
	Down	8x 01 04 03 03 FF	
	Direct	8x 01 04 43 00 00 0p 0q FF	pq: R Gain
CAM_Bgain	Reset	8x 01 04 04 00 FF	Manual Control of B Gain
	Up	8x 01 04 04 02 FF	
	Down	8x 01 04 04 03 FF	
	Direct	8x 01 04 44 00 00 0p 0q FF	pq: B Gain
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 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
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
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
CAM_Gain Limit	Gain Limit	8x 01 04 2C 0p FF	p: Gain Positon
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 Positon
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	pq: ExpComp Position
CAM_Back Light	On	8x 01 04 33 02 FF	Back Light Compensation
	Off	8x 01 04 33 03 FF	

Command	Function	Command packet	Note
CAM_WDRStrength	Reset	8x 01 04 21 00 FF	WDR Level Setting
	Up	8x 01 04 21 02 FF	
	Down	8x 01 04 21 03 FF	
	Direct	8x 01 04 51 00 00 00 0p FF	p: WDR Level Positon
CAM_NR (2D)		8x 01 04 53 0p FF	P=0-7 0:OFF
CAM_NR (3D)		8x 01 04 54 0p FF	P=0-8 0:OFF
CAM_Gamma		8x 01 04 5B 0p FF	p = 0 - 4 0:Default 1:0.45 2:0.50 3:0.55 4:0.63
CAM_Flicker	OFF	8x 01 04 23 00 FF	OFF
	50HZ	8x 01 04 23 01 FF	50HZ
	60HZ	8x 01 04 23 02 FF	60HZ
CAM_Aperture	Reset	8x 01 04 02 00 FF	Aperture Control
	Up	8x 01 04 02 02 FF	
	Down	8x 01 04 02 03 FF	
	Direct	8x 01 04 42 00 00 0p 0q FF	pq: Aperture Gain
CAM_Memory	Reset	8x 01 04 3F 00 pq FF	pq: Memory Number(=0 to 254) Corresponds to 0 to 9 on the Remote Commander
	Set	8x 01 04 3F 01 pq FF	
	Recall	8x 01 04 3F 02 pq 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_ColorSaturation	Direct	8x 01 04 49 00 00 00 0p FF	P=0-E 0:60% 1:70% 2:80% 3:90% 4:100% 5:110% 6:120% 7:130% 8:140% 9:150% 10:160% 11:160% 12:180% 13:190% 14:200%
CAM_IDWrite		8x 01 04 22 0p 0q 0r 0s FF	pqrs: Camera ID (=0000 to FFFF)
SYS_Menu	ON	8x 01 04 06 06 02 FF	Turn on the menu screen
	OFF	8x 01 04 06 06 03 FF	Turn off the menu screen
IR_Receive	ON	8x 01 06 08 02 FF	IR(remote commander)receive On/Off
	OFF	8x 01 06 08 03 FF	
IR_ReceiveReturn	On	8x 01 7D 01 03 00 00 FF	IR(remote commander) receive message via the VISCA communication ON/OFF
	Off	8x 01 7D 01 13 00 00 FF	
CAM_SettingReset	Reset	8x 01 04 A0 10 FF	Reset Factory Setting

Command	Function	Command packet	Note
CAM_Brightness	Direct	8x 01 04 A1 00 00 0p 0q FF	pq: Brightness Position
CAM_Contrast	Direct	8x 01 04 A2 00 00 0p 0q FF	pq: Contrast Position
CAM_Flip	OFF	8x 01 04 A4 00 FF	Single Command For Video Flip
	Flip-H	8x 01 04 A4 01 FF	
	Flip-V	8x 01 04 A4 02 FF	
	Flip-HV	8x 01 04 A4 03 FF	
CAM_VideoSystem	Set camera video system	8x 01 06 35 00 0p FF	P: 0~E Video format 0:1080P60 8:720P30 1:1080P50 9:720P25 2:1080i60 A:1080P59.94 3:1080i50 B:1080i59.94 4:720P60 C:720P59.94 5:720P50 D:1080P29.97 6:1080P30 E:720P29.97 7:1080P25
Pan_tiltDrive	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 ZZZZ: Tilt Position
	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	
	AbsolutePosition	8x 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	RelativePosition	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	

Command	Function	Command packet	Note
Pan-tiltLimitSet	Set	8x 01 06 07 00 0W 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	W:1 UpRight 0:DownLeft 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	

VISCA Protocol Inquiry Command

Command	Command Packet	Return Packet	Note
CAM_PowerInq	8x 09 04 00 FF	y0 50 02 FF	On
		y0 50 03 FF	Off(Standby)
CAM_ZoomPosInq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_FocusAFModelInq	8x 09 04 38 FF	y0 50 02 FF	Auto Focus
		y0 50 03 FF	Manual Focus
		y0 50 04 FF	One Push mode
CAM_FocusPosInq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position
CAM_WBModelInq	8x 09 04 35 FF	y0 50 00 FF	Auto
		y0 50 01 FF	3000K
		y0 50 02 FF	4000K
		y0 50 03 FF	One Push Mode
		y0 50 04 FF	5000K
		y0 50 05 FF	Manual
		y0 50 06 FF	6500K
		y0 50 06 FF	6500K
		y0 50 07 FF	3500K
		y0 50 08 FF	4500K
		y0 50 09 FF	5500K
		y0 50 0A FF	6000K
CAM_RGainInq	8x 09 04 43 FF	y0 50 0B FF	7000K
CAM_BGainInq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: 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	pq: Shutter Position
CAM_IrisPosInq	8x 09 04 4B FF	y0 50 00 00 0p 0q FF	pq: Iris Position
CAM_Gain LimitInq	8x 09 04 2C FF	y0 50 0p FF	pq: Gain Positon
CAM_BrightPosilnq	8x 09 04 4D FF	y0 50 00 00 0p 0q FF	pq: Bright Position

Command	Command Packet	Return Packet	Note
CAM_ExpCompModelInq	8x 09 04 3E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ExpCompPosInq	8x 09 04 4E FF	y0 50 00 00 0p 0q FF	pq: ExpComp Position
CAM_BacklightModelInq	8x 09 04 33 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_WDRStrengthInq	8x 09 04 51 FF	y0 50 00 00 00 0p FF	p: WDR Strength
CAM_NRLevel(2D) Inq	8x 09 04 53 FF	y0 50 0p FF	p: 2DNRLLevel
CAM_NRLevel(3D) Inq	8x 09 04 54 FF	y0 50 0p FF	p:3D NRLevel
CAM_FlickerModelInq	8x 09 04 55 FF	y0 50 0p FF	p: Flicker Settings(0: OFF, 1: 50Hz, 2:60Hz)
CAM_ApertureInq	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture Gain
CAM_PictureEffectModelInq	8x 09 04 63 FF	y0 50 00 FF	Off
		y0 50 04 FF	B&W
CAM_MemoryInq	8x 09 04 3F FF	y0 50 0p FF	p: Memory number last operated
SYS_MenuModelInq	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_ColorSaturationInq	8x 09 04 49 FF	y0 50 00 00 00 0p FF	p: Color Gain setting 0h (60%) to Eh (130%)
CAM_IDInq	8x 09 04 22 FF	y0 50 0p FF	p: Gamma ID
IR_ReceiveInq	8x 09 06 08 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
IR_ReceiveReturn		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	Camera _Backlight
		y0 07 7D 01 04 3F FF	Camera _Memery
		y0 07 7D 01 06 01 FF	Pan_titleDriver
CAM_BrightnessInq	8x 09 04 A1 FF	y0 50 00 00 0p 0q FF	pq: Brightness Position
CAM_ContrastInq	8x 09 04 A2 FF	y0 50 00 00 0p 0q FF	pq: Contrast Position
CAM_FlipInq	8x 09 04 A4 FF	y0 50 00 FF	Off
		y0 50 01 FF	Flip-H
		y0 50 02 FF	Flip-V
		y0 50 03 FF	Flip-HV
CAM_GammaInq	8x 09 04 5B FF	y0 50 0p FF	p: Gamma setting

Command	Command Packet	Return Packet	Note
CAM_VersionInq	8x 09 00 02 FF	y0 50 ab cd mn pq rs tu vw FF	ab cd : vender ID (0220) mn pq : model ID ST (0510), U2(0512), U3 (0513) rs tu : ARM Version vw : reserve
VideoSystemInq	8x 09 06 23 FF	y0 50 0p FF	P: 0~E Video format 0:1080P60 A:1080P59.94 8:720P30 B:1080i59.94 1:1080P50 C:720P59.94 9:720P25 D:1080P29.97 2:1080i60 E:720P29.97 3:1080i50 4:720P60 5:720P50 6:1080P30 7:1080P25
Pan-tiltMaxSpeedInq	8x 09 06 11 FF	y0 50 ww zz FF	ww: Pan Max Speed zz: Tilt Max Speed
Pan-tiltPosInq	8x 09 06 12 FF	y0 50 0w 0w 0w 0w 0z 0z 0z 0z FF	www: Pan Position zzzz: Tilt Position

Note: [X] in the above table indicates the camera address to be operated, [y] = [x + 8].

Pelco-D Protocol Command List

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
Stop	0xFF	Address	0x00	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

Function	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
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 Command List

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
Upleft	0xA0	Address	0x00	0x0C	Pan Speed	Tilt Speed	0xAF	XOR
Upright	0xA0	Address	0x00	0x0A	Pan Speed	Tilt Speed	0xAF	XOR
DownLeft	0xA0	Address	0x00	0x14	Pan Speed	Tilt Speed	0xAF	XOR
DownRight	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
Stop	0xA0	Address	0x00	0x00	0x00	0x00	0xAF	XOR
Focus Far	0xA0	Address	0x01	0x00	0x00	0x00	0xAF	XOR
Focus Near	0xA0	Address	0x02	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

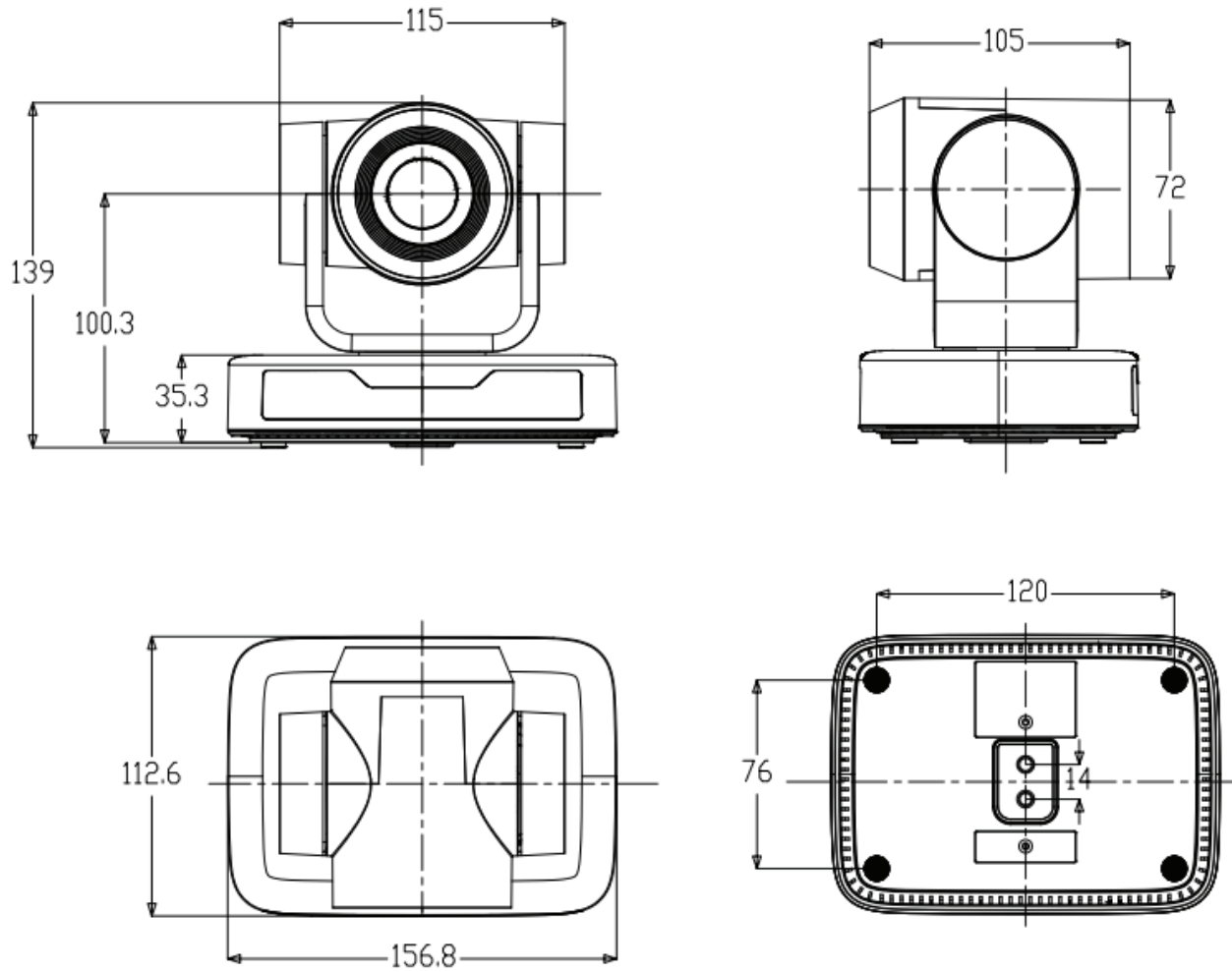
Technical Specifications

Sensor	1/2.9 inch high quality CMOS sensor
Effective Pixels	2.07 megapixel, 16: 9
Video Format	H264/H265/MJPG: 1920×1080P@30/25/20/15/10/5fps; 1280*720P@30/25/20/15/10/5fps; 960*540@30/25/20/15/10/5fps; 800*600@30/25/20/15/10/5fps; 720*576@30/25/20/15/10/5fps; 720*480@30/25/20/15/10/5fps; 640*480@30/25/20/15/10/5fps; 640*360@30/25/20/15/10/5fps ;352*288@30/25/20/15/10/5fps; 320*240@30/25/20/15/10/5fps; YUY2: 1280*720@10/5fps; 800*600@10/5fps; 640*480@30/25/20/15/10/5fps; 640*360@30/25/20/15/10/5fps; 320*180@30/25/20/15/10/5fps
View Angle	8.8°~ 66°
Focus Length	f=4.34mm~41.66mm
AV	F1.85 – F2.43
Optical Zoom	10X
Digital Zoom	10X
Minimum Illumination	0.5Lux(F1.8, AGC ON)
DNR	2D&3D DNR
White Balance	Auto / Manual/ One Push//3000K/3500K/4000K/4500K/5000K/5500K/6000K/6500K/7000K
Focus	Auto / Manual/ One Push Focus
Exposure	Auto / Manual
BLC	On/Off
Video Adjustment	Brightness, Color, Saturation, Contrast, Sharpness, B/W mode, Gamma curve
SNR	>50dB
Input/output Interface	
Video Output	USB2.0 Interface
Video Compression Format	MJPG, H.264, H.265
Control Interface	RS232 (IN/OUT), RS485
Control Protocol	VISCA/Pelco-D/Pelco-P
Power Interface	HEC3800 outlet (DC12V)

Technical Specifications Continued

USB Feature	
Operation Systems	Windows 7, Windows8, Windows10, Mac osx, Linux, etc
Video Compression Format	MJPG/H264/H265
USB Communication Protocol	UVC
PTZ Parameter	
Pan Rotation	-170°~+170°
Tilt Rotation	-30°~+30°
Pan Control Speed	0.1 ~60°/sec
Tilt Control Speed	0.1~40°/sec
Preset Speed	Pan: 60°/sec, Tilt: 40°/sec
Preset Number	255 presets (10 presets via remote control)
Other Parameter	
Input Voltage	12V
Input Current	Maximum: 4.98A
Power Consumption	Maximum: 2.5W
Stored Temperature	-40°C~+70°C
Storage Humidity	20%~90%
Working Temperature	-10°C~+50°C
Working Humidity	20%~80%
Dimension (W*H*D)	156.8mm×112.6mm×139.5mm
Weight	1KG
Application	Indoor
Package	Power Supply, RS232 Control Cable, IR Remote Control, User Manual, Warranty Card, Wall Mount, USB2.0 Cable
Optional Accessories	Ceiling Mount

Product Dimensions



Measurements are in millimeters.

Thank you for your purchase.

For Technical Support please call our
toll-free number at 800-530-8998
or email us at supportlibav@libav.com

www.libav.com

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