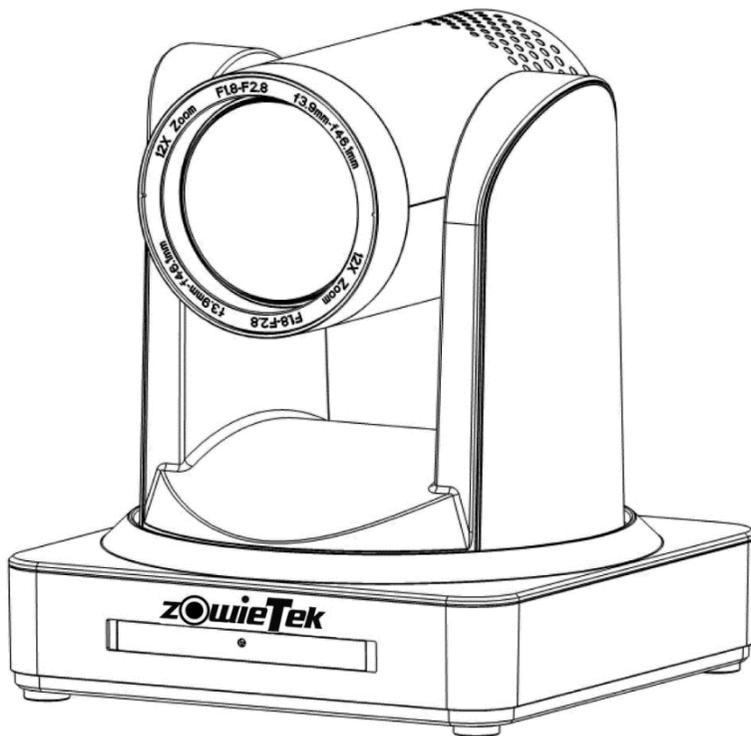# HD PTZ Video Camera
User Manual

PTZ HDMI / SDI Camera
PTZ NDI | HX Camera

CONTENT

1. IMPORTANT INFORMATION

This manual describes in detail about the functions of the camera, the general principles and methods of installation, operation, inspection and maintenance. Please read it carefully before use.

1.1 ATTENTIONS

1.1.1 Caution of Transport

Avoid stress, vibration and soakage in storage, transportation and installation.

1.1.2 Safety of Electricity

Installation and operation must accord with electric safety standard.

1.1.3 Polarity of Power Supply

1. The power supply demand of the product is ±12V, the max electrical current is 2A.
2. Schematics of power supply polarity is as followed:

1.1.4 Warning of Interference

1. Radio interference may be caused in the domestic environment, and appropriate measures are needed.
2. Electromagnetic filed under certain rate may affect camera image!

1.1.5 Do not disassemble discretionarily

Assumes no responsibility for any unauthorized modification or dismantling.

1.2 CAUTIONS

1.2.1 Caution of Installation

1. Do not move the camera by seizing the camera head and do not rotate camera head by hand, otherwise mechanical trouble will occur.
2. This product must be put on the smooth desk or platform, and it cannot be installed at an angle.
3. If the camera is installed on TV or computer, the base can be fixed by four double-sided adhesive trays.
4. The shell of this product is made of organic material, which is forbidden to contact with various liquids, gases or solid substances that may cause corrosion of it.
5. Make sure that there are no obstacles in rotation range.

6. Do not power on before installation is completed.

1.2.2 Caution of Maintenance

1. If the camera is not used for long time, please disconnect AC power adapter from the AC outlet.
2. Please clean the camera cover by soft cloth or tissue to avoid scratches.
3. Do not clean the camera lens by strong or corrosive cleanser to avoid scratches and impact on image effects.

1.3 CERITIFICATION

C€ This equipment has been tested and found to comply with the limits of the European Council Directive on the approximation of the member states relating to electromagnetic compatibility.

FC This equipment has been tested and found to comply with the limits for digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Increase the separation between the equipment and receiver
- Move the computer away from the receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/ television technician for help

1.4 COPYRIGHT NOTICE

2. PRODUCT OVERVIEW

2.1 WHAT'S IN THE PACKAGE

	Accessory
Standard	Switching Power Adapter
	RS232 Cable
	User Manual
	PTZ Quick Start Guide
	Remote Controller
	Double-side Glue Shim
	Support Limiting Column *2
	1/4-20UNC bolt
	Terminal block
	Wall Mounting Bracket
Optional	Cascade Cable
	Ceiling Mounting Bracket

2.2 PRODUCT INTRODUCTION

2.2.1 Product Model

There are four main series according to different lens optical zooms and network interfaces (LAN or NDI).

Model NO. 90XYZ—980

X: Color

Y: Network Interface   8: LAN
                       9: NDI

Z: Optical Zoom   1: 12x
                       2: 20x
                       3: 30x

Please refer to corresponding features in this manual.

2.2.2 Dimension
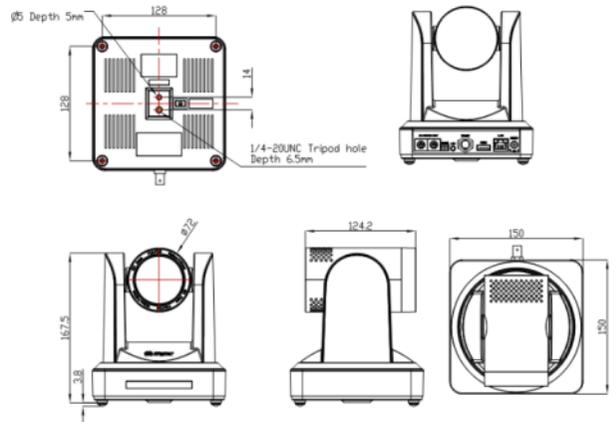
Figure 2.1.2   Camera dimension

2.2.3 Camera Interface Explanation
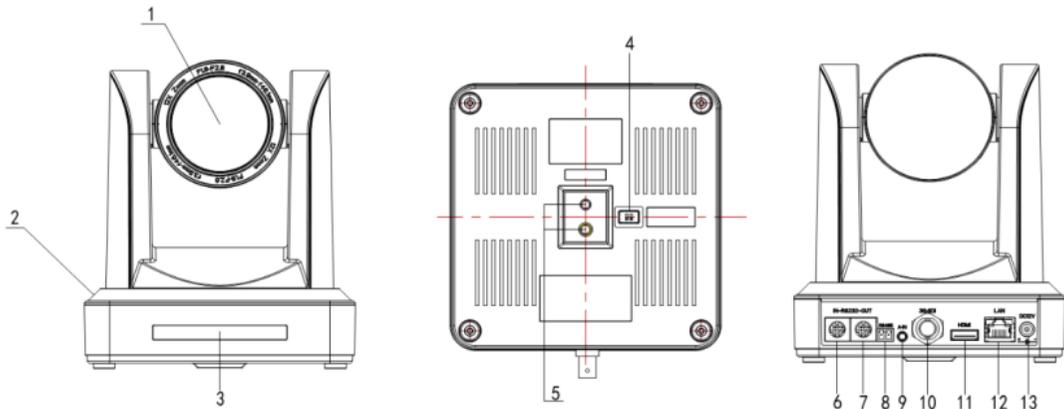
Figure 2.2.3   Interface of PTZ Series

1. Camera Lens
2. Camera Base
3. Remote Controller Receiver Light
4. Bottom Dial Switch
5. Tripod Screw Hole
6. RS232 Control Interface (input)
7. RS232 Control Interface (output)
8. RS485 Input (left+, right-)
9. Audio Input Interface
10. 3G-SDI interface
11. HDMI Interface
12. 10/ 100M Network Interface
13. DC12V Input Power Supply Socket

Note: 1. Users can connect external active microphone or pick-up (3.5mm audio cable) through audio input interface.

2. Network interface for this device is LAN port and for NDI model is NDI port. Audio and video will output at the same time through network interface.

2.3 MAIN FEATURES

2.3.1 Camera Performance

This series camera offers perfect functions, superior performance and rich interfaces. The features include advanced ISP processing algorithms to provide vivid images with a strong sense of depth, high resolution and fantastic color rendition. It supports H.265/ H.264 encoding which makes motion video fluent and clear even with bandwidth less than ideal conditions.

1. Superb High-definition Image: It employs 1/2.8 inch high quality CMOS sensor. Resolution is up to 1920x1080 with frame rate up to 60 fps.

2. Various Optical Zoom Lens: It has 12X/ 20X/ 30X optical zoom lens for options.

3. Leading Auto Focus Technology: Leading auto focus algorithm makes lens a fast, accurate and stable auto-focusing.

4. Low Noise and High SNR: Low Noise CMOS effectively ensure high SNR of camera video. Advanced 2D/ 3D noise reduction technology is also used to further reduce the noise, while ensuring image sharpness.

5. Quiet PTZ: By adopting high accuracy step driving motor mechanism, it works extremely quiet and moves smoothly and very quickly to designated position.

6. Multi-Format Video Outputs: support HDMI, 3G-SDI and LAN interfaces. The 3G-SDI is available for 100m transmission at 1080p60 format.

7. Leading Auto Focus Technology: Leading auto focus algorithm makes lens a fast, accurate and stable auto-focusing.

8. Low-power Sleep Function: Support low-power sleep/ wake up, the consumption is lower than 500mW under sleep mode.

9. Support Multiple Control Protocol: Support VISCA, PELCO-D, PELCO-P protocols which can also be automatically recognized. Support VISCA control protocol through IP port.

10. RS-232 Cascade Function: PTZ series support RS-232 cascade function which is convenient for installing.

11. 255 Presets Positions: Up to 255 presets (10 presets by remoter).

12. Wide Application: Tele-education, Lecture capture, Webcasting, Video conferencing, Tele-training, Tele-medicine, Interrogation and Emergency command systems.

2.3.2 Network Performance

1. Audio Input Interface: Support 16000,32000,44100, 48000 sampling frequency and AAC, MP, PCM audio coding.

2. Multiple Audio/ Video Compression: Support H.264/H.265 video compression; AAC, MP3 and PCM audio compression; Support compression of resolution up to 1920x1080 with frame up to 60 fps and 2 channel 1920x1080p with 30 fps compression.

3. Multiple network protocol: Support ONVIF, RTSP, RTMP protocols and RTMP push mode, easy to link streaming media server (YouTube, Facebook, Twitter, Wowza, FMS).

2.4 FAST INSTALLTION

2.4.1 Bracket Mount

1. Wall mounting

M6 nut and shim   M6 swelling bolt   Wall mount bracket   Camera

Step 1
M6 swelling bolt
Wall

Step2
Wall mount bracket
Wall

Step3
Wall mount bracket
Wall
M6 nuts and shims

Step4
Camera
Wall mount bracket
Wall
1/4-20UNC bolt

Finish

Wall

2. Upside-down mounting

1/4-20UNC screw

Support Limiting Column

Ceiling Mount

KA4*30 Self-Trapping Screw (2PCS)

KA4 Plastic Expansion bolt (2PCS)

Camera

STEP 1
Part A
Slide Split
Slide in this direction
Ceiling Mount
Part B

STEP 2
Ceiling
KA4 Plastic Expansion bolt (2PCS)
Part A
KA4 Self-Trapping screw (2PCS)

STEP 3
Camera
Support Limiting Column
Part B
1/4-20UNC Screw

Ceiling
Part A
Slide back
Part B
Camera

Ceiling
Referrence only, actual installation maybe different from the pictures!
Camera installed

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2.4.2 Video Output

This device has video output from LAN, HDMI and 3G-SDI.

1. LAN Video Output

a. Network Cable Connection Port refers to **No.12** in **Figure 2.2.3**.

b. Web Login: Open your browser and enter 192.168.5.163 in the address bar (factory default); press Enter to enter into the login page; click on the "player is not installed, please download and install!" and follow the installation steps for installation. Then enter the username: admin, password: admin (factory default); press Enter to enter into the preview page, users can carry out PTZ control, configuration and other operations. For more details, please see **4.2 Web Login**.

2. HDMI Video Output

a. HDMI Video Cable Connection refers to **No.11** in **Figure 2.2.3**.

b. Connect the camera and the monitor by HDMII video cable; video output is available after camera self-check.

3. 3G-SDI Video Output

a. 3G-SDI video cable connection refers to **No.10** in **Figure 2.2.3**.

b. Connect the camera and the monitor by 3G-SDI video cable; video output is available after camera self-check.

2.5 INTERFACE INSTRUCTION

2.5.1 External Interface

External interface of this device: VISCA interface, RS485 Input, 3G-SDI Output, HDMI Output, Network Output Interface, DC 12V Power Supply and Audio Input Interface.
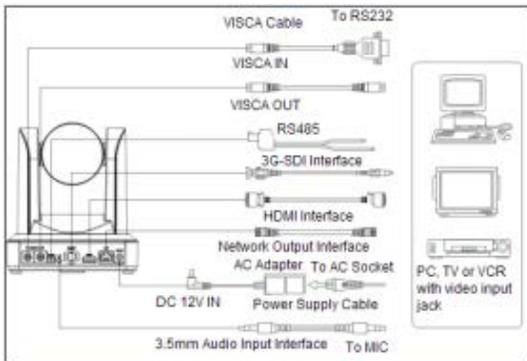
Figure 2.5.1   PTZ model external interface diagram

2.5.2 Bottom Dial Switch

PTZ model Bottom Dial Switch diagram shown in Figure 2.5.2:
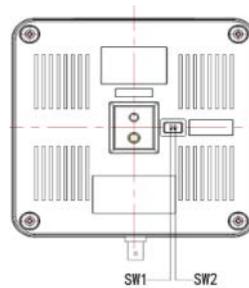
Figure 2.5.2   Bottom Dial Switch diagram

PTZ model: two DIP switches are set to ON or OFF to select different modes of operation as shown in Table 2.5.2.

No.	SW1	SW2	Explanation
1	ON	OFF	Software Upgrade Mode
2	OFF	ON	Working Mode

Table 2.5.2   Dial Switch setting

Note: Working mode can be applicable for web upgrade.

2.5.3 RS-232 Interface

1. PTZ model RS-232C interface specification as shown below:

Computer or keyboard and camera connection method

Camera	WindowsDB-9
1.DTR	1.DCD
2.DSR	2.RXD
3.TXD	3.TXD
4.GND	4.DTR
5.RXD	5.GND
6.GND	6.DSR
7.IR OUT	7.RTS
8.NC	8.CTS
	9.RI
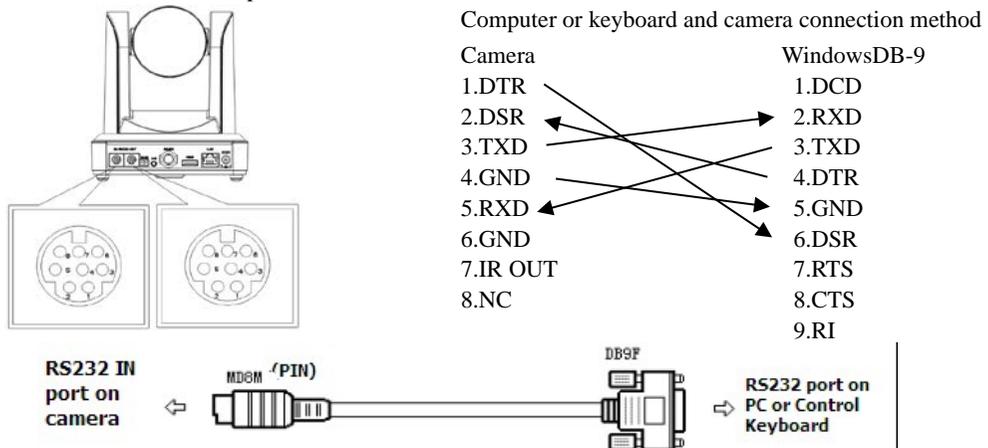
2. RS-232 Mini-DIN 8-pin Port Definition
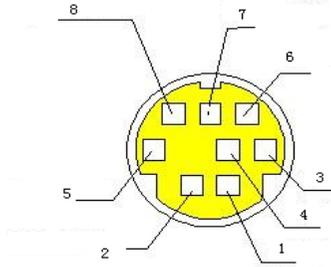
NO.	Port	Definition
1	DTR	Data Terminal Ready
2	DSR	Data Set Ready
3	TXD	Transmit Data
4	GND	System Ground
5	RXD	Receive Data
6	GND	System Ground
7	IR OUT	IR Commander Signal
8	NC	No Connection

3. RS232 (DB9) Port Definition as shown below:
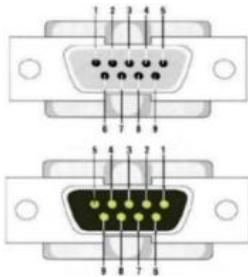
NO.	Port	Definition
1	DCD	Data Carrier Detect
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	System Ground
6	DSR	Data Set Ready
7	RTS	Request to Send
8	CTS	Clear to Send
9	RI	Ring Indicator

4. VISCA networking as shown below:
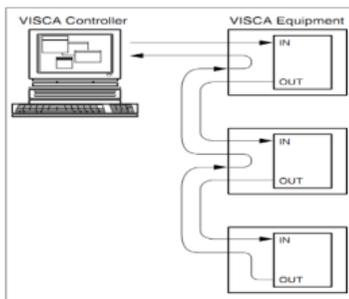
Camera cascade connection method

Camera 1		Camera 2
1.DTR		1.DTR
2.DSR		2.DSR
3.TXD		3.TXD
4.GND		4.GND
5.RXD		5.RXD
6.GND		6.GND
7.IR OUT		7.OPEN
8. NC		8.OPEN
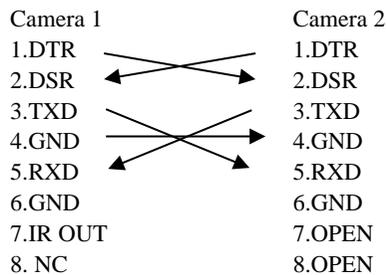
2.5.4 Power on Initial Configuration

1. Power on: Connect DC 12V power supply with switching power adapter.

2. Initial configuration: After connecting the camera with the power supply, it will have initial configuration. IR indicator light will be flashing. After the camera head turns to the left until towards to the bottom left, it returns to the HOME position (both horizontal and vertical are in the middle position). Then lens zooms in and out, self-check is finished. IR led will also stop flashing. If the preset 0 is set, camera will rotate to the preset 0 position after self-check.

Note: If you set preset 0, when Power on self-check is completed, the camera automatically moves to the preset 0 position.

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3.1 REMOTE CONTROLLER

Keys Instruction and Application：

Finishing initialization, it can receive and execute the IR commands. Press the remote controller button, the indicator light is flashing; release the button, the indicator light stops flashing. Users can control the pan/ tilt/ zoom, setting and running preset positions via remote controller.

Key Instruction:

1. In the below instruction, "press the key" means a click rather than a long press. A special note will be given if a long press for more than one second is required.

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

1. Standby Key

After 3s long press, the camera will step into standby mode. Long press 3s again, the camera will self-check again and back to HOME position.

Note: If power-on mode is turned on and Preset 0 is set, it will automatically point to the specified preset position when there is no operation within 12s.

2. Camera Address Selection

Select the camera address to control.

3. Number Key

Set or run 0-9 presets.

Press a number key 0-9 directly to run a relative preset.

Note: Action in vain if a relative preset position is not existed.

4. */ # Key

Key combination use

5. Focus Control Key

Auto Focus: Enter into auto focus mode.

Manual Focus: Enter into manual focus mode. Switch the camera focus mode to manual focus by pressing [+] or [-] to adjust.

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

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

Press and hold the key, the action of focus will keep continue and stops as soon as the key is released.

6. Zoom Control Key

Zoom + : Lens near (Zoom in)

Zoom − : Lens far (Zoom out)

Press and hold the key, the camera will keep zooming in or out and stops as soon as the key is released.

7. Set/ Clear Preset key:

Set Preset: Set a preset position, the users should press the [SET PRESET] key first and then press the number key 0-9 to set a relative preset.

Clear Preset key: Clear a preset position, the user can press the [CLEAR PRESET] key first and then press the number key 0-9 to clear the relative preset.

Note: 10 preset positions in total are available by remote controller. Press the [#] key three times continually to cancel all the preset.

8. Pan/ Tilt Control Key:

Press ▲ Key: Tilt up

Press ▼ Key: Tilt down

Press ◄ Key: Pan left

Press ► Key: Pan right

[HOME] Key: Return to the middle position or enter into the next level menu

Press and hold the up/ down/ left/ right key, the pan/ tilt will keep running until it runs to the end point and the pan/ tilt running stops as soon as the key is released.

9. BLC Control Key:

Back Light ON/ OFF: Turn on or off the back light.

10. Menu Setting:

Enter/ exit the OSD menu or return to the previous menu.

11. Camera IR Remote Control Address Setting:

[*] + [#] + [F1]: Camera Address No. 1

[*] + [#] + [F2]: Camera Address No. 2

[*] + [#] + [F3]: Camera Address No. 3

[*] + [#] + [F4]: Camera Address No. 4

12. Key Combination Functions:

1) [#] + [#] + [#]: Clear all presets

2) [*] + [#] + [6]: Restore factory defaults

3) [*] + [#] + [9]: Flip switch

4) [*] + [#] + [AUTO]: Enter into the aging mod

5) [*] + [#] + [3]: Menu set to Chinese

6) [*] + [#] + [4]: Menu set to English

7) [*] + [#] + [MANUAL]: Restore the default username, password, and IP address

8) [#] + [#] + [0]: Switch the video format to 1080P60

9) [#] + [#] + [1]: Switch the video format to 1080P50

10) [#] + [#] + [2]: Switch the video format to 1080I60

11) [#] + [#] + [3]: Switch the video format to 1080I50

12) [#] + [#] + [4]: Switch the video format to 720P60

13) [#] + [#] + [5]: Switch the video format to 720P50
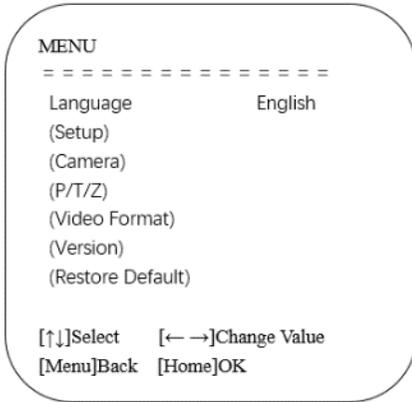
14)[#] + [#] + [6]: Switch the video format to 1080P30

15)[#] + [#] + [7]: Switch the video format to 1080P25

16) [#] + [#] + [8]: Switch the video format to 720P30

17) [#] + [#] + [9]: Switch the video format to 720P25

3.2 MENU SETTING
3.2.1 MAIN MENU

```
MENU
= = = = = = = = = = = = = =
Language          English
(Setup)
(Camera)
(P/T/Z)
(Video Format)
(Version)
(Restore Default)

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

Press the [**MENU**] key on the initial interface to display the menu and use [↑↓] to scroll the cursor up and down, which point at or highlight the selected items.

Language: Language setting, Chinese and English optional
Setup: Enter into system setting
Camera: Enter into camera setting
P/T/Z: Enter into pan, tilt and zoom setting
Video Format: Enter into video format setting
Version: Check current version information of the camera
Restore Default: Enter into reset setting
[↑↓] Select: Menu selecting
[← →] Change Value: Parameter modification
[MENU] Back: Press [MENU] to return back
[Home] OK: Press [Home] to confirm

3.2.2 SETUP Setting

```
SETUP
= = = = = = = = = = = = = =
Protocol            Auto
Visca Address        1
Visca Address Fix   OFF
PELCO-P Address      1
PELCO-D Address      1
Baudrate            9600

[↑↓]Select   [← →]Change Value
[Menu]Back
```
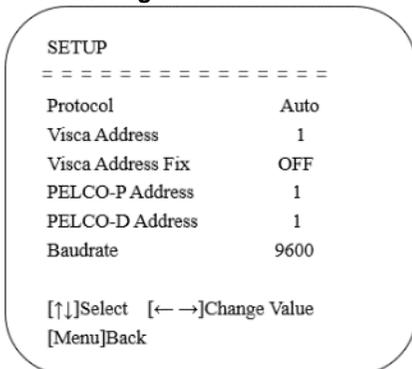
Move the cursor to the **(Setup)** in the Main Menu, click the [**HOME**] key to enter into the **(Setup)** setting page as shown.
Protocol: VISCA/ Pelco-P/ Pelco-D/ Auto
Visca Address: VISCA=1~7 Pelco-P=1~255 Pelco-D=1~255
Visca Address Fix: ON/ OFF
PELCO-P Address: 1
PELCO-D Address: 1
Baudrate: 2400/ 4800/ 9600/ 115200

3.2.3 CAMERA Setting

```
CAMERA
= = = = = = = = = = = = = =
(Exposure)
(Color)
(Image)
(Focus)
(Noise Reduction)
Style              Default

[↑↓]Select   [← →]Change Value
[Menu]Back   [Home]OK
```
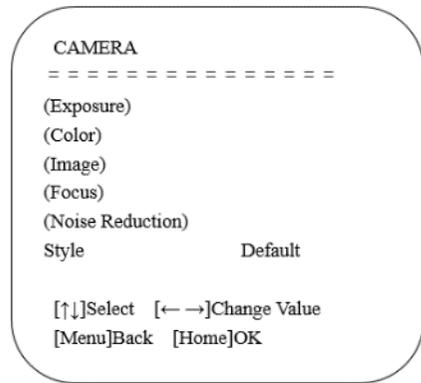
Move the cursor to the **(Camera)** in the Main Menu, click the [**HOME**] key to enter into the **(Camera)** setting page as shown.
Exposure: Enter into exposure setting
Color: Enter into color setting
Image: Enter into image setting
Focus: Enter into focus setting
Noise Reduction: Enter into noise reduction setting
Style: Remain Default

1. EXPOSURE Setting

```
EXPOSURE
= = = = = = = = = = = = = =
Mode                Auto
EV                  OFF
BLC                 OFF
Anti-Flicker        50Hz
Gain Limit           3
WDR                  5
[↑↓]Select   [← →]Change Value
```
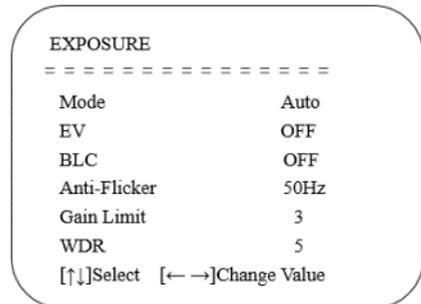
Move the cursor to the **(Exposure)** in the Main Menu, click the [**HOME**] key to enter into the **(Exposure)** setting page as shown.
Mode: Auto, Manual, Shutter priority, Iris priority and Brightness priority.
EV: ON/ OFF (only available in auto mode)
Compensation Level: -7~7 (only available in auto mode when EV is ON)
BLC: ON/ OFF for options (only available in auto mode)
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
Shutter Priority:1/25, 1/30, 1/50, 1/60, 1/90, 1/100, 1/120, 1/180, 1/250, 1/350, 1/500, 1/1000, 1/2000, 1/3000, 1/4000, 1/6000, 1/10000 (only 7available in Manual and Shutter priority mode)

IRIS Priority: OFF, F11.0, F9.6, F8.0, F6.8, F5.6, F4.8, F4.0, F3.4, F2.8, F2.4, F2.0, F1.8 (only available in Manual and Iris priority mode)
Brightness: 0~23 (only available in Brightness priority mode)

2. COLOR Setting

```
COLOR
= = = = = = = = = = = = =
WB Mode              Auto
Saturation           80%
Hue                  7
AWB Sensitivity      High
Color style          Default
Color temp           Low

[↑↓]Select[← →]Change Value
```

Move the cursor to the **(Color)** in the Main Menu, click the [**HOME**] key to enter into the **(Color)** setting page as shown.
WB Mode: Auto, 3000K, 4000K, 5000K, 6500K, Manual, One Push
Red Gain: 0~255 (only available in Manual mode)
Blue Gain: 0~255 (only available in Manual mode)
Saturation: 60%, 70%, 80%, 90%, 100%, 110%, 120%, 130%
Hue: 0~14
AWB Sensitivity: high/ middle/ low
Color Style: Default, style1~4
Color Temp: high/ middle/ low

3. IMAGE Setting

```
IMAGE
= = = = = = = = = = = = =
Brightness           6
Contrast             8
Sharpness            7
Flip-H               OFF
Flip-V               OFF
B&W-Mode             Color
Gamma                Default
DZoom                OFF
DCI                  Close
[↑↓]Select  [← →]Change Value
```
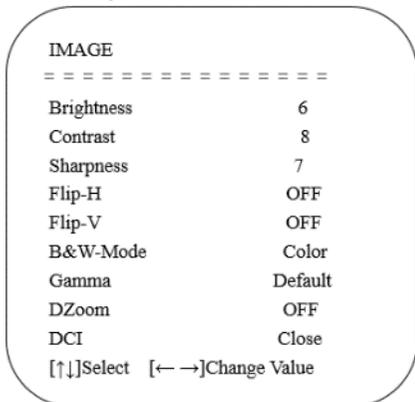
Move the cursor to the **(Image)** in the Menu, click the [**HOME**] and enter into the **(Image)** setting page as shown.
Brightness: 0~14
Contrast: 0~14
Sharpness: 0~15
Flip-H: ON/ OFF
Flip-V: ON/ OFF
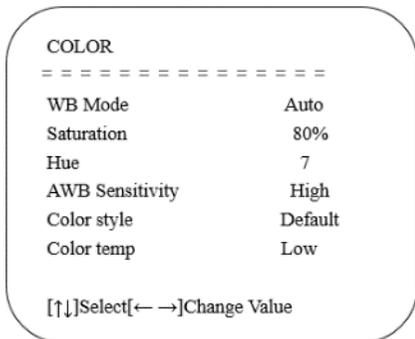**B&W-Mode**: color, black/white
Gamma: default, 0.47, 0.50, 0.52, 0.55
DZoom: digital zoom options: ON/OFF

DCI: Dynamic Contrast: OFF,1 ~ 8

4. FOCUS Setting

```
FOCUS
= = = = = = = = = = = = =
Focus Mode           Auto
AF-Zone              Center
AF-Sensitivity       Low

[↑↓]Select   [← →]Change Value
[Menu]Back
```
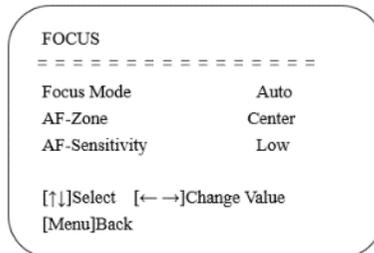
Move the cursor to the **(Focus)** in the Menu, click the [**HOME**] key to enter into the **(Focus)** setting page as shown.
Focus Mode: Auto, manual
AF-Zone: Up, middle, down
AF-Sensitivity: High, middle, low

5. NOISE REDUCTION:

```
NOISE REDUCTION
= = = = = = = = = = = = =
NR-2D                Auto
NR-3D                3
Dynamic Hot Pixel    OFF

[↑↓]Select   [← →]Change Value
[Menu]Back
```
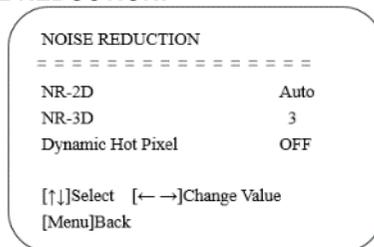
Move the cursor to the **(Noise Reduction)** in the Menu, click the [**HOME**] key to enter into the **(NOISE Reduction)** setting page as shown.
2D Noise Reduction: Auto, close, 1~7
3D Noise Reduction: Close, 1~8
Dynamic Hot Pixel: Close, 1~5

3.2.4 P/T/Z Setting

```
P/T/Z
= = = = = = = = = = = = =
Speed by Zoom        ON
Zoom speed           8
ImageFreezing        OFF
Acc Curve            Slow
Preset speed         10

[↑↓]Select   [← →]Change Value
[Menu]Back
```
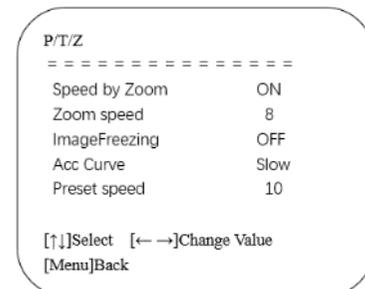
Move the cursor to the **(P/T/Z)** in the Main Menu, click the [**HOME**] key to enter into the **(P/T/Z)** as shown.
Speed by Zoom: Only effective for remote controller, ON/ OFF; When zoom in, the PT control speed by remoter will become slow
Zoom Speed: Set the zoom speed for remote controller, 1~8
ImageFreezing: ON/ OFF
Acc Curve: Set accelerating curve, "Fast" or "Slow"

Preset speed:10

3.2.5 VIDEO FORMAT Setting

```
VIDEO FORMAT
= = = = = = = = = = = = =
1080P60        1080P50
1080I60        1080I50
1080P30        1080P25
720P60         720P50
720P30         720P25
1080P59.94     1080I59.94
1080P29.97     720P59.94
720P29.97
```
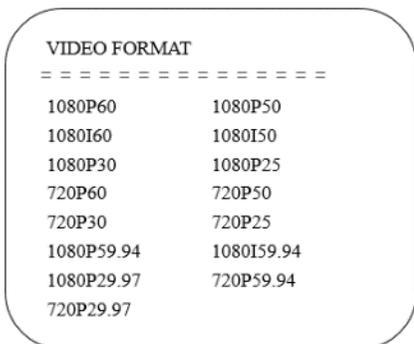
Move the cursor to the **(Video Format)** in the Menu, click the [**HOME**] key to enter into the **(Video Format)** setting page as shown.

Use [↑↓] and [← →] to scroll the pointer, which point at or highlight the selected items, and click to select suitable video format.

Note:

1. S: 1080P60 Downward Compatibility; M: 1080P30 Downward Compatibility

2. Exit menu after modifying parameter to save it after powered off

3.2.6 VERSION

```
VERSION
= = = = = = = = = = = = =
MCU Version    1.0.2    2020-10-19
Camera Version 1.0.5    2020-08-24
AF Version     4.0.8    2019-10-10

[Menu]Back
```
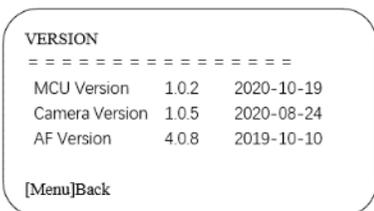
Move the cursor to the **(Version)** in the Main Menu, click the [**HOME**] and enter into the **(Version)** setting page as shown.

MCU Version: Display MCU version information

Camera Version: Display camera version information

AF Version: Display the focus version information

Note: Picture above is for reference only, different models of cameras have different versions.

3.2.7 RESTORE DEFAULT Setting

```
RESTORE DEFAULT
= = = = = = = = = = = = = =
Restore Default?           NO

[↑↓]Select      [← →]Change Value
[Menu]Back       [Home]OK
```
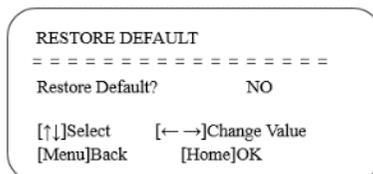
Move the cursor to the **(Restore Default)** in the Main Menu, click the [**HOME**] and enter into the **(Restore Default)** setting page as shown.

Restore default: "YES" and "NO" optional; the video format of camera won't be restored after restoring default.

*Note: Assuming that the address of former remote controller is not **1** but one from **2/3/4**. The corresponding camera address will restore to 1 when all parameters or system parameters are restored. User should change the remoter address to be 1 (press No.1 according to the camera so to get normal operation).*

4. NETWORK CONNECTION

4.1 CONNECTIION MODE

Direct connection mode: Connect the camera and computer by network cable refers to **No.12** in **Figure 2.2.3**.

Internet connection mode: Connect the camera to Internet by Router or Switch. User can login into the device by browser.

Note: Please do not put the power and network cable in the place where can be easily touched to prevent video quality lowered by unstable signal transmission due to poor contact of cables.

4.1.1 IP Check

Press Win + R and type "cmd", and the type "ipconfig" in the appear window and press enter key.
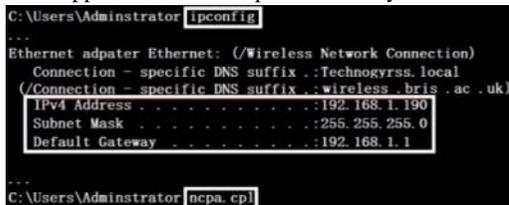
Note: the picture as below are used for reference only, please set according to the actual network condition. IPv4 Address 192.168.1.190 is used as an example, the last segment 190 could be different.

4.1.2 IP Address Setting

1) Firstly, type "ncpa.cpl" in the DOS command window (the same one as in checking IP address step) and press enter key, and then Right-click Local Network connection and select Properties. Open the window of Ethernet Properties, then Double-click the "Internet Protocol Version 4 (TCP/IPv4)" as picture below to enter into Properties window of Internet Protocol Version 4 (TCP/IPv4).
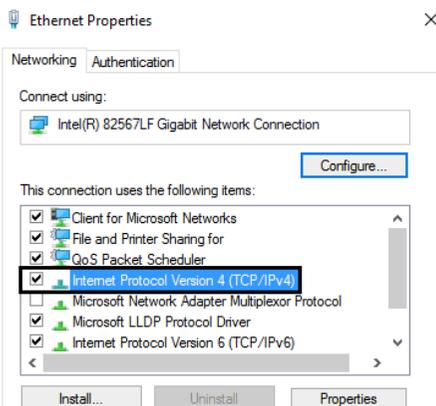
2) Secondly, select options as picture below. Type in the IP address, subnet mask and Default gateway found in the DOS command window. Use default gateway as Preferred DNS server address and 8.8.8.8 as Alternate DNS server.
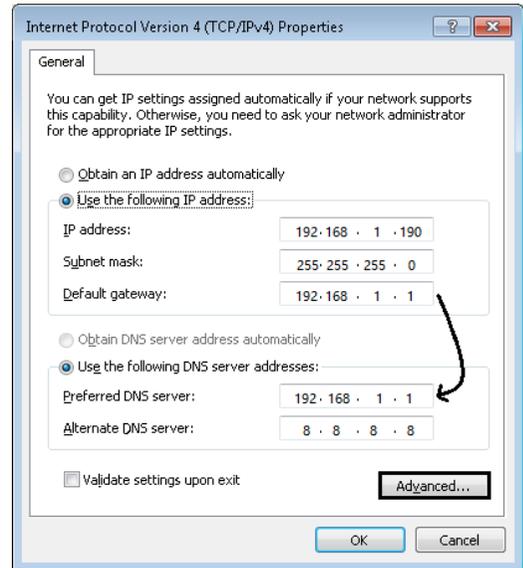
3) Click Advanced to enter into the Advanced TCP/IP Setting. Add a new IP address, whose first three segments are the same as camera factory default IP address (192.168.5.163). Type 192.168.5.26 as picture below for example. Subnet mask remains default.
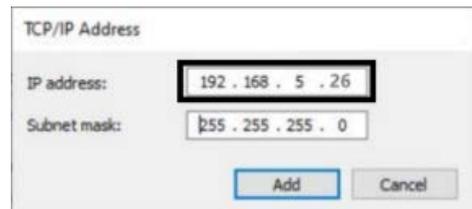
4) Finally, save all the settings.

Note: The IP address to be added cannot be same with that of other computers or devices. The existence of this IP address needs to be verified before adding.

4.1.3 Connection Check

Press Win + R and type "cmd" as picture below to verify if the network segment has been successfully added.

Click OK and open the DOS command window, type "ping 192.168.5.26" and press Enter key, it will show message as below: which means network segment adding is succeed.

It will show as below: which means network connection

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is normal.

Note: After connecting as shown above, it would be better to change the third segment of the camera IP address to be the same as the segment of the current PC IP address. For more detailed information about changing the IP segment, please refer to "IP Address" in "4.2.3 Configurations ".

4.2 WEB LOGIN

4.2.1 Web Client Login

Type in the IP address "192.168.5.163" of the device in the address filed of browser and click Enter button to enter into Web Client login page as below picture.

User can login as administrator and normal user. If login as administrator (Both Username and Password are admin), users can preview, set configuration and logout in the Web Client; If login as normal user (Both Username and Password are user1 or user2), users can only preview and logout, no option for configuration.
Note: Web access supported browsers: Google Chrome,

Firefox, Microsoft Edge and other conventional browsers.

4.2.2 Preview

After successful login into the management interface, it enters the video preview interface. In the preview screen, users can control PTZ, zoom, focus, video capture, sound, focus, full screen and set the preset position, run, delete and other operations.

1. Login as administrator

Both Username and Password are admin, PTZ control can be carried out, zoom, focus, video capture, sound, zoom, full screen and set the preset position, run, and delete; you can preview, set configuration and logout.

2. Login as normal user

Both Username and Password are user1 or user2, PTZ control can be carried out, zoom, focus, video capture, sound, zoom, full screen and set the preset position, run, and delete; you can preview and logout.
NOTE: There is no configuration right for normal user login.

4.2.3 Configurations

Click Configuration to enter into the device parameters setting page.
There are the following options: Local configuration, audio configuration, video configuration, network configuration, PTZ configuration, internet access configuration, system configuration, detailed description sees the following table.

Menu	Explanation
Audio configuration	Including enable, encode type, sample rate, sample bits, bit rate, channel, input volume settings etc.
Video configuration	Including video encode, stream publish, multicast/unicast, video parameters, video OSD, OSD font size, video out settings etc.
Network configuration	Including network port, Ethernet, DNS, GB28181, SRT, RTSP settings etc.
System configuration	Including systAttr, sys time, sysuser, update, default, reboot settings etc.

1. Audio Configuration

Enable: choose to enable the audio or not

Encode Type: set audio encode type and the device will reboot automatically after change (default AAC; MP3, G.711A, G.711U optional)

Sample Rate: set sample rate and the device will reboot automatically after change (default 48000; 16000, 32000 and 44100 optional)

Sample Bits: default 16 (the parameter is only and cannot be modified)

Bit Rate: set audio compressing code rate (default 64Kbps; 32 Kbps, 48 Kbps, 96 Kbps, 128Kbps optional)

Channel: (default Stereo; Mono optional)

Input Volume: (default 4; 1-10 optional)

Note: Click "Save", it will remind "Success! Restart to take effect (except input volume)" in the bottom right corner of the page, and then please reboot the camera to make new setting effect.

2. Video Configuration
1) Video Encode

Stream: Different video output mode settings use different streams (Main stream and Sub stream).

Compression Format: Set the video compression format, save and reboot to take it effect (Main/ Sub stream default H.264; H.265 optional)

Profile: (Main/ Sub stream default HP; BP, MP optional)

Image Size: Set video image resolution, save and reboot to take it effect (Main stream default 1920*1080; 1280*720, 640*480 optional. Sub stream default 320*180; 320*240, 640*360, 640*480, 1280*720, 1920*1080 optional)

Rate control: set rate control mode, save and reboot to take it effect (Main /Sub stream default CBR, VBR optional)

Image Quality: Set the image quality, image quality can be changed only when rate control is variable bit rate (Main stream default best, Sub stream default better; best, better, good, bad, worse, worst optional).

Bit Rate (Kb/s): Set the video bit rate (Main stream 4096 default; 64-12288 optional; Sub stream default 1024Kb/s,64-10240Kb/s optional)

Frame Rate (F/S): Set the video frame rate (Main/ Sub stream default 25, primary stream 5-60 optional, secondary stream 5-30 optional)

I Frame Interval: Set the key frame interval (Main/ Sub stream 75 default; Main stream 1-300 optional, Sub stream 1-150 optional)

I Frame Min QP: Set keyframing minimum QP (Main/ Sub stream 20 default; 10-51 optional).

Stream Name: When receiving RTSP or RTMP stream, the user can modify the stream name; Main stream live/av0 default, Sub stream live/av1 default

Note: Usually reserve LIVE, but only modify the latter part. Click the "Save" button to display the "saved successfully!" message, then settings will take effect.

2) Stream Publish

Enable: To turn on/ off the Main/ Sub stream

Protocol Type: Main/ Sub stream applies RTMP protocol. (Main/ Sub stream default RTMP; RTSP, SRT optional)

Host Address: Server IP addresses (default 192.168.5.11)

Host Port: Server port number (default 1935,0-65535 optional)

Stream Name: Choose a different stream name (default live/av0, live/av1 optional)
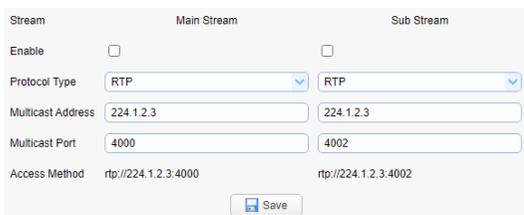
Username: Set the username.

Password: Set the password.

Password for stream encryption:

Crypto key length in bytes:

Note: Click the "Save" button to display the "Save successful!" message, then settings take effect. Method of obtaining RTSP: rtsp:// device IP address: 554/ live/ av0 (av0 for main stream; av1 for sub stream)

3) RTP Multicast

Stream	Main Stream	Sub Stream
Enable	☐	☐
Protocol Type	RTP	RTP
Multicast Address	224.1.2.3	224.1.2.3
Multicast Port	4000	4002
Access Method	rtp://224.1.2.3:4000	rtp://224.1.2.3:4002

💾 Save

Enable: To turn on/ off the Main/ Sub stream

Protocol Type: Main/ Sub stream applies RTMP protocol. (Main/ Sub stream default RTP; TS optional)

Multicast Address: (Main/ Sub stream default 224.1.2.3)

Multicast Port: (Main stream default 4000, Sub stream default 4002)

Access Method: (Main stream default rtp://224.1.2.3:4000, Sub stream default rtp://224.1.2.3:4002)

Note: Click the "Save" button to display the "Save the parameters successful!" message, then settings take effect.

4) Video Parameters

Focus	Exposure	Color	Image	NR	Style	🔄 Refresh

WB Mode	Auto	
RG Tuning	—————⬤—————	0
BG Tuning	—————⬤—————	0
Saturation	100%	
Hue	—————⬤—————	7
AWB Sensitivity	Middle	

a. Focus: Focus mode, AF-Zone, AF-Sensitivity can be set.

Focus Mode: set the focus mode (default Auto; Manual, OnePush optional)

AF-Zone: set the focus range (default All; Top, Center and Bottom optional)

AF-Sensitivity: set the focus sensitivity (default Low; high, medium optional)

b. Exposure: Mode, EV, BLC, Flicker, G.Limit and DRC can be set.

Exposure Mode: set the Exposure Mode (default Auto; Manual, SAE, AAE, Bright optional)

Exposure compensation: Exposure compensation setting is active when it is auto status (default OFF; -7 to 7 optional)

BLC: Set the exposure compensation value, valid when it is set for auto (default OFF)

Flicker: set up Flicker mode, valid when status of automatic, aperture or brightness priority (default 50Hz; OFF and 60Hz optional)

G.Limit: set the gain limits, auto, active when it is status of aperture or brightness priority (default 4, 0-15 optional)

DRC: Set the dynamic range (default 4, OFF-8 optional)

c. Color: WB Mode, RG Turning, BG Turning, Saturation, Hue and AWB Sensitivity can be set.

WB Mode: Set the white balance mode (default Auto; Manual, OnePush and VAR optional)

RG Turning: Set the red gain (default 0; -10 to 10 optional)

BG Turning: Set the Blue gain (default 0; -10 to 10 optional)

Saturation: Set the saturation (default 100%; 60%, 70%, 80%, 90%, 100%, 110%, 120%, 130%, 140%, 150%, 160%, 170%, 180%, 190% and 200% optional).

Hue: (default 7; 0-14 optional)

AWB Sensitivity: Sensitivity Auto white balance settings (default High; Low and Middle optional)

d. Image: Bright, Contrast, Sharpness, Gamma, DCI, B&W Mode, Flip-H, Flip-V, DZoom and Low-Light Mode can be set.

Bright: Set the brightness (default 6; 0-14 optional)

Contrast: Set the contrast (default 8; 0-14 optional)

Sharpness: Set the sharpness value (default 6; 0-15 optional)

Gamma: Set the gamma (default 0.45; default, 0.50, 0.55 and 0.63 optional)

DCI: Set the dynamic contrast (default 2; OFF-8 optional)

B&W Mode: Set the black and white mode (default Color; B&W optional)

Flip-H: Set the Flip Horizontal (default OFF; ON optional)

Flip-V: Set the Vertical Flip (default OFF; ON optional)

DZoom: Set the digital zoom (default OFF; ON optional)

Low-Light Mode: Set the low-light mode (default OFF; ON optional)

e. NR: NR-2D, NR-3D and Dynamic HOT Pixel can be set.

NR-2D: Set 2D noise reduction level (default 6; OFF-7 and Auto optional)

NR-3D: Set 3D noise reduction level (default 4; OFF-8 and Auto optional)

Dynamic Hot Pixel: Set dynamic hot pixel (default OFF; 1-5 optional)

f. Style: Style can be set.

Style: Set the image style (default Clarity; Default, Normal, Bright and Soft optional)

Note: Click the "Refresh" button to refresh parameters of a. b. c. d. e effective.

5) Video OSD

Show Time: Set to show the time or not

Show Title: Set to show the title or not

Time Font Color: Set to change the color of character (default White; Black, Yellow, Red and Blue optional)

Title Font Color: Set to show the color of character (default White; Black, Yellow, Red and Blue optional)

OSD Offset: Set to move the display position of time and title, click the "up, down, left, right" button to move the corresponding character position

Note: Click the "Save" button to display the "Save the parameters successful!" message, then settings take effect.

6) OSD Font Size

According to the resolution Scale size automatically: To be turned on/ off.

Master Stream OSD Font Size: (default 48; 16 and 24 optional)

Slave Stream OSD Font Size: (default 48; 16 and 24 optional)

Note: Click the "Save" button to display the "Save the parameters successful!" message, then settings take effect.

7) Video Out

Video Out Format: (default 1080I60; 1080P60, 1080P50, 1080P30, 1080P25, 1080I50, 720P60, 720P50, 720P30, 720P25, 1080P59.94, 1080I59.94, 720P59.94, 720I59.94, 1080P29.97 and 720P29.97 optional)

Note: Click the "Save" button to display the "Save the parameters successful!" message, then settings take effect.

3. Network Configuration
1) Network Port

Port Data: Set the data port, the device will restart automatically after changed (default 3000; 0-65535 optional).

Port Web: Set Web port, the device will restart automatically after changed (default 80; 0-65535 is optional).

Port Onvif: Set Onvif port, the device will restart automatically after changed (default 2000; 0-65535 optional).

Port Soap: Set Soap port (default 1936; 0-65535 optional).

Port RTMP: Set RTMP port (default 1935; 0-65535 optional).

Port RTSP: Set RTSP port, the device will restart automatically after changed (default 554; 0-65535 optional)

Port Visca: Set Visca port, the device will restart automatically after changed (default 1259; 0-65535 optional)

Port WebSocket: Set WebSocket Port (default 8088)

Note: Click the "Save" button, it will be valid when display "Save successful".

2) Ethernet

DHCP: Enable or disable obtain IP automatically can be set. Save changes and reboot the device to takes effect

(Default OFF)

IP Address: Set the IP address, save changes and reboot the device to takes effect (default 192.168.5.163). (*Note: This IP address is the same with the one used to login Web page.*)

Subnet Mask: Set the subnet mask (default 255.255.255.0)

Default Gateway: Set the default gateway (default 0.0.0.0)

MAC Address: Set the MAC address (the parameter is read-only but cannot be modified)

Note: Click on the "Save" button, it will be valid when display "Save successfully!". (Note: To prevent IP conflicts when modify)

3) DNS

Preferred DNS server: Set the preferred DNS server. (Default 0.0.0.0)

Alternate DNS server: Alternate DNS server settings. (Default 0.0.0.0)

Note: Click on the "Save" button, it will be valid when display "Save successfully!" (Note: Keep the default if you don't connect to the public network.).

4) GB28181

4. System Configuration
1) SystAttr

Device Name: Set the device name (default Camera-1, users can add their own)
Device ID: Set the device ID (default 1, read-Only)

Enable: Set whether open GB28181
ClockSync: Set whether open synchronization time
Video Type: Set the stream type (default Main Stream; Sub Stream optional)
Registration Valid Time (s): 3600 Range 5-65535
Heartbeat Time (s): 60 Range 1-65535
Register ID: 34020000001320000001
Register Name: IPC
Register Password: 12345678
Equipment Belong: Users can add their own
Administrative Regions: Users can add their own
Alarm Areas: Users can add their own
Device Address: Users can add their own
Local SIP Port: 5060 Range 0-65535
Server IP: IP address of the computer
Server SIP Port: 5060 Range 0-65535
Server ID: 34020000002000000001
Note: Click on the "Save" button, it will be valid when display "Save successfully!".

5) SRT

Port SRT: Set SRT port (default 9000)
Password for stream encryption: Users can set their own password
Crypto key length in bytes: Set the crypto key length (default 0; 16, 24 and 32 optional)
Note: Click on the "Save" button, it will be valid when display "Save successfully!".

6) RTSP

RTSP Authentication: Set whether open the RTSP authentication
Note: Click on the "Save" button, it will be valid when display "Save successfully!".

Language: Set the system language (default Simplified Chinese; English optional). Need to re-login after modify and save the setting.
Note: Click the "Save" button to display the "Save the parameters successfully!" message, then settings take effect.

2) Sys Time

Date Format: Set the date format (default YYYY-MM-DD that year-month-day; MM-DD-YYYY that month-day-year and DD-MM-YYYY that date-month-year optional)

Date Separator: set the date separator (default '/'; '.' and '-' optional)

Zone: Set the time zone (default East eight districts; other time zones optional)

Hour Type: Set the time types (default 24 hours; 12 hours optional)

NTP Enable: Set whether open NTP

Update Interval: Set the NTP server automatic updated time interval. Valid after setting NTP server synchronization (default 1 day; 2-10 days optional)

Host Url: Set the NTP server address or domain name (default time.nist.gov) Valid after setting NTP server synchronization

Host Port: Set the NTP server port (default 123) Valid after setting NTP server synchronization

Note: Click the "Save" button to display the "Save the parameters successful!" message, then settings take effect.

Time Settings: Set the time mode (default Synchronization with computer time; Synchronization with NTP Server and set manually optional)

Computer Time: Set the computer synchronization valid

Note: Click the "Sync" button to display the "Synchronize Computer Time Success" message, then settings take effect.

3) SysUser

Authority: Set the user type (default admin; user1 and user2 optional)

Username: Set the username (Select User admin, default admin; select user1, default user1; select user2, default user2; users can modify by their own)

Password: Set a password (Select User Administrator default admin; select a common user1 default user1; to select a common user 2 default user2; user can modify their own).

Confirm Password: Confirm the input passwords are the same or not.

Note: Click the "Save" button to display the "Save the parameters successfully!" message, then settings take effect.

Note: Please note the case-sensitivity of the username and password. If login page by a common user's name and password, one does not have configuration privileges but can only operate to preview and logout.

4) Update

MCU Version   V1.0.2 2020-10-19
Camera Version   V1.0.5 2020-8-24
AF Version   V4.0.8 2019-10-10

The version information is read only. Different types of the machine have different information.

Update file: Click "Browse" installation to select the upgrade file in the pop-up window. Click on the "Upgrade" button, the upgrade dialog will appear. the device will reboot automatically after update successfully.

Note: Make sure the power and network are keeping connected during the process, or the upgrade will fail. After the version upgrade is complete, you need to restore factory defaults; a. Web to restore the factory default configuration; b. Recovery menu; c. Remote control shortcut "" + "#" + "6"; Choose one of the above three ways. If chose a. the IP accounts, then passwords need to be restored to the default.*

5) Default

Click on "Restore Factory Defaults" button and choose "Yes" or "No", then the device will restart automatically and restore factory setting.

6) Reboot

Click on the pop-up "Reboot" button and choose "Yes" or "No", then the device will restart automatically.

4.2.4 LOGOUT

Click the "Logout" bottom and pop-up "Confirmation" dialog; select "Yes" or "No", choose "Yes" to exit the current page and "No" to return to the user login interface again.

5. SERIAL COMUNICATION CONTROL

Under common working condition,the camera could be controlled through RS232/RS485 interface(VISCA),RS232C serial

parameter are as follows:

Baud rate: 2400/4800/9600/115200 bits / sec; Start bit: 1; data bits: 8; Stop bit: 1; Parity: None.
After power on,the camera first go 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 user can control the camera by the serial commands.

5.1 VISCA protocol list

5.1.1 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.

5.1.2 Camera 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	

Command	Function	Command packet	Note
	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	
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	
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	

Command	Function	Command packet	Note
	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	
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 1：0.47 2：0.50 3：0.52 4：0.55
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=0-7 0:60% 1:70% 2:80% 3:90% 4:100% 5:110% 6:120% 7:130%
CAM_IDWrite		8x 01 04 22 0p 0q 0r 0s FF	pqrs: Camera ID (=0000 to FFFF)

Command	Function	Command packet	Note
SYS_Menu	ON	81 01 06 06 02 FF	Turn on the menu screen
	OFF	81 01 06 06 03 FF	Turn off the menu screen
	Home	81 01 04 08 02 FF	Enter into the next level menu
	Menu	81 01 04 08 03 FF	Enter/ exit the OSD menu or return to the previous menu.
	Up	81 01 04 08 02 FF	Menu selecting
	Down	81 01 04 08 03 FF	
	Left	81 01 04 07 02 FF	Parameter modification
	Right	81 01 04 07 03 FF	
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
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 1:1080P50 2:1080i60 3:1080i50 4:720P60 5:720P50 6:1080P30 7:1080P25 8:720P30 9:720P25 A：1080P59.94 B：1080i59.94 C：720P59.94 D：1080P29.97 E：720P29.97
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	

Command	Function	Command packet	Note
	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	
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	

5.1.3 Inquiry command

Command	Function	Command 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_FocusAFModeInq	8x 09 04 38 FF	y0 50 02 FF	Auto Focus
		y0 50 03 FF	Manual Focus
CAM_FocusPosInq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position
CAM_WBModeInq	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 00 FF	6500K
CAM_RGainInq	8x 09 04 43 FF	y0 50 00 00 0p 0q FF	pq: R Gain
CAM_BGainInq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: B Gain
CAM_AEModeInq	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	p: Gain Positon
CAM_ BrightPosiInq	8x 09 04 4D FF	y0 50 00 00 0p 0q FF	pq: Bright Position
CAM_ExpCompModeInq	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_BacklightModeInq	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: 2DNRLevel
CAM_NRLevel(3D) Inq	8x 09 04 54 FF	y0 50 0p FF	P:3D NRLevel
CAM_FlickerModeInq	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_PictureEffectModeInq	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_MenuModeInq	8x 09 06 06 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_LR_ReverseInq	8x 09 04 61 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_PictureFlipInq	8x 09 04 66 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_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
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 (0950) U3 （3950） rs tu : ARM Version vw : reserve
VideoSystemInq	8x 09 06 23 FF	y0 50 0p FF	P: 0~E Video format 0:1080P60 1:1080P50 2:1080i60 3:1080i50 4:720P60 5:720P50 6:1080P30 7:1080P25 8:720P30 9:720P25 A：1080P59.94 B：1080i59.94 C：720P59.94 D：1080P29.97 E：720P29.97
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	wwww: Pan Position zzzz: Tilt Position

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

5.2 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
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

5.3 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
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

6. TROUBLESHOOTING

1) No video output

    a. Check whether the camera power supply is connected, the voltage is normal and the power indicator is lit.

    b. Check whether the machine could do self-check after restarted.

    c. Check whether the bottom of the DIP switch is the normal operating mode (see **Table 2.4.2**).

    d. Check whether the video output cable or video display is normal.

2) No image sometimes

    a. Check whether the video output cable or video display is normal.

3) Image dithering when zoom-in or zoom-out

    a. Check whether the camera installation position is solid.

    b. Whether there is shaking machine or objects around the camera.

4) Remote controller cannot work

    a. Remote controller address is set to 1 (if the machine is set back to the factory defaults, remote controller addresses need to be back to 1 too).

    b. Check whether the battery is installed on the remote controller or low.

    c. Check the camera working mode is the normal operating mode (see **Table 2.4.2**).

    d. Check whether the menu is closed, camera control through remote controller is only available after exiting the menu. If video output from LAN, menu will not be displayed, menu will automatically exist 30s later, then it can be controlled by remote controller.

5) Serial port cannot work.

    a. Check whether the camera serial device protocol, baud rate, address is consistent.

    b. Check whether the control cable is connected properly.

    c. Check whether the camera working mode is the normal operating mode (see **Table 2.4.2**).

6) Web pages cannot login

    a. Check whether the camera is showing normally.

    b. Check whether the network cable is connected properly (Ethernet port yellow light flashes to indicate normal network cable connection).

    c. Check whether your computer is added a static new IP address whose third segment must be consistent with the IP address of the camera.

    d. Click "Start" and select "Run" and then type "cmd" in the computer; Click "OK" then turn on DOS command window to enter ping 192.168.5.163. Press the Enter key to appear message as follows: Description network connection is normal.

7) Instruction for using NDI

    a. Network interface for normal device is LAN port and for NDI model is NDI port.

    b. There is no other difference between PTZ model and NDI model except for the network interface.

8) Camera's default IP address

    a. Factory default IP address is 192.168.5.163, which can simply be found at the bottom of the camera.

9) Camera's current IP address

    a. Login into the camera's web interface and go to Configuration> Network Configure> Ethernet.

    b. Power on the camera after connecting with a monitor, the camera's current IP address will be in the top left corner.

10) Restore to factory default

    a. Login into the camera's web interface and go to Configuration> System Configure> Default, click on "Restore Factory Defaults" bottom and choose "Yes" to restore to default.

    b. Use Remote Controller to press [*] + [#] + [6] in sequence.

11) Stream to YouTube& Facebook

    a. First of all, set the camera and Ethernet properly according to Quick Start Guide according to your own network conditions. Second, use your username and password (both of them default "admin") to login into the camera's administrator interface for further operations. Save your settings. Second, click to enter YouTube/ Facebook page to get Stream Key and Stream URL, which are essential for streaming. Then go to Configuration > Video Configure > Stream Publish and use the information from Step b to set up your stream. Use Stream URL for "Host Address" and Stream Key for "Stream Name". Don't forget to change Host Port to "443". Save your settings. Once saved all the settings above, you're streaming on YouTube/ Facebook starts immediately.

Notice: Some models may need audio configuration to push stream properly. So, if you finished all the steps above and still can't start your stream, please follow the next steps. Go to Audio Configure> Enable Audio Configure> Save settings. In conclusion, set up

streaming needs at least 3 steps: login into the camera's web interface, get the info from the platform you want to stream to, use the info in the right section.

12) Get RTMP(S) URL

a. Take Facebook as an example: go to the Facebook account and follow the next steps. Click "Create Post"> "More"> "Live Video", after then select "Use Stream Key" and paste them into RTMP(S) address setting section of encoder.

13) Push stream through RTSP(VLC)

a. First, choose NETWORK for VLC media source. After login into the camera's web interface, go to Configuration > Stream Publish. And then choose RTSP for Protocol Type and use Host Address and Stream Name to create a unique network URL for VLC. Last, and click "play" to start stream. If you have more questions, you can visit our PTZ FAQ.

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