

PTZ Cameras

79068 User Manual

HD PTZ Cameras

HDMI & HDBaseT IP/PTZ Cameras

5x, 12x, or 20x Optical Zoom, Up to 1080p Resolution



All Rights Reserved

Version: 79068_2020V2.0

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Attentions

Electric Safety

Installation and operation must accord with electrical safety standards

Caution in transportation

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

Polarity of power supply

The power supply of the product is $\pm 12V$ and the max electrical current is 2A. Polarity of the power supply drawing.



Caution in Installation

Never move the camera by seizing the camera head. Do not rotate camera head by hand, as this may lead to mechanical trouble

This series item must be put on a smooth desk or platform and cannot be installed sideways. If the camera is installed on a TV or computer, the base must be fixed by four double-sided adhesive trays.

Ensure no obstacles are within rotation range.
Do not power on before installation is complete.

Don't disassemble discretionarily.

We are not responsible for any unauthorized modification or dismantling.

Attention

Electromagnetic field under certain rate may affect camera image!

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Safety Precautions

To ensure the best performance from the product, please read all instructions carefully before using the device. Save this manual for further reference.

- Unpack the equipment carefully, and save the original box and packing material for possible future shipment
- Follow basic safety precautions to reduce the risk of fire, electrical shock, and injury to persons
- Do not dismantle the housing or modify the module (electrical shock or burn hazard)
- Using supplies or parts not meeting the products' specifications may cause damage, deterioration, or malfunction
- Refer all servicing to qualified service personnel
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water
- Do not put any heavy items on the product's power cable
- Do not remove the housing of the device as opening or removing housing may expose you to dangerous voltage or other hazards
- Install the device in a place with sufficient ventilation to avoid damage caused by overheating
- Keep the module away from liquids
- Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on to the housing, unplug the module immediately
- Do not twist or pull by force ends of the optical cable. It can cause malfunction.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning
- Unplug the power cord when left unused for a long period of time
- Information on disposal for scrapped devices: do not burn or mix with general household waste, please treat them as normal electrical wastes

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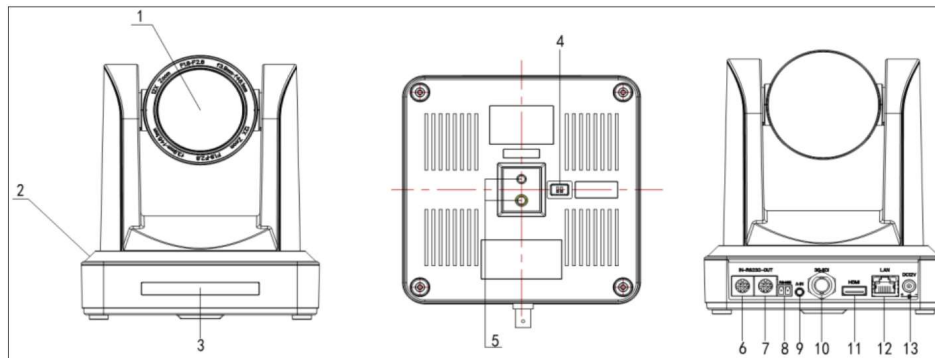
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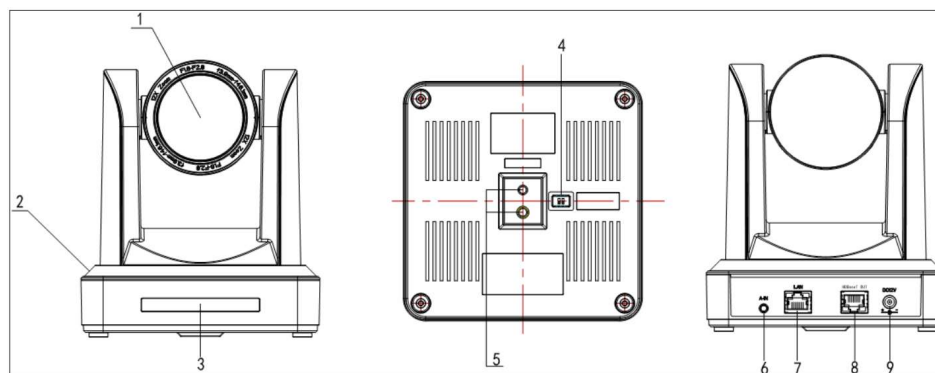
1. Fast Installation

1.1 Camera Interface Explanation



Interface of HDMI 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



Interface of HDBT (HDBaseT) Series

8. Camera Lens
9. Camera Base
10. Remote Control Receiver Light
11. Bottom Dial Switch
12. Tripod Screw Hole
6. Audio Input Interface
7. 10/100M Network Interface
8. RJ-45 HDBaseT Interface
9. DC12V Input Power Supply Socket

Note: 79068-HDMI models are HDMI interface, 79068-HDBT models have RJ-45 HDBaseT interface. Users should read the manual according to the special model.

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1.2 Powering On & Initial Configuration

13. **Power on:** Connect DC12V power supply adapter with power supply socket.

14. **Initial Configuration:** Power on with power indicator light on and remote control receiver light blinking, camera head moves from bottom left to the bottom, and then goes to the HOME position (intermediate position of both horizontal and vertical), while the camera module stretches. When remote control receiver light stops blinking, the self-checking is finished

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

1.3 Video Output

This series has a variety of video output; HDMI models have video output from LAN, HDMI and 3G-SDI, HDBT models from LAN and HDBaseT.

1.3.1 Video Output from LAN

Webpage Login: Open your browser and enter 192.168.5.163 in the address bar (factory default); press Enter to enter 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 and password admin (factory default); press Enter to enter the preview page, users can carry out PTZ control, video recording, playback, configuration and other operations.

1.3.2 HDMI Video Output

Connect the camera and the monitor via HDMI video cable; video output is available after camera self-test.

1.3.3 3G-SDI Video Output

Connect the camera and the monitor via 3G-SDI video cable; video output is available after camera self-test.

1.3.4 RJ-45 HDBaseT Video Output

Connect the device, HDBaseT signal-receiving device, and the display together properly through the network cable and video cable. Image could be displayed after the device finish self-inspection. HDBaseT signal receiving device: HDBaseT adapter box, input HDBaseT signal, output HDMI signal.

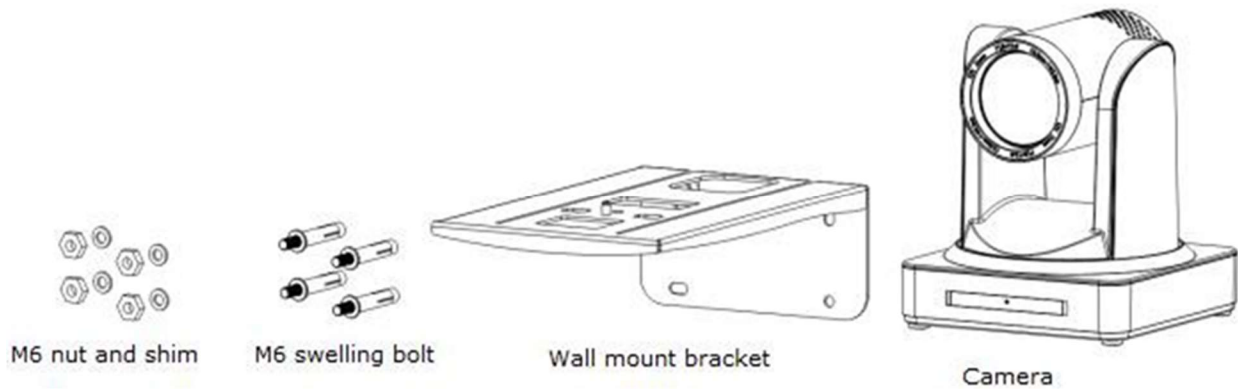
1.4 Bracket Mount

Note: Bracket can only be wall mounted or upside down mounted on template and concrete wall, but cannot be installed on plasterboard.

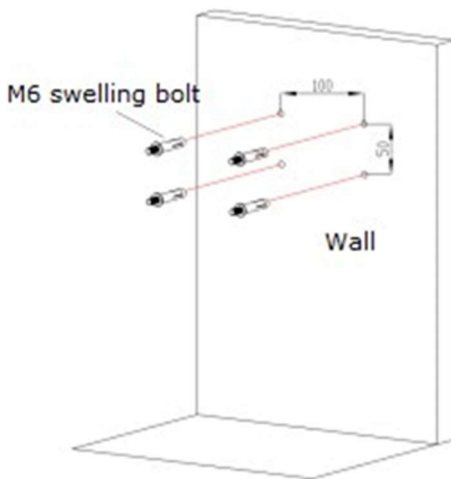
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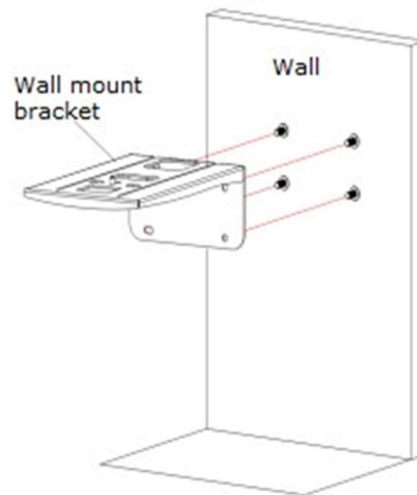
1.4.1 Wall Mount Step



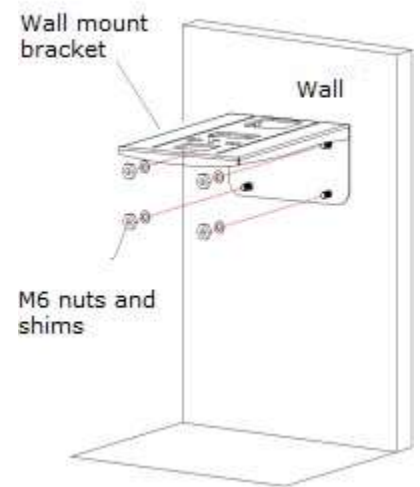
Step 1



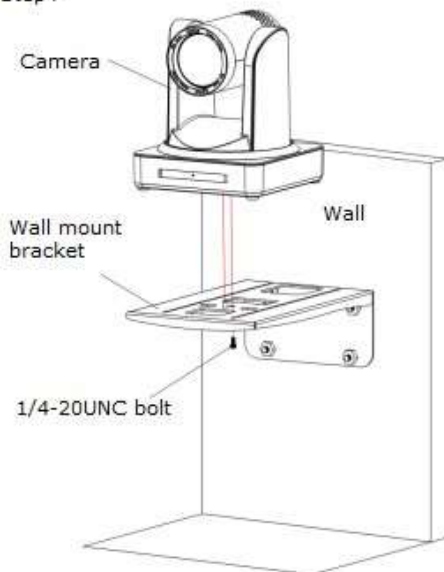
Step2



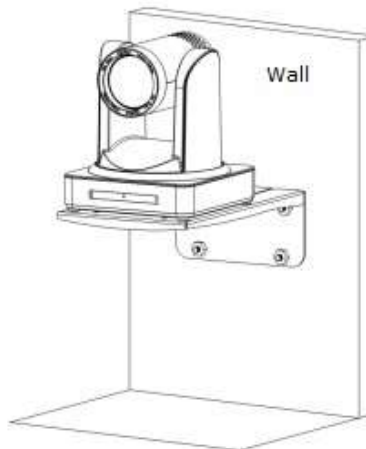
Step3



Step4



Finish



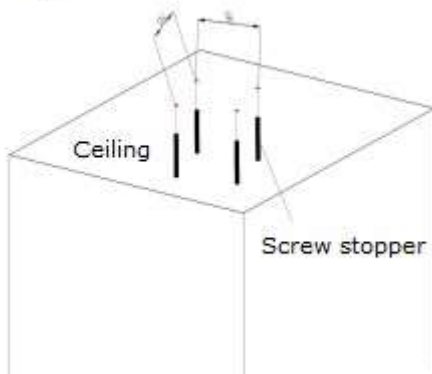
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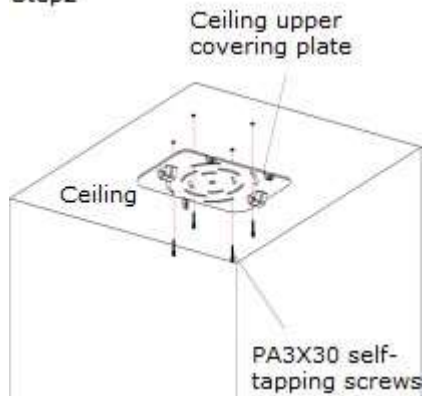
1.4.2 Upside-Down Mount Step



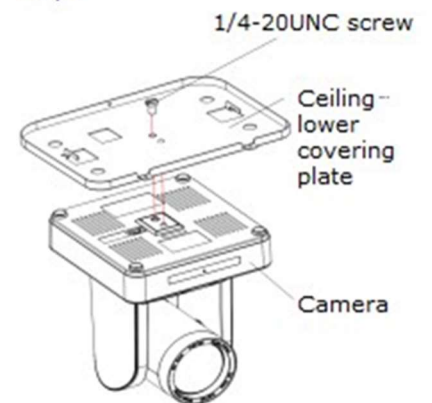
Step1



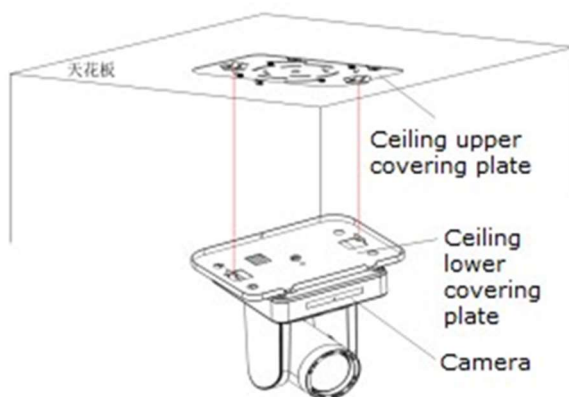
Step2



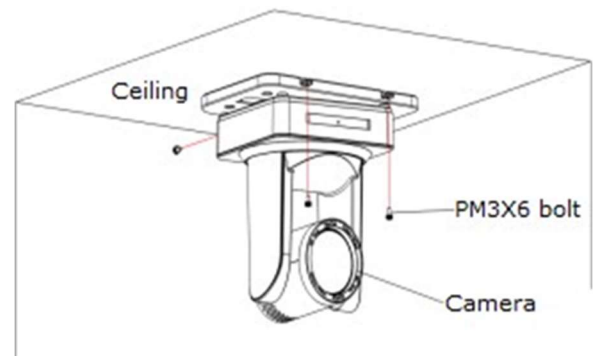
Step3



Step4



Step5



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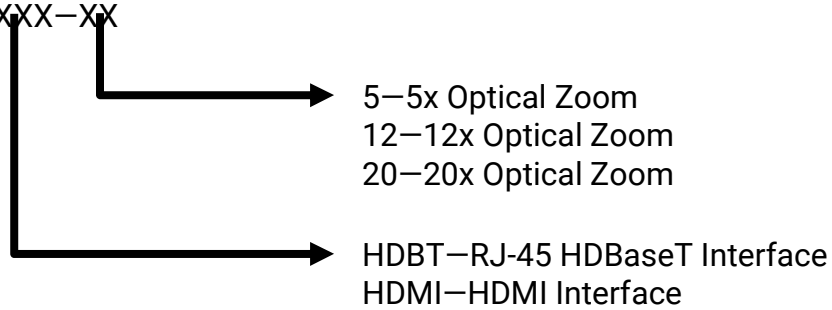
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2. Product Overview

2.1 Product Introduction

2.1.1 Product Model

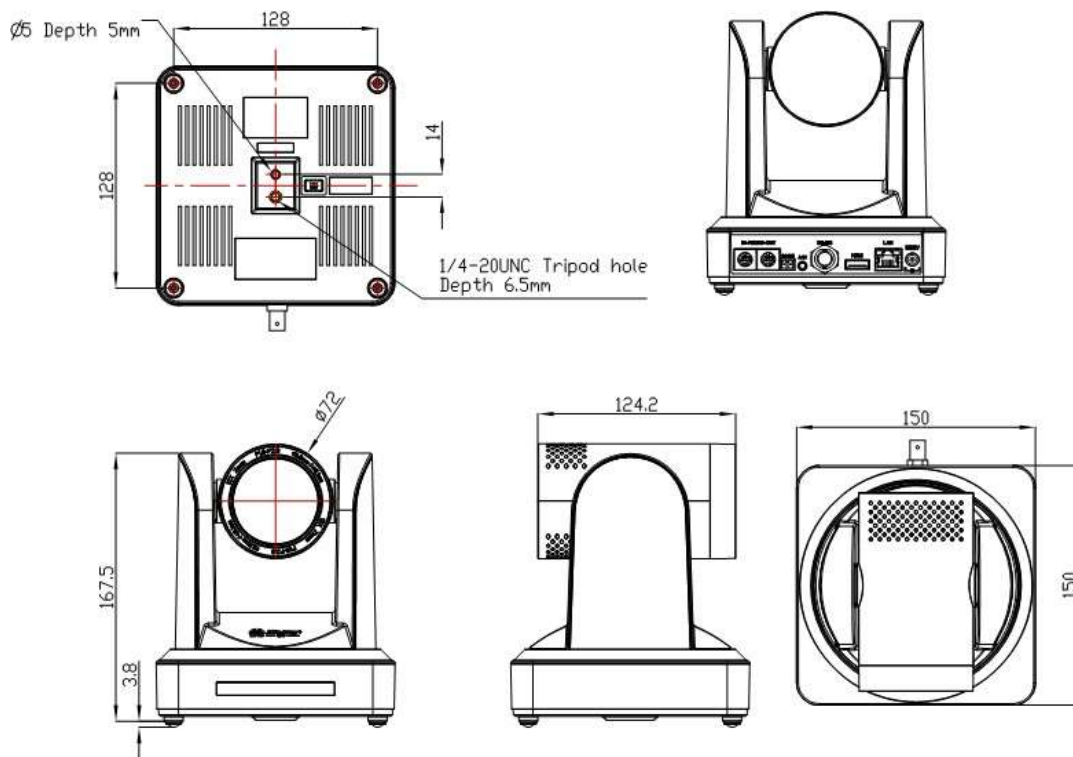
Model Number: 79068-XXXX-XX



Please refer to corresponding features in this manual

Note: 5G Wi-fi is optional for HDMI series only

2.1.2 Dimensions



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2.2 Main Features

2.2.1 Camera Performance

This series of cameras offers improved functions and performance. 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 less than ideal bandwidth conditions.

15. **Superb High-Definition Image:** Employs 1/2.8 inch high quality CMOS sensor. Resolution up to 1920x1080 with frame rate up to 60 fps.
16. **Various Optical Zoom Lens:** Has 5X/12X/20X optical zoom lens. The 5X zoom lens offers 80.9 ° wide view angle without distortion.
17. **Auto Focus Technology:** Leading auto focus algorithm makes lens a fast, accurate, and stable.
18. **Low Noise and High SNR:** Low Noise CMOS effectively ensure high SNR of camera video. Advanced 2D/3D noise reduction is also used to further reduce noise while ensuring a sharp image.
19. **Quiet PTZ:** By adopting a high accuracy step-driving motor mechanism, the camera works quietly, and moves smoothly and quickly to its designated position.
20. **Multi-Format Video Outputs:** supports HDMI, 3G-SDI, USB, wired LAN, and wireless LAN interfaces. The 3G-SDI is available for ~325ft transmission at 1080p.
21. **Multiple Remote Controls:** Includes IR remoter and 2.4G wireless remote. The 2.4G wireless remote controller will not be affected by angle, distance, or IR interference. Supports transparent transmission function.
22. **Low-power Sleep Function:** Supports low-power sleep/wake up. Energy usage is lower than 500mW under sleep mode
23. **Support Multiple Control Protocol:** Supports VISCA, PELCO-D, and PELCO-P protocols which can also be recognized automatically. Supports VISCA control protocol through IP port.
24. **RS-232 Cascade Function:** ST series support RS-232 cascade function for convenient installation.
25. **255 Presets Positions:** Up to 255 presets (10 presets via remote).
26. **Wide Application:** Education, lecture capture, webcasting, videoconferencing, training, and Emergency command systems (e.g. Emergency Operating Centers).

2.2.2 Network Performance

27. **Audio Input Interface:** Supports 16000, 32000, 44100, 48000 sampling frequency, and AAC, MP3, and PCM audio coding.
28. **Multiple Audio/Video Compression:** Supports H.264/H.265 video compression; AAC, MP3, and PCM audio compression. Supports compression of resolution up to 1920x1080 up to 60 FPS and 2 channel 1920x1080p with 30 FPS compression.

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29. **Multiple Network Protocols:** Supports ONVIF, RTSP, RTMP protocols, and RTMP push mode. Also includes easy-to-link streaming media server.

30. **5G Wi-Fi function:** If the product contains a 5G Wi-Fi module, you can set up a wireless Wi-Fi connection. The specific configuration is described in detail on the web configuration page.

2.3 Specifications

Model	5x	12x	20x
Camera Parameters			
Sensor	1/2.8 inch high-quality HD CMOS sensor		
Effective Pixels	16:9, 2.07 Megapixel		
Video Format	HDMI video format 1080P60/50/30/25/59.94/29.97;1080I60/50/59.94;720P60/50/30/25/59.94/29.97		
Optical Zoom	5x f=3.6 ~ 18mm	12x f=3.9 ~ 46.1mm	20x f=5.2 ~ 98mm
View Angle	16.43° (tele) 80.9° (wide)	6.3° (tele) 72.5° (wide)	3.2° (tele) 55.8° (wide)
AV	F1.6 – F3.0	F1.8 – F2.4	F1.5 – F3.0
Digital Zoom	10x		
Minimum Illumination	0.5Lux (F1.8, AGC ON)		
DNR	2D & 3D DNR		
White Balance	Auto / Manual / One-Push / 3000K / 4000K / 5000K / 6500K		
Focus	Auto/Manual		
Aperture	Auto/Manual		
Electronic Shutter	Auto/Manual		
BLC	ON / OFF		
WDR	OFF / Dynamic Level Adjustment		
Video Adjustment	Brightness, Color, Saturation, Contrast, Sharpness, B/W Mode, Gamma Curve		
SNR	>55dB		

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Input/Output Interfaces	
Video Interfaces	'-HDMI models: HDMI, 3G-SDI, LAN '-HDBT models: HDBaseT, LAN
Image Code Stream	Double streams outputs simultaneously
Video Compression Format	H.264, H.265
Control Signal Interface	RS-232 Ring through RS232 output, RS-485
Control Protocol	VISCA/Pelco-D/Pelco-P; Baud Rate: 115200/9600/4800/2400bps
Audio Input Interface	Double track 3.5mm linear input
Audio Compression Format	AAC/MP3/PMC Audio compression
HD IP Interface	100M IP port(100BASE-TX); 5G WiFi (optional), supports IP Visca control protocol
Network Protocol	RTSP/RTMP, ONVIF
Power Interface	HEC3800 outlet (DC12V)

PTZ Parameters	
Pan Rotation	$\pm 170^\circ$
Tilt Rotation	$-30 \sim 90^\circ$
Pan Control Speed	$0.1 \sim 180^\circ / \text{sec}$
Tilt Control Speed	$0.1 \sim 80^\circ / \text{sec}$
Preset Speed	Pan: $60^\circ / \text{sec}$ Tilt: $30^\circ / \text{sec}$
Preset Number	255 presets (10 presets by remote controller)

Other Parameters	
Supply Adapter	AC110V-AC220V to DC12V/2A
Input Voltage	DC12V $\pm 10\%$
Input Current	1A (Max)
Consumption	12W (Max)
Storage Temperature	$-10 \sim 60^\circ \text{C}$
Storage Humidity	20 ~ 95%
Working Temperature	$-10 \sim 50^\circ \text{C}$
Working Humidity	20 ~ 80%

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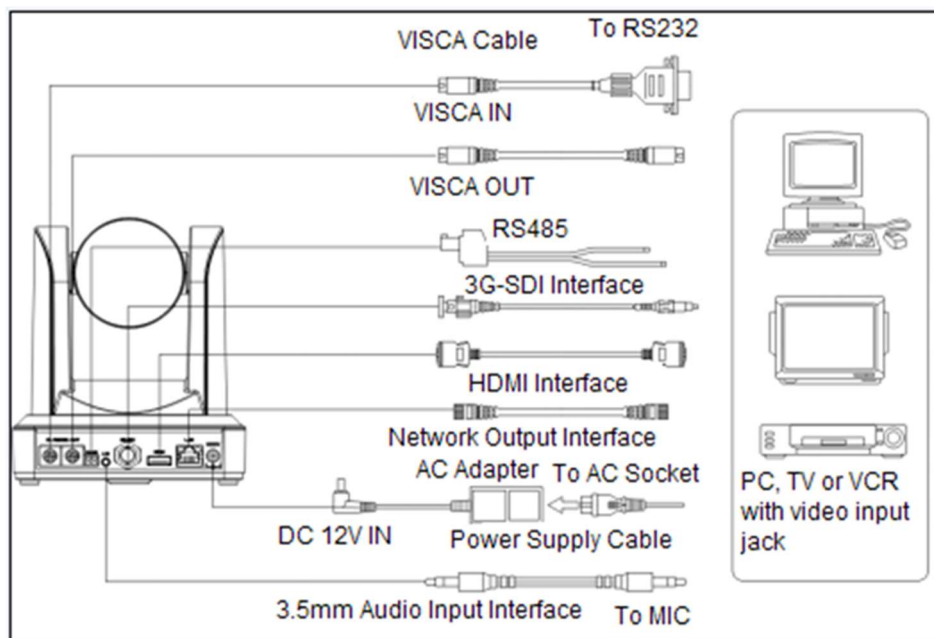
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Dimensions	5.9" (150mm) x 5.9" (150mm) x 6.6" (167.5mm)
Weight	3.1 lbs. (1.4kg)
Working Environment	Indoor
Remote Operation (IP)	Remote Upgrade, Reboot and Reset

2.4 Interface Instruction

2.4.1 External Interface

External Interface of HDMI models: RS232 Input/Output, RS485 Input, Audio Input, 3G-SDI Output, HDMI Output, LAN, and DC12V Power Interface

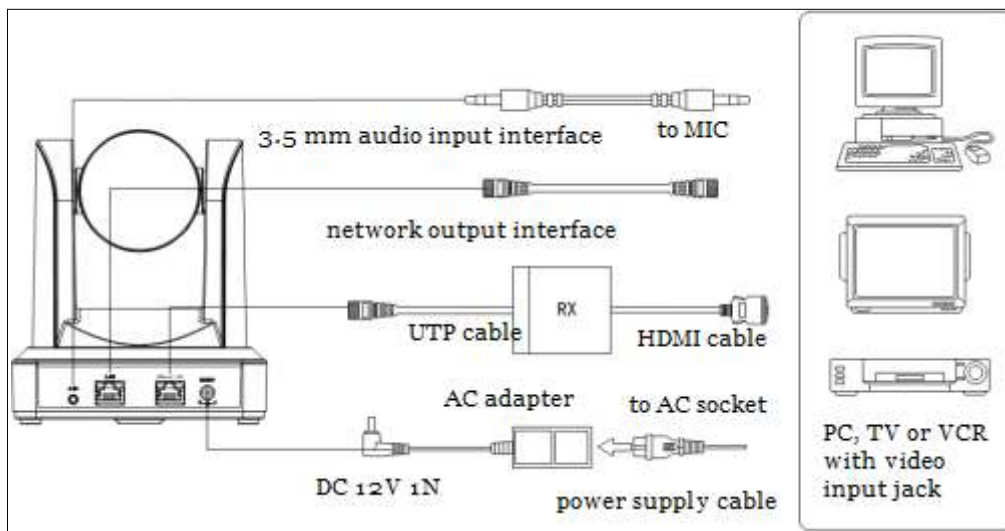


External Interface of HDMI Series

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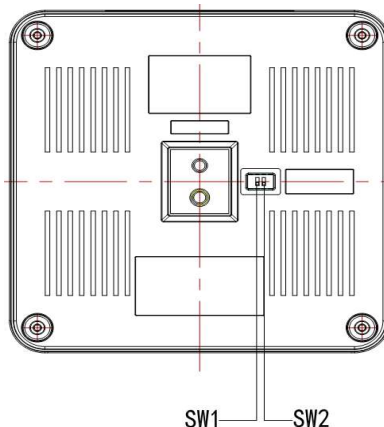
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External Interface of HDBT models: Audio Input, HDBaseT Output, LAN, and DC12V Power Interface



External Interface of HDBT (HDBaseT) Series

2.4.2 Bottom Dial Switch



HDMI models: Two DIP switches are set to ON or OFF to select different modes of operation			
No.	SW1	SW2	Explanation
1	OFF	OFF	Software Upgrade Mode
2	ON	ON	Working Mode

HDBT models: Two DIP switches are set to ON or OFF to select different modes of operation			
No.	SW1	SW2	Explanation
1	OFF	ON	Working Mode
2	ON	OFF	ARM Software Upgrade Mode

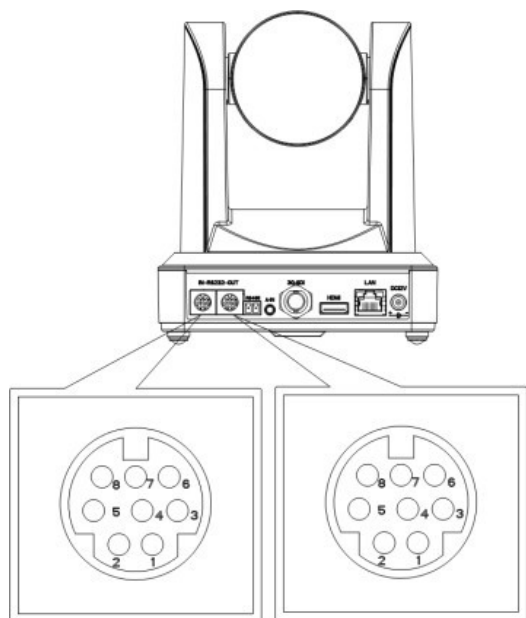
Note: Web upgrade can be conducted while in Working Mode

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2.4.3 RS-232 Interface

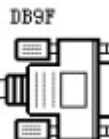
Computer/keyboard & camera connection



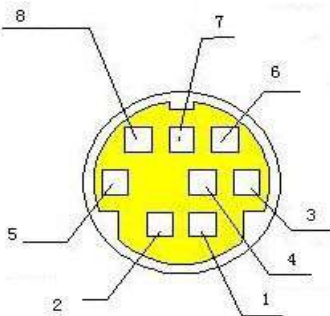
HDMI models' RS-232C interface specification:

Camera	Windows (DB-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

RS232 IN
port on
camera



RS232 port on
PC or Control
Keyboard

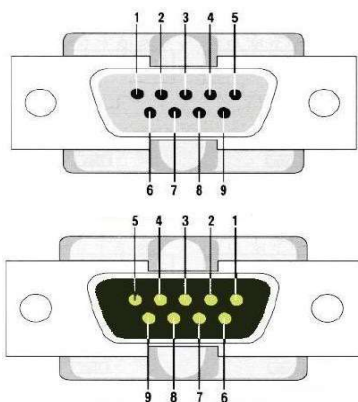


RS-232C Mini-DIN 8-pin Port Definition

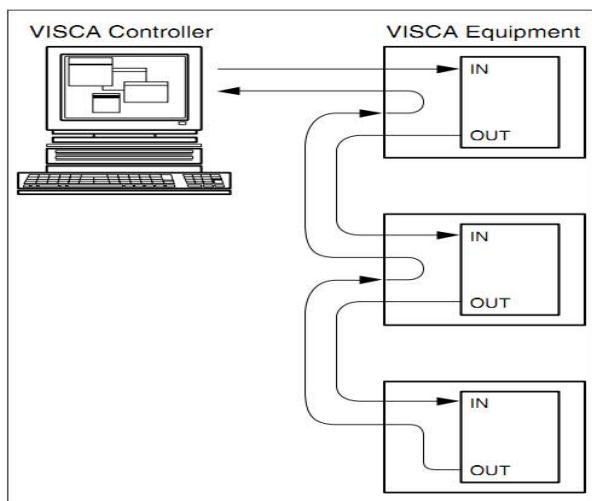
No.	Port	Definition
1	DTR	Data Terminal Ready
2	DSR	Data Set Ready
3	TXD	Transmit Data
4	GND	System Ground
5	RXD	Receive Data
6	GND	System Ground
7	IR OUT	IR Commander Signal
8	NC	No Connection

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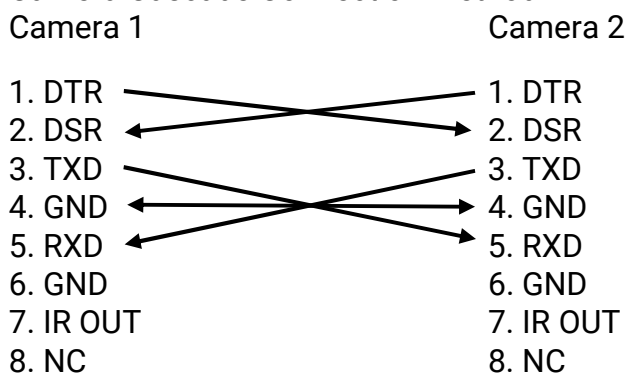


RS232 (DB-9) Port Definition		
No.	Port	Definition
1	DCD	Data Carrier Detect
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	System Ground
6	DSR	Data Set Ready
7	RTS	Request to Send
8	CTS	Clear to Send
9	RI	Ring Indicator



VISCA Networking

Camera Cascade Connection Method



Note: HDMI models have RS232 input & output interfaces, so you can cascade as shown above

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3. Application Instructions

3.1 Video Output

3.1.1 Power-On Initial Configuration

When powered on, the IR indicator light will flash and configure the camera to its default configuration. When the camera returns to the HOME position (middle position for P/T), the lens finish will zoom in/out and finish auto-testing. When completed, the IR LED will also stop flashing. If the preset "0" is set, the camera will rotate to the "0" preset position after initial configuration.

3.1.2 Video Output

31. **Connect to the video output cable:** Select the output mode according to the machine model (Figure 1.4.1).
32. **Network output:** Connect this product and your computer through a network cable and open a web browser. Then, enter the camera IP address (factory default 192.168.5.163) in the address bar, and input a username and password (factory default are "admin") in the login page. Finally, enter the preview page, and the image will appear.
(Note: If you forget your username, password, or IP address, you can manually restore the default using the remote controller key combination * #)
33. **3G-SDI output or DVI (HDMI) output:** Connect the monitor with the corresponding video output interface, then the monitor output image.

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3.2 Remote Controller

3.2.1 Keys Instruction



- 1. Power Button:** After pressing the key for 3 seconds, the camera will enter standby mode. If pressed again for three seconds, the camera will self-test again and then return to the HOME position (If Preset 0 is set, the camera will move to that preset instead of HOME).
- 2. Camera Address Selection:** Select which camera address to control
- 3. Number Keys:** Short press to run presets 0-9
- 4. Restore Factory Defaults:** Press [*] and [#] together to use key combination functions (see Section 12)
- 5. Focus Control Key:**
 - AUTO:** Sets camera to auto-focus mode
 - MANUAL:** Sets camera to manual focus mode
 - FOCUS +/-:** Sets camera to manual focus and shifts focus in/out
- 6. Zoom Control Key:**
 - ZOOM +:** Zoom in to view smaller or more distant objects
 - ZOOM -:** Zoom out to view larger or closer objects
- 7. Set/Clear Preset Keys:**
 - Set Preset:** Press "Set Preset," and then assign a number key to the camera's current position to that preset number
 - Clear Preset:** Press "Clear Preset," then a number key to erase the selected preset
- 8. Pan/Tilt Control Keys:** Press the Up, Down, Left, or Right keys to adjust where the camera faces
Press [HOME] to return camera to its middle position & zoom
- 9. Back-Light Compensation (BLC) Toggle:** Turn back-light compensation on or off
- 10. Menu:** Open or close the OSD Menu
- 11. Camera IR Remote Control Address Setting:**
 - [*] and [#] and [F1]: Camera Address No. 1
 - [*] and [#] and [F2]: Camera Address No. 2
 - [*] and [#] and [F3]: Camera Address No. 3
 - [*] and [#] and [F4]: Camera Address No. 4

12. Key Combination Functions

- | | |
|--|---|
| [#] and [#] and [#]: Clear all presets | [*] and [#] and [6]: Restore factory defaults |
| [*] and [#] and [3]: Set menu language to Chinese | [*] and [#] and [4]: Set menu language to English |
| [*] and [#] and [MANUAL]: Restore default username, password, and IP address | [#] and [#] and [0]: Set video format to 1080P60 |
| [#] and [#] and [1]: Set video format to 1080P50 | [#] and [#] and [2]: Set video format to 1080I60 |
| [#] and [#] and [3]: Set video format to 1080I50 | [#] and [#] and [4]: Set video format to 720P60 |
| [#] and [#] and [5]: Set video format to 720P50 | [#] and [#] and [6]: Set video format to 1080P30 |
| [#] and [#] and [7]: Set video format to 1080P25 | [#] and [#] and [8]: Set video format to 720P30 |
| [#] and [#] and [9]: Set video format to 720P25 | |

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3.2.2 Applications

After finalizing installation, the camera can receive and execute IR commands. When the remote controller button is pressed, the indicator light will flash. When the button is released, the indicator light will stop flashing. Users can control the pan/tilt/zoom setting and run preset positions via the IR remote controller.

Key Instruction:

In this instruction, “press the key” means a single click rather than holding the button down for several seconds.

When a key-combination is required, it must be done sequentially. For example, [*] + [#] + [F1] means press [*] first, then press [#], then press [F1].

1. Camera Selection



Select the address of the camera to control

2. Pan/Tilt Control

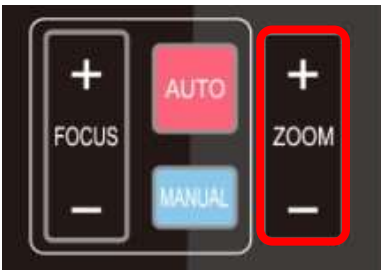


Tilt Up: Press [▲]
Tilt Down: Press [▼]
Pan Left: Press [◀]
Pan Right: Press [▶]
To return to middle position, press [HOME]

While holding the Up/Down/Left/Right key, the pan/tilt will continue running, slowly to quickly, until it reaches the limit of its movement.

The pan/tilt stops running as soon as the key is released.

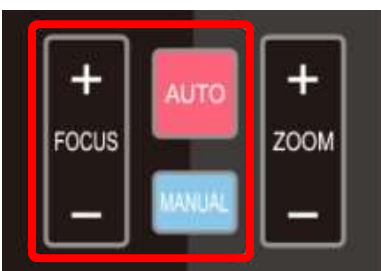
3. Zoom Control



Zoom In: Press [ZOOM +]
Zoom Out: Press [ZOOM -]

While holding either key, the camera will continue zooming in/out. Zooming stops as soon as the key is released.

4. Focus Control



Focus Near: Press [FOCUS +] (Manual Focus mode only)
Focus Far: Press [FOCUS -] (Manual Focus mode only)
Automatic Focusing: Press [AUTO]
Manual Focusing: Press [MANUAL]

While holding either key, the camera will continue focusing in/out. Focusing stops as soon as the key is released.

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5. BLC Setting



To toggle Back-Light Compensation (BLC), press **[BLC ON/OFF]**

6. Setting, Running, and Clearing Presets



1. Setting Presets

To set a preset position, manually move the camera into the desired position, then press **[SET PRESET]**, followed by the number of the desired preset

10 preset positions are available using the remote control

2. Running Presets

To set the camera to a preset position, press a number key **[0-9]**

3. Clearing Presets

To clear a preset position, press **[CLEAR PRESET]**, followed by the number of the desired preset

To clear all presets, press **[#]** three times in rapid succession

7. Camera Remote Controller Address Setting



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

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

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

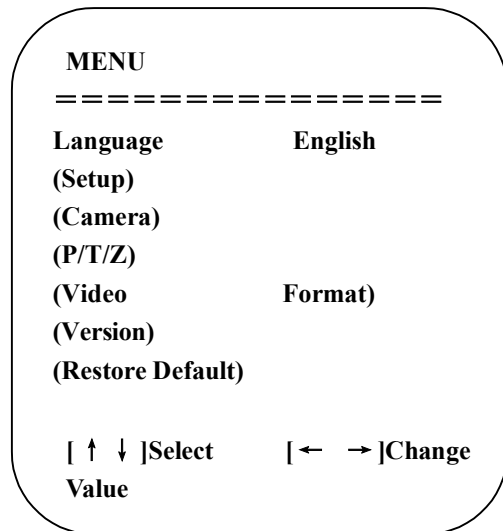
[*] and **[#]** and **[F4]**: Camera Address No. 4

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3.3 Menu Settings

3.3.1 Main Menu



Language: Language setting (Chinese/English)

Setup: System settings

Camera: Camera settings

P/T/Z: Pan, tilt, and zoom settings

Video Format: Output resolution settings

Version: MCU, Camera, and AF version information

Restore Default: Restore all settings to their factory defaults

[MENU]: Go back one step in the menu structure

[HOME]: Enter or OK (Press **[HOME]** again to confirm)

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3.3.2 System Settings

Navigate to "Setup" in the Main Menu, and then press **[HOME]** to enter the System Settings menu

```
SETUP
=====
Protocol           Auto
Visca Address      1
Visca Address Fix  OFF
PELCO-P Address    1
PELCO-D Address    0
Baudrate           9600

[↑ ↓]Select [← →]Change
Value
```

Protocol: Network protocol setting (VISCA/Pelco-P/Pelco-D/Auto)

VISCA Address: 1 ~ 7

VISCA Address Fix: ON indicates that the address cannot be changed

Pelco-P Address: 1 ~ 255

Pelco-D Address: 1 ~ 255

Baud rate: 2400 / 4800 / 9600 / 115200

3.3.3 Camera Settings

Navigate to "Camera" in the Main Menu, and then press **[HOME]** to enter the Camera Settings menu

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

[↑ ↓]Select [← →]Change
Value
```

Exposure: Enter the Exposure Settings sub-menu

Color: Enter the Color Settings sub-menu

Image: Enter the Image Settings sub-menu

Focus: Enter the Focus Settings sub-menu

Noise Reduction: Enter the Noise Reduction sub-menu

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3.3.3.1 Exposure Settings

Navigate to “Exposure” in the Camera Settings menu, and then press **[HOME]** to enter the Exposure Settings sub-menu

EXPOSURE	
=====	
Mode	Auto
EV	OFF
BLC	OFF
Anti-Flicker	50Hz
Gain Limit	3
WDR	5

[↑ ↓]Select [← →]Change Value

Mode: Auto / Manual / Shutter Priority / Iris Priority / Brightness Priority

EV (Exposure Value): ON / OFF (Auto mode only)

Compensation Level: -7 ~ 7 (EV = ON only)

Back-Light Compensation (BLC): ON / OFF (Auto mode only)

Anti-Flicker: OFF / 50Hz / 60Hz (Auto/Iris Priority/Brightness Priority modes only)

Gain Limit: 0 ~ 15 (Auto/Iris Priority/Brightness Priority modes only)

Wide Dynamic Range (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 (Manual/Shutter Priority modes only)

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 (Manual/Iris Priority modes only)

Brightness: 0 ~ 23 (Brightness Priority mode only)

3.3.3.2 Color Settings

Navigate to “Color” in the Camera Settings menu, and then press **[HOME]** to enter the Color Settings sub-menu

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

[↑ ↓]Select [← →]Change Value

White Balance (WB) Mode: Auto / 3000K / 4000K / 5000K / 6500K / Manual / One-Push

Red Gain: 0 ~ 255 (Manual mode only)

Blue Gain: 0 ~ 255 (Manual mode only)

Saturation: 60%, 70%, 80%, 90%, 100%, 110%, 120%, 130%

Hue: 0 ~ 14

Automatic White Balance (AWB) Sensitivity: High / Middle / Low

Color Style: Default, Style 1 ~ 4

Color Temperature: High / Middle / Low

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3.3.3.3 Image Settings

Navigate to "Image" in the Camera Settings menu, and press **[HOME]** to enter the Image Settings sub-menu

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	

Brightness: 0 ~ 14

Contrast: 0 ~ 14

Sharpness: 0 ~ 15

Flip Horizontal (Flip-H): ON / OFF

Flip Vertical (Flip-V): ON / OFF

Black & White (B&W) Mode: Color, Black/White

Gamma: Default, 0.47, 0.50, 0.52, 0.55

Digital Zoom (DZoom): ON / OFF

Digital Contrast (DCI): OFF, 1 ~ 8

3.3.3.4 Focus Settings

Navigate to "Focus" in the Camera Settings menu, and then press **[HOME]** to enter the Focus Settings sub-menu

FOCUS	
=====	
Focus Mode	Auto
AF-Zone	Center
AF-Sensitivity	Low
[↑ ↓]Select	[← →]Change
Value	

Focus Mode: AUTO / MANUAL

Auto-Focus (AF) Zone: Up / Middle / Down

AF Sensitivity: High / Middle / Low

3.3.3.5 Noise Reduction Settings

Navigate to "Noise Reduction" in the Camera Settings menu, and then press **[HOME]** to enter the Noise Reduction Settings sub-menu

NOISE REDUCTION	
=====	
NR-2D	Auto
NR-3D	3
Dynamic Hot Pixel	OFF
[↑ ↓]Select	[← →]Change
Value	

2D Noise Reduction: AUTO, CLOSE, 1 ~ 7

3D Noise Reduction: CLOSE, 1 ~ 8

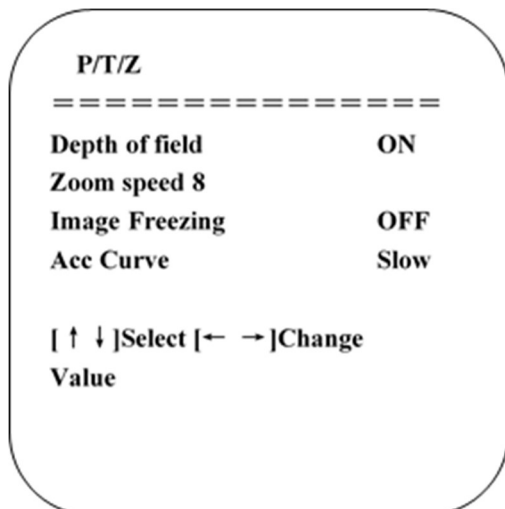
Dynamic Hot Pixel: CLOSE, 1 ~ 5

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3.3.4 P/T/Z Settings

Navigate to "P/T/Z" in the Main Menu, and then press **[HOME]** to enter the PTZ Settings menu



Depth of Field: ON / OFF (Remote Control only)

Reduces zoom speed when zooming in using the remote

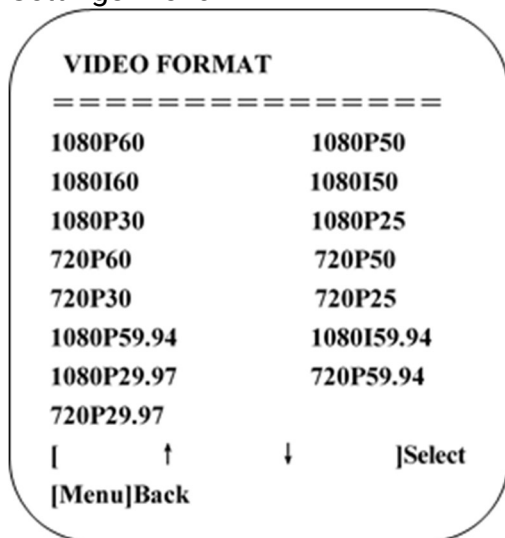
Zoom Speed: 1 ~ 8 (Remote Control only)

Image Freezing: ON / OFF

Acceleration (Acc) Curve: Fast / Slow

3.3.5 Video Format

Navigate to "Video Format" in the Main Menu, and then press **[HOME]** to enter the Video Format Settings menu



Select the desired resolution & video format for the camera's output

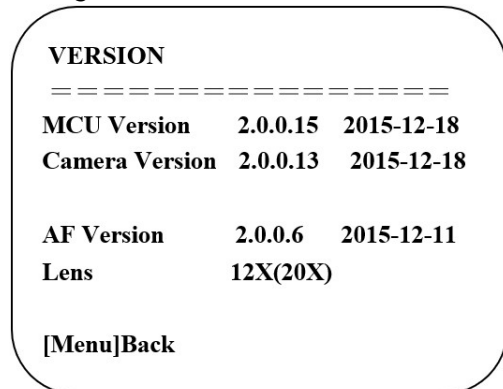
Note: Changes to the resolution may not be applied until the next time the camera powers on.

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3.3.6 Version

Navigate to “Version” in the Main Menu, then press **[HOME]** to enter the Version Information menu



MCU Version: Version information for the camera microcontroller unit (MCU)

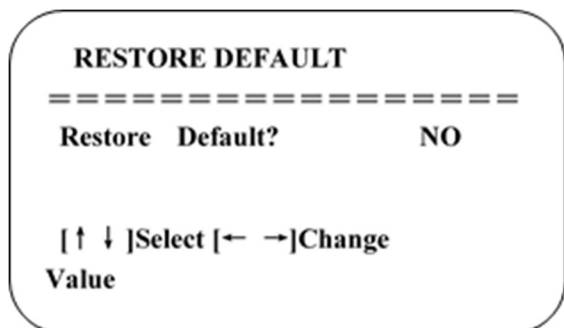
Camera Version: Version information for the camera hardware & software

AF Version: Version information for the camera’s Auto-Focus (AF) software

Lens: Camera optical lens zoom

3.3.7 Restore Default

Navigate to “Restore Default” in the Main Menu, then press **[HOME]** to enter the Restore Default menu



Restore Default: YES / NO

Restoring default settings does not restore video format

Note: Camera address will default to 1 after settings are restored, regardless of previous setting. To ensure remote control continues to control camera, press **[1]** in the “Camera Select” section of the remote control to set it to control Camera 1.

4. Network Connection

4.1 Connecting Mode

Direct Connection: Connect camera to computer via network cable

Internet Connection Mode: Connect the camera to the Internet via a router or switch. Users can log in to the device via an internet browser.

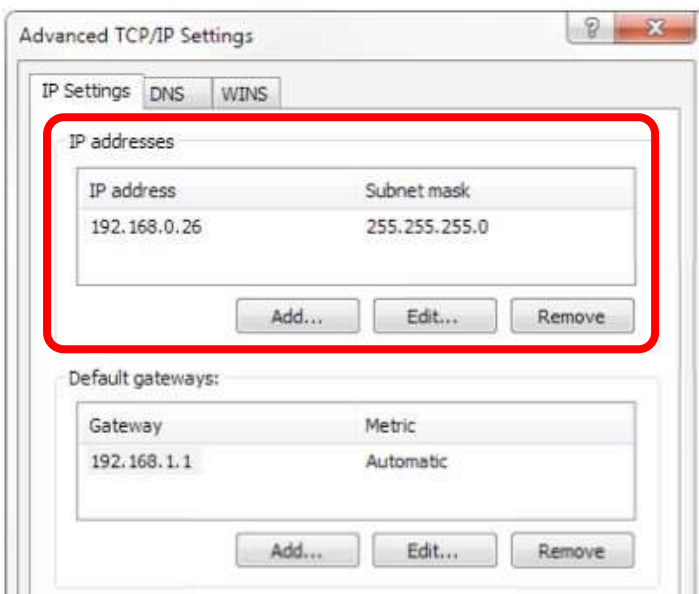
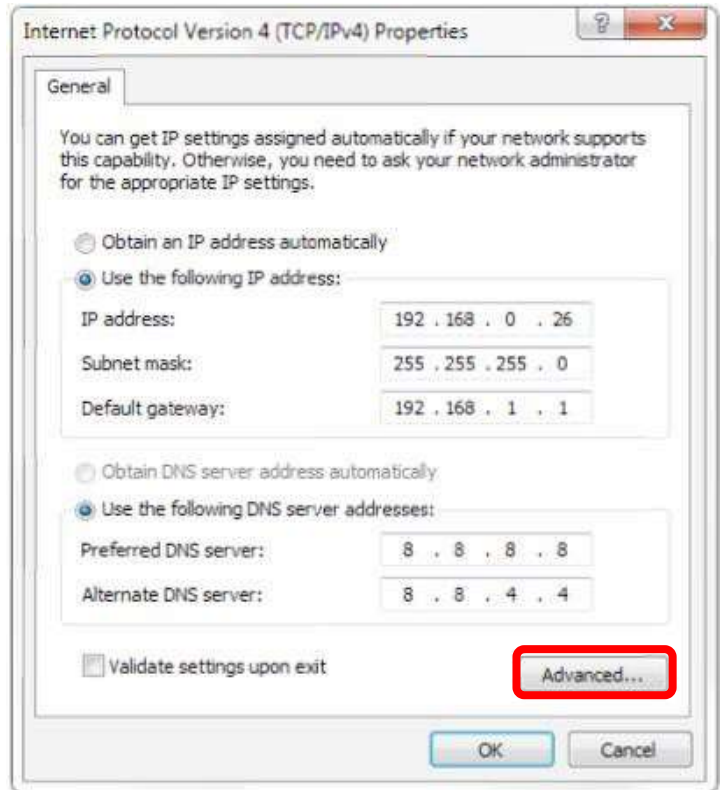
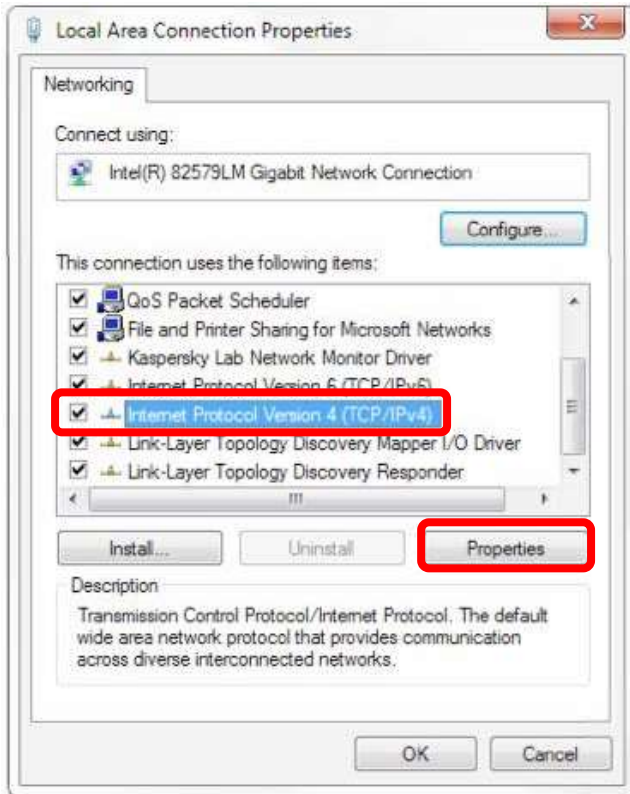
Note: Avoid routing power and network cables through areas in which they can be easily touched, in order to prevent errors from unstable cable connections.

The computer must have a network segment the camera IP address belongs to. The device will not be accessible without the segment (i.e. If the camera default IP address is 192.168.5.163, then segment 5 must be added in the computer). Specific steps are as below:

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First open the “Local Area Connection Properties” on your computer, and then select “Internet protocol version 4(TCP/IPv4)”. Next, click the “Properties” button. From there, select “Advanced” to enter into the Advanced TCP/IP Setting and add IP and subnet mask in the IP browser as pictured below. Finally, click the “Confirm” button to finish the adding the IP segment. If necessary, users can add the corresponding network segment according to the revised IP address of the camera.



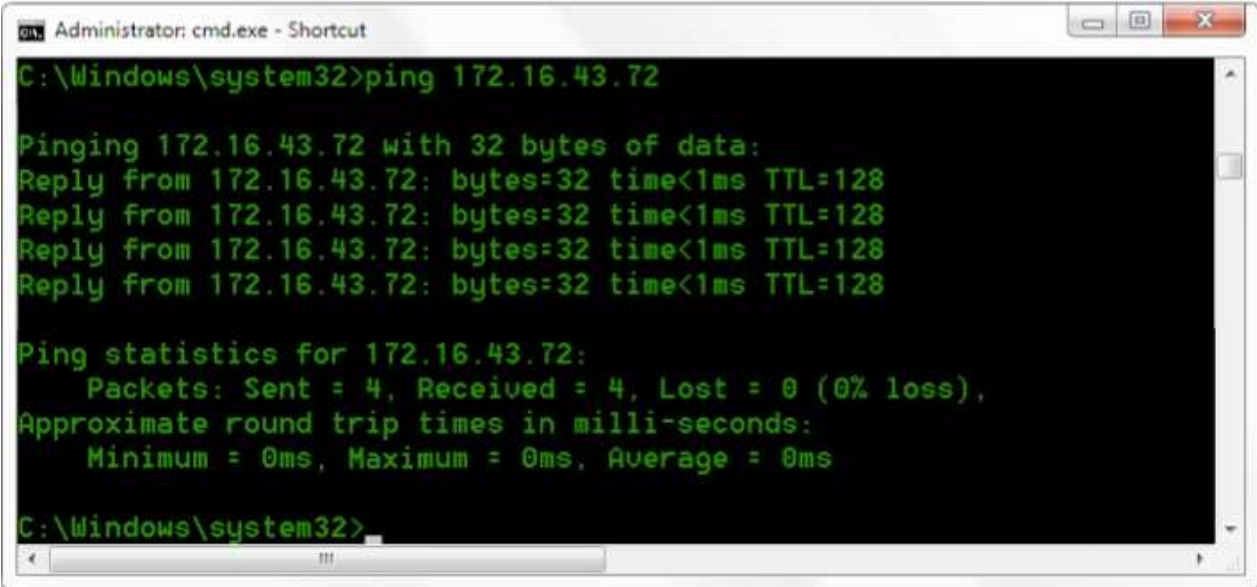
Note: The IP address assigned to the camera cannot be identical to that of any other computer or device. Always verify the availability of an IP address before assigning it.

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After the camera has finished self-checking, users can verify the network connection by clicking the Windows Search icon in the Taskbar and typing "cmd". Press "Enter" to open the Windows Command Prompt window.

If the IP address is set to its default, type "ping 192.168.5.26" and press Enter, and it will show message as below: which means network segment adding is succeed.



```
Administrator: cmd.exe - Shortcut
C:\Windows\system32>ping 172.16.43.72

Pinging 172.16.43.72 with 32 bytes of data:
Reply from 172.16.43.72: bytes=32 time<1ms TTL=128
Reply from 172.16.43.72: bytes=32 time<1ms TTL=128
Reply from 172.16.43.72: bytes=32 time<1ms TTL=128
Reply from 172.16.43.72: bytes=32 time<1ms TTL=128

Ping statistics for 172.16.43.72:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Windows\system32>
```

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4.2 Browser Log-In

4.2.1 Web Client

Web Client Log-In: Input the IP address 192.168.5.163 in your web browser and click the Enter key to enter the Web Client login page as below picture. Users can log in as an administrator or normal user. If logged in as an administrator (Default Username/Password: admin), users can preview, playback, configure, and cancel in the Web Client; If logged in as normal user (Default Username/Password: user1 or user2), users can only preview, playback, and cancel.

Download/Install Plugin: When first using a web browser to access the web conferencing camera, the login page will appear as "Playback plug-in is not installed, please download and install!". Click on this message, and then download and install MRWebXinstall.exe, according to information prompts. After installing the plug, enter username and password, click and Sign (initial default username and password: "admin", users can change the username and password on their own after entering) into the Web client management interface.

4.2.2 Preview

After successfully logging in to the management interface, users enter the video preview interface. In the preview screen, users can control PTZ, zoom, focus, video capture, and set the preset position.

Login as administrator

Username/password - default admin

PTZ control can zoom, focus, capture video, zoom, set the preset position, run, and delete. Furthermore, you can preview, playback, configuration, and log off.

Login as normal user

Default Username/password: user1 or user2

PTZ control can zoom, focus, capture video, zoom, set the preset position, run, and delete. Furthermore, you can preview, playback, configuration, and log off.

NOTE: There is no configuration right for normal user login.

4.2.3 Playback

4.2.3.1 Playback of Video Files

Click "Playback" to enter recording file and picture files playback page, and then select the file "Video File", and click "Search". After finding the video file, click "Play" to play the video file.

4.2.3.2 Playback of Picture Files

Click "Playback" to enter recording file and picture files playback page, and then select the file "Video File", and click "Search". After finding the image file, click "Play" to play the image file.

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4.2.4 Configuration

Click "Configuration" to enter into the device parameters setting page.

It contains the following options: Local configuration, audio configuration, video configuration, network configuration, PTZ configuration, internet access configuration, and system configuration.

Menu	Explanation
Local Configuration	Including video preview mode, record video packing time, record video storage route settings, etc.
Audio Configuration	Including audio compressing format, sampling frequency, sampling precision, compressing code rate settings, etc.
Video Configuration	Including video encoding, video parameters, character-overlapping, character size, video output setting, etc.
Network Configuration	Including basic parameters, Ethernet, DNS, wireless network setting, GB28181, etc.
System Configuration	Including equipment property, system time, user management, version update, Reset, Reboot device settings, etc.

4.2.4.1 Local Configuration

Video Preview Mode: Users can choose real-time priority or fluency priority: The delay will be minor when under real time priority mode, and fluency will be superior when under fluency priority mode. Setting based on the user need (Default value: real time normal, (2) real time best, (1) fluency normal, (3) fluency good, (4) and fluency best (5))

Recording packing time (minute): Set recording video packing time (default is 10, range from 1~120 minutes)

Recording/Snapshot file storage route: Set local recording video/snapshot file storage route.(Default D:\MyIPCam\) Click the Save button to make settings effective.

4.2.4.1 Audio Configuration

Switch: Choose to enable the audio or not.

Compressing format: Set audio compressing format and the device will reboot automatically after change (default MP3, PCM, AAC optional)

Sampling frequency: Set sampling frequency and the device will reboot automatically after change (default 44100, 16000, 32000 and 48000 optional)

Sampling precision: Set sampling precision (default 16bits)

Compressing code rate: Set audio compressing code rate (default 64bits, 32, 48, 96,128bits optional)

Note: Click **[SAVE]**, it will read: "Enable has changed. Restart the device to take effect after the success of the save." Then, reboot the camera to make the new setting take effect.

4.2.5 Video Configurations

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4.2.5.1 Video Encoding

Code Stream: Stream: Different video output mode settings use different streams. (Main stream, secondary stream) Compression Format: Set the video compression format, save and reboot to take effect (primary / secondary stream default: H.264, H.265 optional)

Video Size: Set video image resolution, save and reboot to take it effect (main stream default 1920 * 1080 or 1280 * 720 optional; default secondary stream 640 * 320, 320 * 180, 1280 * 720, 1920 * 1080 optional)

Stream Rate control: Set rate control mode, save and reboot to take effect (Primary / secondary stream default variable bit rate, fixed rate is for option).

Image Quality: Set the image quality, image quality can be changed only when rate control is variable bit rate, (main stream defaulted is better, secondary stream default is not good, there are best, better, good, bad, worse, and worst for options).

Rate (Kb / s): Set the video bit rate (main stream default 4096Kb / s, 64-12288Kb / s optional; secondary stream default 1024Kb / s, 64-10240Kb / s optional).

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

Key frame interval: Set the key frame interval (primary / secondary stream default 75F, primary / stream 1-300F optional. secondary stream 1-150F optional).

Click the "Save" button to display the "saved successfully" message, then settings take effect.

4.2.5.2 Stream Release

Switch: To turn on / off the main / secondary stream.

Protocol: primary / secondary stream applies RTMP protocol.

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

Host Address: server IP addresses (default 192.168.5.11)

Stream Name: choose a different stream name (live / av0, live / av1 optional).

User: Set the username.

Password: Set the password.

Click on the "Save" button to display the "Save successful" message, and then settings take effect.

Method of obtaining RTSP: rtsp://device IP address: 554 / live / av0 (av0 main stream; av1 secondary stream)

4.2.5.3 Video Parameters

Focus: Focus mode, focus range, and focus sensitivity can be set.

Focus Mode: set the focus mode (the default auto, manual optional)

Focus range: set the focus range (the default middle, the upper and lower optional)

Focus Sensitivity: Set the focus sensitivity (default is low, high, medium optional)

Exposure: Exposure mode, exposure compensation, back light compensation, anti-flicker, gain limit, wide dynamic, shutter speed, aperture value and brightness can be set.

Exposure Mode: Set the exposure mode (the default automatic, manual, shutter priority, aperture priority, Brightness priority optional)

Exposure compensation: Exposure compensation setting is active when it is auto status (default is off).

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Exposure compensation value: Set the exposure compensation value - valid when it is set for auto (default 0-7 to 7 optional).

BLC: Set back light compensation - valid when it is auto status (default is off).

Anti-flicker: Set up anti-flicker mode - valid when status is automatic, aperture or brightness priority (default 50Hz, closed, 60Hz optional).

Gain limit: set the gain limits, auto - active when it is the aperture status or brightness priority (default 3, 0-15 optional).

Dynamic range: set the dynamic range (default 5, 0-8 optional).

Shutter speed: active when it is status of manual or shutter-priority (default 1/100, 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 optional).

Aperture value: Set the aperture value, active when it is status of manual or aperture-priority (default F1.8, closed, F11, F9.6, F8.0, F6.8, F5.6, F4.8, F4.0, F3.4, F2.8, F2.4, F2.0, F1.8 optional).

Brightness: Set the brightness value, active when it is a state of brightness priority (default 7, 0-23 optional).

Color: White balance, saturation, color, white balance, sensitivity, and color temperature. Gain red and blue gain can be set.

White balance modes: Set the white balance mode (the default automatic, 3000K, 4000K, 5000K, 6500K, manual, One-push optional). Note: Click the "Correction" button when selected the One-push white balance mode.

Saturation: Set the saturation (default 80%, 60%, 70%, 80%, 90%, 100%, 110%, 120%, 130%, optional).

Auto white balance Sensitivity: Sensitivity Auto white balance settings (default is low, high, medium optional).

Chroma: Set the chrome (default 7, 0-14 optional).

Color Temperature: set color temperature (Default setting: High, with low, middle for options)

Red Gain: Set the red gain, effective when it is manual (default 255, 0-255 optional).

Blue Gain: Sets the Blue gain, effective when it is manual (default 199, 0-255 optional).

Image: Brightness, contrast, sharpness, black and white mode, the gamma curve, Horizontal Flip and Vertical Flip can be set.

Brightness: Set the brightness (default 6, 0-14 optional).

Contrast: set the contrast (default 8, 0-14 optional).

Sharpness: Set the sharpness value (default 7, 0-15 optional).

Black and white mode: Set black and white mode (default color, black/white optional).

Gamma: Gamma value setting (default, 0.45, 0.50, 0.52, 0.55 optional).

Flip Horizontal: Set Flip Horizontal (default Off, On optional).

Flip Vertical: Set vertical flip (default Off, On optional).

Noise Reduction: 2D noise reduction, 3D noise reduction and dynamic dead pixel correction

2D Noise Reduction: Set 2D noise reduction level (default Auto, 1-7 and Off optional).

3D Noise Reduction: Set 3D noise reduction level (default 5, 1-8 and Off optional).

Dynamic dead pixel correction: Set Dynamic dead pixel correction (default Off, 1-8 optional).

Note: Click "Refresh" to make revision of any video parameters of a, b, c, d, e effective.

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4.2.5.4 Character Overlapping

Display date and time: Set whether to display the time and date (default display).

Display Title: Set whether to display the title (default display).

Font Color of Time: Set font color of time and date (default white, black, yellow, red, blue optional).

Font Color of Title: Set font color of title (default white, black, yellow, red, blue optional).

Moving characters: Set the display position of moving date, time and title, click on the "up, down, left, right" buttons to move the corresponding character position.

Title Content: Set title content (default CAMERA1).

Time Content: Set time content (default 1970/01/10 05:36:00)

Click on the "Save" button and display the "Save successful" message, then valid

4.2.5.5 Character Size

Main stream character size: Set the character size of the display, the device will restart automatically after changed and saved (default 16, 24, 16 optional)

Secondary stream character size: Set the character size of the display, the device will restart automatically after changed and saved (default 16, 24, 16 optional)

Click on the "Save" button to display "Parameter saved successfully" message, set to take effect

4.2.5.6 Video Output

Output Format: Set the video output format (default 1080P60, 1080P50, 1080P30, 1080P25, 1080I60, 1080I50, 720P60, 720P50, 720P30, 720P25, 1080P59.94, 1080I59.94, 1080P29.97, 720P59.94, 720P29.97 optional).

Note: only ST and HD model have this item, U3 and U2 do not have. Click on the "Save" button, it will be valid when display "Save successful".

4.2.5.7 USB Subtitle

Display subtitles: Check the box (after checking, USB video output is displayed on the screen caption content) Font color: Default white, black. Yellow. Red and blue are optional.

Subtitle: Users can fill in their own

Ticker: according to the user demand, down, left and right to move the display position of subtitles

Note: only U3 and U2 model have this item, ST and HD do not have.

4.2.6 Network Configuration

4.2.6.1 Network Port

Data port: set the data port, the device will restart automatically after it has been changed (default 3000, 0-65535 optional).

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

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

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

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

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

Visca Port: Set Visca port, the device will restart automatically after it has been changed (default 3001,0-65535 optional). Click on the "Save" button, it will be valid when display "Save successful".

RTMP access: RTMP: / / equipment IP address: 1935 / live/av0 (av0 main stream; av1 second stream)

4.2.6.2 Ethernet Configuration.

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 take 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).

Physical Address: Set the physical address (the parameter is read-only but cannot be modified). Click on the "Save" button, it will be valid when display "Save successful". (**Note:** To prevent IP conflicts When modify)

4.2.6.3 DNS Parameters

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).

Click on the "Save" button. Tt will be valid when it displays "Save successful".

4.2.6.4 GB28181

Switch: set whether open GB28181.

Time Synchronization: whether synchronization time is set

Stream Type: stream type setting (the default main stream, secondary stream optional)

Sign effective time (in seconds): 3600 Range 5-65535

Heartbeat time (seconds): 60 Range 1-65535

Register ID: 34020000001320000001

Register Username: IPC

Register Password: 12345678

Equipment ownership: Users can add their own

Administrative regions: Users can add their own

Alarm Zone: Users can add their own

Equipment installation address: Users can add their own

Local SIP Port: 5060 Range 0-65535

GB28181 Server Address: IP address of the computer

Server SIP Port: 5060 Range 0-65535

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Server ID: 34020000002000000001

Click on the "Save" button, it will be valid when it displays "Save successful".

4.2.7 System Configuration

4.2.7.1 Device Properties

Device Name: Set the device name (the default Camera1, user can add their own).

Device ID: Set the device ID (default 1, Read-Only).

System Language: Set the system language (default Simplified Chinese, English optional). Need to re-login after modifying and saving the setting.

Click on the "Save" button, it will be valid when it displays "Save successful".

4.2.7.2 System Time

Date Format: Set the date format (YYYY-MM-DD default, year - month - day, MM-DD-YYYY namely Month - Day - Year, DD-MM-YYYY date - month - year Optional).

Date separator: set the date separator (default '/',',','-' Optional).

Time Zone: Set the time zone. Time Type: Set the time types (default 24 hours, optional 12 hours).

Time setting: Set time mode (to choose the computer time synchronization, NTP server time synchronization, or set manually).

Computer Time: Set the computer synchronization valid.

Update interval: Set the NTP server automatic updated time interval. Valid after setting NTP server synchronization (default one day, 2-10 days Optional).

NTP server address or domain name: Set NTP server address or domain name (default time.nits.gov). Valid after setting NTP server synchronization.

NTP Server Port: Sets the NTP server port (default 123). Valid after setting NTP server synchronization. Set the time manually, Effective when set manually.

Click on the "Save" button, it will be valid when it displays "Save successful".

4.2.7.3 User Management

Select users: Set the user type (the default administrator, Common User 1, Common User 2 optional)

Username: set the username (Select User Administrator default admin; select a common user1 default user1; to select a common user 2 default user2; user can modify 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).

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

Click on the "Save" button to display the "Save successfully" message, then the set is to take effect.

Note: Please note the case-sensitivity of the username and password. If a regular user logs in, they will not have configuration privileges but can operate to preview, playback, and log off.

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4.2.7.4 Version Upgrade

MCU version: V2.0.0.16 2015-12-18

Camera version: V2.0.0.16 2015-12-18

Focus version: V2.0.0.6 2015-12-11

Users only read the version information above which is consistent with the menu version but cannot modify. 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 successfully updating. (Note: make sure the power and network are keeping connected during the process, or the upgrade will fail)

Note: After the version upgrade is complete, you will need to restore factory defaults; a, through web to restore the factory default configuration; b, through the recovery menu; c, remote control shortcut * # 6;

Choose one of the above three ways. If chose a, the IP accounts, passwords also need to be restored to the default.

4.2.7.5 Restore Factory Settings

Click on pop-up "Restore Factory Defaults" button and choose "yes" or "no", then the device will restart automatically and restore factory settings.

4.2.7.6 Reboot

Click on the pop-up "Reboot" button and choose "yes" or "no", then the device will restart automatically

4.2.8 Logout

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

4.2.9 Wireless Network

If the user's equipment has a wireless network module, Web page "Network Configuration" has "Wireless Network" configuration page, then the specific configuration is as follows:

4.2.9.1 Network Settings

Wireless network configuration:

Network interface enable: can check, to set the following items after checked.

DHCP: can check, if check, it can obtain IP automatically.

IP address: set wireless WIFI IP (default 192.168.1.250, if checked DHCP, IP could be assigned automatically)

Note: Wireless IP address cannot be in the same segment with wired IP address.

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Subnet Mask: Set the wireless IP subnet mask (default 255.255.255.0)

Default Gateway: Set the wireless IP default gateway (default 192.168.1.1)

SSID: The user can modify their own (the default test)

Encryption: can check, the password can be set after checked.

Password: can set password, password can be changed if only checked encryption.

Click on the "Save" button to display "Parameter saved successfully" message, set to take effect

Note: SSID and password should be filled in correctly, otherwise, if restarted after the powered off, the wireless Wi-Fi connection is not successful.

4.2.9.2 Wi-Fi Hot Link

Click on the "search" button to search the WIFI hotspot.

Double-click the dialog box after searched user WIFI hotspot, and then input password to connect WIFI. It connected successfully after shown "successful connect" window.

4.2.9.3 Wireless Wi-Fi Login Page

If you do not check the above configuration DHCP (automatically obtain IP), then open the browser, enter the wireless network IP address in the address bar (default 192.168.1.250), press Enter to log construction; If you checked DHCP, then you obtain IP automatically, just login specific router or switch user interface settings to view the allocation of IP address.

5. Serial Communication 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 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 user can control the camera by the serial commands.

5.1 VISCA Protocol Command List

5.1.1 Camera Return Commands

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

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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 Commands

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		
CAM_Zoom Focus	Direct	8x 01 04 47 0p 0q 0r 0s	pqrs: Zoom Position
		0t 0u 0v 0w FF	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	

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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 Position
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 Position
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 Position

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Command	Function	Command Packet	Note
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 Control
	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	
	Off	8x 01 04 61 03 FF	
CAM_PictureFlip	On	8x 01 04 66 02 FF	
	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)
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 control) receive On/Off
	OFF	8x 01 06 08 03 FF	
IR_ReceiveReturn	On	8x 01 7D 01 03 00 00 FF	IR (remote control) 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

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Command	Function	Command Packet	Note
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>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;</p>
Pan_tiltDrive	Up	8x 01 06 01 VV WW 03 01 FF	<p>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</p>
	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		
Pan-tiltLimitSet	Set	8x 01 06 07 00 0W 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	<p>W: 1 UpRight 0: DownLeft YYYY: Pan Limit Position (TBD) ZZZZ: Tilt Limit Position (TBD)</p>
	Clear	8x 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF	

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5.1.3 Inquiry Commands

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_FocusAFModelInq	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_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
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_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	p : Gain Position
CAM_BrightPosilInq	8x 09 04 4D FF	y0 50 00 00 0p 0q FF	pq : Bright Position
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 : 2D NRLevel
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

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Command	Function	Command Packet	Note
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
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	abcd : Vendor ID (0220) mnpq : Model ID HDMI = 0950 rstu : 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;

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Command	Function	Command Packet	Note
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]

5.2 Pelco-D Protocol Command List

Function	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
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

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5.3 Pelco-P Protocol Command List

Function	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Up	0xA0	Address	0x00	0x08	Pan Speed	Tilt Speed	0xAF	XOR
Down	0xA0	Address	0x00	0x10	Pan Speed	Tilt Speed	0xAF	XOR
Left	0xA0	Address	0x00	0x04	Pan Speed	Tilt Speed	0xAF	XOR
Right	0xA0	Address	0x00	0x02	Pan Speed	Tilt Speed	0xAF	XOR
Upleft	0xA0	Address	0x00	0x0C	Pan Speed	Tilt Speed	0xAF	XOR
Upright	0xA0	Address	0x00	0x0A	Pan Speed	Tilt Speed	0xAF	XOR
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. Camera Maintenance & Troubleshooting

6.1 Camera Maintenance

If camera is not used for long time, please turn off power adapter switch and AC plug.

Use soft cloth or tissue to clean the camera cover.

Use soft cloth to clean the lens; Use neuter cleanser if bad smeared. No use strong or corrosive cleanser or corrosive cleanser avoiding scuffing.

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6.2 Troubleshooting

No video output:

1. Check whether the camera power supply is connected, that the voltage is normal, and that the power indicator is lit.
2. Check whether the machine can perform self-inspection after it has been restarted.
3. Check whether the bottom of the DIP switch is in the normal operating mode (see Table 2.2 and Table 2.3)
4. Check whether the video output cable or video display is normal

No image sometimes:

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

Image dithering when zooming in or out:

1. Check whether the camera installation position is adequate
2. Check whether there is shaking or other objects around the camera

Remote control does not work:

1. Remote control address is set to 1 (if the machine is set back to the factory defaults, remote control addresses need to be set back to 1 as well)
2. Check whether the batteries have been installed or are low on power
3. Check the camera working mode in normal operating mode
4. 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 and automatically exit 30 seconds later. Then, it can be controlled by remote control.

Serial port does not work:

1. Check whether the camera serial device protocol, baud rate, and address are consistent
2. Check whether the control cable is connected properly
3. Check whether the camera working mode is in the normal operating mode

Web page cannot log in:

1. Check whether the camera is showing normally.
2. Check whether the network cable is connected properly (Ethernet port yellow light flashes to indicate normal network cable connection)
3. Check whether your computer is added and that the segment is consistent with the IP address of the camera
4. Click "Start" and select "Run", and then type "cmd" in the Windows Search bar; Click "OK", then open a Command Prompt window to enter "ping 192.168.5.163". Press the "Enter" key to check whether the following message as, "Description network connection is normal".