



User Manual

V1.0

**Please read this user manual
thoroughly before using.**

Preface

Thank you for using this 20x USB2.0 PTZ camera.

This manual introduces the functions, installation process and operation of the HD camera. Prior to installation and usage, please read the manual thoroughly.

Precautions

This product should only be used under the specified conditions in order to avoid any damage to the camera:

- Do not subject the camera to rain or moisture.
- Do not remove the cover. Otherwise, you may risk receiving an electric shock. In case of unintended equipment operation, contact an authorized engineer.
- Never operate under unspecified temperature, humidity or power supply.
- Please use soft dry cloth to clean the camera. If the camera is very dirty, clean it with diluted neutral detergent; do not use any type of solvents, which may damage the surface.

Note:

This is a class A production. Electromagnetic radiation at certain frequencies may affect the image quality of TV in home environment.

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SAFETY GUIDES

1. Electric safety installation and operation must accord with electric safety standard.
2. Use caution to transport, avoid pressure, vibration or soakage during transport, storage and installation.
3. Polarity of power supply:

The power supply of this product is +12V, the max electrical current is 2A. Polarity of the power supply plug is shown as below.



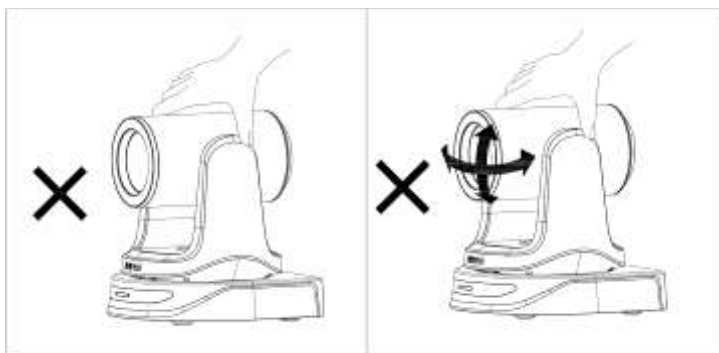
4. Installation precautions:

To reduce the risk of mechanical damage, do not grab the camera lens when carrying it. Do not touch camera lens by hand. Do not use in corrosive liquid, gas or solid environment to avoid any cover (plastic material) damage. Make sure there is no obstacle within rotation range. Do not power on before installation is completed.

5. Do not dismantle the camera. We are not responsible for any unauthorized modification or dismantling.

CAUTION!

Video quality may be affected by certain frequencies of electromagnetic field.
Never grab the lens of the camera, or move the camera by hand when it is working.



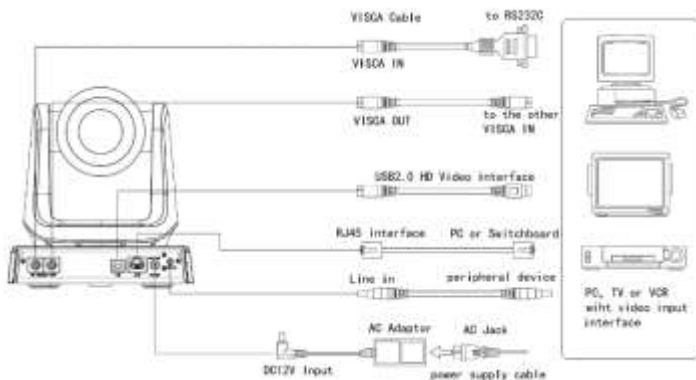
PACKING LIST

When unpacked, check if all supplied accessories are included:

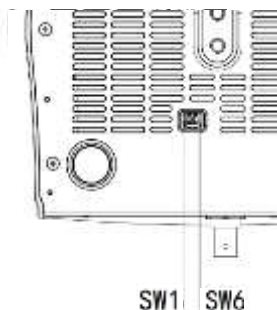
| | |
|----------------------------|-----|
| Camera | 1pc |
| Power Adapter | 1pc |
| Power Cable | 1pc |
| RS232 Control Cable | 1pc |
| USB2.0 Cable | 1pc |
| IR Remote Controller | 1pc |
| User Manual | 1pc |

QUICK START

1. External interface: RS232 I/O, USB2.0 output, LAN output, DC12V power, audio input. Please check all connections before powering on the device.



2. Dial switch settings (at the bottom of the camera):



| Dial Switch (ARM) | | | |
|-------------------|------|------|----------------|
| | SW-1 | SW-2 | Instruction |
| 1 | OFF | OFF | Updating mode |
| 2 | ON | OFF | Debugging mode |
| 3 | OFF | ON | Undefined |
| 4 | ON | ON | Working mode |

| Dial Switch | | | |
|-------------|------|------|-------------|
| | SW-3 | SW-4 | Instruction |
| 1 | OFF | OFF | reserve |
| 2 | ON | OFF | reserve |
| 3 | OFF | ON | reserve |
| 4 | ON | ON | reserve |

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

PRODUCT HIGHLIGHTS

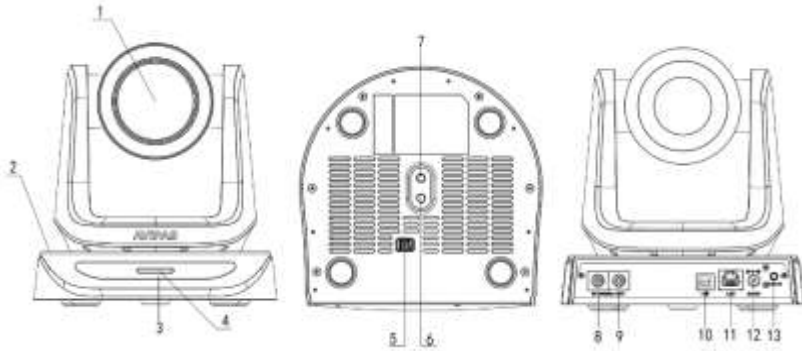
- Adopts advanced ISP, 1/2.8-inch 2.1MP sensor, providing full HD video resolution.
- High-quality 20x optical zoom, 2x digital zoom lens with 60-degree field of view.
- IP, USB video output interface, compatible with different applications.
- Advanced focusing algorithm: fast and precise focusing performance during movement.
- Smooth PTZ mechanism, accurate pan tilt motor control.
- Up to 128 presets available.
- White balance/ Exposure/ Focus/ Iris can be adjusted automatically or manually.
- Support PoE+: one single CAT5/6 for video, control and power, highly efficient video encoding.
- Support line-in function, AAC and LPCM audio encoding.
- Support VISCA, PELCO-P, PELCO-D, ONVIF and VISCA over IP control protocol; IP VISCA over both TCP and UDP.
- Support RS232 daisy chain, up to 7 cameras under VISCA protocol.
- Support upside-down (ceiling) installation, H/V flip.
- Support RS232/UVC control.
- Standard UVC1.1 protocol, seamlessly compatible with all major video conferencing software and platforms.

CAMERA SPECIFICATIONS

| | |
|-----------------|--|
| Video Format | USB: 1920*1080P30; 1280*720P30; 1024*576P30; 960*540P30; 720*576P30; 640*480P30; 640*360P30; 352*288P30; 320*240P30 RJ45: 1920*1080@3~30 / 1280*720@3~30 / 1024*576 @3~30 (Main stream); 1280*720@3~30 / 1024*576@3~30 / 640*360 @3~30 (Sub stream) |
| Video Interface | RJ45, USB2.0 |
| Sensor | 1/2.8" 2.1MP CMOS sensor |

| | |
|-----------------------|---|
| Zoom | f4.9~98mm, F1.5~3.0 View angle: 60°(Far)~3.23°(Near) |
| Rotation Angle | Pan: -170° ~ +170° Tilt: -90° ~ +90° |
| Rotation Speed | Pan: 0°~120°/s Tilt: 0°~80°/s |
| Preset | remote controller: 10; RS232: 128; Accuracy: 0.1° |
| Control Port | RS232, RJ45 (VISCA over IP), USB2.0(UVC1.1) |
| Network Speed | 1000M |
| Video encode | H.264/H.265 (default: H.264) |
| Bit Rate Control | Variable Bit Rate, Constant Bit Rate |
| Video Bit Rate | 1024Kbps~16384Kbps |
| IP Protocol | TCP/IP, HTTP, RTSP, RTMP, DHCP, Onvif, VISCA over IP, NTP |
| POE+ | Support |
| Daisy Chain | RS232 serial daisy chain (up to 7 units under VISCA protocol) |
| Minimum Lux | 0.1 Lux (F1.5) |
| White Balance | Auto/Indoor/Outdoor/Manual/AWT/PUSH |
| Exposure | Auto/Manual/Bright/Shutter/Iris |
| Focus | Auto/Manual |
| Iris | Auto/Manual |
| Electric Shutter | Auto/Manual |
| Gamma | Support |
| WDR | Support |
| BLC | Support |
| 2D/3D Noise Reduction | Support |
| Anti-Flicker | OFF/50Hz/60Hz |
| H/V Flip | Support |
| Input Voltage | DC12V/ POE+ |
| Dimension | 6.6*6.6*7.1inch (167.5*168*180.5mm) |
| Net Weight | 3.1lb (1.4kg) |

CAMERA INTERFACE

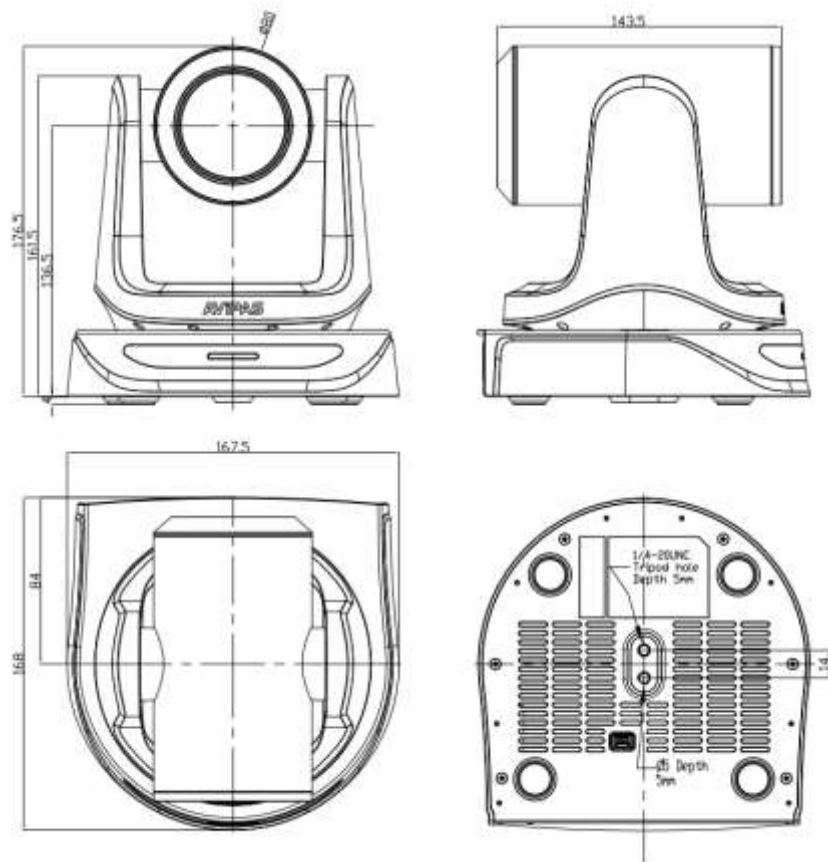


1. Camera Lens
2. Camera Base
3. IR Receiver Panel
4. Power Indicator Light
5. Dial Switch

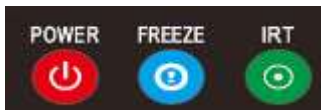
6. Tripod Screw Hole
7. Installation Hole
8. RS232 Control Input
9. RS232 Control Output
10. USB2.0 Output

11. RJ45 Output
12. DC12V Power Jack
13. Line-in Audio Input

CAMERA DIMENSION(MM)



IR REMOTE CONTROLLER



POWER

Under normal working mode, press POWER to enter standby mode. Press POWER again, camera will start self-initialization, then go back to HOME position.

It will go to preset position 0 if the preset is set.

FREEZE (do NOT support USB output)

Press FREEZE to freeze/ unfreeze the image.

IRT (IR Transfer/IR Pass)

Enable/ disable the IR pass function. Press IRT, camera will receive and pass the IR remote control signal to the codec/terminal (via VISCA IN port). Press IRT again to disable the function.



SET 1~SET4 ADDRESS SETTING

To set the current camera's address (ID), press and hold the key for 3 seconds until the backlight of the key is lighting up.

CAM 1~CAM 4 (CAMERA SELECTING)

Press the corresponding camera number to select the camera.



NUMERIC KEY (1-9)

Set preset: press and hold the number for 3 seconds to set preset position.

Call preset: press the corresponding number to call preset position.

CLR PRE (CLEAR PRESET)

Press **【CLR PRE + number】** to clear the corresponding preset position. Press and hold CLR PRE to clear all existing preset positions.



FOCUS

To manually adjust focus, only valid under manual mode.

ZOOM

To manually adjust zoom.

NAVIGATE KEY: UP/DOWN/LEFT/RIGHT

Under working mode, use navigate keys to pan/ tilt.

Once entering the camera OSD menu, use navigate keys to select and enter submenu.

OK /HOME KEY

Under working mode, press OK to make the camera go back to its HOME position.

Once entering the camera OSD menu, press OK to confirm selection.



AF: Auto focus.

MF: Manual focus.

RESET: Press and hold for 3 seconds to reset camera.

MENU: Enter OSD menu.



LEARN+LIMIT L: Set the pan tilt left limit position.

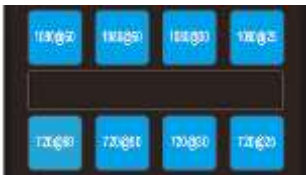
LEARN+LIMIT R: Set the pan tilt right limit position.

LEARN+LMT CLR: Clear all position limits.



BLC OFF/ BLC ON: Turn on/off backlight compensation.

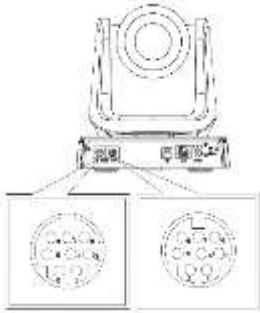
BRIGHT-/BRIGHT+: Set image brightness, only valid under bright priority exposure mode.



Video Format Selection:

Press and hold for 3 seconds to select different video format output.

VISCA IN (RS232 PORT)



VISCA IN & Mini DIN Connection

| Camera VISCA IN | | Mini DIN | |
|-----------------|--------|----------|-----|
| 1 | DTR | 1 | DSR |
| 2 | DSR | 2 | DTR |
| 3 | TXD | 5 | RXD |
| 4 | GND | 4 | GND |
| 5 | RXD | 3 | TXD |
| 6 | A (+) | 6 | NC |
| 7 | IR OUT | 7 | NC |
| 8 | B (-) | 8 | NC |

| No. | V_IN | V_OUT |
|-----|--------|-------|
| 1 | DTR | DTR |
| 2 | DSR | DSR |
| 3 | TXD | TXD |
| 4 | GND | GND |
| 5 | RXD | RXD |
| 6 | A | |
| 7 | IR OUT | |
| 8 | B | |

| VISCA IN | RS485 |
|----------|--------|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | A(+) |
| 7 | IR OUT |
| 8 | B(-) |

VISCA IN & DB9 Connection

| Camera VISCA IN | | Windows DB-9 | |
|-----------------|--------|--------------|-----|
| 1 | DTR | 6 | DSR |
| 2 | DSR | 4 | DTR |
| 3 | TXD | 2 | RXD |
| 4 | GND | 5 | GND |
| 5 | RXD | 3 | TXD |
| 6 | A (+) | | |
| 7 | IR OUT | | |
| 8 | B (-) | | |

VISCA Network Construction:



SERIAL PORT CONFIGURATION

| Parameter | Value | Parameter | Value |
|-----------|-----------------------|-----------|-------|
| Baud rate | 2400/4800/9600/115200 | Stop Bit | 1bit |
| Start Bit | 1 bit | Check Bit | None |
| Data Bit | 8 bit | | |

OSD MENU

1. Under working mode, press MENU on the IR remote controller to enter the camera OSD menu:



2. Use navigate keys UP/DOWN to select from the main menu options.

3. Press RIGHT to enter any submenu; use UP/DONW to select the submenu; use LEFT/RIGHT to change current settings.

4. Press MENU again to return to the previous menu, repeat and exit the OSD menu.

5. OSD Menu setting list

| | | | |
|--------|------------|--|------------------|
| SYSTEM | LANGUAGE | English | Default: English |
| | PROTOCOL | Optional item: VISCA/PELCO-P/PELCO-D | Default: VISCA |
| | ADDRESS | VISCA: 1~7 PELCO-P/D: 0~255 | Default: 1 |
| | BAUDRATE | Optional item: 2400/4800/9600/115200 | Default: 9600 |
| | PTZ SPEED | Pan Tilt speed | Default: 18 |
| | PST PT SPD | Preset pan tilt Speed | Default: 18 |
| | RETURN | Return to previous menu | |

| | | | |
|-------|------------|--|---------------|
| FOCUS | FOCUS MODE | AUTO/MANU/PUSH | Default: AUTO |
| | DZOOM | Turn on/off digital zoom (2x digital zoom) | Default: OFF |
| | ZOOM SPEED | Zoom speed | Default: 5 |
| | PST Z SPD | Preset zoom Speed | Default: 5 |
| | RETURN | RETURN to previous menu | |

| | | | |
|----------|---------------|--|---------------|
| EXPOSURE | EXPOSURE MODE | AUTO/MANU/IRIS/SHUT/BRI. | Default: AUTO |
| | SHUTTER | Shutter speed:1/30~1/10000, only valid under manual mode | Default: AUTO |
| | IRIS | Iris setting:0~13, only valid under manual mode | Default: AUTO |
| | GAIN | Gain setting: 0~15, only valid under manual mode | Default: AUTO |

| | | | |
|--|-----------|--|---------------|
| | BRIGHT | Bright setting:0~27, only valid under bright priority mode | Default: AUTO |
| | FLICK | Anti-Flicker setting:50/60HZ/OFF | Default: 50HZ |
| | BACKLIGHT | ON/OFF | Default: OFF |
| | GAMMA | Gamma curve selection | Default: 0 |
| | RETURN | Return to previous menu | |

| | | | |
|-------|---------|--|---------------|
| IMAGE | WB MODE | Optional: ATW/MANU/SON./FL./AUTO/IDR./ODR./PUSH | Default: ATW |
| | B_GAIN | Blue gain level: 0~255, only valid under manual white balance mode | Default: AUTO |
| | R_GAIN | Red gain level:0~255, only valid under manual white balance mode | Default: AUTO |
| | DEFOG | ON/OFF | Default: OFF |
| | RETURN | Return to previous menu | |

| | | | |
|---------|------------|--|---------------|
| QUALITY | 2D NR | 2D noise reduction: the higher the value, the less noise on image, with lower resolution | Default: OFF |
| | 3D NR | 3D noise reduction: OFF/AUTO/0~4, the higher the value, the less motion noise on image. Higher value will cause image smear. | Default: AUTO |
| | SHARPNESS | Sharpness setting: 0~15 | Default: 3 |
| | CONSTRAS | Set contrast level | Default: 8 |
| | SATURATION | Set saturation level | Default: 8 |
| | BRIGHT | Whole image brightness level | Default: 8 |
| | D_WDR | Set wide dynamic range: OFF, 1~6 | Default: OFF |
| | RETURN | Return to previous menu | |

| | | |
|------|------------|-------------------------|
| CTRL | MIRROR | ON/OFF, Default: OFF |
| | FLIP | ON/OFF, Default: OFF |
| | D/N MODE | DAY/NIGHT, Default: DAY |
| | GAIN LIMIT | Default: 128 |
| | RETURN | Return to previous menu |

| | | | |
|---------|---------|-----------------|---|
| NETWORK | DHCP | ON/OFF | Using up/down/left/right navigation keys to select item, then using numeric keys to set parameter. Press MENU to exit and |
| | ADDRESS | 192.168.001.188 | |

| | | | |
|--|---------|-------------------------|----------------|
| | NETMASK | 255.255.255.000 | save settings. |
| | GATEWAY | 192.168.001.001 | |
| | RETURN | Return to previous menu | |

| | | |
|-------|-----------|------------------------------------|
| RESET | CAM RESET | Reset camera parameters to default |
| | PTZ RESET | Reset pan/tilt presets to default |
| | ALL RESET | Reset all parameters to default |
| | RETURN | Return to the previous menu |

| | | |
|------|--------------|--|
| INFO | CONTROL VER | Camera control firmware version |
| | CONTROL DATE | Camera control firmware releasing date |
| | FORMAT | Current video output format |
| | BAUDRATE | Current RS232 baud rate |
| | IP | Camera IP address |
| | NET MASK | Current subnet mask |
| | RETURN | Return to the previous menu |

UVC CONTROL

1. Make sure the USB2.0 camera output is connected to a USB2.0 port on your PC/MAC, and it is recognized by the PC Device Manager. If connected to the USB3.0 port, output video resolution may be compromised.
2. The interval of control commands sending from the server (via USB) to the camera should be no less than 250ms.

| | |
|--------------------------------------|----------------------------|
| PU_BRIGHTNESS_CONTROL | 81 01 04 4d 00 00 0p 0q FF |
| PU_CONTRAST_CONTROL | 81 01 04 A2 00 00 0p 0q FF |
| PU_SATURATION_CONTROL | 81 01 04 A1 00 00 0p 0q FF |
| PU_SHARPNESS_CONTROL | 8x 01 04 42 00 00 0p 0q FF |
| PU_GAMMA_CONTROL | 8x 01 04 5B 0p FF |
| PU_WHITE_BALANCE_TEMPERATURE_CONTROL | 8x 01 04 35 0X FF |

| | |
|-----------------------------------|--|
| PU_BACKLIGHT_COMPENSATION_CONTROL | 81 01 04 33 02/03 FF |
| PU_POWER_LINE_FREQUENCY_CONTROL | 8x 01 04 AA 00/01/02 FF |
| CT_ZOOM_ABSOLUTE_CONTROL | 8x 01 04 47 0p 0q 0r 0s FF |
| CT_PANTILT_ABSOLUTE_CONTROL | 8x 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z F |
| CT_PANTILT_RELATIVE_CONTROL | 8x 01 06 01 pp qq rr ss FF |
| CT_ZOOM_RELATIVE_CONTROL | 8x 01 04 07 pp FF |

WEB SETTINGS

To preview the video output on a local screen, no need to install additional media player plug-in.

The web interface supports Google Chrome, Firefox, IE, Safari, Opera, etc.

1. Login

To access the camera interface, open a browser, in the address bar, input camera's IP address (**default IP address is 192.168.1.188**).

Default username: admin Default password: admin



2. Real-time Preview



The preview interface is shown above. Virtual control panel on the right offers control options including

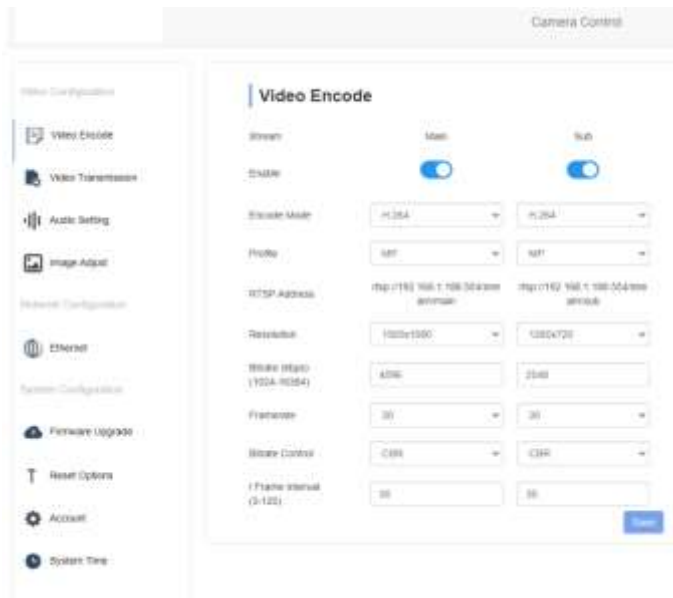
pan, tilt, zoom, focus, pan tilt speed, focus speed, zoom speed, preset position, etc.

On the lower right corner of the preview image, you can select change the volume level. Full-size view and picture-in-picture mode are supported.

3. Configuration

Click “Setting” to enter camera configuration interface.

Video Encode: Set image encoding mode for main stream and sub stream. Resolution, bit rate, frame rate, bit rate control, I frame interval, etc.



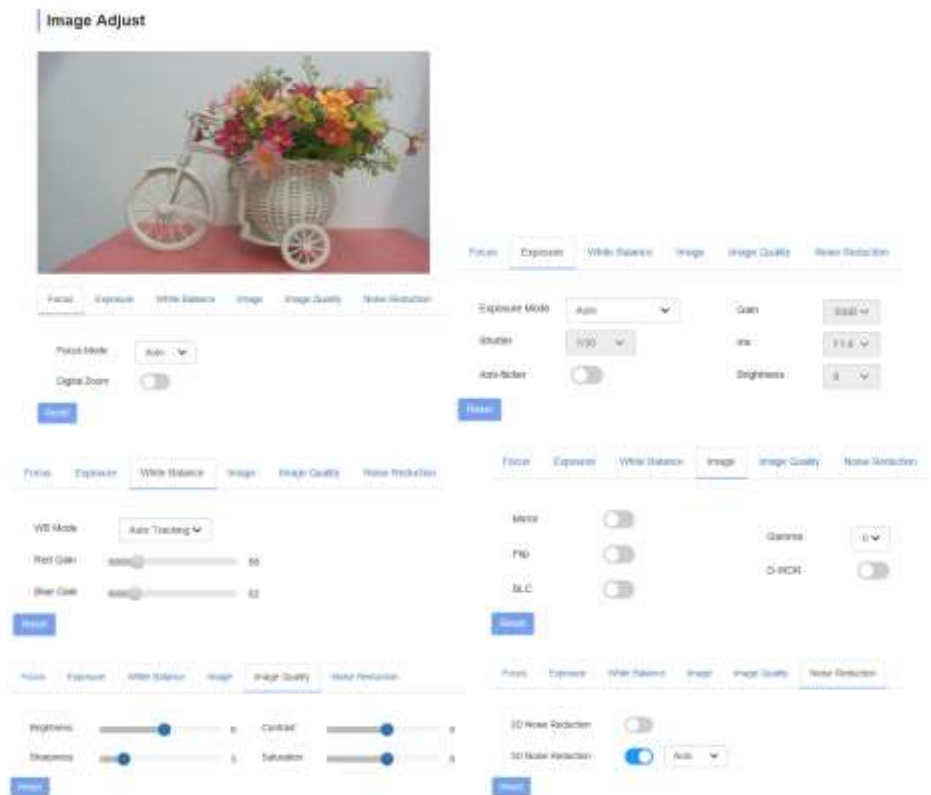
Video Transmission: RTMP syntax: stream URL + “/” + stream key. E.g., Server URL is `rtmp://a.rtmp.youtube.com/live2`, Stream key is `123456abcdefg`, thus for RTMP Address, input `rtmp://a.rtmp.youtube.com/live2/123456abcdefg`



Audio Setting: To enable/disable embedded audio. Audio encoding mode can be selected. Parameters such as sampling rate and bit rate can be adjusted.



Image Parameter: To set focus, exposure, white balance, image, image quality, noise-reduction, etc.



Ethernet: To set DHCP mode, IP address, Net mask, Gateway, DNS, HTTP Port, RTSP Port, Visca Over IP. Default settings are as follows:

| | | | | | |
|------------|---------------|-----------|-------------|---------------|-------|
| DHCP | OFF | Gateway | 192.168.1.1 | RTSP Port | 554 |
| IP address | 192.168.1.188 | DNS | 192.168.1.1 | RTSP Encrypt | ON |
| Netmask | 255.255.255.0 | HTTP Port | 80 | Visca Over IP | 52381 |

Firmware upgrade: To update the camera ISP.

Click Select File, in the dialog box, select the upgrade file. Click Upgrade to start the updating process.

Do NOT power off or do any operation when upgrading. Please reboot the camera after the upgrade is finished.

Then re-login to web interface, select “Reset all” to reset the camera completely.



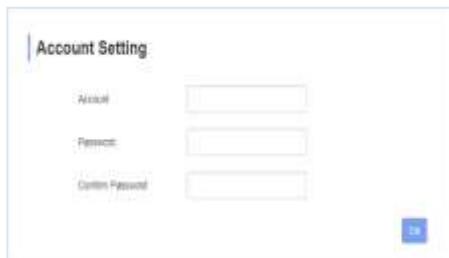
Reset to default: To reset the camera to default settings.

Reset simply: reset camera image settings;

Reset completely: reset all camera settings including IP configurations, image settings, language and protocol;

Reboot: reboot ISP part of the camera.

Account Setting: To set camera account username and password.



System time: set the time zone and NTP enable.

System Time Settings

Time Zone:

NTP Enable:

NTP Update Interval:

NTP Server Address:

NTP Port:

VIEW RTSP STREAM VIA VLC

Default RTSP main streaming URL: `rtsp://192.168.1.188/stream/main`

Default RTSP sub streaming URL: `rtsp://192.168.1.188/stream/sub`

Default RTMP main streaming URL: `rtmp://192.168.1.188:1935/app/rtmpstream0`

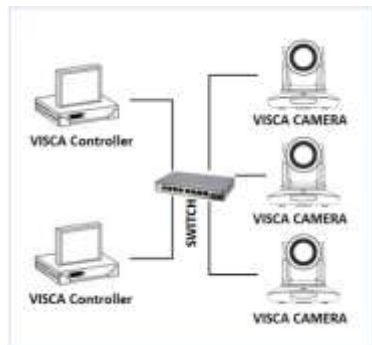
Default RTMP sub streaming URL: `rtmp://192.168.1.188:1935/app/rtmpstream1`

VISCA OVER IP

VISCA over IP means VISCA protocol transmits via IP. This can be used to reduce RS232/RS485 cable headache (the controller used must support IP function).

Communication port specs:

- Control port: RJ45 Gigabit LAN
- IP protocol: IPv4
- Transmit protocol: UDP
- IP address: set via web interface or OSD menu
- Port address: 52381
- Confirm send/transmission control: depend on applied program



- Applied range: in the same segment, not suitable for bridge network.
- To apply, enter camera OSD, choose VISCA option: OVER IP

How to use VISCA over IP

VISCA Command

Commands are sent from controller to camera, and when camera receives the commands, it returns ACK. When the command is executed, a complete message will be returned.

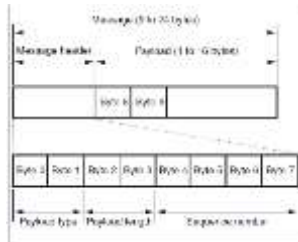
VISCA Inquiry

Inquiry is sent from controller to camera, and when camera receives the command, it will return required message.

VISCA Reply

Reply is sent from camera to controller. ACK, which is the complete message, can be either reply or error reply.

Command format: Note that LAN output is big-endian, and LSB is in the front.



Payload type: data definitions are listed below:

| Name | Value (Byte 0) | Value (Byte 1) | Value |
|------------------------------|----------------|----------------|--|
| VISCA command | 0x01 | 0x00 | Stores VISCA command. |
| VISCA inquiry | 0x01 | 0x10 | Stores VISCA inquiry. |
| VISCA reply | 0x01 | 0x11 | Stores reply for VISCA command and VISCA inquiry, or VISCA device setting command. |
| VISCA device setting command | 0x01 | 0x20 | Stores VISCA device setting command. |
| Control command | 0x02 | 0x00 | Stores control command. |
| Control reply | 0x02 | 0x01 | Stores reply for the control command. |

Payload length: Valid data length in Payload (1~16), is the command length. For example, when valid data length is 16-byte, Byte 2: 0x00; Byte 3: 0x10. Controller will save the sequence number of each command. When one command is sent, the sequence number of that command will add 1; when the sequence number reaches its max, it will return back to 0. The camera will save sequence number of each command, and return

the sequence number to controller.

Payload: According to Payload type, the following data will be saved.

- VISCA command: Save VISCA command packet
- VISCA inquiry: Save VISCA message packet
- VISCA reply: Save VISCA return packet
- VISCA device setting command: Save VISCA equipment setting command packet.
- Control command: The following data is saved in control command payload

| Name | Value | Description |
|-------|--------|---|
| RESET | 0x01 | Resets the sequence number to 0. The value that was set as the sequence number is ignored. |
| ERROR | 0x0Fyy | yy=01: Abnormality in the sequence number. yy=02: Abnormality in the message (message type). |

- Control reply: The following data is saved in the return command payload of control command.

| Message | Value | Description |
|---------|-------|------------------|
| ACK | 0x01 | Reply for RESET. |

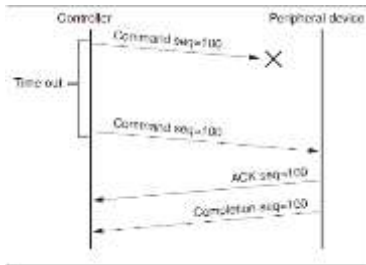
Delivery confirmation:

VISCA over IP uses UDP as transmission communication protocol. UDP communication message transmission is not stable, it is necessary to confirm delivery and resent in application.

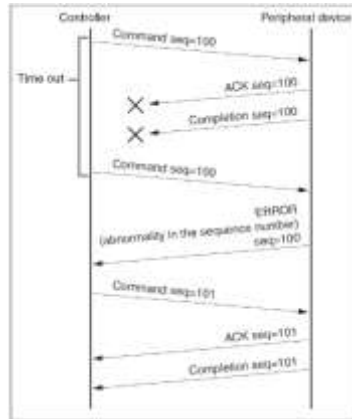
Generally, when controller sends a command to camera, controller will wait for the return message then send the next command. We can detect and confirm if the camera receives the commands within its return message's lag time. If controller detects overtime, it is regarded as error transmission. Controller will resend the commands to check camera's status. The resent command sequence number is the same as the previous one. Following chart lists possible received message and the corresponding status after the resent command.

| Lost message | Received message for retransmission | Status after retransmission | Correspondence after retransmission |
|------------------------------------|---|--|--|
| Command | ACK message | Command is performed by retransmission. | Continue processing. |
| Completion message For the command | ERROR (Abnormality in the sequence number.) | Command has been performed. If only the ACK message is lost, the completion message returns. | If the result by the completion message is needed, retransmit by updating the sequence number. |
| Completion message for the command | ERROR (Abnormality in the sequence number.) | Command has been performed. | If the result by the completion message is needed, retransmit by updating the sequence number. |
| Inquiry | Reply message | Inquiry is performed by retransmission. | Continue processing. |
| Reply message for the inquiry | ERROR (Abnormality in the sequence number.) | Inquiry has been performed. | If the result by the reply message is needed, retransmit by updating the sequence number. |
| Error message | Error message | Command is not performed. If the error cause eliminates, normal reply is return(ACK, reply message) | Eliminate the error cause. If normal reply returns, continue processing. |

| | | | |
|---|---|---|---|
| Inquiry of the VISCA device setting command | Reply message of the VISCA device setting command | Inquiry has been performed by retransmission. | Continue processing. |
| Reply message of the VISCA device setting command | ERROR(Abnormality in the sequence number.) | Inquiry has been performed. | If the result by the reply message is needed, retransmit by updating the sequence number. |



Sequence chart when command lost



Sequence chart when returned message lost

Note: Do not change IP address, subnet mask, or gateway parameters under VISCA over IP mode, otherwise, it will cause network inconsistency.

VISCA PROTOCOL

Part1 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

| Error Messages | | |
|------------------------|----------------|---|
| | Command Packet | Note |
| Syntax Error | z0 60 02 FF | Returned when the command format is different or when a command with illegal command parameters is accepted |
| Command Not Executable | z0 61 41 FF | Returned when a command cannot be executed due to current conditions. For example, when commands controlling the focus manually are received during auto focus. |

Part 2 Camera Control Commands

| Command type | function | command | |
|---------------|-------------------|---|---|
| AddressSet | Broadcast | 88 30 01 FF | Address setting |
| IF_Clear | Broadcast | 88 01 00 01 FF | I/F Clear |
| CommandCancel | | 8x 21 FF | |
| CAM_Power | On | 8x 01 04 00 02 FF | Power ON/OFF |
| | Off | 8x 01 04 00 03 FF | |
| CAM_Zoom | Stop | 8x 01 04 07 00 FF | |
| | Tele (Standard) | 8x 01 04 07 02 FF | |
| | Wide (Standard) | 8x 01 04 07 03 FF | |
| | Tele (Variable) | 8x 01 04 07 2p FF | p = 0(low)~7(high) |
| | Wide (Variable) | 8x 01 04 07 3p FF | |
| | Direct | 8x 01 04 47 0p 0q 0r 0s FF | pqrs: Zoom Position (0(wide) ~0x4000(tele)) |
| | Direct with speed | 8x 0A 04 47 0t 0p 0q 0r 0s FF | t: spd 0~7 pqrs: zoom position (0(wide) ~0x4000(tele)) |
| CAM_DZoom | ON | 8x 01 04 06 02 FF | |
| | OFF | 8x 01 04 06 03 FF | |
| | Combine Mode | 81 01 04 36 00 FF | Combine with optical zoom control |
| | Separate Mode | 81 01 04 36 01 FF | Separate from optical zoom control |
| | Stop | 81 01 04 06 00 FF | Enable In separate mode |
| | Tele (Variable) | 81 01 04 06 2p FF | Enable In separate mode |
| | Wide (Variable) | 81 01 04 06 3p FF | Enable In separate mode |
| | Direct | 81 01 04 46 0p 0q 0r 0s FF | Enable In separate mode |
| CAM_Focus | Stop | 8x 01 04 08 00 FF | |
| | Far (Standard) | 8x 01 04 08 02 FF | |
| | Near (Standard) | 8x 01 04 08 03 FF | |
| | Far (Variable) | 81 01 04 08 2p FF | p=0 (Low) to 7 (High) |
| | Near (Variable) | 81 01 04 08 3p FF | p=0 (Low) to 7 (High) |
| | Direct | 8x 01 04 48 0p 0q 0r 0s FF | pqrs: focus position |
| | Auto Focus | 81 01 04 38 02 FF | |
| | Manual Focus | 81 01 04 38 03 FF | |
| | One Push AF | 8x 01 04 18 01 FF | |
| CAM_ZoomFocus | Direct | 8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF | pqrs: zoom position (0(wide)~ 0x4000(tele)) tuvw:focus position |
| CAM_WB | Auto | 8x 01 04 35 00 FF | |

| Command type | function | command | |
|--------------|------------------|----------------------------|---|
| | Indoor | 8x 01 04 35 01 FF | |
| | Outdoor | 8x 01 04 35 02 FF | |
| | OnePush | 8x 01 04 35 03 FF | |
| | ATW | 8x 01 04 35 04 FF | |
| | Manual | 8x 01 04 35 05 FF | |
| | Sodium lamp | 8x 01 04 35 08 FF | |
| | fluorescent | 8x 01 04 35 09 FF | |
| | OnePush Trigger | 8x 01 04 10 05 FF | |
| CAM_RGain | Reset | 8x 01 04 03 00 FF | R Gain manual control |
| | Up | 8x 01 04 03 02 FF | |
| | Down | 8x 01 04 03 03 FF | |
| | Direct | 8x 01 04 43 00 00 0p 0q FF | pq: R Gain (0~0xFF) |
| CAM_Bgain | Reset | 8x 01 04 04 00 FF | B Gain manual control |
| | Up | 8x 01 04 04 02 FF | |
| | Down | 8x 01 04 04 03 FF | |
| | Direct | 8x 01 04 44 00 00 0p 0q FF | pq: B Gain (0~0xFF) |
| CAM_AE | Full Auto | 81 01 04 39 00 FF | Automatic Exposure mode |
| | Manual | 81 01 04 39 03 FF | Manual Control mode |
| | Shutter Priority | 81 01 04 39 0A FF | Shutter Priority Automatic Exposure mode |
| | Iris Priority | 81 01 04 39 0B FF | Iris Priority Automatic Exposure mode |
| | Bright | 81 01 04 39 0D FF | Bright Mode (manual control) |
| CAM_Shutter | Reset | 8x 01 04 0A 00 FF | Shutter Setting |
| | Up | 8x 01 04 0A 02 FF | |
| | Down | 8x 01 04 0A 03 FF | |
| | Direct | 8x 01 04 4A 00 00 0p 0q FF | pq: Shutter Position (0~0x15) |
| CAM_Iris | Reset | 8x 01 04 0B 00 FF | Iris Setting(0~0xD) |
| | Up | 8x 01 04 0B 02 FF | |
| | Down | 8x 01 04 0B 03 FF | |
| | Direct | 8x 01 04 4B 00 00 0p 0q FF | pq: Iris Position (0~ 0x11) |
| CAM_Gain | Reset | 8x 01 04 0C 00 FF | Gain Setting (0~0x0F) |
| | Up | 8x 01 04 0C 02 FF | |
| | Down | 8x 01 04 0C 03 FF | |

| Command type | function | command | |
|--------------------------|-------------------|----------------------------|--|
| | Direct | 8x 01 04 0C 00 00 0p 0q FF | pq: Gain Positon (0~0x0E) |
| CAM_Bright | Reset | 8x 01 04 0D 00 FF | Bright Setting |
| | Up | 8x 01 04 0D 02 FF | |
| | Down | 8x 01 04 0D 03 FF | |
| | Direct | 8x 01 04 4D 00 00 0p 0q FF | pq: Bright l Positon (0~0x1B) |
| CAM_OverallBright | Direct | 8x 01 04 A4 00 00 0p 0q FF | pq: Bright l Positon (0~0x0F) different with AE BRIGHT |
| CAM_WDR | On | 8x 01 04 3D 02 FF | ExposureCompensation ON/OFF |
| | Off | 8x 01 04 3D 03 FF | |
| | Direct | 8x 01 04 D3 pq FF | pq: ExpComp Position (0~0x6) |
| CAM_BackLight(BL C) | On | 8x 01 04 33 02 FF | Backlight On |
| | Off | 8x 01 04 33 03 FF | Backlight Off |
| CAM_Sharpness | Reset | 8x 01 04 02 00 FF | Aperture Control |
| | Up | 8x 01 04 02 02 FF | |
| | Down | 8x 01 04 02 03 FF | |
| | Direct | 8x 01 04 42 00 00 0p 0q FF | pq: Aperture Gain (0~0x0F) |
| CAM_Memory(prese t) | Reset | 8x 01 04 3F 00 0p FF | p: Preset Number (=0 to 127) Corresponds to 0 to 9 on the Remote Commander |
| | Set | 8x 01 04 3F 01 0p FF | |
| | Recall | 8x 01 04 3F 02 0p FF | |
| CAM_LR_Reverse | On | 8x 01 04 61 02 FF | Image Flip Horizontal ON/OFF |
| | Off | 8x 01 04 61 03 FF | |
| CAM_PictureFlip | On | 8x 01 04 66 02 FF | Image Flip Vertical ON/OFF |
| | Off | 8x 01 04 66 03 FF | |
| CAM_RS485Ctl | On | 8x 01 06 A5 02 FF | |
| | Off | 8x 01 06 A5 03 FF | |
| CAM_Saturation | Saturation | 8x 01 04 A1 00 00 0p 0q FF | Pq: saturation level 0x00~0xff |
| CAM_Contrast | Contrast | 8x 01 04 A2 00 00 0p 0q FF | Pq: contrast level 0x00~0xff |
| CAM_SpeedByZoo m | On | 8x 01 06 A0 02 FF | |
| | Off | 8x 01 06 A0 03 FF | |
| CAM_Preset Freeze Set | Preset Freeze Set | 8x 01 04 76 0p FF | p: Preset Freeze switch 3=OFF, 2=ON |
| CAM_Preset Speed Set | Preset Speed Set | 8x 01 7E 01 0B pp qq FF | pp: Preset NO. qq: Preset Speed 2~24 default:15 |
| CAM_Preset Speed Adj | Preset Speed Adj | 8x 01 7E 01 1B 0p FF | p: Adjustment of direction 3=down, 2=up |
| CAM_PTSpeed | PT Speed | 8x 01 04 C1 00 00 0p 0q FF | Pq: PT speed 0x05~0x18 |

| Command type | function | command | |
|---------------------------|-------------|---|--|
| CAM_ZoomSpeed | Zoom Speed | 8x 01 04 D1 00 00 0p 0q FF | Pq: Zoom speed 0x01~0x07 |
| CAM_ZoomDisplay | On | 8x 01 06 C2 02 FF | |
| | Off | 8x 01 06 C2 03 FF | |
| CAM_IRAddress | IR address | 8x 01 06 D8 0p FF | p: IR address 1~4 |
| CAM_Gamma | Gamma set | 81 01 04 5B 0p FF | P: Gamma NO (0~6) |
| CAM_MountMode | UP | 8x 01 04 A4 02 FF | Mount Up |
| | Down | 8x 01 04 A4 03 FF | Mount Down |
| CAM_ColorGain | Direct | 8x 01 04 49 00 00 00 0p FF | (0~0x0E) |
| CAM_2D Noise Reduction | Direct | 8x 01 04 53 0p FF | 0 – OFF 1 – ON |
| CAM_3D Noise Reduction | Direct | 8x 01 04 54 0p FF | 0 – OFF 1 – AUTO 2-5 – level |
| FLICK | 50HZ | 81 01 04 23 01 FF | |
| | 60HZ | 81 01 04 23 02 FF | |
| | OFF | 81 01 04 23 00 FF | |
| VideoSystem Set | | 8x 01 06 35 00 pp FF | pp: Video format 1080P60 0x2E 1080P50 0x2F 1080I60 0x01 1080I50 0x04 1080P30 0x06 1080P25 0x08 720P60 0x09 720P50 0x0C 720P30 0x0E 720P25 0x11 |
| CAM_IDWrite | | 8x 01 04 22 0p 0q 0r 0s FF | pqrs: Camera ID (=0000 to FFFF) |
| IP address control | IP set | 8x 01 04 AB 0p 0q 0r 0s 0m 0n 0x 0y FF | Set ip to: pq.rs.mn.xy |
| | Mask set | 8x 01 04 AC 0p 0q 0r 0s 0m 0n 0x 0y FF | Set mask to: pq.rs.mn.xy |
| | Gateway set | 8x 01 04 AD 0p 0q 0r 0s 0m 0n 0x 0y FF | Set gateway to: pq.rs.mn.xy |
| SYS_Menu | Menu On | 8x 01 06 06 02 FF | Turn on the menu |
| | Menu Off | 8x 01 06 06 03 FF | Turn off the menu |
| | Menu Back | 8x 01 06 06 10 FF | Menu step back |
| | Menu Ok | 8x 01 7E 01 02 00 01 FF | Menu ok |
| IR_Receive | On | 8x 01 06 08 02 FF | IR (remote commander) receive ON/OFF |
| | Off | 8x 01 06 08 03 FF | |

| Command type | function | command | |
|------------------|------------------|---|--|
| | On/Off | 8x 01 06 08 10 FF | |
| 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 (TBD) ZZZZ: Tilt Position (TBD) |
| | Down | 8x 01 06 01 VV WW 03 02 FF | |
| | Left | 8x 01 06 01 VV WW 01 03 FF | |
| | Right | 8x 01 06 01 VV WW 02 03 FF | |
| | Upleft | 8x 01 06 01 VV WW 01 01 FF | |
| | Upright | 8x 01 06 01 VV WW 02 01 FF | |
| | DownLeft | 8x 01 06 01 VV WW 01 02 FF | |
| | DownRight | 8x 01 06 01 VV WW 02 02 FF | |
| | Stop | 8x 01 06 01 VV WW 03 03 FF | |
| | 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) |
| | Clear | 8x 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF | ZZZZ: Tilt Limit Position (TBD) |

Part 2 Camera Control Command

| Command type | command | return | 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_DZoomOnOff Inq | 8x 09 04 06 FF | y0 50 0p FF | p 2: ON 3: OFF |
| CAM_DZoomModeInq | 8x 09 04 36 FF | y0 50 0p FF | p 0: combination mode 1: separate mode |
| CAM_DZoomPosiInq | 8x 09 04 46 FF | y0 50 0p 0q 0r 0s FF | pqrs: Zoom Position |
| CAM_SpeedByZoomInq | 8x 09 06 A0 FF | y0 50 0p FF | p 2: ON 3: OFF |
| CAM_PTSpeedInq(IR) | 8x 09 04 C1 FF | y0 50 pp FF | pp: 0x05~0x18 |
| CAM_ZoomSpeedInq(IR) | 8x 09 04 D1 FF | y0 50 0p FF | p:0x00~0x07 |
| CAM_FocusModeInq | 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 | Indoor mode |
| | | y0 50 02 FF | Outdoor mode |
| | | y0 50 03 FF | OnePush mode |
| | | y0 50 04 FF | ATW |
| | | y0 50 05 FF | Manual |
| CAM_RGainInq | 8x 09 04 43 FF | y0 50 00 00 0p 0q FF | 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_GainPosInq | 8x 09 04 4C FF | y0 50 00 00 0p 0q FF | pq: Gain Position |
| CAM_BrightPosInq | 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_ApertureInq | 8x 09 04 42 FF | y0 50 00 00 0p 0q FF | pq: Aperture Gain |
| CAM_MemoryInq | 8x 09 04 3F FF | y0 50 pp FF | pp: 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_IDInq | 8x 09 04 22 FF | y0 50 0p 0q 0r 0s FF | pqrs: Camera ID |
| CAM_DHCPInq | 8x 09 04 AE FF | y0 50 pp FF | |
| CAM_IPInq | 8x 09 04 AB FF | y0 50 0p 0p 0q 0q 0r 0r 0s 0s FF | |
| CAM_MASKInq | 8x 09 04 AC FF | y0 50 0p 0p 0q 0q 0r 0r 0s 0s FF | |
| CAM_GATEWAYInq | 8x 09 04 AD FF | y0 50 0p 0p 0q 0q 0r 0r 0s 0s FF | |
| CAM_FlareModeInq | 8x 09 04 B6 FF | y0 50 pp FF | |
| CAM_FlareBrightModeInq | 8x 09 04 B7 FF | y0 50 pp FF | |
| CAM_FlareRed | 8x 09 04 B8 FF | y0 50 pp FF | |
| CAM_FlareGreen | 8x 09 04 B9 FF | y0 50 pp FF | |
| CAM_FlareBlue | 8x 09 04 BA FF | y0 50 pp FF | |
| CAM_IDInq | | | |
| CAM_VersionInq | 8x 09 00 02 FF | y0 50 ab cd mn pq rs tu vw FF | |
| VideoSystemInq(Telycam) | 8x 09 06 23 FF | y0 50 pp FF | pp: Video format |
| VideoSystemInq(Sony) | 8x 09 04 24 72 FF | y0 50 0p 0p FF | pp: Video format |
| IR_Transfer | 8x 09 06 1A FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| IR_Receive | 8x 09 06 08 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| 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 | CAM_Backlight |
| | | y0 07 7D 01 04 3F FF | CAM_Memory |
| | | y0 07 7D 01 06 01 FF | Pan_tiltDrive |
| Pan-tiltMaxSpeedInq | 8x 09 06 11 FF | y0 50 ww zz FF | ww: PanMaxSpeed zz: Tilt Max Speed |
| Pan-tiltPosInq | 8x 09 06 12 FF | y0 50 0w 0w 0w 0w | wwww: PanPosition |

| | | 0z 0z 0z 0z FF | zzzz: Tilt Position |
|-------------------------|----------------------|-------------------------------------|--|
| MainstreamResolutionInq | 8x 09 04 C2 00 FF | y0 50 0p 0q 0r 0s 0m 0n 0x 0y FF | pqrs: Column (x size) mnxy: Line (y size) only support:1920*1080,1280*720, 1024*576 |
| MainstreamRateInq | 8x 09 04 C2 01 FF | y0 50 0p 0q 0r 0s 0m 0n 0x 0y FF | pqrsmnxy: bitrate (1024~16384) |
| SubstreamResolutionInq | 8x 09 04 C3 00 FF | y0 50 0p 0q 0r 0s 0m 0n 0x 0y FF | pqrs: Column (x size) mnxy: Line (y size) only support:1280*720, 1024*576, 640*360 |
| SubstreamRateInq | 8x 09 04 C3 01 FF | y0 50 0p 0q 0r 0s 0m 0n 0x 0y FF | pqrsmnxy: bitrate (1024~5120) |

Note: 【x】 means the camera address: 【y】 = 【x + 8】.

VISCA Pan Tilt Absolute Position Value

| Pan Angle | VISCA Value | Tilt Angle | VISCA Value |
|-----------|-------------|------------|-------------|
| -170 | 0xF670 | -30 | 0xFE50 |
| -135 | 0xF868 | 0 | 0x0000 |
| -90 | 0xFAF0 | 30 | 0x01B0 |
| -45 | 0xFD78 | 60 | 0x0360 |
| 0 | 0x0000 | 90 | 0x510 |
| 45 | 0x0288 | | |
| 90 | 0x0510 | | |
| 135 | 0x0798 | | |
| 170 | 0x0990 | | |

VISCA Pan Tilt Speed Value

| Pan (Degree/Second) | | Pan (Degree/Second)) | |
|---------------------|-----|----------------------|-----|
| 0 | 0.3 | 0 | 0.3 |
| 1 | 1 | 1 | 1 |
| 2 | 1.5 | 2 | 1.5 |
| 3 | 2.2 | 3 | 2.2 |
| 4 | 2.4 | 4 | 3.6 |
| 5 | 2.6 | 5 | 4.7 |
| 6 | 2.8 | 6 | 6 |
| 7 | 3.0 | 7 | 8 |
| 8 | 3.2 | 8 | 10 |
| 9 | 3.4 | 9 | 12 |
| 10 | 3.8 | 10 | 15 |
| 11 | 4.5 | 11 | 18 |
| 12 | 6 | 12 | 23 |
| 13 | 9 | 13 | 30 |
| 14 | 15 | 14 | 39 |

| | | | |
|----|-----|----|----|
| 15 | 19 | 15 | 48 |
| 16 | 25 | 16 | 59 |
| 17 | 32 | 17 | 69 |
| 18 | 38 | 18 | 80 |
| 19 | 45 | | |
| 20 | 58 | | |
| 21 | 75 | | |
| 22 | 88 | | |
| 23 | 105 | | |
| 24 | 120 | | |

PELCO-D PROTOCOL 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 |
| Stop | 0xFF | Address | 0x00 | 0x00 | Pan Speed | Tilt Speed | SUM |
| Clear Preset | 0Xff | Address | 0x00 | 0x05 | 0x00 | Preset ID | SUM |
| Call Preset | 0Xff | Address | 0x00 | 0x07 | 0x00 | Preset ID | SUM |
| Query Pan Position | 0Xff | Address | 0x00 | 0x51 | 0x00 | 0x00 | SUM |
| Query Pan Position Response | 0Xff | Address | 0x00 | 0x59 | Value High Byte | Value Low Byte | SUM |
| Query Tilt Position | 0Xff | Address | 0x00 | 0x53 | 0x00 | 0x00 | SUM |
| Query Tilt Position Response | 0Xff | Address | 0x00 | 0x5B | Value High Byte | Value Low Byte | SUM |
| Query Zoom Position | 0Xff | Address | 0x00 | 0x55 | 0x00 | 0x00 | SUM |
| Query Zoom Position Response | 0Xff | Address | 0x00 | 0x5D | Value High Byte | Value Low Byte | SUM |

PELCO-P PROTOCOL 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 | 0x00 | 0x80 | 0x00 | 0x00 | 0Xaf | XOR |
| Focus Near | 0XA0 | Address | 0x01 | 0x00 | 0x00 | 0x00 | 0Xaf | XOR |
| Stop | 0XA0 | Address | 0x00 | 0x00 | Pan Speed | Tilt Speed | 0Xaf | XOR |
| Set Preset | 0xA0 | Address | 0x00 | 0x03 | 0x00 | Preset ID | 0xAF | XOR |
| Clear Preset | 0xA0 | Address | 0x00 | 0x05 | 0x00 | Preset ID | 0xAF | XOR |
| Call Preset | 0xA0 | Address | 0x00 | 0x07 | 0x00 | Preset ID | 0xAF | XOR |
| Query Pan Position | 0xA0 | Address | 0x00 | 0x51 | 0x00 | 0x00 | 0xAF | XOR |
| Query Pan Position Response | 0xA0 | Address | 0x00 | 0x59 | Value High Byte | Value Low Byte | 0xAF | XOR |
| Query Tilt Position | 0xA0 | Address | 0x00 | 0x53 | 0x00 | 0x00 | 0xAF | XOR |
| Query Tilt Position Response | 0xA0 | Address | 0x00 | 0x5B | Value High Byte | Value Low Byte | 0xAF | XOR |
| Query Zoom Position | 0xA0 | Address | 0x00 | 0x55 | 0x00 | 0x00 | 0xAF | XOR |
| Query Zoom Position Response | 0xA0 | Address | 0x00 | 0x5D | Value High Byte | Value Low Byte | 0xAF | XOR |

Warranty

Thank you for your interest in the products of AVIPAS Inc.

This Limited Warranty applies to HD Conference Camera purchased from AVIPAS Inc.

This Limited Warranty covers any defect in material and workmanship under normal use within the Warranty Period. AVIPAS Inc. will repair or replace the qualified products at no charge.

AVIPAS Inc. provides a two (2)-year warranty (from the date of purchase) for this HD Conference Camera.

This Limited Warranty does not cover problems including but not limited to: improper handling, malfunction or damage not resulting from defects in material.

To receive warranty service, please contact AVIPAS Inc. first. We will decide whether a repair or replacement is needed and will advise you of the cost of such repair or replacement.

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