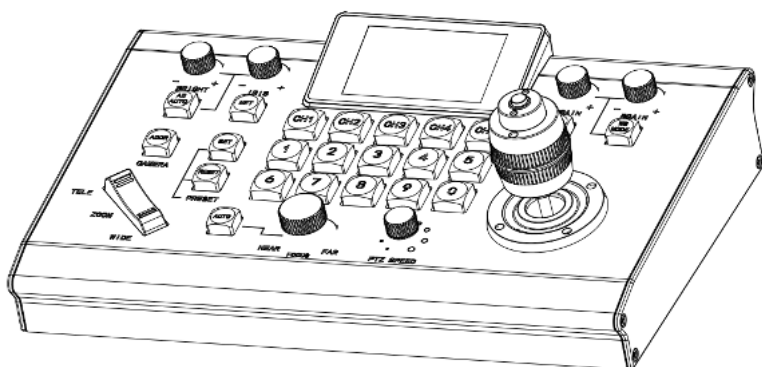# Universal PTZ camera remote controller User Manual

Tips

Thank you for using our products.

In order to enable you to operate the machine proficiently as soon as possible, please carefully read the instruction manual we have provided for you, from which you can obtain product safety precautions, product introduction and product use methods and other related knowledge. After you have read the manual, please keep it in a safe place for future reference.

If you find any problems during the use of the product, please contact our relevant service personnel, thank you for your cooperation.

Precautions

1. Before connecting to the device, make sure that the power supply voltage is correct. Use only the original uncut (unspliced) power supply that came with the keyboard.
2. If the product does not work normally, please contact your dealer. Never try to disassemble the device yourself. (We do not assume any responsibility for problems caused by unauthorized repairs or maintenance.)
3. This product is an indoor device, please do not place this product in a place with water or humidity.
4. When transporting, the equipment should be packed in the original packaging.
5. Do not drop the machine or subject it to physical shocks.
6. Do not use strong detergent to clean the machine. When the dust is thick, wipe it gently with a neutral detergent, and it is limited to external cleaning.
7. Keep the RJ-45 port free of dust and moisture
8. Avoid moving the machine between places that are too cold or too hot to avoid fogging inside the machine and affect its service life.

Affirm

1. We have done our best for the completeness and correctness of the contents of this manual, but there will inevitably be errors and omissions. We will not be responsible for any technical or typographical errors in the manual.
2. The appearance of the product shown in this manual is for reference only and may differ from the actual appearance of the equipment you purchased.
3. This manual guides multiple product models, so it is not used for any specific product alone.
4. The display interface, parameters, drawings and model value ranges in this manual and illustrations may be different. For details, please refer to the actual product.
5. The content of this manual is subject to change without notice.
6. If the software version is upgraded and does not conform to this manual, please refer to the software.

Feature

The smart, ergonomic PTZ controls multiple remote cameras for live event production and content creation, and is used in education, broadcasting, video conferencing, churches, etc.

The high-quality three-dimensional joystick adjusts pan and tilt, and controls the zoom through the handle or a separate Seesaw joystick, which can easily realize professional video production. The dedicated knobs and control buttons simplify direct access to common camera functions without the need to use the camera menu.

Quick image adjustment function, through dedicated knobs and buttons, including automatic exposure level, shutter, iris, gain, white balance, focus, etc. can be directly adjusted.

The controller supports serial RS-232, RS-422/485 and IP mixed control. Allows the use of RS-232, RS-422 / 485, IP on a controller to control cameras in a single system.

With IP control, the controller can automatically search for IP cameras in the system. Support NDI, Onvif, VISCA over IP.

The frontboard
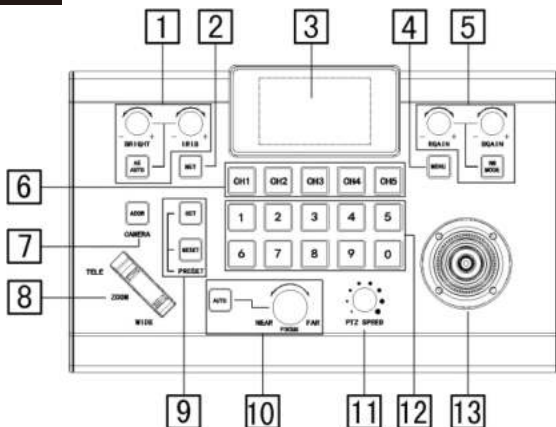
Button fuction

1. Selection of exposure mode
   "AE AUTO" automatic exposure
   "-BRIGHT+" Brightness adjustment
   "-IRIS+" Iris adjustment
2. Network mode, search network equipment
3. Keyboard display
4. "MENU" keyboard/camera menu call/exit, short press to call
   keyboard menu, long press 2S to call camera menu
5. White balance adjustment
   "WBC MODE" automatic white balance mode selection
   "RGAIN" red gain.
   "BGAIN" blue gain.
6. CH1-CH5, camera control channel selection
7. "ADDR/CAMERA" ID address selection/IP address list/long press
   2S to enter the IP list editing interface
8. "ZOOM" focus adjustment
   "TELE" far focus
   "WIDE" close focus
9. "SET" set the preset position
   "RESET" delete preset
10. Focus mode selection
    Auto focus, "AUTO"
    Manual focus, left-handed NEAR focuses on the near end, righthanded FAR focuses on the far end;
11. "PTZ SPEED" camera PTZ and lens control speed level adjustment;
12. 1-10 number keys;
13. PTZ joystick
    The joystick is used to operate the camera pan/tilt pan and tilt and the lens focus. Select the camera you want to control through thejoystick to achieve control;
    Pan and tilt
    The left and right direction of the joystick is panning, and the up and down is tilting. When you release the remote sensing, the camera will stop moving;
    focal length
    When you turn the knob on the joystick clockwise, the field of view will become larger (zoom), otherwise it will be smaller (zoom); The function of the button on the top of the joystick is to reset the pan/tilt lens;

Backside
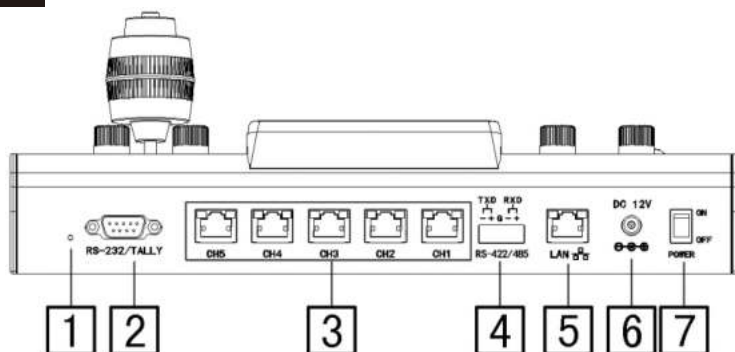
1. Download mode switch button (for manufacturer upgrade)
2. 232/TALLY interface (use CH1 channel control)
3. Camera control channel (CH1-CH5), RJ-45 port
   Each channel is connected to the RS-232 control line, which can control up to 7 daisy chain RS-232 cameras
   Each channel is connected to the RS-485 control line, up to 10 cameras
4. RS422/485 control (using CH1 channel control)
   Connect the RS-422 control line to control up to 7 daisy chain RS-422 cameras
   Connect RS-485 control line, up to 10 cameras
5. LAN interface
6. Power DC interface
7. Power switch

Home Screen
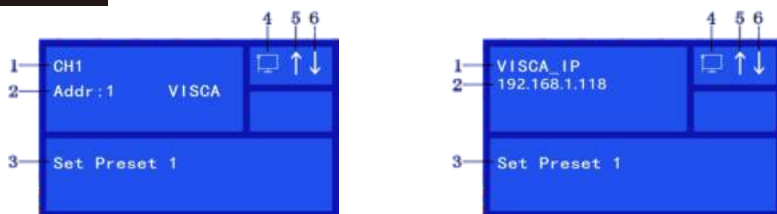
1.When network control, shows network control protocol
   When Serial port control, shows Current control channel
2.When network control, shows network control protocol
   When Serial port control, Shows the ID of camera being controlled, and communication protocol
3.Operation record area
4.Network connection indicator icon
   If appears " ▣ " , indicates that the network has been successfully connected
   If appears " ▣ " , indicates that the network is not connected
5.Instruction sending indicator icon
6.Instruction receives instruction icon

Power supply

Use the following methods to power the keyboard
1. DC power adapter power supply (standard 12V)
2. POE power supply (connect the Ethernet IP port to the POE switch)
   Use CAT6 cable, the maximum distance is 100 meters (802.3 af)

Interface pin definition
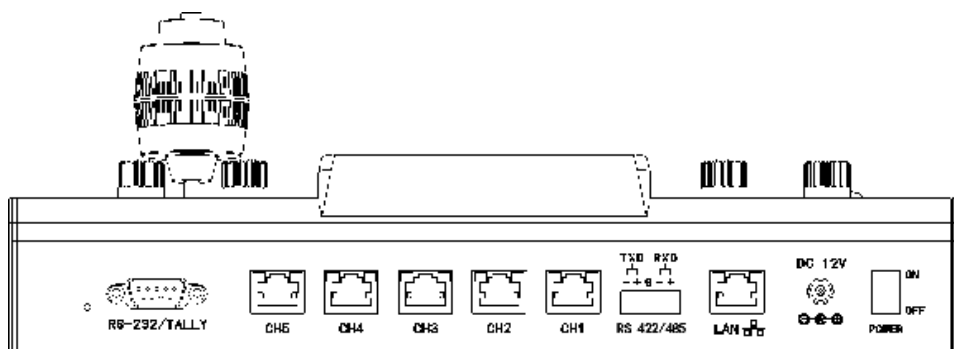
DB9 (RS232/Tally)		CH1-CH5		LAN		
Pin NO	Function	Pin NO	Function	Pin NO	Function	Color
1	NC	1	RS485 A+	1	TX+	Orange/White
2	RS232 RX	2	RS485 B-	2	TX-	Orange
3	RS232 TX	3	RS232 TX	3	RX+	Green/White
4	TALLY 1	4	GND	4	NC	Blue
5	PGND	5	GND	5	NC	Blue/White
6	TALLY 2	6	RS232 RX	6	RX-	Green
7	TALLY 3	7	GND	7	NC	Brown/White
8	TALLY 4	8	GND	8	NC	Brown
9	TALLY 5					

Internet connection

Connect the "LAN" port of the keyboard to the port on the Ethernet switch
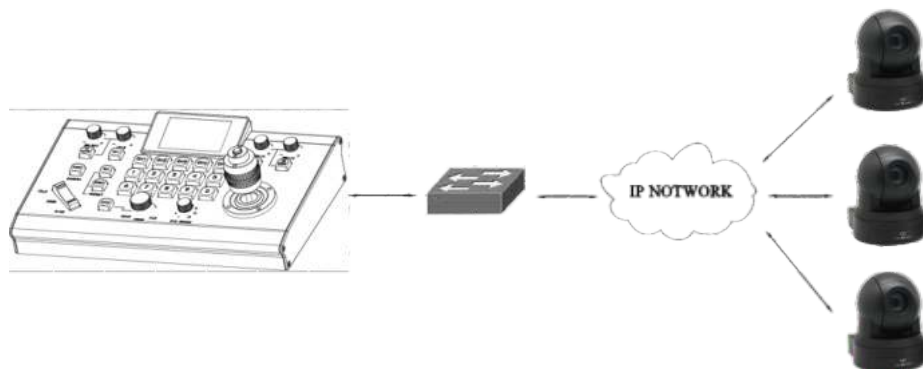
Serial connection

1. Use DB9 to RS232 8-pin mini port control line for RS-232 connection

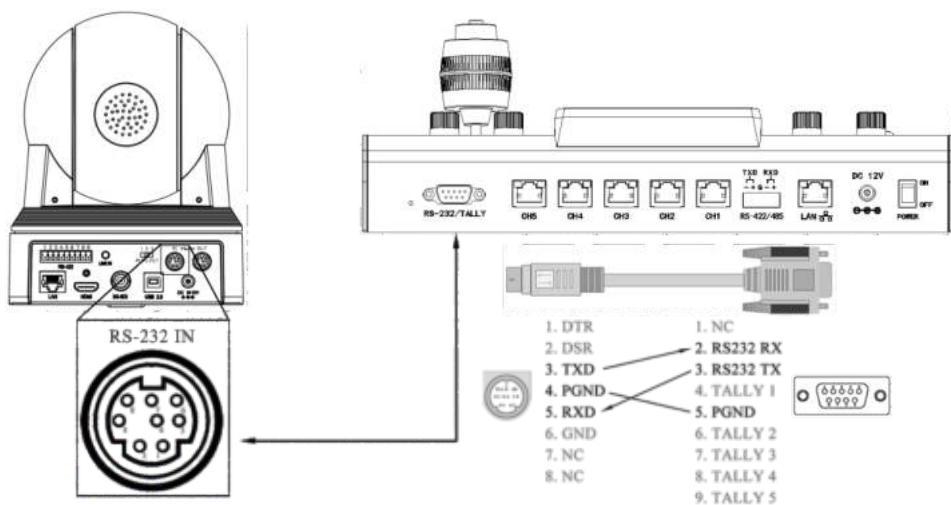|	
1. DTR	1. NC
2. DSR	2. RS232 RX
3. TXD	3. RS232 TX
4. PGND	4. TALLY 1
5. RXD	5. PGND
6. GND	6. TALLY 2
7. NC	7. TALLY 3
8. NC	8. TALLY 4
	9. TALLY 5

2. Use RJ45 to RS232 8-pin mini port control line for RS-232 connection

RS-232 IN

1. DTR	1. RS485 A+
2. DSR	2. RS485 B-
3. TXD	**3. RS232 TX**
4. PGND	**4. GND**
5. RXD	5. GND
6. GND	**6. RS232 RX**
7. NC	7. GND
8. NC	8. GND
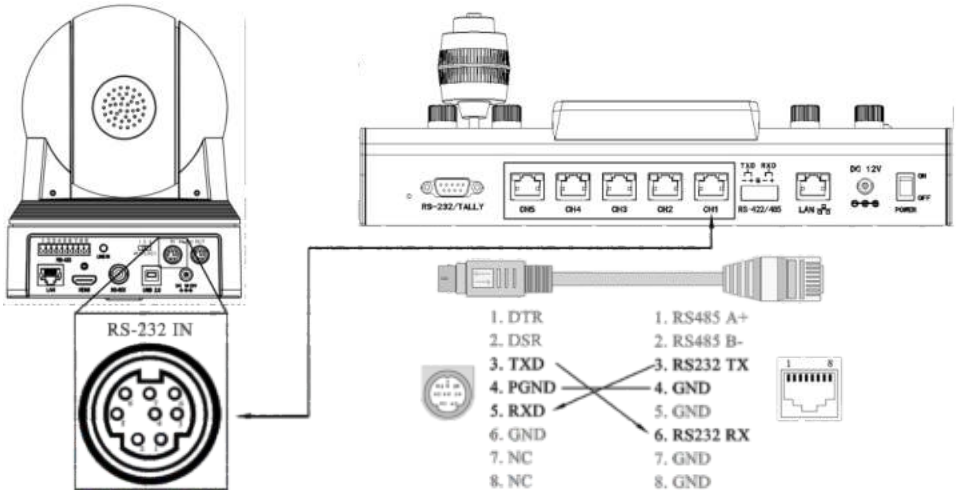
3.Use RJ45 to RS485 RS-485 connection

1. TXD- IN	**1. RS485 A+**
2. TXD+ IN	**2. RS485 B-**
3..RXD- IN	3. RS232 TX
4. RXD+ IN	**4. GND**
5. GND	5. GND
6. TXD- OUT	6. RS232 RX
7. TXD+ OUT	7. GND
8..RXD- OUT	8. GND
9. RXD+ OUT	

4. Phoenix head for RS-4222 connection

1. TXD- IN
2. TXD+ IN
3. RXD- IN
4. RXD+ IN
5. GND
6. TXD- OUT
7. TXD+ OUT
8. RXD- OUT
9. RXD+ OUT

1. TDX-
2. TXD+
3. GND
4. RXD-
5. RXD+
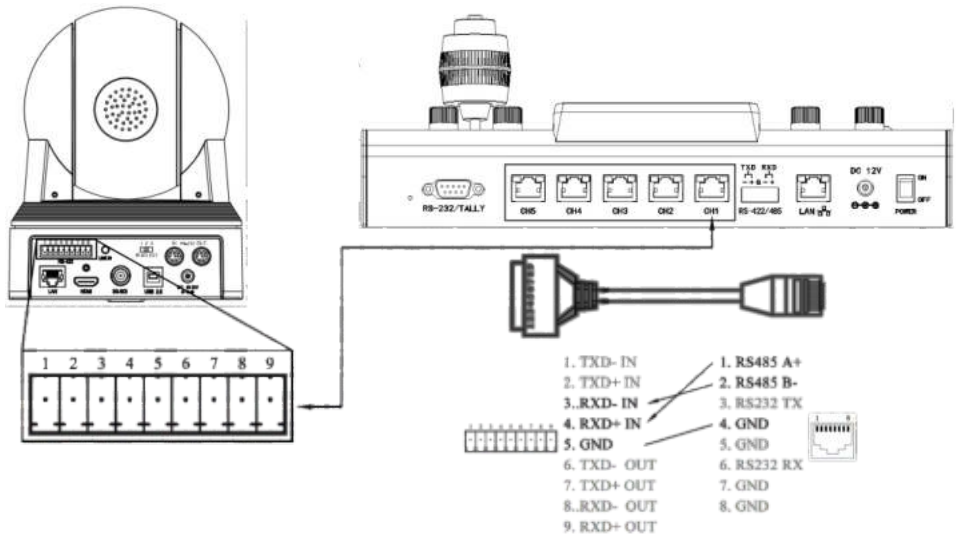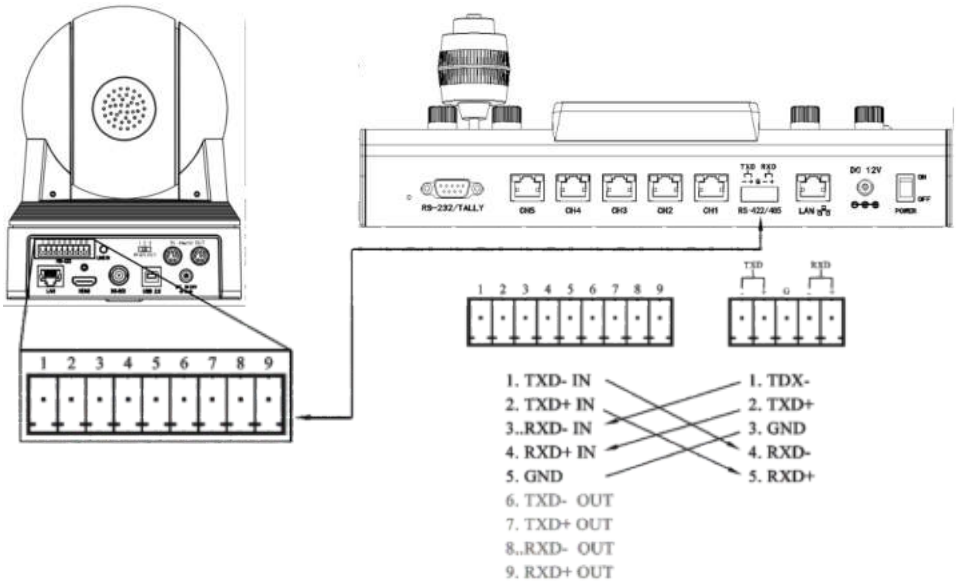
Keyboard OSD menu Settings

● **Short press "MENU" key to open/exit the keyboard menu**
● **Use the joystick to browse the keyboard menu**
   a. **Move the joystick up and down to browse menu options**
   b. **Move the rocker to the right to send "ENTER" command**
   c. **Move the rocker to the left to send "ENTER" command**
   d. **Joystick top button to send "ENTER" command**
● **Use the joystick to operate the virtual keyboard**
   a. **Move the joystick up, down, left, right to select characters**
   b. **The top button of the joystick sends the "ENTER"command**

Main course list

```
SETTING
1.Select Serial Port Protocol  >
2.Protocol setting             >
3.Shortcut                     >
4.Custom Camera List           >
5.Blacklist Setting            >
6.Ethernet                     >
7.Serial Port                  >
8.Rocker                       >
9.Buzzer               OFF>
10.Sleep Time       No Sleep>
11.Language         English >
12.About Device             >
13.Reset Device             >
```

```
     Select  Protocol
1.CH1              VISCA>
2.CH2              VISCA>
3.CH3              VISCA>
4.CH4              VISCA>
5.CH5              VISCA>
```

```
     Select  Protocol
1.VISCA
2.Pelco D             √
3.Pelco P
```

Sub Menu

1. Serial port protocol selection

Set the serial control protocol of each channel of CH1-CH5, the default control protocol of each serial port is VISCA, and the optional control protocol is VISCA/Pelco D/Pelco P;

● **Select the channel to be set—CH1**
● **Select the corresponding agreement—Pelco D**
● **Exit the menu to save**

2. Protocol Setting

Setting compatibility of VISCA protocol control, used to adapt cameras from different manufacturers

● **Select the appropriate brand**
● **Exit the menu and then save**

3.Shortcut Settings

Set IP shortcut channel, could set CH1-CH5, 5 buttons separately control 5 IP channels (only Visca over IP protocol)

● Select the channel—CH1
● Select CH1 shortcut—ON
● though submenu "Edit", "Protocol" select to the brand camera which support "Visca over IP" protocol —SONY
● go back to upper menu, in "IP Address" to fill in the IP of the camera you want to control
● If need, could set in "Comment" and give camera a new description

```
              Shortcut
1.CH1 192.168.1.118      ON>
2.CH2 255.255.255.255    OFF>
3.CH3 255.255.255.255    OFF>
4.CH4 255.255.255.255    OFF>
5.CH5 255.255.255.255    OFF>
```

```
              Shortcut
1.ON/OFF                 ON>
2.Edit
```

```
              Shortcut
1.Protocal            VISCA_IP>
2.IP Address  192.168.001.118 >
3.Comment                      >
```

4.User-defined camera list

Use to add/ manager user-defined IP address(only Visca_IP protocol)

Add new user-defined address
● Select the brand of camera which support Visca_IP—Other1

● when the brand of camera to be "Other1", according to process choice transport protocols UDP/TCP, fill in to IP of address, fill in UDP/TCP port number, then device description, (if not fill in description, could directly choice "Enter" on virtual keyboard, then icon save exit)

Manager user-defined address
● SELECT one user-defined IP address
● When the brand camera selected to be "Other1", then it could edit, though protocol (VISCA_IP, select the appropriate camera brand), IP address, communicate protocol (UDP/TCP), port number, device description, Delete the camera

```
           Custom Camera
1.Add New Custom Address   >
2.Manage Custom Address    >
```

```
           Custom Camera
1.192.168.001.118      Other1>
```

```
           Custom Camera
1.Protocal            VISCA_IP>
2.IP Address  192.168.001.118>
3.Transport Protocol      UDP>
4.Port                  52381>
5.Comment                    >
6.Delete This Camera         >
```

5.Blacklist Settings

Used to manage devices that are added to the blacklist

● Select "Remove all items", select "YES", remove all settings added to the blacklist at once

Blacklist	
1.Remove All Item	>
2.Blacklist	>

Blacklist	
1.NO	
2.YES	

● Select "Blacklist", Displays all device IP that have been added to the blacklist, can remove the blacklist one by one

Blacklist	
1.Remove All Item	>
2.Blacklist	>

Blacklist	
1.192.168.001.012	ONVIF>
2.192.168.001.015	ONVIF>

Blacklist	
1.Remove From Blacklist	>

6.Ethernet settings

IP address could set to static address IP or DHCP address

● If set "DHCP":cursor move to "DHCP", select "ON", exit menu and save

Ethernet	
1.DHCP	ON>
2.IP	192.168.1.118
3.Mask	255.255.255.0
4.GateWay	192.168.1.1

● if set static IP address, Move the cursor to "DHCP", Select "OFF"
● Move the cursor to "IP", enter the corresponding value with the number button
● Set up the subnet mask and gateway as needed
● Exit menu and save

7. Serial port settings

Used to set the baud rate of CH1-CH5 5 ports and instruction repeater ;

● Baud rate setting, select the channel to be set—CH1
● Choose corresponding baud rate—9600
● Exit the menu to save

Serial Port	
1.Baud Rate	>
2.Instruction Repeater	>

Serial Port	
1.CH1	9600>
2.CH2	9600>
3.CH3	9600>
4.CH4	9600>
5.CH5	9600>

```
        Serial  Port
1.2400
2.4800
3.9600                      √
4.19200
5.38400
6.115200
```

● Instruction repeater setting, select CH1 as input; other CH2-CH5 are all output
● Exit the menu to save.

```
        Serial  Port
1.Baud Rate                 >
2.Instruction Repeater      >
```

```
        Serial  Port
1.OFF
2.CH1 As Input              √
3.CH2 As Input
4.CH3 As Input
5.CH4 As Input
6.CH5 As Input
```

8.Joystick settings

Used for 3D joystick function setting and rocker switch correction;

● 3D joystick function setting, select "Pitch Reverse"—ON
● Exit the menu to save

```
          Rocker
1.PAN Reverse          OFF>
2.TILT Reverse          ON>
3.Rocker Switch Correct   >
```

Rocker switch calibration. After entering this option, follow the instructions on the screen to complete the calibration and exit the menu to save

9.Buzzer switch

Set keyboard button beep on/off

● 3D joystick function setting

```
          Buzzer
1.OFF
2.ON                        √
```

10. Time setting of LCD screen

Set the keyboard display sleep time;

● Select "sleep time";
● Select "not sleep", exit the menu to save

```
         Sleep Time
1.1 Minute
2.5 Minute
3.30 Minute
4.No Sleep                  √
```

11. Language

Set the display language of the keyboard menu;

● Select "Language";
● Select "English", exit the menu to save

```
          Language
1.English
```

12. About equipment

Display device information;

● Choose "About Device" to display the current information of the device after opening;

```
About Device
Hardware Version
V1.rel.20191208.0000
Mac Address
B4:2E:99:54:BB-D3
Software Version
2020.ndi.V3.0.2
Compile Date
2020.05.20
```

13. Reset Device

Clear all settings and restore to factory default settings

● Select "Reset Device"
● Select "YES" and wait for the reset to complete;

```
Reset Device
1.NO
2.YES
```

Camera allocation

1. Serial connection to manually asdd camera

● CH1 channel
232 port, through RS-232 Visca protocol, it can control up to 7 daisy chain RS-232 cameras;
422 port, through RS-422 Visca protocol, up to 7 daisy-chain RS-422 cameras can be controlled;
RJ-45 port,
Through RS-232 Visca protocol, up to 7 daisy chain RS-232 cameras can be controlled;
Through RS-485 Pelco protocol, up to 10 cameras;
● CH2 channel, RJ-45 port
Through the RS-232 Visca protocol, up to 7 daisy-chain RS-232 cameras can be controlled;
Through RS-485 Pelco protocol, up to 10 cameras;
● CH3 channel, RJ-45 port
Through the RS-232 Visca protocol, up to 7 daisy-chain RS-232 cameras can be controlled;
Through RS-485 Pelco protocol, up to 10 cameras;
● CH4 channel, RJ-45 port
Through the RS-232 Visca protocol, up to 7 daisy-chain RS-232 cameras can be controlled;
Through RS-485 Pelco protocol, up to 10 cameras;
● CH5 channel, RJ-45 port
Through the RS-232 Visca protocol, up to 7 daisy-chain RS-232 cameras can be controlled;
Through RS-485 Pelco protocol, up to 10 cameras;

● Connect 255 cameras separately through VIisca _IP protocol
● Connect 255 cameras separately through ONVIF protocol
● Connect 255 cameras separately through NDI protocol

If you choose VISCA, PELCO-D, PELCO-P, you need to set the baud rate of each channel to be consistent with the camera;

2. Search the local network and add the IP camera to the keyboard;

● During IP control, press the "NET" button to search for IP cameras (when the current is serial port control, you need to press the "NET" button once to switch to IP mode, and press the "NET" button again to search for IP)

● Keyboard screen shows searching

● Display the discovered ONVIF / VISCA_IP cameras, use the joystick to browse the discovered cameras;

　（For discovered cameras, add camera description, add to camera list, and add to blacklist)

● Edit the discovered cameras and add them to the camera list
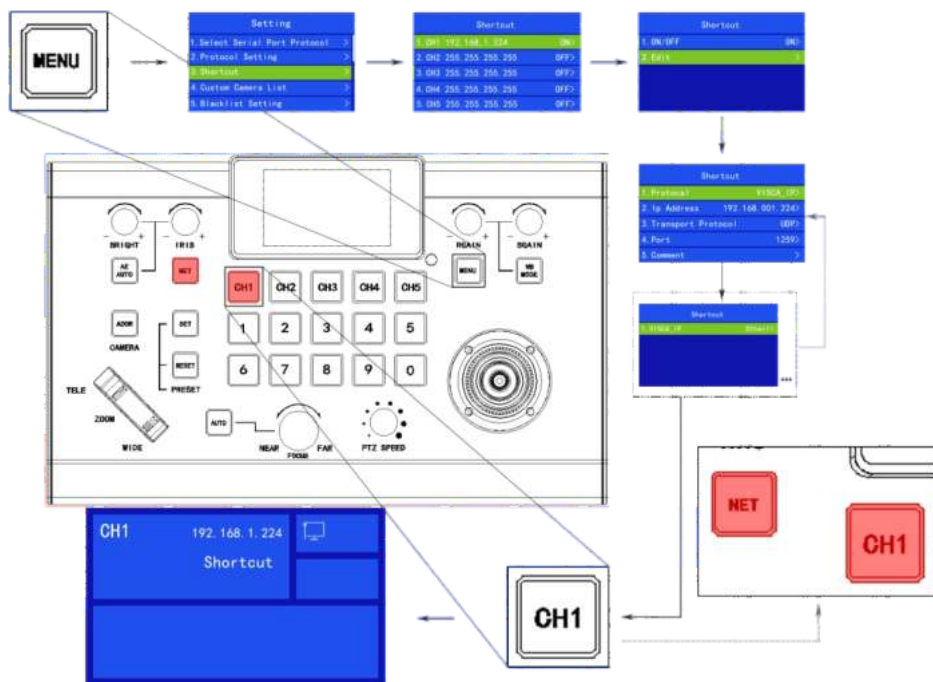
● Exit the search list

● Press the "ADDR/CAMERA" button to open the camera list, use the joystick to select the corresponding camera
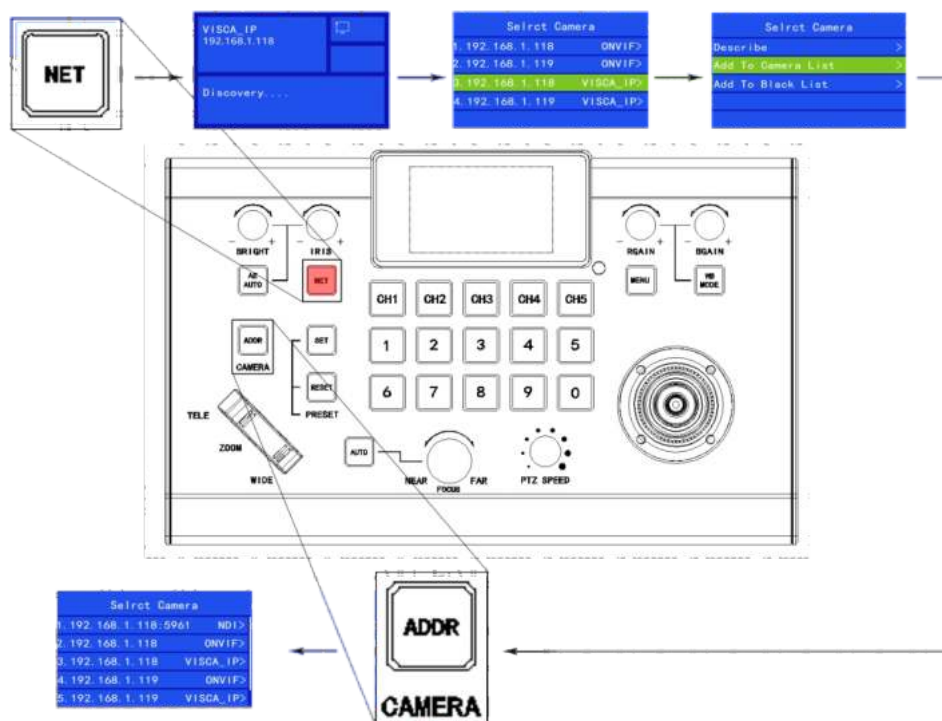
Note: In the network search list, only ONVIF / VISCA_IP devices are displayed, and NDI devices will be directly added to the camera list;

3. Manually add the VISCA_IP camera to the keyboard

● Open the keyboard menu, select the "custom camera list" column, add the required VISCA_IP address; select the brand as Other1, select the transmission protocol UDP/TCP according to the process, fill in the camera IP, fill in the UDP/TCP port number, and device description (not When filling in the description, you can directly select the "Enter" icon on the virtual keyboard to save and exit)

● Exit the keyboard menu

● Press the "ADDR/CAMERA" button to open the camera list, and use the joystick to select the custom camera with "CUSTOM";

4. Add VISCA_IP camera to the keyboard via shortcut

● Open the keyboard menu, select the "shortcut" column, select the "CH1" channel, select the shortcut status as "ON", edit the VISCA_IP camera which need to be added, select the brand as "Other1", fill in the camera IP according to the process and select the transmission protocol UDP/TCP, fill in the UDP/TCP port number, device description (if you don't fill in the description, you can directly select the "Enter" icon on the virtual keyboard to save and exit)

● Exit the keyboard menu

● Press the "CH1" button (the control mode is switched to IP control, the "NET" button and the "CH1" button light up at the same time) to quickly control the added camera

5. Edit the camera list

● In the IP mode, long press the "ADDR/CAMERA" button for 2 seconds to enter the editing interface of the camera list

● Can edit ONVIF/VISCA_IP devices which are added to the camera list from the search list; NDI devices cannot be edited, and manually added VISCA_IP devices can be edited in the keyboard menu;

（Editable, camera description, remove camera list, add to blacklist, ONVIF settings , edit user name and password)
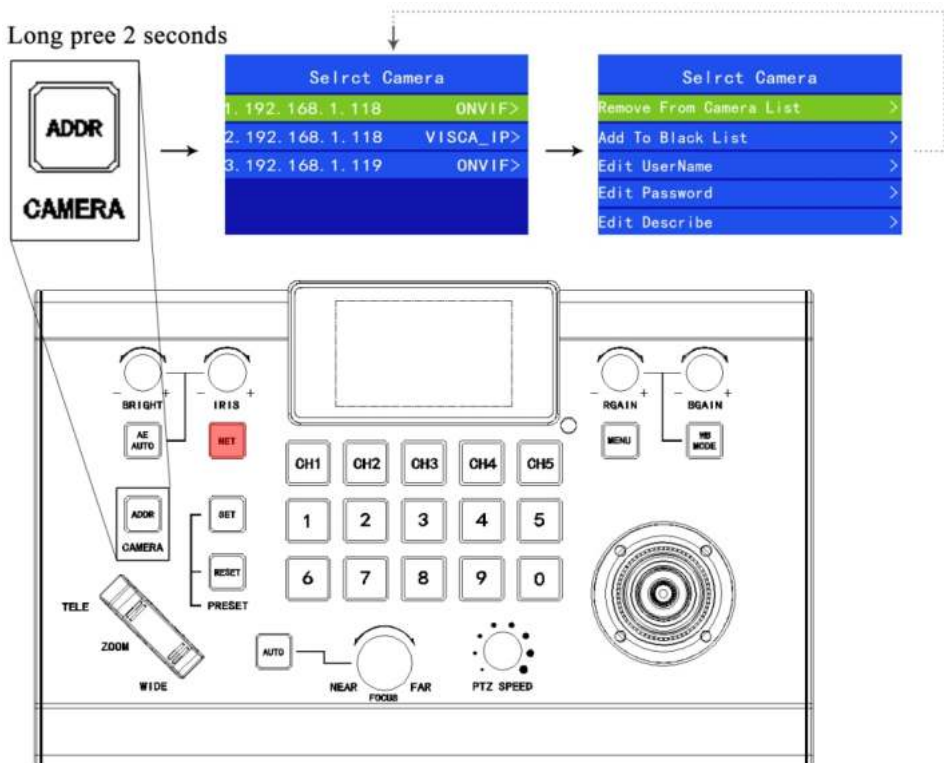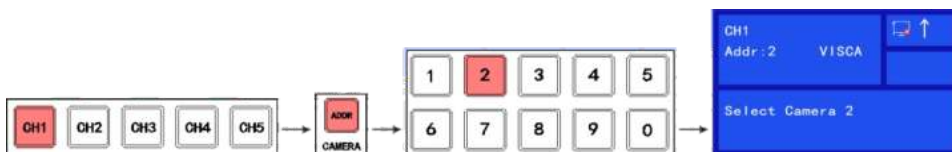
Interact with the camera

1. Serial control
● CH1-CH5 buttons
During serial port control, the output channel buttons in the CH1-CH5 5 channels will remain on (for example: CH1);
● Serial control calls the camera ID
a. Select a channel from CH1-CH5 as output, such as: "CH1"
b. Press the "CAMERA/ADDR" button to select the camera ID
c. Use the keyboard number keys to enter the camera ID: 2

2. IP control
● "NET" button
Press the "NET" button to switch to IP control, and the "NET" button keeps on
● Press the "ADDR/CAMERA" button to open the camera list, use the joystick to select the corresponding device

Camera control

1. Set the camera OSD menu
● Long press "MENU" 2S, send a command to open the camera OSD menu (only applicable to VISCA and VISCA_IP protocol)
● Use the joystick to browse the menu
a. Move the joystick up and down to browse the menu options
b. Move left and right to adjust the value
c. The top button of the joystick sends the "ENTER" command

2. Manually move
● Horizontal, vertical and zoom can be executed simultaneously
● The joystick can be used to move horizontally and vertically in any direction
● The joystick can be rotated to zoom in/out
● The joystick can quickly return the gimbal and lens to the initial position through the top button
● When not in the menu, the PTZ Speed knob can control the camera's horizontal/vertical/zoom speed
● Zoom W/T button and rotary joystick can adjust zoom zoom in/out

3. Set/call/delete presets

● Set the preset position

a. Move the camera to the desired position

b. Press the "SET" button first, and then press the number button "1" to set the No. 1 preset position

c. The keyboard screen's operation record area displays, "Set Preset 1";
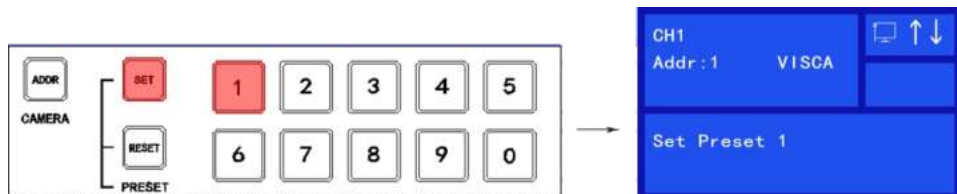
● Call presets

a. Make sure that the three buttons "ADDR/CAMERA", "SET", and "RESET" are all off

b. Press the number "1" button to call the preset position

c. The keyboard screen's operation record area displays, "Call Preset 1";
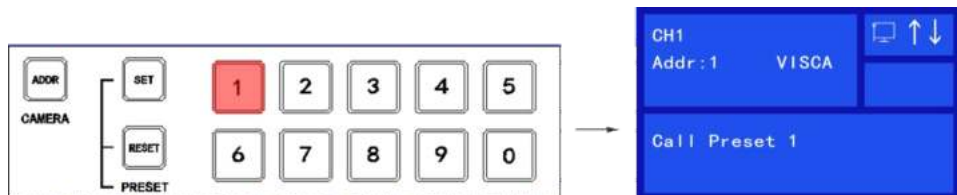
● Delete preset

a. Press the "RESET" button, then press the number "1" button to delete the No.1 preset position

b. The keyboard screen's operation record area displays, "Delete Preset 1"
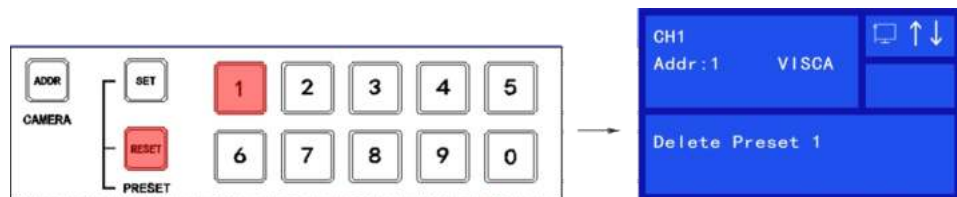
4. Adjust image parameters

Use the image adjustment panel to set or adjust image parameters (only applicable to VISCA and VISCA_IP protocols, PELCO /ONVIF/NDI protocol image adjustment functions are not complete)

Exposure
● Turn the BRIGHT knob to switch to brightness priority and manually adjust the brightness value
● Turn the IRIS knob to switch to aperture priority and manually adjust the aperture value
● Switch to automatic exposure by using the "Auto Exposure" button

White balance
● Turn the RGAIN/BGAIN knob to switch to manual white balance, and manually adjust the red/blue gain value
● Switch between auto/ATW...white balance mode by using the WB MOOD button
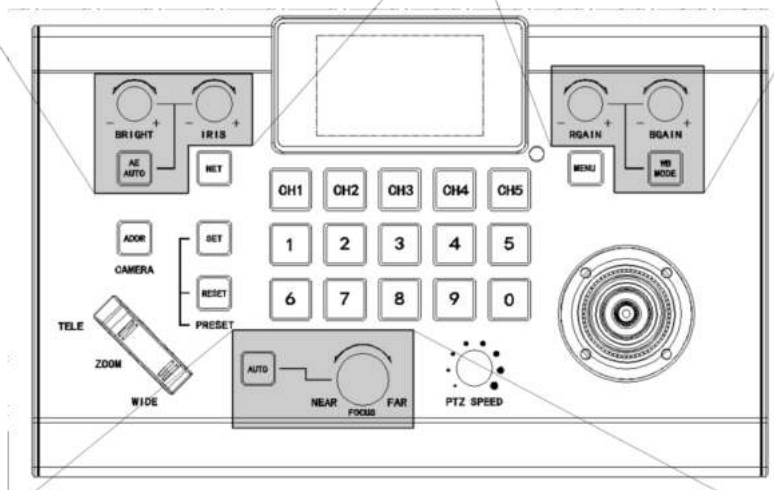
Focus
● Manual adjustment (near/far) by rotating the FOCUS knob
● Automatic adjustment by using the AUTO button