adertech

CMP-CTRL2

Smart PTZ Control Keyboard



User Manual

Safety Operating Guide



Before using this equipment, you must carefully read and understand the following safety warnings and operating instructions. The information contained in this document is critical to prevent personal injury or equipment damage.

To fully master all equipment functions and ensure proper operation, please thoroughly read the accompanying User Manual. It is recommended to retain this manual properly for future reference.

Safety Warnings and Precautions

To ensure equipment safety and normal operation, strictly adhere to the following regulations:

1 Equipment Placement

Do not place the unit on unstable carts, stands, or tables to prevent falling and damage.

2 Power Usage

Operate only at the rated power voltage specified on the equipment.

Do not place heavy or sharp objects on the power cord to avoid damage. Damaged power cords may cause fire or electric shock.

Regularly inspect the power cord for excessive wear or damage and promptly eliminate electrical hazards.

The equipment must be properly grounded to prevent electric shock.

3 Operating Environment

Do not operate the equipment in flammable, explosive, or other hazardous environments to avoid serious consequences such as fire or explosion.

Do not use the unit near water sources or in humid locations.

4 Daily Maintenance

Do not allow liquids, metal debris, or other foreign objects to enter the equipment interior.

During transportation, provide adequate protection against severe impact. Using original packaging or equivalent grade packaging materials is recommended.

5 Equipment Servicing

Do not disassemble the casing, panels, or any internal components while the equipment is powered on.

Before performing any maintenance, you must power off the unit and unplug the power cord.

Internal repairs and adjustments must be conducted by qualified professional personnel.

6 Malfunction Handling

If abnormalities or malfunctions occur, immediately power off the equipment and disconnect all cables before proceeding with further actions.

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1. Introduction

1.1 Overview

This product is a high-performance professional control keyboard, specifically designed for the precise, centralized management of large-scale PTZ camera systems. It supports multiple control interfaces including RS-422, RS-485, RS-232, and IP networks, capable of simultaneously connecting and managing up to 254 cameras. It enables comprehensive and precise control over core parameters such as pan/tilt, zoom, focus, white balance, and exposure, making it widely applicable in critical fields like educational recording, video conferencing, telemedicine, and smart city initiatives.

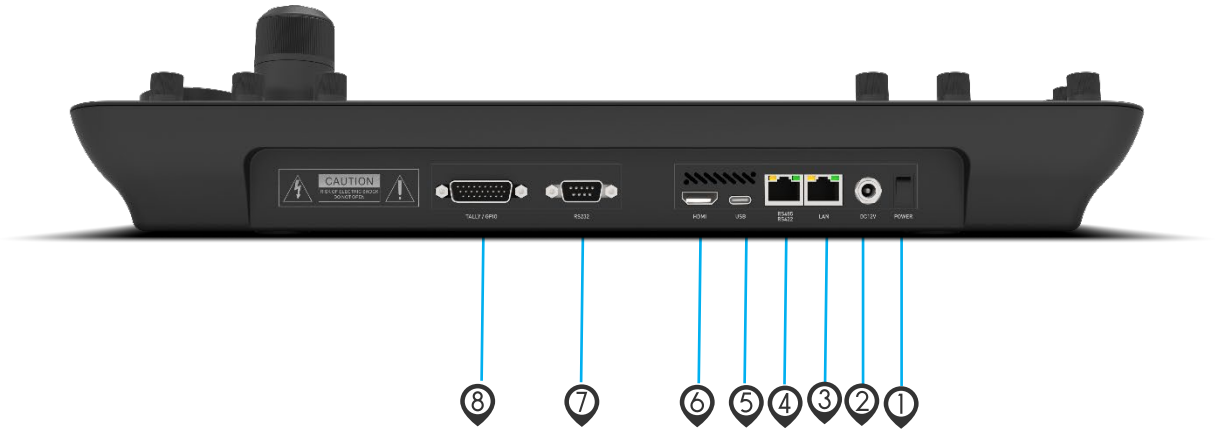


1.2 Key Features

- Integrated Video Monitoring: Equipped with a 7-inch touchscreen, it supports real-time camera viewing via ONVIF and NDI® protocols, integrating control and monitoring into one process.
- Multi-Protocol & Multi-Interface Support: Provides IP and various serial control interfaces, fully compatible with industry-standard control protocols such as NDI®, VISCA, VISCA-over-IP, Pelco P&D, and ONVIF.
- Large-Scale System Integration: A single keyboard can control up to 254 IP cameras and supports setting 255 preset positions for each camera, meeting the rapid recall needs of complex scenarios.
- Precision Control Performance: Enables rapid, fine adjustments to focus, exposure parameters, and pan/tilt/zoom speed, ensuring smooth and precise imagery.
- Professional Production Support: Features a Tally GPIO interface for camera switching status indication and synchronization, meeting the workflow demands of live production and broadcasting.

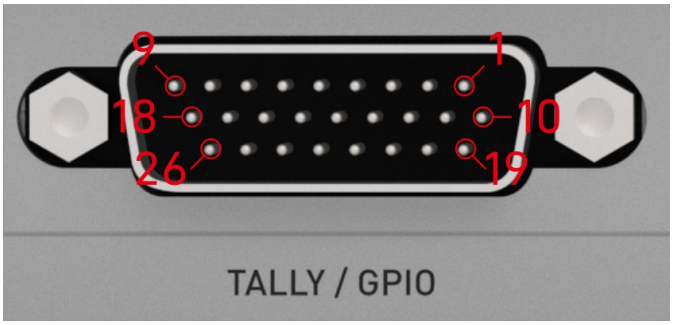
2. Interface Layout

2.1 Interfaces

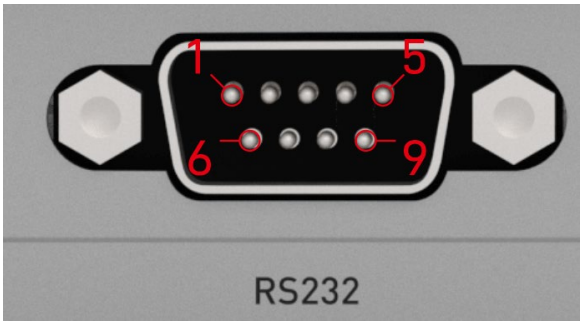


1. Power Switch
2. DC 12V Power Input
3. LAN Port (RJ45, 10/100/1000 BaseT Ethernet)
4. RS-422/485 Port (RJ45, supports PELCO-D, PELCO-P, VISCA protocols)
5. USB-C 3.1 Type-C Port
6. HDMI 2.0 Output Port
7. RS232 Port (DB9 Male, supports PELCO-D, PELCO-P, VISCA protocols)
8. Tally Port (DB26 Male)

2.2 Interface Definitions

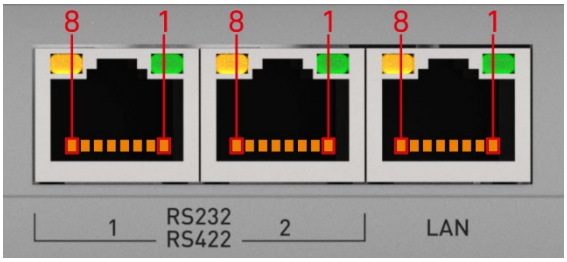


TALLY



RS-232

TALLY	Definition	TALLY	Definition	TALLY	Definition	RS-232	Definition
1	PGM IN/OUT1	10	PGM	19	PVW IN9	1	DCD
2	PGM IN/OUT2	11	PVW IN1	20	PVW IN10	2	RXD
3	PGM IN/OUT3	12	PVW IN2	21	GND	3	TXD
4	PGM IN/OUT4	13	PVW IN3	22	GND	4	DTR
5	PGM IN/OUT5	14	PVW IN4	23	GND	5	GND
6	PGM IN/OUT6	15	PVW IN5	24	n/c	6	DSR
7	PGM IN/OUT7	16	PVW IN6	25	n/c	7	RTS
8	PGM IN/OUT8	17	PVW IN7	26	n/c	8	CTS
9	PGM IN/OUT9	18	PVW IN8			9	RI



RS-422/485 LAN

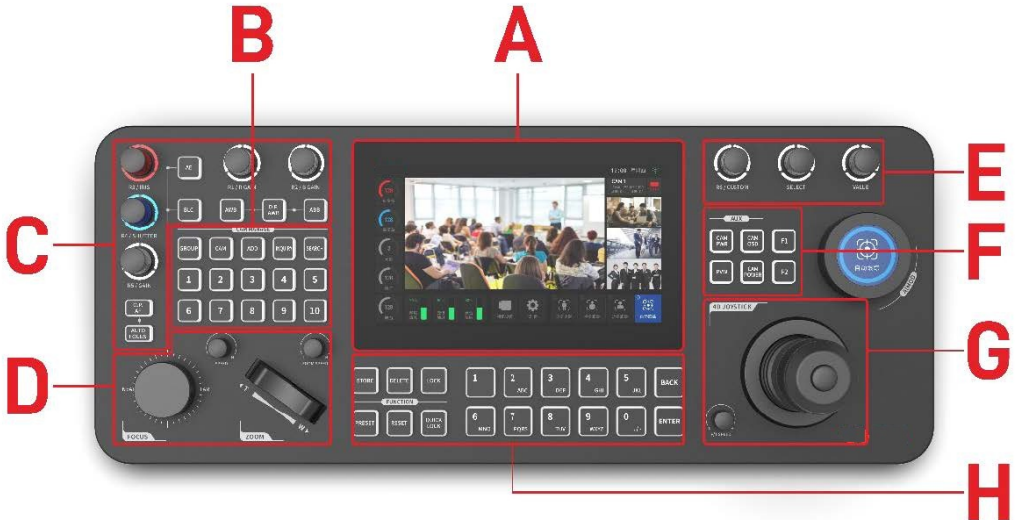
RS-422/485	Definition	LAN	Definition	Color
1	TX+ (RS-485)	1	TX_D1+	Orange/White
2	TX- (RS-485)	2	TX_D1-	Orange
3	RX+	3	RX_D2+	Green/White
4	n/c	4	BI_D3+	Blue
5	n/c	5	BI_D3-	Blue/White
6	RX-	6	RX_D2-	Green
7	n/c	7	BI_D4+	Brown/White
8	n/c	8	BI_D4-	Brown

2.3 Specifications

Specifications		Standard Version
Connection	Interfaces	LAN (RJ45), RS-232 (DB9), RS-485/422 (RJ45), TALLY (DB26), USB 3.0 (Type-C)
	IP Control Protocols	ONVIF，VISCA- IP，NDI|HX3
	Serial Control Protocols	PELCO-D, PELCO-P, VISCA
	Serial Baud Rate	2400, 4800, 9600, 19200, 38400 bps
	Ethernet Standard	1000M ×1 (PoE/PoE+)
Control Interface	Display	7-inch Touchscreen, Resolution: 1024×600
	Knobs	Quick control of camera iris, shutter speed, gain, exposure, white balance, etc.
	Joystick	Pan / Tilt / Zoom / Confirm
	Camera Groups	16 Groups (Supports 4 cameras per group)
	Maximum Connected Cameras	Up to 254
	Preset Positions	Up to 255 per camera
Power	Power Input	Standard 5.5/2.1 Power Interface, DC 12V 2A±10%
	Power Consumption	← 15W
Environment	Operating Environment	-10°C ~ 50°C / 14°F ~ 122°F
	Storage Environment	-40°C ~ 60°C / -40°F ~ 140°F
Physical	Dimensions (L×W×D)	340 × 195 × 49.5 mm
	Weight	1730g (Without packaging)

3. Control Panel

3.1 Front Panel

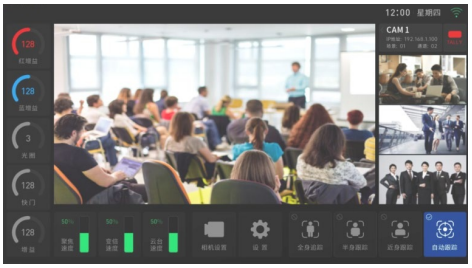


A	7-inch Touch Display
B	Camera Management: Group selection, Camera selection, Manual/Search addition
C	Exposure/White Balance Control: Mode switching, Parameter adjustment
D	Quick Camera Focus & Zoom: Zoom/Focus speed knob, Focus knob, Rocker switch (for camera focus control)
E	Menu Control Knob: For navigating function menu pages
F	Camera Special Functions & User-defined Keys: For toggling camera On/Off, Standby, OSD Menu
G	PTZ Joystick: For controlling camera movement actions
H	Camera Preset & Trajectory Settings: Store/Delete/Recall camera preset positions and trajectories Multi-function Digital Keypad: For inputting numbers, letters, characters, etc.

3.2 Keyboard Key Descriptions

Touch Display

Touch the screen to adjust control keyboard menu options.



Exposure/White Balance Control

- AWB (Auto White Balance) Button: Engages the camera's automatic white balance. Press to have the camera analyze the current scene's light color (color temperature) and instantly adjust color settings, ensuring white objects appear pure white under any lighting condition, thereby correcting color cast across the entire image. Lights up steady blue when active.
- AWB (One Push AWB) Button: Engages one-push white balance. Press to have the camera use the object you are currently pointing at as the "white" reference, instantly measuring and setting the white balance.
- ABB (Auto Black Balance) Button: Engages the camera's automatic black balance. The camera celebrates its "black" reference point, ensuring true black in the image is rendered as pure black without any color noise. Lights up steady blue when active.
- R1/RED Knob: Turn the knob to manually and precisely adjust the intensity (gain) of red in the image. The current red gain is displayed on the left side of the screen.
- R2/BLUE Knob: Turn the knob to manually and precisely adjust the intensity (gain) of blue in the image. The current blue gain value is displayed on the left side of the screen.
- AE (Auto Exposure) Button: Engages the camera's automatic exposure. The camera analyzes the current scene's brightness and instantly calculates and sets the appropriate iris, gain, and shutter speed to achieve a clear, well-exposed image. Lights up steady green when active.
- BLC (Back Light Compensation) Button: Controls the camera's backlight compensation on/off. When enabled, it increases the brightness of the subject (typically in the center of the image) to make it clearly visible, preventing the



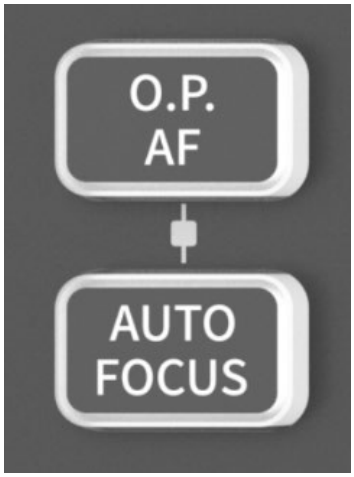
subject from becoming a silhouette against a bright background. Lights up steady blue when active.

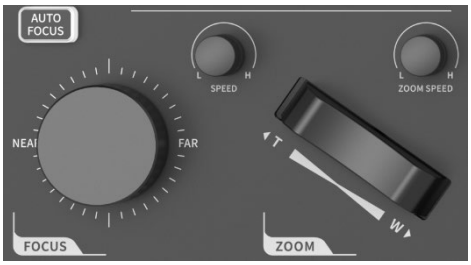
- R3/IRIS Knob: Turn the knob to manually control the lens aperture size, precisely adjusting the amount of light entering the camera sensor to control image brightness and depth of field. The current value is displayed on the left side of the screen.
- R4/SHUTTER Knob: Turn the knob to manually adjust the electronic shutter speed, controlling the duration of a single exposure for the sensor, thereby affecting the clarity of moving objects and overall image brightness. The current shutter speed is displayed on the left side of the screen.
- R5/GAIN Knob: Turn the knob to adjust the manual amplification/reduction of the camera image sensor's electronic signal, modifying the overall brightness of the image. The current value is displayed on the left side of the screen.



Quick Camera Focus & Zoom Adjustment:

- O.P. AF (One Push Auto Focus) Button: One-push auto focus. A single press triggers the camera to automatically and quickly complete the focusing process for the entire scene, obtaining a clear image instantly.
- AUTO FOCUS Button: Camera auto focus. Press to put the camera into "Auto Focus Mode," where it will continuously track focus changes to ensure the subject remains sharp.
- Zoom Rocker Switch: Press left to zoom in (magnify the image, bringing distant objects closer); press right to zoom out (widen the field of view). Alternatively, zoom can also be controlled by rotating the center reset shuttle on the joystick.
- FOCUS Knob: Turn the knob to manually and precisely adjust the camera focus.
- ZOOM Speed Knob: Controls the camera zoom speed. Rotate clockwise to increase the zoom speed for fast push-in or pull-out effects; rotate counterclockwise to decrease the speed for smooth focal length changes. The current speed value is displayed in the lower left corner of the screen.
- FOCUS Speed Knob: Controls the camera focus speed. Rotate clockwise to increase the movement speed when





adjusting focus manually; rotate counterclockwise to decrease the speed for smooth focus changes. The current speed value is displayed in the lower left corner of the screen.	
Camera Selection: ■ GROUP Button: Press to enter camera group selection mode. The button indicator will light steady green. In this mode, press number keys (1-10) to quickly select the corresponding preset camera group. ■ CAM Button: Press to enter individual camera selection mode. The button indicator will light steady green. In this mode, press number keys (1-10) to directly select the corresponding individual camera. ■ ADD Button: Press to enter the "ADD" menu to add cameras to the camera list. ■ INQUIRY Button: Press to enter the "INQUIRY" menu to view information about the current camera in the camera list. ■ SEARCH Button: Press to enter the "SEARCH" menu to search for and add cameras in the camera list. ■ Camera Number Keypad: Used to select camera groups or individual cameras, in conjunction with the GROUP and CAM buttons.	
Menu Knobs ■ R6/CUSTOM Knob: Custom function knob. ■ SELECT Knob: Rotate the SELECT knob to choose menu options; press the knob to confirm the selection or enter the next-level menu interface. ■ VALUE Knob: Rotate the VALUE knob to adjust menu numerical values; press the knob to return to the previous menu level.	

Camera Function & User-Defined Keys

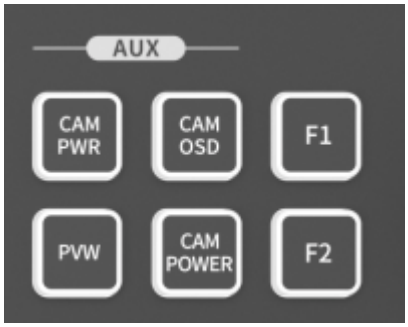
1. CAM PWR: This button controls the power standby status of the currently selected camera. A steady blue indicator light indicates the target camera is powered on; when the light is off, the camera is in standby mode.

(Note: This function is not available under Pelco-D/P protocols.)

2. CAM OSD: This button turns the camera's built-in menu on/off.
3. PVW: Under ONVIF and NDI protocols, press this button to preview the live video feed of the current camera.
4. CAM POWER: This button controls the power status of the currently selected camera. A steady blue indicator light indicates the target camera is powered on; when the light is off, the camera is shut down.

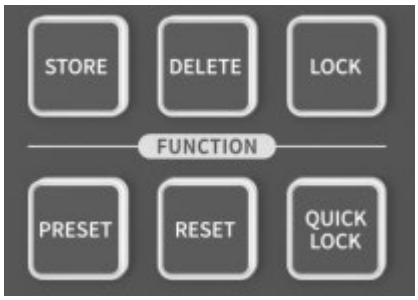
(Note: This function is not available under Pelco-D/P protocols.)

5. F1~F2 Shortcut Keys: Functions can be customized according to user requirements. Specific functions can be configured in the [Customize] settings.



Camera Preset Configuration

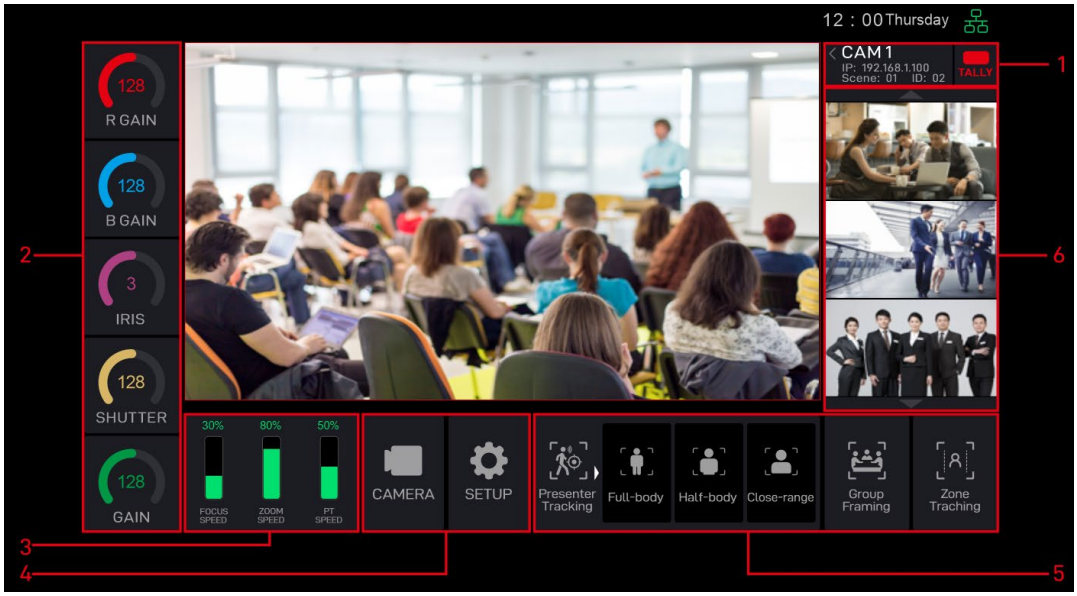
1. STORE: Press to quickly enter the STORE page for rapidly accessing and configuring preset lists with real-time preview, allowing custom parameter settings for presets.
2. DELETE: Deletes specified camera movement trajectories. Input the target trajectory number on the digital keypad, then press "DELETE" to remove the corresponding preset path.
3. LOCK: Enables full keyboard lock. When activated (indicated by steady illumination), all operational keys are disabled to prevent accidental operations.
4. PRESET: Sets camera preset positions. Pre-input a number on the digital keypad, then press PRESET to store the camera's current position under that number.
5. RESET: Sets and recalls camera presets. Input the target preset number on the keypad, then press "PRESET" to save the current pan/tilt position, lens zoom, and other parameters to that number for one-touch restoration.
6. QUICK CALL: Toggles quick preset recall mode. When active (blue indicator steady on), directly input numbers 1-9 to immediately recall corresponding presets without secondary confirmation.



When disabled, this key and the "ENTER" key serve as confirmation buttons for preset recall, suitable for error-prevention scenarios. (Note: Functions for PRESET/RESET keys remain protocol-dependent and unavailable under Pelco-D/P protocols)	
Multifunctional Digital Keypad 1. Number Keys: This keypad serves as the core input component, supporting flexible entry of numbers and letters. It is widely used for system operations such as keyboard IP configuration, camera IP setup, and the setting, recalling, and clearing of camera presets. Input Logic: 2. Number Input: Press a key once to input the corresponding number. 3. Letter Input: Press a key consecutively (e.g., double or triple press) to cycle through and select the corresponding alphabetic character assigned to that key. 4. PTZ Joystick and PT Speed Knob: PT Speed Knob: Controls the pan and tilt speed of the camera.	
PTZ Joystick Used for controlling camera movement: Move the joystick up/down to adjust the camera's tilt angle. Move the joystick left/right to control the camera's pan. Rotate the joystick left/right to control the camera's zoom. The button on top of the joystick locks it, preventing accidental pan/tilt control. Used for adjusting camera menus: (when the camera's built-in menu is active) Move the joystick up/down to select menu options. Move the joystick left/right to navigate menu levels: right to enter a submenu, left to return to the previous menu.	

4. Menu Settings

4.1 Control Keyboard Screen Description



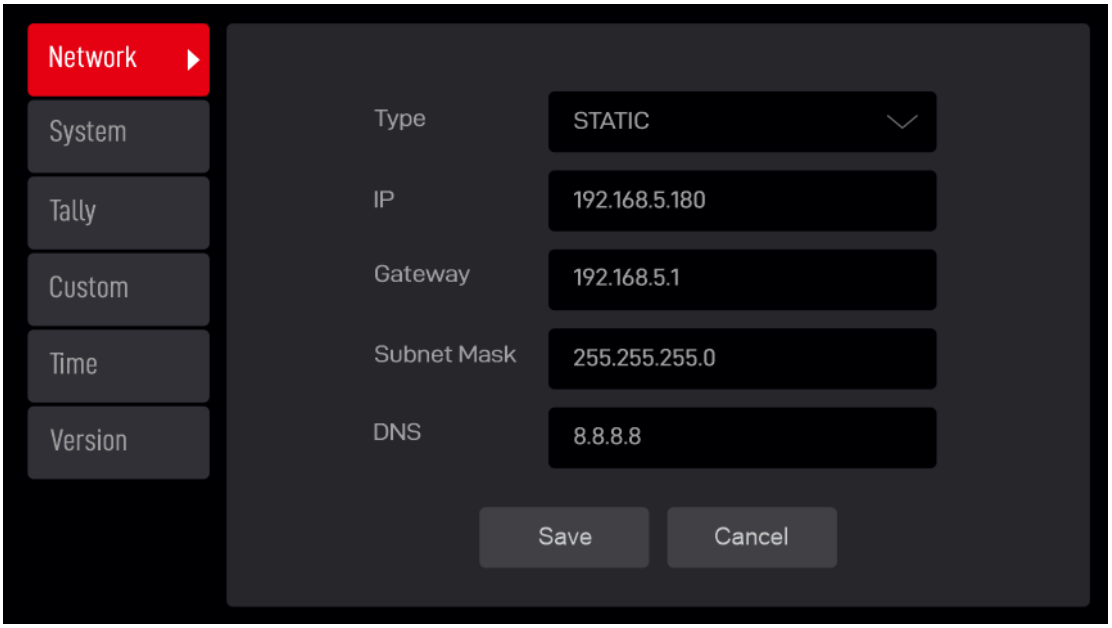
1. Camera Connection Status Area
   Centrally displays core information of the currently connected camera, including device name, IP address, communication channel, scene identifier, and TALLY status. The TALLY indicator logic is: lights green for PGM signal input, and red for PVW signal input.
2. Camera Parameter Status Area
   Monitors and dynamically displays key camera imaging parameters in real-time, including Red/Blue gain, iris value, shutter speed, and master gain status.
3. Camera Movement Speed Area
   Displays the current set values for the camera's pan/tilt speed, lens zoom speed, and focus speed in real-time.
4. System Function Navigation Bar
   Provides quick access points to switch to the Camera List View and the System Settings interface.
5. AI Smart Function Keys
   Centrally displays the status of the AI recognition mode and provides one-touch switching functionality to quickly enable or manage AI tracking mode.
6. In-Group Camera Preview Area
   Dynamically displays real-time preview thumbnails of other cameras within the same group. Supports quickly switching the current main (on-air) camera by long pressing and dragging a preview thumbnail.

4.2 System Settings

4.2.1 Network Configuration

The control keyboard relies on IP addresses to identify and manage cameras. When using an Ethernet port to connect cameras to the control keyboard, the control keyboard's IP address, subnet mask, and gateway parameters must be correctly configured in advance, ensuring the cameras and control keyboard are within the same local network segment.

If using serial interfaces such as RS-422, RS-232, or RS-485 to directly connect cameras to the control keyboard, network configuration is not required. In this case, proceed directly to the [Camera – Manually Add] interface to complete the relevant camera configuration.



1. DHCP Function

When the DHCP function is enabled, the control keyboard can automatically obtain network parameters such as the IP address, subnet mask, and gateway from a DHCP server (typically integrated in a router) on the local network.

2. IP Address Configuration

DHCP Enabled: Connect the control keyboard to a router with DHCP support, and the device will automatically obtain a valid IP address configuration.

DHCP Disabled: In environments without a router, the control keyboard can be directly connected to the camera via an Ethernet cable. In this case, manually set the control keyboard's IP address to ensure it is on the same subnet as the camera. The specific rule is that the first three segments of the IP addresses must be identical, with only the last segment differing (e.g., if the camera's IP is 192.168.1.163, the control keyboard's IP should be set to 192.168.1.xxx). Additionally, the subnet mask

must align with the network plan.

3. Subnet Mask

Used to define the address range of the device's network, with a default value of 255.255.255.0.

4. Gateway

Specifies the exit address for the device to communicate with external networks. Its subnet must match the local IP address, with a default setting of 192.168.1.1

Operation Instructions:

- Press the Cancel key to discard unsaved changes and refresh the current page.

- Press the Save key to store all current network configurations and apply them.

4.2.2 TALLY Settings

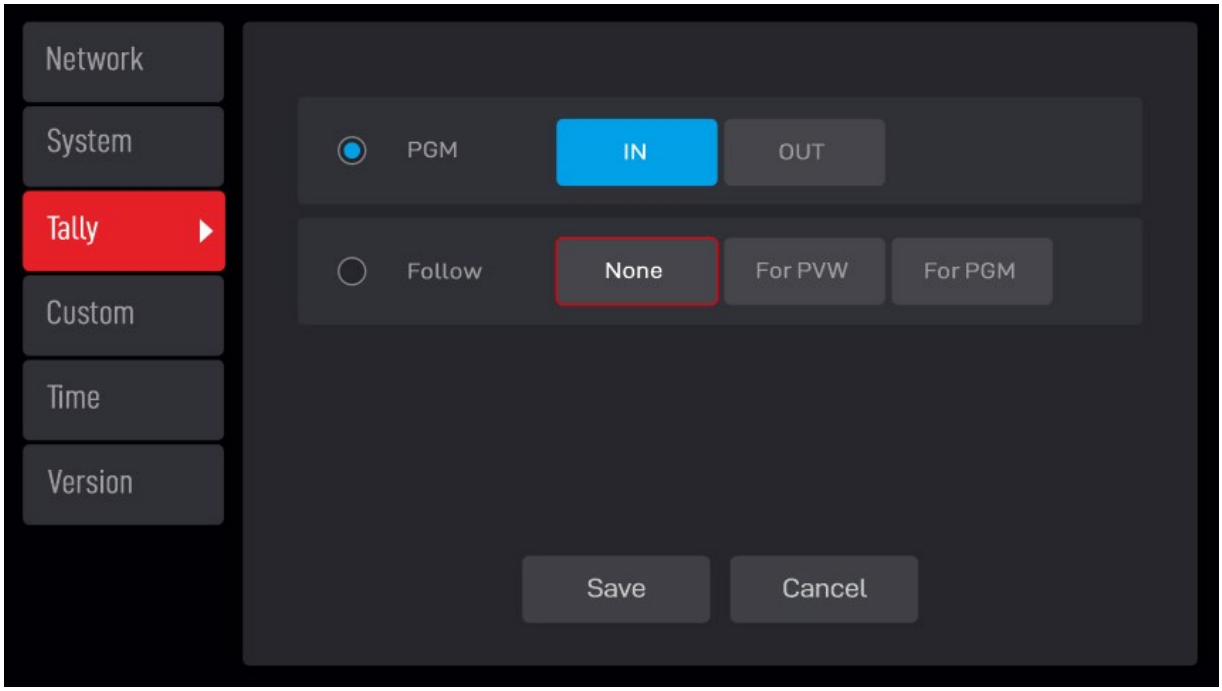
This device supports TALLY signal interaction with video switchers, capable of receiving PGM (Program) and PVW (Preview) signals from the switcher, while also outputting PGM signals to the controlled PTZ cameras.

Signal Type Description

- PGM Signal: The "Program" signal, representing the final broadcast output video from the video switcher.
- PVW Signal: The "Preview" signal, referring to the standby video feed in the video switcher for director preview before being taken on-air.

PGM Signal Configuration

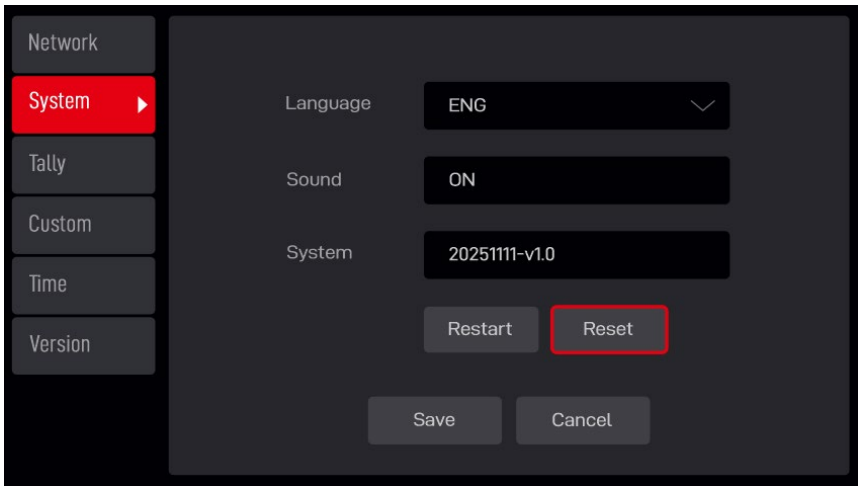
- PGM Input: Receives PGM TALLY signals from the video switcher, used to trigger the TALLY status indicators on this device and the controlled cameras.
- PGM Output: Outputs PGM TALLY signals to the currently controlled PTZ camera, enabling synchronized multi-device indication of the broadcast status.



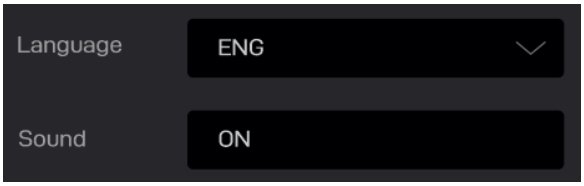
	Name	Color	Status	Description
Control Keyboard TALLY Indicator	PGM Signal Input (Program signal from switcher)	Red	Steady On	When the device detects a PGM (Program) signal from the video switcher, the TALLY indicator area on the touchscreen interface will illuminate steady red, indicating the camera is in the **program broadcast** state.
			Off	No signal.
	PVW Signal Input (Preview signal from switcher)	Green	Steady On	When the device detects a PVW (Preview) signal from the video switcher, the TALLY indicator area on the touchscreen interface will illuminate steady green, indicating the camera is in the **preview** state.
			Off	No signal.

4.2.3 Restore Factory Settings

This will reset all user configuration parameters of the PTZ camera control keyboard, restoring it completely to its original factory state.



4.2.4 System Settings



Used to configure and manage various system parameters of the control keyboard.

- Key Tone: Enable or disable audible feedback for key operations, with options for "On" and "Off".
- Key Light: Control the keyboard backlight illumination system. When set to "Off", the white indicator lights on all keys will turn off.

4.2.5 System Version



This interface displays the current system version information of the control keyboard, including the software version number and hardware version identifier, facilitating system status verification and technical maintenance.

4.3 Camera Management

Supports a maximum connection limit of 254 cameras and adopts a hierarchical grouping management model: each camera group can contain up to 4 cameras.

The system provides the following two methods for camera pairing:

- Auto-Scan for IP Cameras: Automatically scans and identifies online IP camera devices in the network
- Manually Add Cameras: Manually configure and add cameras by specifying parameters.

Additionally, the system supports querying detailed information of already added cameras.

Network Preparation Before Adding IP Cameras:

Before adding an IP camera, ensure the IP camera is connected to the control keyboard via an Ethernet cable. Configure the control keyboard's IP address according to the network plan, ensuring it is on the

same subnet as the camera's IP address (i.e., the first three segments of their IP addresses are identical, with only the last segment differing).

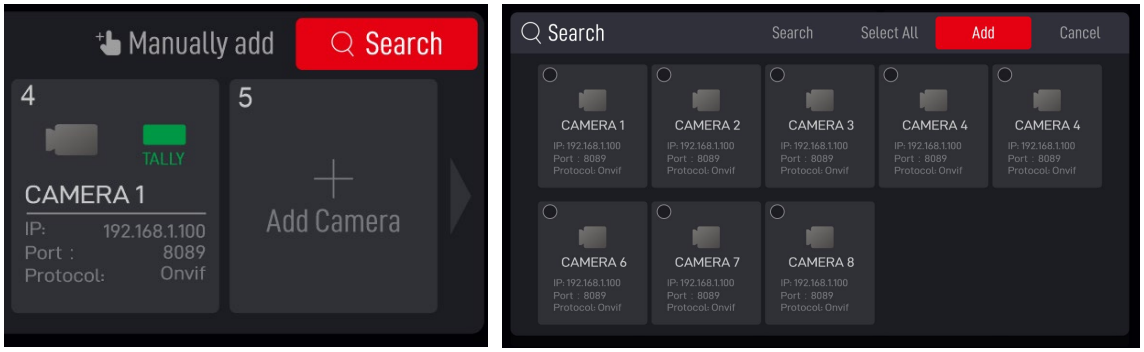
4.3.1 Auto-Scan for IP Cameras

This device supports automatic identification of compatible cameras within the network based on SONY VISCA, ONVIF, and NDI protocols. The specific operational procedure is as follows:

1. Press the SEARCH key on the CAM LIST panel (accessed via the CAMERA button) to enter the camera search interface.
2. Press the Search key to enter the protocol list. After selecting the NDI, VISCA, or ONVIF protocol, the system will automatically scan and list the IP addresses of all identifiable cameras.
3. Select the target camera's IP address to enter the configuration interface. Confirm the camera account password and assign a camera group number for it.
4. Press the Save key to complete the configuration.

Upon successful saving, the operation prompt area will display a status message such as "Save Complete" or "Connection Successful". Users can repeat the above process to add multiple IP cameras sequentially.

If the interface displays "No Cameras Found" after selecting a protocol, it indicates no available devices using the corresponding protocol were detected in the current network environment. In this case, please verify that the physical connection and network configuration between the camera and the control keyboard meet the requirements mentioned previously, or proceed to the [Manual Addition] interface to configure the camera parameters directly.

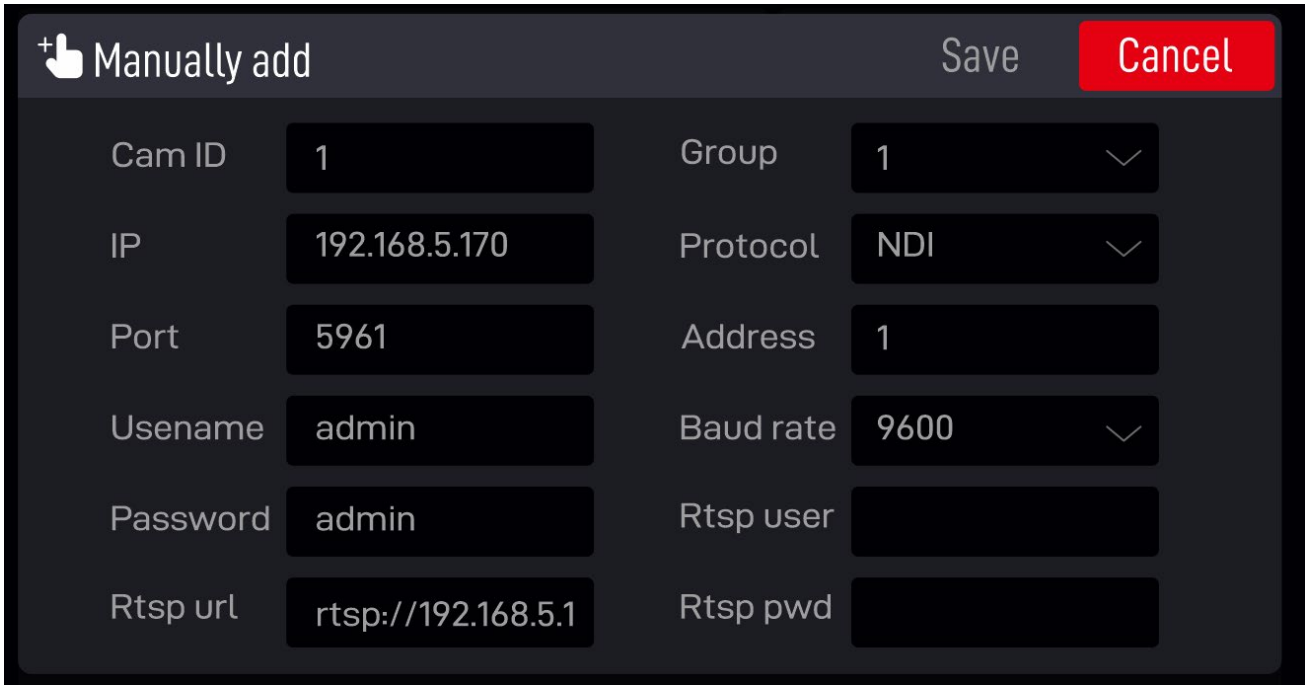


Notes

- The auto-scan function only supports Ethernet connection mode. If connecting devices via RS-232/422/485 serial interfaces, please use the [Manual Addition] interface to complete camera configuration.
- The current auto-scan feature is only compatible with cameras supporting the SONY VISCA over IP protocol. If a device is not recognized, verify whether its communication port 52381 is enabled. If it remains undetected, manually configure the camera parameters using the [Manual Addition] function.

4.3.2 Manual Addition Interface Configurable Settings

On the camera list page, press the **"Manually Add"** key to enter the manual camera addition interface. Sequentially select the device control protocol, and input the IP address, port number, username, and password. The parameter configuration interface will adjust dynamically based on the selected protocol. After completing the settings, press the **"Confirm"** key to save the configuration.



The following parameters can be modified on the manual addition interface:

General Options	Group	Assigns a camera group number (Range: 1-10).
	Camera	Sets the device number within the group (Range: 1-10). After saving, press the **CAM** key to enter camera selection mode, then press the corresponding number key to quickly select the camera within the assigned group.
	Protocol	Select control protocol: • Network: ONVIF, VISCA(UDP), VISCA(TCP), SONY VISCA, NDI • Serial: VISCA, PELCO-D, PELCO-P
	IP	Manually enter the camera's IP address.
	Port	VISCA UDP port number (Default: 1259, usually requires no adjustment).

Protocol-Specific Parameters ONVIF Protocol Options	Address	Camera video stream URL.
	User	Authentication username (Default: admin).
	Password	Authentication password (Default: admin).
VISCA/Pelco-D/P Protocol Options	Physical Address	Camera control address (Must match camera settings, Default: 1).
	Serial Port	Control interface options: RS422/485, RS232.
	Baud Rate	Set communication baud rate (Must match camera, Default: 9600).

4.3.3 Camera Query

All successfully added PTZ camera information is stored in the system's built-in camera list. Users can access the **[Camera List]** interface, select the camera group and device number to view detailed configuration and status information for a specific camera.
Within this interface, in addition to querying, users can also directly edit the selected camera to modify its connection parameters or perform management operations such as deletion.



4.3.4 How to Add Multiple PTZ Cameras

To add multiple devices, repeat the camera addition process sequentially. During the process, strictly adhere to the following addressing specifications:

- Network Interface Connection: When multiple cameras are connected via the same network interface, each camera must be configured with a **unique IP address**. Address duplication is prohibited.
- Serial Interface Connection: When multiple cameras are connected via the same serial interface using the same protocol, each camera must be assigned a **unique physical address**. It is recommended to assign addresses consecutively (e.g., 1, 2, 3...) to ensure uniqueness.

4.3.5 How to Select Cameras

After cameras are successfully added, users can quickly select target cameras using shortcut key combinations. In the system, the GROUP and CAM keys are mode toggle keys, used to define the functional state of the number keys. The number keys serve as shortcut selection keys, corresponding to either camera group selection or individual camera selection operations.

Operating Mode Description:

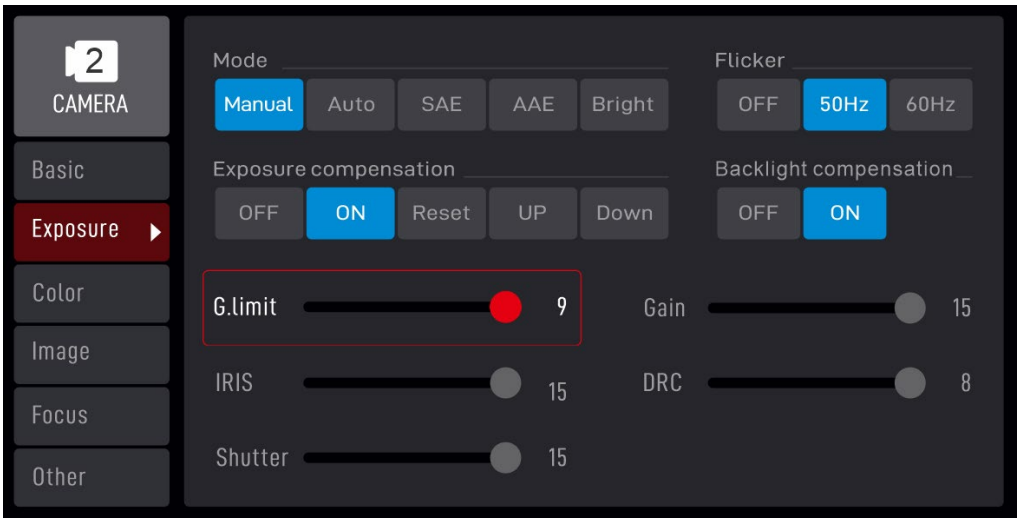
- Group Selection Mode
  When the GROUP key indicator is lit, the system enters camera group selection status. Pressing a number key (1-10) directly selects the corresponding camera group.
- Camera Selection Mode
  When the CAM key indicator is lit, the system enters camera selection status. Pressing a number key (1-10) quickly selects the corresponding camera within the currently active group. Upon successful camera connection, the corresponding number key's blue indicator light will illuminate as a connection status prompt.



4.4 Camera Parameter Configuration

This interface allows for centralized configuration and fine adjustment of various basic imaging parameters for connected cameras, ensuring the video quality meets practical application requirements.

4.4.1 Exposure Settings



After selecting the "EXPOSURE" option, the following camera exposure parameters can be configured:

1) Exposure Mode: Optional modes: Manual, Auto, Shutter Priority, Aperture Priority, Brightness Priority.

2) Exposure Compensation: Operations: Off, On, Reset, Increase, Decrease.

   Activation Condition: Effective only when Exposure Mode is set to "Auto".

3) Backlight Compensation: Select to turn Backlight Compensation On or Off.

   Activation Condition: Effective only when Exposure Mode is set to "Auto".

4) Flicker: Suppresses flicker by adjusting the frame rate. Options: Off, 50Hz, 60Hz.

   Activation Condition: Effective when Exposure Mode is set to Auto/Aperture Priority/Brightness Priority.

5) Gain Limit: Sets the upper limit for camera gain. Adjustable range: 4~9.

   Activation Condition: Effective when Exposure Mode is set to Auto/Aperture Priority/Brightness Priority.

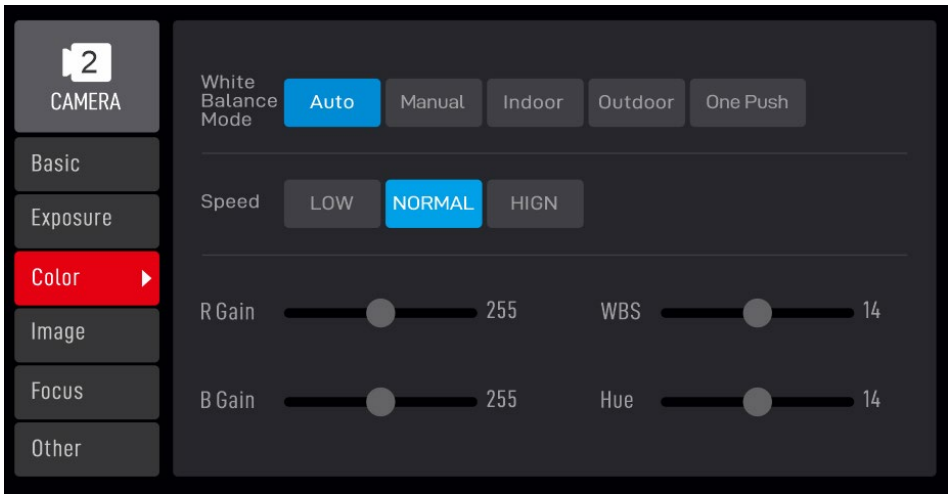
6) Iris: Manually adjusts the aperture size. Adjustable range: 0~15.

7) Shutter: Sets the shutter parameter. Adjustable range: 1~15.

8) Gain: Adjusts the exposure gain intensity. Adjustable range: 0~15.

9) Dynamic Range: Adjusts the image dynamic range. Adjustable range: 0~8.

4.4.2 Color Settings

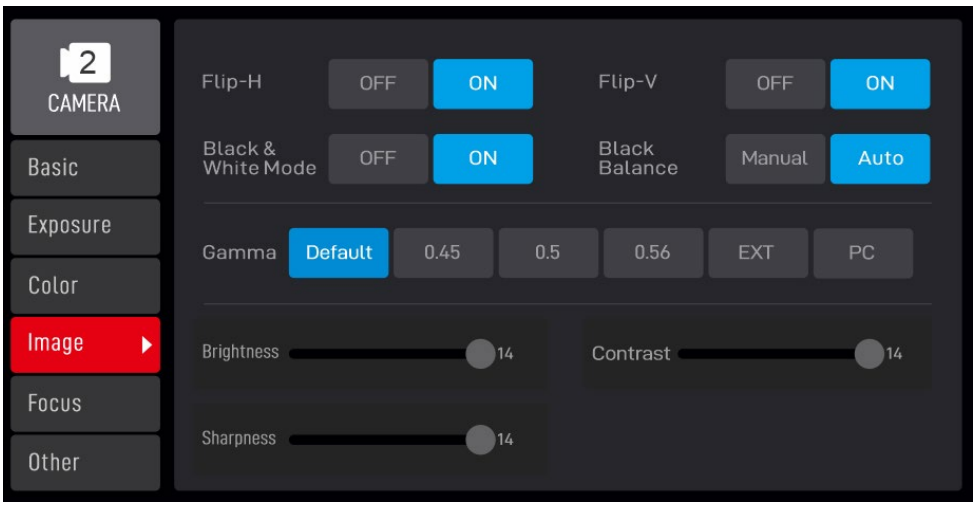


White Balance & Image Parameter Configuration

1. White Balance Mode
   Sets the white balance operating mode. Options: Manual, Auto, Indoor, Outdoor, One Push.
2. Red Gain / Blue Gain
   - Red Gain adjustable range: 0~255
   - Blue Gain adjustable range: 0~255
     Note: Can also be adjusted in real-time using the R1/RED and R2/BLUE knobs on the left side of the control panel.
3. Saturation
   Sets the intensity of image color saturation. Adjustable range: 0~14.
4. White Balance Sensitivity
   Sets the response speed for white balance adjustment. Options: Low, Normal, High.
5. Hue
   Adjusts the image color phase. Adjustable range: 0~14.

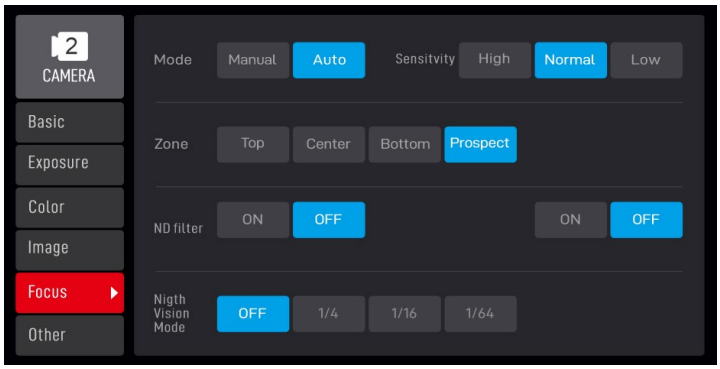
Note: Some parameters are only adjustable when the White Balance Mode is set to "Manual".

4.4.3 Image Settings



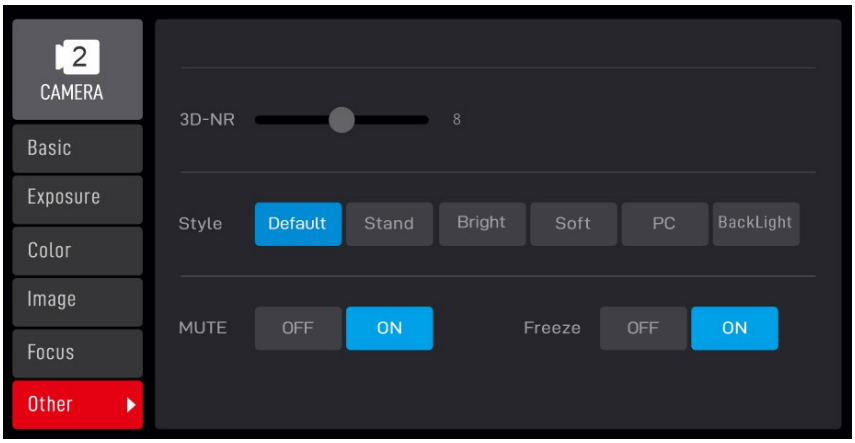
1. Brightness
   Adjusts the overall lightness/darkness of the image. Adjustable range: 0~14 (Higher values result in a brighter image).
2. Contrast
   Adjusts the intensity difference between light and dark areas of the image. Adjustable range: 0~14 (Higher values result in stronger contrast).
3. Image Flip
   - Horizontal Flip: Enable / Disable horizontal image mirroring.
   - Vertical Flip: Enable / Disable vertical image mirroring.
   - Horizontal & Vertical: Simultaneously enable both horizontal and vertical mirroring.
4. Gamma Curve
   Selects the image gamma correction mode. Options:
   Default (Default Mode), 0.45 , 0.5,
   0.56 (ITU-R BT.709 Standard), EXT(Extended Range),PC (Personal Computer Standard Mode),
5. Auto Black Balance
   Sets the black balance calibration mode:
   - Manual: Requires user to manually adjust the black level.
   - Auto: The system automatically performs black balance calibration.

4.4.4 Focus Settings



1. Focus Mode
   Configures the lens focus operation method. Options: Auto Focus, Manual Focus.
2. Focus Area
   Sets the detection zone for auto focus. Options: Upper Zone, Middle Zone, Lower Zone, Full Area.
3. Focus Sensitivity
   Adjusts the response speed and tracking intensity of the auto focus system. Options: Low, Medium, High.

4.4.5 Other Settings



1. 2D Noise Reduction
   Sets the intensity of 2D image noise reduction. Adjustable range: 0~8 (0 = Off, higher values yield stronger noise reduction).
2. 3D Noise Reduction
   Sets the intensity of 3D temporal noise reduction. Adjustable range: 0~8 (0 = Off, higher values yield more significant noise reduction).
3. Mute
   Controls the camera's audio capture function. Options: On / Off.
4. Freeze
   Controls static image output. Options: On / Off (When On, outputs a frozen frame).

4.5 Custom Functions

4.5.1 Shortcut Key Configuration

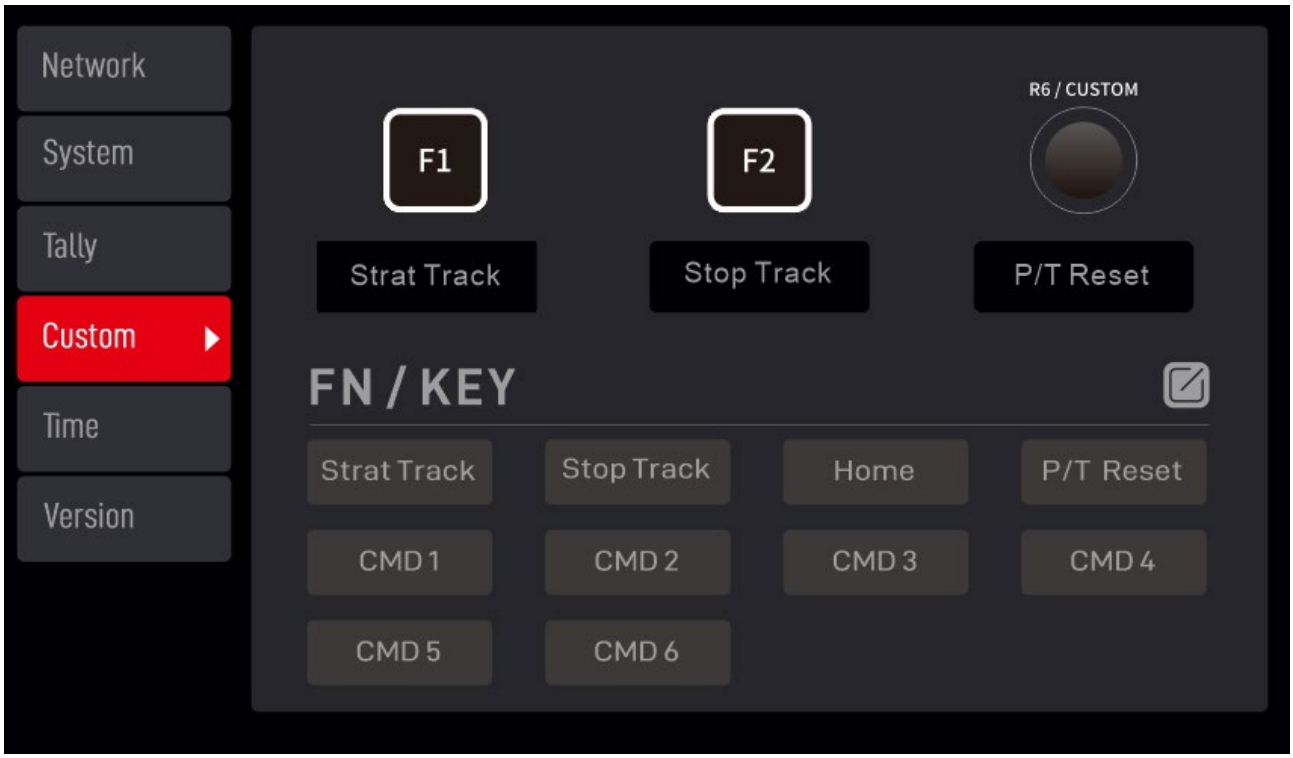
This device features two programmable shortcut keys, **F1** and **F2**, located within the **Fn/Key function area**. These keys support user-assigned custom functions based on operational preferences.

Factory Default Settings:

- **F1:** Start Recording Cruise
- **F2:** Stop Recording

Users can reassign other quick operations to these two function keys via the **[System Settings] → [Shortcut Configuration]** menu to meet rapid operation needs in different scenarios. The optional functions for the shortcut keys are as follows:

1	Start Recording	Starts camera path recording
2	Stop Recording	Stops camera path recording
3	Home Position	Returns camera to initial position
4	P/T Reset	Executes pan/tilt reset
5	CMD1-6	Custom camera function command settings



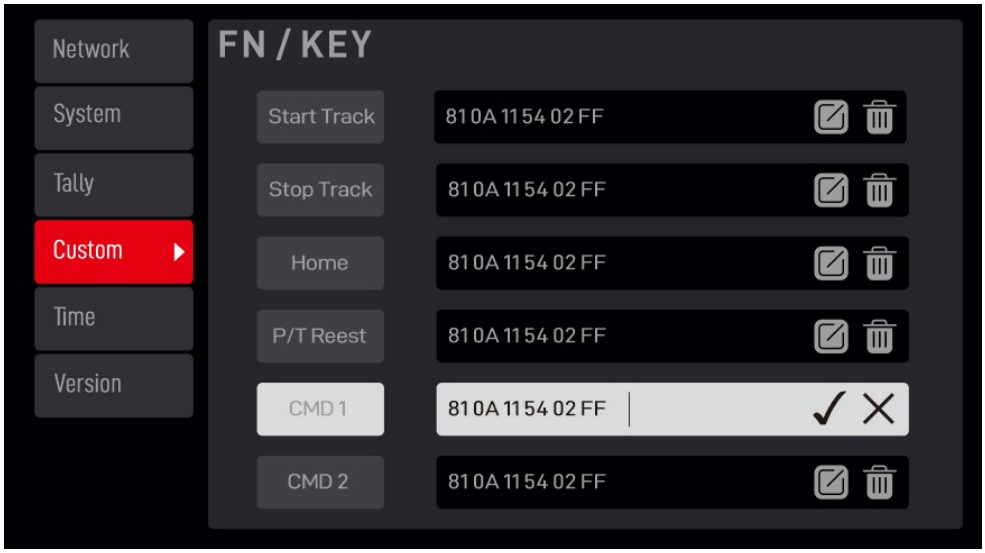
4.5.2 Commands

The F1 and F2 shortcut keys support function expansion through user-defined camera protocol commands. Users can input specific function command codes according to practical application needs to quickly execute camera operations not directly provided on the control panel.

Technical Specifications:

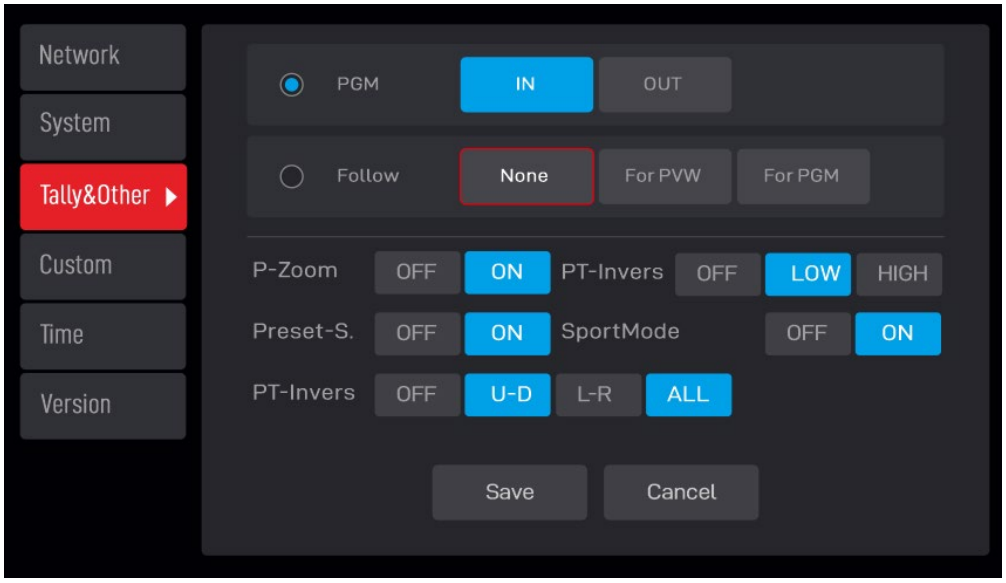
- Command Format: Hexadecimal (HEX)
- Command Length: ⇱12 characters (i.e., 6-byte hexadecimal data)
- Encoding Range: 0 - F

Application Note: This function is suitable for professional scenarios requiring manufacturer-specific protocol commands, enabling full protocol control capability through coded instructions.



4.5.3 Other Settings

- Joystick Zoom Control
  Enables or disables the function of controlling lens zoom by rotating the joystick. When enabled, clockwise or counterclockwise rotation of the joystick zooms the image in or out, respectively.
- Joystick Direction Inversion
  Enables or disables the reversal of pan/tilt control directions. When enabled, the joystick control direction becomes opposite to the actual camera movement (e.g., pushing the joystick up moves the camera down; pushing the joystick left moves the camera right).



5. Operation Guide

5.1 Previewing Camera Feed

The control keyboard supports real-time preview of the current camera group feed on its display after connecting PTZ cameras and assigning them to groups.

Protocol Support Notes:

- When using ONVIF or NDI protocols, the system automatically retrieves the video stream; no additional configuration is needed.
- When using other control protocols (e.g., VISCA OVER IP, Pelco-D/P, etc.), the video stream URL must be manually configured via the RTSP protocol.

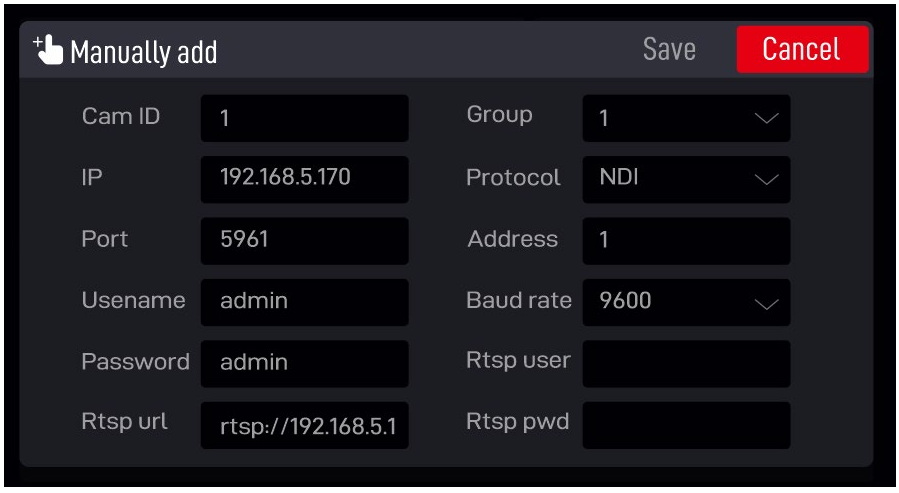
RTSP Stream Configuration Requirements:

- The control keyboard and camera must be directly connected via an Ethernet cable.
- A valid RTSP stream address for the camera must be obtained and entered beforehand.
- The default RTSP address format is:
  rtsp://[Camera IP]:554/live/av0
  (Replace [Camera IP] with the camera's actual IP address)

Configuration Steps (Applicable for non-ONVIF/NDI protocols):

1. Use the ONVIF protocol to search for and add the target camera.
2. Select the camera and press the INQUIRY key to enter the information query and editing interface.
3. Change the control protocol from ONVIF to the target protocol (e.g., VISCA OVER IP or Pelco-D/P).
4. Enter the correct RTSP stream address in the corresponding field.
5. Press the Call key to select the camera and save the settings.

Note: If the video feed fails to preview, check the network connectivity and the validity of the RTSP address.

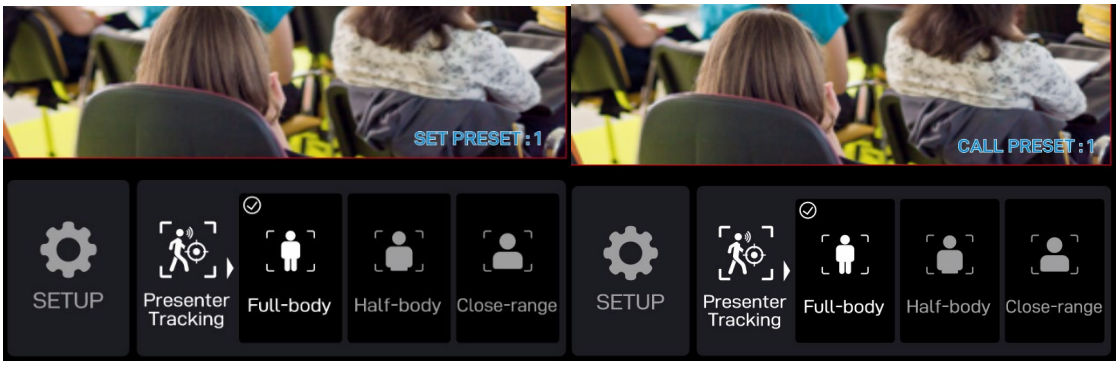


5.2 Camera Preset Configuration

- Set/Create Preset

To save the current camera state as a preset, follow these steps:

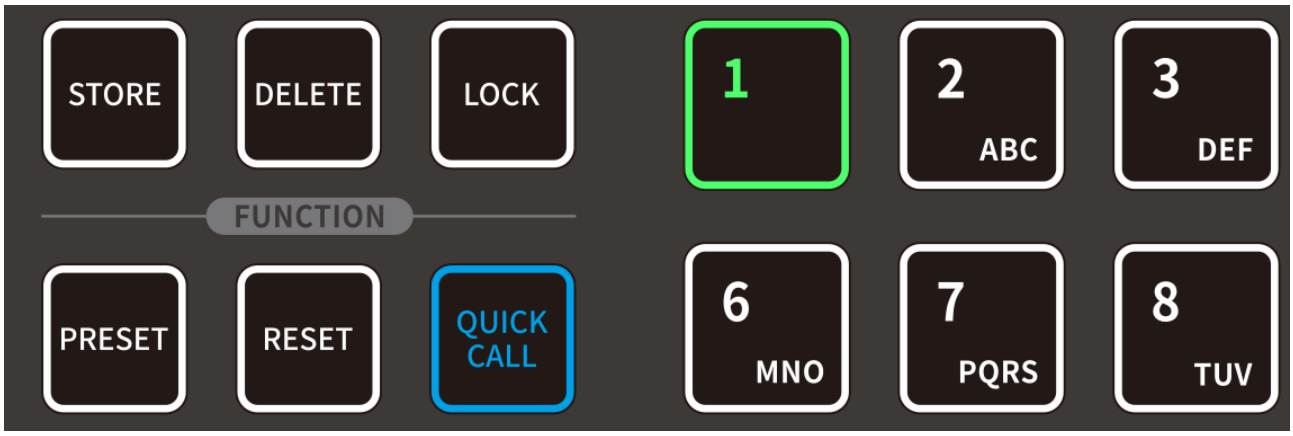
1. Adjust the PTZ camera to the desired position, angle, and zoom.
2. Press the PRESET key to enter preset save mode. The status bar will display the prompt "SET PRESET:".
3. Enter the desired preset number (e.g., number 1) using the numeric keypad.
4. Press ENTER to save the current settings as a preset.



- Call Preset

To recall a previously saved preset, follow these steps:

1. Press the QUICK CALL key to enter preset selection mode. The status bar will display the prompt "GOTO PRESET:".
2. Enter the number of the desired preset (e.g., number 1) using the numeric keypad.
3. Press ENTER to initiate the recall of the selected preset.



- Reset/Clear Preset

To delete a previously saved preset, follow these steps:

1. Press the RESET key to enter preset delete mode. The status bar will display the prompt "DELETE PRESET:".
2. Enter the number of the preset to be deleted (e.g., number 1) using the numeric keypad.
3. Press ENTER to delete the specified preset.

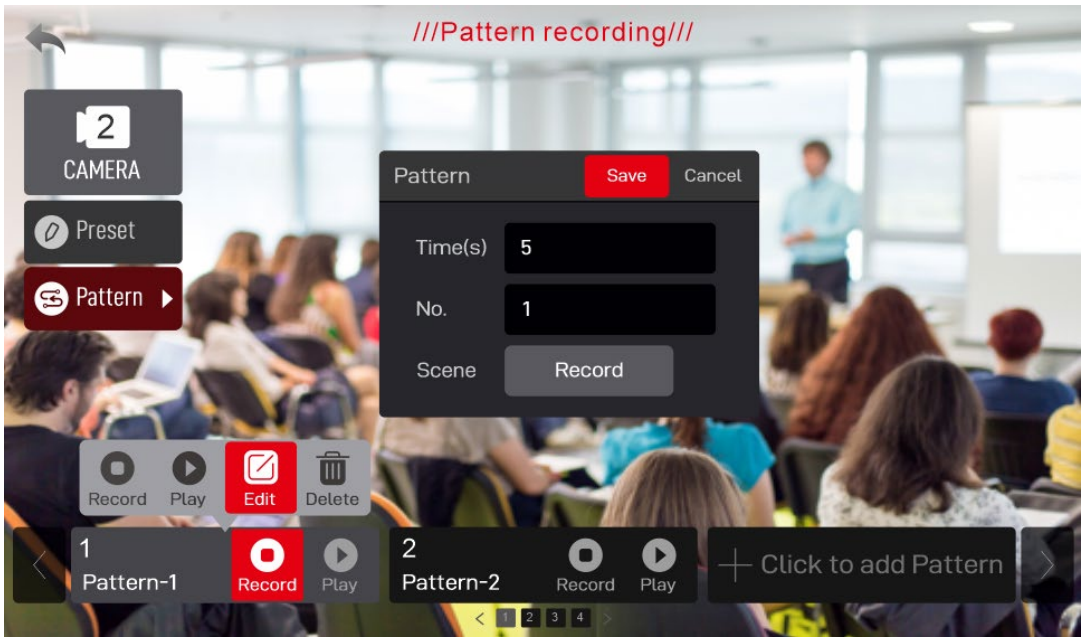


5.3 Camera Path Recording and Playback

- Custom Path Recording

Press the STORE key to enter the Path page, where users can configure and modify the preset path recording function.

- TIME: Stay Duration
- No.: Path Number



Path Cycle Setup Procedure

The path cycle setup consists of the following three steps:

Enter Path Mode

Press the STORE key to enter the Preset & Path menu, then select the "Pattern" option to switch to Path Mode.

1. Start Path Recording
   Click the "+Click to add Pattern" button to create a new path. In the pop-up control window, click "Start" (or use the "Start Recording" key in the custom key settings) to begin recording. The system will automatically record all PTZ control movements.
2. Complete Recording and Save
   Click the "STOP" button (or use the "Stop Recording" key in the custom key settings) to end the recording. A "Path Recording Complete" prompt displayed in the top status bar indicates the current path has been successfully saved.





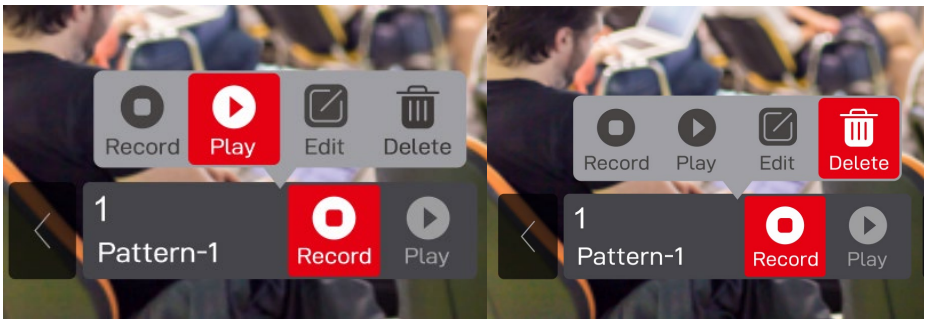
- Playback Path

The path playback procedure consists of the following three steps:

1. Enter Path Mode
   Press the STORE key to enter the Preset & Path menu, then select the "Pattern" option to switch

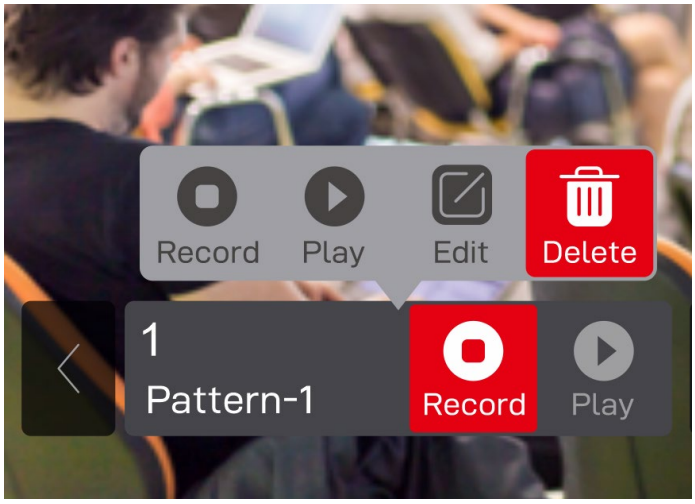
to Path Mode.

2. Initiate Path Playback
   Select the target path from the path list (identifiable by number or name), then click the **"Call"** key to initiate playback. The system will automatically lock out manual PTZ control to ensure the integrity and accuracy of the path execution.
3. Completion
   The camera will automatically follow the preset path until completion. A **"Path [Number] execution complete"** prompt displayed in the status bar indicates the path playback has finished successfully.



- Delete/Clear Path

Select the target path from the path list (identifiable by number or name), then click the **"Delete"** key to remove it.



6. Web Control

Connection Preparation

Connect the control keyboard and the computer to the same LAN router. Enable the DHCP function on the control keyboard to obtain an IP address automatically and note this address.
Alternatively, connect the control keyboard directly to the computer via an Ethernet cable, and set the computer's IP address to be on the same subnet as the control keyboard (for specific setup methods, please refer to **Section 4.2.1 Network Configuration**).

Login Access

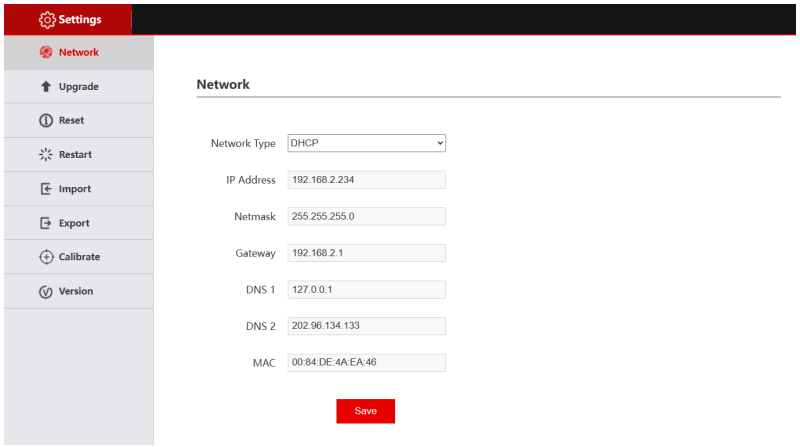
1. Enter the control keyboard's IP address in the browser address bar.
2. On the login screen, enter the authentication information:
3. Username: **admin**
4. Password: (Default is empty)
5. After successful login, you can manage cameras and configure system parameters via the web interface.

Security Notice

It is recommended to change the default password immediately after the first login and keep the account information secure.

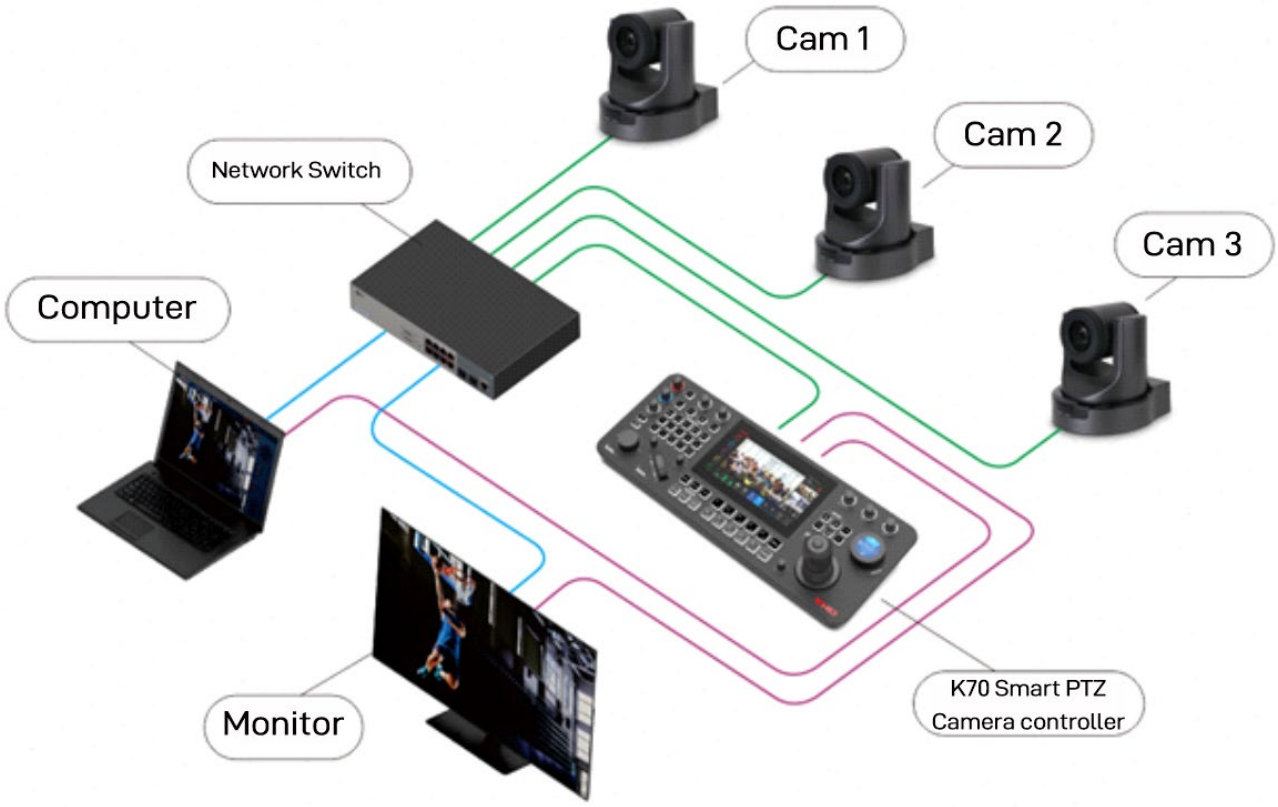
System Settings

Within the system settings, users can configure network settings, change the login password, and view the system version information of the PTZ control keyboard or update its firmware.

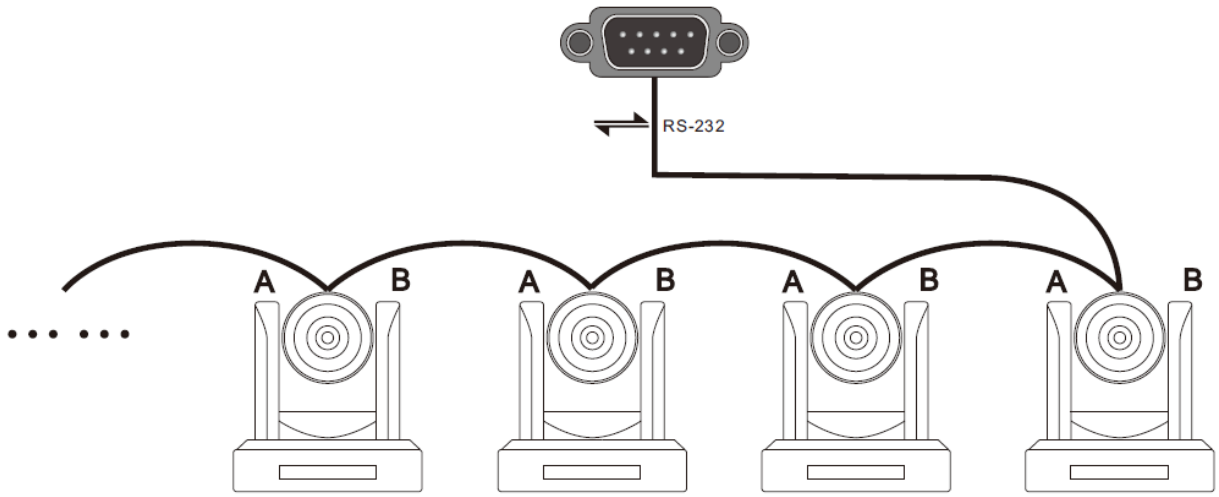


Click **"Browse"** to add the firmware file, then click **"Upgrade"** to begin the process. **Do not power off the control keyboard during the upgrade.** After successful completion, please **manually restart the control keyboard**.

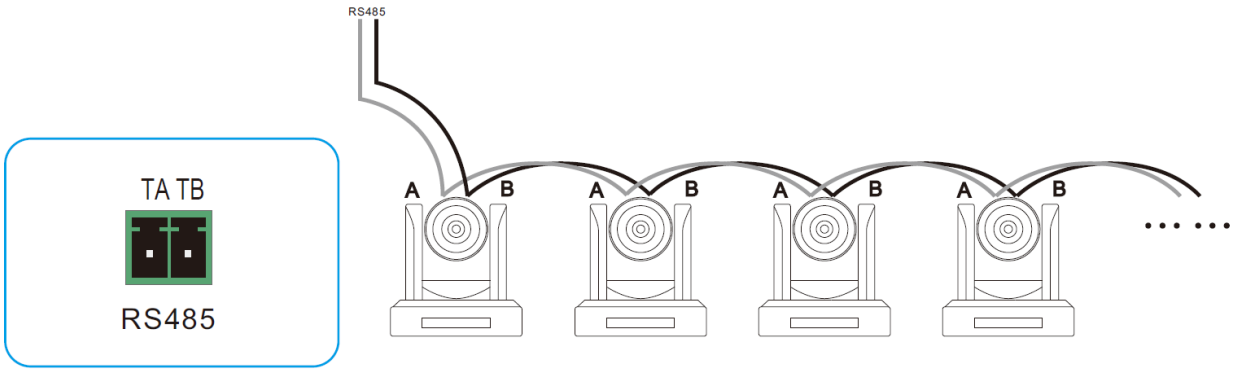
7.PTZ Camera Control Keyboard Connection Diagram



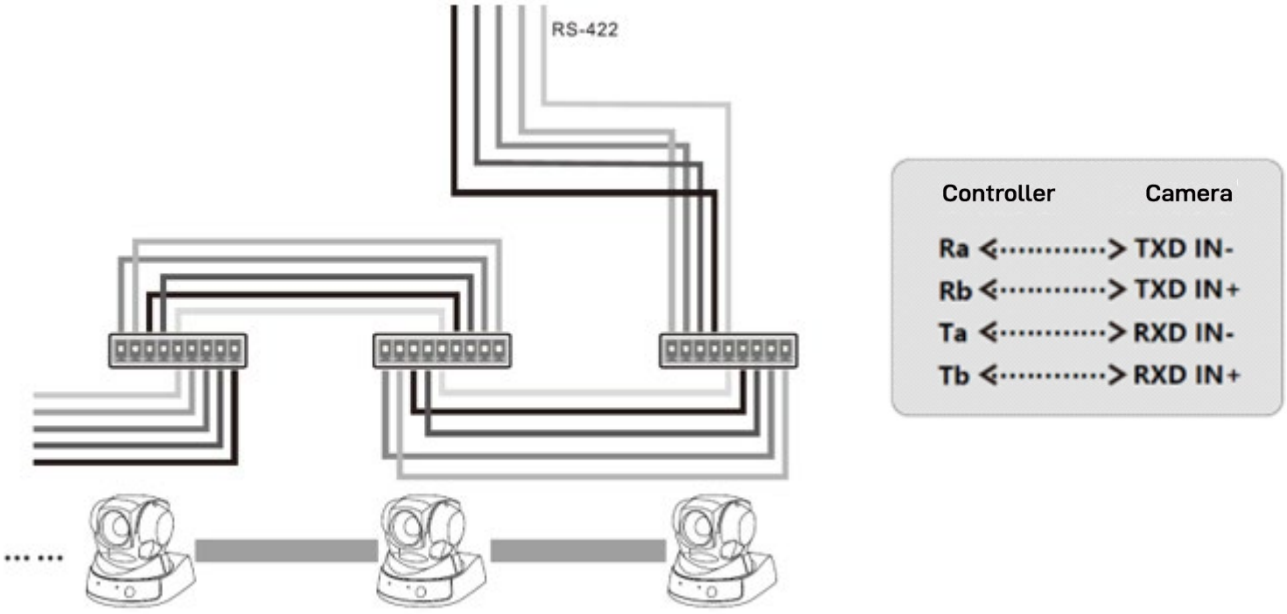
8.RS-232 Connection Diagram



9. RS-485 Connection Diagram



10.RS-422 Connection Diagram



11. Accessories

The PTZ Camera Control Keyboard is equipped with 1 × 12V Power Adapter.

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