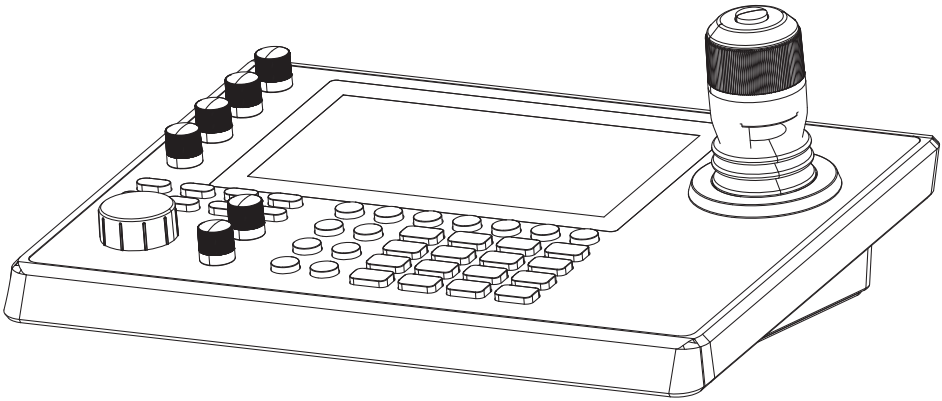
Tenveo

TEVO-KB500

Quad-View Touchscreen Joystick Controller

User Manual | Installation Guide



User Manual Version V1.0

Due to continuous product improvements, the Firmware version on your device and this User Manual may not update in time. Please download the latest Firmware and User Manual from our official website or contact sales.
This manual was updated on June 30, 2026.

Safety Precautions

WARNING: To reduce the risk of fire, electric shock, or personal injury, please strictly follow these instructions.
Emergency situations (troubleshooting abnormal conditions):
• If you notice smoke, strange odor, or unusual sounds from the product.
• If the product has been dropped and damaged.
• If foreign objects (metal, liquid, etc.) enter the product.
If any of the above occur, immediately unplug the power cord from the outlet. Continuing to use the product under these conditions may cause fire or electric shock. Contact official Customer Service as soon as possible.

1. Power Safety
i. Use only the power adapter supplied with this product or a PoE switch that meets specifications (PoE/PoE+: IEEE 802.3 af/at).
ii. Do not use damaged power cords, plugs, or loose power outlets.
iii. Disconnect the power during lightning storms or when not in use for long periods.
iv. Do not plug or unplug the power cord with wet hands.
2. Installation and Placement
i. Place the controller on a stable, level work surface to prevent dropping.
ii. Do not install near heat sources (e.g., radiators, heaters), direct sunlight, dusty, humid, or vibrating environments.
iii. Do not move the controller by pulling the joystick, as this may damage internal precision components.
3. Operational Safety
i. Do not allow liquids, metal shavings, or other foreign objects to enter the product.
ii. Do not disassemble, modify, or attempt to repair the product yourself; there are no user-serviceable parts inside.
iii. If the product emits abnormal odor, sound, or smoke, immediately turn off the power, unplug the power cord, and contact after-sales support.

Important Notes

1. Environmental Requirements
i. Operating temperature: 0°C~40°C; relative humidity: 10%~90% (non-condensing).
ii. Do not use near flammable gases or liquids.

2. Cable Connections

i. It is recommended to turn off the controller power before connecting or disconnecting cables.

ii. Use specified network cables (Cat5 or above recommended) and serial cables, and ensure cables are not pinched or excessively bent.

iii. Do not connect a PoE-powered network cable to the RS-422 terminal, otherwise malfunction may occur.

3. Cleaning and Maintenance

i. Turn off the power and unplug all cables before cleaning.

ii. Wipe the housing with a soft, dry cloth. Do not use alcohol, gasoline, thinner, or other organic solvents.

iii. Gently wipe the LCD screen surface with a glasses cloth to avoid scratches.

4. Firmware Upgrade

i. During the upgrade process, do not cut power, disconnect the network, or operate the controller; otherwise, device damage may occur.

ii. Always obtain firmware from official sales channels.

5. Disposal

i. When disposing of this product, comply with local e-waste disposal regulations. Do not discard arbitrarily.

Contents

Quick Start – 1

1. Product Overview – 4

1.1 Product Introduction – 4

1.2 Key Features – 4

2. Interfaces & Connections – 5

2.1 Rear Interfaces – 5

2.2 Typical Connection Diagrams – – – – – – – – – – – – – – – – – 6

3. Operation Interface & Functions – – – – – – – – – – – – – – – – 8

3.1 Control Panel & Key Functions – – – – – – – – – – – – – – – – 8

3.2 Touchscreen Display Information – – – – – – – – – – – – – – – 10

3.3 Gesture Guide – 12

3.4 Adding IP Cameras & Camera Groups – – – – – – – – – – – – 12

3.5 Adding Serial Cameras (Analog) – – – – – – – – – – – – – – 15

3.6 Deleting Cameras – 15

4. Advanced Settings & Maintenance – – – – – – – – – – – – – – – 16

4.1 Controller SETUP Menu – – – – – – – – – – – – – – – – – – – 16

4.2 Web Configuration Interface – – – – – – – – – – – – – – – – – 18

4.3 Firmware Upgrade – 18

5. Technical Specifications – 19

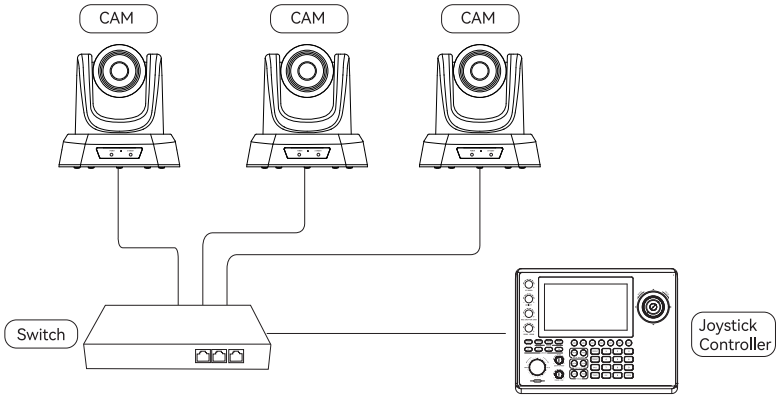
6. Troubleshooting – 20

7. Warranty & Service – 21

Quick Start

Get set up and start controlling your PTZ cameras in 5 minutes.
Connect devices → Power on & network check → Add cameras → Operate & control

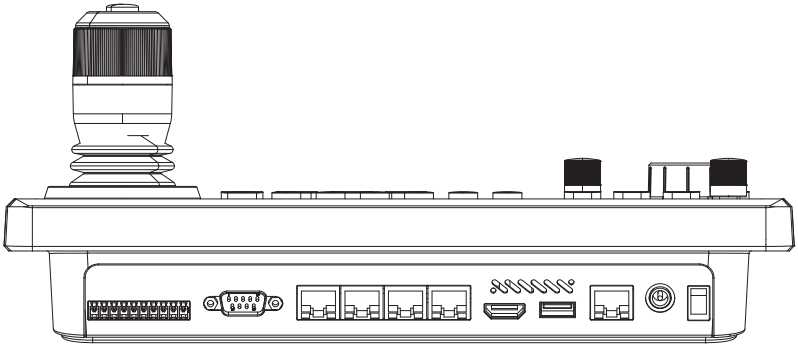
1. Connect Devices



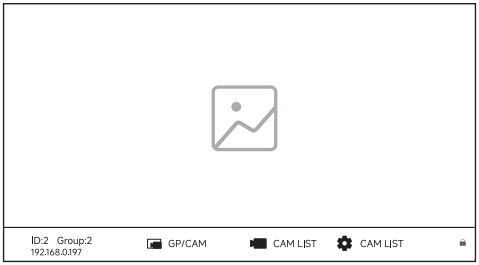
Network Mode (Recommended): Use network cables to connect the controller and cameras to the same switch, or connect a single camera directly to the controller.

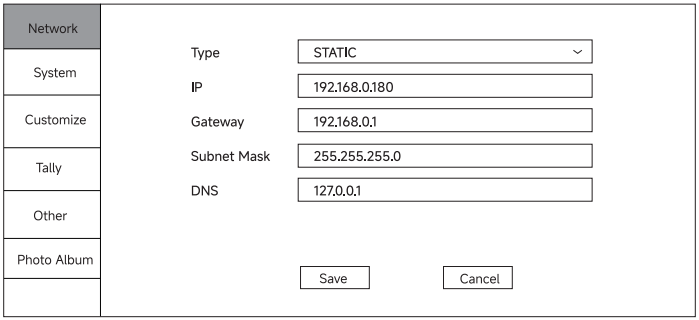
⚠ Do not insert a PoE-powered network cable into the RS-485/RS-422 interface, as this may damage the device.

2. Power On & Network Check



1) Connect DC 12V power or a PoE switch.
2) Turn the POWER switch to ON.
3) On the LCD screen, tap SETUP (bottom right corner) → Network to view the controller's IP address.

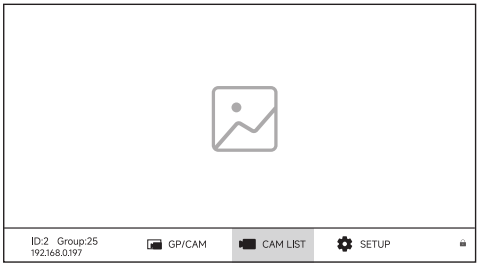


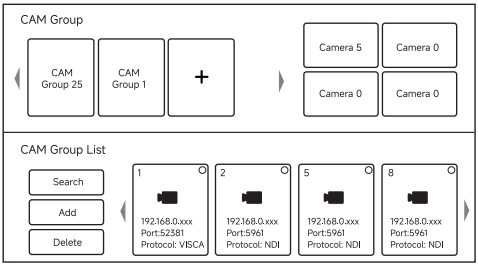


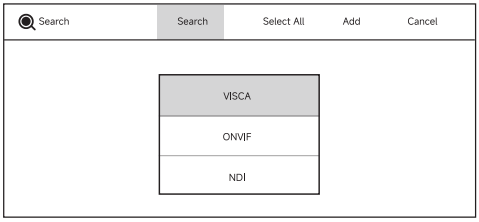
Ensure the controller and camera are on the same subnet (The controller's default IP address is 192.168.0.180).

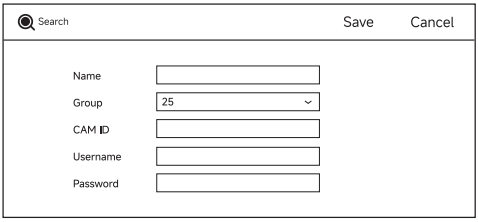
3. Add Cameras

Auto Search: Tap CAM LIST → Search → Select protocol → Check cameras → Add.

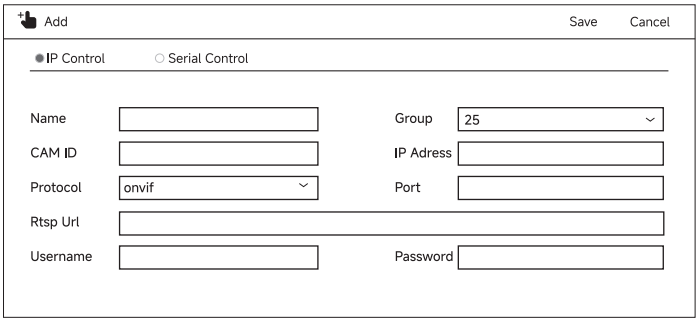








Manual Add: CAM LIST → Add → Fill in Channel ID (CAM ID), Protocol, IP address, Port → Save.



After successful addition, press the corresponding channel shortcut key to control the camera. For channels above 7, use the CAM ID key.

4. Operation & Control

Operation	Method
Pan/Tilt movement	Move the joystick up/down/left/right
Zoom (Tele/Wide)	Rotate the Zoom Knob or the joystick
Pan/Tilt & Zoom speed	Rotate the PT SPEED / ZOOM SPEED knobs
Focus	AUTO FOCUS / MANUAL FOCUS / NEAR FAR (manual adjustment by knob)
Exposure mode switch	Press EXPOSURE CYCLE
White balance mode switch	Press WHITE BALANCE CYCLE
Set preset	Press PRESET, enter a number (0–9), press ENTER to save.
Call preset	Press CALL, enter a number (0–9), press ENTER to recall.
Set trace (cruise)	Long press TRACE, enter trace number (0–9), set interval (7–30s), record movements, press ENTER to save.
Call trace (cruise)	Short press TRACE, enter trace number (0–9), press ENTER to start playback.
Group control	Press GROUP to enter group mode, enter group number (0–9), press ENTER. All presets/traces apply to the whole group. Tap “Exit” or press the GROUP key again to exit Group control mode.
Main-view/Quad-view switch	For CAM 1–6, single-click to switch between main-view and quad-view.
Menu buttons	Press MENU to open camera OSD menu, HOME to confirm, BACK to return. Use joystick up/down to adjust options, left/right for values.
Customizable keys	F1 = Presenter mode, F2 = AutoFraming, F3 = One-push white balance, F4 = Snapshot. All can be customized.

1. Product Overview

1.1 Product Introduction

The Controller is a professional yet easy-to-use PTZ camera controller featuring a 7-inch high-definition touchscreen with 1024×600 resolution and capacitive multi-touch support. With intuitive swipe gestures and taps, you can quickly switch cameras, adjust parameters, and configure system settings - no need to memorize complex buttons. Ergonomically designed with a high-precision 4-axis joystick, multi-function knobs, and a bright LCD screen, it supports smooth control of up to 255 cameras via IP or serial connections.
Applications: Video conferencing, broadcast studios, live production, security surveillance.

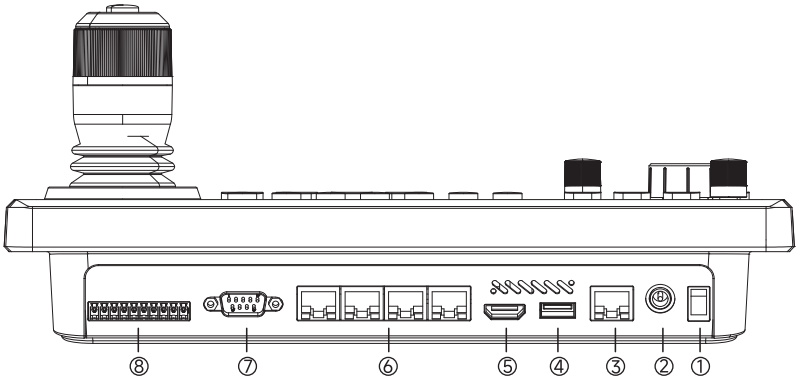
1.2 Key Features

·7-inch HD Touchscreen: 1024×600 resolution, vivid colors, responsive touch. No more menu diving – swipe and tap to switch cameras, adjust settings, and configure the system, boosting efficiency by over 50%.
·Universal Protocol Support: Native support for NDI, VISCA over IP, ONVIF, PELCO-D/P, VISCA, and other mainstream protocols, seamlessly compatible with leading camera brands.
·Intuitive Operation: Physical-feedback 4D joystick (pan, tilt, zoom, push), dedicated zoom knob, and direct camera access keys for precise, fast control and switching.
·One-click AI Tracking: Enable/disable single-person tracking and auto-framing with a single button.
·Dual-mode Control: Simultaneously supports IP network control and RS-232/422/485 serial control; independent IP address in network mode for flexible system integration.
·Group Control & Cruise – Boost Efficiency: Supports up to 26 groups; one-touch group mode to recall presets or cruise paths for multiple cameras simultaneously – ideal for fast multi-camera coordination.
·Multi-view Monitoring: Built-in HD display allows live preview of up to 4 cameras at once, switchable to full-screen view, with Tally status indication.

·Rich Shortcut Functions: Multiple direct camera selection keys, preset direct keys, and customizable macro keys significantly improve operation speed.
·Web Management: Built-in web interface for easy device addition, configuration, and firmware upgrades.
·Flexible Power Options: Supports standard PoE or DC 12V input.

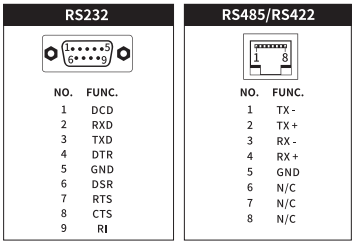
2. Interfaces & Connections

2.1 Rear Interfaces



No.	Interface	Label	Description
1	Power Switch	POWER	Turn on/off Controller power
2	Power Input	DC 12V	Standard 5.5×2.1mm DC barrel, DC 12V 2A ±10%
3	Network	LAN	Gigabit PoE (PoE/PoE+: IEEE 802.3 af/at), for IP control (NDI, VISCA over IP, ONVIF) and web management
4	USB	USB 2.0	Import/export Controller config, export screenshots, and firmware upgrade
5	HDMI	HDMI	Video output, up to 4K@60fps, no audio output
6	Serial	RS-422/485	Connect RS-422/485 protocol cameras
7	Serial	RS-232	Connect RS-232 protocol cameras
8	TALLY	TALLY	Connect to switcher Tally signal for program/preview indication and auto-link

Notes: ① RS-232 pinout diagram; ② RS-422/485 pinout diagram.

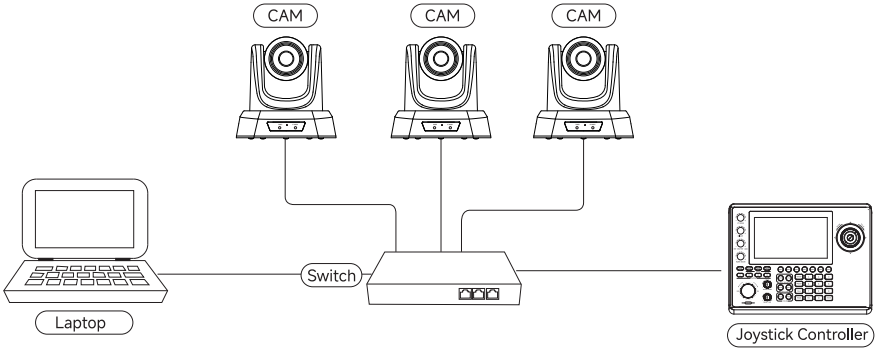


Important:

·Do not insert a PoE-powered network cable into the RS-485/RS-422 interface.

·For serial connections, ensure the baud rate and address match between camera and controller.

2.2 Typical Connection Diagrams



Scenario 1: IP Network Control Mode (Recommended)

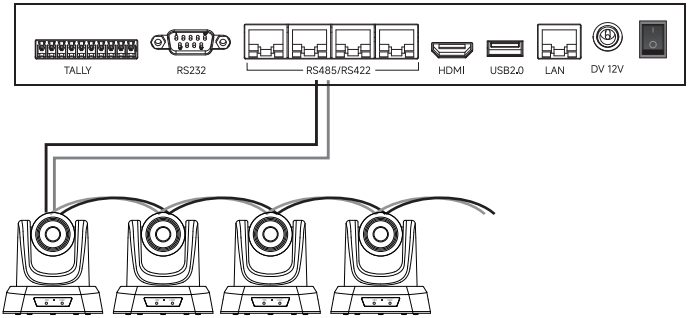
Ensure all devices are on the same subnet (e.g., 192.168.0.x).

For example: IP addresses "192.168.0.123" and "192.168.0.111" are on the same subnet, while "192.168.0.123" and "192.168.1.125" are not on the same subnet.

If any device (including the controller and PTZ cameras) is not on the same subnet, please change the IP address of that device to match the subnet of the other devices.

Controller's Default IP: 192.168.0.180 (static) or can be set to DHCP.

Scenario 2: Serial Control Mode (RS-485)



Controller	Camera
TX-	RS485-
TX+	RS485+

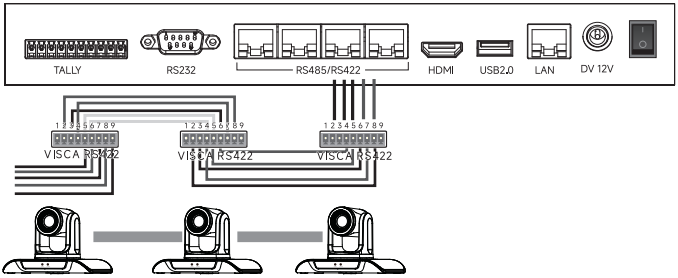
Control output:

Pin1 TX- → camera RS485-

Pin2 TX+ → camera RS485+

Set camera addresses 1,2,3 with same baud rate as controller.

Scenario 3: Serial Control Mode (RS-422)



Controller	Camera
TX-	RXD IN-
TX+	RXD IN+
RX-	TXD IN-
RX+	TXD IN+

Control output:

Pin1 TX- → camera RXDIN-

Pin2 TX+ → camera RXDIN+

Pin3 RX- → camera TXDIN-

Pin4 RX+ → camera TXDIN+

Set camera addresses 1,2,3 with same baud rate as controller.

Scenario 4: Serial Control Mode (RS-232)

Controller	Camera
RXD	TXD
TXD	RXD
GND	GND

Control output:

Pin2 RXD → camera TXD

Pin3 TXD → camera RXD

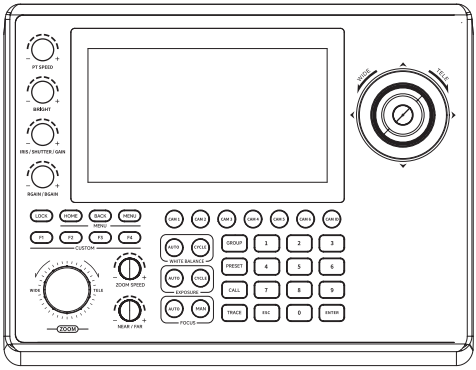
Pin5 GND → camera GND

You may also use the standard RS-232 (DB9) port.

Set camera addresses 1,2,3 with same baud rate as controller.

3. Operation Interface & Functions

3.1 Control Panel & Key Functions



1) LCD Display: Shows camera feeds, menus, and status.

2) Camera Select: CAM 1 – CAM 6 – one-touch target switching; long press to edit camera info.

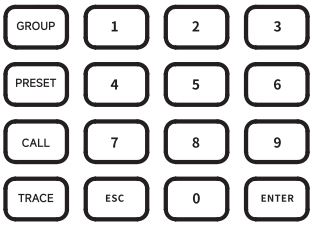


CAM ID – enter multi-digit camera number.
Quad-screen: When a CAM key is active, press it again toggles between main-view and quad-view.

3) Preset Keys (0–9): Short press to recall, long press to save.
PRESET: Enter preset mode, then press number keys + ENTER to save.
CALL: Enter recall mode, then press number keys + ENTER to recall.
HOME: Return to camera original position.
Quick preset: Long press number keys to save; short press to recall.
Note: Supports up to 255 presets (numbers >10 require digital panel input then CALL).

4) Group Control:
GROUP – Enter group mode, enter group number, press ENTER.
Press GROUP again to exit.

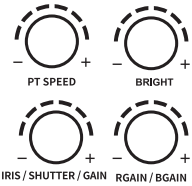
5) Trace (Cruise):
Record: Long press TRACE → enter trace number (0-9) → ENTER → set interval (7-30s) → ENTER → record moves with joystick → ENTER to save.
Playback: Short press TRACE → enter trace number → ENTER.
During recording/playback, TRACE LED flashes.



6) 4D Joystick:
Left/Right/Up/Down – Pan/Tilt
Rotate – Zoom
Top button – Confirm / customizable key



7) Control Knobs:
PT SPEED – Pan/Tilt speed
BRIGHT – Brightness adjustment (right +, left -)
IRIS/SHUTTER/GAIN – Press to cycle modes, rotate to adjust
R GAIN / B GAIN – Manual red/blue gain (right +, left -)



8) Zoom Control:
ZOOM Knob – WIDE/TELE
ZOOM SPEED – Zoom response speed



9) White Balance:
AUTO WHITE BALANCE – Auto white balance mode
CYCLE WHITE BALANCE – Cycle: Indoor/Outdoor/One-push/Manual/Auto



10) Exposure:
AUTO EXPOSURE – Auto exposure mode
CYCLE EXPOSURE – Cycle: Manual/Brightness priority/Shutter priority/Aperture priority/Auto



11) Focus:
AUTO FOCUS – On/Off
MANUAL FOCUS – Manual focus mode; NEAR/FAR knob(left = near, right = far)





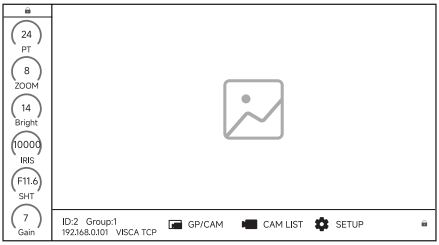
12) Other Keys:
LOCK – Locks all buttons (LED red)
HOME – Camera home
BACK – Back MENU – Open camera OSD menu
ESC – Exit/Cancel ENTER – Confirm



Note: Wait for screen to fully light up after power-on to avoid joystick calibration errors.

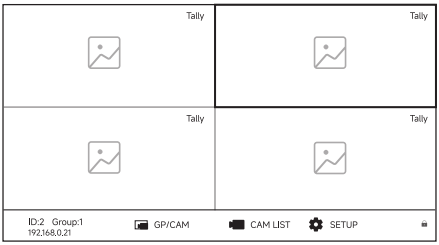
3.2 Touchscreen Display Information

Main screen is divided into four areas:

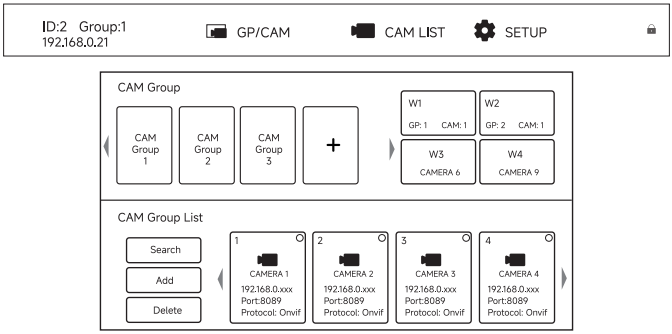


No.	Name	Description
1	Video Preview	Default 4-camera view (main-view/quad-view). Supports H.264/H.265/NDI HX2/HX3 decoding.
2	Tally Indicator	Each preview shows Tally status (green/red) at top-right.
3	Navigation Bar	Shows current camera group/channel, connection status, IP/serial address, protocol.
4	Parameter Bar	Real-time feedback of knob values (speed, iris, shutter, gain, etc.).
5	Info Prompt	Displays operation feedback (e.g., tracking, speed, preset recall).
6	Lock Icon	Locks the status and menu bars.

3.2.1 Video Preview & Camera Switching



Quad-view: Up to 4 cameras simultaneously. Tally colors: Gray (not connected), Green (Preview PVW), Red (Program PGM). Red border indicates the controlled camera.
Main-view: Double-tap any feed to enlarge (preview up to 4K60). Double-tap again to return.
Camera sync: When switching via touch, the CAM1-6 LEDs change accordingly: Green = previewing, Red = currently controlled.

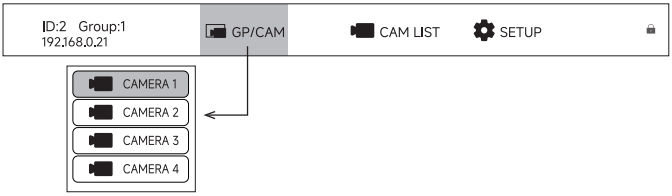


Quad-view layout: Press CAM LIST → drag cameras to windows 1-4.

3.2.2 Parameter Bar (Swipe from left edge)

Displays real-time values for:
R GAIN (0-42dB, step size 3, default 0),
B GAIN (0-42dB, step size 3, default 0),
IRIS (support:F32,F16,F10,F8.0,F6.0,F4.0,F3.4,F3.0,F2.63,F2.2,F2.0,F1.85,F1.6.),
SHUTTER (support:1/25,1/30,1/50,1/60,1/90,1/100,1/120,1/180,1/195,1/215, 1/230,1/250,1/350,1/500,1/725,1/1000,1/1500,1/2000,1/3000,1/4000,1/6000, 1/10000.),
GAIN (0-42dB, step size 1, default 0),
BRIGHTNESS (0-99, step size 1, default 50),
PT SPEED (1-8, step size 1, default 8),
ZOOM SPEED (1-8, step size 1, default 8).
Gray "–" if camera does not return value or protocol not adapted.

3.2.3 Navigation Bar (Swipe up from bottom edge)



Three core entries:
• GP/CAM – Switch current camera (group/channel list)
• CAM LIST – Camera list management
• SETUP – System settings menu
Below: Detailed info of selected camera (group-channel, status, IP/address, protocol).

3.2.4 Info Prompt Area

Bottom of main screen shows real-time operations: AI tracking on/off, speed adjustments, pan/tilt direction, preset/trace recall, trace recording status, etc.

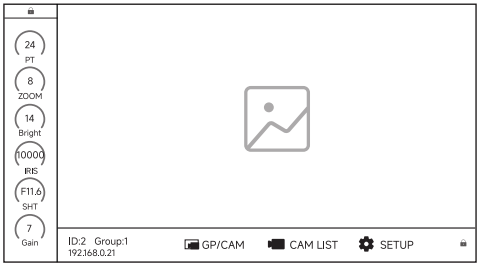
3.3 Gesture Guide

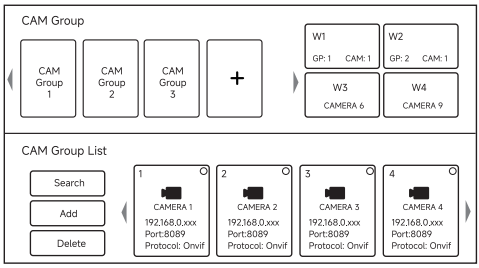
Gesture	Action
Tap a feed	Select/switch camera – parameter bar updates, CAM LED turns red
Double-tap feed	Main-view mode; double-tap again to return to quad-view
Swipe from left edge inward	Show parameter bar
Swipe from right edge inward	Hide parameter bar
Swipe up from bottom edge	Show navigation bar (GP/CAM, CAM LIST, SETUP)
Swipe down from top edge	Open system settings menu
Swipe from left edge to right	Return to previous menu (in any second-level menu)

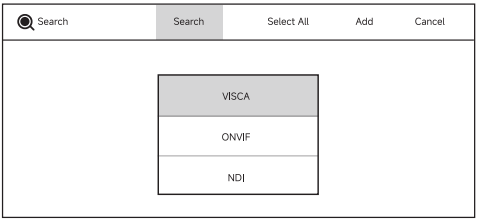
Lock function: Both parameter and navigation bars have a lock icon – tap to prevent accidental hiding.

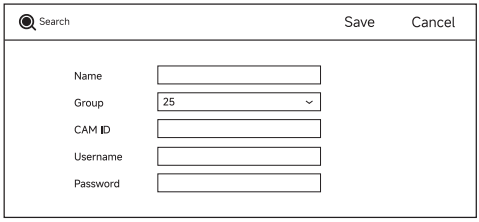
3.4 Adding IP Cameras & Camera Groups

Auto Search



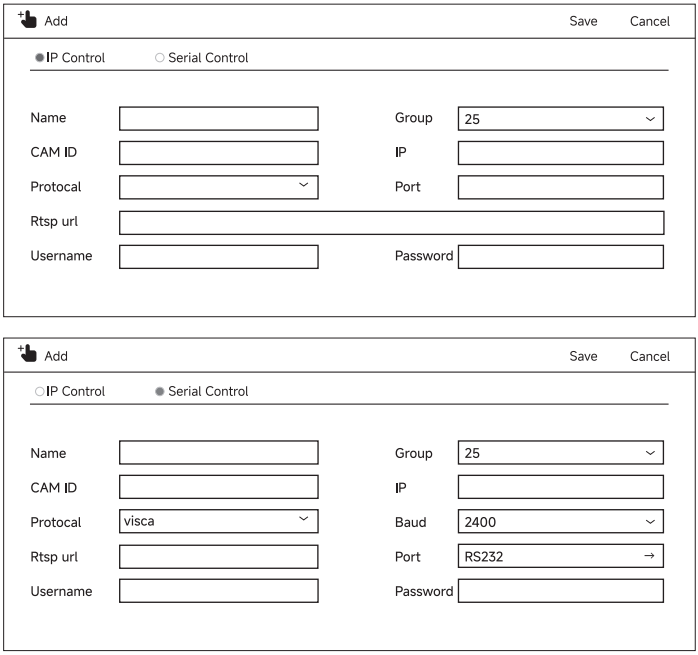






1) Press CAM LIST → Search
2) Select protocol (VISCA, ONVIF, or NDI) – The controller will automatically search for devices on the same subnet.
3) Check cameras, tap Add, and confirm.

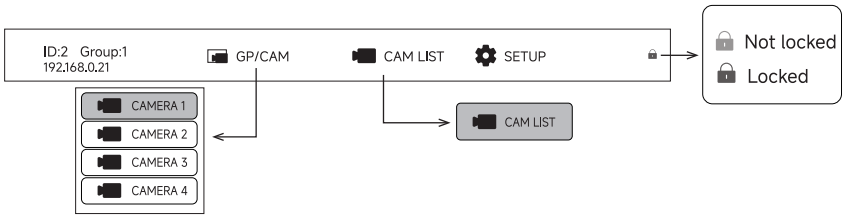
Manual Add

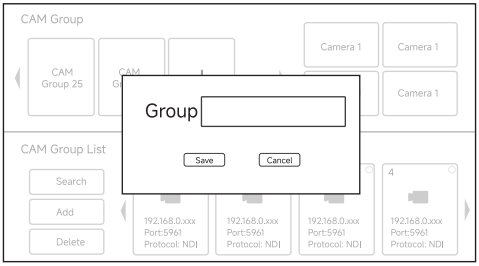


1) CAM LIST → Add
2) Configure:
- CAM ID – key number (e.g., 1 for CAM 1)
- Protocol – VISCA over IP / ONVIF / NDI
- IP address
- Port (e.g., 52381 for VISCA)
- Username/Password (if needed)

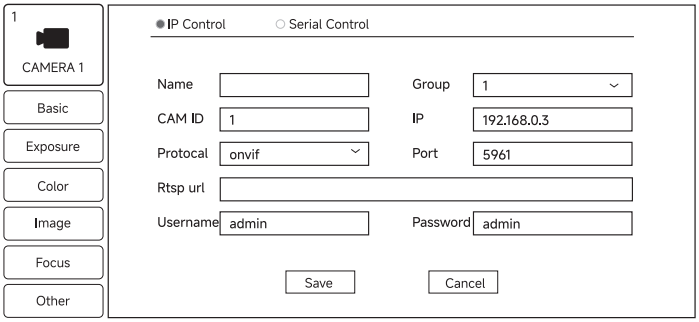
3) Save – then use CAM x key to control.

Camera Groups

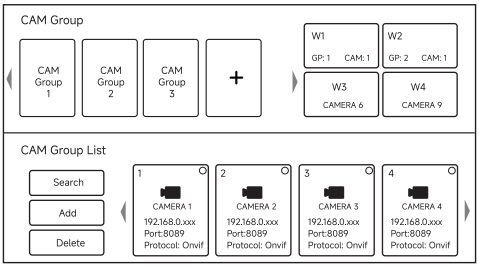




· Create group: CAM LIST → “Camera Groups” → tap “+” → name → save (max 26 groups)



· Add camera to group: In camera list, tap a camera → dropdown to select group; or when adding new camera, assign to group.



· Adjust quad-view layout: In group settings, drag cameras to windows.

· Group control: Press GROUP → enter group number → ENTER. Then any preset/trace recall applies to all cameras in the group. Tap “Exit” or press the GROUP key again to exit Group control mode.

Note: Ensure controller and cameras are on the same subnet (first three IP octets same). Some cameras require enabling VISCA, ONVIF, or NDI first.

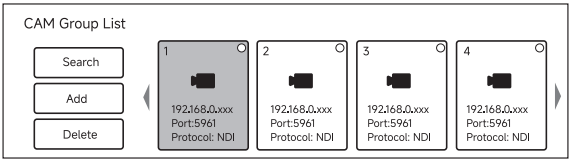
3.5 Adding Serial Cameras (Analog)

1) CAM LIST → Add
2) Configure:
- CAM ID
- Protocol – VISCA / PELCO-D / PELCO-P
- Address – match camera's address
- Baud rate – match camera (e.g., 9600)
- RTSP URL (optional)

3) Save.

Warning: In multi-camera serial control, each camera must have a unique address.

3.6 Deleting Cameras



Check cameras in camera list → tap Delete.

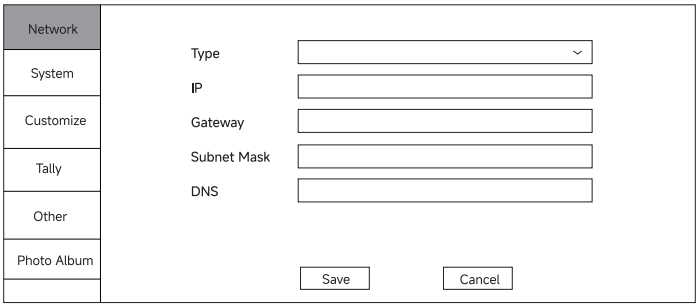
4. Advanced Settings & Maintenance

4.1 Controller SETUP Menu



Press SETUP to enter. Use joystick/touch to navigate.

(1) Network Settings

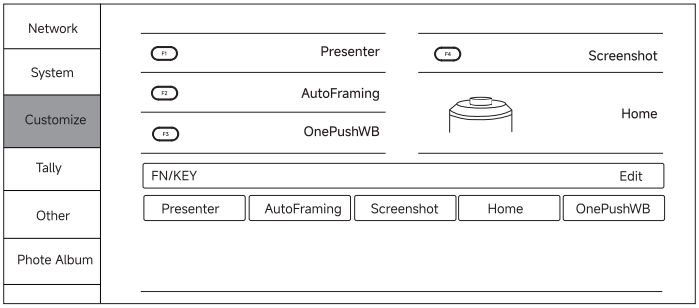


Set DHCP/Static, subnet mask, IP address, gateway. Press ENTER to confirm, then move to “Save” and press ENTER – controller restarts with new IP.

(2) System Settings

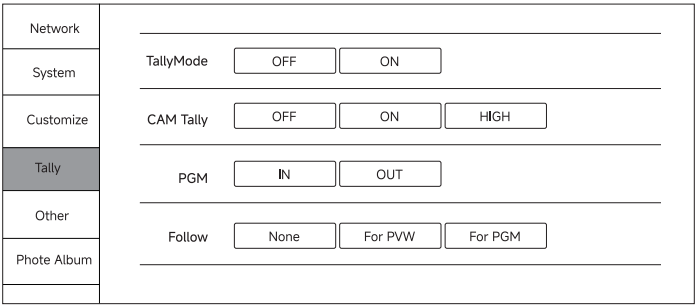
Language (English/Chinese), key sound on/off, factory defaults, restart, upgrade, VISCA response wait, backlight brightness, etc.
Note: “Restore Defaults” – resets some settings. “Factory Reset” – resets all settings.

(3) Custom Settings



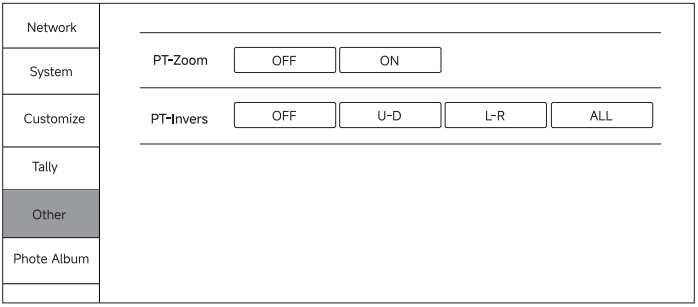
Click to select the button you need to customize, the choose its corresponding function.

(4) TALLY Settings



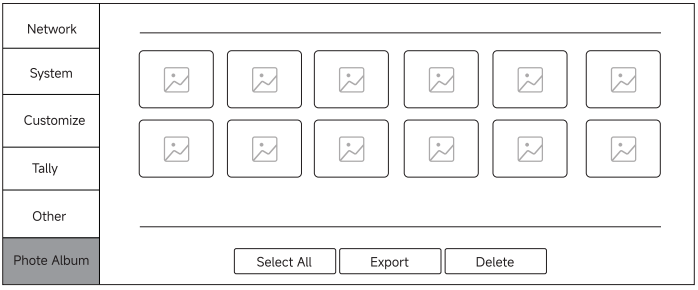
Enable/disable Tally mode, camera Tally function, and follow options.

(5) Other Settings



PTZ function on/off, Pan/Tilt direction reverse, etc.

(6) Gallery



View screenshots. Tap a photo to full-screen; tap again for options (export/delete); swipe from right edge or press ESC to close.

4.2 Web Configuration Interface

The controller includes a powerful web management interface.

1) Connect PC to same network as controller.

2) On controller's Network settings, note its IP address (e.g., 192.168.0.180).

3) In PC browser, enter http://<controller-IP> (e.g., http://192.168.0.180).

4) Default login password: admin (change after first login).

Web features:

- Device Management – add/edit/delete cameras, group control
- Network Settings – change controller IP (static/DHCP)
- System Settings – version info, firmware upgrade, factory reset
- Custom Key Settings – define custom key names and commands, sync to controller
- User Management – add/delete/edit users
- Multi-view Settings – choose which cameras appear in quad-view
- Theme – switch interface style

Note: After changing network settings, restart controller or reconnect web interface. Keep admin password safe; if forgotten, perform factory reset via local menu.

4.3 Firmware Upgrade

1) Download latest firmware from official sales channel.

2) Upgrade via Web UI (System Upgrade page) or local USB2.0.

3) WARNING: Do not cut power, disconnect network, or operate the controller during upgrade – otherwise the controller may become unbootable.

5. Technical Specifications

Item	Specification
Control Protocols	NDI, VISCA (over IP), ONVIF, PELCO-D/P
Control Interfaces	RJ-45 (PoE), RS-422, RS-232
Max Controllable	IP mode: 255 cameras; Serial mode: 7 (VISCA) / 255 (PELCO)
Joystick Type	4D universal (Pan, Tilt, Zoom, Push)
Display	7" IPS, 1024×600, capacitive touch
Power	DC 12V or PoE (802.3af)
Power Consumption	< 10W
Operating Environment	0℃~40℃, 10%~90% RH (non-condensing)
Dimensions/Weight	355×265×170mm (packaged) / approx. 2.02kg

6. Troubleshooting

Issue	Possible Cause & Solution
Controller cannot control camera	1. Check cable connections. 2. Ensure same subnet or matching serial parameters. 3. Confirm camera added and correct CAM ID selected. 4. Check camera's ENABLE/lock status.
Cannot search for cameras	1. Same physical network. 2. Camera supports and enables VISCA/ONVIF/NDI. 3. Temporarily disable PC firewall.
LCD shows red status	Selected camera not responding. Check network or if camera is online.
Preset cannot be saved/recalled	1. Preset number within camera limit. 2. Some cameras need preset image parameter memory enabled.
Forgot web login password	Perform factory reset via local menu (resets all configurations).
Parameter bar item shows gray	Camera not returning that parameter or protocol mismatch. Try VISCA or update camera firmware.
Quad-view feed lagging	Check network bandwidth; quad-view uses substream (up to 1080p60).
Cannot bring up navigation bar	Check if navigation bar is locked (lock icon) or swipe correctly from bottom edge.
Group control number keys not lit	Ensure GROUP pressed to enter pre-call mode, then digit keys flash green before pressing number.
Tally light not working	Check Tally settings page, switcher signal cable, or vMix Tally configuration.
No HDMI output	1. Check HDMI cable and monitor input. 2. Check if the HDMI output resolution is supported by the monitor, and try to change HDMI output resolution (System Settings → HDMI Output → 1080P60).

7. Warranty & Service

1. Warranty Scope

• This product is covered by a free warranty for three years from the date of purchase.

• After the three-year free warranty period, if the same fault occurs within three months of a paid repair, the repair will be provided free of charge.

• The free warranty does not cover faults caused by:
  • Force majeure (e.g., war, earthquake, lightning strike, etc.);
  • Improper use, incorrect installation methods, or other abnormal operations/accidents;
  • Damage during transportation or storage due to heavy pressure, severe vibration, or water immersion;
  • Damage caused by shipping the product in an assembled (non-separate) package, or by using packaging materials other than the original factory packaging;
  • Unauthorized disassembly, modification, or repair by the user (products that have been self-repaired are not covered).

• For products beyond the warranty period, our company offers paid repair services.

• For products repaired within the warranty period, please correctly fill in the product warranty information form, describe the fault in detail, and provide the original or a copy of the sales invoice.

• The manufacturer assumes no risk or liability for damage or loss arising from specific use or application of the product.

• The manufacturer's liability for claims based on breach of contract, negligence, or infringement is limited to the purchase price of the product.

• The manufacturer is not responsible for any special, incidental, or consequential damages arising from any other cause.

• Our company reserves the right of final interpretation of the above terms.

2. Warranty Conditions

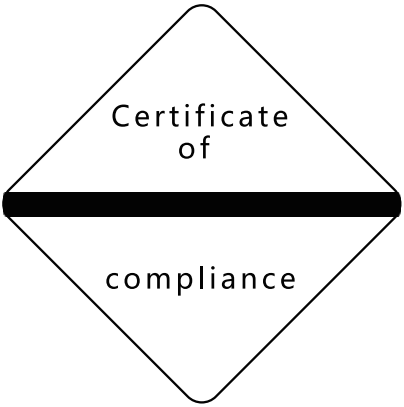
For products requiring repair during the warranty period, the buyer must provide the product warranty card and a detailed description of the fault together with the returned product.

3. Returns

When a product needs to be returned to the manufacturer for repair, the customer may return it to the supplier (who will forward it to the manufacturer) or send it directly to the manufacturer. For direct returns, please contact us in advance to expedite the process.

Our company bears only the one-way shipping cost from the manufacturer to the customer after repair.

We apologize for any printing errors or translation discrepancies. Specifications and appearance are subject to change without notice due to product improvements.


Certificate
of
compliance


Q.A.
QC PASSED