

CV420-30X

Compact 4K60 30X Zoom Camera
12GSDI, HDMI, and IP (HEVC)



User Manual

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Safety Instructions

1. Operation

- 1.1 Use camera in the recommended operating environments.
- 1.2 Do not place the camera in tilted position.
- 1.3 Do not place the product on an unstable cart, stand or table.
- 1.4 Do not use this product near water, extreme humidity or high heat.
- 1.5 Use recommended ¼”-20 mounts and attachments.
- 1.6 Use the power supply that is provided in box.
- 1.7 Always take the following precautions when handling the power plug. Failure to do so may result in sparks, shock or fire:
 - Ensure the plug is free of dust before inserting it into a socket.
 - Ensure that the plug is inserted into the socket completely and securely.
- 1.8 Do not overload wall sockets, use long extension cords, or plug camera into multi-output power strips.
- 1.9 Do not block vents on the camera body as they provide ventilation and prevent the product from overheating.
- 1.10 Do not open or remove camera body, camera warranty is void if opened.
- 1.11 Unplug the product from the wall outlet and consult a licensed service technician when the following conditions arise:
 - If the power cords are damaged or frayed.
 - If liquid is spilled into the product or the product has been exposed to rain or water.

2. Installation

- 2.1 For security consideration, please make sure any mounts that are used are standard UL or CE safety certified and installed by technician personnel.

3. Storage

- 3.1 Do not mount camera where power cord can be stepped on, as this may result in fraying or damage to the lead or the plug.
- 3.2 Never allow debris or objects of any kind to penetrate camera body. Never allow liquid of any kind to spill onto or into the camera body.
- 3.3 Unplug this product during thunderstorms, during electrical surges, or if it is not going to be used for an extended period of time.
- 3.4 Do not place camera or accessories on top of vibrating equipment or heated objects.

4. Cleaning

- 4.1 Unplug all the cables before cleaning. Use a damp cloth for cleaning. Do not use liquid or aerosol cleaners or allow any liquids to enter camera body.

Precautions

Warning: To reduce the risk of fire or electric shock, do not expose this camera to rain, moisture, debris or liquids.

If the HD camera will not be used for an extended time, unplug it from the power socket.



Caution: To reduce the risk of electric shock, do not remove cover (or back). No user-serviceable parts inside. Refer servicing to licensed service personnel. Please do not open it by yourself



This symbol indicates that this equipment may contain dangerous voltage which could cause electric shock.



This symbol indicates that there are important operating and maintenance instructions in this User Manual with this unit.

FCC Warning

This product has been tested and found to comply with the limits for a Class B computer device, pursuant to Article 15-J of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

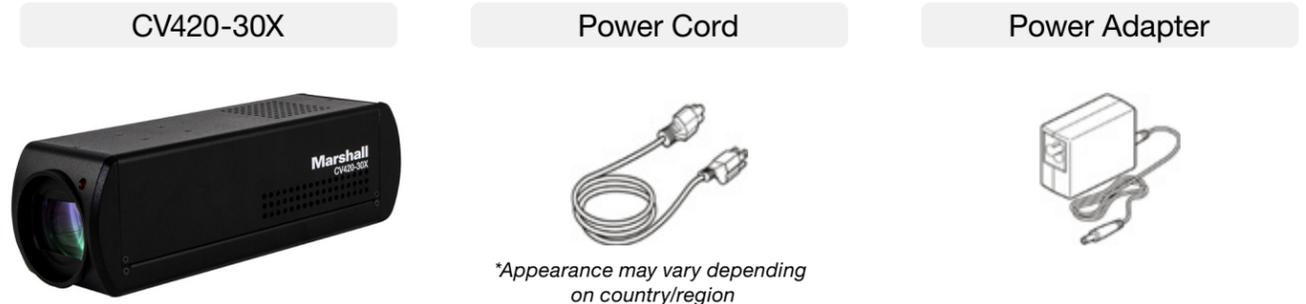
This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus" ICES-003 of Industry Canada.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques," NMB-003 édictée par l'Industrie.

EN55032 (CE Radiation) Warning

Operation of this equipment in a residential environment could cause radio interference.

1. Package Contents



2. Function Introduction

2.1 I/O functions Introductions



No.	Item.	Function Descriptions
1	Lens	30x HD/UHD camera lens
2	Tally indicator light	Tally light displays status of the camera
3	Power indicator light	After power is on, the indicator light will display in red
4	12G-SDI output	12G-SDI output
5	HDMI 2.0 output	HDMI 2.0 output
6	Network port	Network port. Support routers or hubs (IEEE 802.3 af) with PoE power supply support
7	Audio input	3.5mm Audio Input supports Line-level or Mic-level Stereo/Mono input
8	Audio output	Loop-through 3.5mm Output
9	Rest	Factory Reset and reset static IP to default value
10	DC 12 V power connector	AC power supply connecting port
11	RS232 output	RS232 output port. At most 7 cameras can be connected in a serial connection
12	RS232 input	RS232 input port. At most 7 cameras can be connected in a serial connection
3	Tripod screw holes	1/4", 20 UNC tripod deck

2.2 Tally Indicator Light Function Description

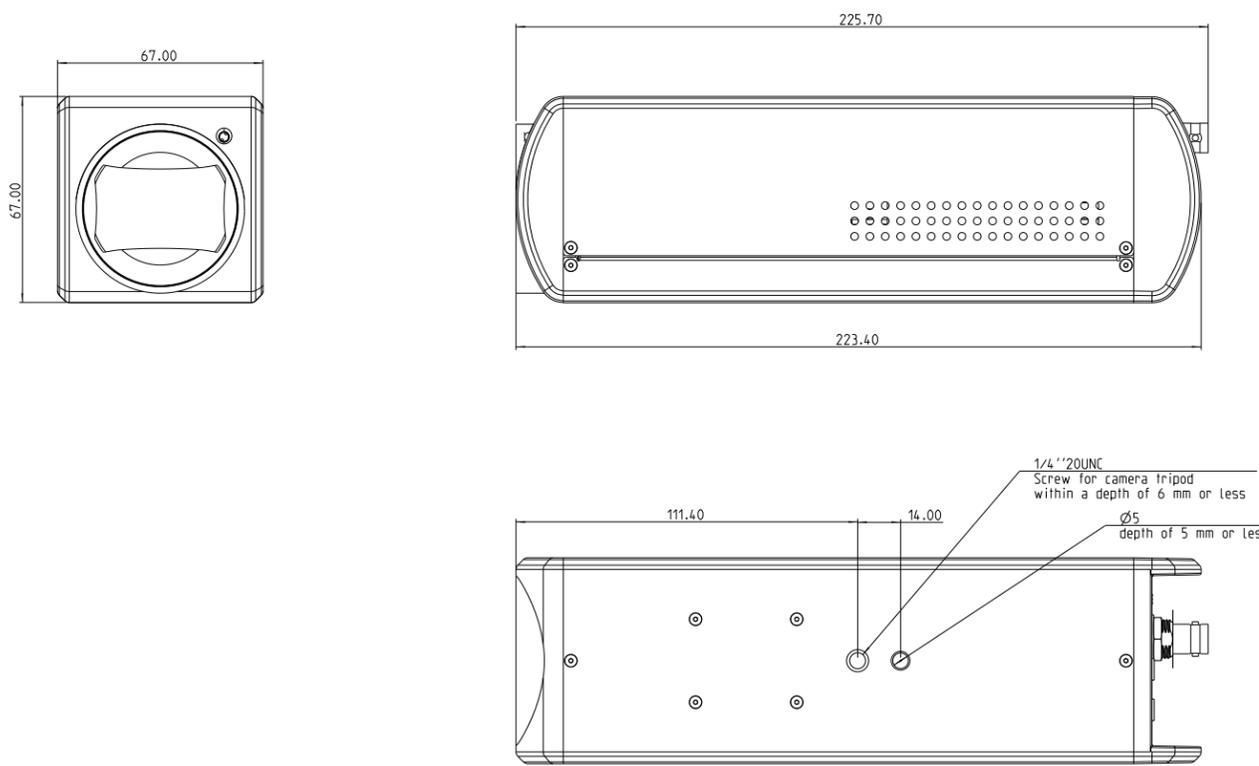
2.2.1 The tally indicator light function may be enabled through the control of RS232 command.

The setting method is as follows:
Tally Mode : 8x 01 7E 01 0A 01 0p FF
p = 0 : OFF
p = 4 : On (half-brightness)
p = 5 : On (full-brightness)

3. Installation Instructions

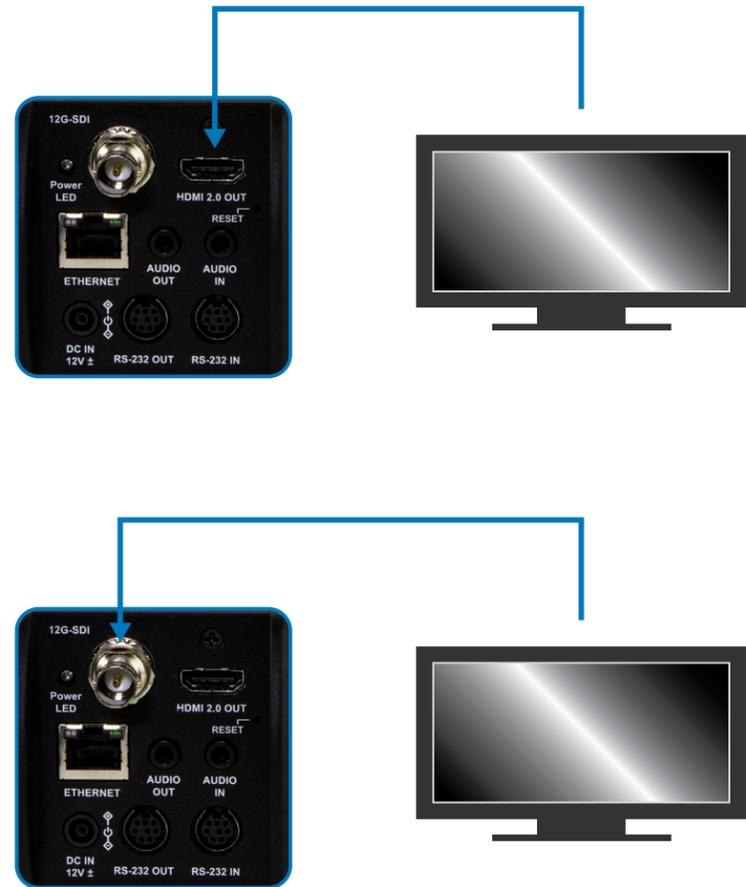
3.1 Installation Basics

3.1.1 CV420-30X Dimensions

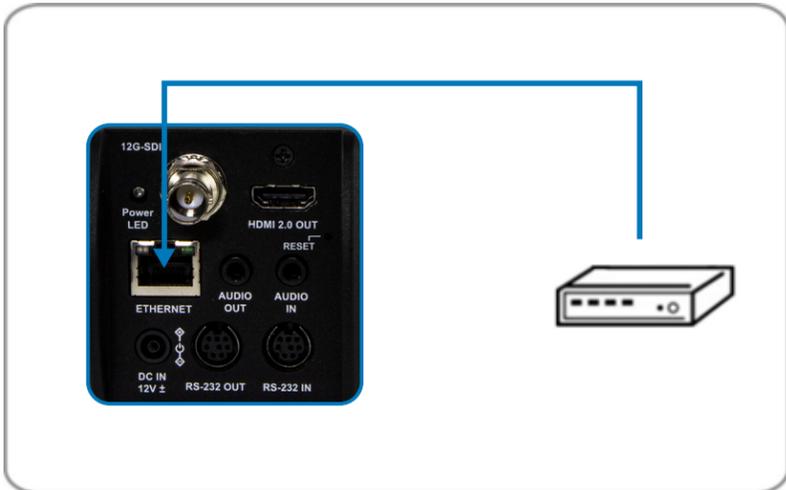


3.2 Connecting devices

3.2.1 SDI and HDMI connection to TV/display screen

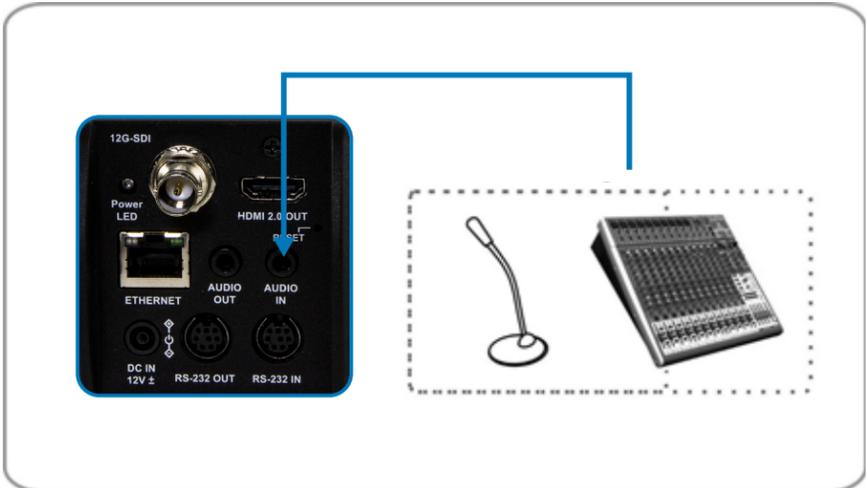


3.2.2 Connecting to Internet



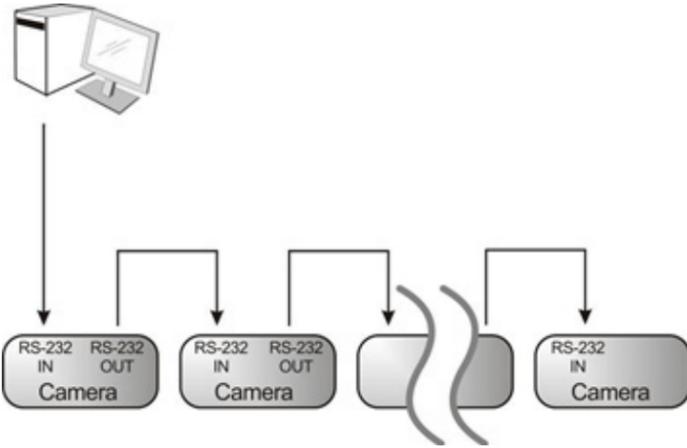
For details of web page connection setting and description, please refer to Chapter 5 Network Function Settings Description.

3.2.3 Connecting AUDIO IN



3.2.4 Connecting RS-232

CV420 camera includes a RS232 IN and OUT for Daisy Chain style connections, or can be setup via home run using splitters (use CV620-CABLE-07 extenders to convert to CAT RJ45 cables for longer runs).



- RS-232 pin definition description

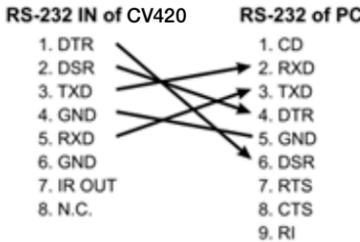
RS-232 IN Pins Instructions

NO	Pins	Signals
1	DTR	Data Transmission Reade
2	DSR	Data Set Reade
3	TXD	Transmit Data
4	GND	Ground
5	RXD	Receive Data
6	GND	Ground
7	IR OUT	IR Commander Signal
8	N.C.	No Connection

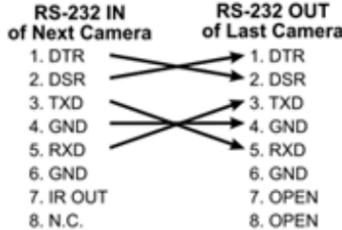
RS-232 OUT Pins Instructions

NO	Pins	Signals
1	DTR	Data Transmission Reade
2	DSR	Data Set Reade
3	TXD	Transmit Data
4	GND	Ground
5	RXD	Receive Data
6	GND	Ground
7	OPEN	Reserved
8	OPEN	Reserved

RS-232 Connection Instructions



RS-232 Connection Instructions



4. Network Function Settings

4.1 Web System Requirements

4.1.1 Web Browser:

- Internet Explorer 11 or above
- FireFox 66.0.3 or above
- Chrome 73 or above
- Edge 42.17134 or above
- Safari 12.1 or above

4.2 Connecting Camera to Network

4.2.1 Connecting to Internet

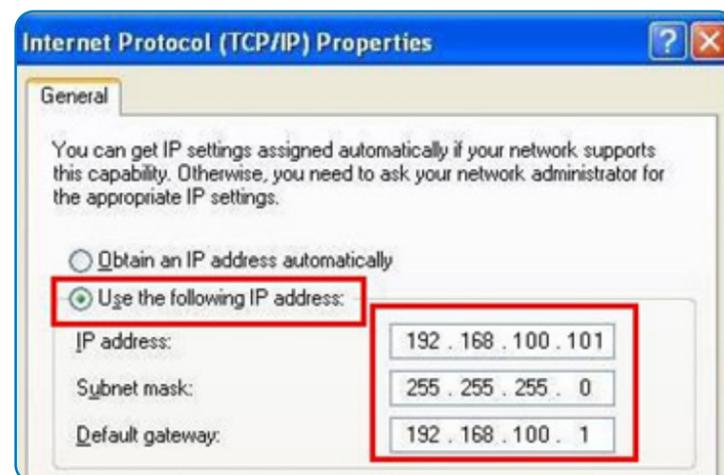
Two common connection methods are shown below

1. Connecting via switch or router



2. If the camera is connected to the computer directly, the computer IP address must be modified to have the same network segment as the camera
For example, the factory-preset default IP address of CV420-30X is 192.168.100.100. The computer IP address must be set with the same subnet, such as 192.168.100.101, so that the computer can be connected correctly with the camera

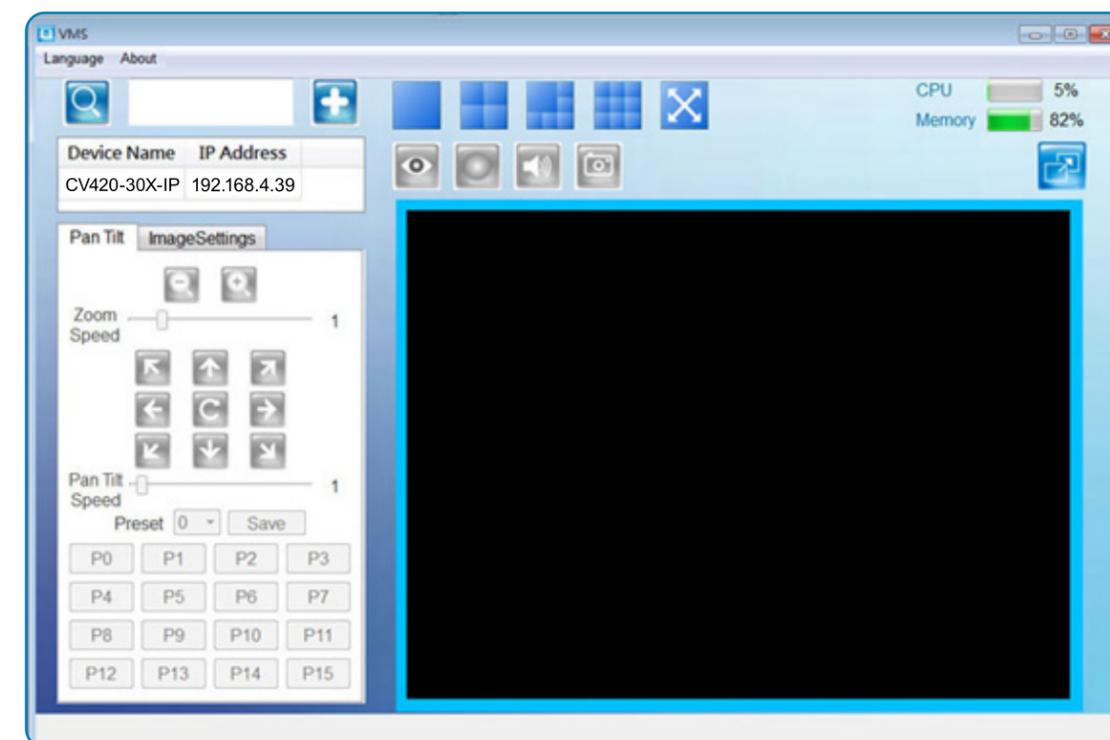
- Connection Diagram
- Change network settings



4.2.2 Using Marshall VMS Software to View the Images

- The CV420-30X DHCP initial setting is ON. If it is connected to the local area network (LAN), the camera IP can be retrieved via the following methods
- Install Marshall VMS software (Please download from the Marshall official website, www.marshall-usa.com)
 - Open Marshall VMS software
 - Search for the camera: Press [automatically search for the device] button to locate the CV420-30X camera
 - Click CV420-30X in the list and start operation after connecting to network

Note: When using automatic search, the camera and computer must be in the same network segment, e.g.: 192.168.4.X



Suggested minimum system requirement for HEVC 4K60 IP Streaming:

- Windows 10
- CPU: Intel i5 (7th gen and above)
- GPU: intel (7th gen and above) or Nvidia GTX 1050 and above
- Memory: 8GB(64-bits) RAM
- Ethernet : Gigabyte
- 1GB Free Disk Space

4.2.3 Using the Browser to View the Images

- Open the browser, and enter the URL of CV420-30X in the IP address bar
e.g.: http://192.168.100.100 (default IP address)
- Enter administrator’s account and password
Account: admin (Default)
Password: 9999 (Default)



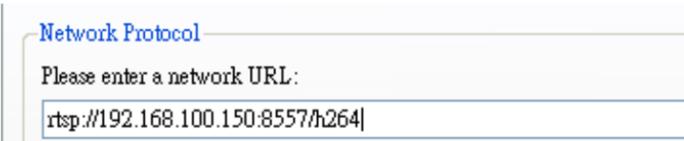
4.2.4 Using RTSP Player to View the Images

Besides the browser and VMS, other free software also can be used for RTSP connection, such as VLC, Quick Time, PotPlayer, and other free software

RTSP connection address formats are as follows:

- RTSP Main Streaming => rtsp://camera IP:8554/hevc
- RTSP Sub1 Streaming => rtsp://camera IP:8557/h264
- RTSP Sub2 Streaming => rtsp://camera IP:8556/h264

Example: Open VLC software and input the URL: rtsp://192.168.100.150:8557/h264



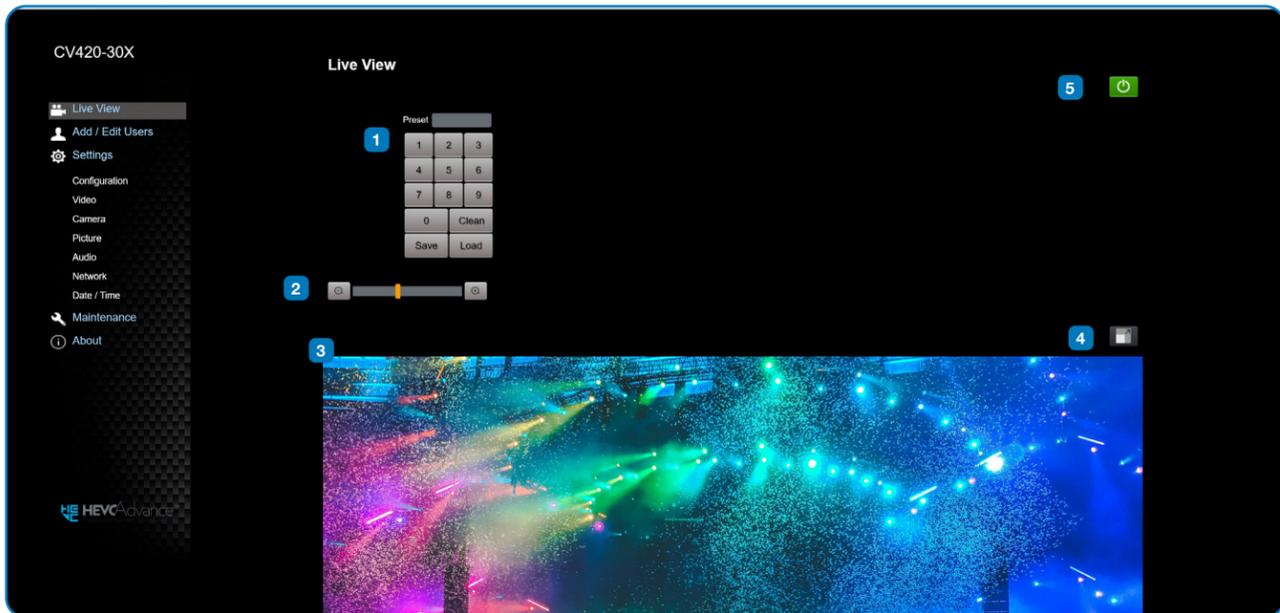
4.3 Web Page Function Description

4.3.1 Login Screen



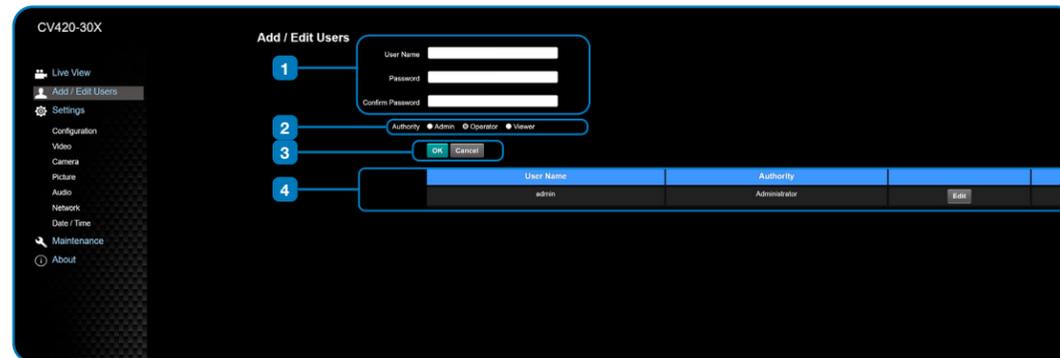
No.	Item.	Function Descriptions
1	Username	Enter user account name (default: admin)
2	Password	Enter user password (default: 9999)
3	Language selection	The system currently supports English, Traditional Chinese, and Simplified Chinese
4	Remember password	Saves user account name and password to the browser.
5	Login	Log into the administrator screen on the website

4.3.2 Viewing In Real Time



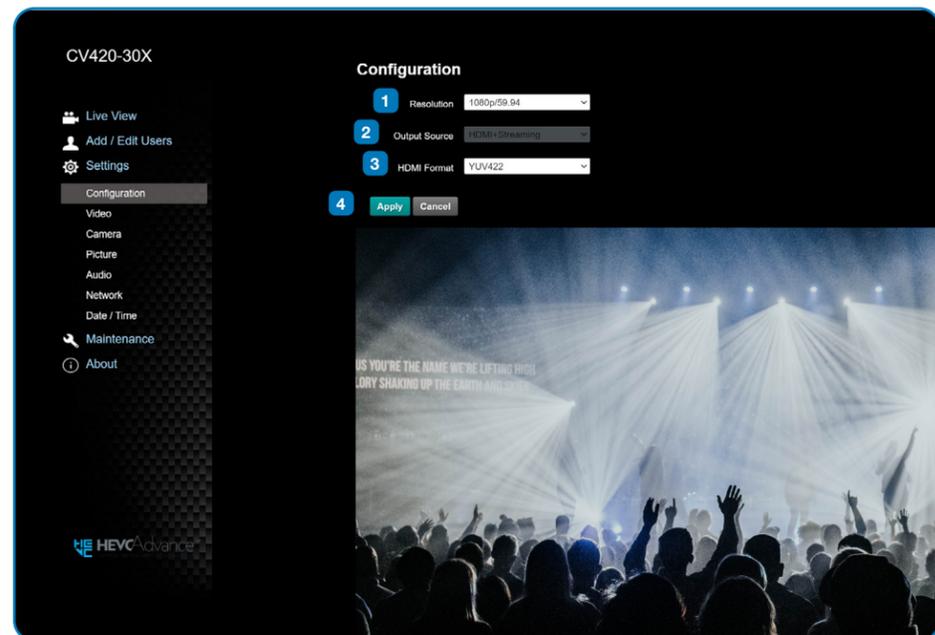
No.	Item.	Function Descriptions
1	Preset setting	Select the number first and then select SAVE or LOAD
2	Zoom ratio	Adjust the zoom-in or zoom-out ratio via scroll bar
3	Preview window	Display the screen currently captured by the camera
4	Switch to Full Screen	Switch the preview window to full screen
5	Power button	Turn on or turn off the camera power

4.3.3 Account Management



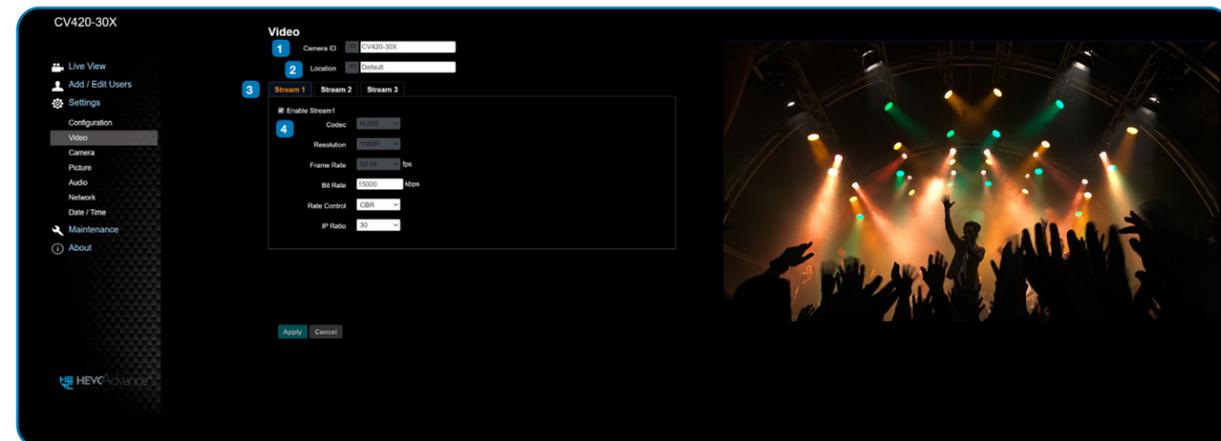
No.	Item.	Function Descriptions																
1	Add user account	Enter a username and password to add a new user																
2	Permission setting	Set the new account management permissions <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>User Type</th> <th>Admin</th> <th>Operator</th> <th>Viewer</th> </tr> </thead> <tbody> <tr> <td>View images</td> <td>Y</td> <td>Y</td> <td>Y</td> </tr> <tr> <td>Settings</td> <td>Y</td> <td>Y</td> <td>N</td> </tr> <tr> <td>Account management</td> <td>Y</td> <td>N</td> <td>N</td> </tr> </tbody> </table>	User Type	Admin	Operator	Viewer	View images	Y	Y	Y	Settings	Y	Y	N	Account management	Y	N	N
User Type	Admin	Operator	Viewer															
View images	Y	Y	Y															
Settings	Y	Y	N															
Account management	Y	N	N															
3	Applying setting	Add the newly created user to the account list																
4	List of accounts	Edit: Modify the user password and permissions																

4.3.4 System Configurations



No.	Item.	Function Descriptions																			
1	Resolution	Set the resolution of the camera. Resolutions supported by the camera are as follows: 3840x2160P 59.94/50/29.97 fps 1080P 59.94/50/29.97/25 fps 1080i 59.94/50 720P 59.94/50/29.97/25 fps After switching to the resolution, the camera will restart. Please refresh the browser																			
2	Output signal	According to the output resolution, selections are available for HDMI output, streaming output, or HDMI + streaming output. For output signals supported by different resolution, please refer to the following table: <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th>Resolution</th> <th>Available output modes</th> </tr> </thead> <tbody> <tr> <td>3840x2160/59.94p</td> <td>HDMI or streaming single output</td> </tr> <tr> <td>3840x2160/50p</td> <td>HDMI or streaming single output</td> </tr> <tr> <td>3840x2160/29.97p</td> <td rowspan="8">Simultaneous HDMI and streaming outputs</td> </tr> <tr> <td>3840x2160/25p</td> </tr> <tr> <td>1080p/59.94</td> </tr> <tr> <td>1080p/50</td> </tr> <tr> <td>1080p/29.97</td> </tr> <tr> <td>1080p/25</td> </tr> <tr> <td>720p/59.94</td> </tr> <tr> <td>720p/50</td> </tr> <tr> <td>720p/29.97</td> <td></td> </tr> <tr> <td>720p/25</td> <td></td> </tr> </tbody> </table>	Resolution	Available output modes	3840x2160/59.94p	HDMI or streaming single output	3840x2160/50p	HDMI or streaming single output	3840x2160/29.97p	Simultaneous HDMI and streaming outputs	3840x2160/25p	1080p/59.94	1080p/50	1080p/29.97	1080p/25	720p/59.94	720p/50	720p/29.97		720p/25	
Resolution	Available output modes																				
3840x2160/59.94p	HDMI or streaming single output																				
3840x2160/50p	HDMI or streaming single output																				
3840x2160/29.97p	Simultaneous HDMI and streaming outputs																				
3840x2160/25p																					
1080p/59.94																					
1080p/50																					
1080p/29.97																					
1080p/25																					
720p/59.94																					
720p/50																					
720p/29.97																					
720p/25																					
3	HDMI YUV	Select YUV422 or YUV420, RGB (This function is only available for these two resolutions, 3840x2160/59.94p and 3840x2160/50p and remains in display mode for all other resolutions)																			
4	Apply	After the setting has been modified, select this button to apply the setting																			

4.3.5 Video Settings

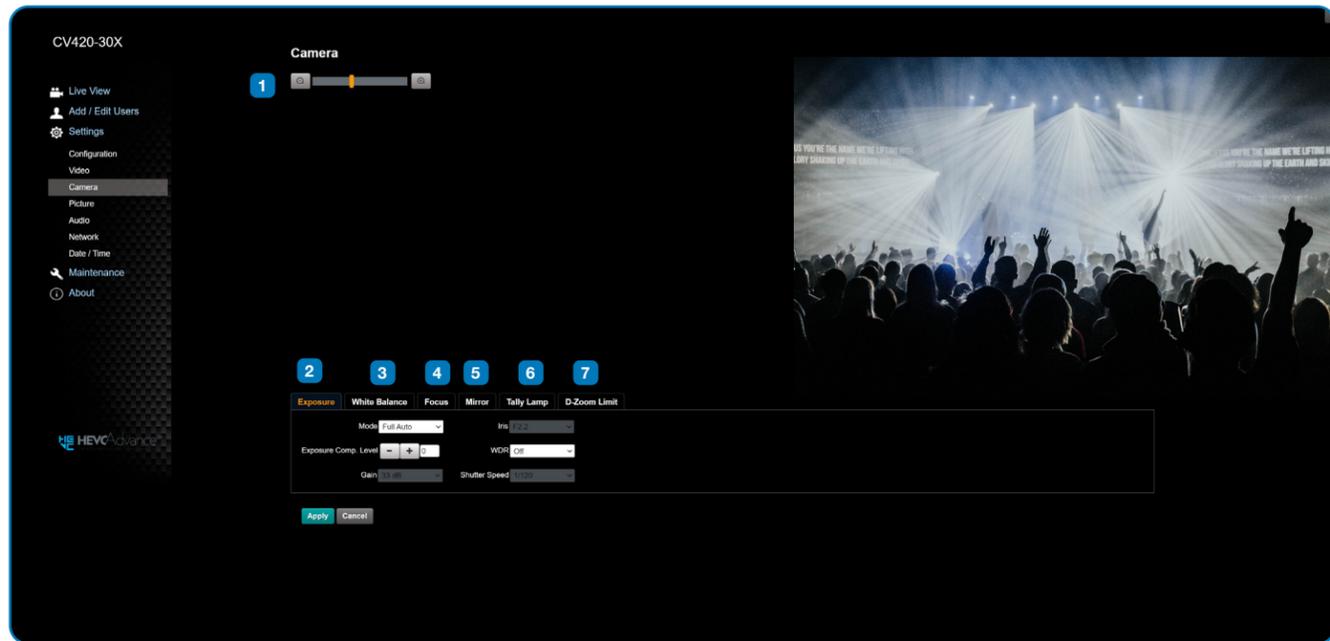


No.	Item.	Function Descriptions
1	Camera name	Modify the camera name <ul style="list-style-type: none"> Camera names are limited to 1-12 characters Please use a camera name by mixing uppercase and lowercase letters and numbers. Do not use "/" and "space" or special symbols
2	Camera location	Modify the location of the camera, such as Meeting Room 1 <ul style="list-style-type: none"> Camera locations are limited to 1-12 characters Please use a camera name by mixing uppercase and lowercase letters and numbers. Do not use "/" and "space" or special symbols
3	Streaming 1 / Streaming 2 / Streaming 3	The CV420-30X supports 3 streaming outputs. Please refer to 5.3.5.1 Streaming Parameter Setting for relevant settings
4	Open streaming	Confirm the streaming function

4.3.5.1 Streaming Parameter Setting

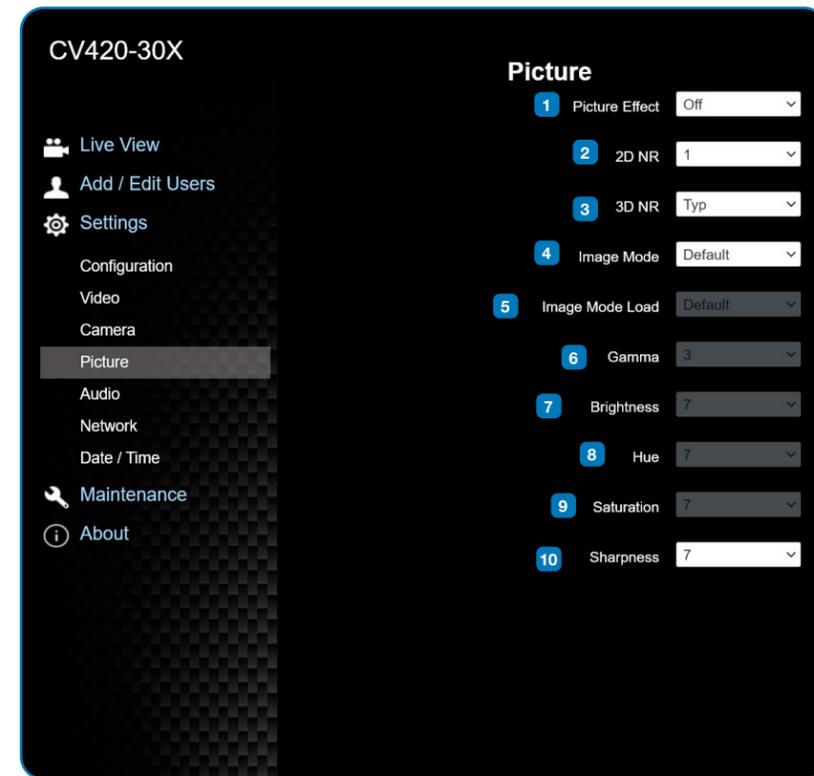
Function	Streaming 1	Streaming 2	Streaming 3	
Encode Format	H.265	H.264		
Resolution	4K /1080P / 720P	1080P / 720P	640x360	
Frame rate	Setting according to the supported resolution			
Bit Rate(kbps)	Range	2,000~20,000	2,000~20,000	512~5,000
	Factory default	15,000	7,500	1,000
Rate control	CBR / VBR			
IP ratio	Setting according to the supported resolution			

4.3.6 Camera Settings



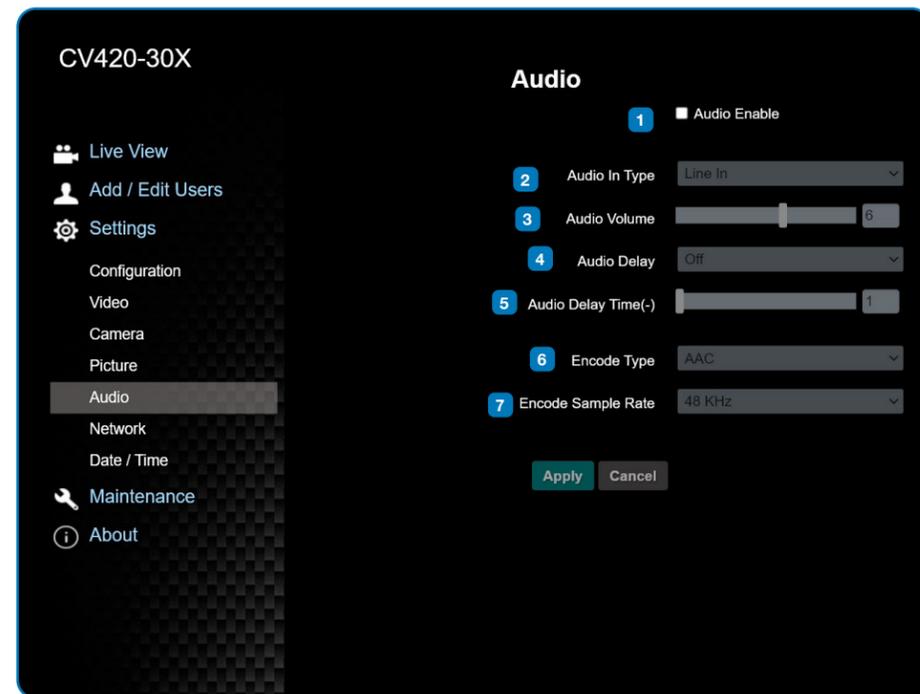
No.	Item.	Function Descriptions
1	Zoom ratio	Adjust the zoom-in or zoom-out ratio via scroll bar
2	Exposure	<ul style="list-style-type: none"> Mode: Select exposure mode (Automatic/Shutter Priority/Aperture Priority/Manual) Exposure Comp. Level: Select exposure compensation level Gain: The gain limit is adjustable when the exposure mode is set to "Manual" Iris: The size of aperture is adjustable when the exposure mode is set to "Manual" or "Aperture Priority" WDR: Set the level of wide dynamic range (WDR) in order to obtain better images in dynamic lighting environments. Shutter Speed: The shutter speed is adjustable when the exposure mode is set to "Manual" or "Shutter Priority"
3	White balance	<ul style="list-style-type: none"> Mode: Select the color temperature mode <ul style="list-style-type: none"> Auto Indoor Outdoor One Push WB ATW Manual Sodium Lamp Open Push Trigger: One push color temperature is adjustable when the white balance mode is set to "One Push Trigger" Manual Red/Blue: Manually adjust blue/red color temperature
4	Focus	<ul style="list-style-type: none"> Mode: Select manual/automatic focus Focus Range: The focusing range is adjustable when the focus mode is set to "Manual" AF Sensitivity: Set automatic focus sensitivity AF Frame: Set automatic focus range Preset AF:
5	Mirror	<ul style="list-style-type: none"> Mirror: Set automatic flip mode
6	Tally Lamp	Enable / Disable
7	D-Zoom Limit	1X-12X

4.3.7 Picture Settings



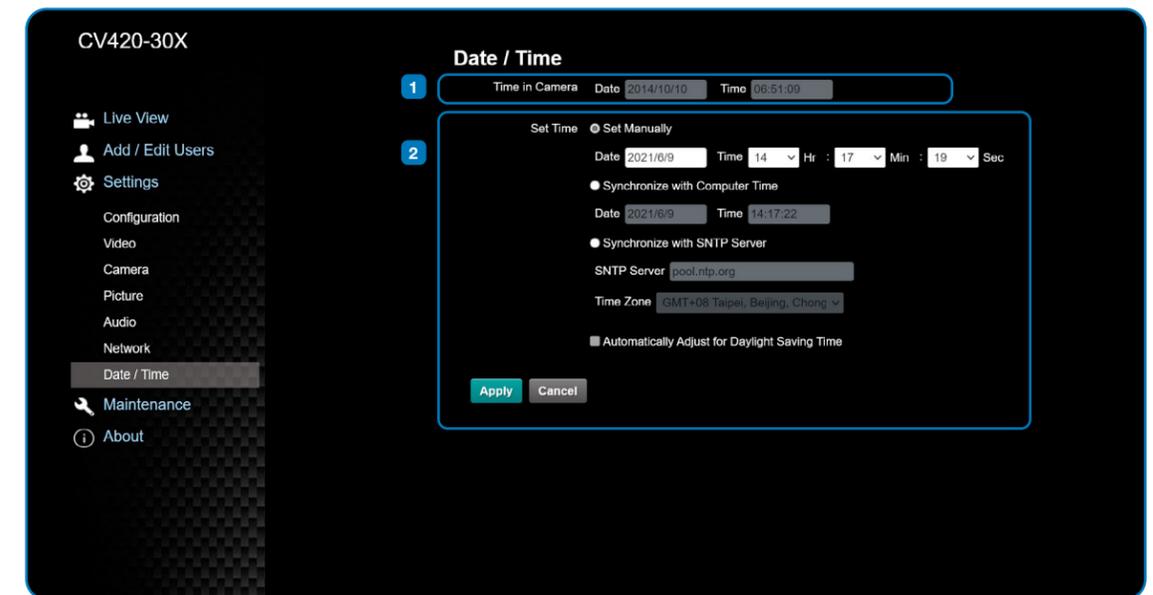
No	Item	Function Descriptions
1	Picture effect	Set picture effect, Off / Film / Black and White
2	2D noise reduction settings	<ul style="list-style-type: none"> 2D noise reduction settings
3	3D noise reduction settings	<ul style="list-style-type: none"> 3D noise reduction settings
4	Image mode	<ul style="list-style-type: none"> The user may customize his/her desired image mode
5	Image mode load	<ul style="list-style-type: none"> When no custom setting is needed, reset the picture parameters back to the factory default by selecting this item
6	Gamma	<ul style="list-style-type: none"> Gamma Level adjustment; Adjustable when the image mode is set to Custom
7	Brightness	<ul style="list-style-type: none"> Brightness adjustment; Adjustable when the image mode is set to Custom
8	Hue	
9	Saturation	<ul style="list-style-type: none"> Saturation adjustment; Adjustable when the image mode is set to Custom
10	Sharpness	<ul style="list-style-type: none"> Adjust the sharpness of the image

4.3.8 Camera Settings



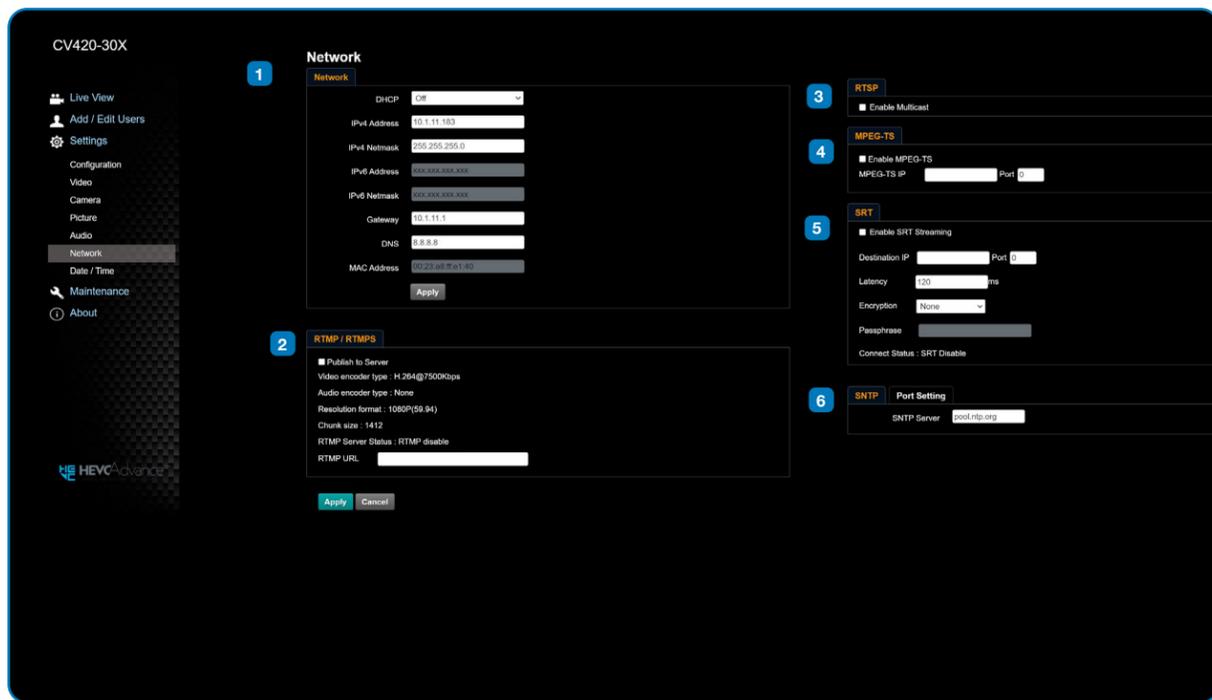
No.	Item.	Function Descriptions
1	Open audio	Enable / Disable
2	Audio In Type	MIC In / Line In
3	Audio Volume	0-10
4	Audio Delay	On / Off
5	Audio Delay Time	1-500
6	Encode Type	AAC:48/44.1/16 G.711 16/8
7	Encode Sample Rate	Encode Sample Rate Selection

4.3.9 Time Settings



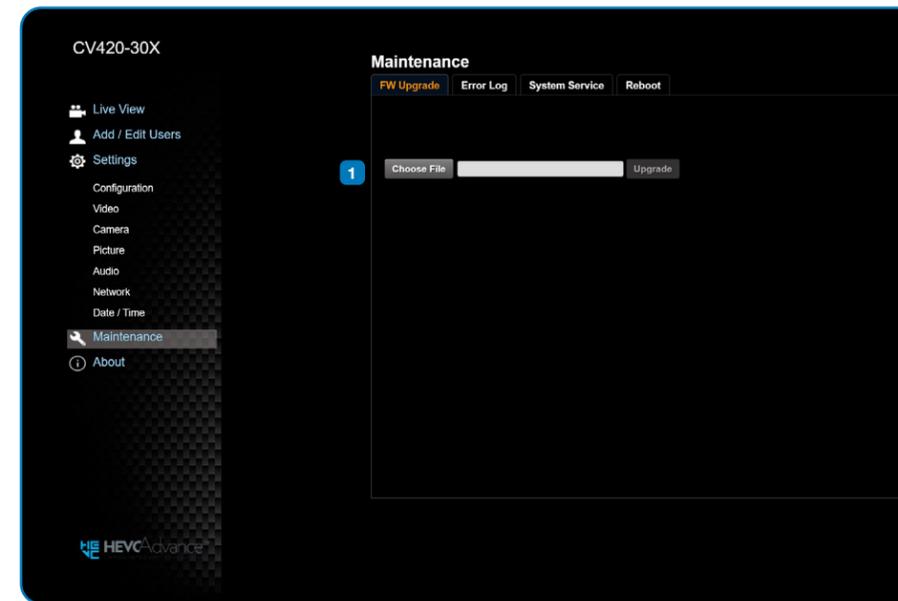
No.	Item.	Function Descriptions
1	Camera Time	Display the date and time of the camera
2	Set the Time	<ul style="list-style-type: none"> Set Manually: Set time manually Synchronize with computer time: Set the camera time according to the computer time Synchronize with SNTP server: Set the camera time synchronously with the SNTP server <p><Remark> SNTP server address: Please change in network setting</p>

4.3.10 Network Settings



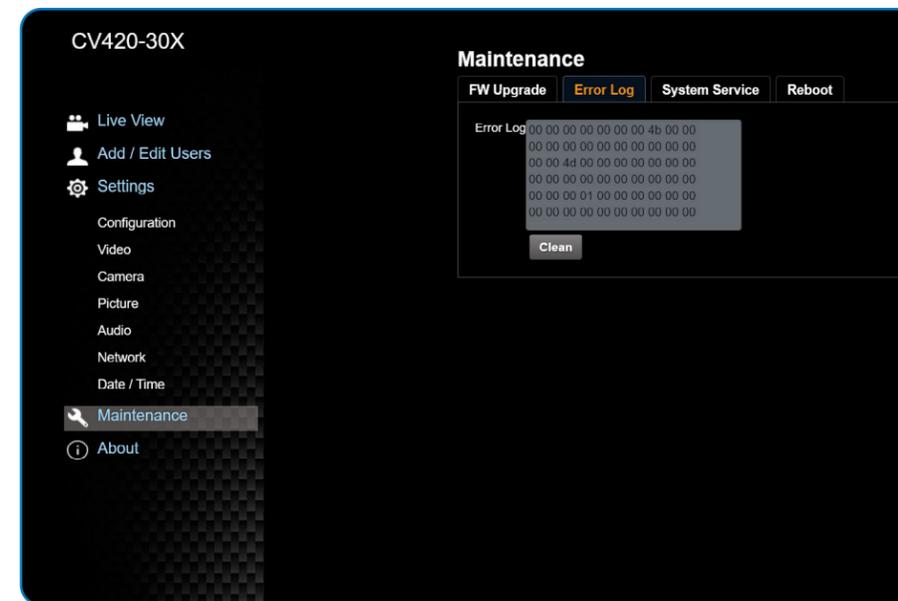
No.	Item.	Function Descriptions
1	Network	Network setting of camera. Change of setting is available only when DHCP function is closed.
2	RTMP/RTMPS Setting	Copy the RTMP web address provided by the RTMP service platform and paste it to the RTMP connection address to publish the camera images on the RTMP service platform.
3	RTSP Setting	To upload to YouTube for live streaming, the audio function must be turned on first.
4	MPEG-TS Setting	Set MPEG-TS format <Remark> The following port has been used by the camera. Setting of the port may not connect correctly. 8554, 8556, 8557, 8080, 80, 81, 9090, 23
5	SRT Setting	<ol style="list-style-type: none"> Set the field of SRT and then check the item to open SRT streaming. After the SRT streaming is opened, it will be connected automatically upon startup. The port number must be set in the range above 1024 with a maximum value of 9999. The following port has been used by the camera. Setting of the port may not connect correctly. 8554, 8555, 8556, 8557, 8080, 9090, 19353. Delay time is for 20 to 8000 microseconds. The default value is 120 microseconds.
6	SNTP Setting	Set SNTP Server IP

4.3.11 Maintenance and Updating Firmware



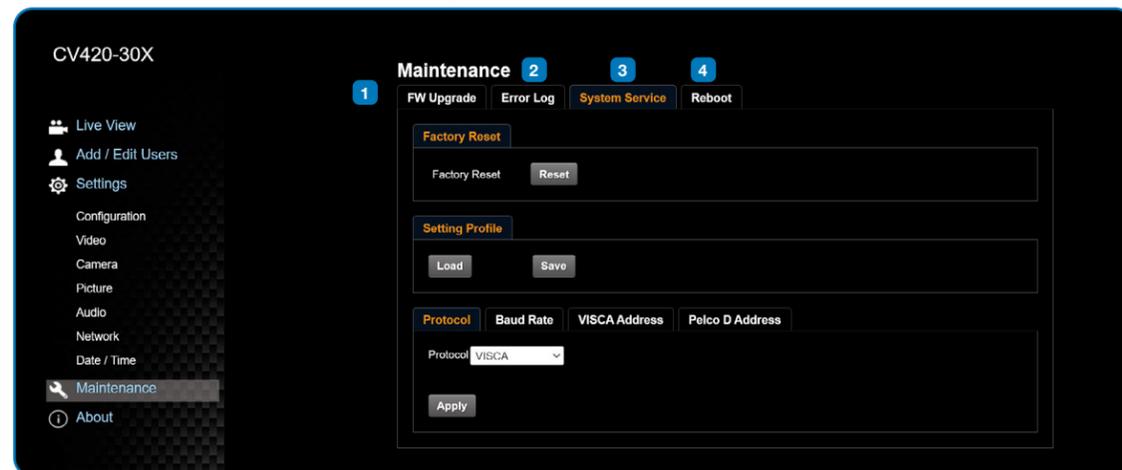
No.	Item.	Function Descriptions
1	Firmware Update	The camera firmware may be upgraded via web page. For the upgrade method, please download the FW upgrade manual from Marshall website.

4.3.12 Incident/Error Logs



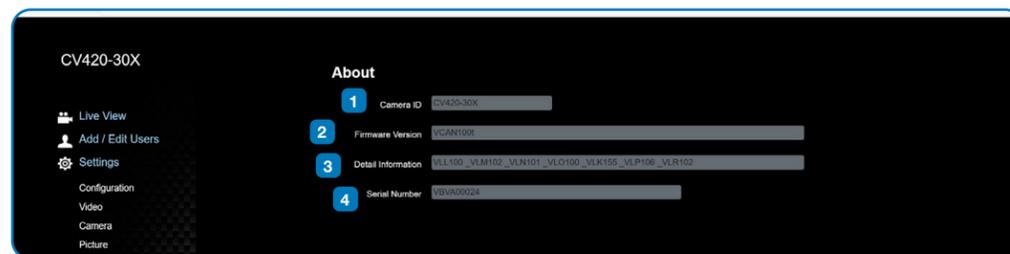
No.	Item.	Function Descriptions
1	Event Logs	If the camera encounters errors, an error code log will be established.

4.3.13 Additional Maintenance Settings



No.	Item.	Function Descriptions	
1	FW Upgrade	The camera firmware can be upgraded via webpage. For the upgrade method, please download the FW upgrade manual from Marshall website.	
2	Error Log	If the camera encounters errors, an error code log will be established	
3	System Service	Factory Reset	Select the reset button to resume the factory default setting as the webpage setting
		Setting Profile	The web page setting parameters can be exported from the computer and imported/applied to another camera
		Protocol	VISA/Pelco
		Baud Rate	Set the camera Baud Rate for the use of connecting RS-232 communication
		VISA Address	VISCA Address 1-7
	Pelco D Address	Pelco D Address 1-255	
4	Reboot	Camera Reboot	

4.3.14 About



No.	Item.	Function Descriptions
1	Camera ID	Display the camera name
2	Firmware Version	Display the firmware version of the camera
3	Detail information	Display the camera firmware details
4	Serial Number	Display the camera serial No.

6. Troubleshooting

This chapter describes problems you may encounter while using CV420-30X. If you have questions, please refer to related chapters and follow all the suggested solutions. If the problem remains, please contact your distributor or the service center.

No.	Problem	Solution
1	Boot without power signal	<ol style="list-style-type: none"> 1. Make sure you have plugged in the power cord. 2. When using a PoE connection, ensure that the power supply supports IEEE 802.3af hubs
2	There is no image output from CV420-30X	<ol style="list-style-type: none"> 1. Check the power supply or PoE supply functions. 2. Confirm the output signals are in streaming output. 3. If the camera is connected to a monitor, confirm the monitor equipment supports 4K output 4. Replace the cables and make sure they are not faulty.
3	CV420-30X image is severely delayed	Please use 4K, 1080p or 720p 60/50 Hz signals rather than 25/30 Hz signals.
4	RS-232 cannot be controlled	<ol style="list-style-type: none"> 1. Confirm the connection is correct (RS-232 Input / Output). 2. Please make sure the Baud rate setting is the same as the control equipment.
5	Whether the Internet can be used for operation	Please refer to Chapter 5 Network Function Description for the Internet usage or call marshall tech support.

Warranty

For Warranty information please refer to Marshall website page:

<https://marshall-usa.com/company/warranty.php>

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