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CV420-27X

Compact 4K60 27X Zoom Camera
12GSDI, HDMI, and IP (HEVC)

User Manual

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Table of Contents

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 multioutput 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:

• f 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.

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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 userserviceable 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 numerique respecte les limites de bruits radioelectriques applicables aux appareils numeriques de Classe B prescrites dans la norme sur le material brouilleur: "Appareils Numeriques, " NMB-003 edictee par l'Industrie.
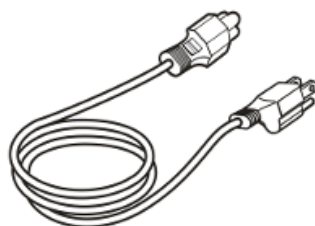
■ EN55032 (CE Radiation) Warning

Operation of this equipment in a residential environment could cause radio interference.
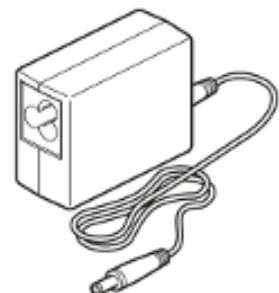
Chapter 1: Package Contents

Camera	Power Adapter	Power Cord

Appearance may vary depending on country/ region

Chapter 2: Function Introduction

2.1: I/O Function 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. Supports 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	Reset	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
13	Tripod Screw Holes	¼", 20 UNC tripod deck

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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:
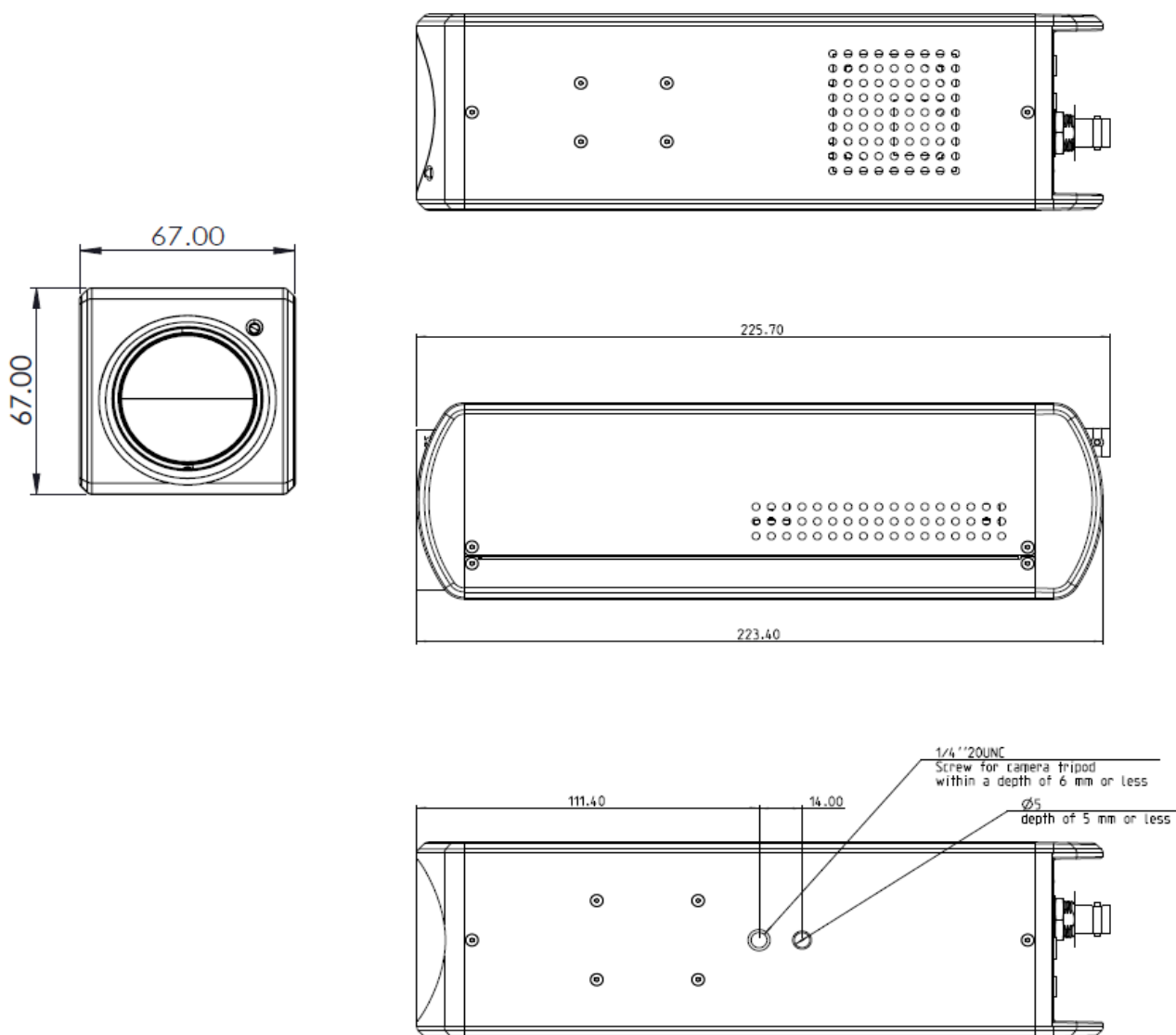Tally Mode: 8x 01 7E 01 0A 01 0p FF

p = 0: OFF

p = 4: On (half-brightness)

p = 5: On (full-brightness)
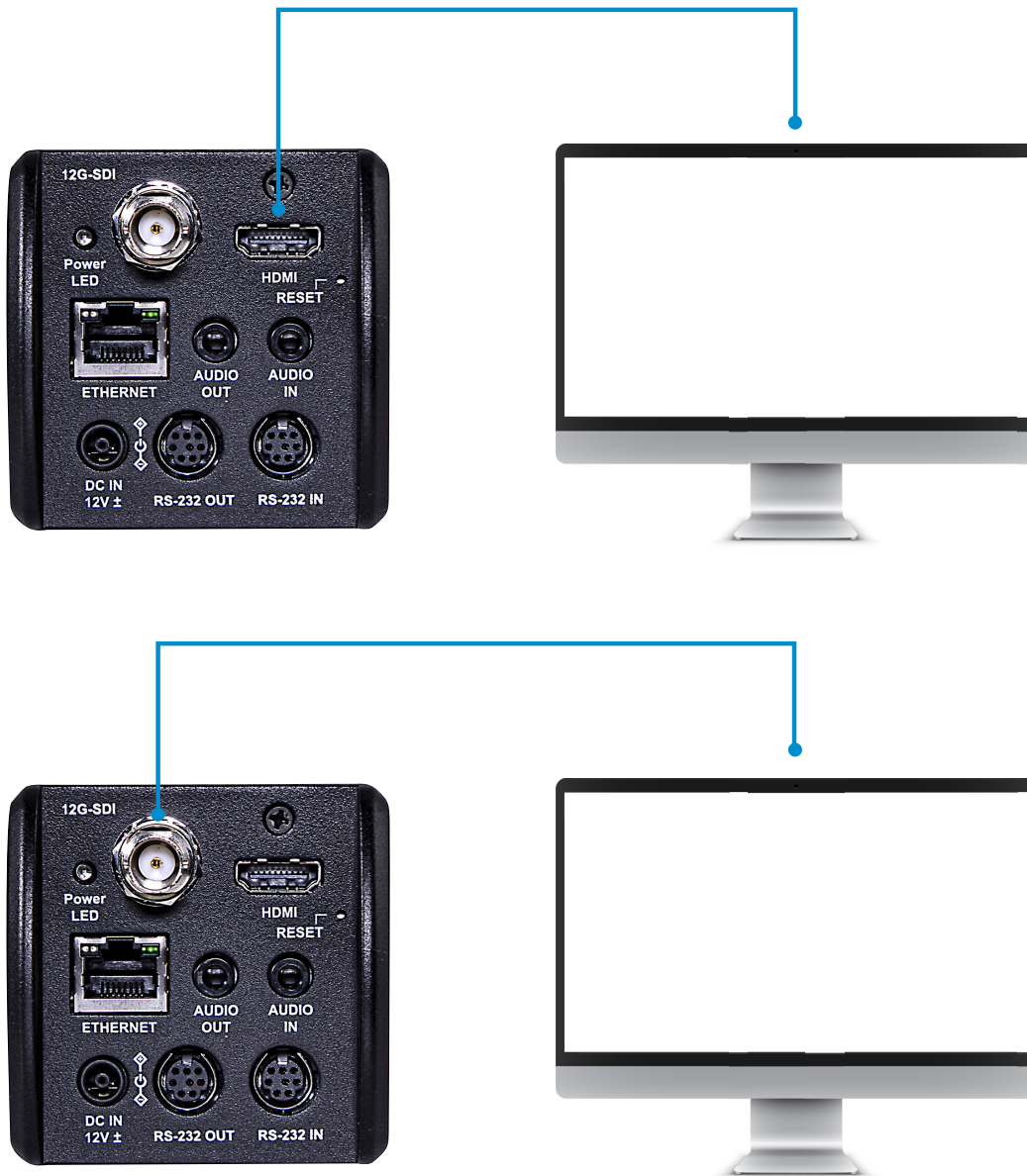
Chapter 3: Installation Instructions

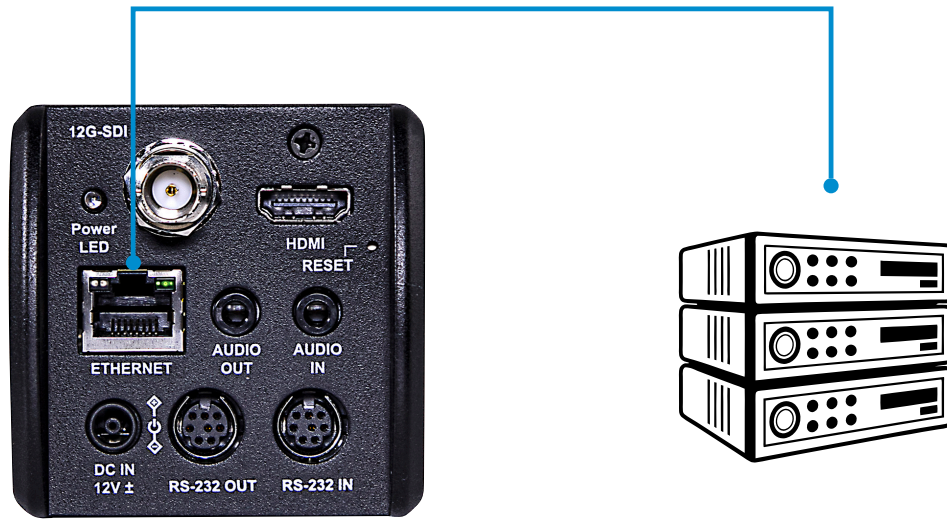### 3.1 Installation Basics
3.1.1 CV420-27X Dimensions

3.2 Connecting Devices

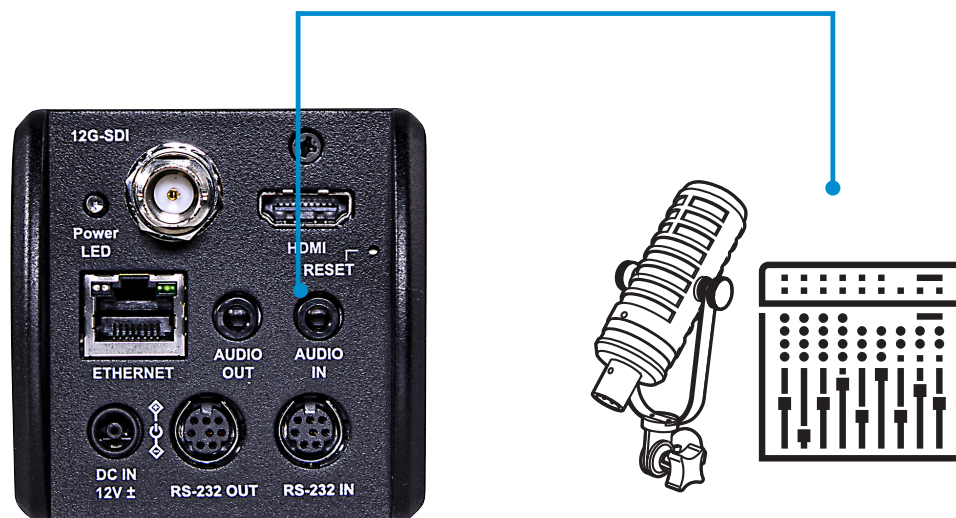### 3.2.1 SDI and HDMI connection to TV/display screen

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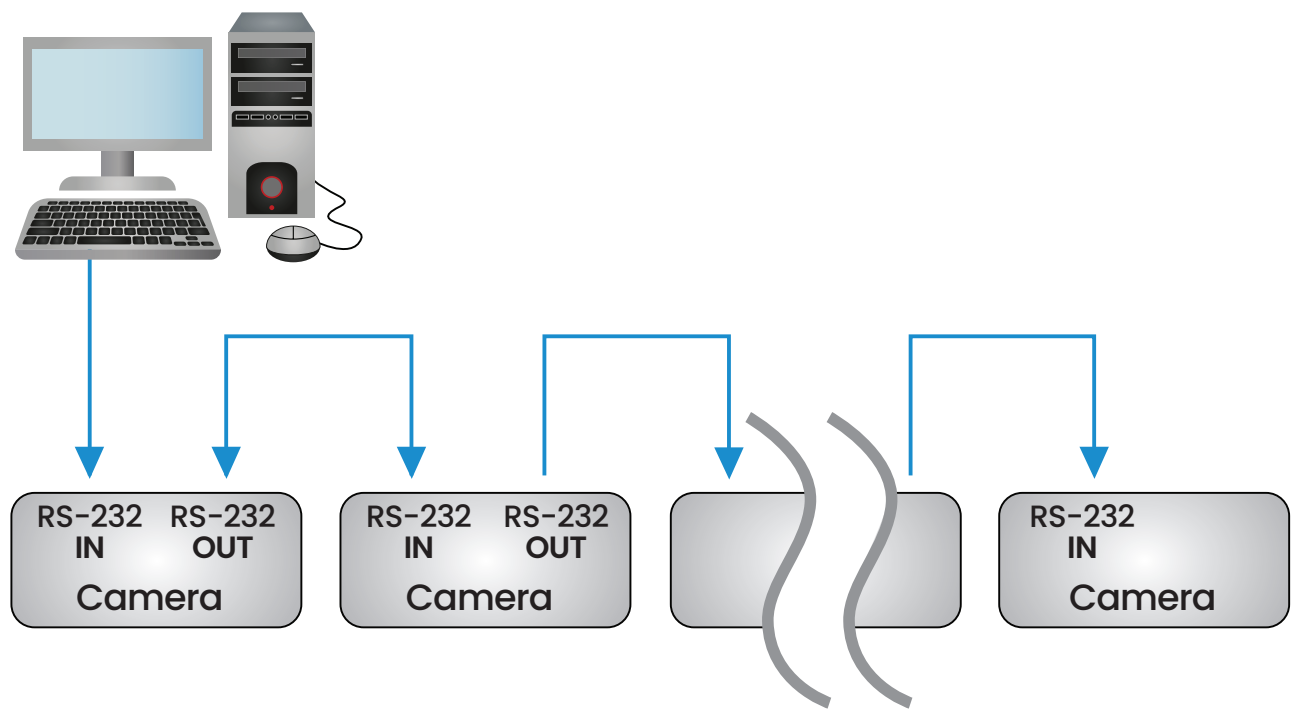### 3.2.2 Connecting to Internet

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-322

The **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).
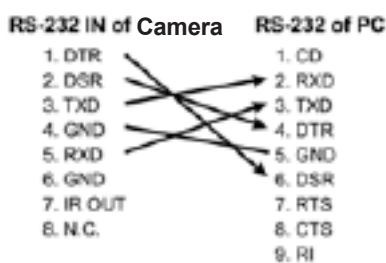

■ RS-232 pin definition description

▼ **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 IN of Camera	RS-232 of PC
1. DTR	1. CD
2. DSR	2. RXD
3. TXD	3. TXD
4. GND	4. DTR
5. RXD	5. GND
6. GND	6. DSR
7. IR OUT	7. RTS
8. N.C.	8. CTS
	9. RI

▼ **RS-232 Connection Instructions**

RS-232 IN of Next Camera	RS-232 OUT of Last Camera
1. DTR	1. DTR
2. DSR	2. DSR
3. TXD	3. TXD
4. GND	4. GND
5. RXD	5. RXD
6. GND	6. GND
7. IR OUT	7. OPEN
8. N.C.	8. OPEN

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Chapter 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

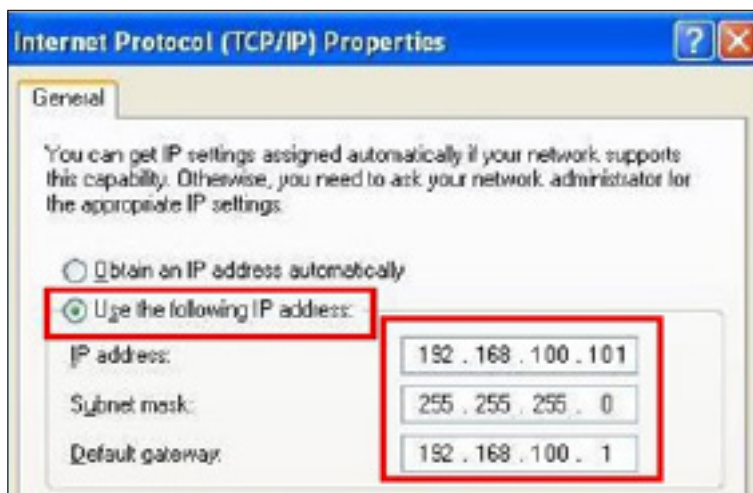### 4.2   Connecting Camera to Network

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 CV420-27X 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
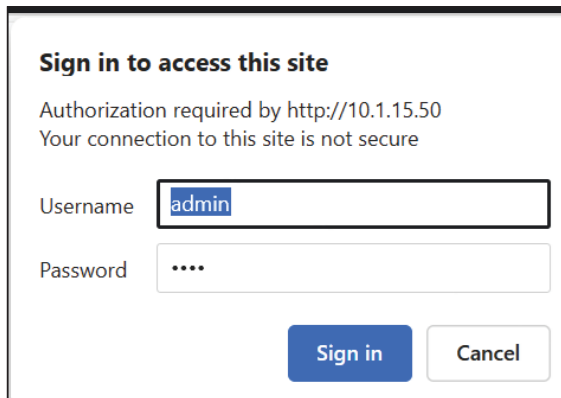
- Connection Diagram
- Change network settings

4.2.2 Using the Browser to View the Images

- Open the browser, and enter the IP address of the camera in the address bar
  e.g.: http://192.168.100.100 (default IP address)

- Enter the Username and Password

For the first time login, please refer to **5.2.11 System-User** to change the default password

Sign in to access this site

Authorization required by http://10.1.15.50
Your connection to this site is not secure

Username admin

Password ••••

[Sign in] [Cancel]

Account: admin
Password: 9999

4.2.3 Using RTSP Player to View the Images

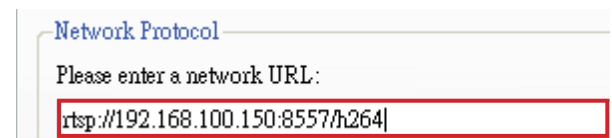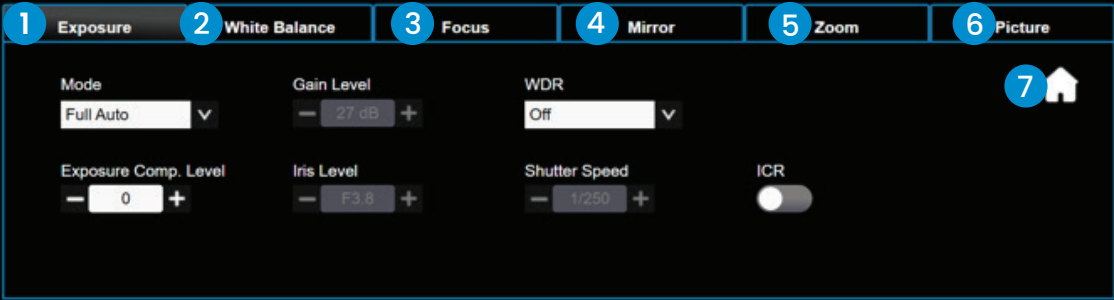Free software can be used for RTSP connections, such as VLC, Quick Time and PotPlayer.

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

If password authentication is enabled, the RTSP connection address is as follows:

- rtsp://Username:Password@IP address:8557/stream1(or stream2)

- To enable password authentication function, please refer to 5.2.9 System-Network

Example: Open the VLC software, click [Open Network Streaming], and enter the URL:
rtsp://192.168.100.150:8557/h264

Network Protocol

Please enter a network URL:

rtsp://192.168.100.150:8557/h264

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4.3 Web Interface Functions

4.3.1 Login

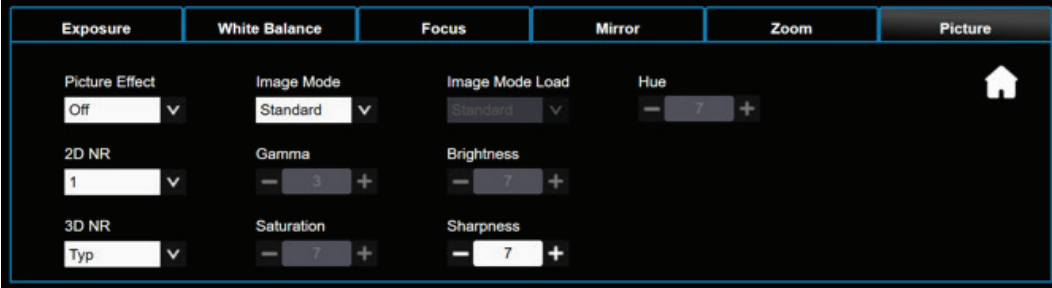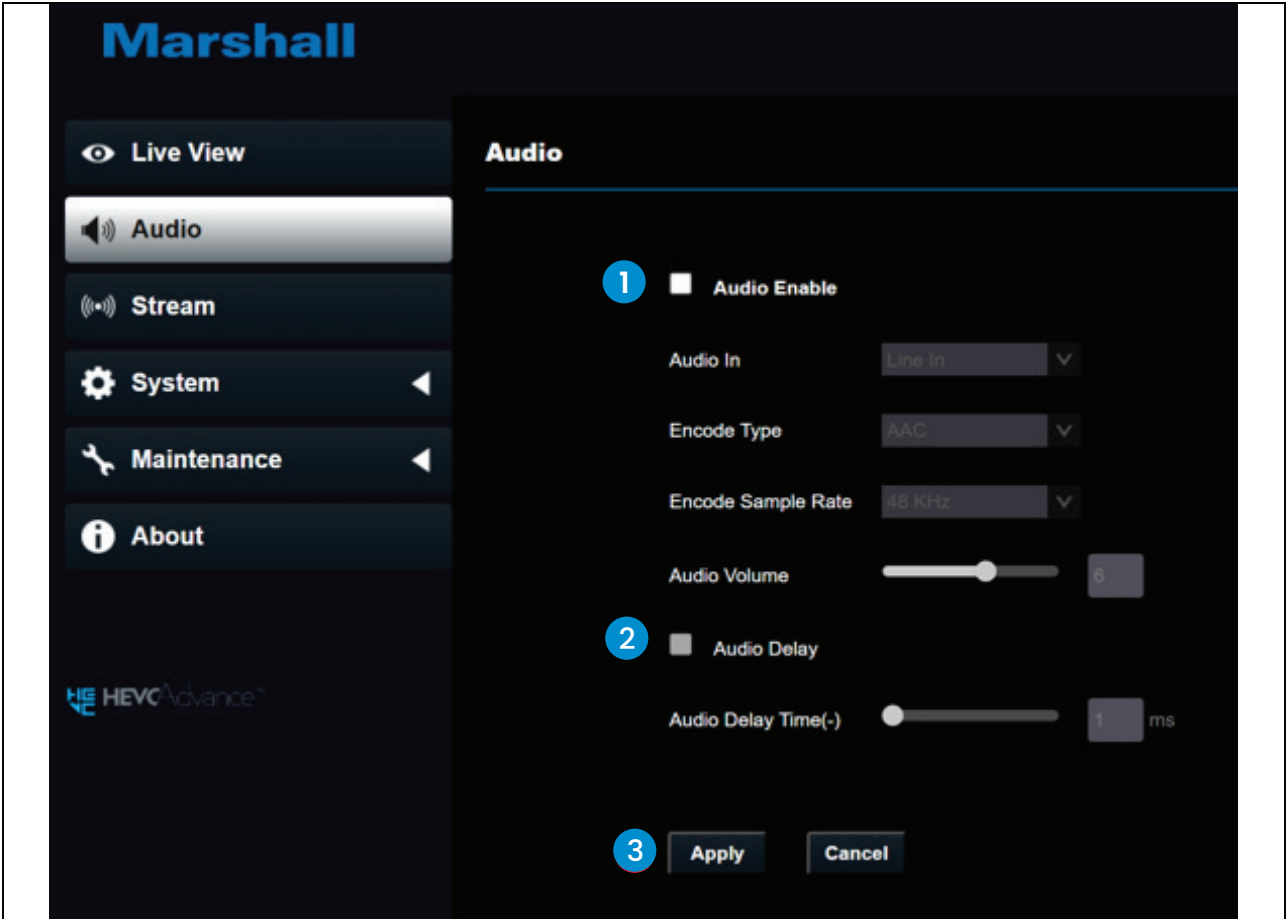| No	Item	Function Descriptions
1	Username	Enter user login account (default: admin)
2	Password	Enter user password (default: 9999) Note For the first-time login, please refer to 4.3.14 System-User to change the default password
3	Sign in	Sign in to the web interface.
5	Cancel	Cancel sign in.

4.3.2 Live View

No	Item	Function Descriptions
1	Camera ID/ Location	Display camera ID/ Location
2	Preview screen	Display the current view of the camera
3	Preset setting	Select the number first and then select Store or Load
4	AF/ MF	Switch Auto Focus/ Manual Focus.
5	Zoom	Zoom In/Zoom Out
6	Setting	Please refer to 4.3.3 Live View - Camera Setting for related settings

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4.3.3　Live View - Camera Setting

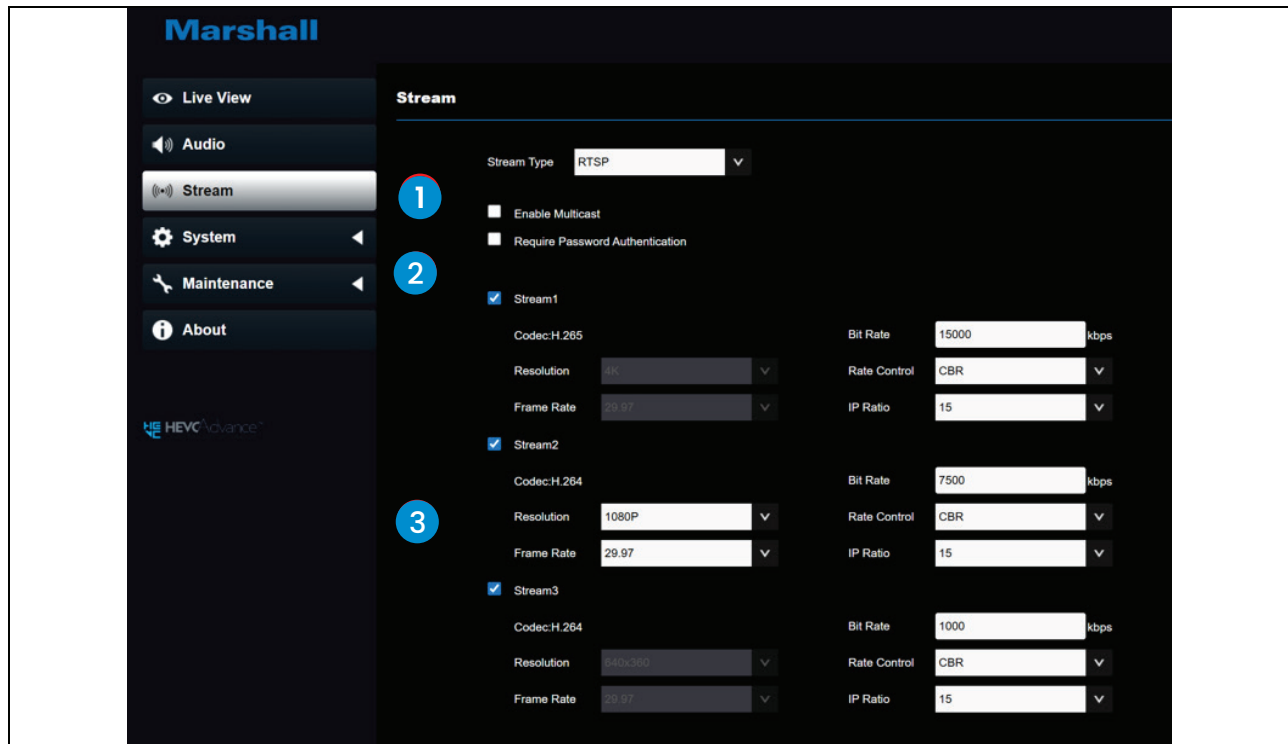| No	Item	Descriptions
1.	Exposure	■ Mode: Exposure mode (Full Auto/ Shutter Pri/ Iris Pri/ Manual/ White Board) ■ WDR: Set the level to change the dynamic range of the picture. ■ Exposure Comp. Level: Select exposure compensation level ■ Gain Level: Adjust gain level (adjustable under "Manual" mode.) ■ Iris Level: Adjust the aperture (adjustable under "Manual" or "Iris Pri" mode) ■ Shutter Speed: Adjust the shutter speed (adjustable under "Manual" or "Shutter Pri" mode) ■ ICR: set IR Cut-filter Removable on/off
2.	White Balance	 ■ Mode: Select the color temperature ■ One Push: Executes a one-time color temperature adjustment (configurable in [One Push WB] mode) ■ Manual Red/Blue: Manually adjust red/blue color temperature
3.	Focus	 ■ AF Sensitivity: change the sensitivity of the auto focus. ■ AF Frame: Changes the focusing zone to the selected mode. ■ Zoom Tracking: The focus mode during lens zooming (can be set in "Manual")
4.	Mirror	 ■ Mirror: Set image mirroring ■ Flip: Set the mode at which the image is turned

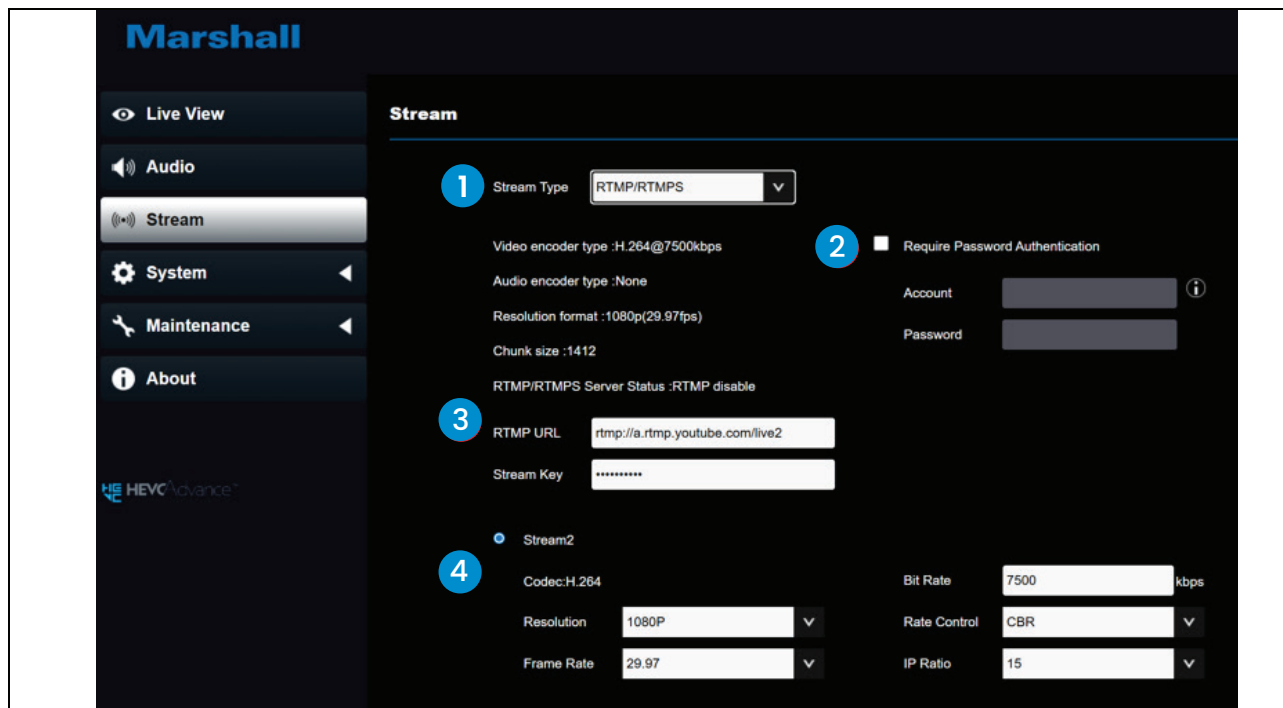| No	Item	Descriptions
5.	Zoom	■ Motionless Preset: Image will freeze when a preset is activated. Freeze will be released after Preset completed ■ D-Zoom Limit: Set the digital zoom limit Note 4K resolution does not support digital zoom
6.	Picture	■ Picture Effect: Displays the image in inverted black and white colors to assist with focusing and detail inspection. ■ 2D/3D noise reduction: 2D/3D noise reduction settings ■ Image Mode: Users can customize the image parameters. ■ Brightness: Adjustable when **Image Mode** set to **Custom** ■ Gamma: Adjustable when **Image Mode** set to **Custom** ■ Saturation: Adjustable when **Image Mode** set to **Custom** ■ Sharpness: Adjustable the sharpness level ■ Hue: Adjustable when **Image Mode** set to **Custom**
7.	Home	Go back to Control page

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4.3.4 Audio

No	Item	Descriptions
1	Audio Enable	Select to enable Audio function ▪ Audio In: Set Line In ▪ Encode type: AAC ▪ Encode sample rate: 48KHz(AAC) ▪ Volume: Adjust Audio Volume
2	Audio Delay	Check to set the audio delay time (10 ~ -500 ms)
3	Apply/ Cancel	Apply/ Cancel Audio Settings

4.3.5 Stream-RSTP

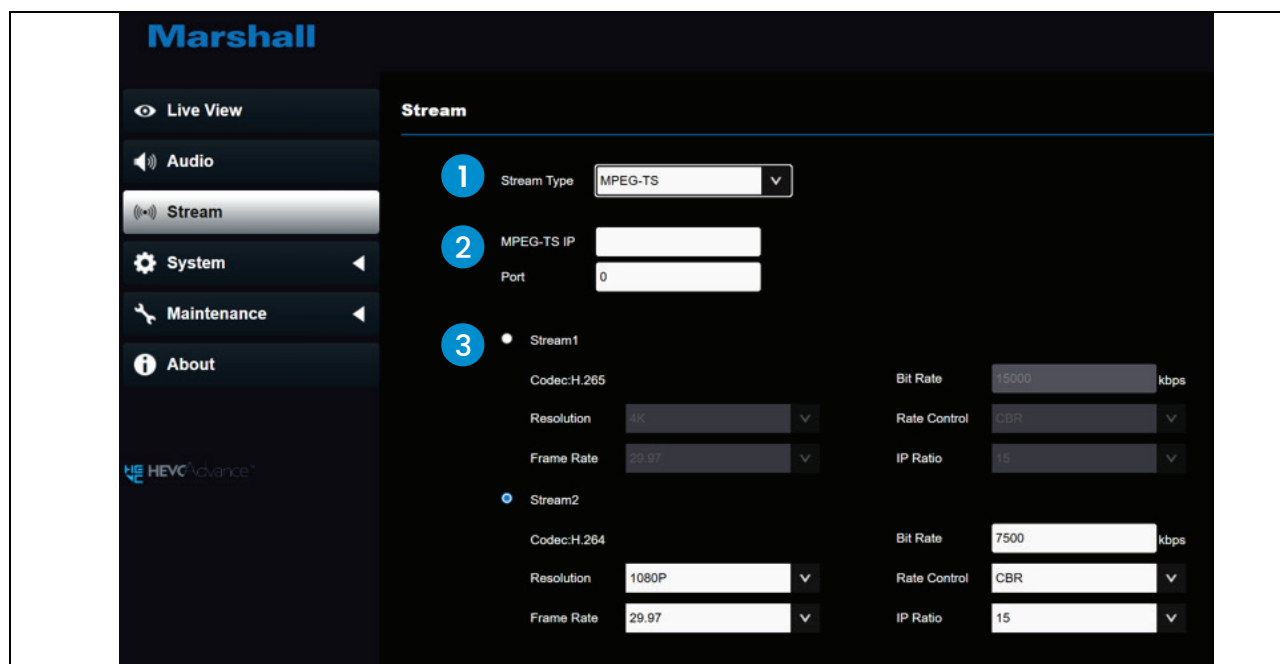| No	Item	Descriptions
1	Stream Type	Select to enable RTSP
2	Multicast / Require Password Authentication	■ Enable/ Disable Multicast Multicast is recommended when the stream is being watched by more than 4 viewers. ■ Enable/Disable Password Authentication ▶ Please refer to 5.1.3 Using RTSP Player to View the Images for the connection format. ▶ The username/ password is the same as the web login password of the camera, please refer to 5.2.11 System Settings - User to add/modify account information
3	Streaming settings	Please refer to 5.2.6.1 Stream Settings.

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4.3.6 Stream-RSTP

No	Item	Descriptions
1	Stream Type	Select to enable RTMP/RTMPS
2	Require Password Authentication	Enable/Disable Password Authentication ► Please refer to 5.1.3 Using RTSP Player to View the Images for the connection format. The username/ password is the same as the web login password of the camera, please refer to 5.2.11 System Settings - User to add/modify account information
3	RTMP/ RTMPS	Use the RTMP URL provided by the RTMP service platform to publish the camera live view to the platform. For YouTube streaming, please refer to 5.2.5 Audio to turn on the audio function
4	Stream settings	Please refer to 5.2.6.1 Stream Settings.

4.3.7 Stream-SRT

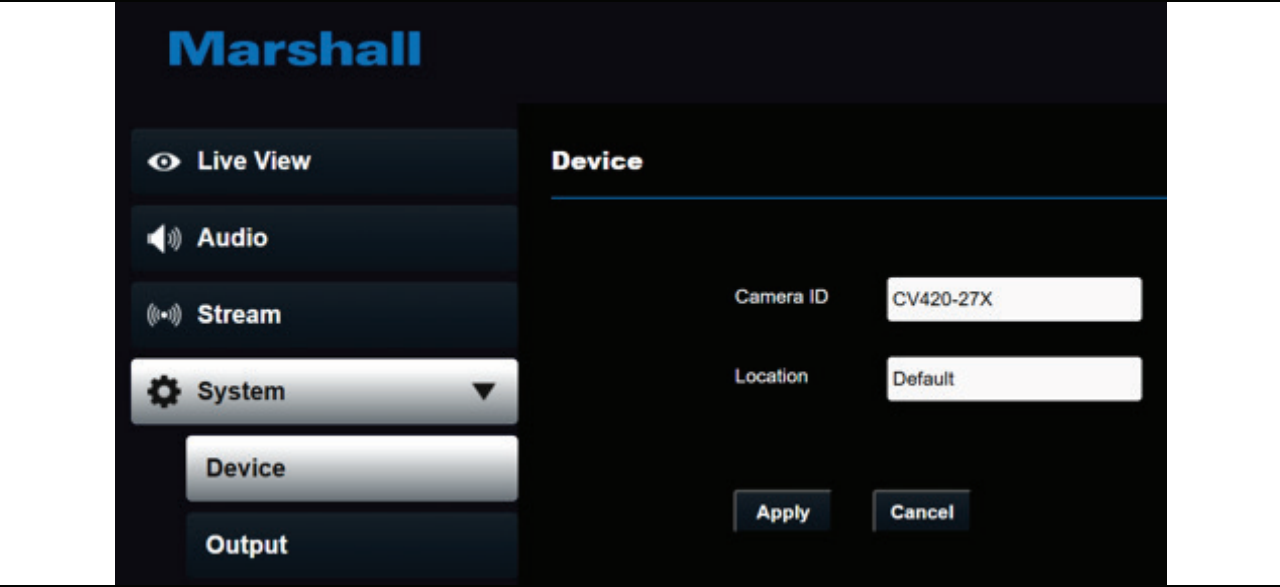| No	Item	Descriptions
1	Stream Type	Select to enable SRT
2	SRT	■ Check to enable and set SRT streaming After the SRT streaming is opened, it will be connected automatically upon camera startup. ■ The port number must be set in the range above 1024 with a maximum value of 65535 Note The following ports are used by the camera. Setting the ports may result in connection issues. 8554, 8556, 8557, 8080, 9090, 1935 Latency can be set between 20-8000 microseconds. (Default is 120 microseconds
3	Stream settings	■ Please refer to **4.3.8.1 Stream Settings**.

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4.3.8 Stream

No	Item	Descriptions
1	Stream Type	Select to enable MPEG-TS
2	MPEG-TS	Port must be set in the range above 1024 with a maximum value of 9999 Note The following port has been used by the camera. Setting of the port may not connect correctly. 8554, 8556, 8557, 8080, 9090, 1935
3	Stream settings	Please refer to 4.3.8.1 Stream Settings.

4.3.8.1 Stream-Settings

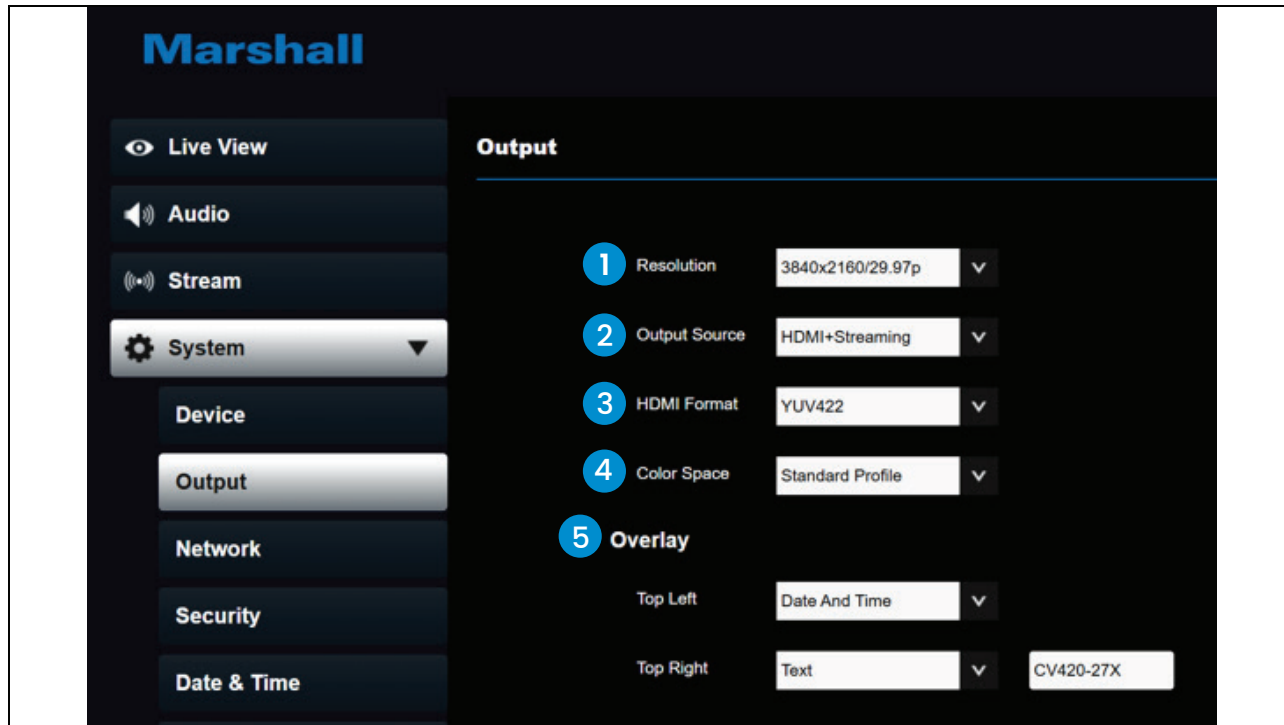| Function		Stream 1	Stream 2	Stream 3
Encode Format		HEVC/ H.264	H.264	H.264
Resolution		4K/ 1080p/ 720p	720p	640x360
Bit rate	Bit rate	2,000~20,000	2,000~20,000	512~5,000
	Default	7,000	3,000	1,000
Rate Control		CBR / VBR		
Frame Rate/ Group of Pictures		Setting according to the supported resolution		

4.3.9 System-Device

Descriptions
Edit camera ID/ Location

- Camera ID: Supporting 1 - 32 characters
- Location: Supporting 1 - 30 characters
- Supporting English, Chinese and numbers. Special symbols such as "/" and "space" cannot be used
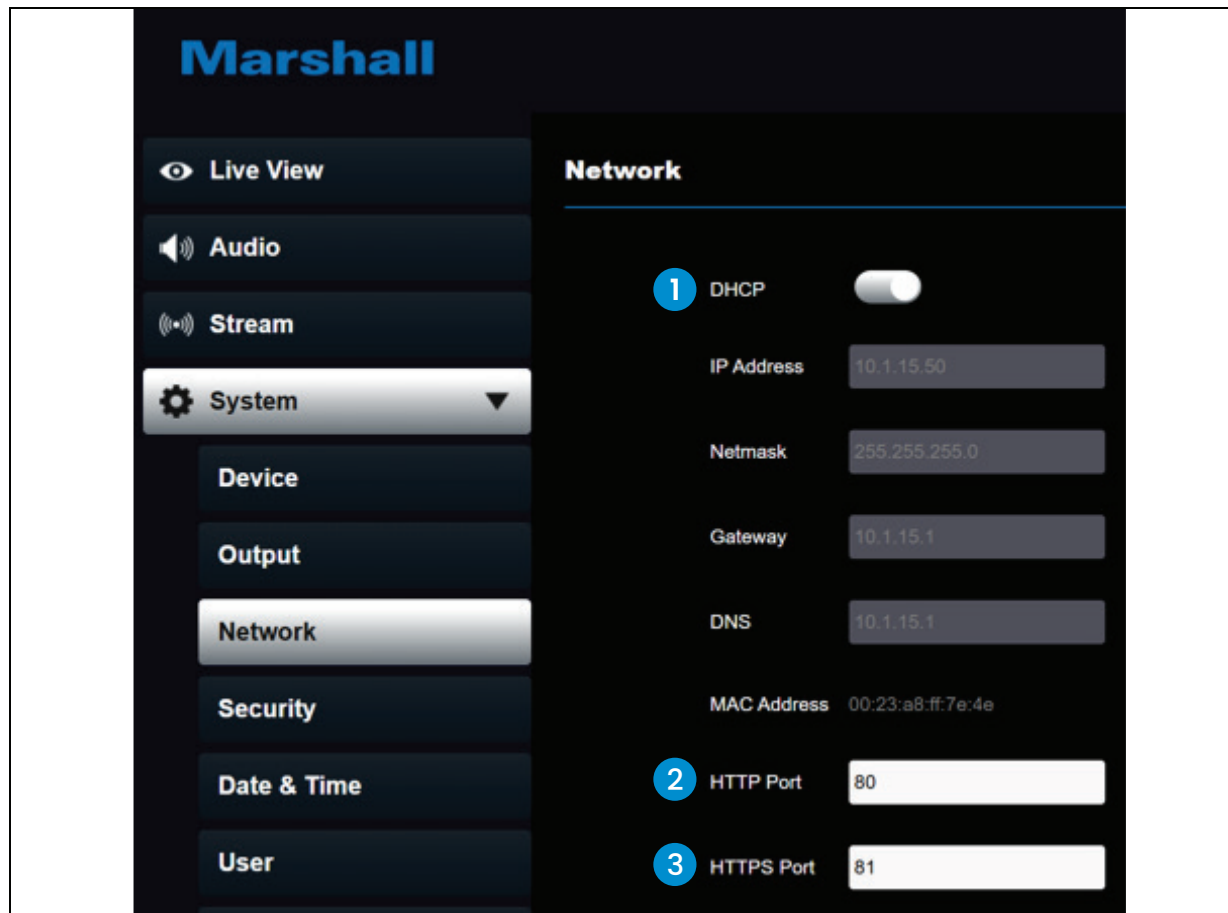
`Note` Modifying this field will also update the ONVIF device name/location.

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4.3.10 System-Output

No	Item	Descriptions
1	Resolution	Set the resolution of the camera Note After changing resolution, the camera will restart. The browser will need to be refreshed.
2	Output Source	HDMI output, streaming output, or HDMI + streaming output
3	HDMI Format	Supporting YUV422/ RGB
4	Color Space	Standard Profile / REC.709 / BT.2020
5	Overlay	The information displayed on the live view image and the monitor can be customized. The display position can be set to the left side, right side, or both 1. Date and Time: Displays the current date and time. 2. Text: Allows you to enter customized text as desired

4.3.11   System-Network

No	Item	Descriptions
1	DHCP	Camera network settings. Configurable when DHCP is set to Off.
2	HTTP Port	Set HTTP port. The default Port value is 80
3	HTTPS Port	Set HTTPS port. The default Port value is 81

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4.3.12 System-Security

Descriptions
Enable or Disable 802.1x Protocol. Settings can be configured after enabling the feature. To use this function, the router must support the 802.1x protocol.

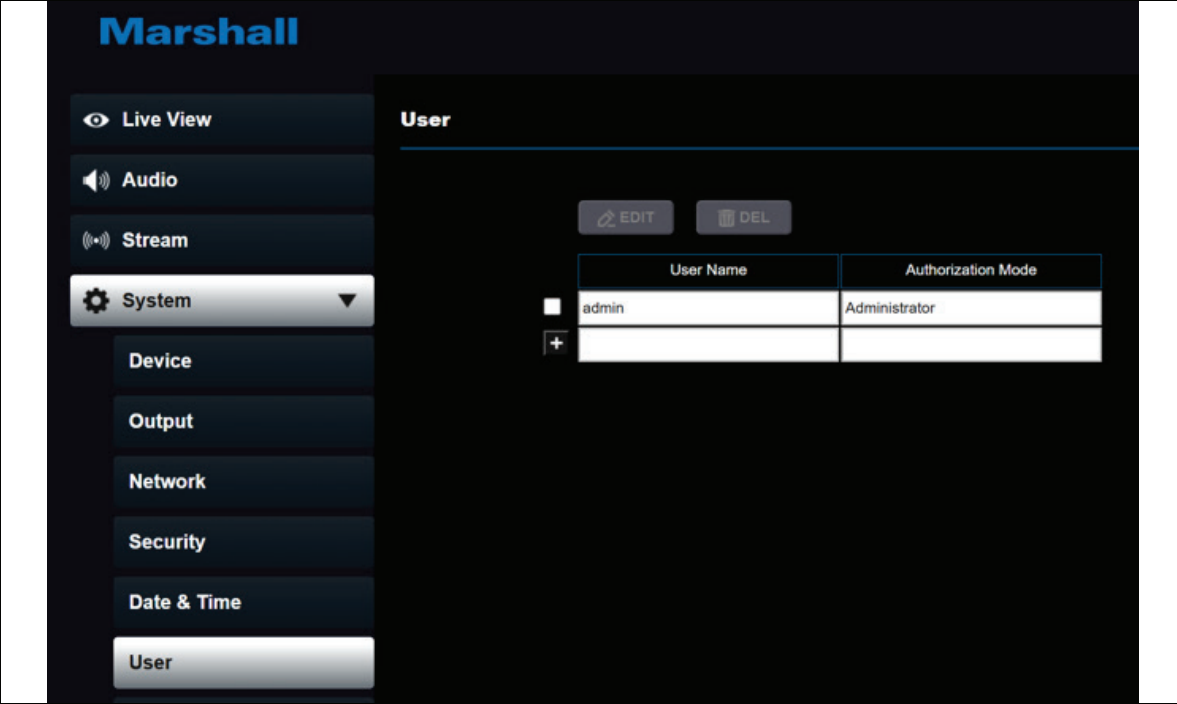## 4.3.13 System-Date & Time

Description
Display the current camera/PC date/time, and set the display format. Manually set [Time Settings], Date & Time or synchronize with your PC.

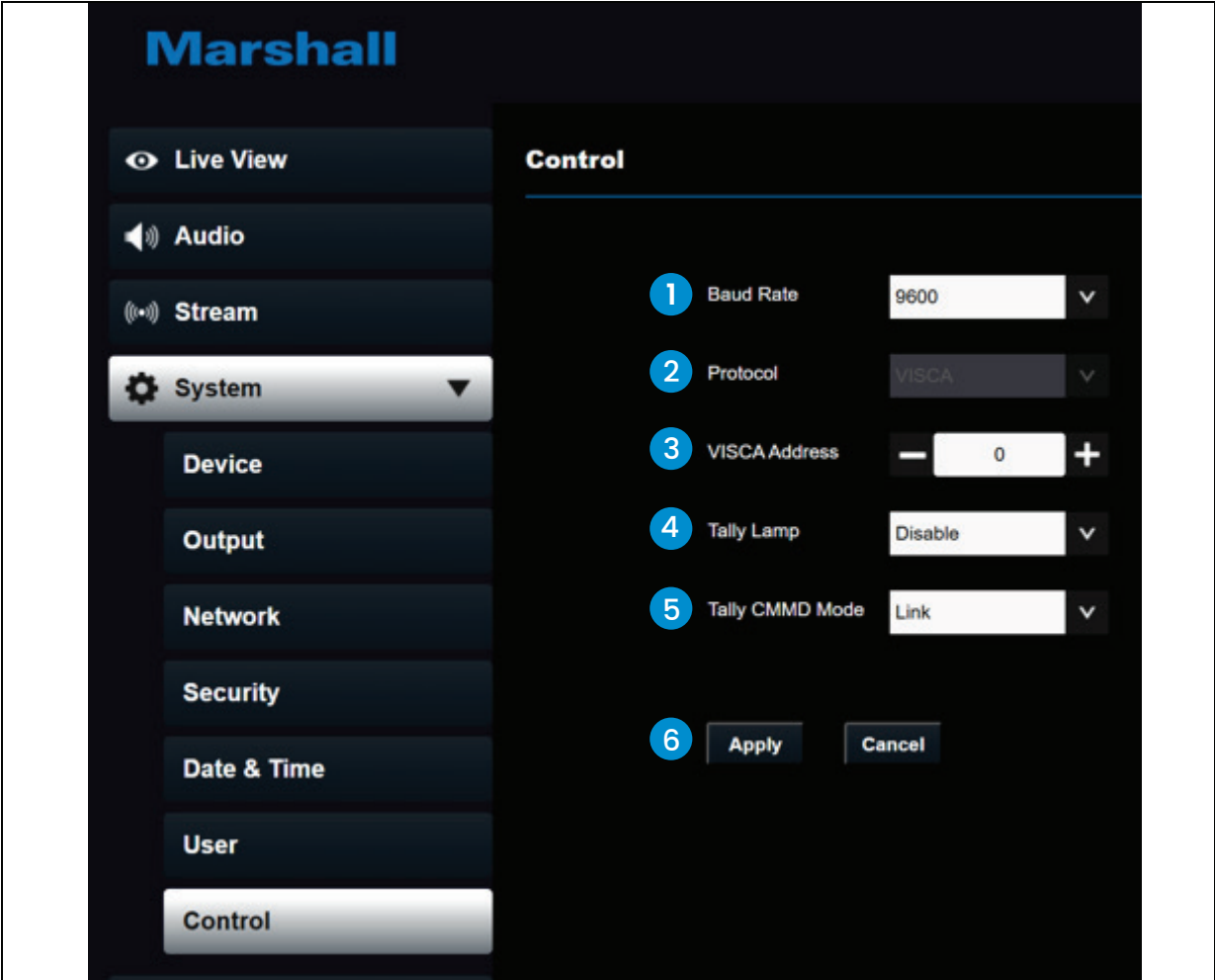## 4.3.14   System-User

Description
Add/Modify/Delete user account

- Supports 4 - 32 characters for user name and password
- Use uppercase, lowercase letters or numbers. Special symbols cannot be used
- Account permissions:

User Type	Admin	Operator	Viewer
Live View	V	V	V
Settings	V	V	X
Account management	V	X	X

Note Performing a factory reset will clear all user data.

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4.3.15   System-Control

No	Item	Function Descriptions
1	Baud Rate	Select the transmission speed of the control signal
2	Protocol	Supports VISCA protocol
3	VISCA address	The camera ID address 0 ~ 7 can be assigned.
4	Tally Lamp	Enable/ disable the tally lamp.

5	Tally CMMD Mode	Set whether the tally lamp is linked with RS232 commands.
		  Normal (Not linked): The tally lamp and mode are set separately.
		    When the tally lamp is on but the default mode is off, an additional command is required to set the indicator light mode
		    When the tally lamp is off, setting the mode will not trigger the indicator light
		Link:
		    When the tally lamp is on, the default mode is red light
		    When the tally lamp is off, setting the mode will turn on the tally lamp.

6	Apply/ Cancel	Apply/ Cancel Setting

4.3.16 Maintenance

No	Item	Descriptions
1	Firmware Update	Click [....] to select the firmware file, and click [Upgrade] to start updating. **Note** 　Update process takes 2-3 minutes. 　Do not operate or turn off the power of the device during the update to avoid firmware failure.
2	Factory Reset	Reset: Reset all configurations to default settings. 　Reboot: Reboot the camera.
3	Configuration	Save setup parameters as a Profile, and users can download and upload camera setup parameters.
4	Event Log	If the camera operates abnormally, please export event log and provide it to Lumens for investigation.
5	Reboot	 Enable/Disable Daily Reboot.

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4.3.17   About

Description
Display the firmware version, serial number, and other related information of the camera For technical support, please scan the QR code at the bottom right.

Chapter 5: Troubleshooting

This chapter describes problems you may encounter while using CV420-27X. If you have questions, please refer to related chapters and follow all the suggested solutions.
If the problem still occurs, please contact your local distributor or Marshall Electronics.

No.	Problems	Solutions
1.	No power to the device	1. Make sure you have plugged in the power cord. 2. When using a PoE connection, ensure that the power supply supports PoE (IEEE802.3af).
2.	There is no image output from camera	1. Check the power supply or PoE supply functions. 2. Confirm whether the camera resolution can be used with the connected display. If the camera is set to 4K resolution, output, confirm the display supports 4K output 3. Replace the cable and make sure it is not faulty.
3.	Camera image is severely delayed	Use 60/50 fps rather than 25/30 fps signals.
4.	RS-232 cannot be controlled	1. Confirm the connection is correct (RS-232 In/ Out) 2. Please make sure the Baud rate setting is the same as the control device.
5.	ONVIF software cannot discover the camera	Please make sure that [System]> [Device]> [Camera ID]/ [Location] in the web page uses only English letters or numbers. The ONVIF software cannot find the camera if you use special symbols or space.

6.	The camera does not save relevant parameters (PTZ, AWB ...) after reboot	Please make sure if the [Initial Position] is set to [Last MEM] from the setting menu or web page
		  OSD Menu: [System]> [Initial Position]
		  Web page: [Live View]> [Setting ⚙]> [PTZ]> [Initial Position]

7.	How to log into the webpage when you forget the password	Please contact the local distributor or Marshall.

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Copyright Information

Warranty

For Warranty information please refer to Marshall website page:
https:marshall-usa.com/company/warranty.php

www.marshall-usa.com