X14G Bonding Encoder

User Manual

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1.Overview

Thanks for purchasing CNDLive C6 Encoder! CNDLive is a subsidiary of CND Electronics Technology Co., Ltd, which was found in 2006, Shenzhen. We has been dedicated to innovation and development of hardware and software in Smart Information Interactive Industry. We are excellent at information display, intelligent dual-touch, biometric special processing and HD remote real-time transmission technology.

With these full experiences, CNDLive will focus on IP based video and audio transmission. We develop an extensive range of solutions for the professional video and audio market, from video encoding, decoding to conversion, either by Ethernet, Wi-Fi and 4G/5G bonding, with full protocols including Full NDI, NDI|HX, SRT, RTMP and more.

CNDLive is committed to bringing professionals high quality and most reliable gear in the field.

We hope that this manual will help you get started quickly and take full advantage of the powerful features of X1 bonding encoder. If you have any questions or need assistance while reading and using this manual, please feel free to contact our technical support team via support@cndlive.com

Thank you for choosing CNDLive and we look forward to making your work more convenient and efficient.

2.Getting Ready

2.1. Introduction

CNDLive X1 is a portable and powerful H265 SDI/HDMI 4G bonding encoder, supporting up to 7 networks bonding to make sure your outdoor live streaming reliable and smoothly. X1 is equipped with SDI and HDMI dual input ports and compatible with different audio video capture equipment. It has built-in 5.5" big display screen to show realtime video source and check the status. We offer the free bonding platform that you can deploy on your server or on-premise, together with bonding platform CNDLive Manager to easily register and manage your products. It is widely used for scenarios including broadcast and television, sports events, conference recording, house of church, education and much more.

KEY BENEFITS:

Dual Powerful bonding and encoding capacities, meet your outdoor live streaming needs

- Support H.264/H.265 (HEVC) video encoding
- Support HDMI 2.0 and up to 3840x2160p30 video encoding, SDI is up to 1920× 1080p60 encoding
- Up to 7 networks bonding, 3x internal Sim cards, 1x Wi-Fi 6, 1x GbE Ethernet, 2x USB modems
- Support to insert 6 Sim cards, 2 cards per 3 slots. When one card runs out of data, you can switch to the other one automatically
- Support AAC and G.711 audio encoding, embedded audio and Line in mix audio

Portable and mountable, your best outdoor live streaming friend

- Tiny size and light weight, easy to carry and setup on the camera with 1/4" threaded screw camera
- Built-in battery to work 3-4 hours, or powered by external power bank
- Powerful and professional cooling system to ensure stable working even under high temperature

Powerful and stable streaming capacities

- H.265 encoding, support SRT point-to-point transmission in Caller and Listener mode
- Simultaneous streaming with RTMP, RTMPS, HLS, TS over UDP, RTSP protocol
- Support dual stream, main stream is up to 4Kp30 encoding and sub stream is 720p60 encoding
- Main stream and sub stream supported to 8 different platforms simultaneously

Simplified and visual operation, not rely on a computer

- Built-in 5.5" big display with touch screen
- Display video source in real time and support simple UI operation

Self-developed bonding technology and diversified bonding server for your choice

- Based on self-developed technology to make sure stable bonding data transmission even under poor network conditions
- Free bonding platform offer that you can deploy on your on-premise or cloud-base to meet your high security needs

- CNDLive Manager with functions of bonding and remote products management that you can check product status, remote firmware updating, etc. Supporting output protocols Supporting output protocols SRT, RTSP, RTMP, RTMPS, TS over UDP
- Optional CNDLive Manager hardware version, supporting output protocols SRT, NDI|HX 2.0, RTSP, RTMP, RTMPS, TS over UDP

2.2. Technical Parameters

Model	**X1**
Video Inputs	1x HDMI 2.0, 1x3G-SDI
Video Encoding	H.265/HEVC, H.264
Video Resolutions	**SDI:** 1920×1080p 23.98/24/25/29.97/30/50/59.94/60fps 1920×1080i 50/59.94/60fps 1280×720p 25/29.97/30/50/59.94/60fps 720×576i 50fps (PAL SD) 720×480i 59.94fps (NTSC SD) **HDMI:** 3840×2160p 30fps 1920×1080p 23.98/24/25/29.97/30/50/59.94/60fps 1920×1080i 50/59.94/60fps 1280×720p 29.97/30/50/59.94/60fps 720×576i 50fps (PAL SD) 720×480i 59.94fps (NTSC SD)
Audio Encoding	AAC, G.711, embedded audio and MIC IN mix
Simultaneous 4G Bonding	3x internal Sim cards, 1x Wi-Fi 6, 1x GbE Ethernet, 2x USB modems
IP Outputs	SRT, RTMP, RTMPS, HLS, TS over UDP, RTSP (Note: If use bonding server hardware version, it can output NDI|HX 2.0)

Other Interfaces	2×USB 2.0, 1x GbE Ethernet port, Type-C (only for power), 1x TF port
Recording	TF card or external USB, formats are TS, .MOV and MP4
Display	5.5" LCD screen and Touch Buttons
Battery	8.4V/5000ma
Management	Web UI Remote Management Platform CNDLive Manager Optional CNDLive Manager Hardware
Dimensions	140x131x43.7mm (140x131x43.7")
Weight	476.5g (16.8oz)
Working Temperature	-10~45°C

2. 3. Packing List

Item	**Unit**	**QTY**
Device	PCS	1
Power Adapter	PCS	1
Black Pouch	PCS	1
Threaded Screw	PCS	1
Warranty Card/Certificate	PCS	1
Quick Start Guide	PCS	1

2.4. Device Interfaces

1. Threaded Screw Port 2. Power Switch 3. 5.5" Touch Screen

4. 1000M Ethernet port 5. USB-A port 6. Type-C Power Connector

7. MIC IN 8. Cooling Holes 9. HDMI Input

10. USB-A Port 11. SDI Input 12. SIM1/2

13. SIM3/4 14. SIM5/6 15. Micro SD/TF Card Slot

16. Threaded Screw Port

3. Device Connection

3.1. Unpacking

Before starting the installation, make sure that the equipment packaging is intact.

Open the package and check the device and its accessories, including the power adapter, Quick Start Guide, etc.

3.2. Preparing the connection material

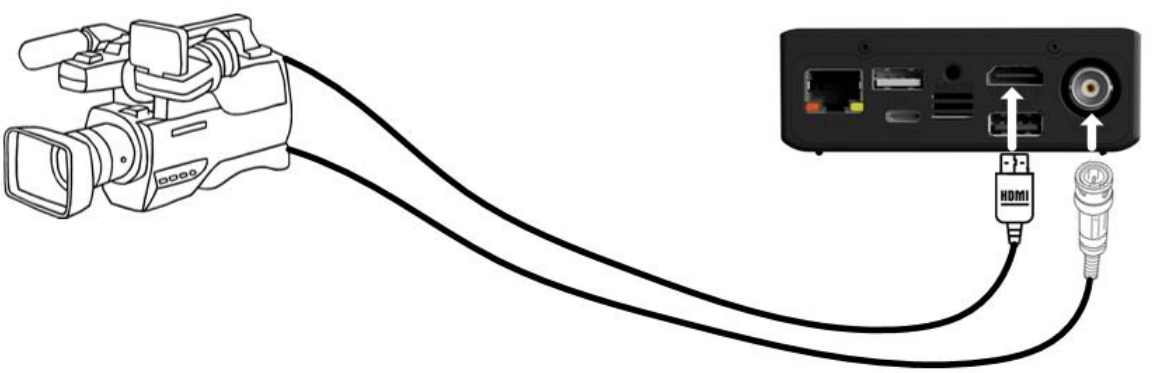
Make sure you have all the necessary connection cables, including the power adapter, Ethernet cable, and HDMI or SDI video cable.

3.3. Connecting the power supply

Plug one end of the power adapter into the X1 encoder's power connector. Connect the other end to a suitable power outlet. Make sure that the voltage and frequency of the power adapter correspond to local standards.

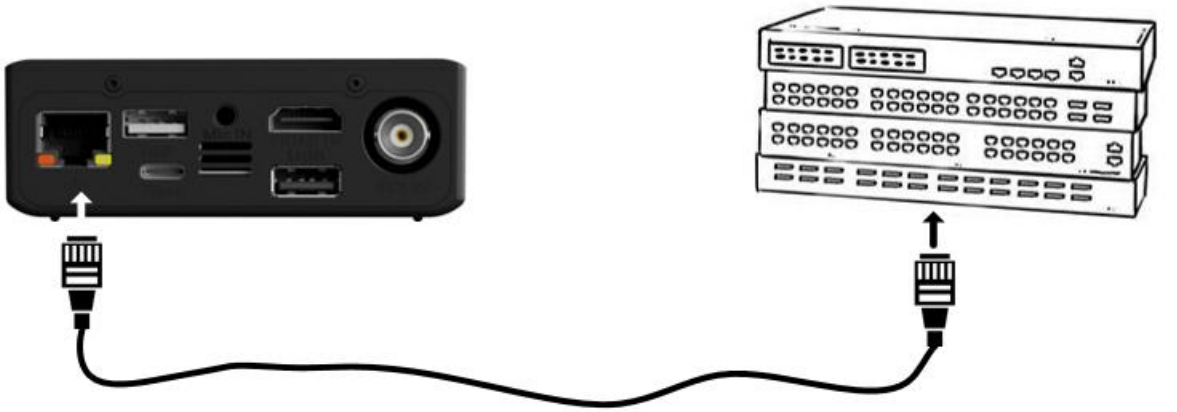
3.4. Connecting the video source

Use an HDMI or SDI cable to connect your video source device (e.g., cameras) to the HDMI or SDI input connector of the device. Make sure that the connectors on both ends of the cable match and are securely connected.



3.5. Connect to network

Connect the 1000M RJ45 Ethernet port of the device to your LAN or the Internet using an Ethernet cable. Ensure that your network supports DHCP to automatically assign an IP address to the encoder.



When using the X1 encoder for the first time, you need to have a DHCP server in your network to obtain an IP address from the DHCP server. If you need a fixed IP address, you can manually assign a static IP address to the device by logging into the Webpage via the DHCP-assigned address.

Note

When configuring your network, make sure that it does not conflict with the IP address of X1 encoder or other network devices.

3.6. Connecting a storage device (optional)

If desired, a Micro SD/TF card or USB storage device can be inserted into the appropriate slot or port for storing configuration or media files.

Make sure that your TF/SD card is inserted into the TF card slot of the device in the correct orientation as shown in the diagram.

In the LCD panel or Web UI, you can view the list of recorded video files, storage space usage, and recording duration.

3.7. Checking connections

After all connections have been done, check all cables and connectors to ensure that there are no loose or damaged connections.

4. Indication and operation of the LCD screen

4.1. Turn on the device

Turn on device via the on/off button on the rear panel.

Check the LCD display to ensure that the device boots up properly and acquires an IP address.

4.2. Preview status

The X1 is equipped with an intuitive LCD screen that provides a real-time preview of the source, ensuring that you are able to monitor and confirm the status of the input signal. When you turn on the device, it will automatically enter the preview state

4.2.1 Preview interface switching

The preview interface is the same as the interface of the encoding you currently set, you can switch the preview through the web UI.

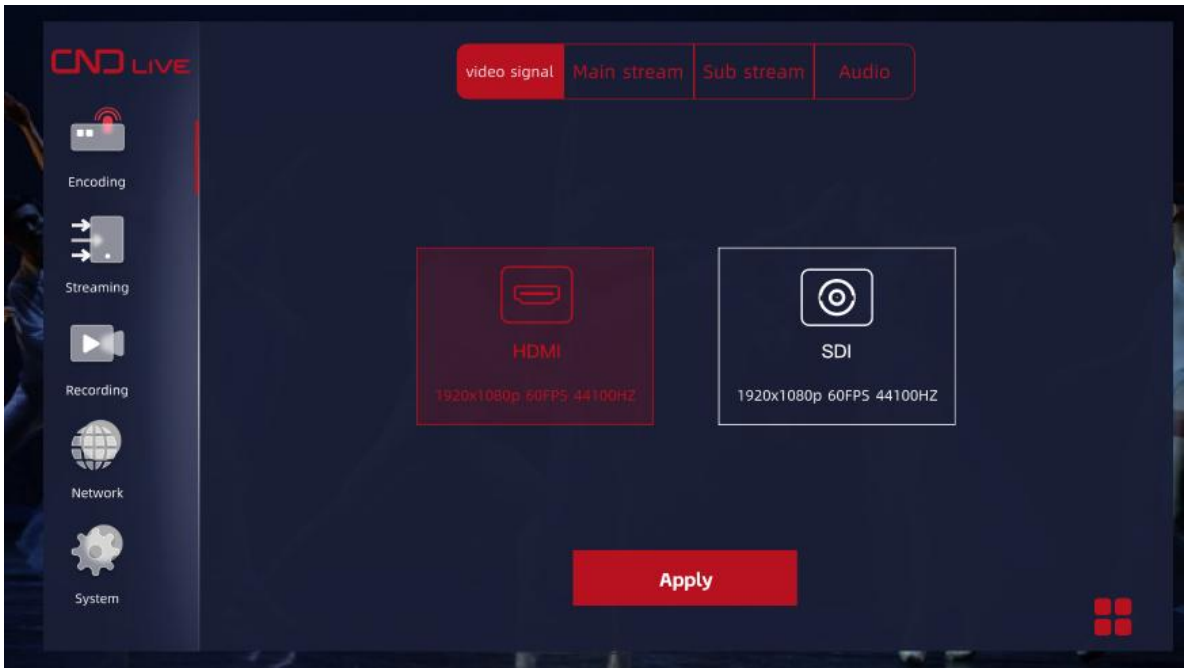
- By default, it displays the screen of HDMI signal source. If the HDMI interface does not detect the signal, the LCD screen will display the message "HDMI source not detected".
- If you switch to SDI interface, the LCD screen will display the screen of SDI signal source. If the SDI interface does not detect the signal, the LCD screen will display the message "SDI source not detected".
- When Synthesize A encoding mode is selected, the LCD screen will display the HDMI signal source screen first. If there is no signal from HDMI, it will try to display the signal from SDI. If there is still no signal from SDI, the message "No HDMI source detected" will be displayed.
- On the contrary, when the Synthesized B encoding mode is selected, the LCD screen displays the SDI source screen in priority. If there is no signal from SDI, it will try to display the signal from HDMI. If there is still no signal from HDMI, the message "No SDI input detected" will be displayed.

Note

- Please make sure the preview interface is same as your input source.
- If preview image becomes abnormal, please check the source or switch to other interface.

4.3. LCD screen operation

The home of LCD panel is the source preview of current device. Right click  to the menu.



OVERVIEW: The panel is divided into left and right sections. The left side lists the names of the main functions, including Encoding, Streaming Services, Recording, Network, and Settings. The right side displays the operation details and setting options for the corresponding function.

Function Selection: By touching the function name on the left, you can select the corresponding function and display on the right.

Functions Operation: You can configure and adjust the function as needed on the right. For example, in "Encoding" option, you can set video and audio encoding parameters; in "Streaming Service", you can add and manage streaming services; in "Recording", you can control the recording function and storage settings; in "Network", you can configure the network parameters; in "Settings", you can access device information and perform system maintenance.

Confirmation and Log Out: After finishing the operation, click the Apply button at

the bottom right corner to save the settings. If you want to log out the panel, click the Menu button at the bottom right corner again.

We have integrated some commonly used functions into the touch screen menu, users can easily play the device without frequently accessing to the webpage. We will explain together with the touch menu corresponding to the webpage in this manual.

4.Web Management and Configuration

4.4. Device login

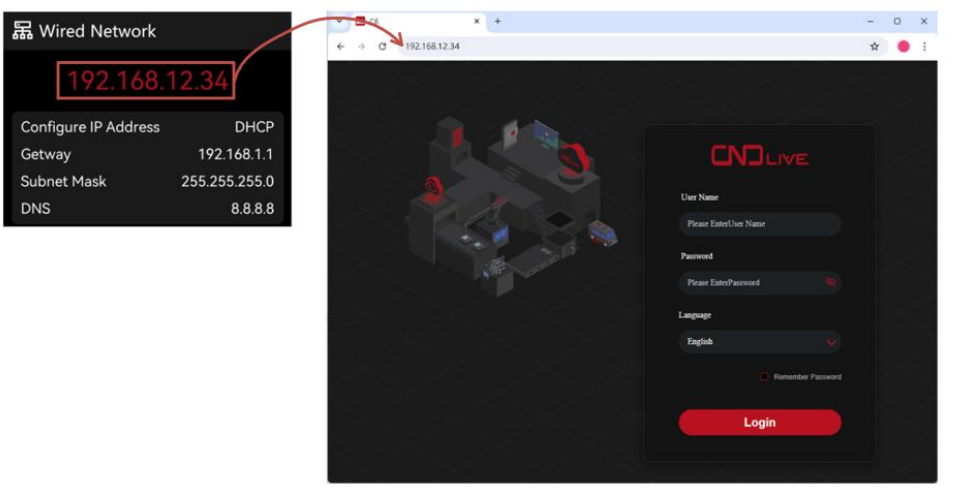
Ensure that the device is properly connected to a DHCP-enabled network by powering up the unit via the rear panel power on/off button.

The device will automatically attempt to obtain an IP address from the network. Check the LCD display on the front panel of the unit and press the Down button until you see the "Wired Network" message, which will display the wired network information, including the IP address.

Open a Web browser on a computer which connected to the same network with the device.

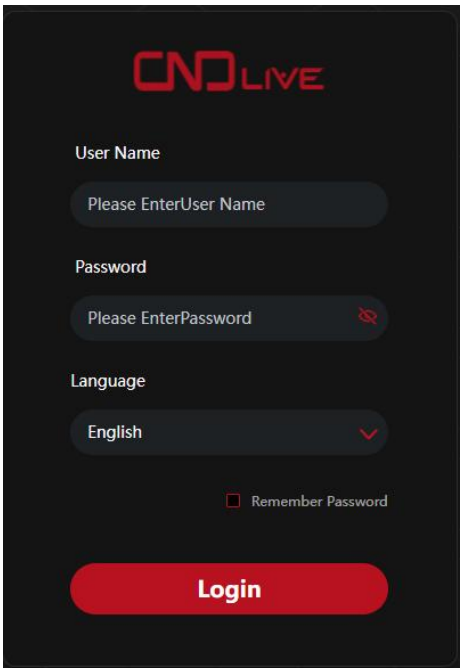
It is recommended to use Chrome and update to the latest version for compatibility with the C6 Encoder Web page.

Enter the IP address obtained by the X1 in the address bar of your browser.



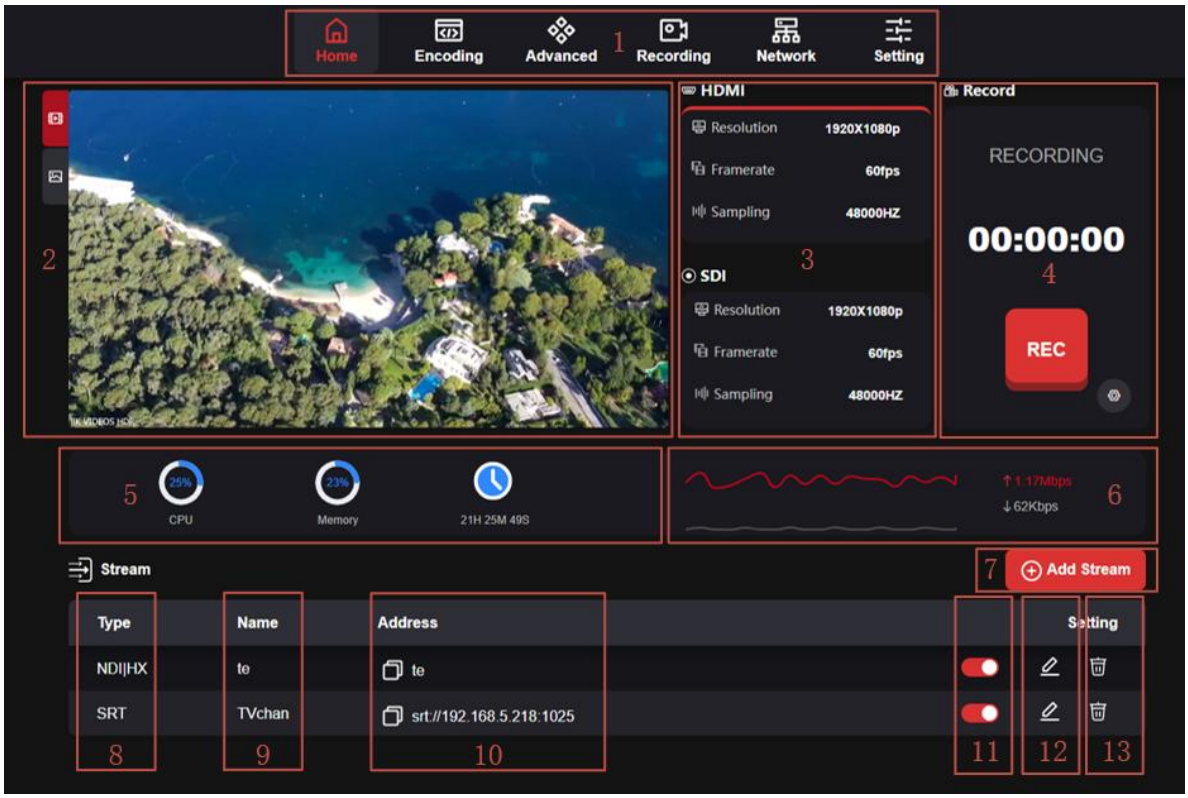
Enter the default username and password: *admin*

Click Login in or press Enter to go to the device's web management page.



4.5. Dashboard homepage

The web management home page is the central platform for you to interact with your device. It provides you with access to device status monitoring, network information, streaming service management, recording function control, and system settings. Through the home page, you can quickly understand device performance, network status, and easily manage your streaming services, recording tasks and system configurations.



1) Top menu:

Home: Enter the home page of the device, display the device status and basic configuration.

Encoding: Configure video and audio encoding parameters.

Advanced: Include system optimization and advanced feature configuration.

Recording: Manage recording features and storage settings.

Network: Configure network parameters and streaming services.

Settings: Device information and system maintenance.

2) **Preview:** Display the screen preview of the current encoding source, which is convenient for users to monitor the video source status in real time.

Select video stream mode, it adopts WebRTC technology to preview the current source.

Select image stream mode, it captures images of the current source and refresh it periodically, which is suitable for the case when the video cannot be previewed.

Image refresh can be set under “Encoding” > “Capture”.

3) Video source:

HDMI: Display the resolution, frame rate, and audio sample rate of the HDMI input.

SDI: Display the resolution, frame rate, and audio sample rate of the SDI input.

4) Recording:

Storage directory: Display the storage path of the recorded file.

Recording duration: Display the duration of the current recording session.

REC recording button: Click to start or stop recording.

Setup button: Click to enter the recording settings and adjust the recording parameters.

5） Running status: Display CPU usage, memory usage and device running hours to help users monitor the performance.

6） Network status: Display a graph of network traffic fluctuations, upstream and downstream bandwidth consumption, and network connection status.

7) Add streaming service: You can add new streaming service, such as NDI|HX, RTMP, etc.

8) Streaming service list: Display the protocol types of streaming services, such as NDI|HX, RTMP, SRT, etc.

9) Stream name: Display the name configured for each stream service to help users identify the different stream services.

10) Stream protocol address: Display the destination address of the stream service, such as the RTMP stream address or SRT address.

11) Streaming protocol switch: Start or stop the streaming service by clicking the switch button.

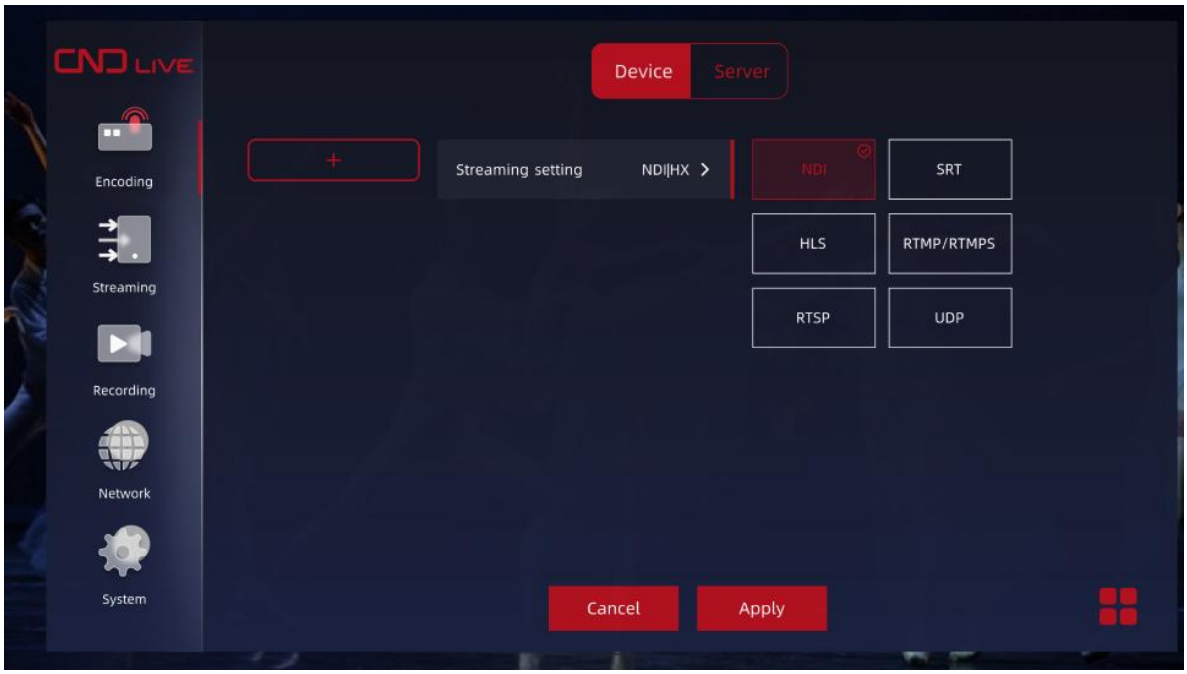
12) Stream edit: Users can click the Edit button in the stream service to configure streams.

13) Delete streaming services: Users can remove streaming services that are no longer needed by clicking the Delete button.

- **Screen Operation**

The users can open the screen operation menu on the LCD touch screen:

Touch the screen and click "Streaming Service" to add and select.



It is very flexible and convenient for operation and bring better user experience to our customers.

4.6. Encoding

The encoding function of the device provides rich video signal options and layout settings to meet the needs of different scenarios. The following is a detailed description about them.

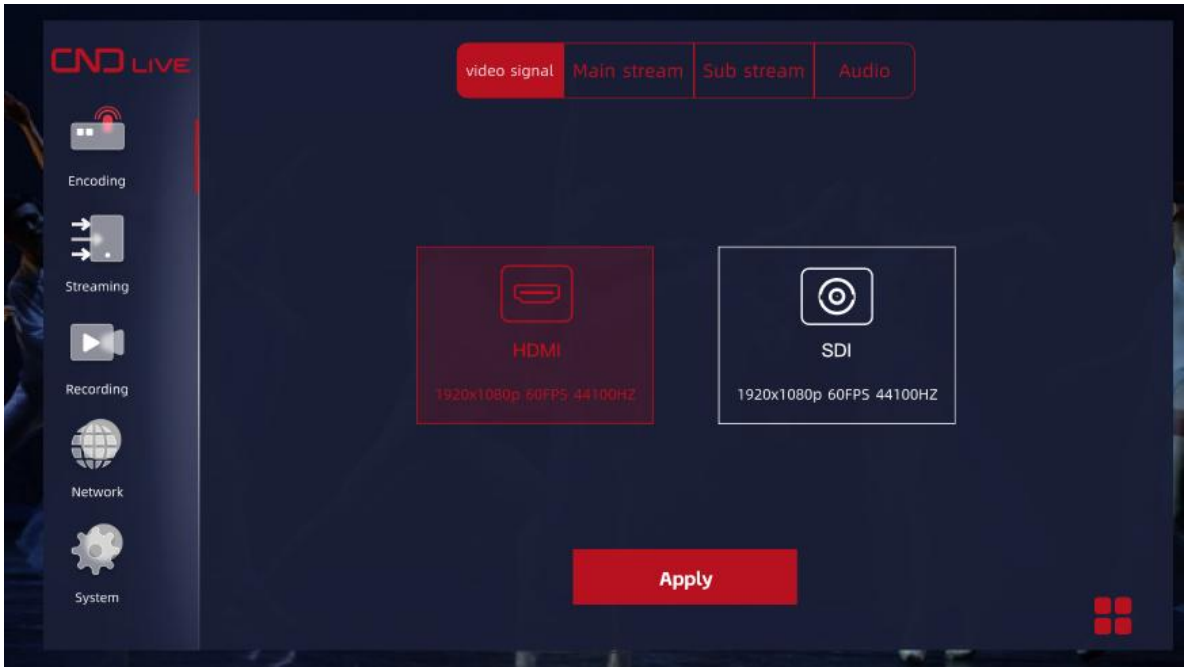
4.6.1. Video signal selection

HDMI: Only encodes the signal from the HDMI input.

SDI: Only encodes the signal from the SDI input.

- **Screen Operation:**

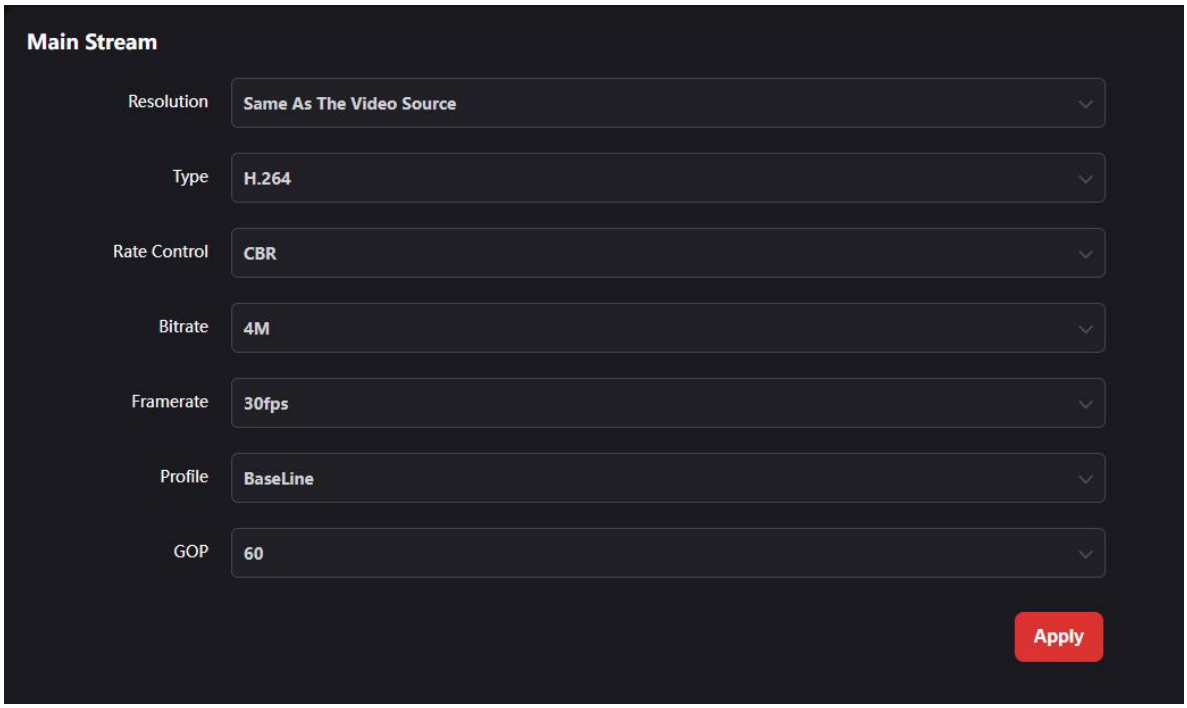
The users can select the video source on the touch screen. Touch and the screen and click "video signal".



You can click HDMI or SDI to connect to your video source.

4.6.2. Main Stream

The X1 encoding function provides rich main stream setting options to meet the needs for different scenarios.



The following is a detailed description of the main stream settings:

(1) Resolution: Resolution determines the clarity and fineness of the video image. Users can choose the appropriate resolution according to the demand, the minimum is 640x360, the maximum is 1920x1080. The higher the resolution, the better the video quality, but the file size will also increase accordingly.

Users can choose a resolution that is consistent with the video source according to actual needs. Note that if the video source input resolution is smaller than the set value, it will be scaled up to the set value; if the video source input resolution is larger than the set value, it will be scaled down to the set value.

(2) Encoding type: H.264 and H.265 are two common video encoding formats that strike a balance between compression rate and picture quality. H.264 is suitable for lower bandwidth scenarios, while H.265 has a higher compression rate for the same image quality and is suitable for higher bandwidth scenarios.

(3) Stream control: CBR and VBR are two different stream control methods. CBR assigns a fixed bit rate to each frame, which makes the overall video quality more stable. While VBR assigns a different bitrate to each frame, which makes the overall video quality fluctuate a lot, but under the same bandwidth, VBR can realize higher image quality. When VBR is selected, the fourth option Bitrate will change to

Maximum Bitrate, which sets the maximum change in bitrate.

(4) Bitrate: Bitrate determines the size and quality of the video file. Users can choose the appropriate bitrate according to the demand, the minimum is 2M, the maximum is 40M. it is recommended to choose the bitrate that matches the actual demand in order to balance the video quality and file size. When VBR is selected, this option will change to maximum bitrate.

(5) Frame rate: The frame rate determines the smoothness of the video screen. Users can choose the appropriate frame rate according to the demand, the minimum value is 24fps, the maximum value is 60fps. it is recommended to choose a frame rate that is consistent with the video source to maintain the smoothness of the picture.

(6) Encoding quality: Baseline, Main Profile and High Profile are three different encoding qualities. Baseline is suitable for lower quality applications, while Main Profile and High Profile are suitable for higher quality applications. Users can choose the appropriate encoding quality according to their needs.

(7) GOP (Group of Pictures): GOP determines the complexity and compression rate of video encoding. Smaller GOP value can realize higher compression rate, but may lead to lower image quality. Larger GOP value can improve the image quality, but may lead to increased file size. Users can choose the appropriate GOP value according to their needs.

In actual use, users can select the appropriate video signal options and master stream settings according to their needs. If you need to adjust the master stream setting parameters, please follow the steps below:

A. Select the appropriate video signal.

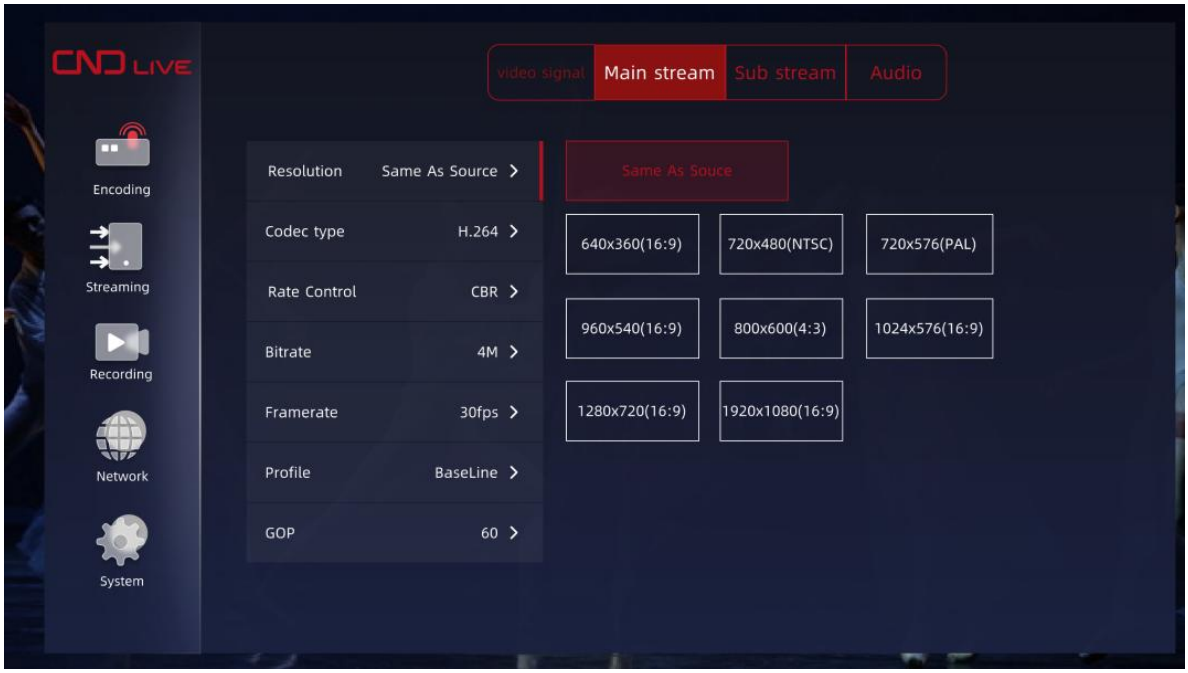
B. Click main stream settings.

C. Adjust the resolution, encoding type, stream control, bitrate, frame rate, encoding quality, and GOP values to the desired values.

- **Screen Operation：**

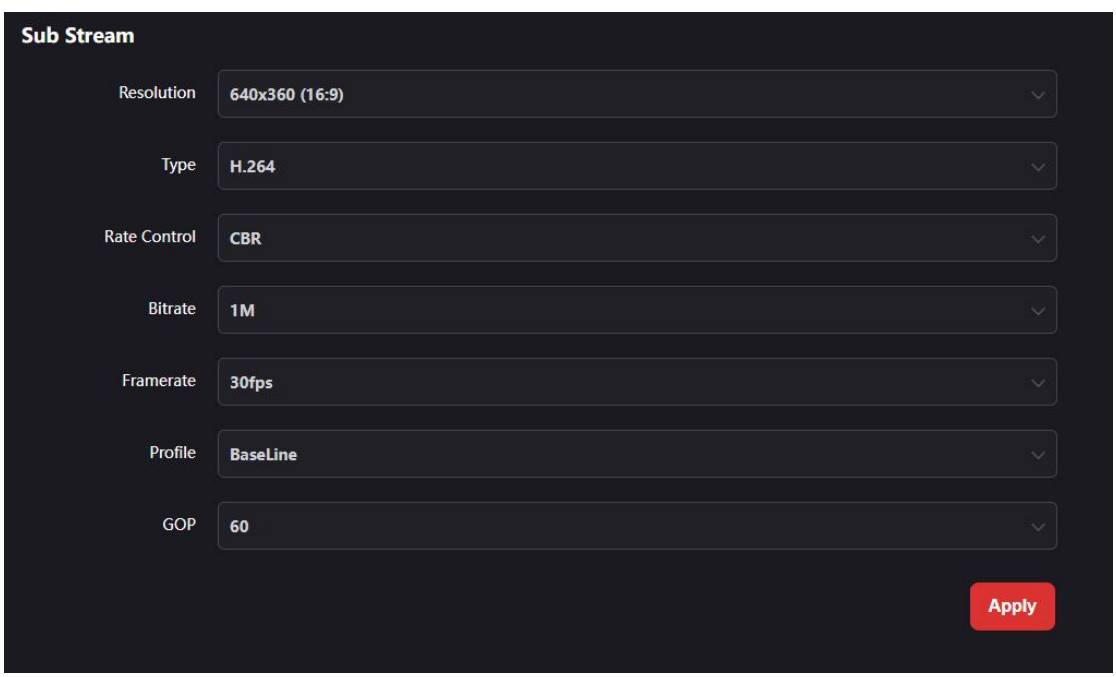
The users can set the main stream on the touch screen, touch “Encoding”, tap

"Main Stream" .



In practical applications, selecting the appropriate video signal and main stream settings according to your actual needs, this operation will help to improve the image quality and streaming effect.

4.7. Sub Stream



About Sub Stream：

The following is a detailed description of the sub stream settings:

(1) Resolution: The sub-stream resolution determines the clarity and fineness of the video image. Users can choose the appropriate resolution according to the demand, the minimum is 640x360, the maximum is 1280x720, it should be noted that it will be enlarged to the set value if the input resolution of the video source is smaller than the set value. It will be reduced to the set value if the input resolution is larger than the set value.

(2) Encoding type: The sub-stream coding type is fixed to H.264.

(3) Stream Control: CBR and VBR are two different stream control methods. CBR assigns a fixed bit rate to each frame, and the overall video quality is more stable. VBR assigns a different bitrate to each frame, and the overall video quality fluctuates more, but in the same bandwidth, VBR can achieve a higher image quality.

(4) Bitrate: The bitrate of the sub-stream determines the size and quality of the video file. Users can choose the appropriate bitrate according to the demand, the minimum is 512K, the maximum is 20M. It is recommended to choose the bitrate that matches the actual demand to balance the video quality and file size. When VBR is selected, this option will change to the maximum bitrate. When VBR is selected, the fourth option bitrate will change to Max Bitrate, setting the maximum change value of the bitrate.

(5) Frame rate: The frame rate of the sub-stream determines the smoothness of the video image. Users can choose the appropriate frame rate according to the demand, the minimum is 24fps, the maximum is 60fps. It is recommended to choose a frame rate that is consistent with the video source to maintain the smoothness of the image.

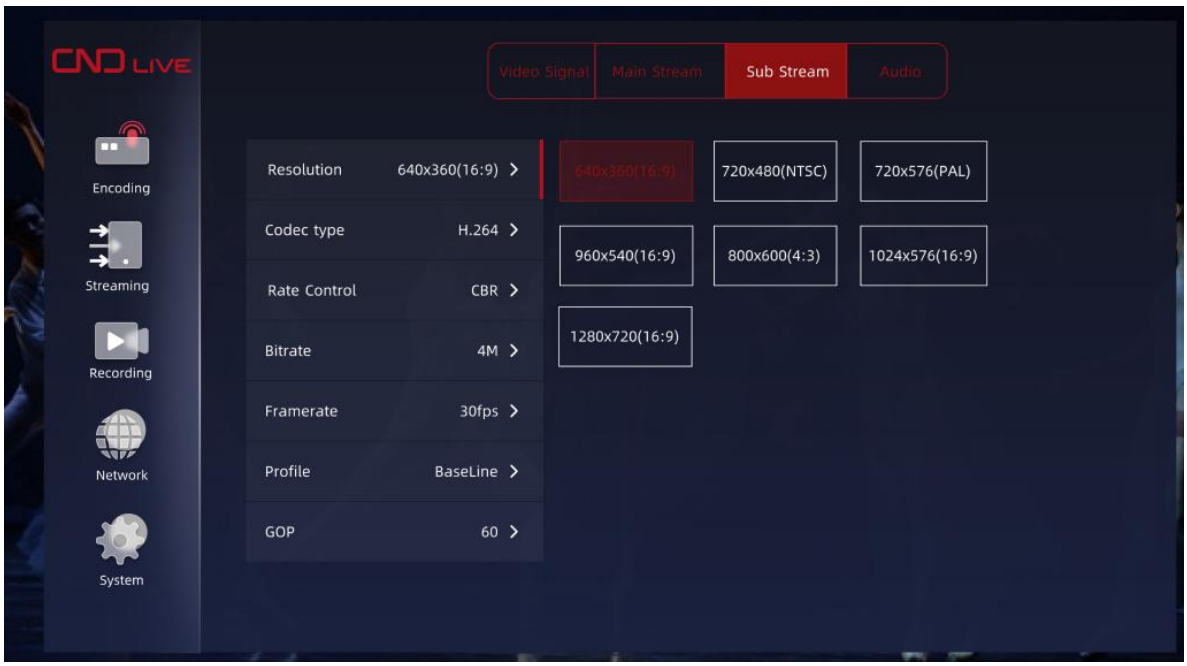
(6) Encoding quality: Baseline, MainProfile and HighProfile are three different encoding qualities. Baseline is suitable for lower quality applications, while Main Profile and High Profile are suitable for higher quality applications. Users can choose the appropriate encoding quality according to their needs.

(7) GOP (Group of Pictures): GOP determines the complexity and compression rate of video coding. Smaller GOP can realize higher compression rate, but may lead to lower image quality. Larger GOP can improve the image quality, but may lead to increased file size. Users can choose the appropriate GOP according to their needs.

The encoding function can meet the needs of use in various scenarios and improve the user experience by flexibly adjusting the parameters of the sub-stream settings. In practical applications, selecting the appropriate video signal and sub stream settings according to the actual needs and scene characteristics can help improve the image quality and viewing effect.

- **Screen Operation**

Users can also set the Sub Stream on the touch screen.



In actual use, users can select the appropriate video signal options and sub-stream settings according to their needs. If you need to adjust the sub-stream setting parameters, please follow the steps below:

A. Select the appropriate video signal.

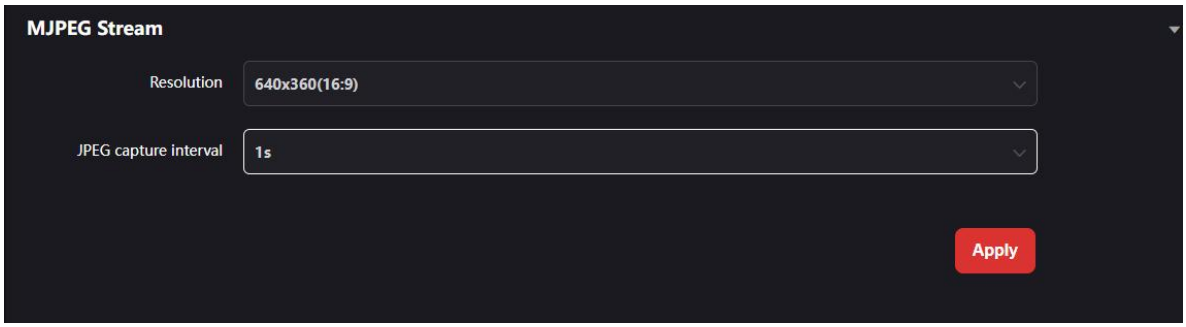
B. Click sub stream settings.

C. Adjust the resolution, encoding type, stream control, bitrate, frame rate, encoding quality, and GOP values to the desired values.

The encoding function can meet the needs of use in various scenarios and improve the user experience by flexibly adjusting the parameters of the sub-stream settings. In practical applications, selecting the appropriate video signal and sub stream settings according to the actual needs will help improve the image quality and streaming effect.

4.8. MJPEG stream

When the device is connected to the management platform, it will display the captured image of C6 video source. You can define the interval time of capturing images to control how long X1 will perform a capturing operation so as to update the management platform to display the preview screen. You can control the frequency of the capture operation by setting the MJPEG capture interval.



X1 supports the following setting options: 1 second, 2 seconds, 3 seconds, and custom. You can adjust according to your actual needs.

If you want to set the JPEG capture interval during actual use, please follow the steps as below:

(1) Select the appropriate video signal.

(2) Click capture function settings.

(3) Select the JPEG capture interval setting option, such as 1 second, 2 seconds, 3 seconds, or custom.

You can control the frequency of capture operation according to the actual demand and scene characteristics by setting the JPEG capture interval so as to ensure the

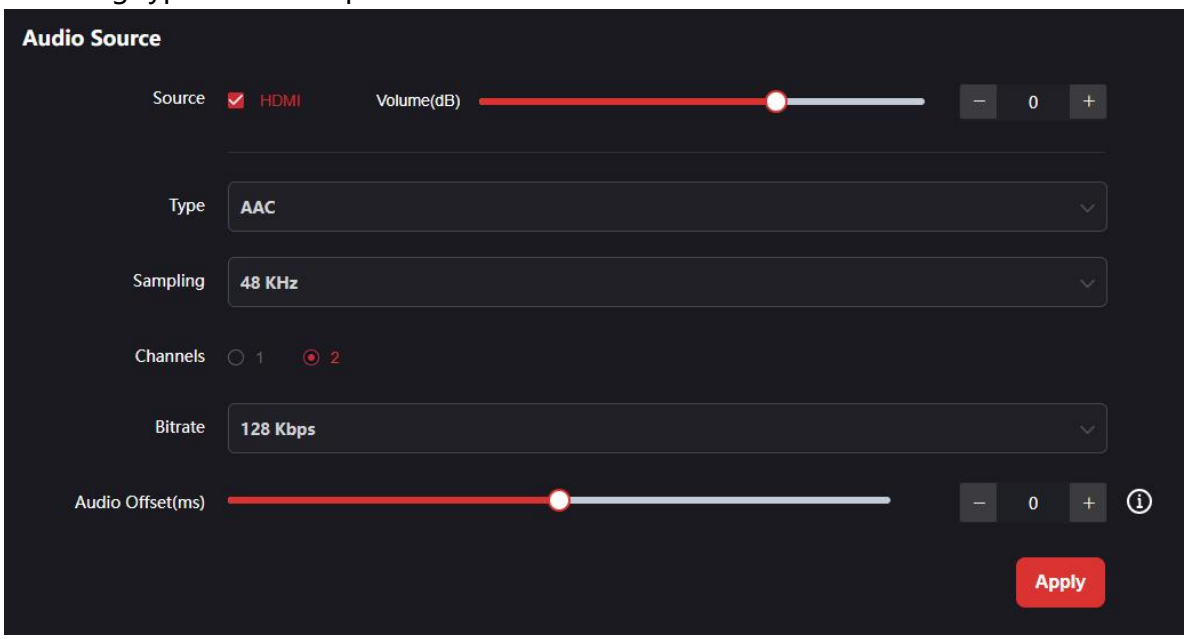
quality of the screen while reducing the consumption of system resources.

Note

- It is also used for preview on the screen.

4.9. Audio Selection

X1 offers the choice for audio sources, including input source, output enabling, encoding type and other parameters related with audio.



Input source: Select HDMI/SDI audio. The default value is 0, the minimum value is -40db, and the maximum value is 20db. By dragging the button to adjust the value, or enter the number or click the + and - signs.

Output: Determines whether the X1's audio output connector is enabled or not. When enabled, the device will output the audio signal to the corresponding port for connection and transmission with other devices.

Encoding Type: You can choose AAC or G.711 as the audio encoding method. AAC is a high-quality audio encoding format with high compression rate and sound quality performance. While G.711 is a common audio encoding format widely used in intercom communication and other fields. Users can choose one of them as the encoding type according to the actual needs. When choosing AAC,, you can further set the sampling rate (8KHz~48KHz), which determines the sampling frequency of

the audio signal and directly affects the sound quality performance. Or you can just choose the default value to run the device.

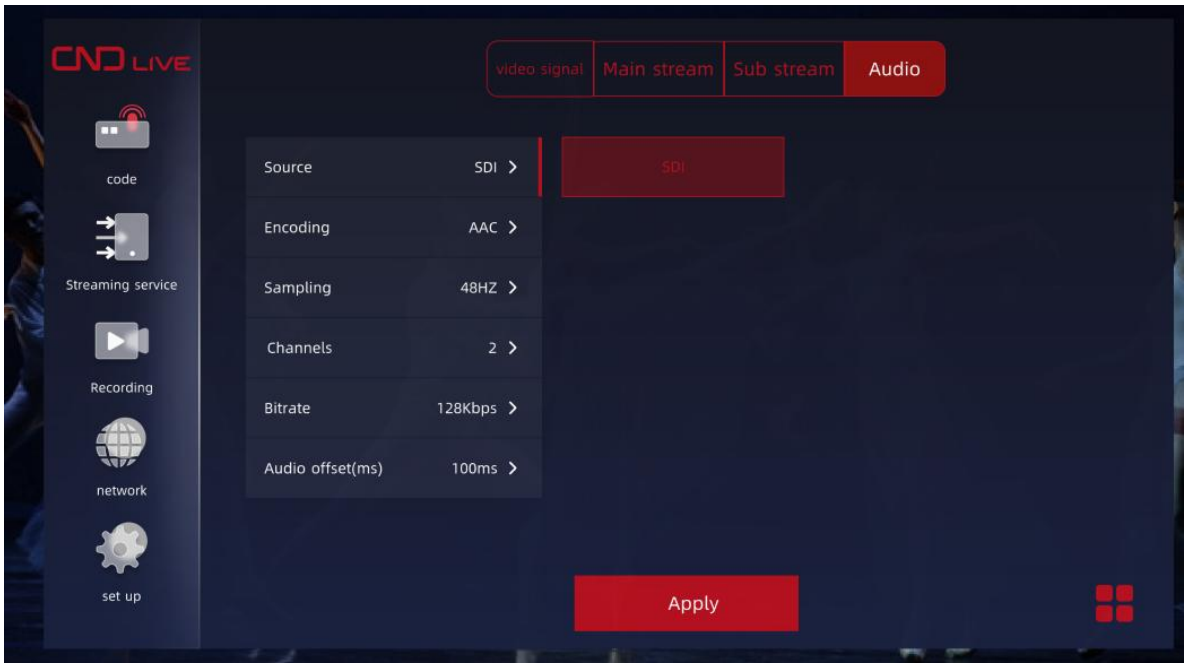
Number of channels: X1 supports Channel 1 and 2 currently, that is Mono and Stereo for choice.

Bitrate: X1 supports bitrate from 32kbps to 512kbps. Bitrate determines the compression rate of the audio signal. Normally higher bitrate provides better sound quality performance, but also increase the transmission bandwidth and storage space requirements. You can choose the default value for bitrate.

Audio Offset: The default value is 0, the minimum value is -200ms, the maximum value is 200ms. You can adjust this parameter by dragging the button, directly inputting the value or clicking the + and - signs. When G.711 is selected as the encoding type, there are no options for sample rate, channel, or bit rate.

- **Screen Operation:**

The user can also configure the audio settings on the touch screen. Open the menu, touch "Encoding" - "Audio".

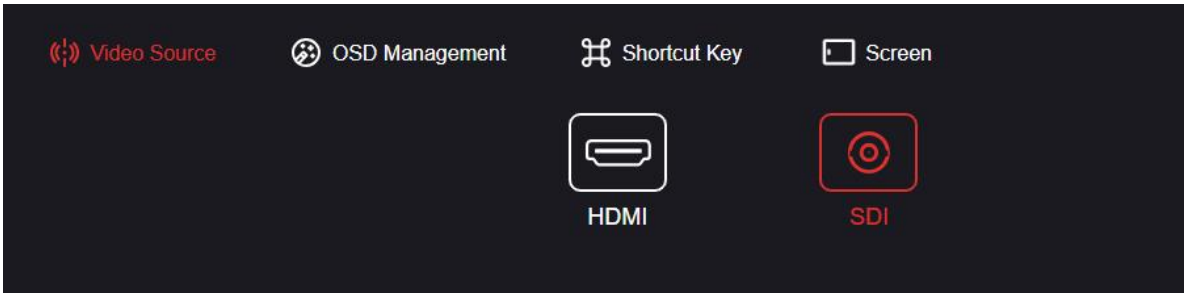


4.10. Advanced

The advanced menu is the key area for video processing and customized settings. It

contains features such as cropping, rotating, audio adjustments, and no-signal background selection to help you achieve better video editing and personalized settings.

Source: Source selection is the first primary option and will determine the video interface where crop, rotate/flip, audio adjustment, and no signal background selections take effect.



4.11. Cropping

This device is equipped with powerful cropping function, which can be applied to both HDMI and SDI. You are able to easily realize the interception and adjustment of the source screen by precisely adjusting the parameters to meet the needs of different scenes.

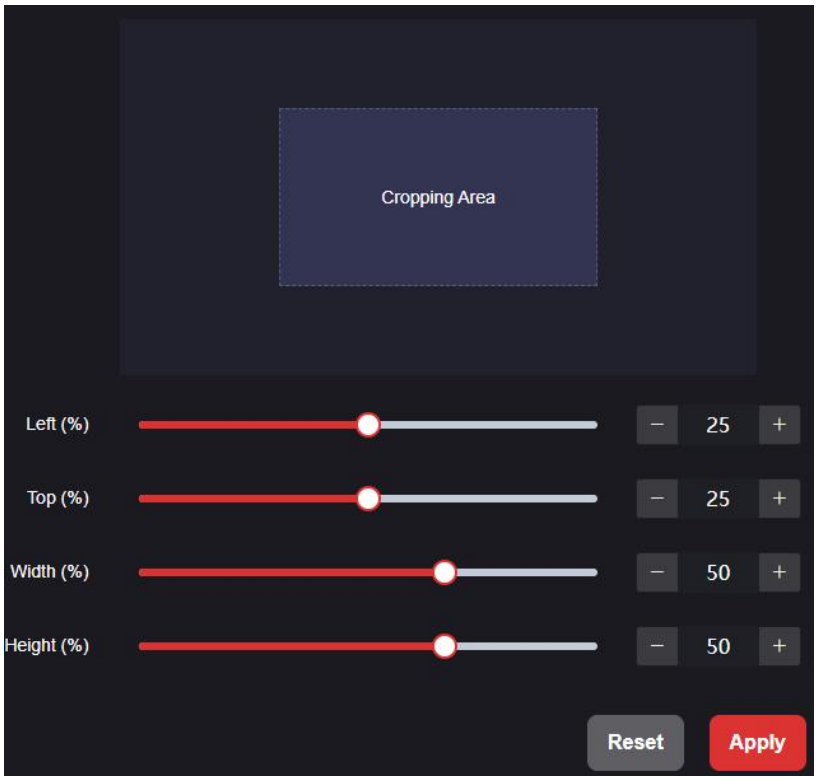
Parameter description

Left: Adjust the left and right directions to control the extent of the screen cropping. The default is 25% and the range is 0%-50%. The leftmost value is 0% and the rightmost value is 50%.

Top: Adjust the up and down direction to control the range of screen cropping. The default is 25% and the range is 0%-50%. The top value is 0% and the bottom value is 50%.

Width: Adjust the width of the screen cropping to realize the screen proportion. The default is 50% and the range is 0%-75%.

Height: Adjust the height of the screen cropping to realize the screen proportion. The default is 50% and the range is 0%-75%.

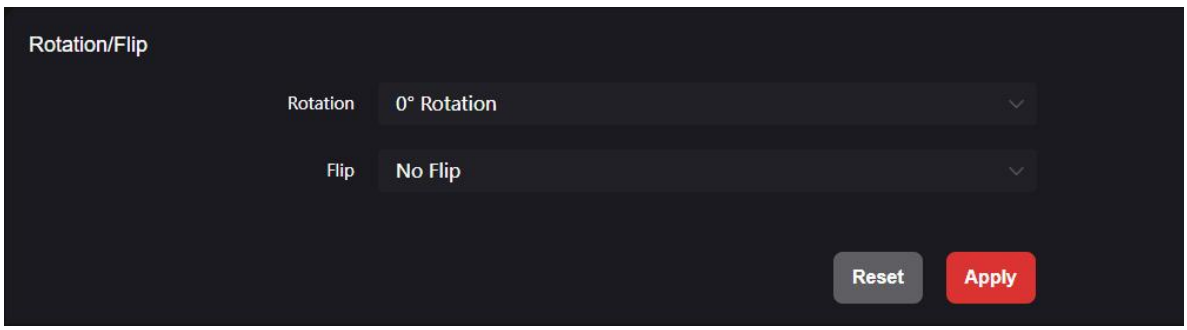


To ensure the balance of the screen, the width will be automatically adjusted accordingly when adjusting the left parameter. The height will be automatically adjusted accordingly when adjusting the top parameter.

With the above detailed parameter adjustments, you can easily realize precise cropping of the screen to meet the needs of various application scenarios. In actual applications, please adjust accordingly to the actual needs to get the ideal image effect.

4.11.1 Rotation/Flip

These options enable a variety of transformation effects on images to meet your needs.



Rotation:

(1) Rotate 0° (no rotation): Keep the image in its original state and does not rotate it.

(2) Rotate 90°: Rotate the image 90 degrees clockwise.

(3) Rotate 180°: Rotate the image 180 degrees counterclockwise.

(4) Rotate 270°: Rotate the image 270 degrees clockwise.

Flip:

(1) No Flip: Keep the image in its original state and does not flip it.

(2) Flip horizontally: Flip the image along the horizontal axis.

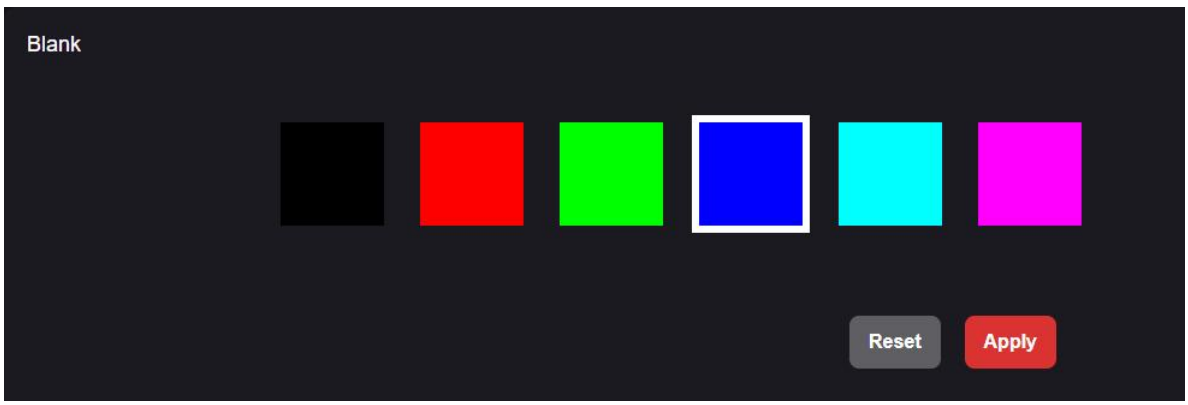
(3) Flip vertically: Flip the image along the vertical axis.

(4) Flip horizontally and vertically: Flip the image along the horizontal and vertical axes at the same time.

In the actual application, you can select the corresponding rotation and flip options to process the image as needed. Please note that different application scenarios and devices may support different functions.

4.11.1.No signal background selection

The user can select the display screen when the device fails to detect signal access.



Here are the details and the available colors:

(1) No signal background selection: User can select the display screen by clicking

the color button when no signal access is detected.

(2) Color options: The following six colors are currently supported:

- Black
- Red
- Green
- Blue
- Cyan
- Purple

Users can choose the appropriate color as the signal-less background according to their personal preference and actual needs.

With the no-signal background selection, users can personalize the display effect when there is no signal to enhance the usage experience. In practical applications, choosing the right background color according to personal preferences and needs helps to improve the comfort and viewing of the device.

4.11.2.OSD management

The X1 provides a set of OSD (On-Screen Display) features that allow users to superimpose text, time, date, stopwatch, and images on the video stream. Below is a detailed description of the OSD features:

Gallery: Click the plus icon and select a local image to upload. When uploading, name the image and click OK.

Image format and size limit: Supported formats include Jpeg/jpg/png, the size cannot exceed 5MB, and the resolution cannot exceed the resolution of the current encoding.

Delete images: After uploading, a selection box will appear at the top right of the image thumbnail. After checking the image, click the minus icon to delete the selected image.

Overlay Management

Main Stream Overlay: Click the plus icon next to Main Stream Overlay to pop up

the add page.

Select Overlay Type: In the Overlay Type drop-down box, you can select Text, Time, Date, Stopwatch or Image.

Set Overlay Position: Click one of the 9-direction and select the position of the overlay (Top Left, Top Center, Top Right, Left, Center, Right, Bottom Left, Bottom Center, Bottom Right).

Adjust font size: Select the font size (12px to 72px).

Select font color: Click the color block to bring up the color palette, select or enter the RGB code to set the color.

Save Settings: Click "OK" to save the overlay settings, or click "Cancel" to close the page without saving.

Sub-Stream Overlay: The options of Sub-Stream Overlay are the same as Main Stream Overlay, allowing users to add and edit the overlay content for the sub-streams.

4.11.3. Shortcut key

The C6 designs a function of shortcut keys, allowing you self-define shortcut keys to improve efficiency.

Currently there are three functions for option, that is start recording, stop recording and screenshot.

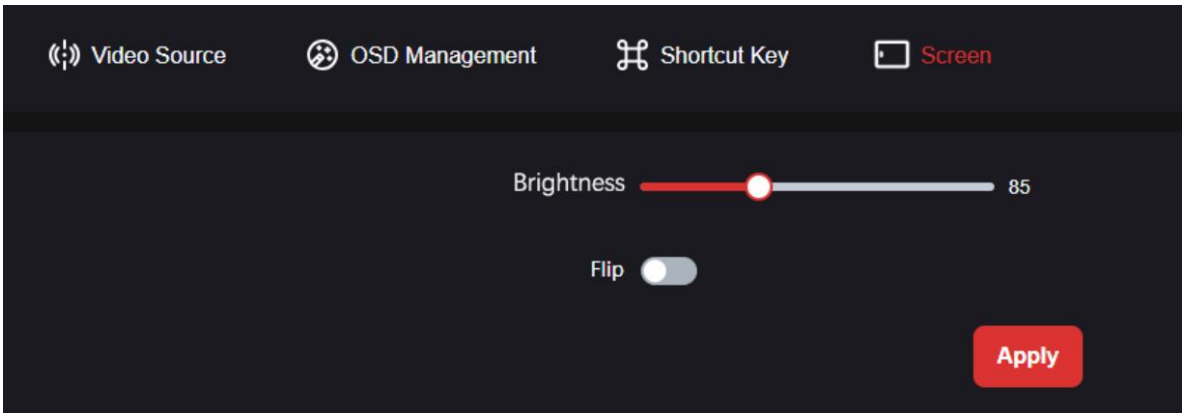
Click the input frame next to each function, it will pop up below soft keyboard.

Select a shortcut key by clicking a button on the soft keyboard, or determine the shortcut key by pressing a key directly on the keyboard.

There is a delete button at the end of the input box for deleting the shortcut keys.
Config button: You can configure the detailed parameters of your current option.

4.11.4. Screen

The user can easily set the screen brightness and rotate the screen to enjoy better user experience.



Brightness: Control the display brightness of the LCD screen. Range is 0%~100%.

100% represents the brightest state of the screen. Minimum brightness is 0%, when the screen will be off.

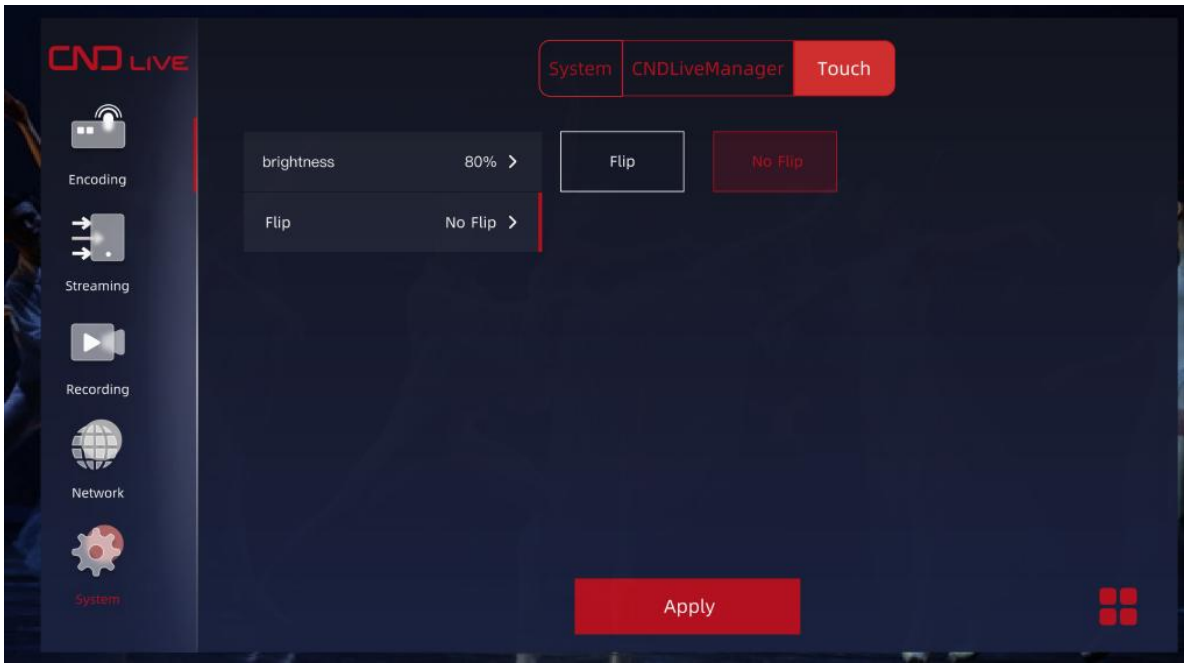
The default brightness setting is 50%, which is suitable for most usage environments.

Flip: The screen flip function allows the user to rotate the LCD screen content by 180°.

- **Screen operation**

Users can also set the brightness and screen flip settings on the touch screen.

Open the menu and select the "Settings" option, click on the "Touch Screen" option.



It is quite useful when you operate the device from different angles, ensuring you can easily view the content regardless of where the device is placed.

4.12. Recording

Video recording feature provides you with powerful video recording and management capabilities. With simple settings, you can easily record HD videos and flexibly manage the recorded files in your storage devices.

4.12.1. Video recording settings

(1) Storage device: Select the storage device where the video files are saved, such as external storage, external SD card, etc. After clicking the drop-down arrow, you can select the path of the recognized storage device.

(2) Recording format: Three recording file formats are provided, including .ts (usually an HD video format), .mkv (a common video container format that supports HD video and multi-language subtitles, etc.), and .mp4 (a common video format that is widely compatible with various players).

(3) File name prefix: Default is "REC-", users can modify the prefix to facilitate the distinction or organization of video files.

(4) Folder name: Default is "/RECORDING", users can modify the folder name to better categorize and manage the video files.

(5) Max Duration: Three time segment options are provided, including 10 minutes, 30 minutes, and one hour. Select the appropriate video time to cut into the desired paragraphs as needed.

(6) Strategy: There are two options including:

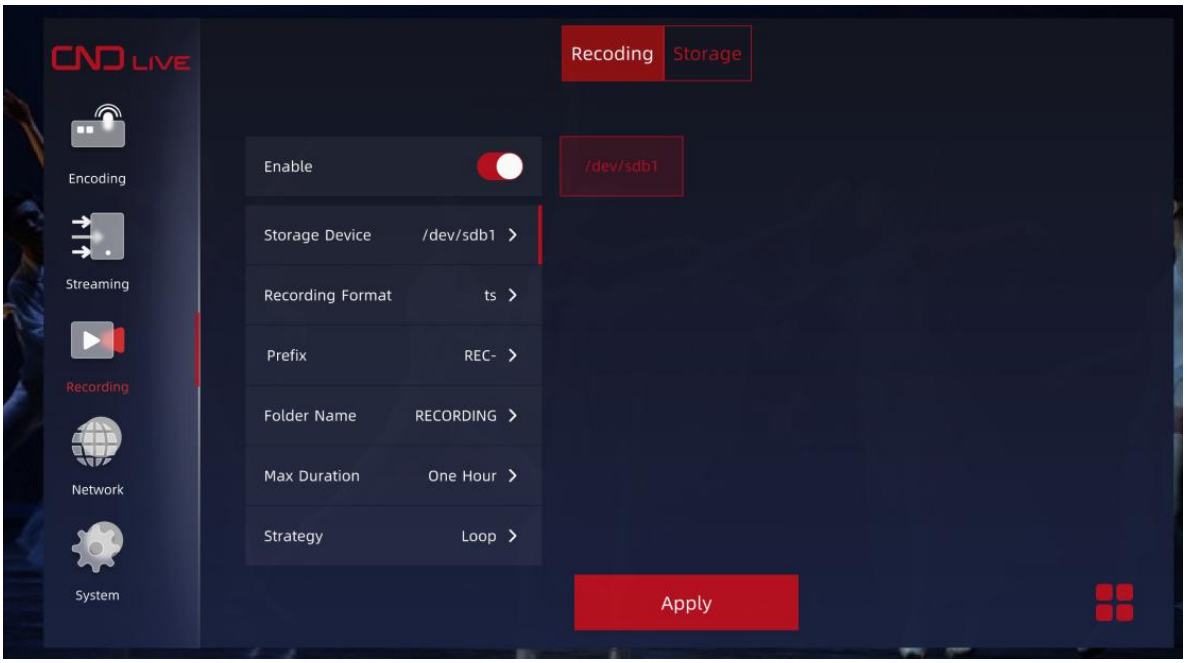
A. Cyclic Write: After the video file reaches the upper limit of the storage device capacity, it will automatically overwrite the earliest video file to realize cyclic recording.

B. Write Full Stop: Stop recording after reaching the upper limit of storage device capacity.

After completing the above settings, click the "Apply" button to save the changes and take effect. Depending on the specific needs and scenarios, users can flexibly configure video recording function according to these setting options.

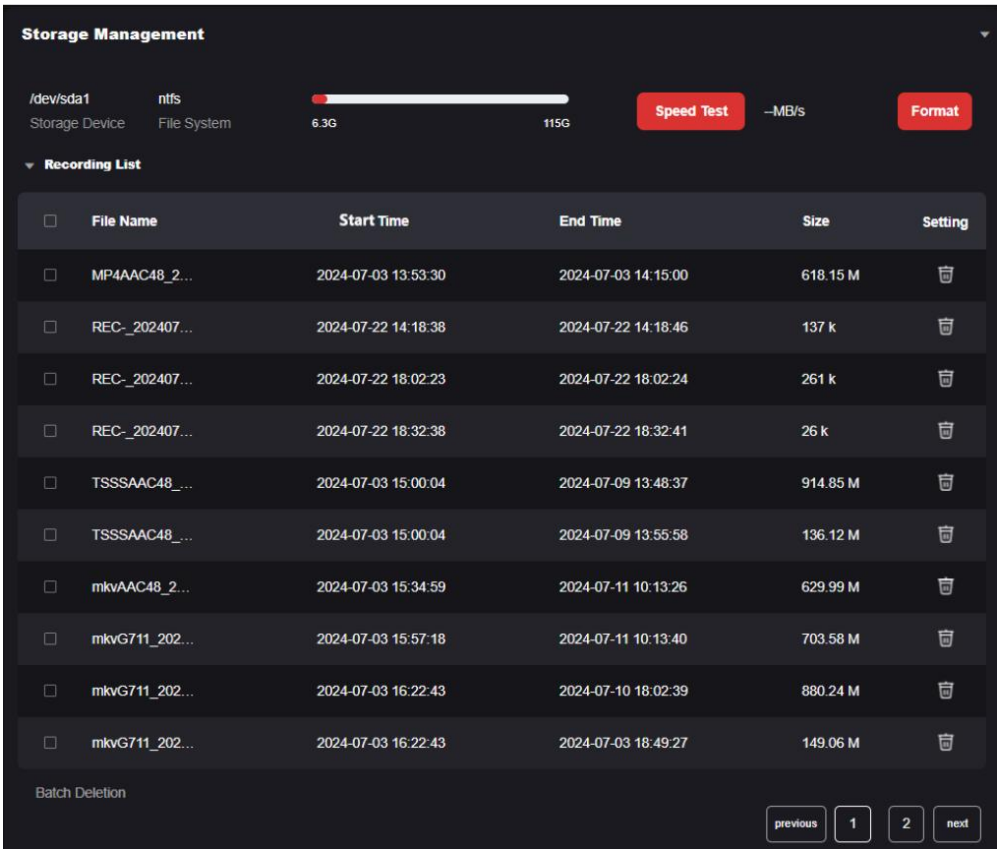
- **Screen operation:**

Open the menu on the screen and touch “Recording”. Click “Apply” after your settings.



4.12.2. Storage management

The storage management function allows users to monitor and manage video files efficiently. View accessed storage devices, file system information, and perform storage device performance testing and formatting operations.



Device list: The storage management interface will display all the accessed storage devices and their file system details. The status of each device will be visualized through the GUI, including total capacity and available capacity.

Device speed test: Users can test the speed of the selected storage device by clicking the "Speed Test" option. The system will perform multiple write operations and calculate the average write speed for users to evaluate the storage performance.

Device format: The format option allows the user to reinitialize the storage device to vfat format. The format operation will erase all data on the device and users should use this function with caution. After clicking "Format", a confirmation dialog box will pop up to ensure that the user intends to format the device.

Recording list: Below the storage device is the video file list, which details the name, start time, end time, file size and operation options for each video file.

(1) File name: The name of each video file consists of a prefix, date and time, and a serial number in the format of "Prefix - year, month, day - hours, minutes, seconds - serial number". This naming convention helps users to quickly identify and retrieve video files.

(2) Start time: indicates the time when the recording of the video file starts, in the format of "year-month-day hour:minute:second". This timestamp is essential for determining the recording range of the video file.

(3) End Time: It indicates the time when the recording of the video file ends, in the same format of "Year-Month-Day Hour:Minute:Second". This timestamp helps users understand the duration of the video file.

(4) File size: It refers to the storage size of the video file, usually in MB or GB. The file size information helps users to evaluate the storage space requirement and remaining capacity.

(5) Operation: It provides the option to delete the video file. Users can select the delete operation to free up storage space or remove video files that are no longer needed.

5. Batch Delete: Users can select multiple video files, then click the "Batch Delete"

button for quick deletion. This feature helps to efficiently clean up video files that are no longer needed.

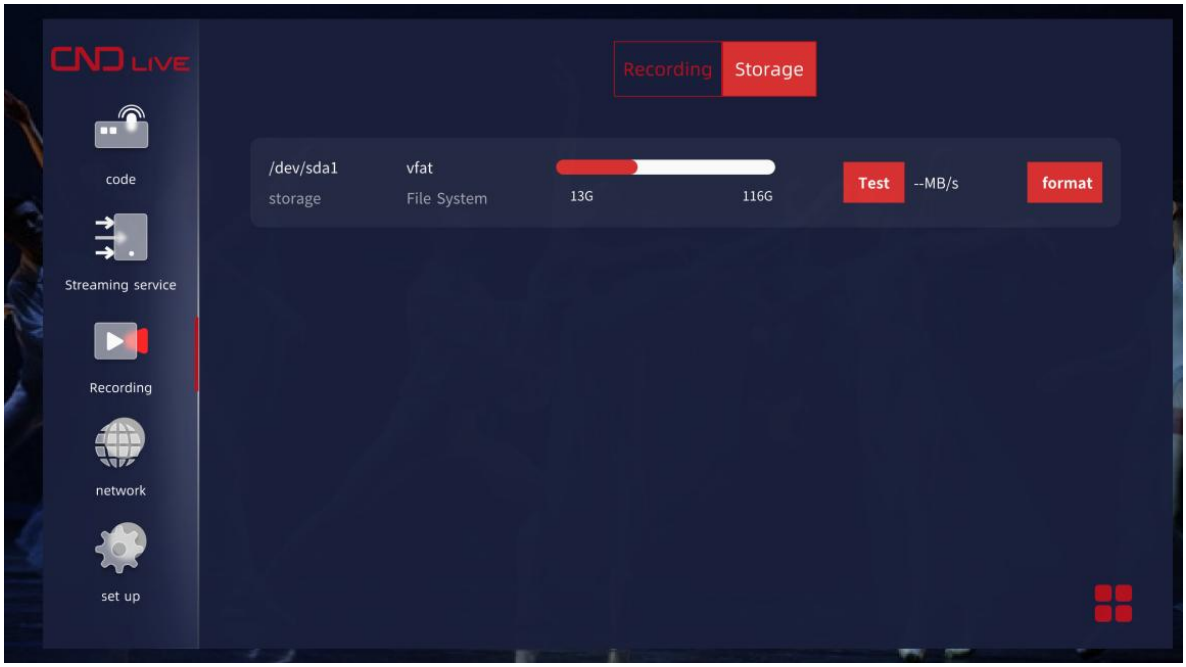
6. Page navigation: Provides page flip options, including "Previous", "Total" and "Next". These options allow users to navigate between different pages of the video file list to view more files.

Notes

- Make sure to back up important data before performing the formatting operation to avoid data loss.
- Measurement results may vary depending on the condition of the storage device and the system load, it is recommended that the test be performed when the device is idle to obtain accurate results.
- The batch delete operation cannot be undone, so please check the selected files carefully before executing it.

- **Screen operation:**

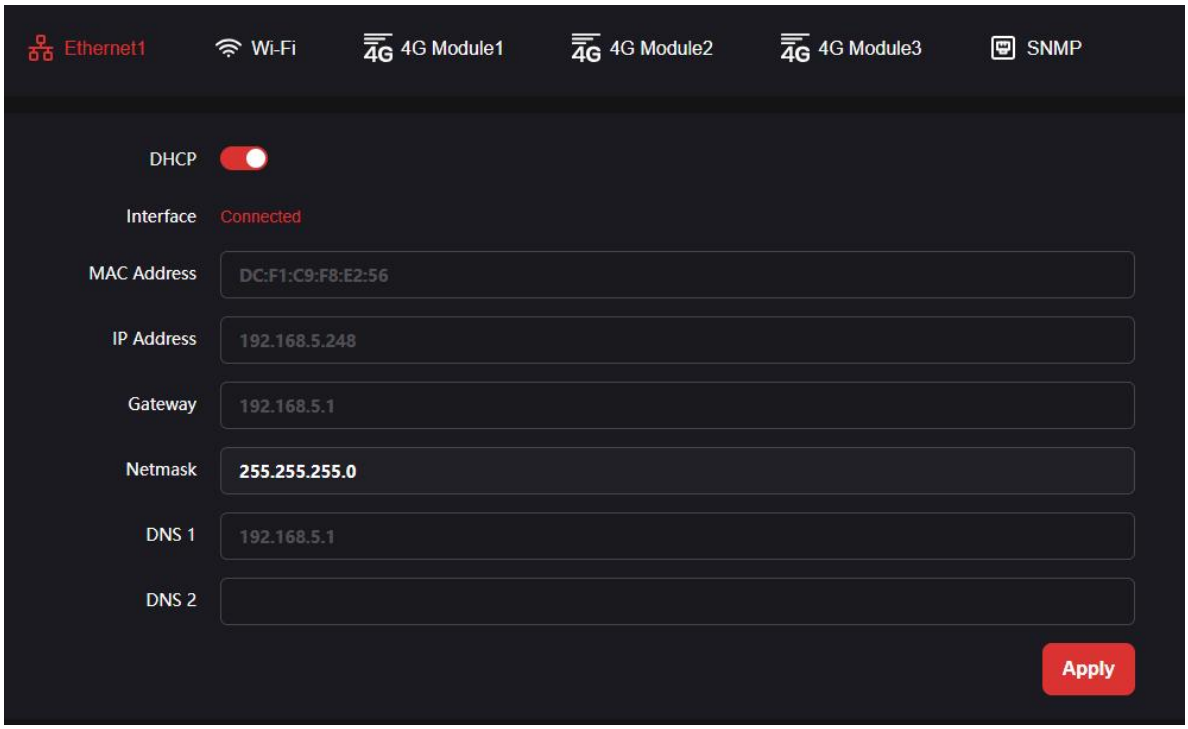
Open the menu, touch "Recording"-"Storage".



4.13. Network

Provide wired network and wireless network (Wi-Fi) connectivity, plus SNMP management.

4.13.1. Wired network



Obtain IP address automatically: This option allows the network device to automatically obtain network information such as IP address from a DHCP server on the network. When this feature is enabled, users cannot manually set the IP address, default gateway, subnet mask, DNS, etc. because these options will be disabled (grayed out).

MAC address: Display the fixed MAC address of the current device, which is necessary information in some network management scenarios, such as when you need to restrict specific devices from accessing the network.

IP address: Manually set the IP address of the device, usually used when there is no DHCP service in the network or when a static IP address is required.

Default gateway: Set the default gateway address for network, packets will be sent to this gateway first before sending to other network.

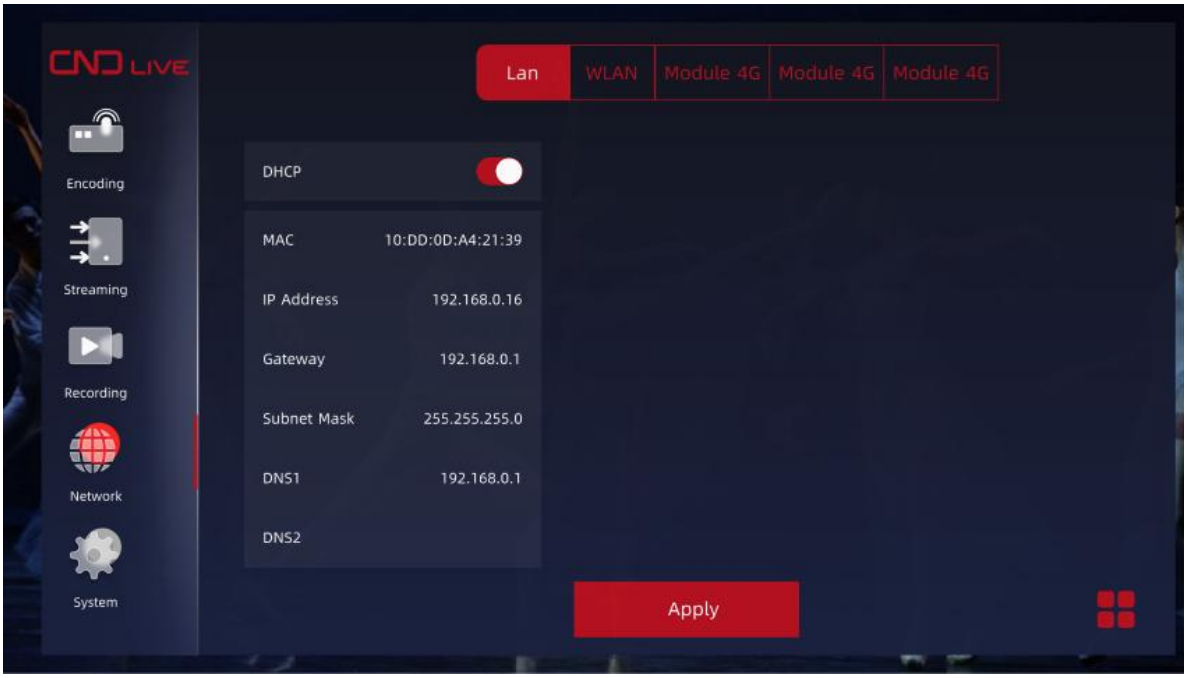
Subnet Mask: Define which portion of the IP address is the network address and which portion is the host address. Subnet masks are used in conjunction with IP

addresses to identify a specific network.

DNS1 and DNS2: Set up DNS server addresses for resolving domain names to IP addresses. Usually, one DNS server is required, but in some cases, multiple DNS servers are set up for reliability and speed.

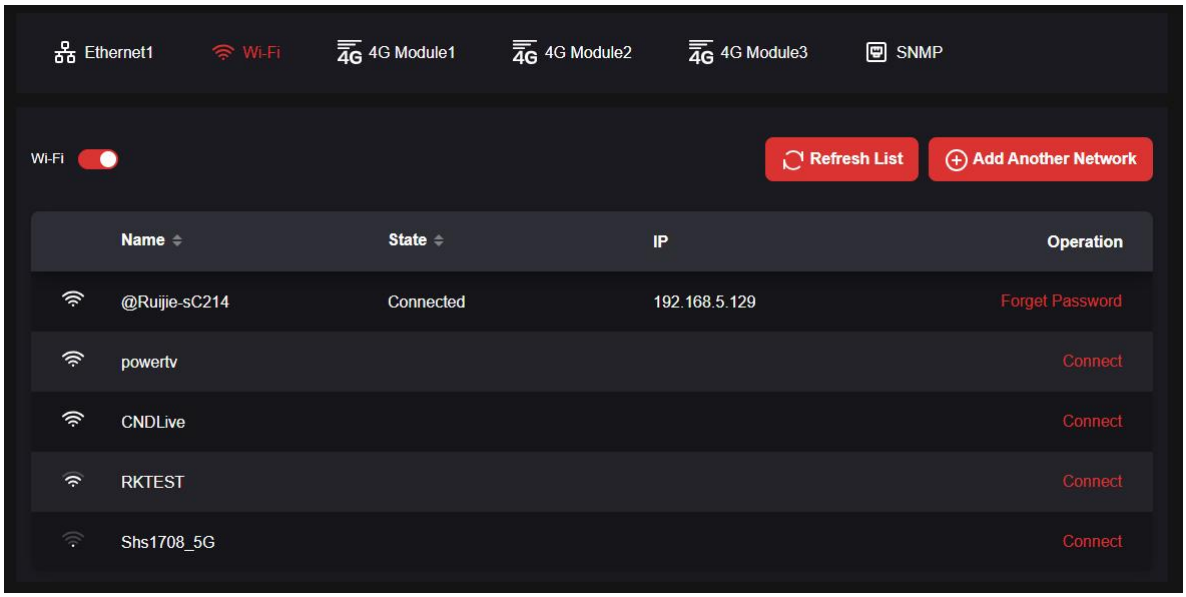
- **Screen operation:**

Open the menu, touch "Network" -" Lan".



NOTE: When you configure the wired network, please be sure the device is probably connected to the network.

4.13.2.WIFI



Wi-Fi function: Click the button to turn on or off the wireless network function. When turned on, the device will search for available wireless signals and list them.

Add another network: Users can add a new wireless network configuration by entering the SSID (network name) and encryption method for that network. After adding, the device saves these configurations and connects automatically on the next boot.

Refresh list: Click this button, the device will rescan the surrounding Wi-Fi signals.

Wi-Fi list: Display detailed information about all Wi-Fi signals that have been searched, including Wi-Fi name, connection status, acquired IP address and operation options.

(1) Signal strength icon: A sector icon is used to indicate the strength of the Wi-Fi signal. The stronger the signal, the better the connection quality usually is.

(2) Wi-Fi name (SSID): This is the name of the network, set by the network owner to identify the network.

(3) Connection status: Indicates whether the device is currently connected to the Wi-Fi network. If it is connected, it will be indicated by the text "Connected".

(4) IP address: the local IP address obtained by the device after connecting to the Wi-Fi network. This information is usually configured automatically and does not

need to be set manually.

(5) Operation: These are user-executable options.

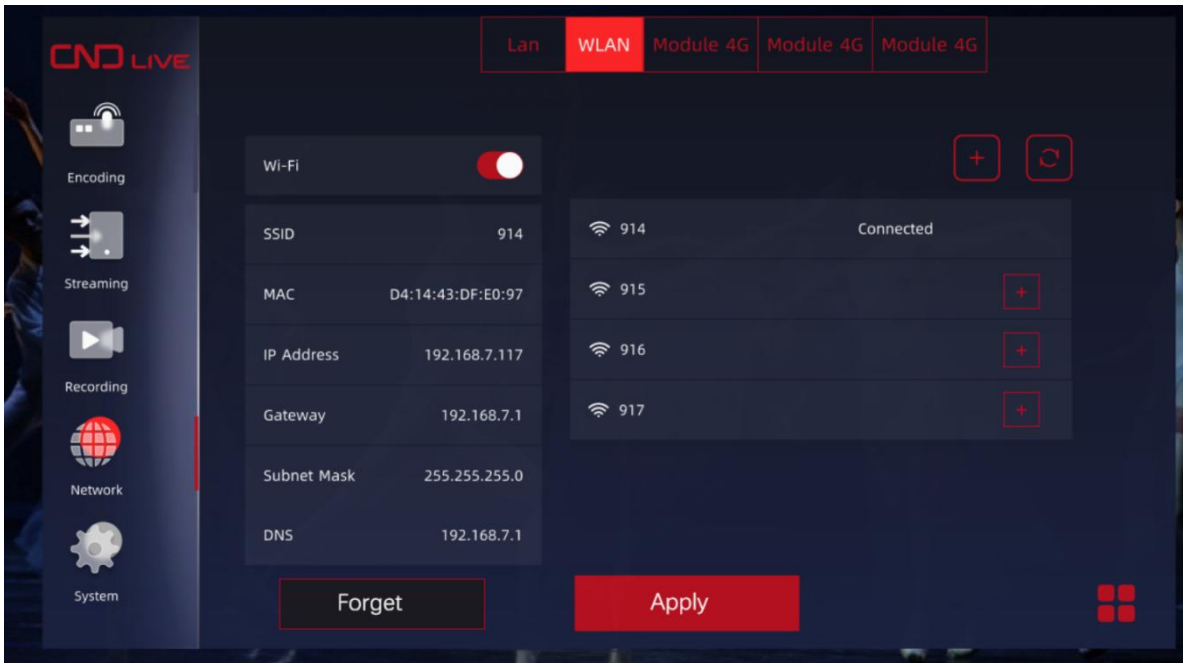
Connect: When clicked, a window will pop up asking the user to enter the password of the Wi-Fi network (if the network is encrypted).

Forget password: For connected networks, this option allows users to forget the password to disconnect and clear the related configuration so that they need to re-enter it the next time they connect.

The above is a detailed description of the C6 network features. In practice, users need to configure these options according to their own network environment and needs.

- **Screen operation:**

Open the menu on the screen, touch "Network" and "Wi-Fi network".



Notes:

Security: On public Wi-Fi networks, make sure you use encryption methods to keep your data safe. Do not connect to Wi-Fi networks from unknown sources, especially those open networks that are not encrypted.

Password protection: Set a strong password for your Wi-Fi network and change it regularly for added security.

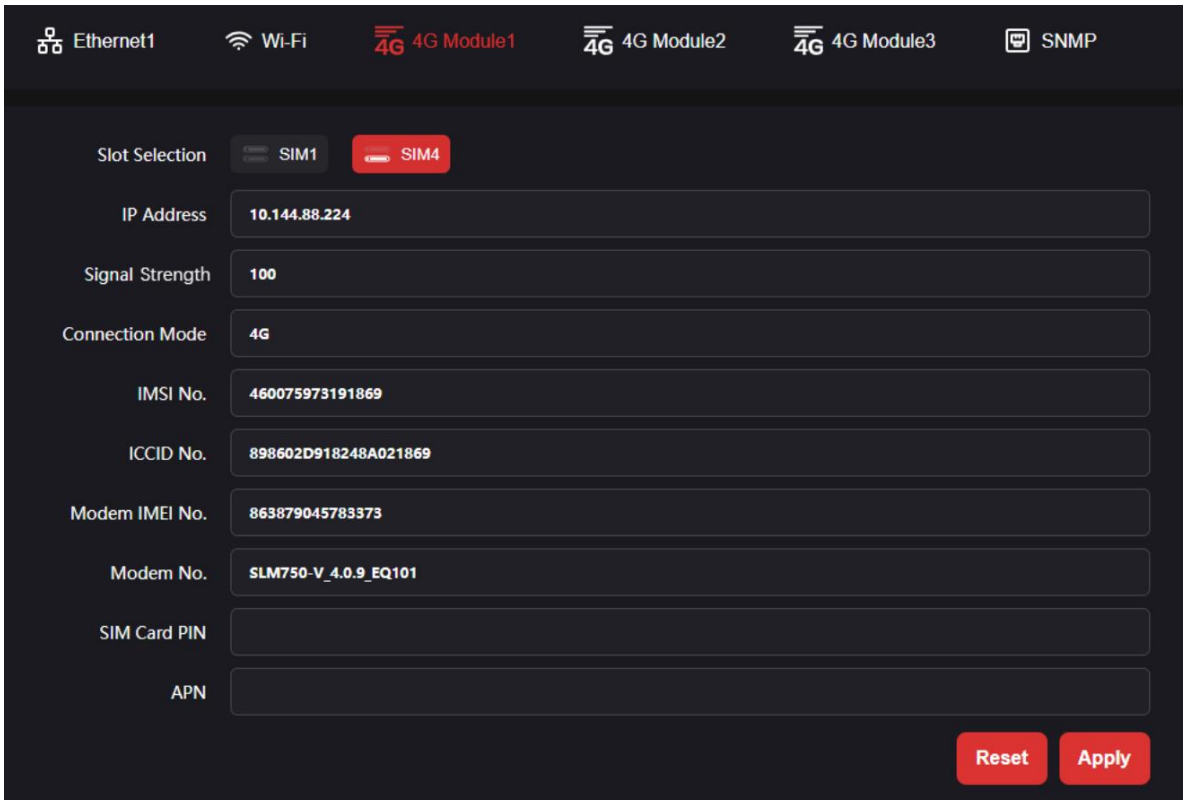
Network identification: Make sure your Wi-Fi network name (SSID) is unique to avoid

confusion with other networks. When setting your Wi-Fi name, do not include any personal information to prevent it from being recognized by others.

Signal interference: Be aware of possible sources of signal interference around you, such as other wireless devices, microwave ovens, Bluetooth devices, and so on. These devices may affect the strength and quality of the Wi-Fi signal.

4.13.3.4G

The 4G feature provides a flexible network connection that enables the X1 with a continuous network connection in environments where other network access is unavailable or unreliable. With three 4G modules, each of which can be inserted with two SIM cards. Stable connectivity is provided through an aggregated link, which reduces the likelihood of interruption of video transmission and ensures smooth and real-time video transmission.



Card Slot Selection: Users can insert two SIM cards into one SIM module and can use either one.

IP Address: The IP address of the 4G module is assigned by the operator and cannot be changed by the user.

Signal Strength: Displays the current signal strength of the 4G module, ranging

from 1 to 100, with higher values indicating stronger signals.

Connection Mode: Displays the data mode of the current network connection, including 2G, 3G or 4G.

IMSI: Displays the International Mobile Subscriber Identity (IMSI) of the current SIM card, which is used to identify the mobile subscriber and associated with the subscriber account.

ICCID: Displays the International Mobile Subscriber Identifier of the current SIM card, which is used to identify the SIM card itself and is associated with the SIM card hardware.IMEI: Displays the device's unique identifier, the International Mobile Equipment Identifier, which is used to identify and track the device in a mobile network.

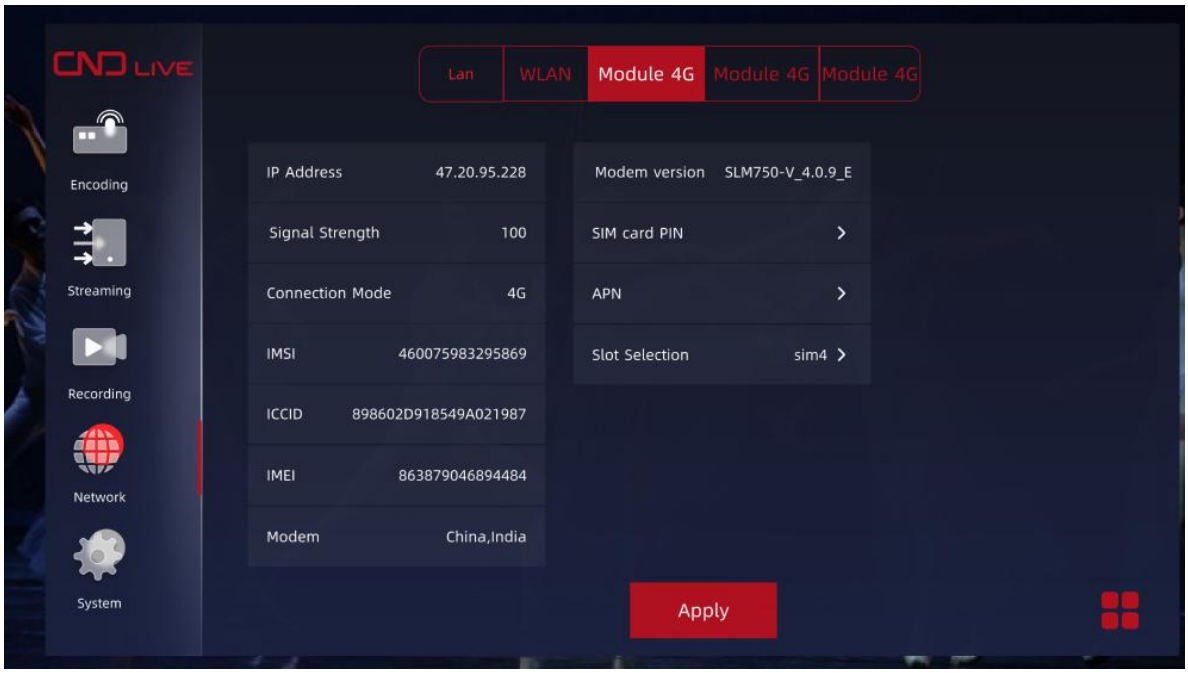
Modem: Displays the 4G module model number, regions may include China/India, Europe, North America, Australia, Latin America, etc.

SIM PIN: Allows users to manage the PIN code of the SIM card, which is used to protect the security of the SIM card.

SIM APN: Allows user to configure APN (Access Point Name) for accessing mobile internet.

- **Screen operation**:

Open the menu on the screen, touch and select “4G Module1”, “4G Module2” or “4G Module3”.



You can check the information of IP address, signal strength, connection mode, IMSI, ICCID, IMEI, region, and module version in the interface of each module.

PIN code can be entered for SIM card security. Configure APN (Access Point Name) for accessing the mobile internet.

You can select the card slot, a SIM module can insert two SIM cards.

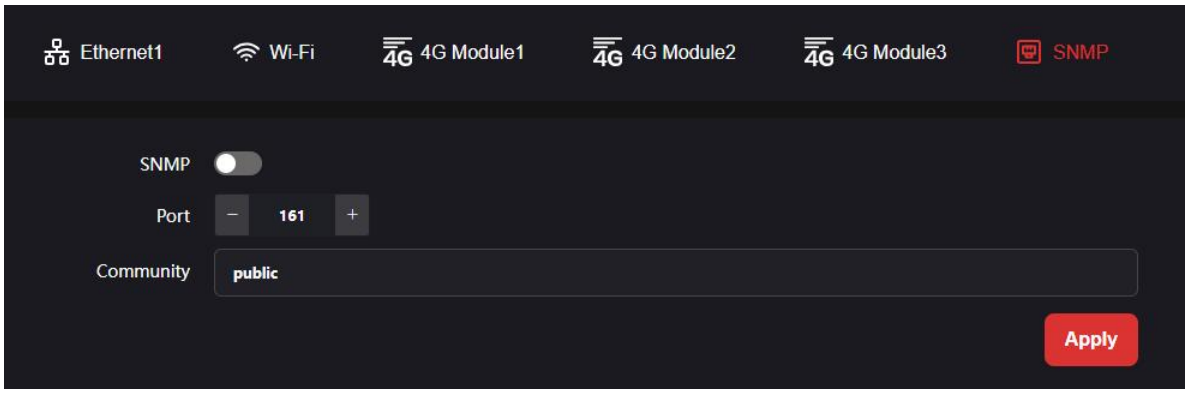
Reset: In the interface of each module, there is a "Reset" button. After clicking the "Reset" button, the currently set PIN and APN information will be cleared and the current 4G module service will be rebooted.

Note: -Ensure that a valid SIM card is inserted when setting up the 4G module.

-Select the appropriate connection mode and APN settings according to the actual network environment and requirements.

4.13.4.SNMP

X1 supports SNMP, allowing network administrators to monitor and manage the device over the network. SNMP functionality can be enabled and configured through the device management interface.



Enable SNMP : Click the Enable button next to the SNMP function to activate the SNMP function.

Configure the SNMP port:

(1) After the SNMP feature is enabled, you will see port configuration options.

(2) The desired SNMP port value can be entered manually or the port number can be adjusted using the increment/decrement buttons (- or + signs) provided.

(3) Ensure that the port number you enter matches your network plan and does not conflict with SNMP ports on other devices in your network.

Set SNMP team name:

(1) Security mechanisms used to control access to the device.

(2) The default name is "public". For security reasons, it is recommended to change this default setting.

(3) Enter a new, secure name to restrict access to the device.

Save the configuration:

(1) After completing the SNMP port and team name settings, click the Apply button.

(2) The device saves your configuration and may need to restart the SNMP service for the changes to take effect.

Notes:

- Ensure that network firewall rules allow SNMP traffic to pass.
- Consider restricting which IP addresses can access the SNMP port for added security.
- Update your SNMP password or team name regularly to keep your network secure.

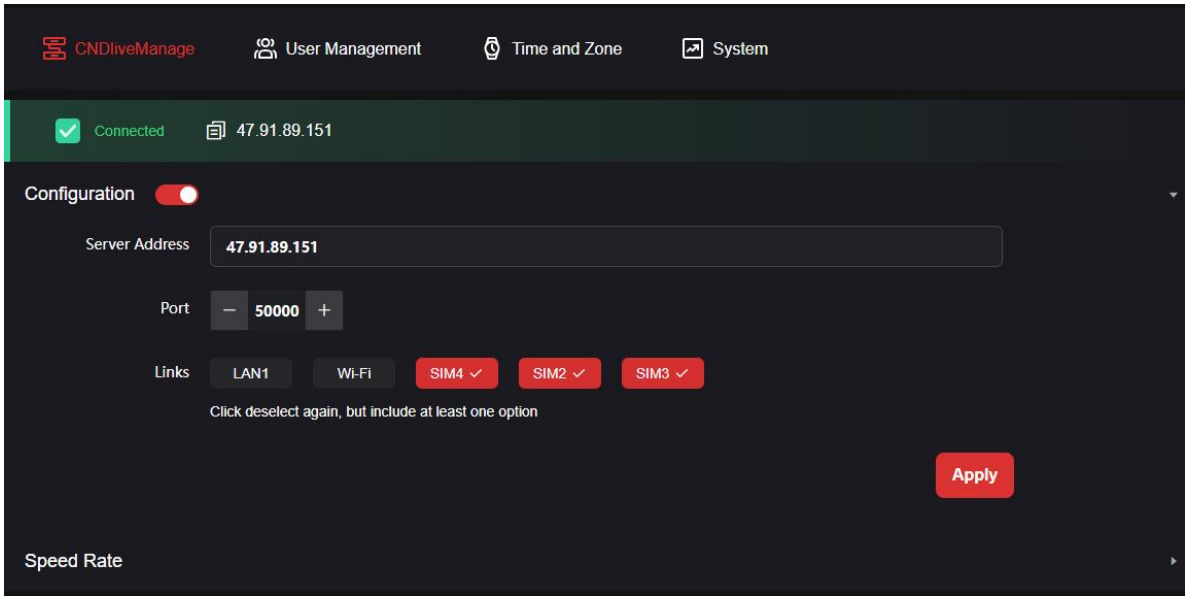
- If you are using SNMP on a public network, it is recommended that you use a VPN or other encryption method to protect data transmission.

4.14. Settings

The Settings menu is a powerful tool for advanced configuration and system management, and includes a connection management platform, user management, time and time zone settings, as well as upgrade and reboot functions to help you optimize device performance and ensure system security.

4.14.1.Management platform

The management platform provides an intuitive user interface for users to monitor and adjust encoder connection and configuration settings.



Connection status: The connection status area of the user interface provides a clear indication of the status of the connection between the encoder and the station. When the encoder successfully establishes a connection to the station, the area will show "Connected" to confirm that the communication link is working.

Configuration: The user can activate the current configuration settings by clicking on the "Enable Configuration" button, that ensures the settings of encoder are applied correctly and works as expected.

(1) Server address: The user can enter the IP address of the station in the "Server

Address" sub-option. This ensures the encoder is directed to the correct management server for data exchange and control commands.

(2) Server port: In the "Server Port" sub-option, users can manually enter the desired port number, or use the "+" and "-" buttons to increase or decrease the port number value. This provides the user with a convenient way to set the port number to meet specific network configuration needs.

(3) Data encryption: In the "Data Encryption" sub-option, the user can choose whether encrypt the transmitted data or not. It includes "No Encryption" and "Encryption" to ensure the security of the data transfer meets the user's specific requirements.

(4) Link selection: Users can select the encoder's connection type in the "Link Selection" sub-option. You can select "eth0" for wired connection or "wlan" for wireless connection. In addition, you can select both types of connection at the same time, in order to switch flexibly according to the actual network environment.

Rate Display: Below the configuration options, the user interface will display a network usage status graph to visualize the current link's used bandwidth. It helps users to monitor network bandwidth usage in order to optimize network resources and encoder performance.

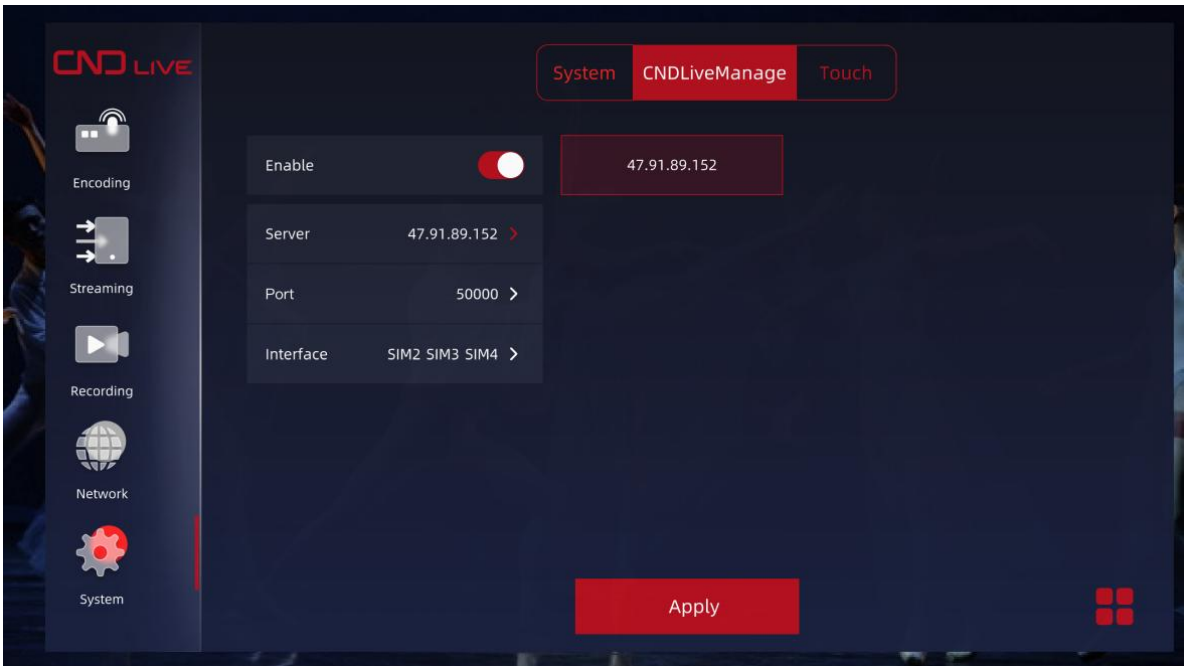
The management platform provides a comprehensive interface for users to manage and monitor encoder connections, configurations and security settings, ensuring that the encoder works efficiently and securely with the management system.

Notes:

- Ensure that the network firewall rules allow the corresponding port traffic to pass.
- Regularly update your version of the management platform to keep the connection successful and secure.

- **Screen operation:**

Open the menu on the screen, touch “System” -” Management Platform”.



The management platform offers a center that help you easily manage and monitor all devices, including connection, status, configuration and security settings to realize efficient and centralized control and management.

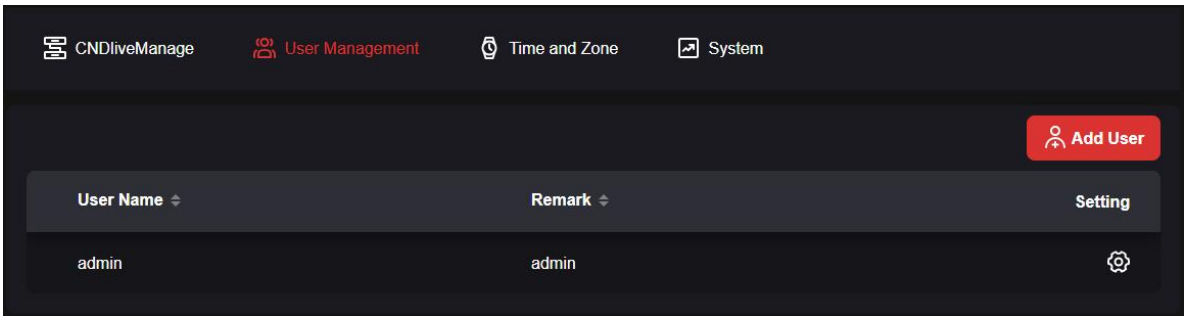
NOTE:

- Ensure that network firewall rules allow corresponding port traffic to pass.

-Regularly update your version of the management platform to keep connections successful and secure.

4.14.2.User management

The user management function allows administrators or users with appropriate privileges to add, edit and delete user accounts in the system.



Adding a user:

To add a new user, follow the steps as below.

(1) Click the "Add User" button.

(2) Will display input fields to enter a username, nickname and password.

(3) Enter the new user's information.

(4) Click the "Apply" button after confirming there are no errors.

(5) The system will save the new user information and create a new user account.

User List:

Display the following information.

(1) User name: Display the user names of all users in the system.

(2) Nickname: Display the user's nickname.

(3) Operation: Operation options are provided underneath each user name, including "Settings" and "Delete" icons.

Edit user information:

Follow the steps as below:

(1) Locate the target user in the user list.

(2) Click on the "Settings" option.

(3) The system will jump to the user edit page and display the user information form.

(4) Change the nickname and password in the form.

(5) Click the "Apply" button to save them when you have completed your changes.

Delete a user:

Follow the steps as below:

(1) Locate the target user in the user list.

(2) Click on the "-" symbol icon below the user name.

(3) A confirmation box will pop up asking whether to confirm the deletion operation.

(4) Click "OK" to execute the deletion, or click "Cancel" to cancel the deletion.

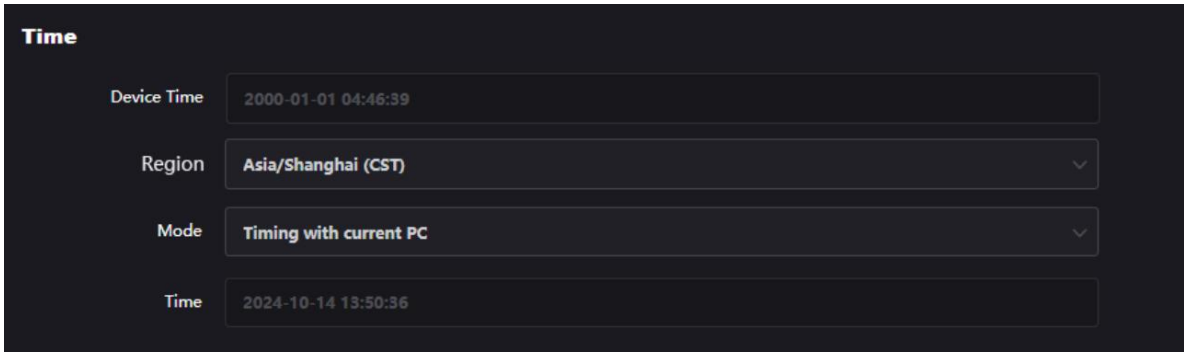
Security tips

- Ensure that best security practices are followed when adding and editing user information, such as using strong passwords and updating passwords regularly.

- Before performing the deletion operation, be sure to confirm that the user no longer needs access to the system to avoid unnecessary privilege leakage.

4.14.3.Time and region

Setting the time and time zone of the device to ensure that the time on the device matches the local time is critical for logging and time-sensitive applications.



Time Synchronization Methods:

(1) Calibration with PC: Allow the user to synchronize the encoder's time with the system time of the connected PC.

(2) Customized time: Users can manually set the encoder time to meet specific needs or for testing.

(3) NTP server synchronization: The encoder can automatically synchronize with

NTP servers to ensure time accuracy and global consistency.

Set button: After completing the time settings, the user needs to click on the "Set" button to apply the changes and save the settings. This feature ensures the persistence of the configuration and prevents loss of settings due to power failure or other reasons.

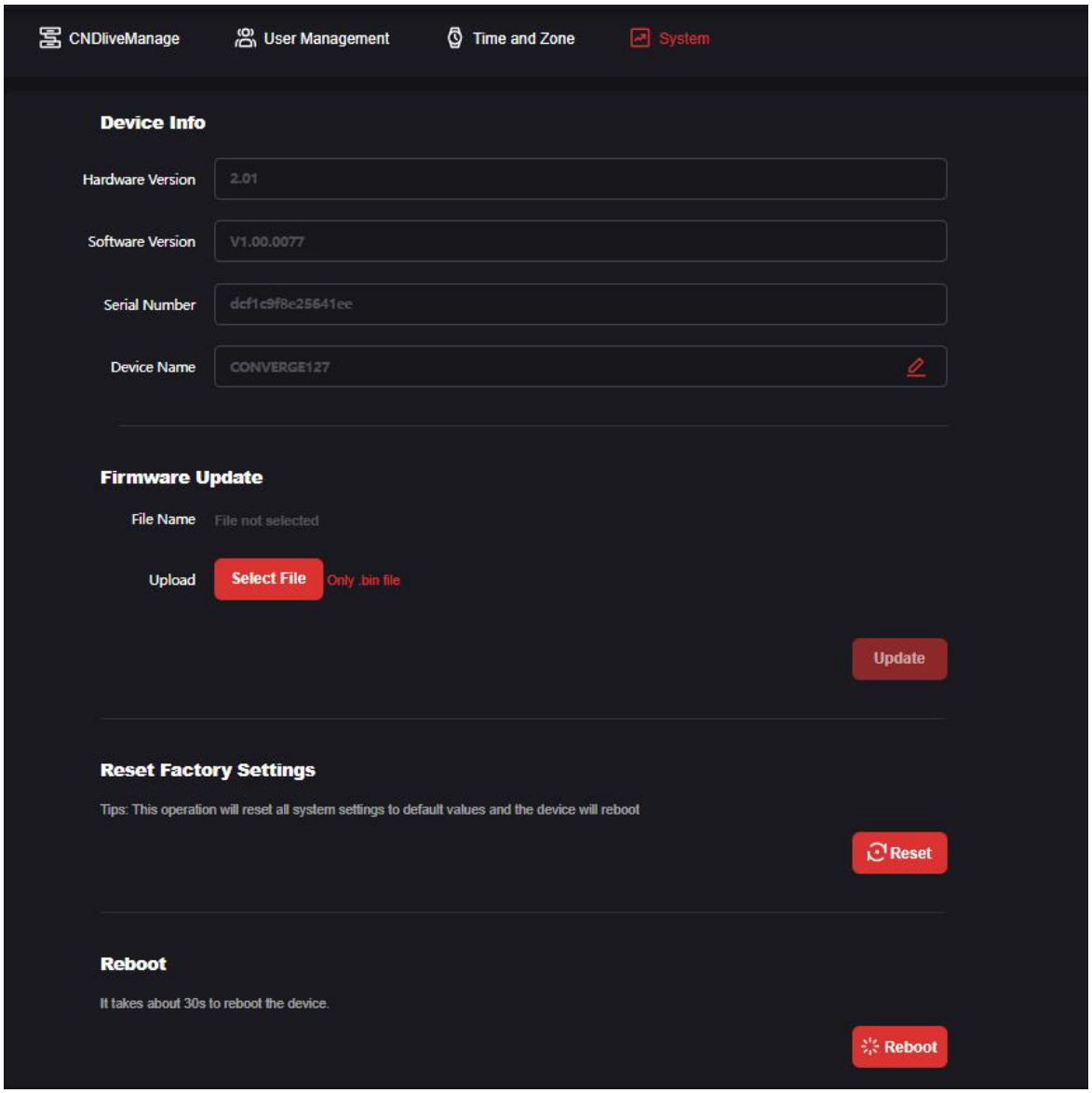
Region and location

To make the user interface more interactive and intuitive, the encoder provides a world map. Users can manually select a location on the map to quickly set the encoder's time zone and other location-dependent parameters.

After selecting a region or manually marking a location on a map, the user needs to click the "Change Time Zone" button to apply the new time zone setting and save it. This ensures that the encoder's time zone matches the user's actual location, thus providing accurate time information.

4.14.4.Systems

The latest firmware update can be installed to improve device performance and fix known issues. Also, a reboot feature is provided to reboot the device and restore factory settings to fix faults.



Current firmware version: Used to display the current firmware version. This information is crucial for users as it helps them to know the software status of the device and update it if necessary.

Upgrade process:

(1) Upload firmware: Users can upload new firmware by clicking the "Select File" button. After clicking this button, a file manager interface will pop up, allowing users to select a firmware file from the local file system. It should be noted that the uploaded file format should be `.bin`, which is the firmware file format supported by C6.

(2) File name: After selecting a firmware file, the file name will be displayed in the

corresponding input field. If the user did not select any file in step 2, the field will display "No file selected", reminding the user that a firmware file needs to be selected before the upgrade can proceed.

(3) Update: After selecting the firmware file and confirming the file name, the Upgrade button will light up to indicate that the firmware upgrade operation can be performed. If no file is selected, the Upgrade button will remain grayed out and unclickable to prevent users from attempting an incomplete upgrade operation.

Restore Factory Settings Function: When this option is selected and executed, all configurations, passwords, network settings, etc. on the device will be reset to factory defaults and the device will reboot automatically. Usually used to resolve configuration errors or system failures.

(1) Access the device's setup menu or configuration screen.

(2) Select the "Restore Factory Settings" option.

(3) The system will prompt a warning message to note that by restoring the factory settings, all configurations, passwords, networks, etc. of the device will be restored to their default values and the device will reboot.

(4) Click the OK button to confirm and perform the factory reset.

Notes

- Before performing a factory reset, make sure that this is the action you want to take, as all personalized settings and data will be erased.
- Restoring the factory settings may affect any calibrations or special configurations on the unit and should be done when necessary.
- In some cases, administrator rights or specific privileges may be required to perform this operation.

Reboot: When this option is selected and executed, the device will perform the normal shutdown process and then automatically reboot. The entire reboot process takes approximately 30 seconds. This feature ensures that the device is able to quickly return to normal operation in the event of a glitch or need, which helps to maintain the stability and performance of the device.

(1) Access the device's setup menu or configuration screen.

(2) Select the "Reboot" option.

(3) The system will prompt a warning message

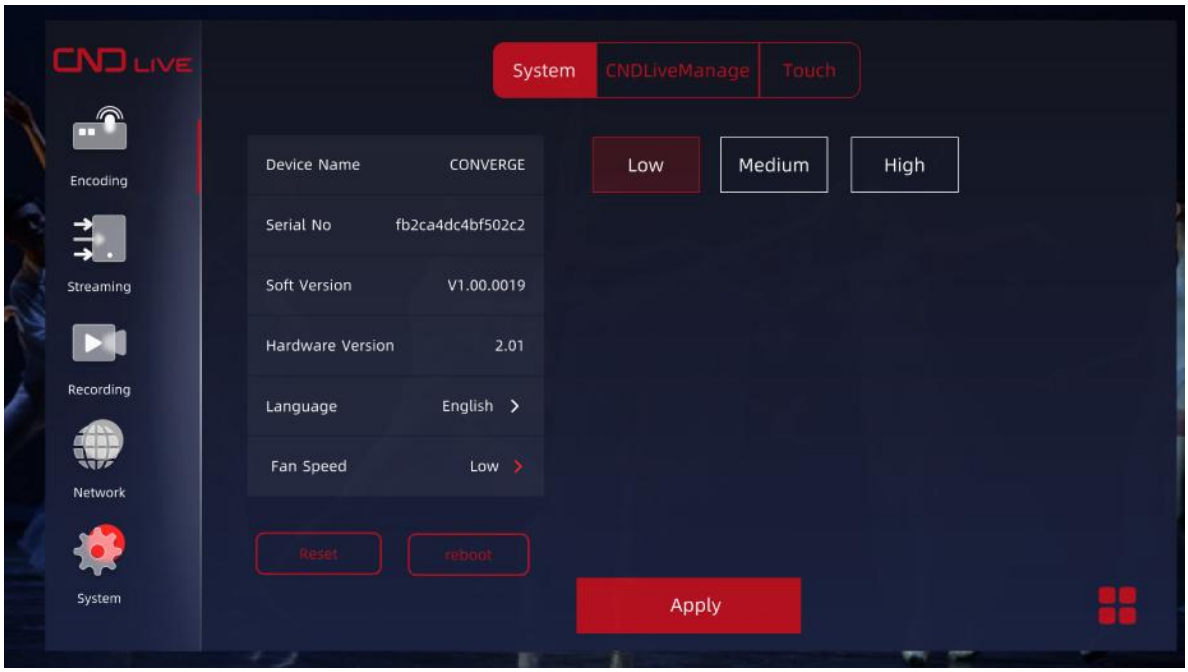
(4) Click the "Reboot" button to confirm and perform the reboot.

Notes

- Before performing a reboot operation, make sure that this is the operation you want, as the device will shut down and reboot.
- A reboot may interrupt ongoing work or data transfer, so please do it at the appropriate time.
- If the device is performing a critical task or update, it is recommended to wait for the task to complete before rebooting.
- The reboot operation may take some time to complete, please wait patiently for the device to reboot and enter normal operation.

- **Screen operation:**

Open the menu on the screen, touch “Settings” - “Systems”.



In the system menu, users can view the following information:

Device Name: Displays the name of the current device, users can modify this name on the Webpage.

Serial No.: Displays the hardware serial number of the current device, which is a unique identifier for device registration to the management platform and troubleshooting.

Soft Version: Displays the current firmware version of your device, which is very important for technical support and software upgrade.

Hardware Version: Shows the hardware version of the current device.

Language: Click the "Language" option, users can switch the interface language between Chinese and English.

Fan Speed: Click the "Fan Speed" option, users can select "Low", "Medium", "High".

⚠ **Notes**

- Before performing a reboot, make sure that this is what you want to do, as the device will shut down and reboot.

- Rebooting may interrupt ongoing work or data transfer, so do it at an appropriate time.

- If the device is performing a critical task or update, it is recommended to wait until the task is completed before performing a reboot.

- The reboot operation may take some time to complete, so please be patient and wait until the device reboots and enters normal operation.

5.Support

If you need more support, please contact the manufacture.

Website: www.cndlive.com

Telephone: 86-0755-26888895

Email: support@cndlive.com