



N Series • Wireless NDI® Video Encoder


# USER MANUAL

Changsha KILOVIEW Electronics CO.,LTD.

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## 1 Product introduction

N series NDI video encoder is a professional device designed for NDI video production field. It compresses and encodes SDI or HDMI video source into NDI stream, transmit video via wired or WIFI for any systems, device and software on your network.

### 1.1 Advantages

- **Portable design, small compact and stable NDI Wireless transmission**

Built-in 5.0GHz WIFI realizes stable NDI Wireless transmission, or USB-extend Ethernet transmission. Built-in large-capacity lithium battery, supports 5-16v external mobile power supply, no need to consider wired power supply.

Internal cooling fan makes it adapts to high temperature conditions, stable and reliable operation 115\*75\*35mm, 380g only, hot shoe mountable makes it easy to install on the camera for portable application.

- **Authorized by NewTek, compatible with other NDI® hardware and software products**

Available as sources for other NDI compatible systems and software, no cables everywhere anymore.

Ultra low-latency, mutual identification and communication of multiple data streams.

Smart connection, discovered and connected by other NDI devices automatically

- **Powerful encoding function, dual stream output, customized graphic overlay, voice intercom, local recording**

Wide adjustable code rate (64kbit/s to 40Mbit/s).

Dual stream output, the main code rate up to 1080p60Hz, and the sub-stream supports 720p60Hz video encoding.

Capable with customized text and image overlay function, which can be at any position on the screen.

With SD/TF card slot, it supports local recording, and supports NAS network storage.

### 1.2 Parameters

Model No.	N1、N2
Input	SDI (N1)、HDMI (N2)
Network Support	Enhanced WIFI (Enhance 5.0GHz frequency+PA), USB-extend Ethernet
Media transmission protocols	NDI-HX/RTMP/TS over UDP/HLS
Video resolution	Up to 1080P60Hz: 1080p23.98/24/25/29.97/30; 1080p50/59.94/60; 1080i50/59.94/60; 720p23.98/24/25/29.97/30; 720p50/59.94/60
Video encoding	H.264/ AVC High/ Main/ Baseline profile (up to Level 5.3); Motion-JPEG; NDI HX
Audio encoding	AAC/G.711
Latency	End-to-end by cable is about 150 ms
Image and text overlay	Custom text, image overlay function, can be superimposed to any position on the screen
Recording	SD/TF card slot, local recording, NAS network storage

Management	Web
Hot shoe	Removable
Battery capacity	3.7V 6800mAh (29.6Wh)
Power supply/Consumption	DC 12V 1A / 6.5W
Size/ Weight	115*75*35mm / 380g
Working temperature	-20°C~45°C

## 2 Operation guidance

- Installation and connection of the device

Connect the power and video input source correctly, power on the device.

- Network Connection and Configuration

The simplest way is that the encoder accesses the network by wired mode, and the device automatically gets an IP address from the network. Without any settings for the device, the encoder can be automatically found and pulled by other NDI devices in the network.

If you want to set up the network manually, when using wired connection mode, you can use the device failsafe IP address (192.168.1.168) to log on to the WEB page for setting up; at the same time, for convenience of operation, you can also connect the device's own WiFi hotspot to configure device through other WiFi terminal, such as mobile phone or pad. If you use the wireless network push flow, you must first log on to the device web Page to set up WiFi.

- NDI Pulling stream

NDI has the function of automatic discovery. After the encoder is normally connected to the network, other NDI-supporting playback tools (such as Newtek studio monitor, OBS, vMix) can be used to automatically discover the encoder and pull its NDI video stream directly.

- Other streaming service

If necessary, you can also configure the device to push video streams such as RTMP, UDP, HLS, etc..

### 3 Packing list and interface description

#### 3.1 Packing list

Please check the parts and accessories you received are exactly

Name	Unit	Quantity	Note
NDI® Encoder	set	1	N1:SDI Input; N2: HDMI Input
WIFI Antenna	pcs	2	
DC12V/1A power adaptor	pcs	1	
USB-DC cable	pcs	1	
USB-RJ45 converter	pcs	1	
Hot shoe rack	pcs	1	
Hot shoe bracket	pcs	1	
Quick start guide	pcs	1	
Certificate/Warranty card	pcs	1	

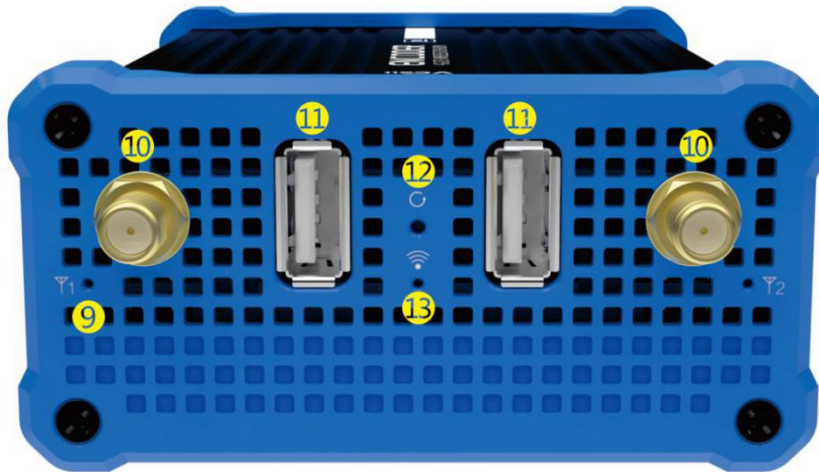
#### 3.2 Interface description



- 1、SDI/HDMI input 2、Battery capacity/charge indicator 3、 Power Supply 4、 SDI/HDMI indicator  
5、 Streaming indicator 6、 Streaming switch 7、 Power indicator 8、 Power switch

Note:5 and 6 are only for customized functions





9、Antenna gain light 10、WIFI antenna interface 11、USB port 12、Reset 13、WIFI status Indicator



14、TF Card slot

### 3.3 Signal indicator

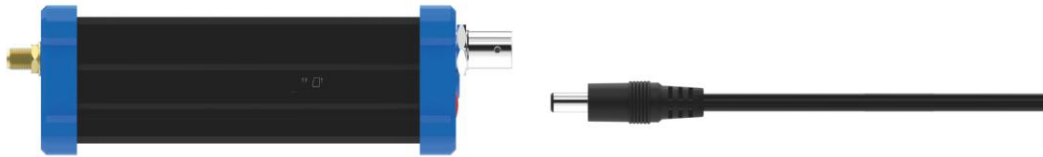
Name	color	Status	Description
Power light	White	Flashing	Starting
		Always on	Working
		Off	Power off
SDI/HDMI status light	White	Always on	SDI Signal Locked
		Off	No SDI Signal
Battery status light	White	Charging status (flashing)	Charging
		Always on	Working
		Off	Power off
Push flow status light	White	Always on	Working
		Flashing	Connecting
		Off	Stop streaming
WIFI status light	Red	Always on	Working
		Off	WIFI disconnect
Antenna gain light	Red	Always on	Working
		Flashing	Connecting
		Off	Disconnect

## 4 Installation and connection

### 4.1 Power connection

Use the standard power adapter (DC 12V) to connect the device, after power on, the device charges the built-in battery. Press the power switch on the device for more than 3 seconds. The power light flashes and the device starts up.

If it is used in the mobile status, it can be powered by the built-in battery directly. Press the power switch to start working (the built-in battery can last for about 4 hours).



About built-in battery:

1. While the device is powered on, connected with the power adapter, the device is powered by the adapter. The battery is not charging.
2. While the device is powered off, connected with the power adapter, the battery will be charging.

About fan

1. While the device is powered on, the fan will start working when reaches a certain temperature.
2. While the device is powered off, the fan is working while charging.

**⚠️ Note:** Please use the standard power adapter provided. Using other unqualified power supplies may damage the device.

### 4.2 Video signal connection

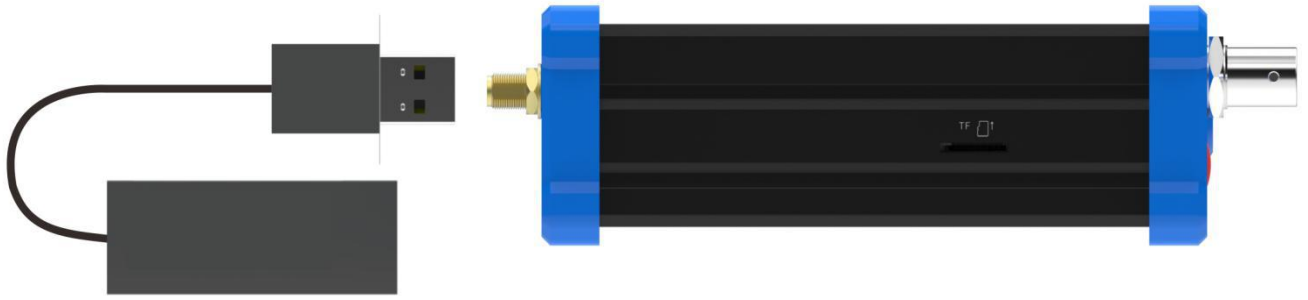
Connect the SDI/HDMI signal from a source (such as a camera) to the input port of the device through a cable.



N1: SDI input; N2: HDMI Input

### 4.3 Network connection

Plug the USB to RJ45 adaptor into the USB port of the device. The network port is connected to the switch, or it can be directly connected to the computer network.



## 5 Login and network configuration


### 5.1 Login to the device through Ethernet

First connect the USB to RJ45 Ethernet port of the NDI encoder and the computer to the same switch, or connect the encoder directly to the computer network port. Then configure the encoder and computer to the same network segment so that the computer can access to the web page of the encoder.

The default management IP address of the encoder is 192.168.1.168 ( This is the failsafe address of the device. Generally, do not modify this IP address. ) . If the IP address of the computer is not in the network segment of 192.168.1.\*, please set the IP address of the computer network port to 192.168.1.\*.

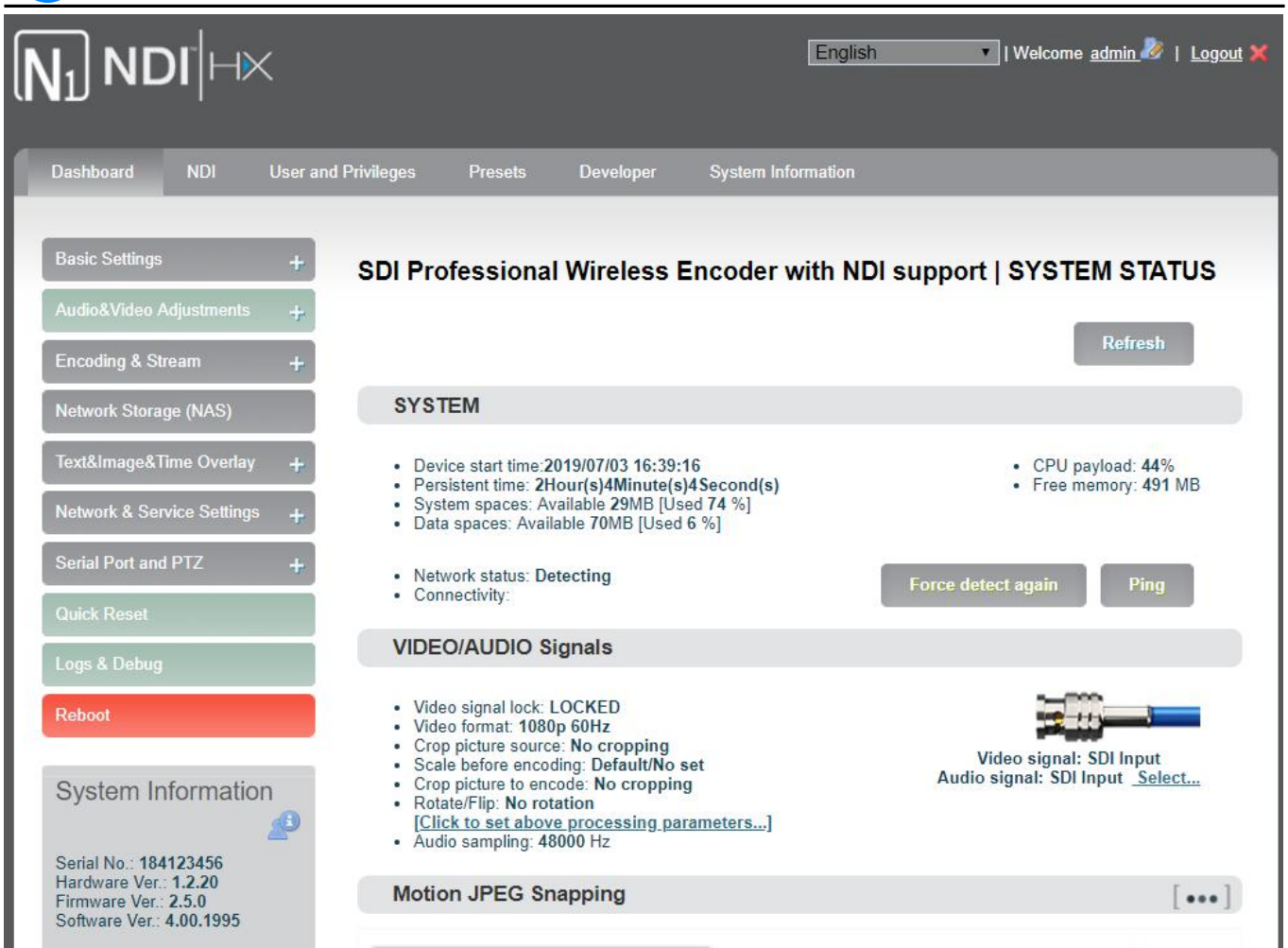
Open the WEB browser, directly input the encoder's IP address (default is 192.168.1.168) or the URL <http://192.168.1.168> and press Enter to open the login interface. After opening the page, an authentication dialog will pop up, please fill in the username and password, the default username is admin, the default password is admin, and then click "Login".

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 **Note:** *Due to the browser compatibility issues, it may cause the web page display abnormal, it is recommended to use Chrome and Firefox.*

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After login, the encoding and function parameters can be set on the encoder management web page. The page is shown as below:



The screenshot shows the NDI HX web interface. At the top, there is a navigation bar with 'English', 'Welcome admin', and 'Logout'. Below this is a menu with 'Dashboard', 'NDI', 'User and Privileges', 'Presets', 'Developer', and 'System Information'. The main content area is titled 'SDI Professional Wireless Encoder with NDI support | SYSTEM STATUS' and includes a 'Refresh' button. The 'SYSTEM' section displays device start time, persistent time, system spaces, data spaces, CPU payload, and free memory. The 'VIDEO/AUDIO Signals' section shows video signal lock, format, crop picture source, scale before encoding, crop picture to encode, rotate/flip, and audio sampling. A 'Motion JPEG Snapping' section is also visible. On the left, there is a sidebar with various settings like 'Basic Settings', 'Audio&Video Adjustments', 'Encoding & Stream', 'Network Storage (NAS)', 'Text&Image&Time Overlay', 'Network & Service Settings', 'Serial Port and PTZ', 'Quick Reset', 'Logs & Debug', and 'Reboot'. A 'System Information' box at the bottom left shows serial number, hardware, firmware, and software versions.

## 5.2 Log in to the device through the WiFi hotspot

In order to facilitate user management, the user can also connect to the device through WiFi terminal . The device comes with a WiFi hotspot by default. Hotspot name is “CAST\_AP” and the hotspot password is “12345678”. You can use a WiFi terminal such as a mobile phone or laptop to connect to this hotspot to log in and manage the encoder device. After connecting to this hotspot, you can log in to the management interface of the encoder by entering <http://192.168.250.254> in the browser of your mobile phone or laptop.

**⚠️ Note:** *The WiFi hotspot function is recommended only for starting use and for convenient log in to the device. In the process of streaming with WiFi, Please do not to use the hotspot function to avoid affecting the streaming.*

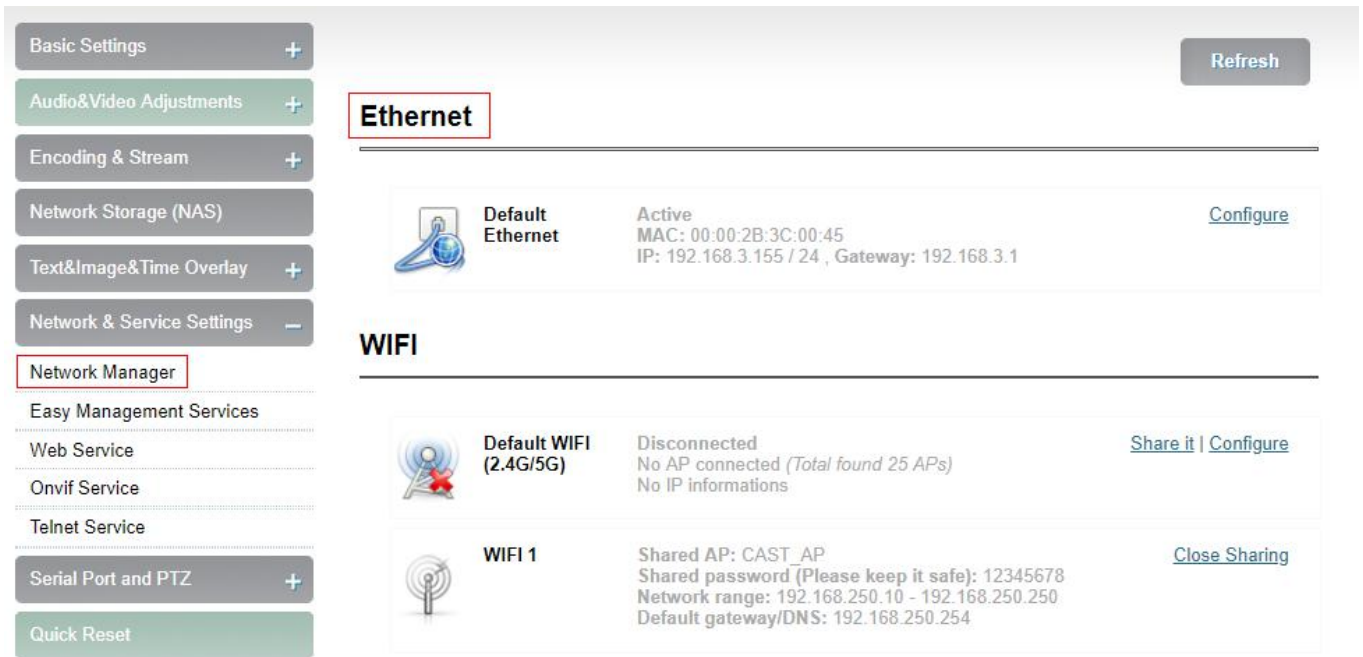
## 5.3 Network configuration

The encoder supports both Ethernet and WIFI. The two networks use separate network cards, which can be configured with IP addresses. The configured IP addresses can be used for network streaming and management of encoders. The specific configuration of the two networks is described in detail below.

### 5.3.1 Ethernet

The encoder can provide an Ethernet access through a USB to RJ45 converter. This port can be configured with an IP address and default setting is DHCP . It will automatically get a complete IP address, gateway and DNS according to this LAN.

Click "Network & Service Settings", click "Network Manager" to enter the following interface, you can see the IP address with Ethernet.



The screenshot shows the 'Network Manager' interface. On the left is a sidebar with various settings categories. The main area is divided into two sections: 'Ethernet' and 'WIFI'.

**Ethernet Section:**

- Default Ethernet:** Status: Active. MAC: 00:00:2B:3C:00:45. IP: 192.168.3.155 / 24, Gateway: 192.168.3.1. A [Configure](#) link is present.

**WIFI Section:**

- Default WIFI (2.4G/5G):** Status: Disconnected. No AP connected (Total found 25 APs). No IP informations. Links for [Share it](#) and [Configure](#) are present.
- WIFI 1:** Status: Shared AP: CAST\_AP. Shared password (Please keep it safe): 12345678. Network range: 192.168.250.10 - 192.168.250.250. Default gateway/DNS: 192.168.250.254. A [Close Sharing](#) link is present.

In addition to the way of DHCP , the encoder also supports manual IP assignment. To change the IP of the wired network, click “Configure” button in the Ethernet to enter the interface for configuring the IP. There are two ways to get the address, one is DHCP, and the other is to manual. To use DHCP to automatically obtain IP, you must first ensure that the router or switch has enabled the DHCP service. This method is simple and convenient, but the IP obtained by DHCP changes continuously, and you cannot directly know what IP address the encoder gets. To use manual, you need to enter a fixed IP to the encoder, and this IP address is fixed as long as the encoder does not restore the factory settings, this method is more stable. Therefore, the two methods have their own advantages, and can be selected accordingly.

### LAN Connection

---

MAC:

MAC Clone:

Address Resolve:


IP Address:

Net Mask:

Gateway:

DNS1:

DNS2:



After Ethernet is configured correctly, you can see that the connection status is “Internet reachable” and the Internet connection is the default Ethernet port on the Information Board.

### 5.3.2 WIFI network

WiFi configuration has two modes, which can realize two functions. "Default WIFI" is used as ordinary terminal, connect router WIFI signal, use WIFI to transmit video; "WIFI1" is as AP hot spot to be connected by other devices, default hot spot name is "CAST\_AP" and the hot spot password is "12345678". You can use a mobile phone or laptop to connect to this hot spot to log in and manage the encoder. After connecting to this hot spot, you can log in to the encoder's web page by typing "192.168.250.254" in the browser of your mobile phone or laptop. As shown in the figure below, click “Set as Shared Hot spot” of WIFI 1 to customize the shared hot spot name and shared password. You can select the wifi channel and the network card to be shared.

**Share it** ✕

---

Sharing AP name:

Disable broadcast SSID:

Sharing key:

Select a Wifi channel:

Through this device to Internet:

For normal use, just click "Default WIFI" option to enter the interface that connects to WIFI.



Click “WIFI scanning list” to connect, usually you need to enter a WiFi password to connect successfully. For some WiFi that hides the SSID, you can also connect a hidden hot spot by manual. The WiFi that has been successfully connected, the encoder will save this record. By default, this WiFi will be automatically connected next time. You can also select this saved WiFi hot spot to disconnect or delete the WiFi.

### Advanced WIFI Settings

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Country/Domain/Standard:

WIFI Roaming:

### Default WIFI Saved connections

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*(No saved connection)*

### WIFI scanning list

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<div style="border: 1px solid #eee; padding: 5px; margin-bottom: 5px;">  Test-02                 </div> <div style="border: 1px solid #eee; padding: 5px;">  HUAWEI-39D8                 </div>	<div style="border: 1px solid #eee; padding: 5px; margin-bottom: 5px;">  KV_JSZC                 </div> <div style="border: 1px solid #eee; padding: 5px;">  Test-03 <span style="float: right; text-decoration: underline;">Connect</span> </div>
---	--

**⚠ Note:** *In order to reduce the wireless network interference and obtain a good video playback experience, it is recommended to place the WiFi router and encoder in the visible range and connect the encoder to the 5.0GHz of the WiFi, and set the router to a relatively clean channel. In order to make sure the fluidity of the video while streaming with wifi, the coding rate can be appropriately reduced as necessary.*

When connecting to WIFI, there are two ways to obtain an IP address, DHCP and manual. Same as Ethernet, if using DHCP, be sure that the wireless router has enabled the DHCP service (usually turned on). This method is simple and convenient, but the IP obtained by DHCP changes continuously, and you cannot directly know what IP address the encoder gets and network cable connection is required for management. To use manual, you need to enter a fixed IP to the encoder, and this IP address is fixed as long as the encoder does not restore the factory settings, this method is more stable.

**⚠ Note:** *When using WIFI function, it is better not to connect to the Ethernet at the same time, because Ethernet has higher priority than WiFi. If you use WIFI for streaming while need to connect to the Ethernet configuration, you must delete the gateway of Ethernet, make sure only one IP address of Ethernet is used to manage the encoder. If not, it may cause that WiFi streaming is not actually used even WIFI is connected.*



### 5.3.3 Convenient management functions

The "localized connection" is configured with a dedicated IP address on Ethernet (This is the failsafe IP address of the Ethernet port. Generally, do not modify this IP address.) . In this way, even if you forget the IP settings of the Ethernet, or if the IP cannot be learned because DHCP gets the address, you can still connect and access the device through the configured private IP address.

#### Easy Management Service

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**About Easy Management**

The 'Easy Management' service provide a easy way for users to manage/use this device. Two important functions is served: 1st, 'Local Link' on ethernet; 2nd, connect your Android or iOS phone/pad to this device.

'Local Link' function give a way to set a special static IP address on Ethernet port. Thus, even you forget the IP or unknow the dynamic IP, you can also access this device by that 'special static IP'.

This device enable you connect Android or iOS phone/pad to it, that you can manage it and watch live video by an App, and share your phone's 4G network.

**Local Link**

Enable Local Link:

Special IP Address:

Netmask:

"Localized connection" is to bind the encoder to a separate IP address, this IP address does not affect the use of other network cards, in special cases, it can play a role to manage encoder, this address can be manually changed, the default address is 192.168.1.168.

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**⚠️ Note:** *When accessing the device through a convenient managed IP address, your computer must have an IP address on the same network segment.*

---

## 6 NDI Discovery and Configuration

N series NDI video encoder is a professional video encoding device for NDI video production. It can compress SDI or HDMI video source code into NDI protocol stream and transmit video over Ethernet or WIFI network for network. It can be compatible with any system, device, or software.

**⚠️ Note:** *NDI encoder cannot support RTSP protocol transmission currently. When the encoder is connected using the NDI tool, the RTSP stream obtained is encrypted and displayed in a mosaic state.*

### 6.1 NDI|HX Driver Installation

At present, the encoder uses a compressed NewTek NDI|HX technology. Before using other tools to connect, you need to download and install the NDI|HX driver from the NEWTEK website (<https://www.newtek.com/ndi/tools>), NDI Tools contains the following:



**⚠️ Note:** *The NDI|HX driver does not support installation on Mac series terminals, so Mac terminals cannot play NDI videos. However, Mac terminals can support NDI functions after installing the NDI toolkit, such as using NDI scan converter to select any active window such as: (IM chat window or browser or any software), and then can make these windows into NDI signals for output.*

*For the NDI|HX version, only the NDI|HX driver can be successfully installed to connect to the encoder NDI stream using other tools.*

*For other products that support NDI 4.0, they can be automatically discovered without installing the NDI|HX driver.*


## 6.2 NDI discover and connection

**⚠️ Note:** *NDI discover is realized via multicast, so it is required to put NDI encoder and other NDI devices in the same subnet, and configured with the IP address of the same subnet and can communicate with each other (can be obtained automatically). Otherwise, the NDI encoder cannot be automatically discovered.*

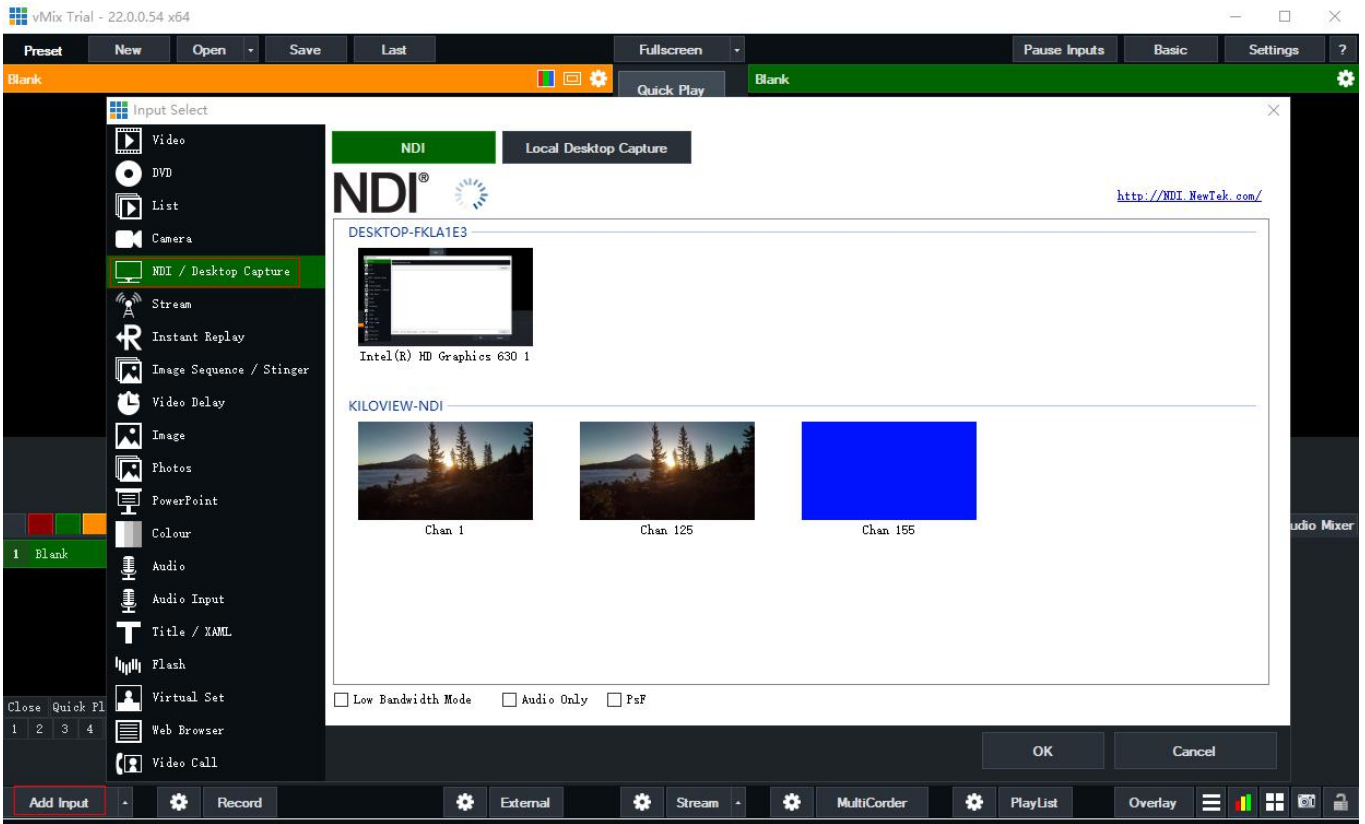
When the device configured with network and NDI|HX driver installed on the PC side, other NDI-enabled tools of the same subnet can discover the encoder automatically. Currently the tools that support the NDI protocol are widely. The following is an example of how to automatically discover and pull NDI video streams by using NewTek studio monitor and VMIX.

- Open NewTek studio monitor software, click the icon in the upper left corner to display the list of device names that have been discovered. The device list will be displayed according to different channel names. Select the device you want to connect, and then you can pull the current video stream of the encoder.



**⚠️ Note:** *After opening the selected video of the encoder by Studio Monitor, click  in the lower right corner of the player to open the Web page of the encoder directly, which is convenient for the management of the encoder.*

- Open vMIX software, click “add input” of the left corner, select “more”, which shows it can add various sources. Click “NDI/desktop capture”, it shows NDI devices list. According to device names and channel names, you could select the device you want to add, then click “OK”, the video source will be added into vMIX play source list.



### 6.3 Modify NDI device name and channel name

When there are multiple NDI encoders in the same network, as default device name and channel name are same, it is required to modify device name and channel name to identify different devices.

Click on the NDI option at the top of the menu to modify the parameters:




### 6.4 Modifying NDI Bit Rate

On the dashboard, click SET at H.264 Main Stream to set the bit rate, which is also the bit rate of NDI stream.

## 7 Parameters configuration

### 7.1 Dashboard

“Dashboard” is an overview of the current running status of the device and the status of audio and video streams. Users can click the “Refresh” button to refresh in real time, which can greatly help the encoder setting and troubleshooting.



The screenshot shows the 'SYSTEM STATUS' page of the SDI Professional Wireless Encoder. The page is divided into several sections:

- SYSTEM:**
  - Device start time: 2019/07/03 16:39:16
  - Persistent time: 2Hour(s)4Minute(s)4Second(s)
  - System spaces: Available 29MB [Used 74 %]
  - Data spaces: Available 70MB [Used 6 %]
  - CPU payload: 44%
  - Free memory: 491 MB
  - Network status: Detecting
  - Connectivity: (with 'Force detect again' and 'Ping' buttons)
- VIDEO/AUDIO Signals:**
  - Video signal lock: LOCKED
  - Video format: 1080p 60Hz
  - Crop picture source: No cropping
  - Scale before encoding: Default/No set
  - Crop picture to encode: No cropping
  - Rotate/Flip: No rotation
  - [Click to set above processing parameters...]
  - Audio sampling: 48000 Hz
- Motion JPEG Snapping:** (with a menu icon)

On the left side, there is a sidebar with navigation options: Basic Settings, Audio&Video Adjustments, Encoding & Stream, Network Storage (NAS), Text&Image&Time Overlay, Network & Service Settings, Serial Port and PTZ, Quick Reset, Logs & Debug, and Reboot. At the bottom left, there is a 'System Information' box showing: Serial No.: 184123456, Hardware Ver.: 1.2.20, Firmware Ver.: 2.5.0, and Software Ver.: 4.00.1995.

#### ● System

Click “Basic Setting”, users can know information including “device start time”, “persistent time”, “system spaces”, “data spaces”, “network status” and “connectivity” of the device, and go for “Ping” testing. If users need to push to Internet platforms, network status should be “Internet reachable”, or it cannot push streams.

The “Ping” provides a simple function to test whether the network is reachable. Open the “Ping” button, enter the test address, click “Ping”, wait for 3s, and “Connectivity” is displayed as “reachable, packet loss rate 0%” means the network is good and streams can be pushed to the Internet normally.



The screenshot shows a 'Ping' dialog box with the following content:

- Ping address:** 8.8.8.8
- Reach:** reachable, Loss rate:0%
- Buttons:** A blue 'Ping' button is located at the bottom right.

**⚠️ Note:** If Ping public IP address is reachable, but Ping domain name is unreachable. Generally, it is because the DNS server configuration is incorrect.



● Video/Audio signals

It can show “Video/audio signal”, “video format”, “ preprocessing”, “audio sampling” as below:

**VIDEO/AUDIO Signals**

- Video signal lock: LOCKED
- Video format: 1080p 60Hz
- Crop picture source: No cropping
- Scale before encoding: Default/No set
- Crop picture to encode: No cropping
- Rotate/Flip: No rotation
- [\[Click to set above processing parameters...\]](#)
- Audio sampling: 48000 Hz



Video signal: SDI Input  
Audio signal: SDI Input [Select...](#)

If “video signal lock” displayed as “ no signal (display blue screen)”, it means the video input source is not detected by the device. Please check if the input cable is plugged in. If “Audio sampling” is displayed as “0Hz”, the audio signal is not collected on the device. Please check if the audio of the input source is normal.

## 7.2 Basic settings

Users can go for some basic functions settings here.

## 7.3 Change WEB login password

Click “Change Password”, an option box will pop up, users can modify the WEB login password, the default password is admin.

**Change my password**
×

---

New Password:

Confirm Password:

### 7.3.1 Location and time

Click “location and time”, then users can modify system time of the encoder, or just select “Synchronize from this PC”.

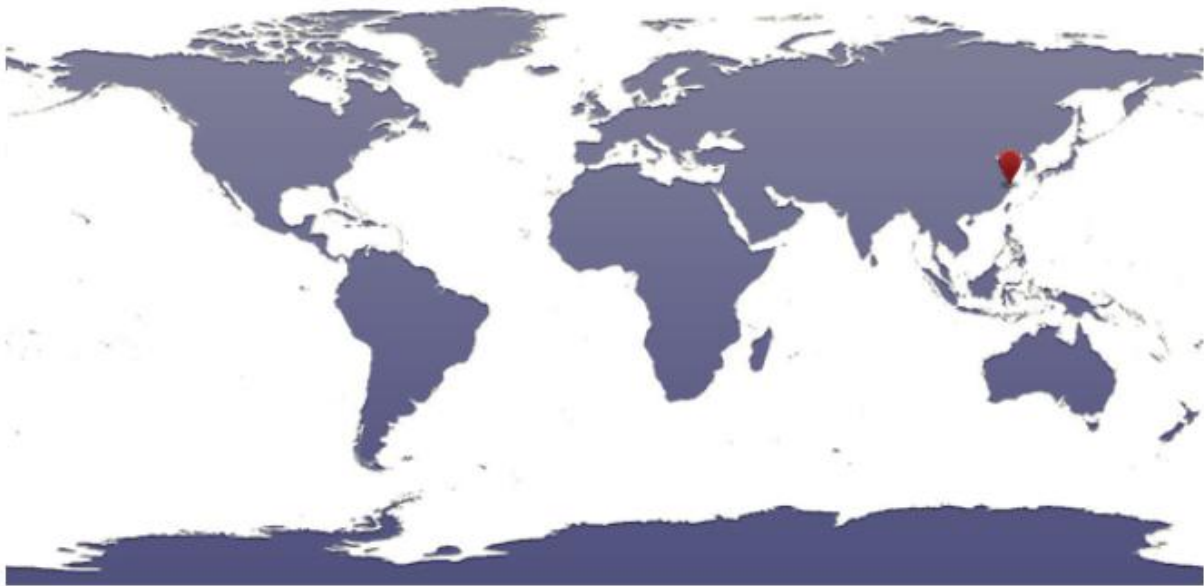
## Location & Time Setting

---

**i** Current time of device: 2019-07-03 19:31:18  
Universal Coordinated Time in Device: 2019-07-03 11:31:18

Location/Time zone: **Asia/Shanghai**  
NTP Time Synchronization Enable: **yes**  
NTP Synchronization Status: **yes**

### Select Your Location



Location/Time zone:

Country/Area:

### Date & Time Setting

Set:


NTP Server:

### 7.3.2 Restore factory settings

If users change parameters that lead encoder couldn't work (Typical situation is that encoder couldn't be visited by network after modifying network address), users could restore factory settings to default value.

Two methods for restoring factory settings:

1. Via the WEB interface, "Basic Setup > restore factory settings" function;
2. Through RESET button:

On the dashboard, there is a button of . Pressing on RESET button for 3 seconds, device will restore factory settings. Restoring factory setting will lead to the device hard restart, restarting course will last 1 minute.

Please note: after restoring factory setting, below parameters will be changed to default value:

- Login username and password will be admin;
- IP address will be restored as 192.168.1.168, subnet mask will be 255.255.255.0;
- All encoding parameters of video and audio will be restored to factory default value;
- Media transmission parameters will be restored as factory default value.

### 7.3.3 Firmware upgrading

The encoder supports online firmware upgrading. Through the “Basic Settings-Firmware Upgrade” of the Web page, users can upload the firmware online. Click “Select Files” to select the upgrade file, and click “Upgrade” to upgrade the device. The upgrade process is slow, around 30s to 1 minute, please be patient.



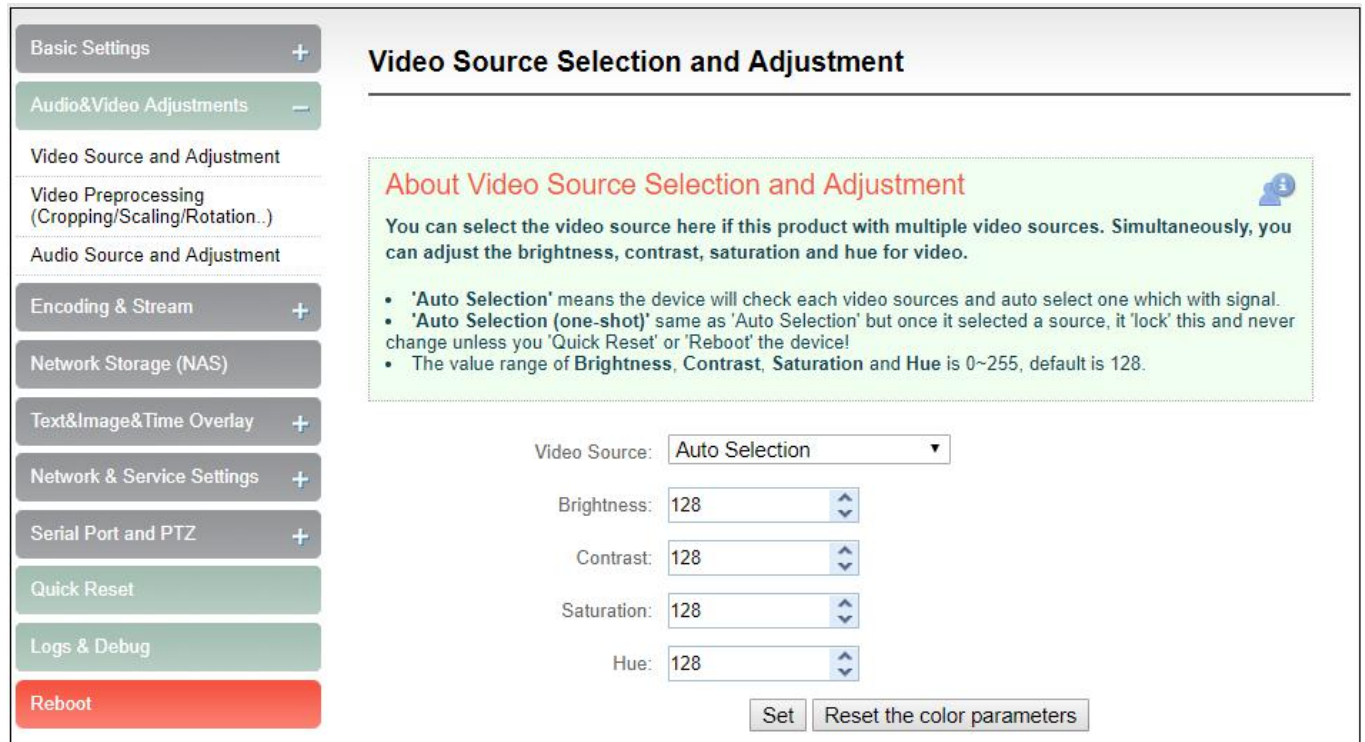
After upgrading, kindly check whether the version information of the latest firmware is consistent with the expected status through the System Status-Software Version of the Web page.



## 7.4 Video&Audio adjustments

### 7.4.1 Video source choice and adjustments

Users can choose video source, adjust brightness, contrast, saturation and hue parameters of the video here.



**Video Source Selection and Adjustment**

**About Video Source Selection and Adjustment**

You can select the video source here if this product with multiple video sources. Simultaneously, you can adjust the brightness, contrast, saturation and hue for video.

- 'Auto Selection' means the device will check each video sources and auto select one which with signal.
- 'Auto Selection (one-shot)' same as 'Auto Selection' but once it selected a source, it 'lock' this and never change unless you 'Quick Reset' or 'Reboot' the device!
- The value range of Brightness, Contrast, Saturation and Hue is 0~255, default is 128.

Video Source:

Brightness:

Contrast:

Saturation:

Hue:

“Auto Selection” means the device will check each video sources and automatically select the one which has signal.

“Auto Selection (one-shot)” same as “Auto Selection” but once it selected a source, it 'lock' this and never change unless you 'Quick Reset' or 'Reboot' the device!

The value range of Brightness, Contrast, Saturation and Hue is 0~255, default is 128. Based on the median value, the increase/decrease value corresponds to the increase/decrease in brightness/contrast/saturation. The default value of Hue is 128, which represents phase 0; the value range is 0-255.

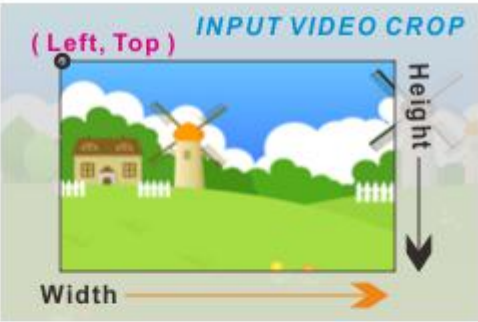
### 7.4.2 Video preprocessing

Before video captured and sent to encoder, we can make some necessary preprocessing:

- (1) Source picture cropping: Crop a part of the original picture for encoding.
- (2) Scaling: After step 1 cropping (or not cropping), video can be scaled up/down to certain format. (E.g. Input video is 1080p60, scaling down to 720p30 for encoding.)
- (3) Second cropping: After the step 2, you can continue cropping the size you want for encoding. (It's almost the same with step 1, but necessary in specific application.)
- (4) Rotation or flipping: It's the last step before encoding, you can rotate the video with 90/180/270 degrees, horizontal mirror or vertical flip.


Above process is a pipeline from step 1 to step 4. You could choose to open, or prohibit it about each step.

Source Picture Cropping:



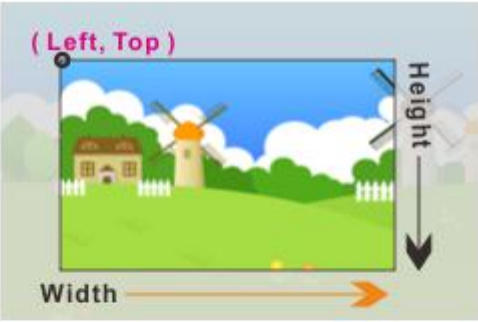
Scale To:

**DEFAULT**









source      output

Cropping The Scaled Picture:



Rotation/Flipping:

		
Default	90 Deg.	180 Deg.
		
270 Deg.	Mirror	Flip

### 7.4.3 Audio signal source

Audio source “Auto selection” mode is automatically to select the embedded audio of the input video source.

- Basic Settings +
- Audio&Video Adjustments -
- Video Source and Adjustment
- Video Preprocessing (Cropping/Scaling/Rotation..)
- Audio Source and Adjustment
- Encoding & Stream +
- Network Storage (NAS)
- Text&Image&Time Overlay +
- Network & Service Settings +
- Serial Port and PTZ +

### Audio Source Selection and Adjustment

**About Audio Source Selection and Adjustment**

You can select the audio source port here. And you can adjust the analog audio gain here too.

- Audio source 'Auto Selection' means the audio source port is auto selected decided by which video source current is. If the video source is 'HDMI' or 'SDI' which has embedded audio, the audio source is embedded digital audio; otherwise, the audio source is Line in.
- 'Audio Gain' is set by 'db'. 0db is the original audio gain, +/- 3db means increment/decrement 50% gain and +/- 6db means increment/decrement 100% gain.

Audio Source:

Line In Gain:

**⚠️ Note:** N series products are without Analog Line in and doesn't support adjust analog input gain.

## 7.5 Encoding & Steam

### 7.5.1 Audio encoding parameter setting

Encoders can set audio encoding parameters. Click “Encoding &stream”, pull downward “Audio Encoding Engine”, then entering into audio parameters setting. Audio encoding channel is forced to enable. Audio encoding modes include AAC and G.711, optional. Audio sampling is chosen according to actual situation. Channels consist of “Stereo” and “Mono”. Encoding bitrate is adjustable between 16K-256K, default is 64Kbps. One more detail: if encoder using TS-UDP protocol or needs using recording, then it needs to choose “With ADTS header” under AAC format.

- Basic Settings +
- Audio&Video Adjustments +
- Encoding & Stream -
- Audio Encoding Engine
- Encoding and Stream Settings
- SIP settings
- Network Storage (NAS)
- Text&Image&Time Overlay +
- Network & Service Settings +
- Serial Port and PTZ +
- Quick Reset
- Logs & Debug
- Reboot

### Audio Encoding Engine

**NOTE:** Please do **"Quick Reset"** to take affect if you changed the 'Resample policy' or 'Sampling' parameter.

#### Audio Encoding Channel 1

Resample policy:   
If the 'Sampling' not be 48KHz, audio 'resample' is required. This parameter decides the resampling quality and CPU consumption. It may consume more CPU if you select 'High quality' option.

Encoding:

Sampling:

Channels:

Bitrate:

**⚠️ Note:** Please do **"Quick Reset"** to take affect if you changed the 'Resample policy' or 'Sampling' parameter.

### 7.5.2 Encoding and stream settings

Video encoding parameters are adjustable. Click “Encoding &Stream”, pull downward “Encoding and stream settings” to enter below interface. We generally set parameters of “H.264 main stream”, click “Setting”.

**⚠ Notice: It is H.264 Main stream, the second setting, not Motion JPEG setting.**



Click SET, entering into below interface for main streaming encoding parameters setting, as follows:

### Main Stream Encoder parameters

---

Scaling:

Color:

H.264 profile:

Bitrate control:

Bitrate:  bps

Bitrate auto adjust:

Framerate:

Dynamic framerate:

GOP Size:

Customized GOP size:

Reference frames:   
(Using multiple reference frames should better encoding quality but this may be not compatible to some decoders)

“Scaling” has 9 options for choice. Default setting is “Default size”, that is, the video size after encoding is the same as the input video size.

“Color” has two options: “With color and monochrome”. Monochrome is black and white color, “with color” remains the original color. Default setting is “With color”.

“H.264 Profile” supports High profile , main profile , baseline, which is set according to platform supported encoding profile. High Profile is the highest compression efficiency, that is, under the same bitrates, image quality is the best; Baseline is the most widely supported; default setting is High Profile.

“Bitrate control” has two ways: CBR-Constant bitrate and VBR-Variant bitrate. From literal meaning, CBR is stable and unchanged bitrate, while VBR is constantly changing according to actual content. Generally, network transmission adopts CBR to guarantee transmission quality, while file storage uses VBR to guarantee file quality. Default setting is CBR-Constant bitrate.

“Bitrate” supports adjustable 64K-25M. Users could choose default setting, or self-define bitrate size. The higher bitrates, video quality after encoding is better. But specific setting should be based on actual network situation, couldn’t be higher than your own upstream bandwidth.

“Framerate” has three options: FULL (same as input source, HALF (half when source framerate $\geq$ 50 and customized framerate. “FULL” means framerate after encoding is the same as the framerate of input source; “HALF” means if input video is 1920\*1080P50, video framerate after encoding will be 25. This will be a good saving on the consumption of network bandwidth; customized framerate is user assigning framerate after encoding, in theory, it shouldn’t be higher than original framerate.

“GOP size” has five options and supports user-defined adjustment. It is adjustable according to actual situation, default is 60, and normally it could meet the most majority of needs.

“Reference frames” has two options: one and multiframe. Theoretically using multiframe can improve encoding quality, but some decoders and players may not support multiframe.

Substream parameter setting refers to Main stream configuration

### 7.5.3 Streaming media service


N series encoder currently support streaming services include: NDI stream, RTMP push, HLS service, TS-UDP push (not support RTSP pull stream currently).

One code stream can run up to 8 stream services at the same time for the encoder, which means it can push the video stream to 8 different live platforms. There are two code streams (the main stream and sub stream) for the encoder, so the encoder can stream up to 16 different live platforms at the same time. In general, the main stream is enough, and the sub stream is mainly used in the security monitoring field to achieve the docking usage with the NVR.


- Motion JPEG stream

Encoder has a Motion JPEG stream, it keeps running without stop. It is blank with blue color if without video access. If with a video signal access, Motion JPEG stream will display the content of current flow, “the video signal lock” displays locked and it will display the current video signal format.

**Motion JPEG Snapping**
[ ... ]



Video: Motion JPEG (Default)  
 Scaling size: Default (720x400)  
 Instant bitrate: 1603 Kbps  
 Instant frame rate: 5 fps  
 Audio engine bundle: [Channel 1 \[ Change... \]](#)  
 Audio Codec: AAC / Stereo  
 Bitrate: 64000 bps  
 Actual sampling: 48000 Hz


SET

**⚠️ Note:** Motion JPEG stream is a picture preview, refresh every 3 seconds, or click the mouse to refresh, so it is normal to see it is not fluent on the page.

- RTMP Pushing (Live streaming)

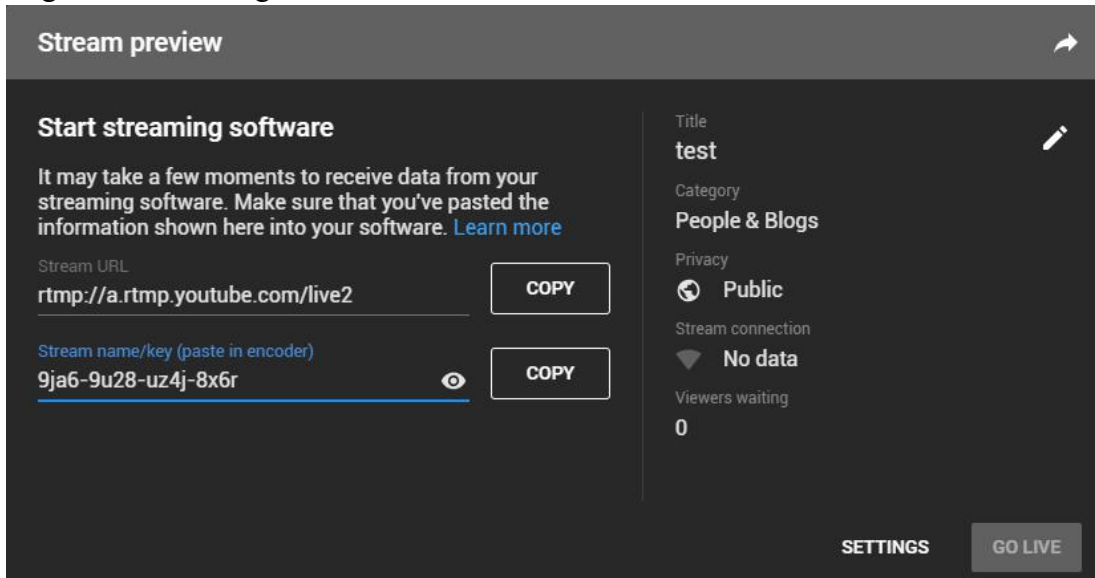
Using RTMP pushing, the first thing is to make sure platform providing RTMP pushing address, otherwise our encoders couldn't do RTMP pushing (Currently some live streaming APP couldn't provide RTMP pushing address.)

**⚠️ Note:** The principle of RTMP push stream is that it must be pushed from the encoder to the platform. The computer/decoder then pulls the RTMP stream from the platform for playback. The encoder cannot directly push the RTMP stream to the computer/decoder for playback.

### YouTube live streaming

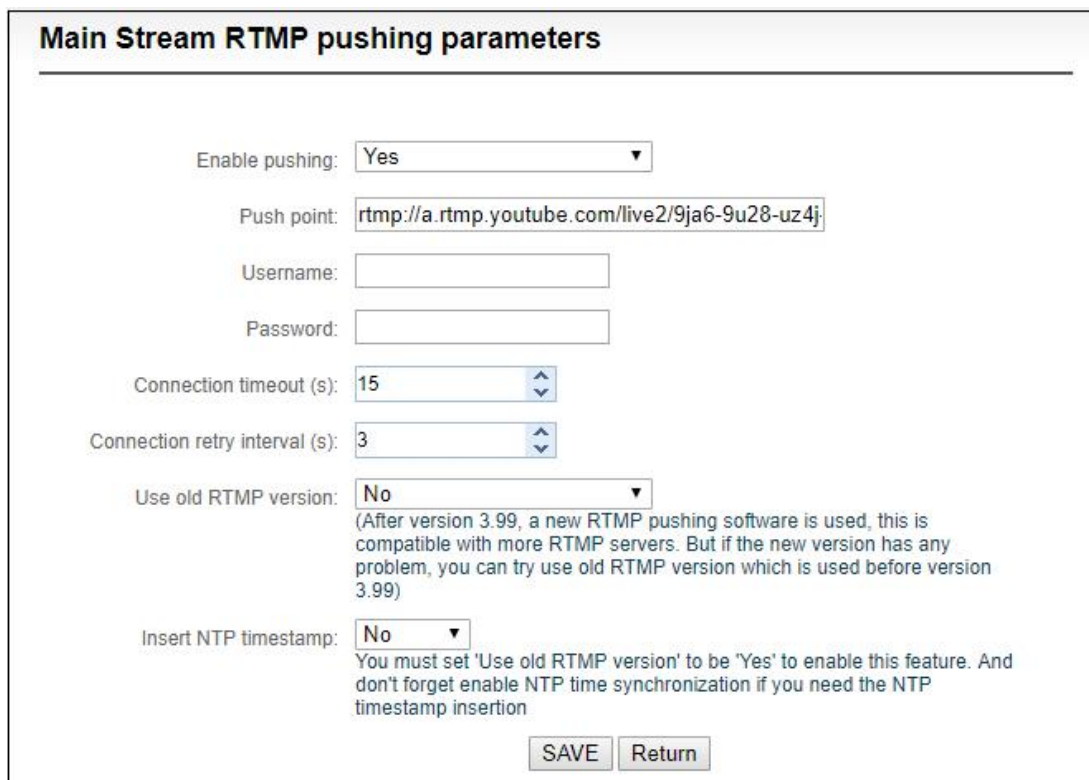
“Streaming point” is RTMP address given by platform (Take YouTube as an example). (Other platforms are similar, if any questions please contact platform technical support for help).

1) Login to YouTube, get below address:



Streaming point should be like Server URL+Stream name/key,  
for example: rtmp://a.rtmp.youtube.com/live2/9ja6-9u28-uz4j-8x6r

2) After you get the RTMP URL address, you need to set it up in the encoder. In the main stream of H.264, there is a stream service option to be added. By adding a RTMP push, you can get a RTMP push option. Click the settings button on the right side of the RTMP push, and you will enter the interface to fill in the RTMP push configuration. The push address on YouTube platform is filled in the "push point", and set "Enable pushing" to "Yes". Click “Save”, then RTMP will stream to YouTube.




If the platform requires user name and password verification, you also need to fill in the corresponding parameters in the encoder.

3) On YouTube platform ,if the video can be displayed, the push stream is successful, otherwise you need to check the network and other configurations .

**⚠️ Note:** *In the case of RTMPS push mode, fill in rtmps URL at Push point and set Use old RTMP version to yes, so that it can be supported.*

- TS-UDP Pushing (unicast and multicast)

Click  [Add a stream...](#) to select TS-UDP Pushing, then entering into TS-UDP setting interface.

TS-UDP pushing divides into unicast and multicast. If using unicast, “pushing target address” is device IP address of receiving TS streaming. “Target port” is any port, but it is better not conflicted with other service port. No need to change Multicast TTL; If using multicast, “pushing target address” needs to write a correct multicast address (224.x.x.x ~ 239.x.x.x). “Target port” is any port, but it is better not conflicted with other service port.

### Main Stream TS pushing parameters

---

Enable pushing:

Target Address:   
( Target IP address or multicast IP address. A valid multicast address is 224.x.x.x ~ 239.x.x.x )

Target Port:

Multicast TTL:   
( TTL is valid when target address is a multicast address. TTL decides how many routers the multicast packet can pass through. )

TS advanced settings Below are some TS advanced options, if you are not sure how to set these, just please use default settings

NULL packets:

Stream ID:   
(1-65535)

PTS to PCR delay:

PMT start PID:   
(16-7936)

Stream start PID:   
(32-3840)

Tables version:   
(0-31)


Service name:

Service provider:




After finishing setting, it will come up an URL address from TS-UDP pushing, which could be decoded through VLC or other decoding player. If it is multicast, please remember to close Windows firewall.


















**H.264 Main Stream**
[ ... ]




Scene  
Cut

Video: H.264 (High Profile)  
Scaling size: Default (1920x1080)  
Instant bitrate: 9384 Kbps  
Instant frame rate: 60 fps  
Audio engine bundle: [Channel 1 \[ Change... \]](#)  
Audio Codec: AAC / Stereo  
Bitrate: 64000 bps  
Actual sampling: 48000 Hz



	<b>Record</b> <a href="#">Start Record</a>	Stopped	 
	<b>RTSP</b> <i>(RTSP always start)</i>	Access by: <a href="rtsp://192.168.3.155:554/ch01">rtsp://192.168.3.155:554/ch01</a>	 
	<b>KMP Media Service</b> <a href="#">Start</a>	<i>(Manual disabled or no publish point, service stopped.)</i>	
	<b>HLS Service</b> <a href="#">Stop</a>	Publish point: <a href="http://192.168.3.155/hls/main/playlist.m3u8">http://192.168.3.155/hls/main/playlist.m3u8</a>	 
	<b>RTMP Pushing</b> <a href="#">Start</a>	<i>(Manual disabled or no publish point, service stopped.)</i>	 
	<b>TS-UDP Pushing</b> <a href="#">Stop</a>	Publish point: <a href="udp://225.225.5.5:5678">udp://225.225.5.5:5678</a>	 


[Add a stream...](#)

- HLS service


Using HLS service, the first thing is to “add a stream service”, then click right-side SET icon of “HLS service” for setting.

Below is setting interface of HLS service. Very simple, if no special requirements, no need setting, only enable service.

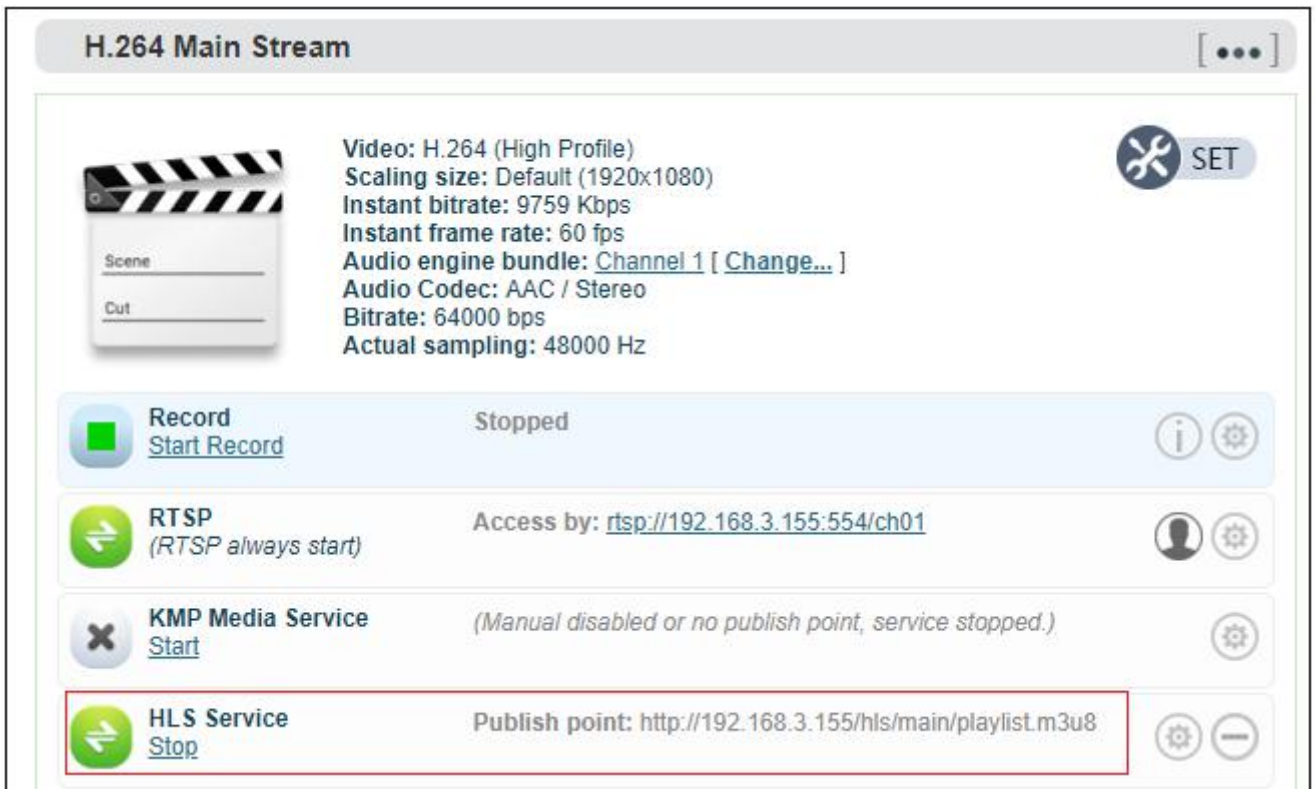
### Main Stream HLS service parameters

Enable Service:

Session ID:   
( Session ID is the unique identifier for HLS services, it can not be empty )

Segment Size:   Milliseconds

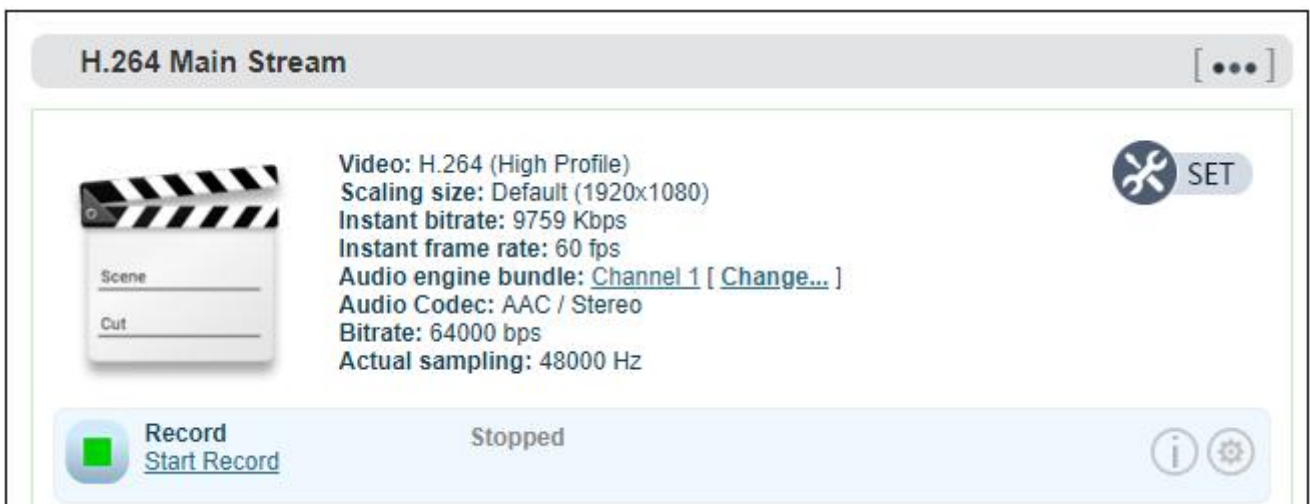
Once enabling service, it will get one HLS Publish point. You could watch it through VLC and other players using this address.




## 7.6 Local recording

N series NDI encoders support local recording function. Encoder with TF card-slot can support TF recording and meanwhile it supports USB disk inserted into USB port of encoder for recording. The recording operation is as follows:

- 1) Click “Record” below “H.264 Main Stream” under “Dashboard” or “Encoding and stream setting”.



- 2) Click  “Record settings” icon for setting

### Main Stream Record Settings

---

#### About Record

Set the record parameters here.

**Why the default format is 'TS':** If you removed USB or SD/MMC disk while recording, a terrible thing may happen that is the recorded file may be wrong and can not play anything, if the file format is '.avi' or '.mp4', etc. But 'TS' format can avoid this, also, the 'TS' format is compatible with almost modern media players.

**DON'T use the NTFS!** This device can support NTFS file system, but no suggest to use it! The NTFS filesystem can cause high CPU using and affect other streaming functions. If you force to use NTFS, please set the encoding bitrate lower than 8Mbps.

After changed the record settings, it can only take effect in next starting record time!

(Plug in disks) Auto record:

Disk Selection:   
Use the largest disk to record files, never care what disk type it is.


Record Format:

Filename Prefix:

File Limitation:

Size Limitation:  KB

Overwrite:

 **Note:** A real challenge for recording by removable disks: If you remove the storage disk while recording, the recorded file may be wrong and can not be played if the file format is '.avi' or '.mp4', etc. But 'TS' format can avoid this, also, the 'TS' format is compatible with almost all the main media players.


**If recording is performed in a non-TS format, when the recording is completed, stop the recording manually, and then remove the storage device to ensure the recording can be played normally.**

3) By default, it automatically starts recording when storage disks inserted, regardless its storage type. It will record to the biggest available storage area. Recording format is TS file by default. Users could set recording for automatic cutting based on specified size. And when storage space is insufficient, it will automatically overwrite the old video file to achieve redundant storage.


- 4) Click  to check recording status and record list.


- When no disks inserted or NAS network storage not set, the status will be as follows , dashboard will show “Stopped”

**H.264 Main Stream**
[ ... ]




Video: H.264 (High Profile)  
 Scaling size: Default (1920x1080)  
 Instant bitrate: 18 Kbps  
 Instant frame rate: 25 fps  
 Audio engine bundle: [Channel 1 \[ Change... \]](#)  
 Audio Codec: AAC / Stereo  
 Bitrate: 64000 bps  
 Actual sampling: 48000 Hz

 SET


**Record**  
[Start Record](#)

Stopped




Record status shows “No valid disks”and “No records”.

**Main Stream - Record Status**

Refresh

**All Disks**


(No valid disks)

**Record List**


(No records)


- After inserted disks, the encoder will start recording automatically and the dashboard shows “Recording”.

**H.264 Main Stream**
[ ... ]





Video: H.264 (High Profile)  
 Scaling size: Default (1920x1080)  
 Instant bitrate: 18 Kbps  
 Instant frame rate: 25 fps  
 Audio engine bundle: [Channel 1 \[ Change... \]](#)  
 Audio Codec: AAC / Stereo  
 Bitrate: 64000 bps  
 Actual sampling: 48000 Hz

 SET


**Record**  
[Stop Record](#)

Recording (TO: USB Storage, FORMAT: ts)  
 [ Files: 1, Total Size: 0 KB, Times: 0:00:08 ]




The "Video Status" is shown below, where you can view the usage of the memory or download the video files that have been stored in the memory to the computer.

### Main Stream - Record Status


Refresh

**All Disks**




**WIN10 [vfat]**  
 Total: 29.46 GB, Free: 25.7 GB  
 Used: 13%

**Record List**



FILE: REC-20190704151459.ts 291.51 MB [Download](#)

Sequence: M-20190704\_151459\_0000 [CURRENT RECORDING]  
 Start time: 2019-07-04 15:15:11, End time: 2019-07-04 15:18:41; FILES: 1, Total Size: 291.51 MB



FILE: REC-20190702105851.ts 79.49 MB [Download](#)

- When it is recording, users can stop the recording manually and it can be restarted again.

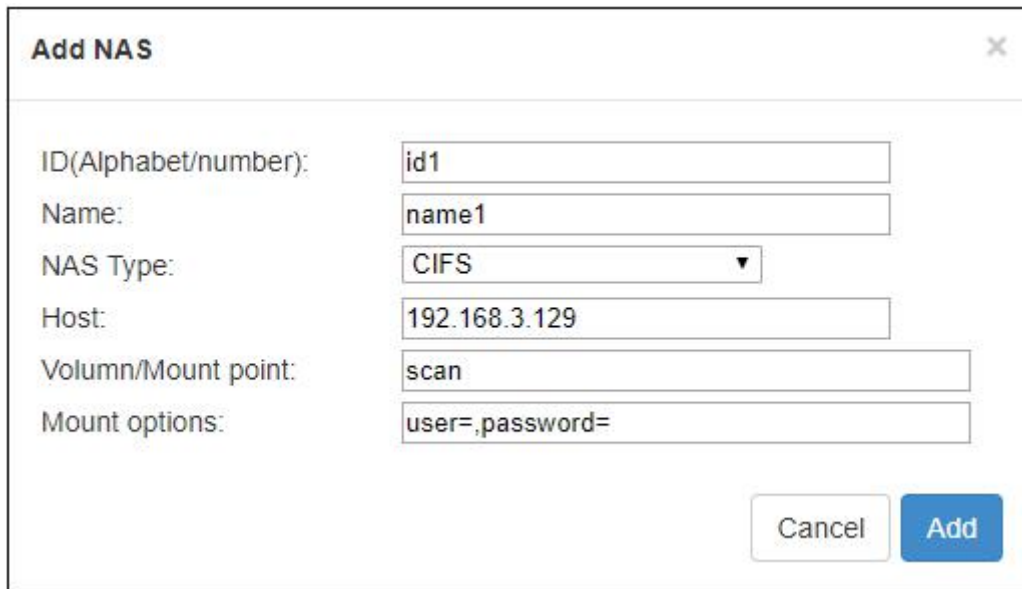
**⚠️ Note:** When recording with TF card, it only supports formats of NTFS、FAT32 or vfat. For TF cards over 64G, the default formatting is exFAT under the formatting program of Windows system, which may lead to the TF card unrecognizable.

Sometimes, due to the influence of some files or programs in the TF card, the TF card can not be recognized. You need to format the TF card once.

## 7.7 Network Storage (NAS)

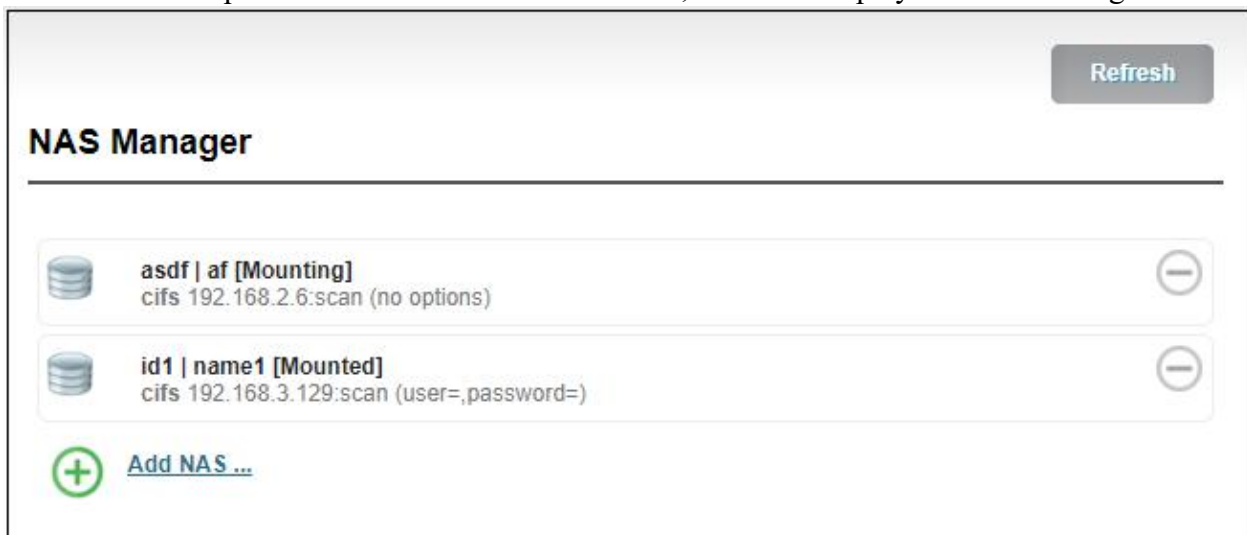
NAS is a Disk Arrays connected by network, it has all the main characteristics of disk arrays: high capacity, high efficiency and high reliability.

Open NAS Manager, click “ add NAS”, then fill in the corresponding parameters.



- ID/ Name: Any Alphabet/number
- NAS Type: NFS or CIFS (CIFS is a shared protocol for network connection, which requires high reliability of network transmission, TCP/IP is usually adopted; NFS is transport-independent,TCP or UDP is adopted; One of the disadvantage of NFS is, it requires the user to install a special software, while CIFS is integrated inside the OS, and no additional software is needed.)
- Host: IP address of the Host
- Volumn/Mount point:Storage location on the host
- Mount options: Settings about the user name and password.

NAS manager will show “Mounted” if NAS connection has been established, and there is a RECORD file under the Mount point. If the connection is abnormal, it will be displayed as “Mounting”.



## 7.8 Text/ Image/Time overlay

Please open the “ Overlay image management” to upload an image first if you want to make image overlay; if text or time overlay, you can set the overlay function directly.

### 7.8.1 Overlay Image Management

Enter “Image Management” --- fill in “ Image ID-- Choose the image that you want-- click” Add”, then image is uploaded to the Encoder storage. You can check the image and information listed under the Image list.

### Overlay Image Management

Refresh

Upload an overlay image (JPEG or PNG)

i

Upload image:

Image ID(\*MUST):

Upload file: 选择文件 未选择任何文件

Add

Image list

Alpha blending: (Not set) [Set alpha...](#)

Overlay size: (640, 138) [Convert...](#)

Transparent color index: (No transparent color key)

Image ID: PIC1 | Image type: png | Original size: 640x138

[Remove this image](#)

You can change the parameters after uploading the image

Set alpha blending: Value range is 0-255, 0 is full transparent and 255 is no alpha blending.

Convert:

- Image size: If width/height set to 0, it will overlay the image as original size.
- PNG transparent threshold: If the original PNG transparent level is less than the threshold value, overlay that area as full transparent. Set a reasonable value can make the image border be smooth.
- Transparent color index: Manually specify an index color to erase background. Set tolerance (0%~100%) to control the similar color range selection. In most cases, transparent PNG images do not need to be processed manually.

### 7.8.2 Overlay function

Go to the overlay settings page, in the settings of “Main stream”, please choose “open” to enable overlay, for “Don't rotate follow picture”, please choose yes or no. Then choose “Add overlay item” to set overlay functions for “Text”, “Time” and “Image” respectively. You can set multiple overlays at the same time

#### Text and Time Overlay

---

**i** NOTE: If you require more fonts/languages support, please contact our technical support. We can customize more fonts/languages, by upgrading a language patch firmware.

#### Main Stream Overlay

Enable overlay for this stream:  Don't rotate follow picture:

[Add overlay item...](#)

Add overlay item ( text)

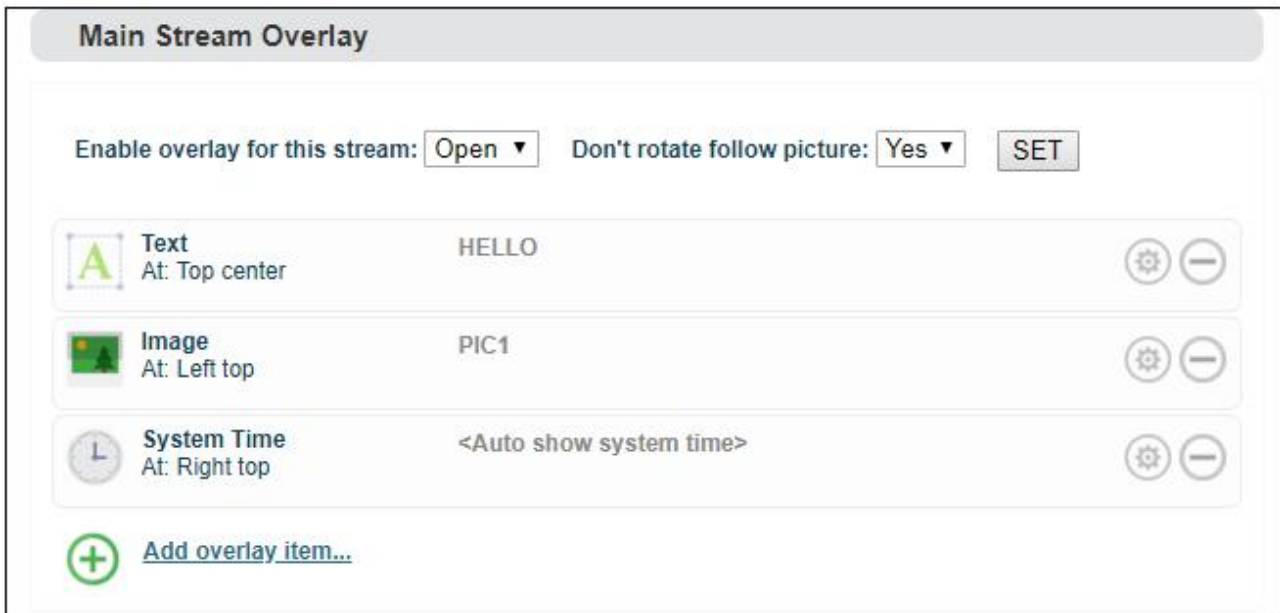
**Add Overlay Item**
✕

---

Overlay Type	<input type="text" value="Text"/>
Show when:	<input type="text" value="Always"/>
Position	<input type="text" value="Left top"/>
Font	<input type="text" value="Default (En)"/>
Font Size	<input type="text" value="Auto - Medium"/>
Font Style	<input type="text" value="Normal"/>
Text Outline	<input type="text" value="2 px"/>
<b>Overlay Text:</b>	<input style="width: 100%;" type="text"/>



For every overlay, you can set the terms of overlay, position, font and font size, Image or text content and so on. After adding that, it will be shown as follows:



After encoding, the overlay will be shown as follow:



 **Note:**

- *The resolution of uploaded image can not be over the video. If the resolution of the video is 1920\*1080, and the uploaded image is 3840\*2160, then the image overlay will fail to display.*
- *Please pay attention to the overlay position, if you add image, text and time with the same position, then some overlay may fail to display.*
- *If the added image occupies the majority of the video screen, the actual bitrate and the set bitrate will be greatly reduced due to the low screen dynamic fluctuation.*
- *For the image format, only JPEG and PNG supported.*

## 7.9 Service Configuration

### 7.9.1 Web Service Configuration

The default web service port is 80 ( https port is 443). You can change it (range: 1-65535) accordingly.

### Web Service Configuration

---

Change the web service port

The default web service port is 80 and https port is 443, but you can change it (range: 1-65535).

NOTE: By HTTPS, if the web browser prompts privacy errors, you need add exception for correct accessing!

Web Service Port:

HTTPS Port:

**⚠ Note:** By HTTPS, if the web browser prompts certificate errors which is caused by the browser certificate security authentication, you will need to add it to the safe list of the browser.

### 7.9.2 Onvif Service Configuration

**⚠ Note:** Since the NDI discovery function of NDI device USES similar principle of onvif, onvif discovery is not supported on N series devices currently.

### 7.9.3 Telnet Service Configuration

Telnet service listens on port 23 for remote connection and debugging of devices. For security reasons, you can choose to close telnet services.

### Telnet service

---

Open or close telnet service

Telnet is a remote control & debug service, it listens at TCP port 23. For security reason, you can choose to close telnet service.

Telnet service:

## 7.10 Serial Ports and PTZ

### 7.10.1 Serial Ports

With USB to RS232/RS422/RS485 adaptor (cable), after connecting to USB port, if the device and identify the serial port correctly, USB port will be listed at “Device”, then you can set the corresponding serial port parameters.

**USB to RS232/RS485/RS422 Serial Port**

Device:  [Refresh serial ports](#)

Baudrate:

Data bits:

Parity:

Stop bits:

XON/XOFF:

RTS/CTS:

**⚠️ Note:** The encoder can automatically identify the USB serial port conversion device of universal USB to Serial/FDTI chip/PL2303 chip. If the USB to RS232/RS422/RS485 converter (line) you inserted cannot be recognized and the converter chip is not supported by default, please replace the serial line.

### 7.10.2 PTZ Setting

The encoder can control the PTZ camera via Sony Visca, Pelco-D, Pelco-P protocols, you can also set the control speed.

**PTZ(Pan/Tilt/Zoom) Setting**

PTZ Protocol:

PTZ Address:

Default Pan Speed:

Default Tilt Speed:

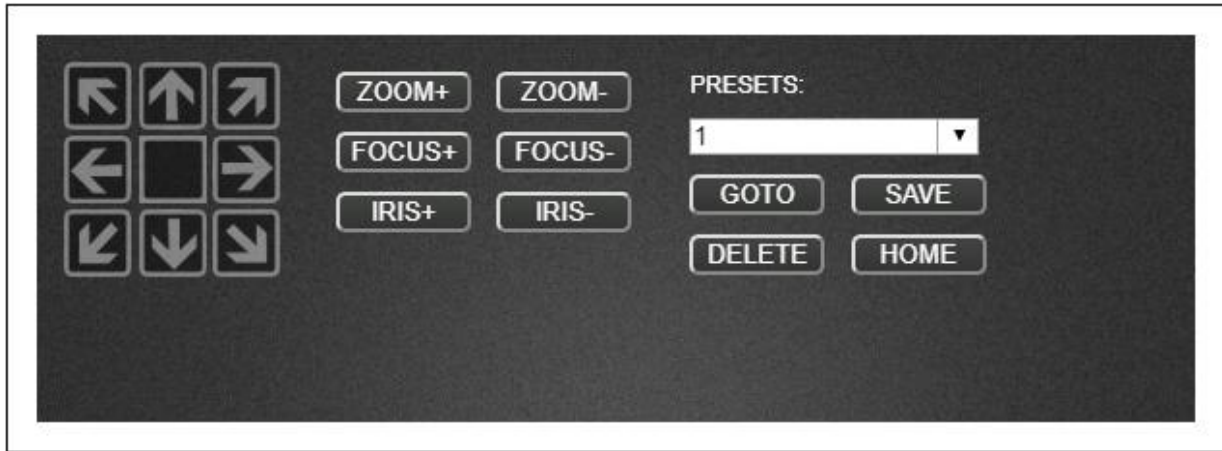
Default Zoom Speed:

Default Focus Speed:

Default Iris Speed:

### 7.10.3 Control Panel

Through the web page of the encoder, you can control the movement, zoom and focus of the camera in all directions.



**⚠ Note:** In the future, the PTZ function of Newtek Studio Monitor, ONVIF Device Manager and other software can be docked with the encoder control panel through product function docking, so as to realize the direct control of the front-end camera.

### 7.11 Quick Reset and Reboot

#### 7.11.1 Quick Reset

"Quick Reset" is used to quickly reset the video encoding service of the encoder, normally it's used to parameters come into force after modification or encoding abnormal, the current encoding service will be stopped and it will take about 3 seconds.

#### 7.11.2 Reboot

"Reboot" is used to restart the device software, it will take about 3 minutes.

### 7.12 Logs and Debug

System logs are available for download, which can be provided to technical service engineers for technical analysis.



**Thank you for reading.**

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