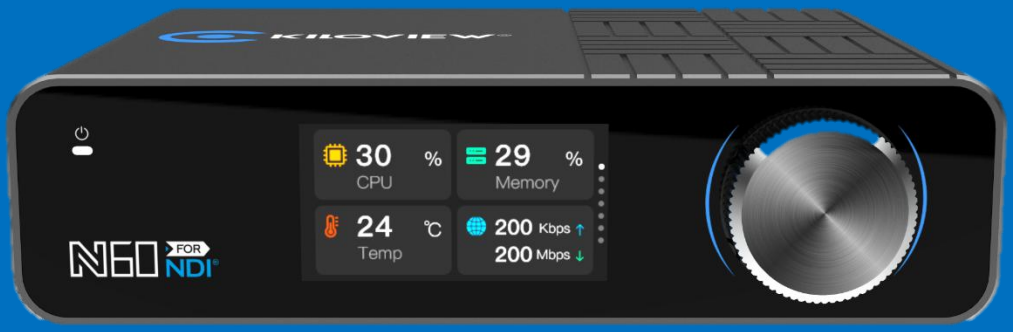
KILOVIEW®



N60

4K UHD HDMI/NDI Bi-Directional Converter

USER MANUAL

Changsha KILOVIEW Electronics Co.,Ltd

Legal Notices

Subject to the receiving of this document from Changsha Kiloview Electronics Co., Ltd.,(Hereinafter referred to “Kiloview”), the following terms are understood and agreed. Or else, please stop using this document.

This document is copyright of Kiloview, all rights reserved. The document covers the proprietary information of the company. No company or individual may copy, transmit, distribute, use or disclose the
document and any images, forms, data and other information contained in the document without the prior written permission of the company.

is the registered trademark of Kiloview. The name and logo are the trademarks or registered trademarks of the company. Other products or company names mentioned in this document may be the
trademarks or registered trademarks of their respective owners. The reading of this document without the
prior written consent of the company or the third party rights holder does not imply that the reader is given any right to use any of the marks appearing in this document by implication, non-evidence or otherwise.

This product complies with the design requirements related to environmental protection and personal safety. The storage, usage and disposal of the product shall be in accordance with the product manual, relevant contract or relevant national laws and regulations.

This document is provided "as is" and "only in this state". Products and technical updates are subject to change without prior notice.

For matters not covered in this document, please visit our website www.kiloview.com for information and technical support.

NDI® is a registered trademark of NewTek, Inc..

CONTENTS

1 PRODUCT INTRODUCTION 4

Product Features 5

Technical parameters 6

2 USER GUIDE 9

3 PACKING LIST AND INTERFACE DESCRIPTION 10

3.1 Packing list 10

3.2 Interface description 10

3.3 Led indicators 10

4 INSTALLATION AND CONNECTION 12

4.1 Connect Video Signal 12

4.2 Connect Network 12

4.3 Connect Power Supply 13

5 LCD SCREEN AND SCROLL WHEEL 14

5.1 Scroll wheel 14

5.2 LCD Screen 14

5.2.1 Working mode 14

5.2.2 Device status 16

5.2.3 Network status 16

5.2.4 Video information 17

5.2.5 Audio information 18

6 LOGIN AND NETWORK CONFIGURATION 19

6.1 Login to the Device via Ethernet 19

6.2 Network Settings 19

7 NDI DISCOVERY AND MONITORING 21

7.1 NDI Tools Installation 21

7.2 Discovery and Connection 21

7.3 NDI Encoding Bitrate 23

8 ENCODER CONFIGURATION 23

8.1 NDI Configuration 23

8.2 Status Column 24

8.3 Basic Settings 24

8.4 NDI Connection 25

9 NDI RECORDING SETTINGS 25

10 SRT ENCODING PARAMETER SETTINGS 27

10.1 SRT Protocol Parameter Configuration 27

10.2 SRT Audio and Video Encoding Parameter Configuration 28

11 DECODER CONFIGURATION 28

11.1 Discovery of NDI sources 29
11.2 Decoding Output 30
11.3 Decoding Preset 30
11.4 Decoding parameter configuration 32
11.5 Discovery service 33

12 SYSTEM SETTINGS 36

12.1 General Settings 36
12.2 Discovery Server 36
12.3 Network Settings 37
12.4 Record Settings 38
12.5 User Management 39
12.6 Area and Time 39
12.7 PTZ Settings 40
12.7.1 Setting up PTZ Function 40
12.7.1 PTZ Testing and Usage 41
12.8 System Settings 42
12.8.1 Restore 42
12.8.2 Firmware Upgrade 42
12.9 Version Info 43
12.10 Upgrade device firmware in recovery mode 43

13 KILOLINK SERVER 44

14. VOICE INTERCOM 46

15 REBOOT 46

1 Product Introduction

Kiloview N60 HDMI to NDI Converter is Kiloview's latest NDI converter(I/O). Adopting the leading FPGA technologies, advanced-level AVC/HEVC algorithm and NDI algorithm, N60 comes with more powerful performance, more excellent encoding quality, better low-latency performance and perfect function.

With the resolution up to 4K UHD (3840x2160@60Hz), N60 can encode a 4K HDMI signal into an NDI video stream under encoding mode. When decoding, it will decode the NDI to HDMI. Encoding or encoding, it depends on your end needs.

N60 supports Speed HQ and AVC (H.264)/HEVC (H.265) codec, which means N60 supports IO conversion between NDI High-bandwidth and NDI HX. Under encoding mode, N60 can simultaneously output NDI and NDI HX video streams up to 4K resolution. When decoding, N60 can automatically adapt to NDI or NDI HX stream. Using NDI technology, combined with Kiloview's own in-depth optimization of video encoding and network transmission technology, N60 can achieve ultra-low latency as low as 80ms from video encoding to decoding.

N60 supports professional YCbCr 4:2:2 color space and 10bit color depth with AVC (H.264) /HEVC (H.265) video encoding (compatible YCbCr 4:2:0 and 8bit AVC/HEVC video encoding)， which promises higher color and image quality, particularly to fulfill the needs in the broadcasting and medical image industries. Combined with the IP interconnection advantages of NDI technology and a complete product ecological chain, N60 can help to gain a leading edge in UHD video IP services

N60 support 2x1000M Ethernet ports, one of which supports PoE (IEEE 802.3AT). N60 has HDMI 2.0 video input interface and output interface. When encoding, the HDMI output interface will loop out the video signal via HDMI; when decoding, the decoded NDI video will be output from the HDMI interface.

The USB interface of the N60 supports extended USB audio interfaces (such as USB headsets) to enable point-to-point voice calls between built-in Kiloview devices and expandable Kiloview Intercom System group voice calls.

The USB interface of the N60 also supports extended storage, allowing you to directly record encoded NDI video to a USB flash drive. Additionally, NAS (Network Attached Storage) recording provides flexibility, reliability, and convenience, suitable for scenarios requiring large-capacity storage and multi-device sharing.

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

As the latest product, N60 further improves the user experience. It provides a color LCD display and a scroll wheel on the front panel. N60 can display the device status and obtain configuration parameters, the recording operations and IP address configuration. At the same time, LCD display can work as a Tally.

With exquisite and compact appearance, N60 has an excellent heat dissipation design, which is convenient for you to use in different scenarios.

Product Features

- **Bi-Directional converting, encoder and decoder, all-in-one**
- Convert HDMI to NDI with a resolution of up to 4K UHD (3840x2160@60Hz) in encoding mode, and convert NDI to HDMI in decoding mode, which can be freely selected by the user.
- Supports NDI High-bandwidth/NDI HX2/NDI HX3/SRT and other media protocols
- Equipped with HDMI input and output interfaces, it can be looped out to a monitor for monitoring during encoding or output via the HDMI interface during decoding.
- Supports both SpeedHQ and AVC(H.264)/HEVC(H.265) encoding and decoding, and supports NDI High-bandwidth (NDI HB) and NDI HX IO conversion at the same time.
- Combined with Kiloview's deep optimization of video encoding and network transmission technology, it achieves ultra-low latency from encoding to decoding as low as 80ms.
- Supports YCbCr 4:2:2 color space and up to 10bit color depth for AVC(H.264), HEVC(H.265) video encoding formats, providing a guarantee of high color quality and image quality.
- Supports two Gigabit Ethernet interfaces, one of which supports PoE (IEEE 802.3AT) power supply and also supports 12V-18V DC input.
- Supports USB extended PTZ control function; supports PTZ cameras including Visca/Visca over IP/Pelco protocols through the network or optional control cable (special PTZ control protocol

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

can be customized).

- The USB interface supports extended USB audio interfaces to enable point-to-point voice calls between built-in Kiloview devices and expandable Kiloview Intercom System group voice calls.
- Supports USB and NAS network recording, allowing encoded NDI video to be directly recorded to a USB flash drive or NAS disk.
- The front panel provides a color LCD display and control roller, which facilitates viewing of device status, obtaining configuration parameters, and is also a large Tally status display.
- Seamlessly integrated with Kiloview Multiview Server, Kiloview Recorder System, Kiloview KiloLink Server, Kiloview NDI CORE, and other products.
- Ensure video frame synchronization, as well as accurate picture and audio synchronization through precise clock and intelligent algorithms.
- Provides a standard screw cold shoe bracket that can be easily installed on the camera.
- The device has a compact and exquisitely designed appearance with excellent heat dissipation, making it suitable for use in different scenarios.

Technical parameters

Function and Performance	
Video Resolution Support	**Input support:** 3840*2160p 60/59.94/50/30/29.97/25/24/23.98fps 1920*1080p 60/59.94/50/30/29.97/25/24/23.98fps 1920*1080i 60/59.94/50fps 1280*720p 60/59.94/50/30/29.97/25/24/23.98fps **Output support:** 3840*2160p 60/59.94/50/30/29.97/25/24/23.98fps 1920*1080p 60/59.94/50/30/29.97/25/24/23.98fps 1920*1080i 60/59.94/50fps 1280*720p 60/59.94/50/30/29.97/25/24/23.98fps
Video Encoding and Decoding	**SpeedHQ (NDI CODEC):** SHQ0, SHQ2 **ISO MPEG-4 Part 10:** Advanced Video Coding (AVC)/ITU H.264 **ISO MPEG-H Part 2:** High Efficiency Video Coding (HEVC)/ITU H.265 **AVC (H.264):** Baseline, Main, High, High10, High 4:2:2 up to 5.2 level **HEVC (H.265):** Main, Main Intra, Main10, Main10 Intra, Main 4:2:2 10, Main 4:2:2 10 Intra up to 5.1 High Tier
Audio Encoding and Decoding	NDI Audio; AAC-LC; Other expandable through software
Typical Encoding Bitrate	**SpeedHQ (NDI CODEC):** 2160p60: 250Mbps 1080p60: 132Mbps 1080p30/1080i60: 112Mbps 720p60: 105Mbps 480i60: 62.5Mbps **NDI HX3(H.264)：** 2160p60:110Mbps 1080p60:62Mbps

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

	NDI HX3(HEVC)： 2160p60: 84Mbps 1080p60:50Mbps **AVC(H.264):** Adjustable bitrates from 1Mbps to 200Mbps. Typical 4Kp60 is recommended above 24Mbps, and 1080p60 is recommended above 10Mbps for better subjective image quality. **HEVC(H.265):** Adjustable bitrates from 1Mbps to 200Mbps. Typical 4Kp60 is recommended above 15Mbps, and 1080p60 is recommended above 6Mbps for better subjective image quality.
Media Protocol Support	NDI High Bandwidth/NDI HX2/NDI HX3/SRT
NDI Encoding and Decoding Support	Simultaneous support for NDI High-bandwidth and NDI HX2/NDI HX3
Recording	USB local recording supports MOV format; supports NAS network remote recording.
Voice Call	Built-in point-to-point calling function between Kiloview devices; with Kiloview Intercom System (KIS), group calling can be realized. A USB external microphone is required to support calls.
PTZ Control	External PTZ control can be done through USB extension RS232/RS485 or network control protocols (such as IP-VISCA).
General Parameter	
Video Input Interface	1x HDMI 2.0
Video Output Interface	1x HDMI 2.0
Audio Interface	1x 3.5mm Line in 1x 3.5mm Line out
Network Interface	2x 1000Mbps Ethernet interfaces (100M/1000M adaptive) Ethernet1 supports PoE (IEEE 802.3AT, 24W Max)
USB Interface	1x USB 3.0 Type-A 1x USB 3.0 Type-C
TF Expansion Interface	1x TF (MicroSD) interface, SDXC (SD 3.0) specification. Maximum speed of 104MB/s, maximum capacity of 2TB.
Tally	Front panel uses LCD screen as Tally indicator; rear panel has Tally LED indicators. Supports external Tally lights.
Human-computer interaction	1.91" LCD screen, Kiloview Magic Rotor
Mounting	Supports cold shoe adapter for device mounting.
Power	DC 12V2A (5.5/2.5) or PoE+ (802.3at)

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

Power consumption	16W MAX
Dimension	135*105.5*35mm
Weight	545g
Working temperature	-20℃~45℃
Storage temperature	-20℃~70℃

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

2 User guide

- Installation and Connection

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

- Network Connection and Configuration

The easiest way for network connection is to connect the device to the network by wire, automatically obtain the IP address and DNS from the network without any setting on the device. After that, use NewTek Studio Monitor and connect the NDI stream of the device, click the gear button ( ) in the lower right corner of the software interface,you can directly open the login link without manually entering the URL(The default username and password is “admin/admin”). (For the first login or the first login after restoring the factory settings, you will need to agree to the “EULA” that pops up. Otherwise, the NDI stream service of the device cannot be used normally).
The default username and password is “admin/admin”

- NDI Streaming

NDI has the function of automatic discovery. After the device is connected to the network, other NDI enabled tools (such as Newtek Studio monitor, OBS, vMix) can automatically discover the device and pull the NDI stream directly.

- NDI Decoding

To find the NDI source in the same LAN or manually adding the source across the network and decode the corresponding source to the display.

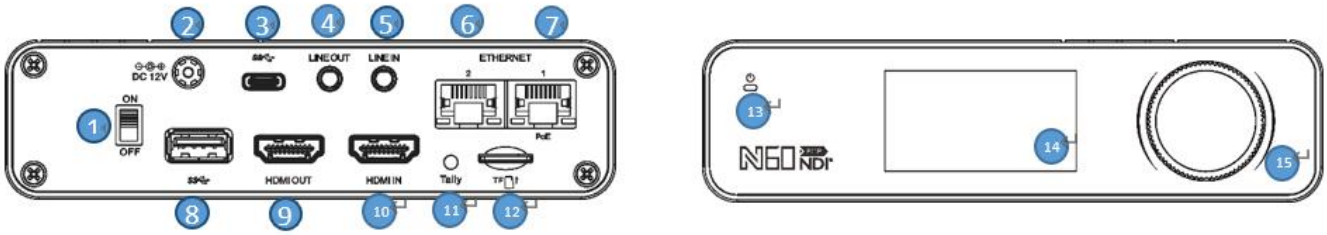
Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

3 Packing list and Interface description

3.1 Packing list

Name	Unit	Quantity
NDI Converter	PCS	1
DC 12V/2A power adapter	PCS	1
Certificate/Warranty card	PCS	1
Cold shoe screw	PCS	1
Cold shoe cradle	PCS	1
Quick start guide	PCS	1

3.2 Interface description



1	Power Switch	2	Power Port
3	Type-C expansion port	4	Line Out
5	Line In	6	1000M Ethernet port
7	1000M Ethernet- PoE	8	USB expansion port
9	HDMI OUT	10	HDMI IN
11	Tally	12	Micro SD/TF slot
13	Status Indicator	14	LCD screen
15	Scroll wheel		

3.3 Led indicators

Tally/LCD screen	**Video Status**	
	Green Light	PVW

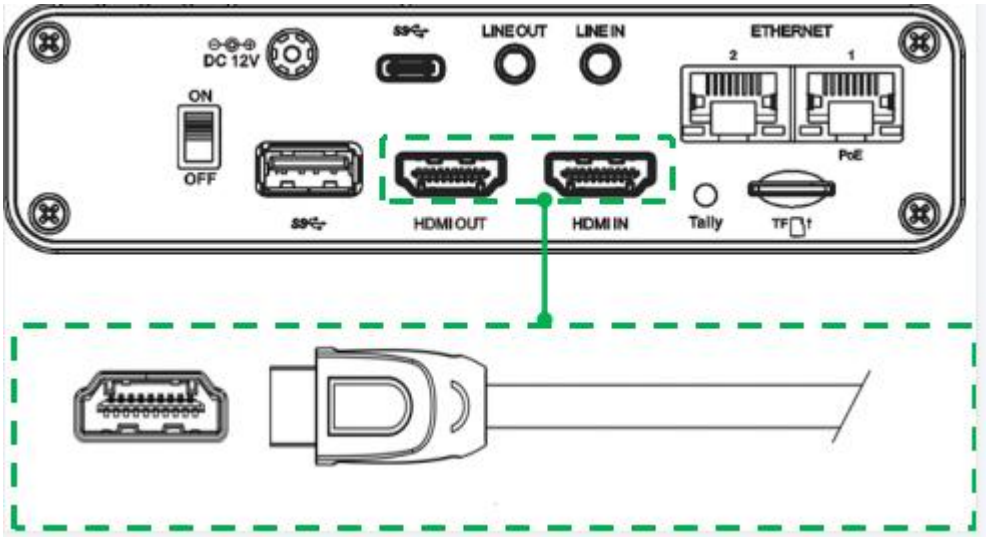
Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

	Red Light	PGM		
Led indicators	**Name**	**Color**	**Status**	**Description**
	Power	White	Always ON	Power connected
			OFF	No power supplied or power failure

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

4 Installation and connection

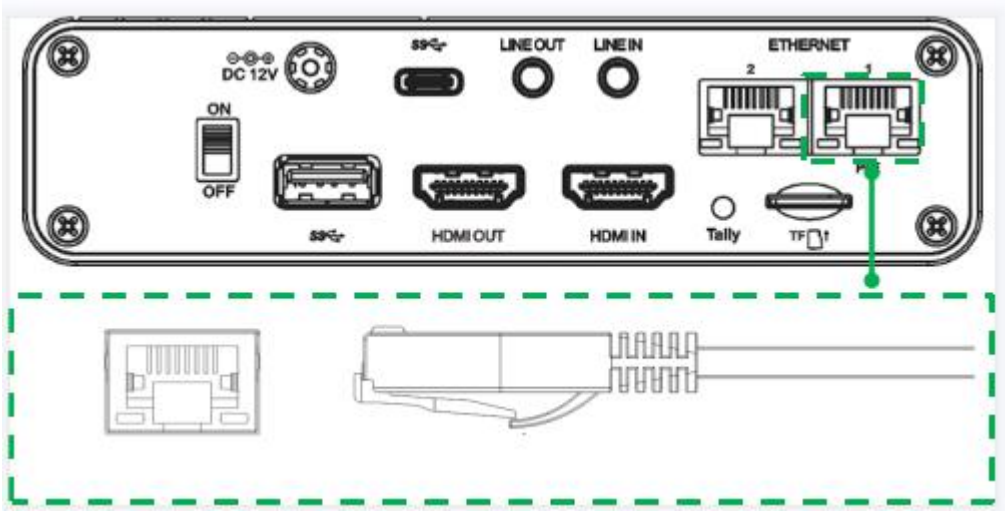
4.1 Connect Video Signal



Connect an HDMI video cable from a suitable video source to N60's input connector.
The HDMI output is connected to the display device via an HDMI cable.

4.2 Connect Network

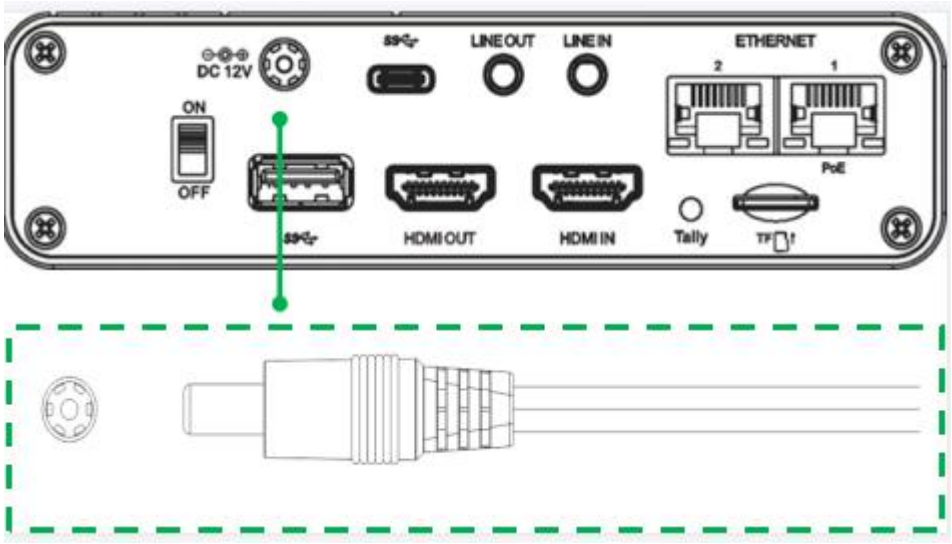
Connect the network cable to Ethernet of the device. The other end of the network cable is connected to your network switch. You can also connect directly to the network port of your computer.



Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

4.3 Connect Power Supply

After connecting the power adapter (DC 12V/2A), the power light will be on and device starts working. (If you use PoE for power supply, there is no need to connect the adapter).



Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

5 LCD Screen and scroll wheel

N60 provides a color LCD screen and a scroll wheel on the front panel. It can view the device status and obtain configuration parameters, and operates the recording operations and IP address configuration. At the same time, LCD screen can work as a Tally.

5.1 Scroll wheel

Rotating the scroll wheel knob to switch the display module. Press the wheel to "OK", and you can enter the current display module to check the working mode as well as the current status, and to restart the device.

- Rotate counterclockwise to previous page
- Rotate clockwise to next page
- Press to confirm

5.2 LCD Screen

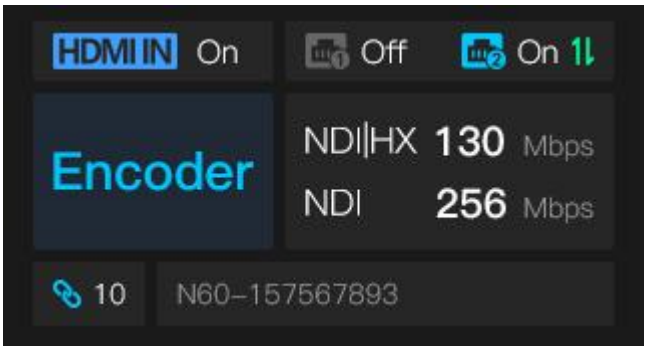
5.2.1 Working mode

The first page of the LCD screen shows the current working mode (Encoder/Decoder) of the N60.

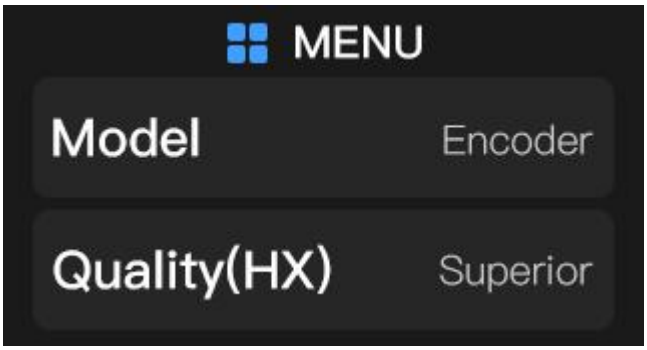
A. Encoding mode

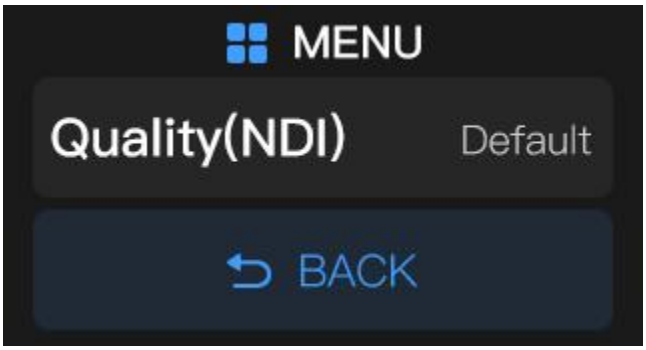
“HDMI IN” On, indicates HDMI video source working successfully. Current stream of NDI High Bandwidth and NDI HX shown on the screen. indicates current number of NDI connections. Below image shows encoding mode:

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved



Press the scroll wheel to enter the sub menu, and modify the working mode through choose Model to enter the setting. You can switch from encoding to decoding, and modifying the encoding quality.

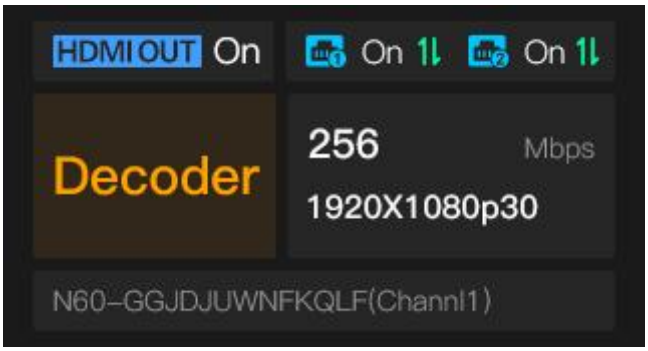


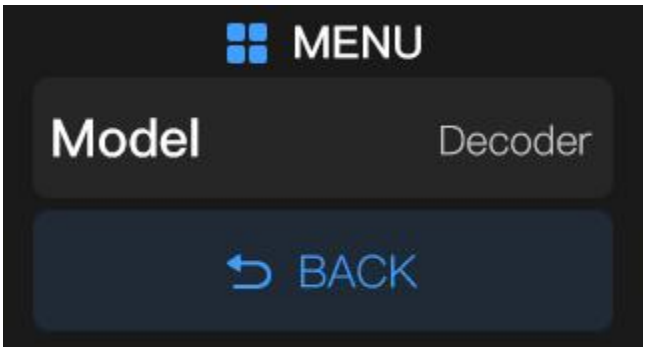


Quality (HX): Encoding quality of NDI HX
Quality (NDI): Encoding quality of NDI High Bandwidth

There are 5 levels of encoding quality, which are:
Superior: Encoding quality is “Excellent”
High: Encoding quality is “Good”
Default: Encoding quality is “Default”
Low: Encoding quality is “Average”
Poor: Encoding quality is “Poor”.

B. Decoding mode
Decoder, indicates the current status is decoding mode. “HDMI OUT” On, indicates the HDMI output video source. The output resolution and NDI stream is shown on the screen. Please take below picture for reference.



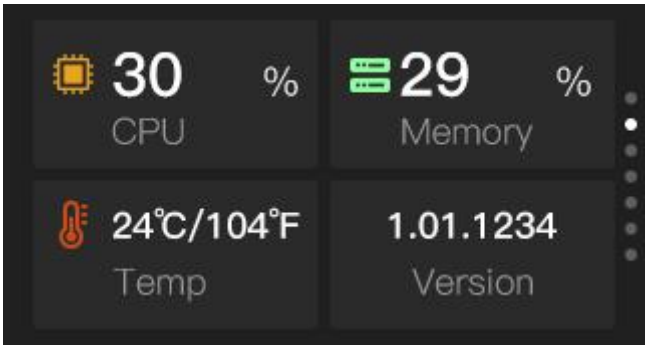


Press the scroll wheel to enter the sub menu, and modify the working mode that switching from the Decoder (decoding mode) to the Encoder (encoding mode).

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

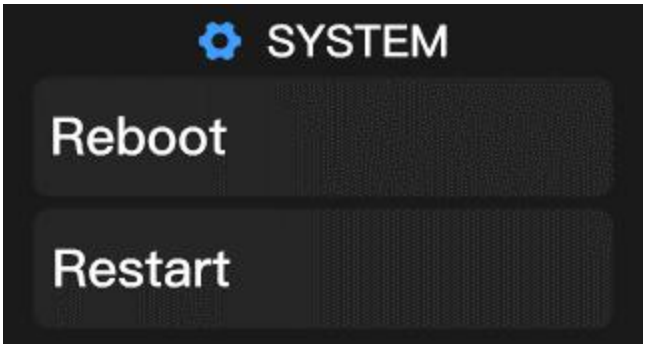
5.2.2 Device status

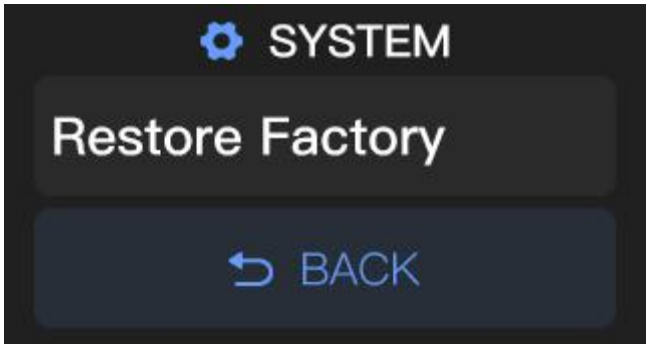
The second page of the LCD screen shows: the current working status of N60, CPU usage, memory usage, current temperature of the device, the current version of the device.



CPU：CPU usage;
Memory：Memory usage;
Temp：Current CPU temperature;
Version：Firmware version currently running on the device.

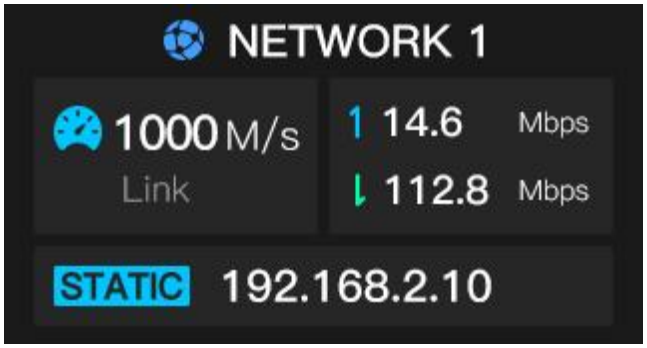
Press to enter the module, quickly reset the device, restart, and restore the factory settings, then select BACK and press the scroll wheel to exit.
Restart：Quick reset
Reboot：Restart the device
Restore Factory: Restore the factory setting

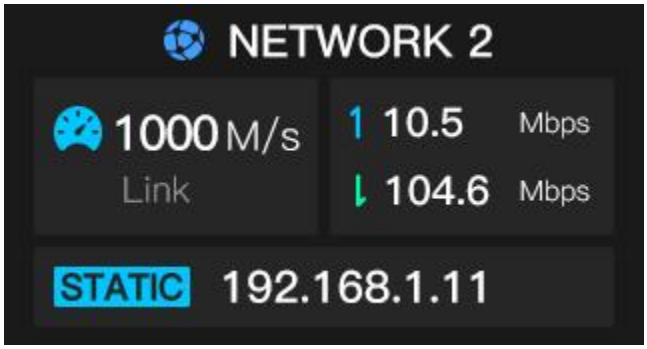




5.2.3 Network status

The third page and forth page of LCD screen show that the network status of the device.



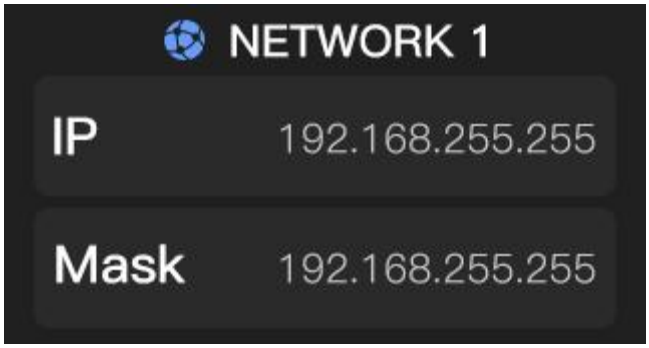


NETWORK 1/ NETWORK 2: Interface data of Port1/Port2
LINK: Network port bandwidth (Gigabit). The arrows show uplink rate and downlink rate

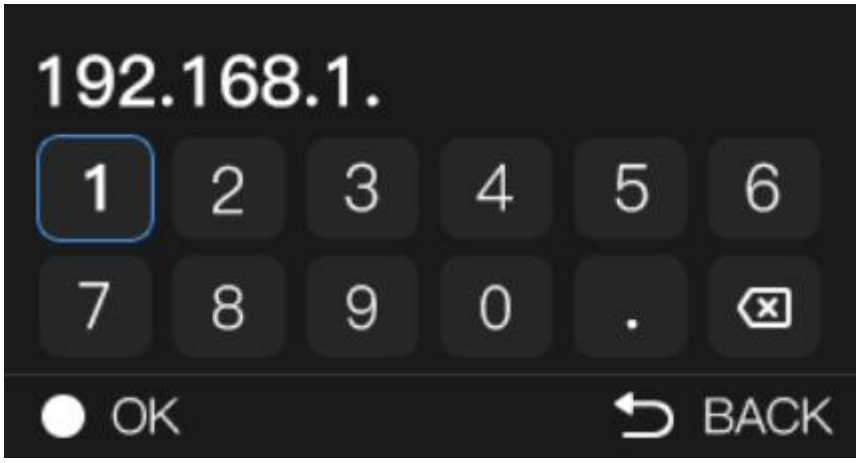
Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

STATIC: Static IP address

Press to view the information of NETWORK1, and supports Network configuration and DHCP on and off.

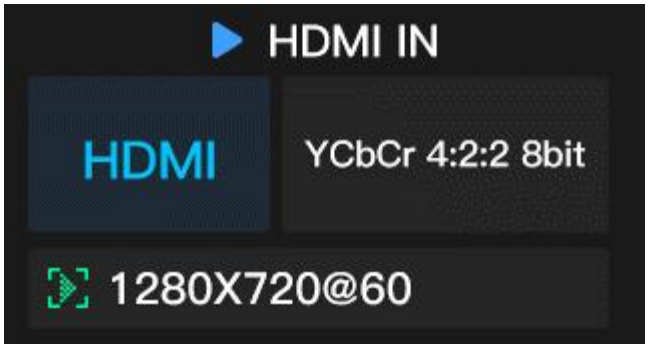


If it is necessary to modify the IP address manually, please select IP, Mask, Gateway to modify individually. Scroll up and down by rotating the wheel to adjust the number of the IP address. After setting, press the rotating wheel and select “OK” to save it, as shown in the following figure:



5.2.4 Video information

The fifth page of the LCD screen shows: HDMI IN/OUT resolution and color space information. If N60 is in encoding mode, then it shows HDMI IN.

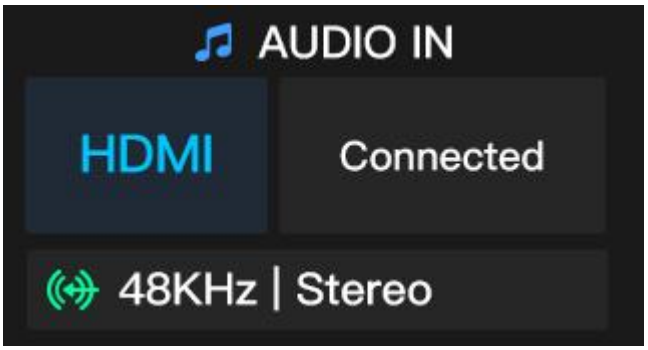


HDMI IN: HDMI input
HDMI OUT: HDMI output
YCbCr: Color space data
Resolution: HDMI IN/OUT resolution

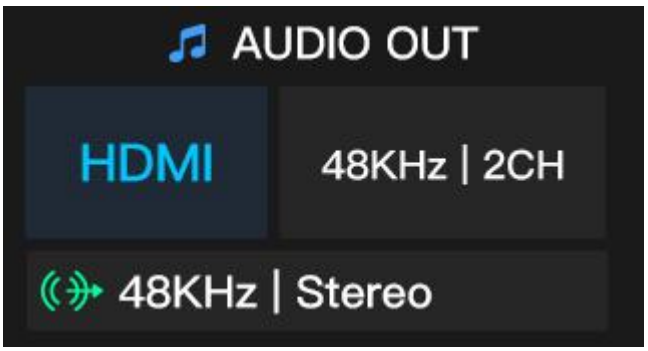
Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

5.2.5 Audio information

The sixth page of the LCD screen shows: audio input information. You can view the sampling rate of the current audio input.
AUDIO IN, indicates that the current audio is HDMI input and Connected.



48KHz|Stereo: Stereo Sampling Rate | Stereo.
AUDIO OUT， indicates that the current audio is in the HDMI output, and displays the current output sampling rate and number of channels.

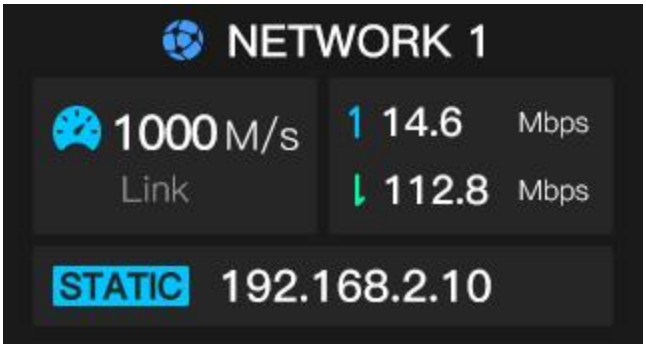


Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

6 Login and Network Configuration

6.1 Login to the Device via Ethernet

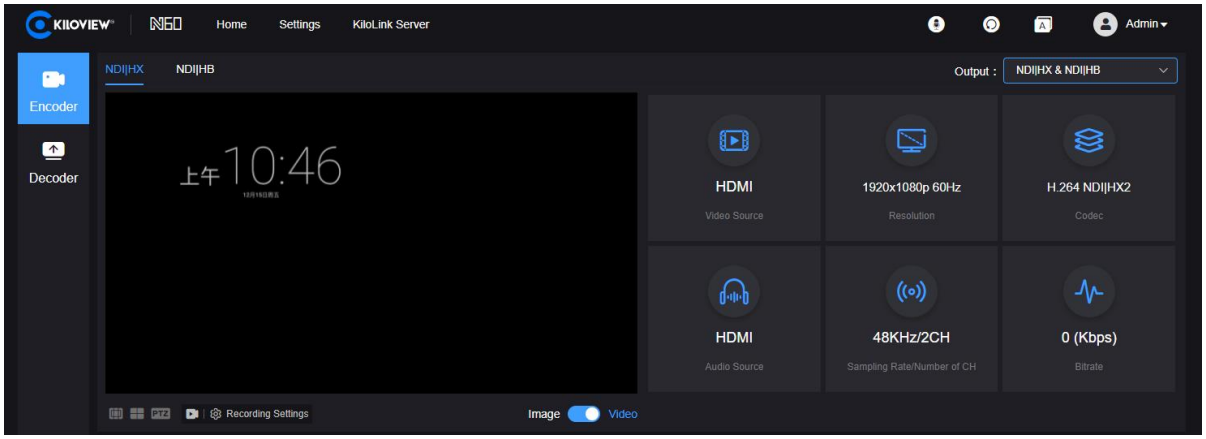
First connect the Ethernet port of the NDI encoder and the computer to the same switch. After powered on, you can turn the wheel knob to switch the screen to view the network port you are currently connected to, such as "ETHERNET 1" (NETWORK 1) or "ETHERNET 2" (NETWORK 2). IP address can be also shown on the page.



Open the WEB browser, directly input the IP address to login. The default username and password are admin/admin.

Note: Due to the browser compatibility issues, it is recommended to use Chrome or Firefox. For the first login after restoring the factory settings, you will need to agree to the "EULA" that pops up. Otherwise, the NDI stream service cannot be used normally.

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



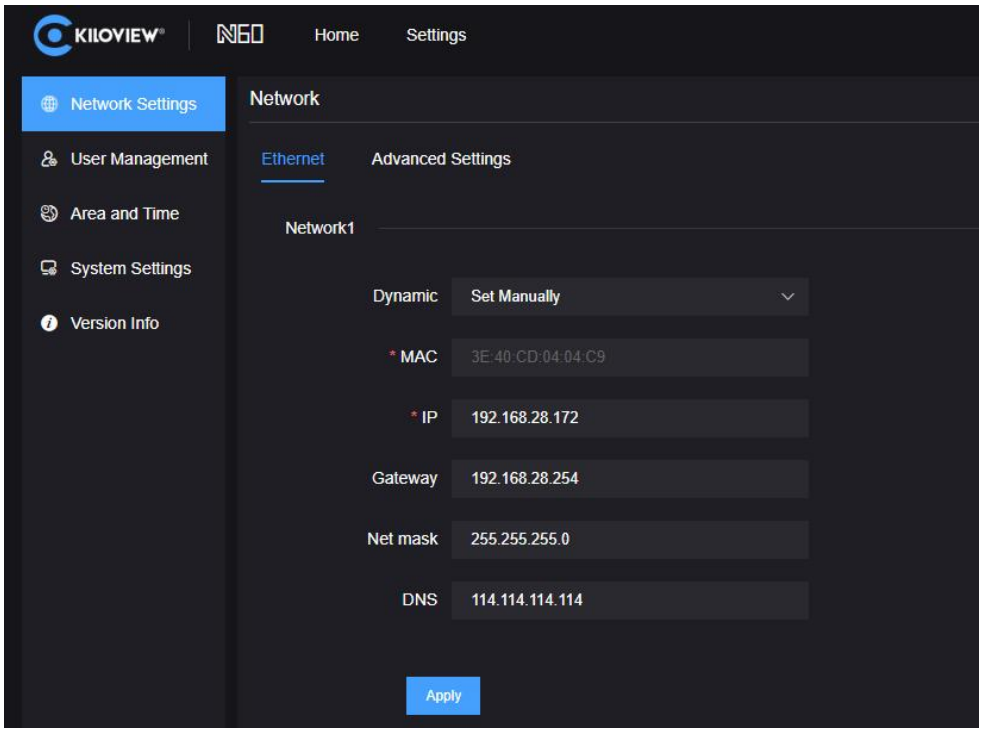
6.2 Network Settings

Connect the network cable to the Ethernet port and configure with an IP address. The IP address of the network port is obtained by DHCP by default, which will automatically get a full IP address, gateway and DNS based on this LAN.

The N60 has two Gigabit network ports, of which Network 1 supports POE. Here take Network 1 as an example.

Click "Network" to check the configuration of the Ethernet.

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved



There are two ways to get the address, one is DHCP, and the other is manual. By DHCP to automatically obtain IP, you must first ensure that the router or switch has enabled the DHCP service. the N60 will obtain a dynamic IP address assigned by the router or switch (with DHCP service enabled).
To set the IP manually, you need to enter a fixed IP to the device, and this IP address will not change if the device is not restored to factory settings.

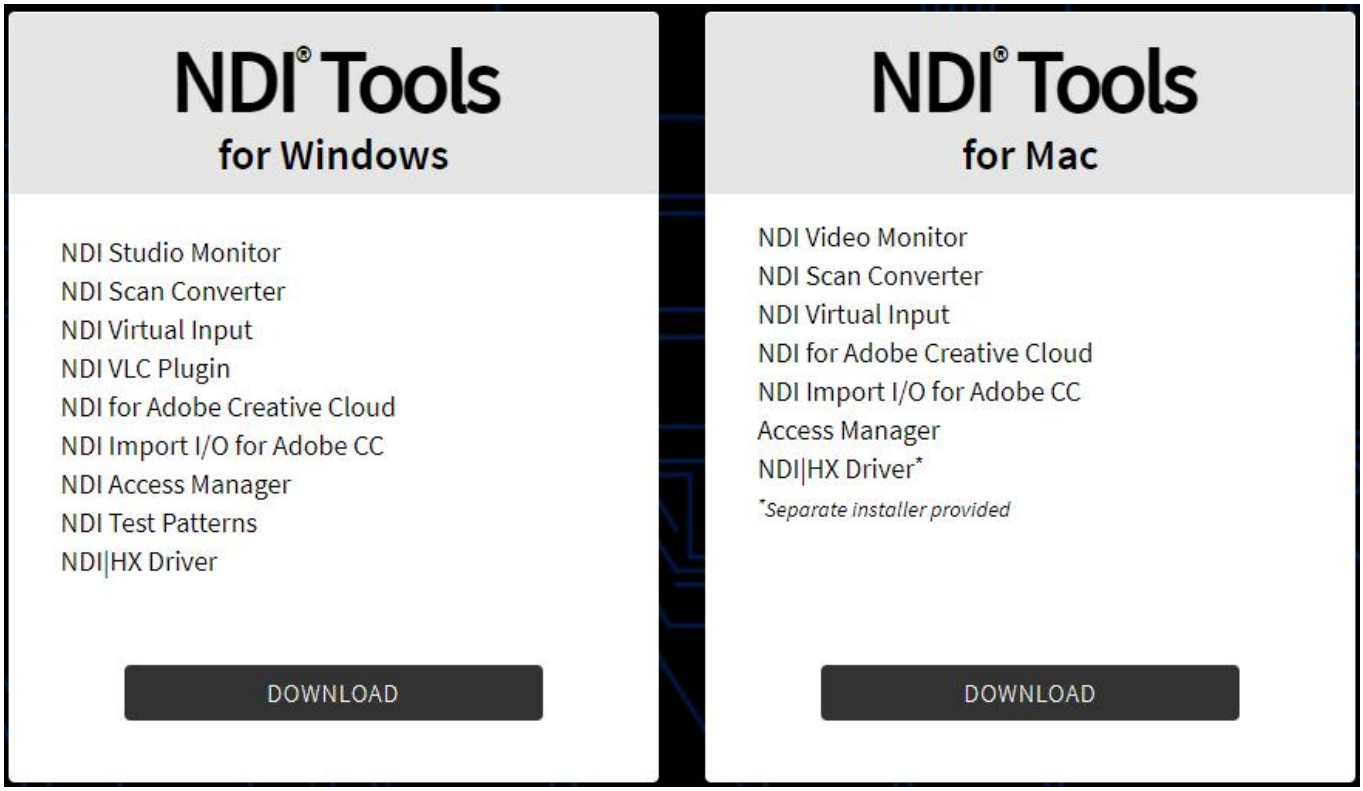
Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

7 NDI discovery and monitoring

N60 is a professional video encoding/decoding device for NDI video production, which can encode HDMI video sources into NDI streams for transmission over Ethernet or decode NDI streams for output to any compatible system, device or software in the network.

7.1 NDI Tools Installation

Download and install the NDI Tools from NEWTEK website: (https://ndi.tv/tools/)

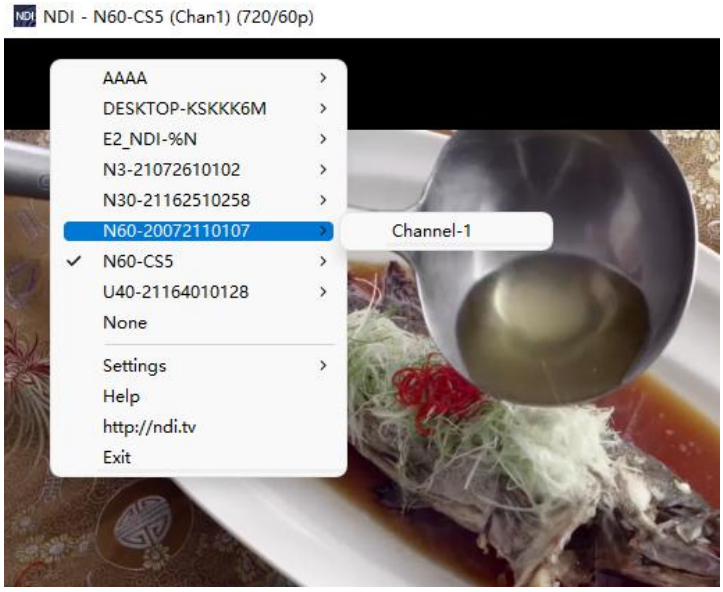


7.2 Discovery and Connection

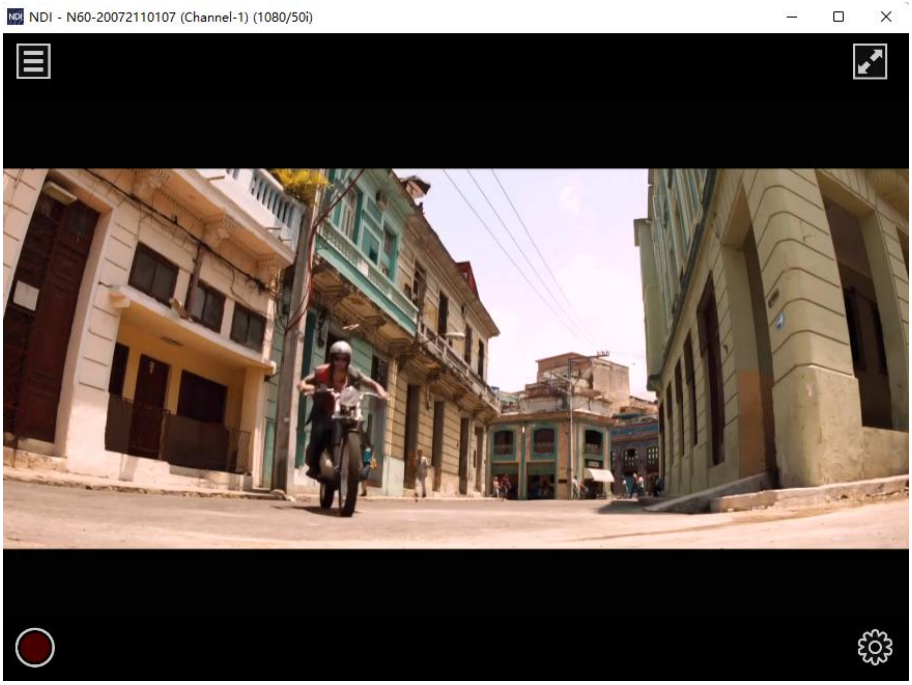
When the device is connected to the network, On the PC side, other NDI-enabled tools of the same subnet can discover the NDI streams automatically. Currently, there are many NDI-enabled software. The following is an example that how to automatically discover and pull NDI streams using NewTek Studio Monitor and vMix.

Open NewTek's Studio Monitor and click the icon in the upper left corner (or right click) to display a list of devices that have been discovered. The list of devices is followed by a list of all NDI streams found in the network with different devices and channels, and you can pull and play the selected video streams.

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

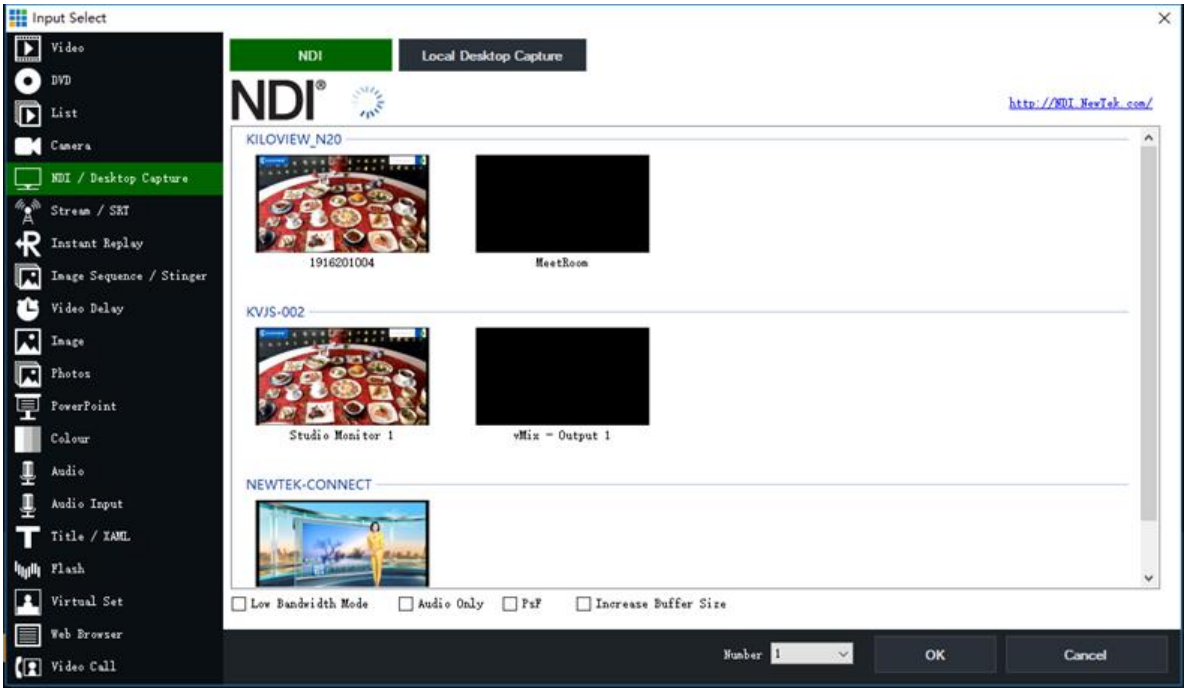


Open the Monitor and play NDI videos, click at the bottom right corner of the player to open the WEB page of the NDI device directly, which is convenient for managing the NDI device directly.



Open vMix, click "Add input" at the bottom left corner, select "more" to display various sources that can be added, click "NDI/Desktop capture" to display the list of NDI sources. Depending on the device name and channel name, you can select the device you want to add and click "OK" to add the selected NDI source to the vMix source list.

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved



Note: NDI discovery is Multicast-based, so the device and other NDI devices should be within the same subnet, and the device is configured with the same subnet IP address and they can communicate with each other automatically, otherwise it may not be able to automatically discover NDI streams.

7.3 NDI Encoding Bitrate

NDI High Bandwidth encoding transmission requires high bit rate, the device needs to be connected to a Gigabit network, and the device at the pulling end also needs a Gigabit network, otherwise it will cause lag or abnormal. The below list shows the reference bitrate for different resolution.

Resolution	Output bandwidth
4KP60	250Mbps
1080P60	125Mbps
1080i60	100Mbps
720P60	90Mbps

8 Encoder Configuration

8.1 NDI Configuration

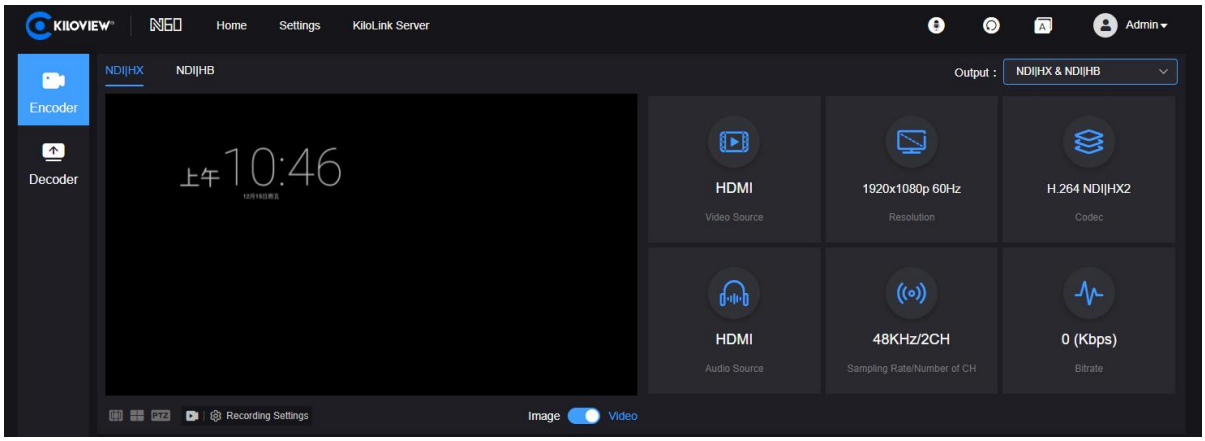
N60 is a professional video encoding/decoding device for NDI video production, which can encode HDMI video sources into NDI streams for transmission over Ethernet or decode NDI streams for output to any compatible system, device or software in the network.

It supports both NDI High Bandwidth and NDI HX. Change the encoding parameters of the device by

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

clicking “NDI” and “NDI HX”.

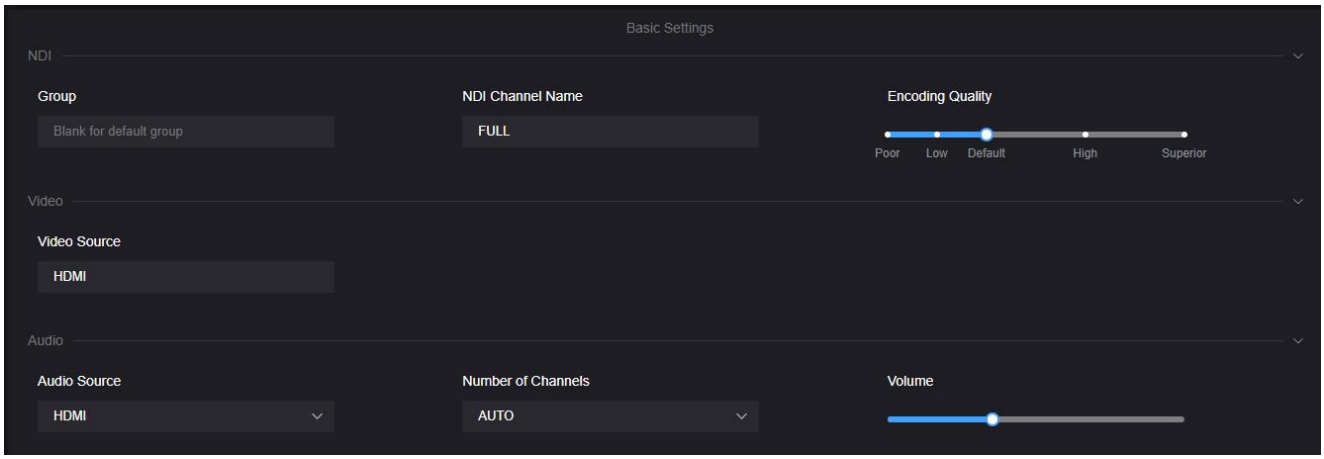
8.2 Status Column



- Video source: Input signal.
- Resolution: Input video source resolution.
- Encode: The encoding protocols. High Bandwidth and H.264 NDI HX (HX supports multiple versions and configurable in the video encoding).
- Sampling rate: The audio sample rate of the input source.
- Number of CH: The number of audio channels.
- Bitrate: Real-time encoding code bitrate.

8.3 Basic Settings

NDI is a protocol developed by NewTek which is used for video-over-IP transmission in LAN with features of high quality and low latency. Configure NDI parameters in “Basic settings”.



- Group: The group name can be the combination of characters and numbers. Multiple group names are allowed to be configured, with commas separating the group names, and the default group name is “public”. If you do not want other devices in the network to find it, please set a specified group name, and other devices can be found with the specified group name.
- NDI channel name: When multiple NDI sources in the same network, change the channel name of the device to distinguish different devices.
- Encoding quality: When decreasing or increasing the encoding quality, the encoding image quality and the encoding bitrate are adjusted as well.
- Encode: Support H.264 and H.265, and NDI HX support NDI HX2 and NDI HX3, you can choose different versions with actual use.

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

- Color space: N60 supports setting the color space of NDI HX encoding, with a maximum supported color space: YCbCr: 4:2:2 10bit.
- Audio source: HDMI embedded audio or analog input audio selectable, the default is HDMI embedded audio.
- Volume: Gain adjustment of the input analog audio or HDMI embedded audio.

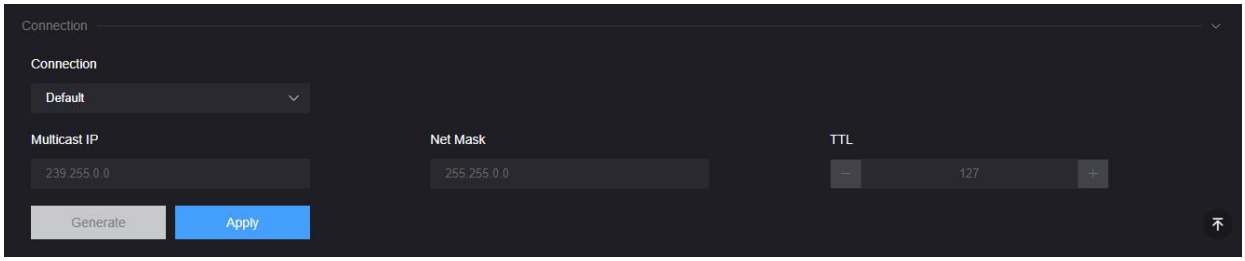
Note:

1. No need to save the configurations after changing the device group, device name and channel name, click any other location on the page for the parameters to take effect.

2. For the color space, N60 only supports changing the color space of NDI HX encoding, not for NDI High Bandwidth color space. When the video resolution is 4K P50/60, the color space of NDI High Bandwidth encoding is YCbCr:4:2:0 8bit; and when the video resolution is lower than 4K P50, it is YCbCr:4:2:2 8bit.

8.4 NDI Connection

NDI supports multiple connection modes, the default is RUDP.
Default: connection by Multi-UDP.
RUDP: connection by RUDP.
Multi-UDP Disallowed: connection by TCP unicast.
Multicast: Connection by UDP multicast.
Users can change the NDI connection mode with actual use.
For example: choose “Multicast”, NDI transmission will transmit audio and video in multicast mode. Click “Generate”, a multicast IP will be generated randomly, or you can configure it manually and click “Apply” to take effect.

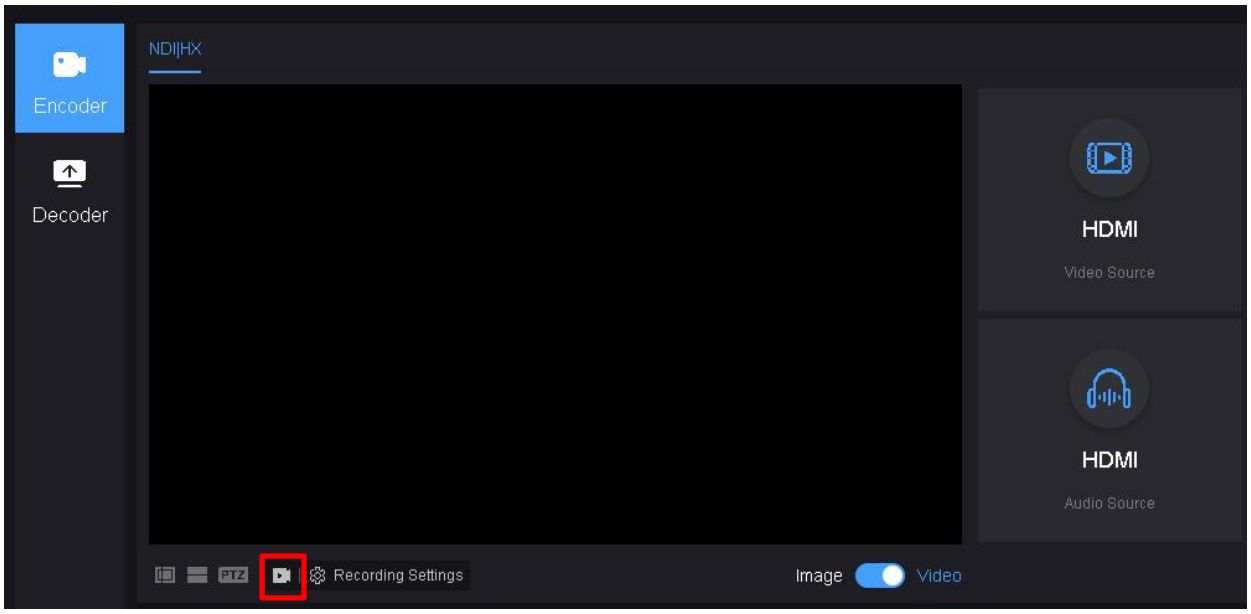


Note: Due to the high bandwidth of NDI High Bandwidth, if you choose “multicast”, please pay attention to the influence on other devices in the network.

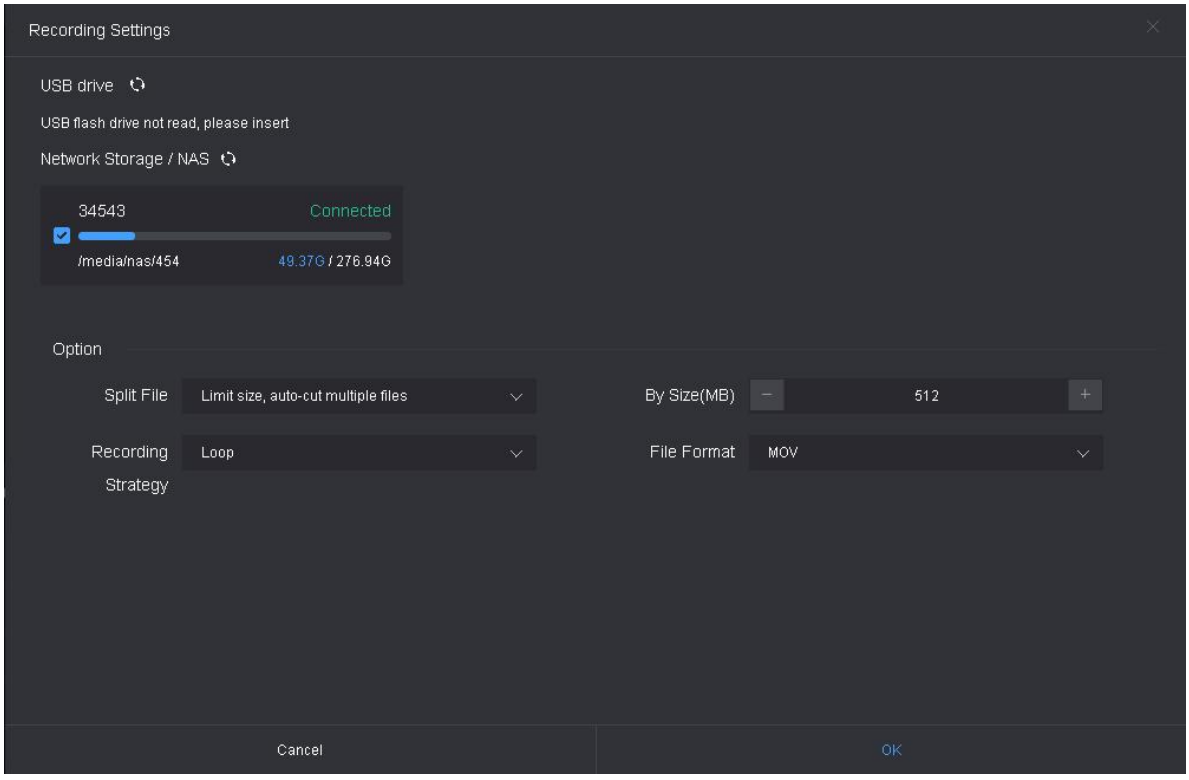
9 NDI Recording Settings

N60 supports recording during NDI HX encoding. N60 recording supports two recording methods: local USB flash drive and NAS recording. Taking local recording as an example, the specific steps are as follows:
1) Insert the USB storage device into N60.
2) In the encoding page of the N60 management backend, click the record button to start recording.
3) Click the stop icon during the recording process to stop recording.

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved



If you need to set recording parameters, you can click "Recording Settings" in the encoding page of the WEB interface. You can choose to record the video on a flash drive or NAS network storage, as well as set recording segmentation strategies and recording formats.



Note: If the storage device is unplugged during the recording process, it may cause permanent damage to the recording files and make them unplayable.

When the recording is completed, please manually stop the recording before removing the storage device to ensure that the recording can be played back normally.

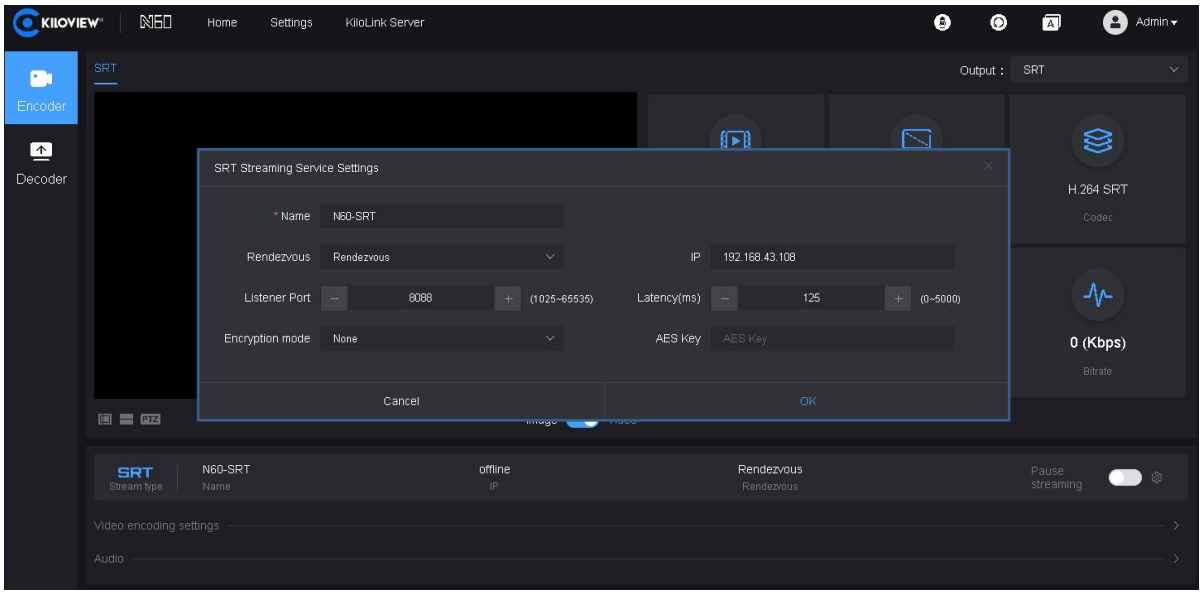
For how to configure NAS network storage, please refer to the user manual section 12.4 Record Settings.

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

10 SRT Encoding Parameter Settings

10.1 SRT Protocol Parameter Configuration

In addition to encoding HDMI video sources into NDI protocol streams, the N60 also supports encoding SRT protocol streams.



1. In the upper right corner of the encoding interface, select: SRT Protocol from the output bar.
2. In the SRT Stream Type section, click the icon and set the parameters for the SRT stream in the pop-up window.
3. Click on the " " push stream toggle to start SRT streaming.

The meanings of various SRT streaming parameters are as follows (adjust according to actual network conditions; default configurations are generally suitable):

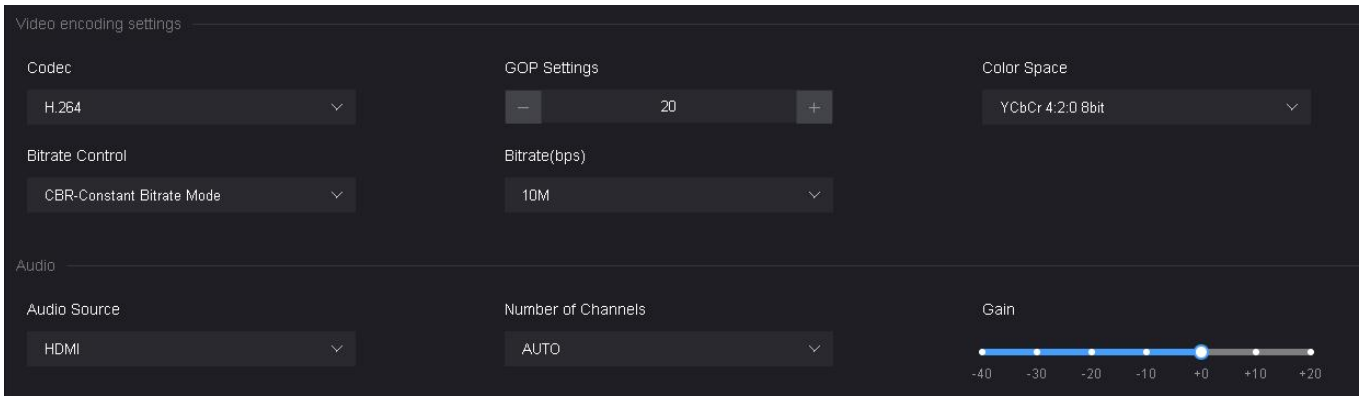
- "Name": The display name for the stream service push.
- "Rendezvous": Optional Caller, Listener, and Rendezvous modes. Under normal circumstances, Caller and Listener modes are used. In a local area network, the encoding end and the decoding end can use Caller and Listener modes interchangeably. When one end uses Caller mode, the other end uses Listener mode. For internet transmission, the end with a public IP address always uses Listener mode.
- "IP": Set the IP address of the receiving end.
- "Listener Port": Set the corresponding listening port of the receiving end.
- "Latency(ms)": Based on the performance of the current network link, the Latency can be set at both the SRT source and target devices. The final transmission latency is determined by the larger value between the two.
- "Encryption mode": Supports AES-128, AES-192, and AES-256 encryption modes.
- "AES Key": Encryption key, enter a combination of 10-32 alphanumeric characters based on the encryption method.

⚠**Note:** SRT Stream ID and AES Key are not mandatory fields. If filled out, the corresponding information must also be entered at the decoding end.

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

10.2 SRT Audio and Video Encoding Parameter Configuration

To modify the audio and video encoding parameters of the SRT protocol, relevant parameters can be set in the SRT encoding interface. SRT encoding parameters are divided into video and audio parameters.



Video Encoding Parameter Explanation:

- Codec: There are two encoding methods available - H264 or H265 can be selected as needed.
- GOP Setting: Supports custom adjustment, with a range of 0-600. The GOP (Group of Pictures) strategy affects the encoding quality. GOP refers to a group of consecutive frames. Adjust this value based on the actual situation; the default is 60, which is sufficient for most requirements.
- Color Space: Supports four options - YCbCr 4:2:0/4:2:2 8/10bit.
- Bitrate Control: There are two modes - CBR (Constant Bitrate) and VBR (Variable Bitrate). CBR maintains a stable and unchanging bitrate, while VBR dynamically adjusts the bitrate according to the actual content. Generally, CBR is used for network transmission to ensure quality, while VBR is used for file storage to ensure video file quality. The default setting is CBR (Constant Bitrate).
- Bitrate(bps): Supports bitrate settings in the range of 1M-200M and allows for custom bitrate settings.

Audio Encoding Parameter Explanation:

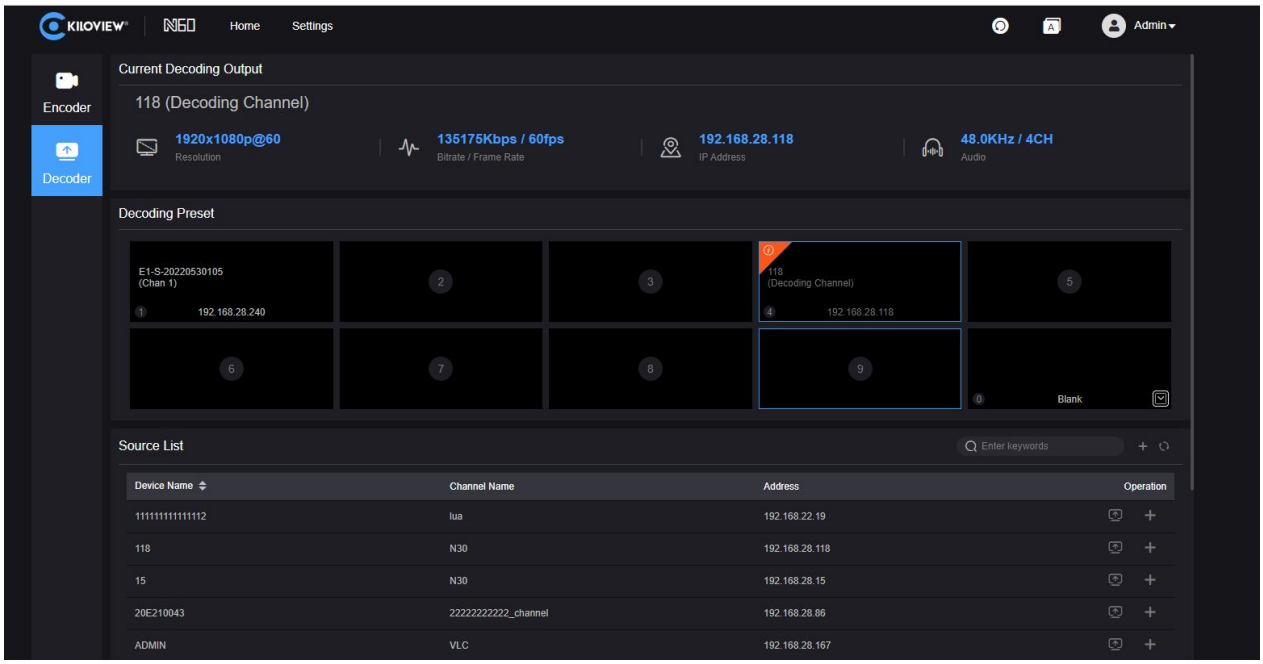
- Audio Source: N60 supports HDMI or "Analog Line Input" as two audio signal sources, which can be selected as needed.
- Number of Channels: HDMI supports "AUTO" or 2, 4, 6 channels; analog line input only supports 2 channels.
- Gain: N60 audio gain supports adjustment in the range of -40dB to +20dB.

11 Decoder Configuration

Click “Decoder” to switch to decoding configurations, or switch to the decoding mode on the LCD screen.

Before switching to decoding mode, please check the Ethernet IP address and log in the WEB page with the address.

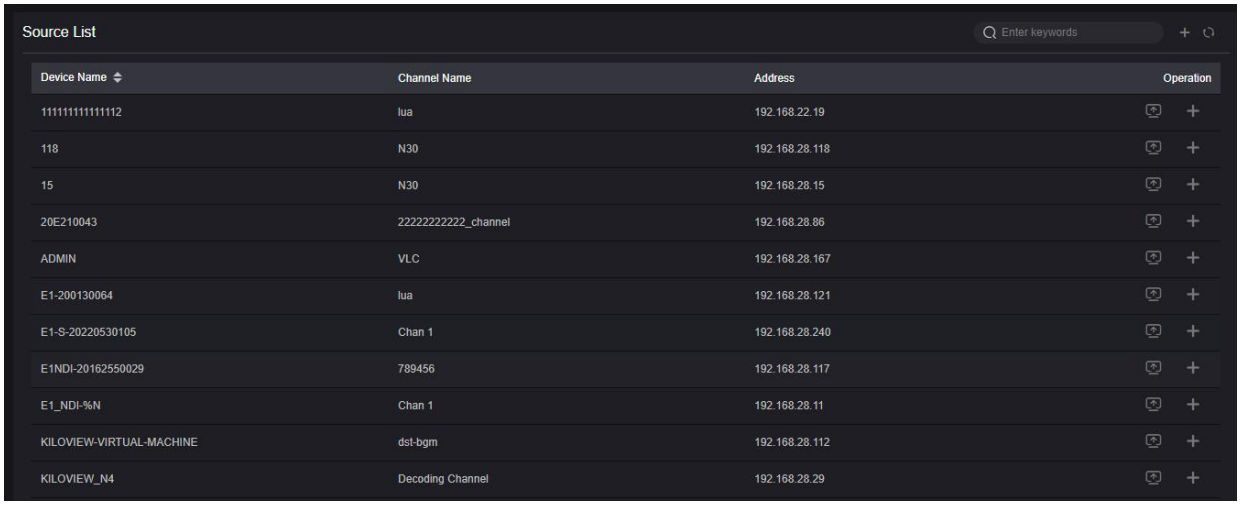
Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved



Note: Encoding and decoding function of the device cannot be performed simultaneously. When switching to the decoder, the encoding function will be stopped. Use Studio Monitor to connect the NDI stream and click the gear button in the lower right corner to go to the WEB page.

11.1 Discovery of NDI sources

The N60 can discover NDI sources on the same LAN autocratically and display them in the source list. Click to update the network NDI sources in real time.

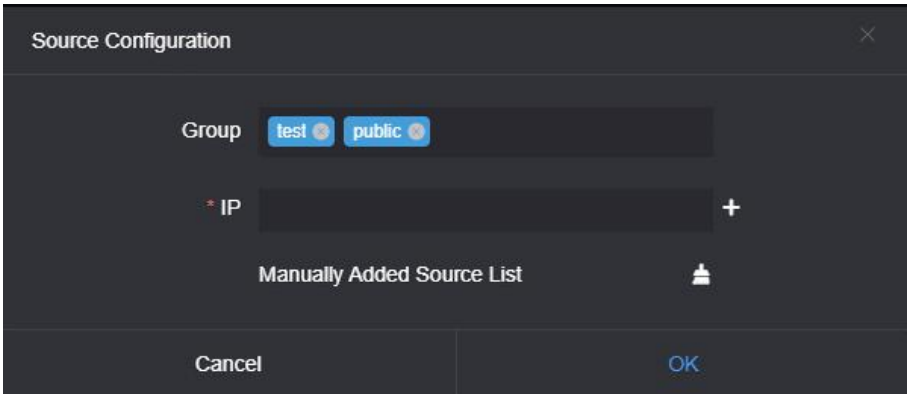


Click + to add NDI video sources from different groups or different network segments in the same LAN.

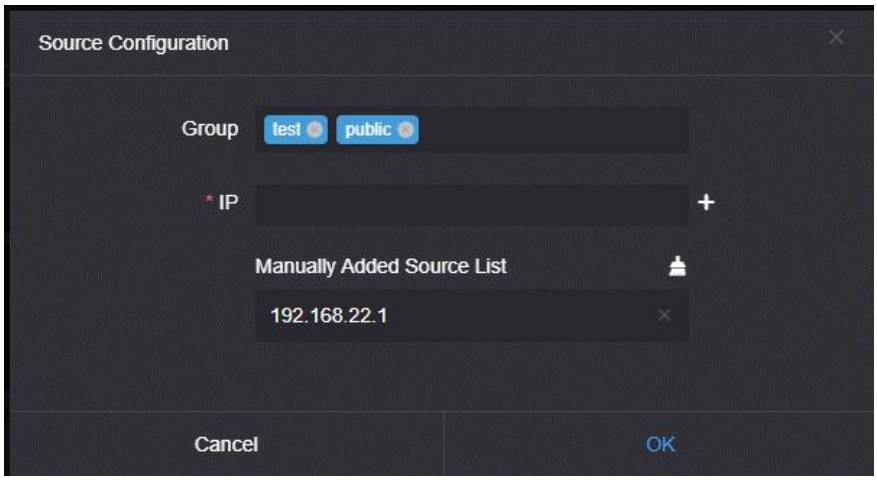
If you want to search for devices with different group names in the same subnet, filling in the specified group name after “Group” (e.g. kiloview), click the “Enter” button, two group names will be displayed in

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

the "Group" box. Then click the "OK" (no need to fill in the IP address) and the device will search for the NDI source of both group names at the same time. (You are allowed to add multiple group names to search).

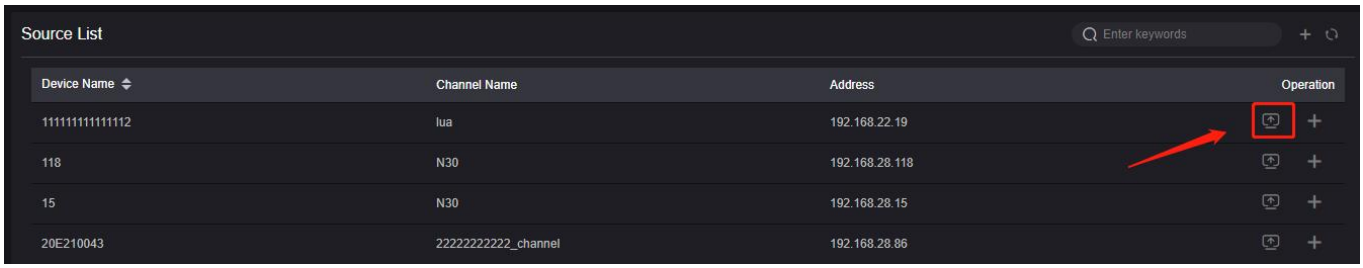


When you need to search for NDI sources across network segments, if the group name is non-public group, you need to fill in the specified group name first, then fill in the specified IP address in the "IP", and then click "OK".



11.2 Decoding Output

Click next to the NDI source to decode and output the video source directly.

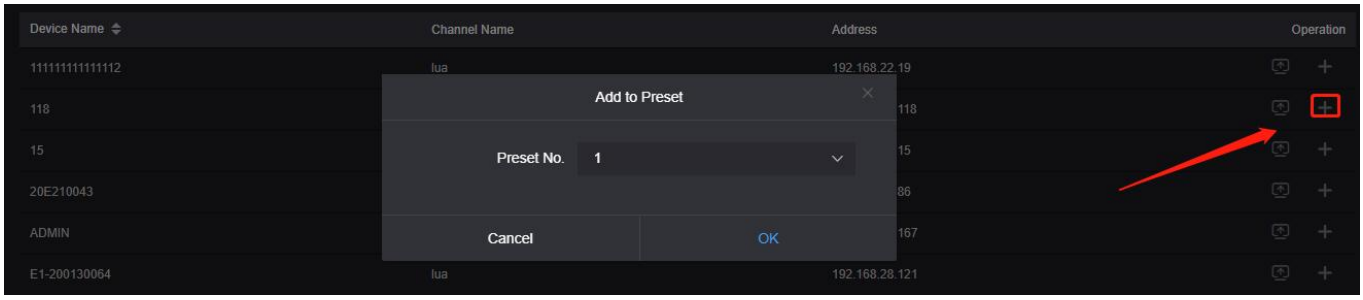


11.3 Decoding Preset

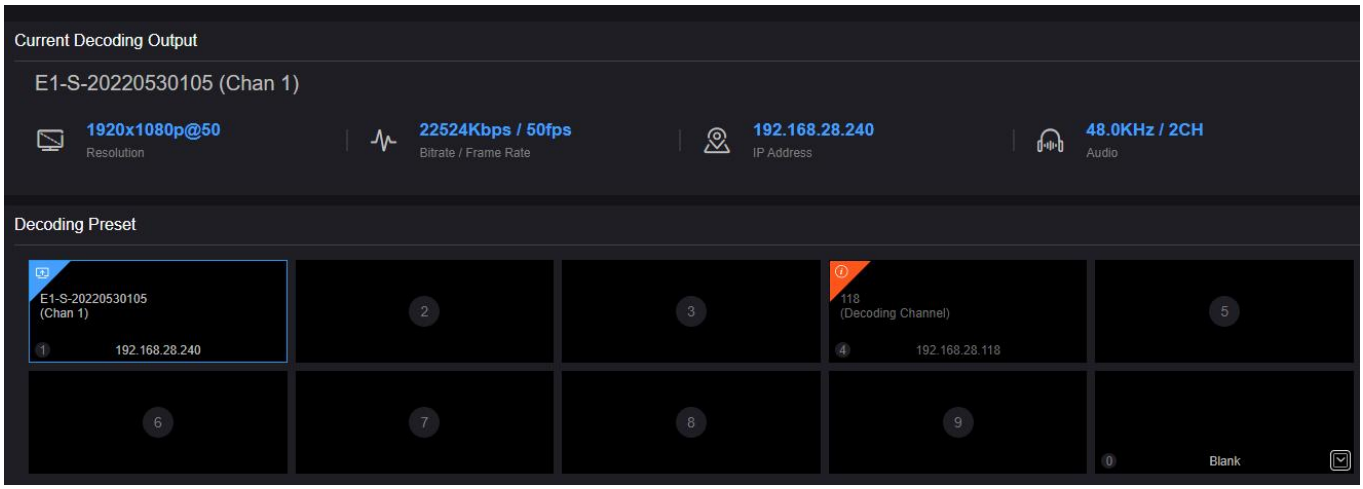
N60 supports up to add 9 preset decoding windows, click the NDI source and the device starts decoding the video.

Click + next to the NDI source to add the source to a different decoding preset window.

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

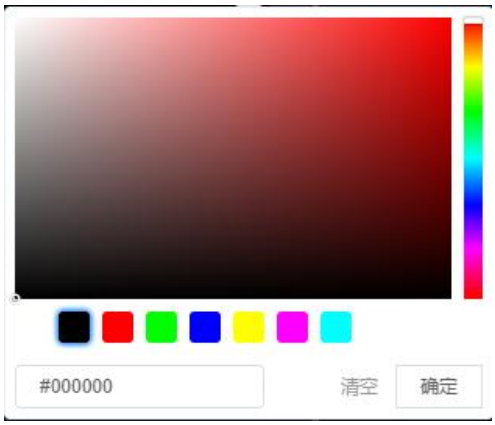


After adding the NDI sources to different preset windows, clicking the preset window and the N60 will immediately start decoding the NDI source, and finish the switching between different NDI sources.



By clicking different NDI sources to switch the decoding output. In the upper right corner of the preset window, click ✕ to delete the added source.

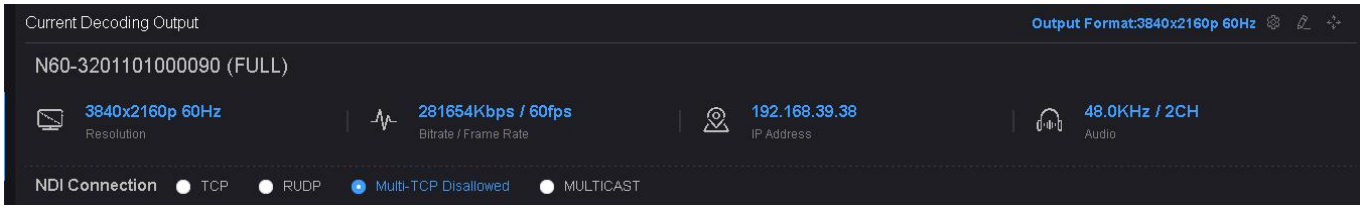
There is a blank output window in decoding preset, if switching to a source without video output, the device will output the preset color. It can also be used for testing the output to the monitor by choosing a different color.



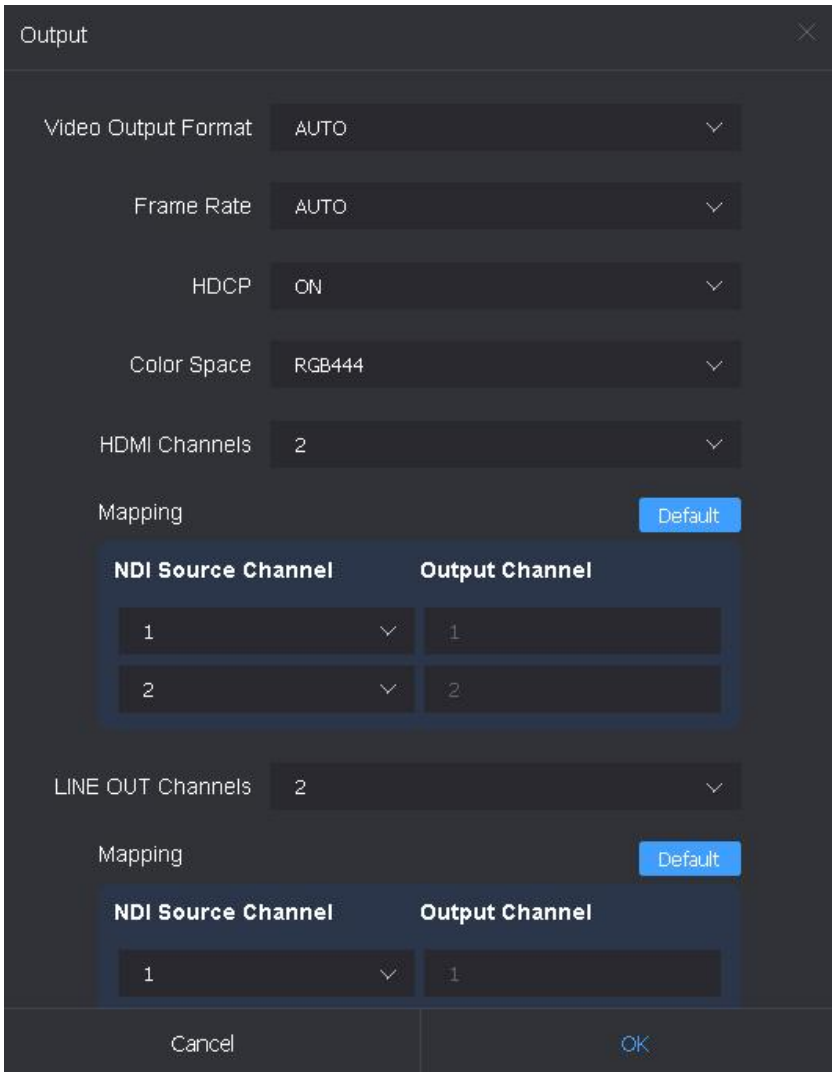
Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

11.4 Decoding parameter configuration

"Current decoding output" displays the current decoding NDI source name, channel name, resolution/frame rate, audio parameters, source IP address, real time bit rate and frame rate and so on.On the right side of the area, there are three functional buttons: '', '', and ''.

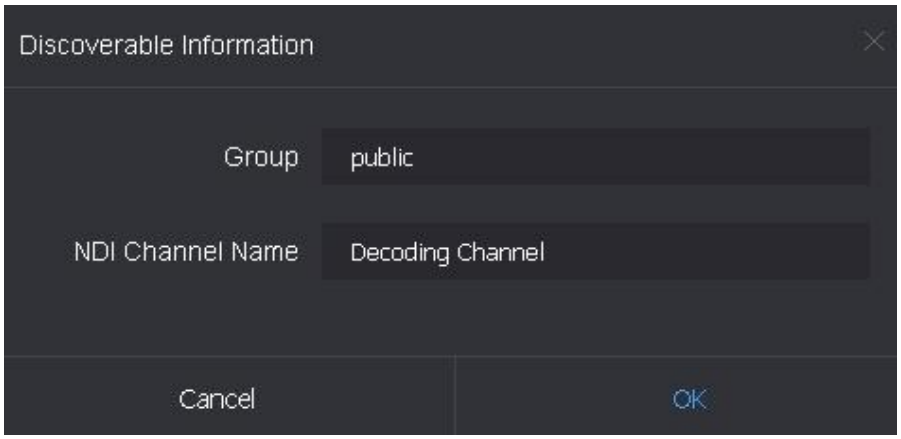


Clicking "" allows you to set the video output format, frame rate, HDCP, color space, and perform channel mapping operations in the decoding mode.

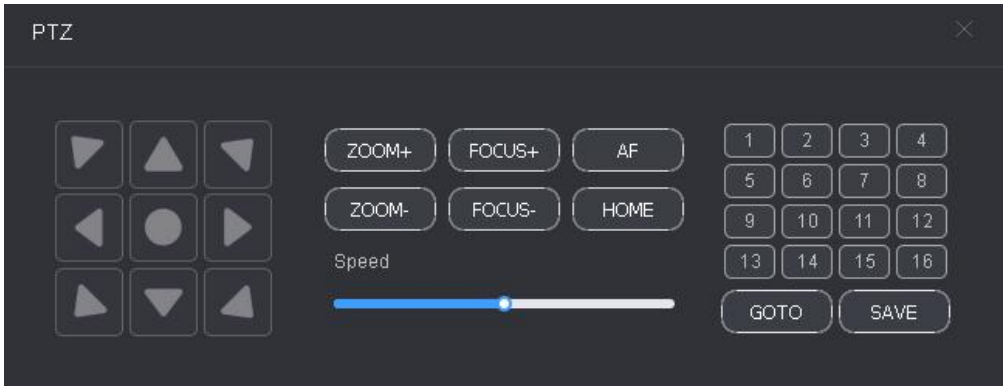


Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

Clicking " " is used to set up NDI groups and channel information that can be found in the decoding state.

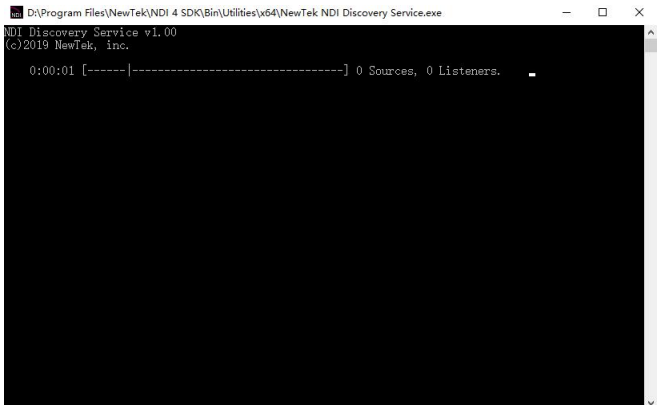


Clicking " " pops up the PTZ virtual keyboard for PTZ control operations.



11.5 Discovery service

NDI discovery server can replace NDI auto-discovery with a server, where NDI sources are centrally registered to the server, and the receiver end obtains NDI source from the server. Through this, the device can also send the output video stream to the receiving end of the cross-network segment.
First, download and install the NDI SDK on a Windows computer at the receiving end. After installation, run Bin\Utilities\x64\NDI Discovery Service.exe.



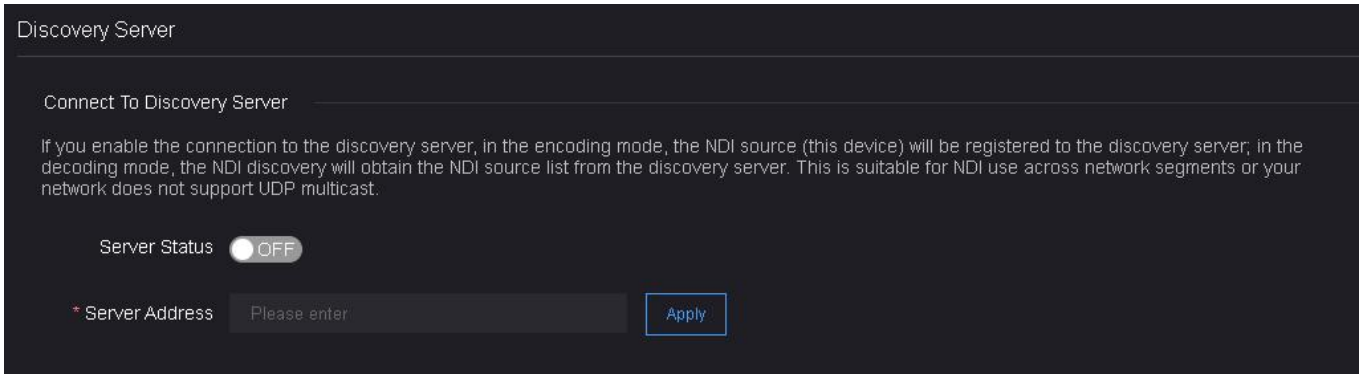
Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

The NDI encoder configures the IP address of the receiving end in the discovery server, and the NDI will be registered to the server. It is recommended that the receiver address be configured as a static IP address to prevent the loss of NDI connections due to IP reassignment.

Note: When the function is enabled, the mDNS auto discovery function is invalid. The stream of the encoder can only be sent to the specified server, and the receiver end must register to the same discovery server to pull the NDI stream.

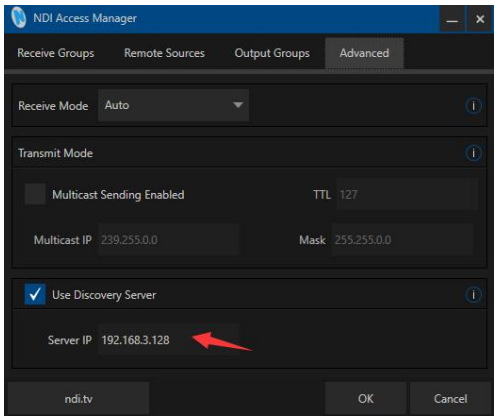
1) Receive with Kiloview NDI High Bandwidth decoder

Switch the NDI High Bandwidth device to decoding mode, click "discover server", and "Enable" it. Fill in the server address with the same registered address of the NDI encoder. Click "OK", all NDI sources registered to the discovery server can be found by scanning the list.



2) Receive with computer-based software

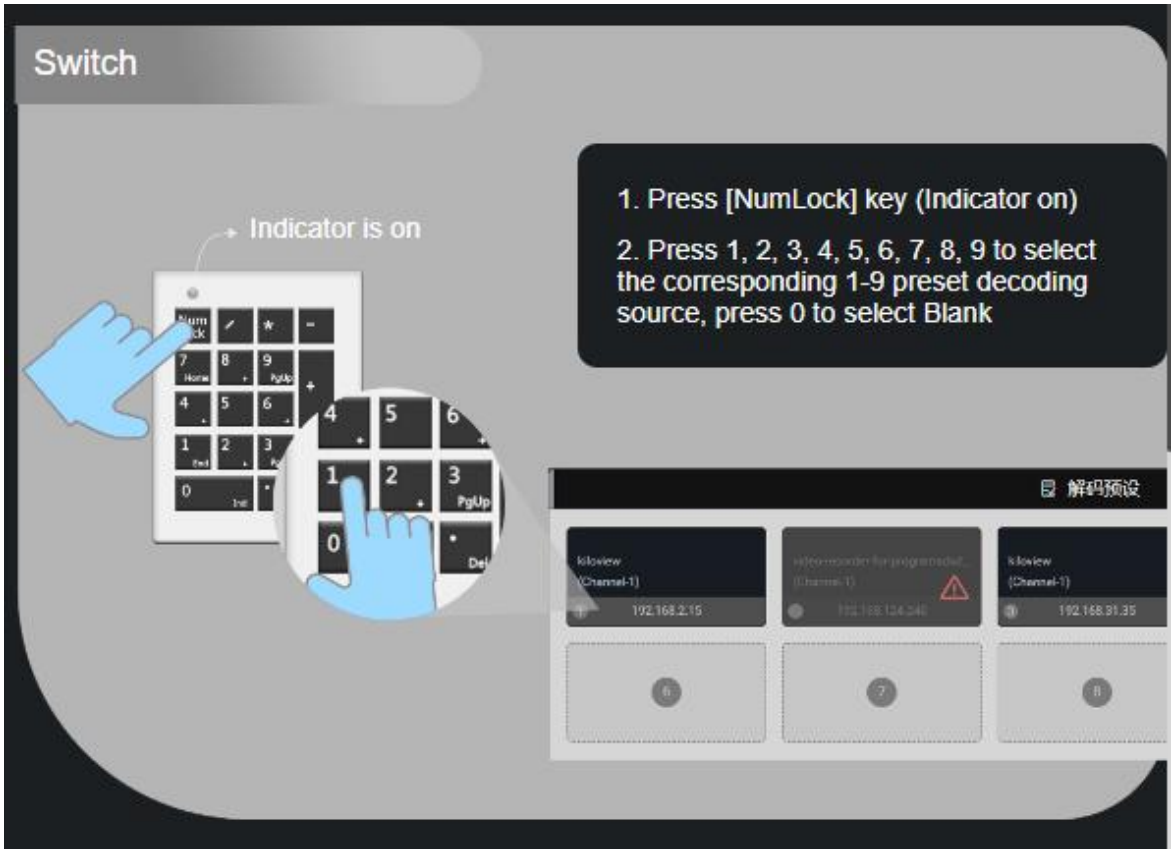
Install NDI tools at the receiving end and open “NDI Access Manager”. Click to enter "advanced", cancel "Multicast Sending Enabled" function, select "Use Discovery Server", and set the "Server IP" address the same to your computer that enables the discovery server function. After configured, the receiving end can discover the NDI stream registered with the server (such as Vmix, Studio Monitor).



The decoding output switching can also be controlled via keypad, firstly connect the keypad via USB.

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

Secondly press【NumLock】on the keypad, if the light is on, you can operate to decode and switch. Press 1-9 to select the corresponding preset decoding sources, and 0 is blank.



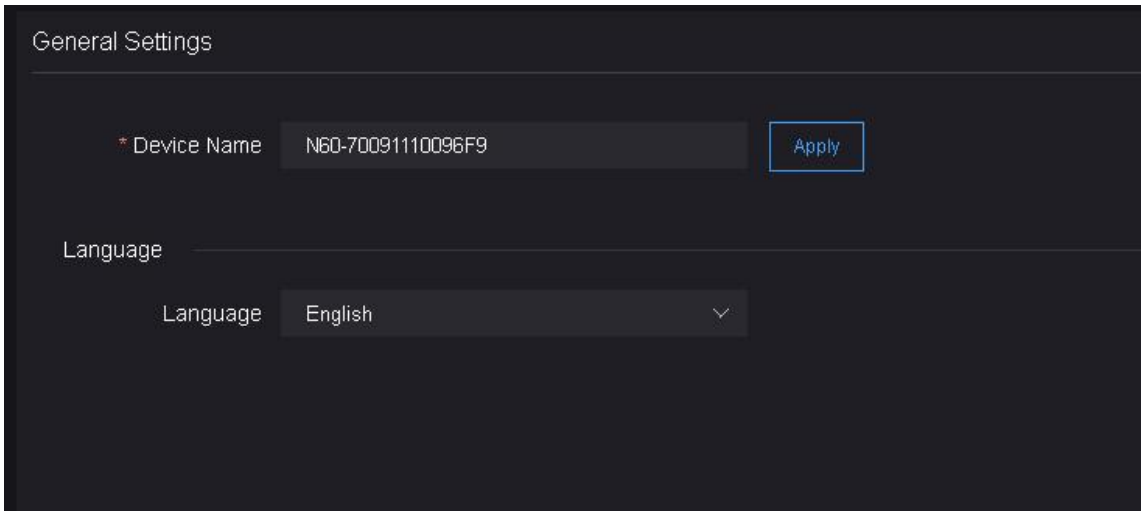
Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

12 System Settings

The settings function in the top navigation bar of N60 includes general settings, discovery server, network settings, storage settings, user management, region and time, PTZ settings, system settings, and version information. These functions can be used to set the various parameters of N60 device functionalities.

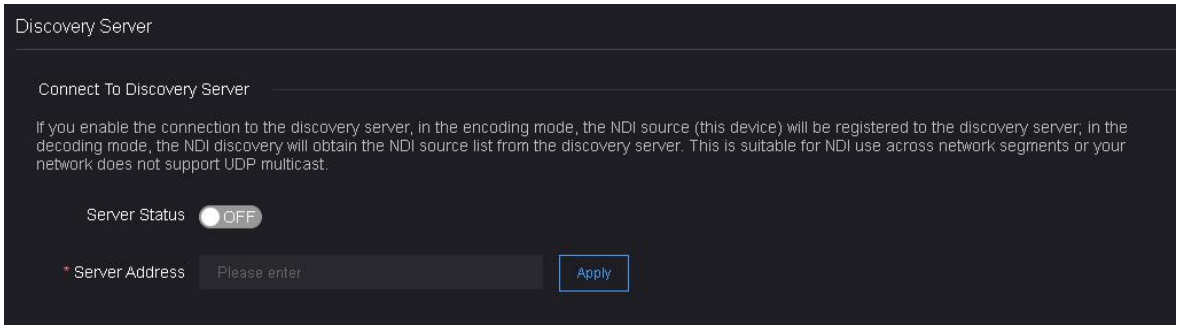
12.1 General Settings

The general settings module provides the ability to set the device name and default language. When you need to modify the device name, simply modify it in this module and click the "Apply" button to complete the process. For the N60 model, it supports two languages, Chinese and English. You can easily switch the current language of the device by selecting the corresponding language in the "Language" drop-down box.



12.2 Discovery Server

The discovery server is a service in the NDI protocol that allows NDI devices to automatically discover each other on the network and establish connections. This enables users to easily find and use other devices that support the NDI protocol without manually configuring network parameters.



For the N60, you can enable the discovery server in the discovery server settings and enter the discovery server address to connect to the NDI's discovery server.

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

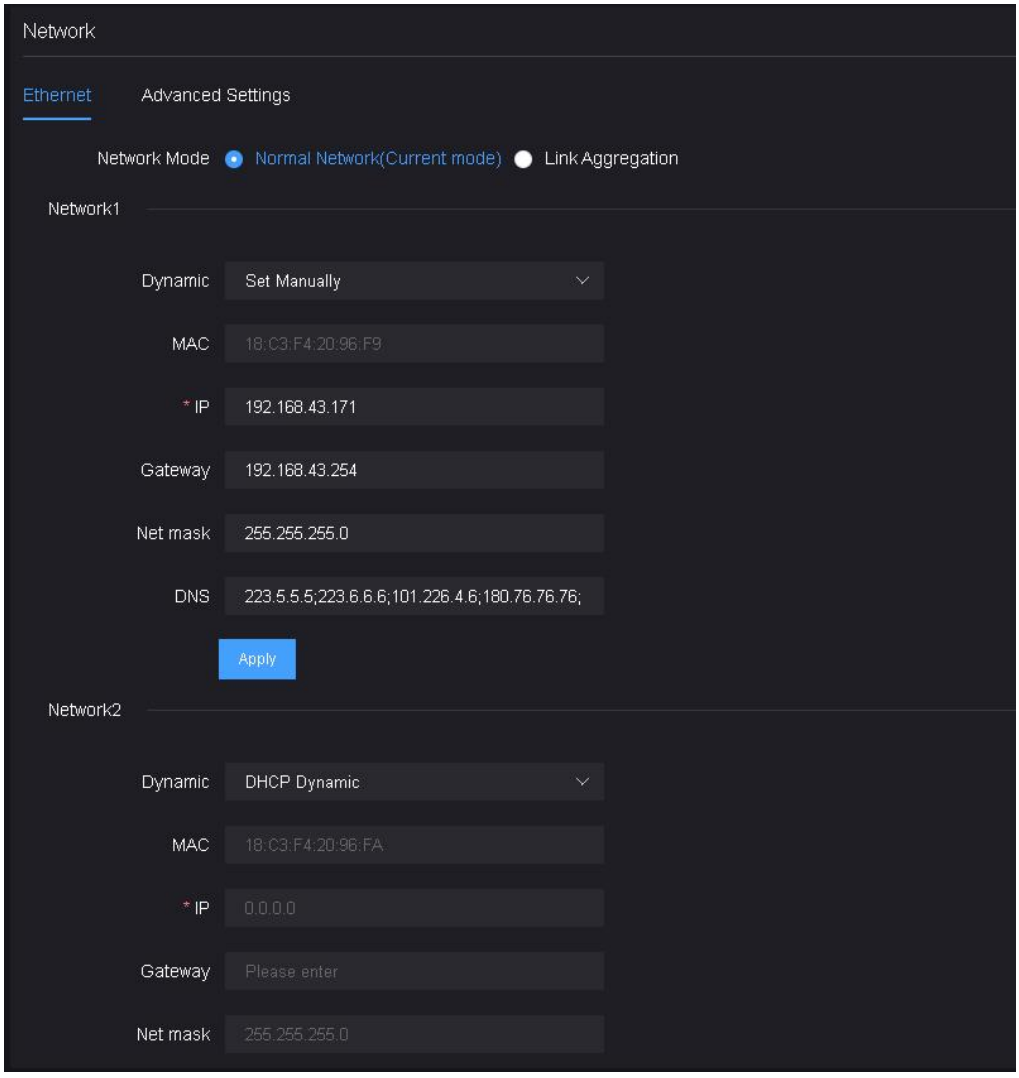
Note

- In encoding mode, this device will register with the discovery server.
- In decoding mode, the NDI resource list will be obtained from the discovery server.
- The discovery server is suitable for scenarios where there are different subnets or networks that do not support UDP multicast.

12.3 Network Settings

The N60 has two Ethernet ports, both of which can be independently configured with IP addresses or bound together using link aggregation.

Clicking on "Settings" in the top navigation, then selecting "Network Settings", will display the network configuration interface as shown below.

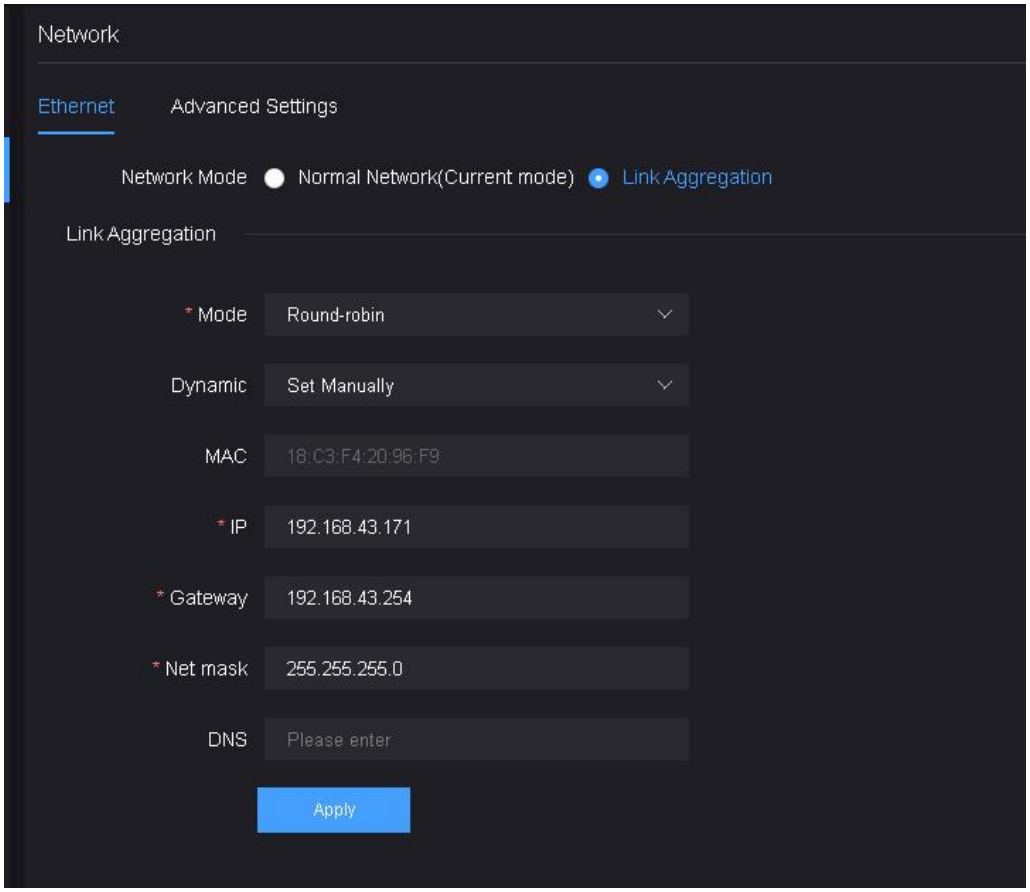


In normal network mode, the two Ethernet ports of the device can be configured separately, supporting both DHCP automatic network information acquisition and manual specification. Under the manual specification method, users can set their own IP, gateway, Net mask, and DNS information. If multiple DNS servers need to be set, semicolons ";" can be used to separate the DNS addresses.

The link aggregation mode of the N60 supports aggregating two physical Ethernet links into one logical link to provide higher bandwidth and redundancy. This device supports round robin mode and active/standby mode. In round robin mode, data packets are sent in turns across available physical links to achieve load balancing. Each data packet is sent to different links in a certain order to evenly

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

distribute the load. This mode is suitable for situations where multiple links need to be utilized simultaneously and can improve overall bandwidth utilization. The advantage of round robin mode is the ability to fully utilize the bandwidth of multiple links, improving network performance and throughput. However, because the sending order of data packets is fixed, if a link fails or becomes congested, it will affect overall performance. In active/standby mode, one link is configured as the primary link while the other links act as standby links. All data packets are transmitted through the primary link, and the standby links are only activated when the primary link fails. Once the primary link fails, the standby link immediately takes over data transmission. The advantage of active/standby mode is providing redundancy and fault recovery capability. Even if the primary link fails, the standby link can ensure network connectivity and reliable data transmission. However, the standby link is not utilized under normal circumstances, so it cannot fully utilize the bandwidth of all links. Users can choose which mode to use based on their needs.



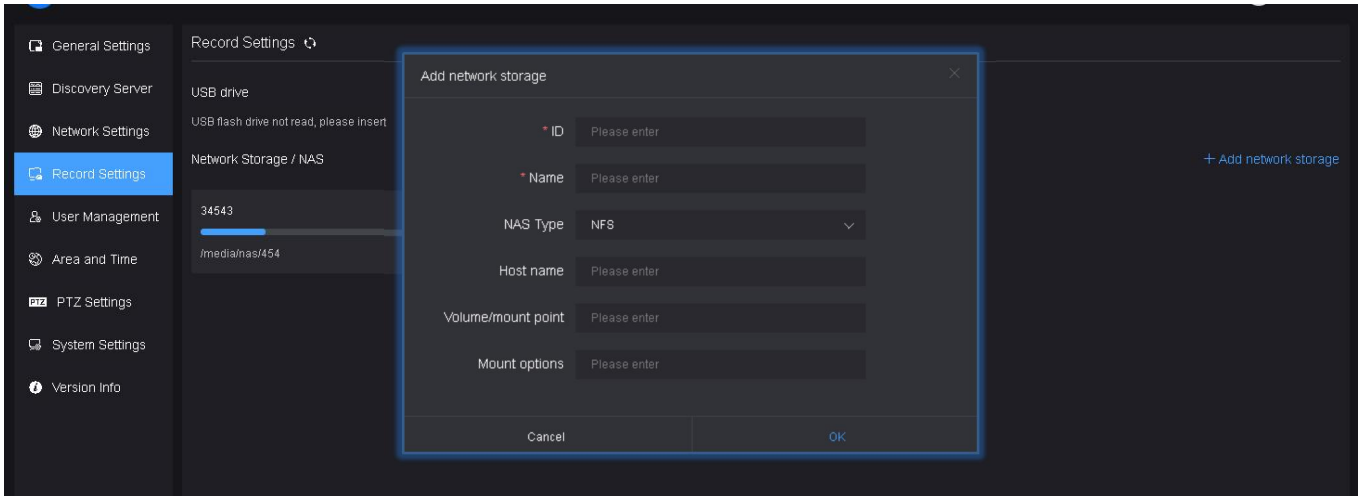
To configure link aggregation mode, simply select link aggregation mode in the network configuration, then choose the desired aggregation mode and set network IP information as with normal network configuration.

In advanced network configuration settings, besides configuring HTTP/HTTPS services and default ports, it is also possible to add routing policies.

12.4 Record Settings

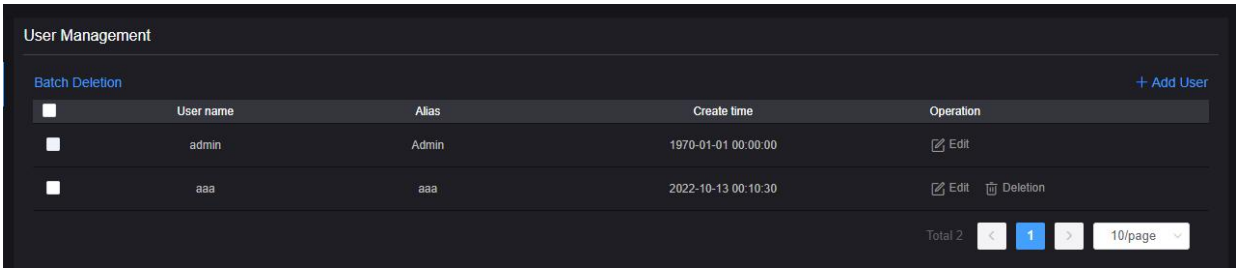
N60 supports two modes of recording: local recording and NAS recording. Therefore, corresponding configuration is required in the storage settings for USB flash drive or NAS network storage. The USB flash drive can be recognized by simply plugging it in, while adding NAS network storage requires clicking on "Add Network Storage" to configure the network storage settings.

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved



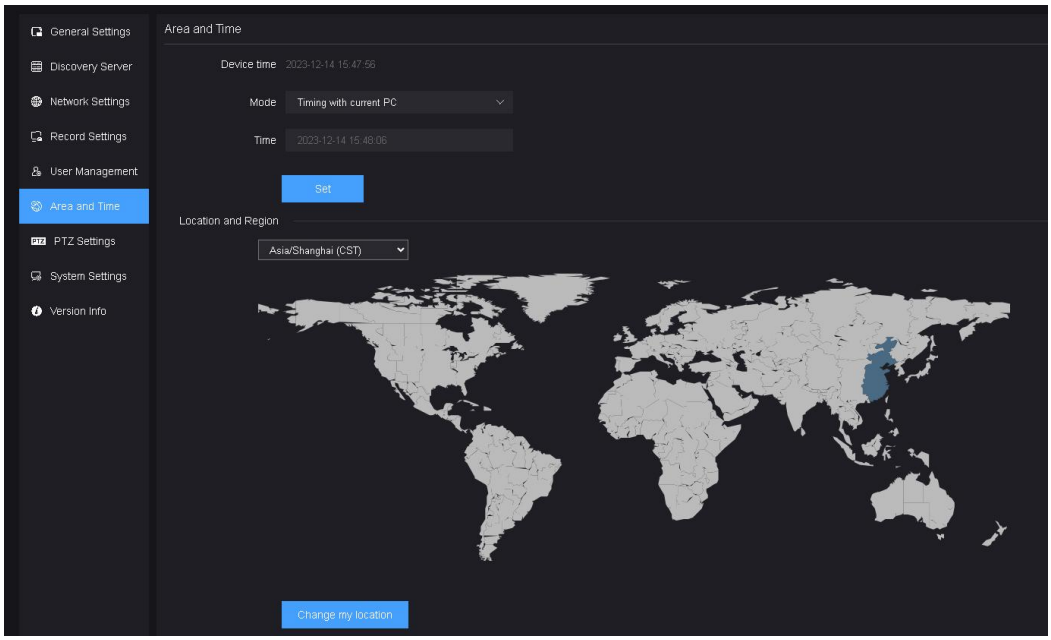
12.5 User Management

To add and delete users, change user passwords, etc.



12.6 Area and Time

After clicking "Area and Time Settings," you can modify the system time of the encoder. If there are no special requirements, select "Timing with current PC" and click "Set" If you need to change the time zone, you can choose or click on the country/region location on the map, and then click "Change My Location" to switch time zones.

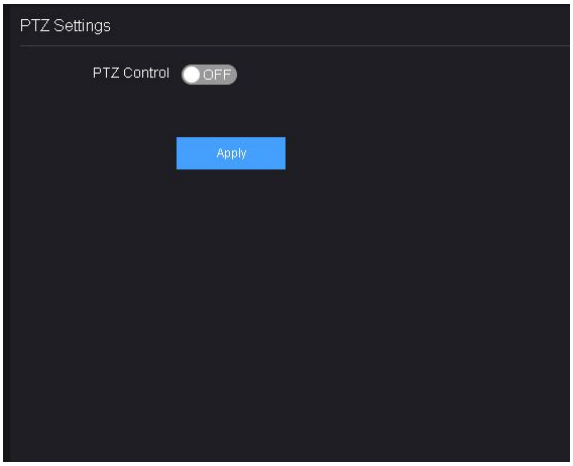


Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

12.7 PTZ Settings

Supports serial PTZ, network PTZ, and PTZ control based on the NDI protocol.

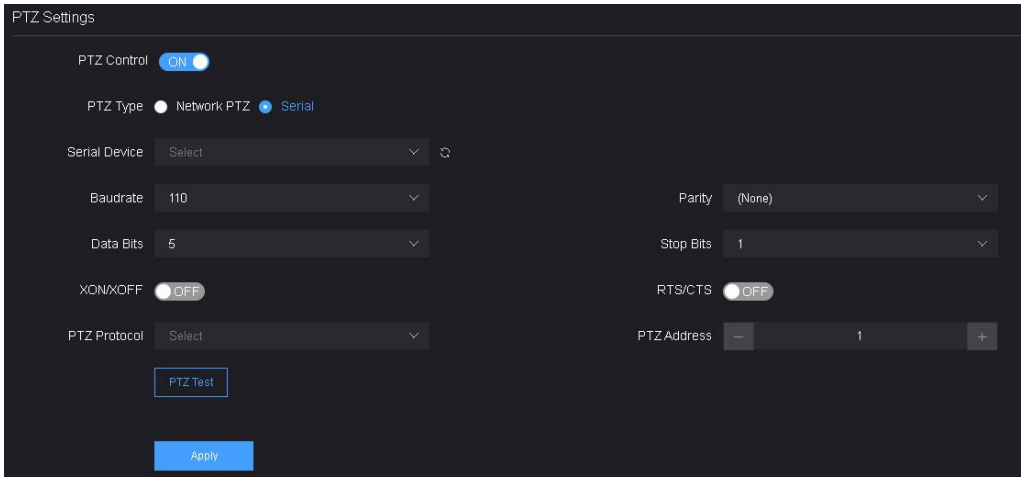
Before using PTZ control, you need to first go to the backend management -> Settings -> PTZ Settings section and enable the PTZ control switch.



12.7.1 Setting up PTZ Function

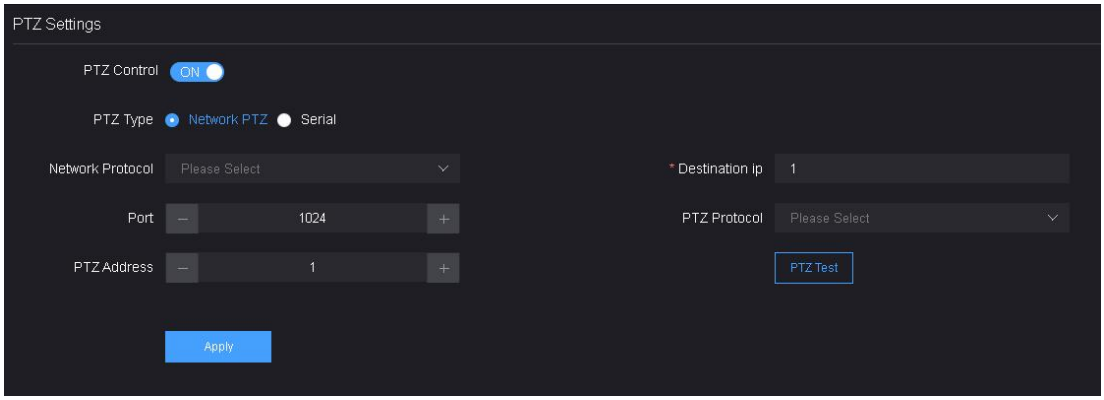
N60 supports control of PTZ cameras using the Sony Visca, Pelco-D, and Pelco-P protocols.

If you want to use serial PTZ control, you need to connect a USB to RS232/RS422/RS485 converter (cable) to the USB interface of the encoder. When the device correctly recognizes the serial port, the corresponding USB extension interface will be added in the "Serial Port Device." Then, select the serial port type in the PTZ settings and set the correct serial connection parameters and PTZ control protocol.



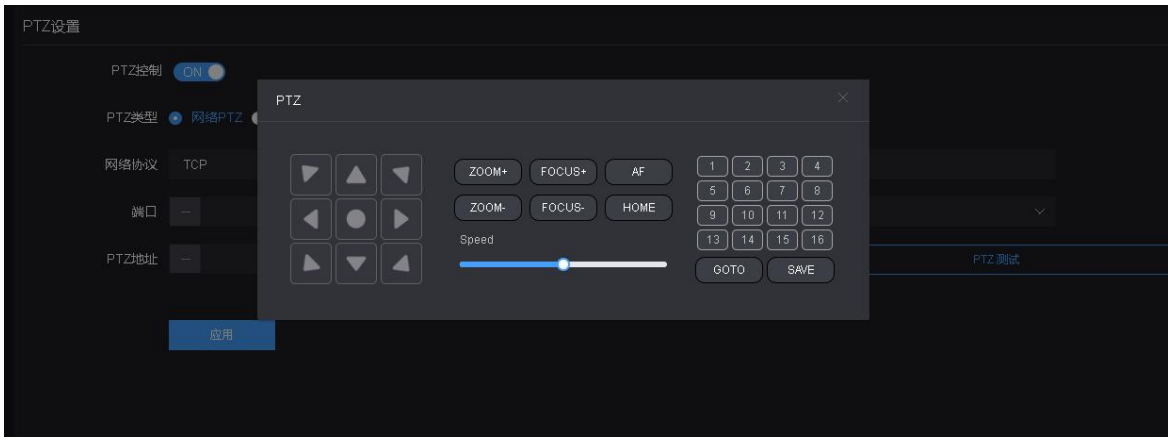
If you want to use network protocol-based PTZ control, simply select "network" in the PTZ settings and set the correct network connection parameters and PTZ control protocol.

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved



12.7.1 PTZ Testing and Usage

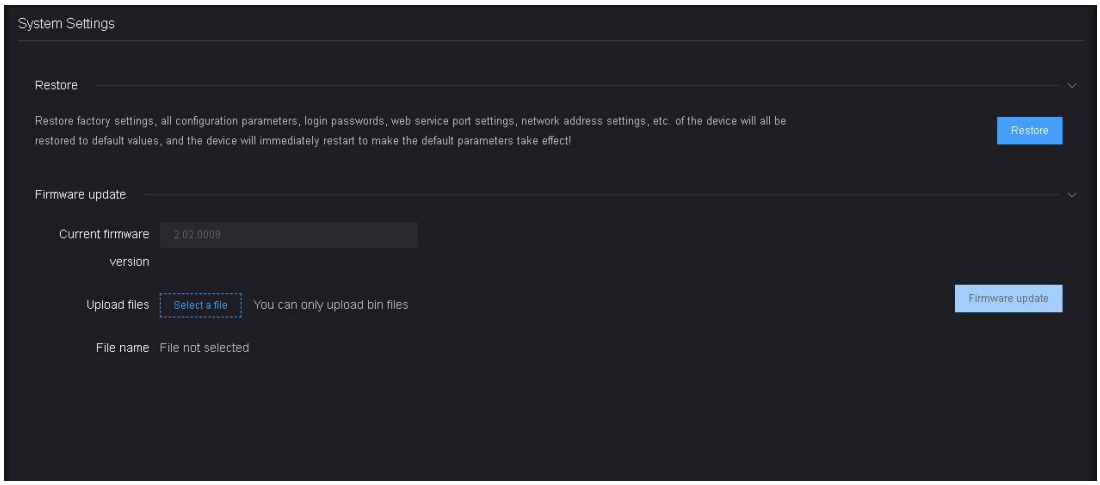
On the PTZ settings page, click the PTZ test button to test the PTZ function.



After successful testing, you can use the PTZ function in real time by clicking the button in the encoder's management system under the encoding mode.

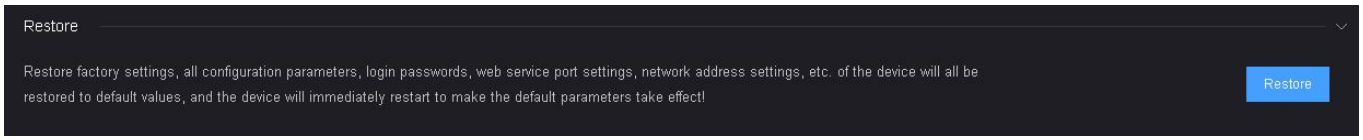
Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

12.8 System Settings



12.8.1 Restore

If the device cannot work normally after modified the parameters or forgot IP configuration, please restore factory settings.



Two Easy Methods:

1) If you can login to webpage, click "Settings>System settings>Restore factory settings" on the webpage.

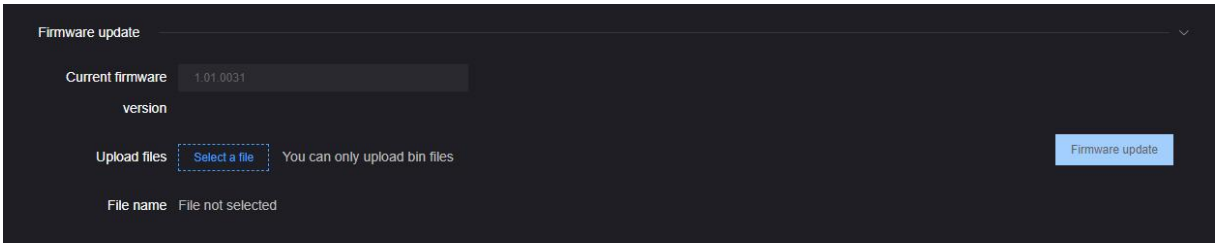
2) LCD screen: Enter the second page of the device by rotating the wheel, select "Restore Factory" and press the wheel to restore the factory settings.

12.8.2 Firmware Upgrade

Our product will be constantly improved, so we will continue to upgrade the device with functions and bug fixes. New functions or bug fixes are supported by firmware upgrading, so please contact our technical support for the upgrade firmware if needed.

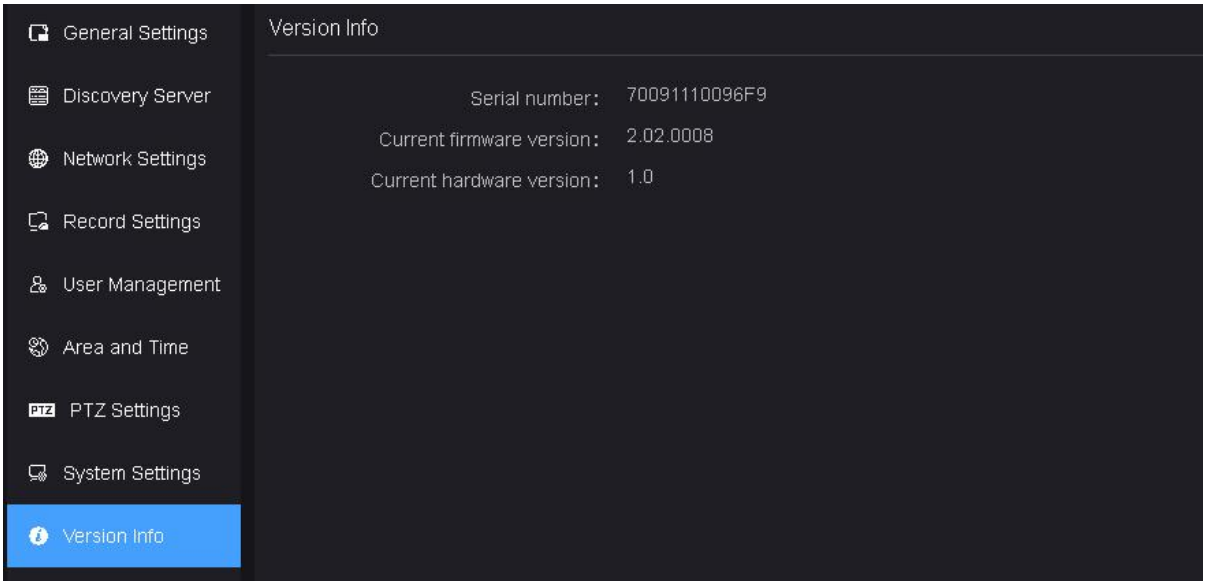
Click “System Setup” and “Firmware update” to enter the firmware upgrade page. After uploading the firmware, click "Firmware Update" to upgrade. The entire upgrade process will last for 2-3 minutes (depends on the firmware size and network conditions). The device will automatically restart, don’t power off during the upgrade process, otherwise the upgrade may fail and the device will be abnormal. If you need help, please contact our technical support to complete the upgrade.

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved



12.9 Version Info

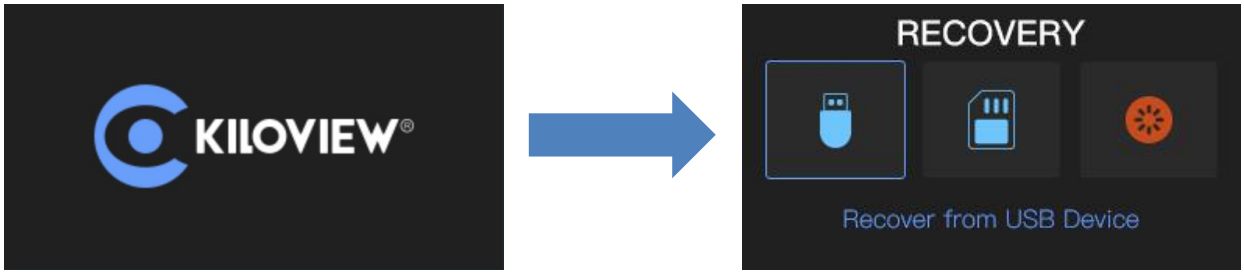
After upgrading, click at the upper right corner of the WEB page to confirm whether the current software version and the latest upgrade firmware are the same, to make ensure the device upgrading is successful.



12.10 Upgrade device firmware in recovery mode

If you are unable to access the N60 management backend, you can perform a firmware upgrade using the Recovery mode. The specific steps are as follows:

Step 1: Prepare a USB flash drive or SD card, copy the firmware file downloaded from Kiloview website to the USB flash drive/SD card.
Step 2: Insert the USB flash drive or SD card into the N60, after the device turned on (about 2s), wait for the Kiloview logo to appear on the screen, long press and hold the scroll wheel for more than 10s until the device enters recovery mode.

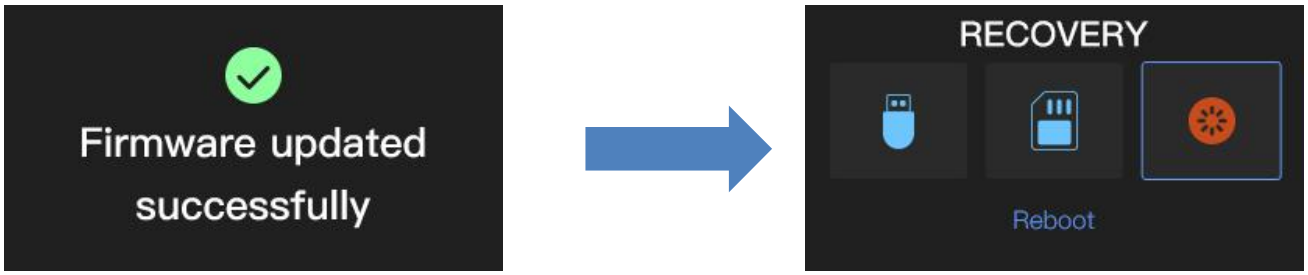


Step 3: Select "Recover from USB Device" or "Recover from SD Card" by turning the scroll wheel, press the wheel to confirm the selection to start the upgrade.

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

Step 4: During the upgrading, it will prompt with "Updating! Please keep the power on." (Please do not power off).

Step 5: When the N60 screen displays "Firmware updated successfully", the N60 has completed the firmware upgrade. At this time, any operation of the scroll wheel will help you return to “RECOVERY”, please select “Reboot” to restart the device.



Note

- “Press and hold the scroll wheel for more than 10s to enter recovery mode” is only available when the device is ON.
- Upgrade firmware is available only in the root folder.
- If the firmware cannot be found, the pop-up window will show "No firmware found", please operate the scroll wheel to return to the selection screen.
- During the firmware upgrading, any operation is invalid.
- If the firmware upgrade fails, it will prompt "Failed to update the firmware", please contact technical support for help.

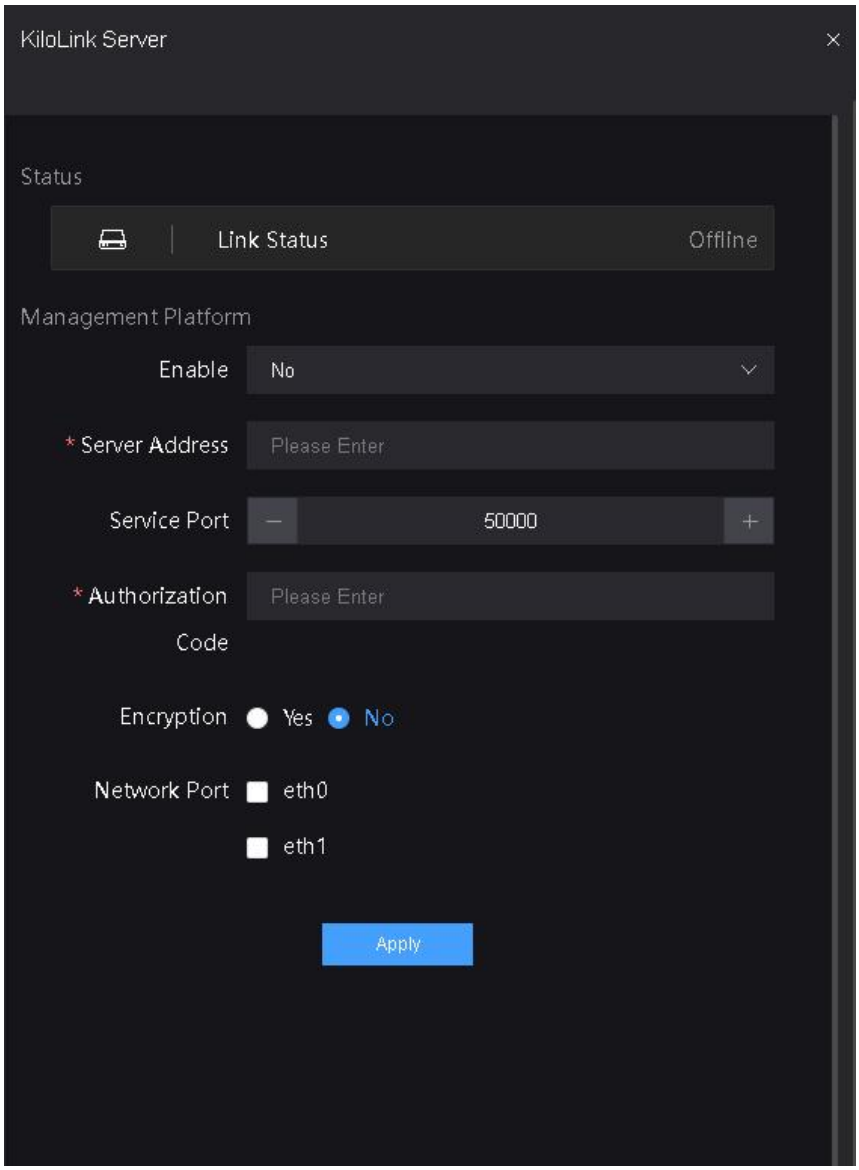
13 KiloLink Server

KiloLink Server is a software based on KiloLink technology that enables centralized online

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

management, status monitoring, remote configuration, centralized control (such as PTZ control), firmware management, and upgrades for all Kiloview products (hardware devices and software systems). N60 can be connected to KiloLink Server through KiloLink technology to achieve centralized device management.

Click on "Kilolink Server" in the top navigation bar to access the KiloLink Server configuration page. Fill in the corresponding information, and the device can be connected to the KiloLink Server platform for unified management through KiloLink Server.



Note

- KiloLink is a proprietary technology developed by Kiloview, which utilizes all possible network links to establish media transmission channels for any Kiloview devices. This is the original intention of KiloLink technology.
- KiloLink Server needs to be deployed independently by the user. For deployment solutions, please refer to: https://www.kiloview.com/en/support/docs/kilolink-bonding-platform/

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

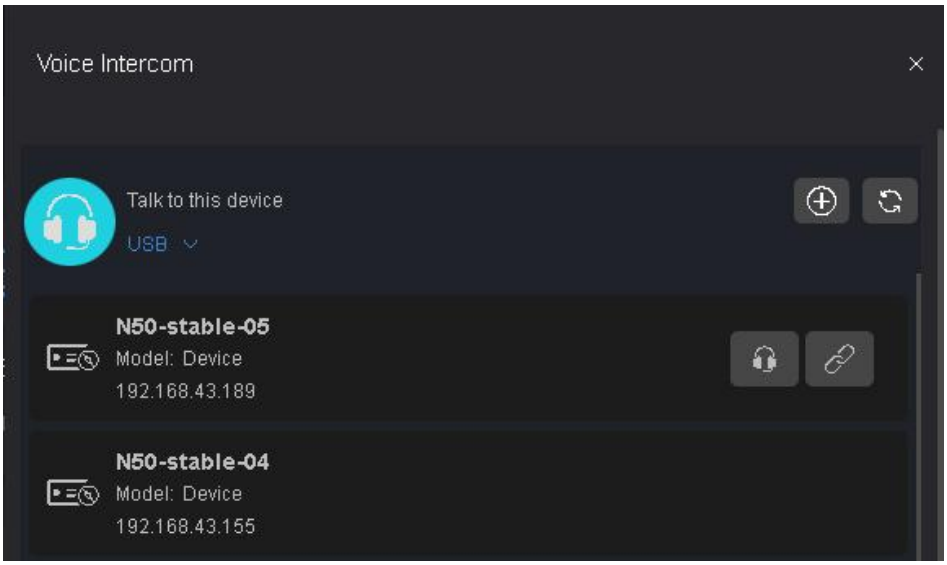
14. Voice Intercom

The voice intercom function of the N60 allows users to use web browsers (Chrome, Edge, Safari) to log in to the web page in HTTPS mode or directly connect a headset to the device for voice intercom.

It supports:

1. Intercom between the management interface and the local device.
2. Intercom between the management interface and other devices.
3. Intercom between the local device and other devices.
4. Joining Kiloview Intercom Server (KIS) for intercom.

In HTTPS mode of the web browser, after that, click on the "" button in the upper right corner of the page to perform voice intercom operation.



Note

- Voice intercom requires the use of HTTPS protocol, so before using voice intercom, you need to enable the HTTPS service in the advanced settings of the network settings in the backend management.

15 Reboot

“"Reboot" is used to restart the device software, which means to reboot the device and it will last about 1 minute.

Click on the "" button in the upper right corner of the navigation bar and confirm to perform the device restart operation.

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved

Thank you for reading!

KILOVIEW Electronics CO., LTD.

Tel: 86-731-88315979
Website: www.kiloview.com/en

Technical support Email: support@kiloview.com
Skype: kiloview-support
WhatsApp: +86-18573195156/18573195256

Address: B4-106/109, Jiahua Intelligence Valley Industrial Park, 877 Huijin Road, Yuhua District, Changsha,China

Copyright © Changsha KILOVIEW Electronics CO.,LTD. All rights reserved