MINI 150 Encoder

User's Manual

V1.0

Preface

About This Manual

This manual provides introductions to users about how to operate the device correctly. The content

includes an introduction to product installation, product characteristics and product settings, etc.

Intended Readers

This manual is suggested to be studied by the following readers:

- Technical Service Engineer
- Maintenance Engineer
- Test Engineer
- Sales Engineer

Important

- Avoid personal injury and product damage! Do not proceed beyond any symbol until you fully understand the indicated conditions. ⚠ You may find this symbol in the document that accompanies this product. This symbol indicates important operating or maintenance instructions.

- Please use good quality cables and make sure the connector is in good condition.

- Please do not use a power supply that doesn't match the input requirement.

- Please do not open the encoder.

- Specifications and functions may be changed for improvement without notice in advance.

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Safety Instructions

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

Electric Shock Hazard

This equipment meets applicable safety standards. Refer to this equipment's Identification label or contact factory for details about regulatory compliance approvals.

WARNING:

To reduce risk of electric shock, perform only the instructions that are included in the operating instructions. Refer all servicing and installation to qualified service personnel only.

Electric shock can cause personal injury or even death. Avoid direct contact with dangerous voltages at all times. The protective ground connection, where provided, is essential to safe operation and must be verified before connecting the power supply.

Know the following safety warnings and guidelines:

- Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

- Only qualified service personnel are allowed to remove encoder covers and access any of the components inside.

- There are no user-serviceable parts inside. Do not open.

Important Safety Instructions

- Read these instructions.

- Keep these instructions.

- Heed all warnings.

- Follow all instructions.

- Do not use this apparatus near water.

- Clean only with dry cloth.

- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

- Only use attachments/accessories specified by the manufacturer.

- Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

- Unplug this apparatus during lightning storms or when unused for long periods of time.

- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

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WARNING:

To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. The apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.

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1 OVERVIEW

1.1 Introduction

The Niagara Mini 150 is a highly effective encoder for video and audio processing which supports HDMI/SDI/CVBS standard input sources and outputs as RTSP/HLS/UDP/RTP/RTMP Ethernet protocols. The Mini 150 supports one channel HD/SD live encoding and one IP stream out.

1.2 Architecture

Front Panel

2   **1**

1. **Power status indicator**: This LED light is turned on when the encoder is powered on. **Signal Lock status indicator**: This LED light turns to green when a channel is locked. Otherwise the light turns to red.
2. **Display screen**: This LCD screen can show the management IP address, work mode, Input stream standard, output protocol, running status and etc.
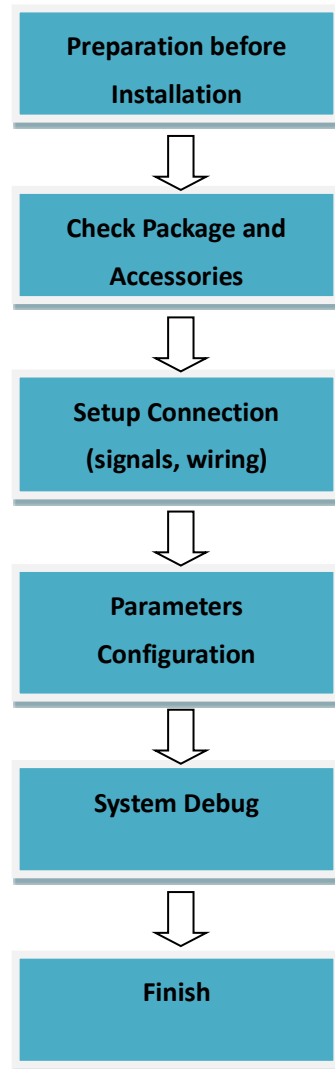
Rear Panel

1. **HDMI /AV /YPbPr/SDI IN** port

2. **RJ45--** management connection port

3. **Power DC—**DC Power connection

4. **WiFi Antenna connectors**

2 INSTALLATION

2.1 Installation Procedure

```
┌─────────────────────────┐
│   Preparation before    │
│      Installation        │
└─────────────────────────┘
            ⇩
┌─────────────────────────┐
│   Check Package and     │
│      Accessories         │
└─────────────────────────┘
            ⇩
┌─────────────────────────┐
│    Setup Connection     │
│    (signals, wiring)     │
└─────────────────────────┘
            ⇩
┌─────────────────────────┐
│      Parameters         │
│    Configuration         │
└─────────────────────────┘
            ⇩
┌─────────────────────────┐
│     System Debug        │
└─────────────────────────┘
            ⇩
┌─────────────────────────┐
│        Finish           │
└─────────────────────────┘
```

2.2 Preparation before Installation

Before installation, you should read through and confirm the following:

- Go through this user manual.
- Have knowledge of digital television system.
- Defined the sources, racks allocation, and set-up plan system wiring.
- Knows how to configure and operate this encoder.
- Go through related engineering design documents about the system.

2.3 Check Package and Contents

The MINI 150 package includes the following:

- Base Unit x1

- Power Supply x1

- HDMI cable x1

- WiFi Antenna x2

- RCA AV cable x1

- Flash Drive with User Guide x1

2.4 Equipment Wiring and Connection

To avoid electric shock and damage to the equipment, before setting up the wiring connection, please power off the equipment and all other connected external devices. Powering on the equipment only after all the wiring connection is completed.

2.4.1 Power Connection

Use the proper power connections is vital to the safe operation of the portable encoder. Only use the supplied 3-prong power connector or one with equal specifications. **Never** tamper or remove the 3rd-Prong grounding pin. This could cause damage to the Portable Encoder.

2.4.2 DC Power Connection

The MINI 150 encoder is intended to be use on either 120V or 240V systems. The power supply will automatically detect the system which is connected to. To hook up the power use the following steps:

1. Locate the DC power cord which is included with the MINI 150.

2. Plug the female end of the power cord (end with no prongs) into the back of the unit.

3. Locate a protected outlet (usually inside of the rack) to plug the male end of the power cable into.

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2.4. 3 Connection Setup for Web Management

Connect the MINI 150 Management port with a network cable and set up a management network with the management PC. The default IP address is 192.168.1.106

2.4.4 Connection Setup for HDMI/CVBS/SDI signal input

Connect HDMI/CVBS/SDI signal to MINI 150 "HDMI IN"/"AV IN"/ "YPbPr IN"/"SDI IN" port with a HDMI /AV/YPbPr/SDI cable.

3 OPERATION GUIDE

3.1 Operating the Front Panel Interface

3.1.1 Powering Up and Initialization

Before powering-up the device, make sure that all cabling is correctly connected (refer to chapter 2.4 of this manual) and the device is correctly connected to the power supply.

Connect the Power port and the unit is powered up and starts the initialization.

The LCD screen lights up and displays the following:

The initialization takes about 20 seconds to complete, and then the LCD screen display as following:

Note: If the unit fails to initialize and hangs at the "booting" stage, switching off the device and then powering up again may help. If the device still fails to initialize, please contact your service representative for help.

3.1.2 Front Panel Menu Structure

1st Layer	2nd Layer	3rd Layer	4th Layer		
Status	live	Playing Paused			
	Playback	Playing Paused			
	Record	Playing Paused			
	Setting	Work Mode	live	Input	Auto HDMI/YPbPr SDI/AV
				Output	UDP/RTP/RTSP/ HLS Live/RTMP
				IP	x.x.x.x OK
				Port	1234 OK
				Back	
			Playback	Mode	Sequence Play Single List Random
				IP	x.x.x.x OK
				Port	1234 OK
				Back	
			Recorded	Recording Input	Auto HDMI/YPbPc SDI/AV
			Back		
		System	Network	Mode	DHCP Enable/Disable
					DNS Static/ Dynamic
					OK
					Back
			Host IP/Gateway/ Mask/DNS		x.x.x.x
					OK
					Back
			AP	Wi-Fi ON/OFF Back	

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			SW/FW/HW version Back	
		Version	SW/FW/HW version Back	
		Recovery	Yes/NO Back	
		Reboot	Yes/NO Back	
		Back		
	Back			
Back				

Press "OK" to apply, press arrow up and down to move to other items.

3.2 Operating the WEB Interface

3.2.1 Access Interface

PC Web-GUI

The Mini 150 can be accessed and configured via web GUI. The accessing instruction is as the followings:

1. Connect the "RJ45" port of the Mini 150 to a network switch and connect the management PC/server to the same network switch.

2. The **Mini 150 default IP address is 192.168.1.106**. Please modify the management server's IP address or Mini 150 IP address to be in the same IP section. To ensure that the equipment is smoothly connected to the network.

3. Open any web browser (e.g. Mozilla v30 or above, IE8.0 or above, safari, chrome v42 or above and etc.), input the equipment's IP address in format: **http://xxx.xxx.xxx.xxx** (xxx.xxx.xxx.xxx refers to Mini 150's IP address) and press ENTER button to confirm. The browser will attempt to connect to the device. If successful, a login page will appear. *(see PIC-3.2.1)*
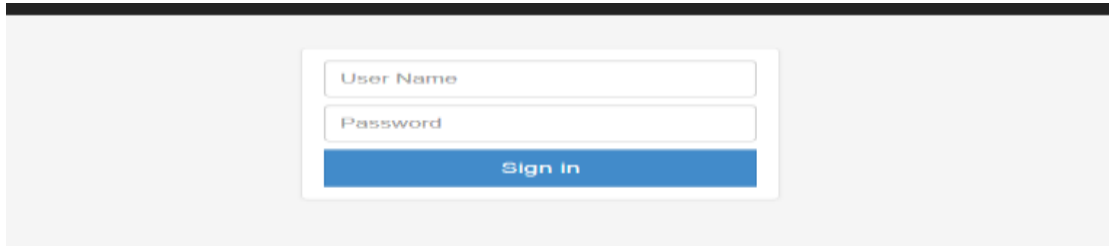
Pic-3.2.1

The default login info shows as below. Click "Sign in" button after input the correct user name and password.

User Name: admin

Password: admin.

Wireless connection to device:

Please refer to **3.3.6 System Wi-Fi Hotspot.**

3.2.2 Main Interface

There are 3 working modes: Live, Playback and Recording. Click to enter desire working mode. (*PIC-3.2.2*)

Live Mode: to encode a live channel via HDMI/SDI/CVBS input and IP output.

Playback Mode: to play the recorded TS from the external USB disk.

Recording Mode: to record the encoded TS and store it to the external USB disk

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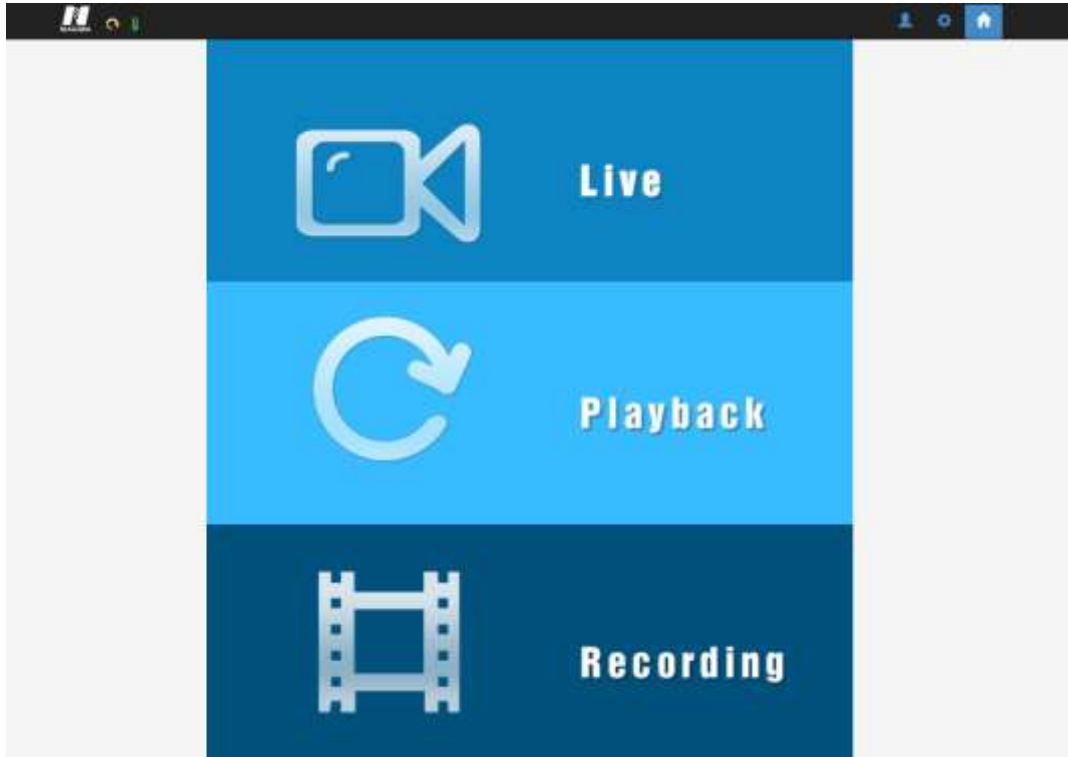
<p align="center">Pic-3.2.2</p>

3.2.3 Live Mode

To set the parameters for HD/SD channels encoding, as well as the broadcasting mode and parameters.

Basic Setting

<p align="center">Pic-3.2.2.1</p>

This interface provides the main parameters of encoding and broadcasting. Please check and set

the parameter according to the following items:

- **Input**: Auto/HDMI/SDI/ YPbPr /AV source can be selected

- **Output:** support **UDP/RTSP/HLS/RTP/RTMP/QAM** protocol

- **Mode:** Ethernet / Ethernet or Wi-Fi can be selected

- **Network Card:** support Ethernet

- **IP/Port:** you can configure the IP streaming output address

UDP Settings

Pic-3.2.2.1-1

RTSP Settings

Pic-3.2.2.1-2

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HLS Settings

Pic-3.2.2.1-3

RTP Settings

Pic-3.2.2.1-4

RTMP Settings

Pic-3.2.2.1-5

Advanced Setting

To configure the advanced setting for encoding and streaming, please click the "Advanced" link in blue. It will take you to a new page to set the detailed parameters for **Live Mode**. It contains three parts of configuration: **Stream info, Video info** and **Audio info (Dolby D St Creator)**

Pic-3.2.2.2

✧ **Stream info:** In this page, you can configure the Output Standard, Program Number, Stream ID, PMT PID, PCR PID and etc.(Pic-3.2.2.2)

Note: For **Empty BitRate,** there may be a PCR error if set to 0!

Pic-3.2.2.3

✧ **Video Info (refer to Pic-3.2.2.3)**

● **Video Source:** base on the source you selected in basic setting page

- **Video PID:** ranging from 32-8190

- **Video Encoding Mode:** DVB/MPEG

- **Video Resolution:** Auto/User can choose certain output resolution
  Resolutions Supported:
  HD: 1920 x 1080@24p/25p/30p/50i/60i,1280 x720@50p/60p/25p/30p
  SD: 720 x 576@50i, 720 x 480@60i

- **Aspect Ratio:** Auto, 16x9_Letter Box, 16x9_Cutoff, 4x3_Pillar Box and 4x3_Cutoff

- **Video Bitrate Mode:** CBR /VBR

- **Video Bitrate:** ranging from 800 to 14000Kpbs(MPEG2/H.264)

- **IDR Interval:** the range is 0-20

- **Vlc Mode:** CABAC/CAVLC

- **Video Profile:** High/Main

- **Video Level:** H.264 3.0/ H.264 3.1/ H.264 3.2/ H.264 4.0/ H.264 4.1/ H.264 4.2

- **GOP Structure:** IBBP, IPPP,IBP,IBBBP

- **GOP Close:** Enable/Disable

Note: When input signal is detected and the preset output signal is of the allowed ones (see mapping table below), the preset will be remained, otherwise the output resolution will changed to Auto automatically.

input signal	preset output signal
1920x1080_30p	1920x1080_30p 1280x720_30p 720x480_60i
1920x1080_60i	1920x1080_30p 1920x1080_60i 1280x720_30p 720x480_60i

1920x1080_24p	1920x1080_24p
1920x1080_50i:/	1920x1080_25p 1920x1080_50i 1280x720_25p 720x576_50i
1280x720_60p:	1280x720_60p 1280x720_30p 720x480_60i
1280x720_50p	1280x720_50p 1280x720_25p 720x576_50i
720x480_60i:	720x480_60i
720x576_50i	720x576_50i

✧ **Audio Info(Dolby D St Creator)**
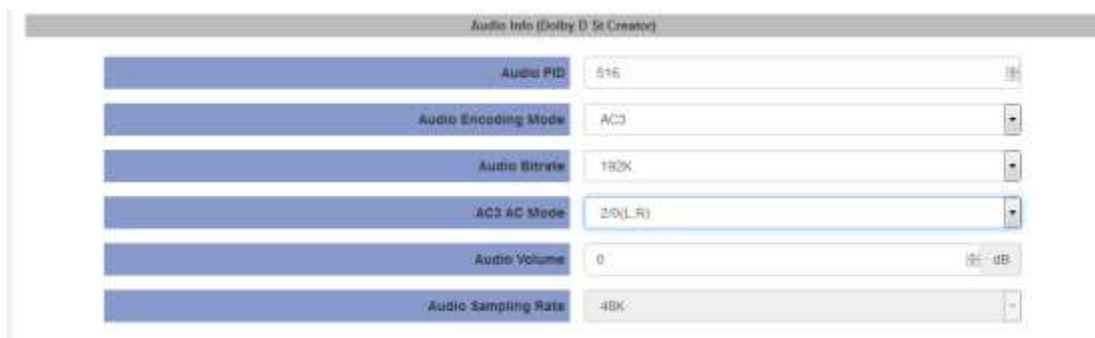
Pic-3.2.2.4

● **Audio Source:** HDMI Audio source could be selected

● **Audio PID:** ranging from 32-8190

- **Audio Encoding Mode:** AC3/MPEG1 Layer2/MPEG2 AAC-LC/MPEG4 AAC-LC

- **Audio Bitrate:** 128K/192K/256K/384K

- **AC3 AC mode:** 1+1(L,R), 1/0(C), 2/0(L,R)

- **Audio Volume:** -12 - 12

- **Audio Sampling Rate:** 48K is fixed output audio sampling rate

Click Apply button to make the new configuration into effect when finishing the setting.

Click Start button to make the encoding into effect;

Live Status

Click the Status icon on the right-bottom to get reflect to the live status page. The page displays and updates the real-time status of encoding and streaming.

3.2.4 Playback mode

Basic Setting

1. Plug one USB disk to USB port on the front panel of the MINI 150 to play the TS from the disk.

2. Click the **PLAYBACK** icon to get the playback page, which will list all the available TS from the USB disk.

3. Click the required TS to play the TS.
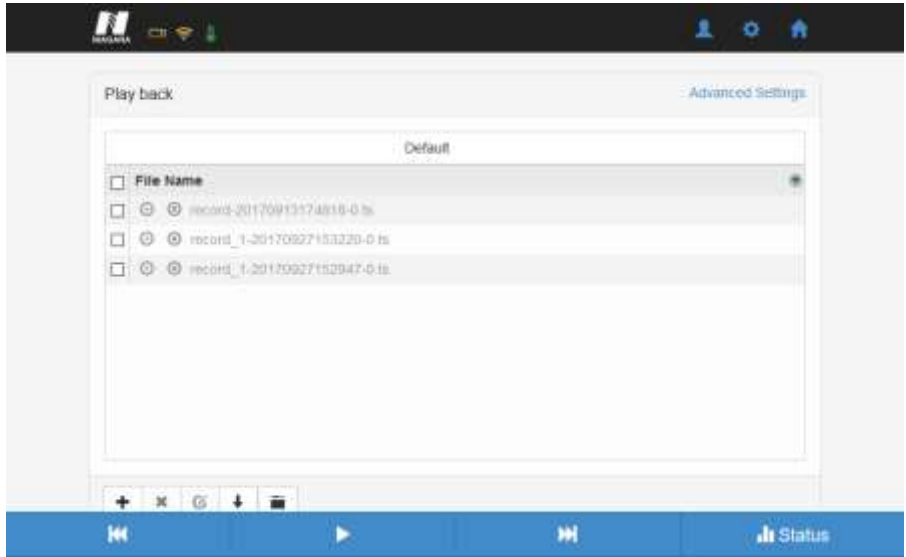
Note: The Playback interface will save and display the TS list from memory of the last USB disk if there is no disk connected.

 : to add new Play list. The default play list is named "default".

 : to delete the existing Play list.

 : to modify the play list name.

 : to change the play mode, including single cycle, listing loop, random, order playback.

 : to add new TS to the play list.

Live Settings

IP: The destination IP address for IP streaming.

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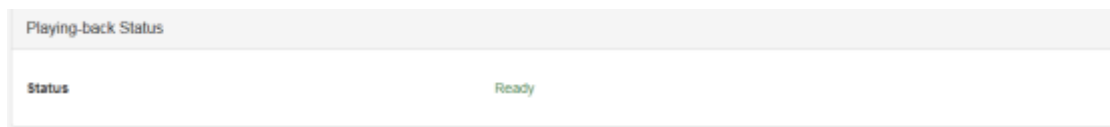**Port**: The destination IP port for IP streaming.

Mode: Ethernet/Wi-Fi could be selected.

Network Card: Ethernet.

**Daily play plan**: To set the play plan.

Playback Status

This page displays the status of Playback.

Playing-back Status	
Status	Ready

3.3.5 Recording Mode

Basic Setting

1. Connect the USB disk to the Mini 150.

2. Set the encoding parameter, and click the start icon to start the recording or pause to stop the recording.

3. Click the status icon to reflect to the Status page.

Recording		Advanced Settings
Input	Auto	
Record Name	record	
Recording	Loop	
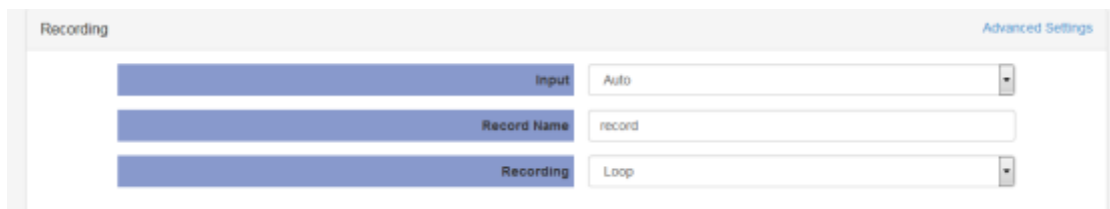
Note: If the USB disk is not connected or there is not enough space on the disk, it is not able to start the recording. The minimum available free space is 10MB. The Mini 150 will overwrite the first file it created when the free space is not enough, all those files which are not created by Mini 150 will not be affected.

Recording Status

This page offers the status of the recording and the storage of the connected USB disk.

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Recording Status	
Status	Free
Input Video Resolution	No Video
Output Bitrate	4686Kbps
Output Effective Bitrate	0Kbps
Record Name	record
USB Status	USB does not exist!
Recorded Time	00:00:00
Record Size	0M

3.3.6 System

The System page provides the Network parameters, Language setup, time setup, upgrade, log and system info. (Pic-3.3.6.1)

Pic-3.3.6.1

✧ **Network Status:** This page shows status of network related info:

Pic-3.3.6.2

✧ **Ethernet:** to set up equipment management access IP address, Subnet Mask, Gateway and

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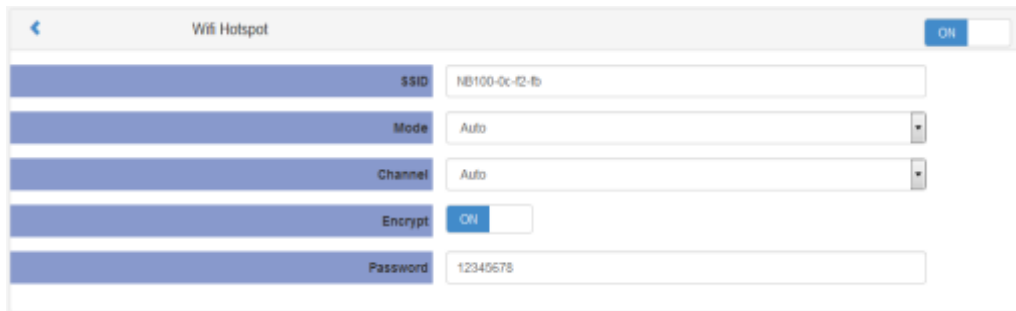   CORPORATION

etc.(see Pic-3.3.3.3) The MINI 150 can be configured to use DHCP to obtain an IP address/Subnet Mask/Gateway. To obtain an IP address may require up to one minute.

Pic-3.3.6.3

◇ **Wi-Fi Hotspot:**

This page shows how to set up a Wi-Fi Hotspot which enables a PC, phone or Tablet to log in via wireless connection to the device.
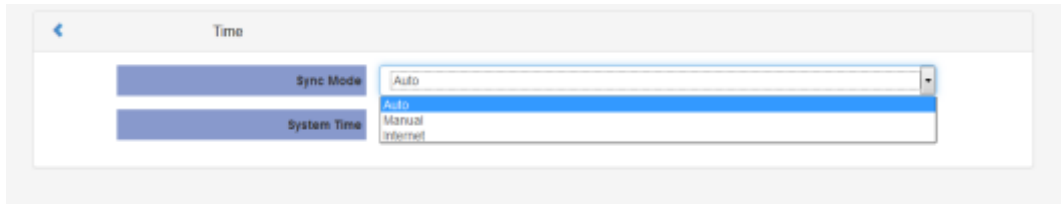

◇ **Wi-Fi**

The Mini 150 can connect to a WiFi Network.

Note: Wi-Fi hotspot and Wi-Fi reception have the same range. When it is used as a hotspot, Wi-Fi reception is disabled automatically, vice versa.

◇ **Time:** to configure the system time with Manual or Internet time.

Pic-3.3.6.5

✧ **Upgrade:** to upgrade new version software by selecting a file and clicking the Arrow button. It will take several minutes to finish the upgrading and after that, it will need to be rebooted.(Refer to Pic-3.3.3.6)
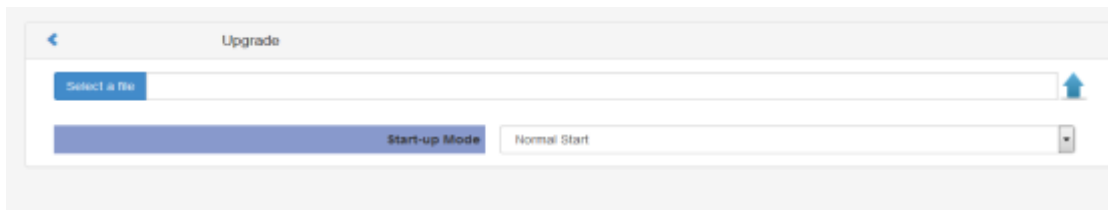
Pic-3.3.6.6

✧ **Development:** to export and clear the logs, check the debug info, export configuration, export& upgrade license and view system information.
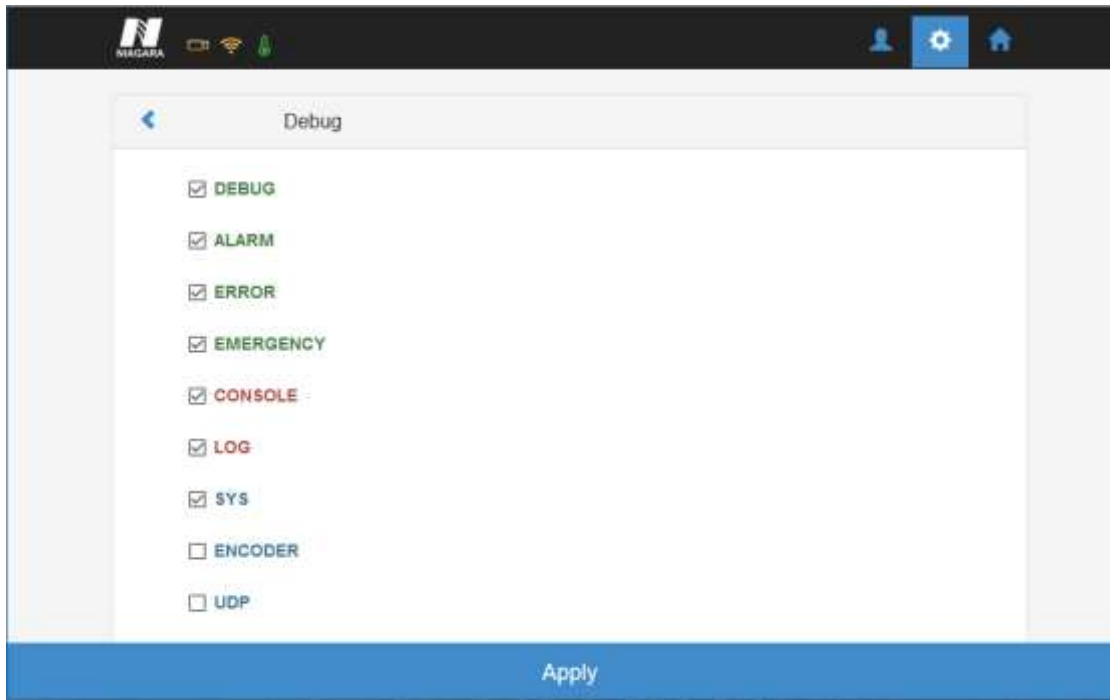

Pic-3.3.6.7

Logs: User can export and clear the logs in this interface.

Pic-3.3.6.7-1

Debug: User can check the debug info which is usually used for R-D.

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Pic-3.3.6.7-2

Configuration: User can export configuration (including system and service configuration) in this tab.
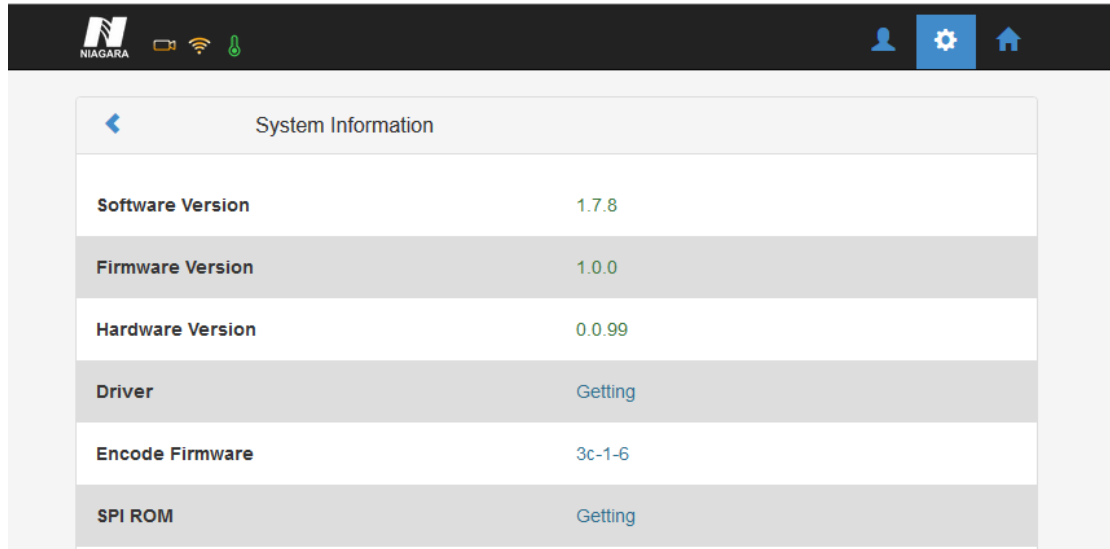

Pic-3.3.6.7-3

License: User can export and upgrade the license, a reboot is needed to active the license.

Pic-3.3.6.7-4

System information: User can check the system info in this tab.

Pic-3.3.6.7-5