# Eurocaster EC-3542A Encoder Modulator

# HDMI&SDI to DVB-C User Manual


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# DIRECTORY

# Chapter 1 Product Introduction

## 1.1 Outline

EC3542A series products are EuroCaster's new breakthrough all-in-one devices which integrate encoding (MPEG-2 HD/SD, MPEG-4/AVC H.264 HD/SD) and modulating to convert V/A signals into Digital RF output. It is equipped with 4 HDMI (4 SDI optional) channels input and 1 ASI input(optional) and output via 2 ASI ports(optional) and 1 DATA (4*SPTS or 2 or 4 MPTS--as per carrier numbers) output over UDP, RTP/RTSP. The latency has been greatly reduced to achieve an extremely low value from the encoding progress to the decoding terminals.

It adopts an inner drawer-type structural design which greatly facilitates the change of encoding modules (HDMI/SDI ) as needed. The signals source could be from satellite receivers, closed-circuit television cameras, Blue-ray players, and antenna etc.

## 1.2 Main Features

- **4* HDMI/SDI inputs**
- **MPEG2 & MPEG4 AVC/H.264 HD/SD video encoding**
- **Up to 1920*1080@50P/60P (MPEG4 AVC/H.264)**
  **Up to 1920*1080@50I/60I (MPEG2 HD)**
- **Huge video buffer (for SDI interface)**
- **MPEG1 Layer II, MPEG2-AAC, MPEG4-AAC, AC3 2.0 (Optional) audio encoding**
- **Resolution Downscale(the same frame rate)**
- **1*ASI input for re-mux and ASI out—(Optional);**
- **1*RF input for mix—(Optional)**
- **Support CC (closed caption ) for SDI interface**
- **DVB-C/DVB-T/ATSC/ISDB-T RF out for option**
- **Support IP (4*SPTS or 4*MPTS) output over UDP, RTP/RTSP protocol---DVB-C/DVB-T/ATSC**
- **Support IP (4*SPTS or 2*MPTS) output over UDP, RTP/RTSP protocol---ISDB-T**
- **Extremely low latency**
- **LCN support (Logical Channel Number)**

- **Excellent modulation quality MER≥40dB**
- **RF Frequency range 50Mhz~960Mhz**
- **LCD display, Remote control and firmware**
- **Web NMS management; Updates via web**

# 1.3 Technical Specifications

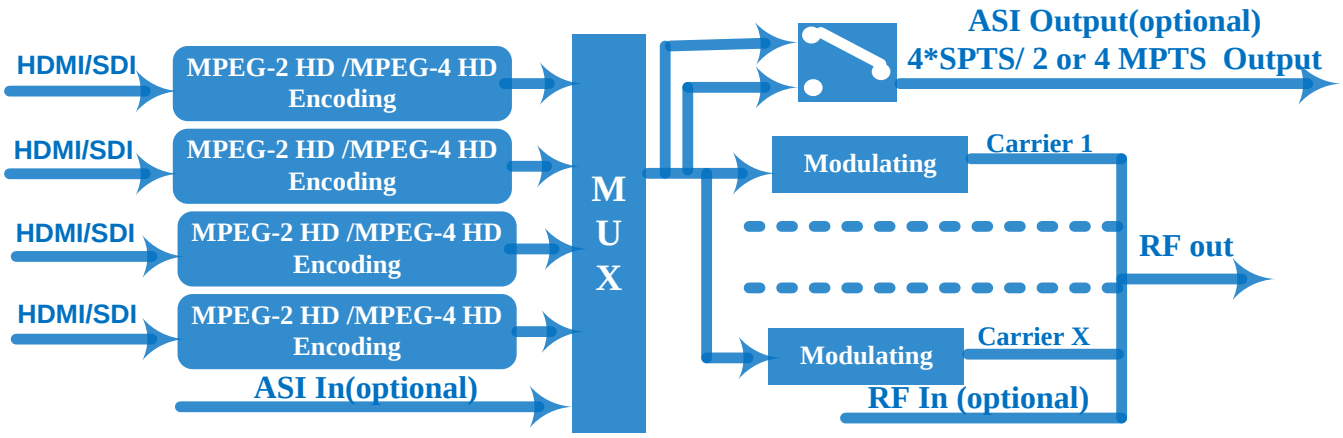
| | | | |
|---|---|---|---|
| **HDMI Encoder Board** | **Video** | Input | HDMI*2 |
| | | Encoding | MPEG2; MPEG4 AVC/H.264 |
| | | Bitrate | 1-19.5Mbps |
| | | Resolution | 1920*1080_60P, 1920*1080_50P,<br>(-for MPEG4 AVC/H.264 only)<br>1920*1080_60i, 1920*1080_50i,<br>1280*720_60p, 1280*720_50P<br>720*480_60i, 720*576_50i |
| | | Low Delay | Normal, Mode 1, Mode 2, Manual |
| | | Chroma | 4:2:0 |
| | | Aspect Ratio | 16:9,4:3 |
| | **Audio** | Encoding | MPEG1 Layer II;MPEG 2-AAC; MPEG 4-AAC and Dolby Digital AC3 2.0(optional) |
| | | Dialog Normalization Applicable for DD AC3 encoding only) | -31 ~ -1 dB |
| | | Sample rate | 48KHz |
| | | Bitrate | 64/96/128/ 192/256/320kbps |
| **SDI Encoder Board** | **Video** | Encoding | MPEG2; MPEG4 AVC/H.264 |
| | | Input | SDI*2 |
| | | Bitrate | 1-19.5Mbps |
| | | Resolution | 1920*1080_60P, 1920*1080_50P,<br>(-for MPEG4 AVC/H.264 only)<br>1920*1080_60i, 1920*1080_50i,<br>1280*720_60p, 1280*720_50P<br>720*480_60i, 720*576_50i |
| | | Low Delay | Normal, Mode 1, Mode 2, Manual |
| | | Chroma | 4:2:0 |
| | | Aspect Ratio | 16:9,4:3 |
| | **Audio** | Encoding | MPEG1 Layer II ,MPEG2-AAC, MPEG4-AAC and Dolby Digital AC3 2.0(optional) |
| | | Dialog Normalization Applicable for DD AC3 encoding only) | -31 ~ -1 dB |

| | | | | |
|---|---|---|---|---|
| | | Sample rate | 48KHz | |
| | | Bitrate | 64/96/128/ 192/256/320kbps | |

| | | | | | |
|---|---|---|---|---|---|
| **Modulator Section** | **DVB-T** | Standard | DVB-T | | |
| | | Bandwidth | 6M, 7M, 8M | | |
| | | Constellation | QPSK, 16QAM, 64QAM | | |
| | | Code rate | 1/2, 2/3, 3/4, 5/6, 7/8. | | |
| | | Guard Interval | 1/32, 1/16, 1/8, 1/4 | | |
| | | Transmission Mode | 2K, 4K, 8K | | |
| | | MER | ≥40dB | | |
| | | RF frequency | 50~960MHz, 1KHz step | | |
| | | RF Out | 4*DVB-T carriers(40MHz bandwidth) | | |
| | | RF output level | -20~ -3dbm, 0.1db step | | |
| | **DVB-C (Optional)** | Standard | J.83A (DVB-C), J.83B, J.83C | | |
| | | MER | ≥40dB | | |
| | | RF frequency | 50~960MHz, 1KHz step | | |
| | | RF output level | -20~ +3dbm, 0.1db step | | |
| | | Symbol rate | 3.000~9.000Msps adjustable | | |
| | | RF Out | 4*DVB-C carriers(40MHz bandwidth) | | |
| | | | **J.83A** | **J.83B** | **J.83C** |
| | | Constellation | 16/32/64/128/ 256QAM | 64/ 256 QAM | 64/ 256 QAM |
| | | Bandwidth | 8M | 6M | 6M |
| | **ATSC (Optional)** (under developing) | Standard | ATSC A/53 | | |
| | | MER | ≥40dB | | |
| | | RF frequency | 50~960MHz, 1KHz step. | | |
| | | RF Out | 4*ATSC carriers | | |
| | | RF output level | -20~ +3dbm, 0.1db step | | |
| | | Constellation | 8VSB | | |
| | **ISDB-T (Optional)** | Standard | ARIB STD-B31 | | |
| | | Bandwidth | 6M | | |
| | | Constellation | QPSK, 16QAM, 64QAM | | |
| | | Guard Interval | 1/32, 1/16, 1/8, 1/4 | | |
| | | Transmission Mode | 2K, 4K, 8K | | |
| | | MER | ≥40dB | | |
| | | RF frequency | 50~960MHz, 1KHz step | | |
| | | RF Out | 2*ISDBT carriers(30MHz bandwidth) | | |
| | | RF output level | -20~ -3dbm, 0.1db step | | |
| **General** | **System** | Local interface | LCD + control buttons | | |
| | | Remote management | Web NMS | | |
| | | Stream Out | 2 ASI out (BNC type, same one mirror out ts as one of 4/2 MPTS outputs and 4 SPTS outputs) | | |

| | | | |
|---|---|---|---|
| | | | DVB-C/DVB-T/ATSC: IP (4 MPTS & 4 SPTS) out over UDP, RTP/RTSP<br>ISDBT: IP (2 MPTS & 4 SPTS) out over UDP, RTP/RTSP |
| | | DATA Port | 1000M |
| | | NMS interface | RJ45, 100M |
| | | Language | English |
| | **Physical Specification** | Power supply | 100~240VAC, 50/60Hz |
| | | Dimensions | 482*400*44mm |
| | | Operation temperature | 0~45℃ |

# 1.4 Principle Chart




# 1.5 Major Technical Comparison

| | The Former Version | The Current Version（V2） |
|---|---|---|
| **Bit rate Mode** | CBR/VBR option | CBR |
| **Audio Group/Pair option-SDI** | No | Yes |
| **Low Delay** | Normal/Mode 1/Mode 2 | Normal/Mode 1/Mode 2/Manual |
| **Character Encoding option** | No | Yes |
| **DATA Port** | 100M port | 1000M port |
| **Frequency Range** | 30-960MHz | 50-960MHz |
| **Symbol Rate--DVB-C** | 5-9Msps | 3-9Msps |
| **ISDB-T carriers** | 1 or 2 carriers for order option | 2 carriers |
| **IP out--DVB-C** | 1 MPTS and 4 SPTS | 4 MPTS and 4 SPTS |
| **IP out--DVB-T** | 4 SPTS | 4 MPTS and 4 SPTS |

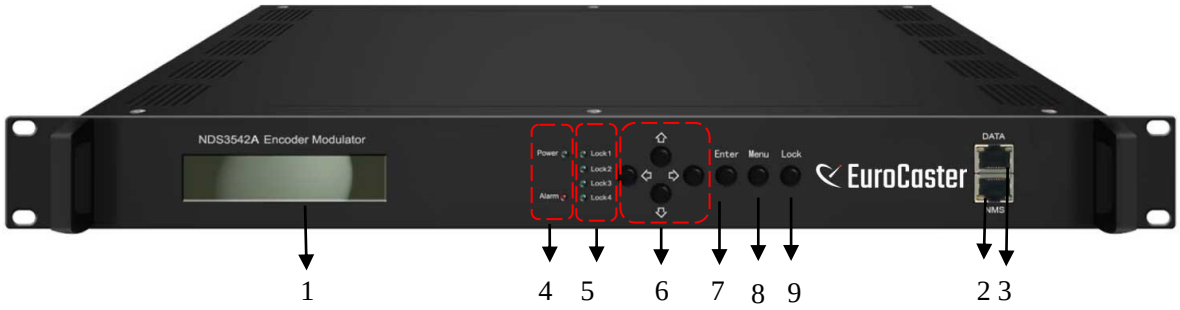
| | | |
|---|---|---|
| **DVB-T carriers** | 2 carriers | 4 carriers |

The other differences are existing in Web GUI design and chassis design etc(NMS/DATA port position), no further description here.

Updated on Dec 19th, 2022

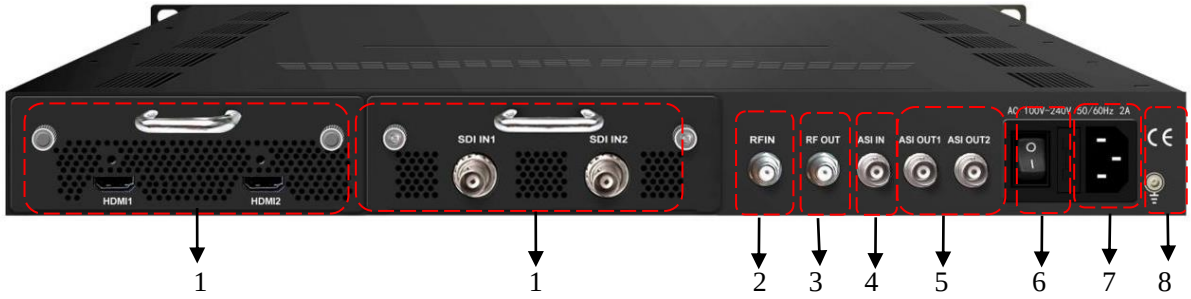
## 1.6 Appearance and Illustration

Front Panel Illustration:




| |
|---|
| 1. LCD Screen |
| 2. NMS Port |
| 3. DATA Port |
| 4. Power and Alarm Indicators |
| 5. Lock 1 and Lock 2: HDMI/SDI input locking status; Lock 3: ASI in locking status. Lock 4: useless |
| 6. Up and Down, Left and Right Buttons |
| 7. Enter Button: for confirm |
| 8. Menu Button: for back step |
| 9. Lock Button: To Lock the screen / cancel the lock state |

Rear Panel Illustration:




| |
|---|
| 1. HDMI&SDI Input interface |

| |
|---|
| 2. RF in for mix |
| 3. RF Output interface |
| 4. ASI in for mux |
| 5. ASI out |
| 6. Power Switch |
| 7. Power Socket |
| 8. Grounding |

# Chapter 2 Installation Guide

## 2.1 Acquisition Check

When users open the package of the device, it is necessary to check items according to packing list. Normally it should include the following items:

- Encoder Modulator
- Power Cord
- Ground lead

If any item is missing or mismatching with the list above, please contact local dealer.

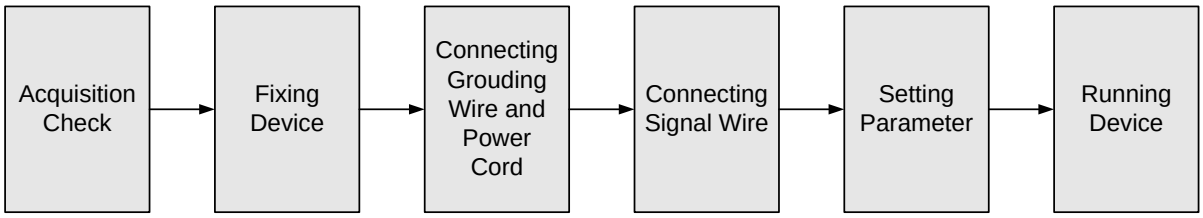
## 2.2 Installation Preparation

When users install device, please follow the below steps. The details of installation will be described at the rest part of this chapter. Users can also refer rear panel chart during the installation.

The main content of this chapter including:

- Checking the possible device missing or damage during the transportation
- Preparing relevant environment for installation
- Installing Encoder Modulator
- Connecting signal cables
- Connecting communication port (if it is necessary)

### 2.2.1 Device’s Installation Flow Chart is Illustrated as following：




## 2.2.2 Environment Requirement

| Item | Requirement |
|---|---|
| Machine Hall Space | When user installs machine frame array in one machine hall, the distance between 2 rows of machine frames should be 1.2~1.5m and the distance against wall should be no less than 0.8m. |
| Machine Hall Floor | Electric Isolation, Dust Free<br>Volume resistivity of ground anti-static material: $1X10^{7}$~$1X10^{10}\Omega$，Grounding current limiting resistance: 1M (Floor bearing should be greater than 450Kg/㎡) |
| Environment Temperature | 5~40℃(sustainable )，0~45℃(short time)，<br>installing air-conditioning is recommended |
| Relative Temperature | 20%~80% sustainable　10%~90% short time |
| Pressure | 86~105KPa |
| Door & Window | Installing rubber strip for sealing door-gaps and dual level glasses for window |
| Wall | It can be covered with wallpaper, or brightness less paint. |
| Fire Protection | Fire alarm system and extinguisher |
| Power | Requiring device power, air-conditioning power and lighting power are independent to each other. Device power requires AC power 220V 50Hz. Please carefully check before running. |

## 2.2.3 Grounding Requirement

- All function modules' good grounding designs are the basis of reliability and stability of devices. Also, they are the most important guarantee of lightning arresting and interference rejection. Therefore, the system must follow this rule.
- Coaxial cable's outer conductor and isolation layer should keep proper electric conducting with the metal housing of device.
- Grounding conductor must adopt copper conductor in order to reduce high frequency

impedance, and the grounding wire must be as thick and short as possible.

- Users should make sure the 2 ends of grounding wire well electric conducted and be antirust.
- It is prohibited to use any other device as part of grounding electric circuit
- The area of the conduction between grounding wire and device's frame should be no less than 25mm$^2$.

### 2.2.4 Frame Grounding

All the machine frames should be connected with protective copper strip. The grounding wire should be as short as possible and avoid circling. The area of the conduction between grounding wire and grounding strip should be no less than 25mm$^2$.

### 2.2.5 Device Grounding

Connecting the device's grounding rod to frame's grounding pole with copper wire.

## 2.3 Wire's Connection

The grounding wire conductive screw is located at the right end of rear panel, and the power switch, fuse, power supply socket is just beside ,whose order goes like this, power switch is on the left ,power supply socket is on the right and the fuse is just between them.

- Connecting Power Cord

  User can insert one end into power supply socket, while insert the other end to AC power.
- Connecting Grounding Wire

  When the device solely connects to protective ground, it should adopt independent way, say, share the same ground with other devices. When the device adopts united way, the grounding resistance should be smaller than 1Ω.

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**☞Caution:**

**Before connecting power cord to this Encoder Modulator, user should set the power switch to "OFF"**.

# Chapter 3 Keyboard Operation

This Encoder Modulator's front panel is user-operating interface. Before operating, users can decide whether directly use the default setting or customize the input and output parameters setting. The detailed operations go as follows:

## Keyboard Function Description:

**ENTER:** Activating the parameters which need modifications, or confirming the change after modification.

**MENU:** To cancel presently entered value, resume previous setting and return to previous menu.

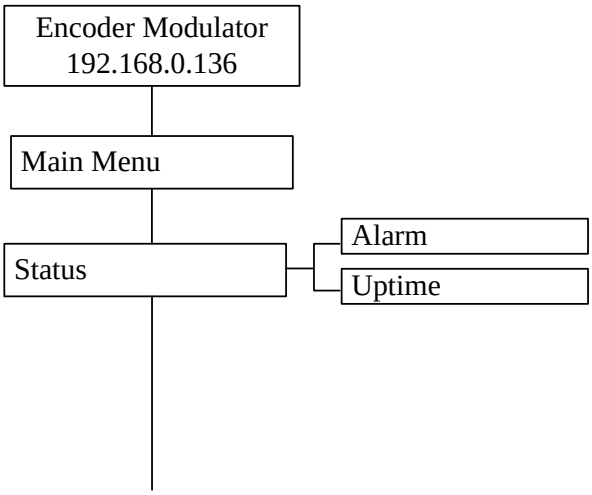
**LEFT/RIGHT:** To move the "►" to choose or set the parameters.

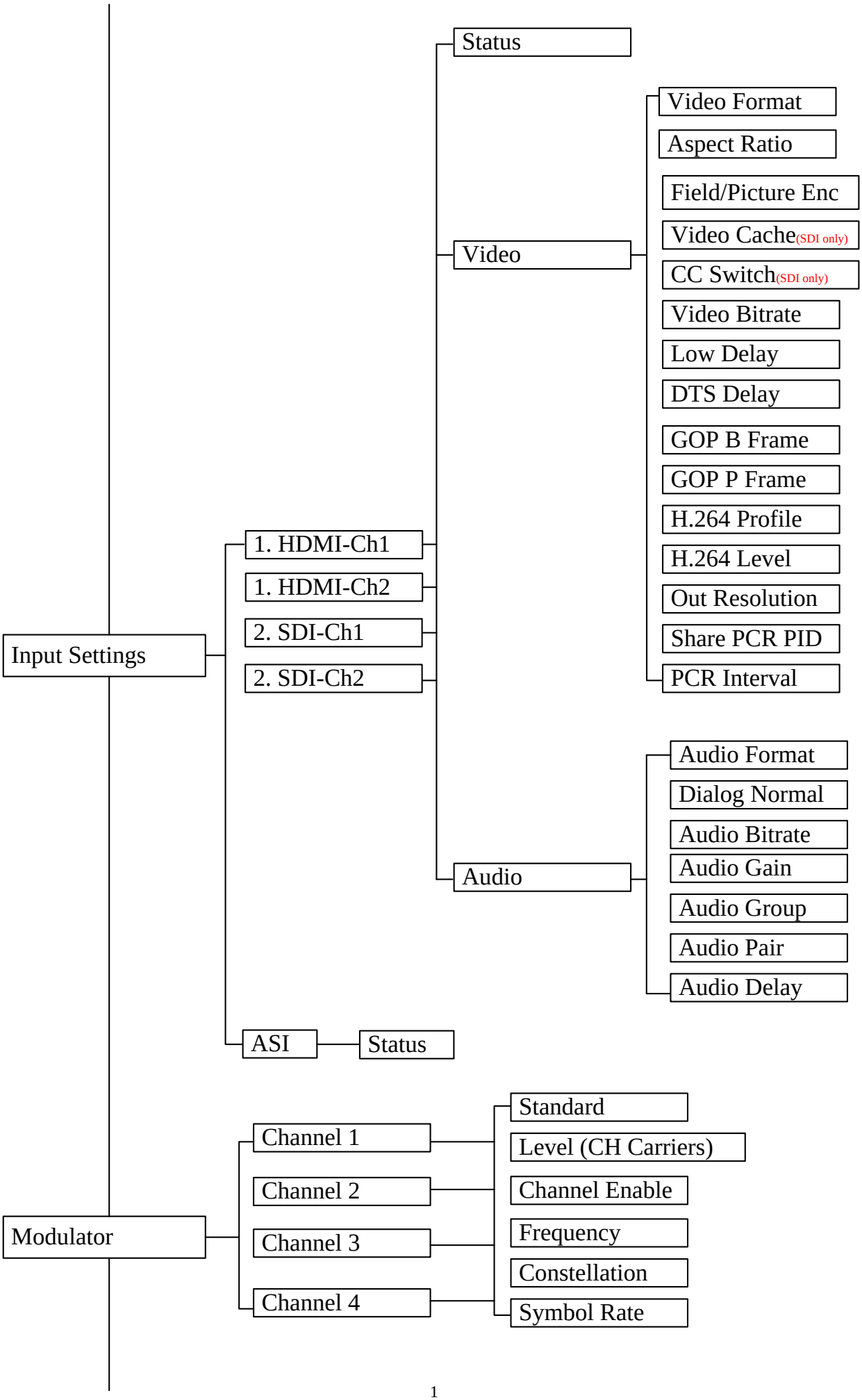
**UP/DOWN:** To modify activated parameter or page up/down when parameter is inactivated.

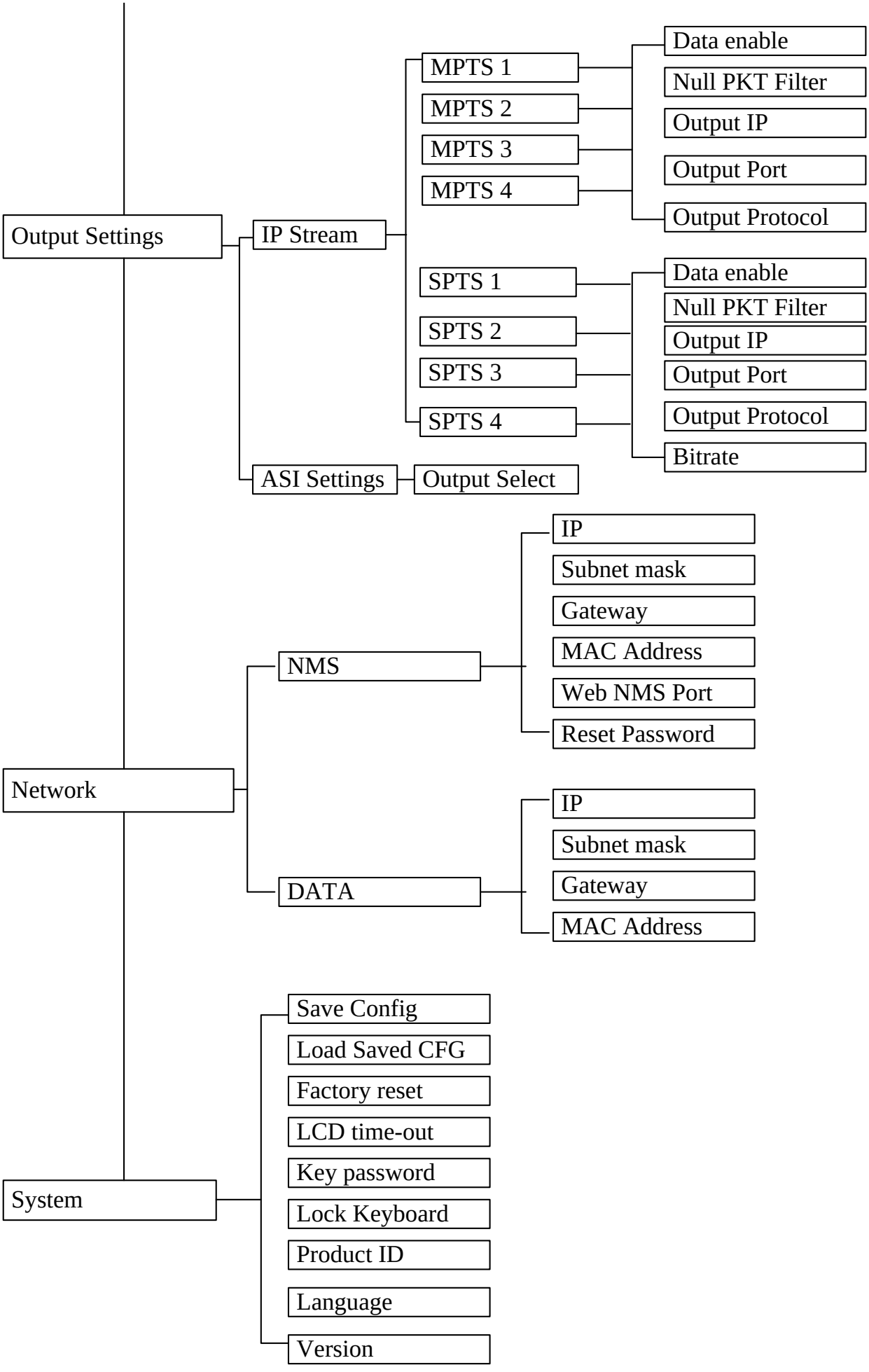
**LOCK:** To Lock the screen / cancel the lock state. After pressing lock key, the system will question the users to save present setting or not. If not, the LCD will display the current configuration state.

At the "Factory Configuration" page, user can press "ENTER" key to restore the factory default configuration.

## 3.1 LCD Menu Tree


Encoder Modulator
192.168.0.136
Main Menu
Status
Alarm
Uptime


Input Settings
1. HDMI-Ch1
1. HDMI-Ch2
2. SDI-Ch1
2. SDI-Ch2
Status
Video
Video Format
Aspect Ratio
Field/Picture Enc
Video Cache(SDI only)
CC Switch(SDI only)
Video Bitrate
Low Delay
DTS Delay
GOP B Frame
GOP P Frame
H.264 Profile
H.264 Level
Out Resolution
Share PCR PID
PCR Interval
Audio
Audio Format
Dialog Normal
Audio Bitrate
Audio Gain
Audio Group
Audio Pair
Audio Delay
ASI
Status
Modulator
Channel 1
Channel 2
Channel 3
Channel 4
Standard
Level (CH Carriers)
Channel Enable
Frequency
Constellation
Symbol Rate


Output Settings
IP Stream
MPTS 1
MPTS 2
MPTS 3
MPTS 4
Data enable
Null PKT Filter
Output IP
Output Port
Output Protocol
SPTS 1
SPTS 2
SPTS 3
SPTS 4
Data enable
Null PKT Filter
Output IP
Output Port
Output Protocol
Bitrate
ASI Settings
Output Select
Network
NMS
IP
Subnet mask
Gateway
MAC Address
Web NMS Port
Reset Password
DATA
IP
Subnet mask
Gateway
MAC Address
System
Save Config
Load Saved CFG
Factory reset
LCD time-out
Key password
Lock Keyboard
Product ID
Language
Version

# Chapter 4 WEB NMS operation

Users can not only use front buttons for setting configuration, but also control and set the configuration in computer by connecting the device to web NMS Port. User should ensure that the computer's IP address is different from this device IP address; otherwise, it would cause IP conflict.

## 4.1 login

The default IP of this device is 192.168.0.136. We can modify the IP through the front panel.

Connect the pc and the device with net cable, and use ping command to confirm they are on the same network segment.

I.G. the PC IP address is 192.168.99.252, we then change the device IP to 192.168.99.xxx (xxx can be 0 to 255 except 252 to avoid IP conflict).

Use web browser to connect the device with PC by inputting the Encoder & Modulator's IP address in the browser's address bar and press Enter.

It will display the Login interface as Figure-1. Input the Username and Password (Both the default Username and Password are "admin".) and then click "LOGIN" to start the device setting.

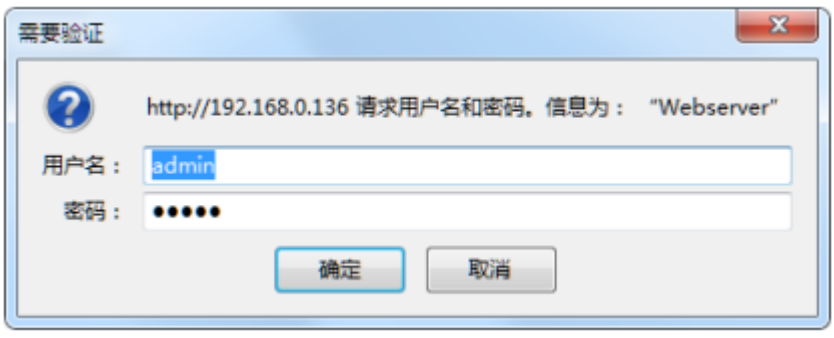



Figure-1

## 4.2 Operation

### Status

When we confirm the login, it displays the Status interface as Figure-2.


Figure-2

## Encoder 1

From the menu on left side of the webpage, clicking “Encoder 1”, it displays the information of the programs from the 1st encoding board（HDMI board as an example）as Figure-3.

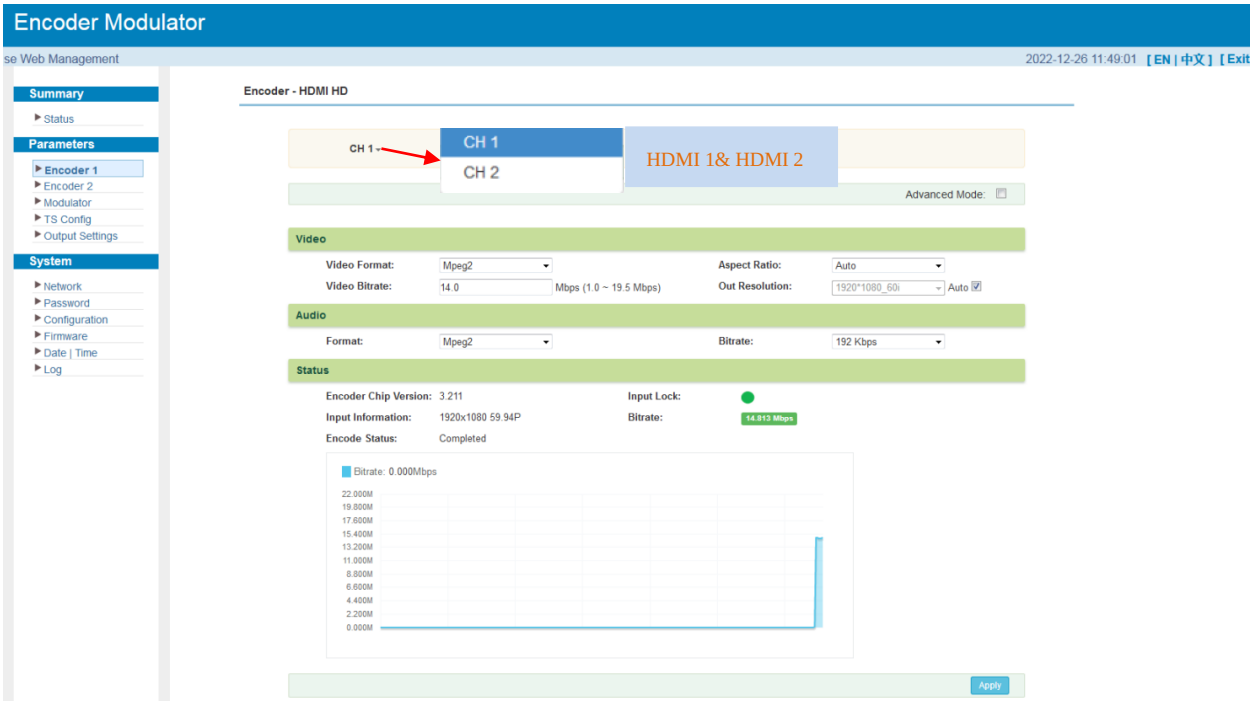



Figure-3

And check the box of Advanced Mode to get a more detailed parameter-setting menu as Figure-4.

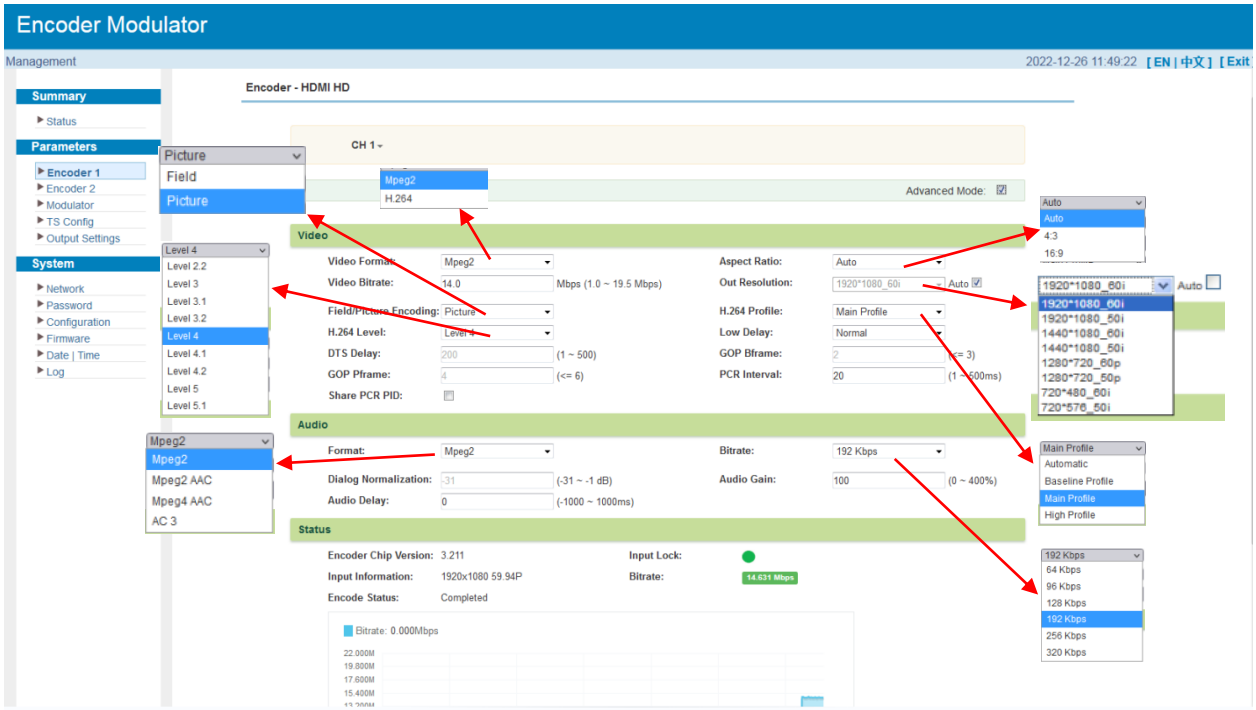



Figure-4

## Low Delay setting

This encoder modulator can achieve the low delay from encoding side to STB decoding side. User can configure the low delay option accordingly in the Web GUI as Figure-5:

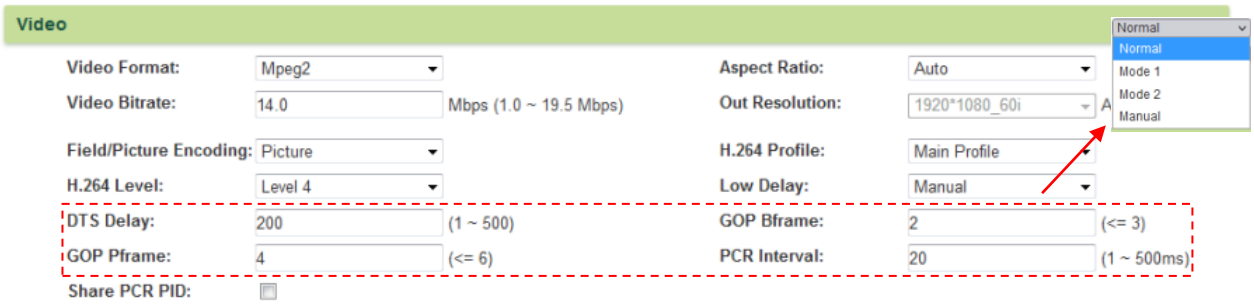



Figure-5

There are 4 low delay options:

1. **Normal:** to disable the low delay function.
2. **Mode 1:** to activate the low delay function in the default Mode 1 configuration.
3. **Mode 2:** to activate the low delay function in the default Mode 2 configuration.
4. **Manual:** to configure DTS Delay, GOP B frame and GOP P frame to get a low delay result accordingly.

The delay is mainly affected by the different combination of **Video Format**, **Video Bit-rate**,

**Low delay Mode** and **the Resolution** of signal source etc.

- **NOTE:** The delay duration will also be impacted as the decoding performance of the STB side change. Users need to apply a well-performed STB or other decoding terminals to achieve a low delay.

## Encoder 2

Similarly, from the menu on left side of the webpage, clicking "Encoder 2", it displays the information of the programs from the 2nd (SDI) encoding board.

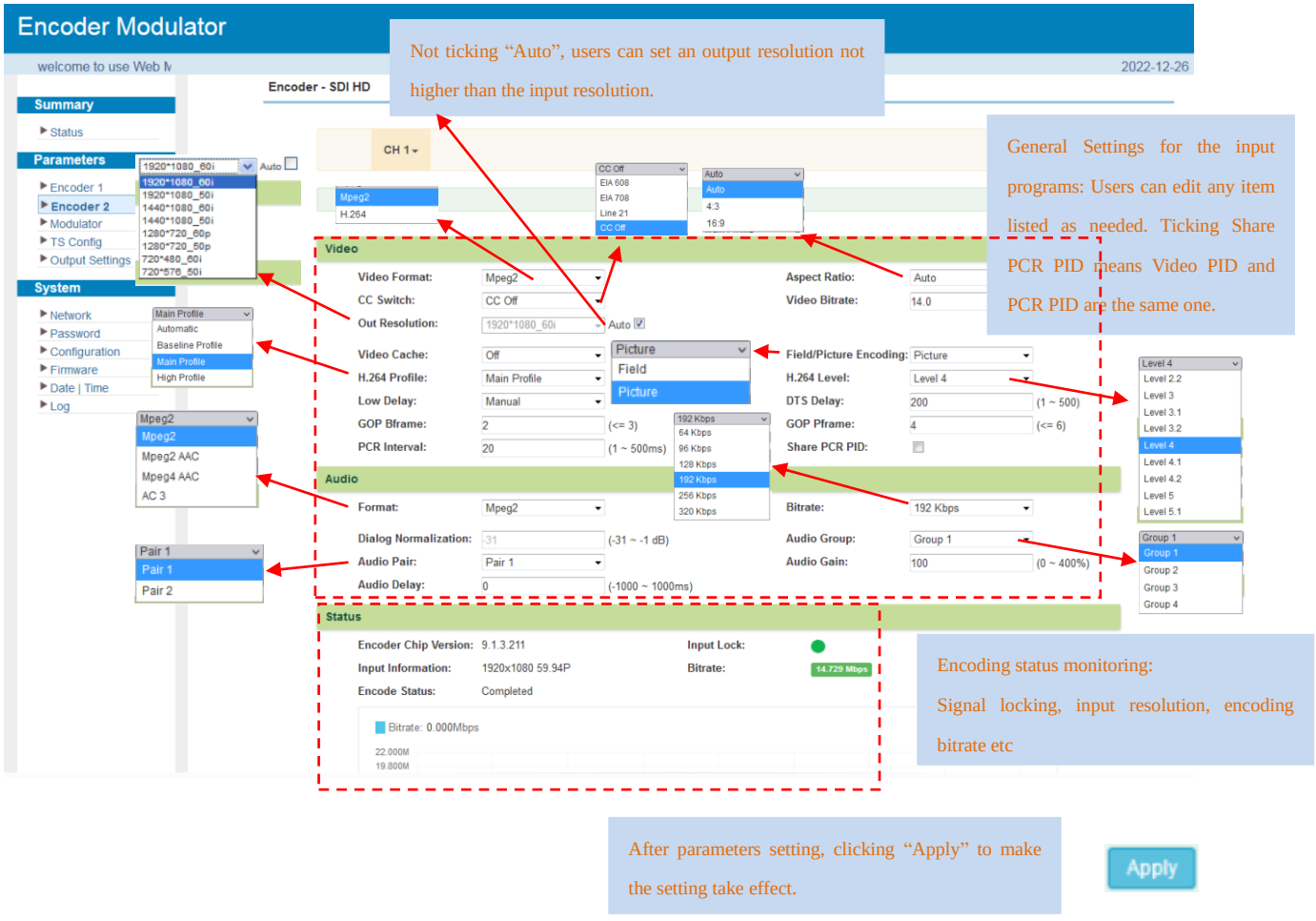



Figure-6

## TS Config

Click "TS Config", it will display the encoded program information as Figure-7. Users can parse and multiplex encoded programs in this interface.

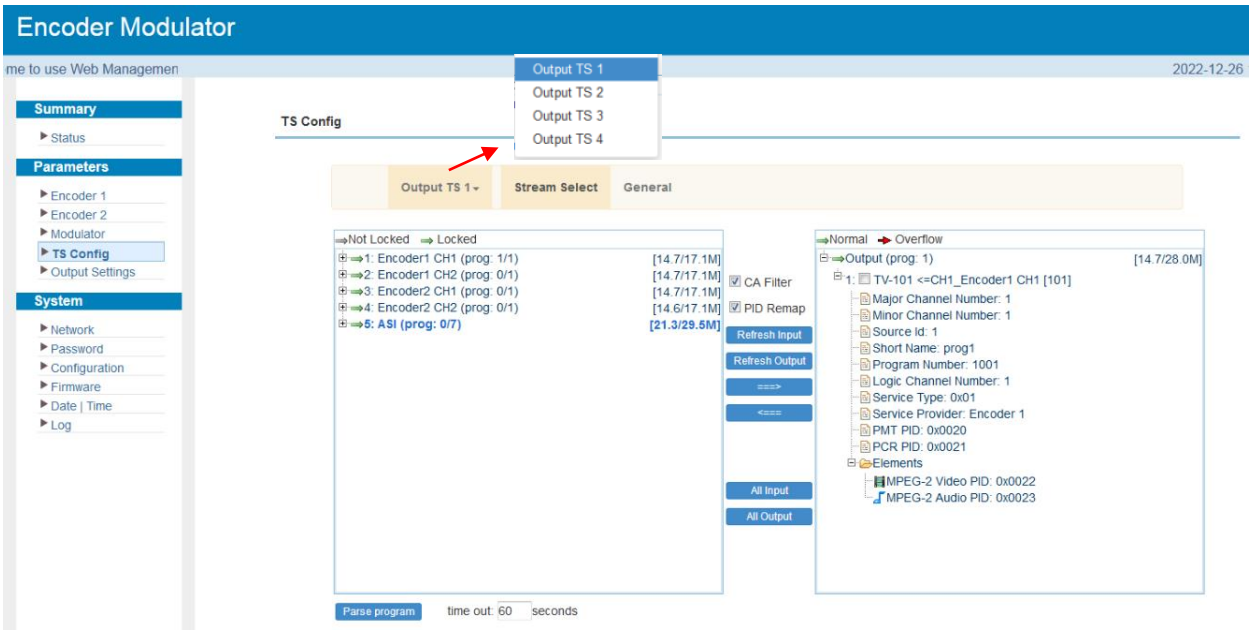



Figure-7

Output TS 1/2/3/4 represents the 4 carrier outputs and 4 MPTS out. Users can configure different program group for each carrier output as needed.

☑CA Filter : To enable/disable the CA filter

☑PID Remap: To enable/disable the PID remapping

Refresh Input To refresh the input program information

Refresh Output To refresh the output program information

===> Select the wanted input program(s) firstly and click this button to transfer the selected program(s) to output.

<=== Cancel the multiplexed programs from the output area after your program selection.

All Input To select all the input programs

All Output To select all the output programs

Parse program To parse programs time out: 60 seconds time limitation of parsing input programs

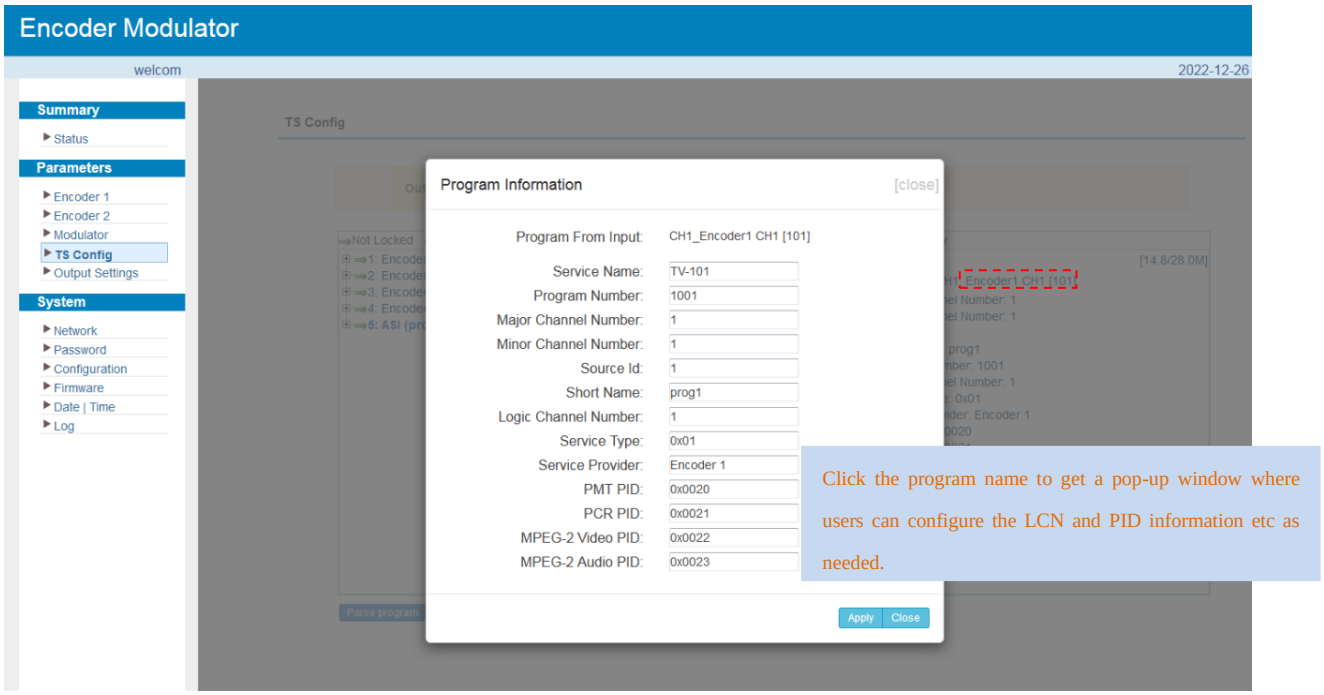



Figure-8

## General

Click “General” from the menu to set Character Encoding option according to the program name language, VCT and NIT etc as Figure-9.

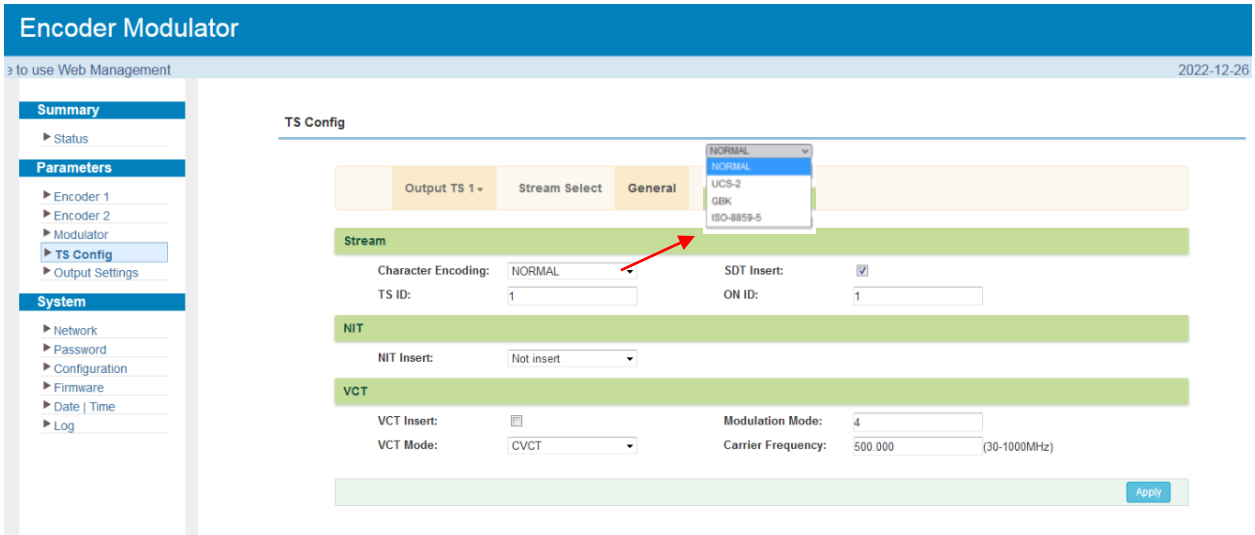



Figure-9

Set Web Insert for NIT Insert and Click “+” from this page, it will display the screen as Figure-10 where it requires to add NIT descriptor. Please follow your configuration in Modulator page to edit the NIT descriptor.

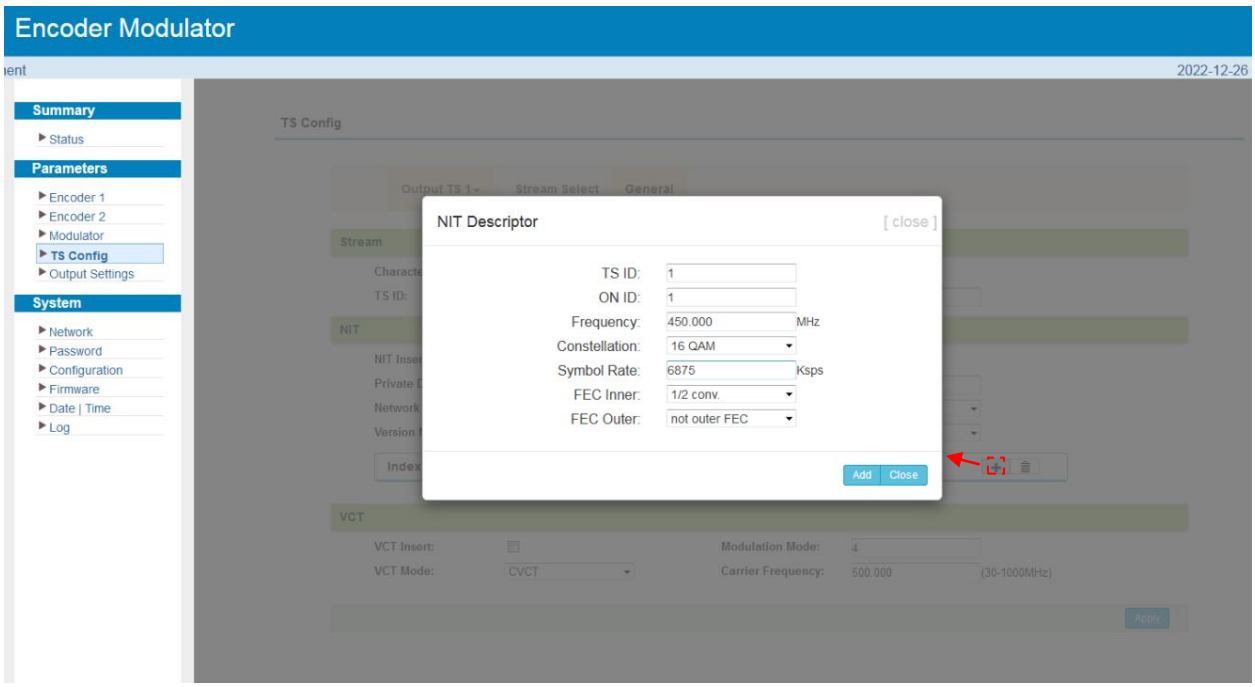



Figure-10

## Modulator

This unit is equipped with 4 DVB-C frequencies output. User can configure the modulation parameters of the 4 carrier outputs by clicking the .

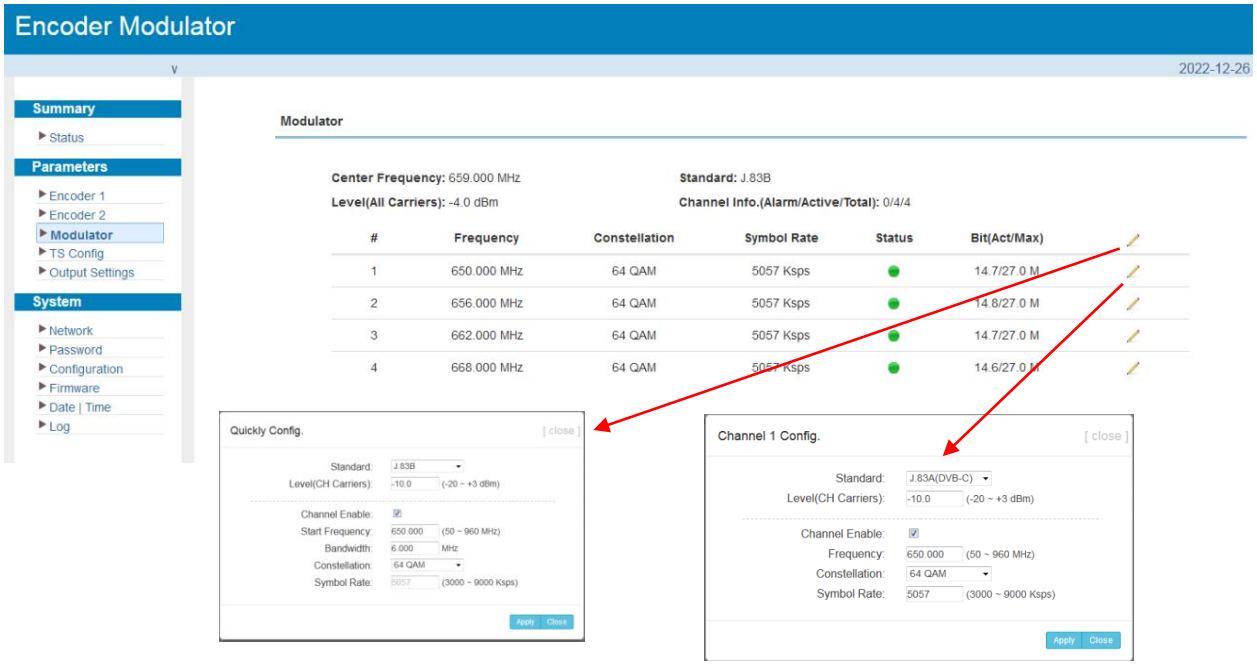



Figure-11

## Output Settings

Click “Output Settings” from the left menu, it will display the page as Figure-12 where to

configure the 4 MPTS output and 4 SPTS Output by clicking the .

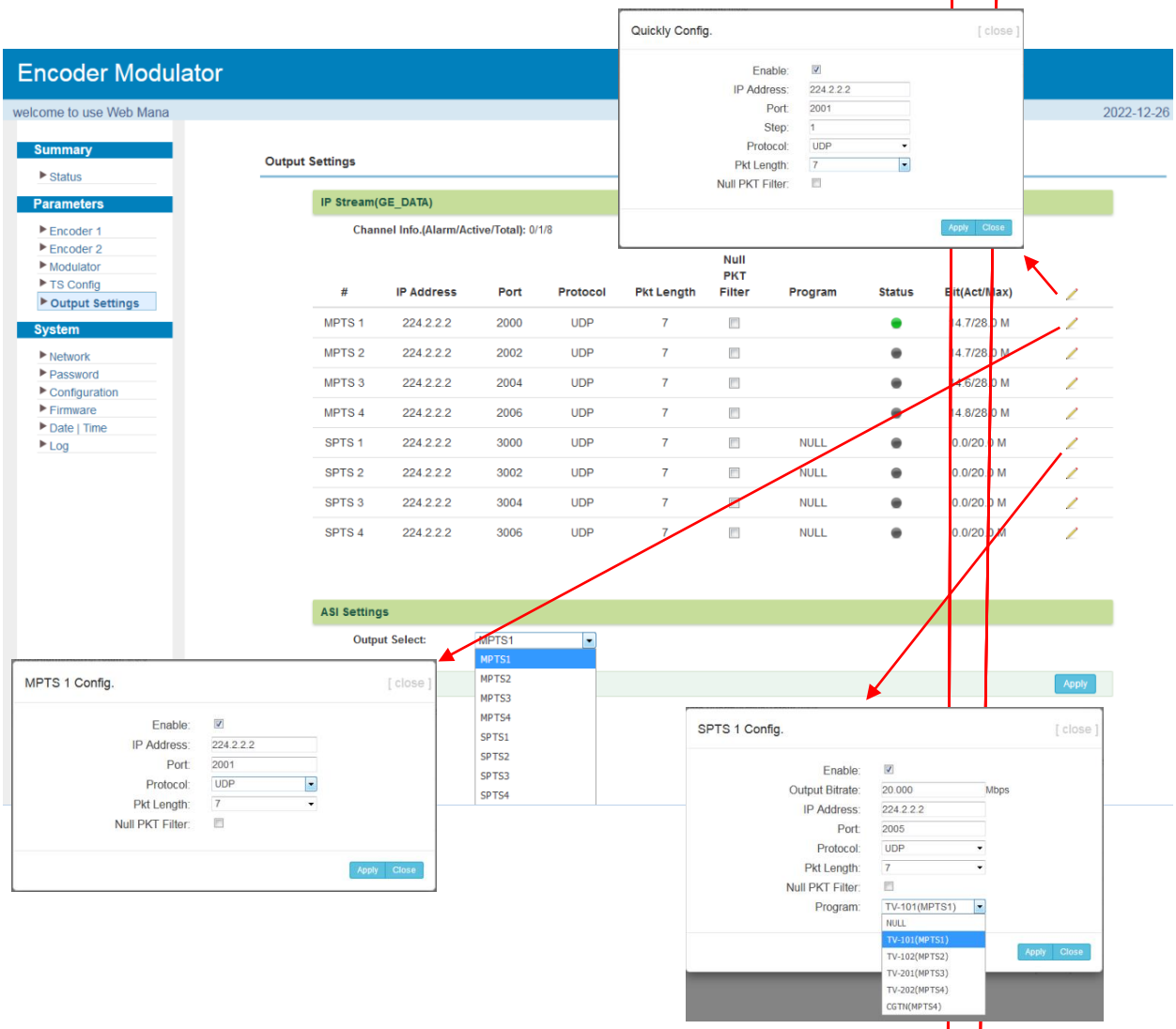



Figure-12

## Network

When user clicks “Network”, it will display the page as Figure-13. It displays the network information of the device. Here users can change the device network configuration as needed.

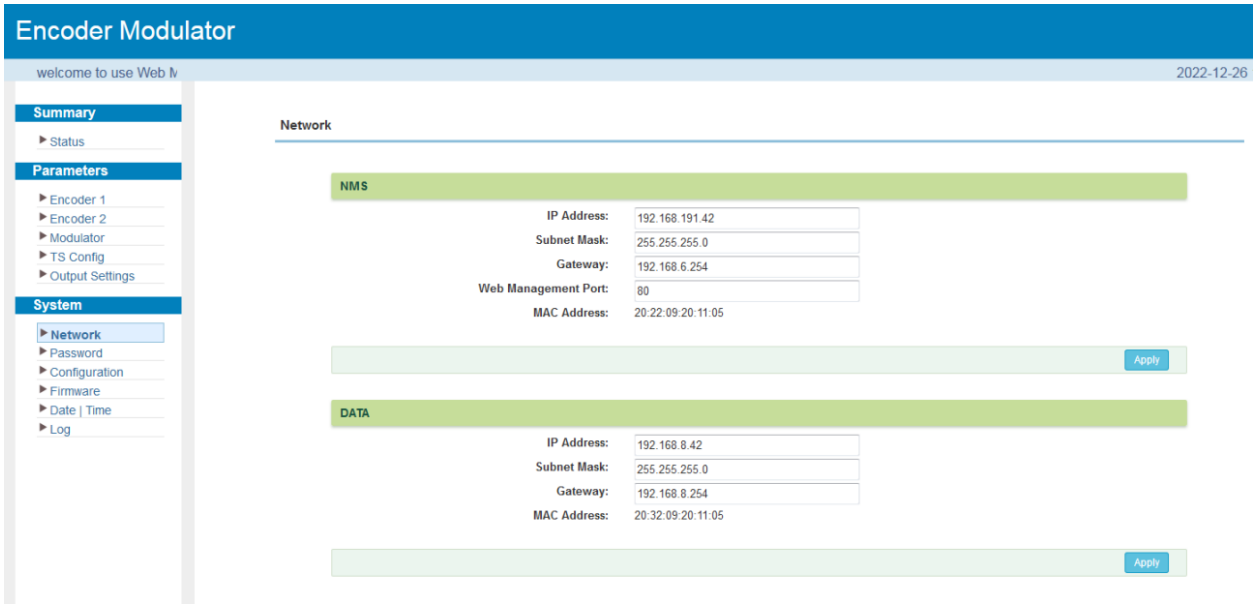



Figure-13

## Password

From the menu on left side of the webpage, clicking “Password”, it will display the screen as Figure-14 where to set the login account and password for the web NMS.

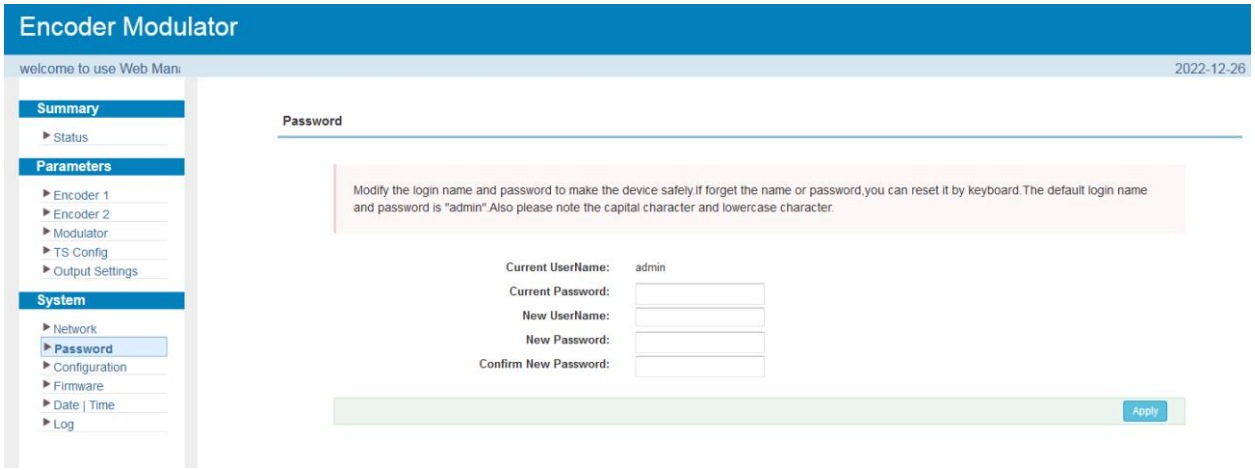
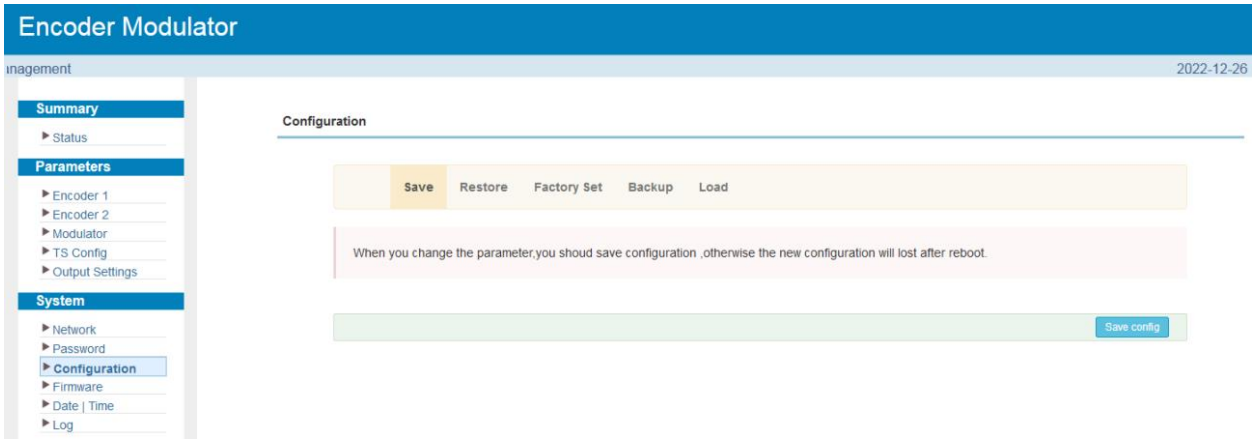
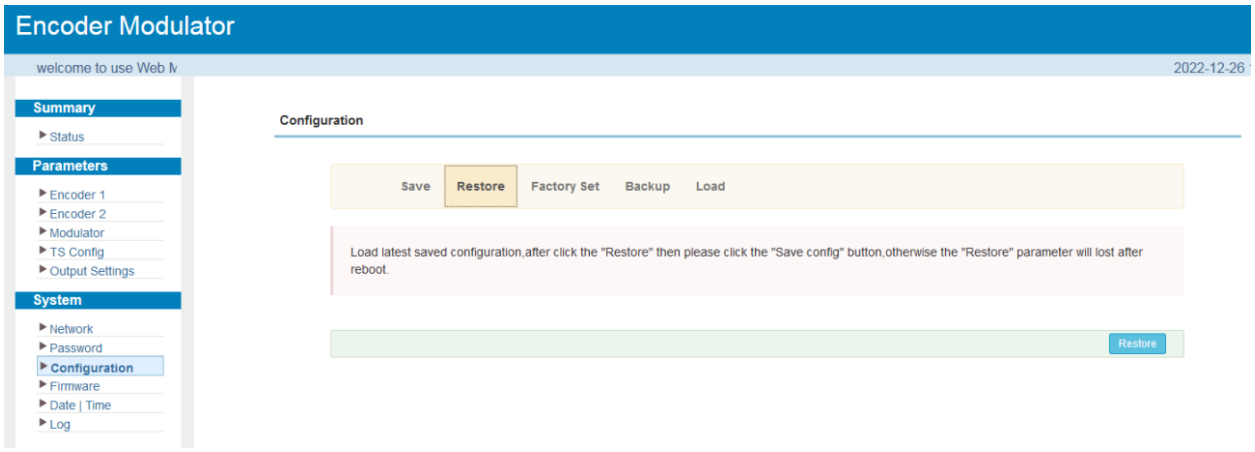


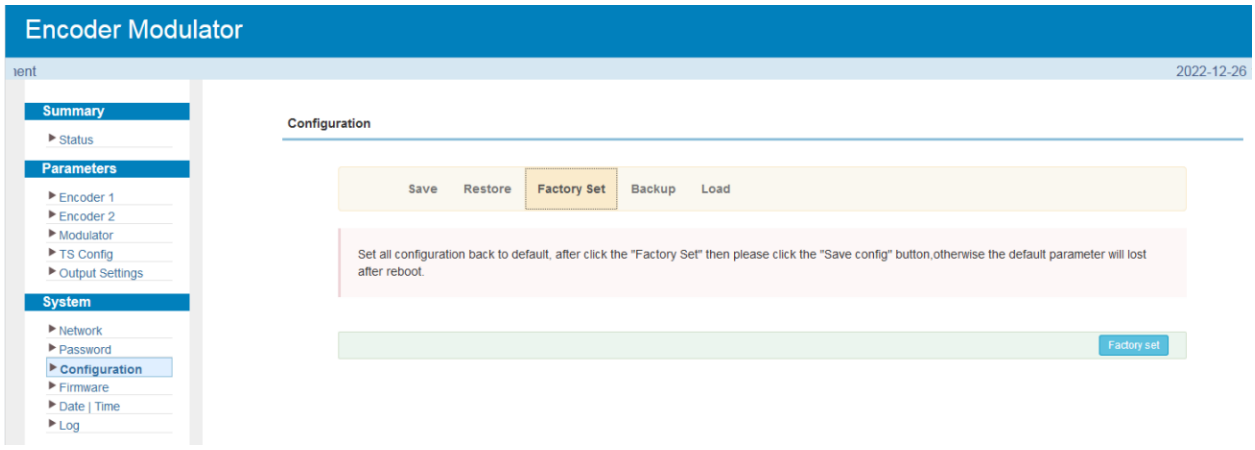

Figure-14

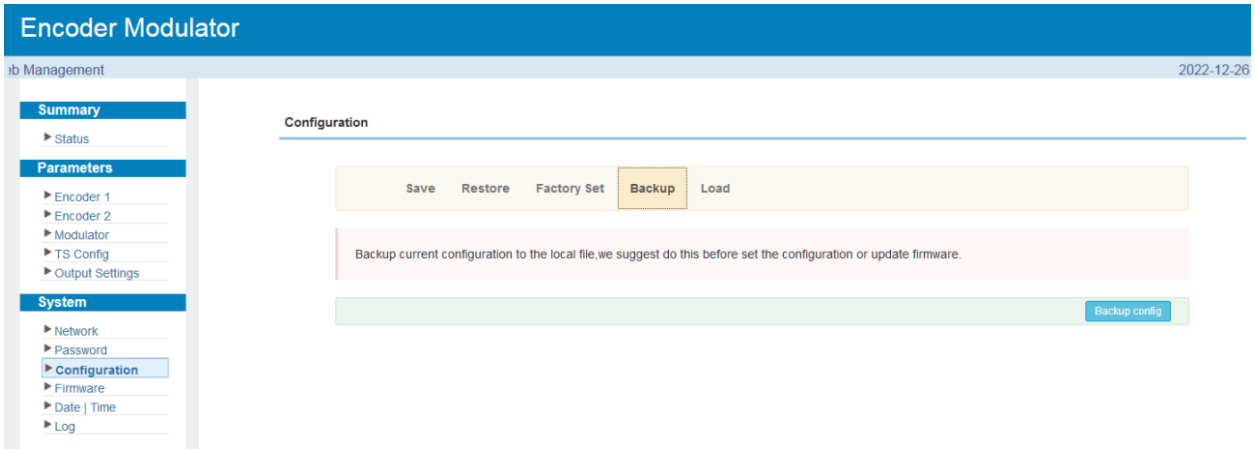
## Configuration

From the menu on left side of the webpage, clicking “Configuration”, it will display the page as Figure-15 where to save, restore, make factory set, backup and load your configurations.


Encoder Modulator
2022-12-26
Summary
Status
Parameters
Encoder 1
Encoder 2
Modulator
TS Config
Output Settings
System
Network
Password
Configuration
Firmware
Date | Time
Log
Configuration
Save
Restore
Factory Set
Backup
Load
When you change the parameter,you shoud save configuration ,otherwise the new configuration will lost after reboot.
Save config


Encoder Modulator
2022-12-26
Summary
Status
Parameters
Encoder 1
Encoder 2
Modulator
TS Config
Output Settings
System
Network
Password
Configuration
Firmware
Date | Time
Log
Configuration
Save
Restore
Factory Set
Backup
Load
Load latest saved configuration,after click the "Restore" then please click the "Save config" button,otherwise the "Restore" parameter will lost after reboot.
Restore


Encoder Modulator
2022-12-26
Summary
Status
Parameters
Encoder 1
Encoder 2
Modulator
TS Config
Output Settings
System
Network
Password
Configuration
Firmware
Date | Time
Log
Configuration
Save
Restore
Factory Set
Backup
Load
Set all configuration back to default, after click the "Factory Set" then please click the "Save config" button,otherwise the default parameter will lost after reboot.
Factory set


Encoder Modulator
2022-12-26
Summary
Status
Parameters
Encoder 1
Encoder 2
Modulator
TS Config
Output Settings
System
Network
Password
Configuration
Firmware
Date | Time
Log
Configuration
Save
Restore
Factory Set
Backup
Load
Backup current configuration to the local file,we suggest do this before set the configuration or update firmware.
Backup config

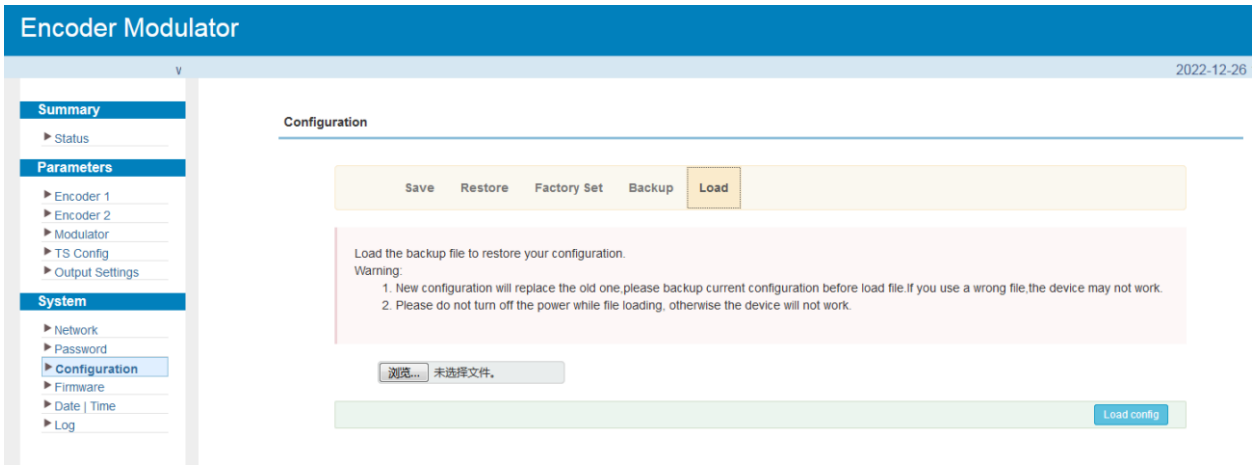



Figure-15

## Firmware

From the menu on left side of the webpage, clicking “Firmware”, it will display the screen as Figure-16 where to update firmware for the device.

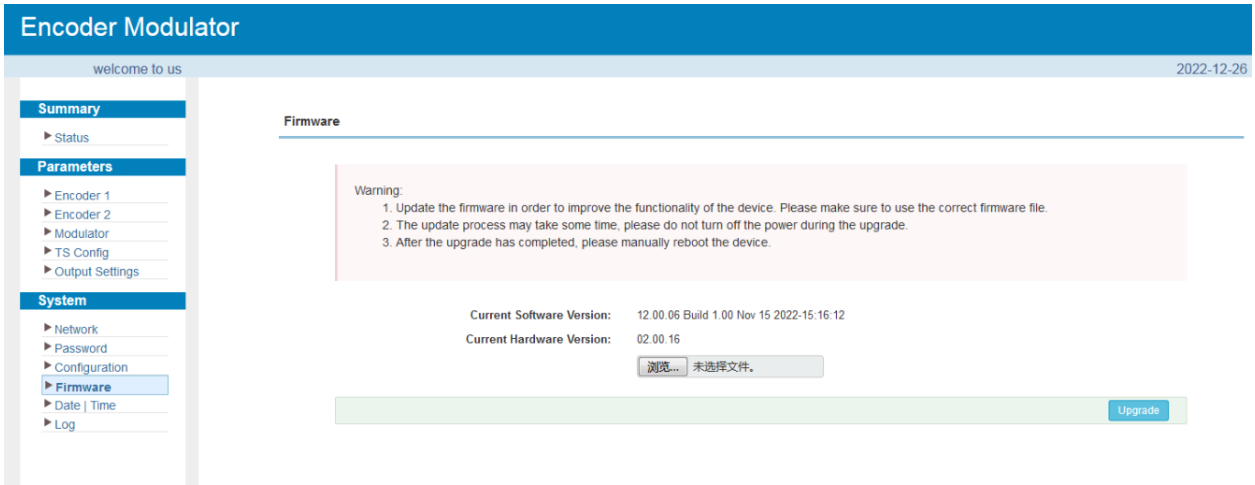



Figure-16

### Date | Time

Users can set timezone and configure NTP server to update Date and Time in the device.

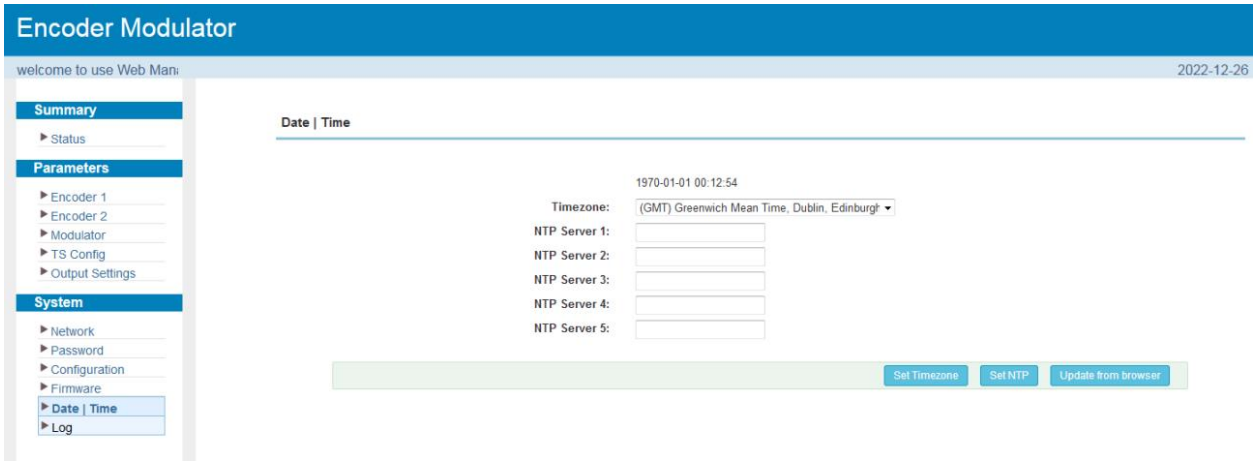



Figure-17

## Log:

The Kernel and System log here are for the R&D debugging reference.

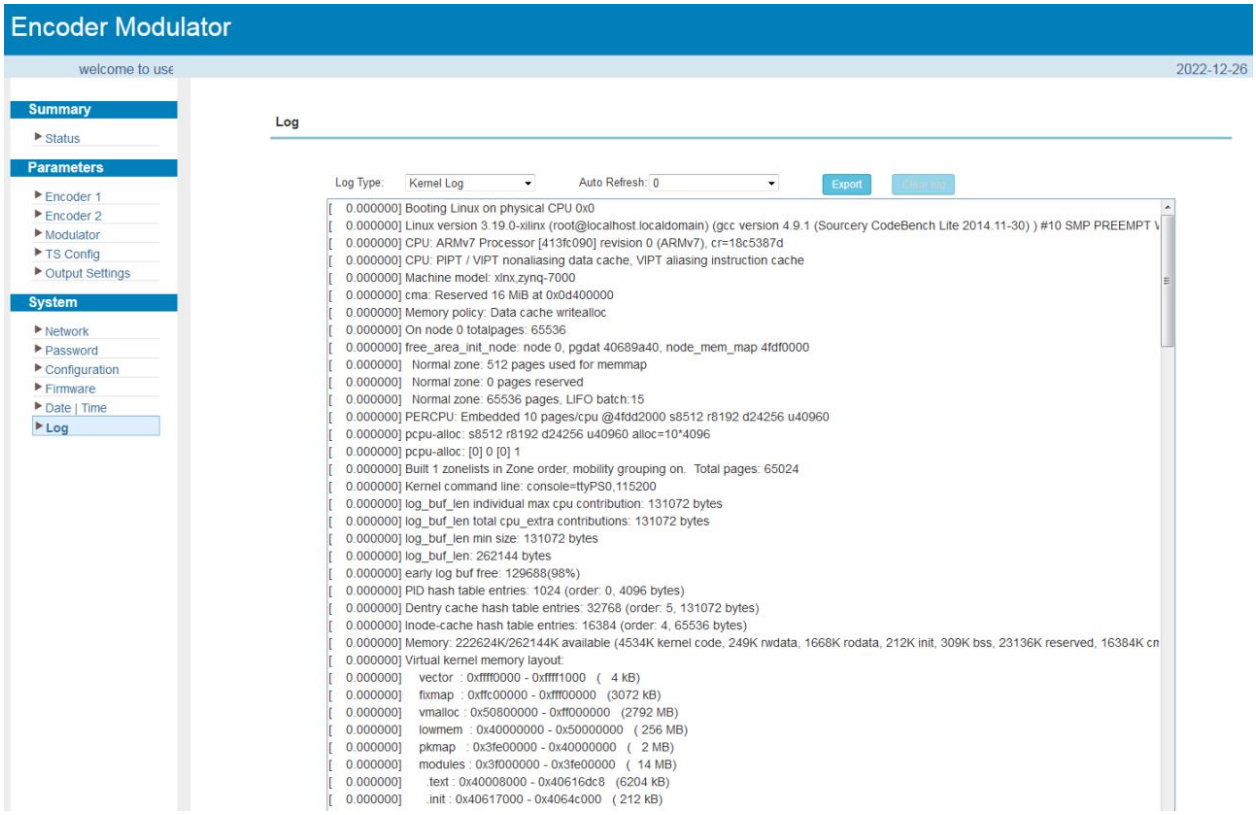



Figure-18

# Chapter 5 Troubleshooting

Our ISO9001 quality assurance system has been approved by CQC organization. For guarantee the products' quality, reliability and stability. All of our products have been passed the testing and inspection before ship out factory. The testing and inspection scheme already covers all the Optical, Electronic and Mechanical criteria which have been published by us. To prevent potential hazard, please strictly follow the operation conditions.

## Prevention Measure

- Installing the device at the place in which environment temperature between 0 to 45 ℃
- Making sure good ventilation for the heat-sink on the rear panel and other heat-sink bores if necessary
- Checking the input AC within the power supply working range and the connection is correct before switching on device
- Checking the RF output level varies within tolerant range if it is necessary
- Checking all signal cables have been properly connected
- Frequently switching on/off device is prohibited; the interval between every switching on/off must greater than 10 seconds.

## Conditions need to unplug power cord

- Power cord or socket damaged.
- Any liquid flowed into device.
- Any stuff causes circuit short
- Device in damp environment
- Device was suffered from physical damage
- Longtime idle.
- After switching on and restoring to factory setting, device still cannot work properly.
- Maintenance needed

# Chapter 6 Packing list

- Encoder Modulator 1 pc
- Power cord 1 pc
- Ground Lead 1 pc