User Manual

H-1SDI-QAM-IPLL

H-2SDI-QAM-IPLL

1/2 SDI to QAM Modulators and IPTV Streaming Encoders

DIRECTORY

Chapter 1 Product Introduction

1.1 Outline

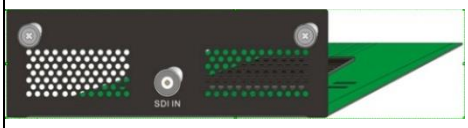
H-1/2SDI-QAM-IPLL series products are THOR's all-in-one devices which integrate encoding, multiplexing and modulation to convert V/A signals into digital RF output. It adopts inner drawer-type structural design which greatly facilitates the change of encoding modules (HDMI/CVBS/SDI/YPbPr/…) as needed. To meet customers' various requirements, H-1/2SDI-QAM-IPLL is also optionally equipped with 1 ASI input for re-mux and 2 ASI out ports. MPTS and SPTS output are available via the gigabit DATA port.

With its various inputs available, our H-1/2SDI-QAM-IPLL series products are widely used in public places such as metro, market hall, theatre, hotels, resorts, and etc for advertising, monitoring, training and educating in company, schools, campuses, hospital… It's a good choice to offer additional info channels.

1.2 Main Features

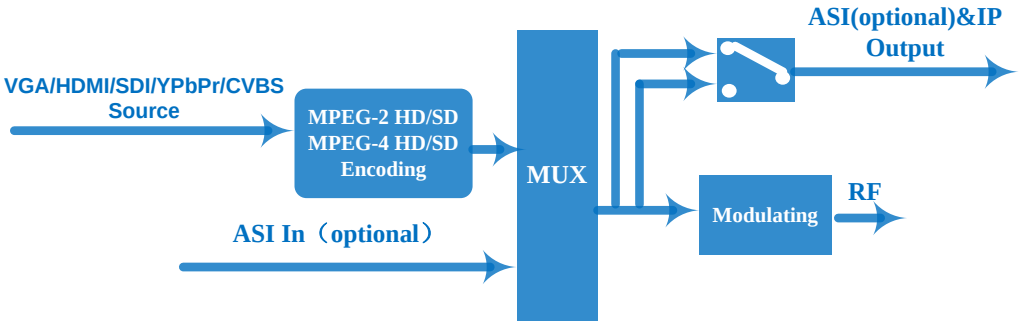
- **HDMI/CVBS/SDI/YPbPr… inputs(Now only HDMI and SDI board are available)**
- **1*ASI in for re-mux and 2 ASI out ports(optional);**
- **MPEG2 HD/SD & MPEG4 AVC H.264 HD/SD video encoding**
- **2* channels in (19" rack case)**
- **MPEG4-AAC; MPEG2-AAC; MPEG1 Layer IIand Dolby Digital AC3 2.0 audio encoding**
- **Dialog Normalization**
- **Support CC (closed caption) for SDI board**
- **Support low delay encoding mode(SDI and HDMI board)**
- **Support PSI/SI editing**
- **Support PID re-mapping**
- **Digital RF out (DVB-C/T/ATSC/ISDB-T RF Optional);**
- **IP out via the gigabit data port**
- **LCN (Logical Channel Number) support – for DVB-C/T/ISDB-T modulating mode**
- **VCT (Virtual Channel Table) support – for DVB-C/ATSC modulating mode**
- **Modular design, pluggable encoding modules**
- **LCD display, Remote control and firmware**
- **Web-based NMS management; Updates via web**

1.3 Technical Specifications

HDMI Encoding Input 	**Video**	Input	HDMI*1(the other is backup)		
		Encoding	MPEG2; MPEG4 AVC/H.264		
		Bitrate	1-19.5Mbps		
		Resolution	1920*1080_60P, 1920*1080_50P, (-for MPEG4 AVC/H.264 only) 1920*1080_60i, 1920*1080_50i, 1280*720_60p, 1280*720_50P 720*480_60i, 720*576_50i		
		Low Delay	Normal, Mode 1, Mode 2		
		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		
		Sample rate	48KHz		
		Bitrate	64/96/128/ 192/256/320kbps		
SDI Encoding Input 	**Video**	Encoding	MPEG2; MPEG4 AVC/H.264		
		Input	SDI*1		
		Bitrate	1-19.5Mbps		
		Resolution	1920*1080_60P, 1920*1080_50P, (-for MPEG4 AVC/H.264 only) 1920*1080_60i, 1920*1080_50i, 1280*720_60p, 1280*720_50P 720*480_60i, 720*576_50i		
		Low Delay	Normal, Mode 1, Mode 2		
		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		
		Sample rate	48KHz		
		Bitrate	64/96/128/ 192/256/320kbps		
Modulation	**DVB-C**	Standard	J.83A (DVB-C), J.83B, J.83C		
		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 combined output		
			J.83A	**J.83B**	**J.83C**
		Constellation	16/32/64/128/256 QAM	64/ 256 QAM	64/ 256 QAM
		Bandwidth	8M	6M	6M

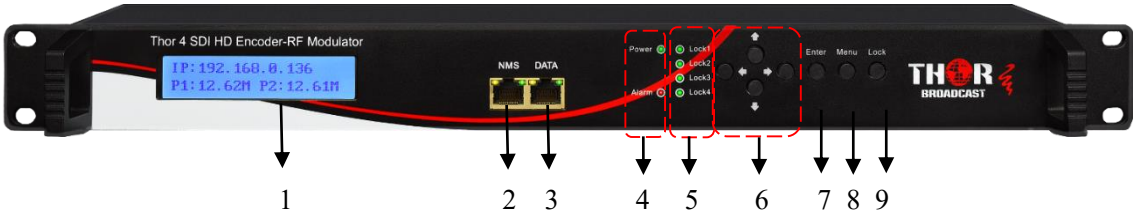
General	**System**	Local interface	LCD + control buttons
		Remote management	Web NMS
		Stream Out	2 ASI out optional (BNC type, same one TS, mirror as MPTS or SPTS)
			IP (4 MPTS & 2 SPTS) out over UDP, RTP/RTSP
		DATA Port	1000M
		NMS interface	RJ45, 100M
		Language	English
	Physical Specification	Power supply	100~240VAC, 50/60Hz
		Dimensions	482*242*44mm
		Operation temperature	0~45℃

1.4 Principle Chart



1.5 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: 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.	SDI Input interface
2.	ASI in/out(optional)
3.	RF Output interface
4.	Power Switch
5.	Power supply Slot
6.	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

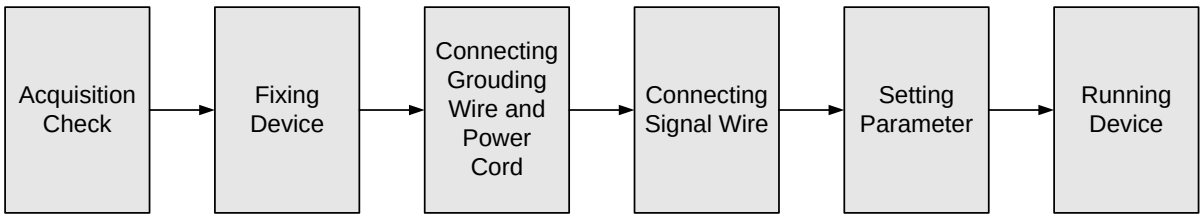
If any item is missing or mismatching with the list above, please contact local dealer.

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 Volume resistivity of ground anti-static material: $1X10^{7}$~$1X10^{10}\Omega$, Grounding current limiting resistance: 1M (Floor bearing should be greater than 450Kg/m^2)
Environment Temperature	5~40℃(sustainable), 0~45℃(short time), 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.

☞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.

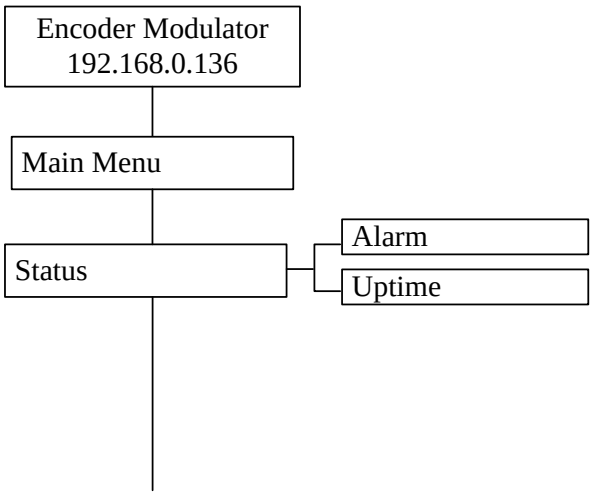
LEFT/RIGHT: To move the "►" to choose or set the parameters.

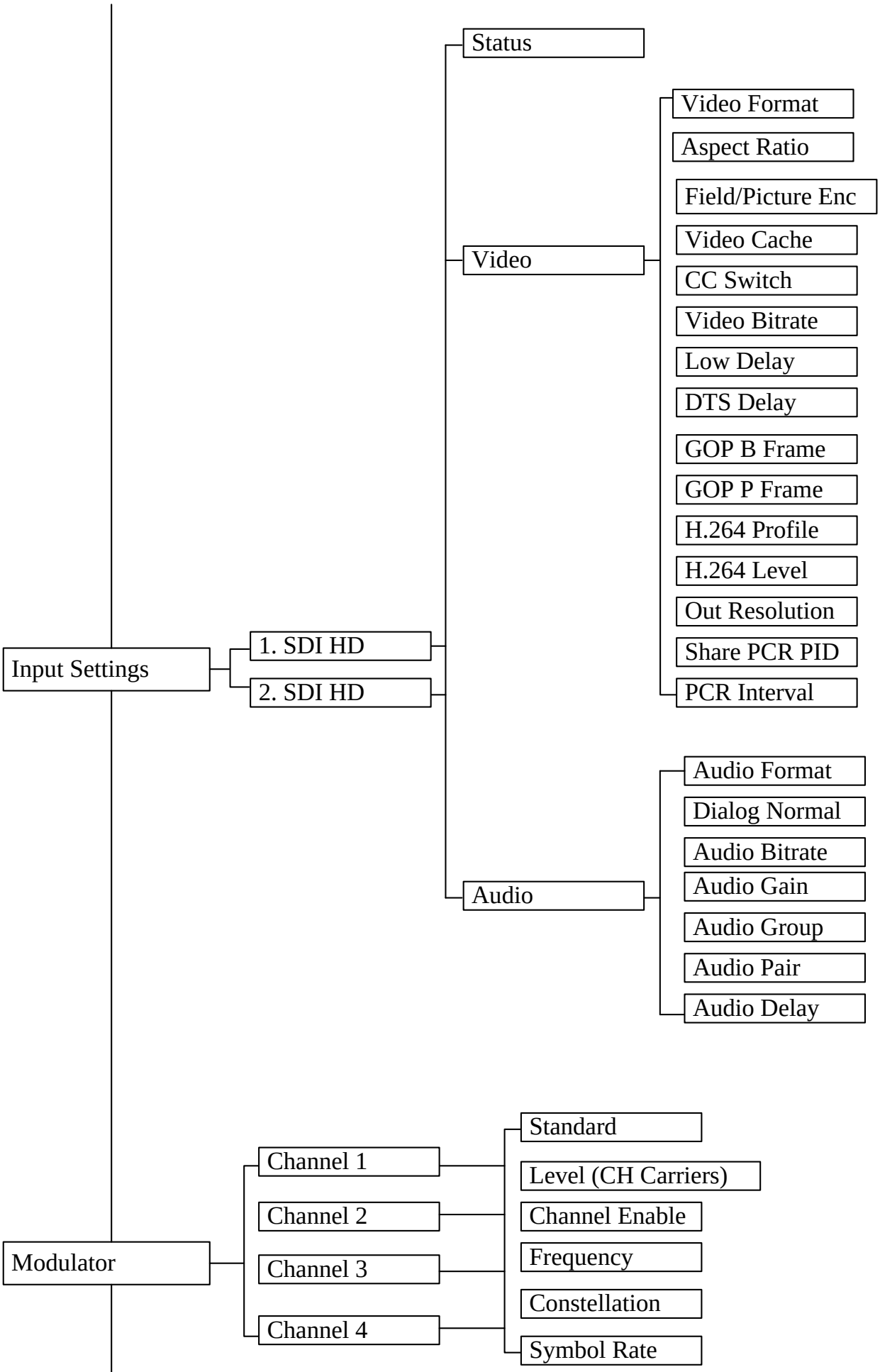
UP/DOWN: To modify activated parameter or page up/down when parameter is inactivated.

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





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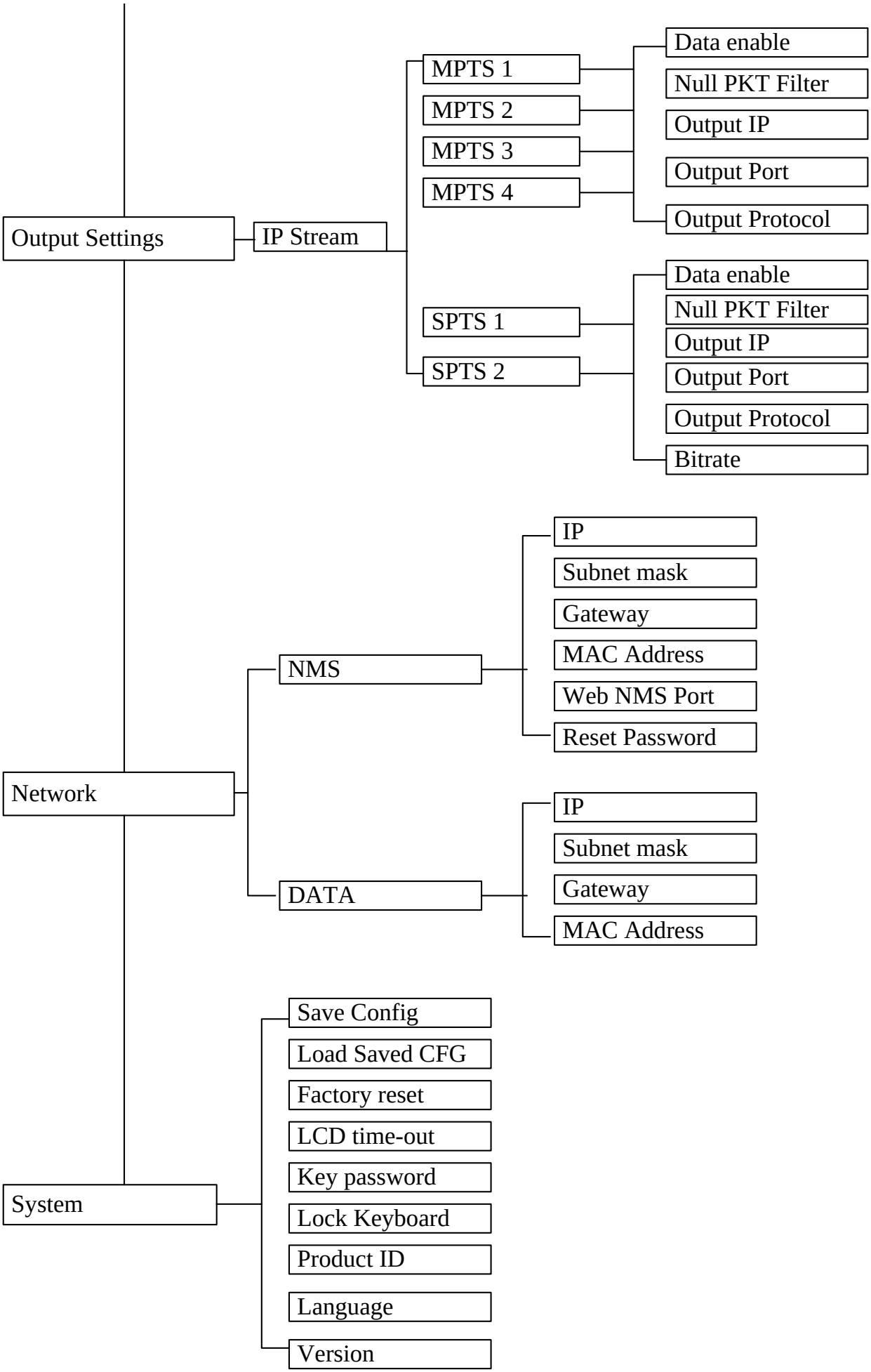
Output Settings
IP Stream
MPTS 1
MPTS 2
MPTS 3
MPTS 4
Data enable
Null PKT Filter
Output IP
Output Port
Output Protocol
SPTS 1
SPTS 2
Data enable
Null PKT Filter
Output IP
Output Port
Output Protocol
Bitrate
Network
NMS
IP
Subnet mask
Gateway
MAC Address
Web NMS Port
Reset Password
DATA
IP
Subnet mask
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.

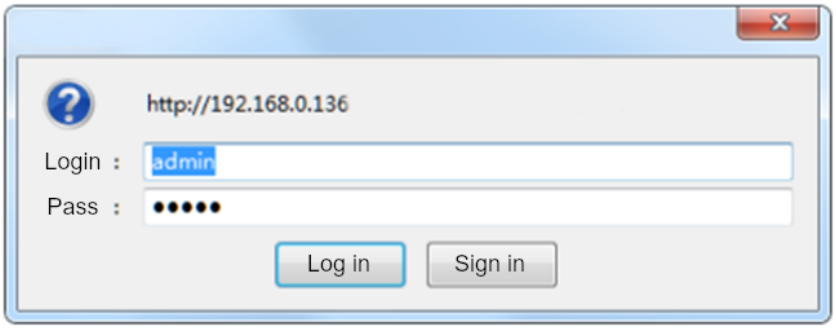

Figure-1

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 as Figure-3.

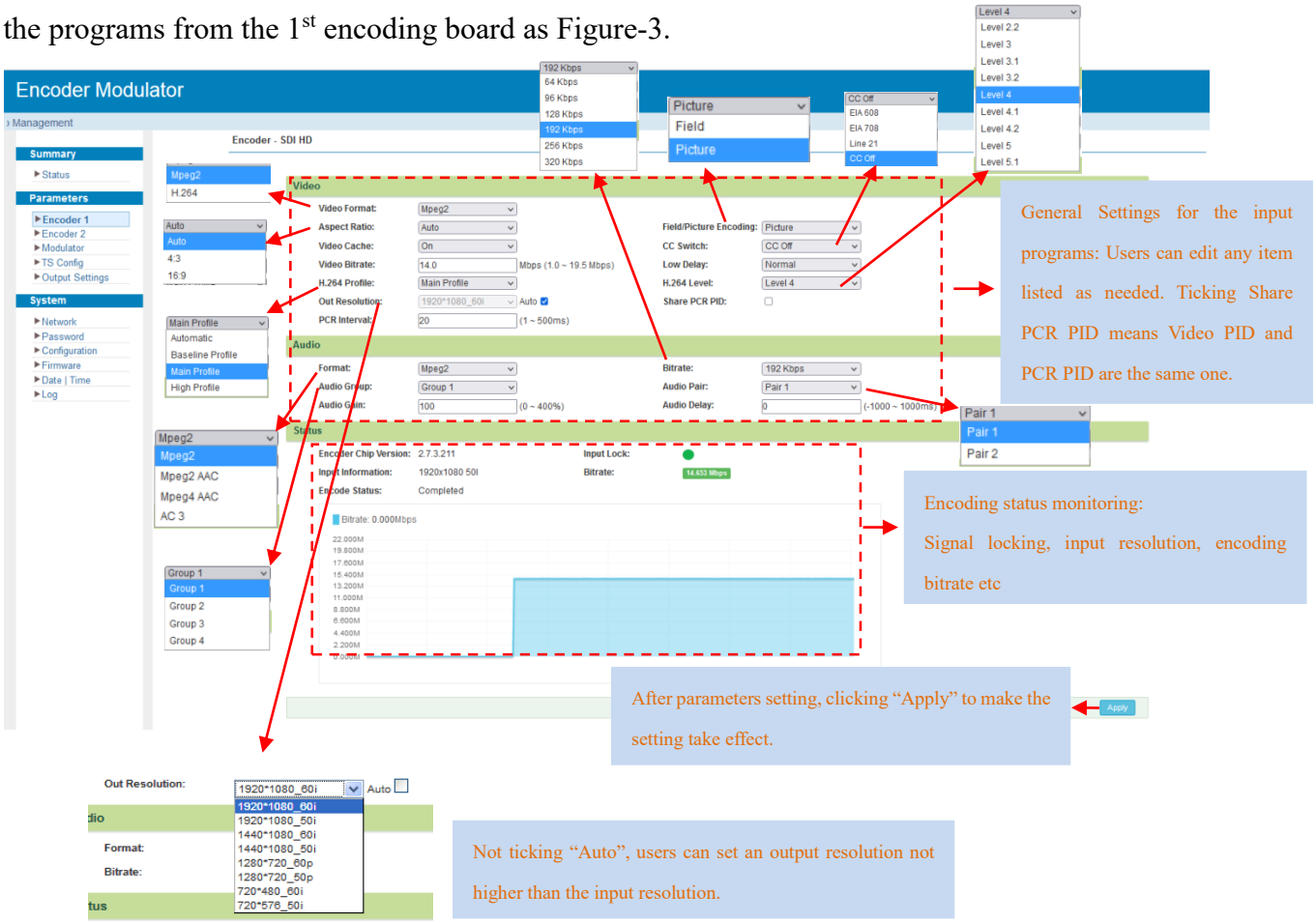

Figure-3

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-4:

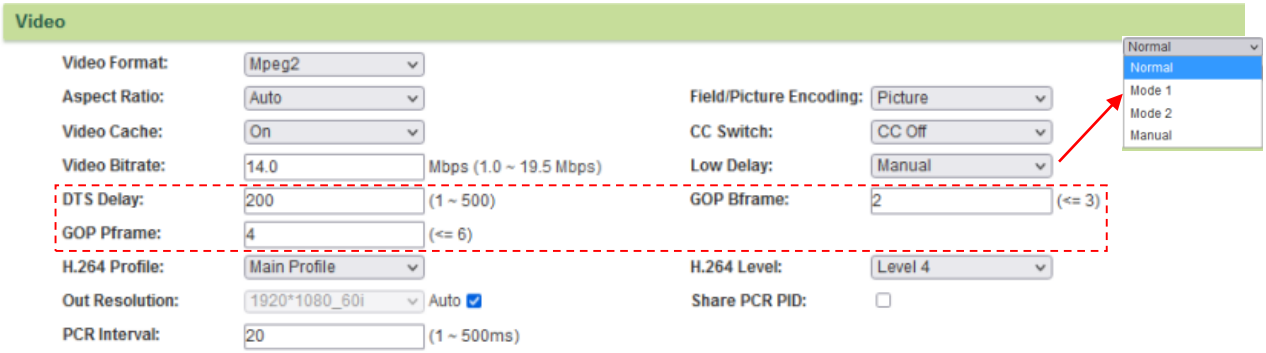

Figure-4

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. In this example. SDI 2 has no signal input.

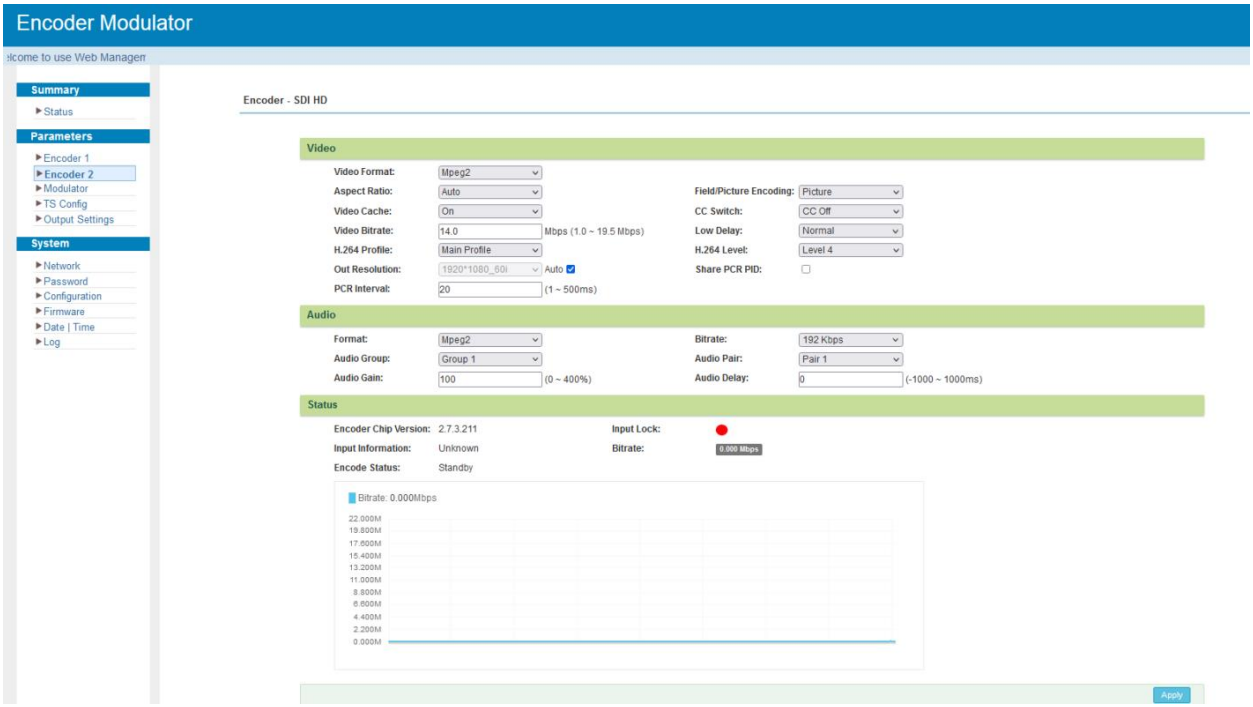

Figure-5

TS Config

Click "TS Config", it will display the encoded program information as Figure-6. Users can parse and multiplex encoded programs in this interface.

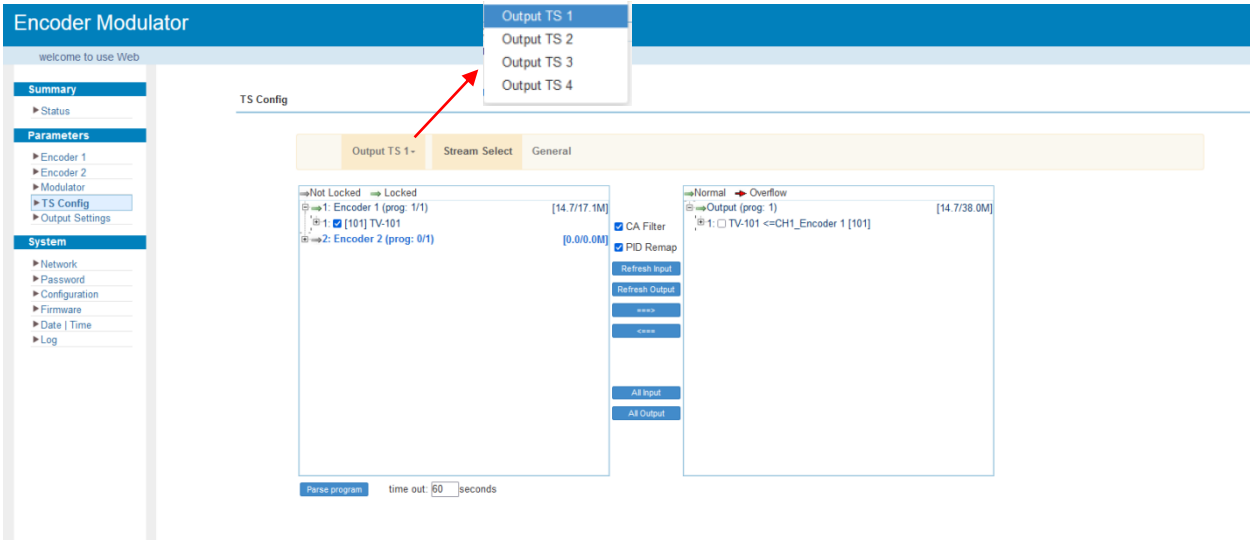

Figure-6

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

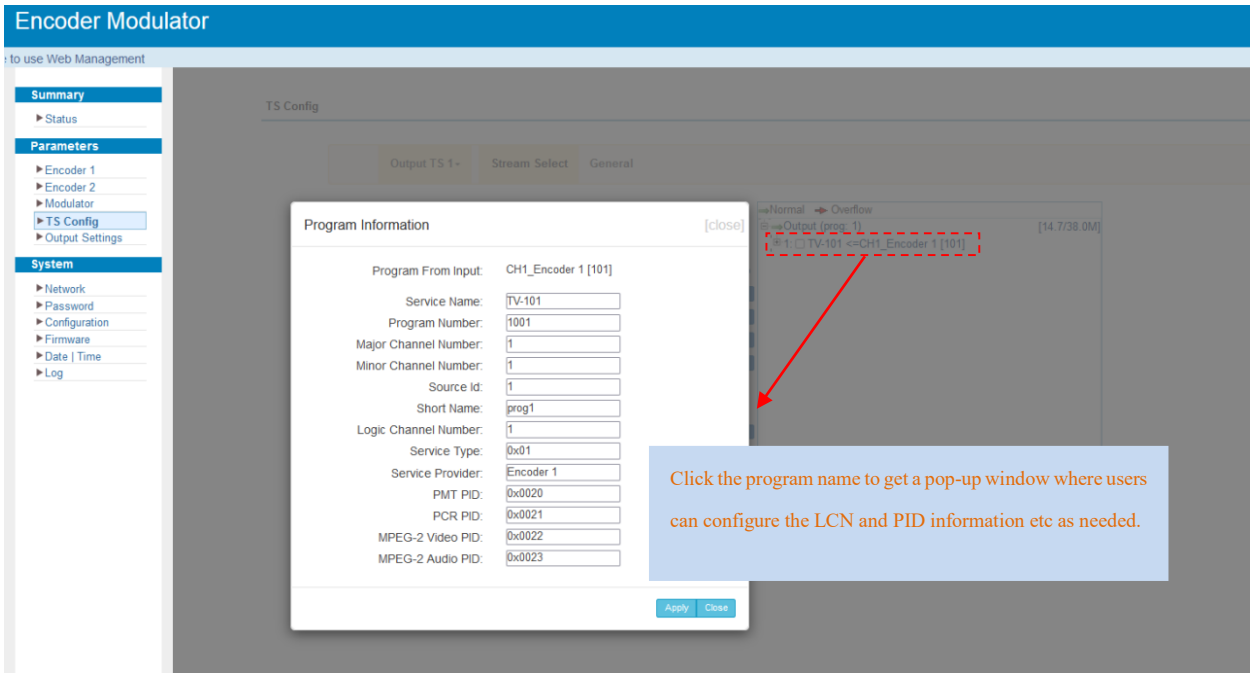

Figure-7

General

Click "General" from the menu to set Character Encoding option according to the program name language, NIT and VCT etc as Figure-8.

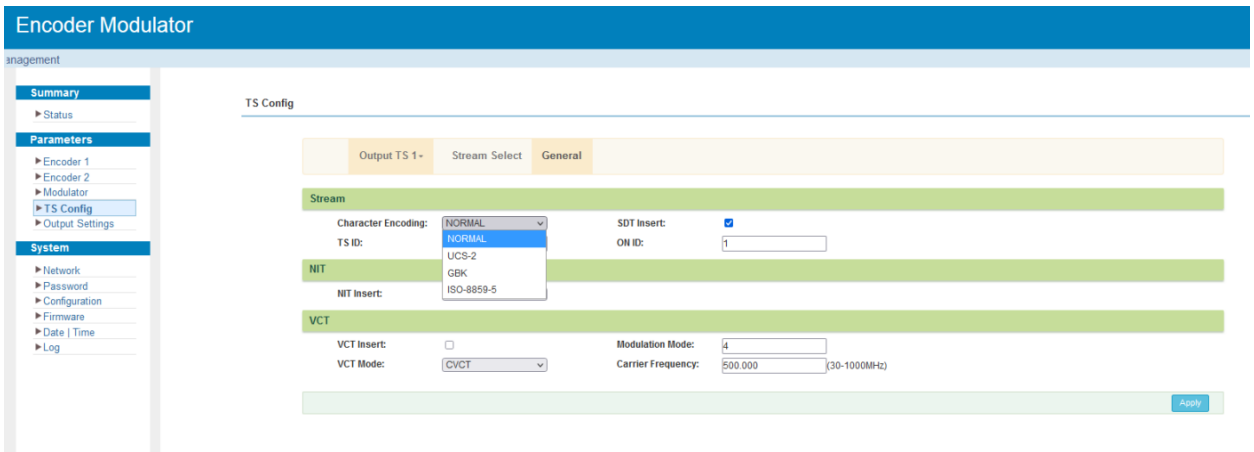

Figure-8

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Set Web Insert for NIT Insert and Click "+" from this page, it will display the screen as Figure-9 where it requires to add NIT descriptor. Please follow your configuration in Modulator page to edit the NIT descriptor.

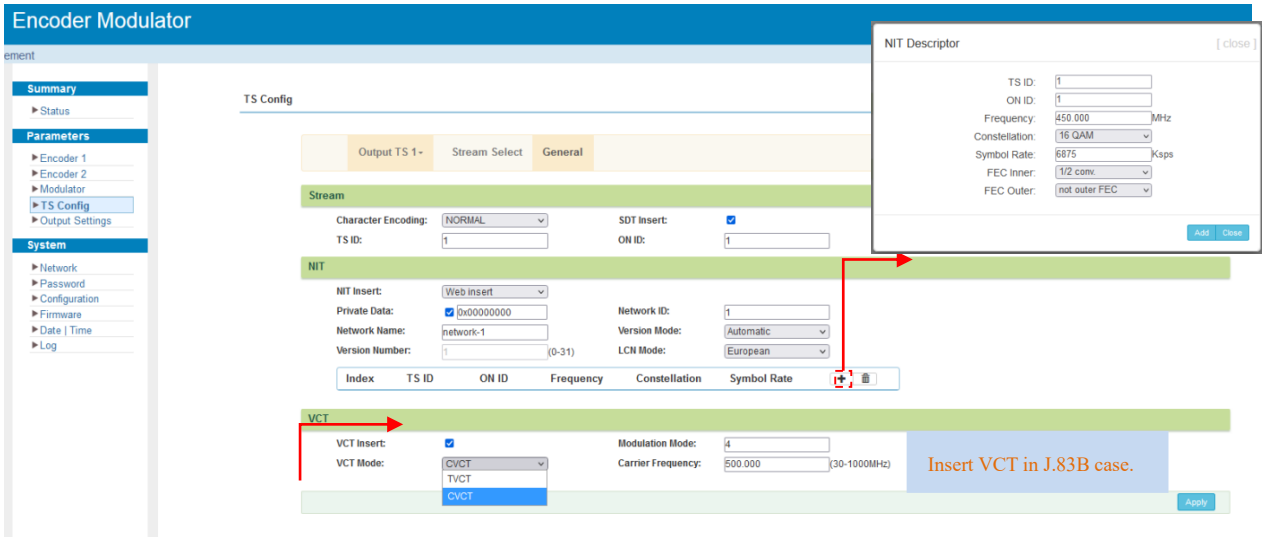


Figure-9

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 .

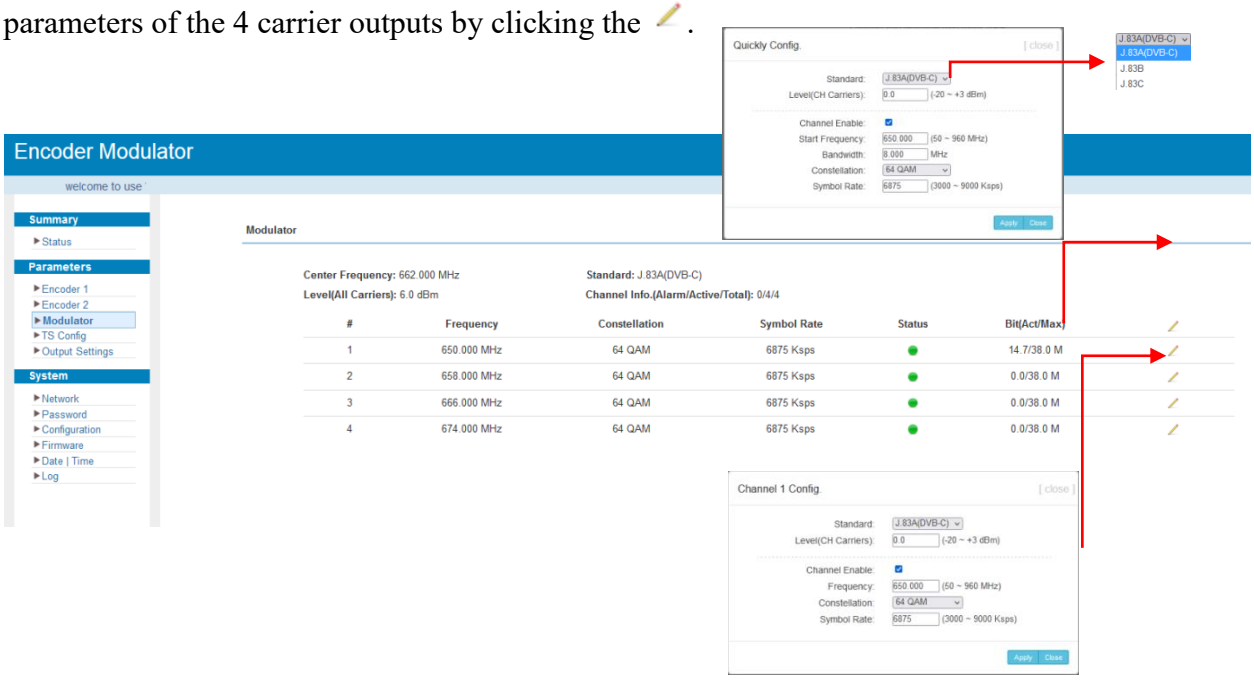


Figure-10

Output Settings

Click "Output Settings" from the left menu, it will display the page as Figure-11 where to configure

the 4 MPTS output and 2 SPTS Output by clicking the .

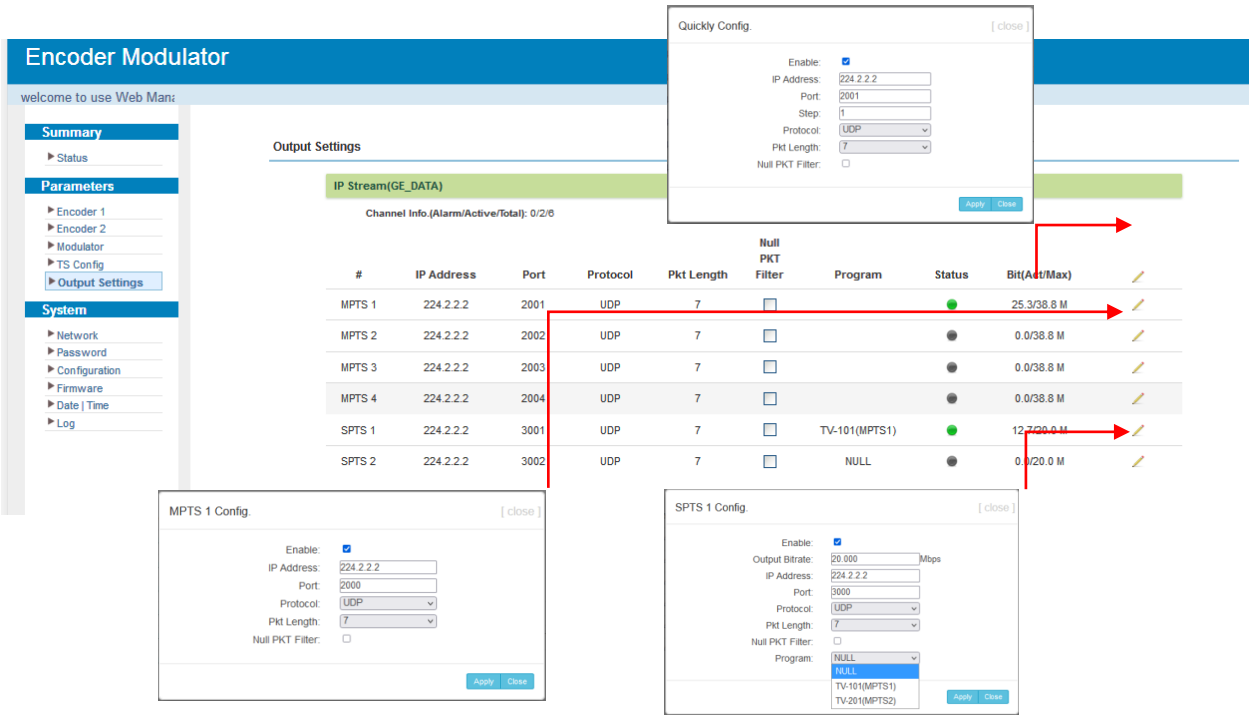


Figure-11

Network

When user clicks “Network”, it will display the page as Figure-12. It displays the network information of the device. Here users can change the device network configuration as needed.

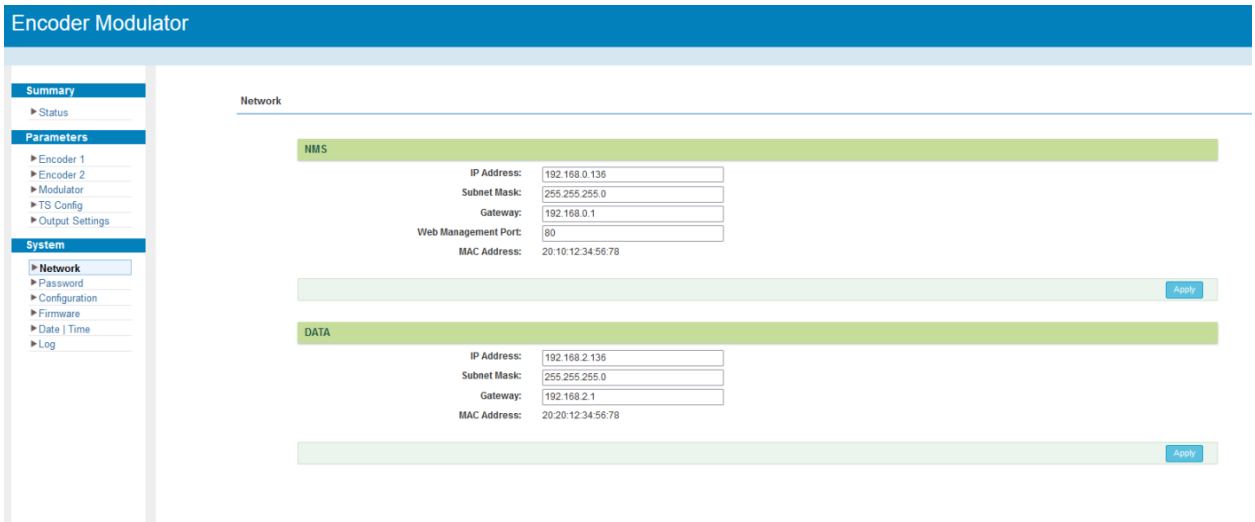


Figure-12

Password

From the menu on left side of the webpage, clicking “Password”, it will display the screen as

Figure-13 where to set the login account and password for the web NMS.

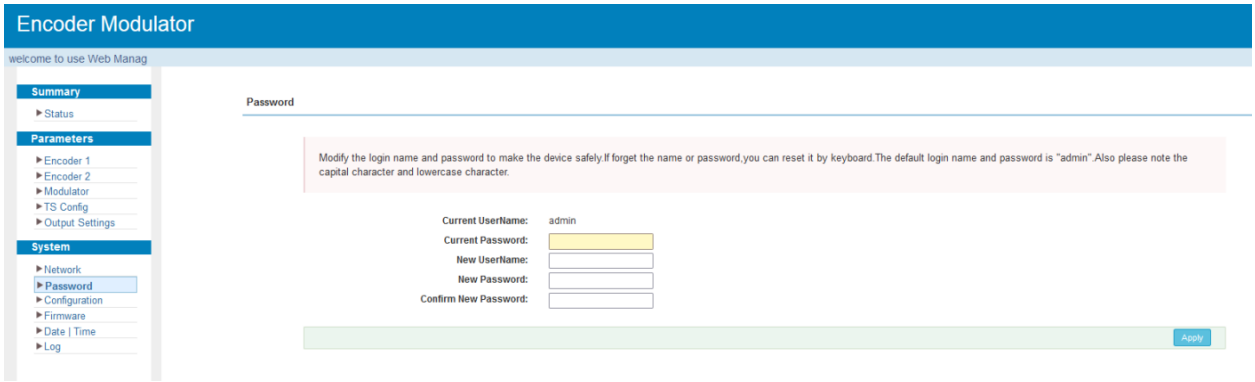
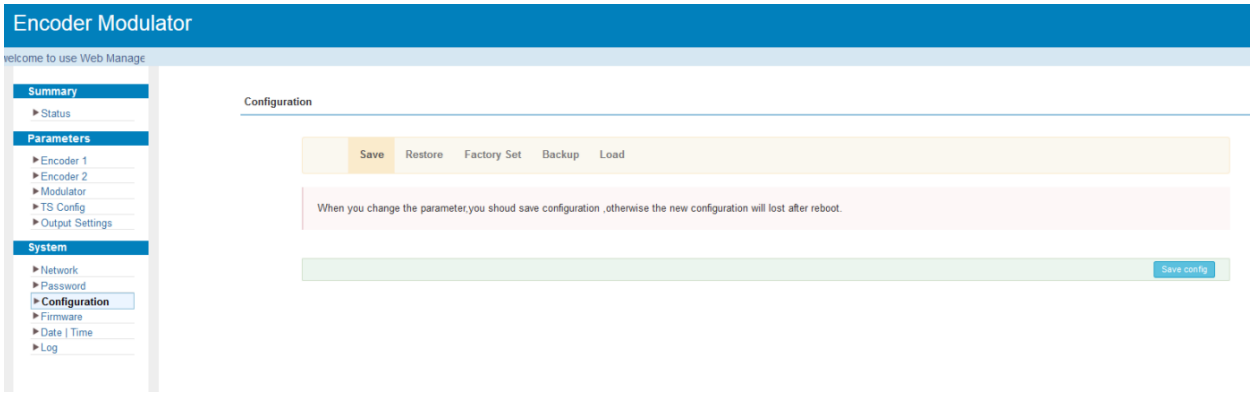
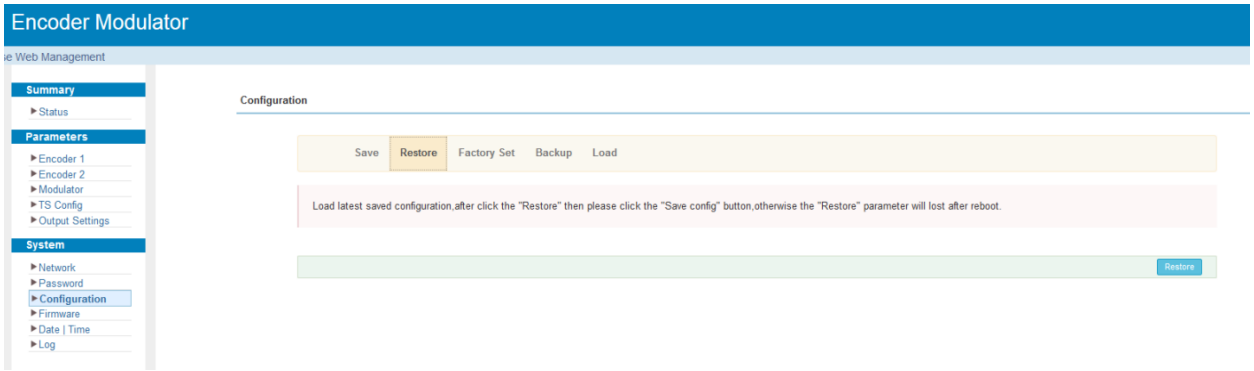


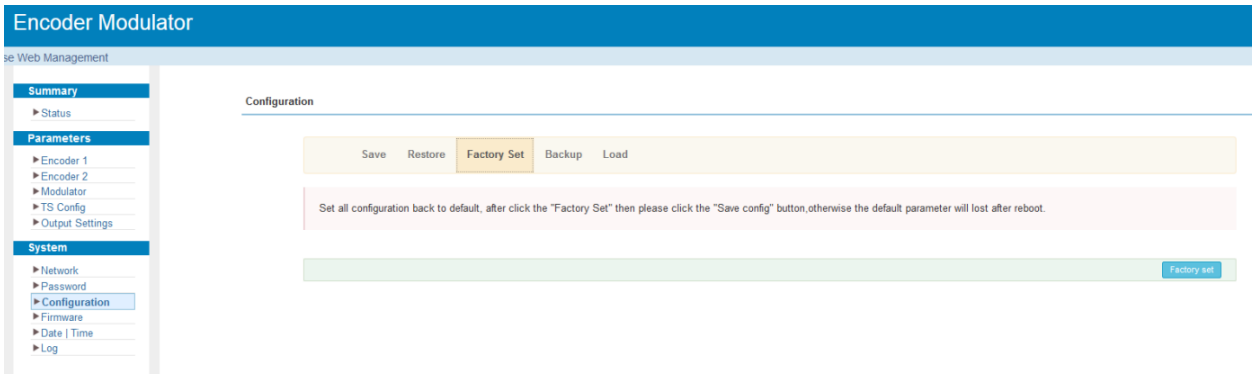
Figure-13

Configuration

From the menu on left side of the webpage, clicking "Configuration", it will display the page as Figure-14 where to save, restore, make factory set, backup and load your configurations.







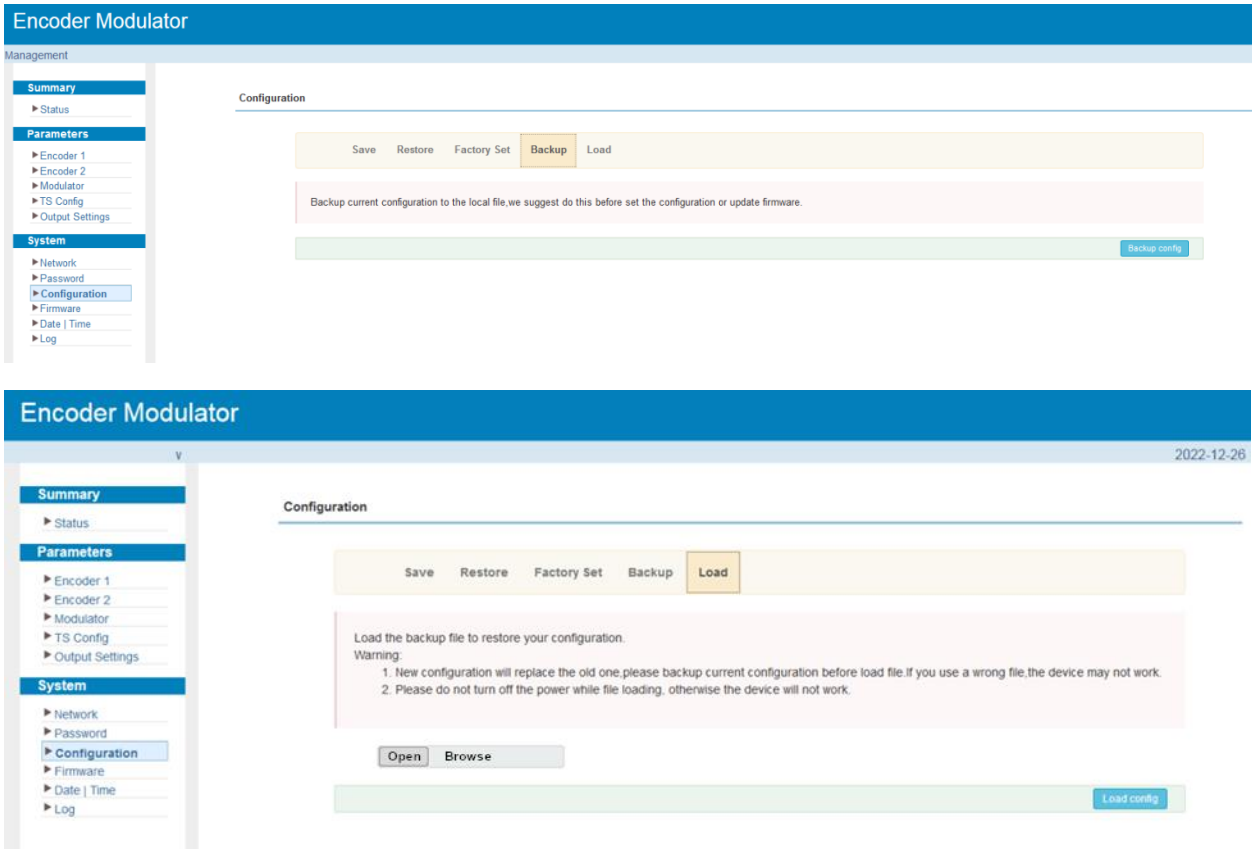


Figure-14

Firmware

From the menu on left side of the webpage, clicking “Firmware”, it will display the screen as Figure-15 where to update firmware for the device.

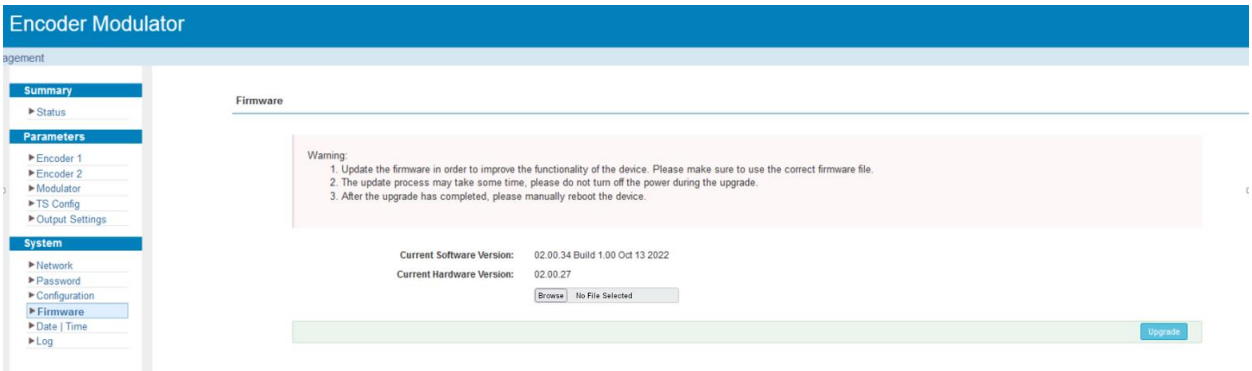


Figure-15

Date | Time

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

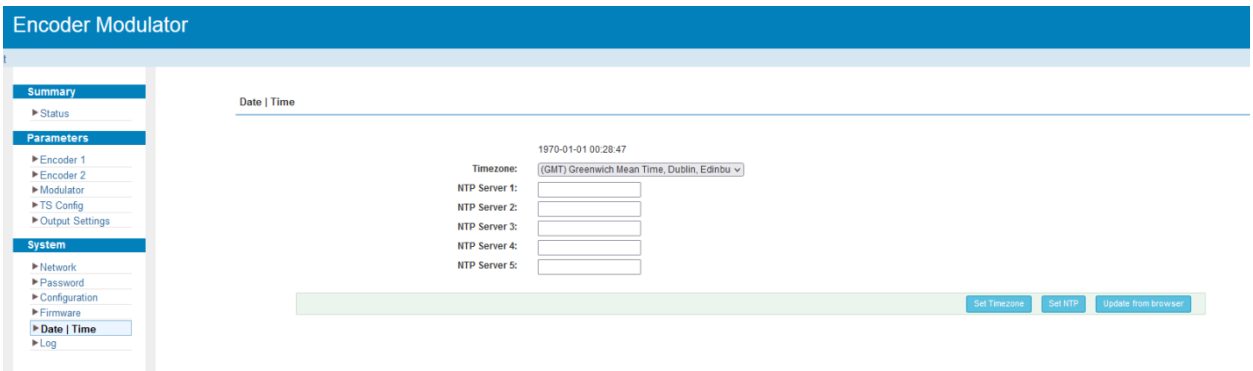


Figure-16

Log:

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

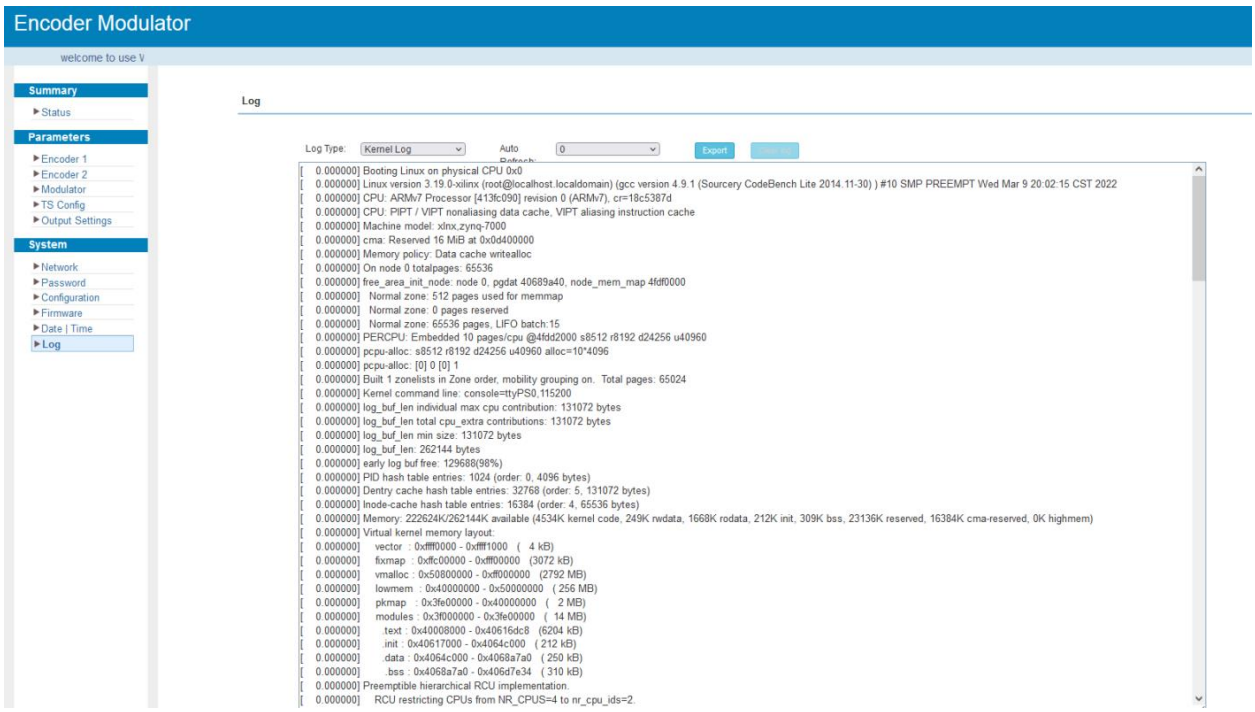


Figure-17

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 °C
- 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