

**16x DVB-C/-T/-T2/-S/-S2, 2xASI, 512xIP  
в 16 QAM трансмодулятор со встроенным  
скреблером**

**User's Manual**



## DIRECTORY

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# Chapter 1 Product Outline

## 1.1 Outline

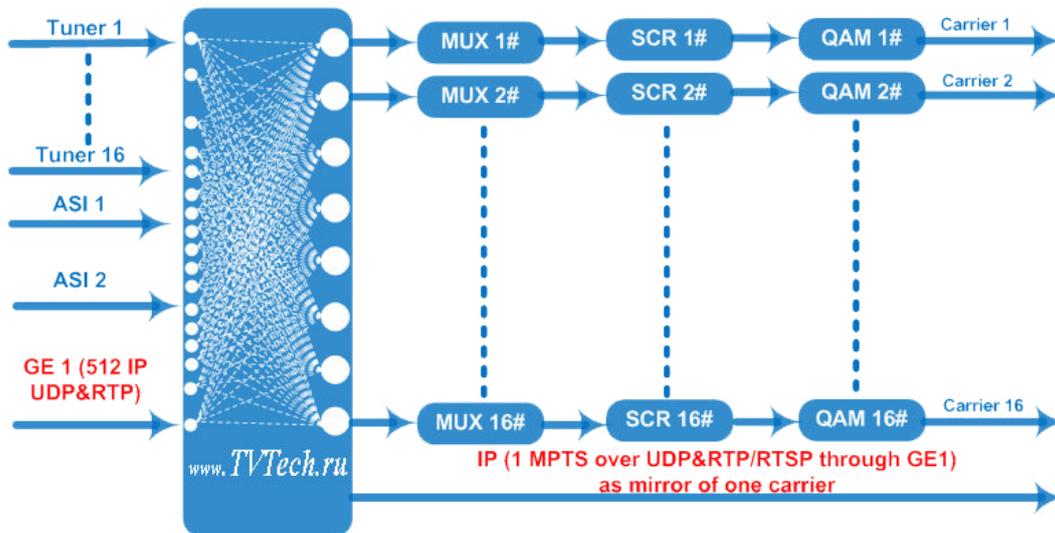
This device is a high performance and cost-effective 16 in 1 Mux-Scrambling QAM modulator designed by us. It has 16 DVB-C (DVB-T/T2/S/S2, ATSC, ISDB-T optional) FTA tuner input to 16 non-adjacent carrier output with multiplexing, scrambling and QAM modulating included. It also supports maximum 512 IP input port and one IP (MPTS) output through GE1 and TS input for re-mux through 2 ASI ports.

It is also characterized with high integrated level, high performance and low cost. It supports dual power supply (optional). This is very adaptable to newly generation CATV broadcasting system.

## 1.2 Features

- **16 DVB-C (DVB-T/T2/-S/S2, ATSC, ISDB-T Optional) FTA Tuner + 2 ASI input+512 IP (GE1 only) input over UDP and RTP protocol**
- **16\*DVB-C RF output**
- **1 IP(MPTS) output over UDP and RTP/RTSP, as mirror of one carrier**
- **Excellent RF output performance index, MER $\geq$ 40db**
- **Support 16 groups multiplexing+16 groups scrambling +16 groups QAM modulating**
- **Support accurate PCR adjusting**
- **Support PSI/SI editing and inserting**
- **Support Web management, Updates via web**
- **Redundancy Power Supply (optional)**

### 1.3 Principle Chart



### 1.4 Technical Specifications

<b>Input</b>	16 DVB-C (DVB-T/T2/-S/S2, ATSC, ISDB-T optional) FTA Tuner		
	512 IP (GE1 only) input over UDP and RTP protocol		
	2 ASI input, BNC interface		
<b>Tuner Section</b>	DVB-C	Standard	J.83A(DVB-C), J.83B, J.83C
		Frequency In	30 MHz~1000 MHz
		Constellation	16/32/64/128/256 QAM
	DVB-T/T2	Frequency In	30MHz ~999.999 MHz
		Bandwidth	6/7/8 M bandwidth
	DVB-S/S2	Input Frequency	950-2150MHz
		Symbol rate	QPSK 1~45Mbauds 8PSK 1~45Mbauds
		Code rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
		Demodulation Mode	QPSK, 8PSK
	ISDB-T	Input Frequency	170~860MHz
ATSC	Input Frequency	30MHz~1000MHz	
	Bandwidth	6M	
<b>Multiplexing</b>	Maximum PID Remapping	128 input per channel	
	Function	PID remapping (automatically or manually)	
		Accurate PCR adjusting	

		Generate PSI/SI table automatically	
<b>Scrambling Parameters</b>	Max simulcrypt CA	4	
	Scramble Standard	ETR289, ETSI 101 197, ETSI 103 197	
	Connection	Local/remote connection	
<b>Modulation</b>	QAM Channel	16	
	Standard	EN300 429/ITU-T J.83A/B	
	MER	≥40db	
	RF frequency	50~960MHz, 1KHz step	
	RF output level	-20~+10dbm(87~107 dbμV),0.1db step	
	Symbol Rate	5.0Msps~7.0Msps, 1ksps stepping	
	Constellation	16/32/64/128/256QAM	
		J.83A	J.83B
	Constellation	16/32/64/128/256QAM	64/256 QAM
	Bandwidth	8M	6M
<b>Stream out</b>	RF output (F type interface)		
	1 IP (MPTS) output over UDP and RTP/RTSP (GE1 only), As mirror of one carrier		
<b>System</b>	Network management (WEB)		
	Chinese and English language		
	Ethernet software upgrade		
<b>General</b>	Dimension (W*D*H)	482mm×300mm×44.5mm	
	Temperature	0~45°C(Operation) ; -20~80°C(Storage)	
	Power	AC 100V±1050/60Hz; AC 220V±10%, 50/60HZ	

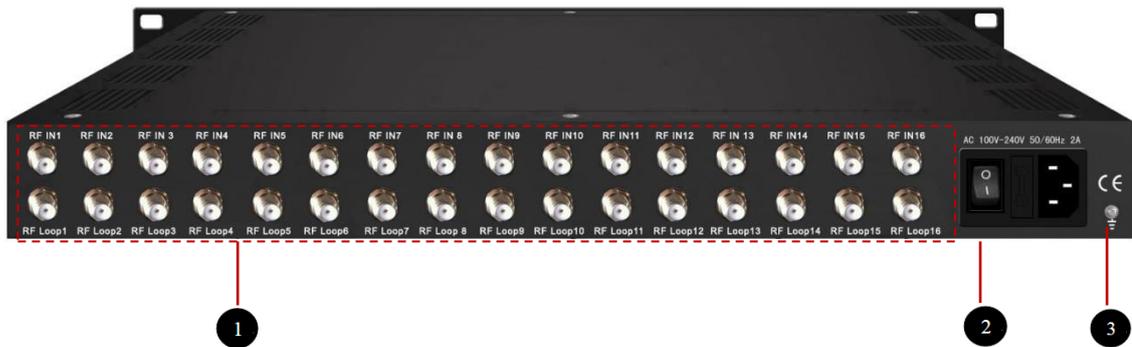
## 1.5 Appearance and description

Front Panel Illustration:



1	Power indicator
2	Reset: Reset webmaster IP address, recover it to default IP address
3	NMS port: Network management interface
4	Data port ( GE1 ) : IP input and output port
5	ASI input port
6	RF Out port

### Rear Panel Illustration



1	16 channels RF IN Interface
2	Integrated power switch and socket
3	Grounding Wire

## Chapter 2 Installation Guide

### 2.1 Acquisition Check

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

- 16 in 1 Mux-Scrambling QAM Modulator
- User's Manual
- Power Cord

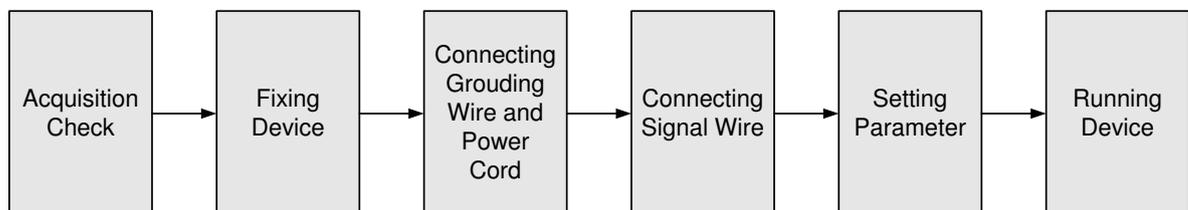
### 2.2 Installation Preparation

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 modulator
- Connecting signal cables
- Connecting communication port (if it is necessary)

#### 2.2.1 Device's Installation Flow Chart 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: $1 \times 10^7 \sim 1 \times 10^{10} \Omega$ , Grounding current limiting resistance: 1M (Floor bearing should be greater than 450Kg/m <sup>2</sup> )
Environment Temperature	5~40°C(sustainable ), 0~45°C(short time), installing air-conditioning is recommended
Relative Humidity	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 100-240V 50-60Hz. Please carefully check before running.

### 2.2.3 Grounding Requirement

- All function modules' good grounding is 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 cables 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<sup>2</sup>.

### 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<sup>2</sup>.

### 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 16 in 1 Mux-Scrambling QAM Modulator, user should set the power switch to “OFF”.**

## 2.4 Signal Cable Connection

The signal connections include the connection of input signal cable and the connection of output signal cable. The details are as follows:

16 in 1 Mux-Scrambling QAM Modulator Cable Illustration:

- **NMS Cable illustration (CAT5):**



- **RF Input/Loop Cable Illustration:**



- **ASI input cable illustration:**



## Chapter 3 Web-based NMS Management

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

### 3.1 login

The default IP address of this device is 192.168.0.136.

Connect the PC (Personal Computer) 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 1 to 254 except 252 to avoid IP conflict).

Use web browser to connect the device with PC by inputting the 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 are defaulted as "admin".) and then click "LOGIN" to start the device setting.

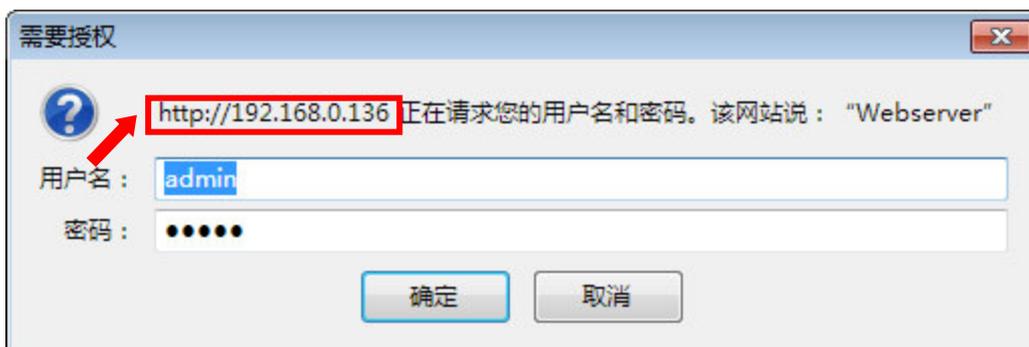


Figure-1

### 3.2 Operation

#### Summary:

When we confirm the login, it displays the WELCOME interface as Figure-2 where users can have an overview of the device's system information and working status.

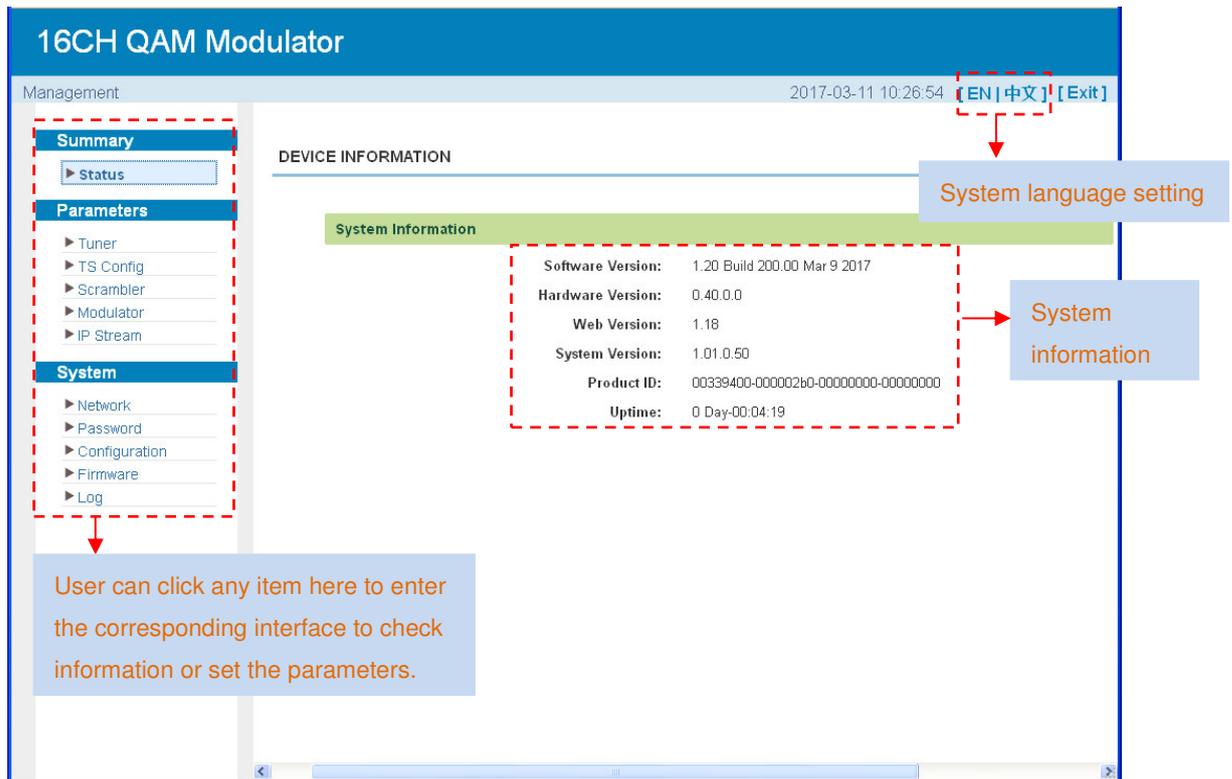


Figure-2

## Parameters → Tuner 1-16

This device supports 16 DVB-S/S2 (DVB-T/T2/C, ATSC, ISDB-T optional) Tuner input. From the menu on left side of the webpage, clicking “Tuner1-16”, it displays the information of each encoding channel as Figure-3.

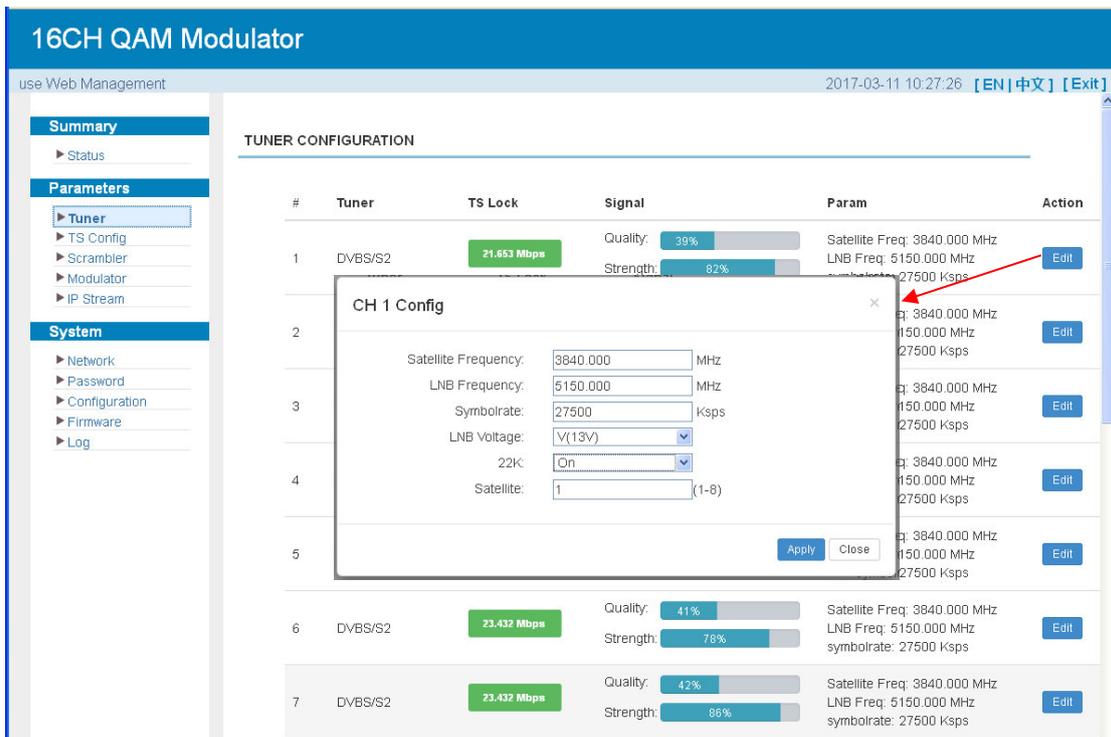




Figure-4

➤ **TS Config→Stream select:**

From the menu on up side of the webpage, clicking “Stream select”, it displays the interface where users can select program(s) to multiplex out and modify program info.

(Figure-5)

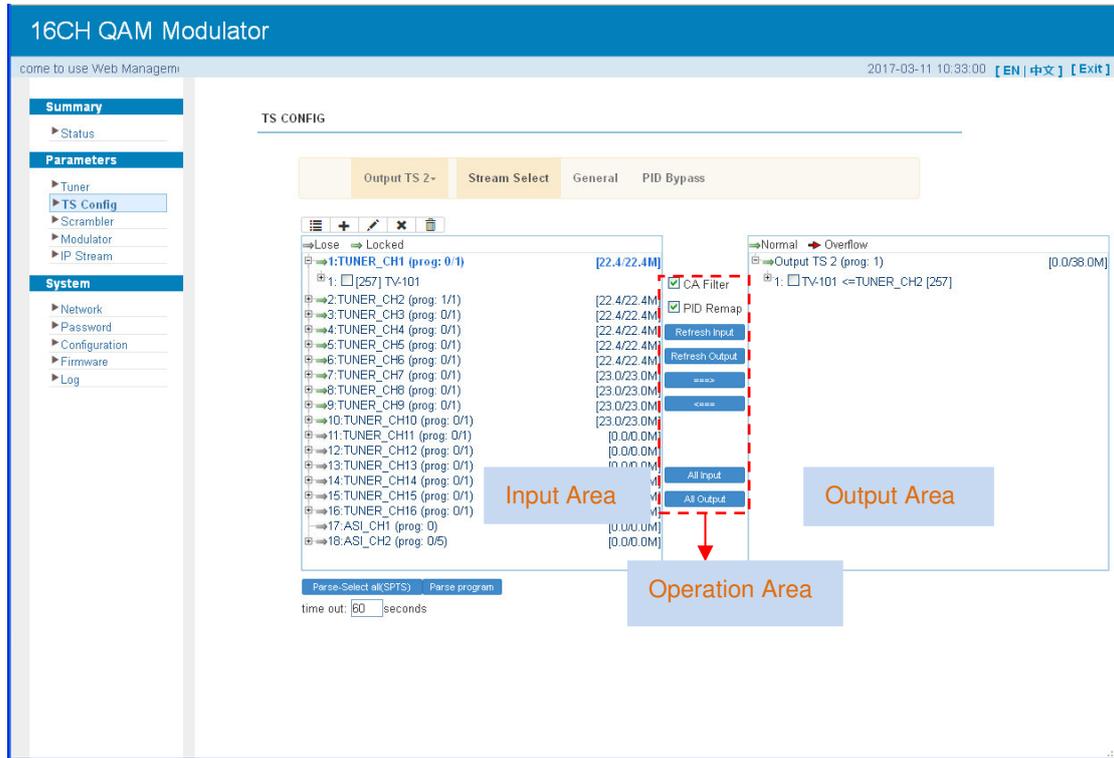


Figure-5

Configure ‘Input Area’ and ‘Output Area’ with buttons in ‘Operation Area’. Instructions are as below:

**+** : To add input channel which come from Data port

**✎** : To edit the input channel

**✕** : To delete the input channel

**🗑** : To delete all inputs channel

**→Lose → Locked** : To check input IP lock or not, green means current IP locked

**→Normal → Overflow** : To check current TS overflow or not, red color means current TS overflow, need to reduce program

**CA Filter** : To filter/not filter the source CA information

**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 one input program first and click this button to transfer the selected program to the right box to output.

**<===** Similarly, user can cancel the multiplexed programs from the right box.

**All Input** To select all the input programs

**All Output** To select all the output programs

**Parse program** To parse programs  seconds time limitation of parsing input programs

### ➤ **Program Modification:**

The multiplexed program information can be modified by clicking the program in the 'output' area. For example, when clicking  TV-201 <=CH2\_Module 2 [201], it triggers a dialog box (Figure 6) where users can input new information.

Program From Input:	TUNER_CH1 [257]
Service Name:	TV-101
Program Number:	101
Logic Channel Number:	1
Service Type:	0x01
Service Provider:	TV-Provider
PMT Descriptor Tag:	<input type="checkbox"/> 0x00
PMT Descriptor Data:	(Hex)
PMT PID:	0x0020
PCR PID:	0x0021
MPEG-2 Video PID:	0x0022
MPEG-1 Audio PID:	0x0023

Figure-6

### ➤ **TS Config→General:**

From the TS Config menu on up side of the webpage, clicking "General", it displays the interface where users can set output mode, enable PSI/SI table out, NIT insert/VCT insert, PCR correction. (Figure-7)

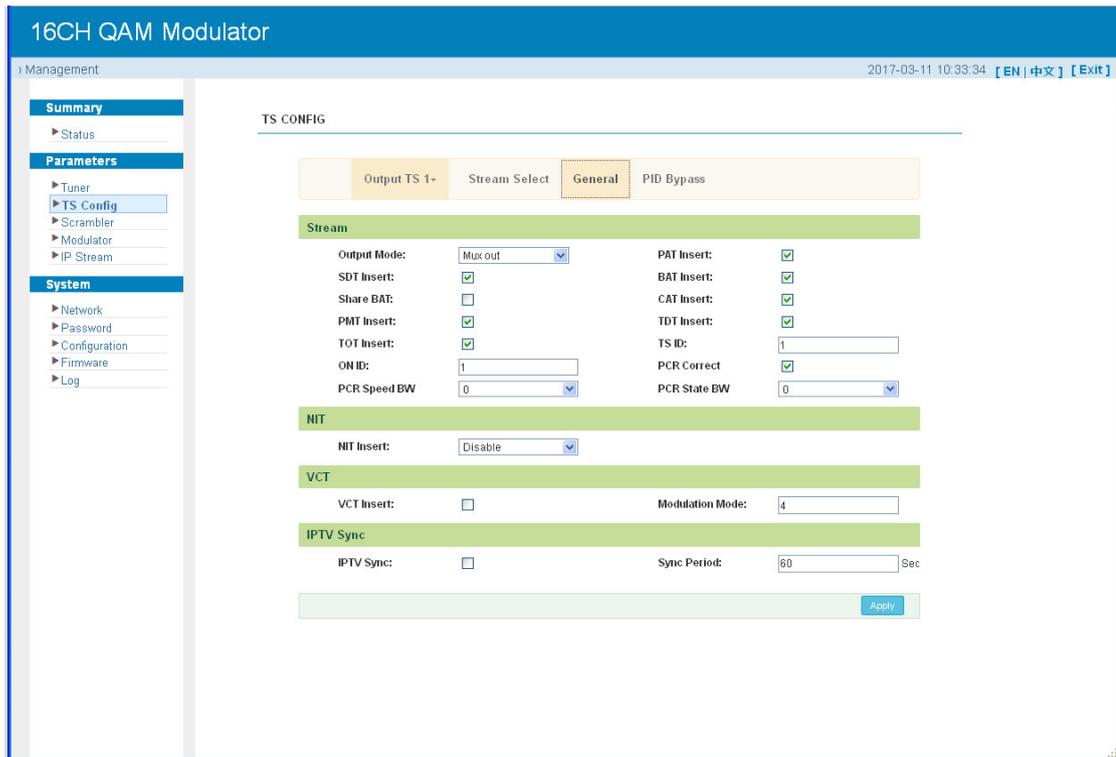


Figure-7

➤ **TS Config→PID Bypass:**

From the TS Config menu on up side of the webpage, clicking “PID Bypass”, it displays the interface as Figure-8 where user can add PIDs to be passed, click the “+” symbol, input current IP channel number, then input current IP source PID and output PID which is customer needed , then click “set” to apply the parameters.

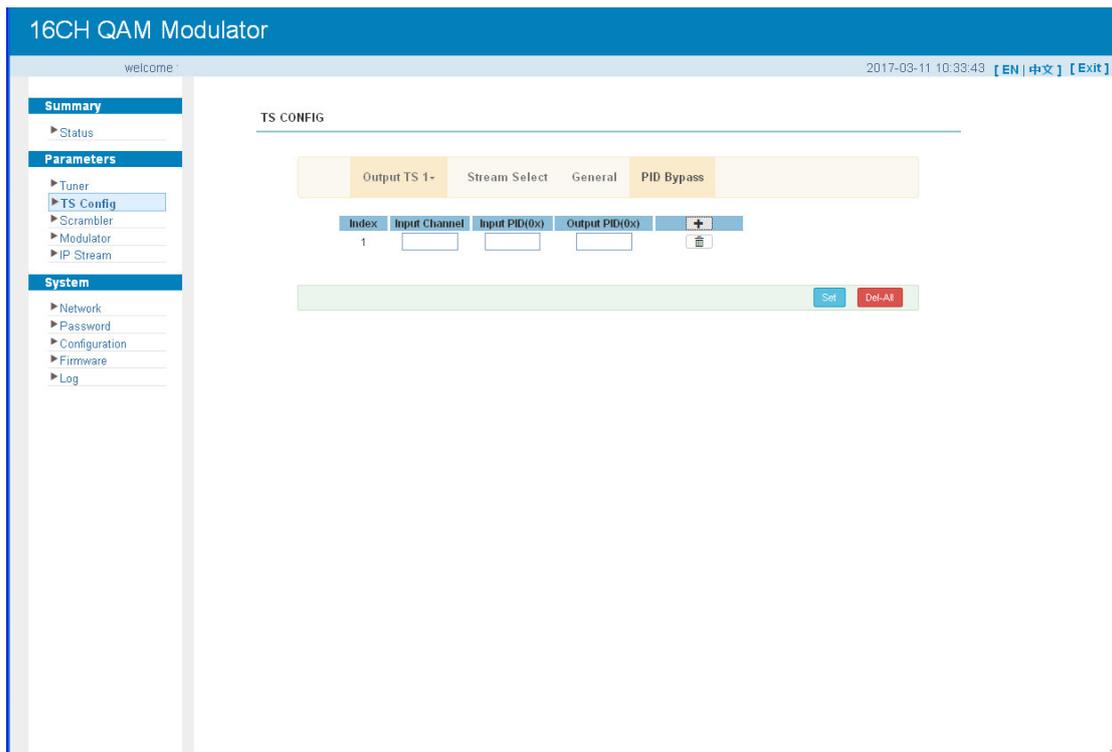


Figure-8

### Parameters → Scrambler:

From the menu on left side of the webpage, clicking “Scrambler”, it displays the interface where users can choose the programs to scramble (Figure-9).

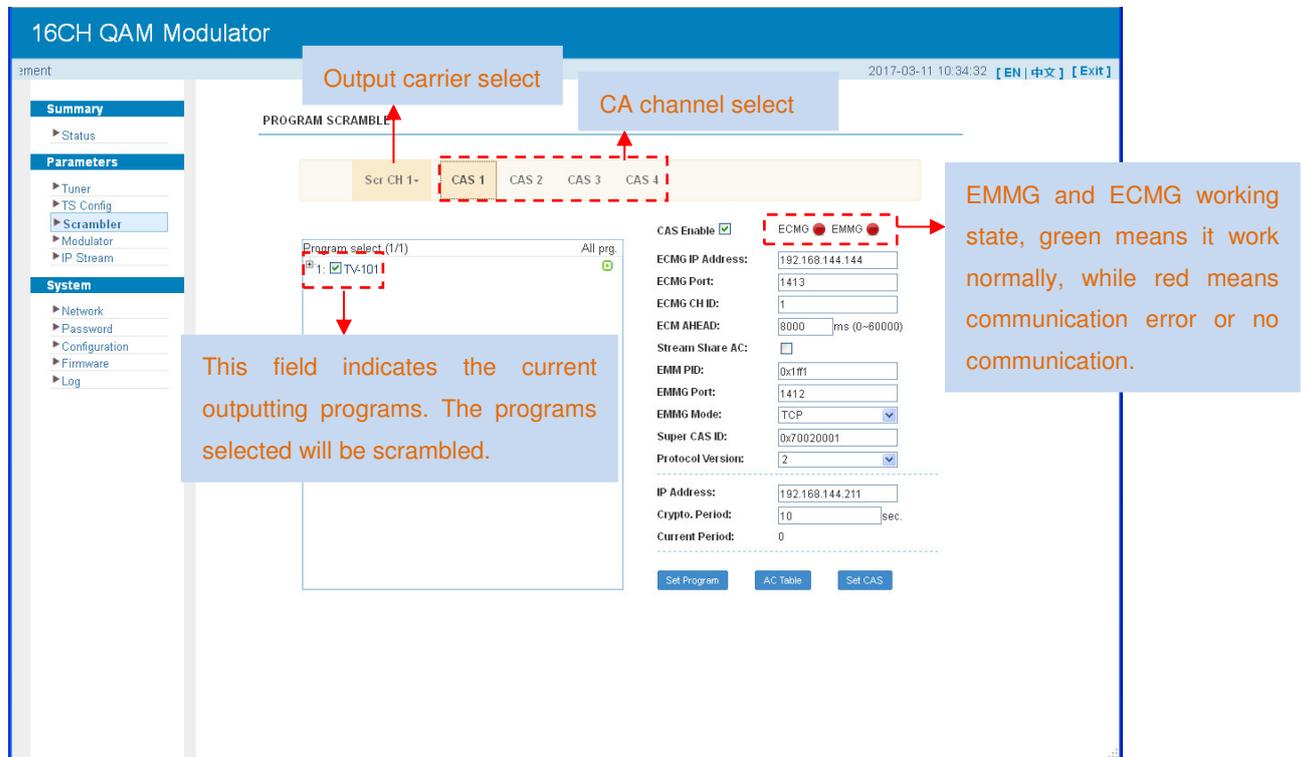


Figure-9

### Parameters → Modulator:

From the menu on left side of the webpage, clicking “Modulator”, it displays the Modulator Configuration screen as Figure-10. Here user can set modulation parameters.

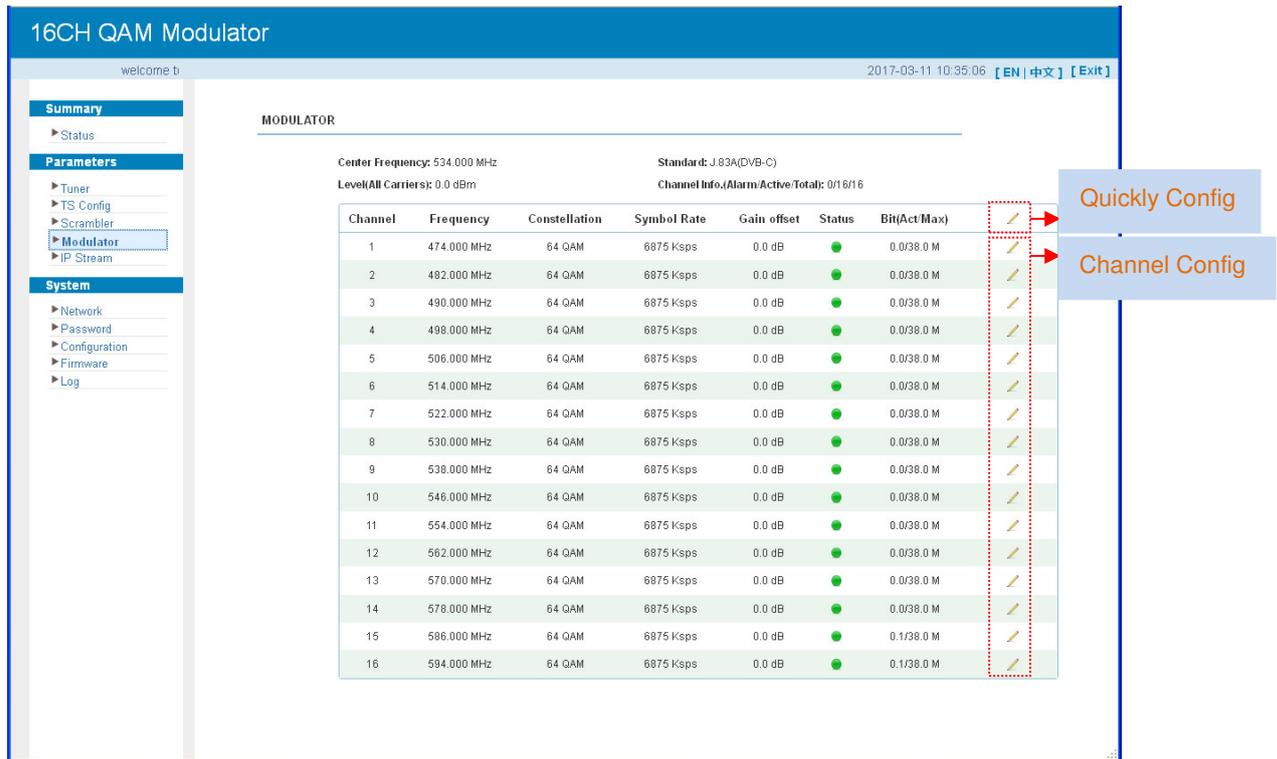
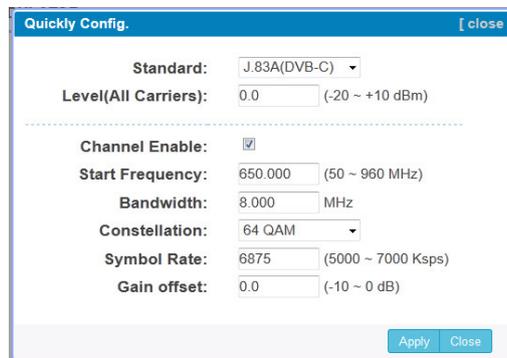


Figure-11

When users click “quickly config” button, it triggers a dialog box as follow where users can set all channels configuration.



When users click “Channel config” button, it triggers a dialog box as follow where users can set the corresponding channel configuration.



### Parameters → IP Stream:

This device supports TS to output in IP (1\*MPTS) format as copy of one carrier

through the DATA port.

Clicking “IP Stream”, it displays the interface where to set IP out parameters (Figure-12).

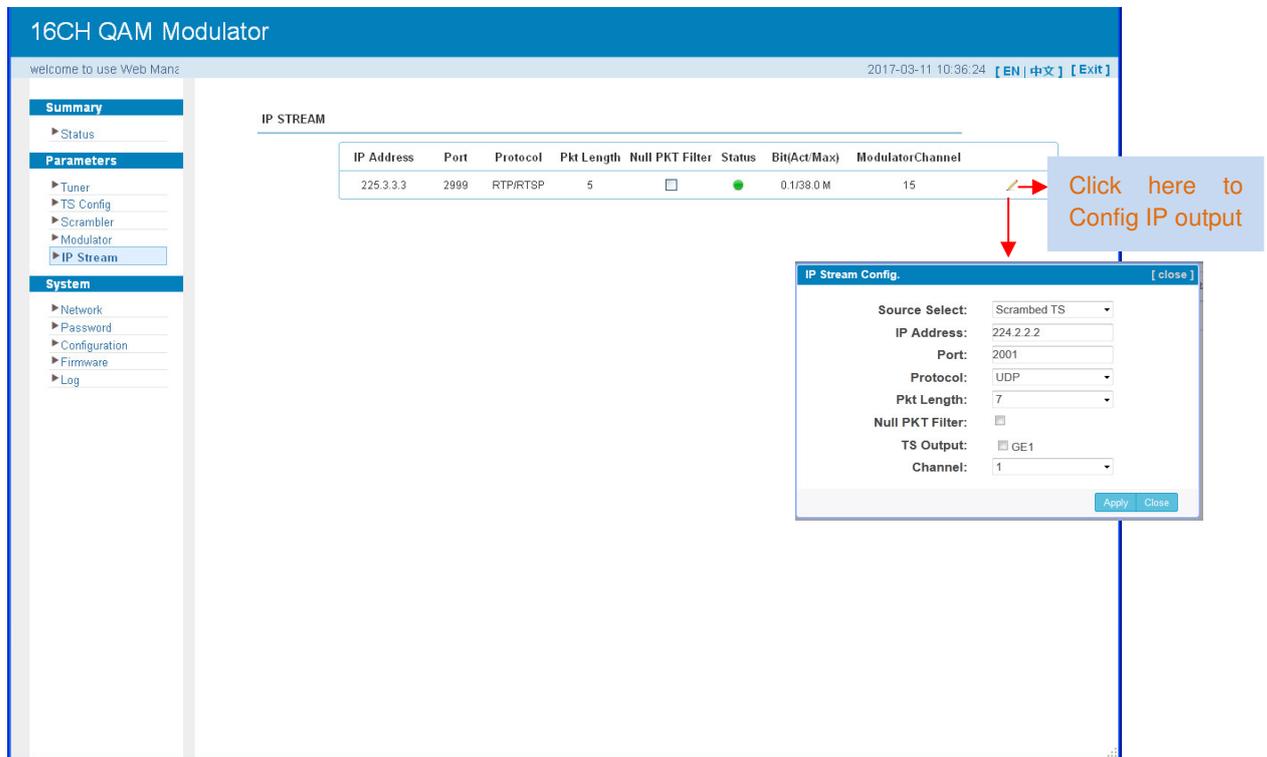


Figure-12

### System → Network:

Clicking “Network”, it displays the interface as Figure-13 where to set network parameters.

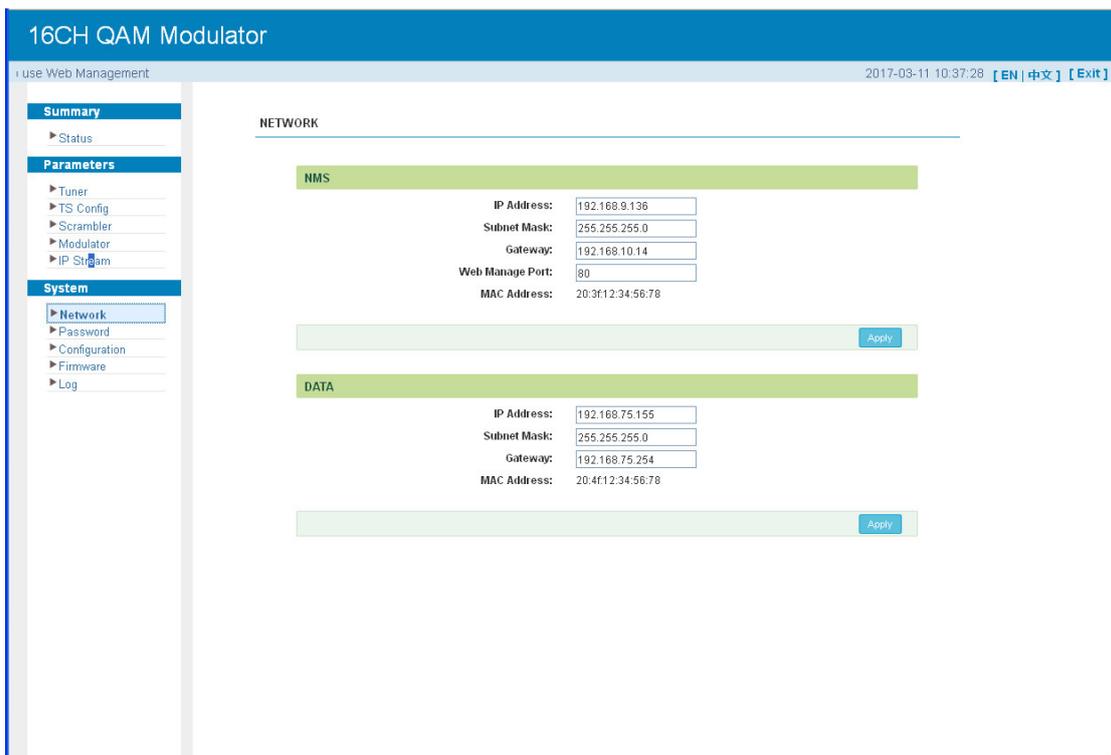


Figure-13

## System → password

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

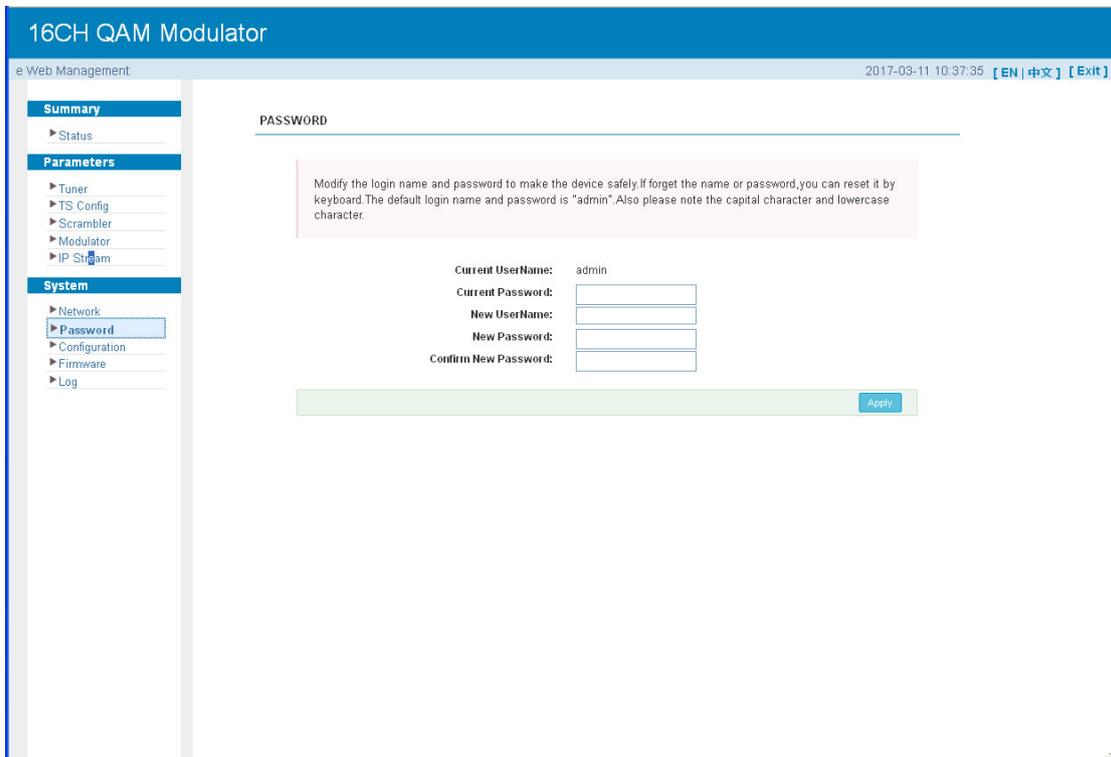


Figure-14

## System → Configuration:

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

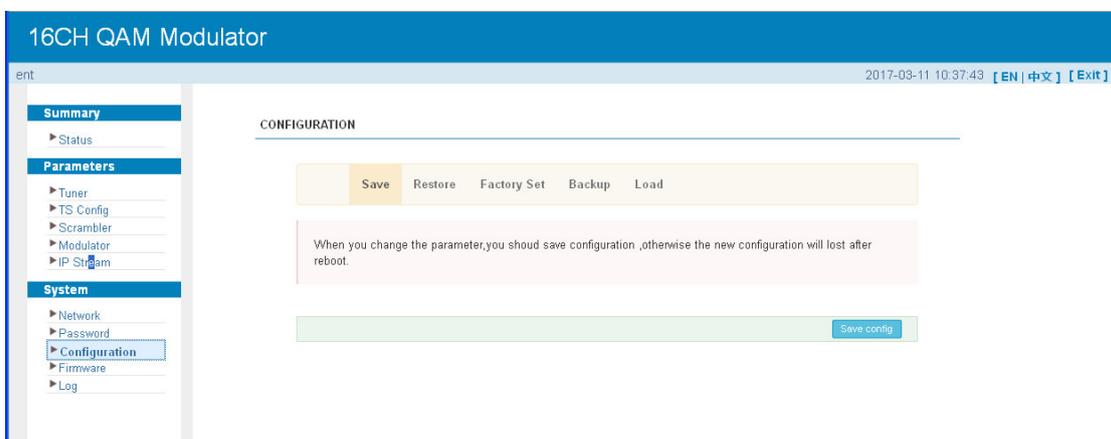


Figure-15

### System → 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 this modulator.

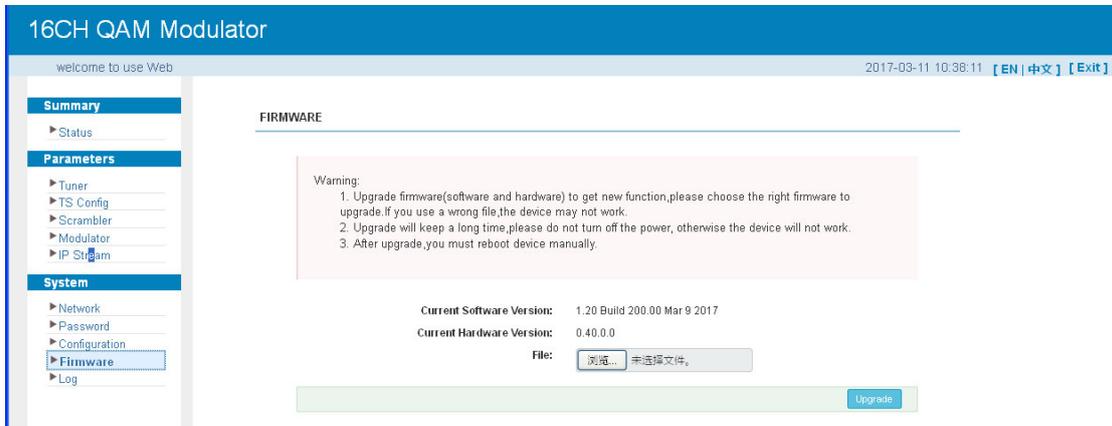


Figure-16

### System→ Log:

From the menu on left side of the webpage, clicking “Log”, it will display the log interface as Figure-17 where to check or export the Kernel/System log.

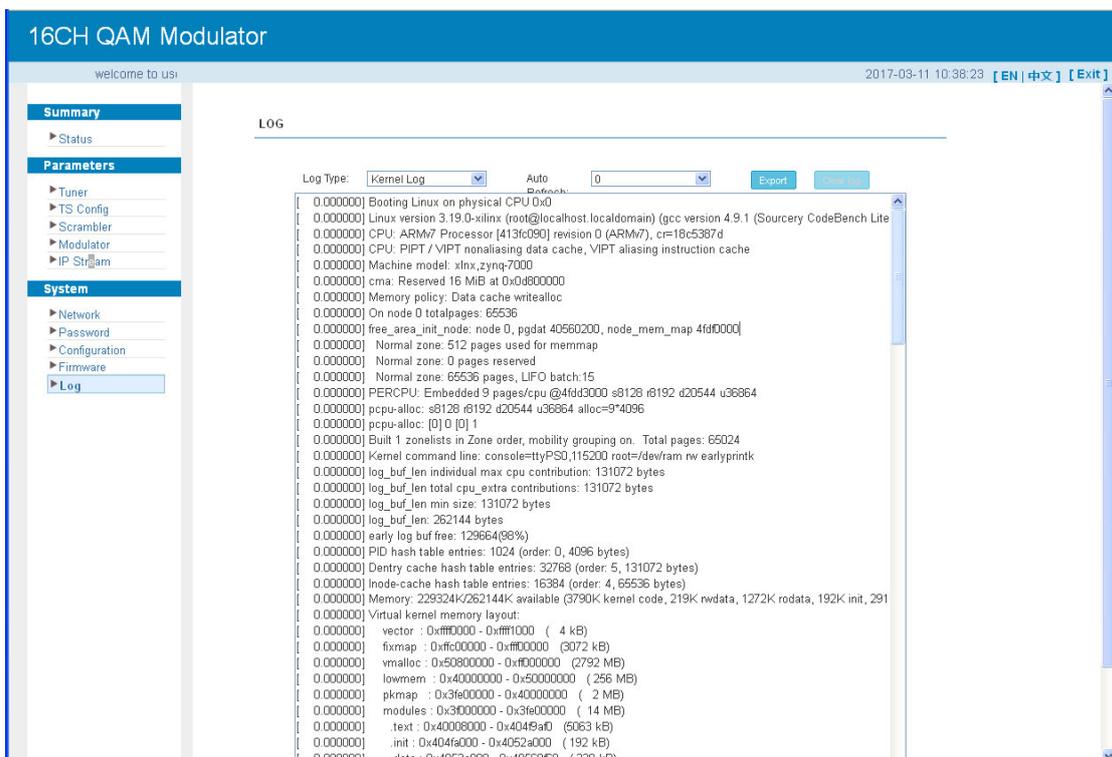


Figure-17

## Chapter 4 Troubleshooting

Our ISO9001 quality assurance system has been approved by CQC organization. For guarantee the products' quality, reliability and stability. All 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 voltage 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 5 Packing List

- 16 in 1 Mux-Scrambling QAM Modulator 1pc
- User's Manual 1pc
- Power Cord 1pc