User Manual

H-IPRF-16QAM

Revision 2017

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A Note from Thor Broadcast about this Manual

Intended Audience

This user manual has been written to help people who have to use, integrate and to install the product. Some chapters require some prerequisite knowledge in electronics and especially in broadcast technologies and standards.

Disclaimer

 The contents of this document are subject to revision without notice due to continued progress in methodology, design and manufacturing. Thor shall have no liability for any error or damage of any kind resulting from the use of this document.

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Chapter 1 Product Overview

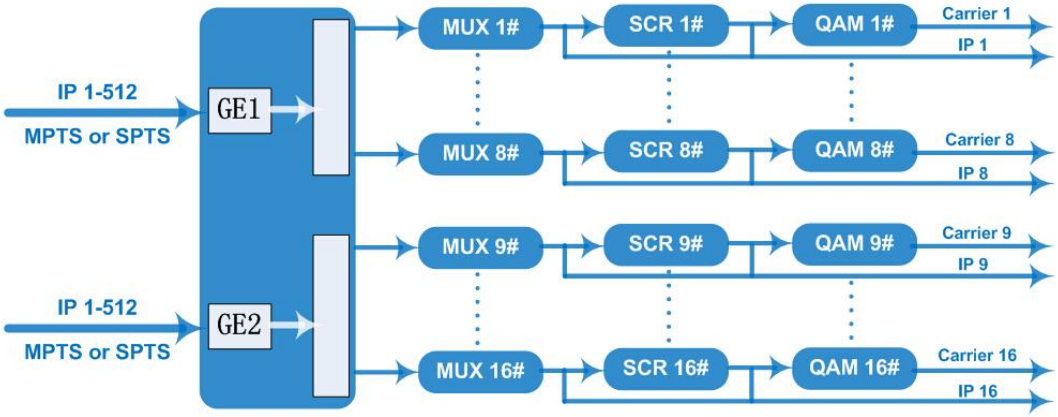
1.1 Outline

The Thor Broadcast new Edge QAM Modulator is a new 1 RU chassis headend in a box that will ingest IP feeds and convert to a QAM channel lineup of your choosing. The latest gen unit has an inclusive chassis that no longer uses blades but does all necessary functioning preloaded to successfully convert IP streams to 16 (or 32- model dependent) QAM channels to create your own efficient IPTV headend into an RF headend. This powerhouse will scramble, multiplex, and modulate up to 16 or 32 channels that supports a maximum 1024 IP TS streams through the 2 GE ports and output 16 or 32 non-adjacent carriers (50MHz~960MHz) via the single RF output interface on the rear of the unit. High performance encoding means you can now distribute countless channels into the bandwidth of 16 QAM carriers.

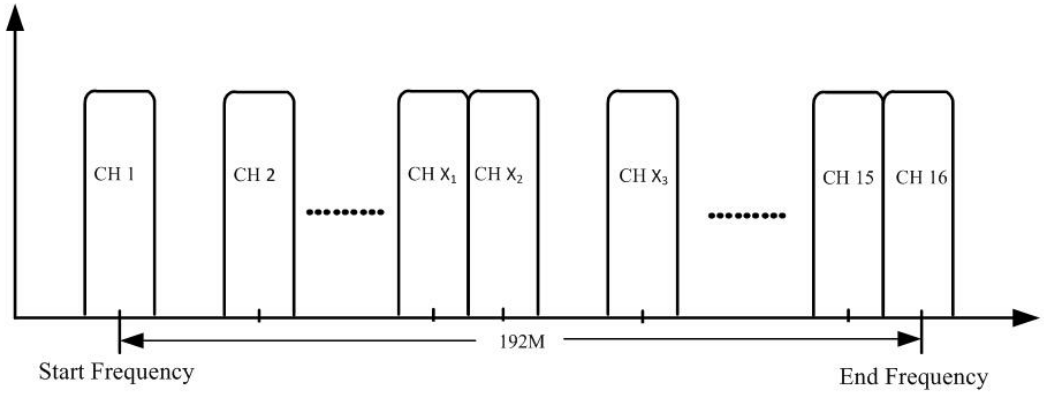
1.2 Key Features

- **2 GE input, SFP interface**
- **Supports up to 1024 channels TS over UDP/RTP, unicast and multicast, IGMP v2\v3**
- **Max 840Mbps for each GE input**
- **Accurate PCR adjusting**
- **CA PID filtering, remapping and PSI/SI editing**
- **Up to 180 PIDS remapping per channel**
- **DVB general scrambling system (ETR289), simulcrypt standards ETSI 101 197 and ETSI 103 197**
- **16 multiplexed or scrambled TS over UDP/RTP/RTSP output**
- **16 non-adjacent QAM carriers output, compliant to DVB-C (EN 300 429) and ITU-T J.83 A/B**
- **RS (204,188) encoding**
- **NMS Web-based Network management**

1.3 General Mapping



1.4 Carrier Setting Illustration



1.5 Specifications

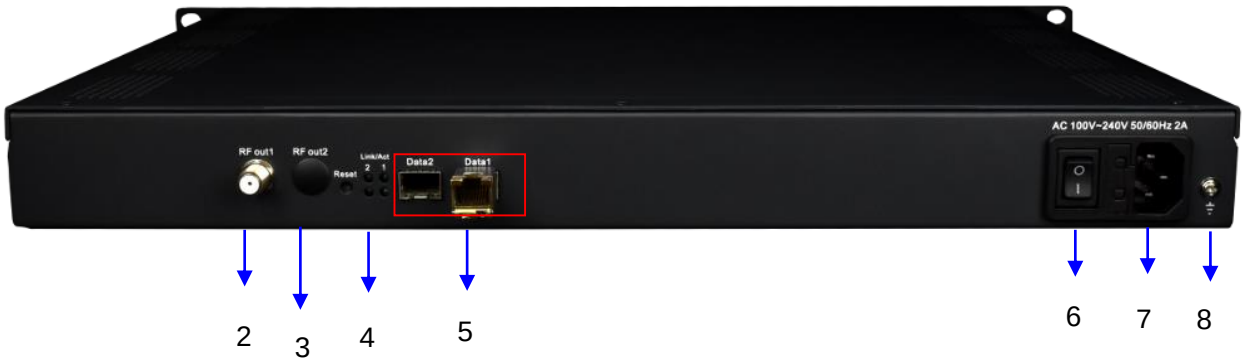
Input	Input	512×2 IP input, 2 100/1000M Ethernet Port (SFP)
	Transport Protocol	TS over UDP/RTP, unicast and multicast, IGMP V2/V3
	Transmission Rate	Max 840Mbps for each GE input
Mux	Input Channel	1024
	Output Channel	16
	Max PIDs	180 per channel
	Functions	PID remapping(auto/manually optional)
		PCR accurate adjusting
		PSI/SI table automatically generating
Scrambling Parameters	Max simulscrypt CA	4
	Scramble Standard	ETR289, ETSI 101 197, ETSI 103 197
	Connection	Local/remote connection
Modulation Parameters	QAM Channel	16 non-adjacent carriers
	Modulation Standard	EN300 429/ITU-T J.83A/B
	Symbol Rate	5.0~7.0Msps, 1ksps stepping
	Constellation	16, 32, 64, 128, 256QAM
	FEC	RS (204, 188)
RF Output	Interface	1 F-type output port for 16 carriers, 75Ω
	RF Range	50~960MHz, 1kHz stepping
	Output Level	-20dBm~+10dBm(87~117dbμV), 0.1dB stepping
	MER	≥ 40dB
	ACLR	-60 dBc
TS output	16 IP output over UDP/RTP/RTSP, unicast/multicast, 2 100/1000M Ethernet Ports	
System	Network management software (NMS)	
General	Demission	420mm×440mm×44.5mm (WxLxH) – 1RU
	Weight	3kg
	Temperature	0~45℃(operation), -20~80℃(storage)
	Power Supply	AC 100V±10%, 50/60Hz or AC 220V±10%, 50/60Hz
	Consumption	15.4W

Chapter 2 - Appearance

2.1 Frontal View:

1

2.2 Rear Panel Illustration:



2 3 4 5 6 7 8

1	NMS/CAS: network management port and CA data port
2	RF output port
3	Reset IP: Reset webmaster IP address, recover to default IP address
4	Link/Act Indicators
5	Data Input/Output 1/2 (SFP)
6	Power switch
7	AC Power Socket
8	Ground

Chapter 3 Installation Guide

3.1 In the Box

When you open the Thor Edge QAM powerhouse, please check all items according to packing list.

Normally it should include the following items:

- H-IPRF-16/32QAM
- User's Manual
- Power Cord

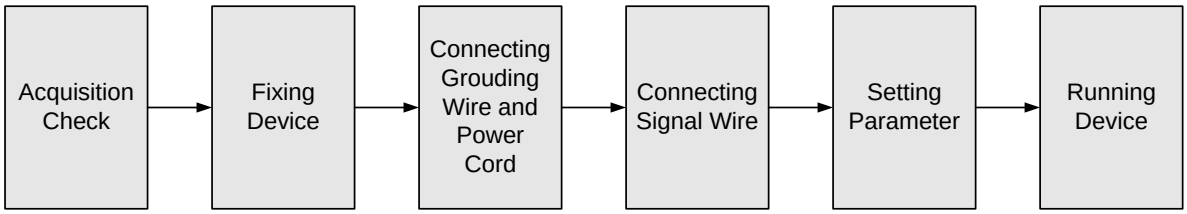
If any item is missing with the list above, please contact Thor Broadcast – 1-800-521-8467

3.2 Installation Preparation

The main steps of the installation include:

- Checking the possible device for missing pieces or damage from transport
- Preparing relevant environment/rack for installation
- Installing the IP to QAM Modulator
- Connecting signal cables
- Connecting communication port (if it is necessary) ; (it is necessary ☺)

3.2.1 Device's Installation Flow Chart Illustrated as follows：



3.2.2 Environment

Item	Requirement
Machine Hall Space	When installing unit on rack, 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, HVAC anti-static material:$1X10^{7}$~$1X10^{10}\Omega$, Grounding current limiting resistance: 1MΩ (Floor bearing should be greater than 450Kg/㎡)
Environment Temperature	5~40℃(sustainable)，0~45℃(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
Fire Protection	Fire alarm system and extinguisher
Power	Device power, HVAC and lighting should be independent to each other. Device power requires AC 110V±10%, 50/60Hz or AC 220V±10%, 50/60Hz. Please carefully check before running.

3.2.3 Grounding

- ✓ It is important to keep this device grounded to ensure all of the modules function correctly. Correctly grounding the device will also help prevent any electrical interference, lightening. Etc. Also it helps reject minor interference that may disrupt the devices ability to function smoothly. General rule of them, make sure the device is grounded when installing anywhere.
- ✓ Always use copper wire. When applied correctly the ground must be wrapped well to ensure maximum conduction so it can reduce any high frequencies. The copper ground wire should also be as short and thick as possible
- ✓ Installer must make sure that the two ends of the ground are well conducted and have appropriate anti-rust properties.
- ✓ It is prohibited to use any other device as part of the grounding electric circuit.
- ✓ The area of the conduction between the ground wire and device's frame should be no less than 25 ㎡.

Chapter 4 Web NMS Management

This is literally how you control the device; there is no front interface with D-Pad

4.1 Login

The factory default IP address is 192.168.0.136 and users can connect the device and web NMS through this IP address.

Connect the PC (Personal Computer) and the device with a net cable, and use ping command to confirm they are on the same network segment. For instance, 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). Launch the web browser an input the device 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.

This is the front splash screen with details on your unit – Status & Summary

Figure-1

4.2 Operation

4.2.1 Summary

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

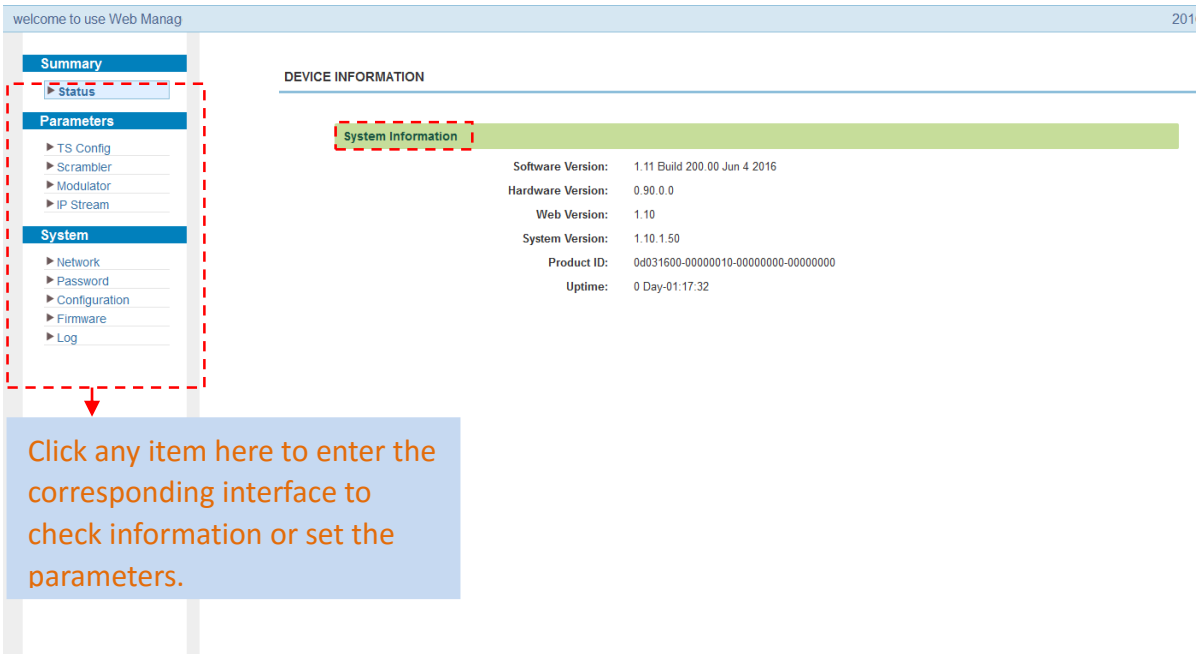


Figure-2

4.2.2 Parameters

Parameters → TS Config:

Click “TS Config”, it displays the interface where users can configure the output TS parameters in this interface. (Figure-3)

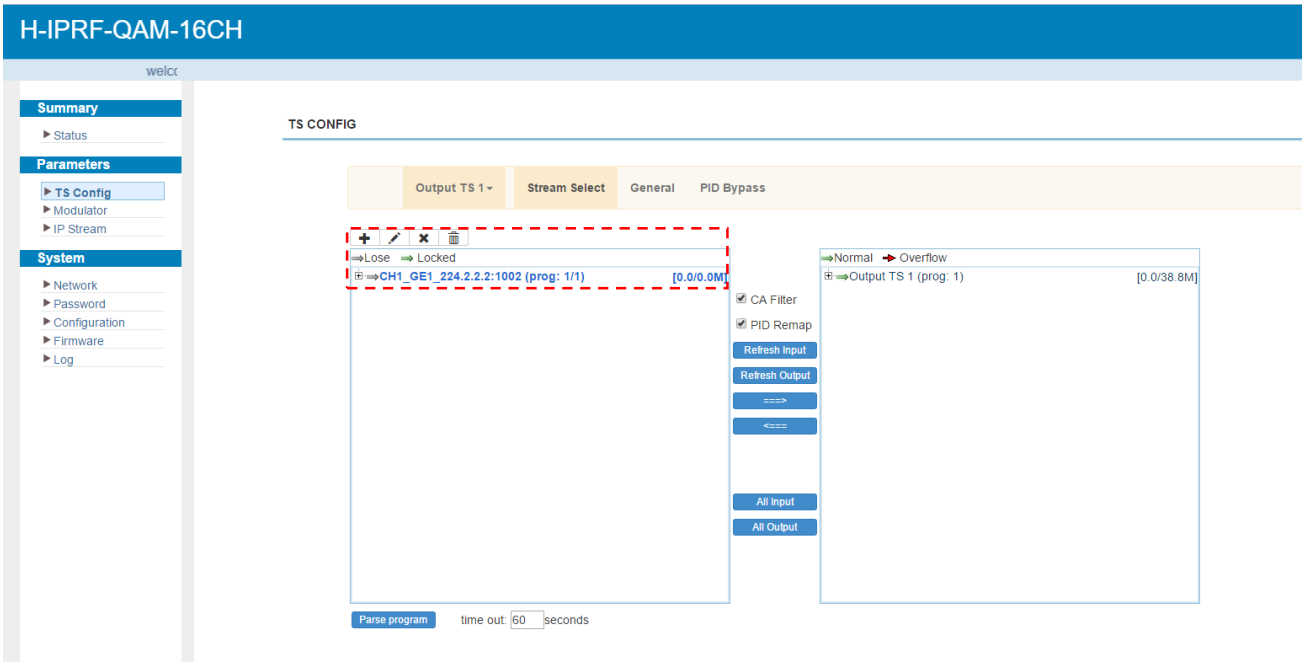


Figure-3

➢ Output TS X

From the menu on top of the webpage, click “Output TS X”, it’ll display the interface as in Figure-4. Select the output TS channels.

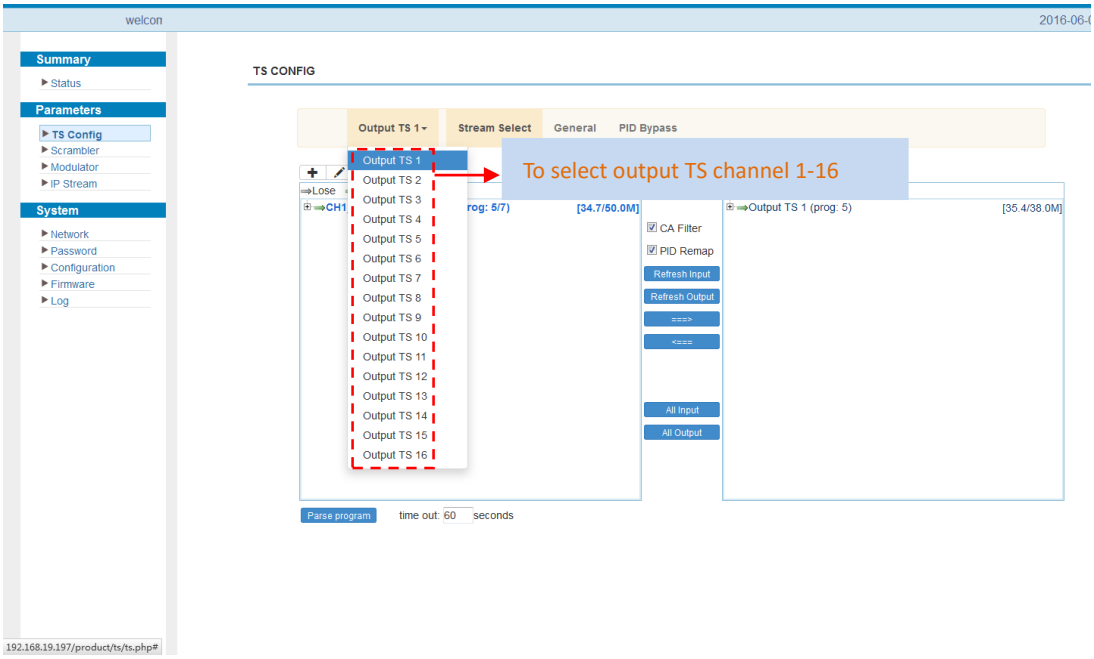


Figure-4

➢ Stream Select

From the menu on top of the webpage, click “Stream Select”, it displays the interface where you can choose the programs to Mux. (Figure-5)

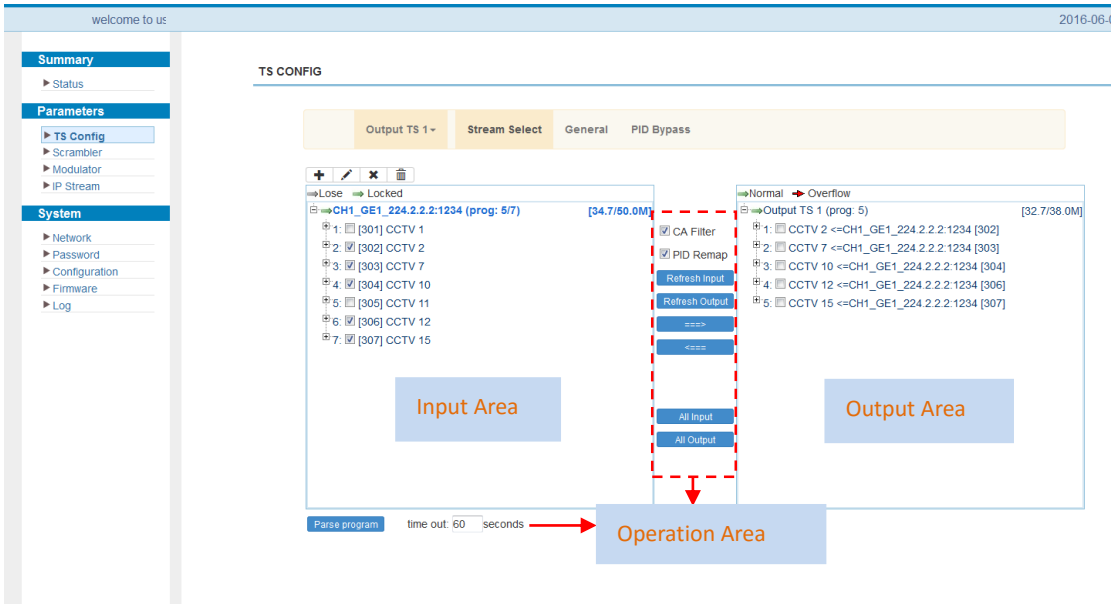


Figure-5

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

☑ CA Filter : Enable/disable the CA Filter function. By clicking the box, you can filter the input CA to avoid disturbing the devices scrambling function.

☑ PID Remap: To enable/disable the PID remapping

Refresh Input Refresh the input program information

Refresh Output 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.

<=== You 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 time out: 60 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 CCTV 2 <, it triggers a dialog box (Figure 6) where you can input new information.

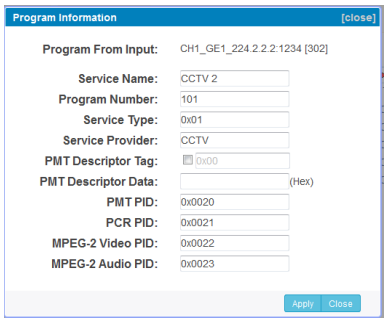


Figure 6

➢ General

From the menu on the top of the webpage, click “General”, it displays the interface where you can set parameters for each output channel. (Figure-7)

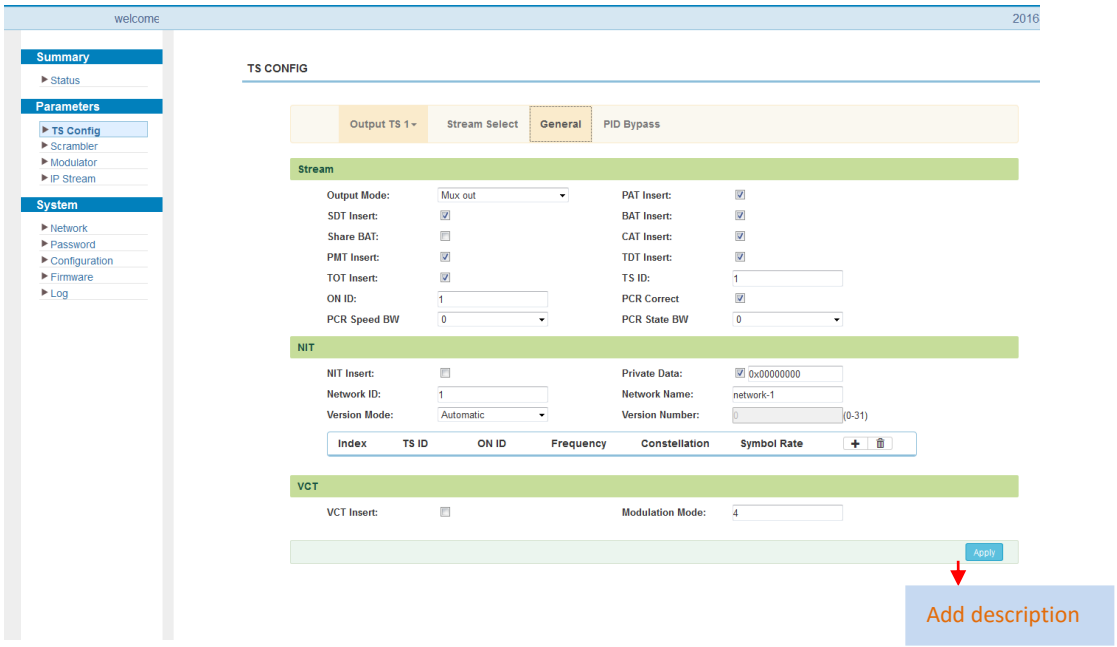


Figure-7

Click + and then click Add to apply the modified parameters.(Figure-8)

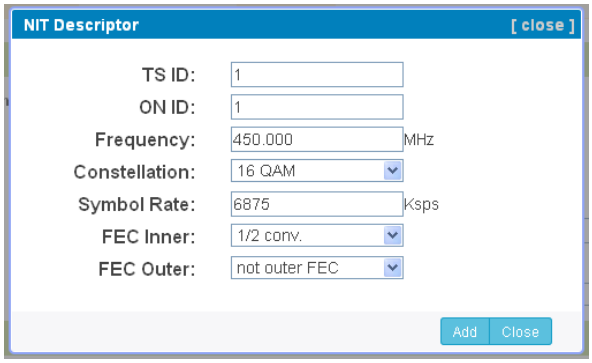


Figure-8

➢ PID Pass

From the menu on the top of the webpage, click “PID Pass”, to display the interface where to add the PIDs which need pass through. (Figure-9)

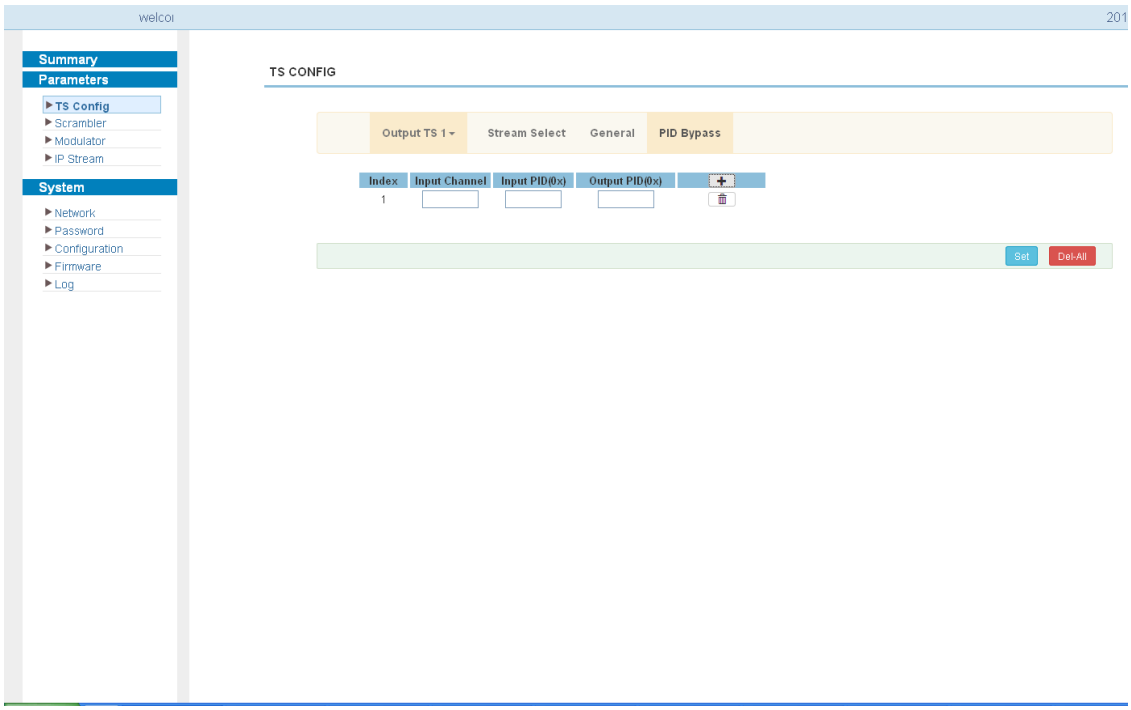


Figure-9

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-10)

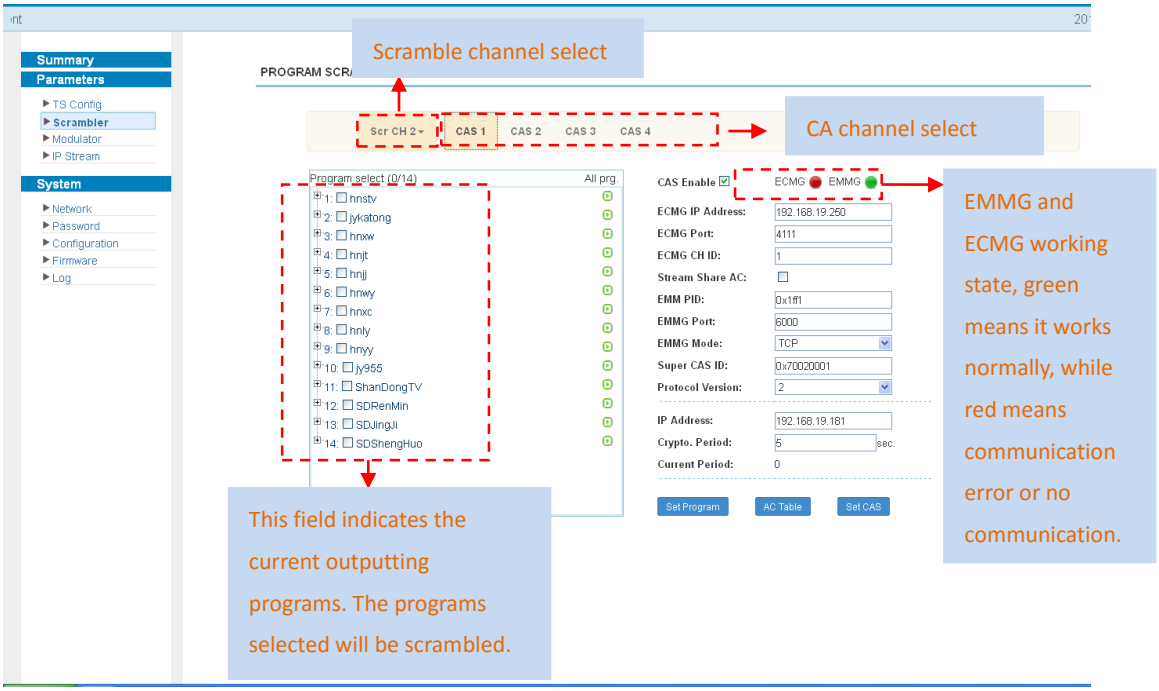


Figure-10

Parameters → Modulator:

From the menu on left side of the webpage, click 'Modulator', it will display the interface as shown in Figure-11 where to set RF output parameters.

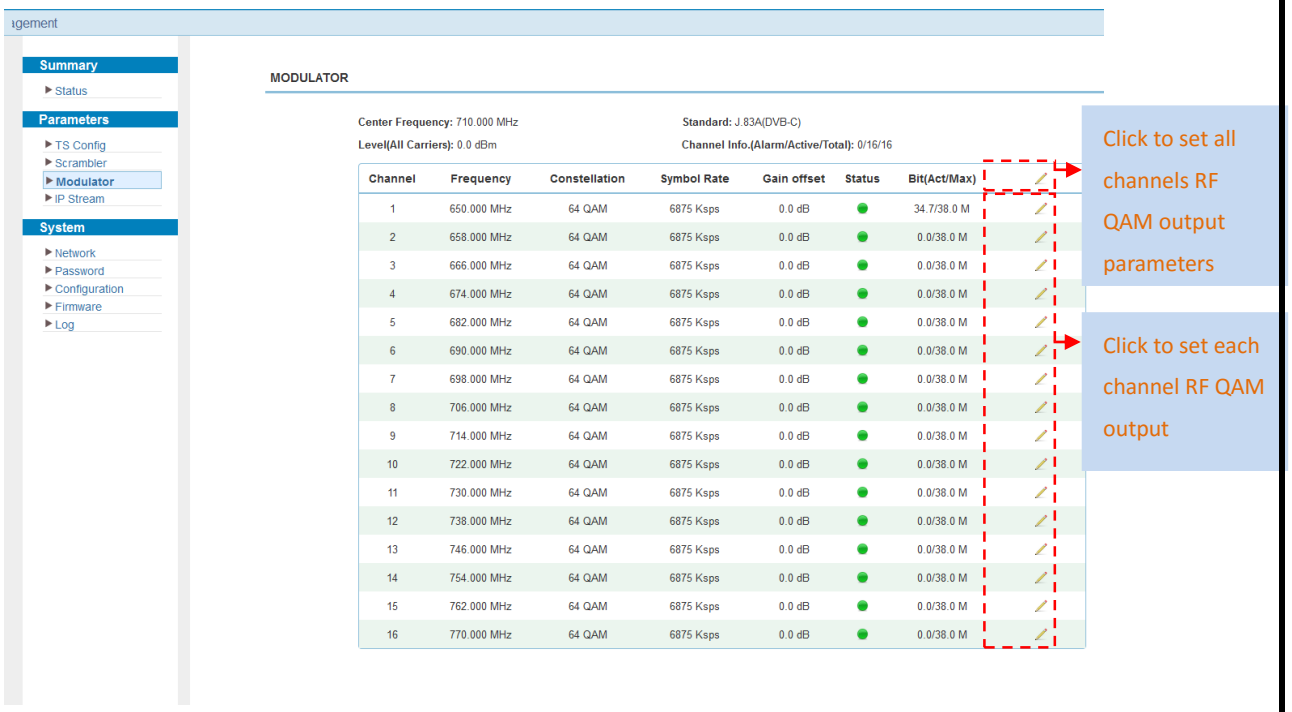
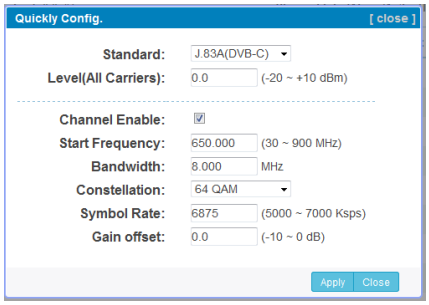
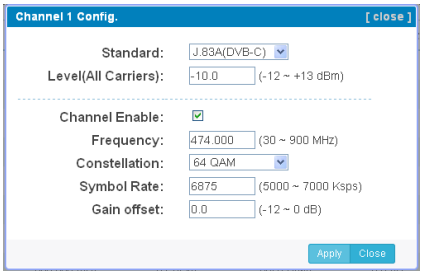


Figure-11





Parameters → IP Stream:

Thor's Edge QAM supports TS to output in IP (16*MPTS) format through the DATA port.

Click 'IP Stream', it will display the interface as shown in Figure-12 where to set IP out parameters.

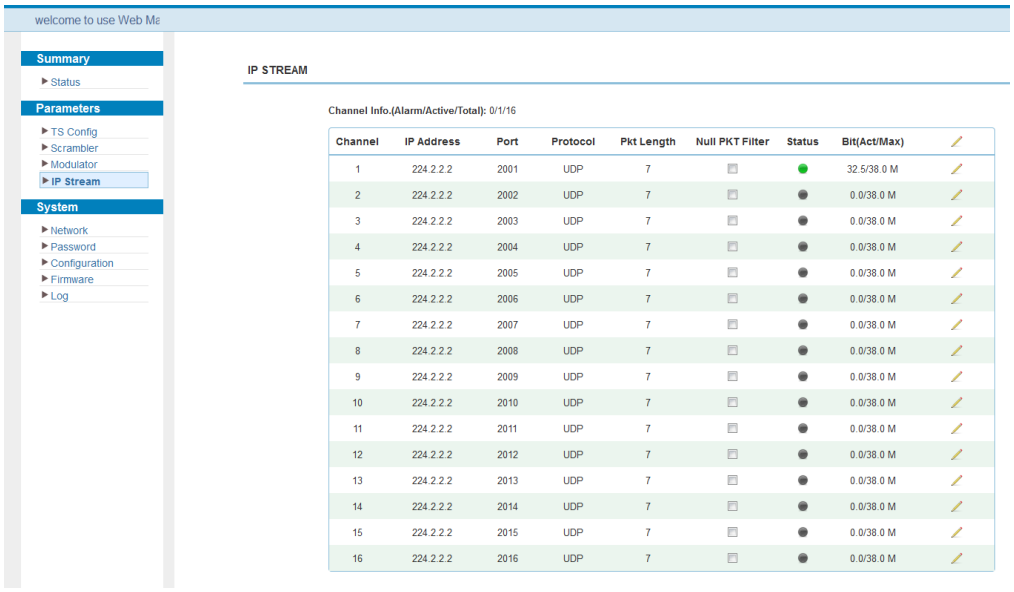
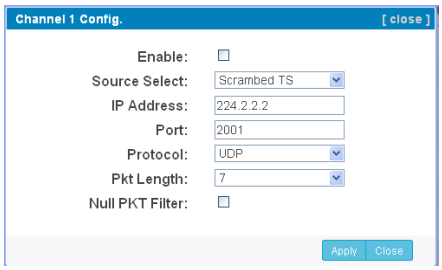


Figure-12



System → Network:

Click 'Network', it will display the interface as shown in Figure-13 where to set network parameters.

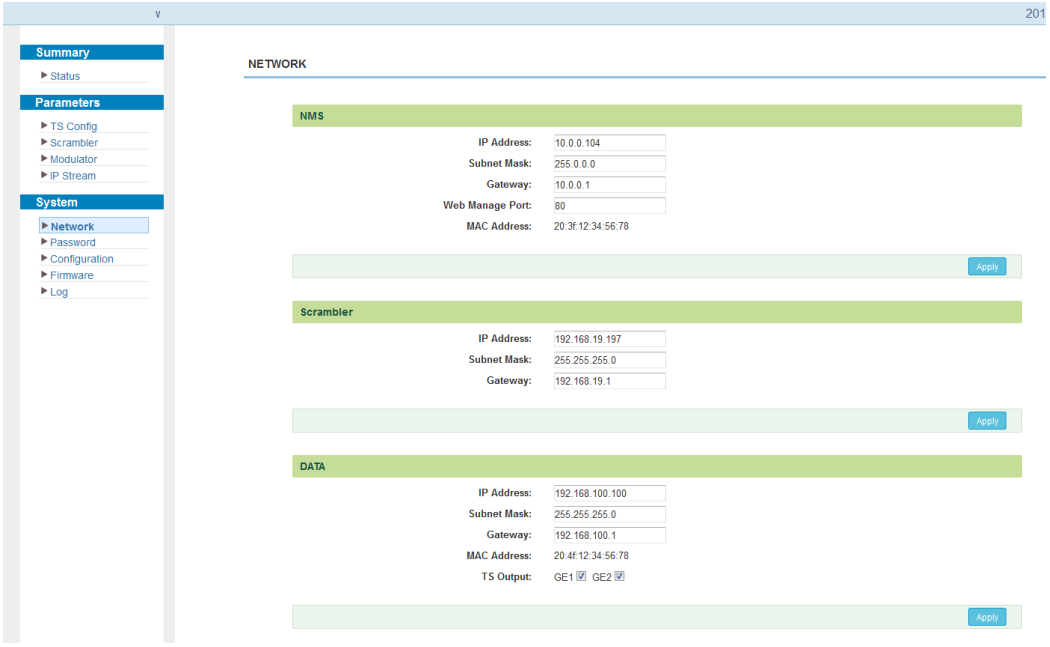


Figure-13

System → Password:

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

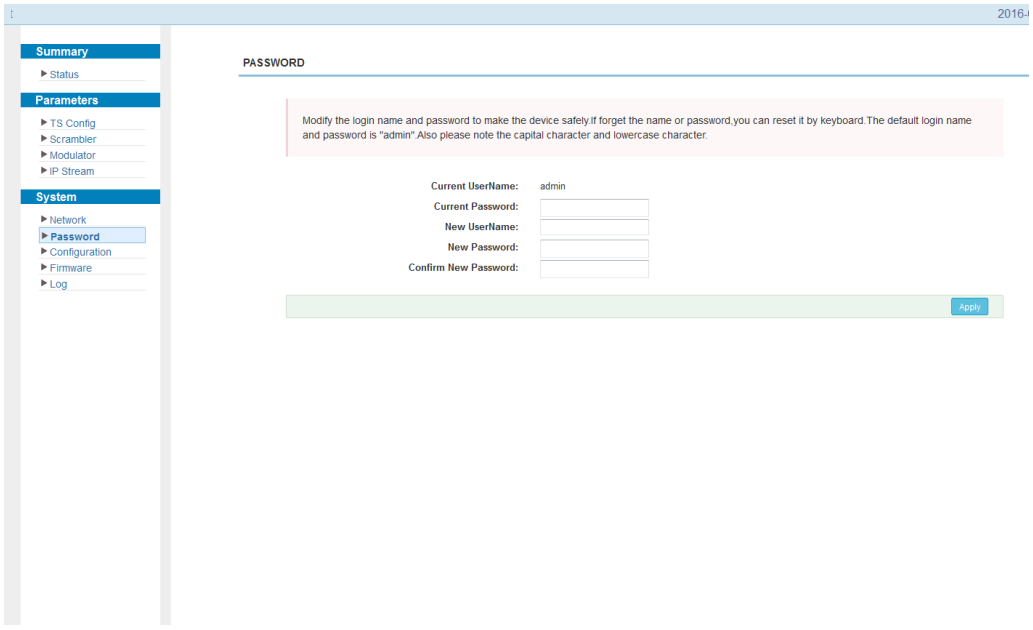


Figure-14

System → Configuration:

From the menu on left side of the webpage, click “Configuration”, it will display the screen as Figure-15 where to set your configurations for the device.

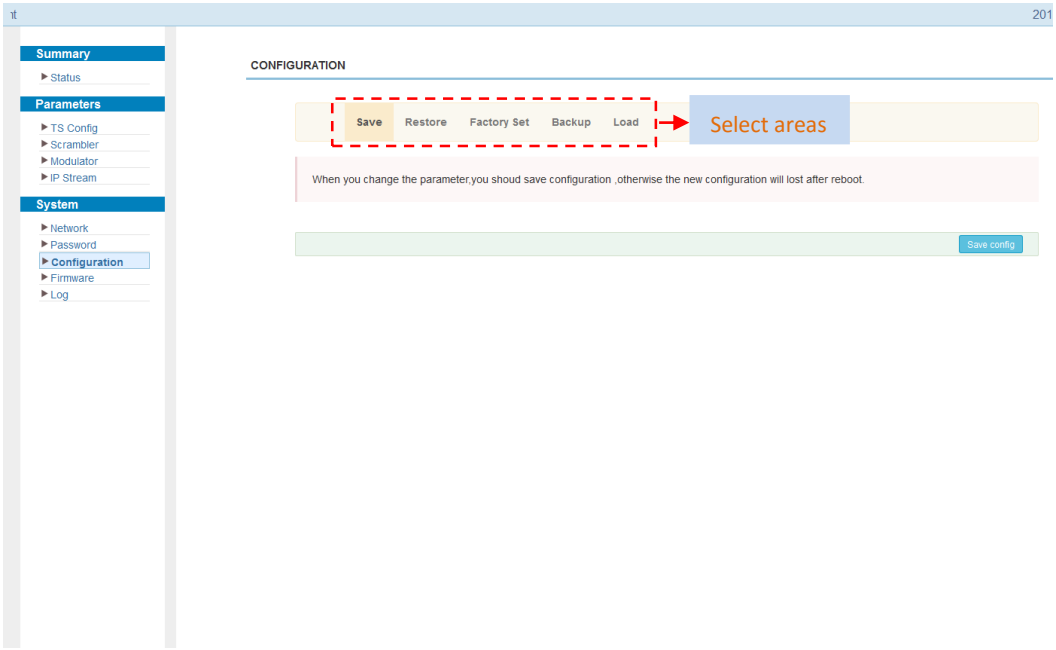


Figure-15

System → Firmware:

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

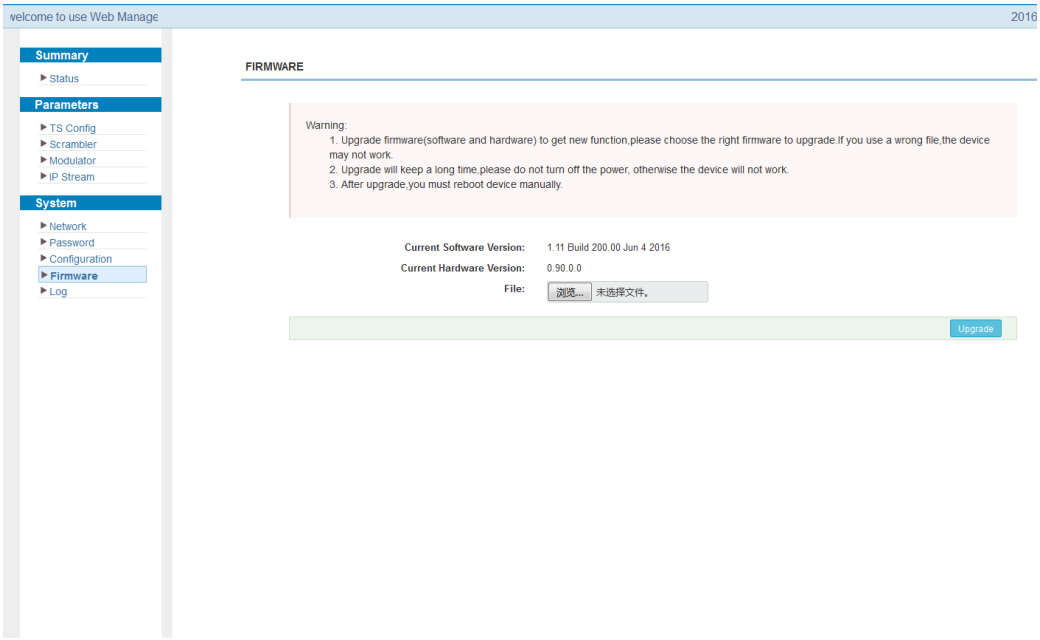


Figure-16

System → Log:

From the menu on left side of the webpage, click “Log”, it will display the screen as shown in Figure-17 where to check the “Log”.

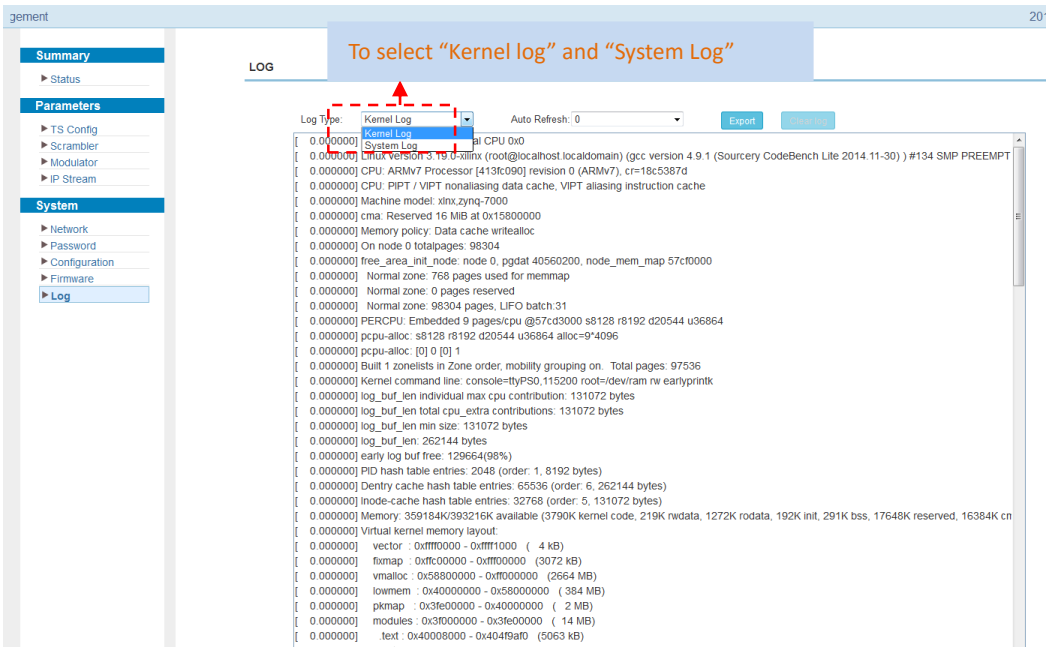


Figure-17

Chapter 5 - Troubleshooting

THOR's ISO9001 quality assurance system has been approved by the CQC organization. We guarantee the products' quality, reliability and stability. All THOR products haven passed all testing and manual inspections before they are shipped out. The testing and inspection scheme already covers all the Optical, Electronic and Mechanical criteria which have been published by THOR. To prevent a potential hazard, please strictly follow the operation conditions.

Prevention Measures

- Installing the device in a place where the environmental temperature is between 0 to 45 °C
- Making sure the unit has plenty of ventilation for the heat-sink on the rear panel; and other heat-sink bores if necessary
- Checking the AC input within the power supply and ensure it is working, the connection is correctly installed before switching on device
- Checking the RF output levels to stay within a tolerable 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 be greater than 10 seconds.

Conditions needed to unplug power cord

- Power cord or socket damage.
- Any liquid that got into the device.
- Any stuff that could cause a circuit short
- Device in damp environment
- Device has suffered from physical damage; i.e. it fell off a rack.
- Longtime idle.
- After switching on and restoring to factory setting, device still won't work properly.
- Maintenance needed on device

Chapter 6 Packing list

- Thor Broadcast IP QAM Modulator 1 pc
- User's Manual 1 pc
- Power Cord 1 pc

Thor Fiber & Thor Broadcast

Los Angeles CA

1-800-521-8467 ext 2 for Support