User Manual

16 RF Tuners to IPTV Gateway & QAM Modulator

H-16QAM-IP-RF

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.

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Chapter 1

1.1 Outline

The Thor Broadcast H-16QAM-IP-RF gateway is our new solution in converting tuner based inputs into IP transport streams. This ideal head-end conversion device has massive processing power which lets you intake up to 16 QAM frequencies and convert them to a single Ethernet output. Thor's new power packed device integrates tuner demodulation and IP gateway functionality, which can demodulate the signals from 16 tuners into 16 MPTS or 512 SPTS via UDP and RTP/RTSP protocols.
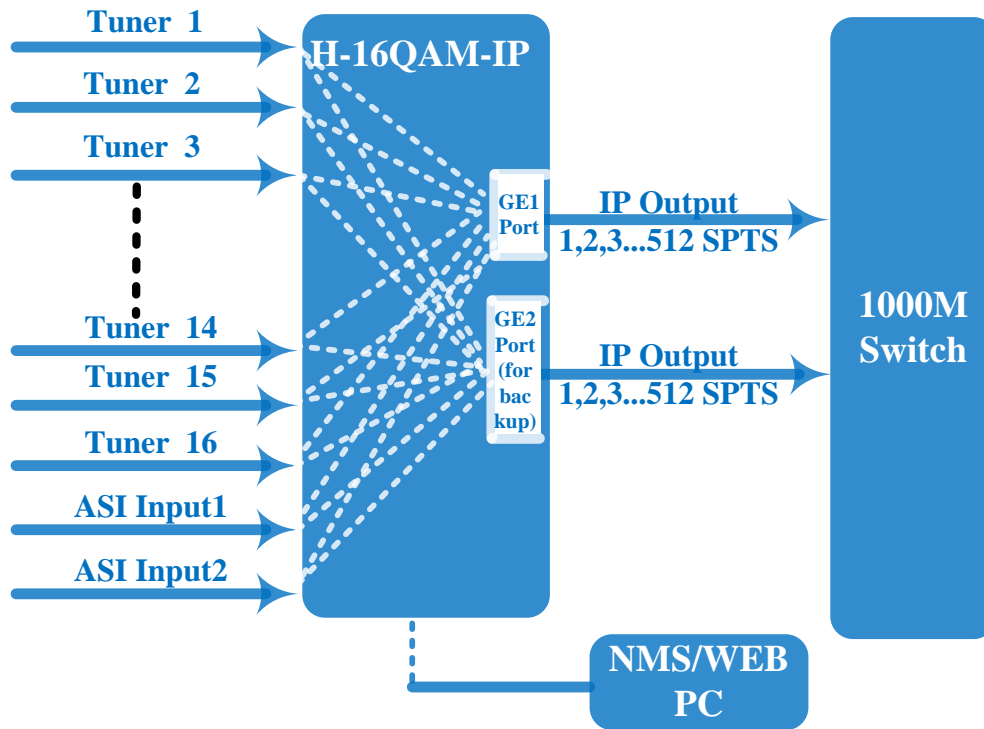
1.2 Features

- 16 QAM/ATSC/FTA DVB-S/S2 inputs (model dependent), 2 ASI inputs
- BISS descrambling
- Diseqc functionality
- 16 MPTS or 512 SPTS output (MPTS and SPTS output)
- 2 GE mirrored outputs, up to 850Mbps---SPTS
- 2 independent GE output port, GE1 + GE2---MPTS
- PCR adjusting (Only for SPTS output)
- PID filtering, re-mapping (Only SPTS output)
- PSI/SI rebuilding and editing (Only SPTS output)
- "Null PKT Filter" function (For MPTS output)
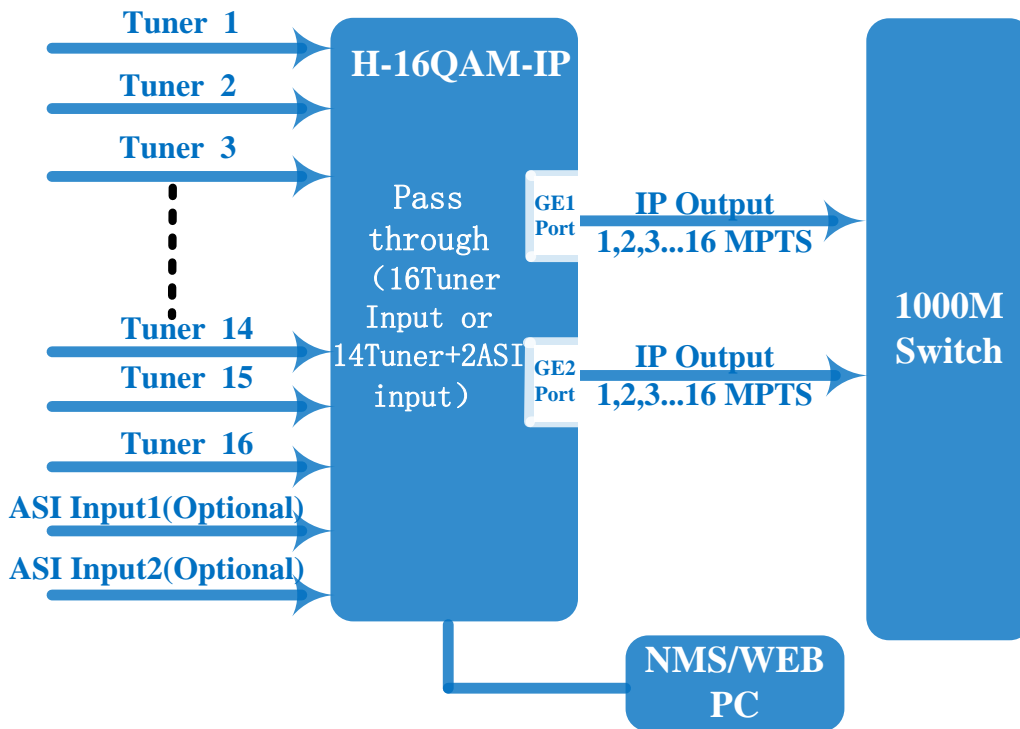- Support Web operation

1.3 Specs

Input	Optional 1:16 QAM tuners input +2 ASI input---SPTS output Optional 2:14 QAM tuners input +2 ASI input --- MPTS output Optional 3:16 QAM tuners input --- MPTS output	
Tuner Section QAM	Input Frequency	45-960MHz
Output	512 SPTS IP mirrored output over UDP and RTP/RTSP protocol through GE1 and GE2 port, Unicast and Multicast	
	16 MPTS IP output (for Tuner passthrough) over UDP and RTP/RTSP protocol through GE1 and GE2 port, Unicast and Multicast	
BISS descrambling	Mode 1, Mode E (Up to 850Mbps) (descramble individual program)	
Miscellaneous	Dimension(W×L×H)	482mm×410mm×44mm
	Approx weight	3.6kg
	Environment	0~45℃(work)；-20~80℃（Storage）
	Power requirements	100~240VAC，50/60Hz
	Power consumption	20W

1.4 Flow Chart

Tuner 1
Tuner 2
Tuner 3
Tuner 14
Tuner 15
Tuner 16
ASI Input1
ASI Input2

H-16QAM-IP

GE1 Port

GE2 Port (for backup)

IP Output 1,2,3...512 SPTS

IP Output 1,2,3...512 SPTS

1000M Switch

NMS/WEB PC

SPTS output

Tuner 1
Tuner 2
Tuner 3
Tuner 14
Tuner 15
Tuner 16
ASI Input1(Optional)
ASI Input2(Optional)

H-16QAM-IP

Pass through (16Tuner Input or 14Tuner+2ASI input)

GE1 Port

GE2 Port

IP Output 1,2,3...16 MPTS

IP Output 1,2,3...16 MPTS

1000M Switch

NMS/WEB PC

MPTS output

1.5 Appearance and Description

Front Panel Illustration:
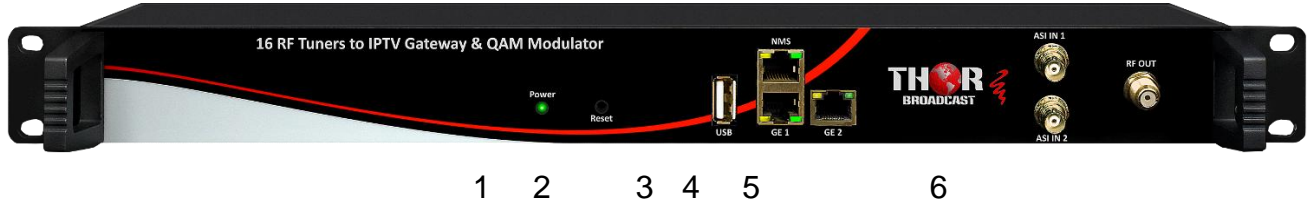
1	Power Indicator
2	Reset: Reset webmaster IP address, recover to default IP address
3	USB Port for Updates
4	NMS – Network Management Interface
5	Data Ports (1 & 2) – IP Output for SPTS / MPTS
6	ASI input ports (1 & 2)

Rear Panel Illustration

7	16 channels RF IN Interface (top row)
8	Loop Out Interface (bottom row)
9	Power Switch and Socket

Chapter 2 - Installation Guide

This section is here to explain the cautions you should adhere to so you don't hurt yourself or anyone else. That would not be good for anyone; so read through before operating your new Thor Broadcast equipment.

2.1 General Precautions

✓ Must be operated and maintained in an area free of dust and debris.

✓ The cover should be securely fastened, do not open the cover of the chassis when thepower is on. This will also void Thor's manufacturer's warranty.

✓ After installation, securely stow away all loose cables, external antenna, and others.

2.2 Power precautions

✓ Be careful when connecting a power source to the device.

✓ Do not operate in wet or damp areas. Make sure the extension cable is in good condition

✓ Make sure the power switch is off before you start to install the device

2.3 Device's Installation Flow Chart Illustrated (as following)

Acquisition Check → Installing Device → Connecting Grouding Wire and Power Cord → Connecting Signal cable → Setting Parameter → Running Device
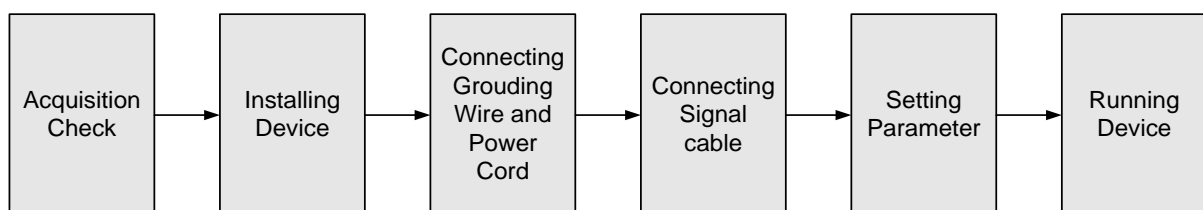
2.4 Environment

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: $1M\Omega$ (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.

2.5 Grounding Requirement

- ✓ 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 m^2.

Chapter 3 – WEB NMS

4.1 Setup the NMS

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.

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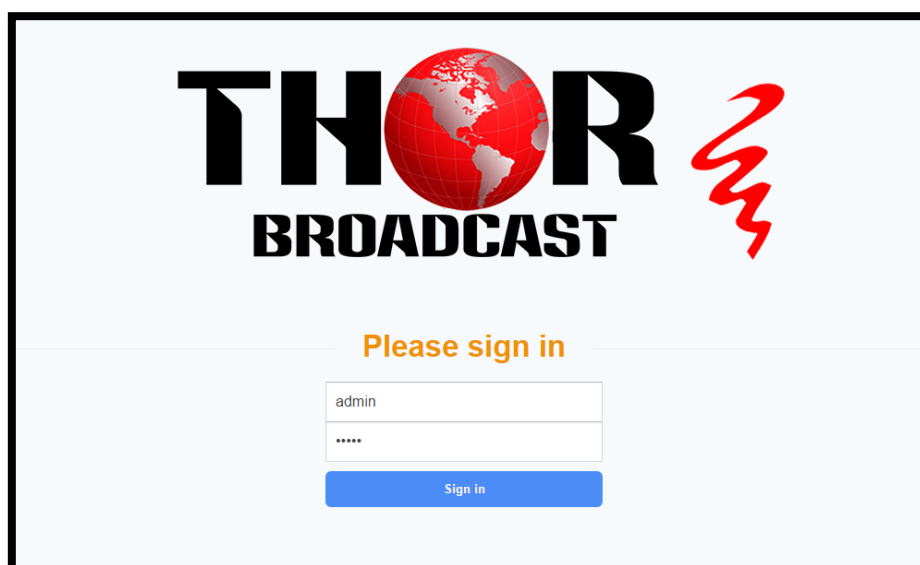
Use any web browser to connect the device with the PC by inputting the Encoder & Modulator's IP address in the browser's address bar and press Enter.

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"tostart the device setting.

4.2 NMS Operation

4.2.1 Login Interface

Once you set the units address and enter that IP into your browser this Login window appears

Both the default user name and password are admin.

4.2.2 Status Page

Status

When we login, it will display the status interface as shown in Figure-2.
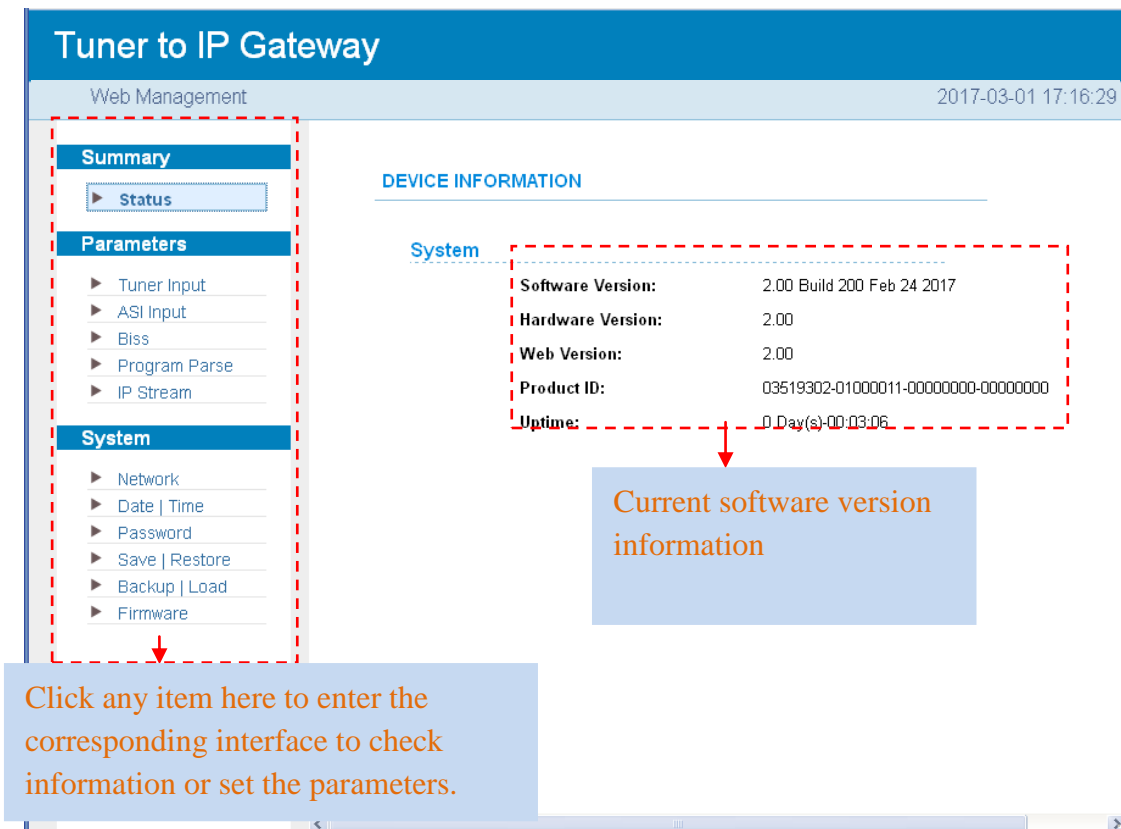
Figure-2

Parameters→Tuner input

From the menu on left side of the webpage, click "Tuner Input", it displays the interface where you can check the 16 Tuner input status. (Figure-3)
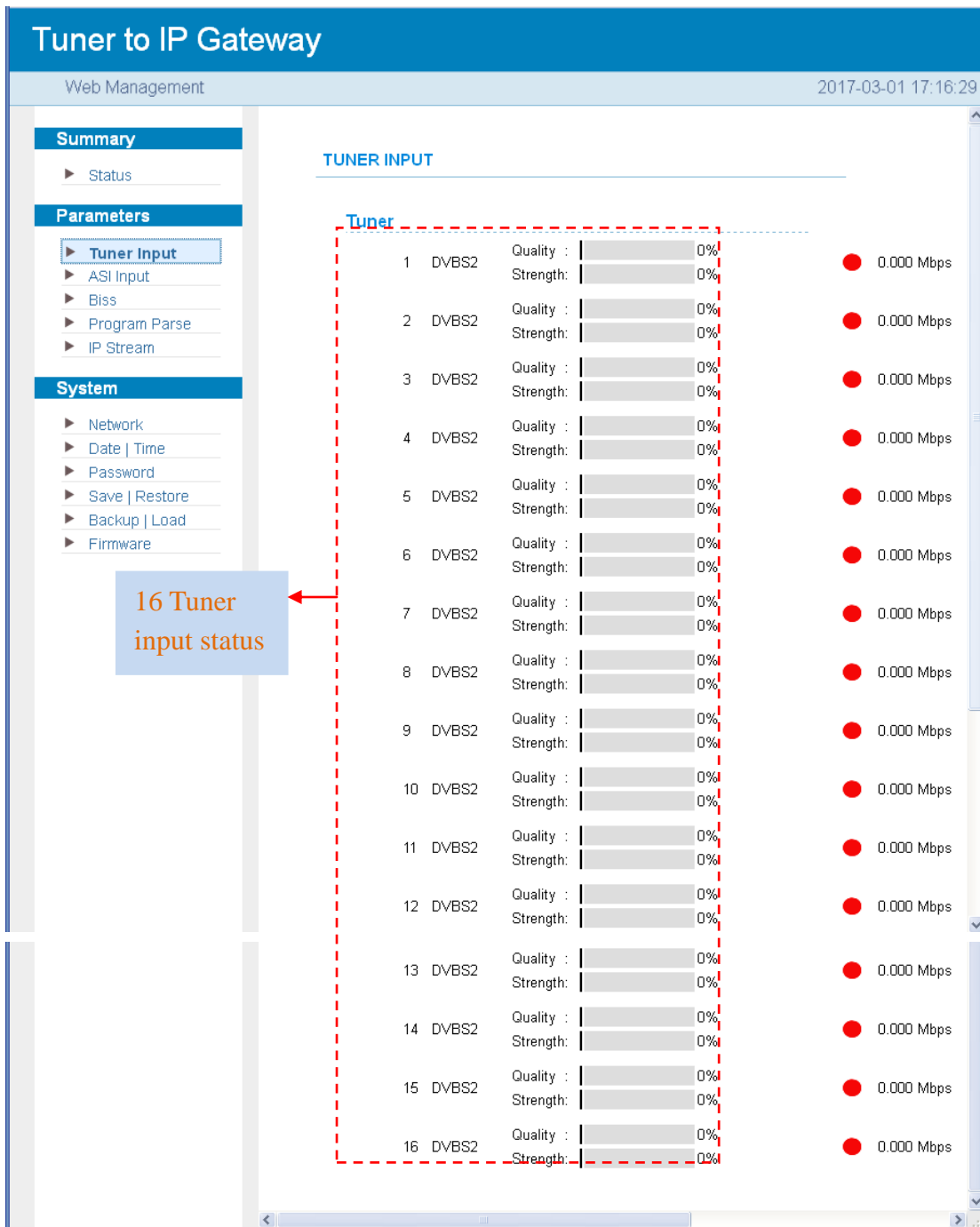
Figure-3

Parameters→ASI input

From the menu on left side of the webpage, click "ASI Input", it displays the interface where you can check the 2x ASI input status. (Figure-4)
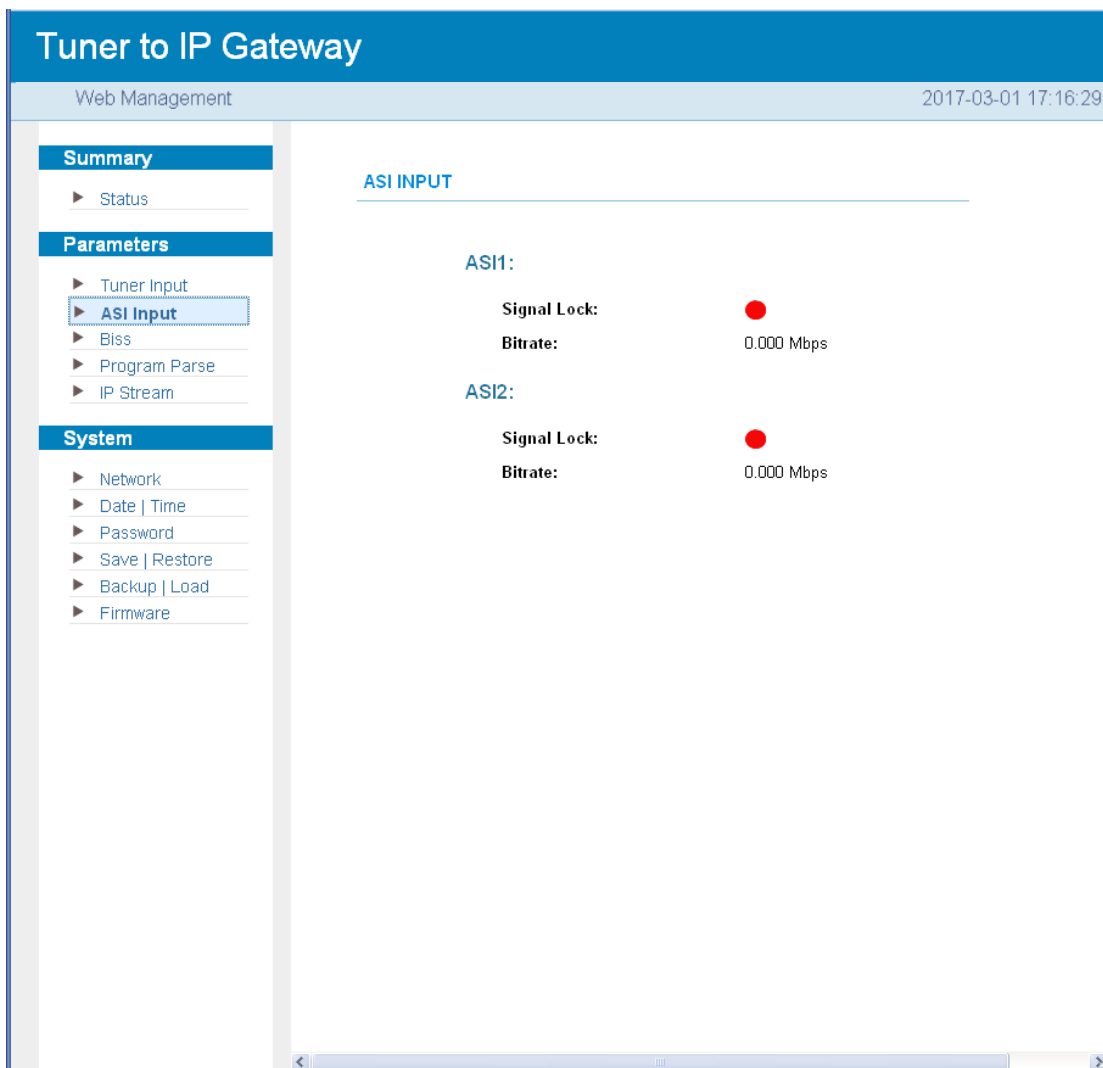
Figure-4

Parameters→BISS

From the menu on left side of the webpage, click "BISS", it displays the interface where you can configure BISS and descramble the input channels (Figure-5).
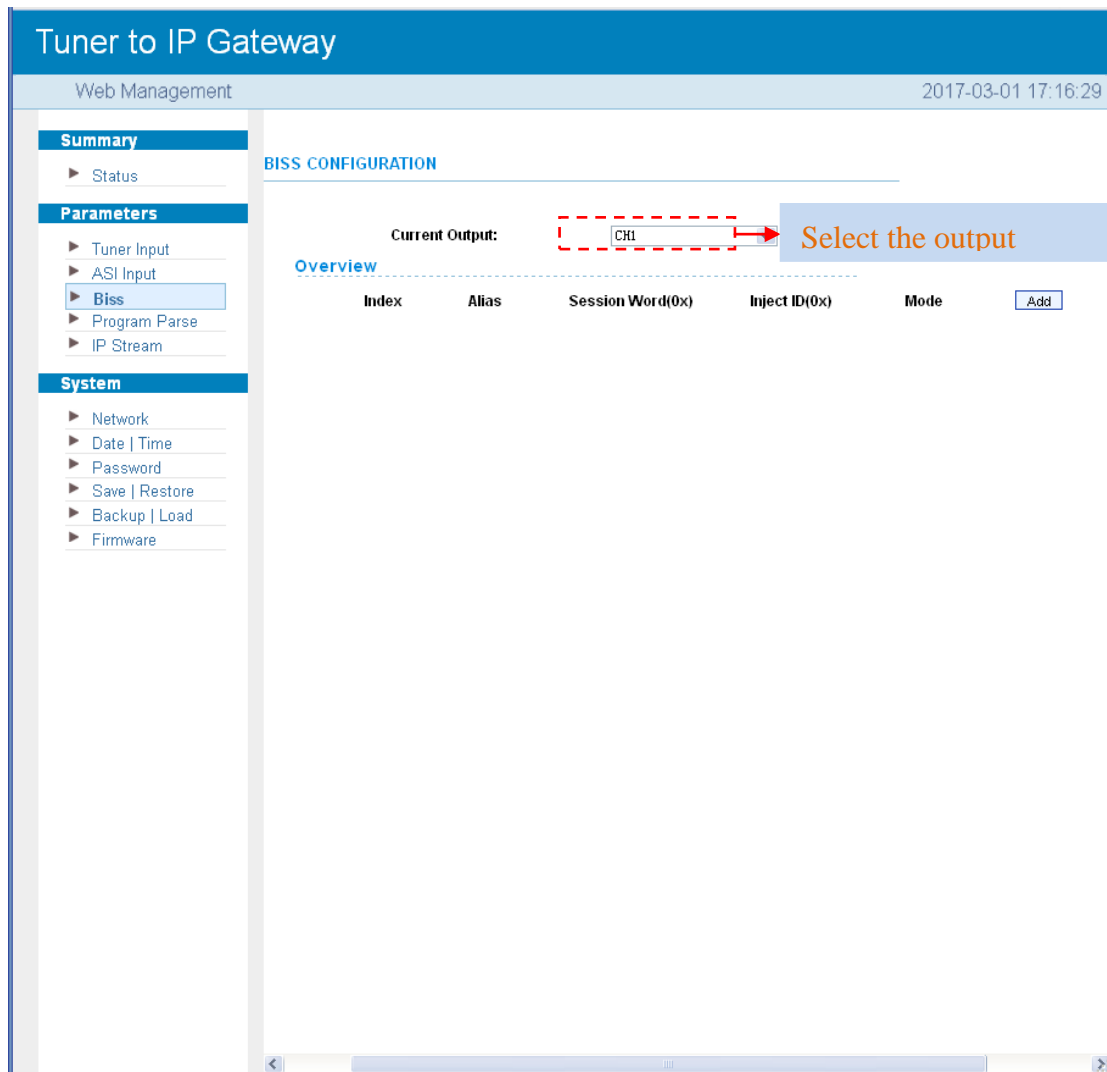
Figure-5

Parameters→Program Parse

From the menu on left side of the webpage, click "Program Parse", it displays the interface where you can parse the program from the input channels.

When you disable the ASI input, the RF to IP Gateway can support 16 Tuner inputs with 16 MPTS IP outputs (Figure-6).
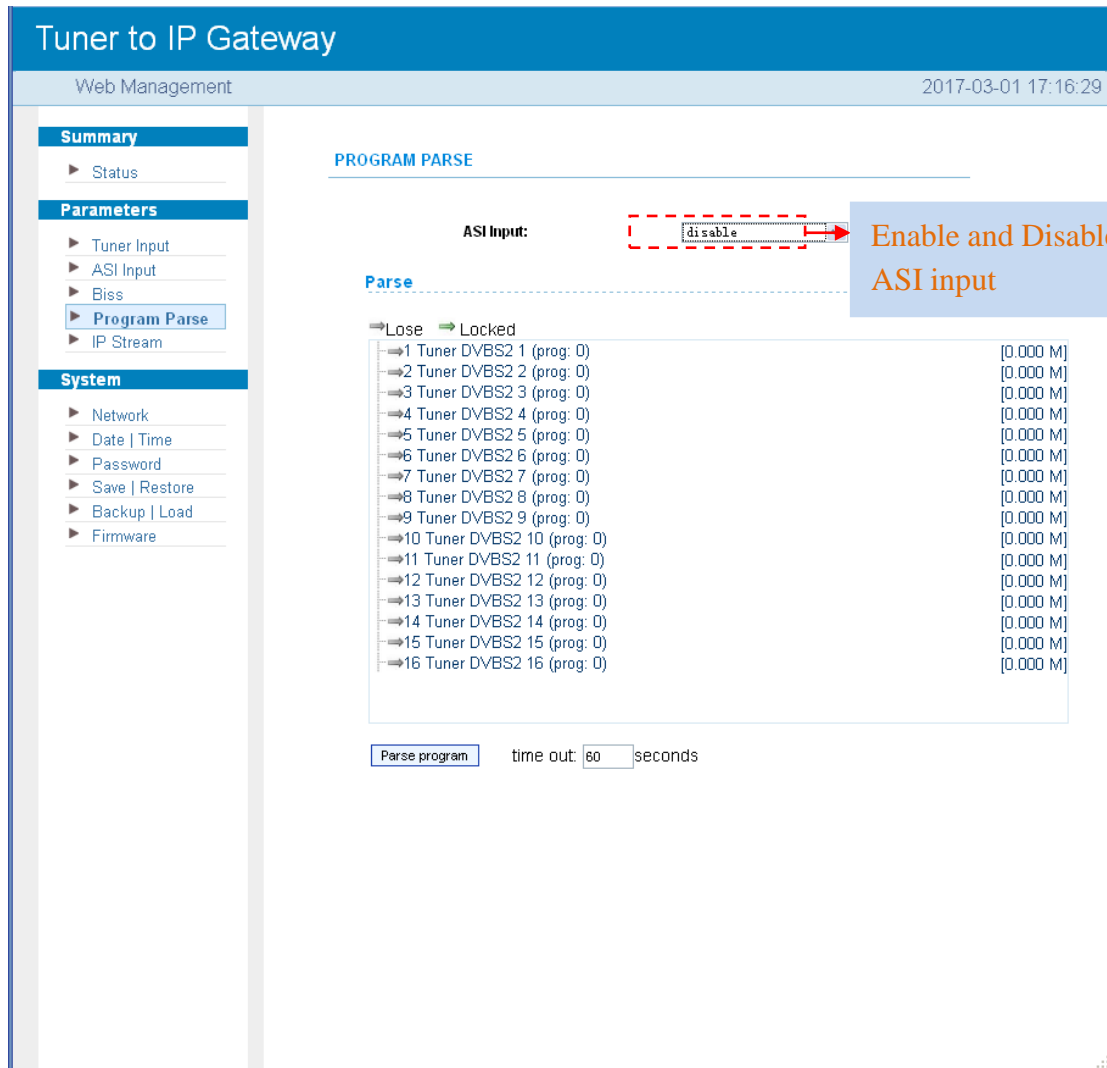
Figure-6

When you enable the ASI input, the RF to IP Gateway can support 14 Tuner inputs and 2 ASI inputs with 16 MPTS IP outputs (Figure-7).

Figure-7

Parameters→IP Stream

The H-16QAM-IP-RF supports TS to output in IP (16*MPTS) format through the GE1 or GE2 port.

Click 'IP Stream', it will display the interface where to set IP out parameters (Figure-8).
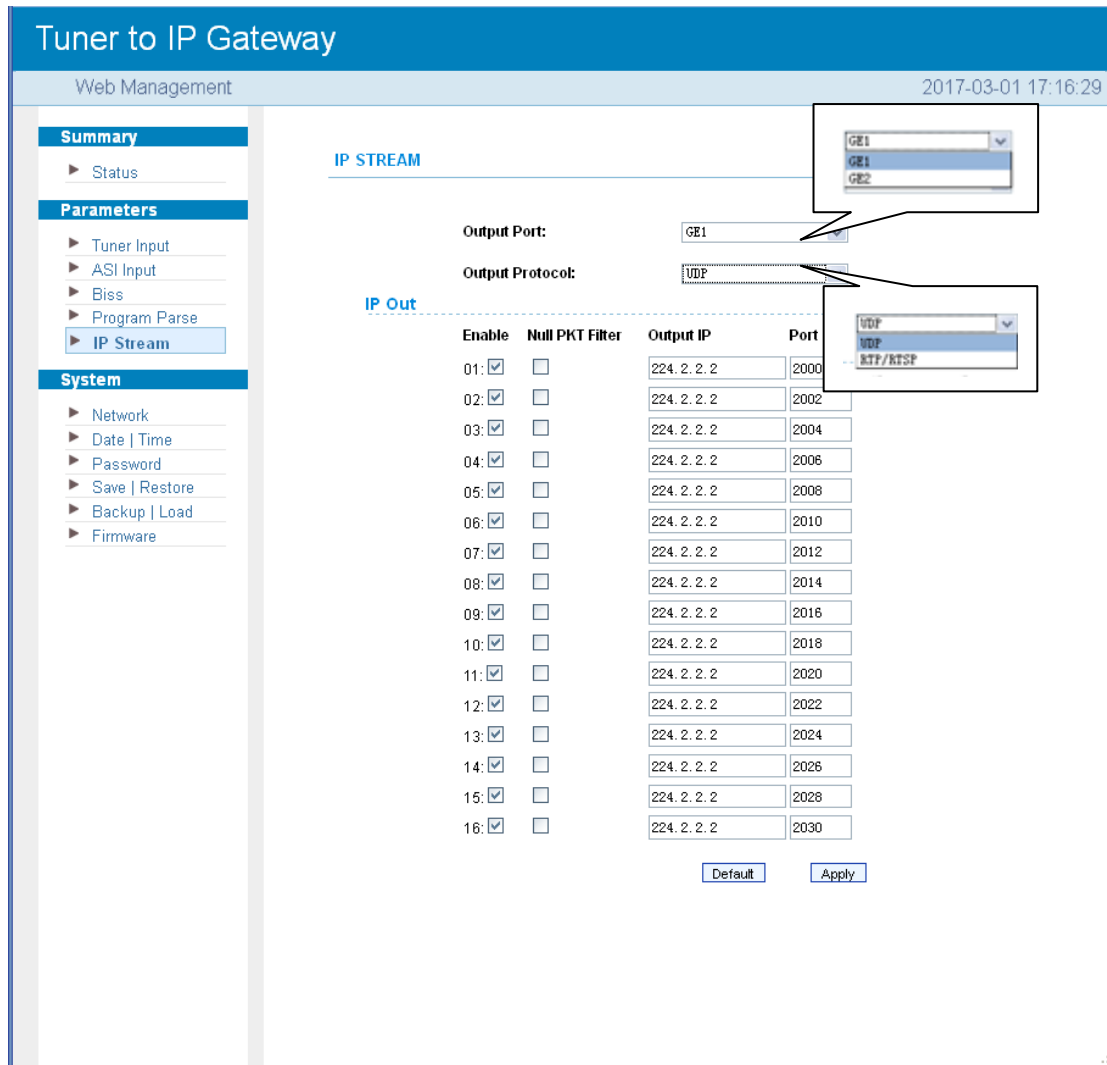
Figure-8

This RF to IP Gateway supports 16 Tuner inputs and 2 ASI input with 512 SPTS output, the parameter interface is different from MPTS. When you switch MPTS to SPTS, the new mode will work after you reboot the device.

Parameters→Tuner Input (SPTS MODE)

From the menu on the left side of the webpage, click "Tuner Input", it displays the interface where

you can check the 16 Tuner input status. (Figure-9)

Parameters→ASI Input (SPTS MODE)

From the menu on top side of the webpage, click "ASI Input", it displays the interface where users

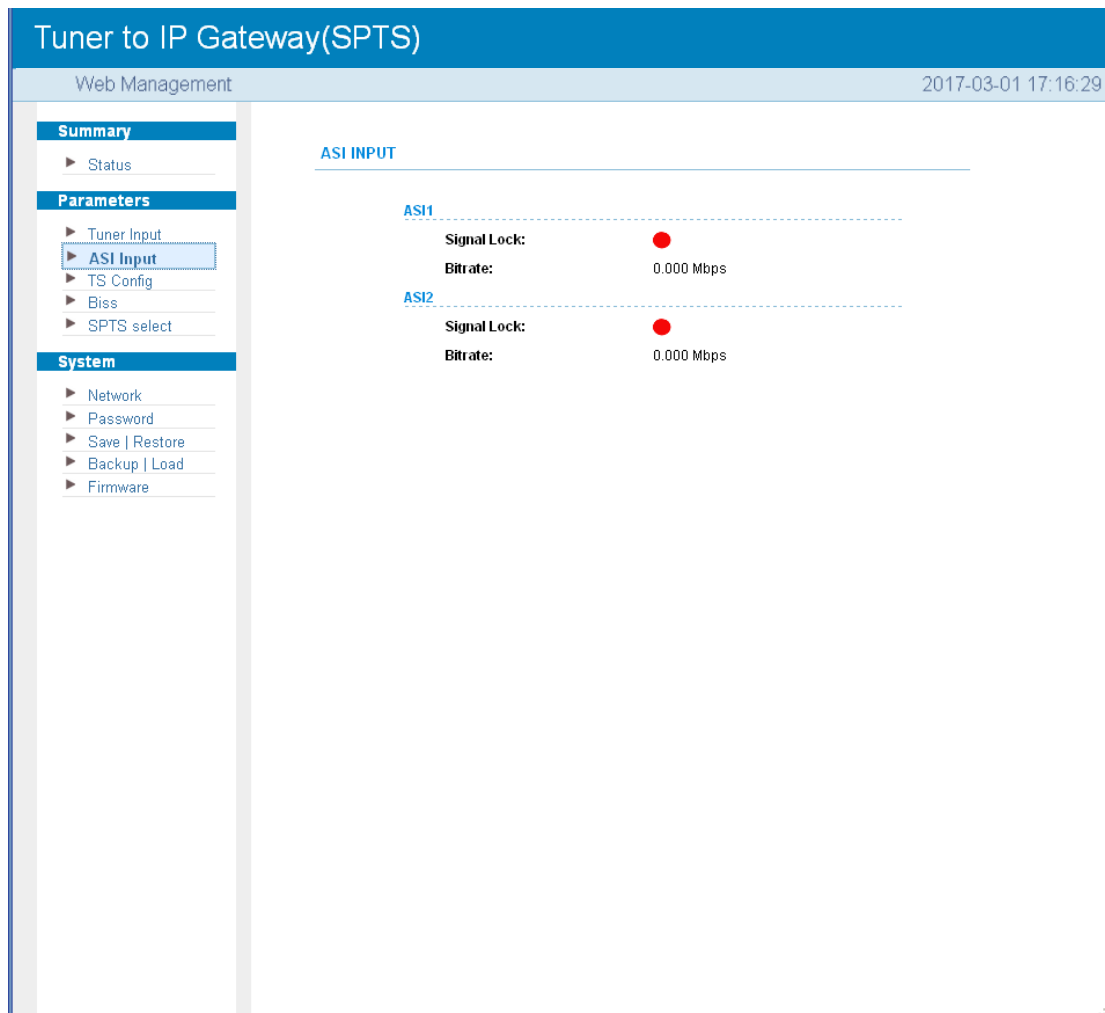can check the 2 channels ASI input status. (Figure-10)

Figure-10

Parameters→TS Config (SPTS MODE)

Click "TS Config", it displays the interface where you can set the output TS and configure TS ID and ON ID the four output channel (Figure-11)..

Figure-11

![THOR logo]

Parameters→BISS: (SPTS MODE)

From the menu on left side of the webpage, click "BISS", it displays the interface where you can configure BISS and descramble the input channels (Figure-12).
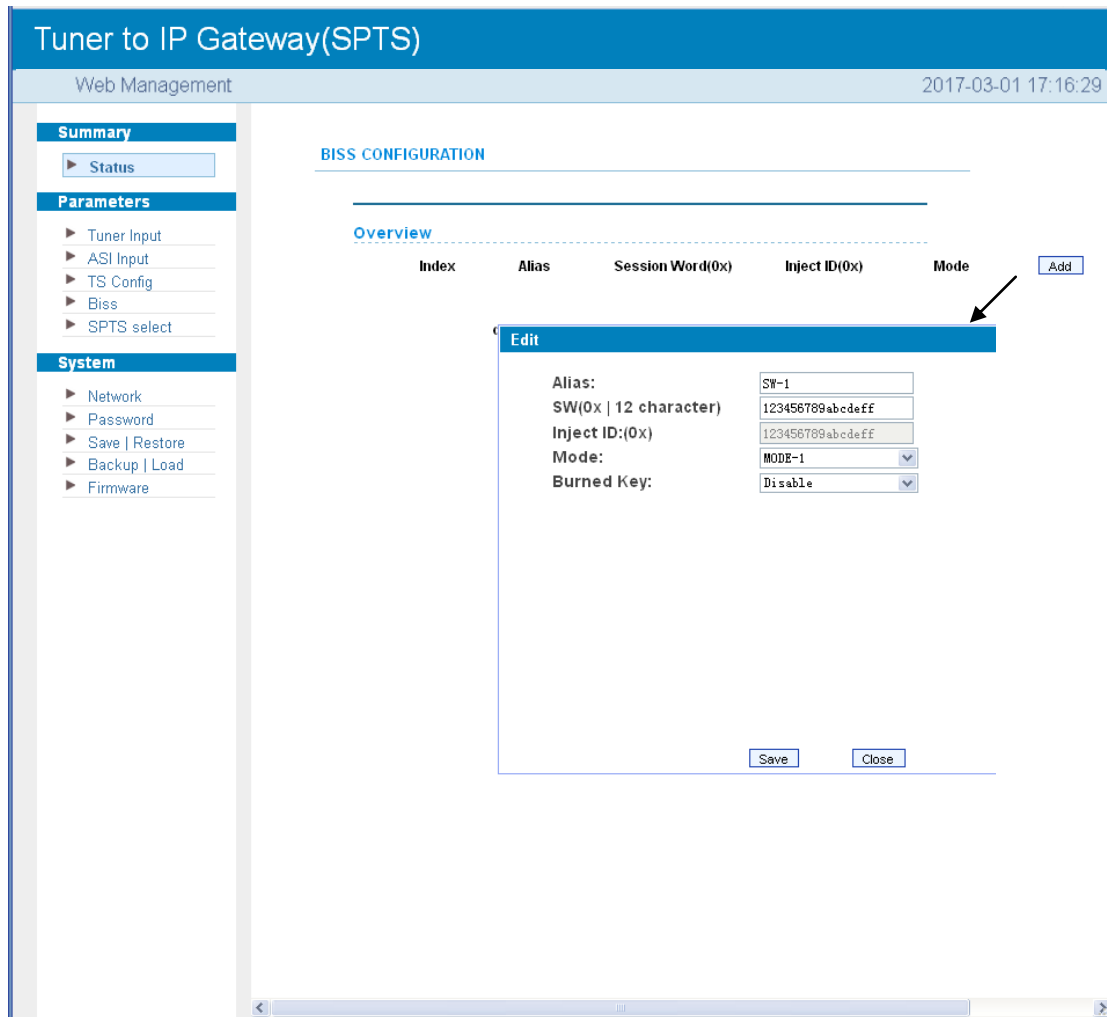

Figure-12

Parameters → SPTS Select:

From the menu on left side of the webpage, click "SPTS Select", it displays the interface where you can choose 16 Tuner inputs and 2 ASI Input programs to output from IP (max 512 SPTS). (Figure-13)
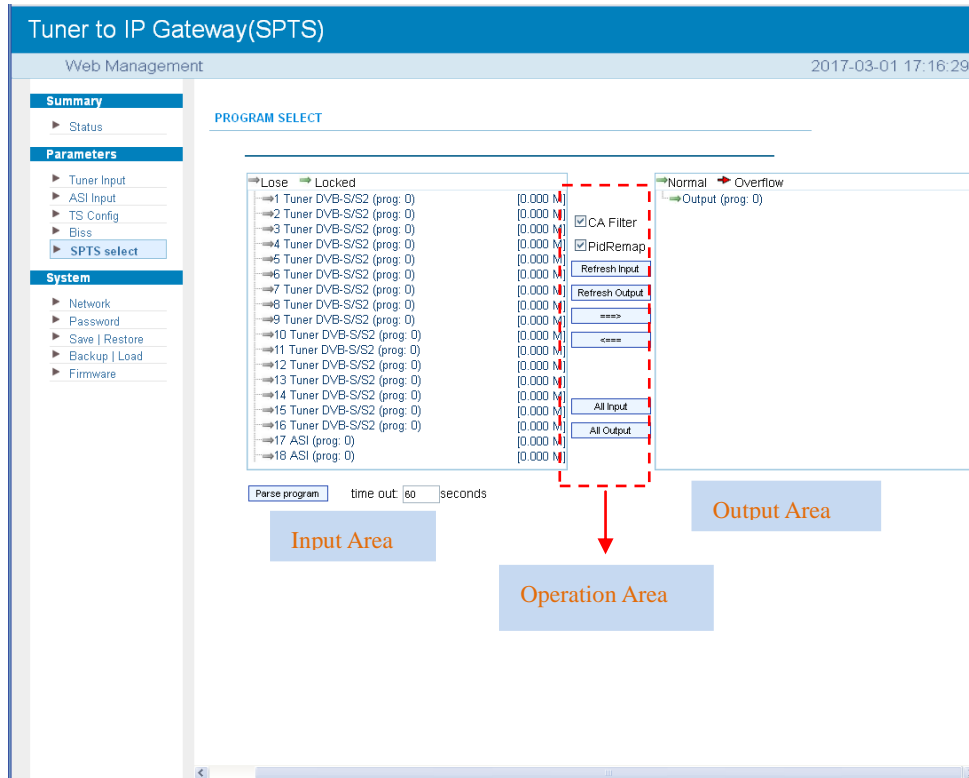

Figure-13

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

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

PidRemap : 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   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 1: ☐ CCTV-101=>239.93.0.1:5101   clicking, it triggers a dialog box (Figure 14) where you can input new information.

Figure-14

System → Network:

Click 'Network', it will display the interface as Figure-15 where to set network parameters.

Figure-15

System → Date/Time:

From the menu on left side of the webpage, click "Date/Time", it will display the screen as in

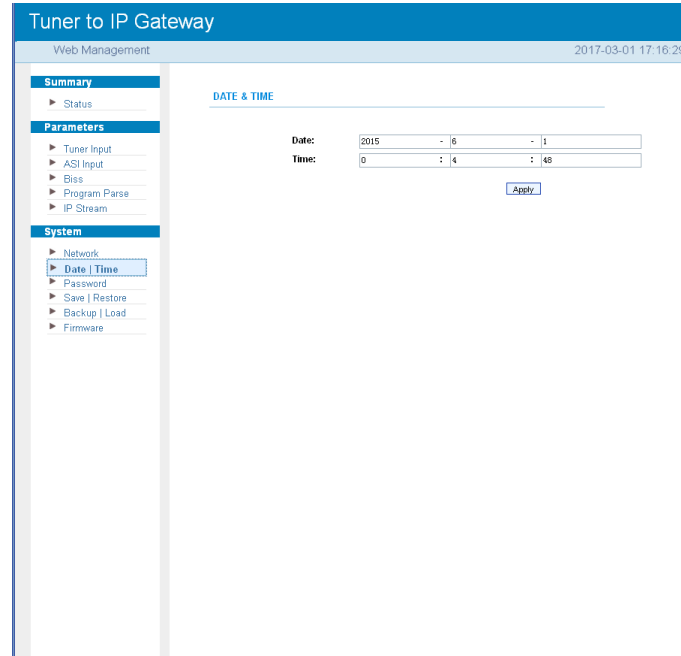Figure-16 where to set date and time for the device.

Figure-16

System → Password:

From the menu on left side of the webpage, click "Password", it will display the screen as in

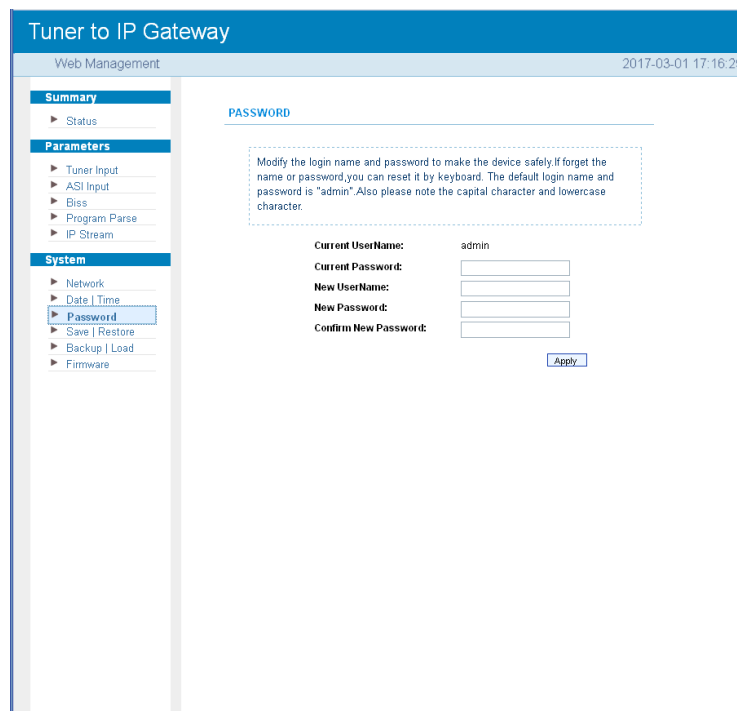Figure-17 where to set the login account and password for the web NMS.

Figure-17

System → Save/Restore:

From the menu on left side of the webpage, clicking "Save/Restore", it will display the screen as Figure-18 where to save or restore your configurations.
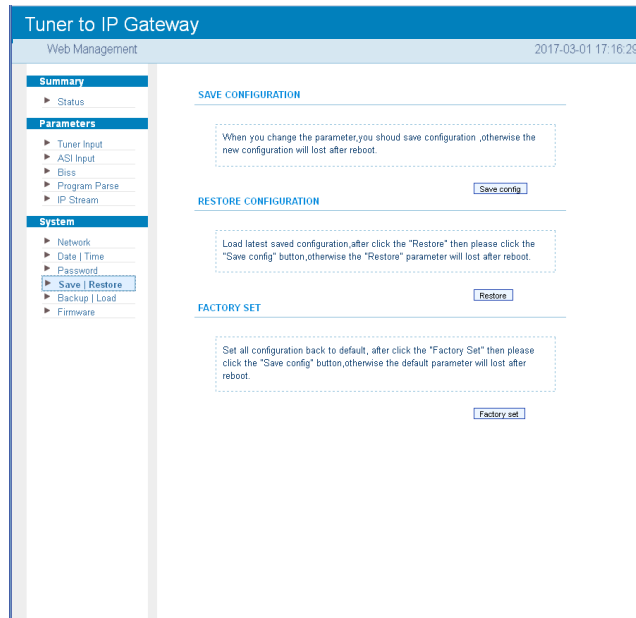

Figure-18

System → Backup/Load:

From the menu on left side of the webpage, clicking "Backup/Load", it will display the screen as Figure-19 where to backup or load your configurations.
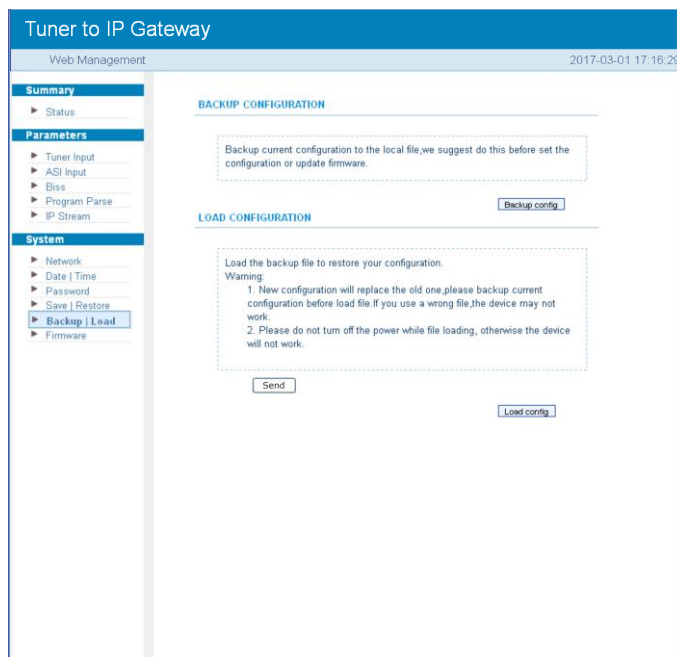
Figure-19

System → Firmware:

From the menu on left side of the webpage, click "Firmware", it will display the screen as in Figure-20 where to update firmware for the device.
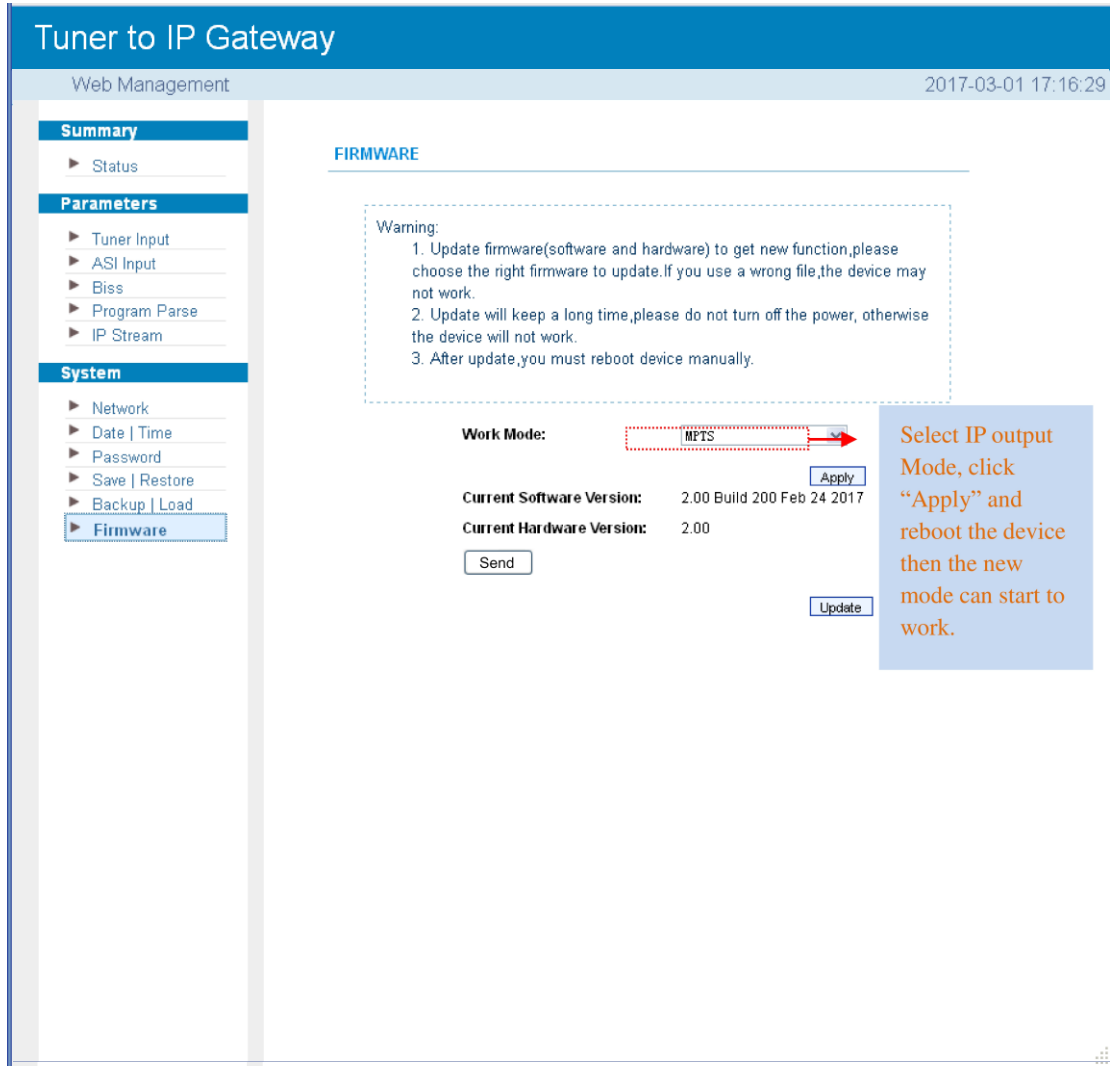

Figure-20

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

H-8QAM-IP-RF	1PC
User's Manual CD	1PC
Power Cord	1PC
RF In and Loop-out Cables	16PCS

For Further Tech Support

1-800-521-Thor(8467)

support@thorfiber.com