



## **H-4SDI(4HDMI)-QAM-IP 4 SDI(HDMI) to 4 DVB-C Encoder Modulator**

(MPEG-2 HD/MPEG-4 HD Encoding + DVB-C Modulating)



4 SDI or 4 HDMI



**Revision 2.1**

## 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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**\*\*\*Note – This manual is intended for the Thor H-QAM-IP chassis, this guide is universal for both HDMI & SDI units.**

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# Chapter 1 Introduction

## 1.1 Product Overview

H-4SDI-(HDMI)-QAM-IP series products are Thor'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 DVB-C RF output. It is equipped with 4 SDI, or HDMI) channel input and 1 ASI input and output with 2 ASI ports and 1 UDP IP port. Delay problems have been greatly reduced to achieve an extremely low value from the encoding progress to the decoding terminals. It adopts inner drawer-type structural design which greatly facilitates the change of encoding modules (HDMI/SDI /...) as needed. The signal source could be from satellite receivers, closed-circuit television cameras, Blue-ray players, and antenna etc. Its' output signals are to be received by DVB-C TVs or STBs and etc.

## 1.2 Key Features

- **MPEG2 & MPEG4 AVC/H.264 HD/SD encoding**
- **Up to 1920\*1080@50P/60P supported (MPEG4 AVC/H.264 HD)**
- **Up to 1920\*1080@50I/60I supported (MPEG2 HD)**
- **4\* SDI(HDMI) input; 1\*ASI input for re-mux; 1\*RF input for mix**
- **4\* DVB-C RF out (4 carriers combined output)**
- **Support 4 \* SPTS output**
- **Extremely low delay**
- **LCN support (Logical Channel Number)**
- **Excellent modulation quality MER≥42dB**
- **RF Frequency range 30Mhz~960Mhz**
- **LCD display, Remote control and firmware**
- **Web NMS management; Updates via web**
- **Lowest cost per channel**

## 1.3 Specifications

### Encoding Section

#### Video

Encoding	MPEG2; MPEG4 AVC/H.264
Input	SDI*4
Resolution	1920*1080_60P, 1920*1080_50P, (-for MPEG4 AVC/H.264) 1920*1080_60i, 1920*1080_50i, 1280*720_60p, 1280*720_50P 720*480_60i, 720*576_50i

#### Audio

encoding	MPEG1 Layer II, MPEG2-AAC, MPEG4-AAC
Sample rate	48KHz
Bit rate	64kbps, 96kbps, 128kbps, 192kbps, 256kbps, 320kbps

### DVB-C Modulator Section

Standard	J.83A , J.83B, J.83C
MER	≥42dB
RF frequency	30~960MHz, 1KHz step
Symbol rate	5.000~9.000Msps adjustable
RF output level	-30~ -10dbm (81~97 dbμV), 0.1db step

#### J.83A

Constellation	16/32/64/128/256QAM
bandwidth	8M

#### J.83B

Constellation	64QAM/ 256QAM
bandwidth	6M

#### J.83C

Constellation	64QAM/ 256QAM
bandwidth	6M

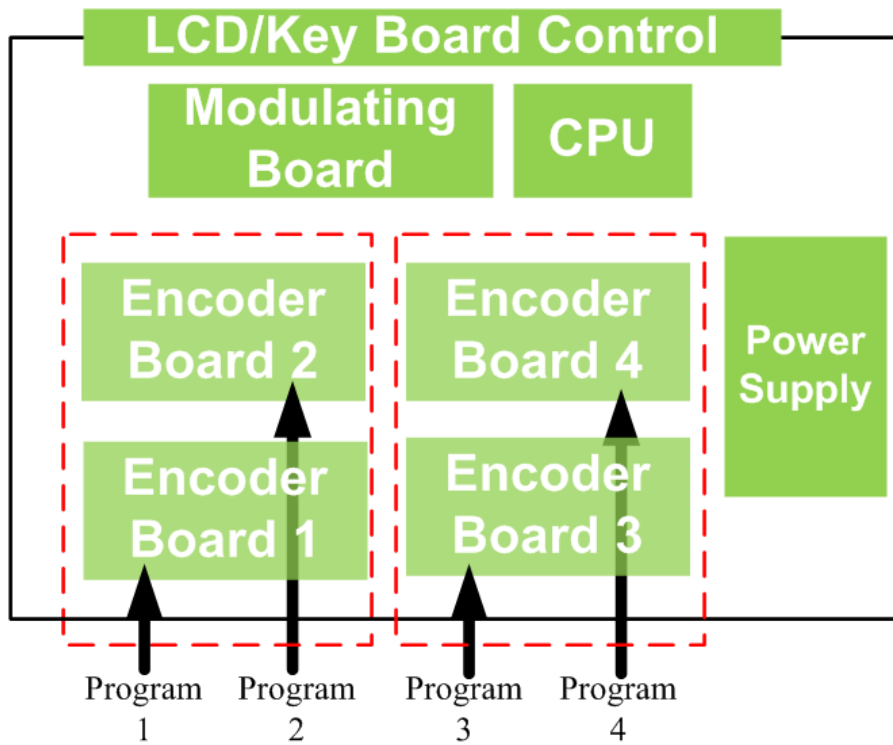
### System

Local interface	LCD + control buttons
Remote management	Web NMS
output	ASI out (BNC type); 4*SPTS out (RJ45, 100M)
NMS interface	RJ45, 100M
Language	English

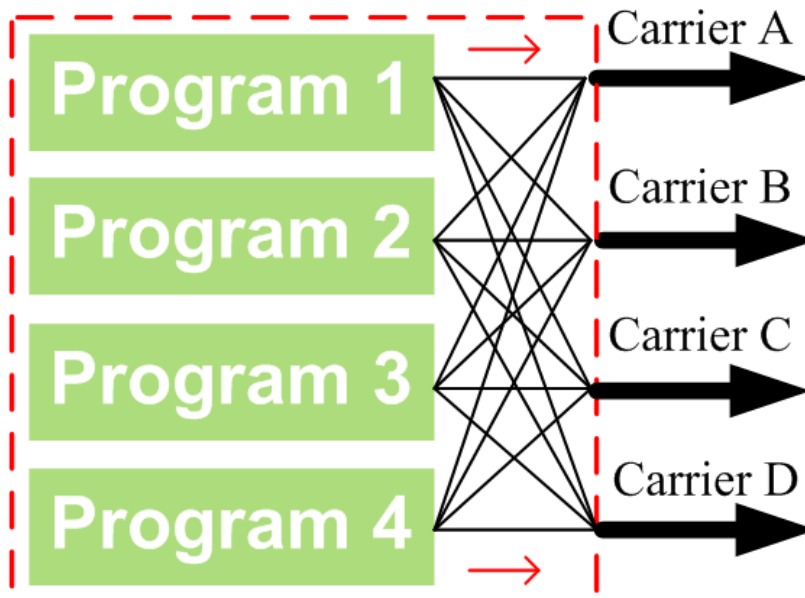
### General

Power supply	AC 100V~240V
Dimensions	482*400*44mm
Weight	5 kgs
Operation temperature	0~45°C

**1.4 Schematic Overview**

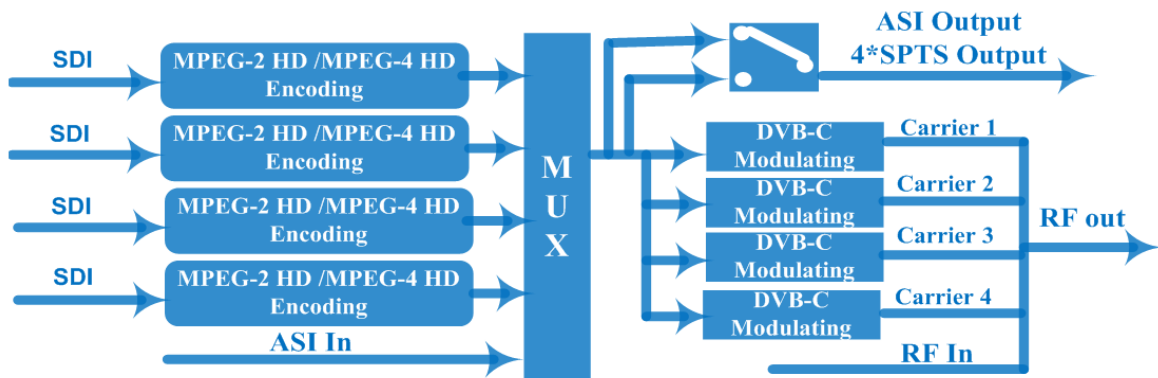


Inner Construction Overview



The Links between Programs and Carriers

### 1.5 Principle Chart



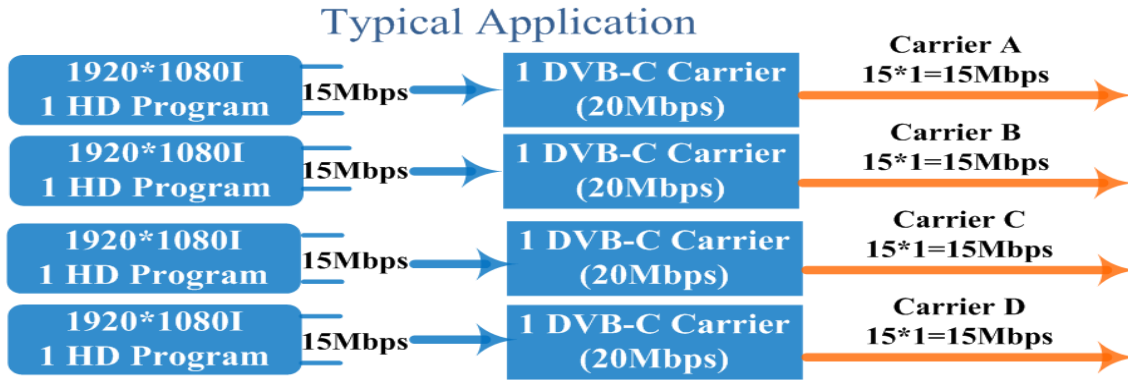
### 1.6 Typical Application of 4 \* Carrier Outputs

As we all know, to guarantee the picture quality of 1920x1080@50I/60I resolution HD program, the video bit-rate may exceed 10 Mbps, and even reach up to 15Mbps. However, when the modulating constellation is 64QAM (with 6MHz bandwidth), the maximum possible bit-rate output for single DVB-C carrier is only around 20Mbps.  $15\text{Mbps} \times 4 = 60\text{Mbps} > 20\text{Mbps}$ .

It means the single DVB-C carrier simply can't carry the 4 channels 1080i HD program if the average bit-rate exceeds 10Mbps.

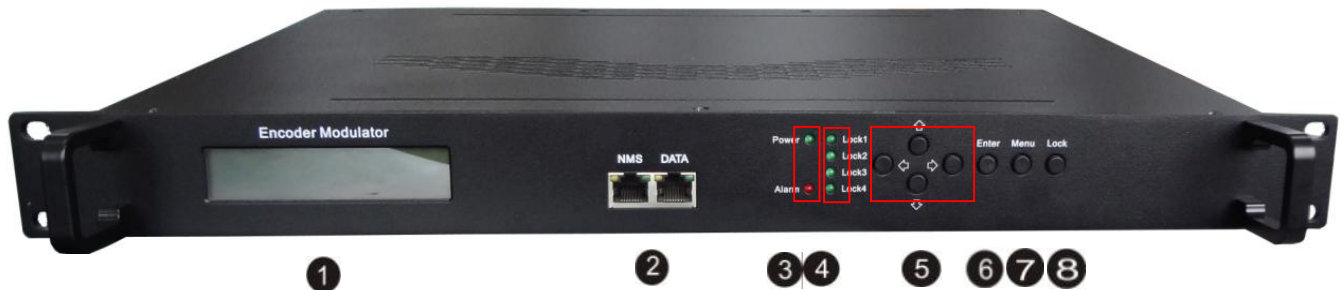
That's why we designed 4\*DVB-C carrier modulation board which quadruples the maximum possible bit-rate bandwidth up to 80Mbps and above when 64QAM constellation is used. This breakthrough makes it possible to reliably carry 4 channels of MPEG2 HD programs output simultaneously.

Below this chart will help to clearly illustrate the working principle.



## 1.7 Appearance and Description

### Front Panel Illustration



- ① LCD window: LCD display
- ② NMS & DATA ports
- ③ Power and Alarm Indicators
- ④ Lock Indicators
- ⑤ Up and down, left and right button
- ⑥ Enter button: for confirm



- ⑦ Menu button: for back step
- ⑧ Lock button: press to lock set

Rear Panel Illustration



- ① SDI(HDMI) Module 1: SDI input port 1&2
- ② SDI(HDMI) Module 2: SDI input port 3&4
- ③ RF in port (for combiner use)
- ④ RF out port
- ⑤ ASI input port
- ⑥ ASI output ports
- ⑦ Switch
- ⑧ Power supply slot
- ⑨ Grounding

4 Channel HDMI Version pictured below



## Chapter 2 Installation Guide

Please use caution when operating this device in order to abstain any possible injury during installation. For this reason, please read all details listed below and make and use caution before proceeding to operate and use this electronic equipment.

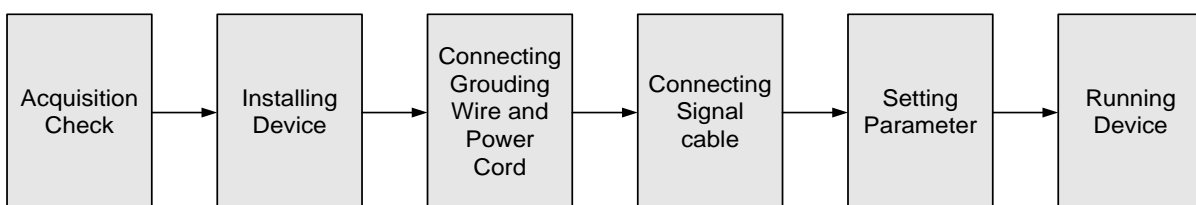
### 2.1 General Precautions

- ✓ Must be operated and maintained free of dust or debris.
- ✓ The cover should be securely fastened, do not open the cover of the products when the power is on.
- ✓ After installation, securely stow away all loose cables, external antenna, and others.

### 2.2 Power Precautions

- ✓ When you connect the power source, make sure it is grounded correctly so it doesn't cause an overload.
- ✓ Avoid operating on a wet floor in the open. 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



## 2.4 Environment Requirement

Item	Requirement
Machine Space Hall	When user installs machine 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 Volume resistivity of ground anti-static material: $1 \times 10^7 \sim 1 \times 10^{10} \Omega$ , Grounding current limiting resistance: $1 M\Omega$ (Floor bearing should be greater than $450 \text{Kg/m}^2$ )
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 $110\text{V} \pm 10\%$ , 50/60Hz or AC $220\text{V} \pm 10\%$ , 50/60Hz. Please carefully check before running.

## 2.5 Grounding Requirement

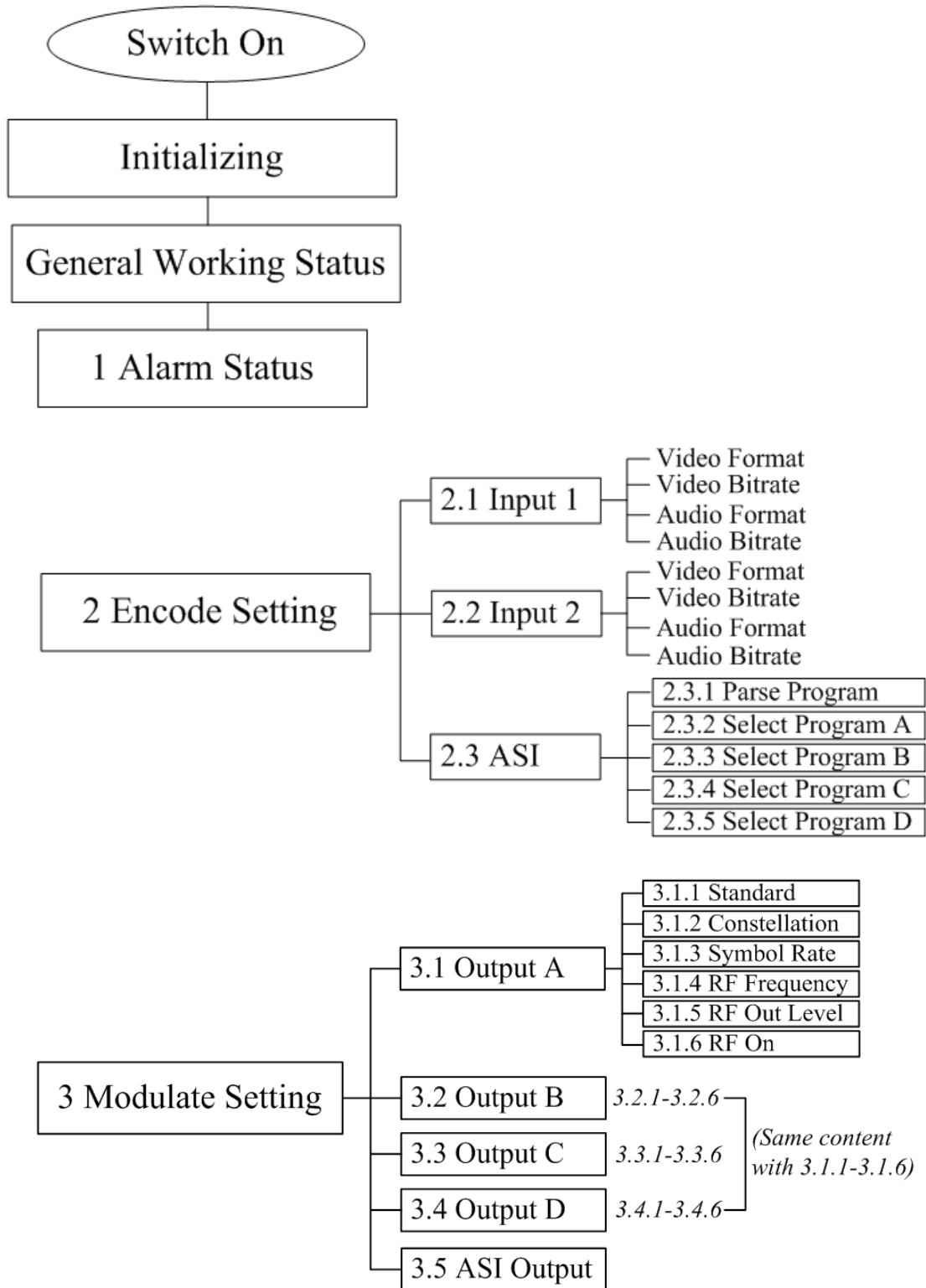
- ✓ It is important to keep this device grounded to ensure all of the modules function correctly. Correctly grounding the device will also help prevent any electrical interference, lightning. Etc. Also it helps reject minor interference that may disrupt the devices ability to function smoothly. General rule of them, make sure the device is grounded when installing anywhere.

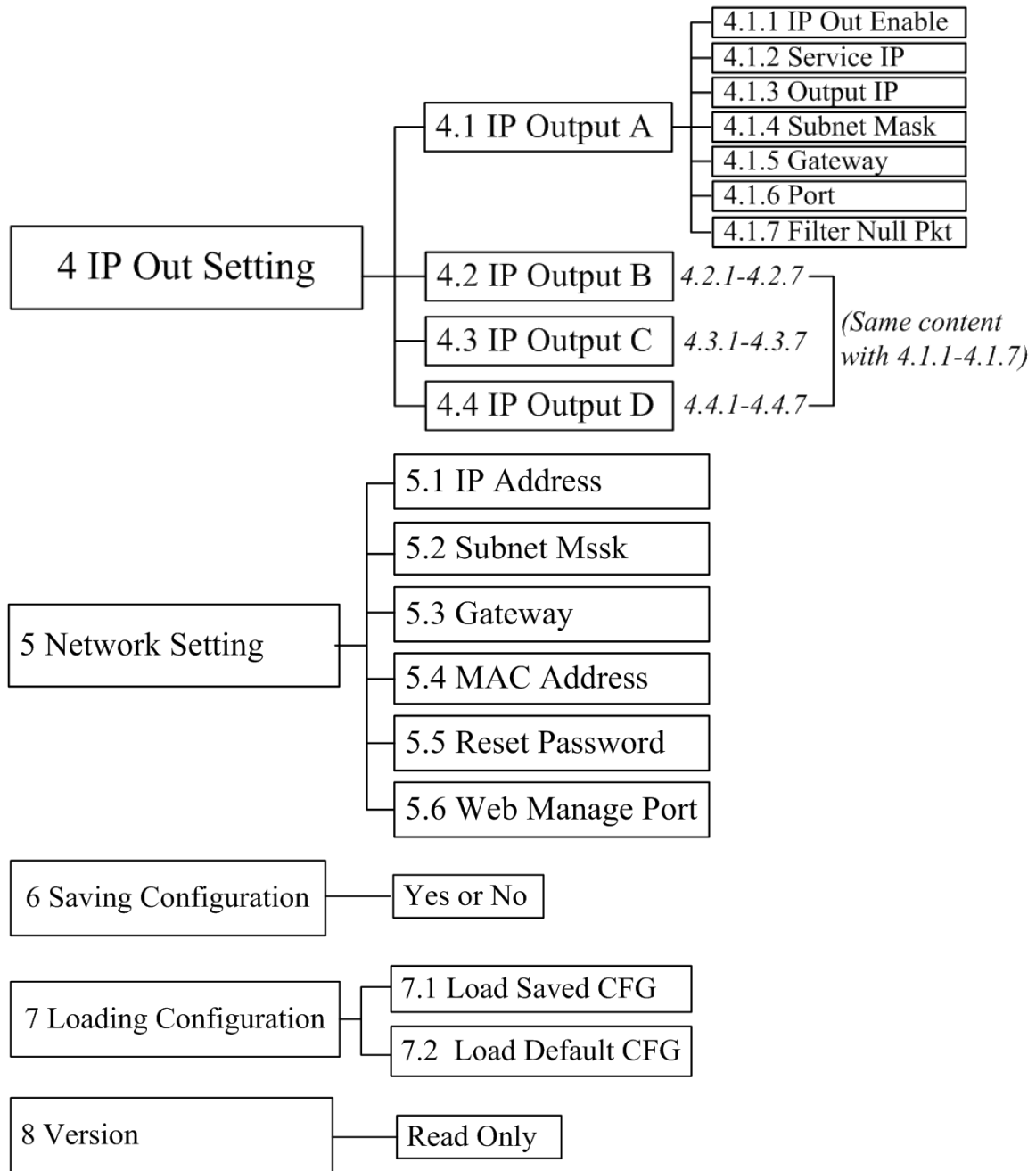
- ✓ Always use copper wire. When applied correctly the ground must be wrapped well to ensure maximum conduction so it can reduce any high frequencies. The copper ground wire should also be as short and thick as possible
- ✓ Installer must make sure that the two ends of the ground are well conducted and 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<sup>2</sup>.

## **Chapter 3 Operation**

### **3.1 LCD Menus**

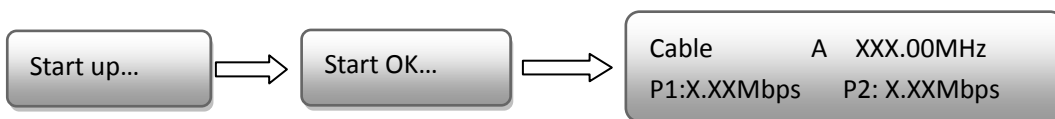
*An overview of the LCD menus:*





### 3.2 Initial Status

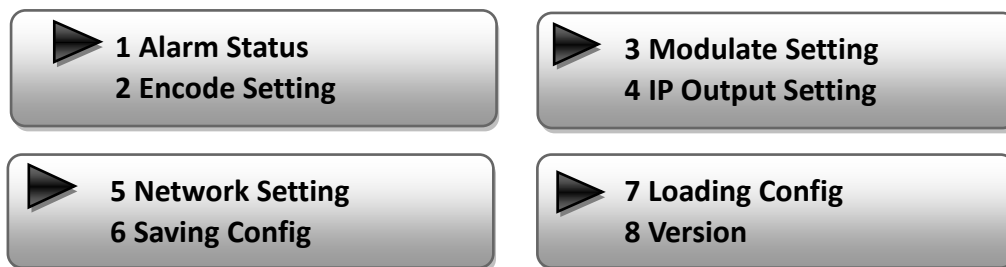
Switch on the device and after a few seconds' initialization, it presents start-up pictures as below:



- **Cable:** indicate the modulation standard of this device is DVB-C.
- **A:** the symbol of different carrier output. “A”, “B”, “C”, and “D” alternate constantly with the following output frequency.
- **XXX.XX MHz** indicates the current output frequency (range: 30~960MHz) of its corresponding carrier output.
- **P1:** Program 1; **P2:** Program 2; **P3:** Program 3; **P4:** Program 4
- **X.XX Mbps:** indicate the encoding bit rate of each channel respectively.

### 3.3 General Settings for Main Menu

Press “Lock” key on the front panel to enter the main menu. The LCD will display the following pages where user can configure the parameters for the device:



User can press UP/DOWN buttons to specify menu item, and then press ENTER to enter the submenus as below:

#### 1) Alarm Status

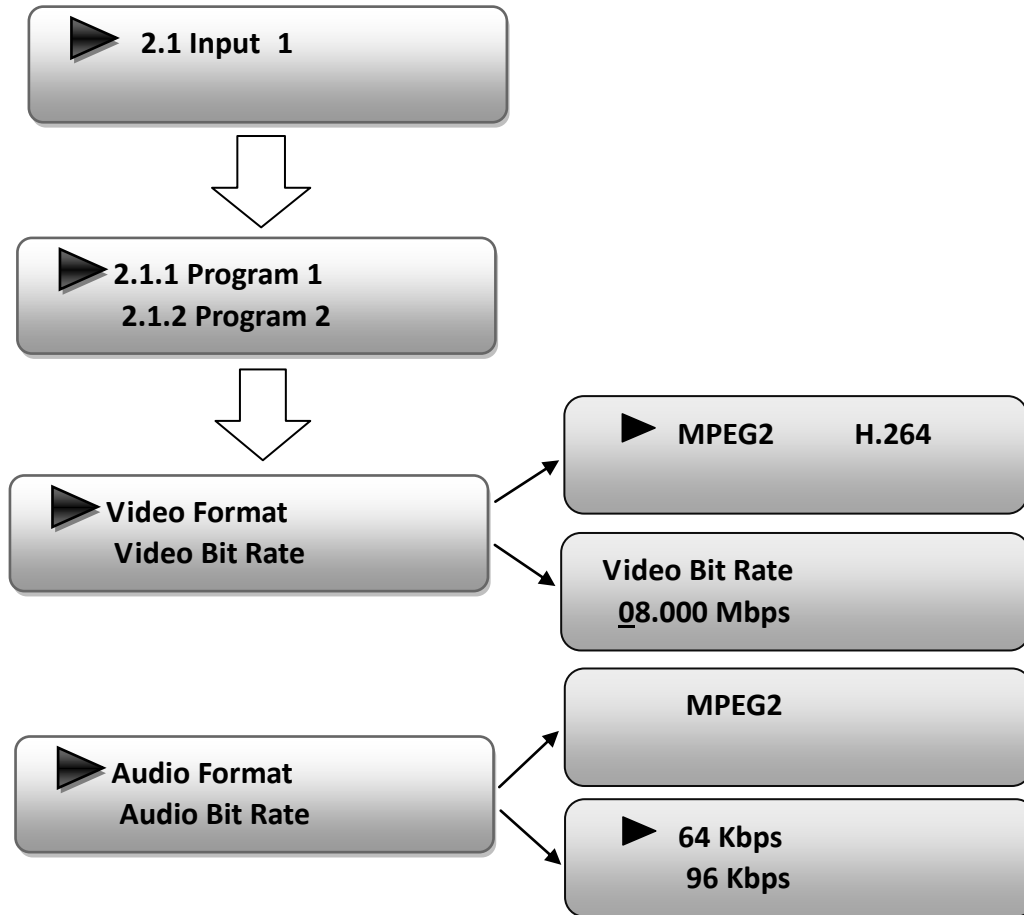
The alarm indicator will turn on if there is no A/V signals inputting or outputting bit rate overflows. User then can enter this menu to check the error type.

#### 2) Encode Setting

Under this submenu, the LCD will show “2.1 Input 1”, “2.2 Input 2” and “2.3 ASI”.



Under submenus 2.1 or 2.2, user could set the video encoding format and bit rate, and set audio encoding bit rate and also read the audio encoding format of the program from the SDI(HDMI) input.



“Video Format”: the encoding module supports both MPEG2 and MPEG4 AVC/H.264 formats. Move the triangle mark with LEFT/RIGHT keys to specify the intended format and press ENTER to confirm.

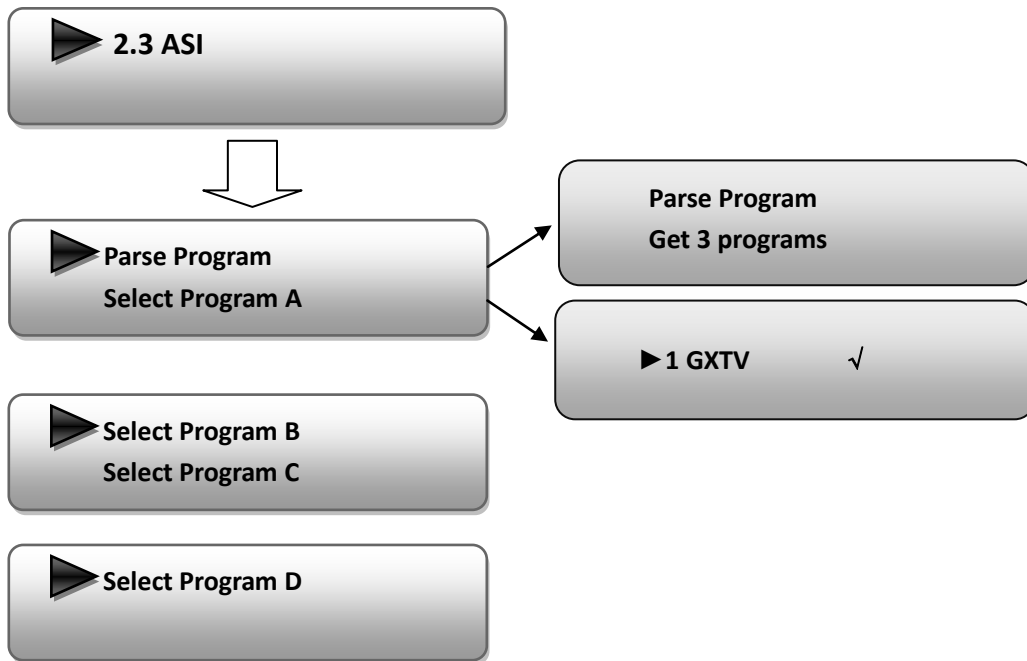
“Video Bit Rate”: Move the underline with LEFT/RIGHT keys and modify the value of frequency with UP/DOWN keys, and press ENTER key to save the settings.

“Audio Format”: the encoding module supports MPEG2 audio format. This is a read-only interface for checking.

“Audio Bit Rate” is to select audio encoding bit rate from the options provided.



Under submenu 2.3, user could parse the inputting programs and select the programs to output.



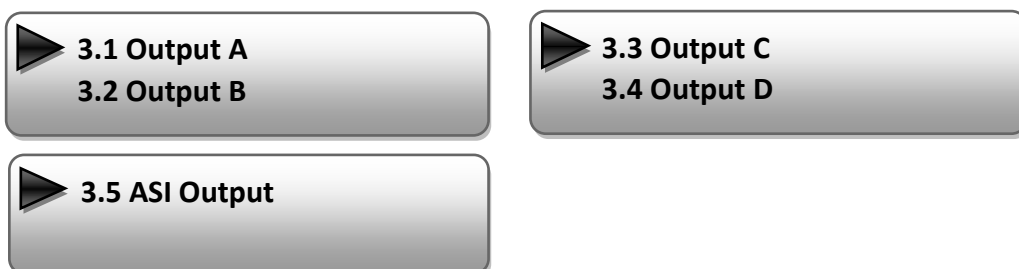
“Parse Program” is for checking the quantity of input programs from the corresponding Tuner input.

“Select Program A” is for selecting programs from the ASI IN to output through Carrier A. Move the triangle mark to specify the program and press RIGHT/LEFT keys to shift the mark between “√” and “X”. (“√”: to output the corresponding program; “X”: not to output the corresponding program)

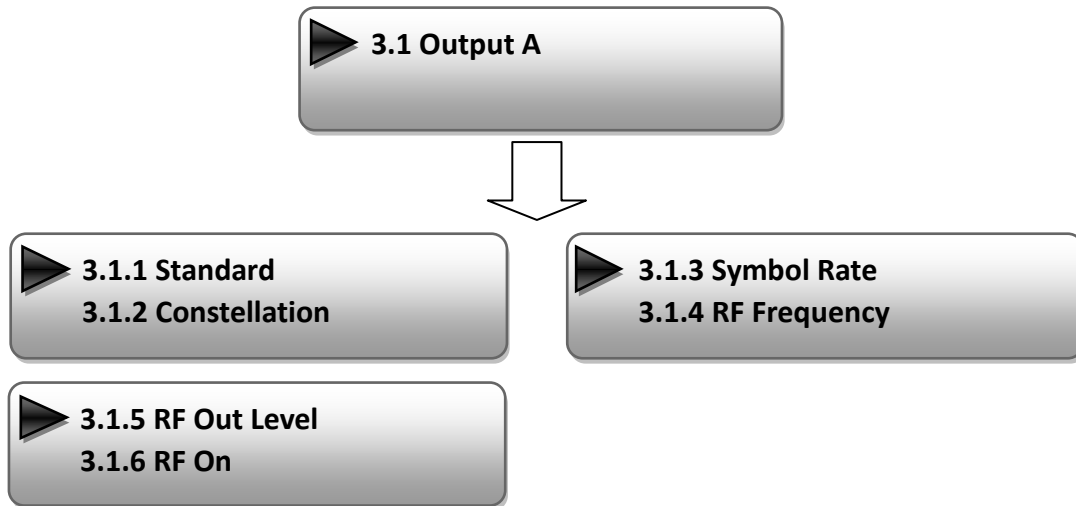
**REMARK:** “Select Program B/C/D” shares the same explanation with “Select Program A”.

### 3) Modulator Setting

When entering “Modulator Setting” submenu, user can find below different parameters can be set and the LCD window would show as below:



As the H-4SDI-(4HDMI)-QAM-IP (DVB-C Modulating) is with 4 carrier outputs, “3.1”-“3.4” represent the “Carrier A”, “Carrier B”, “Carrier B”, and “Carrier D” respectively. User can enter “3.1”/“3.2”/“3.4”/“3.4” to set the corresponding modulating parameters. Submenus (taking “3.1” as an example) are as below:



➤ **Standard**

There are three possible options provided for selecting **Standard**: J.83A (DVB-C), J.83B, J.83C when the display shows them, user just need swift LEFT and RIGHT key to choose.

➤ **Constellation**

Three different constellations: J.83A (DVB-C), J.83B, J.83C will show on the LCD window when Constellation been entered.

J.83A (DVB-C) contains 16QAM, 32QAM, 64QAM, 128QAM, and 256QAM;

J.83B contains 64QAM, 256QAM;

J.83C contains 64QAM, 256QAM.

16QAM: Quadrature Amplitude Modulation is 16

32 QAM: Quadrature Amplitude Modulation is 32

64QAM: Quadrature Amplitude Modulation is 64

128QAM: Quadrature Amplitude Modulation is 128

256QAM: Quadrature Amplitude Modulation is 256

Setting method is just the same. When the display shows them, user just need swift LEFT and RIGHT key to choose and repressing “ENTER” for confirm.

➤ **Symbol Rate**

The symbol rate range of both J.83A (DVB-C) & J.83C is 5Msps to 9Msps and J.83B is fixed and cannot be changed.

➤ **RF Frequency**


The RF output frequency range is from 30 to 960MHz with 1K stepping. After entering the RF frequency setting submenu, users the can press LEFT, RIGHT, UP, and DOWN buttons to adjust the frequency and confirm by press ENTER button.



**RF Frequency**  
750.000 MHz

➤ **RF out level**

The RF attenuation range is from -30~-10dbm (81~97dbμV) with 0.1db step. After entering this setting submenu, user can shift UP/DOWN/LEFT/RIGHT key to set the output level and press ENTER to confirm.



**RF Out Level**  
-10.0 dbm

➤ **RF On**

This interface is to decide whether to enable the RF (carrier A) output or not.

**OFF:** to disable programs to output through carrier A.

**ON:** to enable programs to output through carrier A.



**RF On**  
▶ **Off**      **On**

**NOTE: The setting principle of “3.2”, “3.3”, and “3.4” are the same with “3.1” explained above.**

**ASI Output:**

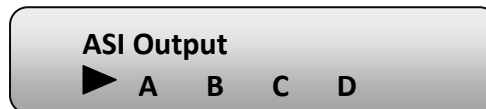
H-4SDI-QAM-IP encoder & modulator (DVB-C Modulating) is with quad-carrier output: Output A, B, C, and D.

**Output A:** the ASI output programs are same as carrier output A.

**Output B:** the ASI output programs are same as carrier output B.

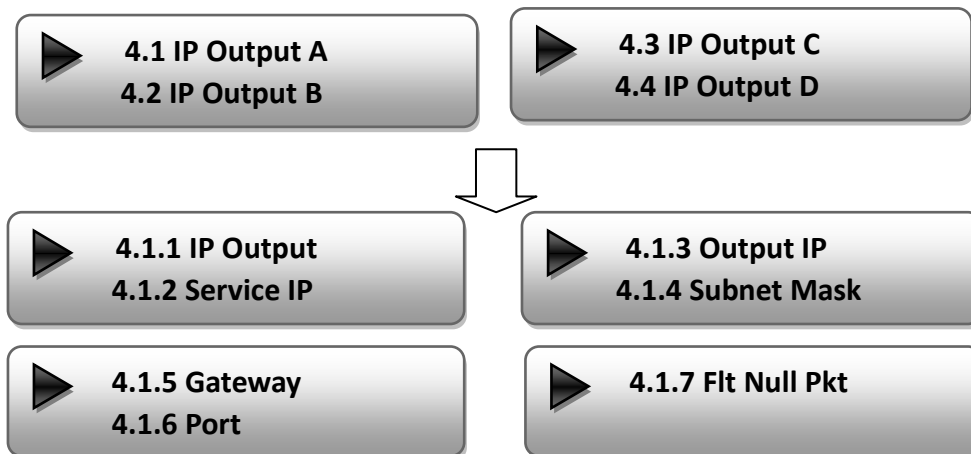
**Output C:** the ASI output programs are same as carrier output C.

**Output D:** the ASI output programs are same as carrier output D.



#### 4) IP Output Setting

H-4SDI-(4HDMI)-QAM-IP encoder & modulator (DVB-C Modulating) is with quad-carrier output (Output A, B, C, and D), “4.1” to “4.4” are for the settings of the 4 carrier outputs respectively. Submenus go as 4.1.1-4.1.7

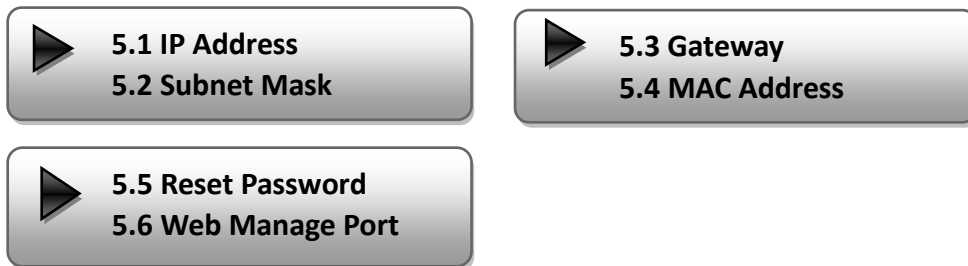


User can enter 4.1.1 to decide whether to turn the IP port on or off, and enter to the rest menu items to set the corresponding parameters.

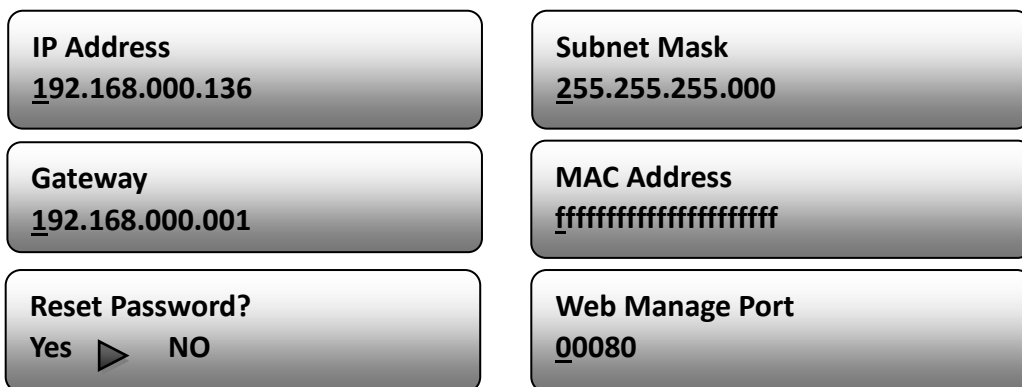
IP Output OFF ► ON	Service IP 192.168.002.137
Output IP 224.002.002.002	Subnet mask 255.255.255.000
Gateway 192.168.002.000	Port 01234
Filter Null Packet OFF ► ON	

5) Network setting

After enter Network Setting, there are three submenus shows as the following LCD displays.



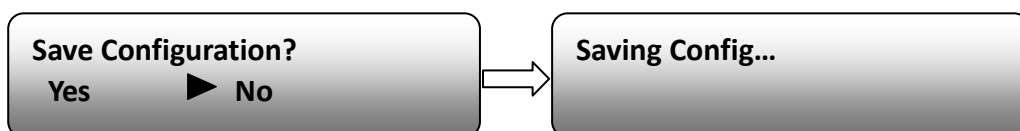
User can press “UP/DOWN” to choose this item and “ENTER” & “LEFT/RIGHT” to set the parameters.



**NOTE:** The MAC address is according to the factory setting, and it is unique.

6) Saving Configuration

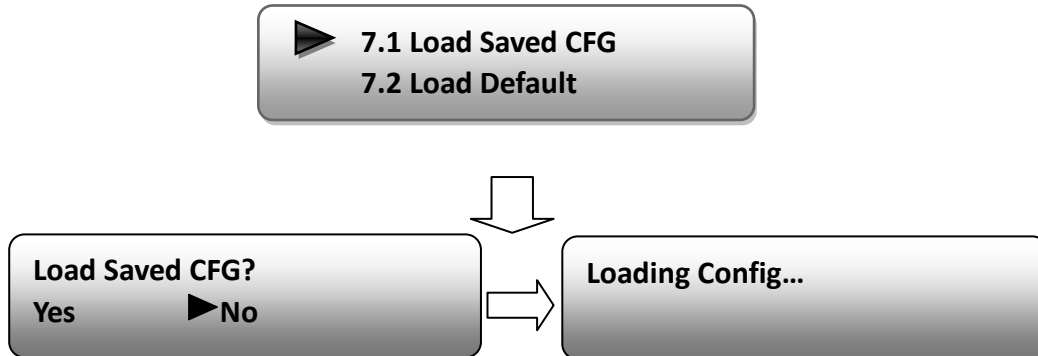
Users can enter Saving Configuration submenu for saving settings. Choose yes and press ENTER to confirm.



7) Loading Configuration

At this menu, user can press UP/DWON key to select and repress ENTER to confirm.

User can restore the device into the last saved configuration by choosing “7.1” and restore the device into factory configuration by choosing “7.2” the display will show as below:



#### 8) Version

User can check the software version and hardware version of this equipment under this submenu.



## Chapter 4 WEB NMS Operation

User not only can use front buttons to set configuration, but also can 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 the H-4SDI-QAM-IP IP address; otherwise, it would cause IP conflict.

### 4.1 login

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

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 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.

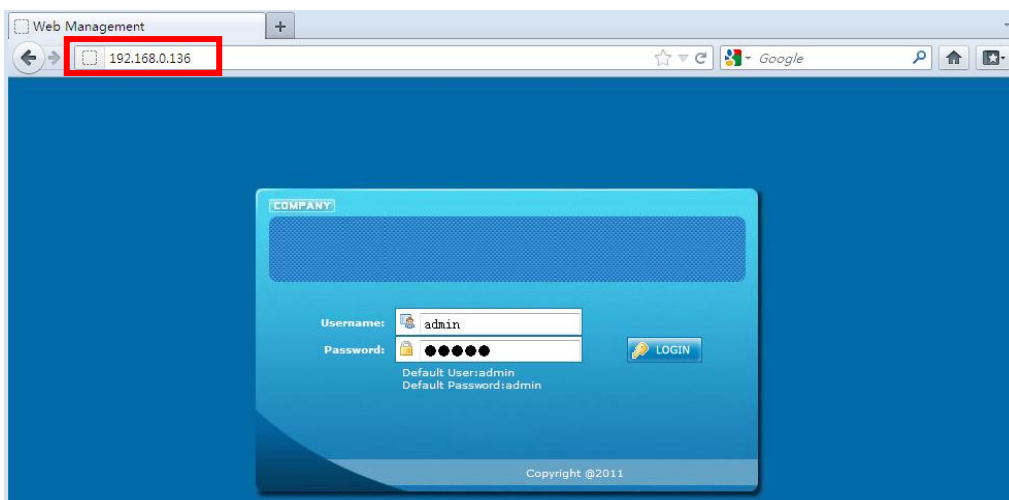


Figure-1

## 4.2 Operation

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

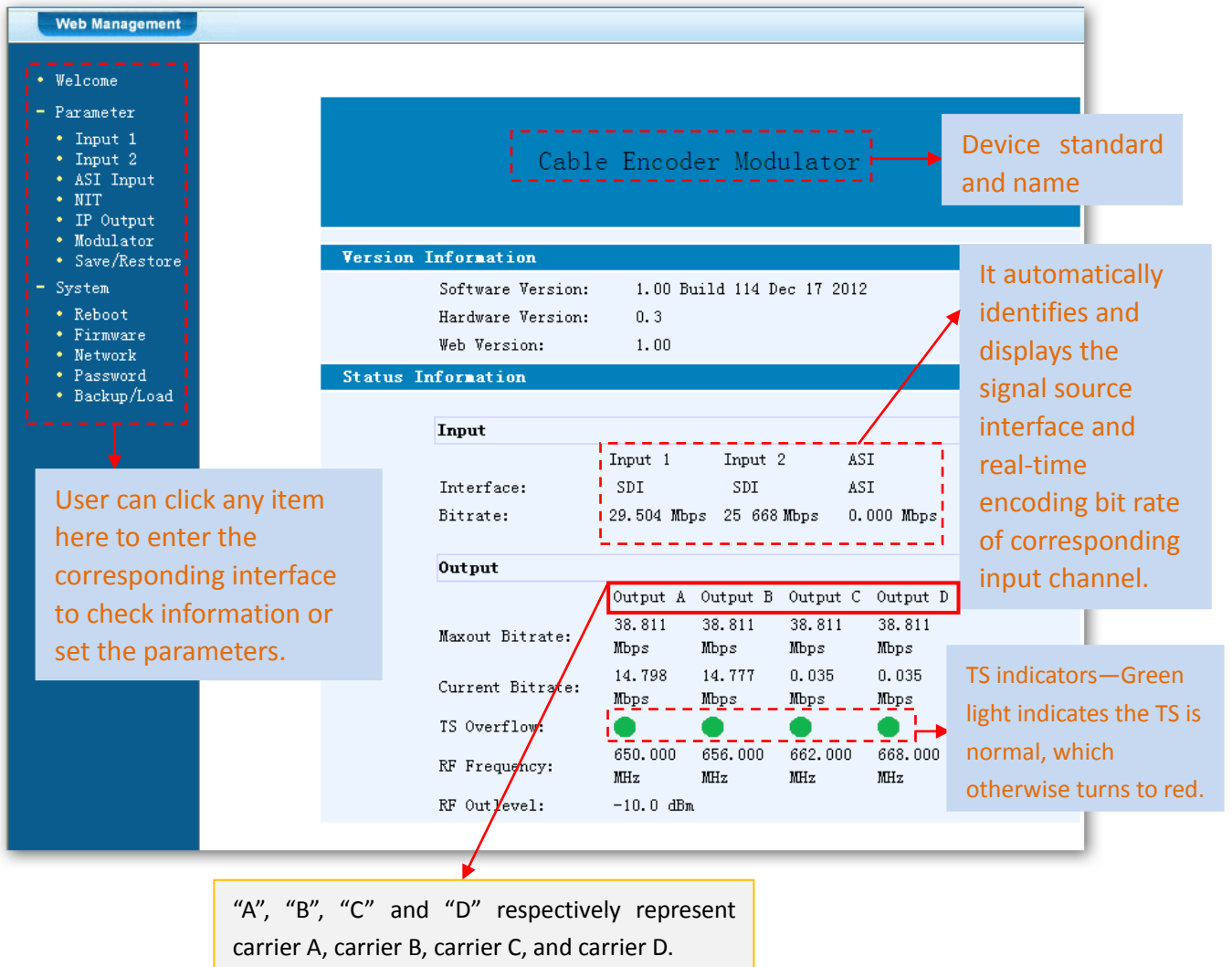


Figure-2

### Input 1

From the menu on left side of the webpage, clicking “Input 1”, it displays the information of the 2 programs from the 1<sup>st</sup> SDI encoding slot as Figure-3.



This column is for setting the 1<sup>st</sup> SDI IN program.

This column is for setting the 2<sup>ed</sup> SDI IN program.

General Settings for the SDI IN programs: User can edit any item listed as needed.

Encoding Status—Green light indicate it works normally, which otherwise turn to red.

Parameter	1 <sup>st</sup> SDI IN Program	2 <sup>ed</sup> SDI IN Program
Video Format	Mpeg2	Mpeg2
Low delay	Mode 2	Mode 1
Video BitRate	14.000 Mbps	14.000 Mbps
Audio Format	Mpeg2	Mpeg2
Audio BitRate	192 Kbps	192 Kbps
Audio Gain(0-400%)	100%	100%
Program Out Enable (ABCD)	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Program Name	TV-101	TV-102
Service ID	0x101	0x102
PMT PID	0x100	0x104
Video PID	0x101	0x105
Audio PID	0x102	0x106
PCR PID	0x103	0x107
Video:	<span style="color: green;">●</span>	<span style="color: green;">●</span>
Video Format:	1920x1080 50i	1920x1080 50i
Encoding:	<span style="color: green;">●</span>	<span style="color: green;">●</span>
Bitrate:	12.112 Mbps	11.350 Mbps
Rom Version:	0. a. 0. 35	0. a. 0. 18

Figure-3

#### Enable or Disable the Carrier Output Function:

Program Out Enable (ABCD)

The 4 boxes respectively represent Carrier A, B, C, and D. Tick the corresponding box(es) to enable the related program output through the corresponding Carrier. One program can output through a single or multiple Carriers. However, it is suggested that a single carrier outputs only one program to adapt the fluctuant encoding bit rate.

#### NOTE

The different combination of **Video Format**, **Video Bit-rate**, **Low Delay Mode** and the **Resolution** of signal source will have an impact on the delay. Please refer to the **Appendix** attached for detailed information.

**Help** For user to reference detailed explanation of terms on this interface

**Default** Click this button to apply the default setting of Input 1

**Apply** Click this button to apply the modified parameters.

## Input 2

Similarly, from the menu on left side of the webpage, clicking “Input 2”, it displays the information of the 2 programs from the 2<sup>nd</sup> SDI encoding slot.

## ASI Input

Click “ASI Input”, it will display ASI input program information as Figure-4.

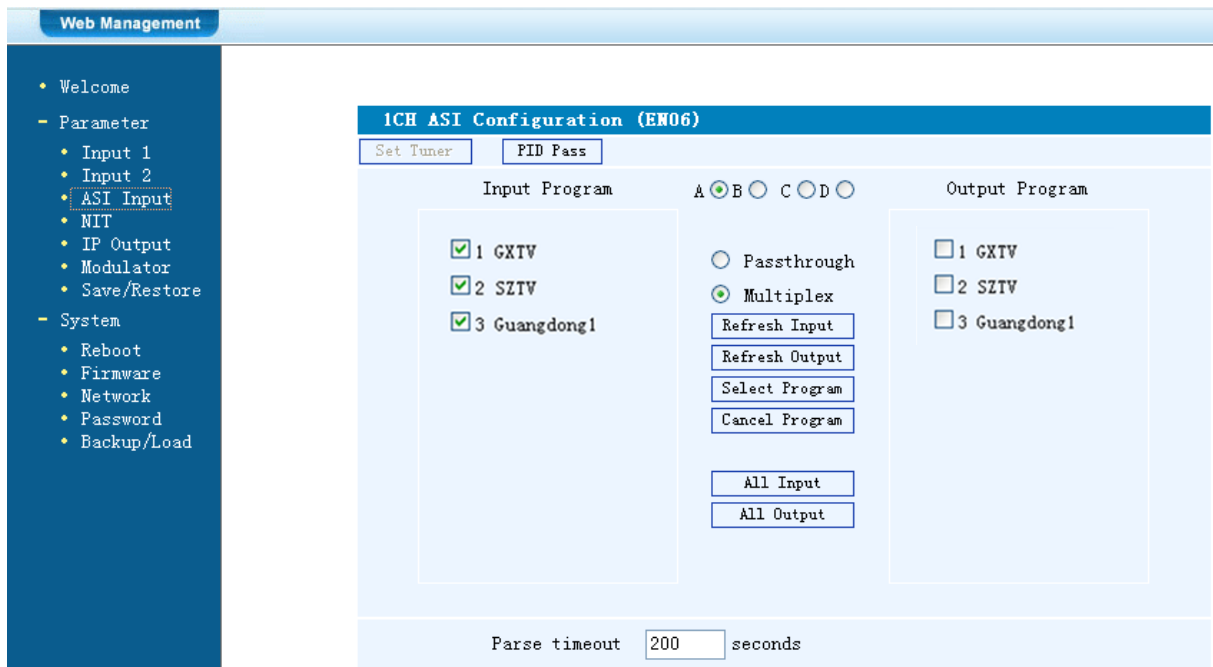


Figure-4

**A B C D** Select the carrier output channel for the multiplexed programs.

**Passthrough** If this item is selected, all the input programs will pass through without any elimination.

**Multiplex** Selecting this item to allow user select programs as required to output.

**Refresh Input** Click “Refresh Input” to refresh the input program list.

**Refresh Output** Click “Refresh Output” to refresh the output program list.

**Select Program** When user checks one input program with “√”, one can transfer the checked program to the right box to output.

Here user can select the programs which we want to output or we can output all the programs.

**Cancel Program** Similarly, user can cancel the multiplexed programs from the right box.

**All Input** & **All Output** to select all the input/output programs with one-time clicking.

**Parse timeout**  **seconds** Time limitation to parse the input programs

**PID Pass** Click this button to trigger a dialog box as below, where to add the PIDs which need pass through.

In some occasions, there are some PIDs which won’t belong to any program, such as EPG, NIT tables and so on which user just wants to pass them through the multiplexing module without changing anything. This is the main purpose of this function.



Click “Add” **Add** to add more boxes for filling the Input & Output PIDs, then click “Apply” to confirm.

### NIT Table setting

Click “NIT” from the menu to trigger the screen as Figure-5. Then click “Add” from this screen to add the program descriptor in NIT Table.

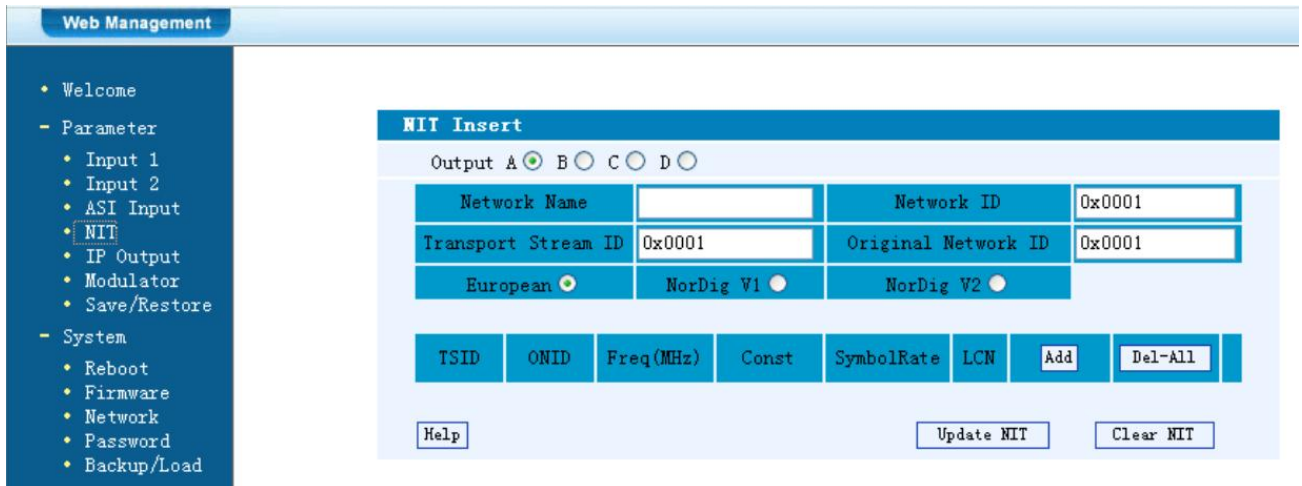


Figure-5

Output A  B  C  D  Select the carrier output channel for the inserted NIT.

**Add** Click “Add” from this page, it will display the screen as Figure-6 where it requires to add Service ID and configure other parameters for the programs.

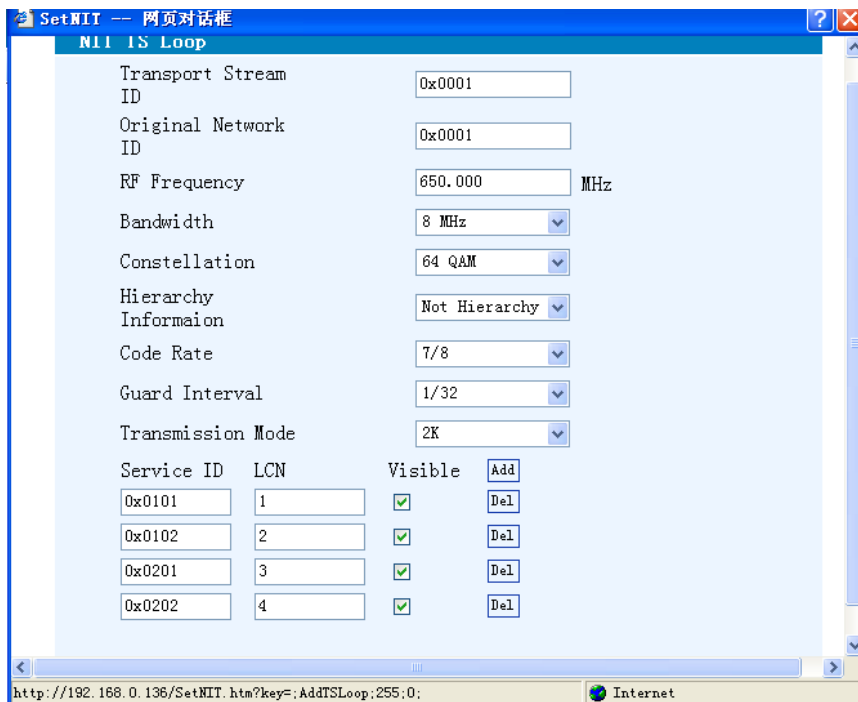


Figure-6

**Add** Here by clicking “Add”, users can set the program LCN in its respective

field. After setting all the data, users need to click on “Save”  to save the setting. As Figure-7, click “Update NIT”  to update the NIT information.

TSID	ONID	Freq(MHz)	Bandwidth	Const	LCN
0x0001	0x0001	750.000	8 MHz	64 QAM	yes

Figure-7

## IP Output

Click “IP Output” from the left menu, it will display the screen as Figure-8 where to set the multicast IP Output address for the device if needed and set the IP output for the programs.

After setting the parameters, click “Apply” to save the setting.

**IP Output Configuration**

IP Output Enable: If not set, the following parameters will be no use, the IP Output will not work.

Service IP: The IP Output port address. The format is xxx.xxx.xxx.xxx (like as 192.168.2.137).

Output IP: The IP Output data receive address. The format is xxx.xxx.xxx.xxx (like as 224.2.2.2). After set the Output IP address, you must use the new address to receive IP Output data.

Subnet Mask: General is 255.255.255.0, it is must the same in a local area network.

Gateway: If the device is in different net segment, you must set the gateway.

Port: The UDP protocol port (like as 8001), you should use Output IP and new port to receive IP Output data (like as udp://224.2.2.2:8001).

IP Output Enable (ABCD):

Filter Null Pkt (ABCD):

Output IP A:	224.2.2.2	Port:	1234
Output IP B:	224.2.2.2	Port:	1235
Output IP C:	224.2.2.2	Port:	1236
Output IP D:	224.2.2.2	Port:	1237

Service IP: 192.168.2.137

Subnet Mask: 255.255.255.0

Gateway: 192.168.2.0

The 4 boxes represent the 4 SPTS out respectively.

To configure the output IP address and ports for the 4 SPTS respectively.

Figure-8

## Modulator Setting

Enter in “Modulator” and it will display the Modulator Configuration screen as Figure-9 where can set modulation parameters.

**RF On** –To decide whether to enable the RF (carrier A/B/C/D) output or not.

**Standard** –Modulating standard selecting.


**Constellation** –QAM type selecting.

**Symbol Rate** – To set the symbol rate

**RF Frequency A/B/C/D**– to set the RF frequency for the 4 carriers

**RF Out level** –to set the RF output level

**ASI Output**– To select carrier output channel for ASI output (**Output A:** The ASI output programs are same as carrier A; **Output B:** The ASI output programs are same as carrier B; and the like.)

After setting all the parameters, click “Apply”  to save the Modulator Configuration.

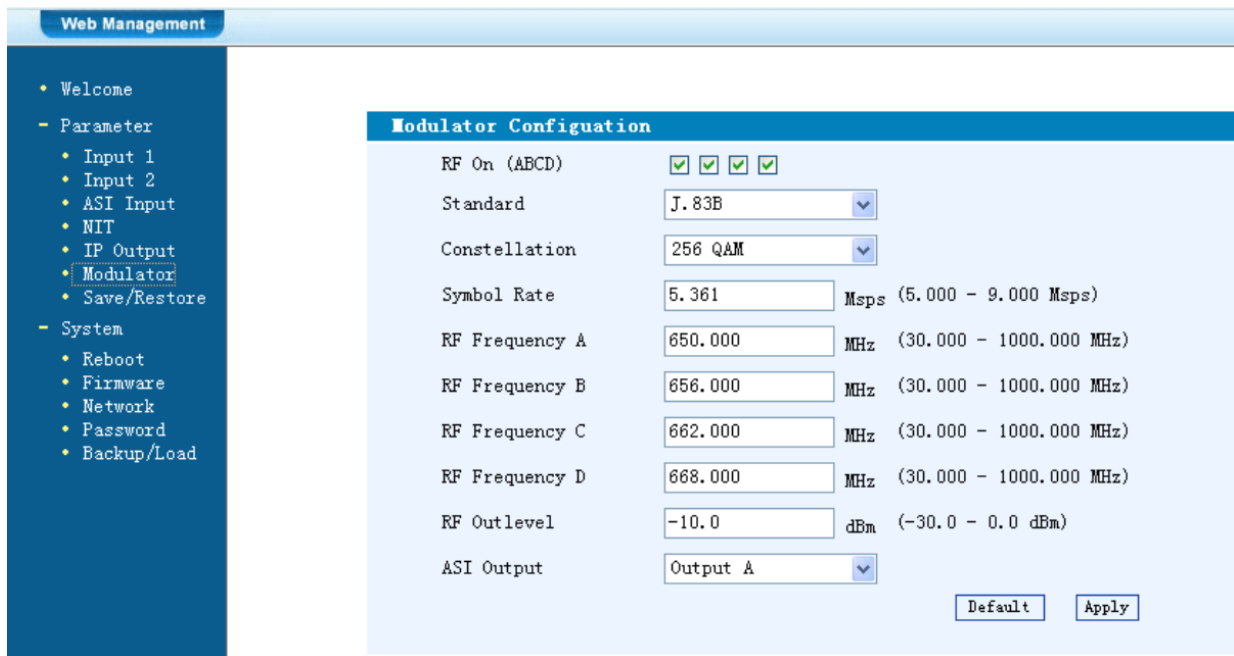


Figure-9

## Save/Restore

Clicking “Save/Restore” from the menu, it will display the screen as Figure-10 where can save the configuration permanently to the device. Click “Save Configuration”,

for store the data permanently to the device.

By using “Restore Configuration” user can restore the latest saved configuration to the device.

By using “Factory Set” user can import the default factory configuration.

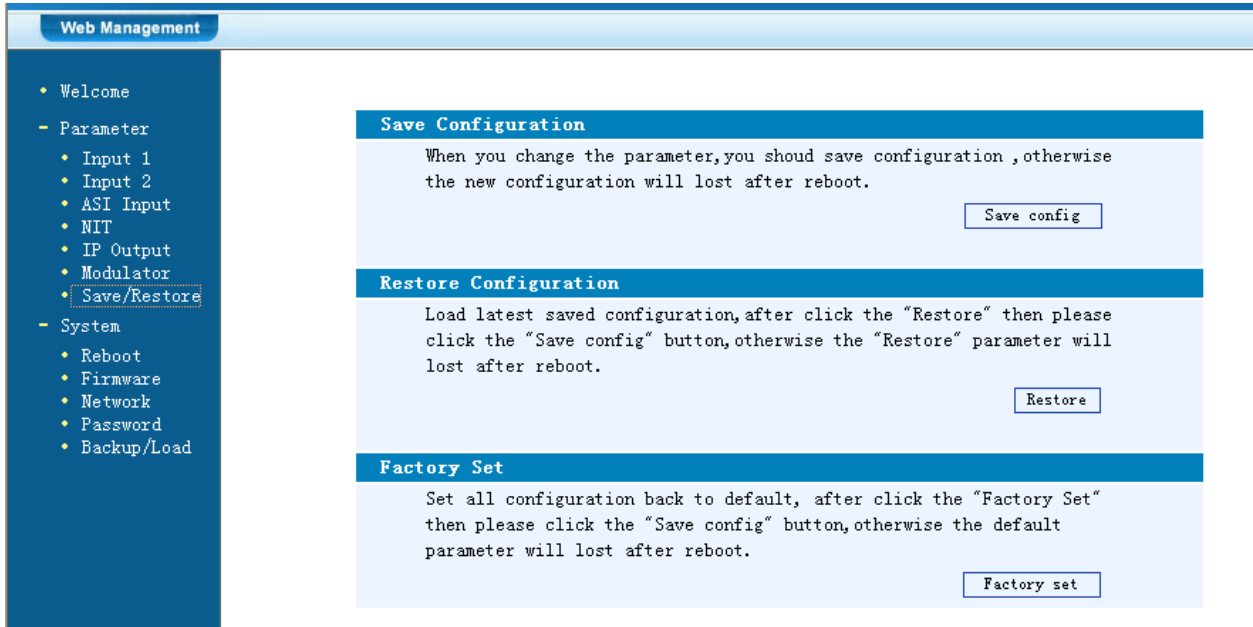


Figure-10

## Restart the Device

Click “Reboot” from the menu, the screen will display as Figure-11. Here when clicking “Reboot” box, it will restart the device automatically.

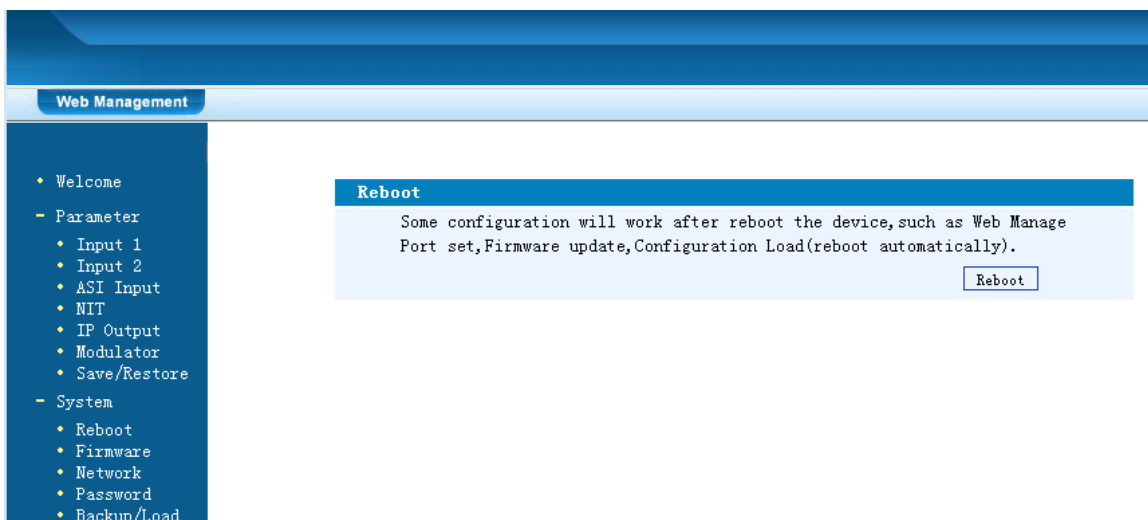


Figure-11

## Update the Device

Click “Firmware” from the menu it will display the screen as Figure-12. Here user can update the device by using the update file.

Click “Browse” to find the path of the device update file for this device then click “Update” to update the device.

After updating the device, user needs to restart the device by using Reboot option.

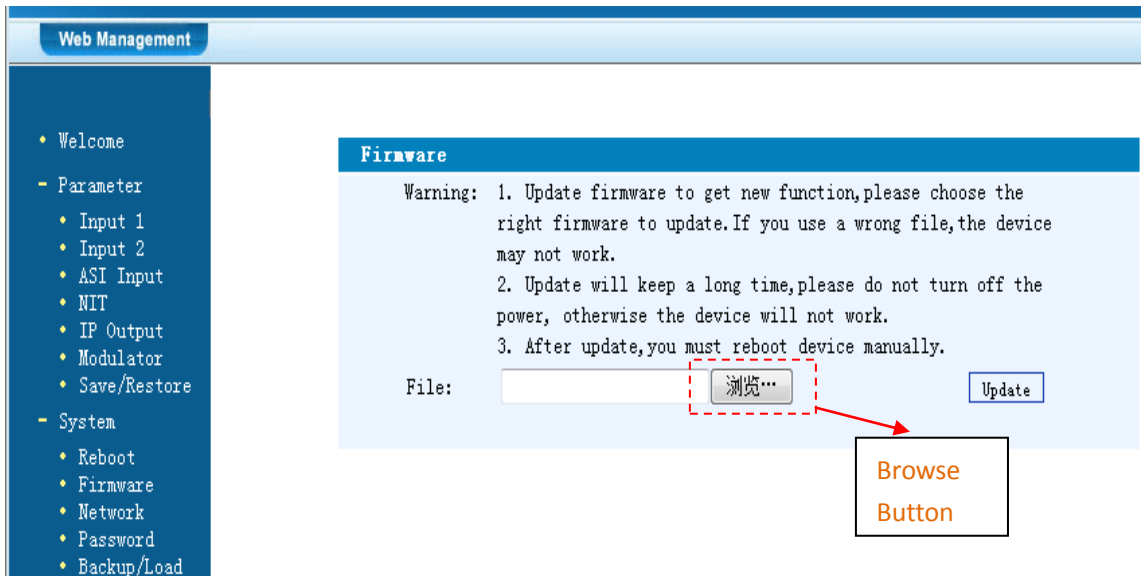


Figure-12

## Network

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



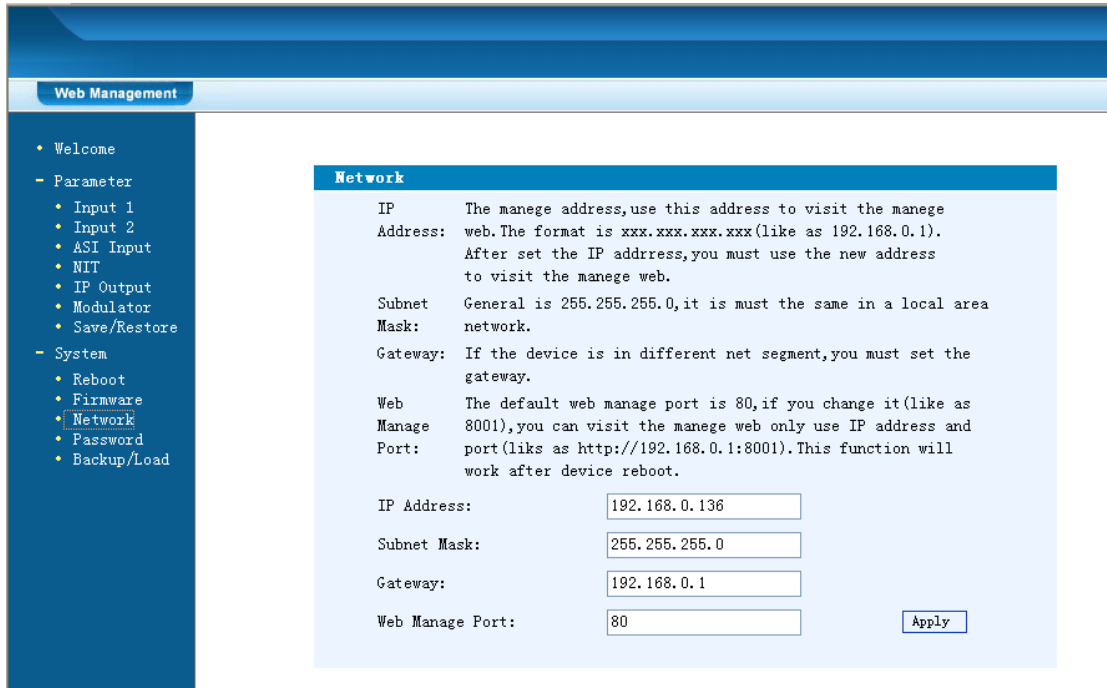


Figure-13

### Change Password

When user clicks “Password”, it will display the password screen as Figure-14. Here user can change the Username and Password for login to the device. After putting the current and new Username and Password, click “Apply” to save the configuration.

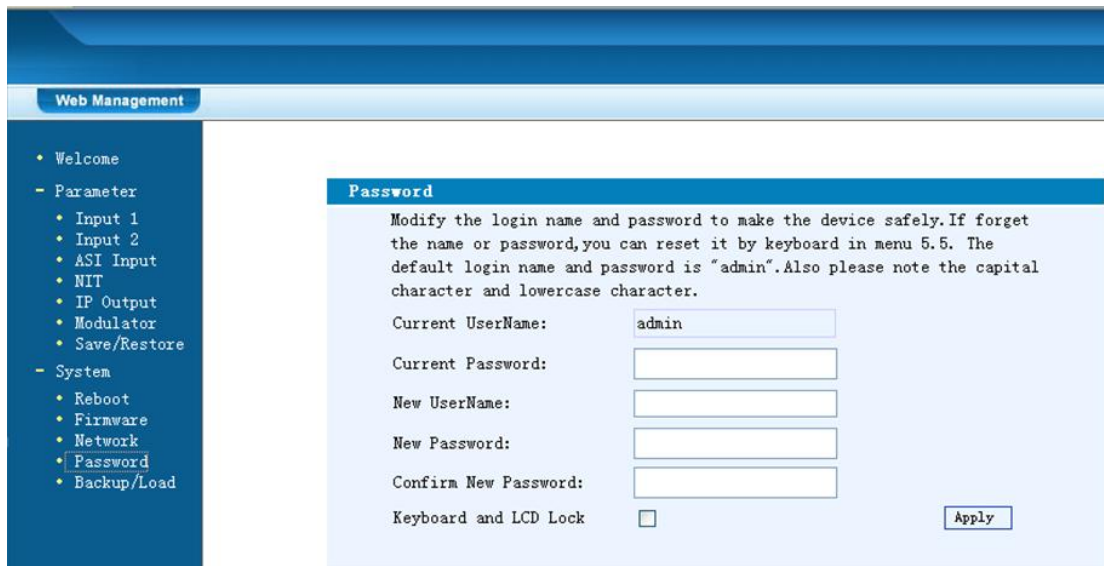
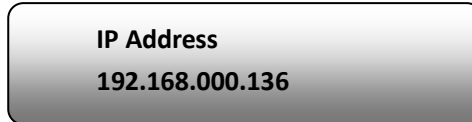


Figure-14

Keyboard and LCD Lock

➤ Keyboard and LCD Lock: If it is marked with “√”, the LCD and keyboard will be locked to avoid unrelated users’ modifying or view the device information and configurations. User can’t operate the keyboard & LCD while only the device IP address can be noted in the LCD window.



## Backup/Load

Click “Backup/Load” from the menu, it will display the screen as Figure-15.

**Backup Configuration** – To back up the device configuration file to a folder

**Load Configuration** – If user needs to load the old configuration to the device, click “Browse” and find the backup configuration file path. After selecting the file, click “Load File” to load the backup file to the device.

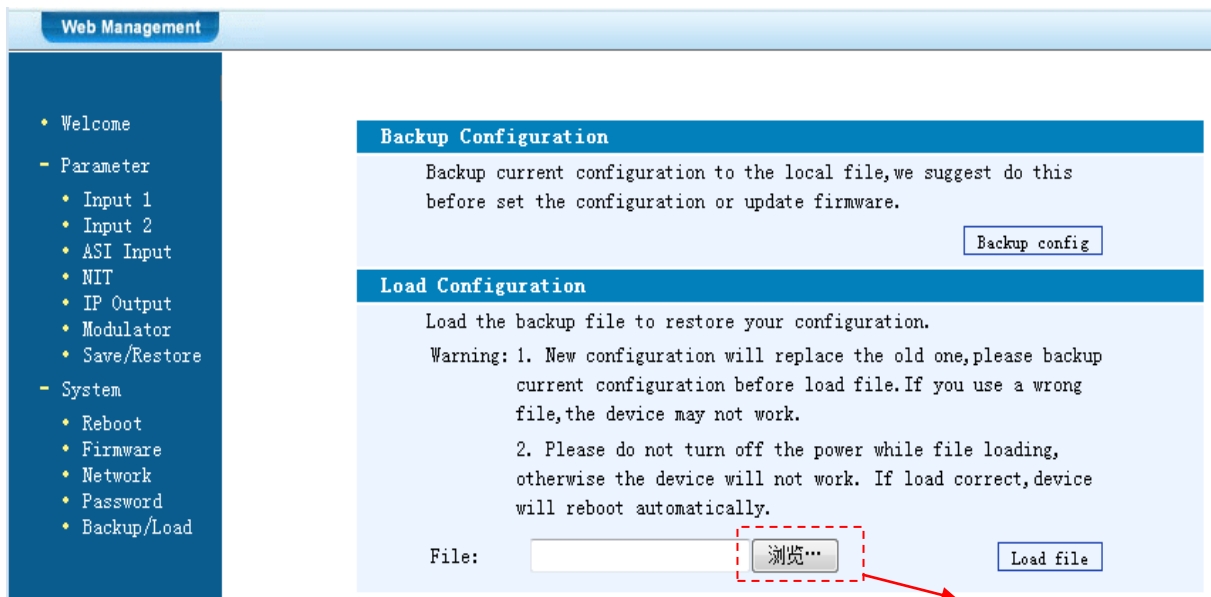


Figure-15

Browse  
Button

## Chapter 5 Troubleshooting

Thor Broadcast has every device go through several levels of inspection for quality control. All systems shipped by Thor Broadcast are fully tested and visually inspected after manufacture. Additionally, all units are re-inspected and pre-configured prior to shipping. Under most circumstances, Thor offers free configuration service for most equipment. Thor can set operating parameters prior to shipping, and ensure trouble free operation and installation.

### **Prevention Measure**

- Please ensure that the environment remains within 0 to 45 °C
- Provide adequate ventilation to the heat sinks and side vents
- Check the input AC voltage, please use appropriate power supplies
- Check the RF output level, make sure it varies within a tolerable range if necessary
- Check that all signal cables are securely installed and nothing is loose
- Frequently switching on/off device is prohibited; please allow at least 10 seconds before switching system on and off.

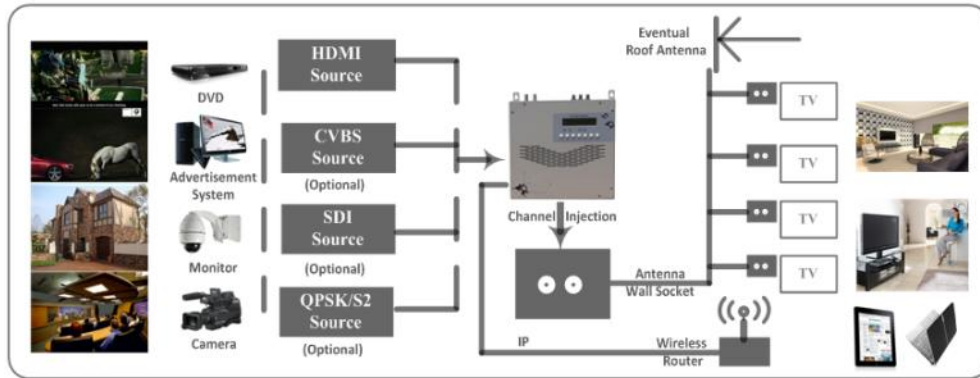
### **Conditions need to unplug power cord**

- Power cord or socket damaged.
- Any liquid that got into the device.
- Any stuff that could cause a circuit short
- Device is 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

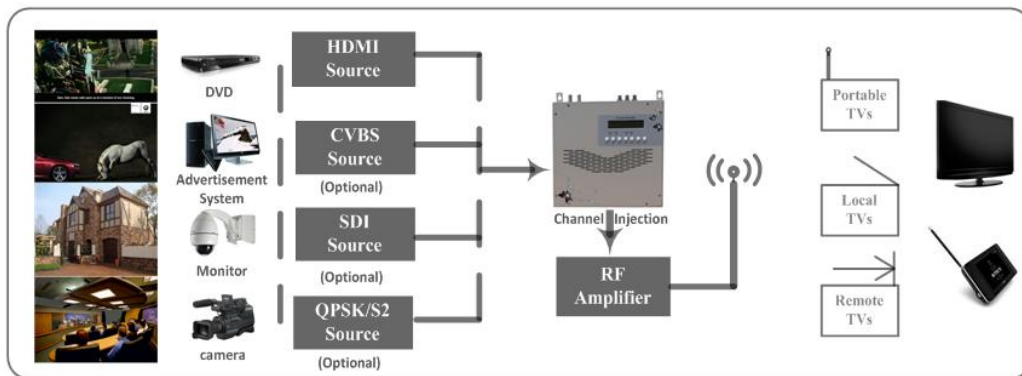
# Chapter 6 Application

## Application Examples

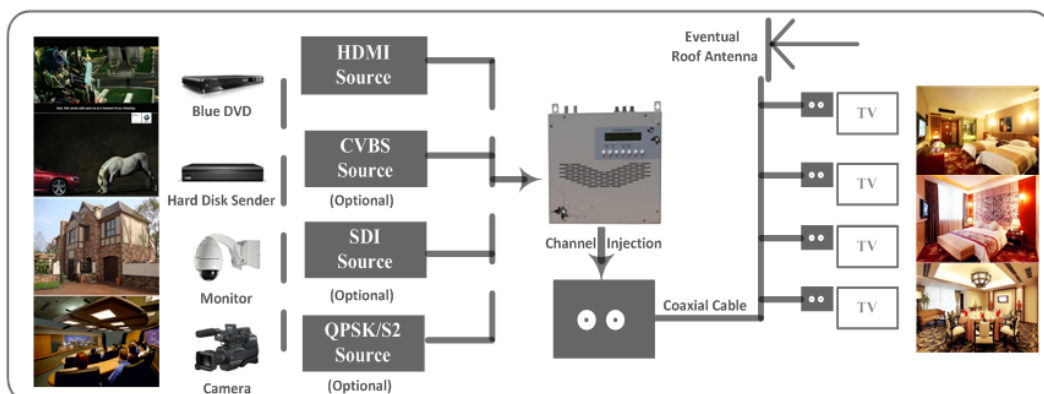
### 1). Residences and Private Homes Video content DVB-T/ISDB-T distribution



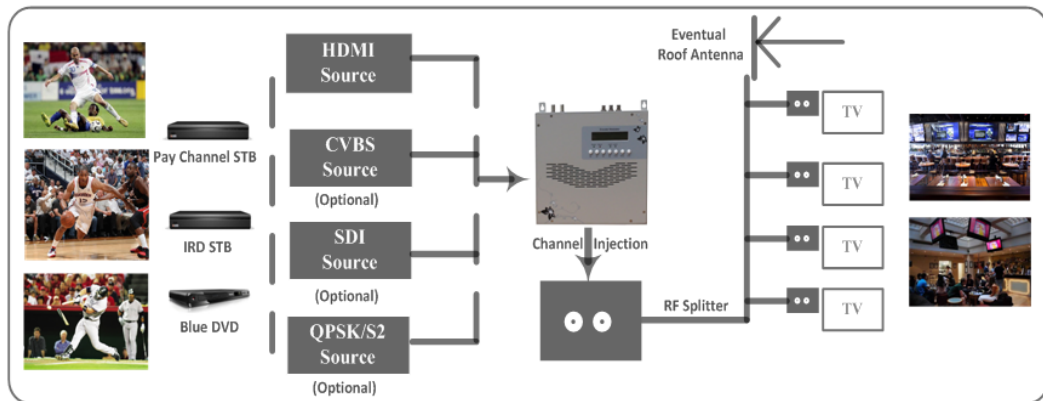
### 2) Outside Audio- Video contents ON- AIR DVB- T/ISDB-T distribution



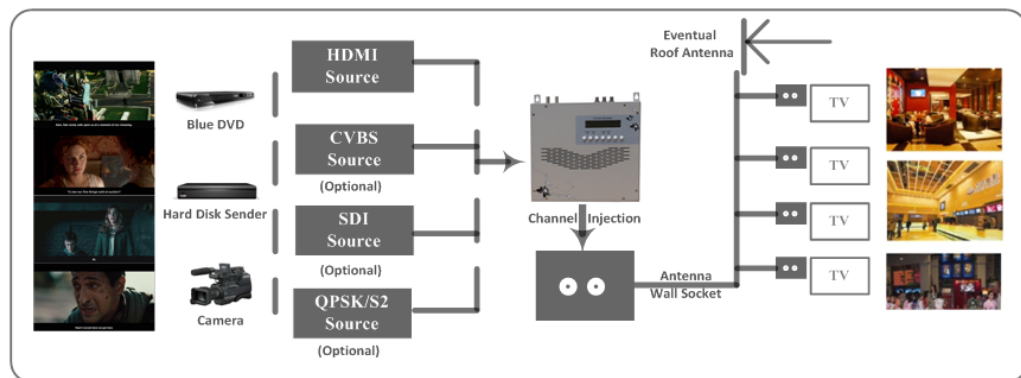
### 3) Hotel Audio- Video contents DVB- T/ISDB-T distribution



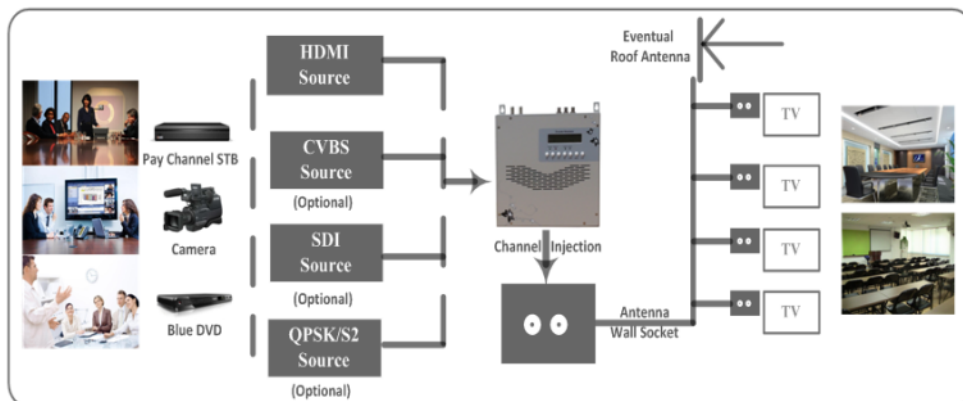
**4) Bar Audio- Video contents distribution**



**5) Cinema Audio- Video contents DVB- T/ISDB-T distribution**



**6) Company Audio- Video contents distribution**



## Chapter 7 Packing List

H-4SDI(4HDMI)-QAM-IP	Encoder/Modulator
1PC	
User's Manual	1PC
SDI Cables	4PCs
Power Cord	1PC

# APPENDIX

## INTERNAL TEST REPORT OF DELAY

**(The values of average delay cover the progress from Encoding to Decoding.)**

Decoding Terminal	Encoding Details					Average Delay (ms)
	Resolution	Encoding Bit Rate	DTS Mode	Single Source Interface	Video Format	
DVB-C HD STB	1080i@50	14M	DTS=1 (Mode 1)	HDMI	mpeg2	170
					H.264	347.5
				SDI	mpeg2	227.5
					H.264	367.5
			DTS=40 (Mode 2)	HDMI	mpeg2	222.5
					H.264	395
				SDI	mpeg2	240
					H.264	397.5

DVB-C HD STB	720p@50	14M	DTS=1 (Mode 1)	HDMI	mpeg2	85.75
					H.264	237.5
				SDI	mpeg2	127.5
					H.264	295
			DTS=40 (Mode 2)	HDMI	mpeg2	182.5
					H.264	277.5
				SDI	mpeg2	167.5
					H.264	325

DVB-C HD STB	576i@50	14M	DTS=1 (Mode 1)	HDMI	mpeg2	310
					H.264	600
				SDI	mpeg2	330
					H.264	620
			DTS=40 (Mode 2)	HDMI	mpeg2	270
					H.264	610
				SDI	mpeg2	280
					H.264	620



H-4SDI-or-4HDMI-QAM-IP