

# HP814B 4 in 1 MPEG-2/H.264 HD Encoder

## User's Manual



*SW Version: 1.11sa*

*HW version: 0.3*

*Web NMS version: 1.10*

**CATCAST TECHNOLOGY CO., LTD. (CHENGDU)**

## About This Manual

### Intended Audience

This user manual has been written to help people who have to use, to 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 Introduction

## 1.1 Product Overview

HP814B 4 in 1 MPEG2/H.264 HD Encoder is CATCAST's new professional HD audio & video encoding device with powerful functionality.

It has equipped with 4 YPbPr/HDMI channels input supporting MPEG-2 & MPEG-4 AVC/H.264 video encoding and DD AC3 (2.0), MPEG4-AAC, MPEG2-AAC, MPEG1 Layer II audio encoding and AC3 (2.0/5.1/7.1) passthrough. It is also embedded with 4 CVBS port for CC (Closed Caption) only.

To meet customers' various requirements, HP814B is also equipped with 1 ASI input, and output with 2 ASI ports and 1 IP port.

## 1.2 Key features

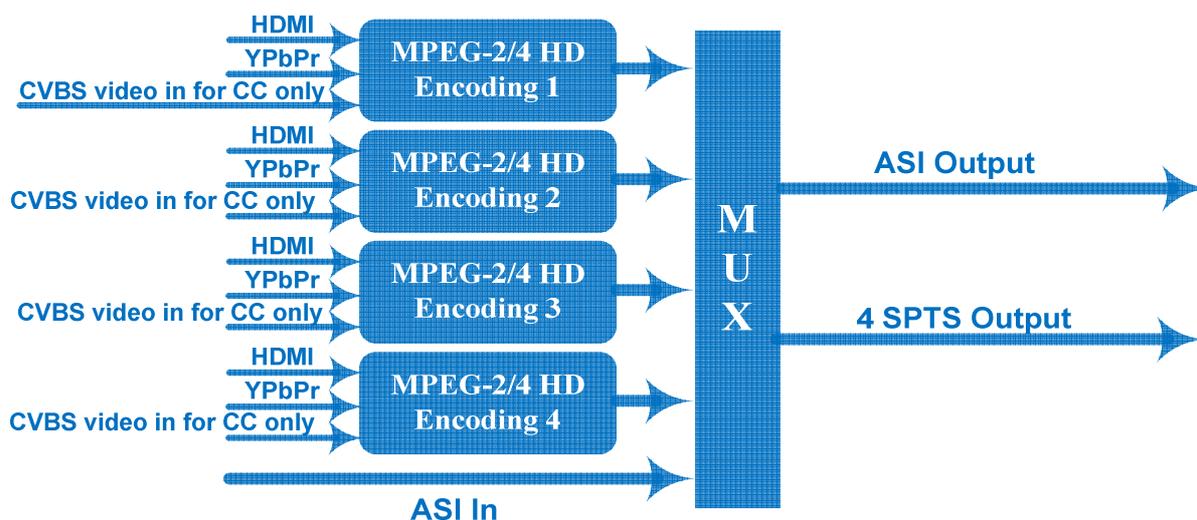
- **MPEG2 HD & MPEG4 AVC H.264 HD video encoding**
- **DD AC3 (2.0), MPEG4-AAC, MPEG2-AAC, MPEG1 Layer II audio encoding**
- **Support DD AC3 (2.0/5.1/7.1) passthrough**
- **4\* HDMI/YPbPr channels in**
- **1\*ASI in for re-mux;**
- **Support CC (Closed Caption) EIA608, (from CVBS source only)**
- **Support Low Delay**
- **ASI output, IP (MPTS & 4 SPTS) output over UDP, RTP/RTSP**
- **LCN (Logical Channel Number) support**
- **LCD display, Remote control and firmware**
- **Web-based NMS management; Updates via web**

## 1.3 Specification

Encoding Section	
Video (HDMI)	
Encoding	MPEG2; MPEG4 AVC/H.264
Interface	HDMI*4
Resolution	1920*1080_60i, 1920*1080_50i, 1280*720_60p, 1280*720_50P
Low Delay	Normal, Mode 1, Mode 2
Aspect Ratio	4:3; 16:9
Audio (HDMI)	
Encoding	MPEG1 Layer II; MPEG2-AAC; MPEG4-AAC; DD AC3(2.0); DD AC3 (2.0/5.1/7.1) passthrough
Interface	HDMI*4 (SPDIF Not Applicable)
Sample rate	48KHz
Bit rate	64/96/128/ 192/256/320kbps
Video (YPbPr)	
Encoding	MPEG2; MPEG4 AVC/H.264
Interface	YPbPr*4 (RCA)
Resolution	1920*1080_60i, 1920*1080_50i; 1280*720_60p, 1280*720_50P

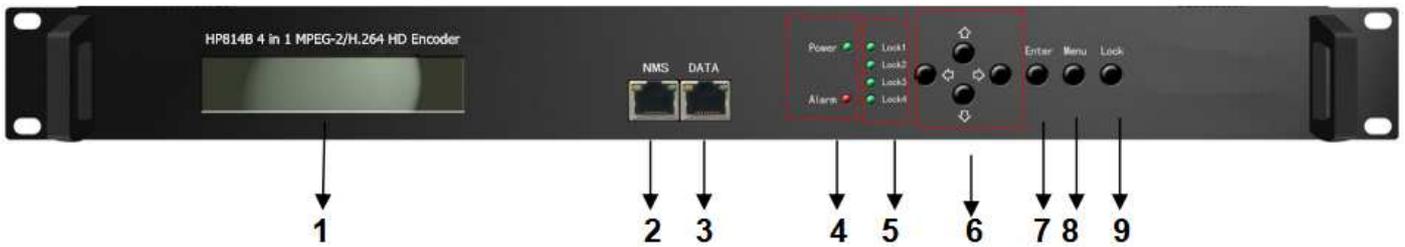
Audio (L/R)	
Encoding	MPEG1 Layer II; MPEG2-AAC; MPEG4-AAC; DD AC3(2.0); DD AC3 (2.0/5.1/7.1) passthrough
Interface	4*Stereo/8*mono
Sample rate	48KHz
Bit rate	64/96/128/ 192/256/320kbps
System	
Local interface	LCD + control buttons
Remote management	Web NMS
Stream Out	2 ASI mirrored out (BNC type, 100M); IP (MPTS&4 SPTS) over UDP, RTP/RTSP out (RJ45, 100M)
NMS interface	RJ45, 100M
Language	English
General	
Power supply	AC 100V~240V
Dimensions	482*400*44mm
Weight	4.5 kg
Operation temperature	0~45℃

## 1.4 Principle Chart



# 1.5 Appearance and Description

## Front Panel Illustration

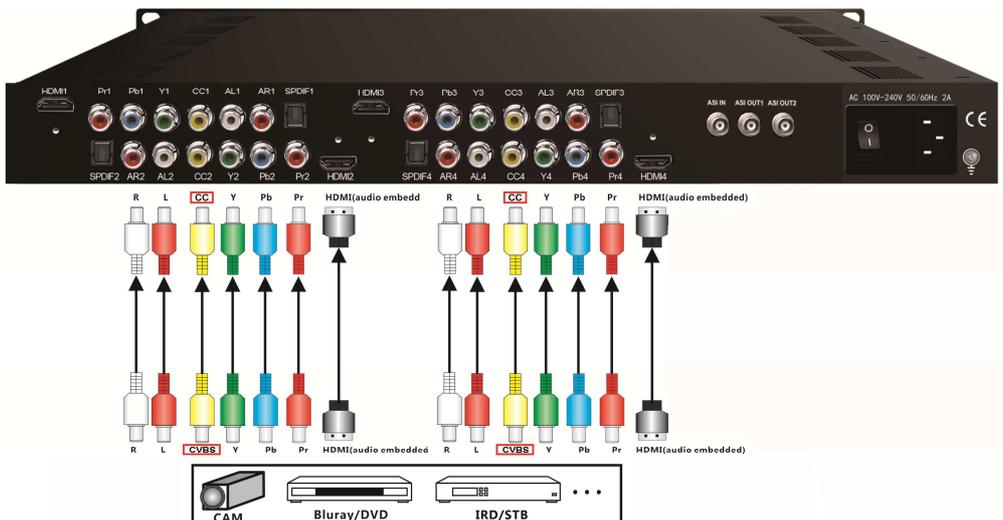


- ① LCD Screen
- ② NMS Port
- ③ Data Port
- ④ Power and Alarm Indicators
- ⑤ TS Lock Indicators
- ⑥ Up and Down, Left and Right Buttons
- ⑦ Enter Button: for confirm
- ⑧ Menu Button: for back step
- ⑨ Lock Button: press to lock set

## Rear Panel Illustration



- ① HDMI input port
- ② YPbPr input port
- ③ CVBS input port for CC only
- ④ L/R Audio input (Stereo or Mono)
- ⑤ SPDF port(Not applicable at present)
- ⑥ ASI input port
- ⑦ ASI Output port 1&2
- ⑧ Power Switch
- ⑨ Power supply Slot
- ⑩ Grounding



# Chapter 2 Installation Guide

This section is to explain the cautions the users must know in some case that possible injure may bring to users when it's used or installed. For this reason, please read all details here and make in mind before installing or using the product.

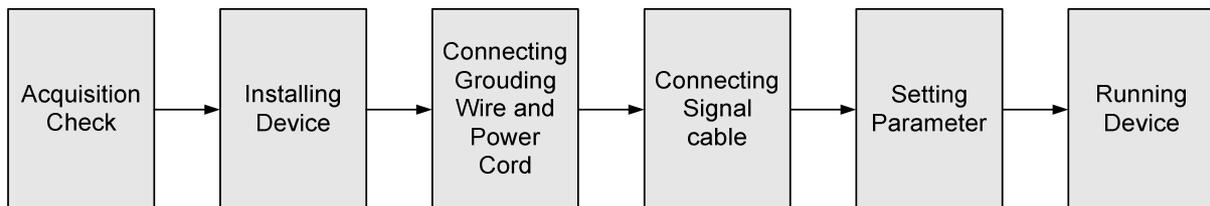
## 2.1 General Precautions

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

## 2.2 Power precautions

- ✓ When you connect the power source, make sure if it may cause 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 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 <sup>7</sup> ~1X10 <sup>10</sup> Ω, Grounding current limiting resistance: 1MΩ (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 110V±10%, 50/60Hz or AC 220V±10%, 50/60Hz. Please carefully check before running.

## 2.5 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.
- ✓ 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 25 m<sup>2</sup>.

# Chapter 3 Operation

The front panel of HP814B Encoder is the user-operating interface and the equipment can be conveniently operated and managed by user according to the procedures displayed on the LCD:

## Keyboard Function Description:

**MENU:** Cancel current entered value, resume previous setting; Return to previous menu.

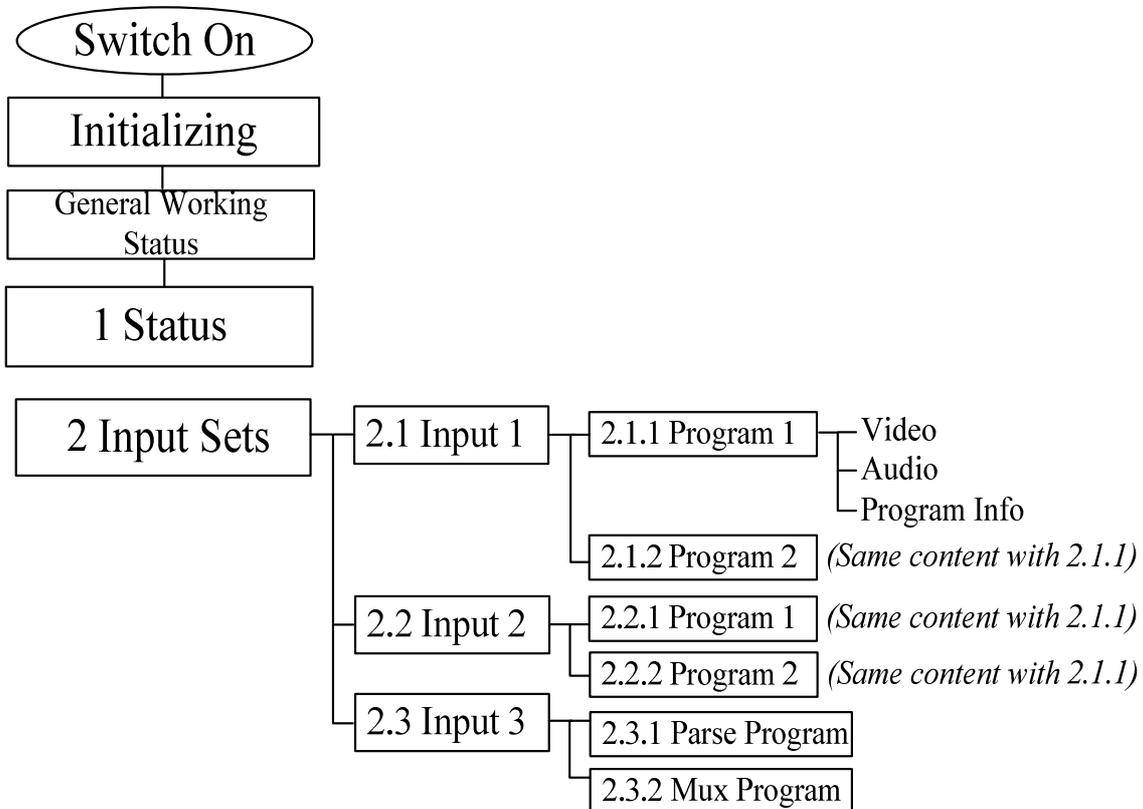
**ENTER:** Activate the parameters which need modifications, or confirm the change after modification.

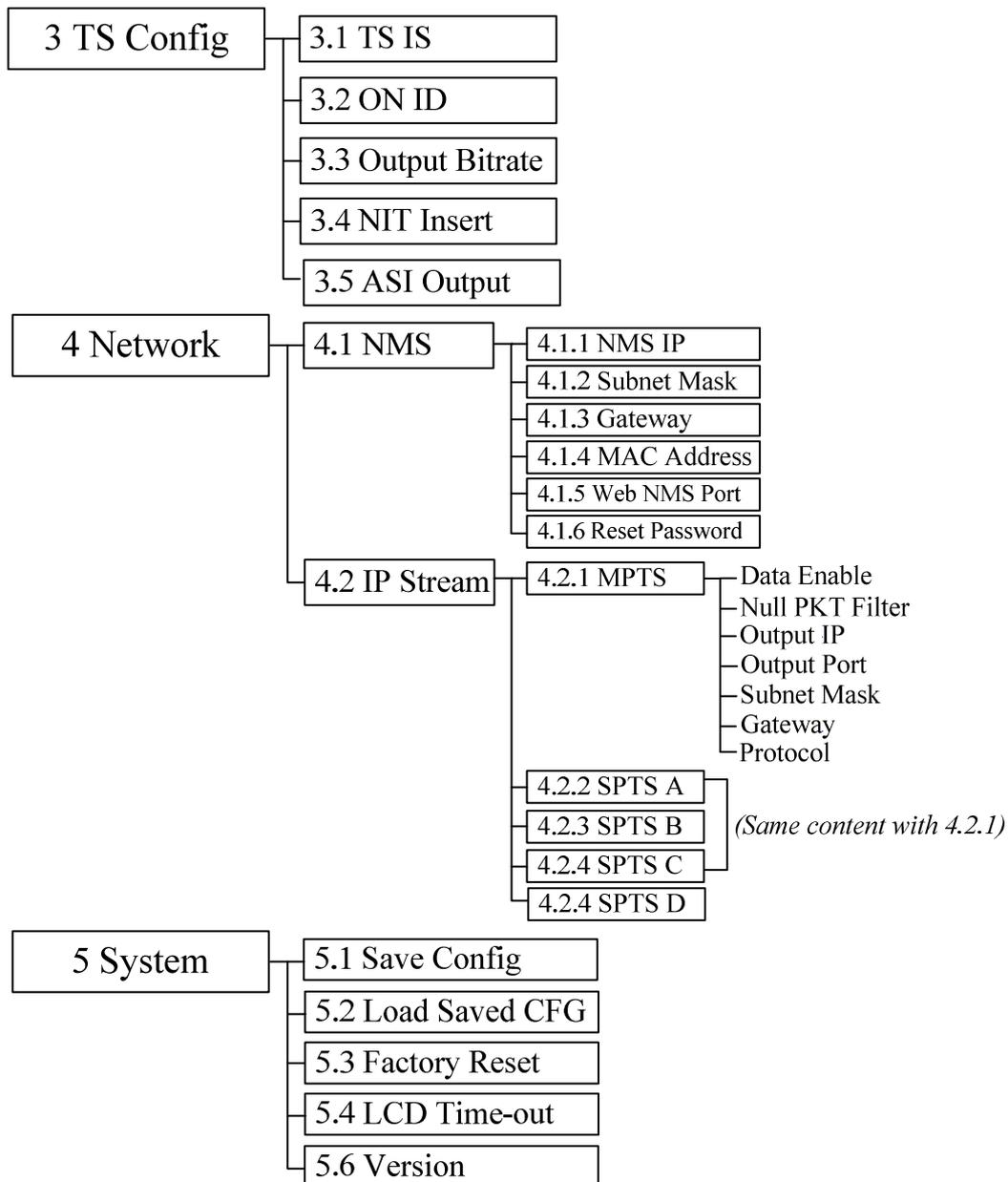
**LEFT/RIGHT:** Choose and set the parameters.

**UP/DOWN:** Modify activated parameter or paging up/down when parameter is inactivated.

**LOCK:** Lock the screen/cancel the lock state. After pressing the lock key, the LCD will display the current configuring state.

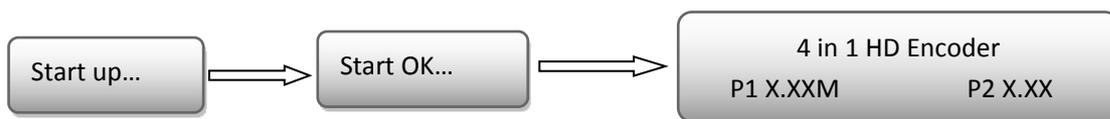
### 3.1 3.1 LCD Menu Structure





### 3.1 Initial Status

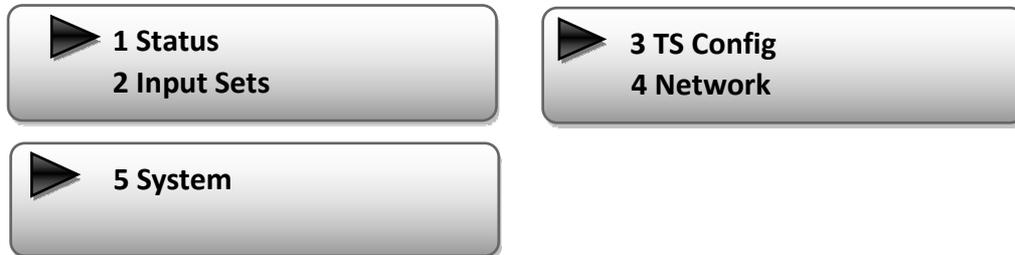
After powering on the device, it will take a few seconds to initialize the system. It shows as below:



- **4 in 1 HD Encoder:** To indicate the device's name.
- **P1:** Program 1; **P2:** Program 2; **P3:** Program 3; **P4:** Program 4
- **X.XX M:** To indicate the encoding bit rate of each encoding board respectively.

### 3.2 General setting for Main Menu

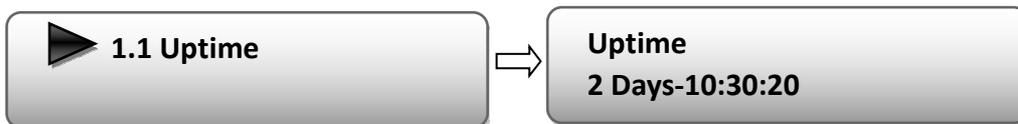
By pressing “Lock” key on the front panel, user can enter the main menu. The LCD will display the following pages:



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

#### 1) Status

Press Enter to enter “Status” and it displays the working time duration of the device. It times upon power on

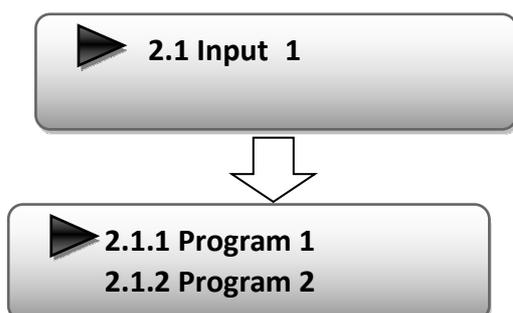


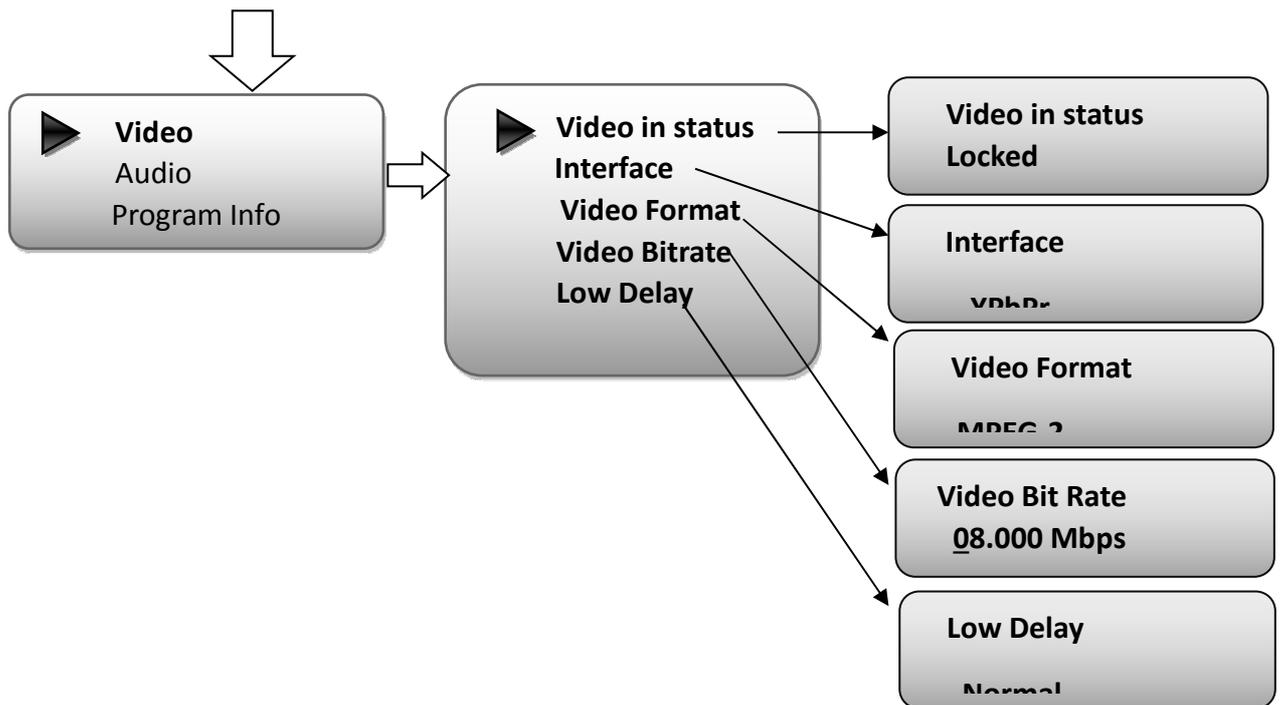
#### 2) Input Sets

Under this submenu, the LCD will show “2.1 Input 1”, “2.2 Input 2” and “2.3 Input 3”.



“2.1 Input 1” and “2.2 Input 2” respectively represent the two encoding boards and there are two programs under each input. User could enter each program to set the interface as per the signal source and set the related video & audio parameters.





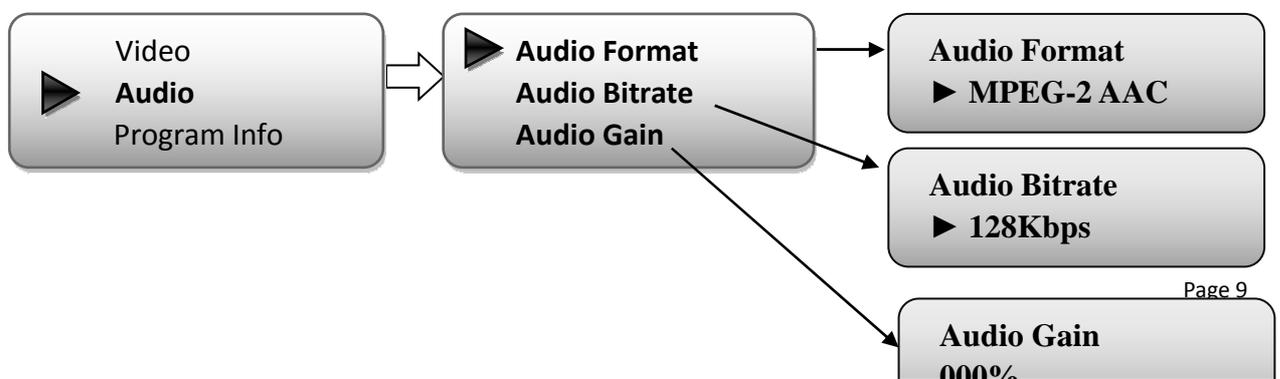
“Interface”: Connect the signal source to the corresponding input channel and select the interface from the options provided in the submenu (YPbPr, HDMI optional). Press Enter key to confirm and the system will automatically search the signal source.

“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 (1-19Mbps) with UP/DOWN keys, and press ENTER key to save the settings.

“Low Delay”: Normal: not to enable the low delay mode.

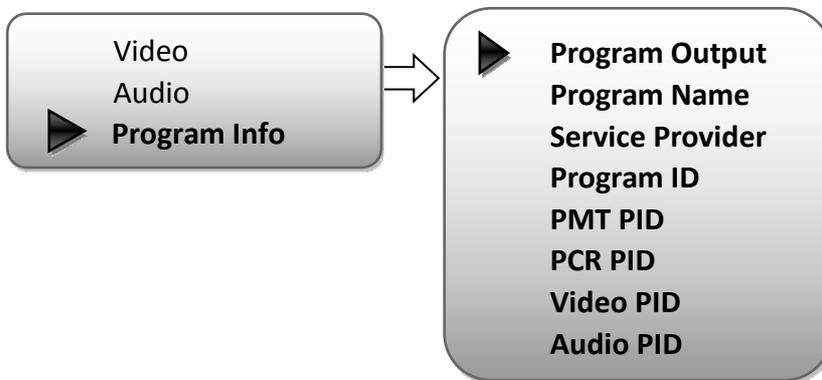
**NOTE:** The different combination of **Video Format**, **Video Bit-rate**, **Low Delay Mode** and the **Resolution** of signal source will have an impact on the time latency on receiving side. Please refer to the **Chapter 6** attached for detailed information.



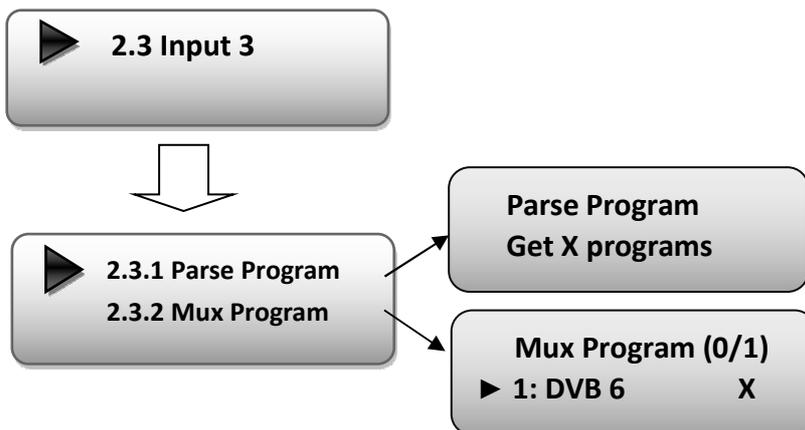
“Audio Format”: MPEG-1 Layer 2, MPEG-2 AAC, MPEG-4 AAC, AC3, AC3 Passthrough optional.

“Audio Bitrate”:64-320Kbps optional.

“Audio Gain”: 000% to 400% adjustable.



“2.3 Input 3” represents the ASI input. User could parse and select program(s) to mux out.



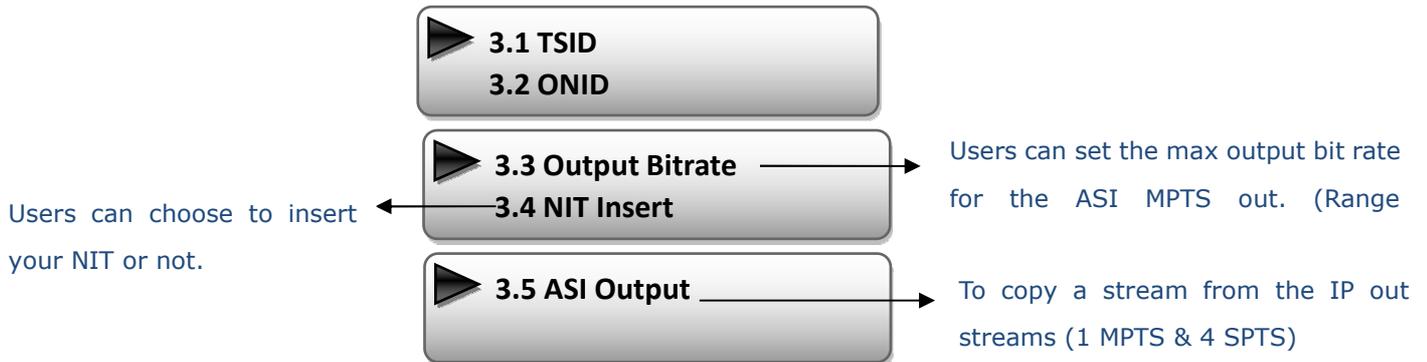
“Parse Program” is for checking the quantity of input programs from the corresponding Tuner input.

“Mux Program” is for selecting programs from the ASI IN to output or not. 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)

### 3) TS Config

‘TS Config’ is for the configuration of TS output. Its submenus contain:

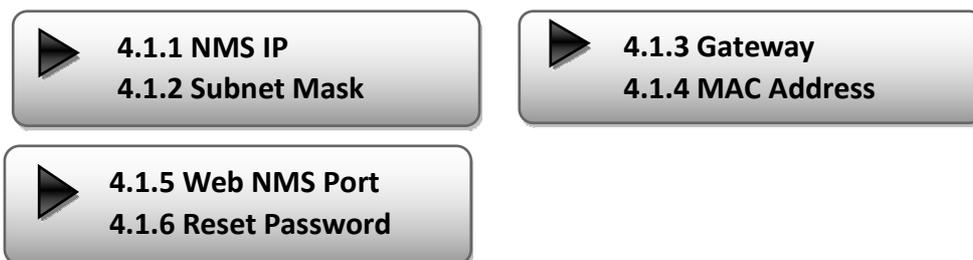


### 4) Network

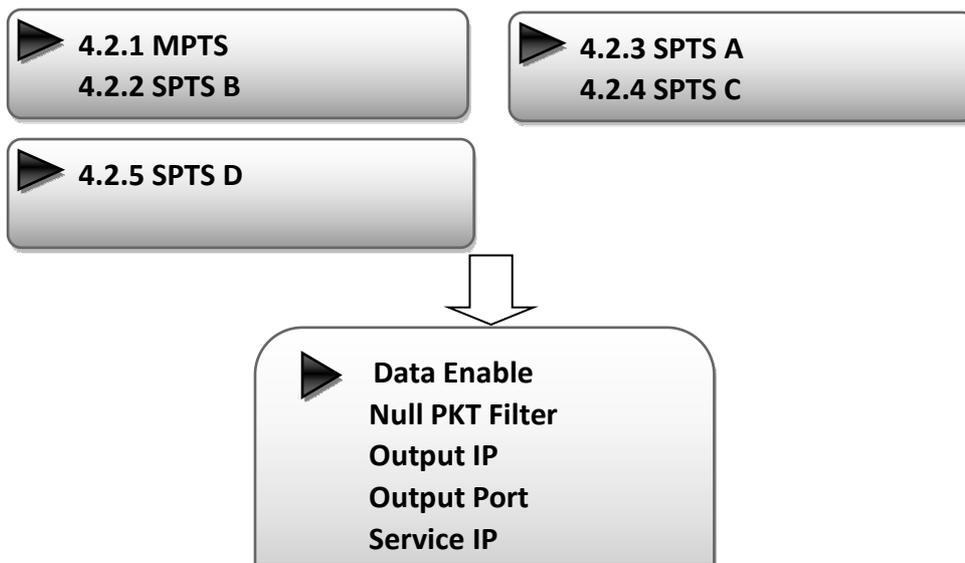
Network contains “4.1 NMS” and “4.2 IP Stream”.



“4.1 NMS” is for setting the network parameters for the connection between the device and PC.



“IP Stream” is for configuring the 1 MPTS and 4 SPTS output respectively.



## 5) System

It contains 5 submenus where users can save/load configurations.



# Chapter 4 WEB NMS operation

User not only can use front buttons for setting 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 HP814B's 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'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.

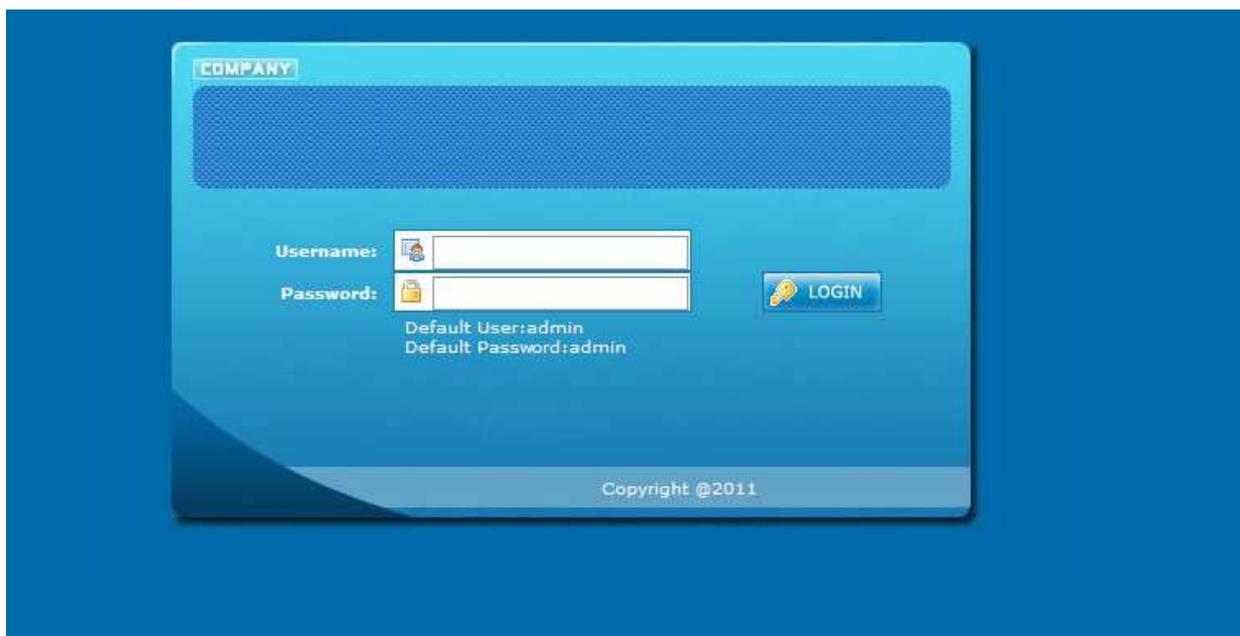


Figure-1

## 4.2 Operation

### Welcome

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

The screenshot displays the '4 In 1 HD Encoder' web management interface. The top navigation bar includes 'Web Management' and 'Logout Exit'. The left sidebar menu is expanded to show options like 'Welcome', 'Parameter', and 'System'. The main content area shows 'Version Information' (Software Version: 1.11sa Build 134 Aug 15 2014, Hardware Version: 0.3, Web Version: 1.10) and 'Status Information'. The 'Input' section shows two channels: Input 1 (HDMI/HDMI, 0.000 Mbps) and Input 2 (HDMI/HDMI, 0.000 Mbps). The 'Output' section shows Maxout Bitrate: 59.999 Mbps, Current Bitrate: 0.078 Mbps, and a green 'TS Overflow' indicator. Three callout boxes provide additional context: one points to the menu, another points to the input selection area, and a third points to the green TS Overflow indicator.

User can click any item here to enter the corresponding interface to check information or set the parameters.

It automatically identifies and displays the signal source interface and real-time encoding bit rate of corresponding input channel.

TS indicators—Green light indicates the TS is normal, which otherwise turns to red.

Figure-2

### Input 1

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

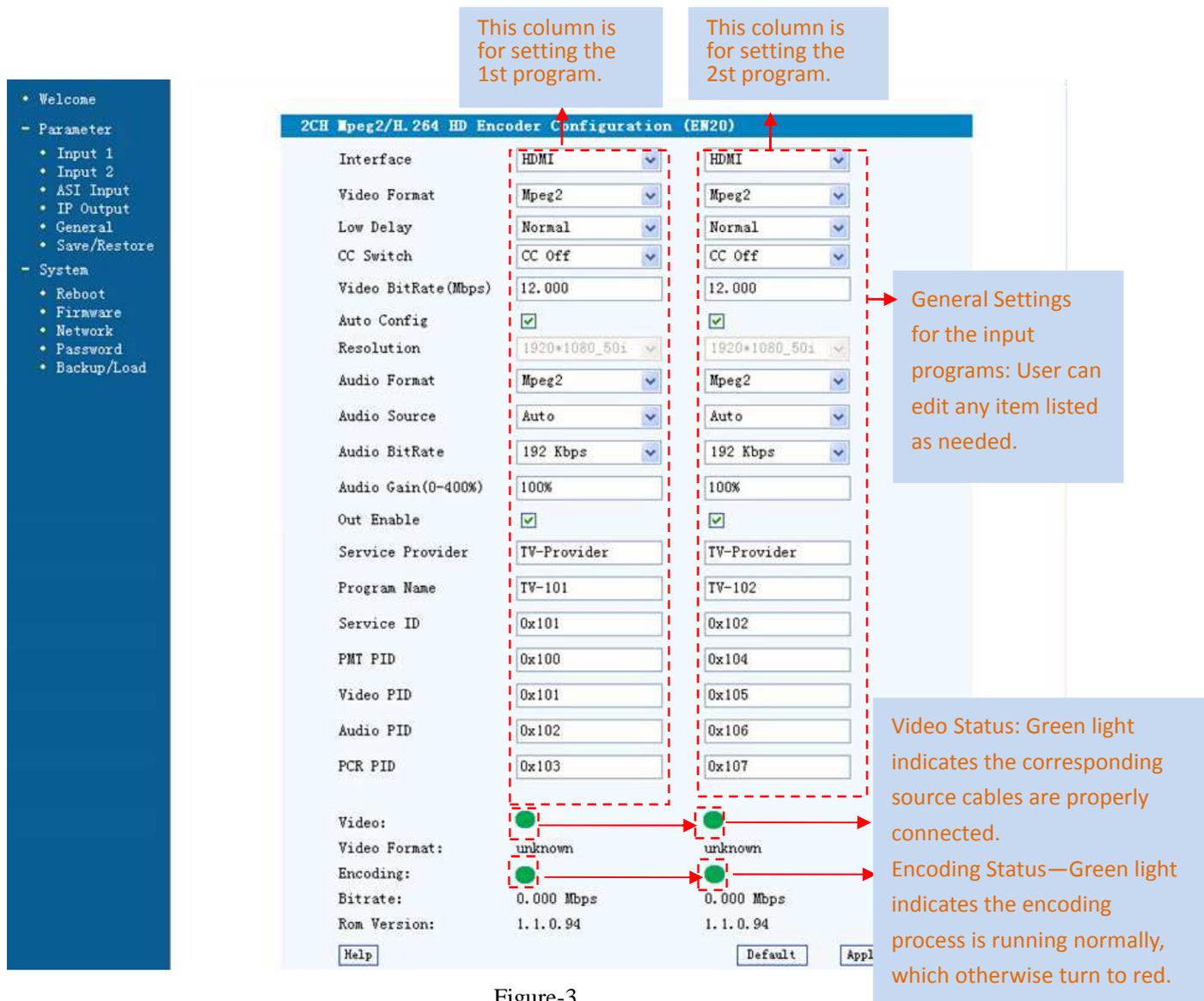
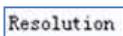


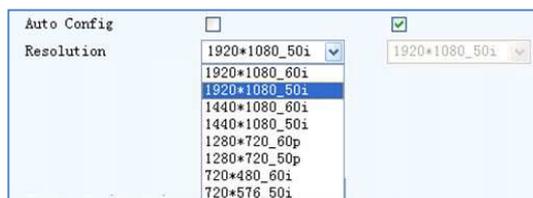
Figure-3



For user to choose out put the program or not



User clicks the Auto Config box, the output resolution is the same as input resolution. If not, user can choose output resolution manually, but should keep the scanning form and frame rate (e.g. 50i→50i); and the output resolution should the same or lower than the original. On condition that the manual configuration is wrong, the box will be clicked automatically.



For user to turn to refer detailed explanation of terms on this interface



Click this button to apply the default setting of Input 1

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

**CC Switch** Please refer to the **Chapter 5** attached for detailed information.

**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 latency. Please refer to the **Chapter 6** attached for detailed information.

## Input 2

Similarly, from the menu on left side of the webpage, clicking “Input 2”, it displays the information of the programs (3<sup>rd</sup> & 4<sup>th</sup> ones) from the 2<sup>ed</sup> encoding board.

## ASI Input

Click “ASI Input”, it will display ASI input program information as Figure-4. User can parse and multiplex ASI IN programs in this interface.

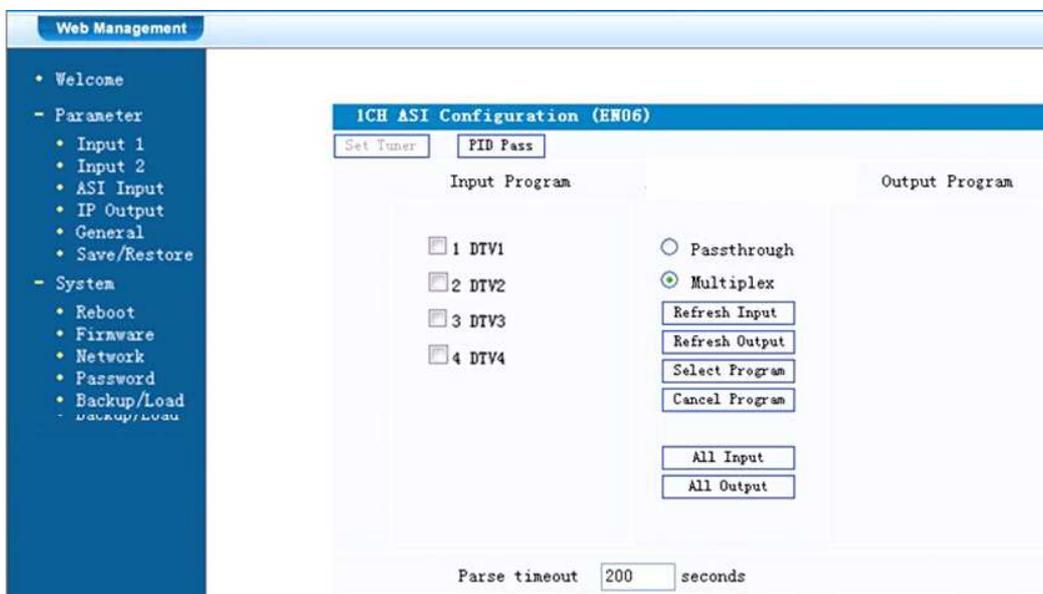


Figure-4

**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.

## IP Output

Click “IP Output” from the left menu, it will display the screen as Figure-5 where to configure the 4 IP SPTS Output.

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

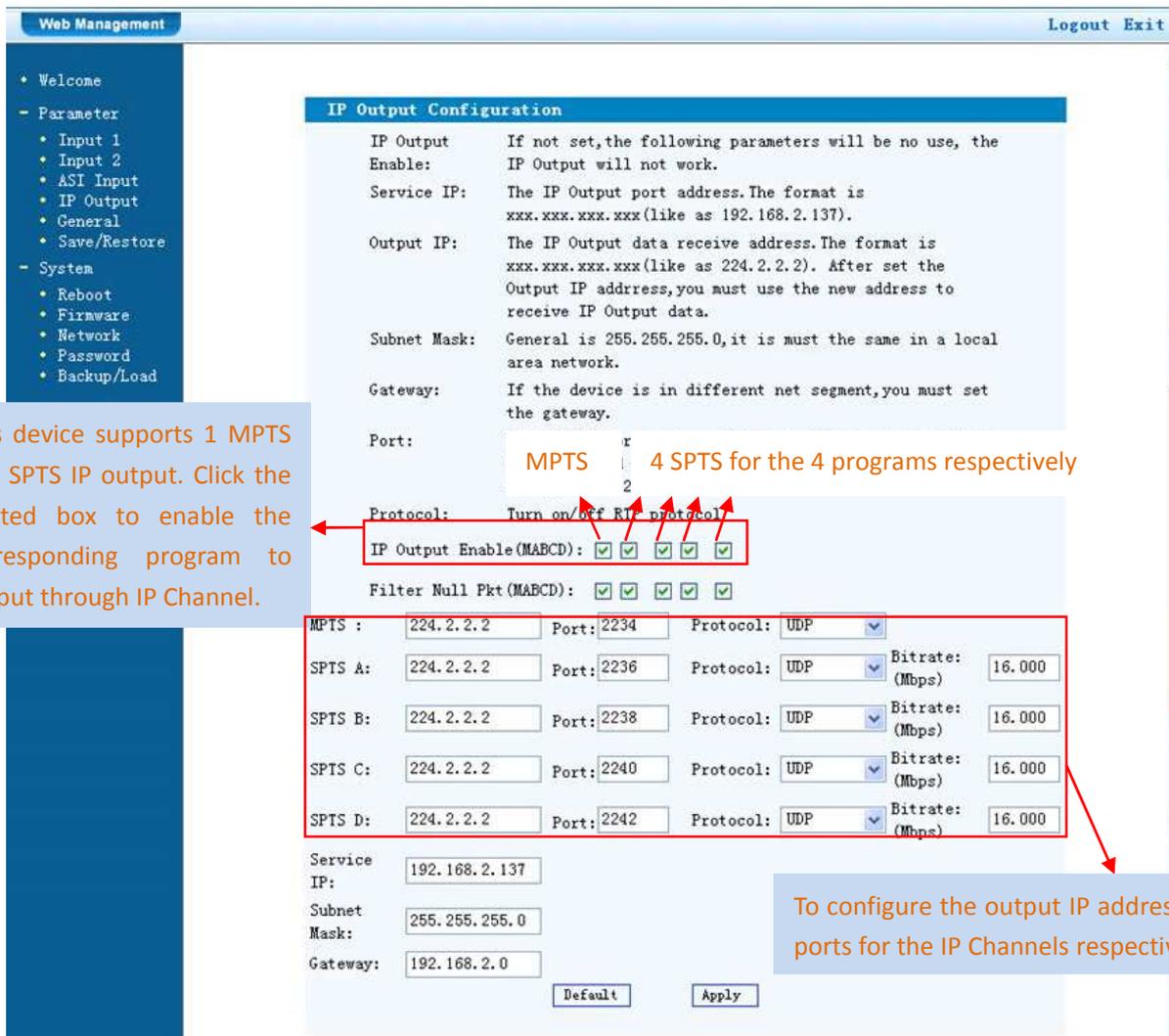


Figure-5

## General

Clicking “General” from the menu, it will display the interface as Figure-6 where to set the network info for the output TS.

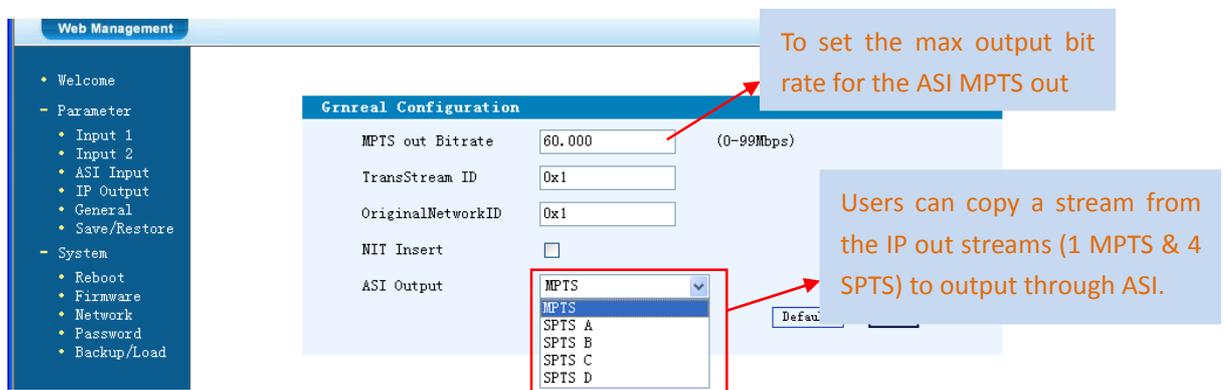


Figure-6

## Save/Restore

Clicking “Save/Restore” from the menu, it will display the screen as Figure-7 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.

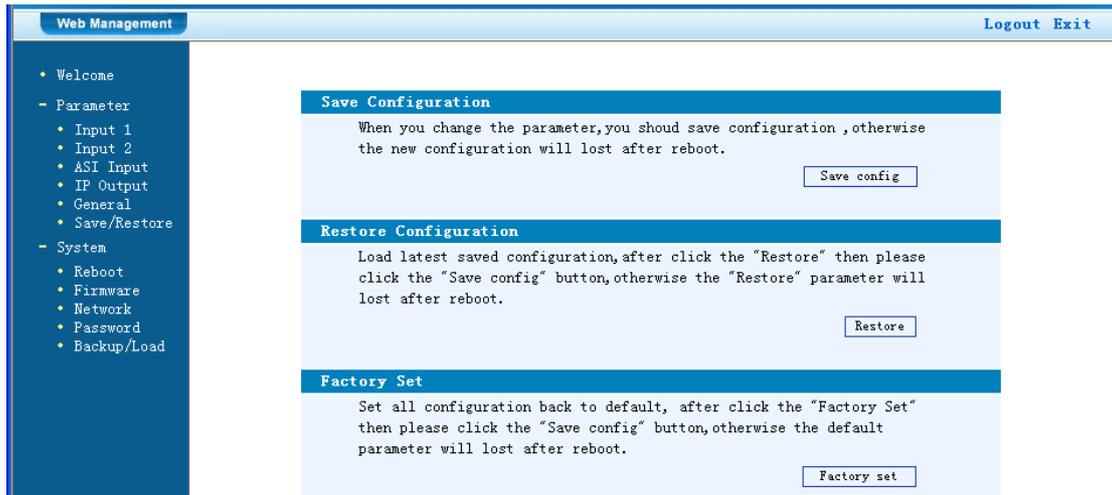


Figure-7

## Restart the Device

Click “Reboot” from the menu, the screen will display as Figure-8. Here when clicking “Reboot” box, it will restart the device automatically.

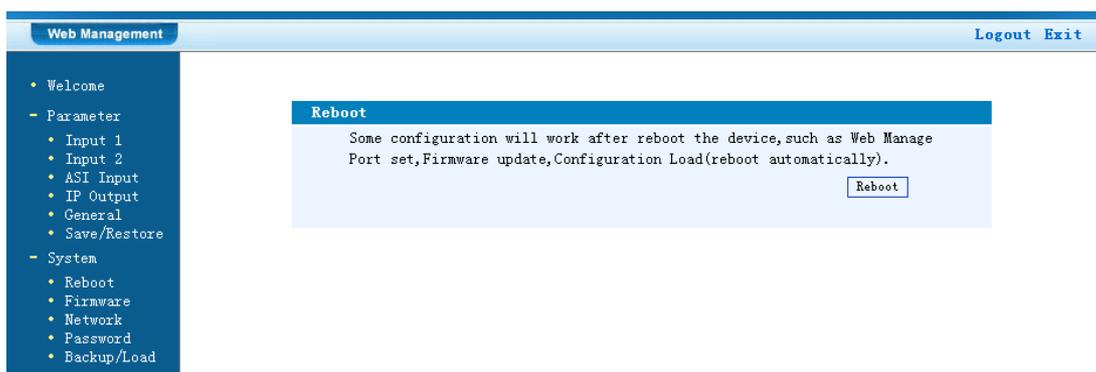


Figure-8

## Update the Device

Click “Firmware” from the menu it will display the screen as Figure-9. 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.

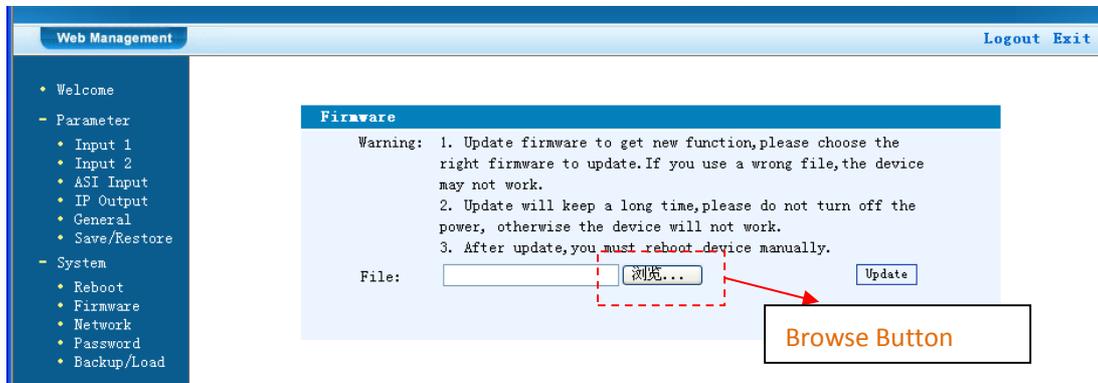


Figure-9

## Network

When user clicks “Network”, it will display the screen as Figure-10. It displays the network information of the device. Here user can change the device network configuration as needed.

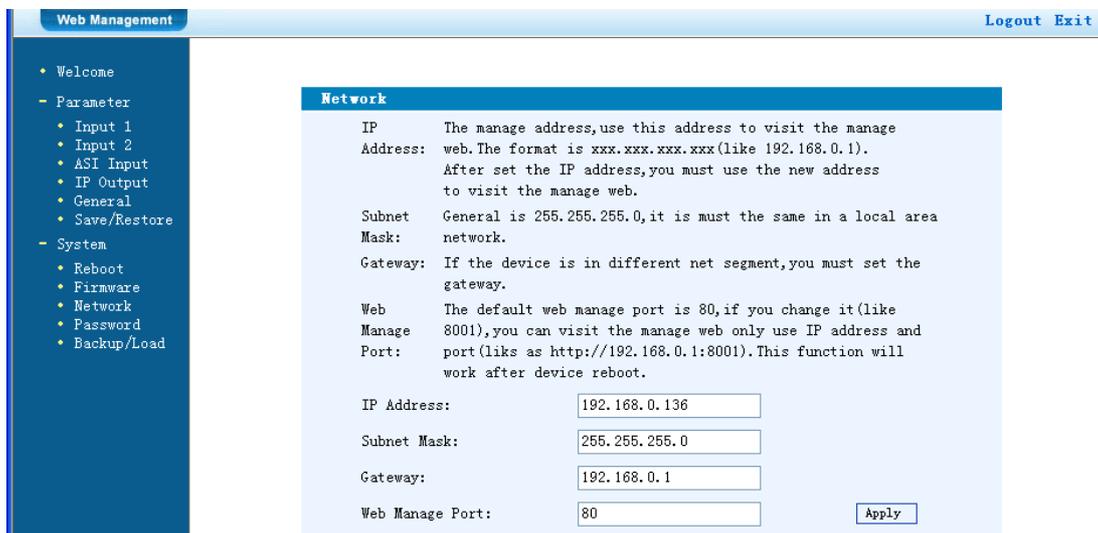


Figure-10

## Change Password

When user clicks “Password”, it will display the password screen as Figure-11. 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.

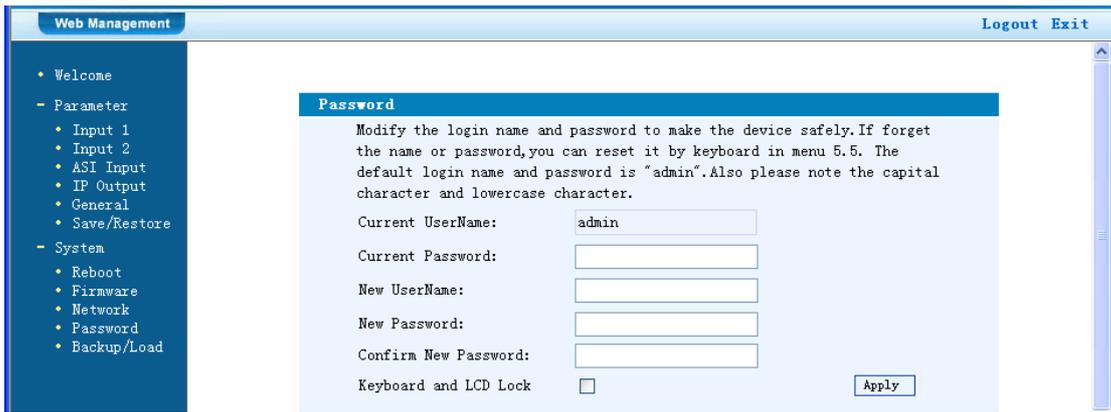
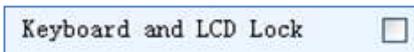


Figure-11



➤ **Keyboard and LCD Lock:** If it is marked with “√”, the LCD and keyboard will be locked to avoid unexpected modification or view of 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-12.

**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.

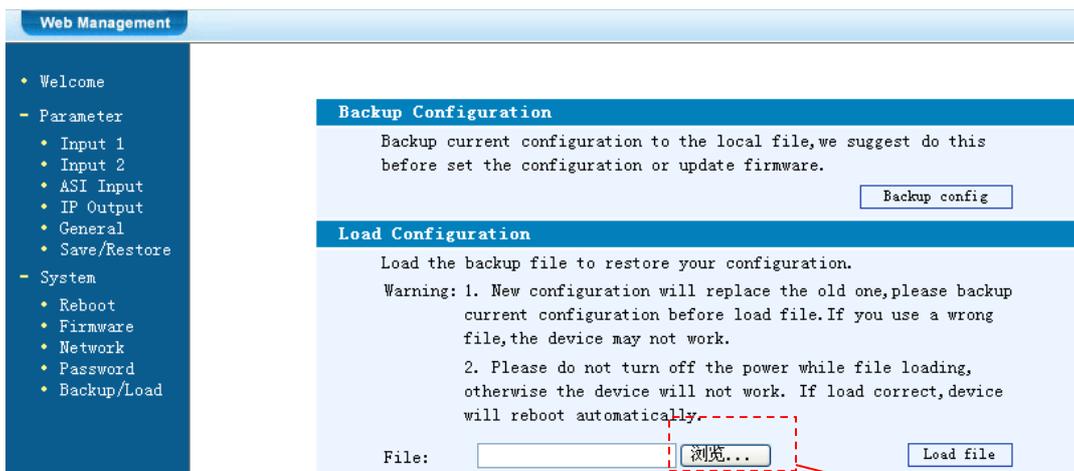


Figure-12

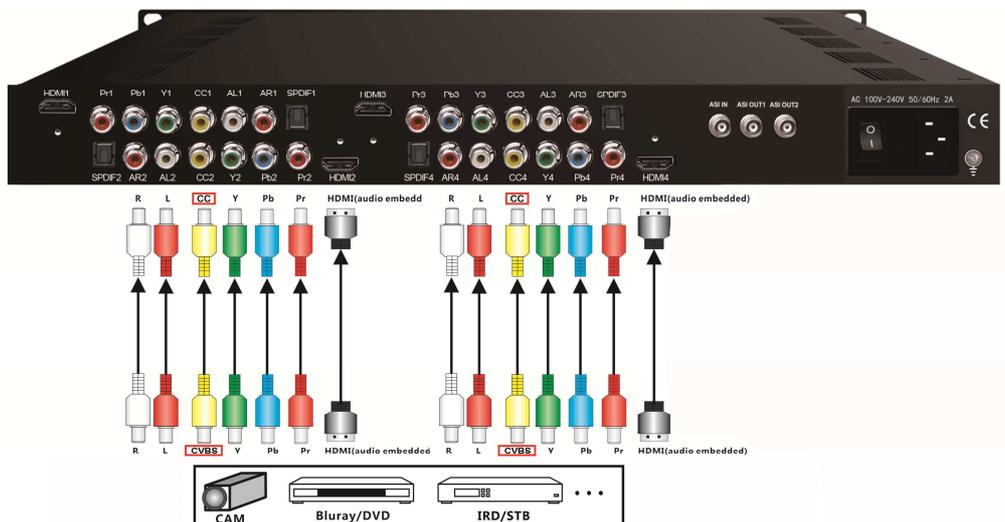
Browse  
Button

# Chapter 5 Operation of Closed Caption (CC)

Closed Caption, hereinafter referred to as the CC.

CC is from CVBS source output from IRD or STB etc. Connecting the CVBS cable to the CC port at the rear panel (as shown in below image), CC can be mixed with HDMI/YPbPr/RL audio inputs to generate programs with CC.

### CC wiring diagram (From CVBS input)



### CC switch in Web based NMS

The screenshot shows a 'Web Management' interface with a sidebar menu on the left and a main configuration area. The main area is titled '2CH Mpeg2/H.264 HD Encoder Configuration (EN20)'. It contains two columns of settings for two different channels. The 'CC Switch' setting is highlighted with a red dashed box and a red arrow pointing to a callout box. The callout box contains the text: 'CC On: Enable CC in' and 'CC Off: Unnable CC'.

Parameter	Channel 1	Channel 2
Interface	HDMI	HDMI
Video Format	Mpeg2	Mpeg2
Low Delay	Normal	Normal
CC Switch	CC Off	CC Off
Video BitRate(Mbps)	12.000	12.000
Auto Config	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Resolution	1920*1080_50i	1920*1080_50i
Audio Format	Mpeg2	Mpeg2
Audio Source	Auto	Auto
Audio BitRate	192 Kbps	192 Kbps
Audio Gain(0-400%)	100%	100%
Out Enable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## Chapter 6 Low Delay Setting

HP814B can achieve a signal low delay from encoding to STB decoding side. User can enable the low delay function in the web-server NMS interface as shown below:

Click 'Input 1' or 'Input 2' to sent a low delay mode for each program:

The screenshot shows the 'Web Management' interface for the HP814B. The main content area is titled '2CH Mpeg2/H.264 HD Encoder Configuration (EN20)'. It contains two columns of configuration options for two different channels. The 'Low Delay' setting is highlighted with a red dashed box, and a red arrow points from it to a callout box that reads 'Low delay: Normal, Mode 1, Mode 2 optional'. The 'Low Delay' dropdown menu is currently set to 'Normal'. Other settings include Interface (HDMI), Video Format (Mpeg2), CC Switch (CC Off), Video BitRate (12.000), Auto Config (checked), Resolution (1920\*1080\_50i), Audio Format (Mpeg2), Audio Source (Auto), Audio BitRate (192 Kbps), Audio Gain (100%), and Out Enable (checked).

There are 3 low delay modes:

1. **Normal:** to disable the low delay function.
2. **Mode 1/Mode 2:** to activate the low delay function.

The delay duration is based on the different combination of **Video Format**, **Video Bit-rate**, **Low delay Mode** and **the Resolution** of signal source, which combine together to have a comprehensive impact on the delay. Please refer to the below table for reference.

**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.

**Internal Test Report of Time Delay**  
**The values cover the progress from Encoding → Decoding**

Decoding Terminal	Encoding Details					Average Delay (ms)
	Single Source Interface	Bit Rate Mode	Resolution	Low Delay Mode	Encoding Type	
HD STB	HDMI	VBR	1080i@50	Mode 1	mpeg2	300
					H.264	335
				Mode 2	mpeg2	407.5
					H.264	492.5
			720p@50	Mode 1	mpeg2	230
					H.264	285
				Mode 2	mpeg2	382.5
					H.264	395
HD STB	YPbPr	VBR	1080i@50	Mode 1	mpeg2	282.5
					H.264	395
				Mode 2	mpeg2	397.5
					H.264	450
			720p@50	Mode 1	mpeg2	267.5
					H.264	255
				Mode 2	mpeg2	385
					H.264	422.5

# Chapter 7 Troubleshooting

CATCAST's ISO9001 quality assurance system has been approved by CQC organization. For guarantee the products' quality, reliability and stability. All CATCAST 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 CATCAST. 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 8 Packing List

HP814B Encoder	1PC
User's Manual	1PC
HDMI Cables	4PCS
YPbPr Cables	4PCS
CVBS Cables	4PCS
Power Cord	1PC