H-2ADHD-QAM-IPLL

2 HDMI/YPbPr HD/SD IPTV

Encoder + RF Modulator

QAM, ATSC, DVB-T, ISDB-T

THOR BROADCAST

LOS ANGELES CA

1-800-521-8467

A Note From Thor 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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Directory

Chapter 1 Introduction

1.1 Product Overview

The Thor Broadcast H-2ADHD-QAM-IPLL is our new all-in-one devices that integrates encoding (MPEG-2, MPEG-4/AVC H.264) and modulation to convert HDMI/YPbPr /CVBS (Pr in) signals etc to digital RF output. To meet customers' various requirements, the H-2ADHD is also equipped with 1 ASI input, and output with 2 ASI ports and 1 IP port.

The signals source could be from satellite receivers, CCTV cameras, Blu-ray players, and OTA antennas etc. Its output signals are to be received by TVs, STB and etc with the same corresponding standard. Thor Encoder/Moudlator's are readily used in public places such as metro, market hall, theatre, hotels, restaurants, stadiums, private TV headends for advertising, monitoring, and any other visual displays necessary.

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
- Supports DD AC3 (2.0/5.1/7.1) pass-through
- Supports AC3 Dialog Normalization
- 2* HDMI/YPbPr/CVBS (Pr in) channels in
- 1*ASI in for re-mux; 1*RF in for RF mix
- 4* DVB-C & 4 ATSC RF out in one device
- 2 separate ASI outputs to mirror MPTS or one carrier programs
- IP(2*SPTS & 1*MPTS) out
- Support CC (Closed Caption) EIA608
- Supports Low Delay
- LCN (Logical Channel Number) support
- VCT (Virtual Channel Table) support
- Excellent modulation quality
- 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*2
Resolution	1920*1080_60P, 1920*1080_50P (For MPEG 4 AVC/H.264 only), 1920*1080_60i, 1920*1080_50i, 1280*720_60p, 1280*720_50P
Low Delay	Normal, Mode 1, Mode 2, Manual
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*2/SPDIF*2
Sample rate	48KHz
Bit rate	64/96/128/ 192/256/320kbps
Video (CVBS/YPbPr)	
Encoding	MPEG2; MPEG4 AVC/H.264
Interface	CVBS/YPbPr*2(RCA)
Resolution	CVBS: 720*576_50i, 720*480_60i YPbPr: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	2*Stereo/4*mono/2*SPDIF
Sample rate	48KHz
Bit rate	64/96/128/ 192/256/320kbps
DVB-C Modulator Section	

DVB-C Modulator Section			
Standard	J.83A (DVB-C), J.83B, J.83C		
MER	≥43dB		
RF frequency	36~960MHz, 1KHz step		
RF output level	-30~ -10dbm (77~97 dbµV), 0.1db step		
Symbol rate	5.000~9.000Msps adjustable		
RF Out	4*DVB-C adjacent carriers combined output		
	J.83A	J.83B	J.83C
Constellation	16/32/64/128/ 256 QAM	64/ 256 QAM	64/ 256 QAM
Bandwidth	8M	6M	6M

ATSC Modulator Section	
Standard	ATSC A/53
Constellation	8 VSB
RF output level	-30~ -10dbm (77~97 dbµV), 0.1db step
MER	≥42dB
RF frequency	36~960MHz, 1KHz step
RF Out	4*ATSC adjacent carriers combined output

System	
Local interface	LCD + control buttons
Remote management	Web NMS
Stream Out	2 separate ASI out (BNC type, 100M); IP (2* SPTS&1*MPTS) over UDP/RTP out (RJ45, 100M)
NMS interface	RJ45, 100M
Language	English

General	
Power supply	AC 100V~240V
Dimensions	333*232*44mm
Weight	2.5 kg
Operation temperature	0~45°C

1.4 Appearance and Description

Front Panel Illustration

1 2 3 4 5 6
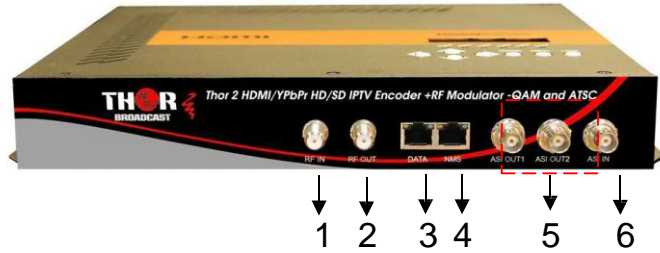
① RF in port   ④ Data Port
② RF out port   ⑤ ASI Output port 1&2
③ NMS port   ⑥ ASI input port

Rear Panel Illustration

1
2 3 4 5 6 7

①YPbPr input port(Pr for CVBS input)   ⑤HDMI input port
②SPDIF port   ⑥Power Switch
③L/R Audio input (Stereo or Mono)   ⑦ Power supply Slot
④CC input port for CC only
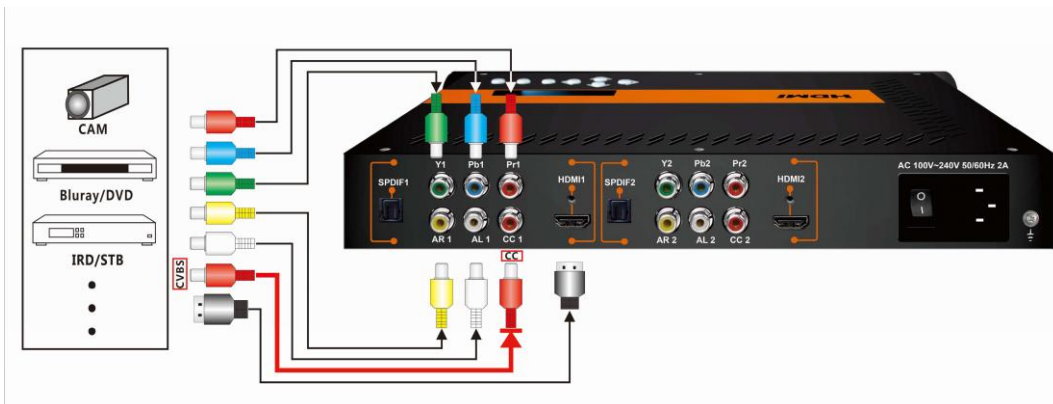
Cover/Above View Illustration

1
2
3

① LCD Window
② Indicator
③ Control Buttons

1.5 Principle Chart

CVBS(Pr in)/HDMI/YPbPr		1 ASI Output
CVBS video in for CC only	MPEG-2/4 HD/SD Encoding 1	2 ASI Output
		IP Output(2 *SPTS & 1*MPTS)

```
CVBS( Pr in)/HDMI/YPbPr ──┐
                          ├── MPEG-2/4 HD/SD          1 ASI Output
CVBS video in for CC only ─┘   Encoding 1              2 ASI Output
                                                       IP Output(2 *SPTS & 1*MPTS)
                               M    DVB-C&ATSC  Carrier A
CVBS( Pr in)/HDMI/YPbPr ──┐    U    Modulating
                          ├── MPEG-2/4 HD/SD    DVB-C&ATSC  Carrier B    Built-in   RF
CVBS video in for CC only ─┘   Encoding 1    X  Modulating              Combiner
                                                DVB-C&ATSC  Carrier C
                                                Modulating
              ASI In                            DVB-C&ATSC  Carrier D
                                                Modulating
                                                     RF In
```

Chapter 2 Installation Guide

Please use caution when operating this device in order to abstain from 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.
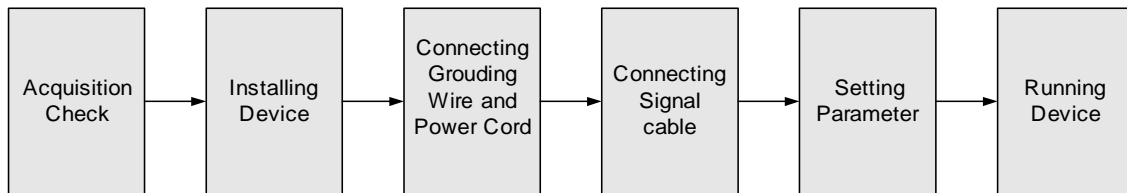
2.1 General Precautions

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

./ The cover should be securely fastened, do not open the cover of the chassis when the power 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 Requirement

Item	Requirement
Machine Hall Space	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: $1X10^7 \sim 1X10^{10}\Omega$, Grounding current limiting resistance: 1MΩ (Floor bearing should be greater than 450Kg/㎡)
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
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

./   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 3 Operation

The front panel of the H-2ADHD Encoder Modulator 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:

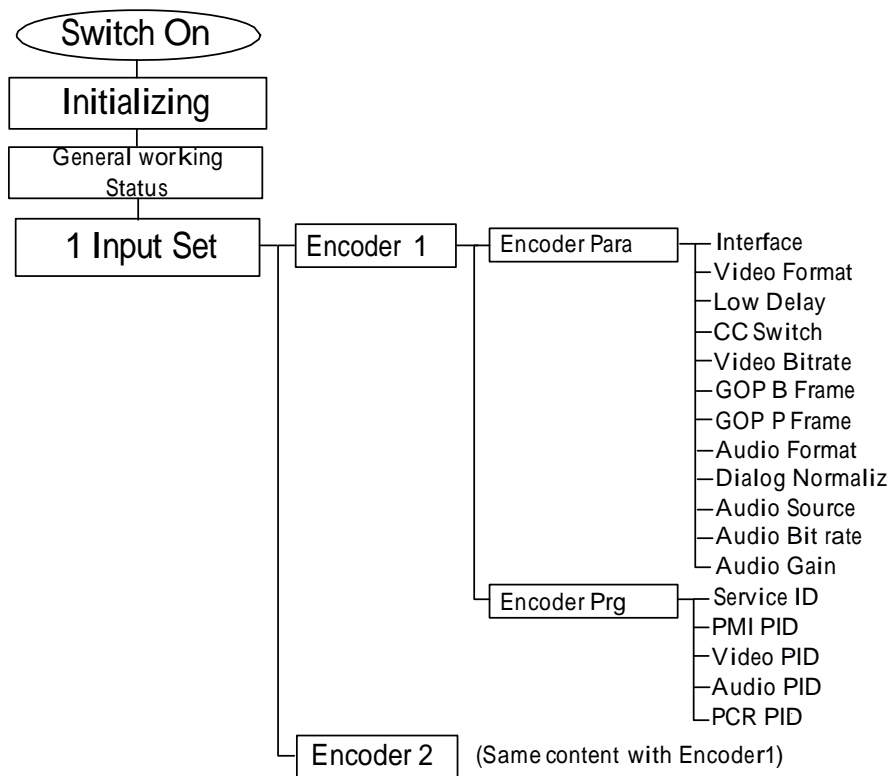MENU: Cancel current entered value, resume previous setting; Return to previous menu.

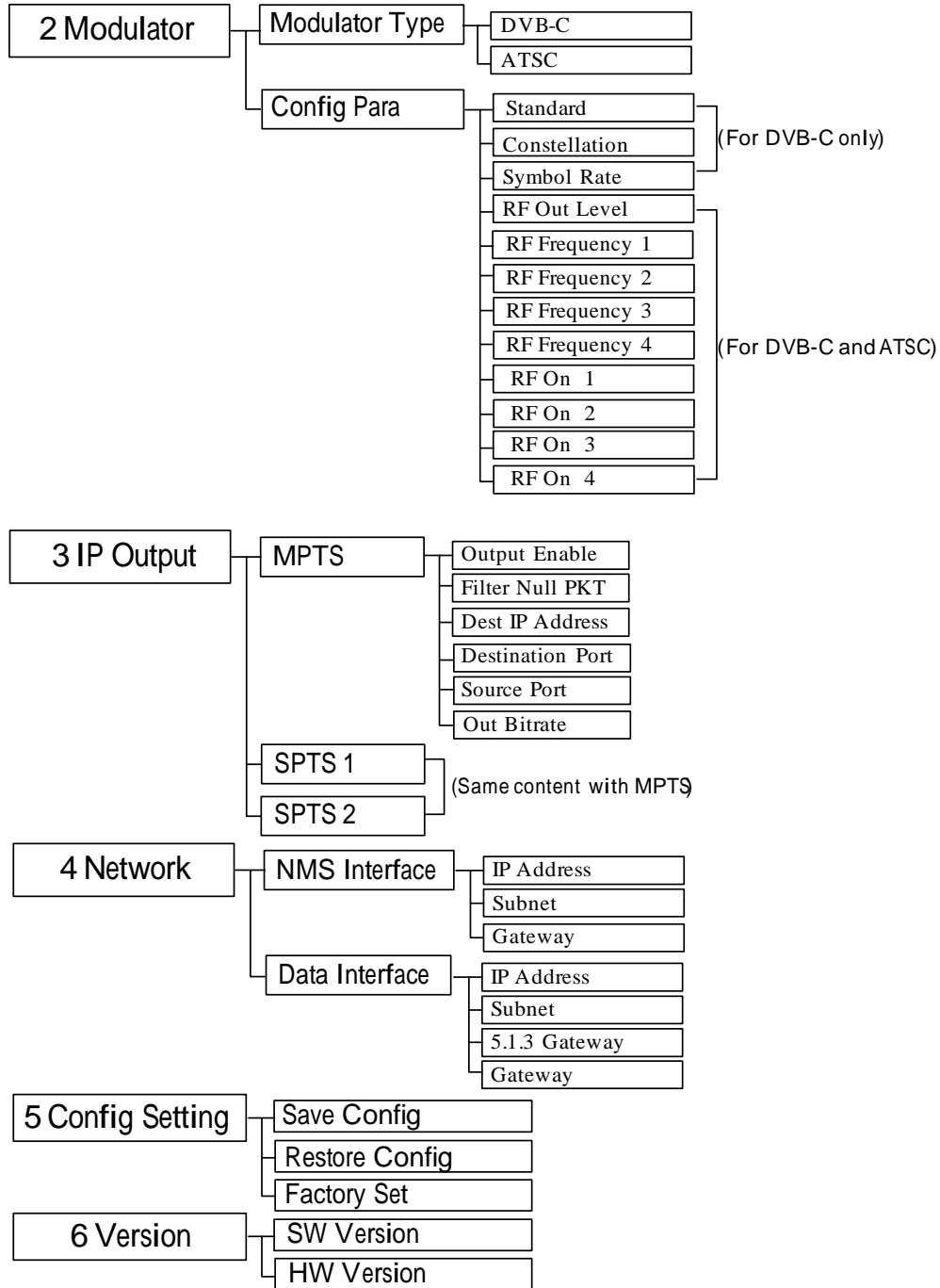ENTER: Activate the parameters which need modifications, or confirm the change after modification.

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

```
2 Modulator ─┬─ Modulator Type ─┬─ DVB-C
              │                   └─ ATSC
              │
              └─ Config Para ─┬─ Standard ─────────┐
                              ├─ Constellation      ├─ (For DVB-C only)
                              ├─ Symbol Rate ───────┘
                              ├─ RF Out Level ──────┐
                              ├─ RF Frequency 1     │
                              ├─ RF Frequency 2     │
                              ├─ RF Frequency 3     │
                              ├─ RF Frequency 4     ├─ (For DVB-C and ATSC)
                              ├─ RF On  1           │
                              ├─ RF On  2           │
                              ├─ RF On  3           │
                              └─ RF On  4 ──────────┘


3 IP Output ─┬─ MPTS ─┬─ Output Enable
             │        ├─ Filter Null PKT
             │        ├─ Dest IP Address
             │        ├─ Destination Port
             │        ├─ Source Port
             │        └─ Out Bitrate
             │
             ├─ SPTS 1 ─┐
             │          ├─ (Same content with MPTS)
             └─ SPTS 2 ─┘


4 Network ─┬─ NMS Interface ─┬─ IP Address
           │                  ├─ Subnet
           │                  └─ Gateway
           │
           └─ Data Interface ─┬─ IP Address
                              ├─ Subnet
                              ├─ 5.1.3 Gateway
                              └─ Gateway


5 Config Setting ─┬─ Save Config
                  ├─ Restore Config
                  └─ Factory Set

6 Version ─┬─ SW Version
           └─ HW Version
```
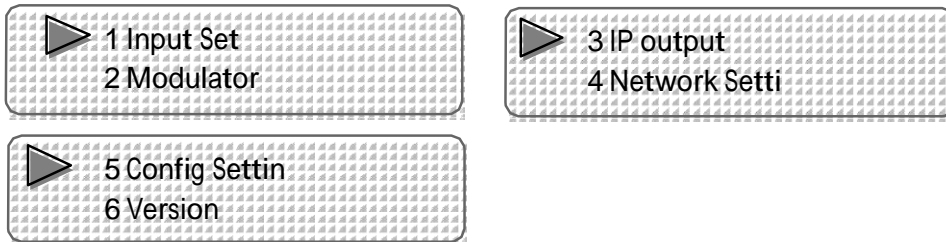
3.1 Initial Status

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

Start up... → Start OK... → DVB-C/ATSC
Enc1 x.xxMbps   Enc2 x.xxMbps
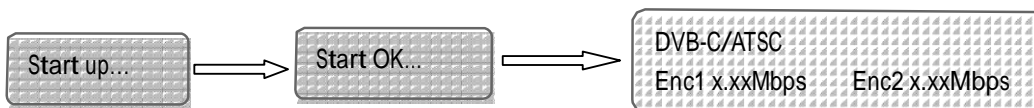
- DVB-C/ATSC: indicates the current modulation standard of this device.
- Enc1/Enc2: indicates the two Encoding channel
- X.XX Mbps: indicates the encoding bit rate of each encoding channel respectively.

3.2 General setting for Main Menu

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

```
▷ 1 Input Set              ▷ 3 IP output
  2 Modulator                4 Network Setti

▷ 5 Config Settin
  6 Version
```

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

.2.1   Input Set

Under this submenu, the LCD will show "Encoder 1" and "Encoder 2".

```
▷ Encoder 1
  Encoder 2
```
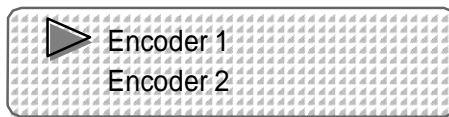
"Encoder 1" and "Encoder 2" respectively represent the two encoding channel. User could enter submenus to set the Encoder parameters.

```
▷ Encoder 1     ⟹     ▷ Encoder Parm
                         Encoder Prg
```
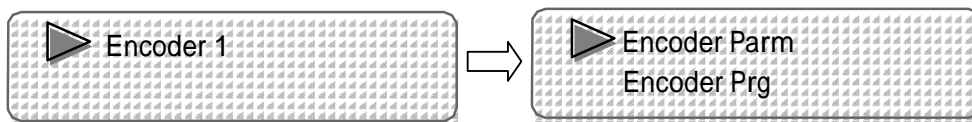
.2.1.1   Encoder Pararmeters

❖   Interface

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

10

The current option

```
┌─────────────────────────────────┐        ┌─────────────────────────────┐
│ ▶ Interface    [1] HDMI          │        │ ▶  [1] HDMI                 │
│    [1] HDMI                      │   ⇨    │    [2] YPbPr                │
│                                  │        │    [3] CVBS                 │
└─────────────────────────────────┘        └─────────────────────────────┘
```
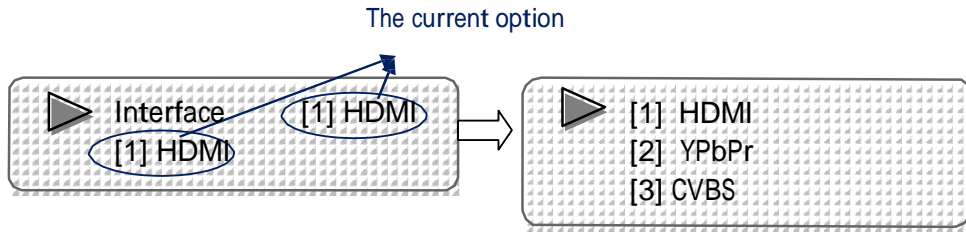
┌──┐
│ NOTE: These explanations are applied in this entire manual.   │
│   │
│ 1) When user enters this submenu, the LCD displays only one option which is the device's │
│   current option when user presses ENTER again to enter the operation interface.   │
│   │
│ 2) Press UP/DOWN buttons to specify the item, and then press Enter key to confirm   │
└──┘

❖   Video Format

Supports both MPEG2 and MPEG4 AVC/H.264 formats. Move the triangle mark with UP/DOWN keys to specify the intended format and press ENTER to confirm.

```
┌─────────────────────────────────────┐
│ ▶ Video Format   [2] H.264          │
│    [2] H.264                        │
└─────────────────────────────────────┘
```
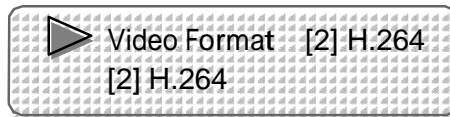
❖   Low Delay

Select a latency mode (Normal, Mode 1, Mode 2, and Manual optional) for the content. Move the triangle mark to specify a mode and press ENTER to confirm.

```
┌─────────────────────────────────────┐
│ ▶ Low Delay     [1] Normal          │
│    [1] Normal                       │
└─────────────────────────────────────┘
```
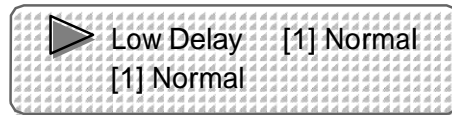
Normal: not to enable the low delay mode.

┌──┐
│ ⊹ 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 5 attached for detailed information.   │
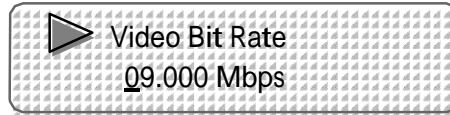└──┘

❖   CC

CC (closed caption) can be input through "CC" port and it can be enable and disabled in this menu. Please refer to the Chapter 5 attached for detailed information.
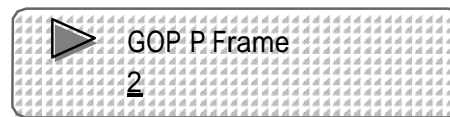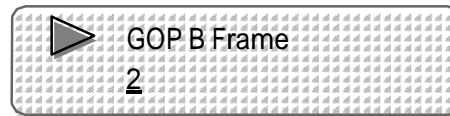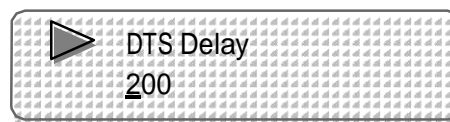
```
┌─────────────────────────────────────┐
│ ▶ CC Switch     [1] OFF             │
│    [1] OFF                          │
└─────────────────────────────────────┘
```

❖   Video Bitrate

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.

```
   ▶  Video Bit Rate
      09.000 Mbps
```

❖   DTS Delay/GOP B Frame/GOP P Frame

These items are programmable when the "Low Delay" mode is set "Manual".

```
   ▶  DTS Delay
      200
```

```
   ▶  GOP B Frame
      2
```

```
   ▶  GOP P Frame
      2
```

Mode 1: B frame=0, P frame=14, DTS=1

Mode 2: B frame=0, P frame=14, DTS=1

Manual: Under this mode, B frame (≤3), P frame (≤6) and DTS (1-500) can be customized manually.

❖   Audio Format

Choose the equipment video format among MPEG-1 Layer 2, MPEG-2 AAC, MPEG-4 AAC, AC3, AC3 Pass HDMI and AC3 Pass SPDIF in this interface. The LCD will display the following interfaces after users pressing the enter key.

```
   ▶  Audio Format    [4] AC3
      [4]AC3
```
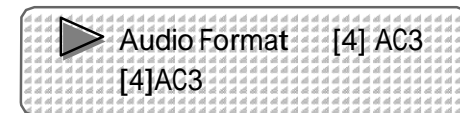
❖   Dialog Normal

"Dialog Normal" refers to dialog normalization based on Dolby Digital AC3 audio coding. It can be customized when the audio format above is set "AC3". (Range: -31~-10 dB)

```
   ▶  Dialog Normal
      -10
```

❖ Audio Source

Audio Source supports Analog, HDMI, SPDIF and Auto (automatically identify audio source). Move the triangle mark with UP/DOWN keys to specify the intended format and press ENTER to confirm.

```
▷ Audio Source    [1] Auto
  [1] Auto
```

❖ Audio Bit Rate

User can set the input audio bit-rate by pressing the enter key to enter the main editing interface. And there are: 64Kb/s~320Kb/s. After the modification, users can press enter key again to take the modification into effect.

```
▷ Audio Bitrate    [1] 64kbps
  [1] 64kbps
```
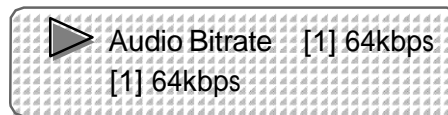
❖ Audio Gain

Move the underline with LEFT/RIGHT keys and modify the Audio Gain (0-400% adjustable) with UP/DOWN keys, then press ENTER key to save the settings.

```
▷ Audio Gain
  100
```

2.1.2   Encoder Prg

❖ Service ID/PMT PID /Video PID /Audio PID/PCR PID Settings

Users can set those parameters by pressing ENTER to enter these submenus. The LCD will display the following pages, and the maximum PID number cannot exceed 0x1fff.
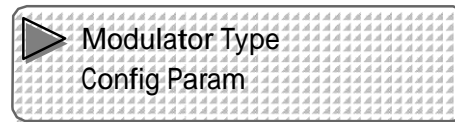
```
▷ Service ID
  0101
```

```
▷ PMI PID
  0100
```

```
▷ Video PID
  0101
```

```
   ▶ PCR PID
        0103
```
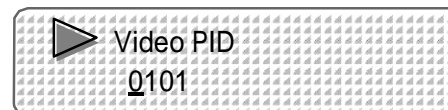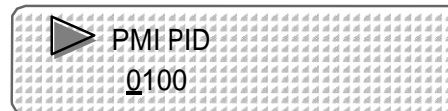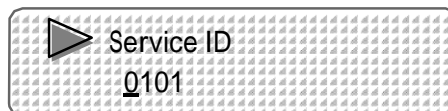
2.2 Modulator Setting

When entering "Modulator" submenu, user can configure the modulating parameters for the 4 carrier output separately:

```
   ▶ Modulator Type
      Config Param
```

2.2.1 Modulator Type

DVB-C and ATSC Modulating in one device. User can move the triangle mark with UP/DOWN keys to specify the intended Modulator Type and press ENTER to confirm, and then reboot the device to activate the modulator type.

```
   ▶ DVB-C
      ATSC
```
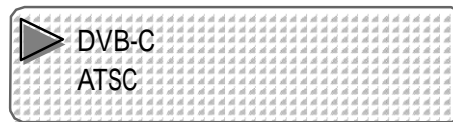
2.2.2 Config Param

This device (DVB-C&ATSC Modulating) has 4 carrier outputs. User can enter Config Param to set the modulating parameters.

User can enter Config Param to set the modulating parameters.

◆ Standard (For DVB-C Modulating only)

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 UP and DOWN key to choose.

◆ Constellation (For DVB-C Modulating only)

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 UP/DOWN key to choose and repressing "ENTER" for confirm.

❖ Symbol Rate (For DVB-C Modulating only)

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.
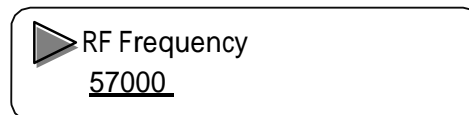
❖ RF level (For DVB-C and ATSC Modulating)

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 Level
  -10.0 dbm
```
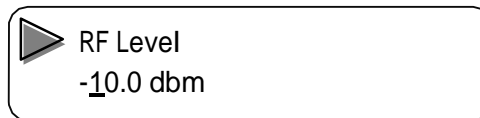
❖ RF Frequency 1/2/3/4(For DVB-C and ATSC Modulating)

The RF output frequency range is from 36 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
  57000
```

❖ RF On 1/2/3/4(For DVB-C and ATSC Modulating)

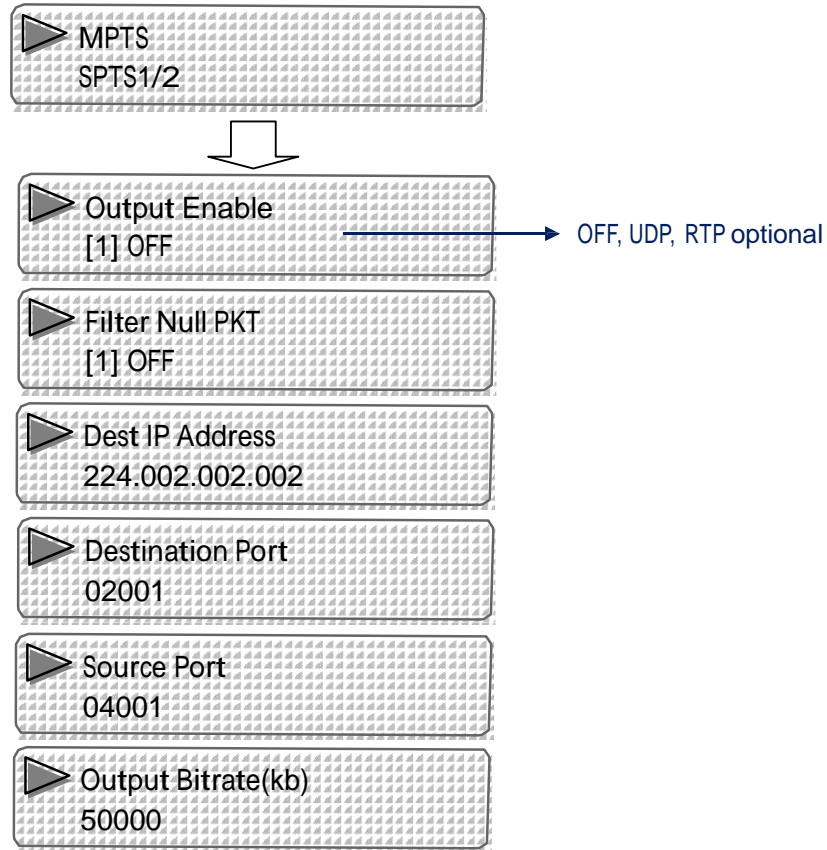This interface decides whether to enable the RF (4 carriers) output or not.

OFF: to disable programs to output through carrier.

ON: to enable programs to output through carrier.

```
▷ RF On
  [1] YES
```

2.3 IP Output

"IP output" is for configuring the 1 MPTS and 2 SPTS output respectively.

```
┌─────────────────────────┐
│ ▷ MPTS                   │
│    SPTS1/2               │
└─────────────────────────┘
```

⬇

```
┌─────────────────────────┐
│ ▷ Output Enable          │ ──────────→  OFF, UDP, RTP optional
│    [1] OFF               │
└─────────────────────────┘
┌─────────────────────────┐
│ ▷ Filter Null PKT        │
│    [1] OFF               │
└─────────────────────────┘
┌─────────────────────────┐
│ ▷ Dest IP Address        │
│    224.002.002.002       │
└─────────────────────────┘
┌─────────────────────────┐
│ ▷ Destination Port       │
│    02001                 │
└─────────────────────────┘
┌─────────────────────────┐
│ ▷ Source Port            │
│    04001                 │
└─────────────────────────┘
┌─────────────────────────┐
│ ▷ Output Bitrate(kb)     │
│    50000                 │
└─────────────────────────┘
```

2.4 Network

Network contains "NMS Interface" and "Data Interface".

```
┌─────────────────────────┐
│ ▷ NMS Interface          │
│    Data Interface        │
└─────────────────────────┘
```
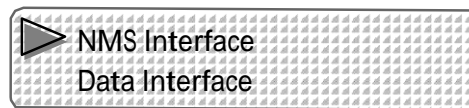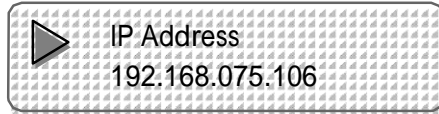
"NMS Interface" is for setting the network parameters for the connection between the device and PC.

```
┌─────────────────────────┐        ┌─────────────────────────┐
│ ▷ IP Address             │        │ ▷ Submask                │
│    192.168.002.136       │        │    255.255.255.000       │
└─────────────────────────┘        └─────────────────────────┘
┌─────────────────────────┐
│ ▷ Gateway                │
│    192.168.002.000       │
└─────────────────────────┘
```
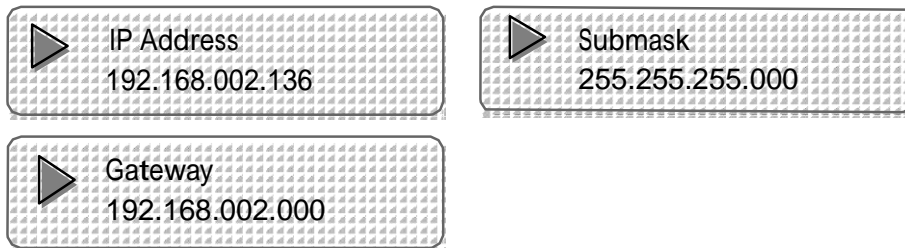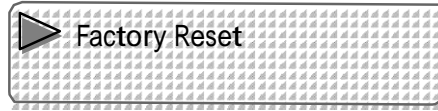
"Data Interface" is for configuring the 2 SPTS and 1 MPTS output. SPTS is for carrying the 2 encoded programs respectively, while MPTS is for carrying the muxed programs.

```
┌──────────────────────────┐   ┌──────────────────────────┐
│  ▷   IP Address          │   │  ▷   Submask             │
│       192.168.075.106    │   │       255.255.255.000    │
└──────────────────────────┘   └──────────────────────────┘
┌──────────────────────────┐
│  ▷   Default Gateway     │
│       000.000.000.000    │
└──────────────────────────┘
```
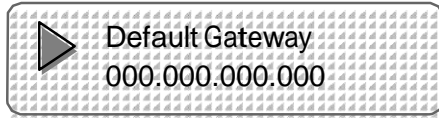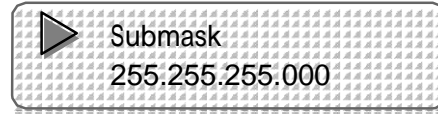
2.5   Configuration Setting

It contains 3 submenus where users can save/load configurations.

```
┌──────────────────────────┐   ┌──────────────────────────┐
│  ▷  Save Config          │   │  ▷  Factory Reset        │
│     Restore Configa      │   │                          │
└──────────────────────────┘   └──────────────────────────┘
```

2.6   Version

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

```
┌──────────────────────────┐   ┌──────────────────────────┐
│  ▷  SW Version           │   │  ▷  HD Version           │
│       X.X.X              │   │       X.X                │
└──────────────────────────┘   └──────────────────────────┘
```

Chapter 4 WEB NMS operation

Using the LCD digital display and front buttons for setting configuration is always an option if you are close by, conveniently you can alter the same settings through a computer by connecting the device to the web NMS Port. Always make sure that the computer's IP address is different from the Units IP address; otherwise, it will cause an IP conflict. Below is an explanation of how you can adjust settings through a web portal

4.1 login

The default IP of this device is 192.168.2.136. 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 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.
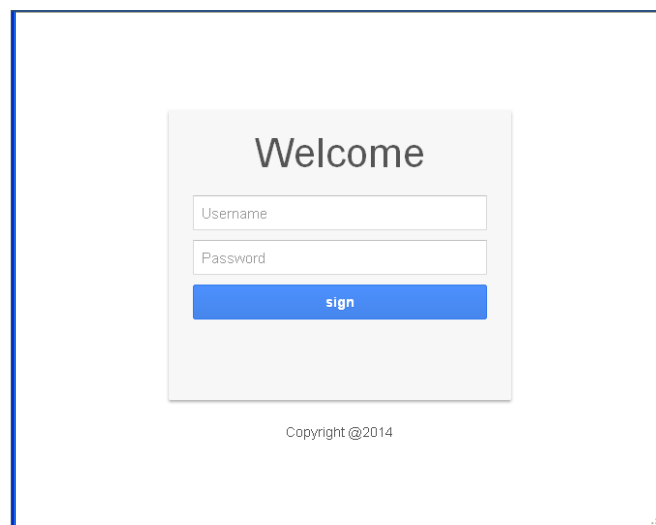
Figure-1

4.2 Operation

System

When we confirm the login, it displays the SYSTEM INFORMATION interface as Figure-2 where user can view the system information.
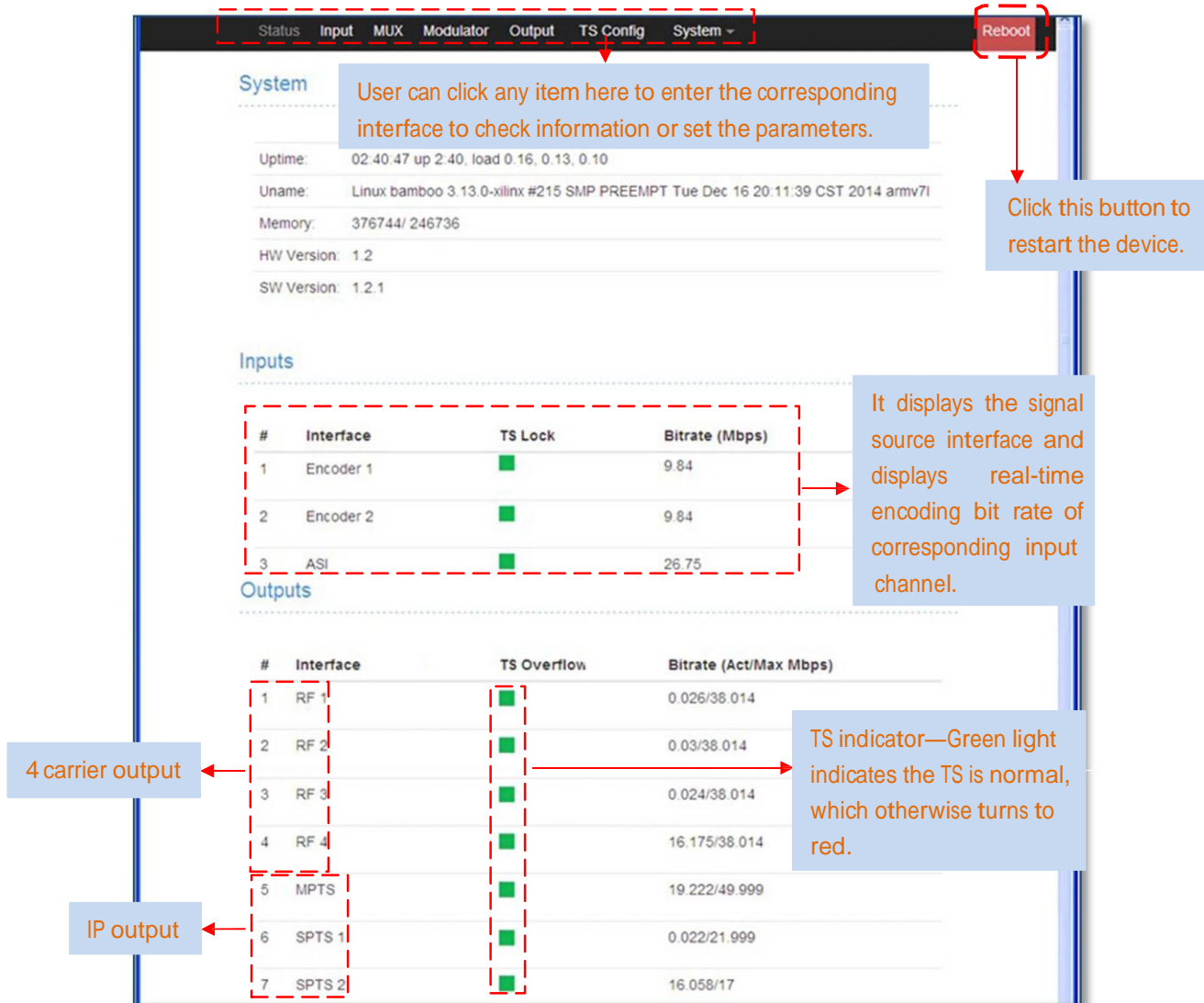
Figure-2

Input

From the menu on top side of the webpage, clicking "Input", it displays the information of the encoding channel as below.

E n co d er Pa ram

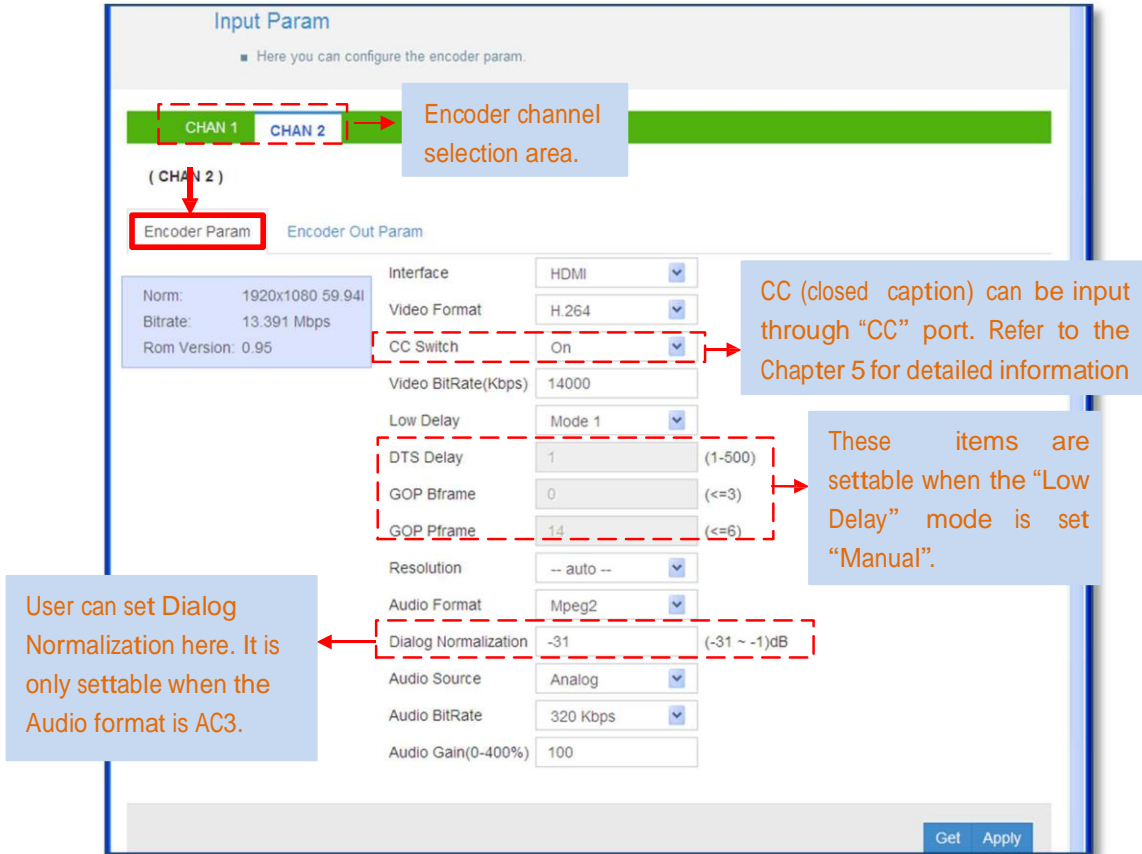Clicking "Encoder Param" it displays the information of the Video and Audio encoding parameters as Figure-3. User can set the Video and Audio parameters.

Figure-3

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

Mode 1: B frame=0, P frame=14, DTS=1

Mode 2: B frame=2, P frame=4, DTS=1

Manual: Under this mode, B frame (≤3), P frame (≤6) and DTS (1-500) can be customized manually.

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 5 attached for detailed information.

Encoder out Param

Clicking "Encoder out Param", User can set the encoded program output parameters.
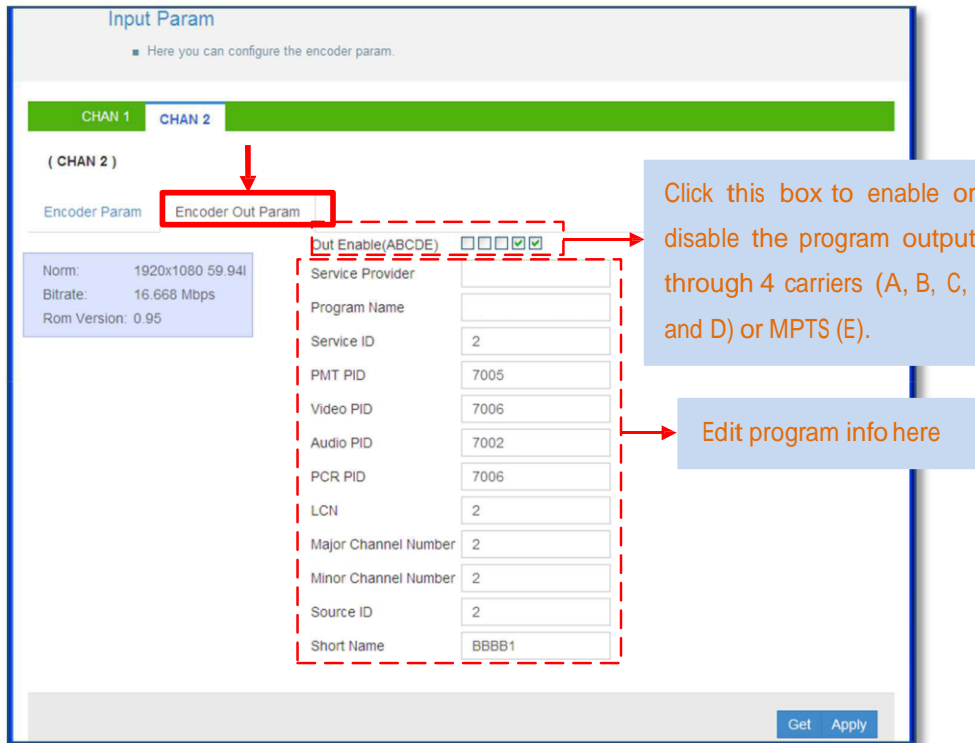
Figure-4

Mux

Click "Mux", it will display ASI input program information as Figure-5. User can parse and multiplex out programs through 4 carriers or MPTS in this interface.
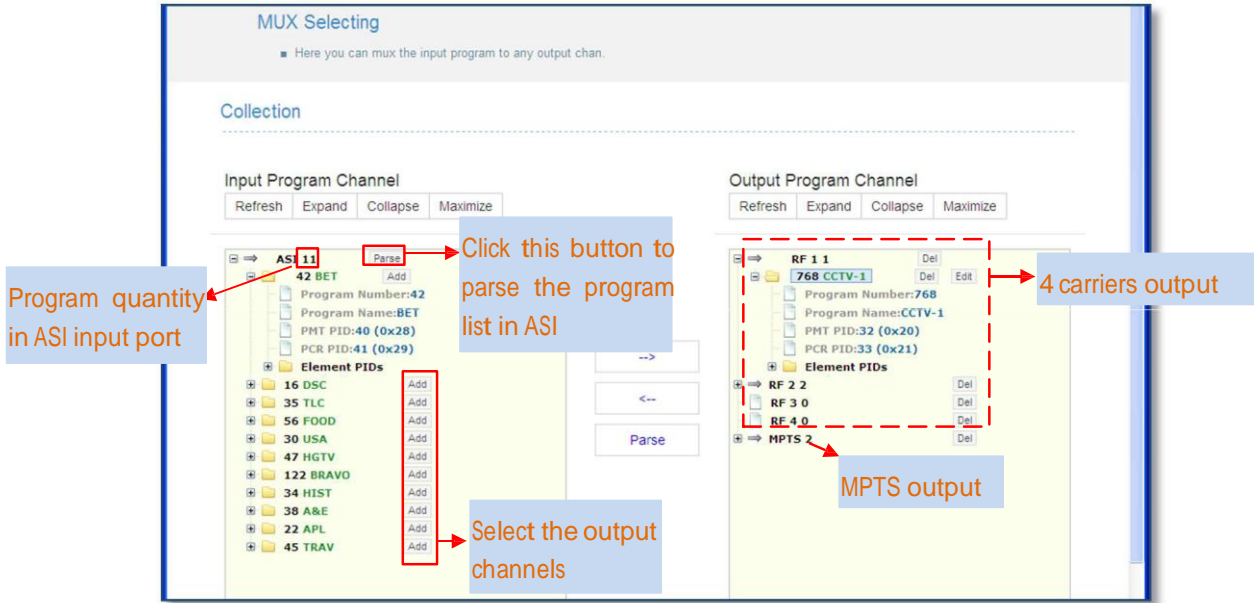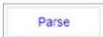
Figure-5

 Click those buttons to refresh/expand/collapse/Maximize the ASI input

programs or RF, MPTS out programs

 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.

 Click this button to parse the program list in each input channel.

Program Modification:

The multiplexed program information can be modified by clicking the program in the 'output' area.

For example, first select the target a program in the 'output' area, then clicking it triggers a

dialog box (Figure 6) where users can input new information.

Figure-6

22

Input new data and click 'Apply' button at last to confirm the modification.

Modulator Setting

User can use front buttons to set the intended Modulator Type. Please refer to Chapter 3 (2.2.1 Modulator Setting) for detailed information.

DVB- C M o d u latin g

When user chooses DVB-C as Modulator Type, enter in "Modulator" and it will display the Modulator Configuration screen as Figure-7 where can set DVB-C modulation parameters.
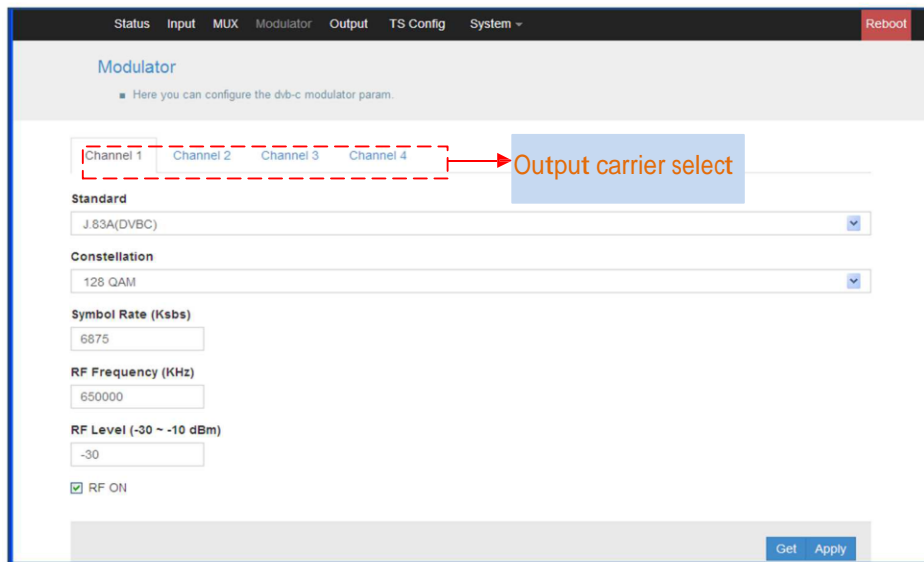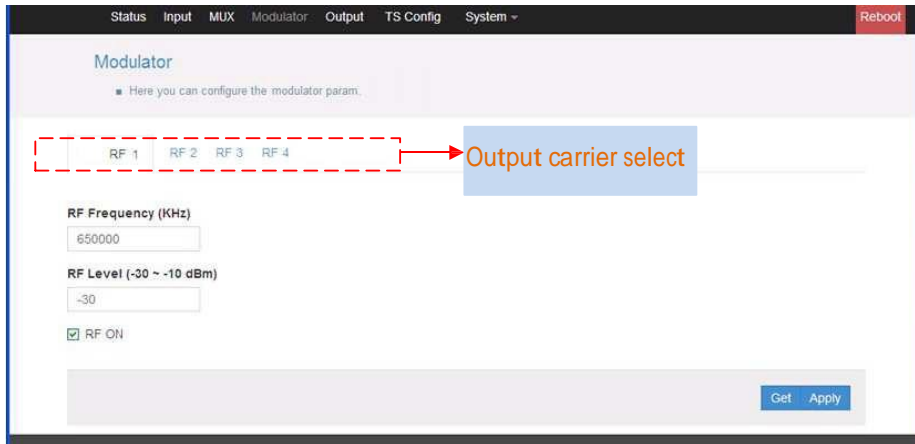

Figure-7

After setting all the parameters, click "Apply" [Apply] to save the Modulator Configuration.

ATSC Mo d u latin g

When user chooses ATSC as Modulator Type, enter in "Modulator" and it will display the Modulator Configuration screen as below where to set ATSC modulation parameters.

23

Output Parameters

Click "Output" from the top menu, it is for configuring the IP and ASI output respectively.

Output Setting

Enter in "Output Setting" and it will display the screen as Figure-8 where user can set the 1 MPTS and 2 SPTS parameters separately.
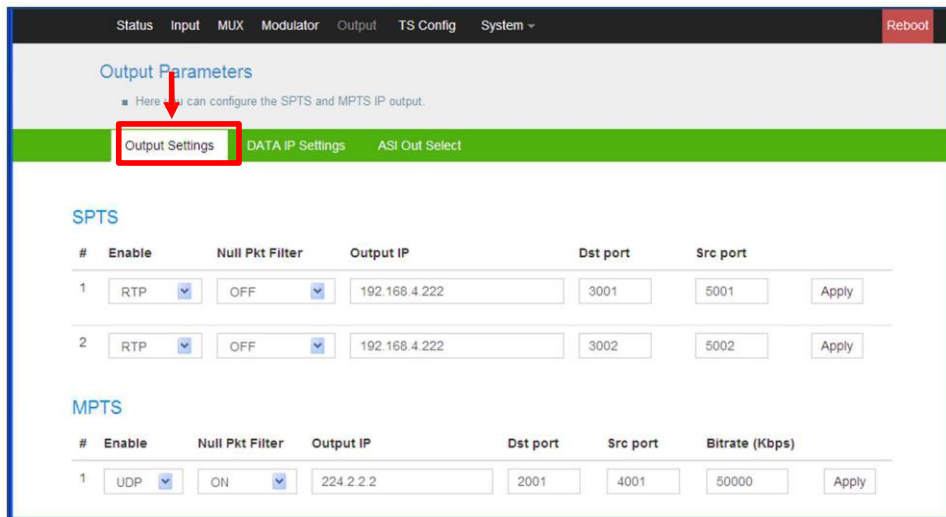

Figure-8

Data IP Setting

Data IP Setting is for setting the Data parameters for the device. (Figure-9)
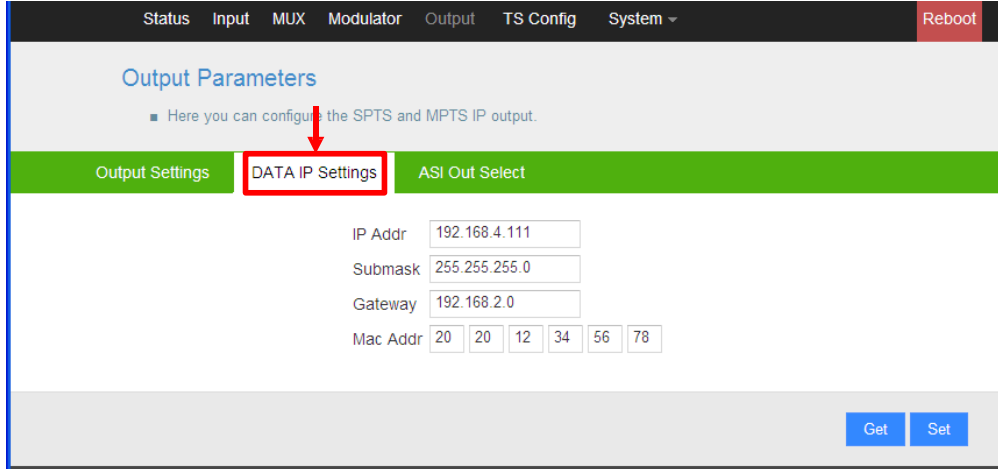
Figure-9

ASI Out Select

Clicking "ASI Output select" from the menu, it will display the interface as Figure-10 where to choose TS to output from ASI.
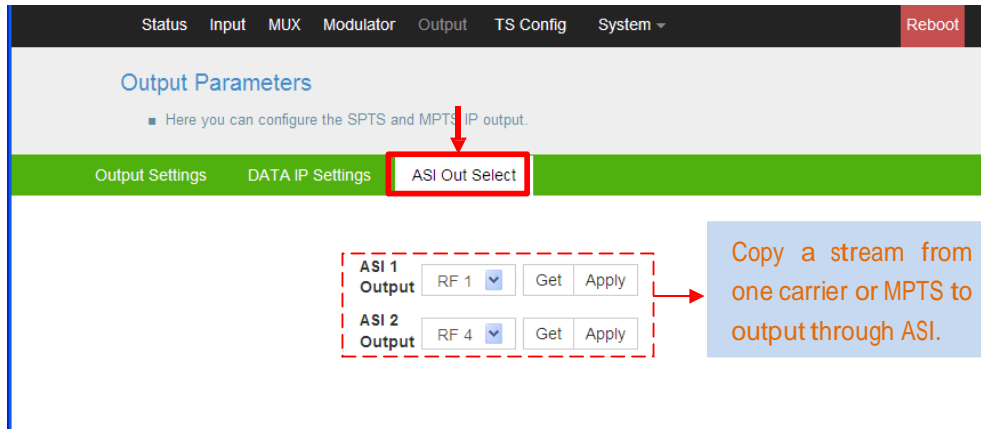

Figure-10

TS Config

Enter this interface to configure the TS ID, Original Network ID, NIT and VCT for the 4 carriers and ASI MPTS output.

Status Input MUX MOdulator Output · System · Reboot

TS Param

- Here u can anfigure the @flcooer param

: A B C D E !----+ 4 carriers and MPTS select

Stream

TSID

ONIC

NIT

Network 10

Network Name

netwcrk-1

Version Mode

AutomatiC

Version Number

22

LCN Mode

European

country Code

0

ChannelList IC

0

ChannelList Name

Private Data

0

NIT Inse

VCT

Modulation Mode

VCT Inserl

Get Apply

Figure-11

System→Save load

Clicking "Save load" from the menu, it will display the screen as Figure-12 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.

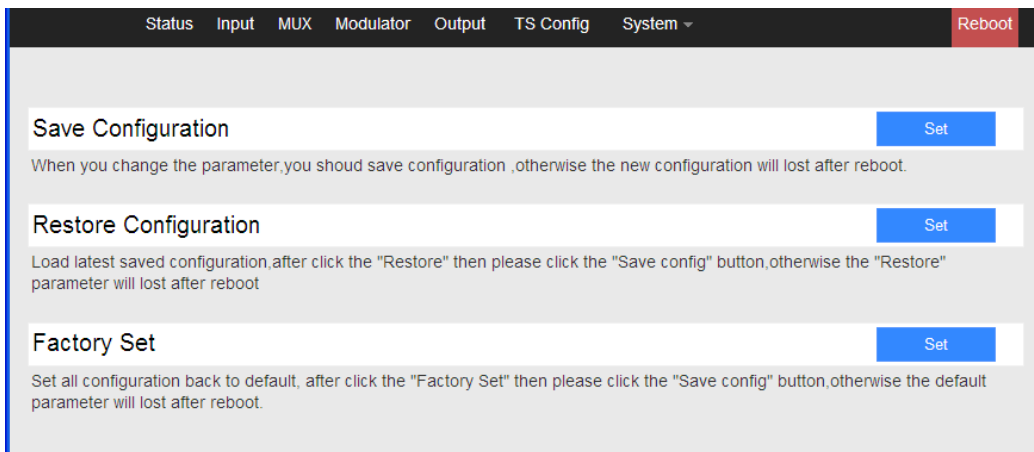By using "Factory Set" user can import the default factory configuration.

Figure-12

System→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.
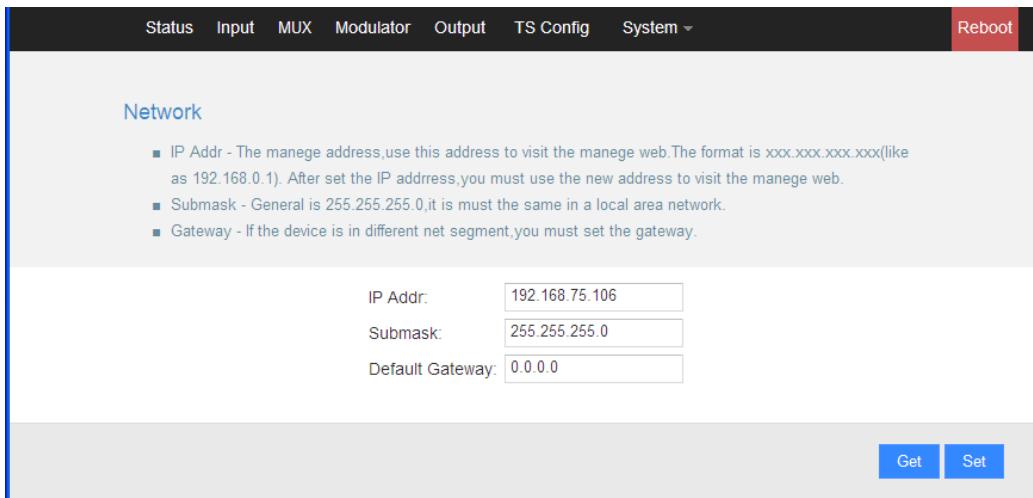

Figure-13

System→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 "Set" to save the configuration.
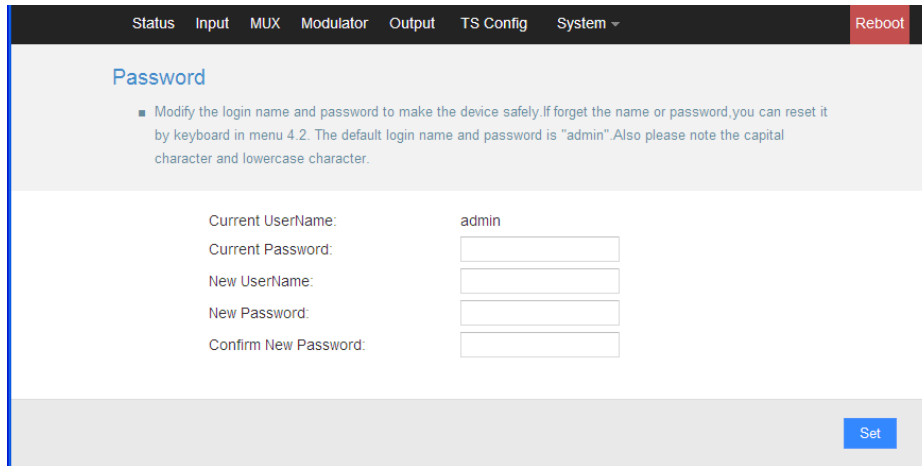
Figure-14

System→Firmware

Click "Firmware" from the menu it will display the screen as Figure-15. 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-15

Chapter 5 Operation of Closed Caption (CC)

Closed Caption, hereinafter referred to as the CC. This unit has analog CC 608 only.

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 A/V inputs to generate programs with CC.

CC wiring diagram

CC switch in Web based NMS

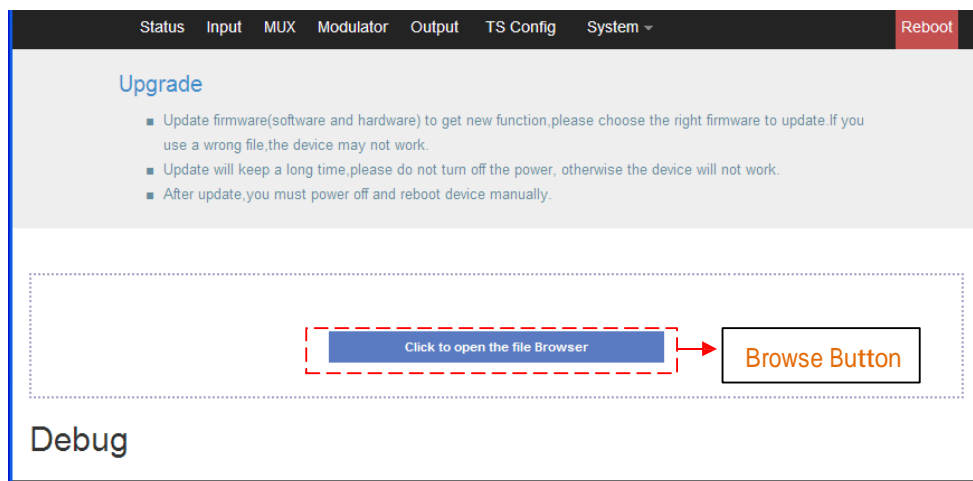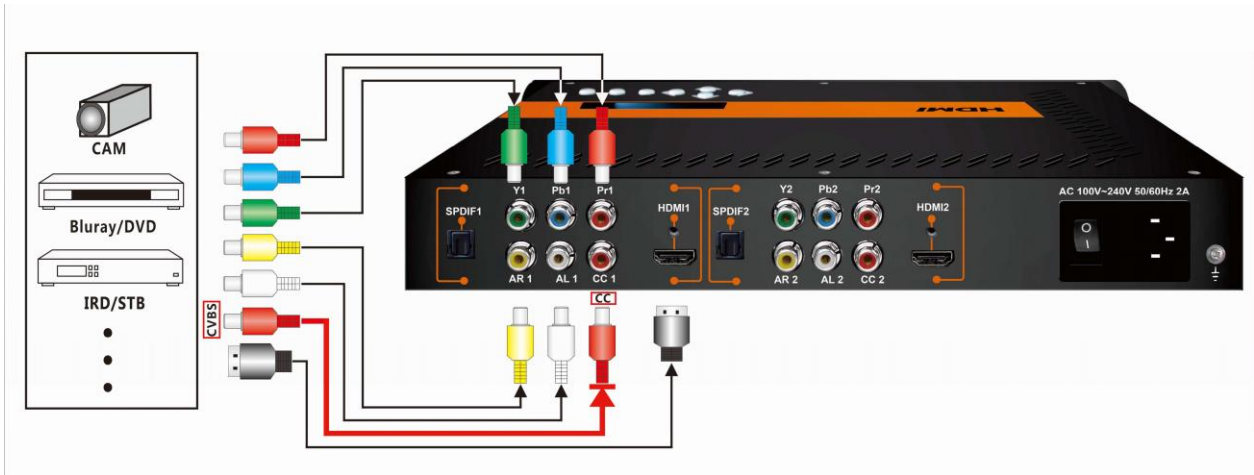# Chapter 6 Low Delay Setting

The H-2ADHD has a low delay option from encoding to STB decoding side. User can enable the low delay function in the web-server NMS interface as shown below:

Click "Encoder Param" of "Channel 1" or "Channel 2" to set a low delay mode for each channel:

There are 4 low delay modes:

1. Normal: to disable the low delay function.

2. Mode 1/Mode 2/Manual: 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	Bit Rate Mode	Resolution	Low Delay	Encoding Type	

Decoding Terminal	Single Source Interface	Bit Rate Mode	Resolution	Low Delay Mode	Encoding Type	Average Delay (ms)
	Interface			Mode		
DVB-C 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
DVB-C 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
DVB-C HD STB	CVBS	VBR	576i@50	Mode 1	mpeg2	450
					H.264	570
				Mode 2	mpeg2	510
					H.264	620

Decoding Terminal	Single Source Interface	Bit Rate Mode	Encoding Details		Encoding Type	Average Delay (ms)
			Resolution	Low Delay Mode		
ATSC 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
ATSC 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
ATSC-T HD STB	CVBS	VBR	576i@50	Mode 1	mpeg2	470
					H.264	515
				Mode 2	mpeg2	540
					H.264	570
			480i@60	Mode 1	mpeg2	460
					H.264	500
				Mode 2	mpeg2	510
					H.264	550

Chapter 7 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

ATSC Off-Air US Television Channels Center Frequency (MHz) Chart

ATSC - US Television Channels (MHz)					
Channel	MHz Center Frequency	Channel	MHz Center Frequency	Channel	MHz Center Frequency
2	57	27	551	52	701
3	63	28	557	53	707
4	69	29	863	54	713
5	79	30	569	55	719
6	85	31	575	56	725
7	177	32	581	57	731
8	183	33	587	58	737
9	189	34	593	59	743
10	195	35	599	60	749
11	201	36	605	61	755
12	207	37	611	62	761
13	213	38	617	63	767
14	473	39	623	64	773
15	479	40	629	65	779
16	485	41	635	66	785
17	491	42	641	67	791
18	497	43	647	68	797
19	503	44	653	69	803
20	509	45	659		
21	515	46	665		
22	521	47	671		
23	527	48	677		
24	533	49	683		
25	539	50	689		
26	545	51	695		

CATV QAM Channel Center Frequency - 54 MHz to 860 MHz (J.83B)

QAM 256 / Symbol Rate 5.361Msps , QAM 64 / Symbol Rate 5.057Msps

EIA CH.	MHz Center Frequency	EIA CH.	MHz Center Frequency	EIA CH.	MHz Center Frequency
2	57	42	333	87	603
3	63	43	339	88	609
4	69	44	345	89	615
5	79	45	351	90	621
6	85	46	357	91	627
95	93	47	363	92	633
96	99	48	369	93	639
97	105	49	375	94	645
98	111	50	381	100	651
99	117	51	387	101	657
14	123	52	393	102	663
15	129	53	399	103	669
16	135	54	405	104	675
17	141	55	411	105	681
18	147	56	417	106	687
19	153	57	423	107	693
20	159	58	429	108	699
21	165	59	435	109	705
22	171	60	441	110	711
7	177	61	447	111	717
8	183	62	453	112	723
9	189	63	459	113	729
10	195	64	465	114	735
11	201	65	471	115	741
12	207	66	477	116	747
13	213	67	483	117	753
23	219	68	489	118	759
24	225	69	495	119	765
25	231	70	501	120	771
26	237	71	507	121	777
27	243	72	513	122	783
28	249	73	519	123	789
29	255	74	525	124	795
30	261	75	531	125	801
31	267	76	537	126	807
32	273	77	543	127	813
33	279	78	549	128	819
34	285	79	555	129	825
35	291	80	561	130	831
36	297	81	567	131	837
37	303	82	573	132	843
38	309	83	579	133	849
39	315	84	585	134	855
40	321	85	591	135	861
41	327	86	597		

Link to the 4 ch HDMI /YPbPR encoder Modulator

4 Channel HDMI /YpBpr IP Encoder / QAM Modulator 1080p

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