



# 6 Ch RF + 2 Ch ASI Over IP DVB Multiplexer

# User Manual

**1B-RF-ASI-IP-TS-MX**



## DIRECTORY

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# Chapter 1 Product Outline

## 1.1 Outline

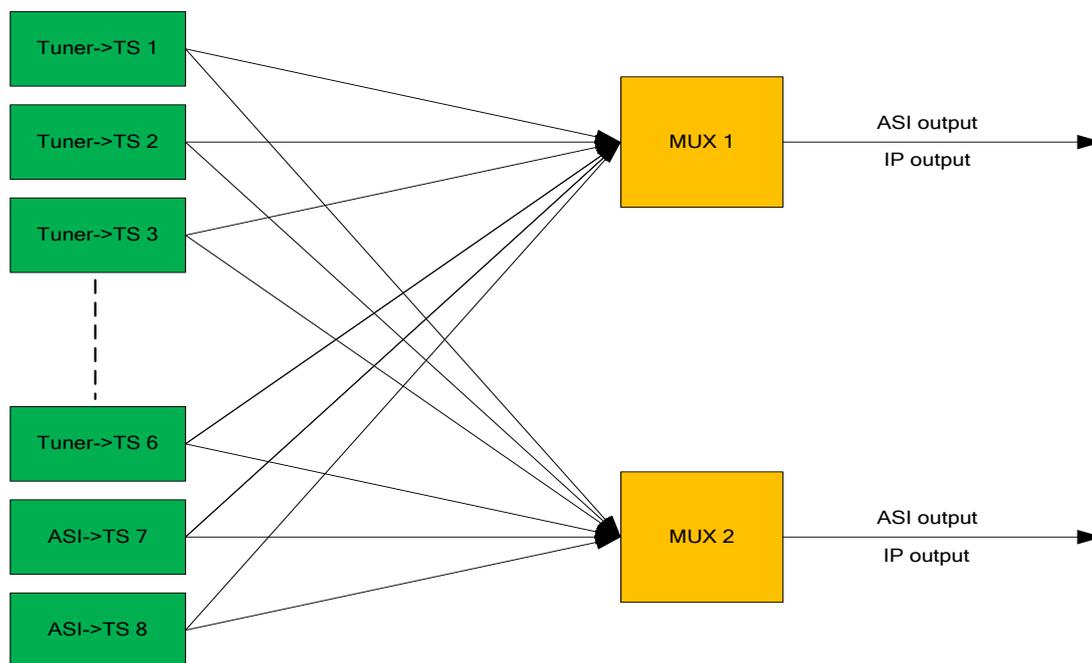
1B-RF-ASI-IP-TS-MX DVB-S2 Tuner Input Multiplexer is the latest demodulation and multiplexing device for digital TV broadcasting head-end system. Different from normal multiplexer,

this multiplexer has 2 ASI inputs, supports 6 tuner inputs (ISDB-T/DVB-C/S/S2/T/ISDB-T optional), two separate ASI output ports and one DATA port for two separate gigabit IP outputs. In other words, It can multiplex the RF signals from satellite into the output ports via the 6 tuners, also it can multiplex up to 2 channels ASI input MPTS into the output transport stream (MPTS). In other words, one Tuner Input Multiplexer can work as 6 standalone FTA IRD and two separate ASI output multiplexer. In conclusion, its high integration and cost effective design make this device widely used in the Next Generation of CATV Broadcasting system.

## 1.2 Features

- Fully complies with ISO13818 and EN300468 standard
- Integrated demodulating and multiplexing functions
- 6 DVB tuner inputs and 2 ASI inputs
- MPEG-2 and mpeg-4 transport stream re-multiplexing
- SPTS and MPTS code stream multiplexing
- Supports accurate PCR and PID re-mapping
- Two groups( each group has 2 channels) separate TS output
- Two channels Gig IP output (the mirrors of the 2 ASI outputs)
- Supports PSI/SI editing
- Supports huge buffer memory and resists unexpected code stream
- Supports multiplexing the same program to all the output channels
- Alarming function
- Supports network remote upgrading
- Full-size LCD display and NMS operation

### 1.3 Principle Chart



### 1.4 Specifications

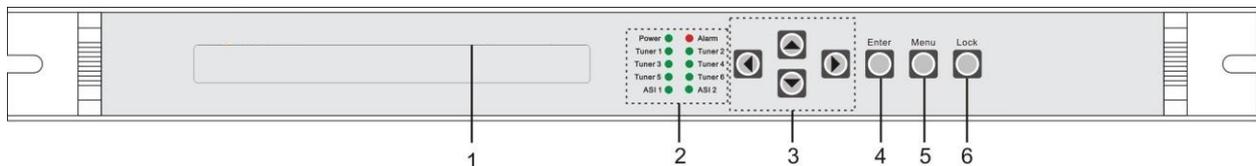
Input interface	Tuner	6 channels (ISDB-T/DVB-C/S/S2/T optional)
	ASI	2 channels (Up to 214Mbps per channel)
Re-multiplex		MPEG-2 TS re-multiplex
		PID re-mapping ( auto/manual optional)
		PCR correction
		Automatic generating PSI/SI table
Input	Packet format	204/188 self-adaption
Output port	ASI	2 separate groups outputs (each group has 2 channels)
	IP	2 channels separate Giga IP output
PID	Output range	0000—1FFF
	PID transparent	Any PID transparent and mapping achievable
	Amount of output PID per input	256 ( at most)
NMS port	Ethernet port	10/100M
Miscellaneous	Demission (W *L*H)	482mm×410mm×44mm

Weight	4kg
Temperature	0~45°C(operation) , -20~80°C(storage)
Power supply	AC 110V±10%, 50/60Hz or AC 220V±10%, 50/60Hz
Consumption	≈18W

## 1.5 Appearance and description

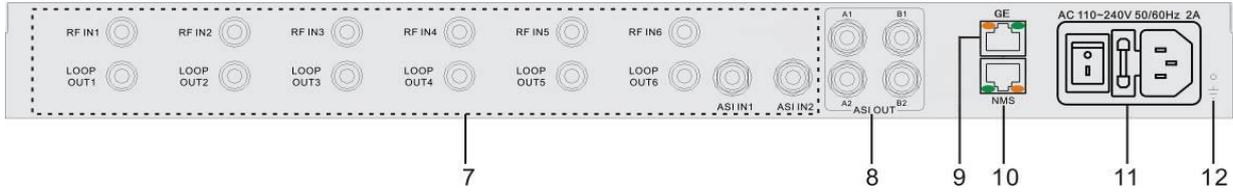
### Front panel Illustration:

Indicator area: All the indicators will light on when 1B-RF-ASI-IP-TS-MX multiplexer works at its current mode.



1	LCD Display	
2	Indicators	Power Indicator
		Alarm Indicator
		Tuner 1-6: when the input signal of tuner 1-6 is locked, the lighter is green which otherwise becomes red.
		ASI 1-2: TS input of port 1-2. When the input stream is normal, the lighter is green which otherwise becomes orange
3	UP/ DOWN /LEFT/RIGHT Key	
4	ENTER Key	
5	MENU Key	
6	LOCK Key	

### Rear panel Illustration:



7	RF IN & LOOP OUT	RF IN 1: Channel 1
		LOOP OUT 1: Channel 1
		RF IN 2: Channel 2
		LOOP OUT 2: Channel 2
		RF IN 3: Channel 3
		LOOP OUT 3: Channel 3
		RF IN 4: Channel 4
		LOOP OUT 4: Channel 4
		RF IN 5: Channel 5
		LOOP OUT 5: Channel 5
		RF IN 6: Channel 6
		LOOP OUT 6: Channel 6
	ASI IN	ASI 1: TS input port 1
		ASI 2: TS input port 2
8	ASI output ports: Group A & Group B	
9	GE port	
10	NMS Ethernet Port ( 10-100Mbps)	
11	Power switch, fuse, socket	
12	Grounding pole	

# Chapter 2 Installation Guide

## 2.1 Acquisition Check

When user opens the package of the device, it is necessary to check items according to packing list. Normally it should include the following items:

- 1B-RF-ASI-IP-TS-MX DVB-S2 Tuner Input Multiplexer
- User's Manual
- ASI Cable
- Power Cord

If any item is missing or mismatching with the list above, please contact local dealer.

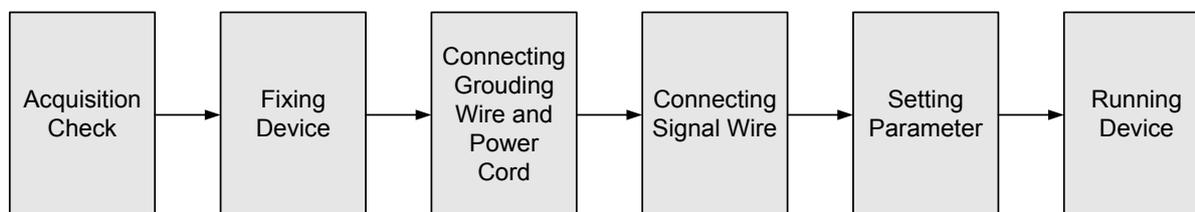
## 2.2 Installation Preparation

When users install device, please follow the below steps. The details of installation will be described at the rest part of this chapter. Users can also refer rear panel chart during the installation.

The main content of this chapter includes:

- Checking the possible device missing or damage during the transportation
- Preparing relevant environment for installation
- Installing multiplexer
- Connecting signal cables
- Connecting communication port (if it is necessary)

### 2.2.1 Device's Installation Flow Chart Illustrated as following:



### 2.2.2 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: $1 \times 10^7 \sim 1 \times 10^{10} \Omega$ , Grounding current limiting resistance: $1 M\Omega$ (Floor bearing should be greater than $450 \text{Kg/m}^2$ )
Environment Temperature	$5 \sim 40^\circ\text{C}$ (sustainable ), $0 \sim 45^\circ\text{C}$ (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 power 220V 50Hz. Please carefully check before running.

### 2.2.3 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.
- ASI cable's outer conductor and isolation layer should keep proper electric conducting with the metal housing of device.
- 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  $25\text{mm}^2$ .

## 2.2.4 Frame Grounding

All the machine frames should be connected with protective copper strip. The grounding wire should be as short as possible and avoid circling. The area of the conduction between grounding wire and grounding strip should be no less than  $25\text{mm}^2$ .

## 2.2.5 Device Grounding

Connecting the device's grounding rod to frame's grounding pole with copper wire.

## 2.3 Wire's Connection

The grounding wire conductive screw is located at the right end of rear panel, and the power switch, fuse, power supply socket is just beside, whose order goes like this, power switch is on the left, power supply socket is on the right and the fuse is just between them.

- **Connecting Power Cord**

User can insert one end into power supply socket, while insert the other end to AC power.

- **Connecting Grounding Wire**

When the device is solely connected to protective ground, it should adopt independent way, say, share the same ground with other devices. When the device adopts united way, the grounding resistance should be smaller than  $1\Omega$ .

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### Caution:

Before connecting power cord to 1B-RF-ASI-IP-TS-MX multiplexer, user should set the power switch to "OFF".

## 2.4 Signal Cable Connection

The signal connections include the connection of input signal cable and the connection of output signal cable. The details are as follows:

### 2.4.1 ASI In and ASI out connection:

- ASI Input Connection

User can find ASI input port on the device according to connector mark described in the rear panel illustration, and then connect the ASI cable (in the accessories). One end is connected to the Multiplexer's ASI input port, while the other end is connected to Encoder's ASI output port or ASI output port of other equipment.



- ASI Output Connection

User can find ASI output port on the device according to connector mark described in the rear panel illustration, and then connect the ASI cable (in the accessories); one end is connected to the Multiplexer's ASI output port and the other end to the Modulator's ASI input port or ASI input of other equipment. Multiplexer's ASI cable illustrated as follows:



- 2.4.3 RF IN and LOOP OUT connection:

Users can find the RF IN and LOOP OUT interface on the device according to the connector mark described on the rear panel illustration, and then connect the cable. One end is connected to the RF IN interface of the tuner multiplexer while the other end is connected to the satellite signal source equipment or LOOP OUT interface of the previous satellite receiver when several satellite receivers are series connection. As follows:



- RF In and loop out cable illustration:



- Network cable illustration:



# Chapter 3 Operation

1B-RF-ASI-IP-TS-MX DVB-S2 Tuner Input multiplexer’s front panel is user operation interface. The detailed operations go as follows:

Keyboard Function Description:

**ENTER:** Activating the parameters which need modifications, or confirming the change after modification.

**MENU:** To cancel presently entered value, resume previous setting, return to previous menu.

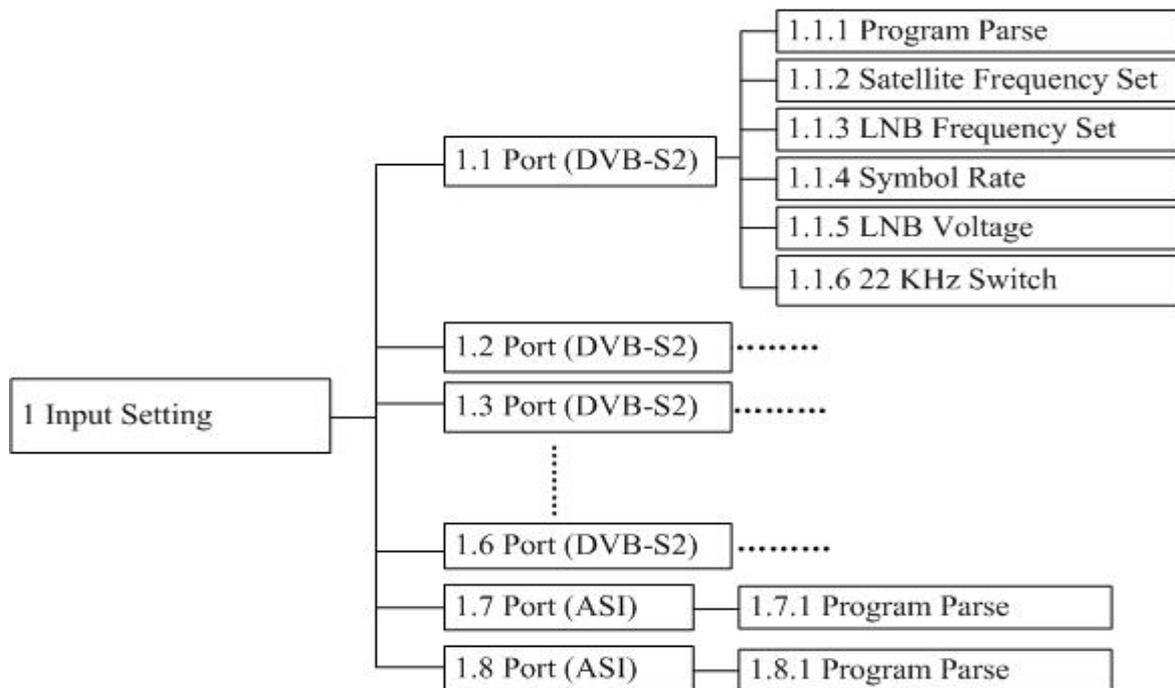
**LEFT/RIGHT:** To move the “▶” to choose or set the parameters.

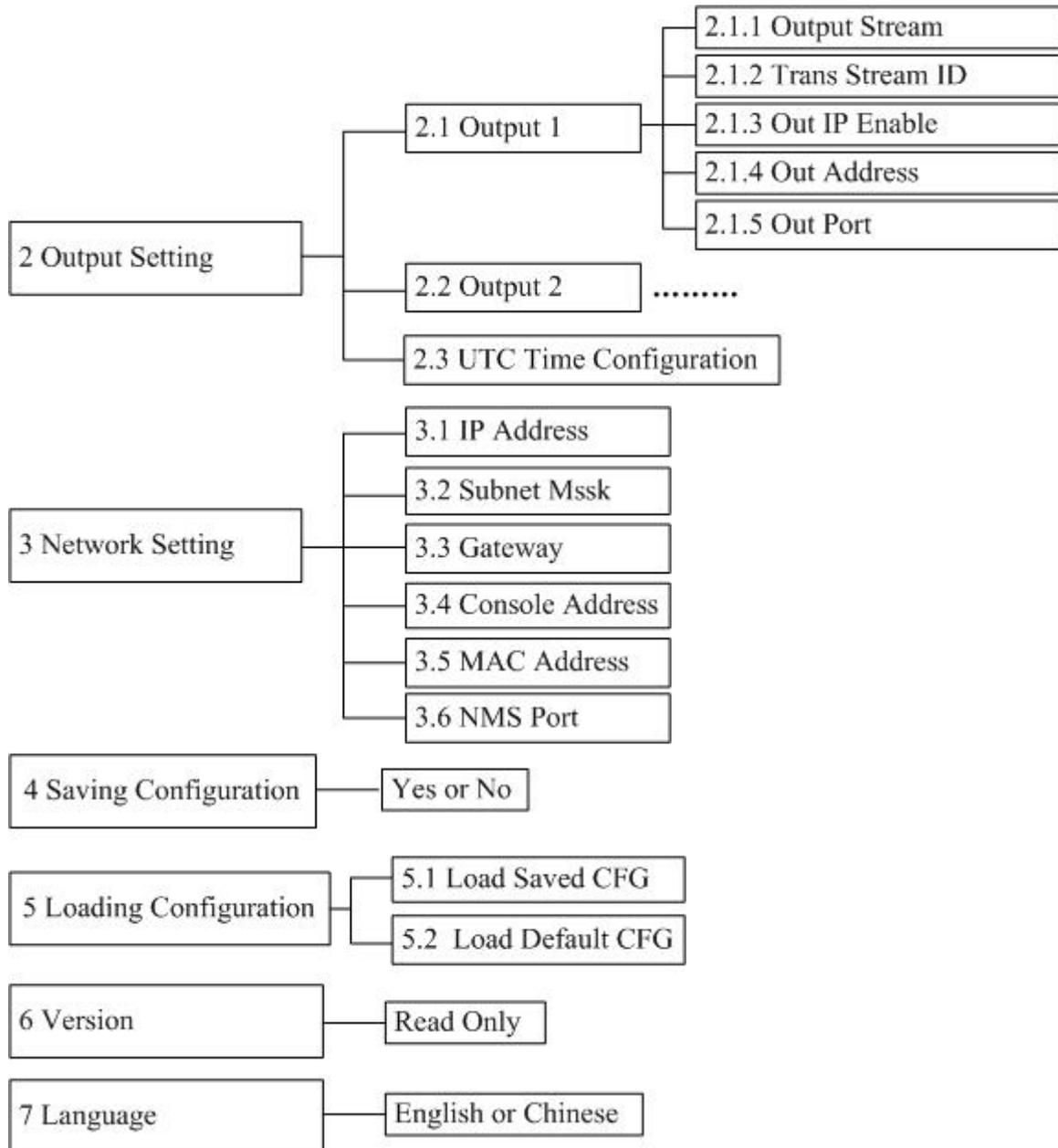
**UP/DOWN:** To modify activated parameter or page up/down when parameter is inactivated.

**LOCK:** To Lock the screen / cancel the lock state. After pressing lock key, the system will question the users to save present setting or not. If not, the LCD will display the current configuration state.

At the page of 5.2 “Load default CFG”, user can firstly press “ENTER” key, consequently system resumes factory parameter setting.

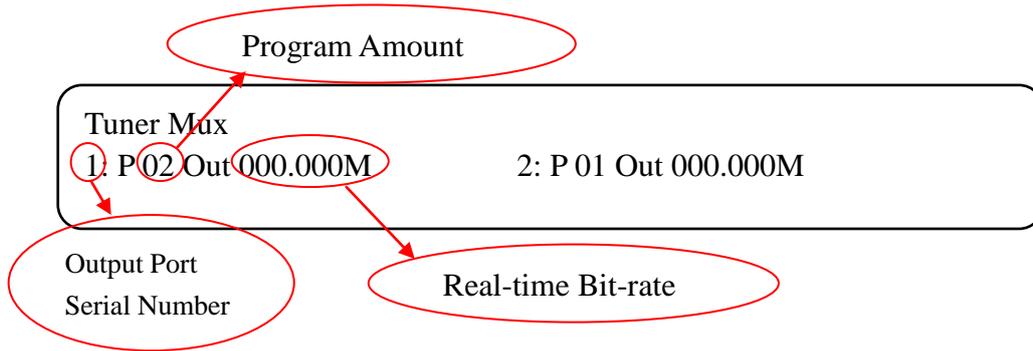
### Class Tree of LCD Menu:





### 3.1 Initializing

After switching on the multiplexer, the LCD will display the device name in the first row, while the output program amount and real-time bit-rate of both output ports are displayed in the second row.



### 3.2 General setting

By pressing “LOCK” key to enter the main menu, user can enter the following pages:

- |                            |                         |
|----------------------------|-------------------------|
| ▶ 1. Input Setting         | 2. Output Setting       |
| 3. Network Setting         | 4. Saving configuration |
| ▶ 5. Loading configuration | 6. Version              |
| 7. Language                |                         |

The option with “▶” is the current selection, users can press the ENTER key to enter the specified submenu to modify the device parameter.

#### 3.2.1 Input Setting

User can press “ENTER” key to enter into the menu of Input Setting when this menu is marked with ▶. It shows as bellow:

- |                     |                   |
|---------------------|-------------------|
| ▶ 1.1 Port (DVB-S2) | 1.2 Port (DVB-S2) |
| 1.3 Port (DVB-S2)   | 1.4 Port (DVB-S2) |
| ▶ 1.5 Port (DVB-S2) | 1.6 Port (DVB-S2) |
| 1.7 Port (ASI)      | 1.8 Port (ASI)    |

The two-page menu from 1.1 to 1.8 represent the 6 tuner input ports and 2 ASI input ports of this multiplexer. User can multiplex the input programs from any port to output either output port A or port B, or output ports both A and B.

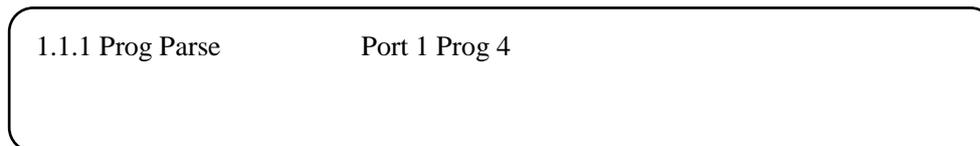
### 3.2.1.1 Tuner Input (DVB)

Here we take the 1.1 Port (DVB) signal input as an example:

User pressing the “ENTER” key, the device will analyze the input TS or signal and then display the program list at the submenu 1.1.1-1.1.6.



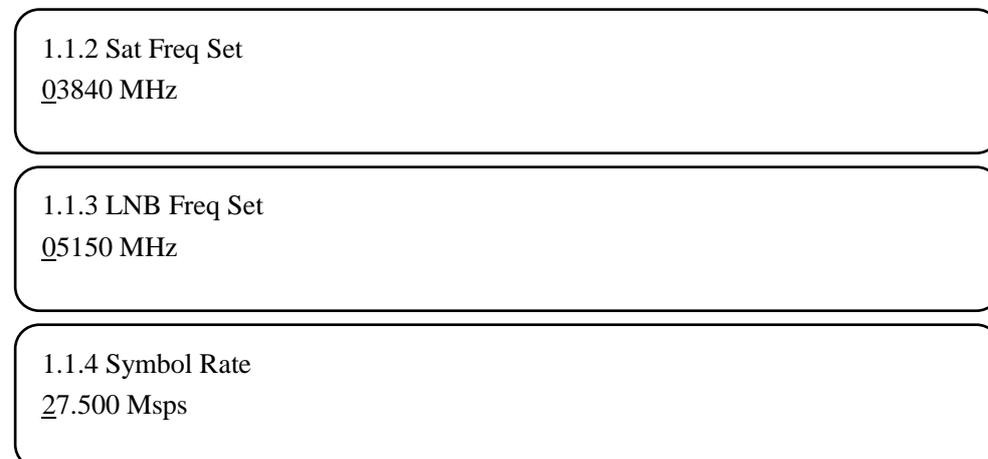
By pressing the “ENTER” key, user can enter the submenu of 1.1.1 Program Parse.



At the submenu 1.1.1, the first row displays the port number and the program amount. For example, Port 1 means the signal comes from port 1 and the “Prog 4” means the quantity of the program is 4.

Also user can check and set the satellite frequency, LNB frequency and symbol rate at the corresponding submenus “1.1.2”, “1.1.3” “1.1.4”.

- 1) To move the underline through LEFT/RIGHT keys.
- 2) To modify the value of underlined character through UP/DOWN keys



At the submenu 1.1.5, user can select the LNB voltage from the 3 options shown below by moving LEFT/RIGHT keys and pressing ENTER to confirm.

1.1.5 LNB voltage		
V (13V)	*H (18V)	OFF (0V)

At the submenu 1.1.6, user can decide whether to enable or disable the 22 KHz Switch.

1.1.6 22 KHZ Switch	
*OFF	ON

**P.S.:** The descriptions of 1.2-1.6 Port (DVB) signal input are the same.

### 3.2.1.2 ASI Input

Here we take port 1.1.7 port (ASI IN) as an example:

1.7.1 Prog Parse	Port7 Prog 3
------------------	--------------

At the submenu 1.7.1, the first row displays the port number and the program amount. For example, Port 7 means the TS stream comes from port 7 and the “Prog 3” means the quantity of the programs is 3.

**P.S.:** The descriptions of 1.8 Port (ASI) signal input are the same.

### 3.2.2 Output Setting

User can press “ENTER” key to enter into the menu of Output Setting.

2.1 Output 1	2.2 Output 2
2.3 UTC Time Config	

#### 3.2.2.1 Output 1

User can set the parameters of ASI and IP output in this submenu.



The description and settings of 2.2 port 2 are the same as the 2.1 port 1.

2.1.5 Output Port  
01001

**P.S.: The description of 2.2 Output 2 is the same with 2.1.**

### 3.2.2.2 UTC Time Configuration

UTC Time Configuration  
2012-01-29 15:45:03

UTC refers to Universal Time Coordinated. User can enter this menu to set the time as needed and it will then generate the DTD table and show in the user's STB.

### 3.2.3 Network Setting

User can press "ENTER" key to enter into below menus of the Network Setting and modify the parameters under its corresponding submenu in the same way explained above.

3.1 IP Address  
192.168.002.136

### 10/100M IP Setting

The 10/100Mbps Network port is for NMS controlling only. User can set the device's NMS networking parameters in the series of submenus.

3.2 Subnet Mask  
255.255.255.000

3.3 Gateway  
192.168.000.001



User can check the device's hardware version and software version at this submenu:

HW1.7

SW 01.05

# Chapter 4 Troubleshooting

## Preventive Measures

- Installing the device at the place in which environment temperature is 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 be greater than 10 seconds.

## Conditions need to unplug the 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