PRODUCT MODEL NUMBER: TL-9542A 4 HDMI TO 4 ATSC ENCODER MODULATOR

(MPEG-2 HD/MPEG-4 HD Encoding + ATSC Modulating)

ABOUT THIS MANUAL

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CHAPTER 1

INTRODUCTION

1.1 PRODUCT OVERVIEW

TL-9542A series products are TRANSLITE's new breakthrough all-in-one devices which integrate encoding (MPEG-2 HD, MPEG-4/AVC H.264) and modulating (DVB-C, DVB-T, ISDB-T, or ATSC) to convert V/A signals into RF output. It is equipped with 4 HDMI channels input and 1 ASI input and output with 2 ASI ports and 1 UDP IP port.

It adopts inner drawer-type structural design which greatly facilitates the change of encoding modules (HDMI/CVBS/SDI/YPbPr/…) as needed.

The signals source could be from satellite receivers, closed-circuit television cameras, Blue-ray players, and antenna etc. Its output signals are to be received by TVs, STB, etc. with corresponding standard.

With its various inputs available, our TL-9542A series products are wildly used in public places such as metro, market hall, theatre, hotels, resorts, etc. for advertising, monitoring, training and educating in companies, schools, campuses, hospital. It's a good choice to offer HD channels and more.

1.2 KEY FEATURES

- MPEG2 HD & MPEG4 AVC H.264 HD video encoding
- MPEG2 HD/MPEG4 HD video encoding
- Up to 1920*1080@50P/60P supported (MPEG4 HD)
- Up to 1920*1080@50I/60I supported (MPEG2 HD)
- 4* HDMI in, 1*ASI in
- Simultaneously encoding each channel more than 10Mbps

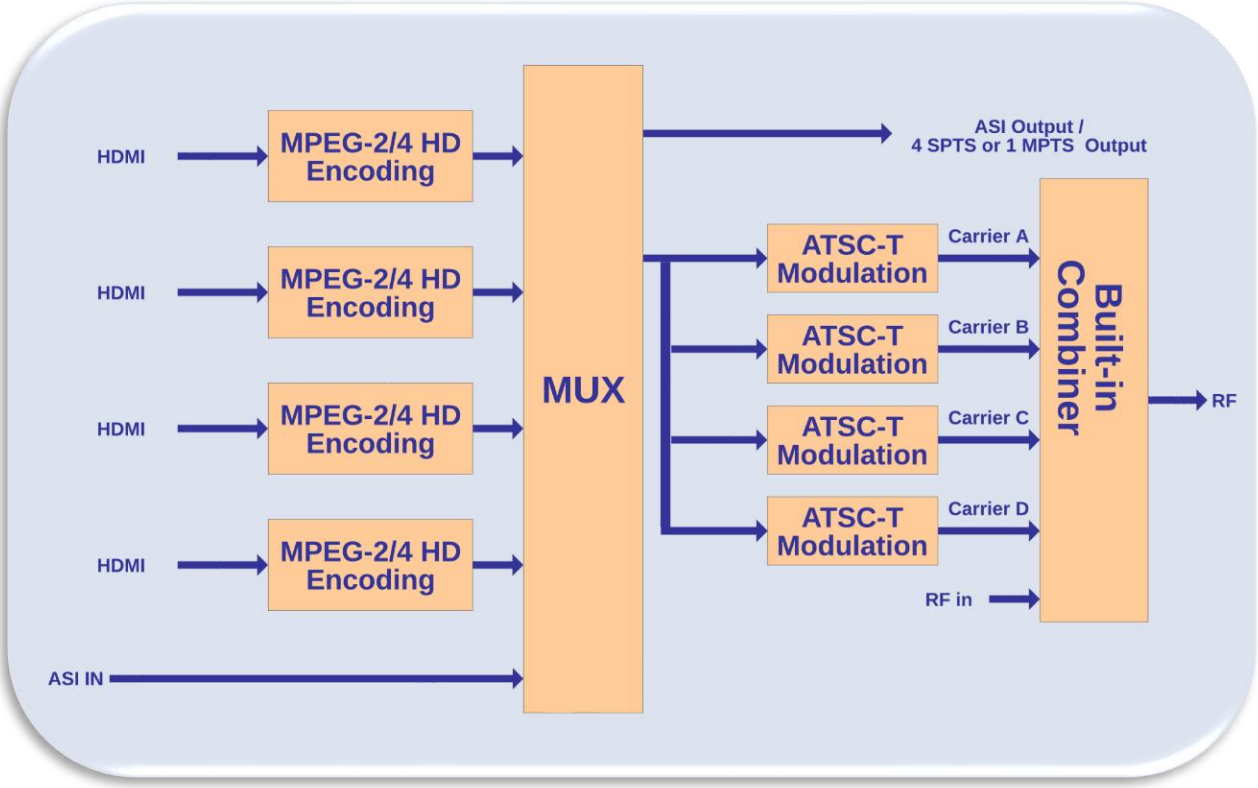
- 4* ATSC RF out (4 carriers combined output)
- Support IP (MPTS) output
- Excellent modulation quality MER≥42dB
- RF Frequency range 30Mhz~960Mhz
- LCD display, Remote control and firmware
- Web NMS management; Updates via web
- Lowest cost per channel --- breakthrough price

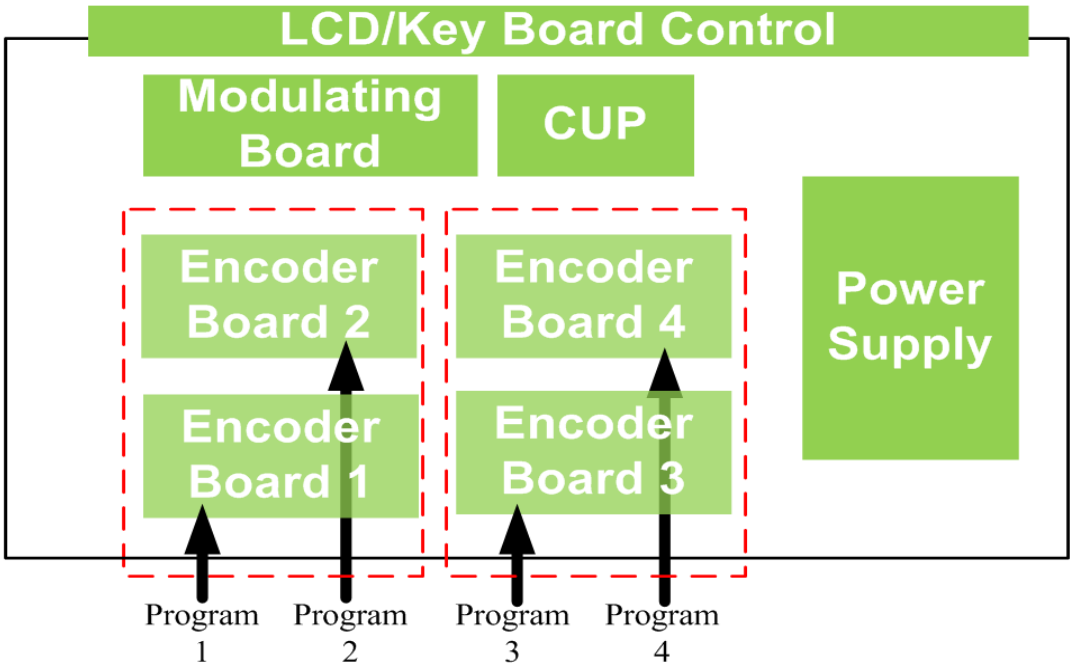
1.3 SPECIFICATIONS

Encoding Section - Video	
Encoding	MPEG2, MPEG4 AVC/H.264
Input	HDMI*4 (or SDI*4)
Resolution	1920*1080_60P, 1920*1080_50P, (-for MPEG4 AVC/H.264 only) 1920*1080_60i, 1920*1080_50i, 1280*720_60p, 1280*720_50P 720*480_60i, 720*576_50i
Low delay	Normal, mode 1 mode 2
Encoding Section - Audio	
Encoding	MPEG1 Layer II, MPEG2-AAC, MPEG4-AAC, AC3 2.0（Optional）
Sample rate	48KHz
Bit rate	64kbps, 96kbps,128kbps, 192kbps, 256kbps, 320kbps
Functions	PID re-mapping (auto/manually optional) PCR accurate adjusting PSI/SI table automatically generating

ATSC	
Standard	ATSC A/53
MER	≥42dB
RF frequency	4 carriers combined output; 30~960MHz, 1KHz step
RF output level	-26~-10dbm (81~97dbμV), 0.1db step
Constellation	8VSB
SYSTEM	
Local interface	LCD + control buttons
Remote management	Web NMS
output	ASI out (BNC type);
	1 IP (4*SPTS or 1 MPTS) out over DUP, RTP/RTSP (RJ45, 100M)
NMS interface	RJ45, 100M
Language	English
Local interface	LCD + control buttons
GENERAL	
Power supply	AC 100V~240V
Dimensions	420*400*44mm
Weight	4.5 kgs
Operation temperature	0~45℃

1.4 PRINCIPLE CHART





Typical Application of 4 * ATSC Carrier Outputs

Firstly, it is to guarantee the sound picture quality of HD programs.

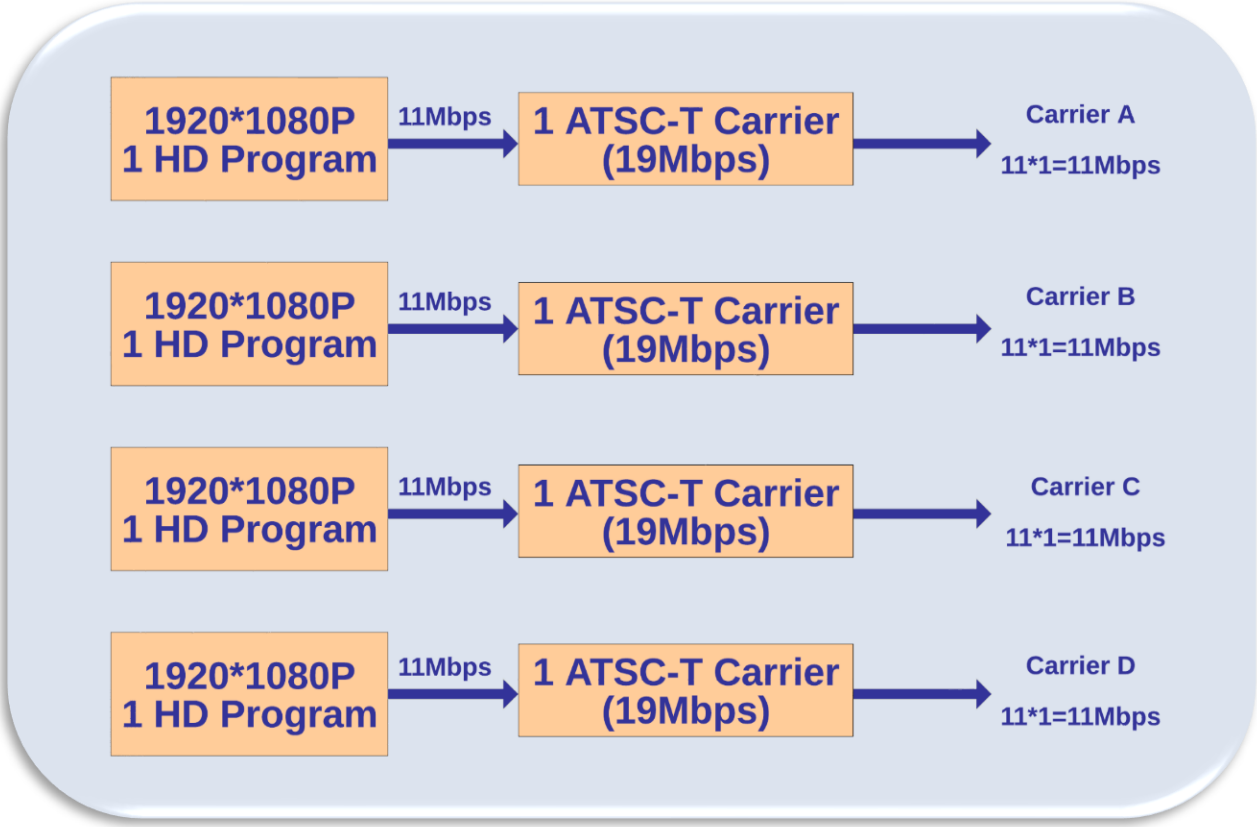
As we all know, to guarantee the picture quality of 1920x1080@50I/60I resolution HD program, the video bit-rate may reach up to 11Mbps and even above. However, the maximum possible bit-rate output for single ATSC-T carrier is only around 19 Mbps.

11Mbps x 4 = 44Mbps > 19 x 2 Mbps.

It means the single or even dual ATSC-T carriers simply can't carry the 4 channels 1080i HD program if the average bit-rate exceeds 8Mbps.

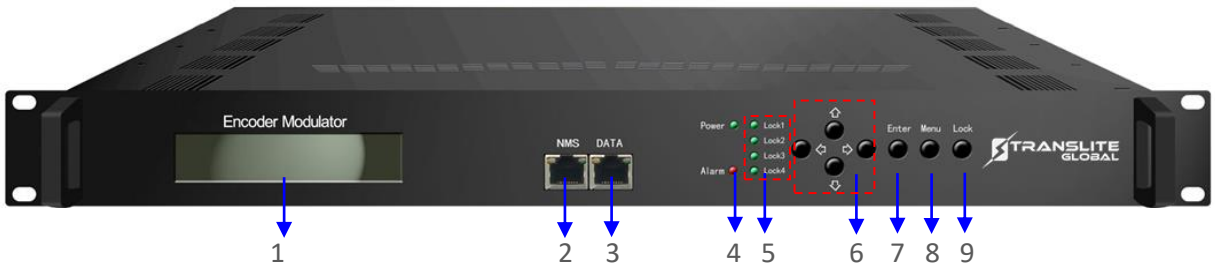
That's why we design 4*ATSC-T carrier modulation board which broaden the maximum possible bit-rate bandwidth up to 76Mbps (19*4), which rightly makes it reliably carry 4 channel HD programs output simultaneously.

Below brief chart will help to illustrate the working principle more clearly.



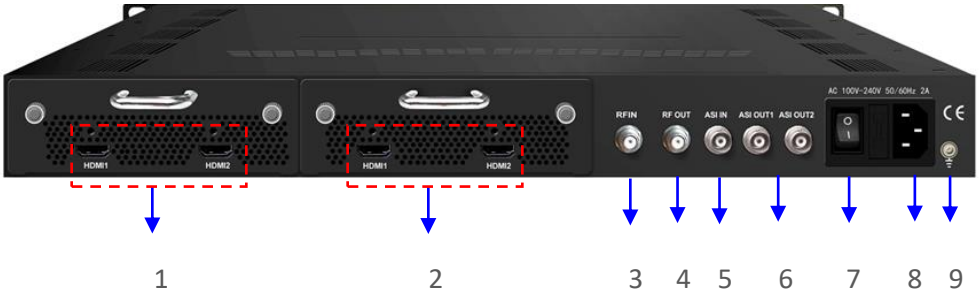
1.5 APPEARANCE AND DESCRIPTION

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 Mode: For Confirm
8	Menu Button: For Back Step
9	Lock Button: Press to Lock Set

Rear Panel Illustration



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

CHAPTER 2

INSTALLATION GUIDE

This section is to explain the cautions the users must know in some case that possibly 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.

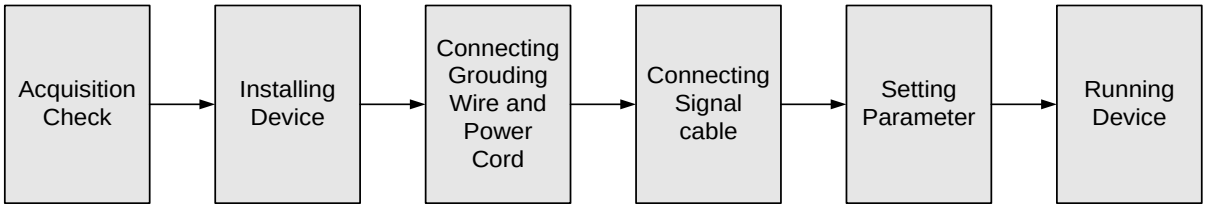
2.1 GENERAL PRECAUTIONS

- 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: 1X107~1X1010Ω , Grounding current limiting resistance: 1MΩ (Floor bearing should be greater than 450Kg/㎡)
Environment Temperature	5~40℃ (sustainable), 0~45℃ (short time) installing air-conditioning is recommended
Relative Humidity	20%~80% sustainable 10%~90% short time
Pressure	86~105KPa
Door & Window	Installing rubber strip for sealing door-gaps and dual level glasses for window
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 25mm^2.

CHAPTER 3

OPERATION

The front panel of TL-9542A 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.

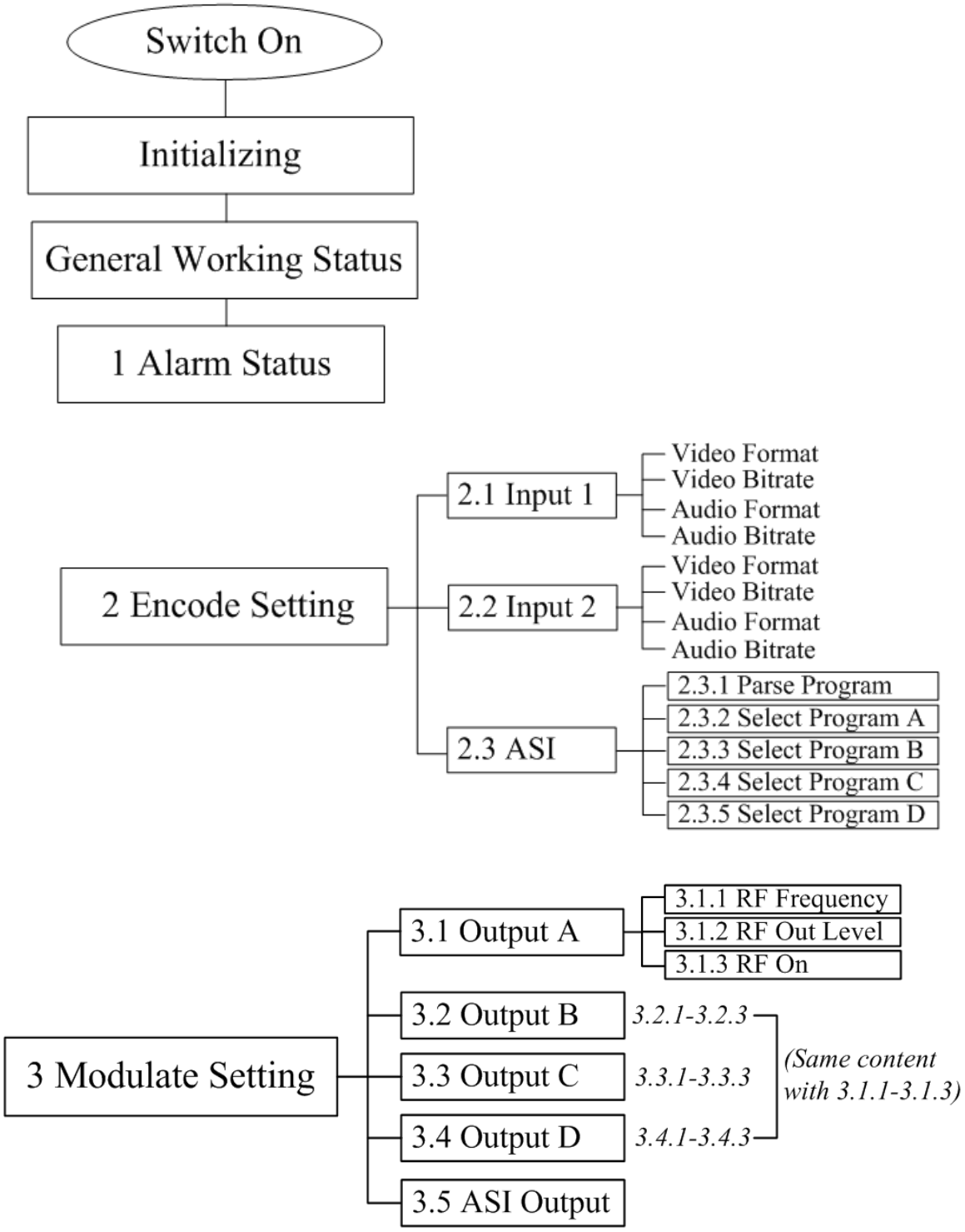
ENTER: Activate the parameters which need modifications or confirm the change after modification.

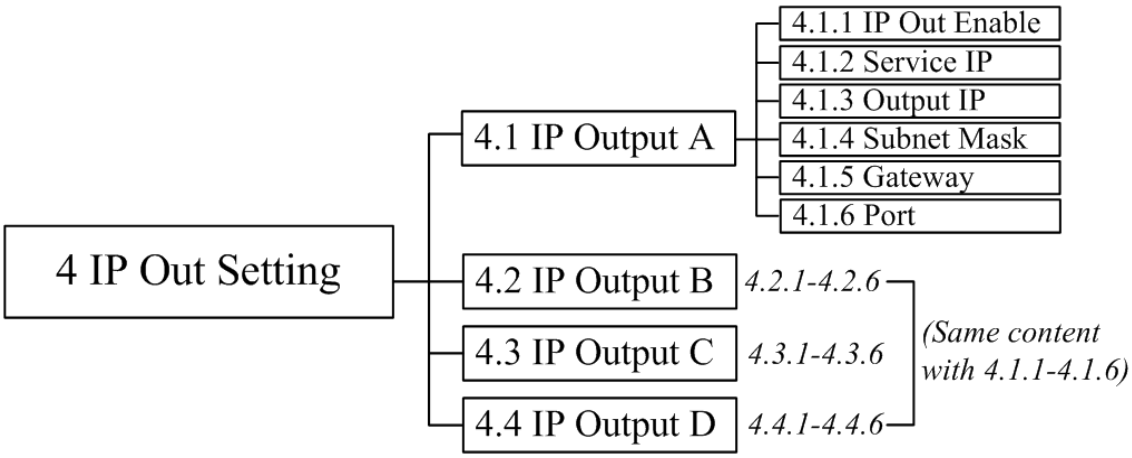
LEFT/RIGHT: Choose and set the parameters.

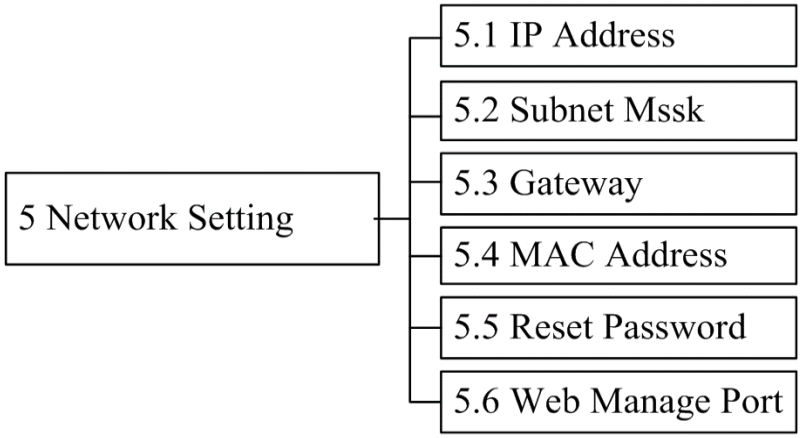
UP/DOWN: Modify activated parameter or paging up/down when parameter is inactivated.

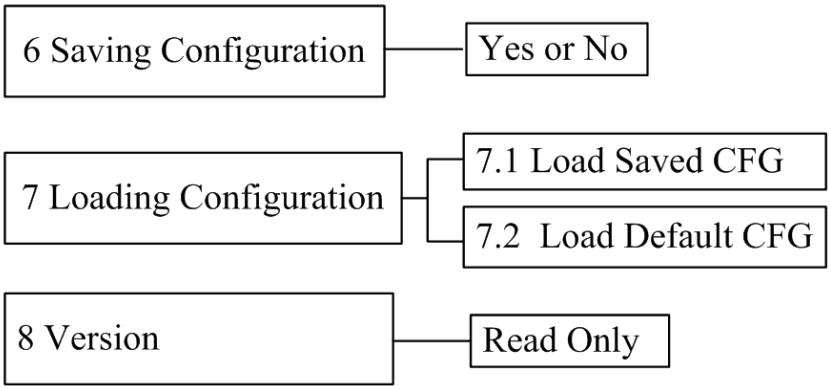
LOCK: Lock the screen/cancel the lock state. After pressing the lock key, the LCD will display the current configuring state.

3.1 LCD MENU STRUCTURE



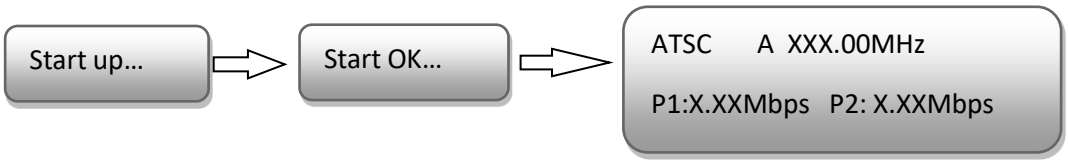






Initial Status

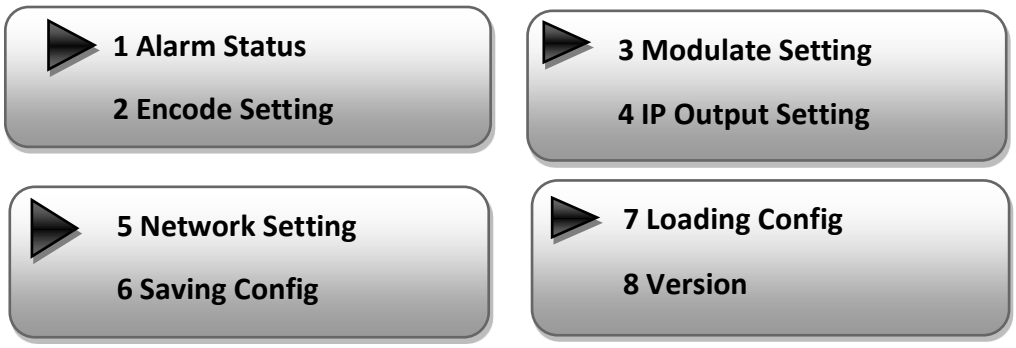
Switch on the device and after a few seconds' initialization, it presents start-up pictures as below:



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

3.2 GENERAL SETTINGS FOR MAIN MENU

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



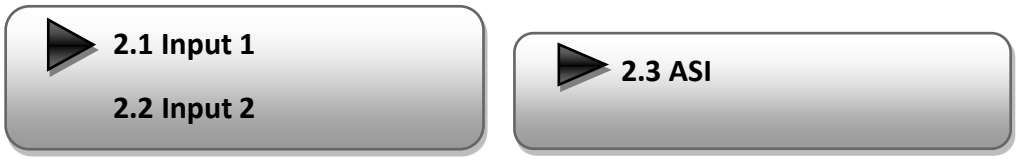
User can press UP/DOWN buttons to specify menu item, and then press ENTER to enter the submenus as below:

1) Alarm Status

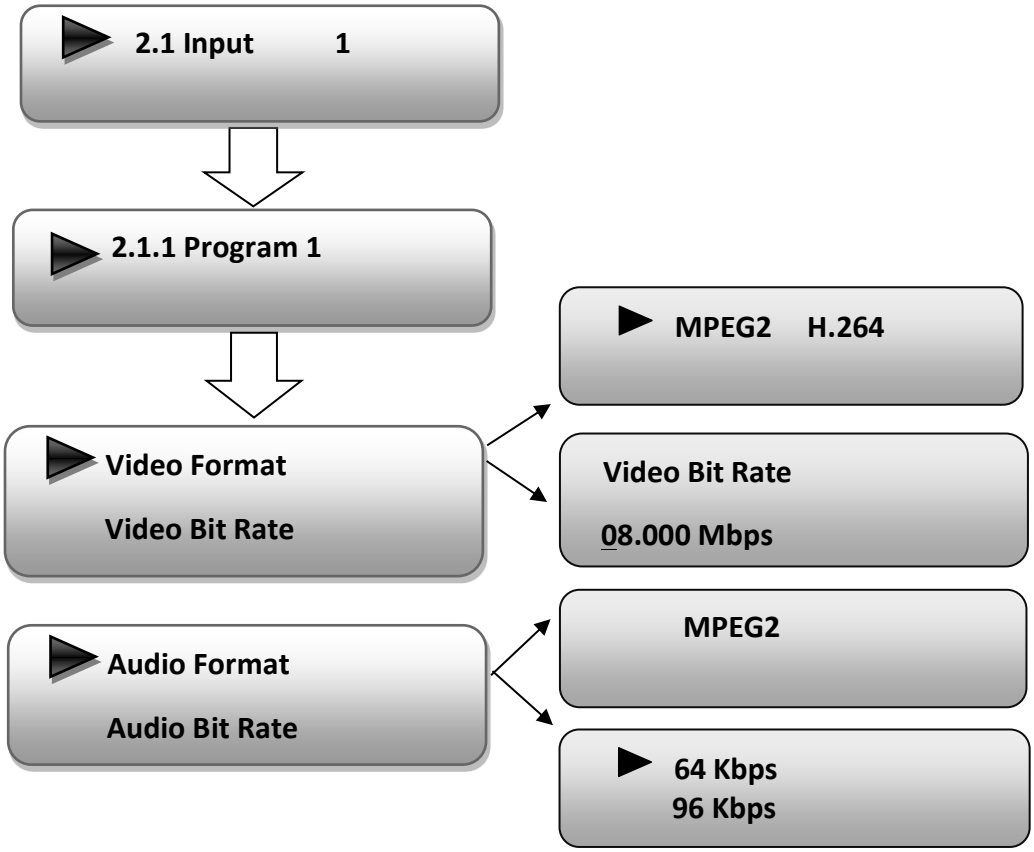
The alarm indicator will turn on if there is no A/V signals inputting or outputting bit rate overflows. User then can enter this menu to check the error type.

2) Encode Setting

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



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



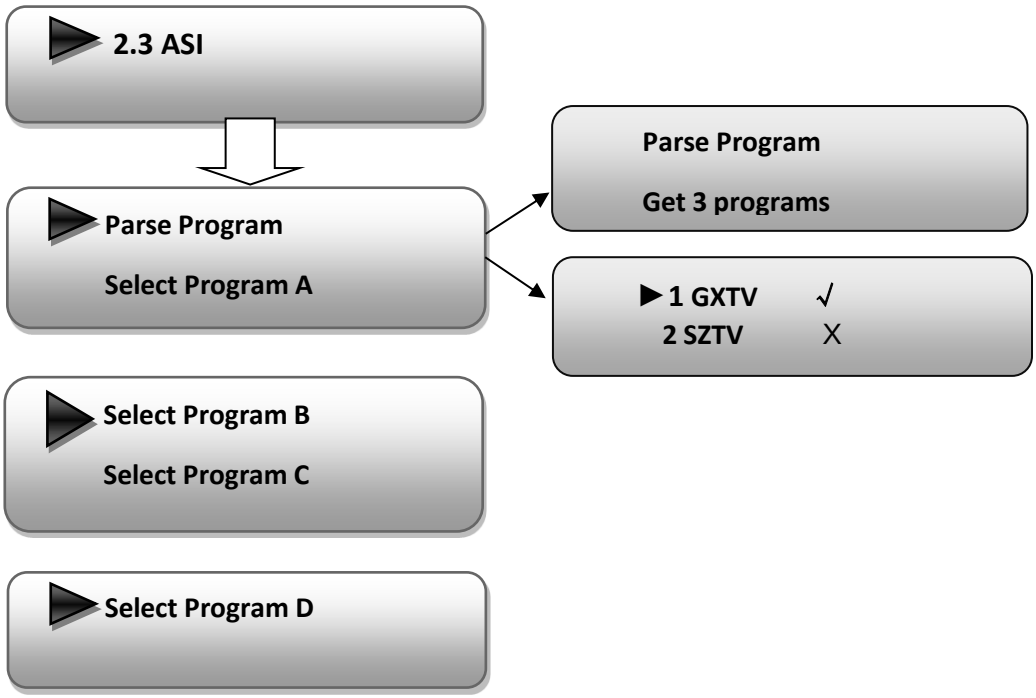
“Video Format”: the HDMI encoding module supports both MPEG2 and H.264 (MPEG-4 AVC/H.264) formats. Move the triangle mark with LEFT/RIGHT keys to specify the intended format and press ENTER to confirm.

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

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

"Audio Bit rate" is to select bit rate for the audio. Move the triangle mark to specify the target bit rate and press ENTER to confirm.

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



"Parse Program" is for checking the quantity of input programs from the ASI IN port.

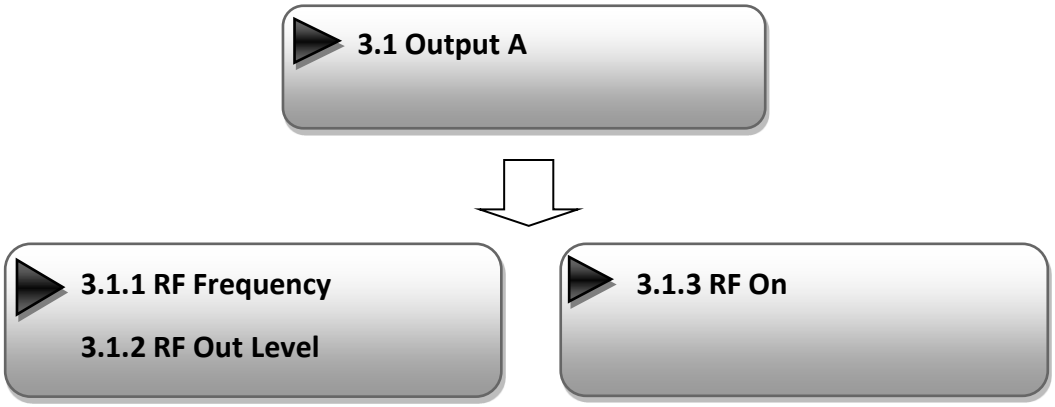
"Select Program A" is for selecting programs from the ASI IN to output through Carrier A. Move the triangle mark to specify the program and press RIGHT/LEFT keys to shift the mark between "√" and "X". ("√": to output the corresponding program; "X": not to output the corresponding program)

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

3) Modulator Setting

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

As the TL-9542A (ATSC Modulating) is with 4 carrier outputs, “3.1”-“3.4” represent the “Carrier A”, “Carrier B”, “Carrier C”, and “Carrier D” respectively. User can enter “3.1”/“3.2”/“3.4”/“3.4” to set the corresponding modulating parameters. Submenus (taking “3.1” as an example) are as below:



➢ RF Frequency

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

RF Frequency

750.000 MHz

➢ RF out level

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

RF Out Level

-10.0 dbm

➢ RF On

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

OFF: to disable programs to output through carrier A.

ON: to enable programs to output through carrier A.

RF On

▶ **Off** **On**

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

ASI Output:

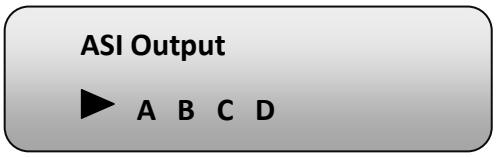
TL-9542A encoder & modulator (ATSC Modulating) is with quad-carrier output: Output A, B, C, and D.

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

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

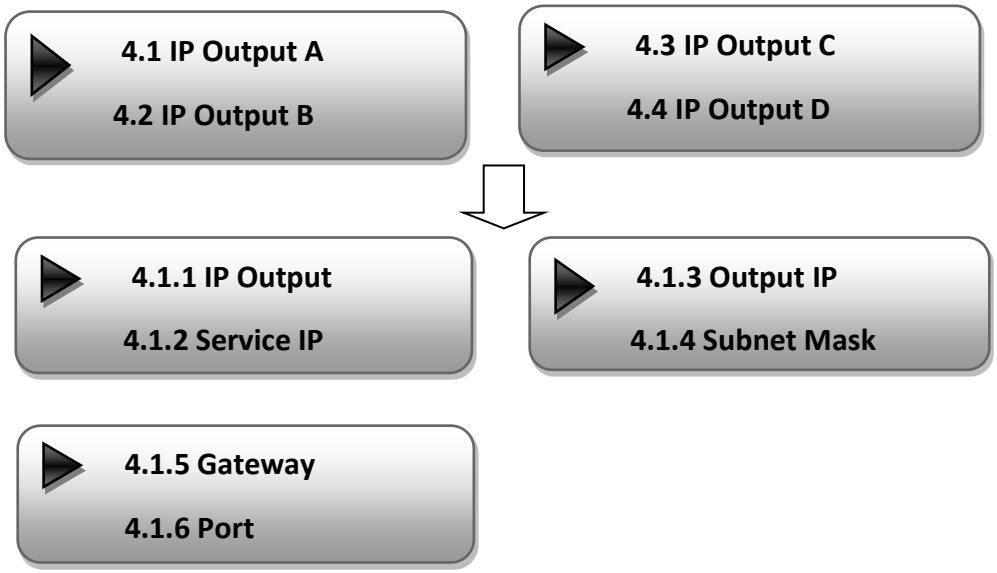
Output C: the ASI output programs are same as carrier output C.

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



4) IP Output Setting

TL-9542A encoder & modulator (ATSC Modulating) is with 4 MPTS IP output (Output A, B, C, and D), “4.1” to “4.4” are for the settings of the 4 MPTS IP outputs respectively. Submenus go as 4.1.1-4.1.6



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

IP Output OFF ▶ ON	Service IP 192.168.002.137
Output IP 224.002.002.002	Subnet mask 255.255.255.000
Gateway 192.168.002.000	Port 01234

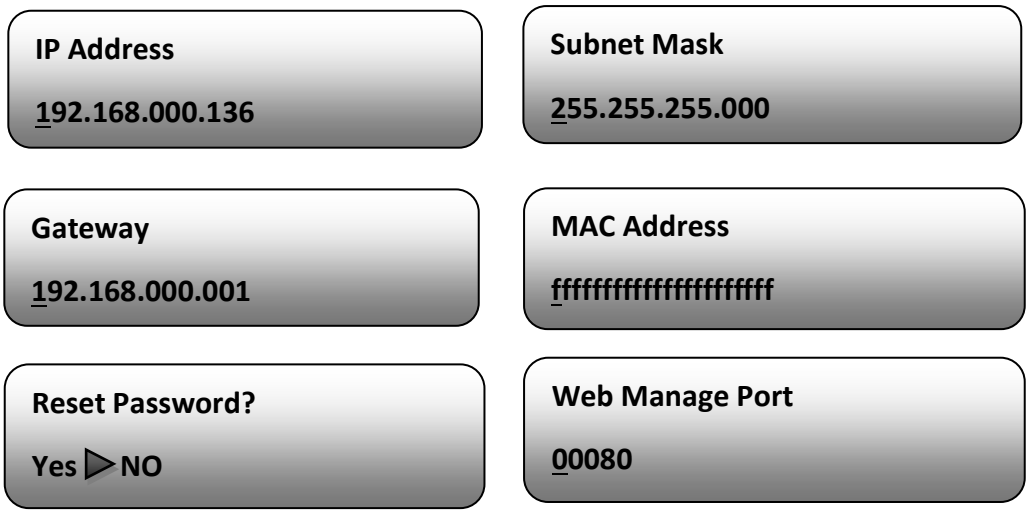
NOTE: The sub-menus under "4.2"- "4.4" are the same as "4.1" explained above.

5) Network setting

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

▶ **5.1 IP Address** **5.2 Subnet Mask**	▶ **5.3 Gateway** **5.4 MAC Address**
▶ **5.5 Reset Password** **5.6 Web Manage Port**	

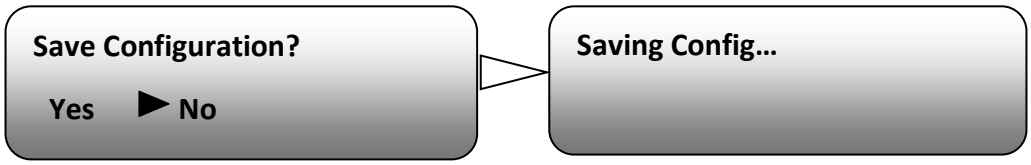
User can press "UP/DOWN" to choose this item and "ENTER" & "LEFT/RIGHT" to set the parameters.



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

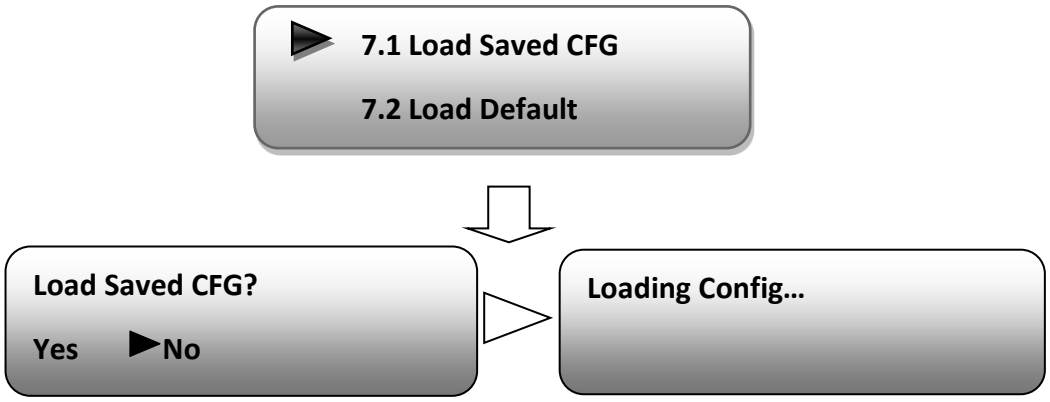
6) Saving Configuration

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



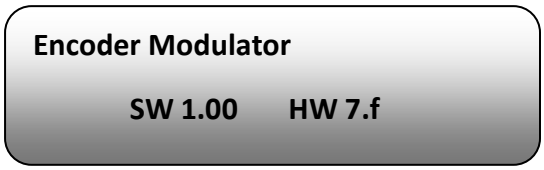
7) Loading Configuration

At this menu, user can press UP/DWON key to select and repress ENTER to confirm. User can restore the device into the last saved configuration by choosing “7.1” and restore the device into factory configuration by choosing “7.2” the display will show as below:



8) Version

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



CHAPTER 4

WEB NMS OPERATION

User not only can use front buttons 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 TL-9542B'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 & 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.

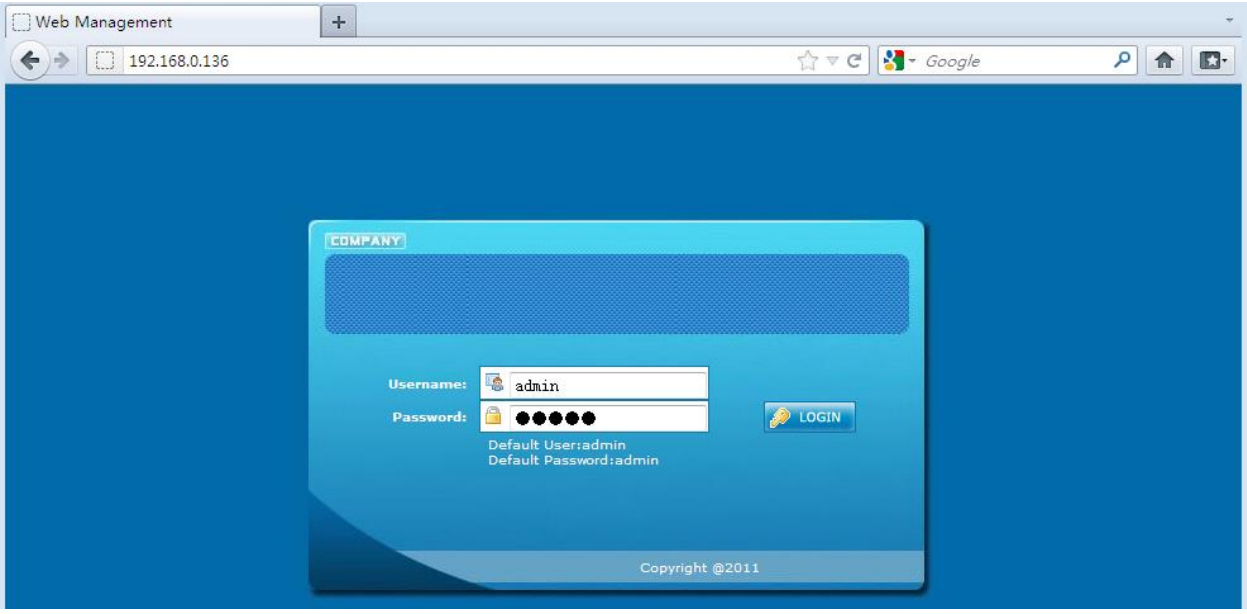


Figure-1

4.2 OPERATION

Welcome

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

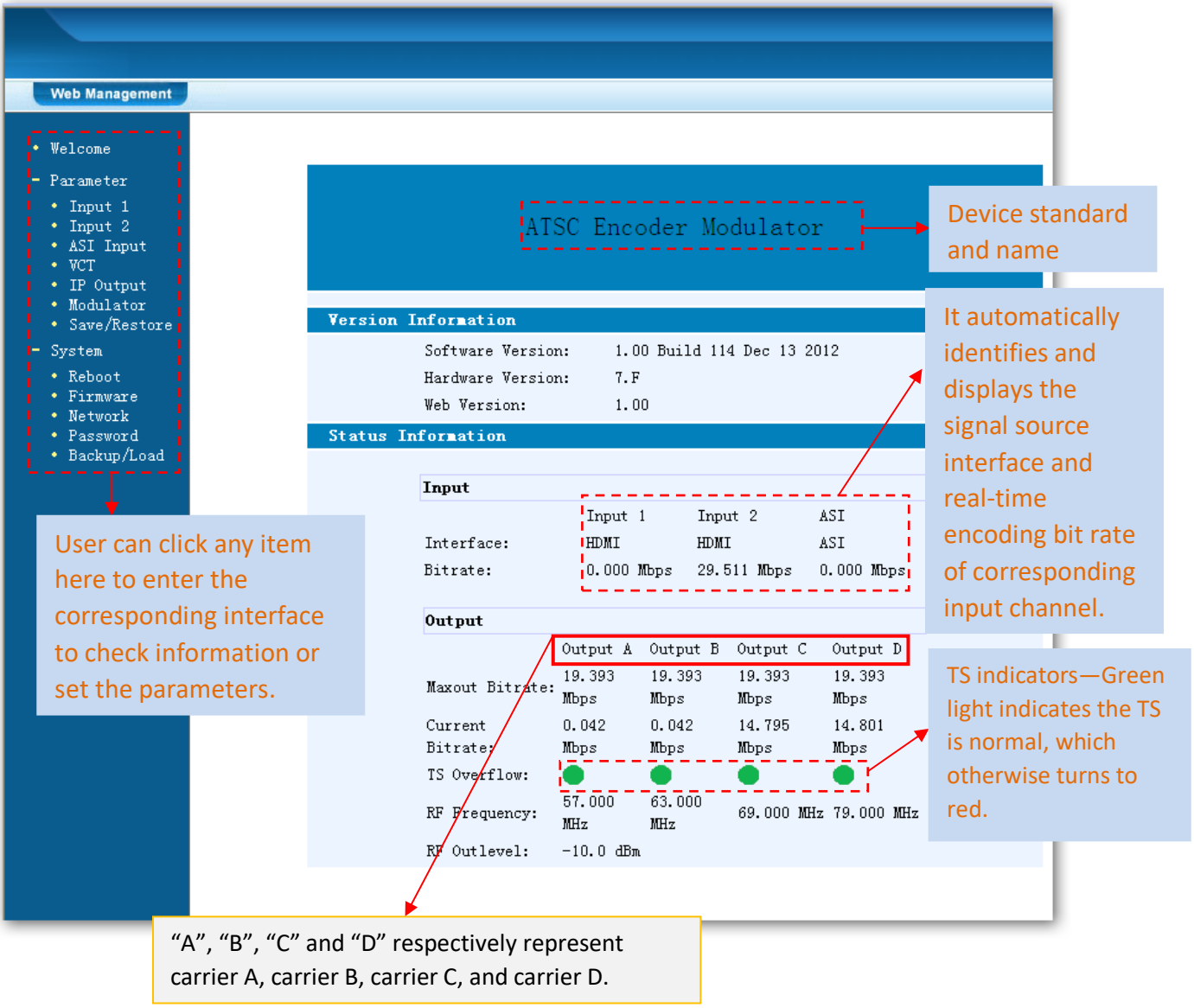


Figure-2

Input 1

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

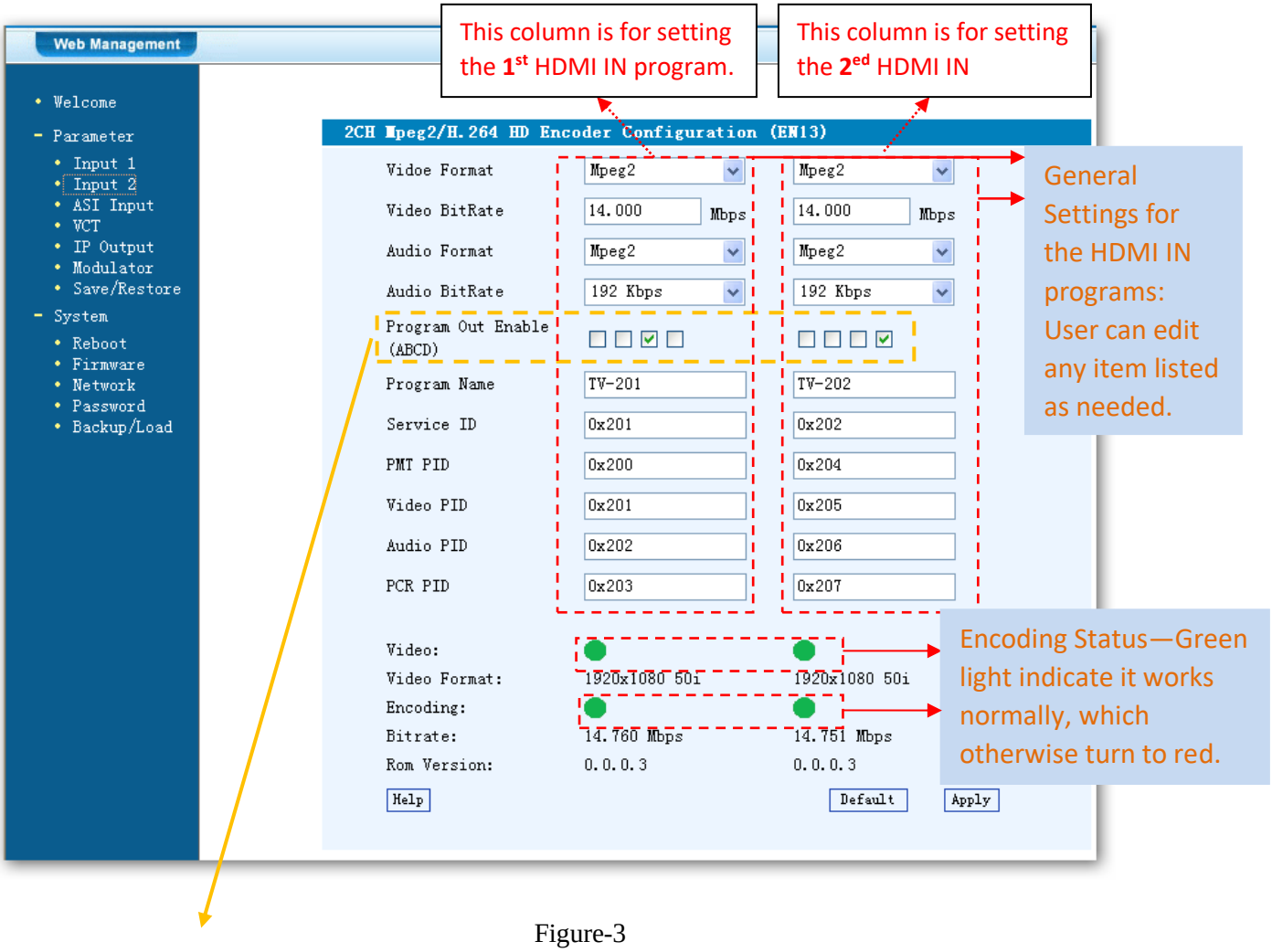
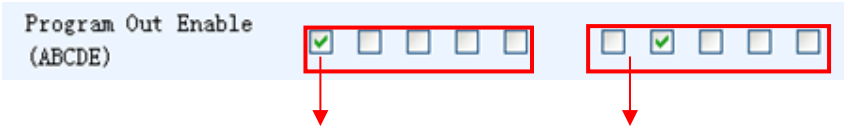


Figure-3

Enable or Disable the Carrier Output Function:



The 4 boxes respectively represent IP Channel A, B, C, and D. The related programs can output through the selected IP Channel(s). (It shows that the 1st program outputs through IP Channel C and the 2ed through IP Channel D). One program can also output through more than one IP Channels. (e.g.: ☐ ☑ ☑ ☐)

Refer to “**1.3 Schematic Overview**" for the relationship between the input interfaces and encoder boards.

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

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

Apply Click this button to apply the modified parameters.

Input 2

Similarly, from the menu on left side of the webpage, clicking “Input 2”, it displays the information of the 2 programs from the 2nd HDMI encoding slot.

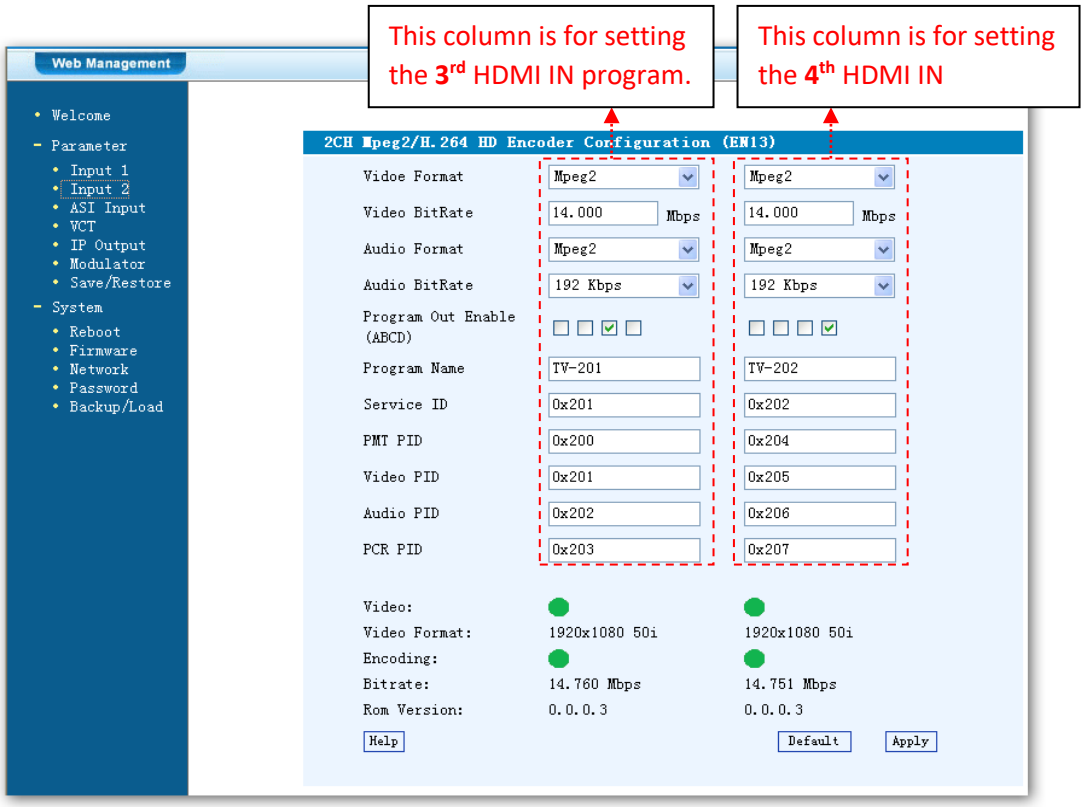


Figure-4

ASI Input

Click “ASI Input”, it will display ASI input program information as Figure-5.

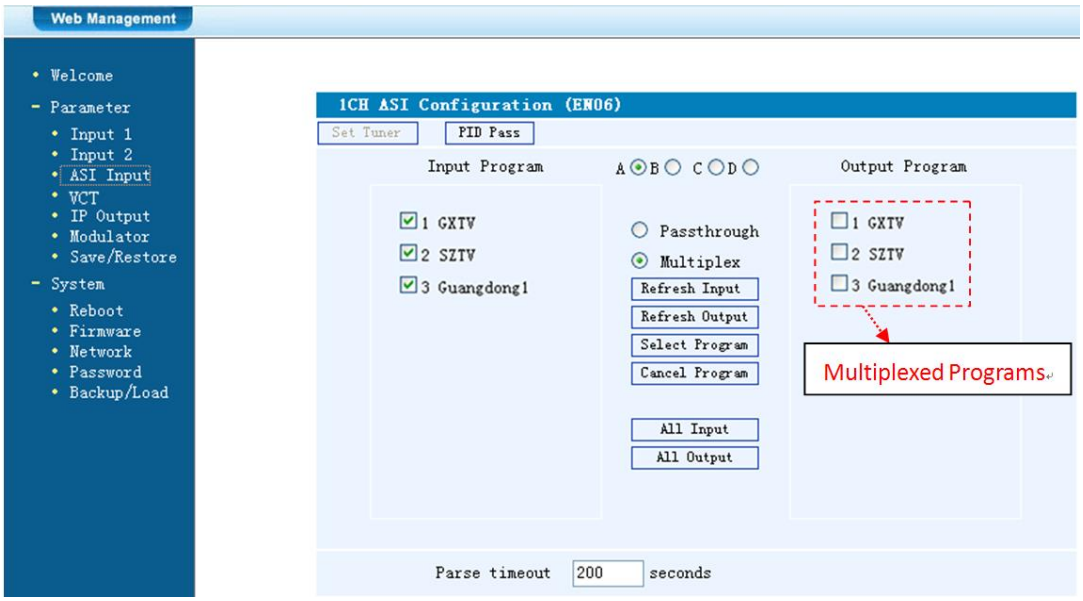


Figure-5

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

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

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

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

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

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

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

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

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

Parse timeout 200 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.

VCT (Virtual Channel Table) Setting

Click "VIT" from the menu to trigger the screen as Figure-6. Then click "Add" from this screen to add the program descriptor in VCT.

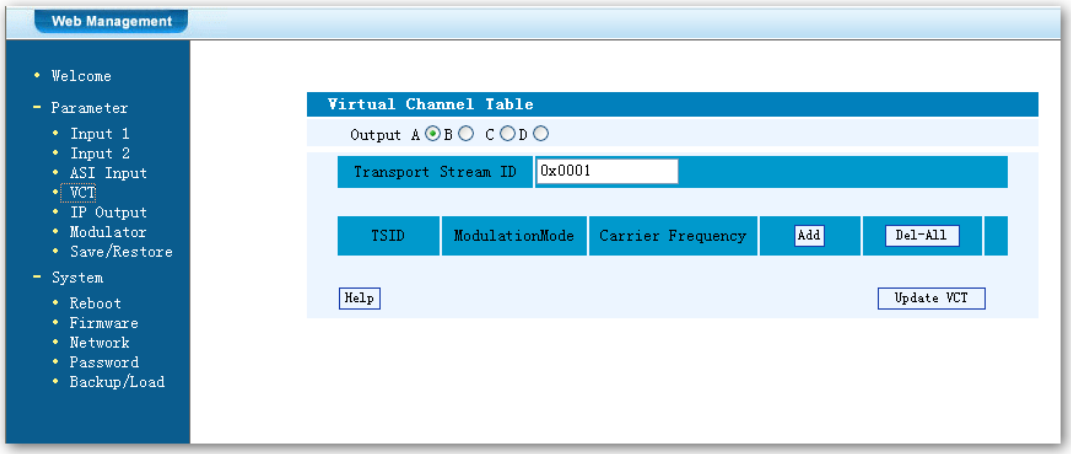
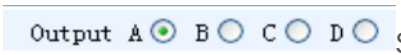


Figure-6



Select the carrier output channel for the inserted VCT.

Click “Add” from this page, it will display the screen as Figure-7 where it requires to add Channel TSID and configure other parameters for the programs.

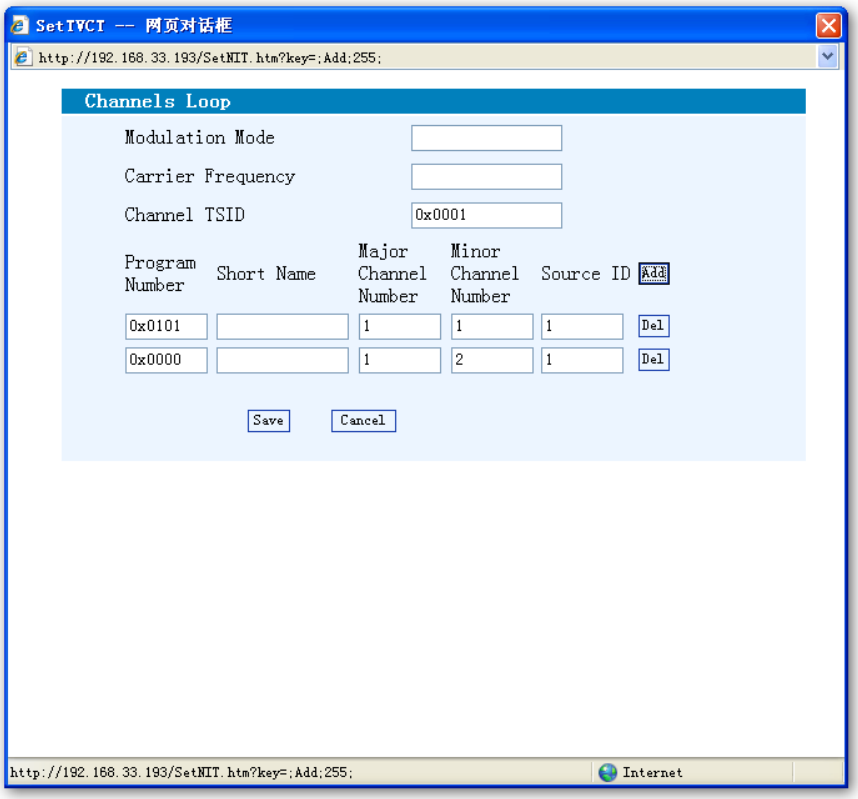
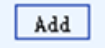


Figure-7



: Click “Add” to add boxes where to configure parameters in its respective fields. After setting all the data, users need to click “Save” 

to save the setting.

IP Output

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

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

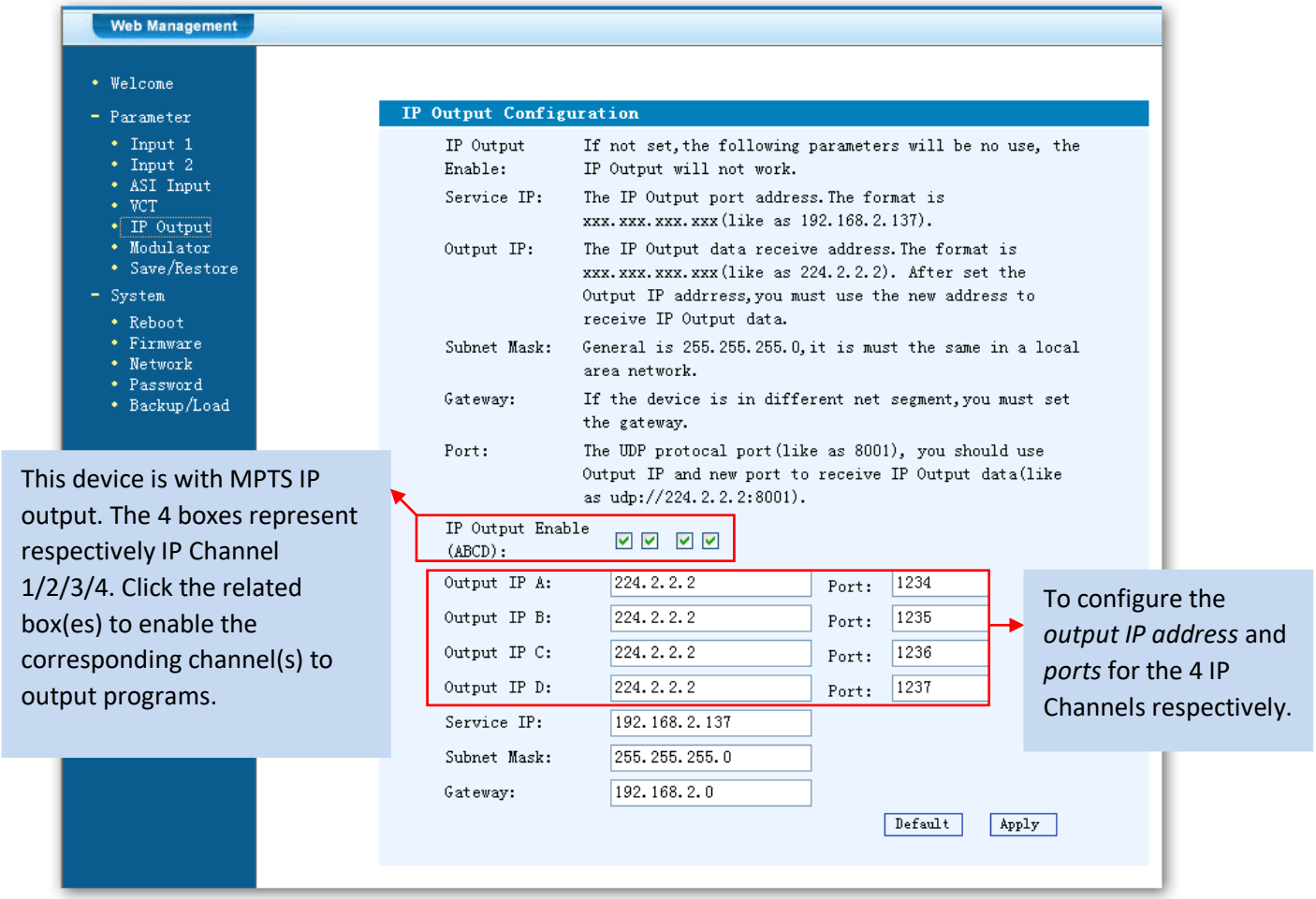


Figure-8

Modulator Setting

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

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

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

RF Out level –to set the RF output level

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

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

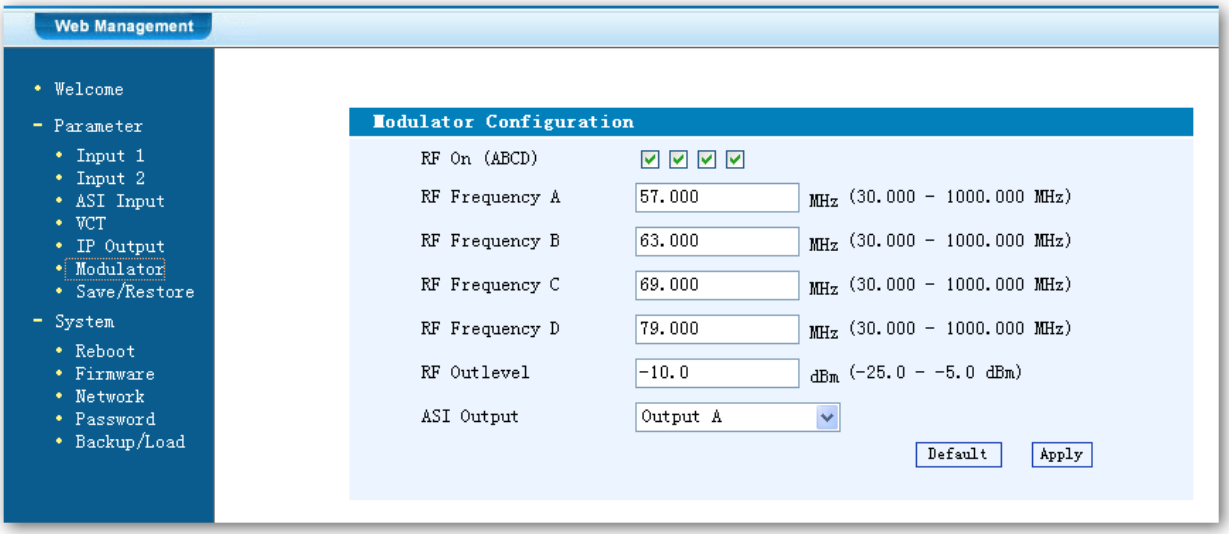


Figure-9

Save/Restore

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

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

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

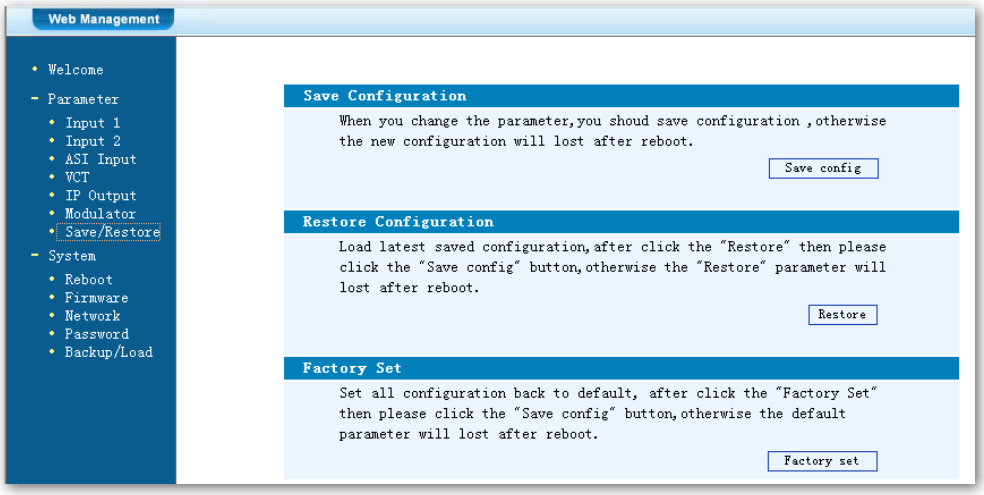


Figure-10

Restart the Device

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

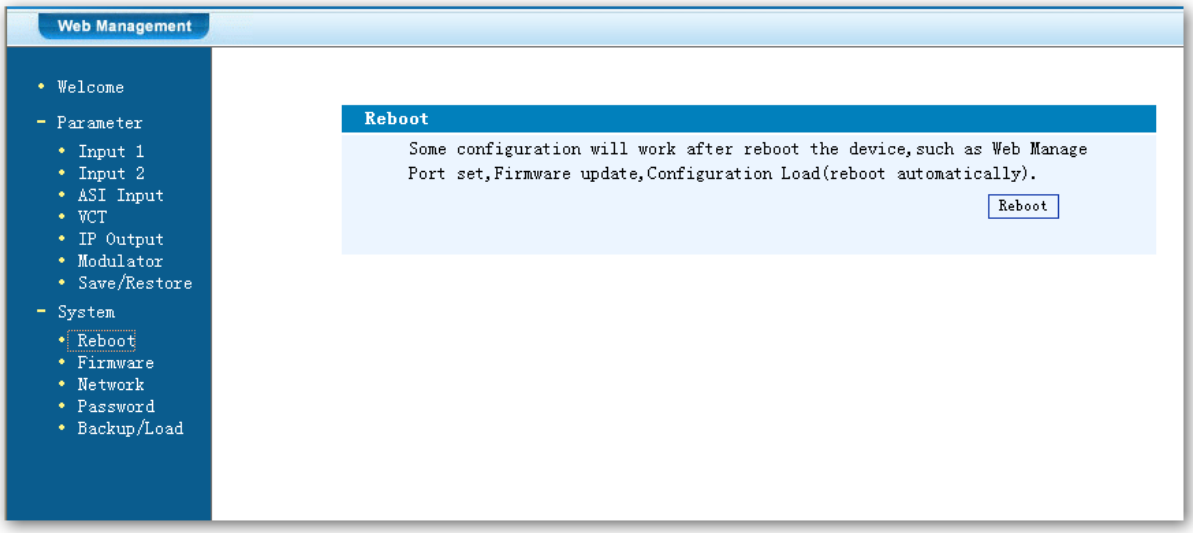


Figure-11

Update the Device

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

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

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

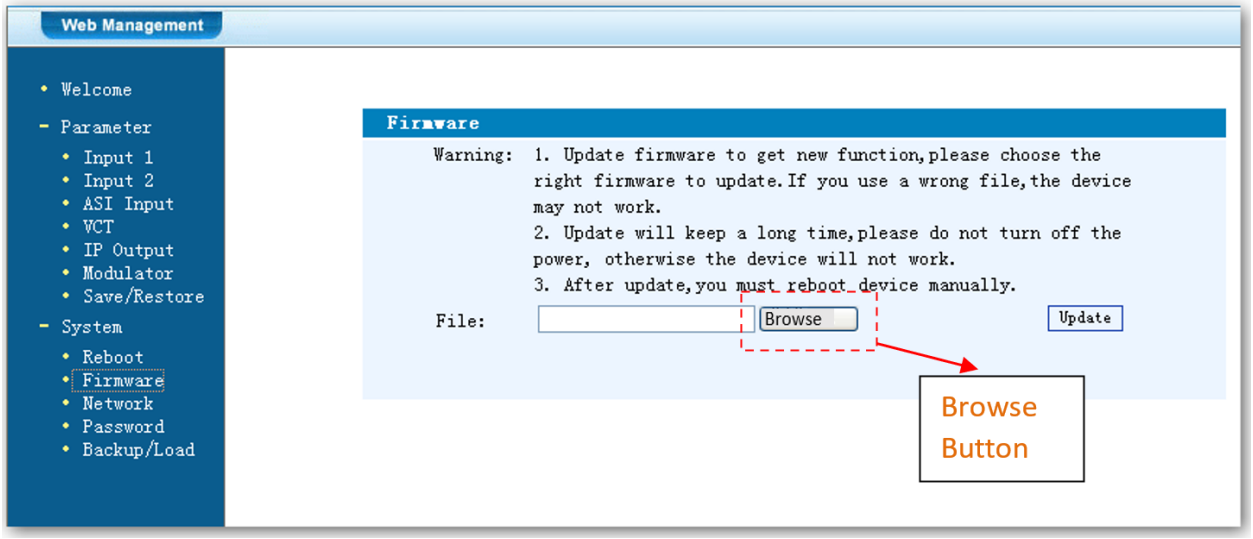


Figure-12

Network

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

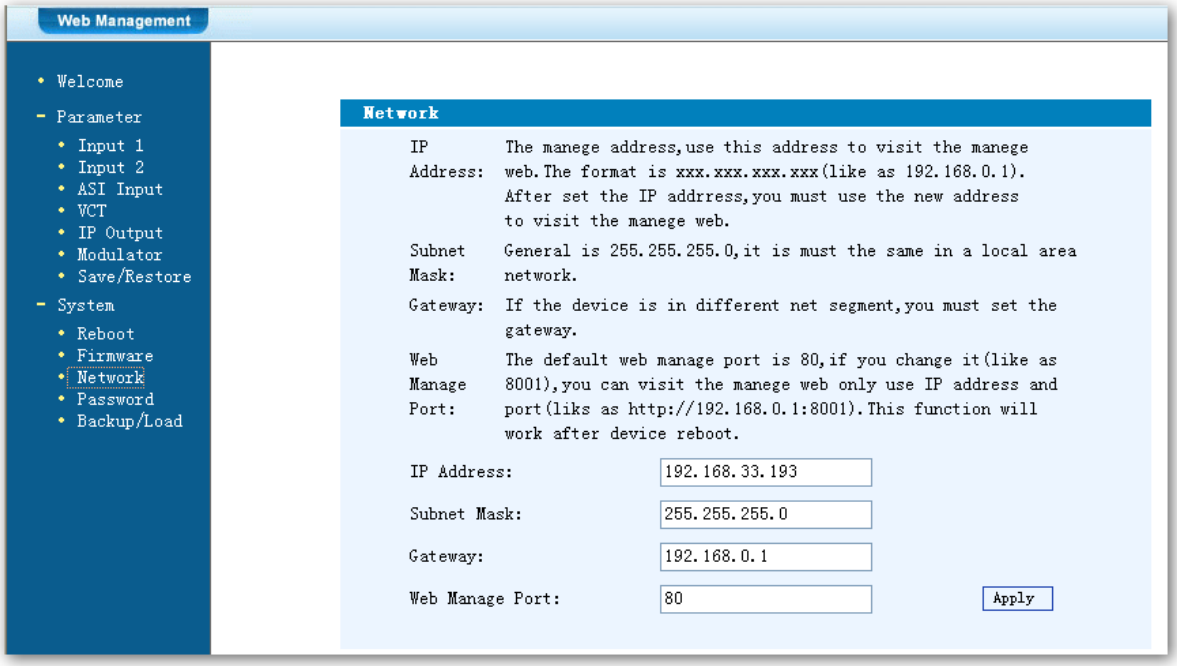


Figure-13

Password

When user clicks “Password”, it will display the password screen as Figure-14. Here user can change the Username and Password for login to the device.

After putting the current and new Username and Password, click Apply” to save the configuration.

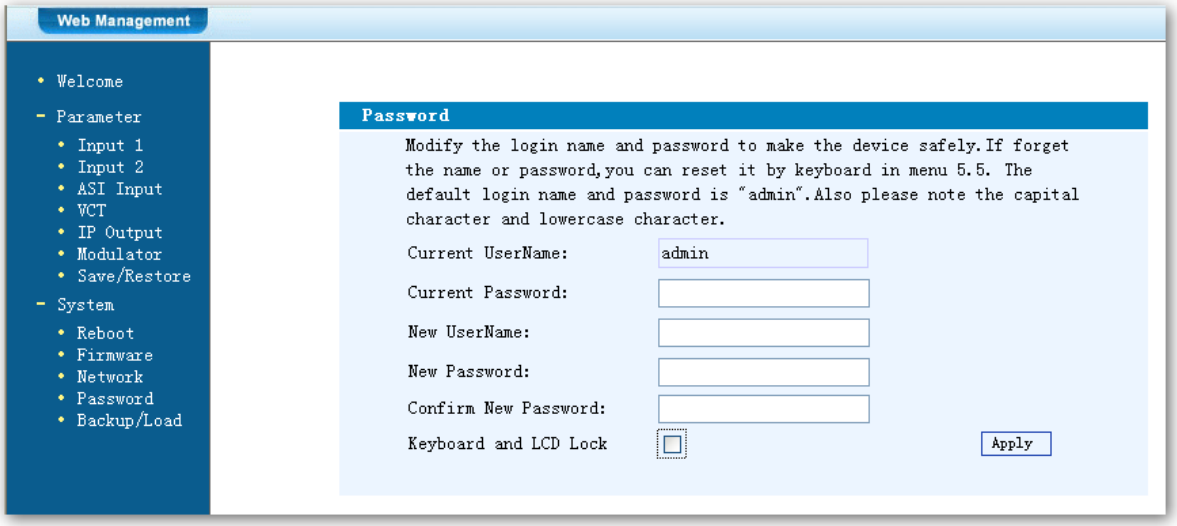
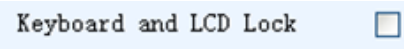
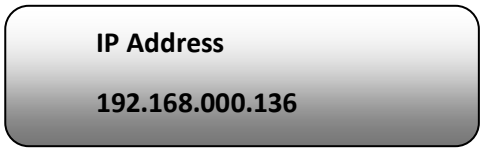


Figure-14



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



Backup/Load

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

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

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

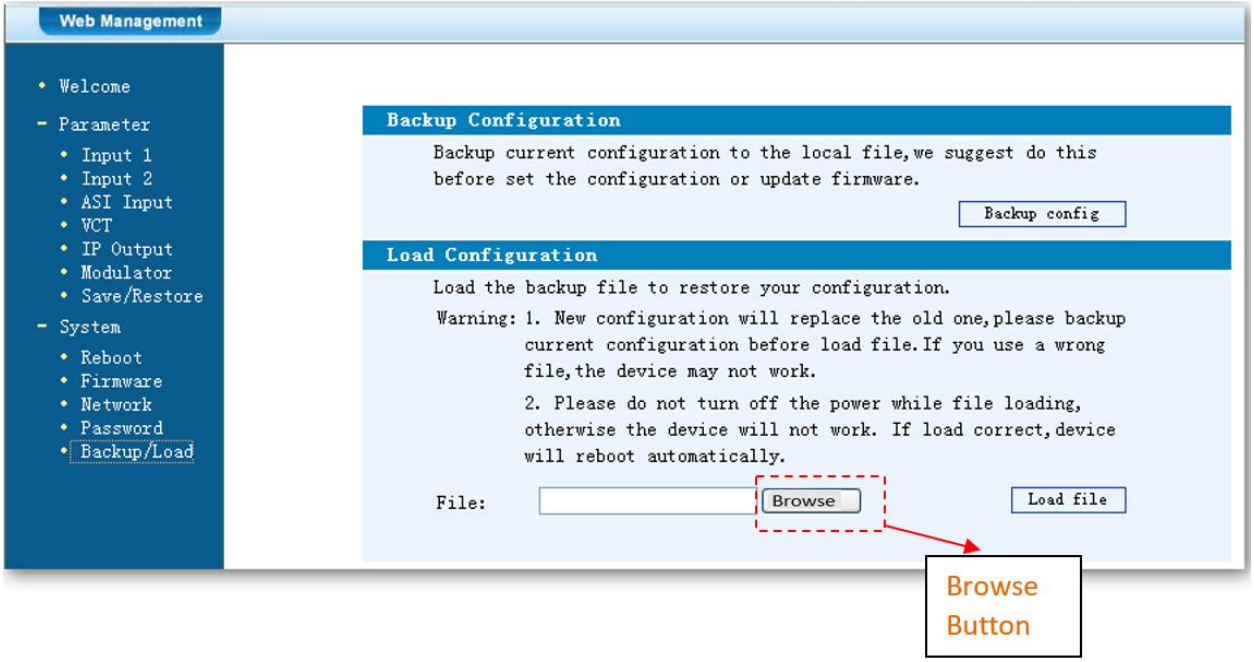


Figure-15

CHAPTER 5

TROUBLESHOOTING

All TRANSLITE products have been passed the testing and inspection before shipping out from factory. The testing and inspection scheme already covers all the Optical, Electronic and Mechanical criteria which have been published by TRANSLITE. 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 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 6

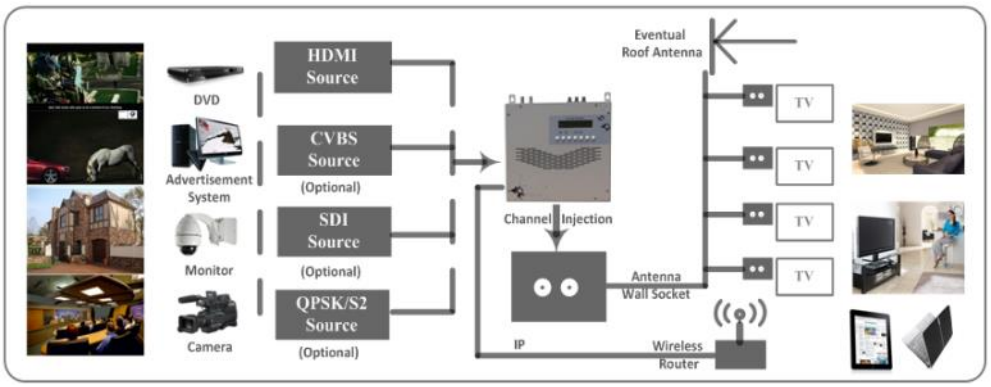
PACKING LIST

TL-9542A Encoder Modulator	1PC
User's Manual	1PC
HDMI Cables	4PCS
Power Cord	1PC

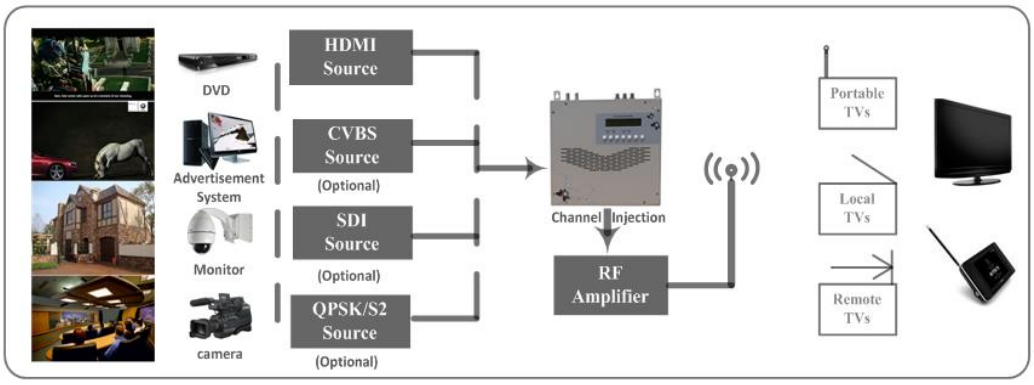
CHAPTER 7

APPLICATIONS

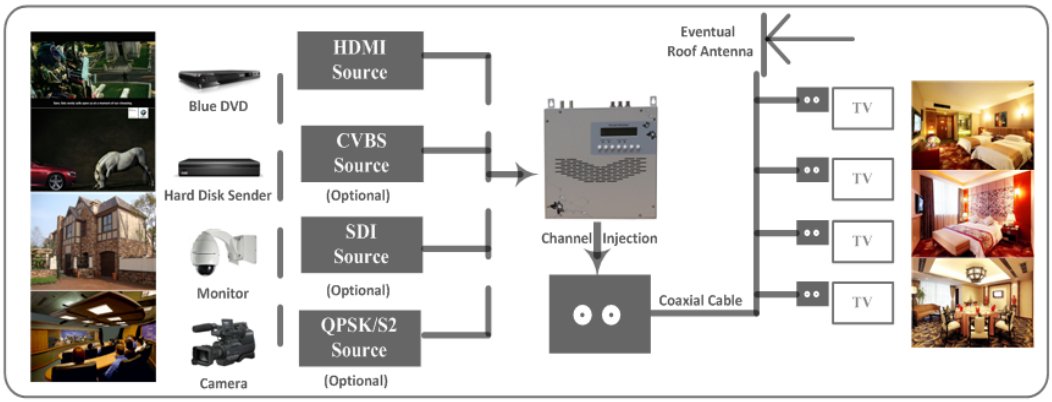
1) Residences and Private Homes Video content DVB-T/ISDB-T distribution



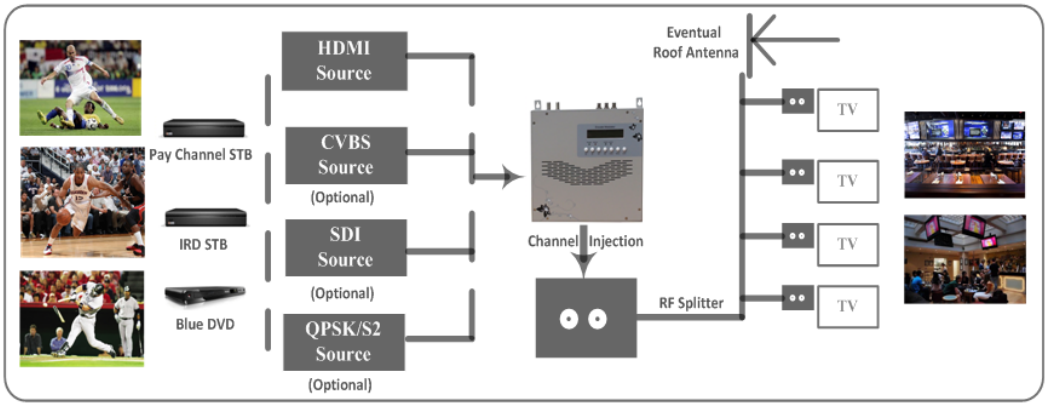
2) Outside Audio-Video contents ON-AIR DVB-T/ISDB-T distribution



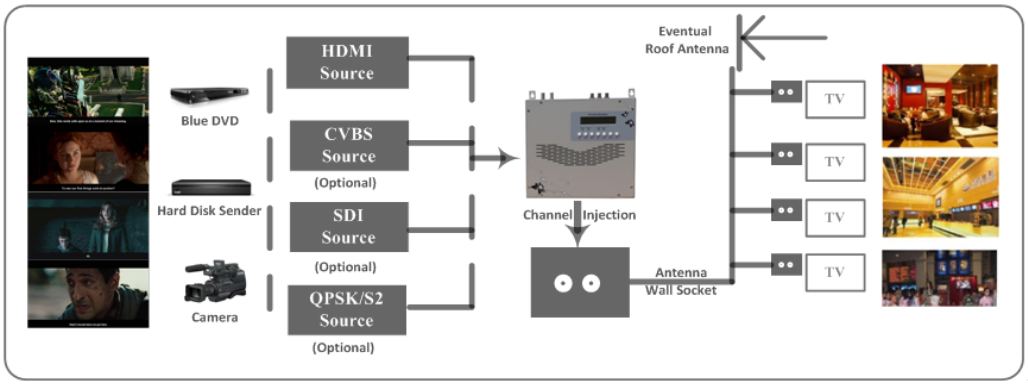
3) Hotel Audio-Video contents DVB-T/ISDB-T distribution



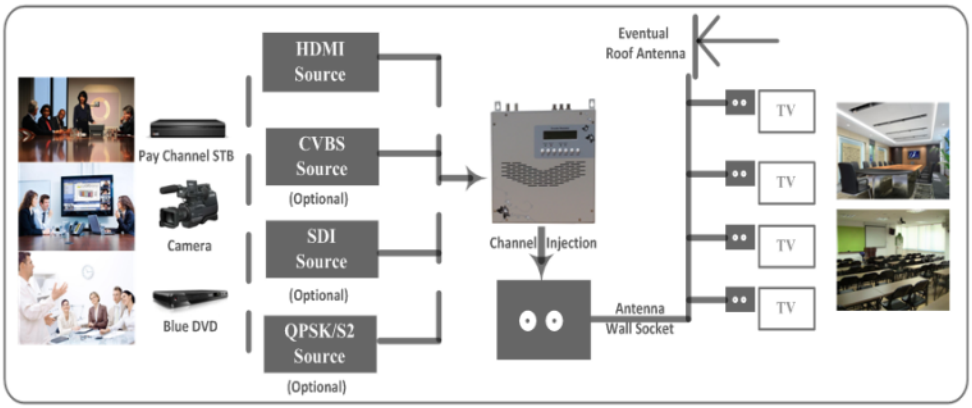
4) Bar Audio-Video contents distribution



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



6) Company Audio-Video contents distribution



Our encoder & modulator series are individual-module design, and the encoding modules include:

- ✓ MPEG2 SD encoding with 1 or 2 CVBS in
- ✓ H.264 SD encoding with 1CVBS in
- ✓ MPEG4 AVC /H.264 encoding with 1 or dual SDI in
- ✓ DVB-S2/-C/ISDB/ATSC tuner input
- ✓ YPbPr +HDMI +CVBS input
- ✓ MPEG2 SD YPbPr +S-Video +CVBS input
- ✓ MPEG4 AVC/H.264 encoding with 1 or 2 HDMI input
- ✓ MPEG2 HD encoding with 1 or 2 HDMI input
- ✓ MPEG2 HD encoding with 1 SDI input

Modulation modules include:

- ✓ ISDB-T RF (single/dual carriers) out module
- ✓ DVB-C RF (single/dual/quad carriers) out module
- ✓ ATSC RF (single/dual/quad carriers) out module
- ✓ DVB-T RF (single/dual carriers) out module

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