# HTT 101


## HDMI/YPbPr/S-Video/AV to DVB-T Encoder Modulator

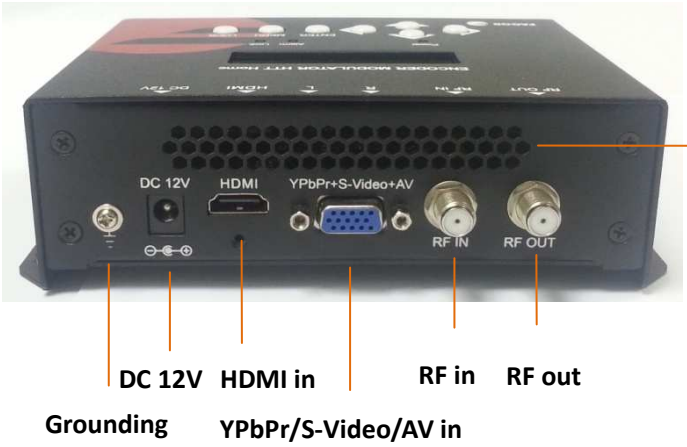
# TABLE OF CONTENTS

# 1. SPECIFICATIONS

## 1.1 Product Overview

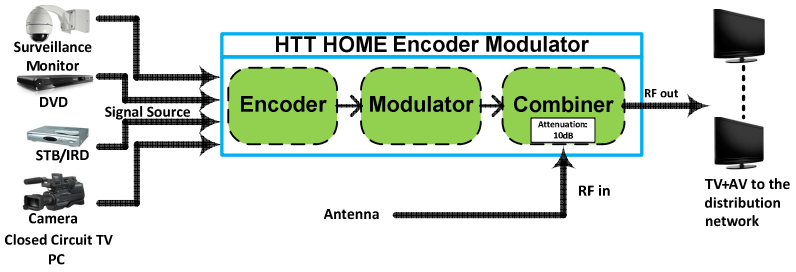
**HTT Home encoder & modulator** allows audio/video signal input in TV distributions with applications in home entertainment, surveillance control, hotel Digital Signage, shops etc.
It is an all-in-one device integrating MPEG4 AVC/H.264 encoding and DVB-T modulating to convert input signals to DVB-T RF out in the frequency range of 30~960MHz.
The signals source could be from satellite receivers, closed-circuit television cameras, Blue-ray players, and antenna etc. its output signal is to be received by DVB-T standard TVs or DVB-T STBs etc.

## 1.2 Appearance and Description




**Grounding**: to connect the earth cable
**DC 12V**: power input
**HDMI**: HDMI stream input supporting HD signals
**YPbPr/S-Video/AV:** YPbPr/S-Video/AV signal input through a VGA adapter cable
**RF in:** RF Loop-through input (10dB attenuation)
**RF out:** RF output to distribute modulated signal (30-960 MHz, 71~91 dBμV)

## 1.3 System Diagram




## 1.4 Characteristics

| Encoding Section | | | |
|---|---|---|---|
| HDMI | Video | Encoding | MPEG-4 AVC/H.264 |
| | | Interface | HDMI |
| | | Resolution | 1920*1080_60P,1920*1080_50P;<br>1920*1080_60i, 1920*1080_50i;<br>1280*720_60p, 1280*720_50P |
| | | Bit rate | 0.500~19.500 Mbps |
| | Audio | Encoding | MPEG1 Layer II, (MPEG2-AAC, MPEG4-AAC available) |
| | | Interface | HDMI |
| | | Sample rate | 48KHz |
| | | Bit rate | 64, 96,128, 192, 256, 320, 384kbps |

| | | | |
|---|---|---|---|
| YPbPr/ CVBS/ S-Video | Video | Encoding | MPEG-4 AVC/H.264 |
| | | Interface | CVBS *1, YPbPr*1, S-Video*1 |
| | | Resolution | **CVBS & S-Video:** 720x576_50i (PAL);<br>720x480_60i (NTSC)<br>**YPbPr:** 1920*1080_60i, 1920*1080_50i;<br>1280*720_60p, 1280*720_50P |
| | | Bit rate | 0.500~19.500 Mbps |
| | Audio | Encoding | MPEG1 Layer II, (MPEG2-AAC, MPEG4-AAC available ) |
| | | Interface | 1*Stereo /mono |
| | | Sample rate | 48KHz |
| | | Bit rate | 64, 96,128, 192, 256, 320, 384kbps |

| Modulator Section | |
|---|---|
| Standard | DVB-T COFDM |
| Bandwidth | 6M, 7M, 8M |
| Constellation | QPSK, 16QAM, 64QAM, |
| Code rate | 1/2, 2/3, 3/4, 5/6, 7/8. |
| Guard Interval | 1/32, 1/16, 1/8, 1/4. |
| Transmission Mode: | 2K, 8K |
| MER | ≥42dB |
| RF frequency | 30~960 MHz, 1KHz step |
| RF output level | -16~ -36 dBm (71~91 dBμV), 0.1db step |

| System |
|---|

| | |
|---|---|
| Management | Local control: LCD + control buttons |
| Language | English |
| LCN Insertion | yes |
| Upgrade | JTAG |
| **General** | |
| Power supply | DC 12V |
| Dimensions | 153*110*50mm |
| Weight | < 1kg |
| Operation temperature | 0~45℃ |

# 2. Installation Guide and Safety Instructions

## 2.1 Safety Instructions

**WARNING: To prevent fire or electrical shock, do not expose the device to rain or moisture**.

The encoder modulator is powered with a voltage of 12V DC. The power supply voltage must not exceed the recommended voltage, which otherwise may cause irreparable damage to the device and the invalidation of the warranty. Therefore:

- Do not replace power supply with a voltage greater than 12V DC.
- Do not connect the device to the power if the power cord is damaged.
- Do not plug the device into mains supply until all cables have been connected correctly.
- Do not cut the cord.

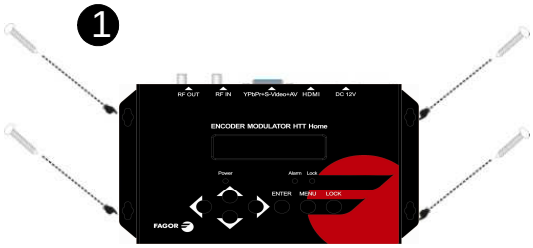
Avoid placing the device next to central heating components and in areas of high humidity.
Do not cover the device with elements that obstruct the ventilation slots.
If the encoder modulator has been kept in cold conditions for a long time, keep it in a warm room minimum 2 hours before plugging into the mains.
Mount the device in vertical position with the connectors located on the top side.
When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutes may result in fire, electric shock or other hazards.
Safety check- Upon completion of any service or repairs to this device, ask the service technician to perform safety checks to determine that the device is in proper condition.

## 2.2 Installation

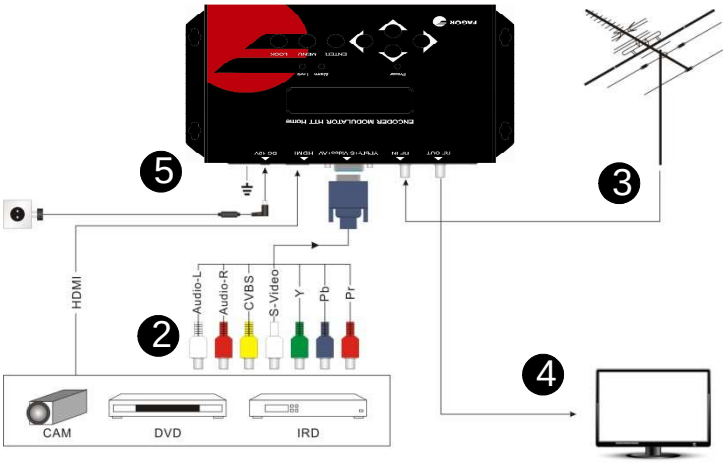
**RISK OF damage to the unit**

Mechanically handling the unit may result in damage. Do not connect the unit to the power supply before or during assembly. Connect the unit as below instructed.

1. Mount and tighten the screws and plugs to secure the unit to the wall. Left 10 cm of free space around from each unit.




2. Connect the signal input in the respective connectors. The signal source can be from a surveillance monitor, DVD, set-top box, CCTV and etc.
3. Optionally, connect the loop-through RF input coaxial cable.
4. Connect cable to RF output to STB/TV.

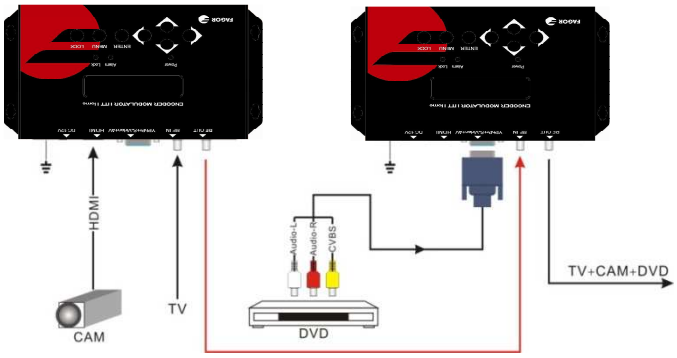



5. Power supply connection: a) Connect the earth cable; b) Connect the power plug to the unit mains connector; c) Connect the power plug to the mains socket.

## Cascade Installation

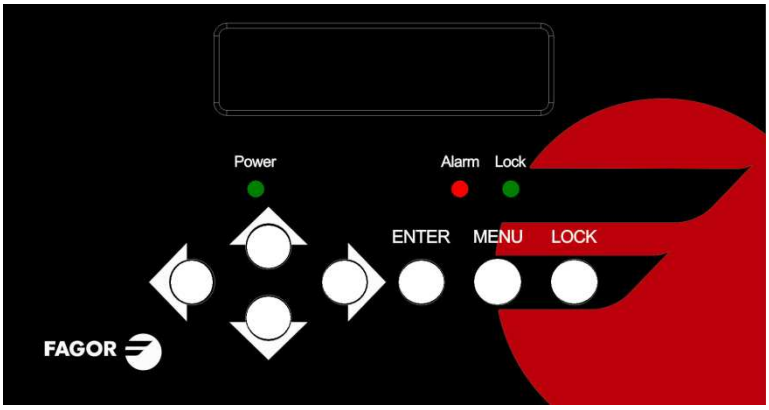
HTT Home unit has 1 TV signal to RF output encoded as DVB-T Digital TV signal.

Several HTT Home units can be cascaded in order to increase the capacity. To cascade 2 or more units, connect the RF output of the preceding unit to the TV input (loop-through) of the next unit (see right illustration).



# 3. Operation

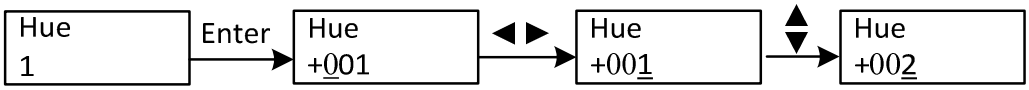
HTT HOME is controlled and managed through the key board and LCD display.



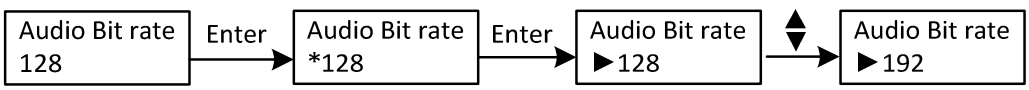

**LCD Display –** It presents the selected menu and the parameter settings. The backlight in the display is on when the power is applied.
**LED –** These lights indicate the working status

- Power: It lights on when the power supply is connected.
- Alarm: It lights on when there is error, such as the signal source loss.
- Lock: It lights on when the signal source connected and goes off when the signal lose.

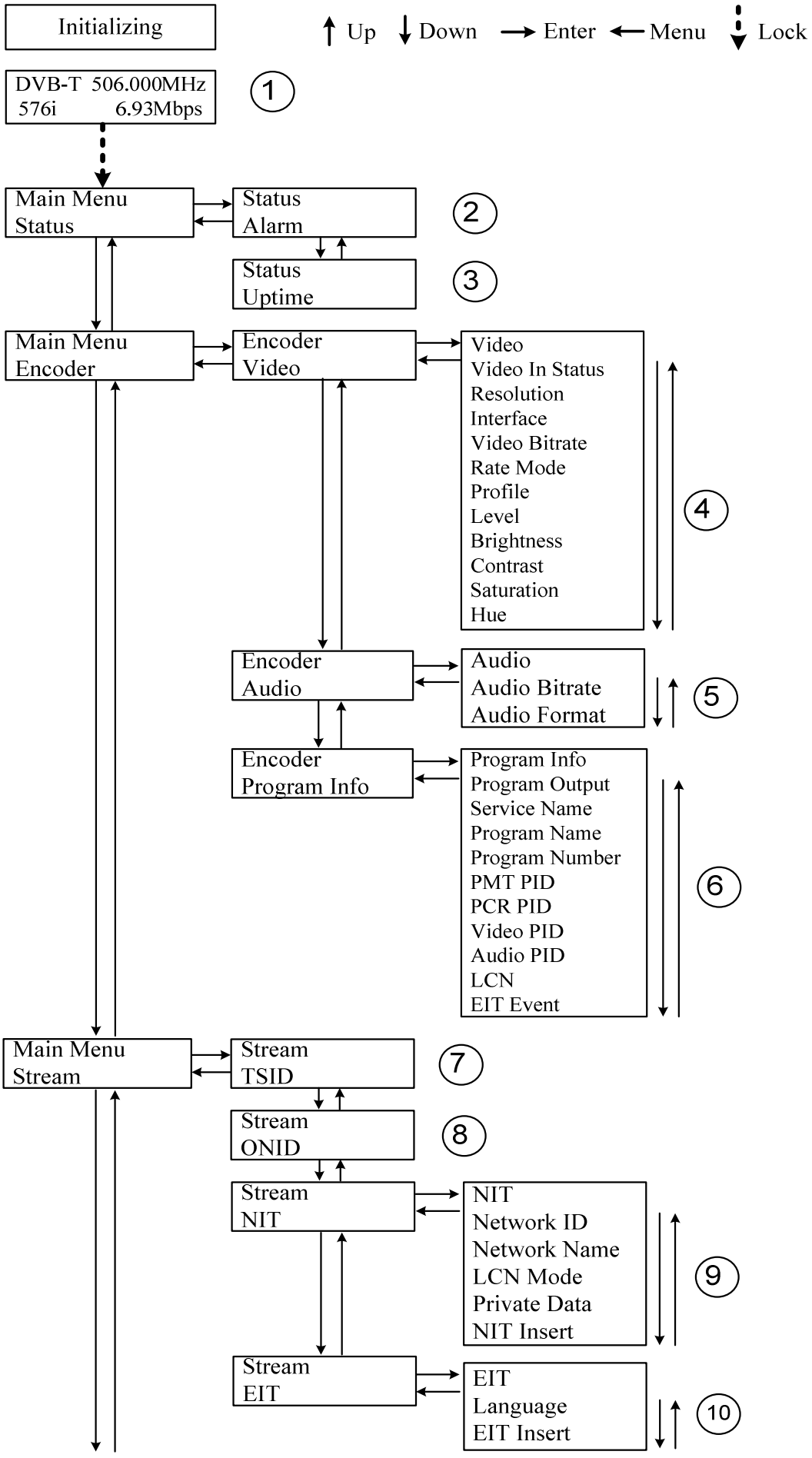
**Left/Right/Up/Down buttons –** Use these buttons to turn the screen pages, shift the target items by moving the triangle, or change the parameter settings in the program mode.
**Enter –** Use this button to enter a submenu or save a new setting after adjustment; press it to start adjusting the value of certain items when the corresponding underline flash with Up and Down buttons;

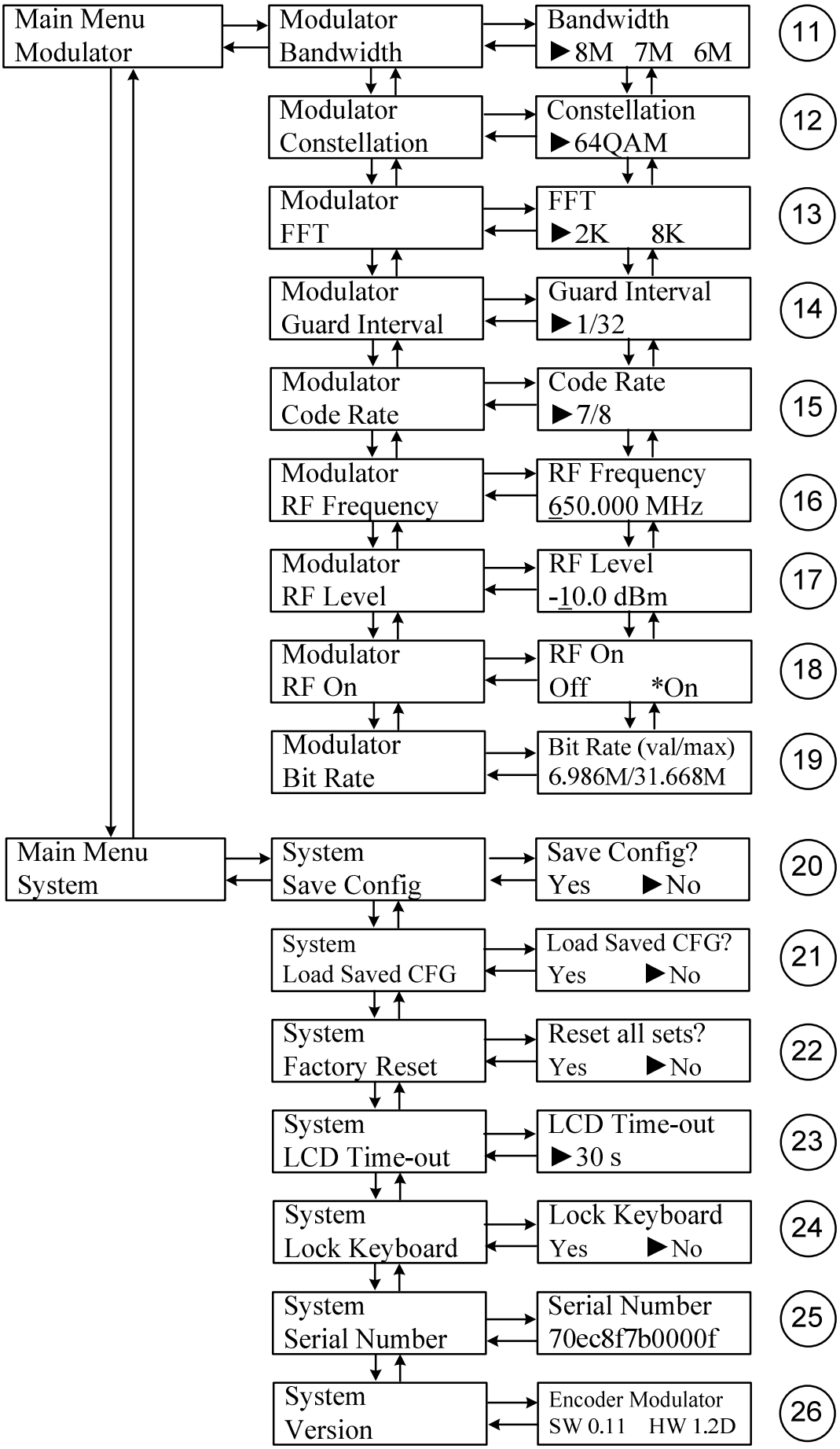



Press it to activate the hidden selections and change the setting with Up and Down (or Left and Right) buttons.




**Menu –** Press this button to step back
**Lock –** Locking the screen / cancelling the lock state, and entering the main menu after the initialization of the device. 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.
When the power is connected, the LCD will start to initialize the program. The LCD menu goes as below chart.


Initializing
Up
Down
Enter
Menu
Lock
DVB-T 506.000MHz
576i 6.93Mbps
1
Main Menu
Status
Status
Alarm
2
Status
Uptime
3
Main Menu
Encoder
Encoder
Video
Video
Video In Status
Resolution
Interface
Video Bitrate
Rate Mode
Profile
Level
Brightness
Contrast
Saturation
Hue
4
Encoder
Audio
Audio
Audio Bitrate
Audio Format
5
Encoder
Program Info
Program Info
Program Output
Service Name
Program Name
Program Number
PMT PID
PCR PID
Video PID
Audio PID
LCN
EIT Event
6
Main Menu
Stream
Stream
TSID
7
Stream
ONID
8
Stream
NIT
NIT
Network ID
Network Name
LCN Mode
Private Data
NIT Insert
9
Stream
EIT
EIT
Language
EIT Insert
10


Main Menu
Modulator
Modulator
Bandwidth
Bandwidth
▶8M 7M 6M
11
Modulator
Constellation
Constellation
▶64QAM
12
Modulator
FFT
FFT
▶2K 8K
13
Modulator
Guard Interval
Guard Interval
▶1/32
14
Modulator
Code Rate
Code Rate
▶7/8
15
Modulator
RF Frequency
RF Frequency
650.000 MHz
16
Modulator
RF Level
RF Level
-10.0 dBm
17
Modulator
RF On
RF On
Off *On
18
Modulator
Bit Rate
Bit Rate (val/max)
6.986M/31.668M
19
Main Menu
System
System
Save Config
Save Config?
Yes ▶No
20
System
Load Saved CFG
Load Saved CFG?
Yes ▶No
21
System
Factory Reset
Reset all sets?
Yes ▶No
22
System
LCD Time-out
LCD Time-out
▶30 s
23
System
Lock Keyboard
Lock Keyboard
Yes ▶No
24
System
Serial Number
Serial Number
70ec8f7b0000f
25
System
Version
Encoder Modulator
SW 0.11 HW 1.2D
26

**1**) DVB-T: modulating standard; XX.XXX MHz: the current output frequency; 576i: video resolution of signal source; X.XX Mbps: the current encoding bit rate

**2**) Alarm Status: For example, if the CVBS cable disconnected, it will display *Video 1 Not Lock* under this menu.

**3**) Uptime: It displays the working time duration of the device. It times upon power on.

**4**) Video Parameters: User can enter the items respectively to view the video status and signal source resolution, and set the input interface. User can also adjust values of rest items (Bit rate: 0.500~19.500 Mbps; Brightness & Contrast & Saturation: 0-255; Hue: -128 - +127)

**5**) Audio Bit rate: Select audio bit rate among 64, 96, 128, 192, 256, 320, 384 kbps.
Audio Format: Select audio format among MPEG2, LC-AAC and HE-AAC.

**6**) Program Information: User can enable or disable the program output under menu *Program Output*. User can also enter the other items to edit the *Service Name, Program Name, Program Number*, and PIDs of *PMT, PCR*, *Video* and *Audio,* and edit LCN (Logical channel number). *EIT Event* – User can enter this menu to setup EIT (Event Information Table) for the current and next program event. The EIT contains Start Year, Start Time, Duration, and Event Name of the event. All the EIT information can be displayed on the TV screen on condition that the EIT is chosen to insert (see explanation 10.).

**7**) TSID: (Transport Stream ID) User can view or adjust after enter this menu.

**8**) ONID: (Original Network ID)-User can view or adjust after enter this menu.

**9**) NIT: (Network Information Table) NIT table is a very important table for describing the network and TS. User can enter the submenus displayed and edit the values or select the LCN (Logical channel number) mode, and choose whether to insert the NIT. If user chooses to insert the NIT, information (Network ID, Network Name, LCN Mode, Private Data and LCN number of the program mentioned in explanation 6) will be added to the transport stream.

- **NOTE**: when the Private Data is set as 0*0, it is invalid.

**10**) EIT: EIT Insert - As mentioned above (6), the event information table can be chosen whether to insert into the TS or not under this menu. If yes, the EIT information set above (6) will be displayed on the TV screen. Language Code – to set the EIT language For example, code of the English language is *eng*. If you set the code as *eng*, the EIT displayed will be in English language.

**11**) Bandwidth: choose between 6M, 7M and 8M.

**12**) Constellation: DVB-T modulator contains 3 constellation modes – 64 QAM, QPSK and 16 QAM.

**13**) FFT (Transmission Mode): Select between 2K and 8K.

**14**) Guard Interval: Select among 1/32, 1/16, 1/8 and 1/4.

**15**) Code Rate: It refers to FEC-Forward Error Correction rate. It contains 1/2, 2/3, 3/4, 5/6 and 7/8.

- **NOTE**: The different combination of bandwidth, constellation, guard interval and code rate (FEC) will form a different output code rate. Please refer to appendix table 2.

**16**) RF Frequency: Adjust it at range of 30 to 999 MHz. Set it according your regional situation or inquire your local services.

**17**) RF Level: Adjust it at range of -16~ -36dBm.
**18**) RF On: User can choose to turn on or turn off the RF under this menu.
**19**) Bit Rate: User can read the current modulating bit rate and the maximum bit rate
**20**) Save Config: *Yes/No*-to save/give up the adjustment of setting.
**21**) Load Saved CFG: *Yes/No*-to load/ not to load the saved configuration.
**22**) Reset all sets: *Yes/No*-choose/not choose the factory's default configuration.
**23**) LCD Time out: A time limit that LCD will light off. Choose among 5s, 10s, 45s, 60s, 90s and 120s (seconds).
**24**) Lock Keyboard: Choose *Yes* to set a password and lock the keyboard, then the keyboard will be locked and cannot be applicable. It is required to input the password to unlock the key board. This operation is one-off. (If forgetting your password, please use the universal code "*005599*".)
**25**) Serial Number: User can view the serial number of this device. It is read-only and unique
**26**) Version: It displays the version information of this device. *Encoder Modulator*: the name of the device; *SW*: software version number; *HW*: hardware version number. User can also press ENTER again to view the published time of this device.

# Appendix

| Modulation Constellation | FEC | 6MHz Bandwidth | | | | 7MHz Bandwidth | | | | 8MHz Bandwidth | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Guard Interval | | | | Guard Interval | | | | Guard Interval | | | |
| | | 1/4 | 1/8 | 1/16 | 1/32 | 1/4 | 1/8 | 1/16 | 1/32 | 1/4 | 1/8 | 1/16 | 1/32 |
| QPSK | 1/2 | **The weak ability of error-correcting and anti-interference in this area** | | | | | | | | | | | 6.03 |
| | 2/3 | | | | 6.03 | 5.80 | 6.45 | 6.83 | 7.03 | 6.64 | 7.37 | 7.81 | 8.04 |
| | 3/4 | | 6.22 | 6.58 | 6.78 | 6.53 | 7.25 | 7.68 | 7.91 | 7.46 | 8.29 | 8.78 | 9.05 |
| | 5/6 | 6.22 | 6.91 | 7.31 | 7.54 | 7.25 | 8.06 | 8.53 | 8.79 | 8.29 | 9.22 | 9.76 | 10.05 |
| | 7/8 | 6.53 | 7.25 | 7.68 | 7.91 | 7.62 | 8.46 | 8.96 | 9.23 | 8.71 | 9.68 | 10.25 | 10.56 |
| 16QAM | 1/2 | 7.46 | 8.29 | 8.78 | 9.04 | 8.70 | 9.67 | 10.24 | 10.55 | 9.95 | 11.06 | 11.71 | 12.06 |
| | 2/3 | 9.95 | 11.05 | 11.70 | 12.06 | 11.61 | 12.90 | 13.66 | 14.07 | 13.27 | 14.75 | 15.61 | 16.09 |
| | 3/4 | 11.19 | 12.44 | 13.17 | 13.57 | 13.06 | 14.51 | 15.36 | 15.83 | 14.93 | 16.59 | 17.56 | 18.10 |
| | 5/6 | 12.44 | 13.82 | 14.63 | 15.08 | 14.51 | 16.12 | 17.07 | 17.59 | 16.59 | 18.43 | 19.52 | 20.11 |
| | 7/8 | 13.06 | 14.51 | 15.36 | 15.83 | 15.24 | 16.93 | 17.93 | 18.47 | 17.42 | 19.35 | 20.49 | 21.11 |
| 64QAM | 1/2 | 11.19 | 12.44 | 13.17 | 13.57 | 13.06 | 14.51 | 15.36 | 15.83 | 14.93 | 16.59 | 17.56 | 18.10 |
| | 2/3 | 14.92 | 16.58 | 17.56 | 18.09 | 17.41 | 19.35 | 20.49 | 21.11 | 19.91 | 22.12 | 23.42 | 24.13 |
| | 3/4 | 16.79 | 18.66 | 19.76 | 20.35 | 19.59 | 21.77 | 23.05 | 23.75 | 22.39 | 24.88 | 26.35 | 27.14 |
| | 5/6 | 18.66 | 20.73 | 21.95 | 22.62 | 21.77 | 24.19 | 25.61 | 26.39 | 24.88 | 27.65 | 29.27 | 30.16 |
| | 7/8 | 19.59 | 21.77 | 23.05 | 23.75 | 22.86 | 25.40 | 26.89 | 27.71 | 26.13 | 29.03 | 30.74 | 31.67 |

Table 1 Channel output max. capacity in Mbps