

EN-206 LITE

DVB-T MODULATOR



SAFETY NOTES

Read the user's manual before using the equipment, mainly the "**SAFETY RULES**" paragraph.

The symbol  on the equipment means "**SEE USER'S MANUAL**". In this manual December also appear as a Caution or Warning symbol.

WARNING AND CAUTION statements December appear in this manual to avoid injury hazard or damage to this product or other property.

USER'S MANUAL VERSION

Version	Date	Software Version
1.0	June 2021	1.11

SAFETY RULES

- * **The safety could not be assured if the instructions for use are not closely followed.**
- * When using some of the following accessories use **only** the **specified** ones to ensure safety:
 - External DC charger
 - Power cord
- * Do not use the external DC power cord if it is damaged.
- * Do not connect the external DC power until all cables are properly connected.
- * Do not manipulate the external DC power supply.
- * Observe all **specified ratings** both of supply and measurement.
- * Remember that voltages higher than **70 V DC** or **33 V AC rms** are dangerous.
- * Use this instrument under the **specified environmental conditions**.
- * 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.
- * **Do not obstruct the ventilation system of the instrument.**
- * To prevent fire or shock hazard, do not expose this appliance to rain or moisture.
- * Use for the signal inputs/outputs, appropriate low radiation cables.
- * Follow the cleaning instructions described in the Maintenance paragraph.

- * The operator is not allowed to intervene inside the equipment. Any change on the equipment should be carried out by qualified personnel.
- * Mechanical handling / electric unit can cause damage. Do not connect the appliance to the mains before or during assembly.
- * Symbols related to safety:

	DIRECT CURRENT		ON (Supply)
	ALTERNATING CURRENT		OFF (Supply)
	DIRECT AND ALTERNATING		DOUBLE INSULATION (Class II protection)
	GROUND TERMINAL		CAUTION (Risk of electric shock)
	PROTECTIVE CONDUCTOR		CAUTION REFER TO MANUAL
	FRAME TERMINAL		FUSE
	EQUIPOTENTIALITY		EQUIPMENT OR COMPONENT TO BE RECYCLED
			

Descriptive Examples of Over-Voltage Categories

Cat I Low voltage installations isolated from the mains.

Cat II Portable domestic installations.

Cat III Fixed domestic installations.

Cat IV Industrial installations.

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HIGH DEFINITION MULTI-STANDARD MODULATOR EN-206



1 INTRODUCTION

1.1 Description

The **EN-206** encoder and modulator is an equipment that allows you tv distribution from audio/video signal input. It has applications for home entertainment, surveillance control, hotel Digital Signage, shops etc. It is an all-in-one device integrating MPEG4 AVC/H.264 encoding and modulating to convert input signals to digital RF out.

Source of signals can be from different types: satellite receivers, closed-circuit television cameras, blu-ray players, antenna, etc. Output signal can be received in TVs or Set-Top Boxes that must be compatible to the selected standard.

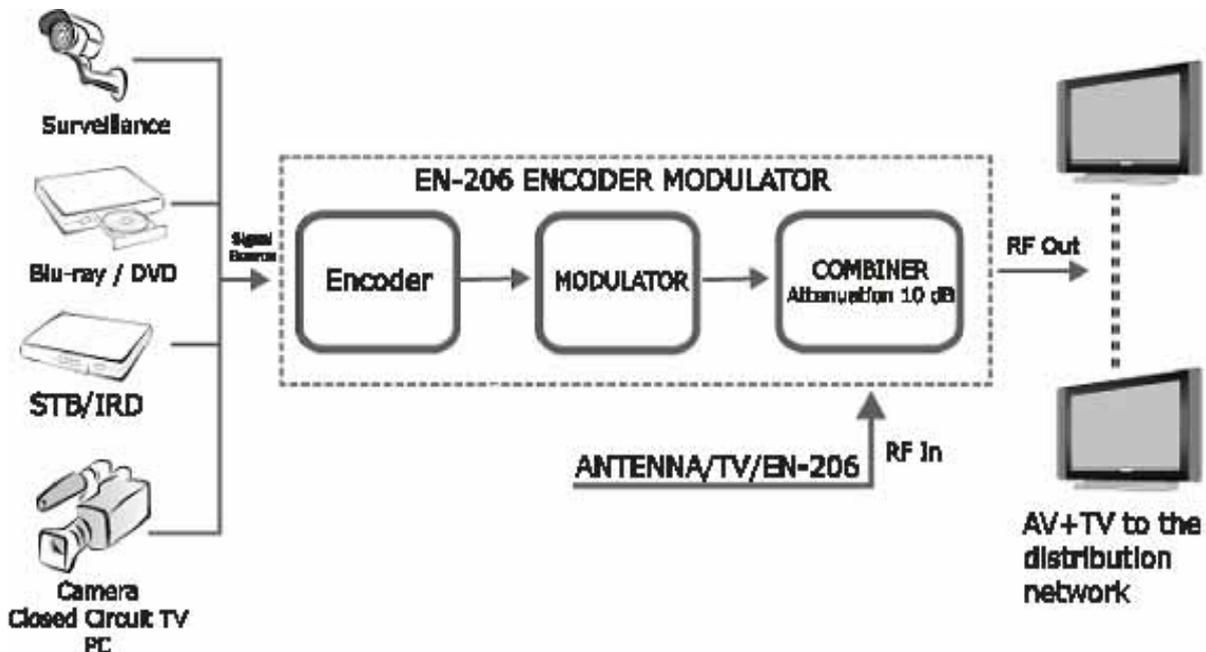


Figure 1. System Connection Chart.



1.2 Equipment Details

■ Front View

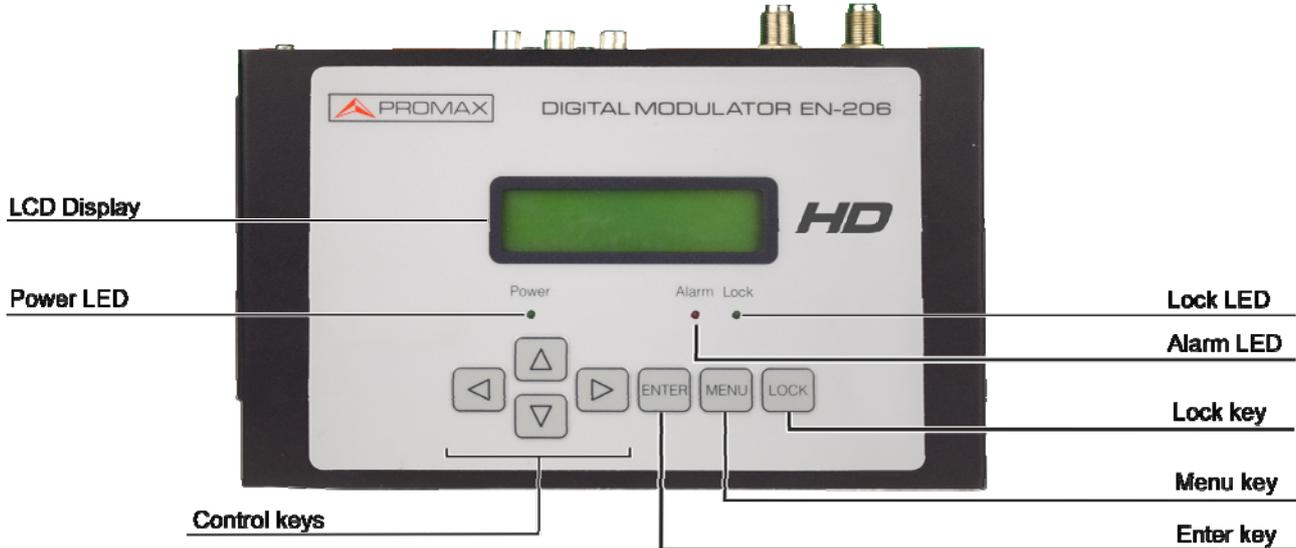


Figure 2.

■ Up View

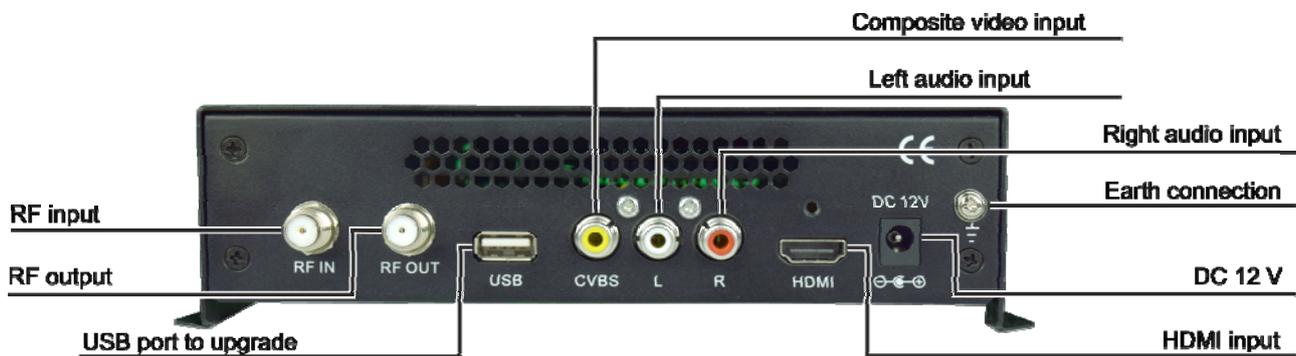


Figure 3.

- ▶ **Grounding:** To connect the earth cable.
- ▶ **DC 12V:** Power Input.
- ▶ **HDMI :** HDMI input stream supporting HD signals.
- ▶ **RF in:** RF input.
- ▶ **RF output:** RF output to distribute modulated signals.
- ▶ **USB Port:** To system update.



1.3 Installation

- 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 the RF output cable to a STB or 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.



Figure 4.

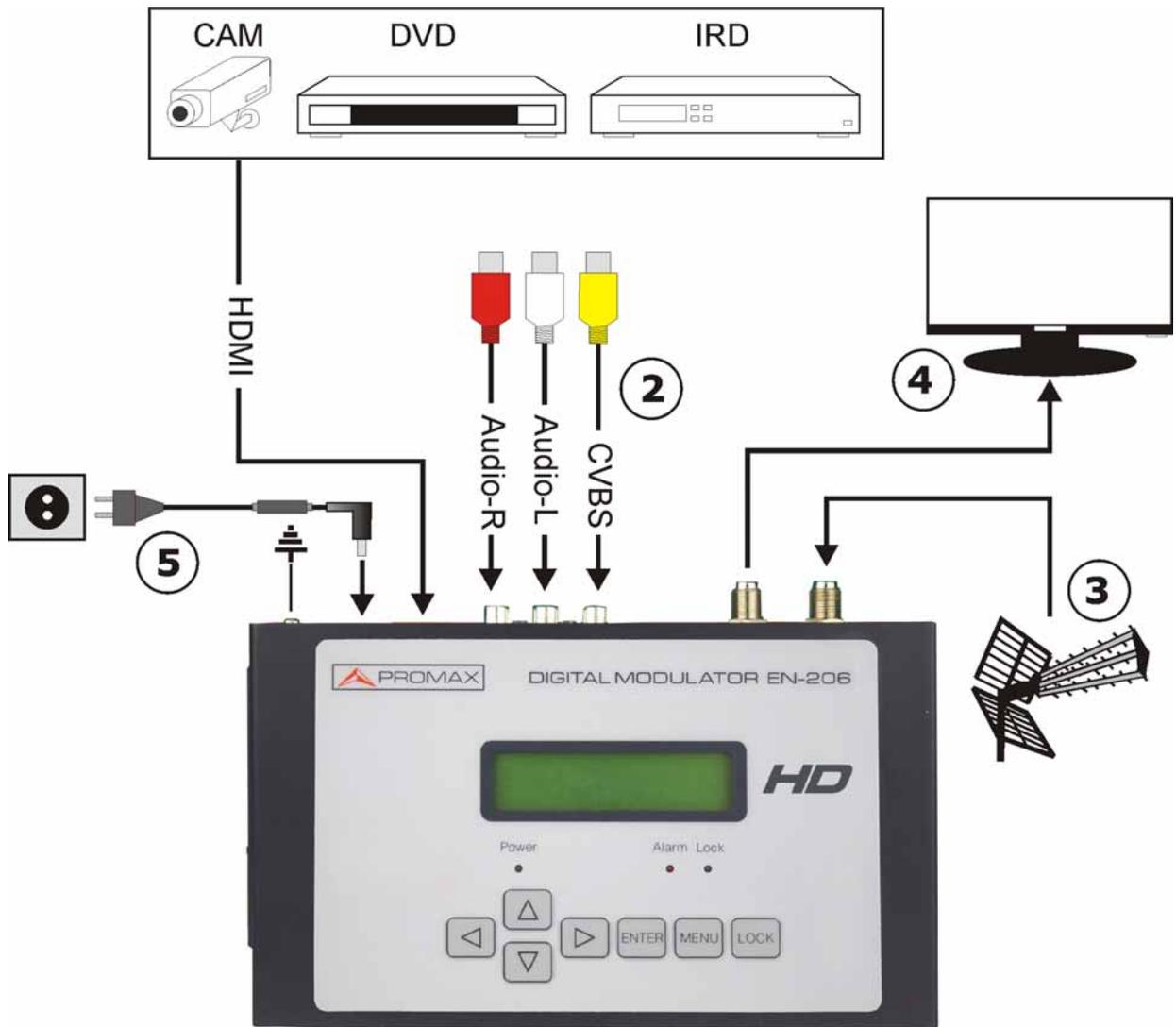


Figure 5.



1.4 Cascade Installation

Each unit has 1 TV signal to RF output encoded as Digital TV signal.

Several units can be cascaded in order to increase the capacity. Maximum capacity of a series of N units is 1xN incorporated TV signals. 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 next figure).

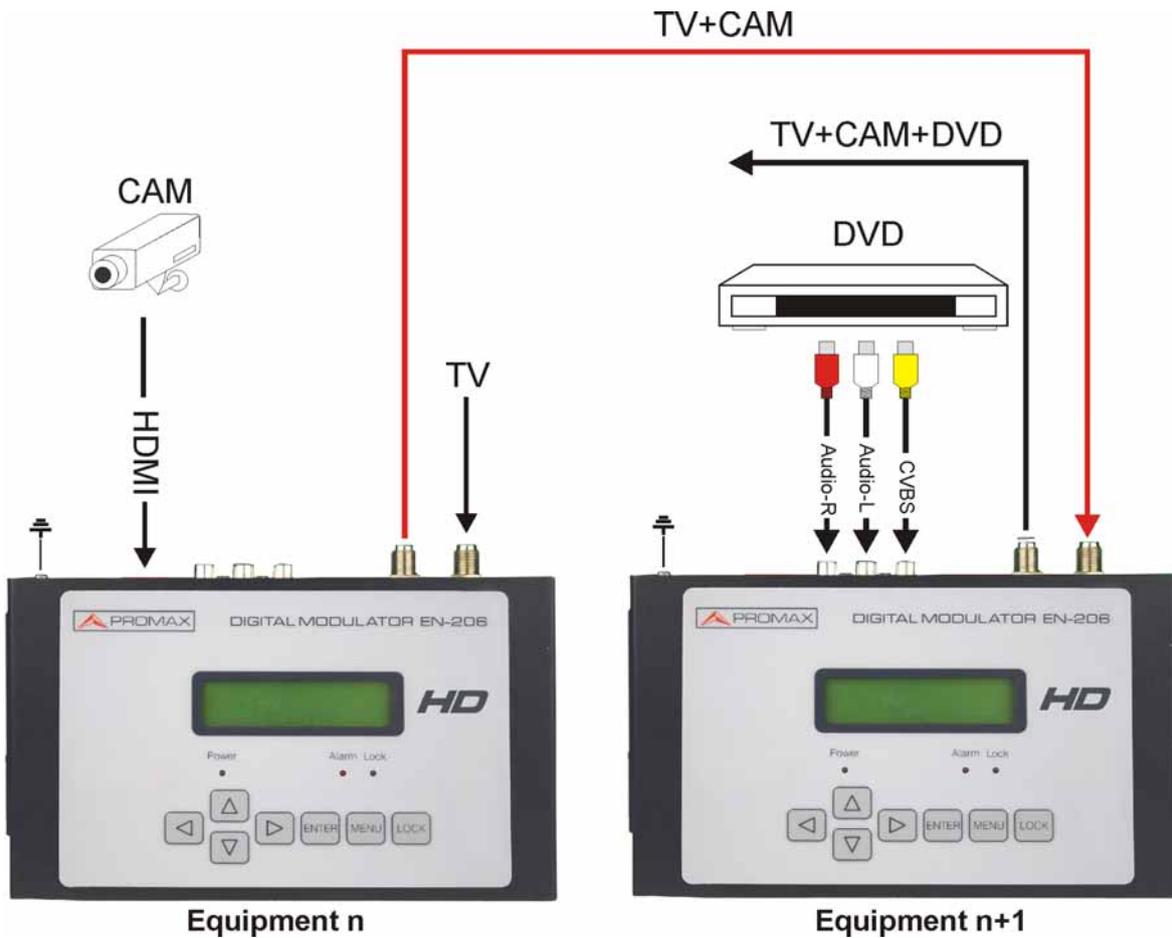


Figure 6.



2 OPERATIONS AND MANAGEMENT

This demodulator controlled and managed through the keyboard and LCD display.



Figure 7.

► LCD Display:

It presents the selected menu and the parameter settings. The display backlight 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 an error, such as loss of signal source.
- **Lock:** It lights when a signal has been locked.

► Cursor Keys:

Use these keys to: Change menu, change between available options or change parameter settings in Program Mode.



► **Enter:**

Use Enter to get into a submenu or save a new setting. Also to start editing a value in some options; press up and down when the underline is blinking to change value.



Figure 8.

Press Enter to enable hidden options and change it with cursor keys.



Figure 9.

► **Menu:**

Press Menu to go back to the upper menu.

► **Lock:**

It enables/disables the screen lock.

After switching ON, it shows the main menu on screen. After that, if you press the lock key, it asks to save or not save the current configuration.

If you choose NO, it keeps the current configuration.

After switching ON, to start browsing the menu tree, you need to press LOCK to unlock the keyboard.



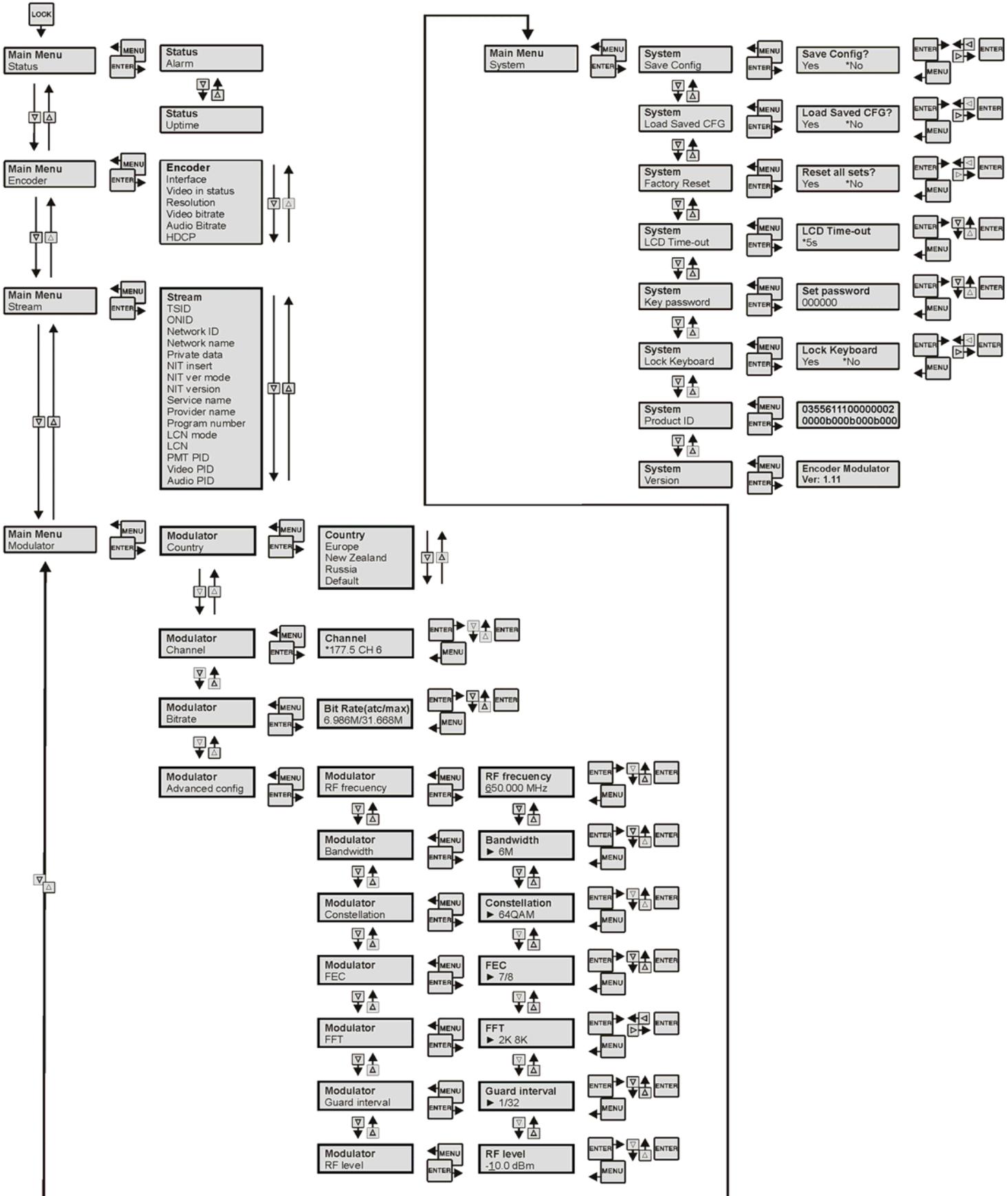
3 MENU TREE

When power is connected, the LCD will start to initialize the program. After the initialization of the device, press LOCK to unlock the keyboard. Then you will be able to browse in the menu tree.

The LCD menu goes as below chart. Numbers on the menu refers to the numbers on the menu tree.

Initializing

DVB-T 650.000M
576i 6.93Mbps





3.1 Parameter Definition

(1) Start Screen:

- **DVB-T**

Modulating standard.

XX.XXX MHz: Current output frequency.

576i: Video resolution of signal source.

X.XX Mbps: The current encoding bit rate.

(2) Status:

- **Alarm:**

It shows alarm messages. For example, if input cable is not connected, it will show the message "Video 1 not lock" on this menu.

- **Uptime:**

It displays working time of the device (days, hours, minutes and seconds). It starts counting when power-on.

(3) Encoder:

User can enter these options to set video parameters.

- **Interface:** Select the interface type from the available options. After that, it automatically starts to search a signal and to encode.
- **Video in Status:** It allows the user to check the video status.
- **Resolution:** Resolution of signal source, only read.
- **Video bitrate:** Adjust in a range between 1000 and 19000 Mbps.
- **Audio Bit rate:** Select audio bitrate from 64, 96, 128, 192, 256, 320 kbps.



(4) **Stream** (Transport Stream settings):

- **TSID** (Transport Stream ID):
User can check or change this value from this menu.
- **ONID** (Original Network ID):
User can view or adjust this value from this menu.
- **Network ID (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. If user chooses to insert the NIT, information (*Network ID, Network Name, LCN Mode, Private Data*, etc.) will be added to the Transport Stream.

NOTE: When the Private Data is set as 0*0, it is cancelled.

(5) **Modulator:**

- **Country:**
It allows the user to select a country or continent to automatically set parameters. There are 4 options: Europe, New Zealand, Russia or Default. If the user selects Default, modulation parameters must be set manually by means of Advanced Configuration. For any other option, parameters are automatically adjusted (RF frequency, bandwidth, constellation, FEC, FFT, guard interval and RF level) according to the country and selected channel.
- **Channel:**
It allows user to select a channel.
- **Bitrate:**
It shows the current bitrate for the selected modulation and maximum bitrate.
- **Code rate:**
It refers to FEC-(Forward Error Correction) rate. Select between 1/2, 2/3, 3/4, 5/6 and 7/8.
NOTE: Different combination of bandwidth, constellation, guard interval and code rate (FEC) release a different output code rate. Please refer to appendix.
- **RF Frequency:**
Adjust it at range of 30 to 999 MHz. Set it according your location or ask your local distributor.



- **Bandwidth:**
Select between 6M, 7M and 8M.
- **Constellation:**
DVB-T modulator contains these constellation modes: 64 QAM, QPSK and 16 QAM.
- **FEC:**
Forward Error Correction rate. Available values are 1/2, 2/3, 3/4, 5/6 y 7/8.
- **FFT:**
Select between 2K and 8K.
- **Guard Interval:**
Select between 1/32, 1/16, 1/8 and 1/4.
- **RF Level (RF Level):**
Adjust the signal level between -14~ +6dBm.

NOTE: Different settings for bandwidth, constellation, guard interval and FEC will give a different code rate. Refer to appendix. To ensure a good quality image, code rate must be bigger than 22 MHz.

(6) **System:**

- **Save Config?:**
Yes / No. Saving settings.
- **Load Saved CFG?:**
Yes / No. Loading saved settings.
- **Reset all sets?:**
Yes / No. Loading default settings from factory.
- **LCD Time-out:**
A time limit that LCD will light off. Choose among 5, 10, 45, 60, 90 and 120 (seconds).
- **Set password:**
User can set a 6 digital password used to unlock the keyboard.



- **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 "000000".)
- **Product ID:**
User can view the serial number of this device. It is read-only and unique.
- **Version:**
It shows information of the device.
Encoder modulador: The name of the device.
SW: Software version number.
HW: Hardware version number.



4 SPECIFICATIONS

HDMI

VÍDEO

Encoding	H.264 MP@L 3.0/3.1/4.04	
Interface	HDMI	
Resolution	Input	Output
	480@59.94/60p	480@60p
	480@59.94/60i	480@30p
	576@50i	576@25p
	720@50/59.94/60p	720@50/59.94/60p
	1080@50i	1080@25p
	1080@59.94/60i	1080@30p
	1080@59.94/60p	1080@30p
Aspect Ratio	16:9	
Bit rate	1.000 ~ 18.000 Mbps	

AUDIO

Encoding	MPEG1 layer 2
Sample Rate	48 KHz
Bit rate	4, 96, 128, 192, 256, 320 kbps



Codificación CVBS

VÍDEO

Encoding	H.264 MP@L 3.0	
Interface	CVBS x 1	
Resolution	Input	Output
	480@60p	480@60p
	480@60i	480@30p
	576@50p	576@50p
	576@50i	576@25p
Aspect Ratio	4:3	
Bit rate	1.000 ~ 18.000 Mbps	

AUDIO

Encoding	MPEG1 layer 2
Interface	Stereo Analogue / Mono (RCA unbalanced)
Sample Rate	48 kHz
Bit rate	64, 96, 128, 192, 256, 320 kbps

DVB-T Modulation

Standard	DVB-T COFDM
Bandwidth	6 MHz, 7 MHz, 8 MHz
Constellation	QPSK, 16 QAM, 64 QAM
Code rate	1/2, 2/3, 3/4, 5/6, 7/8
Guard Interval	1/32, 1/16, 1/8, 1/4
Transmission Mode	2 K, 8 K
MER	≥31 dB
RF frequency	142,5 ~ 946 MHz; 1 kHz steps
RF output level	-14 ~ +6 dBm; 0,1 dB steps



System

Local control	Control buttons and LCD display
Language	English
LCN Insert	Supported
RF attenuation combined	10 dB
Update	USB

General

Power supply	DC 12V
Dimensions	183 An. x 110 Al. x 50 Pr. mm
Weight	< 1 kg

NOTE: Equipment specifications are set in these environmental operating conditions. Operation outside these specifications are also possible. Please check with us if you have specific requirements.

INCLUDED ACCESSORIES

External DC power supply

Quick Reference Guide

RECOMMENDATIONS ABOUT PACKING

It is recommended to keep all the packing material in order to return the equipment, if necessary, to the Technical Service.



5 MAINTENANCE

5.1 **Instructions for Returning by Mail**

Instruments returned for repair or calibration, either within or out of the warranty period, should be sent with the following information: Name of the Company, name of the contact person, address, telephone number, receipt (in the case of coverage under warranty) and a description of the problem or the service required.

5.2 **Cleaning Recommendations**

CAUTION

To clean the cover, make sure the instrument is disconnected.

CAUTION

Do not use scented hydrocarbons or chloride solvents. Such products can damage the plastics used in the construction of the cover.

The cover should be cleaned by means of a light solution of detergent and water applied with a soft cloth.

Dry thoroughly before using the system again.

CAUTION

Do not use alcohol or its derivatives for the cleaning of the front panel and particularly the viewfinders. These products can damage the mechanical properties of the materials and reduce their useful lifetime.



6 APPENDIX

Modulation Constellation	FEC	6 MHz Bandwidth				7 MHz Bandwidth				8 MHz 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. Recommended MPEG-2 Code Rate.