



For the Best

SD ENCODER AND MODULATOR CVBS TO DVB-T DIGITAL RF

14MM-DM04

USER MANUAL

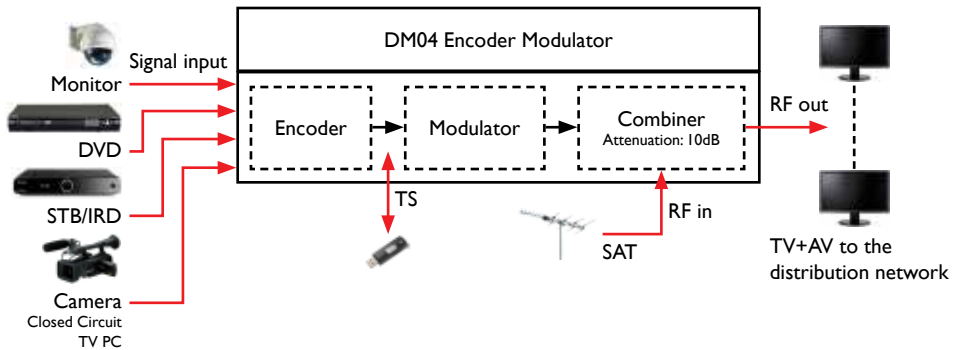


PRODUCT INTRODUCTION

1. Grounding: to connect the earth cable
2. DC 12V: power input
3. CVBS: composited video input supporting NTSC and PAL
4. L/R channel: Stereo Left and Right audio channels
5. RF in: to combine input RF signal (10 dB attenuation)
6. RF out: to distribute modulated signal (30-960 MHz, 73-93 dB μ V)
7. Indicators
8. LCD Window
9. Control Buttons
10. USB port for video record, save and playback
11. JTAG port for upgrade



System connection chart



Technical Specifications

Encoding Section - Video

Encoding	MPEG-2 MP@ML(4:2:0)
Interface	CVBS *I
Resolution	720x576_50i (PAL); 720x480_60i (NTSC)
Bit rate	1.000~19.500 Mbps

Encoding Section - Audio

Encoding	MPEG I Layer II
Interface	I*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
MER	≥42dB
RF frequency	30~960 MHz, 1KHz step
RF output level	-16~ -36 dBm (73 - 93 dBμV), 0.1 db step

System

Management	Local control: LCD + control buttons
Language	English
LCN Insertion	Yes
Upgrade	JTAG or USB

General

Power supply	DC 12V
Dimensions	153*110*50mm
Weight	< 1kg
Operation temperature	0~45°C

SAFETY INSTRUCTION AND INSTALLATIONS

Safety Technical Specifications

WARNING: Hot plug is not allowed since it may cause system failure.

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.

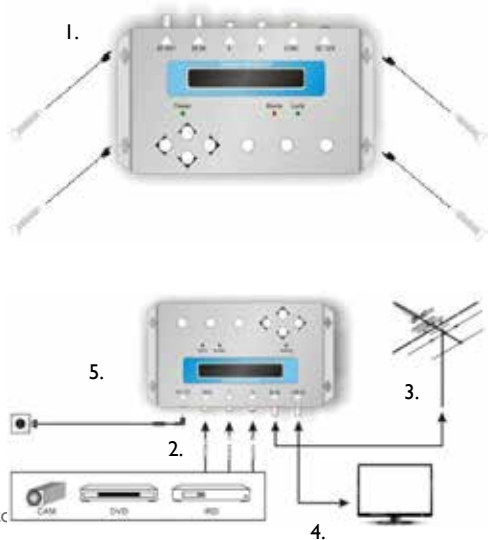
Installations

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.

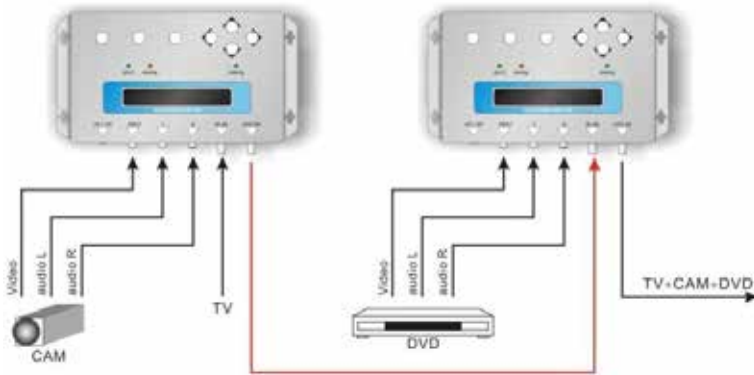
NO HOT PLUG!

1. Mount and tighten the screws and plugs to secure the unit to the wall. Left 10cm of free space around from each unit.
2. Connect cables to audio/video source. 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 connect
 - c) Connect the power plug to the mains socket.



Cascade Installations

DM04 unit has 1 AV analogue TV signal to RF output encoded as DVB-T Digital TV signal. Several DM04 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 below illustration).



USB Recorder and Player

TS Recorder and Save:

- DM04 can encode the source video to *.ts files and save them through the USB flash drive.
- Connect the signal source to DM04 and start encoding process.
- Start the record process and save the TS generated to the USB flash drive.

*.ts Video Creation Software:

1. Users can also create *.ts videos containing pictures, videos and music with our creator software on a PC and save them into the USB flash drive.
2. Drag the files to "Creator" application.
Formats supported include:
Image: JPG, PNG, BMP, GIF
Audio: MP3, WAV
Video: WMV, MPG, MP4, TS, AVI...
3. Start the conversion process to generate *.ts videos

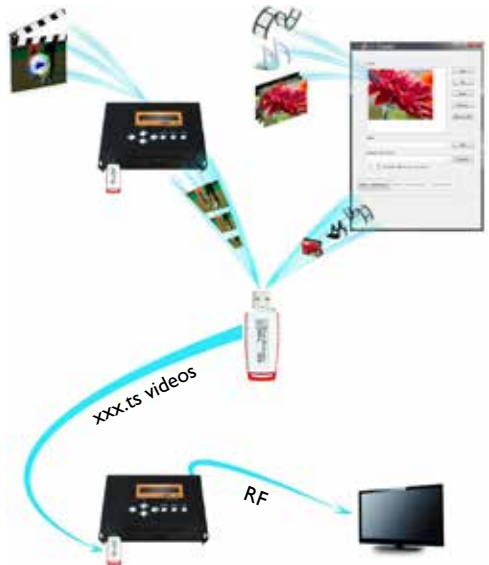
TS Playback:

1. Insert the USB flash drive with *.ts videos in DM04 and play back the content in an easy way.
2. A single video can be up to 2G in size and multi videos can be played on a loop.

USB Flash Drive Specifications Required:

Standard: High Speed 2.0 File System: FAT 32

Memory: 32G is suggested



OPERATIONS OF TS CREATOR SOFTWARE

DM04 encoder modulator has a function to create TS videos with the *.ts creator software. Users can create *.ts files containing images, videos and audios in a simple and intuitive way, and play them on a television through DM04's USB port.

File format supported include:

Image: JPG, PNG, BMP, GIF

Video: MP4, WMV, AVI, MPG, TS, MKV...

Audio: MP3, WAV

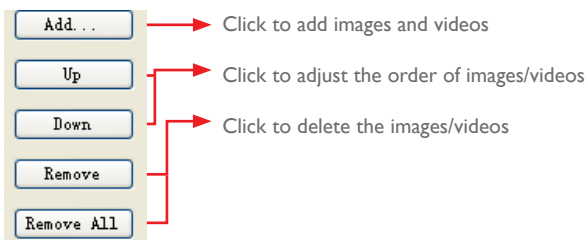
Contact Matchmaster for TS creator software.

Installation

1. Download our "TS Creator" software package on your PC to get the installer and its auxiliary routine.
2. Occasionally, if your PC hasn't installed "Net Frame 2.0" yet, double-click "NetFx20SP2_x86.exe" until complete the installation.
3. Double-click "Setup.exe" application to install the "Creator" and generate a desktop shortcut.

Operations of "Creator"

Double-click the "Creator" shortcut icon, it will trigger an operation interface like below:



Audio

Click to add audios

Saving Directory

Click to set a save path for the TS video to be created.

Picture Duration

To set time duration for every picture when playing the video

Out Put Size

To set the resolution for the output video

Rate

The video is transformed based on VBR (Variable Bit Rate).The number set here represents the **highest bit rate** for the output video and bit rate will varies under the number.

EncodeFormat H. 264 MPEG2

Users can select a encode format here according to the standard of receiving terminal.

Null Packet Filter Yes No

Users can filter the null packet to boost the video's effect bit rate.

File Separated Size

A single video can be maximum 2.0 GB in size. (DM04 cannot play a video bigger than 2GB.)

After setting all the parameters, click to start the transformation.

Click "OK" when it prompts **"The operation completed normally."**

Click this button to stop the transformation before the operation completed.

After finishing the transform operation, users can click this button to play the generated TS video.

File Management

After finishing the transformation, users can find out the videos files generated according the Saving Directory. For example, we save the video in "D:\ABC" so we can find it in Disk D\Folder ABC.

Management:

1. Three files will be generated if the Null Packet has been filtered.

FinalOutput.ts → TS video for preview through the "Creator" interface by clicking "Play" button
 FinalOutput_204_0.ts →
 FinalOutput_204_0.tsinfo → TS video and information files: Users need to save the two files together in the USB memory, and then DM04 can read them and play the video.

2. Two files will be generated if the Null Packet has **not** been filtered.

FinalOutput.ts → TS video for preview through the "Creator" interface by clicking "Play" button
 FinalOutput_0.ts → TS video: Users need to save it in the USB memory, and then DM04 can read it and play the video.

Remarks:

- All the file names are automatically generated.
- Rename the files before creating a new video to avoid covering the previous files.
- If you rename “FinalOutput-204-0.ts” or “FinalOutput-204-0.tsinfo”, always keep the names the same (Extension excluded) and then DM04 can read them and play the video.

Devices Operations and Management

DM04 is controlled and managed through the key board and LCD display.



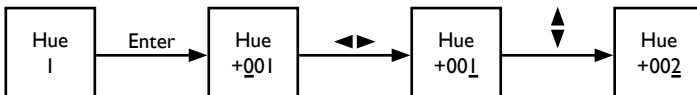
LCD Display - It presents the selected menu and the parameter settings. The backlight in the display is on when the power is applied.

LED - These lights indicate the working status

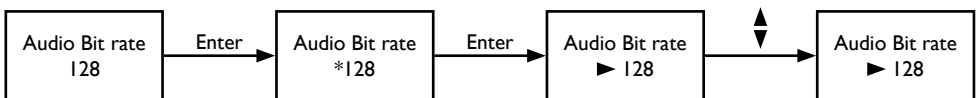
- Power: It lights on when the power supply is connected.
- Alarm: It lights on when there is an error, such as the signal source loss.
- Lock: It lights on when the signal source is connected and goes off when the signal is lost.

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 flashes with Up and Down buttons;



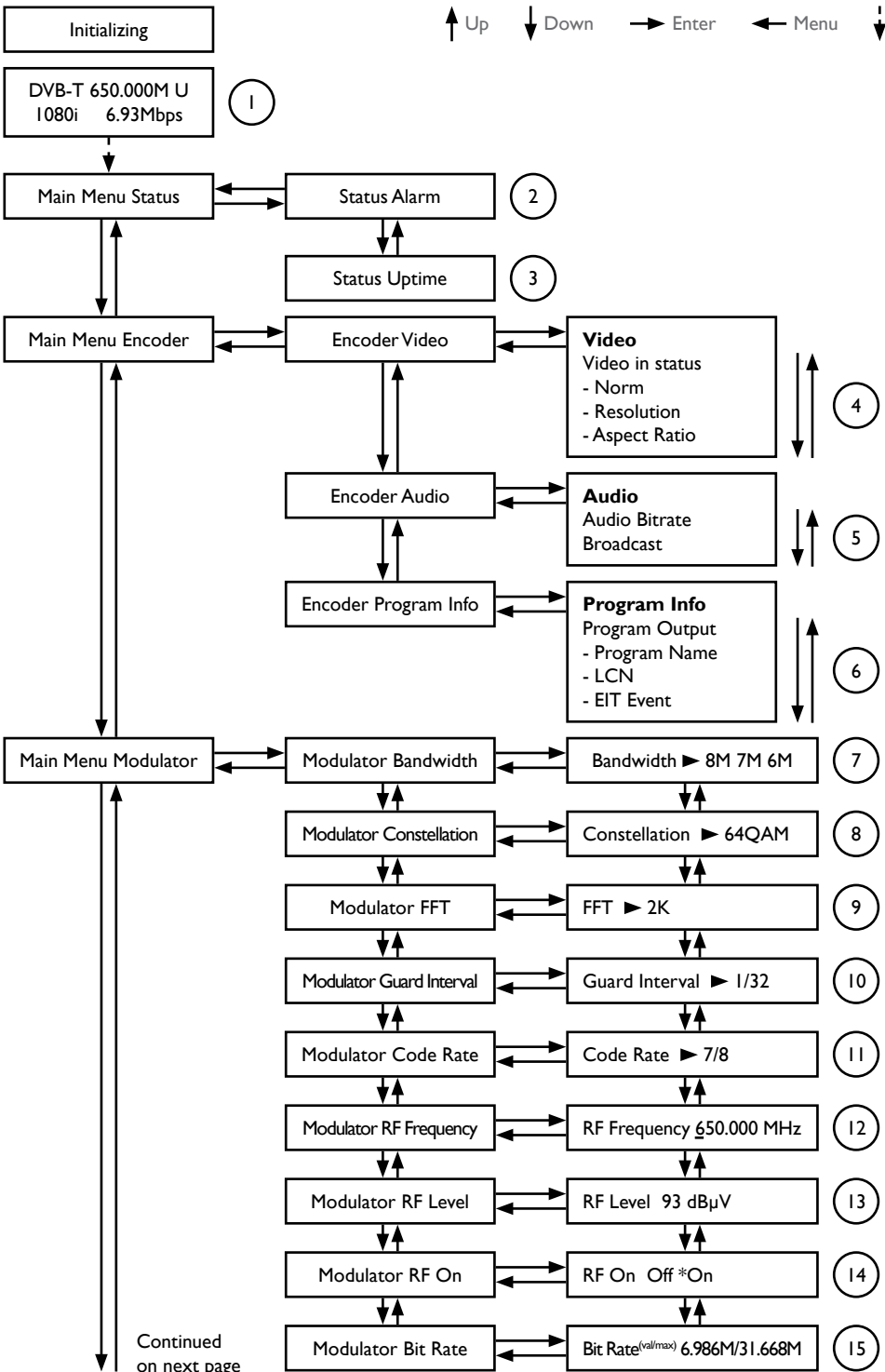
Press it to activate the hidden selections and change the setting with Up and Down (or Left and Right) buttons.



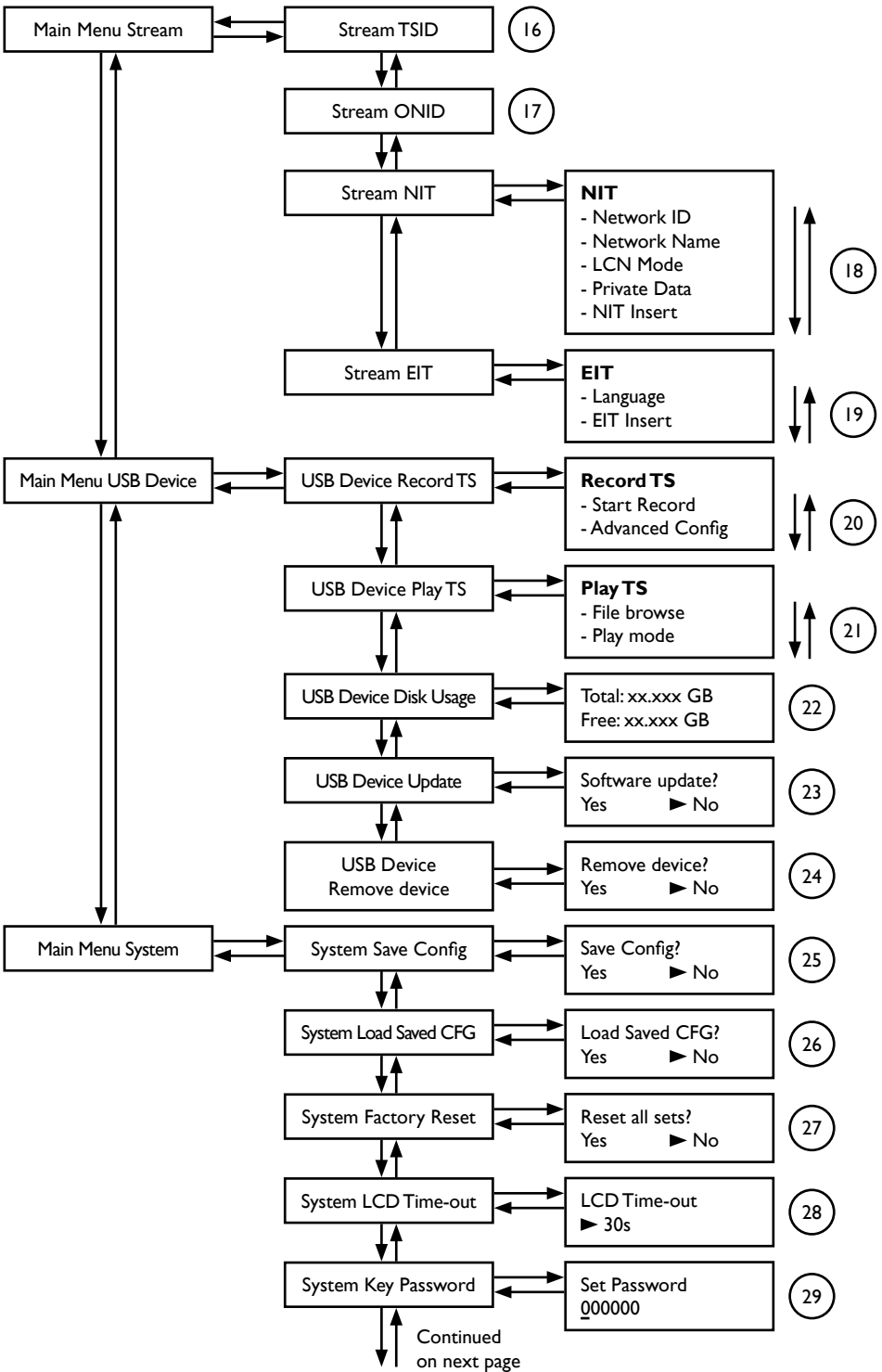
Menu - Press this button to step back

Lock - Locking the screen / cancelling the lock state, and entering the main menu after the initialization of the device. After pressing the lock key, the system will question the user to save the 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.

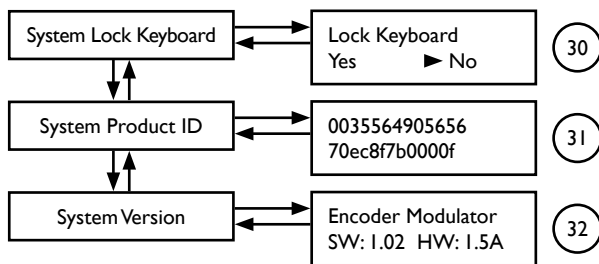
↑ Up ↓ Down → Enter ← Menu ↓ Lock



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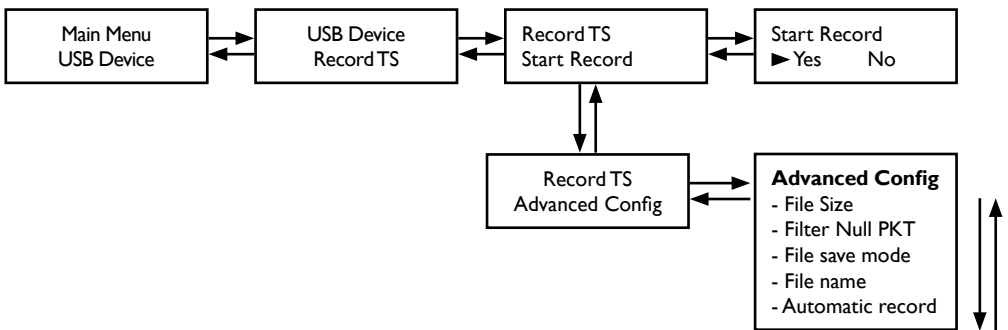
1. **DVB-T:** modulating standard; XX.XXX M: the current output frequency; U: symbol of the USB disk insertion; 1080i: video resolution of signal source; X.XX Mbps: the current encoding bit rate
2. **Alarm Status:** For example, if the signal cable disconnected, it will display Video 1 Not Lock under 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 set video norm. 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 Broadcast: Enable – the output program will broadcast only audio without the picture; Disable - cancel broadcast mode to resume both audio and video.
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 18.). VCN – virtual channel number
7. **Bandwidth:** choose between 6M, 7M and 8M.
8. **Constellation:** DVB-T modulator contains 3 constellation modes – 64 QAM, QPSK and 16 QAM.
9. **FFT (Transmission Mode):** 2K
10. **Guard Interval:** Select among 1/32, 1/16, 1/8 and 1/4.
11. **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.
12. **RF Frequency:** Adjust it at range of 30 to 999 MHz. Set it according your regional situation or inquire your local services.
13. **RF Level:** Adjust it at range of -16~ -36dBm/73-93dBμV.
14. **RF On:** User can choose to turn on or turn off the RF under this menu.
15. **Bit Rate:** User can read the current modulating bit rate and the maximum bit rate
16. **TSID:** (Transport Stream ID) User can view or adjust after enter this menu.
17. **ONID:** (Original Network ID)-User can view or adjust after enter this menu.
18. **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.
19. **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.

20. Please refer to Chapter 5 for details.
21. Please refer to Chapter 5 for details.
22. Please refer to Chapter 5 for details.
23. Please refer to Chapter 5 for details.
24. Please refer to Chapter 5 for details.
25. **Save Config:** Yes/No-to save/give up the adjustment of setting.
26. **Load Saved CFG:** Yes/No-to load/ not to load the saved configuration.
27. **Reset all sets:** Yes/No-choose/not choose the factory's default configuration.
28. **LCDTime out:** A time limit that LCD will light off. Choose among 5s, 10s, 45s, 60s, 90s and 120s (seconds).
29. **Key Password:** User can set a 6-digital password used to unlock the keyboard.
30. **Lock Keyboard:** Choose Yes to lock the keyboard, then the keyboard 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")
31. **Product ID:** User can view the serial number of the device. It is read-only and unique
32. **Version:** It displays the version information of this device. Encoder Modulator:The name of the device; SWV: software version number; HWV: hardware version number. User can also press ENTER again to view the published time of this device.

Operations of Record TS and Play TS through USB Disk

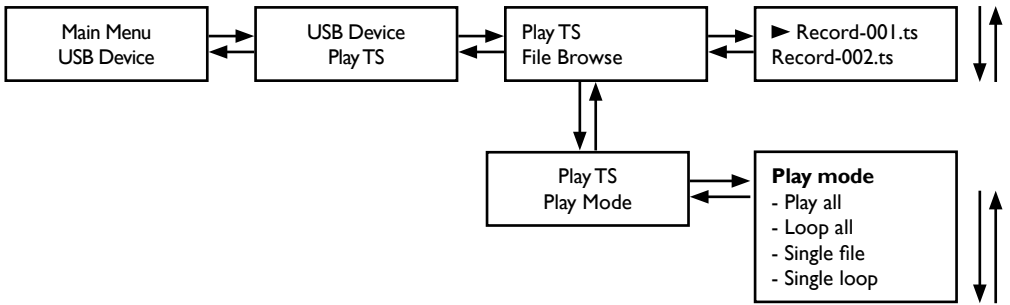
The DM04 encoder modulator has new functions of:

1. ***.ts Video Creation**
See Chapter 3.
2. **TS Record and Save**



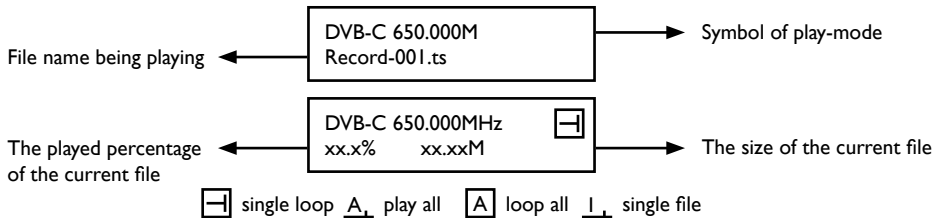
1. Connect the signal source, enter "Start Record" and choose "Yes" to start recording the encoded TS.
2. **Advanced Config:** File size: users can set the file size for the *.ts to be recorded. A single file can be maximum 2000M in size. Filter null PKT: Users can decide whether to filter the null packet for the *.ts files to be recorded. File save mode: there are 3 modes provided: "single file" (For example, when the file size is set as 1000M and the *.ts is recorded up to 1000M, it automatically stops recording TS.). "Segmented file" (For example, when the file size is set as 1000M and the *.ts is recorded up to 1000M, it automatically saves the files and continues to record TS and save it to next file until the USB memory is full.) "Loop record": (it automatically saves the files and continues to record TS and save it to next file. When the USB memory is full, it replaces the previous files.) File name: Users can enter this menu to edit name for the *.ts files to be recorded. For example, if users name it "Record-", it will give name to the saved *.ts files "Record-001.ts", "Record-002.ts"... "Record-00N.ts". Automatic Record: Users can choose whether to set DM04 record the TS automatically or manually.

3. TS Playback

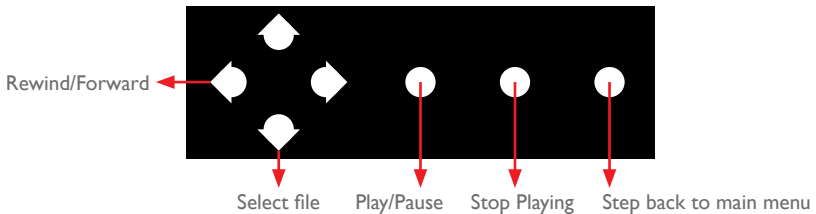


1. File browse: There is a video list under this menu, choose one file and press “Enter” button to start play.
2. Play mode: User can select a play mode for the saved *.ts files as needed before playing the *.ts file.

When the *.ts is being playing, DM04 LCD will present a playing interface as shown below.



At this time, the key board also plays a different rule



4. Disk Usage

Users can enter this menu to view the USB disk's capacity left.



5. Update

Choose “Yes” to update the DM04 with the update file stored in the USB disk.



6. Remove Device

Choose “Yes” to safely remove the USB disk. DM04 will then automatically resume encoding and playing the program input from the encoder module.



Appendix

Australia Air Channels

CH.	Frequency		
	Start	Center	End
VHF			
C06	174	177.5	181
C07	181	184.5	188
C08	188	191.5	195
C09	195	198.5	202
C9A	202	205.5	209
C10	209	212.5	216
C11	216	219.5	223
C12	223	226.5	230
UHF			
C28	526	529.5	533
C29	533	536.5	540
C30	540	543.5	547
C31	547	550.5	554
C32	554	557.5	561
C33	561	564.5	568
C34	568	571.5	575
C35	575	578.5	582
C36	582	585.5	589
C37	589	592.5	596
C38	596	599.5	603
C39	603	606.5	610
C40	610	613.5	617
C41	617	620.5	624
C42	624	627.5	631
C43	631	634.5	638
C44	638	641.5	645
C45	645	648.5	652
C46	652	655.5	659
C47	659	662.5	666
C48	666	669.5	673
C49	673	676.5	680
C50	680	683.5	687
C51	687	690.5	694
C52	694	697.5	701

Australia Air Channels

CH.	Frequency		
	Start	Center	End
C53	701	704.5	708
C54	708	711.5	715
C55	715	718.5	722
C56	722	725.5	729
C57	729	732.5	736
C58	736	739.5	743
C59	743	746.5	750
C60	750	753.5	757
C61	757	760.5	764
C62	764	767.5	771
C63	771	774.5	778
C64	778	781.5	785
C65	785	788.5	792
C66	792	795.5	799
C67	799	802.5	806
C68	806	809.5	813
C69	813	816.5	820

Table 1 Australia Television Frequency/Channels (MHz)

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			
64QAM	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			
	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 2 Recommended MPEG-2 Code Rate

AU Technical Support
1800-AERIAL ²³⁷⁴²⁵
www.matchmaster.com.au

NZ Technical Support
0800-AERIAL ²³⁷⁴²⁵
www.matchmaster.co.nz