



ZMEncM-180 SD&HD Encoder & Modulator

With ISDB-T modulation dynamic switching



User Manual

Thank you for buying this encoder modulator.

Please read this manual carefully to install, use and maintain the encoder modulator in the best conditions of performance. Keep this manual for future reference.

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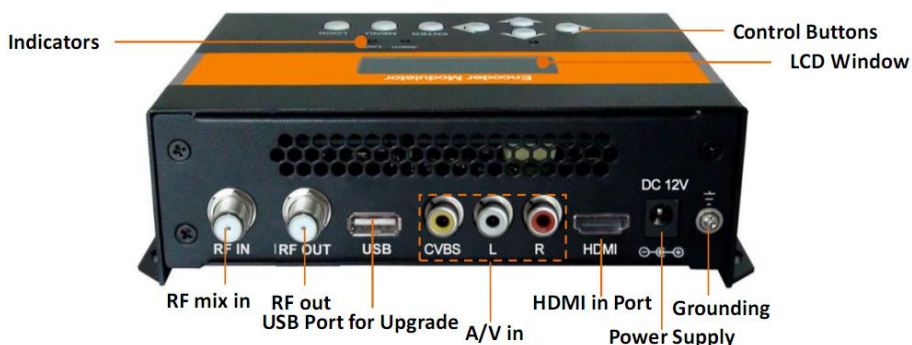
CHAPTER 1 Product Introductions

General Description

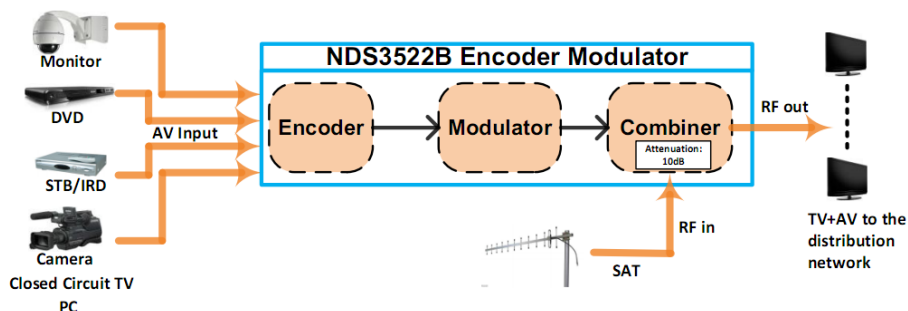
DEXIN NDS3522B HD/SD encoder & modulator is designed based on consumer electronics which allow audio/video signal input in TV distributions with applications in home entertainment, surveillance control, hotel Digital Signage, shops etc.

It is an all-in-one device integrating MPEG-4 AVC/H.264 encoding and modulating to convert audio/video signals into ISDBT RF out.

The signals source could be from STB, satellite receiver, closed-circuit television cameras and antenna etc. Its output signal is to be received by ISDBT TV sets or STBs etc.



Working Principle



Technical Specifications

HDMI Encoding Section

Video	Encoding	H.264 MP@L 3.0/3.1/4.0	
	Interface	HDMI*1	
		Input	Output
	Resolution	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, 4:3	
	Bit rate	1.000~18.000 Mbps	
Audio	Encoding	MPEG1 layer 2	
	Sample rate	48KHz	
	Bit rate	64, 96,128, 192, 256, 320kbps	

CVBS Encoding Section

Video	Encoding	H.264 MP@L 3.0	
	Interface	CVBS*1 (RCA)	
		Input	Output
	Resolution	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	Analog Stereo/Mono (Unbalanced RCA)	
	Sample rate	48KHz	
	Bit rate	64, 96,128, 192, 256, 320kbps	

ISDB-T Modulator Section

Standard	ARIB STD-B31
Bandwidth	6M
Constellation	QPSK, 16QAM, 64QAM
Guard Interval	1/32, 1/16, 1/8, 1/4
Transmission Mode	2K, 4K, 8K
MER	≥30dB
RF frequency	150~950MHz, 0.1MHz step
RF output level	-47~ 0 dBm (60~107 dBμV), 1db step

System

RF mix in ATT	10 dB
Management	Local LCD + control buttons
Language	English
Upgrade	USB

General

Power supply	DC 12V
Dimensions	183*110*50mm
Weight	< 1kg

CHAPTER 2 Safety Instruction and Installations

Safety Instructions



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

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 AND CONNECT THE CABLE AS FOLLOWING STEPS.

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.

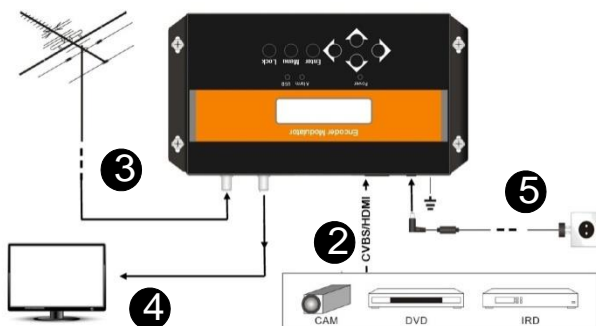


2. Connect the signal input in the respective connectors. The signal source can be from a surveillance monitor, DVD, set-top box, CCTV and etc.

3. Optionally, connect the loop-through RF input coaxial cable.

4. Connect cable to RF output to STB/TV.

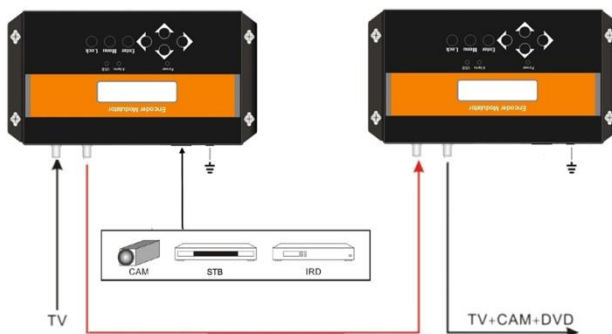
5. Power supply connection: a) Connect the earth cable; b) Connect the power plug to the unit mains connector; c) Connect the power plug to the mains socket.



Cascade Installation

NDS3522B unit has 1 TV signal to RF output encoded as ISDB-T Digital TV signal.

Several NDS3522B units can be cascaded in order to increase the capacity. The maximum capacity of a series of N units is $1 \times N$ 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 right illustration).



Typical Applications

...for communities of residents
an information channel on their television



...for restaurants
information about daily menus ,special deals,etc



...for hotels
meeting rooms,exhibitions,message,etc



...for hospitals
training courses, healthy guide, etc



...for Public Spaces
adversing,user information,news,etc



...for shopping centres
new collections,special deals,etc



**Create your own advertising and information
channel using only your NDS3522B Encoder Modulator**

CHAPTER 3 Operations and Management

NDS3522B is controlled and managed through the key board and LCD display.



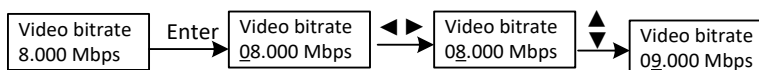
LCD Display – It presents the selected menu and the parameter settings. The backlight in the display is on when the power is applied.

LED – These lights indicate the working status

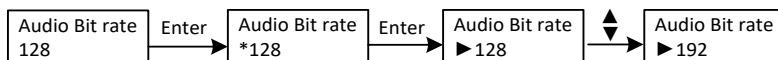
- **Power:** It lights on when the power supply is connected.
- **Alarm:** It lights on when there is error, such as the signal source loss.
- **USB:** It lights on when the USB is properly connected and detected.

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 with Up/Down buttons when the corresponding underline flash;



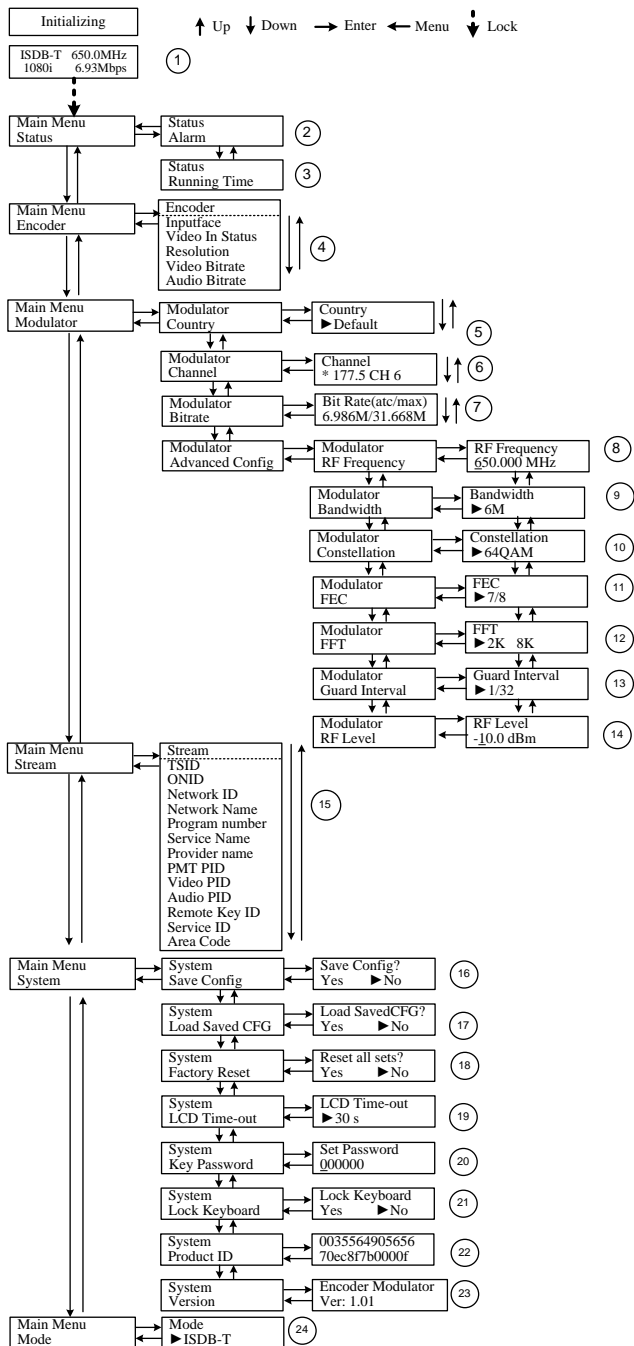
Press it to activate the hidden selections and change the setting with Up/Down (or Left/Right) buttons.



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.



- 1) ISDB-T modulating standard; XX.XXX MHz: the current output frequency; 1080i: video resolution of signal source; X.XX Mbps: the current encoding bit rate
 - 2) Alarm Status: For example, if the signals lose, it will give alarm and display error type under this menu. For example: *Video Not Lock*
 - 3) Running time: It displays the working time duration of the device. It times upon power on.
 - 4) Encoder Parameters: User can enter the items respectively to set Encoder parameters.
Interface: To select the input port (HDMI or CVBS), the device will process the signal from the corresponding interface. **Video in Status:** User can view the video status under this menu.
Resolution: signal source resolution, read-only. **Video Bit rate:** adjust in the range of 1.000~18.000 Mbps. **Audio Bit rate:** Select audio bit rate among 64, 96, 128, 192, 256, 320kbps.
 - 5) Country: User can choose country under this menu. There are two options Default and Brazil if the modulation is ISDB-T. And user can choose from Default, Australia, New Zealand, Sweden, Italy and UK if the modulation standard is DVB-T. If user chooses Default, modulating parameters need to be set manually through advanced configuration. Choose Brazil, Default, Australia, New Zealand, Sweden, Italy or UK, user do not need to set RF frequency, Bandwidth, Constellation, FEC, FFT, Guard interval and RF Level. It will configure automatically according to the Country and Channel. It is a shortcut.
 - 6) Channel: User can choose Channel under this submenu.
 - 7) Bit Rate: User can read the current modulating bit rate and the maximum bit rate
 - 8) RF Frequency: Adjust it at range of 150 MHz to 950MHz. Set it according your regional situation or inquire your local services.
 - 9) Bandwidth: 6M for ISDB-T; 6M, 7M and 8M for DVB-T.
 - 10) Constellation: modulator contains 3 constellation modes – 64 QAM, QPSK and 16 QAM.
 - 11) FEC: Forward Error Correction rate. It contains 1/2, 2/3, 3/4, 5/6 and 7/8.
 - 12) FFT (Transmission Mode): Select between 2K, 4K and 8K for ISDB-T. Select between 2K and 8K for DVB-T.
 - 13) Guard Interval: Select among 1/32, 1/16, 1/8 and 1/4.
 - 14) RF Level: Adjust it at range of -47~ 0 dBm.
- **NOTE:** The different combination of bandwidth, constellation, guard interval and FEC (code rate) will form a different output code rate. To ensure the output image quality, it is required the output code rate to be higher than 22 MHz.
- 15) Stream: User can view or adjust TSID (Transport Stream ID), ONID (Original Network ID),

Network Name, Program number, Service name, provider name and PIDs of PMT, PCR, Video and Audio. User can also set remote key ID, Service ID and Area Code at this menu.

16) Save Config: *Yes/No*-to save/give up the adjustment of setting.

17) Load Saved CFG: *Yes/No*-to load/ not to load the saved configuration.

18) Factory Reset: *Yes/No*-choose/not choose the factory's default configuration.

19) LCD Time out: A time limit that LCD will light off. Choose among 5s, 10s, 45s, 60s, 90s and 120s (seconds).

20) Key Password: to set a 6-digit password for unlocking the keyboard.

21) Lock Keyboard: Choose *Yes* to 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. (Password forgotten, please use the universal code "000000".)

22) Product ID: User can view the serial number of this device. It is read-only and unique

23) Version: It displays the version information of this device. *Encoder Modulator*: the name of the device; *Ver*: version number of this device.

24) Mode: User can select the modulation standard between ISDB-T and DVB-T at this menu in accordance with the TV standard used to receive the output RF. After selecting the Modulation standard, press enter key the device will reboot automatically.

CHAPTER 4 How to Upgrade

NDS3522B encoder modulator is embedded with USB Port for upgrading. The supported file format is IMG and file name must be "jedi.img".



Upgrade steps: Insert USB device→Power on→Upgrade automatically(It will need 10-20 seconds to upgrade.) →Remove USB device→Power off→Power on.

Appendix

Brail Air Channel			
Ch.	Frequency		
	Start	Center	End
VHF			
7	174	177.143	180
8	180	183.143	186
9	186	189.143	192
10	192	195.143	198
11	198	201.143	204
12	204	207.143	210
13	210	213.143	216
UHF			
14	470	473.143	476
15	476	479.143	482
16	482	485.143	488
17	488	491.143	494
18	494	497.143	500
19	500	503.143	506
20	506	509.143	512
21	512	515.143	518
22	518	521.143	524
23	524	527.143	530
24	530	533.143	536
25	536	539.143	542
26	542	545.143	548
27	548	551.143	554
28	554	557.143	560
29	560	563.143	566
30	566	569.143	572
31	572	575.143	578
32	578	581.143	584
33	584	587.143	590
34	590	593.143	596
35	596	599.143	602
36	602	605.143	608
37	608	611.143	614

Brail Air Channel			
Ch.	Frequency		
	Start	Center	End
38	614	617.143	620
39	620	623.143	626
40	626	629.143	632
41	632	635.143	638
42	638	641.143	644
43	644	647.143	650
44	650	653.143	656
45	656	659.143	662
46	662	665.143	668
47	668	671.143	674
48	674	677.143	680
49	680	683.143	686
50	686	689.143	692
51	692	695.143	698
52	698	701.143	704
53	704	707.143	710
54	710	713.143	716
55	716	719.143	722
56	722	725.143	728
57	728	731.143	734
58	734	737.143	740
59	740	743.143	746
60	746	749.143	752
61	752	755.143	758
62	758	761.143	764
63	764	767.143	770
64	770	773.143	776
65	776	779.143	782
66	782	785.143	788
67	788	791.143	794
68	794	797.143	800
69	800	803.143	806

Table 1 Brazil 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 Code Rate

ZATECH IP SERVICES V.V.D.