

Digital Satellite Receiver

GX6107 Twin Tuner

User's Guide

Preface

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Limitation of Liability

While reasonable efforts have been made to ensure the accuracy of this manual, the manufacturer and distributor assume no liability resulting from errors or omissions in this manual, or from the use of the information contained herein.

Federal Communications Commission Radio Frequency Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: 1. This device may not cause harmful interference; and 2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced Notebook technician for help.

NOTE:FCC Radiation Exposure Statement:This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

NOTE: Changes or modifications not expressly approved by FG DIGITAL TEKNOLOJILER ELEKTRONIK could void the user's authority to operate the equipment.

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Safety Precaution

This STB has been designed and manufactured to satisfy the international safety standards. Please read the following safety precautions carefully before operating this receiver.

■ Main Supply:

Before operating, please check the units operating voltage is 90~250V AC 50/60Hz.

■ Overload:

Do not overload a wall outlet, extension cord or adapter, neither use damaged power cord or touch it with wet hand as this may result in electric shock.

■ Liquid:

The receiver shall not be exposed to dripping or splashing water, and that no objects filled with liquids, such as base, shall be placed on the apparatus.

■ Ventilation:

Keep the slots on top of the receiver uncover to allow sufficient airflow to the unit. Do not put the receiver on soft furnishings or carpets. Do not expose the receiver to direct light or do not place it near a heater or in humid conditions. Do not stack other electronic equipments on top of the receiver.

■ Cleaning:

Plug out the receiver from the wall outlet before cleaning. Clean the receiver by a soft cloth or mild solution of washing-up liquid (no solvents).

■ Connection:

Disconnect the receiver from the mains when you connect it to satellite LNB or disconnect it from LNB. Failure would possibly cause damage to the LNB.

■ Location:

Put the receiver indoor in order to avoid lightening, raining or sunlight.

■ Uncover:

Do not remove the cover, to reduce the risk of electric shock. Contact qualified and licensed service personnel to repair the receiver, or contact your dealer.

1. Reference

1.1 General Features

- MPEG-2 Digital and Fully DVB-S Compliant
- SCPC/MCPC Receivable from C/KU-Band Satellite
- User Friendly OSD Menu with Full Function
- Installation by Easy Setup Guide
- 100 Satellites, 4000 Transponders, 6100 Channels.
- Brilliant On Screen Graphic
- Small Picture in Graphic and Zoom in Function
- 8 Favorite Groups and Parent Lock Function
- EPG, Including 7 Days Epg and Timer
- Supports DiSEqC 1.0/1.2 and 22KHz Tone
- Fast Channel Switching
- 256 Color graphic user interface
- High Sensitivity QPSK Tuner and Demodulator
- Network Search/ Blind Search/Easy Tunning
- Multi Language (Menu/Audio)
- Support 32 Audio PID (Language)
- USB and Rs232 port for Additional Information Service and Upgrading Software.
- Supports DVB and TTX subtitles.
- Supper fast 800 pages OSD Teletext supported
- Twin tuner
- LNB Power Overload Protection
- Digital audio support with AC3.
- Picture in Picture, Multi Picture Selection(4/9/10/12/13/16)
- View Jpeg/Bmp, Play *.dat, *.mpg, *.vob and mp3
- Support USB
- PVR: Time Shift and PIP
- Ethernet
- HDMI Output, Support Ypbpr
- CA
- Update Via SDX (www.satcodx.com)

1.2 Accessories

- A/V Cable
- Batteries
- Users manual
- Remote Control Unit

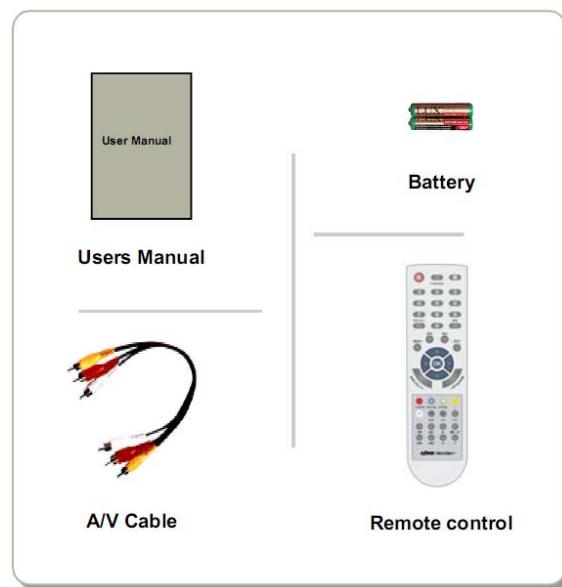


Figure 1. Accessories

2. Basic Function

2.1 Front Panel



Figure 2. Front Panel

1. Power Button

The **POWER** button is used to turn the power on or to make it on Standby Mode.

2. Power LED

Power indicator.

3. Signal LED

Signal indicator.

4. Display (4-digi 7-segment)

4-digi displays channel information. In Standby mode the 7-segment displays local time.

5. MENU Button

Activate the main menu in viewing mode, or exit all menu.

6. OK Button

Activate the highlighted sub menu in menu mode and activate the channel list in viewing mode.

7. CH+ / CH- Button

Change channel in viewing mode and move the cursor up/down in menu mode.

8. VOL+/ VOL- Button

Increase / decrease the volume in viewing mode and change settings in menu mode.

2.2 Rear Panel

Figure 3. Rear Panel

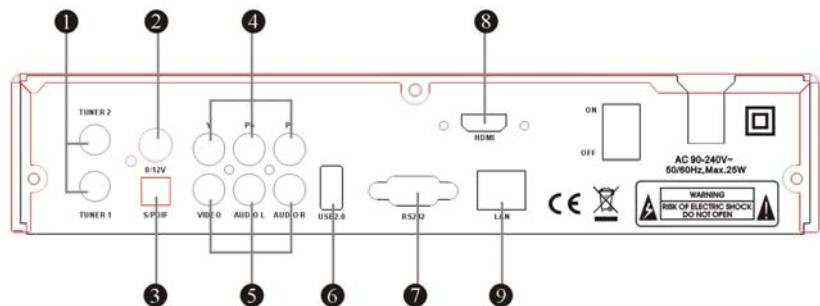


Figure 3. Rear Panel

1. TUNER1/2

Connect the Satellite Dish LNB.

2. 0/12V

Supply 12V DC to other apparatus.

3. S/PDIF

Digital Audio output.

4. Y, Pb, Pr

Components Video.

5. AUDIO, VIDEO

Connect to Audio/Video of TV. Connect Yellow to Video port, connect Red and White to Audio Right and Audio Left.

6. USB2.0

One USB 2.0 Host Port.

7. RS232

Connect to serial port of PC for software upgrade by manufacturer ONLY (Not by user).

8. HDMI

HD signal output.

9. LAN

Network Interface.

2.3 Remote Control Unit(RCU)

You can control this receiver by this remote controller with full function.

1. POWER:  Switch the receiver on or off.

2.TV/R: Switch between TV and RADIO.

3. MUTE:  Turn the sound On/Off.

4. NUMERIC KEY (0~9):

Change program or input number

5. RECALL:

Move to the previous viewed channel.

6. SAT:

Show the scanned satellite list.

7. MENU:

Activate main menu or exit to live channel.

8. EPG (Electronic Program Guide):

Show the TV/Radio program guide.

9. FAV:

To get favorite channel list you set before.

10. EXIT:

Exit current menu step by step.

11. CH◀ / ▶ :

Change program.

12. VOL ▼ / ▲ :

Change volume in viewing mode.

13. PAGE+/-

Page up/down on menu.

14. OK:

Confirm the highlighted menu item.

Open the program list.



Figure 4. Remote Control Unit

15. AUDIO : Select or change the Audio.

16. PAUSE: Freeze the picture.

17. ZOOM: Picture Zooming function.

18. INFO (i):

Show the information of the current channel.

19.F1: No Function

20 F2 SUB:

Showing Subtitle information if the channel contains.

21. F3: Activate Multi picture menu and select picture.

22. TXT:

Show the teletext content if teletext is transmitted.

23. ►►: Fast forward.

24. ◀◀: Fast backward.

25. ►: Start playing / Release pause.

26. ■/USB : Enter USB/Stop recording.

27. I◀◀ : Play previous item.

28. ►► I: Play next item.

29. I I: Pause/time shift.

30. ●: Start recording.

3. Installation and Connection

The following diagram shows you the connections among receiver, TV, LNB and other equipment, please read this first if you are not sure about the connection, and it will guide you to the correct connection.

3.1 Connecting to TV

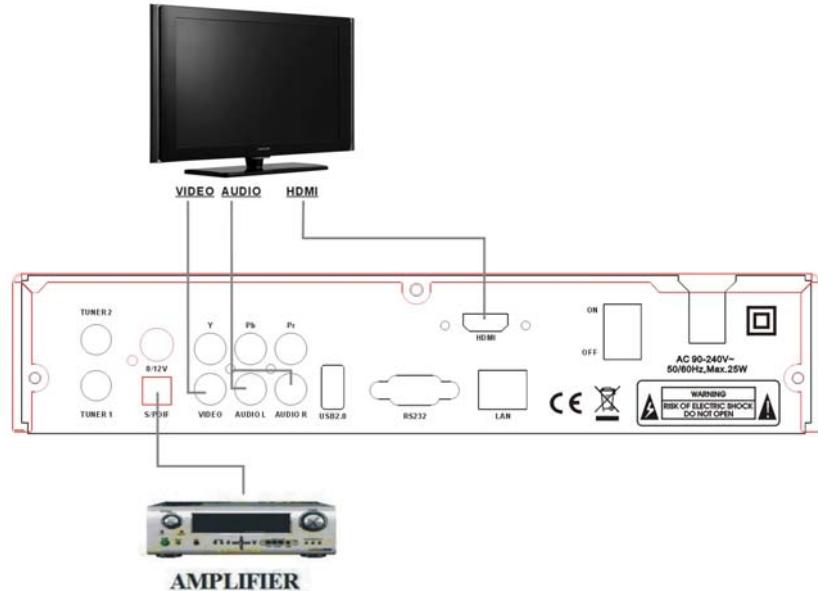


Figure 5. Connecting to TV

3.2 Connecting to Dish LNB

You can connect one fixed dish LNB directly to the LNB IN, or connect at least two dish LNB by DiSEqC Switch, you can also connect to HH mount dish LNB.

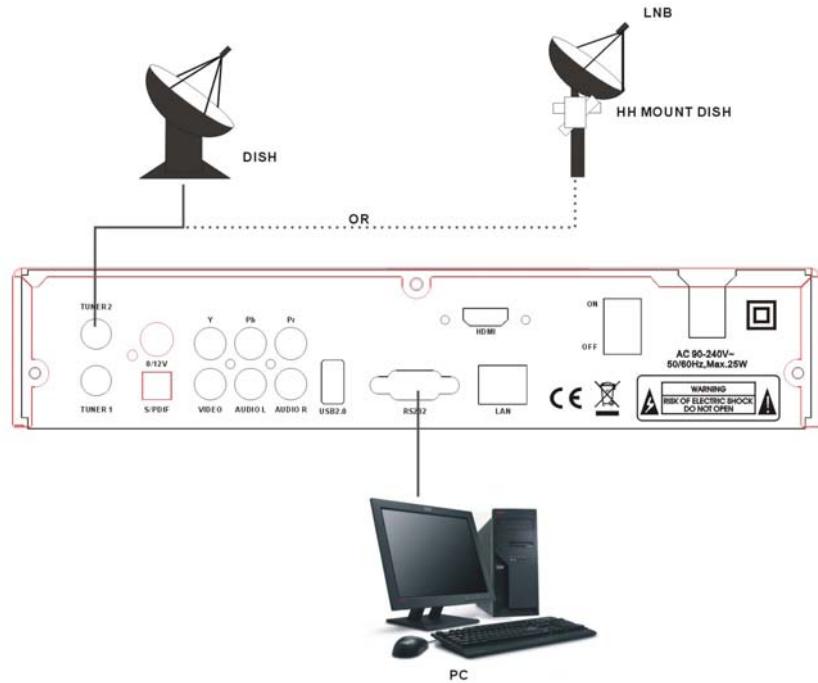


Figure 6. Connecting to Dish LNB

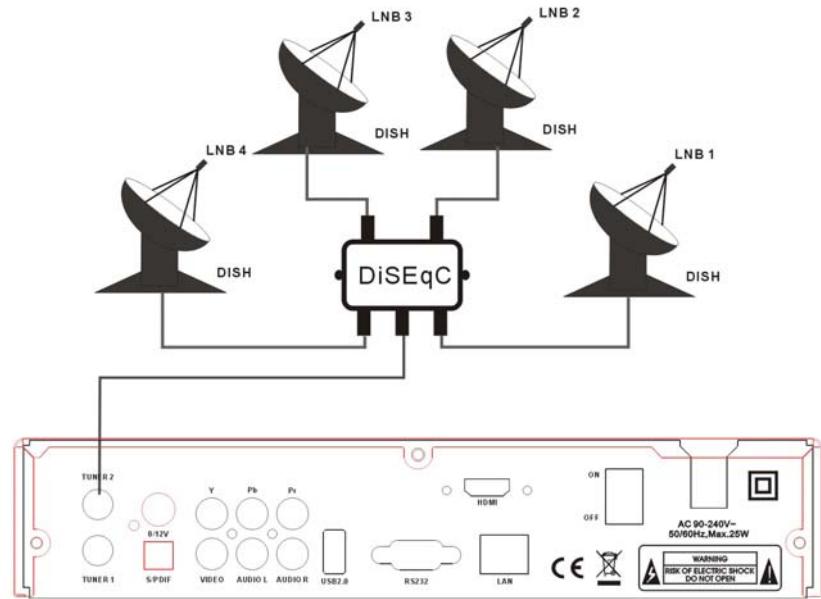


Figure 7. Connecting to Dish LNB

4. Installation and Operation

After connecting the receiver to other required equipment, turn on the receiver, there should be no channel information available at the first startup; you need to follow the procedure to setup your receiver to search the channel

--Main Menu--

Press MENU button to activate main menu, main menu consists of Installation, service organization, STB setting, STB status, USB Menu, Ethernet Setting, CA Menu.

 Use UP/DOWN button to select your subject and press OK to confirm your selection and enter that sub menu, press EXIT button you can return to the previous menu.

4.1 Installation

Select Installation, press OK button to activate Installation menu, the Installation window will be displayed.



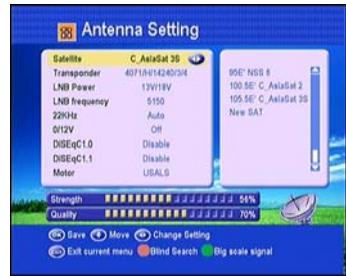
4.1.1 Antenna Setting

Press OK to Enter Antenna Setting; here you can make Satellite Search, TP search, blind Search and other Functions.



a: Satellite List

Enter this picture, you can see the presorted Satellite list, in this menu, you can press the UP/DOWN keys choose the satellite which you want to use, then press the OK to confirm the setting, you can setting other parameters.



b: Transponder List

If you change the satellite, the transponder will be changed automatically. You will find the transponder list of selected satellite here. Choose TP which you want to use, then press the OK to confirm the setting, you can setting other parameters.



c: LNB frequency and power

Here you need to check the LNB frequency according to your antenna, set the correct frequency or define yourself, and keep LNB power to be 13/18V.

d: 22KHz

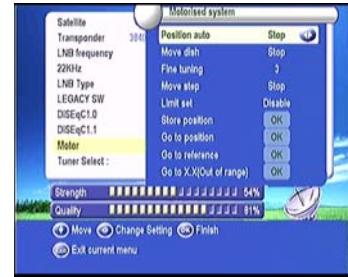
In case you are using two antennas connected to a 22KHz tone switch box. You can supply either 22KHz by setting "ON" or "OFF" to select antenna.

e: DiSEqC1.0 DiSEqC1.1

If you connect antenna to DiSEqC Switch, you need to specify the DiSEqC input to which your selected satellite have been configured.

f :Motor

When you Enable this option, and press OK, you will get this window to show you how to adjust position of the dish.



➤Move Auto [W/E]

Press RIGHT/LEFT button, the dish will be

motorized to East/West

continuously, it will stop until it find the best signal.

➤Move west-east

Push RIGHT/LEFT button, the dish will be motorized to East/West step by step until you find the best signal showed on the signal bar.

➤Fine Tuning(1)

Input digital button to set the moving step; Press RIGHT/LEFT button to move steps.

➤Store Position

Save the current position you searched.

➤Go to Position

Press OK button to move the dish to the stored position.

➤Go to Reference

Press OK button to move the dish to 0 position.

Press Exist after setup, and you can search channel now

➤Set West Limit

Enable West limit.

➤Set East Limit

Enable East limit.

➤Disable Limit

Disable West limit and East limit.

USALS: If you use USALS and select the Motor Mode to USALS, here one more option you can move the dish to exact position of the satellite.

g:Tuner Select

Enter this menu, select tuner which one you input the signal, tuner1 or tuner2 supply change

NOTE: If you don't know any message about the satellite you can press the RED key using blind search.

4.1.2 Automatic Satellites Search

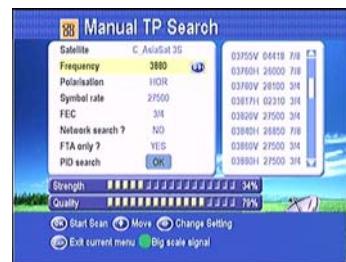
Selecting one satellite, and press OK to mark, you can select more satellite at this time, but make sure they are all configured to your DiSEqC Switch, after this step , select all channel scan, free channel scan or blind search, Pressing OK will start searching, During searching



the TV Channel and Radio Channel will be listed separately.

4.1.3 Manual TP Search

Here you need to select one satellite which your dish pointed, then select the frequency, you need to setup the Polarization of that selected transponder, symbol rate, FEC,Network search (if the transponder contains this function), if you know the PID figure for that channel, you can input and search by this way.



4.1.4 Transfer Data

Here you can transfer main sw or channel data from pc to STB



FTP Download

VFTP download some receiver like message, sw, channel list, so you should connect the Ethernet, then connect FTP severs.



4.1.5 Reset Factory Default

You can erase all the channels and settings you made by selecting ALL, if you only want to erase the channels you searched and stored, please select Channel List. You also can save or load channels



4.1.6 USALS Setup

You can setup the Dish position to the satellite you want to search, you need to check the detailed information from internet and input the accurate parameters about your local position.



4.2 Service Organizing

Enter the service organizing; you can set channel fav, edit channels, like lock, rename, delete, and so on.



4.2.1 Edit Favorites

Here you can select your favorite channel and mark them set 8 fav, Press the FAV button, you can classify the favorites categories.



4.2.2 Edit Channels

In this menu you can delete, rename, lock and move the selected channel.



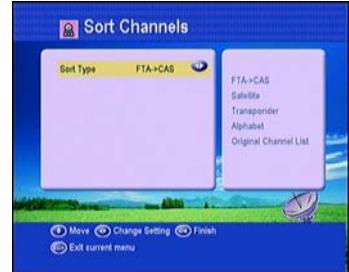
4.2.3 Remove Satellite

Select one satellite and press OK to mark, after you exit this menu, you will be asked to confirm whether delete the satellite or not. If you select YES, all the channels in the selected satellite will be deleted.



4.2.4 Sort channels

You can sort the channels in different sequence; press OK on viewing mode you can check the sorting result..



4.2.5 Edit Transponder list

Here if you press OK on the left you can rename Delete, Move, and Add satellite. If you are on the right and press OK, you can Delete, Edit and add transponder.



4.3 STB Setting

Here you can setup Menu Language, audio Language, TV output and Time setting according to your country.



4.3.1 Output Setting

You can setup TV type PAL/NTSC, select TV screen mode either 4:3 or 16:9 according to the TV type and choose Scart output either CVBS or RGB according to the Standard of your country. You also can set the video change.



4.3.2 Parent Lock

This function prevents children or unauthorized persons from watching programs. You can select if need the password or not for Installation, Service and System, also you can change the Password, the default password is 0000.. When you choose yes, you can "change the password option to unlock or lock some menu enter.



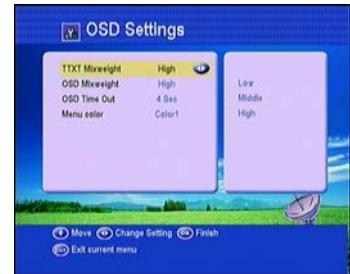
4.3.3 Language Setting

You can setup the menu language, audio language according to the standard of your country.



4.3.4 OSD Setting

Here you can setup the menu background, transparency and color, and help information for menu, Time out means the duration of the information bar.



4.3.5 Timer Setting

Here you can set Timer, Event Timer and Sleep Timer.

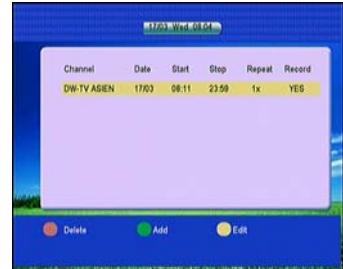
a: Time Setting

The default time setup is auto, you can select manual and input the by hand, select the time zone according you country and you will get the correct current time which is based on TDT (Time and Data Table) in the stream of the current channel service.



b: Event Timer

Here you can set your favorite channel to begin broadcasting at future time you set, including both TV and Radio, you can add, edit and delete the event you set.



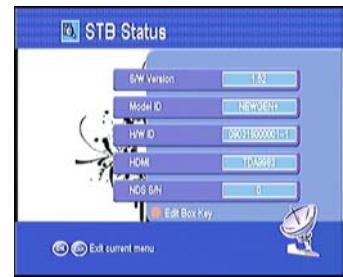
c: Sleep Timer

Here you can set Sleep timer and this will enable receiver to sleep automatically according to the time you set.



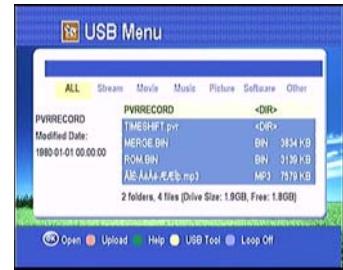
4.4 STB Status

In this window, you can get the information about the STB, such as product name, software & hardware ver, loader ver and so on. When you need service from the dealer you need to submit this information in order to get the correct and fast after sales service.



4.5 USB menu

Press USB key to enter USB menu. The current directory path display on the top part of the menu. The default file list is composed of all files and subfolders in the current path.



All supported files can be opened by pressing "OK" key, and these files such as *.mp3, *.jpg, *.bmp, *.dat, *.mpg, *.VOB, can also be opened by pressing ▶ key.

- 1) Press ◀ / ▶ key to switch to a specific file list of the current folder
- 2) Press OK key to play the selected file

- 1) Press Blue button change loop off/on.
- 2) Press Green button get help message.
- 3) Press RED button upload the software.
- 4) Press the Yellow key, enter USB tool, you can rename & delete & move the file or format the disk and other's function, select one which you want.



A-1 : Play Stream

- **OK** : View play list / Play the selected file in play list
- **▶** : Play the selected file in play list / Resume playing file
- **■** : Stop playing file
- **◀◀** : Play the previous item
- **▶▶** : Play the next item
- **II / PAUSE** : Pause
- **◀ / ▶** : Adjust volume
- **EXIT** : Exit play list menu / Exit playing state and return to file list menu.

A-2 : Play Movie

- **OK** : View play list / Play the selected file in play list
- **▶** : Play the selected file in play list
- **■** : Stop playing
- **II / PAUSE** : Pause
- **◀◀** : Fast backward
- **▶▶** : Fast forward
- **◀◀** : Play the previous item
- **▶▶** : Play the next item
- **EXIT** : Exit playing state and return to file list menu

A-3: Play Music

- **OK** : View play list / Play the selected file in play list
- **▶** : Play the selected file in play list
- **■** : Stop playing
- **II / PAUSE** : Pause
- **◀◀** : Fast backward
- **▶▶** : Fast forward
- **◀◀** : Play the previous item
- **▶▶** : Play the next item
- **EXIT** : Exit playing state and return to file list menu

A-4: View picture

- **OK** : View play list / Play the selected file in play list
- **◀◀** : Play the previous item

- ►►| : Play the next item
- ▲/▼ : Play the previous/ next item
- **EXIT** : Exit playing state and return to file list menu

A-5: Download Software/Database

- 1) Press **◀ / ▶** key to switch to “Software” file list of the current folder
- 2) Press **OK** key to open and download the selected file

USB PVR:

If the event timer record status is YES, the channel will be recorded in PIP mode .Use USB devices such as USB memory stick, or USB interface hard-disk drive (HDD) with this receiver, the start time is coming, For example, A is currently view, B set to recording, you will be meet two situation



- 1)A and B are same channels, the view will be play/record at the same time.
- 2) A and B under same TP, the view will be play A channel, and recording B at same time.

In any way you set record as what is said above, Watching one channel and recording another channel you can switch the channel

4.6 Ethernet Setting

Enter this view, you can set some net parameter. press the Green key, start auto search IP, the receiver will reboot. Press Blue key, change the net port, and press Red key can set IP by hand



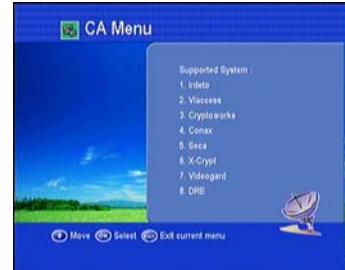
4.6.1 IP Setting

press the Green key, start auto search IP, the receiver will reboot. Press Blue key, change the net port, and press Red key can set IP by hand



4.7 CA Menu

Press OK enter the CA menu in this view, you can find some CA message

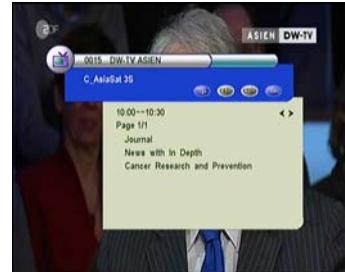


4.8 Other Useful Information

This will guide you on how to use general info while watching TV program or listening Radio program.

➤ **i:**

In the viewing mode when you press **INFO** button, the info bar will pop up, it contains satellite and channel information, detailed EPG info will display in the menu if press **INFO** again.



➤ **SAT**

Press **SAT** button on the remote control, you will get this menu which contains the satellites you searched and stored, select one satellite and press **OK**, all channels will be listed under that satellite you selected



➤ Recall

Press **Recall** button and you can get the viewed history channel. maximum it can list channels that you recently viewed.



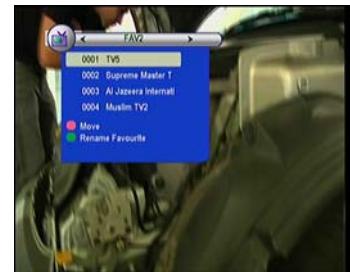
➤ ZOOM

Picture zooming function.



➤ Fav

In viewing mode, you can get the favorite channel group by pressing FAV, press **◀/▶** to change category. Press RED Key you can move the channels. Press GREEN key you can rename favors



➤ EPG

Press EPG button on remote control, you can get the electronic program guide if pliable. You can get the detailed information bout that program by pressing INFO. Press RED key to go to timer Active, timer Active's operation similar to the above Event Timer's functions.

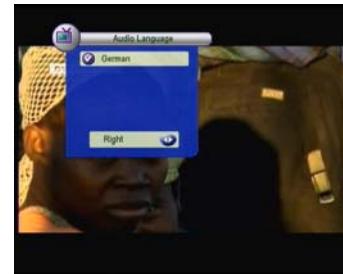


- You can Switch Day EPG and Weekly EPG by Pressing Green Key. In this menu, press Right/Left button, you can view the different time EPG of one day. In the end, you can get the detailed information about that program by pressing INFO Key.



➤ AUDIO

In viewing mode press AUDIO button and you will get this window. You can set the Audio mode here.(stereo, left, right).



➤ Channel List-OK

In viewing mode press OK button and you will get this window. Press **◀ / ▶** to view channel in different type, ALL, FTA, Scramble.



- 1) Press the Red button, you can put in the channel name and quickly find the channel you want .
- 2) Press the Green button; you can watch the channels sort by alphabet A-Z

➤ TXT:

Show the teletext content if teletext is transmitted.



➤ Recording

Press the ● Start recording, you will be asked record the current channel ,select "YES" or "NO" of you mind, when you select yes ,enter the USB recording, press F1 button then you can view the current channel in big window and selected channel in small windows



In this menu, some special operation like this.

- 1)press F1 button. enter PIP menu,
- 2)Press F1/F2 button ,zoom in/out the small picture.
- 3)Press ◀ / ▶ or ▾ / ▷ move small windows.
- 4)Press INFO button, show or hide the info bar

➤Time shift

Press the **pause** button, enter the time shift function. can pause and resume a live television program, and even rewind and replay it. When you are watching a program and you miss something, you can rewind and replay it. Or when your attention is needed elsewhere, you can pause it and resume it a short time later without losing any of it. When you do this, you are no longer watching the live program; instead you are watching a delayed presentation of it. This is called time shifted television., you can skip commercials until you catch up to the live broadcast.



With time shift enabled, the following operations are possible: To go back in time, hold down the **◀◀** button; to go forward, hold down the **▶▶** button.

■ Press the pause button again, pause the channels

■ Press the Exit button, you will be asked whether exit or save the program data, select yes or no you want.



5. Additional Information

5.1 Problem Solving

You might meet abnormal working of this STB with various reasons, check the following which may help you.

Problem	Possible causes	What to do
LED on the front panel fail to light up/is not lit.	Mains supply cable is not connected.	Check if the mains supply cable is plugged into the power socket.
No picture or sound.	Satellite dish is not aiming to satellite accurately. No signal or weak signal. The LNB is faulty. The cable is faulty.	Adjust the dish. Check the signal strength indicator in one of the channel search submenus. Check the cable connections, LNB and other equipment connected to LNB & receiver, or adjust dish. Replace the LNB. Replace the cable.
Bad picture/blocking error.	Satellite dish is not aiming to the satellite accurately Signal too strong. Satellite dish is too small. LNB noise factor too high. The LNB is faulty.	Adjust the dish. Connect a attenuator to LNB input. Change to a larger dish. Change LNB with lower noise factor. Replace the LNB.
No startup menu on screen after turning on STB for the first time.	The system is connected by SCART cables and the TV is not in AV/EXT mode.	Switch the TV to the appropriate AV input.
The remote control is not working.	Battery exhausted. Remote control is not aimed correctly STB is in standby mode.	Change the batteries (both). Aim the remote control at the STB. Check that nothing blocks the front panel. Check if LED indicator on the front panel is showing the time, press the power button to switch off standby mode.
You have forgotten your password.		Contact the dealer or Service Provider. They will help you set it up again.
Poor picture quality or Less channels in scanning.	Low LNB power or singal loss in cable.	Change the LNB power to 14V/19V in Antenna setup menu.

5.2 Technical Specification Tuner & Demodulator

Frequency Range	950 MHz to 2150 MHz
Input Connector	F-type, IEC 169-24, Female
Signal Level	-25 to -65 dBm
RF Impedance	75 Ω, unbalanced
IF Band width	55 MHz/8Hz(Per 5Msps)
LNB Power &	Vertical : +13 V, 14V +/-5%
Polarization	Horizontal : +18 V, 19V+/-5% Current : 500 mA Max. Overload Protection
LNB Tone Switch	22KHz+/-2KHz, 0.6Vpp+/-0.2V
DiSEqC Control	Version 1.0/1.2 Compatible, Tone burst A/B
Demodulation	QPSK
Symbol Rate	1~45Ms/s/SCPC,MCPC
FEC Decode	Convolution Code Rate 1/2, 2/3, 3/4, 5/6 and 7/8 with Constraint Length K=7

MPEG

Transport Stream	MPEG-2 ISO/IEC 13818 Transport stream specification
Profile Level	MPEG-2 MP@ML
Input Rate	15 Mbit/s Max
Aspect Ratio	4:3, 16:9
Video Resolution	720 x 576(PAL), 720*480(NTSC)
Audio Decoding	MPEG/Musical Layer I & II
Audio Mode	Single channel/Dual channel/Joint stereo/Stereo
Sampling	32, 44.1 and 48 KHz

A/V and Data In/Out Connector

TV SCART	RGB, CVBS, L, R out
VCR SCART	CVBS, L, R out, AUDIO L, R.
3RCA	AUDIO L, R. VIDEO out.
RS-232C	RS232C D-sub male type.
LNB IF Input	F type, IEC 169-24 Female
LNB IF Output	F type, IEC 169-24 Female

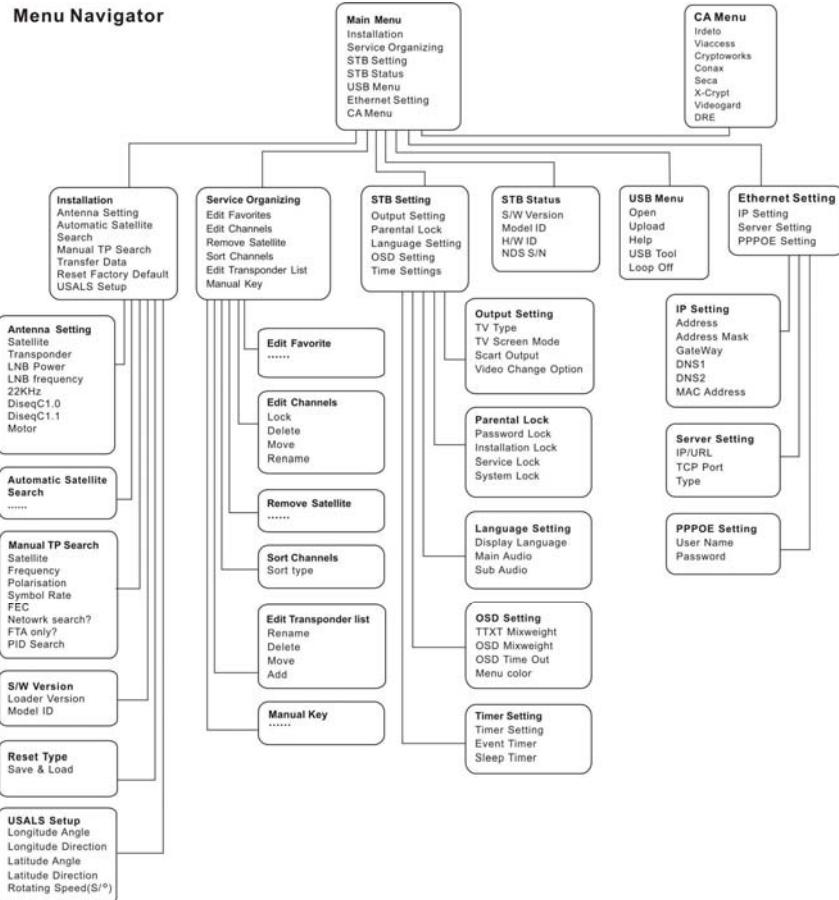
Power Supply

Input Voltage	90 - 240V AC, 50/60 Hz
Power Consumption	Max. 25 W
Protection	Separate internal fuse. Input shall have lightning Protection

Physical Specification

Weight (Net)	Around 2.0 kg
Operating Temp	0°C + 40°C
Storage Temp	-40°C to + 65°C

5.3 Menu Screen Structure



5.4 Glossary

Antenna

A device that collects and radiates electromagnetic waves. Includes a satellite dish and broadband antenna.

DiSEqC

DiSEqC(Digital Satellite Equipment Control)system, it is a communication bus between satellite receivers and peripheral equipment using only the existing coaxial cable.

DVB

The Digital Video Broadcast group was created to establish a technical framework for the introduction of digital video broadcasting systems.

LNB (low-noise block converter) or LNBf

An electronic unit mounted on the satellite dish. It receives the signals reflected by the dish and converts them to signals that can be used by the digital satellite receiver.

GHz

The prefix giga means milliard, and Hertz means cycles per second. Signals in the GHz range are often called microwaves.

MHz

The prefix mega means million, and Hertz means cycles per second.

MPEG

Moving Picture Experts Group. Established by the International Standards Organization to provide the basis for a picture coding and compression system.

Forward Error Correction(FEC)

A system of error control for data transmission.

■ **PID(Packet Identifier)**

A set of numbers that identifies transport stream packets containing data from a single data stream.

■ **Polarization**

Polarization allows several programmers to be fit into the same frequency band. The signals from a satellite are transmitted either with linear (vertical or horizontal) polarization or circular (right or left) polarization.

■ **QPSK(Quaternary Phase Shift Keying)**

Phase-shift keying in which four different phase angles are used.

■ **Transponder**

An automatic device that receives, amplifies and retransmits a signal on a different frequency.

■ **Symbol rate**

Speed of the digital transmission

■ **Scrambled TV programmer**

Some TV programmers are transmitted in scrambled form.

■ **SERIAL RS 232**

A serial communication standard data port.