



World First LINUX O/S Twin Tuner PVR

Connecting People To Digital Home Entertainment



0. GENERAL INFORMATION

Thank you for purchasing the PVR (Personal Video Recorder). This PVR is the world 1st Twin Tuner PVR based on LINUX O/S. This product is fully compliant with the DVB standards and transmits digital broadcasting service directly to your TV through the various satellites and record those programs and enjoying trick play.

You can notice that every operation of the PVR is based on a dynamic and user-friendly user interface and menus. The PVR is easy to use and adaptable for future upgrade. The software is to be upgraded continuously to improve the functionality. Also new utilities for easy control of system setup and user manual are to be upgraded together.

1. SAFETY INFORMATION

Please read the following recommended safety cautions carefully for your safety

- Main Supply: 110-220 Vac 50/60Hz 50W
- Allow clear space around the PVR for sufficient ventilation.
- Never place the PVR on soft furnishing or carpet.
- Do not stack other electronic equipment on top of the PVR.
- Use a soft/dry cloth and a mild solution to clean the exterior of the PVR.
- Never allow liquids. The inside of the PVR shall not be exposed to dripping, spray or other objects filled with liquids.
- Do not use any attachments that are not recommended.
- Do not allow the unit to be exposed hot, cold or humid conditions.
- Service should be carried out only at a qualified service agent.
- Do not connect or modify cables when the PVR is plugged in.
- Do not remove the cover.

2.HOW TO USE THIS MANUAL

This manual provides complete instructions for installing and using the PVR. The following symbols will serve as follows.

Symbol	Explanation
1. MENU (Capital & Bold)	Represents Main Menu category.
1.1. Menu(Bold)	Represents a sub-category of the main menu
1.1.1. Menu	Indicates a selectable option in a sub-category.


Please do not open or change any part or option of this menu without full understanding or skillful installer's guidance.

Press the MENU key on the RCU (Remote Control Unit) to make the main menu appeared.

In some menus, you are asked to put the PIN (Personal Identification Number) code as a password.

Factory default password is '0000'. Press PIN code by numeric buttons on the RCU.

2.1 How to move the cursor


Use  the Navigation Button.

UP and Down Direction button: Navigate the cursor Upwards and Downwards.

Left and Right Direction button: Navigate the cursor left and right

2.2 How to select an option

OSD(On Screen Display)- menus are supported to navigate the functions or options with these

 buttons. Use these buttons to reach the targeted option or function. To select desired option or function, press OK button.

2.3 How to use the virtual keyboard

In some menus, you are asked to put the alphabetical characters by

the virtual keyboard. Move the cursor by using these buttons . Select each alphabet character you want type by pressing OK button. Once it is complete, move the cursor on the Enter key on the virtual keyboard, press it to save it.



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3. BEFORE YOU BEGIN

3.1 Advanced Features

- Application and Expansion.
LINUX O/S enables ultimate applications and expansions to fulfill the customer's need.
- Max. Two Channels Recording and One Prerecorded File Playback.
Simultaneous Double Descrambling with Viaccess CAM.
- Playback without CAM
Playback on prerecorded scrambled program without CAM
- Almost Unlimited Channel Memory up to 10,000 channels
- Variable HDD Size is Applicable for production up to 250GB or above
- Enhanced Search Channel Option
Search by all satellite
Search by satellite/ network
Search by all TP scanning
- Unlimited Trick Play
Unlimited trick play on any of Real Time Live Programs/ Recording Program/ Prerecorded Program.
- Smart EPG
Automatically updates Program Info. EPG shows all Satellites' Program Guide
Search programs by Genre on the EPG
- Enhanced Recording Plan by timer setting/ EPG

- USB 1.1 Supported for PC connection/ enhanced program utility/Prerecorded files uploads to PC
- Ethernet Port Supported

NOTICE

Normally, a CI CAM works for descrambling on one channel at a time. To descramble two different channels simultaneously, it requires two modules at same time. (Proper CAM and smart card required for the channels that you wish to watch, check the channel encryption)

Exceptionally, Viaccess CAM works for dual descrambling simultaneously with only one VIACCESS CAM.

4. THE CONTENTS OF THE BOX

Please make sure that the following items are included in the Package.

- PVR main unit
- Remote Control Unit
- 2 Batteries (size AAA **ALKALINE**)
- Operation Manual

5. REMOTE CONTROL UNIT (UNIVERSAL TYPE)



To switch On / Off



For Mute



To make RCU respond to TV set



To make RCU respond to STB



To toggle between TV and Radio mode



To recall previous channel when you watch a live program or Switch into LIVE program or RECORDING channel or a prerecorded FILE



To record a selected program.

TV mode: it allows you to switch input modes.



P/Pg



To move Page up / down in the OSD (On Screen Display)

TV mode: channel up /down



To increase and decrease the volume



To go to Electronic Program Guide (EPG)



To manage prerecorded programs (Files). You can see prerecorded TV/Radio program list and reserved recording plans.



To manage the Favorite channel list.



To go to Main menu and move back to previous page.



Navigation-Buttons enable to make channel Up & Down on the live channels and move the cursor Up & Down in the OSD-menu. Also to make volume increased & decreased on the channels watching mode and move the cursor left & right in the OSD-Menu.



To exit from the OSD-menu or to go back to previous menu.



To make Bookmarks on the File progressing time bar (find on the channel Information

banner)



To display program information Bar



To select options /To bring up the Channel List.



To stop a File playback or a recording program



To play recorded files / Catch up for real time live point



To pause the screen



For Fast reverse or random play



For Fast forward or Random play



For Slow motion forward or Frame-by-Frame Play



For Section Repeat between the position by Bookmark in File playback and for teletext in program watching mode



To select alternative audio options



To display subtitle



To go to Multifeed, press this MultiFeed button once



5.1. Programming the remote control for your TV set.

This Universal type remote control works for both TV and PVR.

There are two ways to program the remote control; Automatic Code Search and Direct Entry.

5.1.1 Using automatic code search

1. Turn on the component (TV) you want to control.
2. Press and hold the TV button until the LED (TV button) turns on red, then release the key.
3. Point the remote at the component (TV), press and release the UP (▲) button, and then wait three seconds or until the LED stops flashing.

At this point the remote control is searching for the correct code to program. If, after three seconds, the component (TV) you want to control does not turn off, press and release UP (▲) button again to make the remote to search the next set of codes.

4. If the component you want to control does turn off; Press and release OK button, then the LED blinks three times.

5.1.2. Using direct entry method

1. Turn on the component (TV) you want to control.
2. Locate the Code List (refer to code list on the page 59). Find your TV brand that you want to control.
3. Press and hold the TV button until the LED on the remote control turns on red, then release the key.
4. Enter 3-digit code from the code list, then the LED blinks three times.
5. If you get no response, repeat these steps using the next code listed for your TV brand until the component responds to the remote control command.

5.1.3. Locking the volume control.

Locking the volume controls to a single device makes it easier to control volume, without having an unexpected volume change. If you lock the remote's volume controls to the TV set, you will be always able to change the volume to the level you want, without having adjusting it twice on multiple devices.

If you want to lock the volume for the TV system;

1. Press and hold the **STB** component key until the LED on the remote control turns on.

2. Enter 3-digit code, **9 9 9** .
3. Press and release the **STB** component key, then the LED blinks three times.

5.1.4. Unlocking the volume control.

If you want to unlock the volume for the **STB** component;

1. Press and hold the **STB** button until the LED on the remote control turns on.
2. Enter 3-digit code, **9 9 9** .
3. Press and release the **STB** component key, then the LED blinks three times.

NOTICE

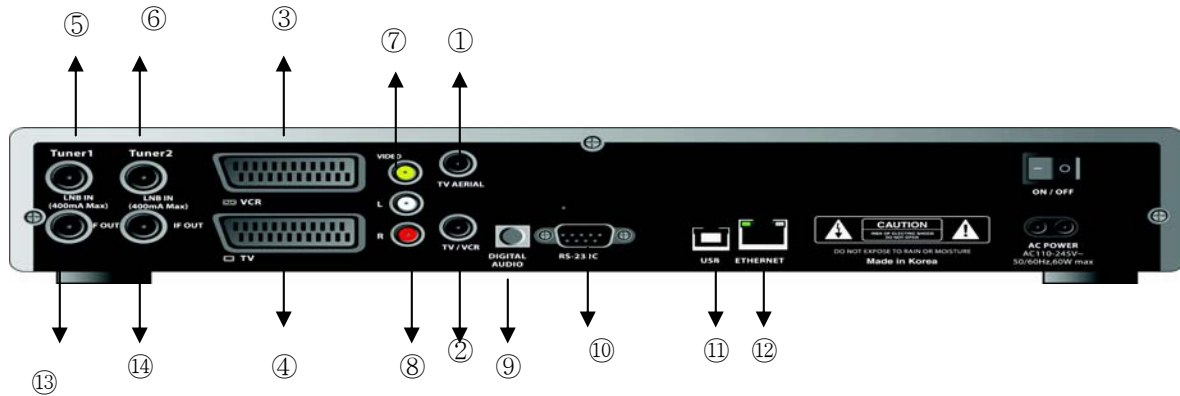
Find the TV brand code list on the page 67.

6. FRONT PANEL



- Two slots for the smart cards
- Two slots for CAM
- VFD (Vacuum Fluorescent Display) with door type front panel
- Displays channel number, error messages, current time and status and remote control commands
- Power On/ Stand by
- Push the button to eject CAM
- Manu Button
- EPG Button
- FILE Button
- OK
- Volume Up
- Volume Down
- Channel Up
- Channel Down

7. REAR PANEL



①TV Aerial

RF IN

②TV antenna

RF OUT

③VCR Scart

④TV Scart

⑤Tuner 1(LNB IN)

⑥Tuner 2(LNB IN)

⑦Video

RCA Video output

⑧Audio L/R

RCA Audio outputs

⑨Digital Audio

⑩Serial

RS232C

⑪USB

To read and load the A/V data

⑫ Ethernet

⑬IF OUT

⑭IF OUT

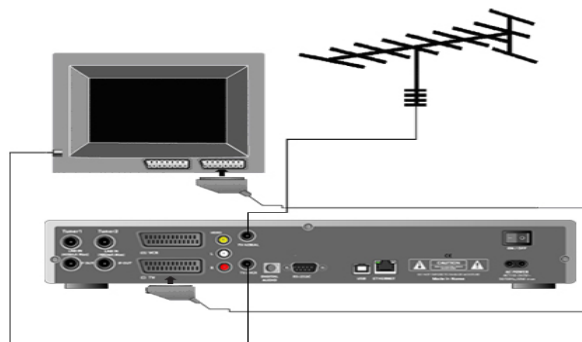
8. INSTALLATION

Most effective and common setting methods are suggested below. Please follow the instructions carefully.

8.1 Connection to TV, VCR and Hi-Fi

8.1.1 Connection to TV with SCART cable

Connect the TV to the PVR with a SCART cable. One end of SCART cable goes into the TV SCART socket and the other end goes into to the SCART socket on the PVR.



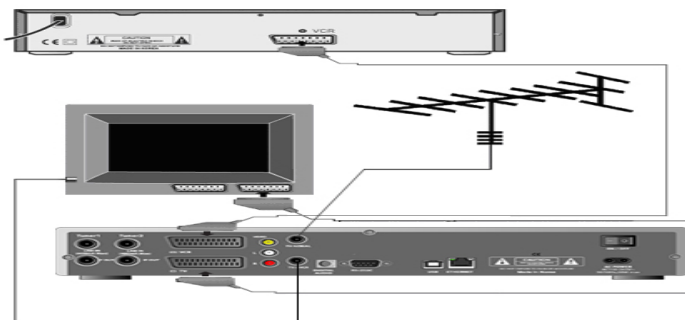
8.1.2 Connection to VCR with RCA and SCART cable

A. Connect the VCR with a SCART CABLE

After connecting the PVR to TV with a SCART cable, connect VCR to the PVR same way that the TV and the PVR connected with SCART cable.

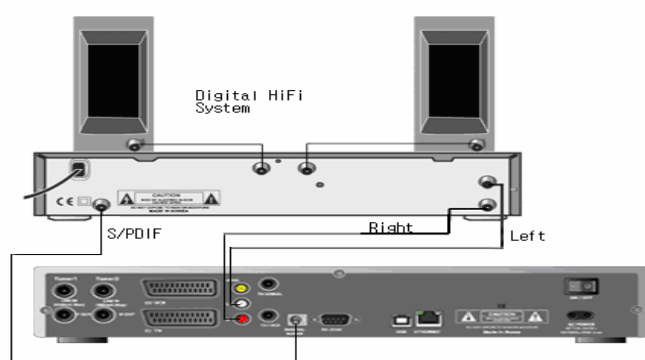
B. Connect the TV to the VCR with RCA cable

Connect one end of RCA (RED: Audio right, White: Audio left, and Yellow: Video) to PVR and the other end of RCA to the TV.



8.1.3 Additional audio connection with Hi-Fi system

Connect one end of RCA stereo cable to the 'AUDIO L/ R' outputs on the PVR and the other end of RCA cable to the Audio L/R inputs on the Hi-Fi system.



8.2 Dish Connection

Most effective and common setting methods are suggested below. Please choose one of these ways to connect the dish-antennas and follow the instructions. Please carefully review the instructions before you install.

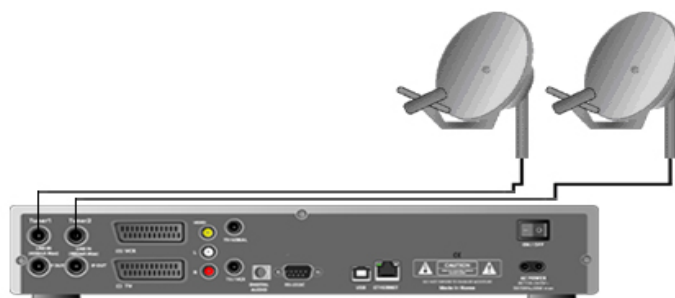
8.2.1 Installing the PVR with two separated antennas.

In the LNB Setting menu, the connection type should be set to “separated.”

Two Satellite antennas are installed separately with a single universal LNB each.

While recording a channel from one Satellite, you can only watch or record channels from the other Satellite.

Caution) To descramble two channels simultaneously, 2 CI Modules are required.



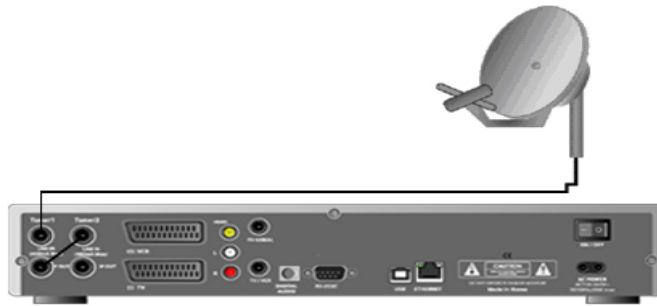
8.2.2 Installing the PVR with one antenna.

In the LNB Setting menu, the connection type should be set to” Loop Through”

Satellite Antenna has to be connected to the first LNB IN (the first one from the left: see the picture below). The second LNB IN and IF OUT (the first one from the left) should be connected with a coaxial cable. If the connection is done opposite way, the PVR will not be able to scan the channels.

A Satellite antenna is installed with one single LNB. When the tuner is reserved for a recording, only the channels from same Polarity group can be watched.

Caution) To descramble two channels simultaneously, 2 CI Modules are required



8.2.3 Installing the PVR with twin LNB Antenna

In the LNB Setting menu, the connection type should be set to “separated”

A Satellite Antenna is installed with twin/dual universal LNB.

While one tuner is reserved for a recording, all other channels can be watched or recordable.

Caution) To descramble two channels simultaneously, 2 CI Modules are required



8.2.4 Installing the PVR with two separated antennas with twin LNB.

In the LNB Setting menu, the connection type should be set to “separated”

Each twin or dual universal LNB is connected to two different Satellite Antennas separately.

While one channel is recorded, all channels from two Satellites can be watched or recorded.

Caution) To descramble two channels simultaneously, 2 CI Modules are required.



9. BEFORE SETTING

9.1 Menu Information

Selectable lines are generally activated (highlighted). No-activated lines are not selectable.

Most of OSD- menus show short information at the bottom of the screen.

9.2 Basic Key Control

With the UP/DOWN direction button you can move the cursor upwards and downwards in the OSD (On Screen Display)- menu. In most of menus, you can search channels with these buttons.

When you have reached the desired option or function, press the OK button to confirm your choice.

In case of changing TV channel you can only press UP/DOWN direction button.

In most of menus, you can select menu items with LEFT/RIGHT direction button.

When you want to return to the previous menu with saving the change, press the MENU Button.

When you want to exit from the current menu, press the EXIT button.

10. GET STARTED FOR THE FIRST TIME

If it is the first time using the PVR, you should set parameters for system configuration and scan the satellites. Follow setup procedure for scanning the satellite. When you have finished the procedure, you can start watching TV or listening to the Radio.

The HDD Preparing time is depends on HDD data size.

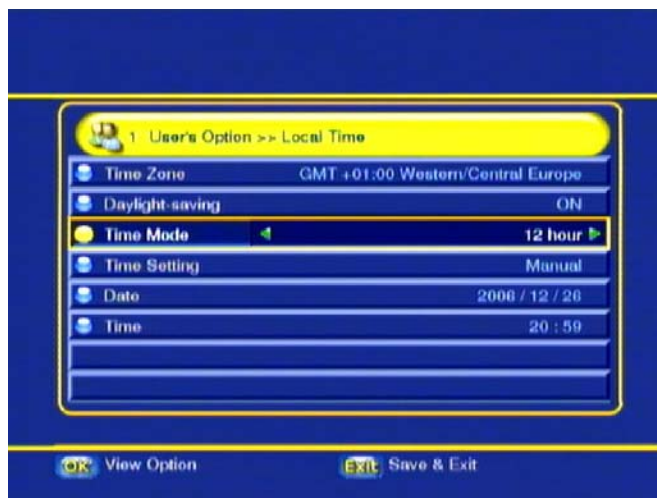
If the power goes off unexpectedly, it may requires certain amounts of time to read HDD depends on the existing prerecorded program size on HDD.

10.1 Switch your TV and PVR On.

The Local Time setting menu will appear automatically.

10.2. Adjusting the local time.

Press LEFT/RIGHT buttons to find your area on Time Zone and select Daylight-saving (summer time) ON or OFF. Also, you can adjust local time manually by directly inputting digits from RCU for your local Date and Time. To save the settings you made, press MENU/ EXIT button on RCU.

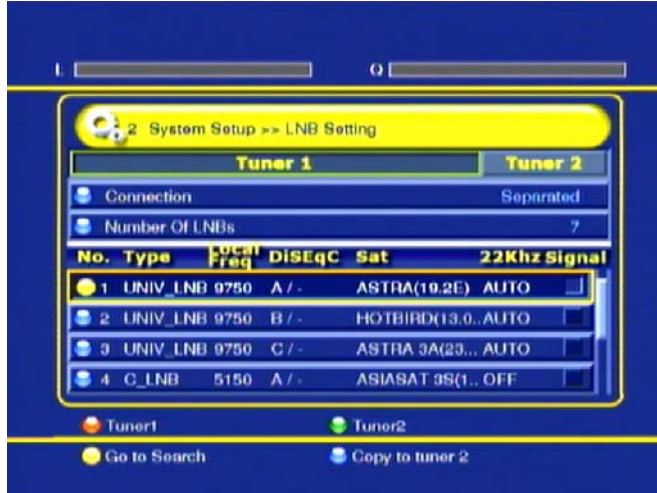


10.3. LNB setting.

The LNB Setting menu will appear automatically right after adjusting Local Time. You can select Tuner 1 to set up by pressing LEFT/RIGHT button or RED and GREEN button. Select the right connection type of LNBs between Separated and Loop Thru as the tuner connected. Choose the Number of LNBs, then press OK button to setup each LNB.

10.3.1. Set each LNB parameter.

SAT Name, LNB Type, Local Freq, DiSEqC Ver, DiSEqC No, 22 KHz, and TP Freq by pressing LEFT/ RIGHT button as your LNB and dish aimed. You can see whole values of each item if you press OK button. Press MENU or EXIT button when you complete putting all settings. You will see the Signal indicator as yellow if all values are set correctly. (Blue color means incorrect settings.)



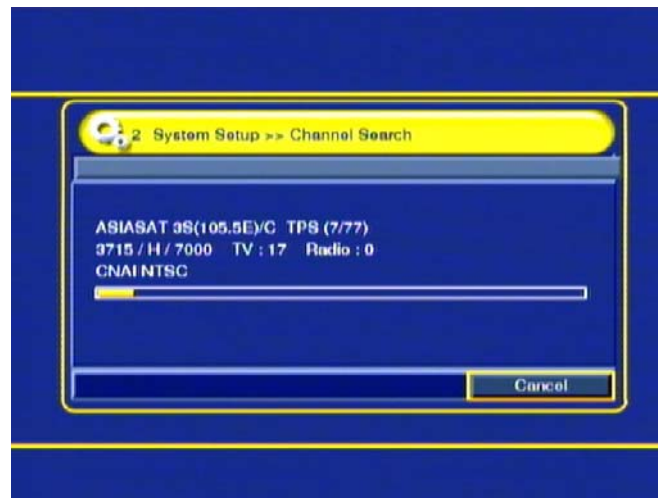
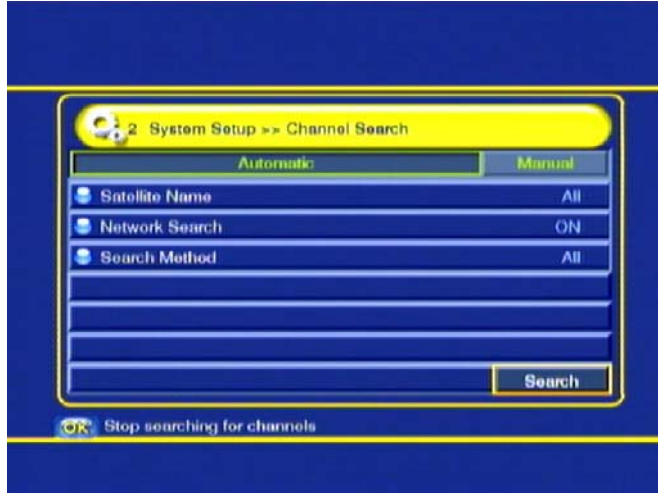
You can setup Tuner 2 if Connection is separated. To copy the values of LNB 1 to LNB 2, just press BLUE button. Press YELLOW button to move to Channel Search menu.



10.4. Scanning the satellites.

10.4.1. Automatic

This is to scan all channels in the satellites you setup in LNB Setting menu. Set Satellite Name, Network Search option and Search Method option by pressing LEFT/RIGHT button and press OK on SEARCH to start scanning.



10.4.2. Manual.

This is to scan channels on specific TP. Set Satellite Name, Frequency, Symbol Rate, Polarity values. You can press OK to check the values on Frequency and Symbol Rate menu or press NUMERIC buttons to input values directly. Press OK on Manual Search to start scanning. If you input new TP data on this menu, the new data will be saved on the satellite automatically.




Once channel search is done, searched channel shows up automatically.

11. HOT BUTTONS

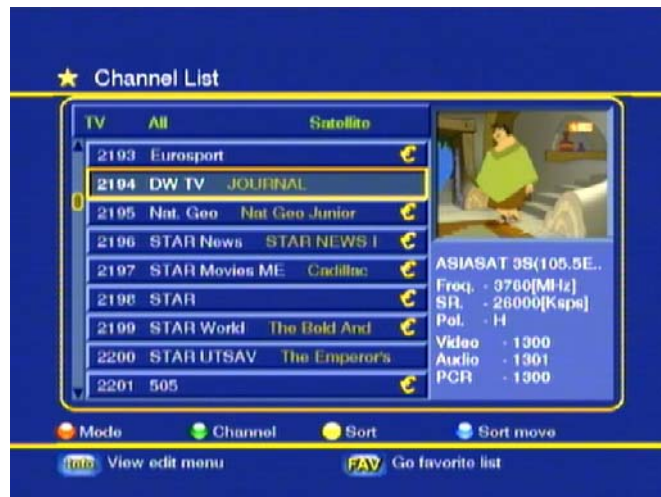
This section explains various functions while watching TV or listening to Radio. These buttons enable to reach the desired function or menu directly by pressing them.

11.1 TV or Radio Channel List



While watching TV or listening to Radio, you can get the 'TV or Radio a Channel List by pressing OK button on the remote controller. Use  the navigation-buttons to move the cursor up/down and left /right. When you reach a channel that you want to check, press OK button for a view. To move to a channel that you have chosen, press MENU button.

There are 3 sorting options: First, 'Mode' Second, 'Channel' Third, 'Sort' to search desired channel quickly.



11.1.1 Mode

Sort the channels by TV or Radio.



11.1.2 Channel

Three options are available 'All' 'Favorite' 'Satellite'. The channels also can be sorted by All, Favorite, Satellite



11.1.3. Sort

It allows you to sort the channels by Default, A to Z, Z to A, FTA to CAS, Provider and Satellite.



11.1.4. Sort Move

Highlighted cursor jumps accordingly as sorted (default, A to Z, FTA to CAS, Provider, Satellite), press Blue buttons on the RCU.

11.2. Edit in the Channel List




To Switch into Channel Edit mode, press "I" at the bottom of the channel list.

To move back to the channel list, press “I” again.



11.2.1. To Favorite


Move to Favorite by using the navigation-buttons and press OK button to bring the favorite add list. The highlighted channel will be added to the one of categories on favorite group where you wish to save.

-  Switch to TV or Radio list
-  Change favorite Group category backward order (such as Sport, Drama, News, Movie and Music)
-  Change favorite Group category forward order (such as Sport, Drama, News, Movie and Music)



You can create a new favorite category (make Fav. Group) if needed, also rename the existing favorite group. When the rename procedure is completed, press Enter key.

11.2.2. Hide

Select the channel that you wish to hide by moving high-lights and press OK button. You will be asked to a password, by putting correct password the channel will be hidden. If you wish to bring the hidden channel back, Move to Main menu  and select Lock control under User's option and Switch Hide Channels OFF by entering PIN number.

After switching into Hide Channels OFF mode, move back to Channel list, then you can see the channel which was hidden before with "H" beside channel name. To get rid of "H" mark, select UNHIDE, then press OK button to confirm. It requires PIN number to complete.

But if you wish to hide the several channels continuously, press the **right direction** button of navigation-button and then insert the password. By doing this, you can enter the MODE to hide the channels one by one.



11.2.3. Lock

Select the channel you wish to Lock and move to Lock by moving high-lights and press OK button and put password. A "Lock icon" will appear beside channel name. The channel with Lock icon can be un-locked by entering PIN number again.

When you wish to lock the several channels continuously, press the **right direction** button of navigation-button and then insert the password. By doing this, you can enter the MODE to select and lock the channel one by one.



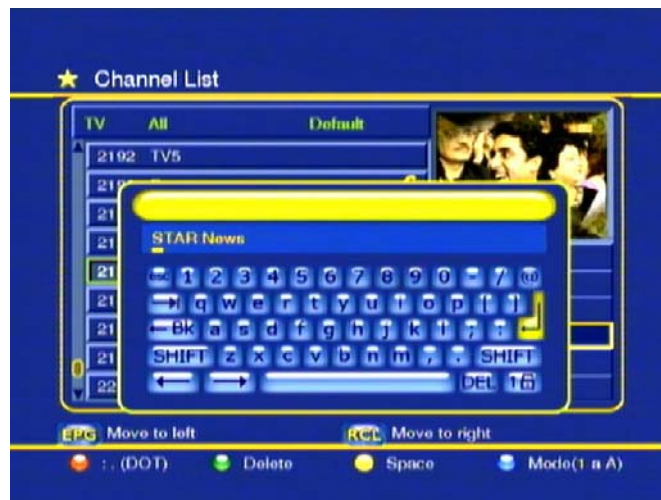
11.2.4. Rename

Change the selected channel name using virtual key board.

Move to Rename option and press OK button then the virtual keyboard will appear.

In the virtual keyboard the Capital letter and the small letter can be alternatively appear by pressing lock image key (Next to DEL key). When renaming is done, to save the changed name select ENTER KEY in the virtual key board.


To exit from virtual keyboard without saving settings, press OK button.



11.2.5. Delete

Select the channel you wish to delete and move to Delete option and press OK button then enter your password.

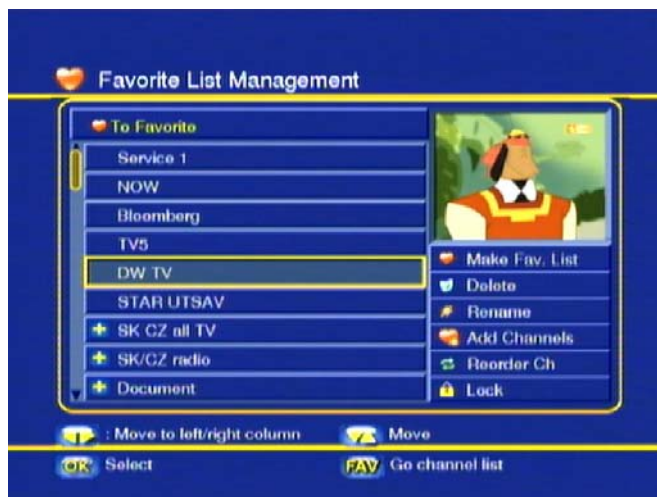
Multi Selection Mode

When you wish to delete several channels at a time, press the **right direction** button  and then insert the password. You can enter the MODE to delete the channels one by one.



11.3. Favorite Channel Lists

While watching TV or listening to Radio, the favorite channel list is available anytime by pressing the FAV button on the remote controller. The default favorite groups are Sports, Drama, News, Movie and Music.



11.3.1. Make Fav. List

Move to Make Fav. List and OK button to bring virtual key board and create new favorite group by using virtual keyboard.

To save created favorite group, select the enter key on the virtual keyboard.

11.3.2. Delete

To delete the high-lighted channel in favorite group, move to Delete and press OK button again, confirm the Delete by pressing OK button.

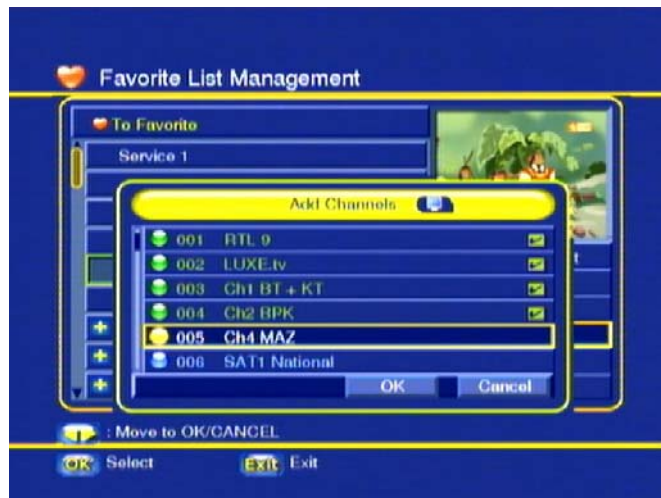
11.3.3. Rename

To rename a channel or favorite group, move to Rename and press OK button to bring virtual keyboard and rename the selected channel & fav group, then select ENTER to save changed name and exit from virtual keyboard.

11.3.4. Add Channels

To add channels to a favorite group, move to Add Channels and press OK button, then all channel list appears.

The high-lighted channel will be added by Pressing OK button, then you can see check-sign image next to channel added.

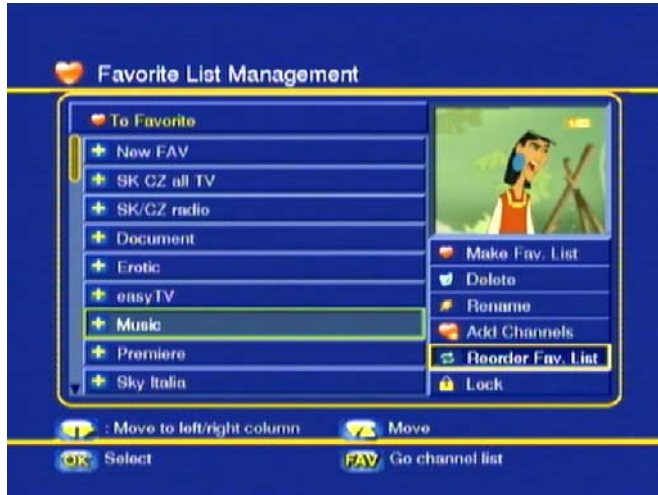


11.3.5. Reorder FAV.

Reorder selected channel & Fav. Group

To reorder Fav. Group, select a group or channel that you wish to reorder by high-lightening it and Move to Reorder Fav and press OK button, then move the Fav group or channel. When it is at the position where you want to place it then press OK


button. The channel or Fav group successfully will be placed at right position as wanted. To exit from Favorite Channel List without making any changes, press Fav. button or EXIT button.



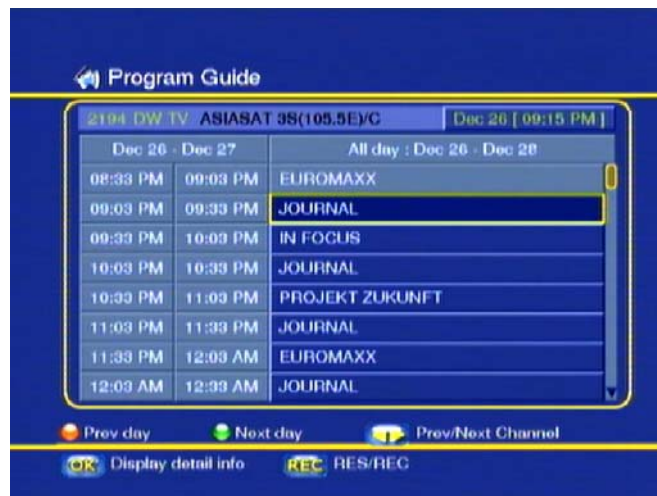
11.4. Electronic Program Guide



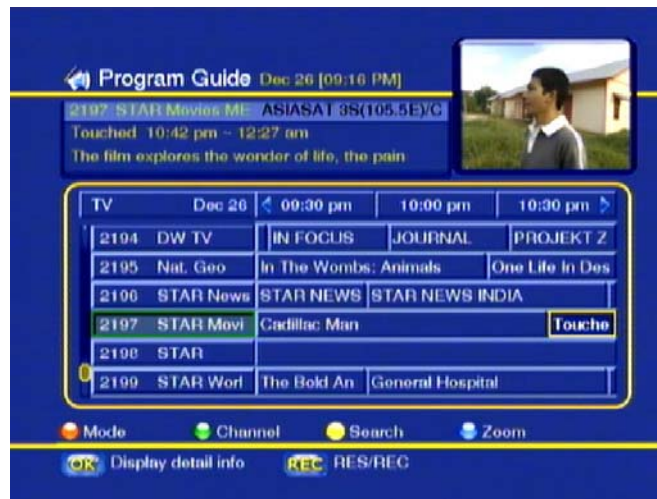
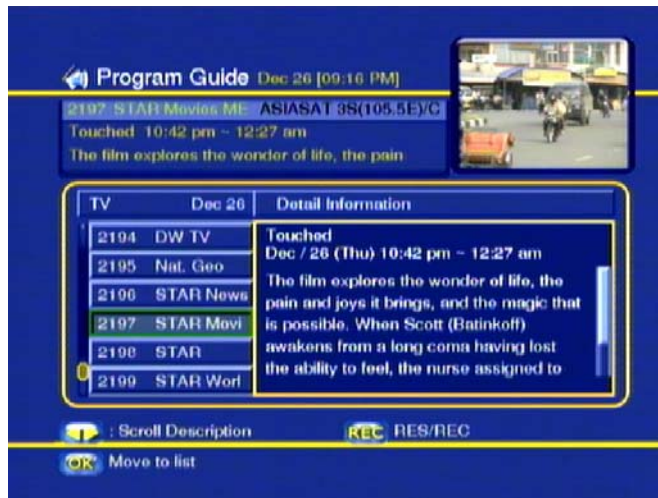
Press the EPG button on the remote control, the TV electronic program guide (EPG) will appear.

Search channels schedules by using  the navigation-buttons up/down and left/right to move the highlights.

Press the EPG button on the remote control, the TV electronic program guide (EPG) will appear. If you press once, list type of EPG will appear. If you press once more, grid type of EPG will appear.



To get more detailed EPG on specific channel, move high-lights to the channel then press OK button.

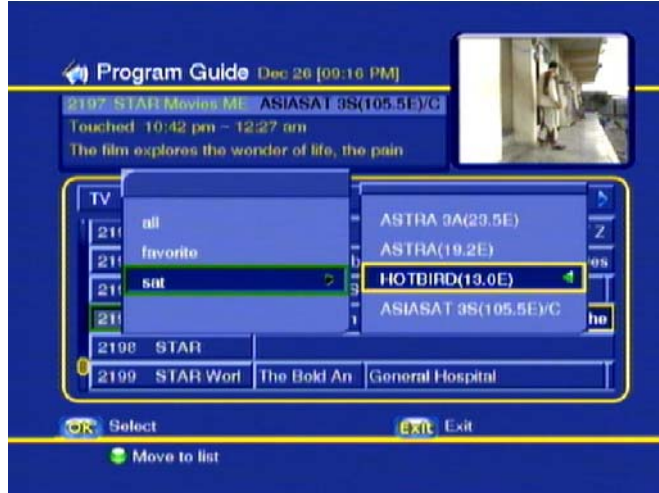


11.4.1. Mode

Press the Red button, to switch into TV or Radio channel mode.

11.4.2. Channel

Press the Green button at the button on the RCU, and select one of options from All, Favorite and SAT. It displays EPG information on your selection.



11.4.3. Search

To search channel's EPG under specific category/genre that you like, press yellow button at the bottom of the RCU.

EPG data will show up depends on EPG availability of providers by satellite.

Category: Select genre of a programs.

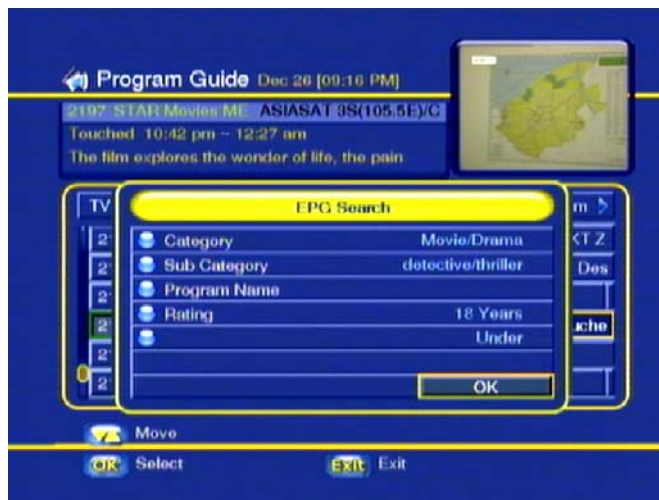
(Movie/News/ Sports etc)

Sub Category: Select sub-category of programs

(Adult movie / Romance / Comedy etc)

Program name: Put in a specific program name by using virtual key board.

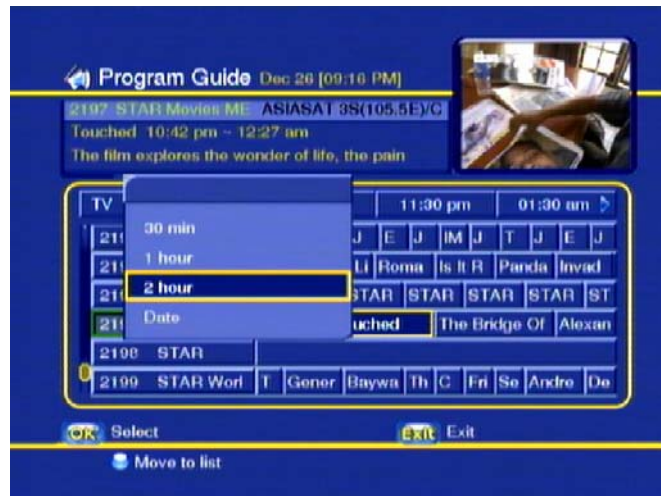
Rating: Select Age limits on the programs.



11.4.4. Zoom

Press The Blue button at the bottom of the RCU, select the time-grid of EPG display by 30 Min, 1 hour, 2 hours and date, or specific date is selectable up to maximum 7days.

To reserve a specific channel for recording, press REC bottom on RCU then the channel name will be high-lighted in yellow.



☞ Notice

If more than two channels are scheduled to be recorded at a time, a warning message will pop up. Readjust recording plan by canceling one to avoid conflicts on the reservation of recordings.

11.4.5. Recording reservation

The PVR automatically turns on two minutes before the recording starts, if you leave the PVR standby mode.



After two minutes lapse, Pop-up appears to confirm whether you want to continue the recording or not if all of two tuners were already reserved. Select Cancel to stop the recording. You will be leaded to the channel that you were watching previously.



If you don't touch RCU for a minute when recording starts, it recognizes as there are no one in presence. It starts to record itself and after done recording, it turns off automatically. However if you touch or press any button on the RCU during recording, it recognize that there are someone in presence and it does not goes off automatically.

11.5. File list management

Press FILE button to move to File List Management.



Yellow Button: Record Plan shows the reserved recordings' status.

Record plan in Yellow color indicates the currently recording channels.


Record plan in White color indicates the upcoming recording schedules.

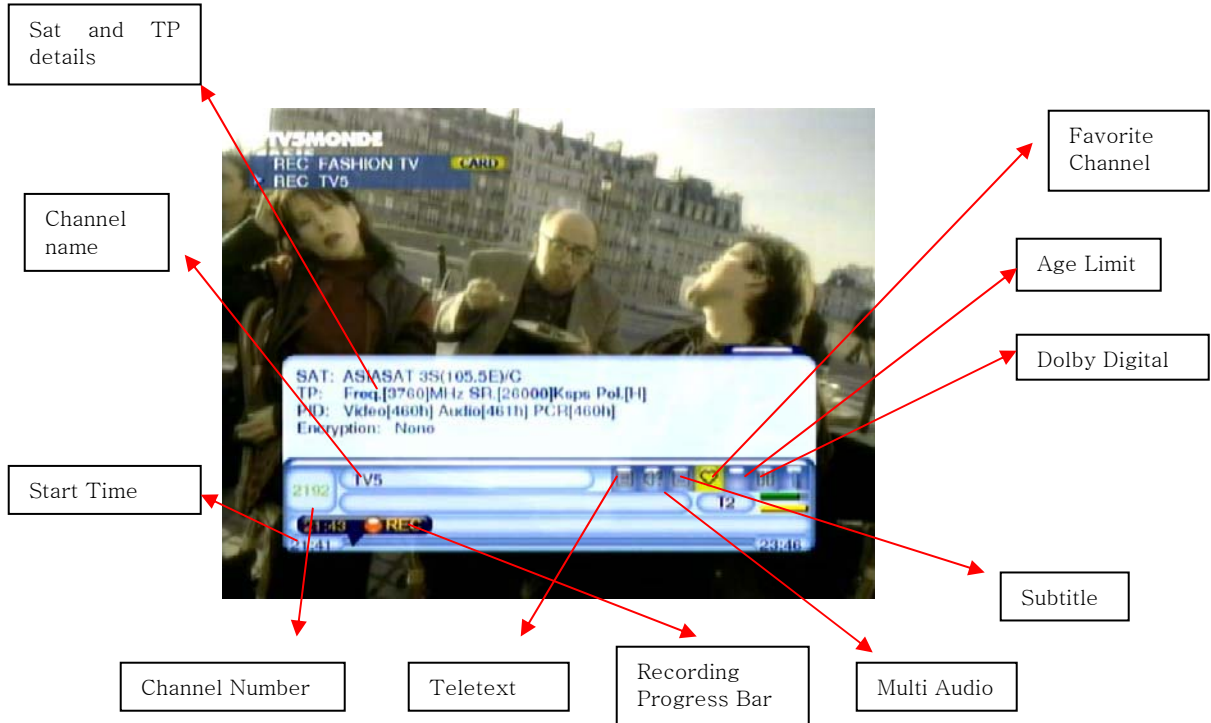


Detailed Recording plan information is available by pressing OK button. To move highlights, use the navigation- button. Recording option editing is also available in this OSD-Menu.

To exit from FILE Management press EXIT button.

11.6. Channel Information

Info bar appears by pressing the  button. If you press twice, channel details are also available. The infobar shows all necessary information about selected channel. Any highlighted image in yellow on the infobar indicates the availability of the services.



11.7 RCL

To move back to the previous live channel, press this button.

By pressing RCL button from a recorded channel, it will be switch into the live channel that you were watching previously.

11.8 Subtitle

If a channel is available for the subtitle service by satellite, press the subtitle image button under the lid at the bottom of RCU by sliding the cover. If it services more than two languages it is also language selectable.



11.9 Audio Setting




Press the AUDIO button on the remote controller; to select an audio language and sound mode.

Mix / Mono Left / Mono Right, Audio languages are selectable by pressing Left/Right direction button. Press AUDIO or EXIT key to exit.

While recording or Trick play, audio options are not selectable. It has to be set before recording or trick play.



Premiere Multifeed Function


If you move to 'main feed' and press the Multifeed button  of RCU , Multifeed List (Channels) appear.



12. PVR OPERATION

Maximum 2 channel recording and 1 recorded channel playback.


12.1. Recording

To record a live channel, press  button to record a channel that you are currently watching.



In the channel list, a channel in red indicates the currently recording channel.



Press  button to stop recording. Select a channel name that you want to stop the recording then press OK button to confirm.



The default recording time is two hours, recording time can be set up to maximum 23h 59min.

FILE-> Record plan->New-> Duration.

The recording notice will pop-up two minutes before a recording starts.

If the power is turned off, the PVR automatically goes on and performs /starts recordings when the scheduled recording time is 2 minutes left away. When the PVR finishes recordings, the power also goes off automatically. During the recordings if you touch RCU, then the power stays on.

During recording, if you try to turn off the power by pressing the Power button on RCU, it will prompt you to confirm if you want to stop the recording. Press OK to save the recorded file on HDD.



12.2. Recorded file open

Press FILE button, to check the recorded files and HDD space information.

1. Video
Shows recorded video files
2. Radio
Shows recorded audio files.
3. Record Plan

Shows currently recording files and reserved recording list.




12.3. Record plan

Press Left/Right direction button and move to RESERVATION and select options

1. New
New recording plan can be made in this section by selecting various selecting options.
(Start times, Duration, Period, and Parental Rock are available options)
2. Edit
Set options are editable in this section.
3. Delete
Delete Recording Plans from the list.

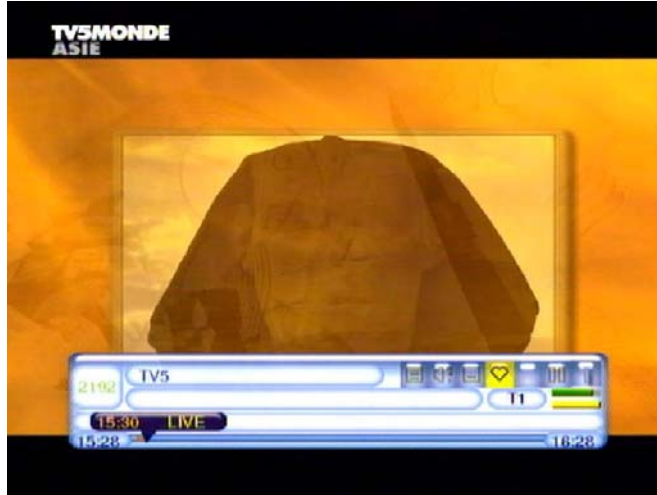
12.4. Play back

Press FILE  button, move to recorded file you want to watch then press OK button to playback.


12.5. Trick play on live channels.

Trick play on a live channel is available. When channel is changed, the recorded file will disappear automatically, then it starts to record the current live channel.


On live Channel, all kinds of the PVR function are available such as Pause, Jump back, Jump forward, rewind, Fast forward, slow, frame by frame.



12.6 Book mark

Press the  button, to make a book mark on the time bar where you want.

If you want to move next book mark, press PLAY button to jump to next book mark

To remove book mark on the time bar, press the  button again.



12.7. Play

On the Display time bar and press the button under the book mark to jump to the next book mark, then the playback start from the marked point.

12.8. Repeat

Press repeat button to repeat in the pointed book marks

If there are not any marked points, the whole section can be repeated instead of two points. To exit from the repeat function, press Repeat button one more time.

12.9. Stop

Stop the watching prerecorded file and back to a live channel.

12.10. Pause

Pause the watching files and live channels. To go back to normal play mode, press Play button.

12.11. Fast forward or random position jump & playback

Move the time bar forward x2, x4, x8, x16 speed and keep pressing the button then, the time bar move as fast as you desired. Press PLAY button back to normal speed mode.

In the channel list, press the button the channel to jump up to every 100 unit

If the channels are sorted by CAS to FTA, it jumps from CAS to FTA unit alternatively.

If the channels are sorted by Satellites, it jumps from one Satellite to another Satellite.

12.12. Fast reverse or random position jump & playback

Move the time bar backward x2, x4, x8, x16 speed keep press the button, the time bar move fast to backward direction.

12.13. OSD teletext.


OSD teletext is available upon service availability. If the teletext image on Info Bar is high-lighted in yellow, press this button to see the teletext information.



12.14. Slow motion and Frame by Frame

Press the button 1~2secs then it will show slow motion. As you push the button, it shows speed such as x1/16, x1/8, x1/4, x1/2.



Press the button less than 1sec, it shows still screen at first. As you press the button, it will show frame by frame. Press PLAY  button to move back to normal play mode.



13. USER'S OPTION

13.1 User's setting



13.1.1. Banner Time Out

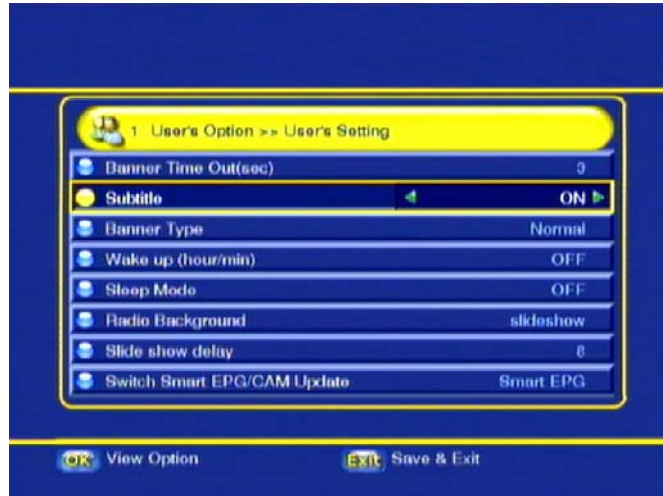
Select the time-out length for information banner from 2 to 10seconds.

13.1.2. Subtitle

Select subtitle display ON/ OFF.

13.1.3. Switch Smart EPG/CAM Update

All searched channels' EPG will be saved automatically in side receiver when the power goes off. When you need update the CAM, You have to switch from Smart EPG into CAM Update mode.



13.2. Lock Control

13.2.1. Maturity Control

Select the age limit form OFF, 5, 8, 10, 13, 15 to 18 for programs.

If the contents have parental guide information, channels will be locked automatically according to the option.

13.2.2. System Lock

Switch System Lock ON or OFF. If you select ON, a password input box will appear. The default password is 0000.

13.2.3. Channel Lock

Switch Channel Lock ON or OFF. Each channel can be locked on the channel list under channel edit mode. Refer to Channel List to lock specific channels.

13.2.4. Hide Channels

Switch Hide Channels ON or OFF. The hidden channels will be excluded from the Channel List. Refer to Channel List to hide specific channels.



13.3. Language

13.3.1. Menu Language

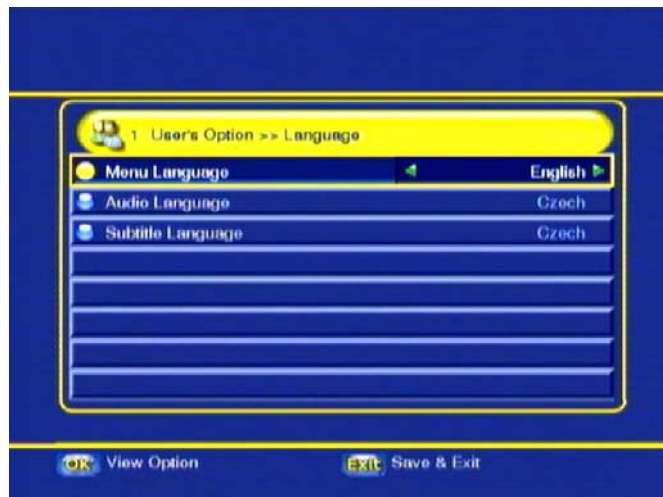
Select a language for Menus, dialog boxes, and help messages.

13.3.2. Audio Language

Select an audio language for the program with multilingual audio.

13.3.3. Subtitle Language

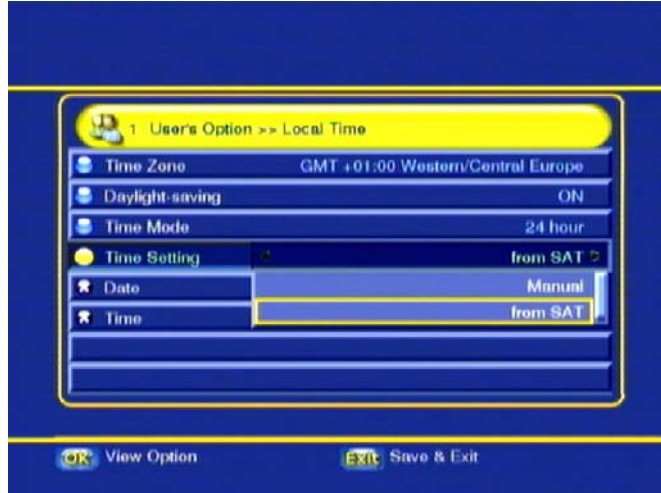
Select a subtitle language for the program with multilingual subtitle.



13.4. Local Time

Select or change your Time Zone, Year, Month, Date, Hour, Minute and Daylight-saving time.

To save changed settings, press EXIT button.



13.5. USB Mode

13.5.1. PC editor

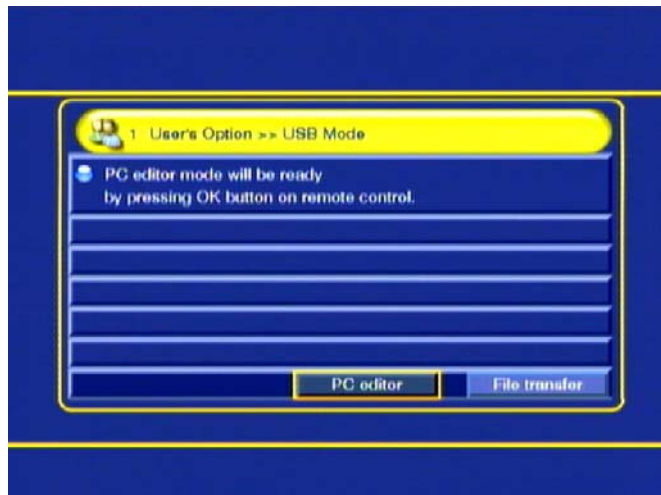
Use PC editor to edit searched channel data on your PC. To download existing channel data or edited data from PC to the PVR, the PVR has to be connected to PC by USB cable and the PVR has to be ready for PC editor mode.

Menu→ User's Option→USB Mode→PC editor→"OK" Button

13.5.2. File transfer

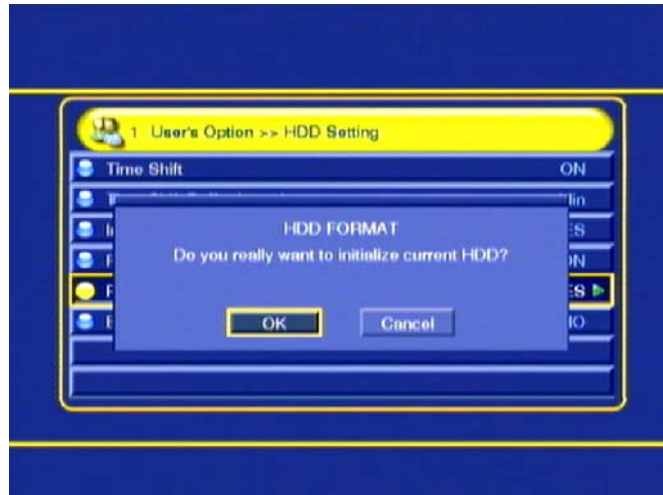
To Upload the recorded files from the HDD to PC, the PVR has to be connected by USB cable to PC and has to be ready for File transfer mode.

Menu→ User's Option→ USB Mode→ File Transfer→ "OK" Button



13.6. HDD Management

Select HDD Format or HDD Exchange as you want. When you select Format, the system will be restarted and current HDD will be formatted.



When you select exchange, current setting data and recorded files are saved for next use.





NOTICE

We strongly recommend you to use A/V or CE HDD only. If you use the HDD made for PC use, we do not guarantee the best performance on the PVR.

When you select Exchange, current setting data and recorded files are saved for next use.

14. SYSTEM SETUP

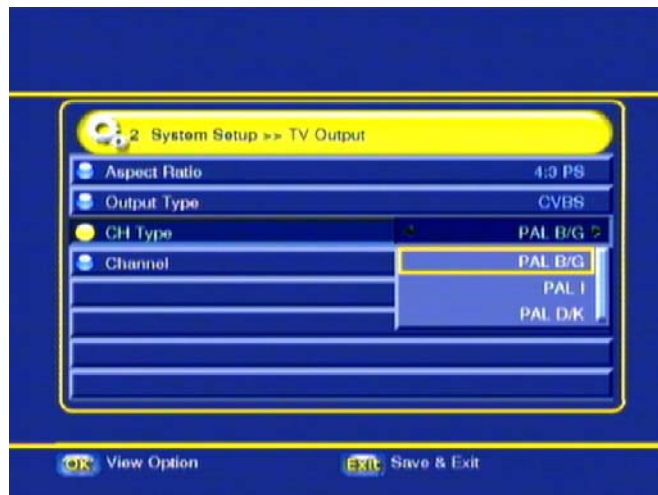
14.1 TV Output

14.1.1. CH type

Select a proper TV broadcasting system among the PAL B/G, PAL I and PAL D/K.

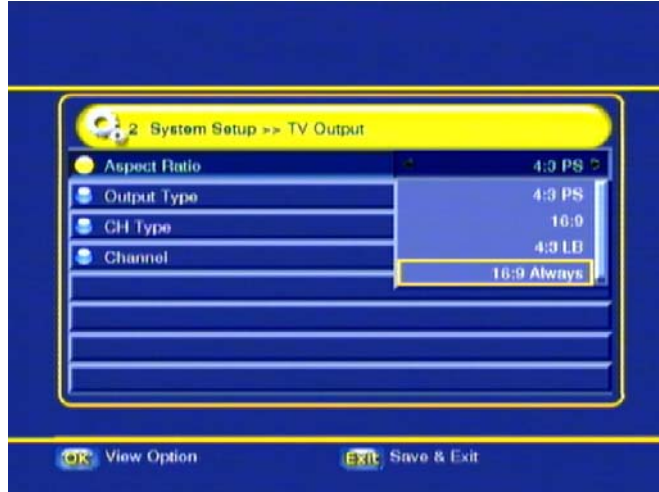
14.1.2. Channel

Select a UHF TV channel for the TV connected to RF modulator output. The default channel is 38.



14.1.3. Aspect Ratio

Select 4:3 PS (Pan & Scan) or 4:3 LB (Letter Box) for Standard TV or 16:9 for wide screen TV.



14.2. LNB Setting

Tuner 1, Tuner 2





Select Tuner 1 or Tuner 2 first.

Make sure your tuner Connection is Separated or Loop Thru.

In case of Loop through connection, tuner 2 is selectable for set up.

In case that the receiver is connected both tuner 1 and tuner 2, select tuner 1 for the set up first, then consecutively select tuner 2 for the set up.

Hot Keys

-  : To bring up Tuner 1
-  : To bring up Tuner 2
-  : Go to channel search
-  : Copy LNB settings of Tuner 1 to Tuner 2



14.2.1. Connection

In case the 2 tuners are connected to separately to Satellites, select separated.

If the Tuners are connected by Loop through, select Loop Thru.

14.2.2. Number of LNBs

Select the number of LNBs you have installed.

14.2.3. LNB set up

Move the high-lights to each LNB, press OK button on the RCU. In the pop-up menu appeared, fill the required information LNB Type, Local Frequency, DiSEqC port No., Satellite Name and TP Frequency.



Once your setup is complete, press EXIT button to save and exit.

14.2.4. The Signal Indicator

It displays Signal Strength(Green) and Signal Quality(Yellow) on top of this menu.

When you see the Green and yellow bar on top, it means LNB Settings are correctly set.



Yellow button: Go to Search channels

Once LNB setting is completed, select Go to Search to move to Channel Search menu.

14.3. Channel search

Auto search and Manual search are available.

To search one specific desired channel, manual search is recommended.

Please refer to website www.lyngSat.com to find out channel information (Frequency, Symbol Rate and Polarity)

14.3.1. Automatic

It searches channels automatically using the TP data that the PVR already has.

By Satellite Name: Select each satellite name or All.

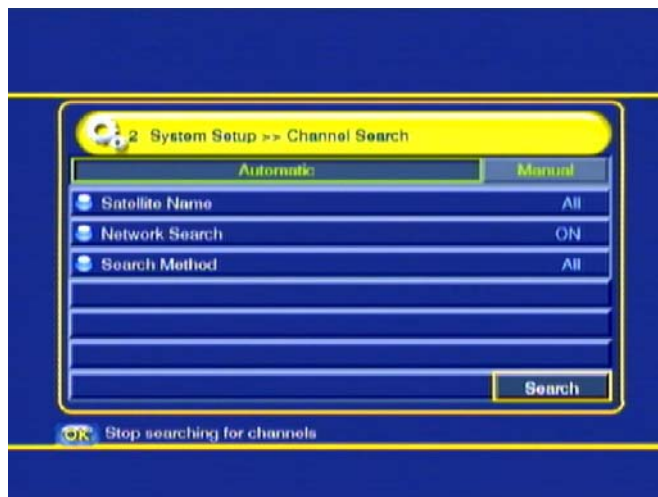
By Network Search: Select Network Search ON/OFF

By Search Method: Select ALL, FTA, or Scrambled.

All: It detects and searches both FTA and Scrambled channels.

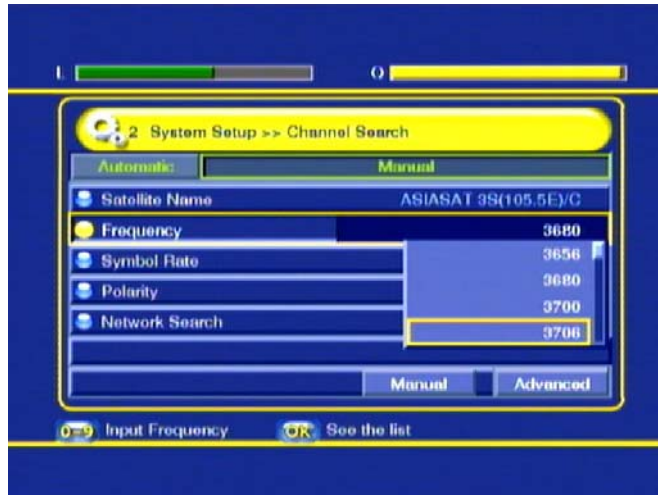
FTA: It detects and searches only the Free-To-Air channels.

Scrambled: It detects and searches only the Scrambled channels.



14.3.2. Manual

Select specific Satellite Name, Frequency, and Symbol Rate, and Polarity and press Manual button to start searching the particular channels.



14.3.3. Advanced Search

Video PID: Enter the correct VIDEO PID value by using numeric buttons on the RCU.
Audio PID: Enter the correct AUDIO PID value by using numeric buttons.
PCR PID: Enter the correct PCR PID value using numeric Buttons.



14.4. DiSEqC 1.2 positioner

If you have a DiSEqC1.2 motorized system, then you can use the DiSEqC function.

Select the satellite name first, and switch the DiSEqC Enable and put other required options.
Select the right TP to catch the strong Signal Strength.



14.5 USALS setting

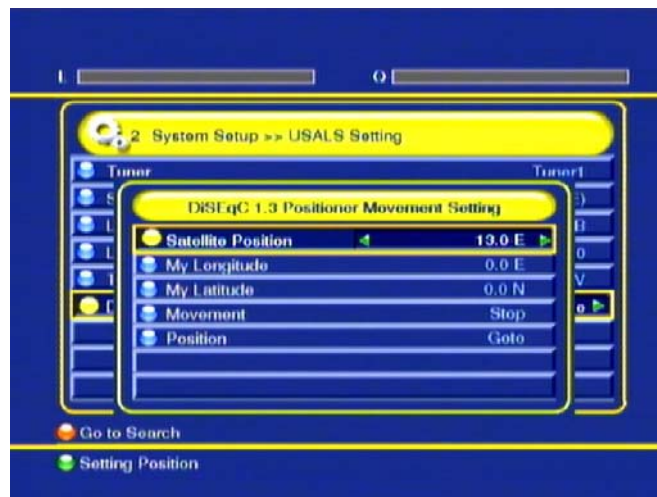
USALS is very convenient motorized DiSEqC system that support DiSEqC 1.3 command and also can get the satellite position automatically if you know your geographical location.

If you have USALS motorized system, then you can use the USALS as follows.

Select the tuner that is connected with USALS system.

Switch USALS Enable and Select the satellite name which will be used to identify a motor system.


Put your longitude and Latitude and press OK button to start search satellite.



14.6. IP setup

14.6.1. Manual

For the static IP address users.

Use the Navigation-Buttons  and numeric buttons to set the Values then press SUBMIT button.

IP: Enter your IP address to specify the host IP address.

Subnet mask: Enter the subnet mask here to find Host IP address in its Subnet.

Gateway: Enter the gateway values.

14.6.2. AUTO (DHCP)

For the VDSL or ICS client users.

It detects values automatically. No need to enter any values here. After selecting Auto(DHCP), press submit button to have all settings show up automatically. If LAN cable is not properly connected, all settings might appear as "0.0.0.0." In this case, check the cable connection and retry it.



14.6.3. AUTO (PPPoE)

For the ADSL users

ID and Password (which acquired from internet service provider) are required here; enter the values by using virtual Keyboard. Press OK button to bring the Virtual Key board.

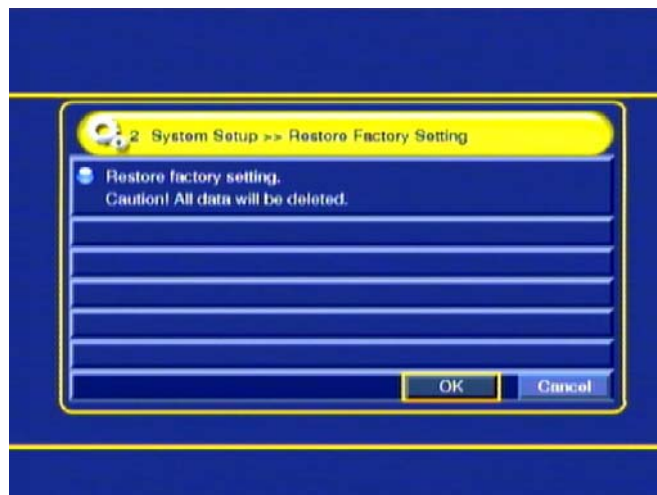
Internet



14.7. Restore Factory Setting

It removes Channel List, FAV List, LNB Settings and it restores original factory settings, but the files you recorded on the HDD will be remained in HDD.

To restore factory settings, press ok. All settings will be deleted.



15. CI MODULE

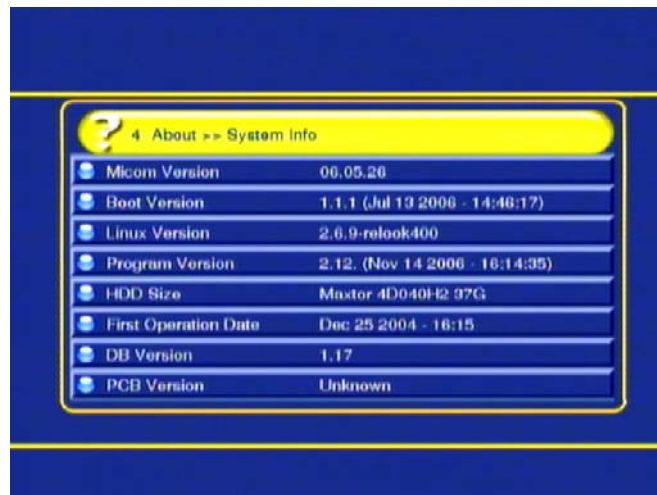
This menu shows the status of CI Modules.



16. ABOUT

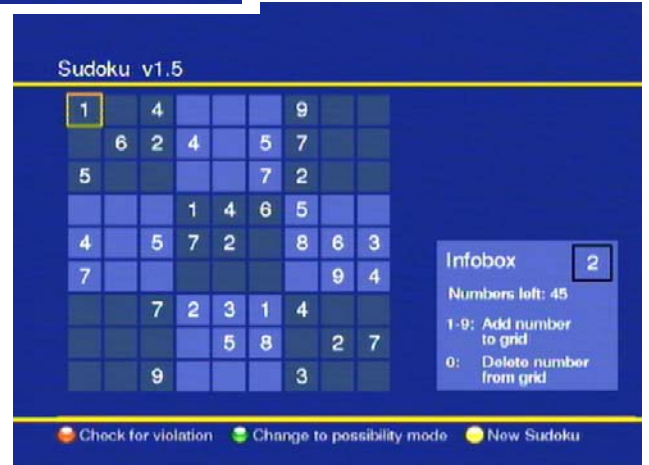
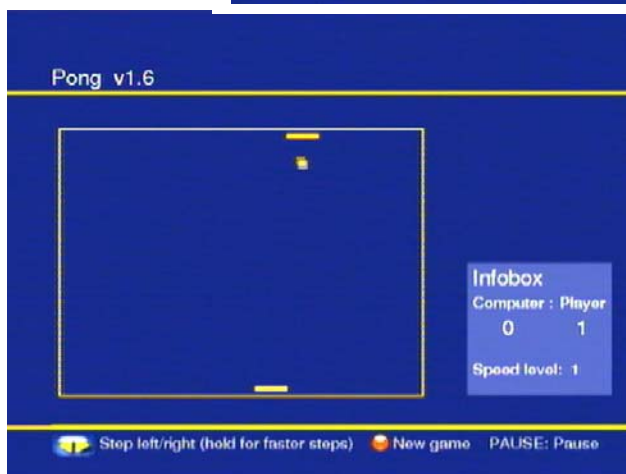
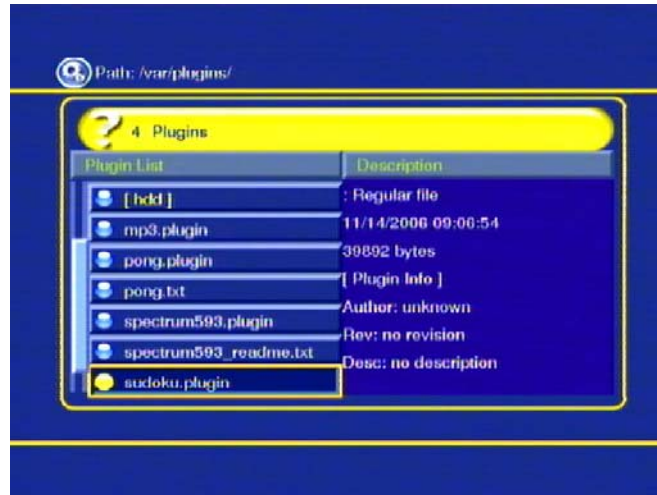
16.1. System Info

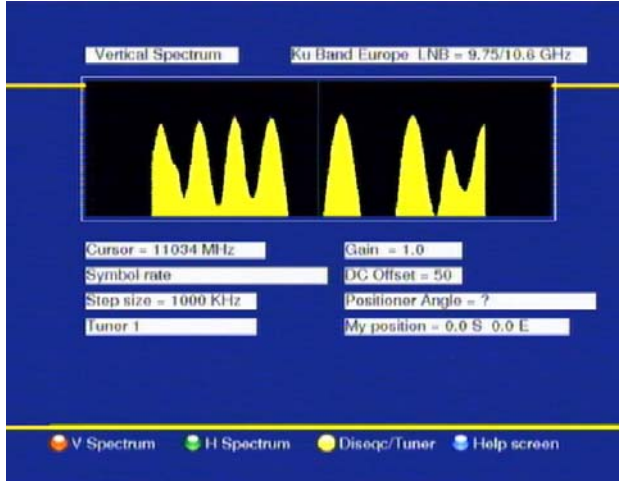
It displays Micom Version, Boot Version, Linux Version, Program Version, size of HDD and first date of operation.



16.2 Plugins

Press the plug-in (games, web-interface) you want to enjoy.





16.3 Mount Manager

You can listen to “mp3” music by using the HDD of your PC.

1. Type (cifs : accessing to Windows PC, nfs : accessing to Linux PC)
2. Mount point: Point for the mounting of the mp3 files in STB
3. Server : IP address of the server PC that your computer has
4. Directory : Folder name which mp3 files exist in your PC. It has to be shared.
5. User/Password : If your computer has ID or PASSWORD, insert them. If not exist, leave it as a blank.
6. Active : Select 'yes' and then click on 'Mount' button at the bottom of the screen.

⚠ Caution

In case that your computer is switched off or disconnected, click on 'Unmount' button. Otherwise it can cause some problem such as longer booting time.



17. SOFTWARE UPGRADE

Make sure that **Hardware Driver** and **Flash Tools** are completely installed on your PC.

17.1. Driver installation.

For the first time, follow the instructions from 1 to 10. This procedure is required for initial use for once.

1. Download the Flash tools on your PC
2. Connect PC and STB by USB Cable
3. If STB is standby mode when it is connected by USB, skip the # 4, follow the # 5 to enter USB mode.
- 3-1. If the power is on, follow the instruction # 4 to enter Standby mode first then #5 to enter "USB" mode.
- 4. Press Power button more than 2seconds (to turn STB into Standby mode)**
- 5. Press and Hold Power button until you see "USB" on the front display of STB.**
6. PC detects new hardware device (important)
7. Driver Installation Wizard Appears
8. Click on proper (recommended) driver search.(the top choice)
9. Click on designate the folder
10. Designate the folder at C:/Programfiles/Flash_tools/VESTAUSB
11. Folder starts transfer
12. Click on Finish when it is done.

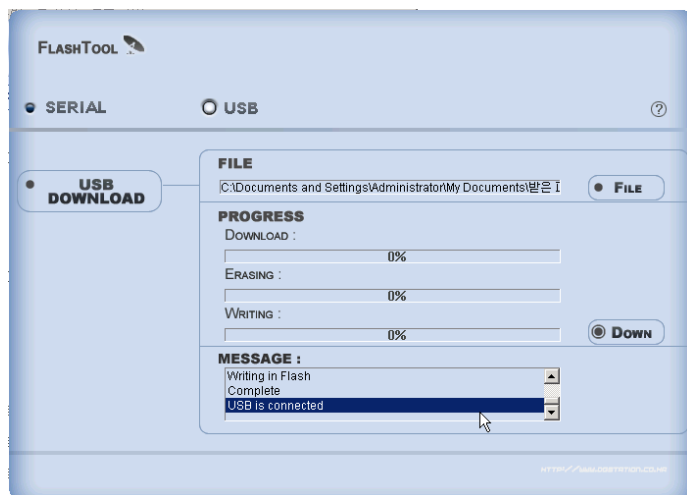
Important) The order of this procedure is very important; please do follow the instruction step by step.

When Driver is installed successfully, it is ready to download the latest image to STB (USB download instructions)

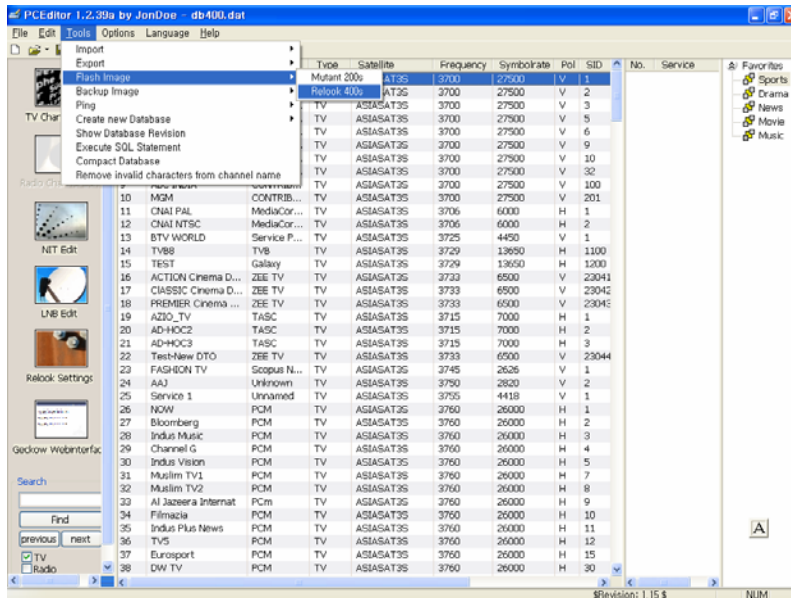
17.2. S/W Updating.

1. STB and PC have to be connected by USB cable.
2. STB has to be "USB "upgrade mode ("USB" on the display of STB)
3. Run the Flash Tools
4. Click on USB→ check the "USB connected" message at the bottom
5. Designate the image that you want to download to STB by pressing FILE
6. DONE on the front display→ Press Power button on RCU→ STB will be restarted

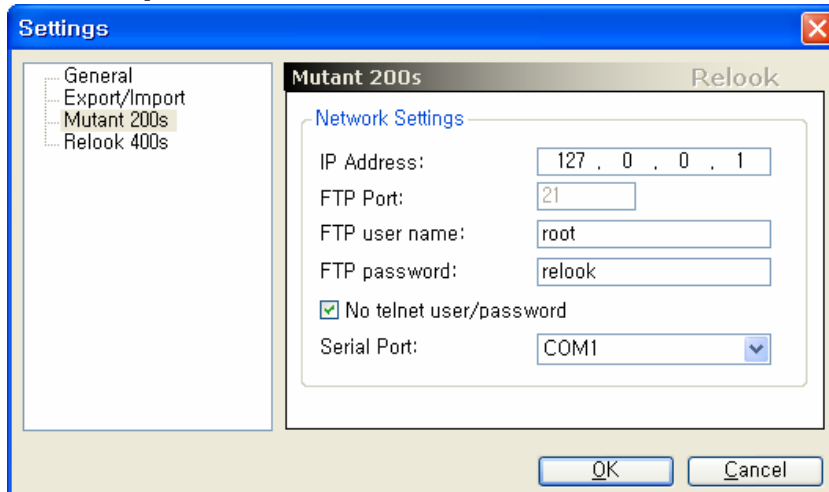
Important) To enter "USB MODE" : Turn STB into standby mode(press the power button more than two seconds) then press and hold power button again until you see "USB" on the display of STB.



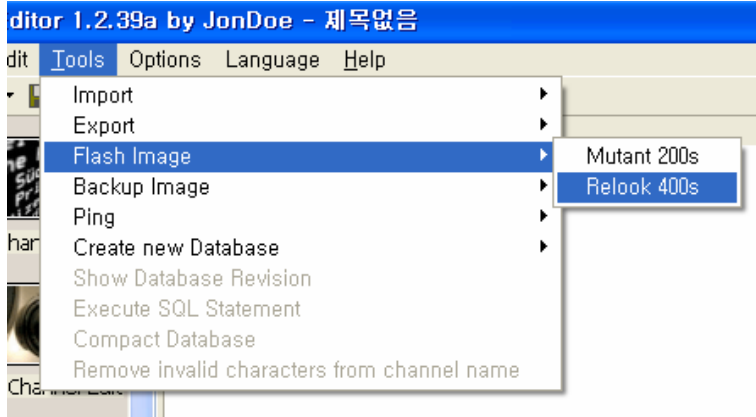
Downloading Flash Images via NETWORK(UTP cable) using PC editor



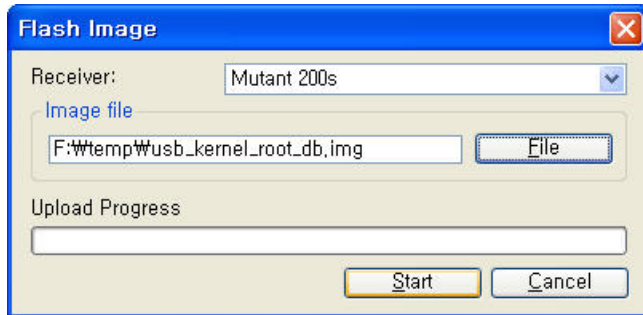
1. IP setup in PC editor : it should be same IP address with STB



2. select "flash image" menu



3. select a proper USB image



4. pressing "Start"

*Note: You should check the version of bootloader. If it does not fit with application software, you should download a new bootloader by using serial cable.

Downloading method of serial to serial (Set to Set)

Master Unit

Connect two sets with Serial cable (Null modem cable)

1. Power on
2. Press the power button and the "OK "button at the same time.
3. Press and hold the power button and then the down direction arrow button consecutively.
4. The display of front panel will show "SET 2 SET" shortly and then " 1" .
and at the same time TV screen displays some firmware choices from 1 to 8.
5. You can select one of the items from 1 to 8 using left/right direction arrow buttons
6. Press ""ok"" to confirm the choice you made, front display will show "REDY".
7. Move to set up the slave unit.

Items

- "1. 0xff800000-0x040000 : ""config_welcome""
- "2. 0xff840000-0x140000 : ""kernel""
- "3. 0xff980000-0x420000 : ""root""
- "4. 0xffda0000-0x230000 : ""db""
- "5. 0xfffd0000-0x030000 : ""boot"" (in this case, you should be more careful in downloading)
- "6. 0xff800000-0x800000 : ""all"" (in this case, you should be more careful in downloading)
- "7. 0xff800000-0x7d0000 : ""all_noboot""
- "8. 0xff840000-0x560000 : ""kernel_root""

Slave unit

1. Power on
2. Press the power button and the "OK" button at the same time.
3. Press and hold the power button and then the right direction arrow button consecutively.
4. The display of front panel will show "SERIAL UPGRADE"
5. Press ""ok"" on Slave unit to load
6. The display of front panel will show ""progressing rate
7. It will displays " DONE " in front panel when downloading is complete.

Caution : Serial cable is null modem cable.

This will take about 30 minutes to copy from Set to Set.

18. GLOSSARY OF TERMS

<p>CA Conditional Access. A system to control subscriber access to services/ programs.</p>	<p>RF Radio frequency (known as HF in some countries).</p>
<p>Common Interface DVB standard hardware and software architecture for Conditional Access systems.</p>	<p>SCART A 21-pin connector used for connection of the STB, VCR and TV. Also known as Euro connector</p>
<p>DVB The Digital Video Broadcast group was created to establish a technical framework for the introduction of digital video broadcasting systems.</p>	<p>S/PDIF Sony/Philips Digital Interface Format digital audio output.</p>
<p>EPG Electronic Program Guide. The programming information provided By the service provider that enables a viewer to find the much Information of programs.</p>	<p>Symbol Rate Speed of the digital transmission</p>
<p>LNB (Low-Noise Block Converter) 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 satellite receiver</p>	<p>TS Transport stream.</p>
<p>Polarization Polarization allows several programs 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.</p>	<p>CMS Contents Management System</p>

19. TROUBLE SHOOTING

Problem	Possible Causes	What ToDo
No display appeared on front	Power cord is not plugged in.	Check that power cord
No Sound/ Picture	Wrong Audio/ Video output connection between the receiver and TV set. Mute Audio	Check Audio/ Video output connection between the receiver and TV set. Press Mute button to recover.
	TV Power off	Turn TV on
	No Signal	Check the cable connections, LNB and other equipment connected between the LNB and the receiver, or adjust the dish.
	Wrong direction of the dish	Adjust correctly the direction of the dish to the satellite
Remote controller does not respond	Batteries are not inserted correctly or low.	Check the batteries or replace with new batteries
CA module is not working	CA module is not inserted. CA module is not inserted correctly.	Check if CA module is inserted correctly.
Recording is not working/ Recording is stopped	No HDD space is available.	Check HDD status.
Forgot PIN Code		Contact your local service provider/ dealer.
System Halt	System Halt or Error	Press & Hold OK and Power key on the front panel to return to stand by mode.

20. PRODUCT SPECIFICATION

Part	Type	Specification
CPU	Type	IBM's PowerPC405
	Speed	350 MIPS
	Data/Instruction Cache	16KB/16KB
Tuner (Twin) & Channel	Input Connector	2 x IEC169-2 female
	Loop through Connector	2 x IEC169-2 male
	Frequency Range	950MHz to 2150MHz
	Loop through Out Impedance	75 ohms nominal
LNB Control	Band selection	22 KHz tone
	Switch	DiSEqC 1.1,1.2, USALS
	Polarization	13/18V (400mA Max/per each)
MPEG Transport Stream & A/V Decoding	Transport Stream	ISO/IEC 13818-1 Specification
	Aspect Ratio	4:3, 16:9 with pan vector
	Video Resolution	720 x 576(PAL)
	Audio Decoding	MPEG-1 Audio Layer 1,2
Network	Ethernet	RJ-45(10Base-T/100Base-TX)
	Flash Memory	8MB+ expandable Nand Flash
Memory	SDRAM	96MB
	Conditional Access System	2 slots PCMCIA TYPE 2 / DVB CI standard
RF-Modulator	smartcard	2 slots(xcrypt & firecrypt embedded)
	RF-Connect	750hm, IEC 169-2, Male/ Female
	Output Frequency	470MHz to 860MHz
	Output Channel	CH 21-69
A/V & Data In/Out	TV Standard	PAL D/K, PAL B/G, PAL I
	TV SCART	1 x SCART
	VCR SCART	1 x SCART
	RCA	Video x 1, Audio x 2
	Data Interface	9 Pin D-Sub, RS232C,
Power Supply	Input Voltage	AC110-220V, 50Hz/60Hz
	Power Consumption	50W max. (Under 7W max. at stand-by mode)
Physical Specification	Size (W x H x D)	380mm x 60mm x 280mm
	Weight	About 3 .0kg

NOTICE

Contents of this manual and features/ Specifications of the PVR are subjected to change without notice.

21. TV BRAND CODE LIST.

Brand List for TV		1 of 12			
[A]					
A MARK	022				
A.R. SYSTEM	008	086	209		
ABEX	006				
ACCENT	008	086			
ACCUPHASE	008				
ACTION	113	125			
ACURA	024				
ADMIRAL	030	044	070	075	109
	123	197	210		
ADYSON	006	053			
AEA	008	086			
AGASHI	053	070			
AGB	184				
AGEF	197				
AIKO	008	018	019	024	053
	070	086	107	194	
AIM	008	018	086	131	
AIWA	148	149	193		
AKAI	005	008	018	024	029
	053	070	086	096	099
	107	109	125	146	177
	182	184	185	186	187
	188	194	210		
AKIBA	008	074	086	189	
AKITO	008	086			
AKURA	008	024	054	070	074
	086	131	200	207	
ALARON	052	061	065		
ALBA	007	008	024	054	086
	110	123	146	174	200
	210				
ALCYON	196				
ALKOS	194				
ALLORGAN	053	111			
ALLSTAR	008	086			
AMBASSADOR	041				
AMPLIVISION	053	174			
AMSTRAD	008	024	041	049	070
	086	131	146	155	184
	208				
ANAM	008	023	024	062	086
ANAM NATIONAL	008	014	086		
ANGLO	024	070			
ANITECH	008	024	070	074	086
	129	196			
ANSONIC	008	024	086	112	129
	174	180	198	200	210
	213				
AOC	005	022	029	066	
APOLLO	181				
ARCAM	052	053			
ARCHER	022				
ARDEN	008	086	187		
ARISTONA	008	086			
ARTHUR-MARTIN	210				
ASA	160	161	170	173	178
	195	197	198	199	
ASBERG	008	086	129	196	
ASORA	024				
ASTRA	008	086			
ASUKA	053	054	070	074	
ATLANTIC	008	086	108		
ATORI	024				
AUCHAN	210				
AUDINAC	089				
AUDIOSONIC	008	024	053	070	086
	174	176	180	187	188
AUDIOTON	053	070	174	176	180
AUDIOVOX	019	022	062	082	
AUMARK	016				
AUSIND	179	196			
AUTOVOX	053	058	075	107	178
	196	197	205		
AWA	008	024	053	070	086
	131	185			
AXXENT	024				
AXXON	187				
[B]					
BAIRD	018	053	096		
BANG & OLUFSEN	197				
BARCO	084	210			
BASIC LINE	008	024	053	054	074
	086	189	200	210	
BASTIDE	053				
BAUR	008	085	086	087	092
	098	107	109	205	
BAYSONIC	062				
BAZIN	053				
BEAUMARK	029	060			
BEC	109	113	125		
BECRESE	042	098	099	109	113
BEKO	008	086	174	176	180
	185	187	188	194	
BELCOR	029				
BELL & HOWELL	026	039	096		
BEON	008	086	123		
BERTHEN	200				
BEST	174				
BESTAR	008	086	174		
BINATONE	053				

Brand List for TV

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BLACK DIAMOND	008 146	CINERAL	019 082
BLACK PANTHER	129	CITIZEN	005 009 015 016 019 042 067 073
BLACK STRIP	194	CITY	024
BLACKSTRIPE	042 096 098	CLAIRTONE	066
BLACKTRON	074	CLARIVOX	008 086 123 124 129 195
BLACKWAY	074	CLATRONIC	008 024 053 070 086 108 129 174 187 196
BLAUPUNKT	050 051 069 189	CLAYTON	146
BLUE SKY	008 054 074 086 146 187 188 189 200	CME	007 008 018 024 025 041 044 053 055 056 058 075 078 085
BLUE STAR	074	CMS HIGHTEC	053
BOOTS	024 053	CONCERTO	015
BOSCH-BAUER	108	CONCORDE	024
BPL	008 074 086 209	CONDOR	008 024 070 074 086 108 112 123 129 174 210
BRADFORD	062	CONIC	113
BRINKMANN	008 086 123 176 200	CONRAD	008 086
BRIONVEGA	008 086 197 208	CONTEC	007 008 024 052 062 066 070 086
BRITANNIA	052 053	CONTINENTAL EDISON	151
BROCKWOOD	029	COSMEL	008 024 086
BROKSONIC	022 057 083	CRAIG	062
BROTHER	070	CRIPTOVISION	095
BRUNS	128 180 197	CROSLLEY	013 113 162 196 197 210
BSR	103 107 111 210	CROWN	008 009 024 062 086 096 123 129 174 176 185 187 188 196 204 207 209
BTC	054	CSELECTRONICS	052
BUSH	007 008 024 053 054 070 074 086 096 103 107 109 110 146 187 200 201 205 210	CTC	108
[C]		CURTIS MATHES	005 009 010 011 013 015 016 026 030 036 039 042 046 082 096
CANDLE	005 015 067	CXC	062
CAPEHART	125	CYBERTRON	054
CAPSONIC	070	[D]	
CARAD	008 086 200	DAEWOO	008 009 019 024 029 053 082 086 133
CARENA	008 086 189	DAINICHI	054
CARNIVALE	005	DANSAI	008 024 053 070 086 194
CARREFOUR	007 008 086 195	DANSETTE	131
CARVER	013 048	DANTAX	174 176 185 187 188
CASCADE	008 024 086		
CASIO	008 086 205 210		
CATHAY	008 086		
CCE	008 053 077 086		
CCI	118		
CENTRUM	146		
CENTURION	008 086		
CENTURY	197		
CGE	091 123 174 196 210		
CIE	133		
CIMLINE	024 110		

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DATSURA 096 209
 DAWA 008 086
 DAYTON 024
 DAYTRON 008 009 029 086 098
 DE GRAAF 096 210
 DECCA 008 018 053 086 126
 184
 DEITRON 008 086
 DENKO 070
 DENON 036
 DENVER 008 086 185
 DESMET 008 024 086 108 197
 DIAMANT 008 086
 DIAMOND 070 201
 DIGATRON 008 086
 DIGILINE 008 086
 DIGITOR 008 086
 DIGIVISION 107
 DIK 008 086
 DIXI 008 023 024 053 086
 128 197
 DOMEOS 200
 DORIC 205
 DTS 024
 DUAL 008 053 086 107 205
 210
 DUAL TEC 053
 DUMINT 129
 DUMONT 018 027 029 053 129
 195 197 198
 DUNAI 210
 DUX 008 086
 D-VISION 008 086
 DYNATECH 053
 DYNATRON 008 086

[E]

EB TELECOM 095
 ECTEC 089
 ELBE 008 053 086 107 112
 119 174 184 208 210
 213
 ELBE-SHARP 184
 ELCIT 129 184 197 210
 ELECTROBAND 066
 ELECTROHOME 088 096 113
 ELEKTA 008 024 070 074 086
 ELG 008 086

ELIN 008 024 086 107 198
 199 205 210
 ELITE 008 042 054 086 096
 108
 ELMAN 129
 ELTA 024 070
 EMERSON 008 009 029 039 041
 057 060 061 062 063
 064 065 066 071 073
 074 083 086 107 174
 176 195 196 197 210
 EMPEROR 074
 ENVISION 005
 ERRES 008 086
 ESC 008 053 086
 ESTELE 210
 ETRON 008 024 086 210
 EURO-FEEL 053 070
 EUROMANN 008 053 070 086 174
 EUROPA 008 086
 EUROPHON 008 053 086 129 184
 210
 EXCEL 008 086
 EXPERT 210
 EXQUISIT 008 086

[F]

FAGOR 008 086
 FAMILY LIFE 008 086
 FENNER 024
 FERGUSON 008 086 107 194 198
 FIDELITY 008 052 070 086 087
 094 107 131 210
 FILSAI 053
 FINLANDIA 018 096 107 173 207
 210
 FINLUX 008 018 053 061 086
 103 112 123 126 129
 160 161 162 163 170
 173 178 179 181 182
 183 184 185 186 187
 188 195 196 197 198
 199 210
 FIRST LINE 008 018 024 052 053
 086 096 107 111 112
 129 187 200 205 210
 FISHER 018 039 043 053 096
 098 107 128 174 197
 198 205 210

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FLINT 008 018 070 086 189
 FNR 129
 FORMENTI 008 086 093 108 176
 196 197 210
 FORMENTPHOENIX 162 179
 FORTRESS 197
 FRABA 008 086 174
 FRIAC 008 024 086 129 174
 FRONTECH 024 044 053 070 109
 205 210
 FUJITSU 008 024 018 053 061
 086 107 125 129 210
 FUJITSU GENERAL 024 053 210
 FUNAI 049 061 062 070 111
 131 200
 FUTURE 008 086
 FUTURETECH 062

[G]

GALAXI 008 086 107 129 210
 GALAXIS 008 086 123 129 152
 174
 GALERIA 024
 GBC 024 109 162 210
 GE 001 003 010 011 014
 029 030 035 060 074
 082
 GEANT CASIONO 210
 GEC 008 018 053 086 105
 107 113 126 184 205
 210
 GELOSO 024 109 162 210
 GENERAL TECHNIC 024
 GENESIS 024
 GENEXXA 008 024 044 054 086
 131 210
 GIANT 053
 GIBRALTER 005 027 029
 GO VIDEO 016
 GOLDFUNK 200
 GOLDSTAR 005 006 008 009 015
 020 021 024 029 034
 053 060 070 086 103
 107 113 125 150 174
 185 210 212
 GOODMAN'S 007 008 018 024 053
 061 070 086 133 146
 182 184 194 200 212

GORENJE 174
 GPM 054
 GRADIENTE 008 012 015 048 080
 086
 GRADIN 108
 GRAETZ 008 044 086 107 109
 204 210
 GRANADA 008 018 053 086 096
 099 125 181 184 196
 204 206 207 210
 GRANDIN 008 024 074 086 187
 188 189 200 210
 GRONIC 053 129 210
 GRUNDIG 008 024 050 058 069
 086 137 170 174 195
 196 202
 GRUNPY 061 062

[H]

HAIER 070 201
 HALIEAX 070
 HALIFAX 053 070
 HALLMARK 060
 HAMPTON 053
 HANSEATIC 008 024 053 074 086
 087 107 108 109 111
 112 162 174 180 197
 205 209 210 213
 HANTAREX 008 024 086 129 184
 HANTOR 008 086
 HARLEY DAVIDSON 061
 HARMAN KARDON 013
 HARVARD 062
 HARWOOD 008 024 086 131
 HAUPPAUGE 008 086
 HCM 008 024 053 070 074
 086 123 131
 HEDZON 008 086
 HEMA 024 053
 HEMMERMANN 107 205
 HIGHLINE 008 070 086
 HINARI 007 008 024 054 061
 070 086 096 210
 HISAWA 074 189
 HIT 197
 HITACHI 006 007 008 015 018
 029 031 032 036 038
 040 044 053 056 086

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HITACHI 087 092 098 099 100
101 104 105 106 107
109 113 114 115 116
117 125 158 167 181
182 183 184 199 205
206 207 210 211

HITSU 024 189

HMV 197

HORNYPHONE 008 086

HOSHAI 189

HUANYU 052

HUSPIELEKTRONIK 123

HYGASHI 053

HYPER 024 053

HYPER VISION 107 134

HYPSON 008 053 070 074 086
187 188 189

HYUNDAI 008 086

[I]

IBERIA 008 086

ICE 008 024 053 070 086

ICES 054

ICT 008 086

IMPERIAL 008 086 091 102 107
109 112 123 174 196
205 210

INDESIT 058

INDIANA 008 086

INFINITY 013

INGEKEN 139

INGELEN 044 107 187 210

INGERSOLL 024

INNO HIT 008 018 024 053 074
086 125 129 184 196
212

INNOVA 008

INNOVATION 008 086

INTEQ 027

INTERACTIVE 008 086 087 107 174
197 210

INTERBUY 008 024 070 086 087

INTERFUNK 008 044 086 087 105
107 109 168 174 177
197 205 210

INTERNAL 008 086

INTERVISION 008 024 053 070 074
086 129 154 174 176
189 210

IRRADIO 008 024 086 179 196
212

ISUKAI 008 054 074 086 189

ITC 053

ITS 008 024 070 074 086

ITT 044 061 096 098 107
109 173 181 182 204
205 210

ITT-NOKIA 061 096 107 168 173
177 181 182 185 186
204 205 210

ITV 008 070 086

[J]

JACSON 126

JBL 013

JCB 137

JEC 042 194

JMB 008 086

JOCEL 203

JUBILEE 008

JVC 007 012 047 064 123
185

[K]

KAISUI 008 024 052 053 054
074 086 189

KAMP 052

KAPSCH 044 105 107 109 198
210

KARCHER 008 070 074 086 129
174 210

KATHREIN 008 086 087

KAWASHO 052 076

KB ARISTOCRAT 210

KEC 062

KENDO 008 086 087 109 110
112 129 174 180 208
210

KENNEDY 162 210

KENWOOD 005 029 199

KINGSLEY 052

KITON 008 086

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KLOSS 002
 KMC 034
 KNEISSEL 008 086 112 174 208
 213
 KOLSTER 008 086 129 205
 KONIG 007 008 024 025 044
 051 058
 KONKA 008 086 123 187
 KORPEL 008 086
 KORTING 108 174 197
 KOSMOS 008 086
 KOTRON 070 131
 KOYODA 024
 KTV 005 009 053 062 065
 066 073
 KUBA 205 210
 KUBAELECTRONIC 107 205 210
 KURO 209
 KYOSHU 070 123 131
 KYOTO 053 210

[L]

LASAT 174 176
 LEADER 024
 LECSON 008 086
 LEMAIR 112
 LENCO 008 024 070 086 133
 156 198 210
 LENOIR 024
 LEVIS AUSTRIA 008 086
 LEYCO 008 018 070 086 111
 125
 LG 008 015 024 029 053
 086 107 144 174 185
 187 210 212
 LIESENK & TTER 008 086
 LIESENKOTTER 008 086
 LIFETEC 008 024 070 086 087
 146 200
 LLOYD'S 024
 LLOYTRON 006
 LOEWE 008 013 086 087 146
 147 171 172 174 175
 190 197 208 213
 LOGIK 008 020 026 086 201
 LOGIX 200
 LUMA 008 024 086 109 112
 208 210

LUMATRON 008 053 070 086 107
 208 210
 LUX MAY 008 024 086
 LUXMAN 015
 LUXOR 053 058 061 092 096
 104 107 109 125 167
 173 177 181 182 183
 186 205 206 210 211
 212
 LXI 010 013 027 029 039
 042 060 096

[M]

MAGNADYNE 107 129 162 184 197
 210
 MAGNAFON 129 179 184 196
 MAGNASONIC 096
 MAGNAVOX 000 002 004 005 007
 008 013 061 067 068
 086 113
 MAGNUM 008 086 187 188
 MAIDSON 008 086
 MAJESTIC 026
 MANDOR 070
 MANESTH 008 053 070 086 108
 110 194 210
 MANHATTAN 008 086 146 200 210
 MARANTZ 005 008 013 086 087
 131
 MARELLI 197
 MARK 008 024 053 086 187
 188
 MASUDA 008 024 053 070 086
 MATSUI 008 018 024 025 041
 053 086 096 102 107
 110 184 189 194 205
 210
 MATSUSHITA 011 079
 MC MICHAEL 113
 MEDIATOR 008 086
 MEDION 008 086 087 200 201
 MEGATRON 022 029 036 060 099
 MEI 066
 M ELECTRONIC 008 024 044 053 086
 087 107 112 173 182
 183 198 199 205 210
 MEMOREX 015 016 024 026 029
 034 037 039 060 070
 079 096

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MEMPHIS 018 024 125
 MERCURY 008 024 086
 METZ 008 086 146 197 200
 MGA 005 008 029 033 037
 060 086 198
 MICROMAXX 008 086 146 200
 MIDLAND 006 009 010 011 027
 035
 MINATO 008 086
 MINERVA 058 184 195 196
 MINOKA 008 086 131 207
 MINUTZ 001
 MITSUBISHI 007 008 029 030 033
 037 058 060 086 087
 096 197
 MITSURI GENERAL 210
 MIVAR 052 053 170 174 184
 196 212 213
 MONACO 024
 MORGAN'S 008 086
 MOTION 196
 MOTOROLA 014 030
 MTC 005 015 016 029 052
 066 087 107 174 205
 210
 MULTISTANDARD 129
 MULTITEC 008 086 146 176 200
 MULTITECH 008 024 052 053 062
 070 086 109 129 174
 176 196 205
 MURPHY 018 198 210
 MUSIKLAND 008 086
 MULTIMEDIA 132
 MYRYAD 008 086

[N]

NAD 029 042 046 060 107
 210
 NAIKO 008 086 185
 NAKIMURA 008 086
 NAONIS 109 210
 NATIONAL 058
 NEC 005 007 008 015 024
 029 048 053 086 189
 NECKERMANN 008 053 069 085 086
 087 092 109 112 123
 174 197 205 210
 NEI 008 086 210

NESCO 061
 NETSAT 008 086
 NEWFUNK 008 024 074 086 187
 NEW TECH 008 024 053 086
 NIKKAI 006 008 018 024 042
 052 053 054 070 086
 125 194
 NIKKO 005 010 019 027 029
 039 042 060
 NISATO 089
 NOBLEX 081
 NOBLIKO 129 179 195 196
 NOKIA 061 070 096 098 104
 105 106 107 109 153
 173 181 182 183 185
 186 204 205 207 210
 NORDIC 053
 NORDMENDE 008 086 187 210
 NORFOLK 210
 NORMEREL 008 086
 NOSHI 028
 NOVATRONIC 008 086 199
 NTC 019
 NURNBERG 107 210

[O]

OCEANIC 044 096 107 109 111
 177 181 182 210
 ODEON 070
 OKANO 008 018 024 070 086
 174
 OMEGA 070
 ONWA 062 129
 OPERA 008 086
 OPTIMUS 030 039 045 046 079
 ORBIT 008 086
 ORION 008 024 041 057 061
 070 083 086 107 108
 110 111 129 131 184
 187
 ORLINE 008 086
 ORMOND 008 146 200
 ORSOWE 184
 OSAKI 006 008 018 053 054
 070 086 125 131
 OSIO 008 086 212
 OSO 054
 OSUME 006 008 018 086 125

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OTTO VERSAND 007 008 024 053 069
074 085 086 087 092
098 103 107 108 109
110 111 162 180 184
205 209

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PACIFIC 008 086
PAEL 179
PALLADIUM 008 053 086 109 112
123 174 197 205 210
PALSONIC 008 053 070 086 131
201
PANAMA 008 024 053 070 086
PANASONIC 008 010 011 012 013
014 016 020 030 036
037 039 042 044 045
055 058 060 078 079
086 107 109 184 210
PANAVISION 008 086 112
PATHE CINEMA 052 108 174 205 210
213
PAUSA 024
PCE/PEC 042 096 098
PENNY 001 003 005 006 009
010 011 015 016 021
022 028 029 035 042
060
PERDIO 008 018 074 086 210
PERFEKT 008 086
PHASE 006
PHILCO 000 002 004 005 008
013 029 036 067 068
083 086 123 162 174
196 197 210
PHILEX 210
PHILHARMONIC 053
PHILIPS 000 001 002 003 004
008 009 013 027 028
029 086 087 113 125
138 140 197
PHOENIX 008 018 086 174 176
197 210
PHONOLA 008 086 108 197
PILOT 005 008 009 029 086
203
PIONEER 008 044 046 086 087
107 174 176 180 210
PLANTRON 008 024 070 086
PLAYSONIC 053 187

POLICOM 058 107 129 195 197
210
POLYRON 070
POPPY 024
PORTLAND 009 019 029
PRANDONI PRINCE 107 109 179 184 196
PRECISION 053
PREMIER 024
PRIMA 024 042 070 096 131
PRINZ 018 107 125 205 211
PRISM 011
PROFEX 024 107 196 210
PROFI 024
PROFITRONIC 008 086 129
PROLINE 008 018 086 112
PROSCAN 005 010
PROSONIC 008 086 174 187 200
PROTEC 109 129
PROTECH 008 024 053 070 074
086 123 176 200 205
210
PROTON 022 029 060
PRO-VISION 008 086 146
PULSAR 027 029 113 125
PYE 008 086 131 197 205
PYMI 024

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QUASAR 011 014 024 045 079
QUELLE 008 024 025 053 070
085 086 087 098 103
107 109 110 111 160
161 168 170 173 177
178 179 195 198 199
200 205 212
QUESTA 007

[R]

R-LINE 008 086 210
RADIALVA 008 086 210
RADIO SHACK 005 006 008 009 010
015 029 039 045 060
062 086 096
RADIOLA 008 053 086
RADIOMARELLI 008 086 184 197
RADIOTONE 008 024 070 086 123
131 174 180 200

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RADIX	098				
RANK	195				
RANK ARENA	007				
RBM	195				
RCA	010	011	028	029	030
	035				
REALISTIC	005	006	009	015	029
	039	045	060	062	096
RECOR	008	086			
RECTILIGNE	008	086			
REDIFFUSION	107	173			
REDSTAR	008	086			
REFLEX	008	086	146	200	
REKORD	159				
REOC	187				
REVOX	008	086	174		
REX	044	070	075	109	112
	210				
RFT	018	070	086	128	174
	180	197	213		
RHAPSODY	052	065	066		
RICOH	008	086			
ROADSTAR	008	024	054	070	074
	086	123	146		
ROBOTRON	197				
RODEX	008	086			
ROWA	053	070	201	203	
ROYAL LUX	131	174			
RTF	008				
RUKOPIR	008	086			
RUNCO	005	027			
[S]					
SABA	044	105	107	109	197
	184	210			
SAGEM	074	139	189		
SAISHO	024	025	041	053	070
	110	184	210		
SAIVOD	008	086	210		
SAKIO	070				
SALORA	044	092	096	104	107
	109	125	164	165	166
	167	168	169	177	184
	191	192	204	205	206
	207	209	210	211	212
SAMBERS	129	179	184	196	
SAMPO	005	006	009		
SAMSUNG	005	006	008	009	015
	016	018	024	029	053
	060	070	077	086	087
	096	125	137	174	210
	212				
SAMSUX	009				
SANDRA	052	053			
SANSEI	082				
SANSUI	008	083	086	189	202
SANTON	024				
SANYO	007	008	018	024	025
	039	043	053	086	096
	097	098	125	126	161
	174	176	198	204	209
	210	213			
SAVE	008	086			
SBR	008	086			
SCHAUB LORENZ	107	109	176	185	187
	205				
SCHNEIDER	008	053	054	070	086
	107	136	146	153	157
	162	187	200	205	210
SCIMITSU	029				
SCOTCH	060				
SCOTLAND	210				
SCOTT	029	057	060	061	062
SEARS	010	013	015	029	039
	042	043	049	060	061
	096				
SEG	007	008	024	053	070
	086	128	129	146	196
	200	205	208	210	
SEI	008	041	086	129	184
	197	205	210		
SEI-SINUDYNE	008	086	107	109	110
	111	129	184	197	
SELECO	044	070	075	090	109
	112	121	122	173	208
	210				
SEMIVOX	062				
SEMP	042				
SENCORA	024				
SENTRA	024	042	194	205	
SERINO	189				
SHARP	007	009	030	045	184
SHINTOSHI	008	086			
SHIVAKI	008	086			
SHOGUN	029				
SHORAI	061	111			

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SIAREM 129 162 184 197 210
 SICATEL 120
 SIEMENS 008 050 051 069 086
 107
 SIERA 008 086
 SIESTA 174
 SIGNATURE 026 042
 SILVA 008 086 107
 SILVER 007 008 061 086 107
 188 189 210
 SIMPSON 067 068
 SINGER 008 024 086 129 162
 197 210
 SINUDYNE 008 041 086 107 129
 162 184 197 205 210
 SKANTIC 109 206
 SKY 008 086
 SKYMASTER 199
 SLX 200
 SOGERA 108
 SOLAVOX 006 008 018 044 086
 107 210
 SONIKO 008 086
 SONITRON 053 096 098 174 204
 SONNECLAIR 008 086
 SONOKO 008 024 053 070 074
 086
 SONOLOR 044 074 096 107 210
 SONTEC 008 024 086 174
 SONY 007 008 025 072 085
 086 129
 SOUND&VISION 008 086 129
 SOUNDESIGN 029 060 061 062 067
 SOUNDWAVE 008 086 123
 SPECTRA 024 133
 SPECTRICON 022
 SQUAREVIEW 049
 SR2000 096
 SSANGYONG 024
 SSS 029 062
 STAKSONIC 024
 STANDARD 008 024 053 054 086
 108 146
 STARLITE 008 024 062 070 086
 131 210
 STENWAY 074

STERN 044 070 075 109 112
 210
 STRATO 008 024 070 086
 STYLANDIA 053
 SUNIC LINE 008 086
 SUNKAI 008 086 110 111 189
 SUNSTAR 008 024 070 086
 SUNWOOD 008 024 086
 SUPERLA 053 184
 SUPERTECH 008 024 086 107
 SUPRA 015 024
 SUSUMU 054
 SUTRON 024
 SYDNEY 053
 SYLVANIA 000 002 004 005 013
 067 068 088
 SYMPHONIC 049
 SYSLINE 008 086

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TADNDY 125
 TANDBERG 107 112 208 210
 TANDY 018 030 044 053 054
 210
 TASHIKO 007 053 113 207 210
 TATUNG 008 014 018 022 053
 086 125 184
 TCM 187
 TEAC 008 024 029 053 070
 074 086 087 107 123
 131 146 162 189 200
 201 202 203 205
 TEC 008 024 053 086 107
 133 210
 TECHLINE 008 086 129 200
 TECHNEMA 108
 TECHNICS 010 011 027 079
 TECHNISAT 008 086 130 210
 TECHNOL ACE 061
 TECHWOOD 011 015 022
 TECHNIMAGEN 008
 TEDELEX 008 024 053 086 096
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TEKNIKA	009 013 015 016 019 026 029 037 061 062 067	TRIAD	008 086
TELECO	135	TRIDENT	053 184
TELECOR	008 053 086 210	TRISTAR	070
TELEFUNKEN	008 015 086 176	TRIUMPH	008 041 059 086 173 184
TELEGAZI	008 070 086 210	TSOSCHI	074
TELEMEISTER	008 086 108	TV TEXT	087
TELESONIC	008 086	TV TEXT 95	008
TELESTAR	008 086 131		
TELETECH	008 024 086 200	[U]	
TELETON	007 053 067 109 205 210	UHER	008 086 108 123 129 174 176 196
TELEVIDEON	108 210	ULTRA	089 125
TELEVIEW	008 086	ULTRAVOX	008 086 129 162 197 210
TELEXA	129	UNIC LINE	008 086 181 189 205
TEMPEST	008 024 086	UNITED	008 086 187 188
TENNESSEE	008 086	UNIVERSAL	001 003
TENSAI	008 024 053 054 086 103 108 111 188 198 199 210	UNIVERSUM	008 024 053 070 086 087 107 112 123 173 174 181 182 183 186 195 196 198 199 200 205 208 210 212
TENSON	024	UNIVOX	008 086 197 210
TESLA	135	UTAX	210
TEVION	008 086 200		
TEXET	024 052 053 054	[V]	
THOMAS	113 125	VECTOR RESEARCH	005
THOMSON	008 058 086 145 205	VESTEL	008 053 086 146 200 210
THORN	008 018 042 085 086 087 097 098 107 113 115 126 127 194 198 207	VEXA	008 024 086
THORN-FERGUSON	107 194 198	VICTOR	012
TMK	015 029 041 060	VIDEOSYSTEM	008 086
TOKAI	008 024 053 086 125 200 210	VIDEOLOGIQUE	053
TOKYO	194	VIDEOTECHNIC	053
TOMASHI	074	VIDEOTON	104 206 210
TOSHIBA	007 016 039 042 053 059 096 098 129 170 194 195	VIDIKRON	013 129
TOSONIC	066	VIDTECH	007 029 060
TOTEVISION	009	VISA	007 008 024 025 044 058
TOWADA	053 109 129 205	VISION	008 053 086 108
TOYODA	024	VISTAR	107
TRAKTON	070	VORTEC	008 086
TRANS CONTINENS	008 053 086 200	VOXSON	008 044 086 109 123 196 197 210
TRANSONIC	008 070 086 087 189 201 203	VTQ	128

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WALTHAM	008 053 086 104 109
	123 200 206
WARDS	000 001 003 004 005
	013 015 026 029 035
	042 045 060 061 068
WATSON	008 024 086 108 146
	200 210
WATT RADIO	107 129 162 205 210
WEGA	007 008 086 197
WEGAVOX	008 024 086
WELTBlick	008 053 086
WESTON	008 086
WHARFEDALE	008 086
WHITE WESTINGHOUSE	008 052 086 096 108
WINDSOR	200
WINDSTAR	074
WINDY SAM	008
WINTEL	187
WORLD-TECH	133

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XRYPTON	008 086
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YAMAHA	005 029
YAMISHI	008 053 074 086 189
YOKAN	008 086
YOKO	008 024 053 070 086
	133 174 204 209
YORK	098

[Z]

ZANUSSI	053 075 109
ZENITH	019 026 027
ZENOR	204
ZONDA	022