Dual Tuner DVR STB Users Manual (Draft Version) (Model : LSK279-8TZM)

November. 14, 2007
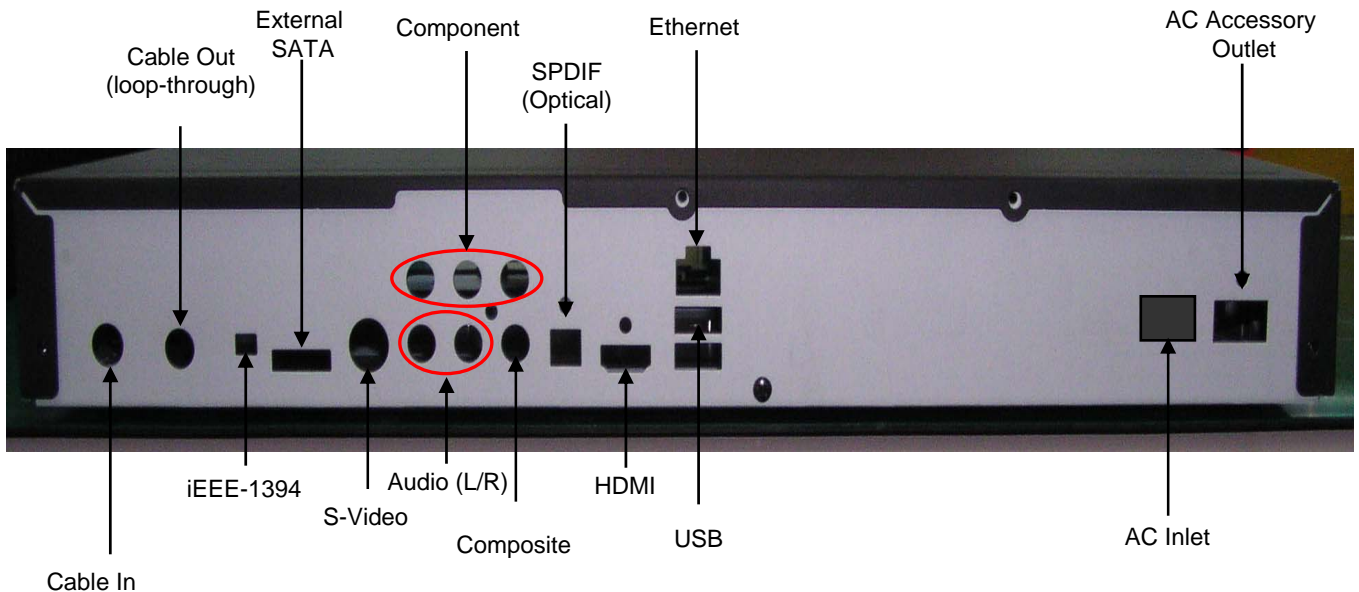
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Front & Rear Panel Specification

[Front Panel Layout]

[Rear Panel Layout]

Cable Out (loop-through)

External SATA

Component

SPDIF (Optical)

Ethernet

AC Accessory Outlet

iEEE-1394

S-Video

Audio (L/R)

HDMI

Composite

USB

AC Inlet

Cable In

FCC Rules

NOTE: 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 in-stalled and used in accordance with the instructions, 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 radio/ TV technician for help.

"Changes or modifications not expressly approved by the party responsible
for compliance could void the user's authority to operate the equipment."

Remote Controller

■ Remote Control Lay-out

Layout

Basic Function + Hot Key

Navigation Key

Number + Character Input Key

Picture in Picture

Remote Controller

■ Remote Control Lay-out

* Requirement : ALL Classes of NGSTB's shall be able to receive signal transmitted by Motorola DRC800 and Philips RC1445301 remote controls and correctly interpret the IR code transmitted.

* **Remote Control IR Codes**
 REMOTE control Key /IR code Mapping shall conform to the following table:

Key Name	IR code
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
POWER	0A
CHAN +	0B
CHAN -	0C
VOL +	0D
VOL -	0E
MUTE	0F
SELECT/OK	11
EXIT	12
LAST CHANNEL	13
INPUT/RF BYPASS	14
FAVORITE	15
A (Yellow Triangle)	17
MENU	19
VOD	1A
PLAY	1B
STOP	1C
FAST FORWARD	1D
REWIND	1E
PAUSE	1F
PiP ON/OFF	22
PiP SWAP	23
B (Blue Square)	27
C (Red Circle)	28
D (Green Diamond)	29
GUIDE	30
RECORD	31
INFO	33
UP	34
DOWN	35
LEFT	36
RIGHT	37
REPLAY	3C
LIST (DIGITAL RECORDINGS)	3D
SKIP FORWARD	3F
ASPECT	40
FiOS TV	41
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New function introduction

| Feature	Description	Method
OpenCable Compliant HD STB	A standard Interface between OpenCable HD STB and CableCARD Module that handles CAS.	▪ Creation of a bidirectional OpenCable HD STB that satisfies digital cable broadcast standard using Broadcom Cable Chip (BCM7400) ▪ M-CARD UDCP Verification
Digital Cable Signal Transmission/Reception	**In-Band Channel**: Reception of 64/256 QAM signal **Communication between STB and Head-End**: Down channel : Legacy OOB, Up channel : MoCA	▪ Receiving 64/256 Digital cable QAM signal via Cable in the home ▪ For bidirectional communication between cable Head-End and STB, Legacy OOB (down channel) and MoCA (up channel) are used.
Home Networking Over Coaxial Cable	Inter-compatibility and Contents sharing between CE, PC and Mobile Devices via wired/wireless networking,	▪ Creation of On-board MoCA Module in order to utilize MoCA in the home Cable Network. ▪ Creation of DLNA/UPnP stack for the intercommunication between Consumer devices in the home. ▪ Participation in Plug Fest, Certification and DLNA Logo program.
MR-DVR	Connectivity between Home Devices	▪ AV streaming via MoCA Network with DLNA/UPnP stack ▪ Viewing of saved server Contents using media Player ▪ Connectivity of Home Network Devices ▪ Contents Up/Download feature ▪ Link Protection (DTCP-IP) ▪ Mobile Device Connectivity support (HID) - MIU: Media Interoperability - M-NCF: Network Connectivity

In-home Networking and MR-DVR Through MoCA

- Entropic's "c.LINK" enables cable STB with integrated PVR or cable modem to be a whole-house solution extending
  - PVR & IPTV services to all TVs
  - Ethernet directly to a PC
- No consumer adoption or education issues
  - Consumer is not aware of the presence of any network. No new wires, connections, or behavior

Operational Concept

Cable Head-end (Signal Lab)
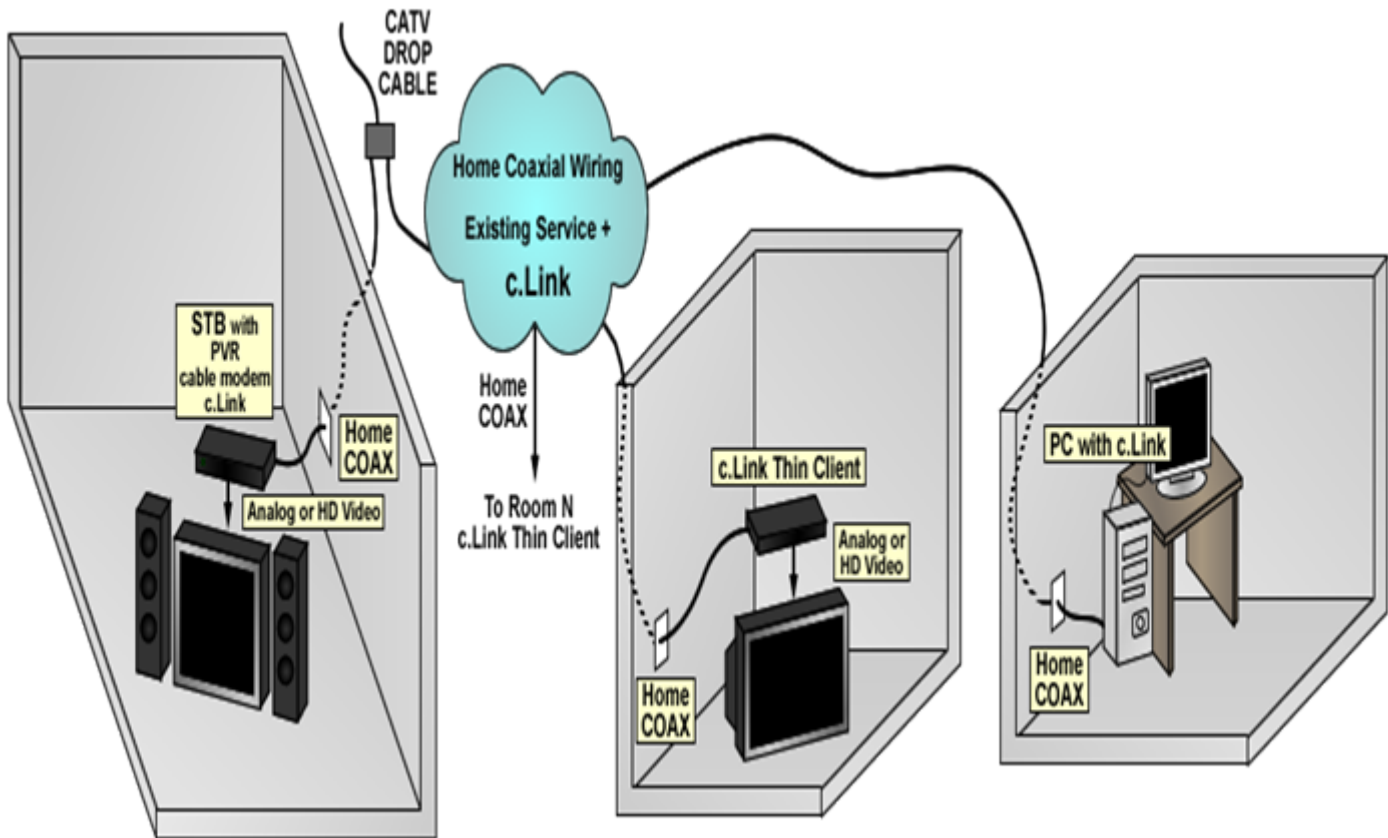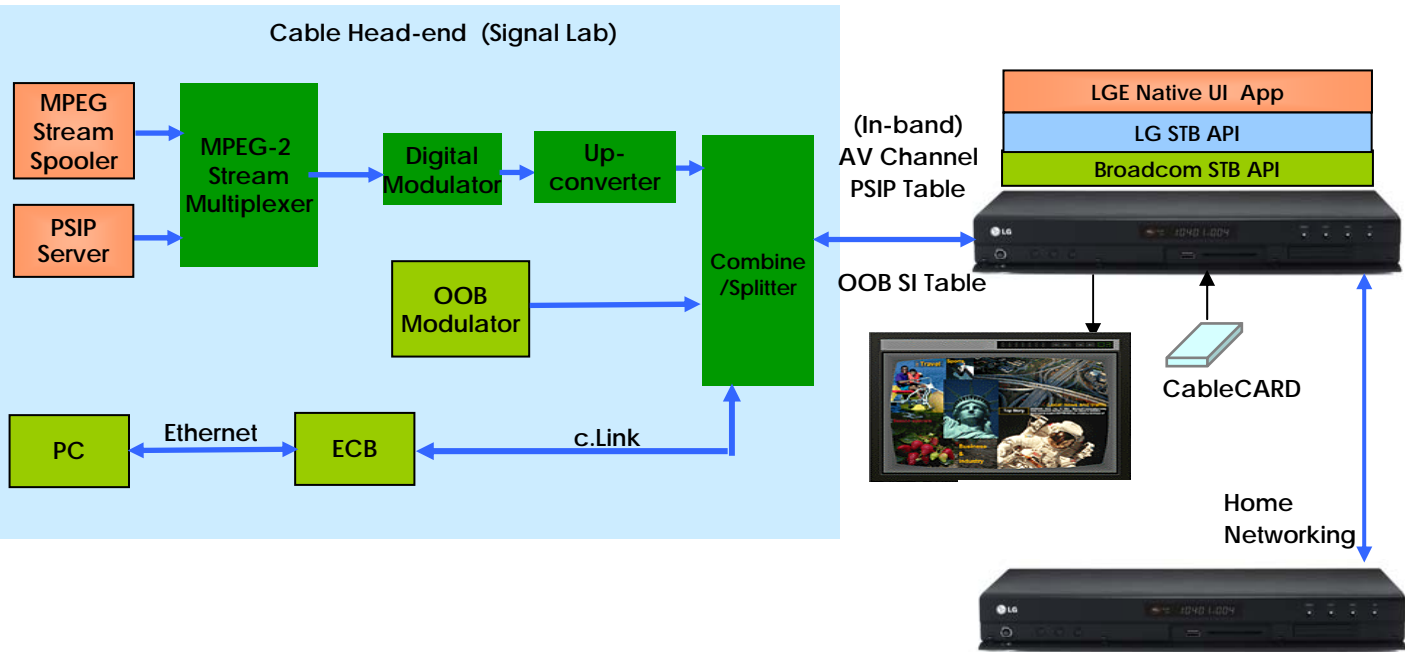
> QAM/IP STB Operational Concept

[64/256 QAM Channel]
♦ For the A/V Channel Tuning test, the existing QAM signal set up at the AV Business Dept. will be used.
♦ Verify A/V output and channel change with basic channel tuning.

[OOB Channel]
♦ Produce random signals from the OOB Modulator and verify Tuning status.

[MoCA Channel]
♦ Verify MoCA Network communication with Ethernet connection between the PC and ECB.

[CableCARD]
♦ Verify CableCARD Operation.

[Home Networking]
♦ Verify connectivity between STBs (Server/Client).
♦ Verify Media Interoperability and Network Connectivity.

1. In-band tuner tuned A/V channel Navigation

1)   Without a cable card, turn the power on. After the system boots, it will tune to a preset channel like the screen on the left.

(Note) The first channel is tuned using saved Channel information from the clear QAM signal that is currently broadcasted from the research lab.

(note) The banner OSD is setup to display the currently tuned channel number.
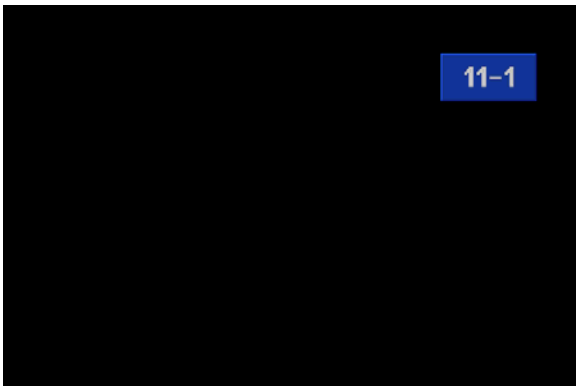
2) If the remote control or front panel's CH UP or CH DN key is pressed, the A/V will mute and tune to the next channel.

At this time the currently tuned channel number will be displayed on the banner OSD. The channel banner will automatically disappear after 3 seconds.

3) If the channel change is complete, the banner OSD will disappear and A/V will output.

2. Basic Set-top Box Functionality Verification using the menu

1) MAIN MENU

If the MENU key is pressed, the Menu OSD will be displayed like the screen on the left.

(Note) Basic MENU Navigation can be performed using the UP, DOWN, LEFT, RIGHT and SELECT (OK) keys.

(Note) Menu items will increase for future functionality tests.

2) SYSTEM INFO

If the SELECT (OK) key is pressed at the Info & Test menu, the Info & Test drop down menu will be displayed.

Like the picture on the left, the System Info menu item will display the Set-top Box's basic information (Model Number, S/W Information, H/W Information, etc).

3) TUNER INFO
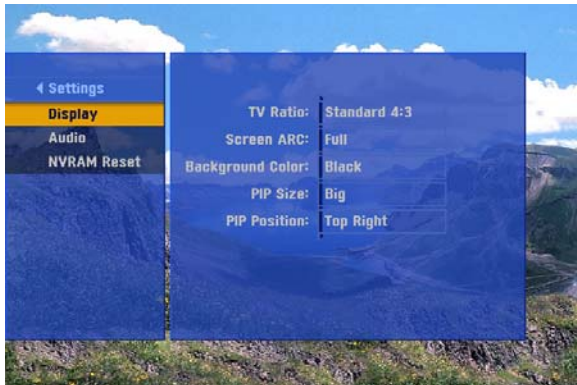
Tuner Info will show signal strength information for the set-top's 2 tuners in the form of simple bars.

4) HDD INFO

HDD Info will show the set-top internal SATA HDD's basic information.

3. Display Menu

1) DISPLAY

This screen is displaying the Display menu items. The Display menu items provides various menus to control or change display settings.

If the SELECT (OK) or RIGHT key is pressed, the focus will shift to the Display menu OSD.

2) DISPLAY

This screen is showing the menu where the key focus has been moved to the Display item.

To move between menu items, use the UP, DOWN or PAGE UP, PAGE DN keys.

If the SELECT (OK) key is pressed, the setting can be changed to like a window's combo box.

3) DISPLAY -> TV Ratio

The menu sets the type of the Set-top Box's connected TV.

If the SELECT (OK) key is pressed, the item entry will be completed and a screen similar to 2) will be displayed.

If the LEFT key is pressed, the item entry will be canceled and a screen similar to 2) will be displayed.

Menu Item

• Standard 4:3 – when connected to a 4:3 TV
• Widescreen 16:9 – when connected to a 16 :9 TV

3. Display Menu

4) DISPLAY -> Screen ARC

Change input video's aspect ratio.

Menu Item

- Full – Display full screen irregardless of input video format.
- Box – Display Letter Box or Pillar Box.
- Crop – Display Pan Scan or Zoom.

(note) In the case of Live TV the remote control's ASPECT key can also be used.

Item	4:3 TV	16:9 TV
Full	16:9 stream will be vertically stretched to fill up the display.	4:3 stream will be horizontally stretched to fill up the display.
Box	16:9 stream will produce top and bottom bar while preserving stream ratio. (Letter Box)	4:3 stream will produce left and right bar while preserving stream ratio. (Pillar Box)
Crop	16:9 stream's left and right section will be cut to fill up the display. (Pan Scan)	4:3 stream's top and bottom section will be cut to fill up the display. (Zoom)

5) DISPLAY -> Background Color

Change color of all regions excluding video, i.e. non active region.

Menu Item : Black, Gray, Dark Gray, Red, Green, Blue

(note) If the video is covering the whole display, the color change cannot be seen, unless PIP or aspect ratio is also on.

3. Display Menu

6) **DISPLAY -> PIP Size**

Set PIP size.

Menu Item : Big, Normal, Small

(note) To see actual PIP, press the remote control's PIP key during Live TV.

6) **DISPLAY -> PIP Position**

Set PIP position.

Menu Item : Bottom Right, Top Right

(note) Press remote control's PIP MOVE key during Live TV.

4. Audio Menu

1) AUDIO

This screen is displaying the Audio menu items. The Audio menu items provides various menus to control or change audio settings.

If the SELECT (OK) or RIGHT key is pressed, the focus will shift to the Audio menu OSD.

2) AUDIO -> Language

Choose audio setting for broadcasts in other languages.

Menu Item : English, Spanish, Chinese, French, German, Italian, Japanese, Korean
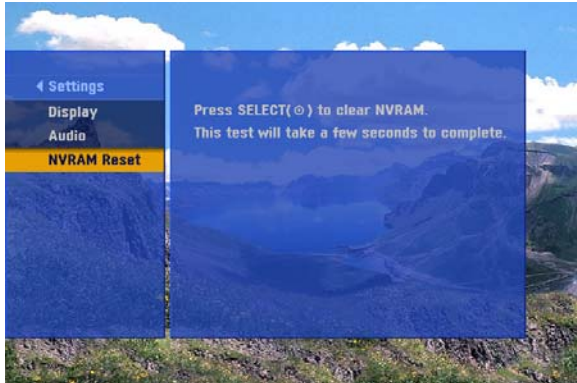
(note) Currently not operational.
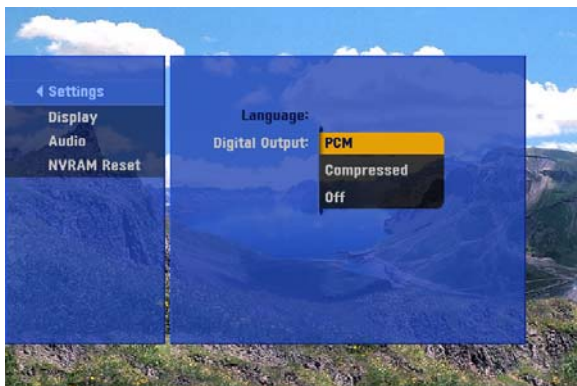
3) AUDIO -> Digital Output

Control digital audio output.

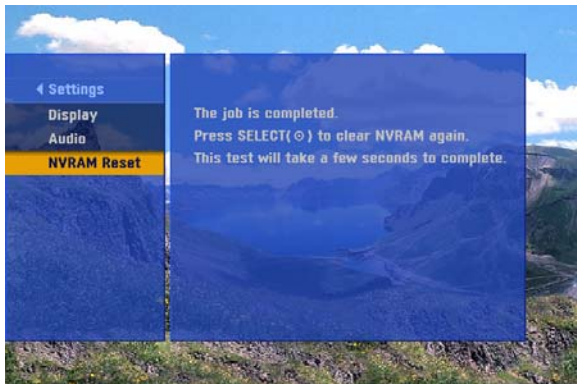**Menu Item** : Compressed(AC3), PCM, Off

5. NVRAM Reset Menu

1) **NVRAM RESET**

This screen is displaying the NVRAM Reset menu items.

If the SELECT (OK) or RIGHT key is pressed at this menu, the NVRAM will initialize.

(note) If this menu is launched, all settings will revert back to default.

2) If the SELECT (OK) or RIGHT key is pressed at the above menu, the current operation status and after that the result will be displayed.

6. PVR Test

1) If the RECORD key is pressed during a viewing, recording will start and the OSD will be displayed on the screen.

Press the STOP key to stop (end) the recording.

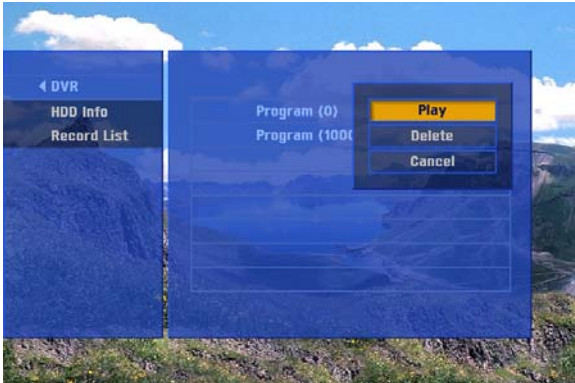2) If the PLAY key is pressed during a viewing, the most current recorded program will be played.

Press the STOP key to stop the play.
If the STOP key is pressed, the previously viewed channel will be shown.

2) Recorded items can be verified at the DVR -> Record List menu.

6. PVR Test

4) After selecting a program from the list and pressing the ENTER key, a popup menu will appear to allow "Play", "Delete" or "Cancel".

If "Play" is selected, the selected program will be played.
If "Delete" is selected, the selected program will be deleted.

5) If "Play" is pressed at the previous screen, the program will play on the screen.

From here, other programs can be played by moving back to 4).

6) The program that is currently being played can be verified at the Record List.

(note) The program that is currently being played cannot be deleted.

7. PIP Test

1) If the PIP key is pressed, PIP can be turned on or off.

If PIP is turned on, the last viewed channel or the first channel will be displayed.

(note) PIP size can be adjusted at the PIP Size menu.

(note) PIP position can be adjusted at the PIP Position menu.

(note) PIP channel can be changed using the PIP CH UP or PIP CH DOWN key. PIP channel change scenario is the same as the main display.

(note) PIP activation is independent of the main display, i.e. PIP will still work even if the main display is performing RECORD or PLAYBACK.

8. Volume Control Test

1) The Set-top Box's volume can be adjusted using the VOL UP or VOL DOWN key.
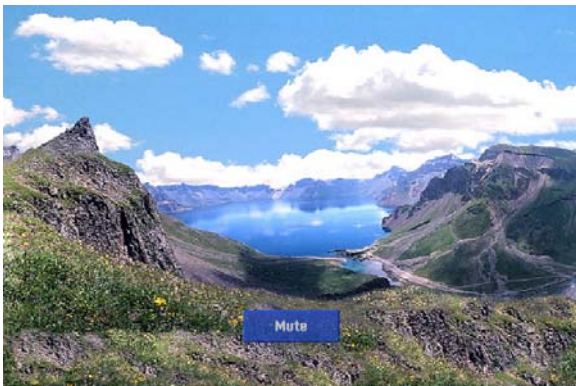
2) If the MUTE key is pressed, Audio output will be blocked.

(note) At this time, if the VOL UP or VOL DOWN key is pressed, the volume will revert back to the previous setting.
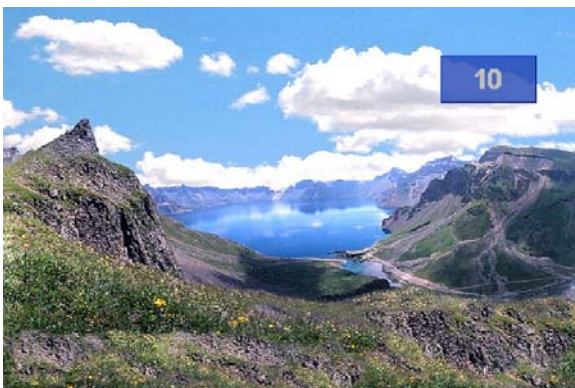
9. DLNA Test

1) If the VOD key is pressed during a viewing, the DLNA test screen will appear.

(note) Audio/video decoding will be stopped upon loading of the DLNA screen.

(note) For DLNA related detailed test scenario, please refer to the relevant document.

2) At anytime during the DLNA test, press the VOD key again or select TV from the menu to go back to TV viewing mode.