Matrix

Get Started Guide V2.1

Contents

Overview

Matrix is a single board mini computer based on ARM with a wide range of interface, equipped with a powerful i.MX6 Freescale processor, it can run Android, Linux, Ubuntu and other operating systems, a switch between different operating systems can be done within just a few minutes! Matrix also has great support for TBS USB tuners and popular software such as XBMC, VDR, Tvheadend, DVBLast [1]and so on.

Features

- **TBS Tuner Support**

Equipped with the mini PCIe slot and USB ports, Matrix works perfectly with TBS USB tuners.

The supported USB tuners are:

TBS5220, TBS5280, TBS5281, TBS5880, TBS5881, TBS5922, TBS5925, TBS5680, TBS5980, TBS5990, TBS DVB-C stick

Support for more tuners will be added.

- **Freescale Quad Core**

Based on Freescale i.MX6, Matrix provides a much more powerful ready-to- run platform.

- **Open Source**

It's 100% open source, Matrix runs Linux, Android, Ubuntu, and any other OS you like.

To switch from one OS to another, you just need to burn the new OS into the eMMC on the Matrix board, and then reboot it.

- **XBMC, VDR, Tvheadend Support**

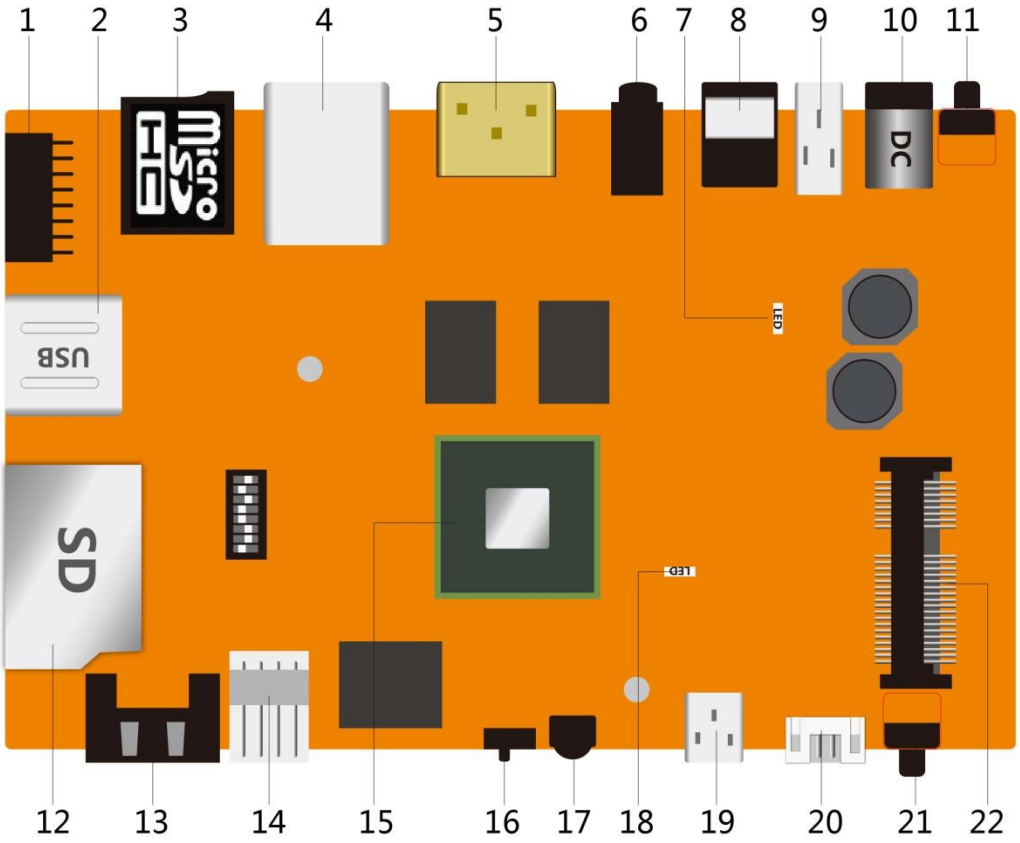
Popular software like XBMC, VDR, Tvheadend are ready for Matrix.

[1] The DVB software are preinstalled in a customized Linux OS called MatrixTV, the OS image can be found in the download section of www.tbsdtv.com

Specification

System-on-a-Chip (SoC)	Freescale i.MX6Q
CPU	Quad ARM Cortex-A9 at 1.0GHz
GPU	Vivante GC2000, Quad core GPU, Quad IPU
RAM	2GB DDR3
USB 2.0 Ports	3x USB 2.0
Audio & Video	3.5 mm jack
	HDMI port, High-Bit-Rate (HBR) Audio over HDMI passthrough support for DTS-HD MA (DTS High-Definition Master Audio) and Dolby TrueHD
Other Interface	SATA3.0
	UART port
	I/O port
	OTG (mini USB)
	mini PCIe
	Optical (S/PDIF)
	IR receiver
Remote Support	HDMI-CEC
Storage	16GB eMMC
	1x SD card slot
	1x micro SD/ TF card slot
Network	10/100/1000 wired Ethernet
	WIFI IEEE 802.11n/b/g
Power Input	12 V, 2A
Dimension	board:130*83 mm
	case: 135*90*45 mm
	package: 186*182*80 mm
Package Contents	1x Matrix ARM mini PC
	1x power adapter
	1x SATA power cable

Interface Introduction

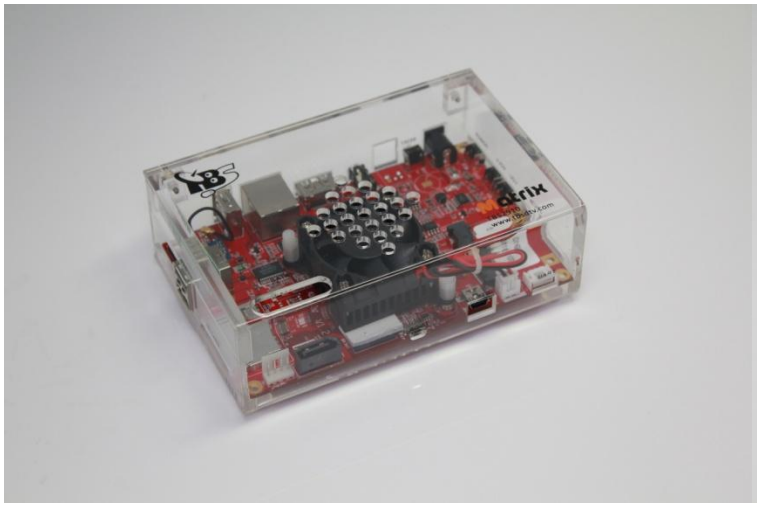


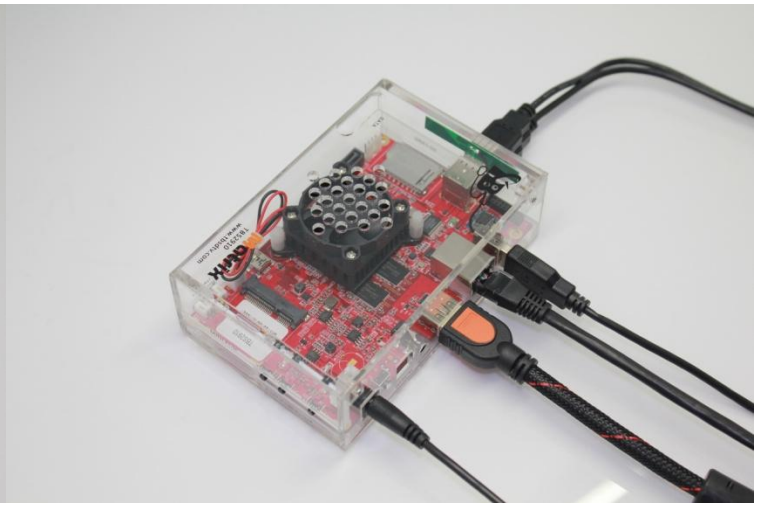
1. I/O port
2. 2x USB 2.0 ports
3. Micro SD/ TF card slot
4. LAN port
5. HDMI port
6. Audio (3.5mm jack) port
7. LED indicator
8. Optical (S/PDIF) port
9. USB 2.0 port
10. DV 12V (power connector)
11. Reset button
12. SD card slot
13 & 14. SATA port
15. Main chip
16. BOOT/ UPDATE switcher
17. IR receiver
18. LED indictor
19. OTG/ mini USB port
20. UART port
21. ON/OFF button
22. mini PCIe slot

Get Started

Matrix is an open source mini PC based on ARM, which can run Android, Linux, Ubuntu and many other operating systems, by default it has MatrixTV system preinstalled inside, it's easy to switch to another system within just a few minutes, by burning a new OS image[2] into the eMMC on the board. Below you can find a brief guide for connection, before you get started, make sure the following things are ready:

- Matrix
- Power adapter (12V. 2A)
- HDMI cable
- Monitor or digital TV with HDMI input
- Network cable
- USB devices (keyboard & mouse)





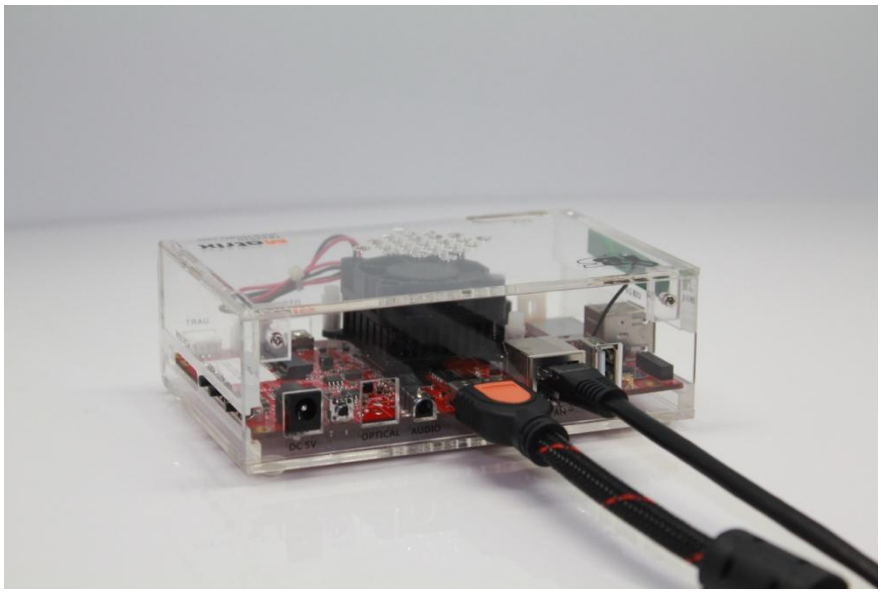
01- Connect the HDMI cable

Plug one end of the HDMI cable to the HDMI port on Matrix, and the other end to your monitor or digital TV.

[2] OS images and some software can be found in the download section of www.tbsdtv.com

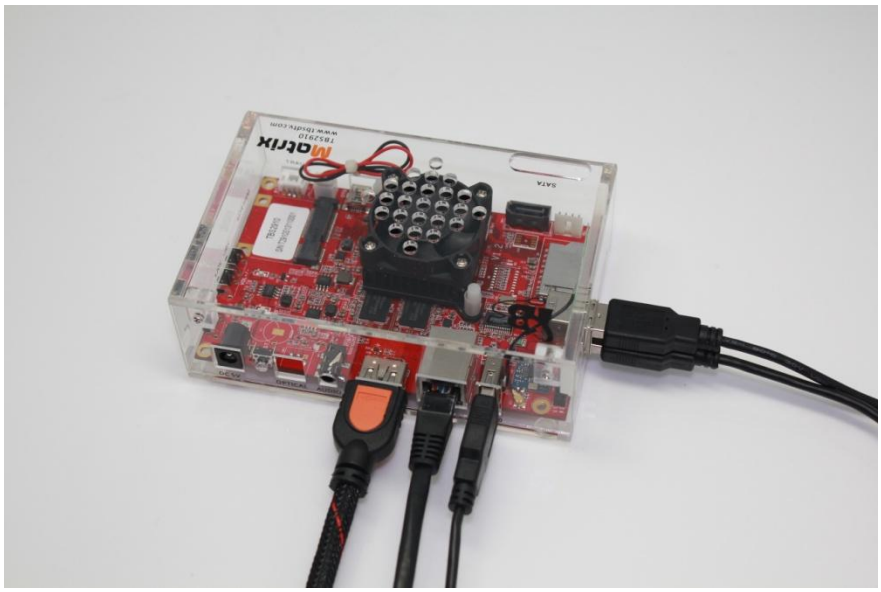
02- **Connect the network cable**

Connect the network cable to the LAN slot on Matrix.



03- Connect keyboard & mouse

There are 3 USB2.0 ports on Matrix, two of which can be used to connect with a keyboard and a mouse.



04- Power on Matrix

Matrix starts to boot the moment you plug the power supply to the “DC 12V” slot.

Now Matrix is ready for you to explore more!

Switch to another operating system

Matrix runs MatrixTV system by default, if you want to switch to another operating system, you need to burn a new OS [3]intos the eMMC on the board. In order to burn the new OS into eMMC, you are going to need:

- 1x PC
- 1x USB mini cable (Type: mini B)

Download the OS image files from the download section of our website to your PC, and then follow a few steps below:

Move the “Burn/Run“ switcher on the board to the “Burn” side.

1. Connect one end of the USB mini cable to the OTG port on Matrix, the other end to the USB port of the PC.
2. Open the software “MfgTool2” in the folder, where the OS image files are inside, click “Start”, and wait a few minutes until it’s completed.
3. Power off Matrix.

4. Move the “Burn/Run“ switcher on the board back to the “Run” side.
5. Power on to let Matrix restart, now it can run the new OS you have just burnt into eMMC.

How to burn a new OS into eMMC on Matrix?

Matrix can run Android, Linux and many other operating systems. In order to burn the new OS into eMMC, you are going to need:

- 1x PC
- 1x mini USB cable (type: mini B)

Download the OS image files from the download section of our website to your PC, and then follow a few steps below:

1. Move the “BOOT/UPDATE“ switcher on the board to the “UPATE” side.
2. Connect one end of the USB OTG cable to the OTG port on Matrix, the other end to the USB port of the PC.
3. Open the software “MfgTool2” in the folder, where the OS image files are inside, click “Start”, and wait a few minutes until it’s completed.

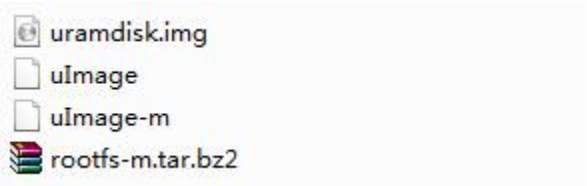
[3] The OS images can be found in the download section of www.tbsdtv.com

4. Power off Matrix.
5. Move the “BOOT/UPDATE“ switcher on the board back to the “Start” side.
6. Power on to let Matrix restart, now it can run the new OS you have just burnt into eMMC.

How to update MatrixTV system through SD card

If your Matrix runs MatrixTV V1.0.0.7 or a later version, system update becomes more convenient now, you no longer have to connect it via mini USB cable to the PC and then flash the new OS to eMMC, because MatrixTV V1.0.0.7 and the later versions support update through SD card, and there are just a few easy steps!

1. Prepare a SD card (minimum 2GB).
2. Download the latest MatrixTV OS from our website, copy the OS file to the root directory of the SD card.
   Like this:



3. Insert the SD card to the SD card slot on Matrix, power on Matrix, when it starts to update, the blue LED light is flashing, wait about 5 minutes until the update completes, the blue LED light is then off.
4. Power off Matrix, remove the SD card from Matrix.
5. Power on, your Matrix runs now a newer version of MatrixTV.

Note: *Only MatrixTV versions 1.0.0.7 or later support this function.*

How to use MatrixTV with TBS USB tuner

MatrixTV is a customized operating system based on Linux, XBMC and VDR are integrated in the system to make it an all-in-one system for watching digital Live TV, extra software for playback is no need to be installed, it is the default OS when you get your Matrix. In this guide, we are going to show you how to use Matrix running MatrixTV together with a TBS USB tuner to watch digital Live TV.

Matrix is a powerful ARM mini PC that can work together with TBS USB tuner for watching digital TV, the supported TBS USB tuners are on list below:

DVB-S2/S

- TBS5922 DVB-S2 TV Tuner USB Box (discontinued)
- TBS5922SE DVB-S2 TV Tuner USB Box
- TBS5925 Professional DVB-S2 TV Tuner USB Box
- TBS5980 DVB-S2 TV Tuner CI USB Box
- TBS5990 DVB-S2 Dual Tuner Dual CI USB Box

DVB-T2/T/C

- TBS5220 USB DVB-T2 / T / C Tuner TV Stick
- TBS5280 USB DVB-T2/T Dual Tuner TV Box (discontinued)
- TBS5281 DVB-T2/T/C Dual Tuner TV USB Box
- TBS5880 USB DVB-T2/T/C CI TV Box (discontinued)
- TBS5881 USB DVB-T2/T/C CI TV Box

DVB-C

- TBS5680 DVB-C TV Tuner CI USB Box
- TBS DVB-C Stick (TBS5610)

** more new models will be added to the list, the details and update can be found on:*

http://www.tbsdtv.com/launch/tbs-2910-matrix-arm-mini-pc.html

Before we get started, we should check and make sure:

The firmware of Matrix is up-to-date, the latest firmware is available in the download section below:

http://www.tbsdtv.com/download/

and the following things are ready for use:

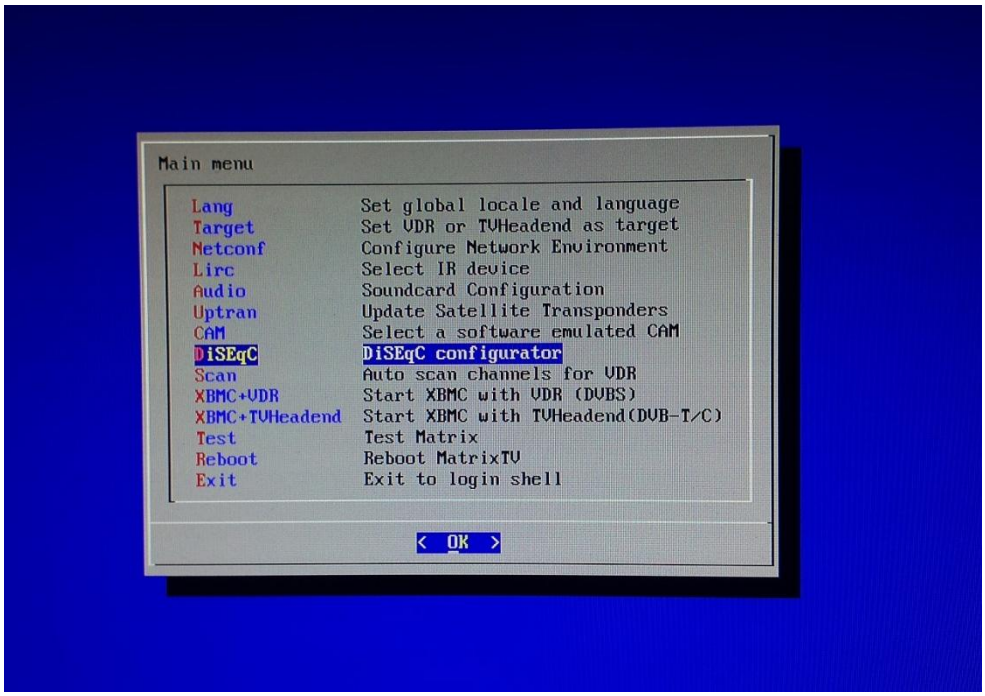
- 1x Matrix (included power supply)
- 1x USB keyboard
- 1x USB mouse
- 1x network cable
- 1x TBS USB tuner
- DVB-S2/T2/C signal (in our test below we use TBS5990, so DVB-S2 signal is required)

After an USB keyboard, an USB mouse and a network cable is connected to Matrix, power on Matrix, we will notice that:

- The blue LED light blink 3 times
- The fan turns only 1 round

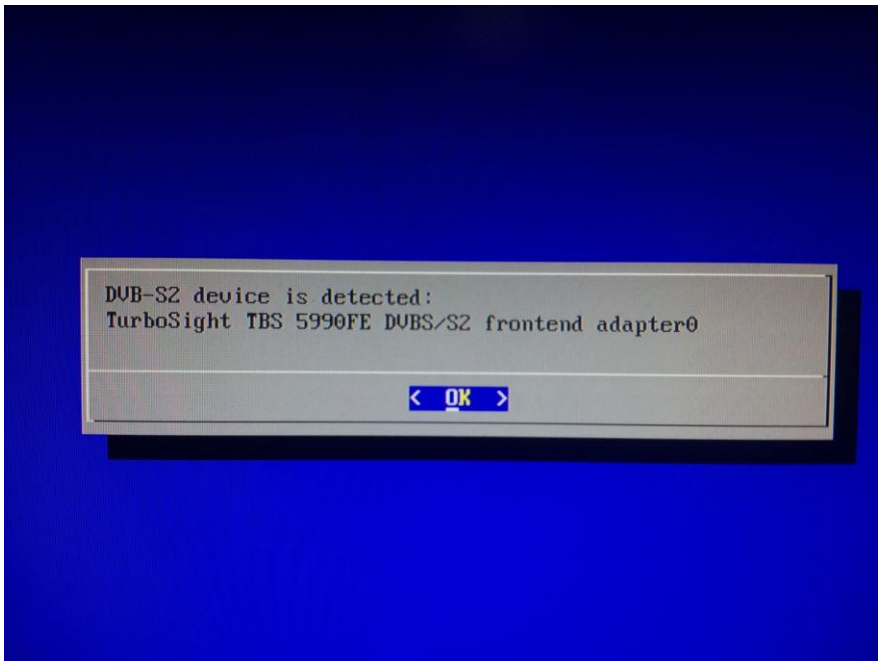
This means the Matrix we are about to test works normally, if one of those two signal is missing, the matrix might not be able to boot or work.

When it begins to load the system, we can press any key to enter to system settings, on the settings main menu, go to: **DiSEqC --> OK**

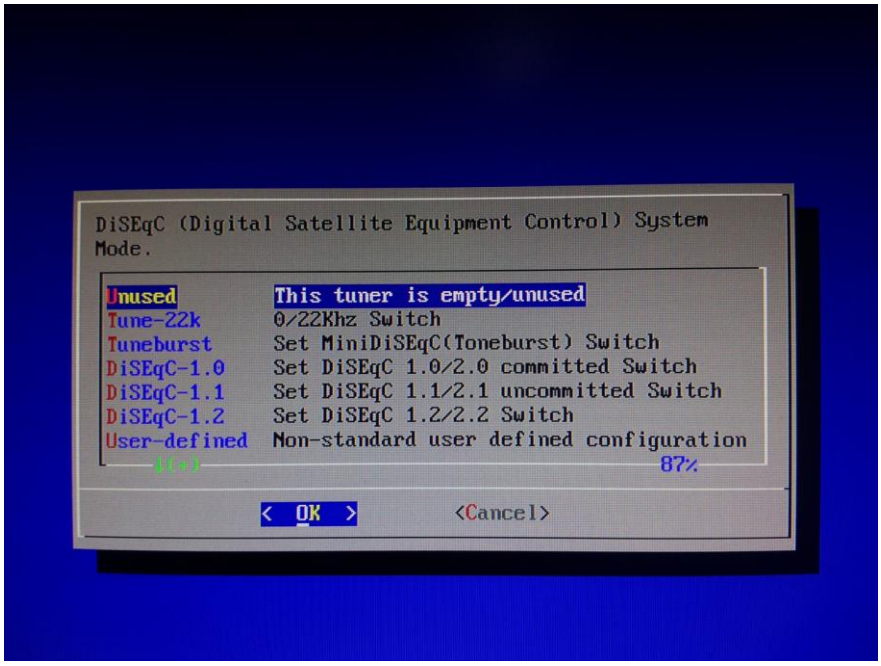


In this test, we are using TBS5990 (other USB tuners from the supported list above can be used), after we click **OK**, the USB tuner can be detected, in our test, it shows:

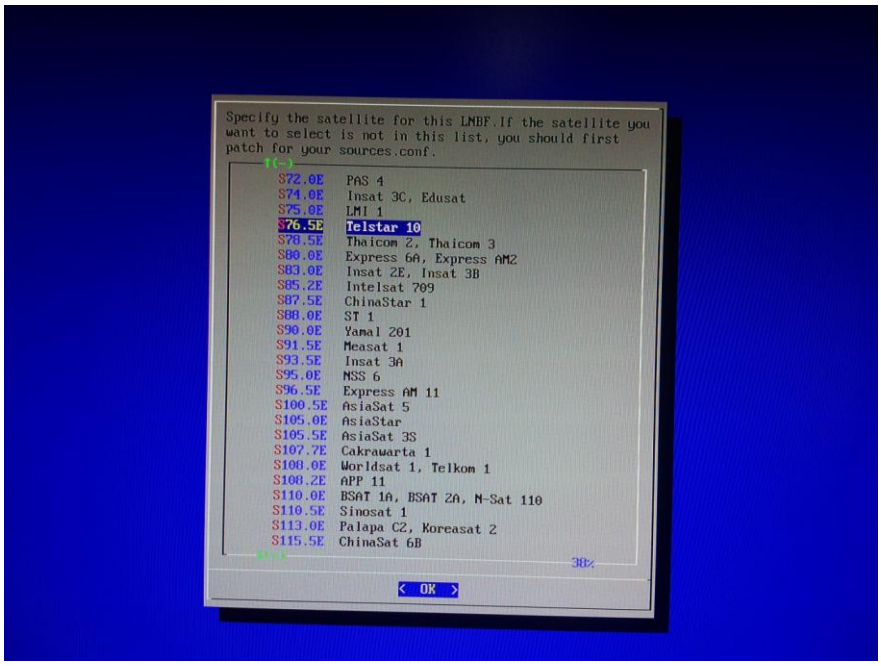
DVB-S2 device is detected



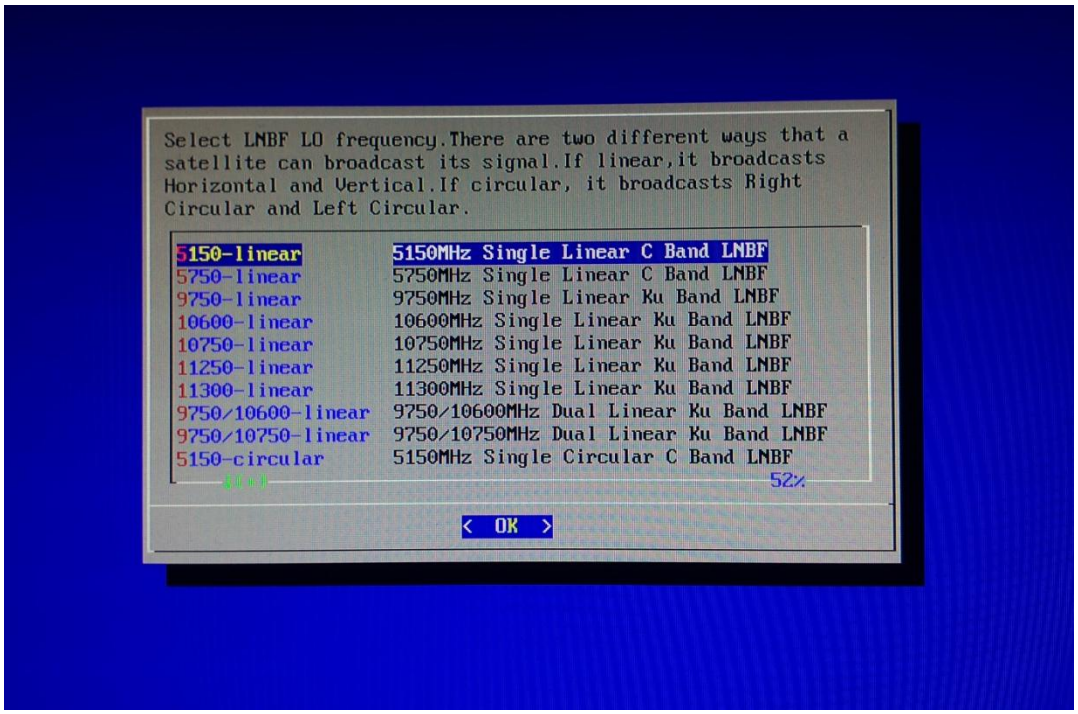
Click **OK**, and then we can select the right DiSEqC type that we need to use from the list below;



Click **OK**, and then we need to specify the satellite for LNBF;

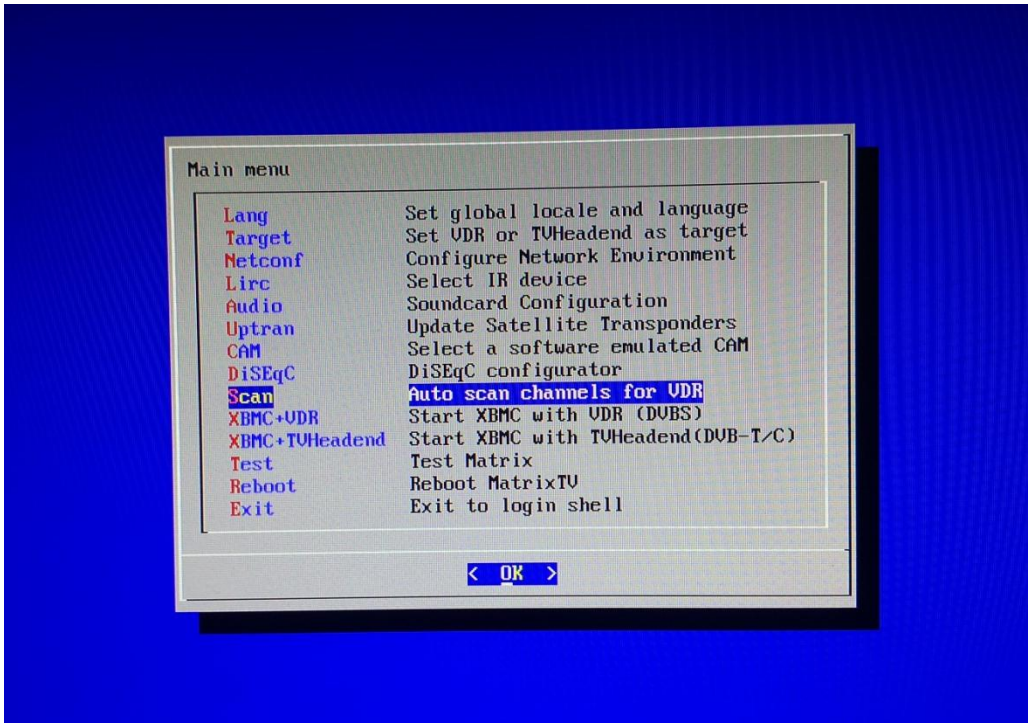


Click **OK**, and then set the LNBF from a list of frequencies;

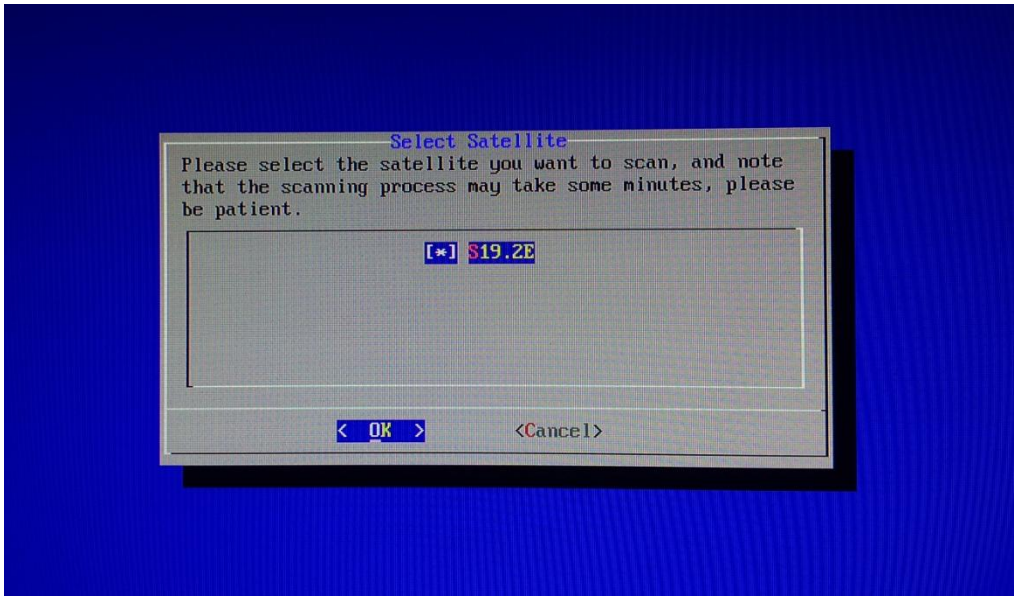


Click **OK**, and then go down the list of main menu to **Scan**

Auto scan channels for VDR



Click **OK**, and then select the satellite, from which we want to receive Live TV channels;



Click **OK**, now the settings for the TBS5990 to receive satellite Live TV is done.

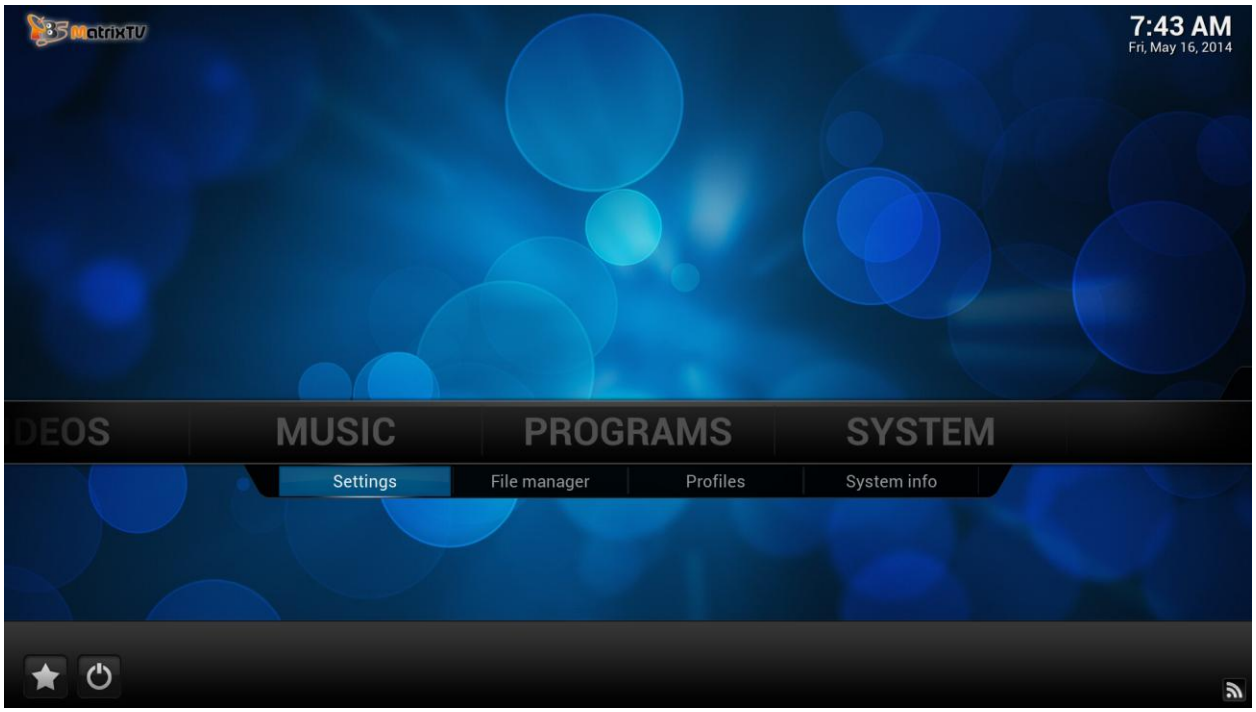
After a few seconds, we can see both the blue and green LED lights are on.

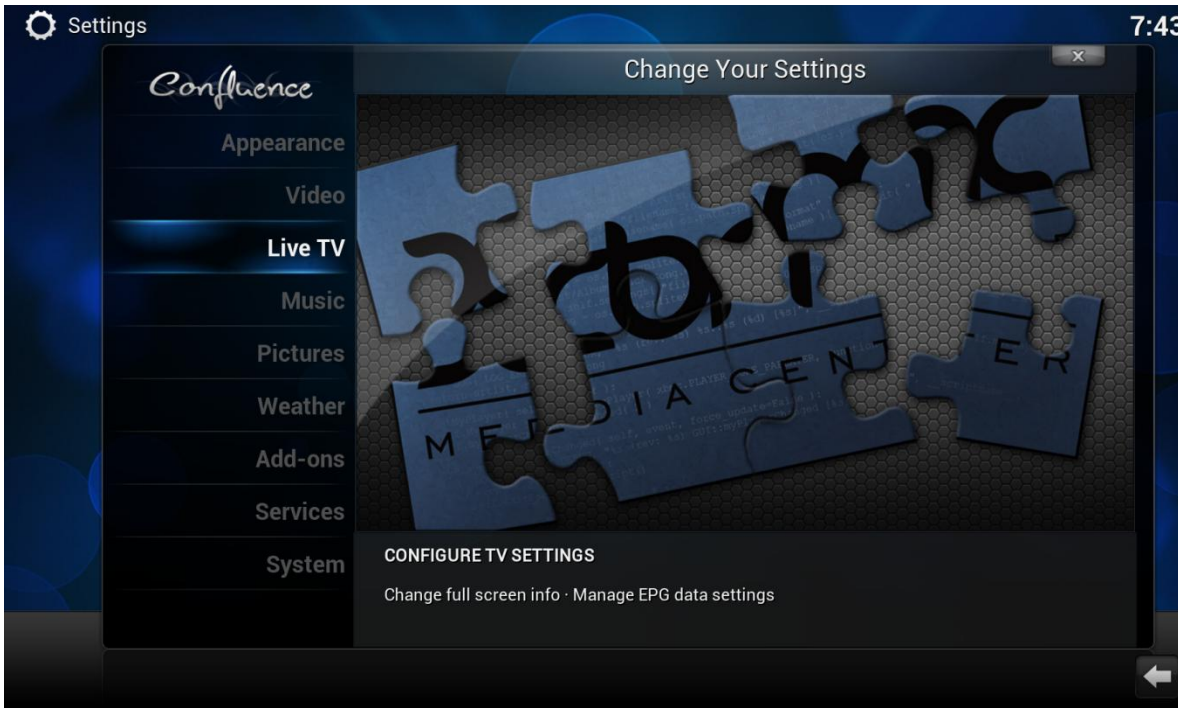
Looks familiar? Yes, because we will see the XBMC UI, only with a TBS logo added at the top left corner.

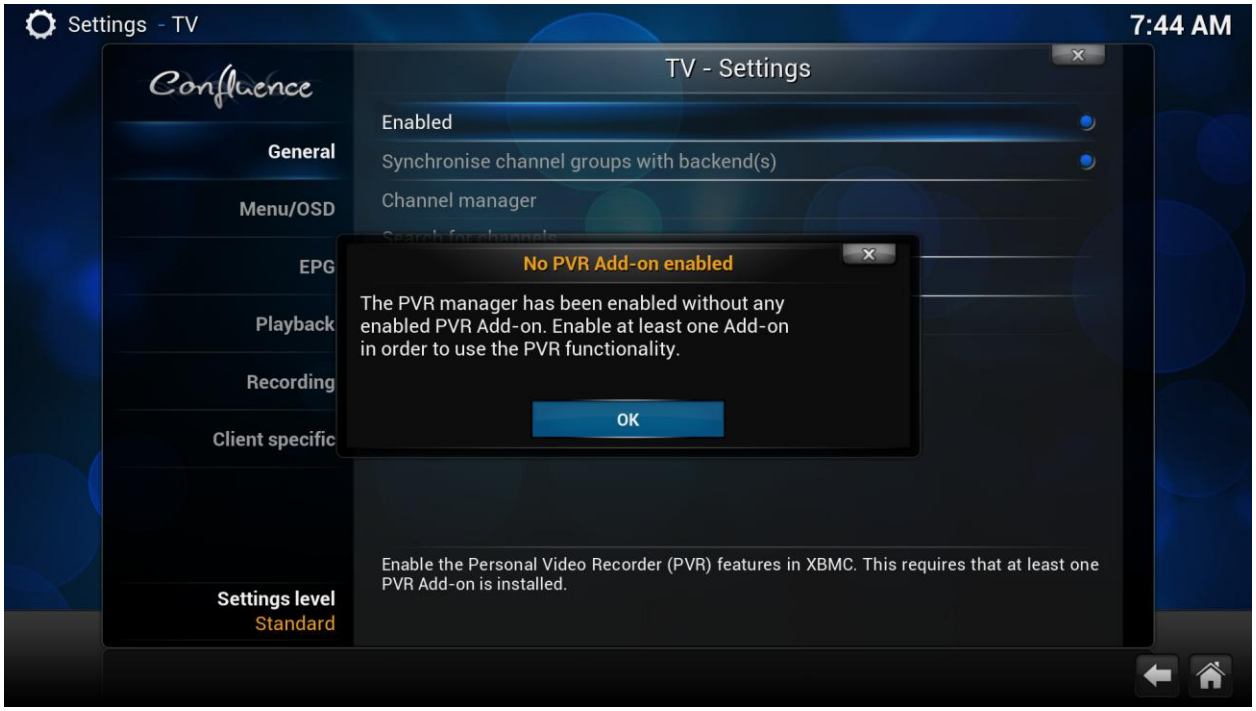
Firstly, we need to activate **Live TV** function by following the steps**:**

Settings --> **Live TV** --> **General** -->**TV settings** --> **enable** --> **OK**

We need to do this because this function in XBMC is deactivated by default.



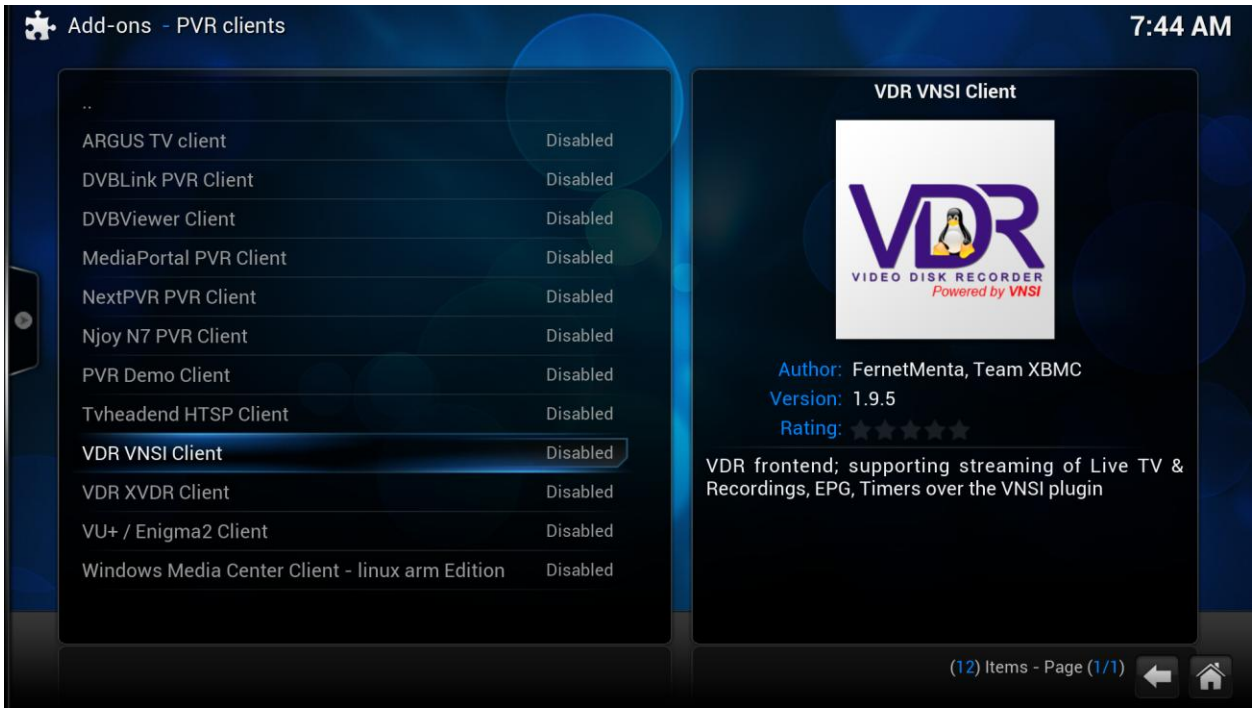

Settings
7:43
Confluence
Change Your Settings
Appearance
Video
Live TV
Music
Pictures
Weather
Add-ons
Services
System
CONFIGURE TV SETTINGS
Change full screen info · Manage EPG data settings

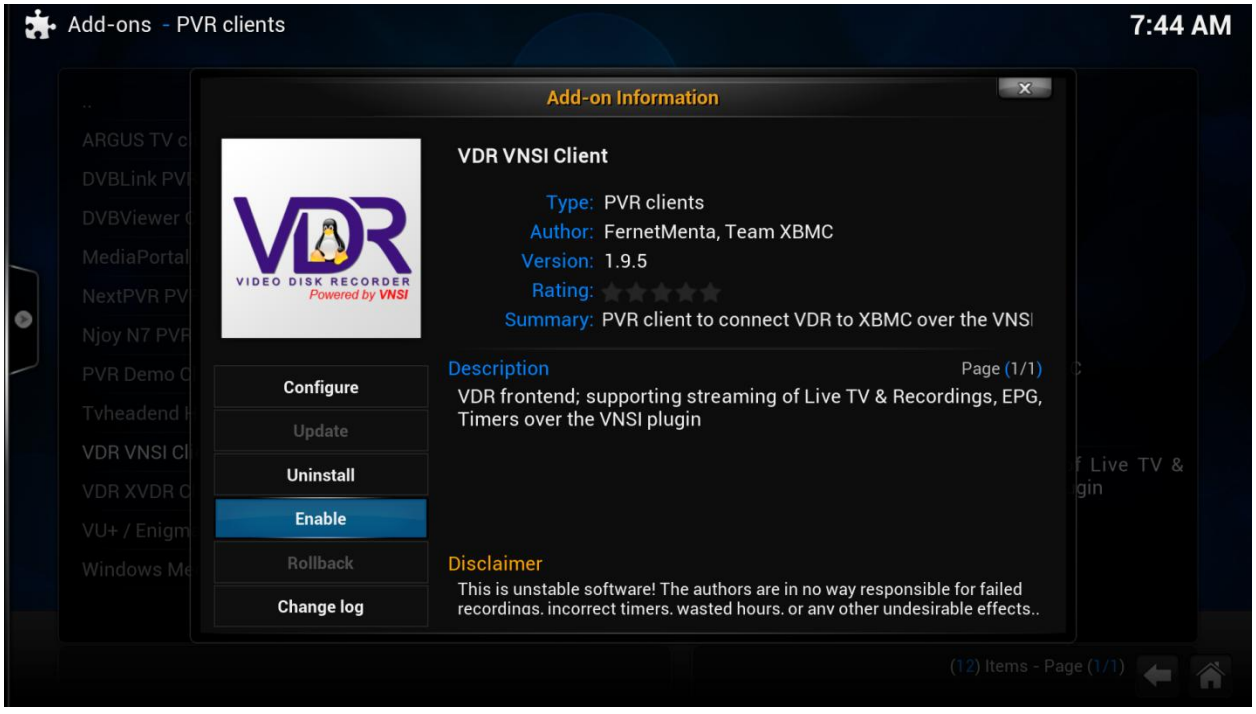

Settings - TV
7:44 AM
Confluence
TV - Settings
General
Menu/OSD
EPG
Playback
Recording
Client specific
Settings level
Standard
Enabled
Synchronise channel groups with backend(s)
Channel manager
No PVR Add-on enabled
The PVR manager has been enabled without any enabled PVR Add-on. Enable at least one Add-on in order to use the PVR functionality.
OK
Enable the Personal Video Recorder (PVR) features in XBMC. This requires that at least one PVR Add-on is installed.

After Live TV function is activated, go back to “home”, to do this we can just click the “house” button at the right bottom.

Then we should enable **VDR** is Add-ons, on the **Settings** list, click:

Add-ons --> PVR clients --> VDR VNSI Client --> Enable



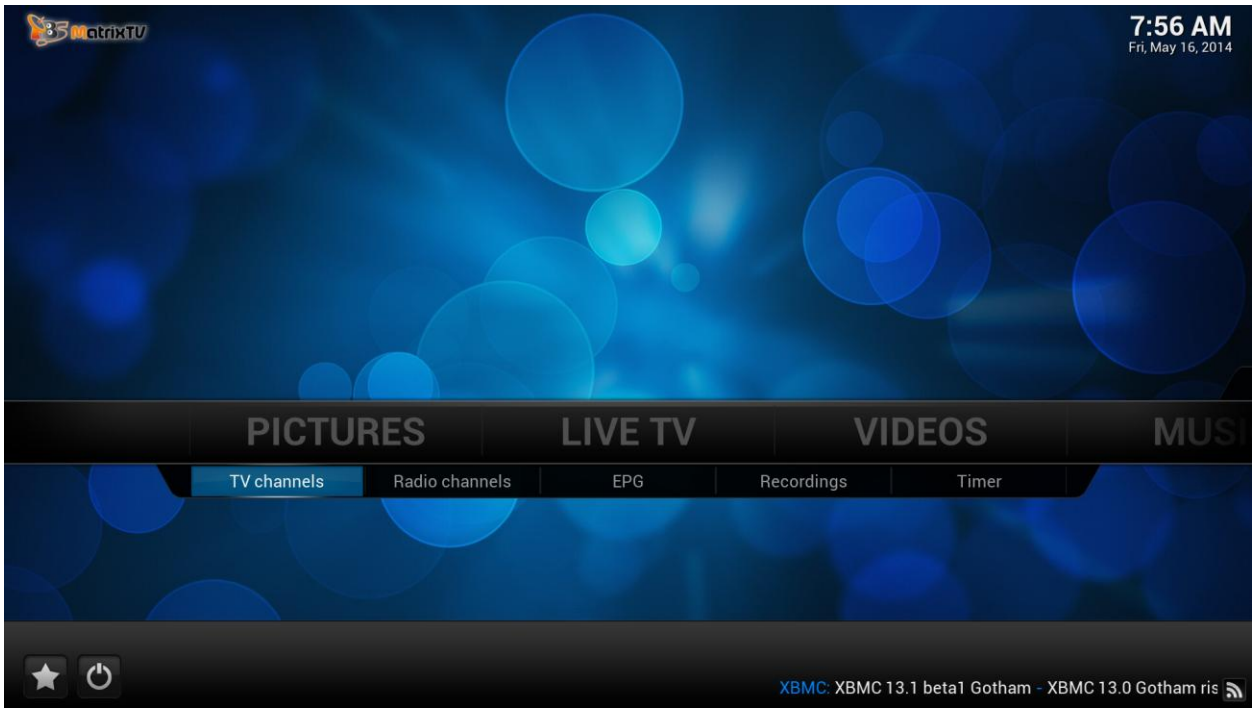


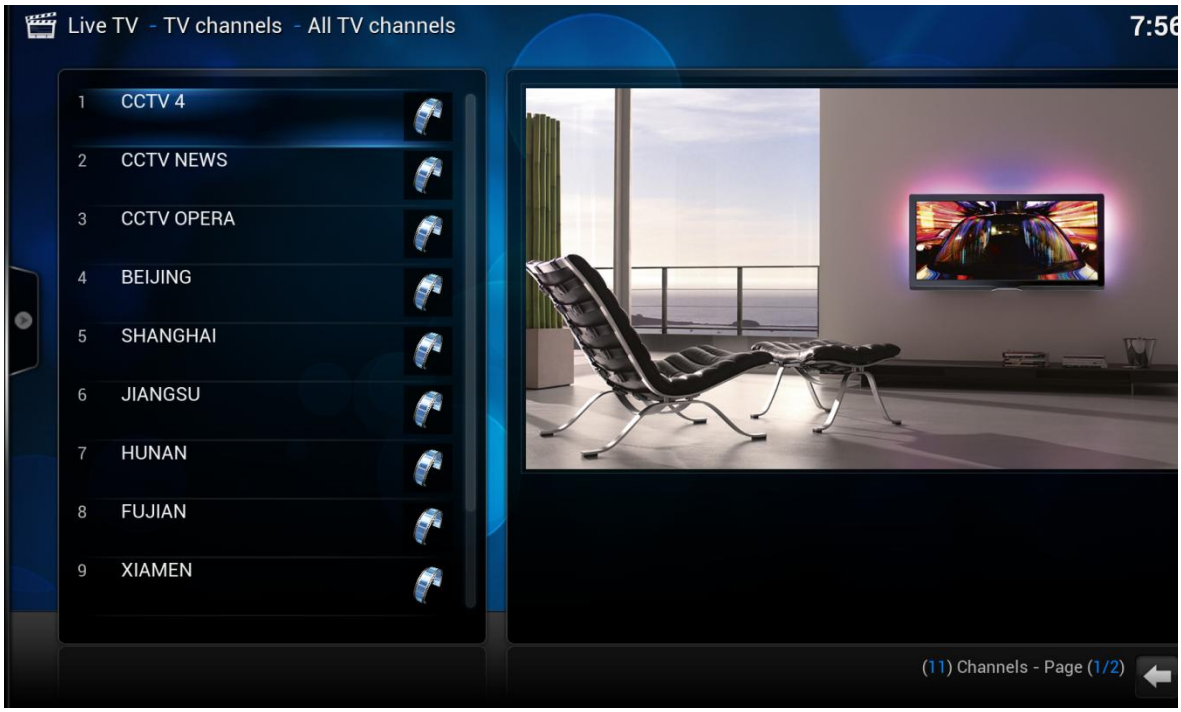
Now we have enabled both Live TV function and VDR, it's ready for enjoying some Live TV, because the TV channels are received by the USB tuner, in order to do the playback, we need to use XBMC, that's why XBMC is combined in MatrixTV to make it an all-in-one system.

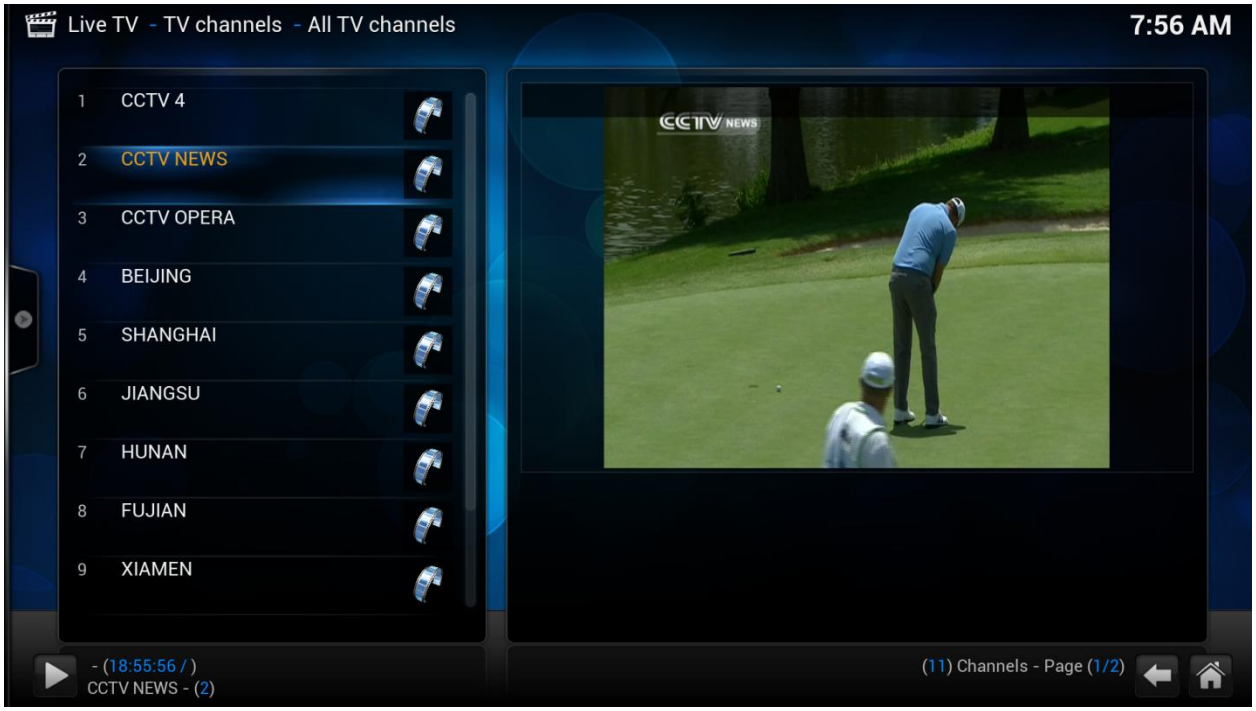
Go back to "home", click:

Live TV --> TV channels --> All TV channels

Now we can see a list of TV channels received by the USB tuner we are using, and we are free to click on the channel name to watch it or edit it, the same as we all we can do by using the normal XBMC version.




Live TV - TV channels - All TV channels
7:56
1 CCTV 4
2 CCTV NEWS
3 CCTV OPERA
4 BEIJING
5 SHANGHAI
6 JIANGSU
7 HUNAN
8 FUJIAN
9 XIAMEN
(11) Channels - Page (1/2)


Live TV - TV channels - All TV channels
7:56 AM
1 CCTV 4
2 CCTV NEWS
3 CCTV OPERA
4 BEIJING
5 SHANGHAI
6 JIANGSU
7 HUNAN
8 FUJIAN
9 XIAMEN
CCTV NEWS
- (18:55:56 /)
CCTV NEWS - (2)
(11) Channels - Page (1/2)