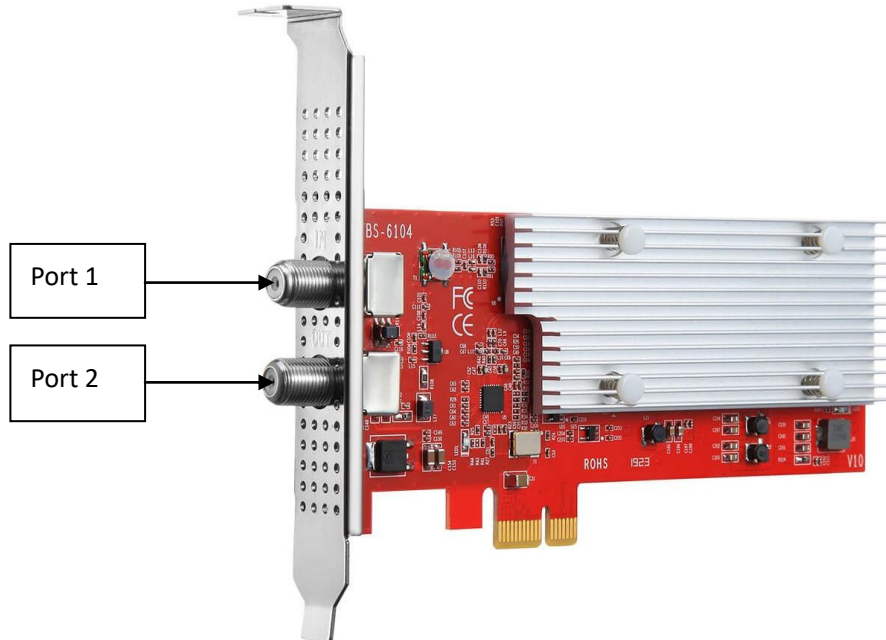


How to configure TBS6104 DVBT Modulator card

TBS6104 is a 4-frequency DVBT Modulator card, it supports modulate 4 different frequencies. The following will explain you how to configure and make TBS6104 DVBT Modulate card work.



Port 1: signal loop in; Port 2: signal out/RF out.

Signal “series connection”:

If you have multiple Modulator cards in a same Server, you can try “signal series connection”, and then all signals/frequencies can be output from a same port. For example, there’re 2 Modulator cards in a same Server (total 8 frequencies/ 8-r out):

Card 1 “RF OUT” (signal out) connects to the card 2 “Loop IN” (Loop in) by Coaxial cable, and last all signals output from a same “RF OUT” Port.

Linux platform

System: Ubuntu, centOS, Debain and ect.

1.Install the Modulator card

TBS6104 is based on PCIe x1 interface, please make sure card is correctly installed to Mother board PCIe slot.

2.Make sure Modulate card is detected by your Server (Mother board)

```
# lspci -vvv | grep 6104
```

```
daowei@daowei-laptop:~$  
daowei@daowei-laptop:~$  
daowei@daowei-laptop:~$  
daowei@daowei-laptop:~$  
daowei@daowei-laptop:~$ lspci -vvv | grep 6104  
        Subsystem: Device 6104:0001  
daowei@daowei-laptop:~$
```

3. Install Linux driver

https://github.com/tbsdtv/linux_media/wiki

Downloading and building:

```
# git clone https://github.com/tbsdtv/media_build.git  
# git clone --depth=1 https://github.com/tbsdtv/linux_media.git -b latest ./media  
# cd media_build  
# make dir DIR=./media  
# make distclean  
# make -j4  
# sudo make install
```

Firmware(TBS6104 DVBT modulator card no need firmware, but for some DVB tuner cars it's needed. So it's better to install it):

```
# wget http://www.tbsdtv.com/download/document/linux/tbs-tuner-firmwares_v1.0.tar.bz2  
# sudo tar jxvf tbs-tuner-firmwares_v1.0.tar.bz2 -C /lib/firmware/  
# reboot
```

If any errors happen during the compiling step "make -j4" please check and fix error first, do not go to operate "make install". You can find the solution from the part "FAQ":

https://github.com/tbsdtv/linux_media/wiki

The following we have listed some command errors and the corresponding solutions:

1>/bin/sh: 1: lsdiff: not found

```
# sudo apt-get install patchutils
```

2>you may need to install the Proc::ProcessTable module

```
# sudo apt-get install libproc-processtable-perl
```

3>fatal error: drx39xyj/drx39xxj.h: No such file or directory

```
# mkdir -p v4l/drx39xyj
```

```
# cp v4l/drx39xxj.h v4l/drx39xyj/
```

4>Can not find the 6909 firmware

```
# wget http://www.tbsdtv.com/download/document/linux/dvb-fe-mxl5xx.fw
```

```
# cp dvb-fe-mxl5xx.fw /lib/firmware/
```

5>If you find module load errors like "module has wrong symbol version", this means that there still are old modules from your previous Media Tree installation (usually duplicated modules in two different places).

```
# sudo rm -rf /lib/modules/`uname -r`/kernel/drivers/media/*
```

6>Can not use CONFIG_CC_STACKPROTECTOR_STRONG: -fstack-protector-strong not supported by compiler

```
# sudo add-apt-repository ppa:ubuntu-toolchain-r/test
```

```
# sudo apt-get update
```

```
# sudo apt-get install gcc-4.9 g++-4.9
```

```
# sudo rm /usr/bin/gcc
```

```
# sudo ln -s /usr/bin/gcc-4.9 /usr/bin/gcc
```

7>make[2]: gcc: Command not found

```
# sudo apt-get install gcc
```

Or you can write to us, we can help you with the driver install:

support@tbsdtv.com

Driver installed, need to reboot Server. If it's successfully installed, Modulate devices "tbsmodxx" will be loaded, under directory "/dev". Like this:

```
[root@localhost ~]# ls /dev
autofs          cpu             fd              kmsg           irqpoll        pts            sg0            tty            tty16          tty24          tty32          tty40          tty4
block          cpu_dma_latency full            kvm            net            network_latency raw            snapshot       tty0           tty17          tty25          tty33          tty41          tty5
bsg            cuse           fuse           Lightnvm       network_latency raw            snapshot       tty1           tty18          tty26          tty34          tty42          tty5
btrfs-control  disk           hpet           Log            network_throughput rtc            snd            tty10          tty19          tty27          tty35          tty43          tty5
bus            dm-0           hugepages     loop-control   null           rtc0          stderr         tty11          tty2           tty28          tty36          tty44          tty5
centos         dm-1           hwrng         mapper         nvram          sda            stdin          tty12          tty20          tty29          tty37          tty45          tty5
char           dri            initctl       mcelog         port           sda1          stdout         tty13          tty21          tty3           tty38          tty46          tty5
console        dvb            input         mem            ppp            sda2          tbsmod0        tty14          tty22          tty30          tty39          tty47          tty5
core           fb0            kfd           memory_bandwidth ptmx           sda3          tbsmod1        tty15          tty23          tty31          tty4           tty48          tty5
```

tbsmod0, tbsmod1

Each card has 4-modulate devices:

```
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]# ls /dev/tbsmod0/
mod0 mod1 mod2 mod3
[root@localhost ~]#
```

Device "tbsmod0" means the 1st modulator card; and e "tbsmod1" means the 2nd modulator card; "tbsmod2" means the 3rd, and so on.

/dev/tbsmod0/mod0 means the 1st modulate device of the TBS6104;

/dev/tbsmod0/mod1 means the 2st modulate device of the TBS6104;

/dev/tbsmod0/mod2 means the 3st modulate device of the TBS6104;

/dev/tbsmod0/mod3 means the 4st modulate device of the TBS6104;

Actually, we also provide the software which based on Linux for TBS6104 DVBT modulator card. The control is webUI, and driver will be contained in our software package, no need to install separately:

http://www.tbsdtv.com/download/document/modulator/rootfs-6004_6014_6104_690b-centos-1.0.0.1.tar.bz2

http://www.tbsdtv.com/download/document/modulator/rootfs-6004_6014_6104_690b-ubuntu-1.0.0.1.tar.bz2

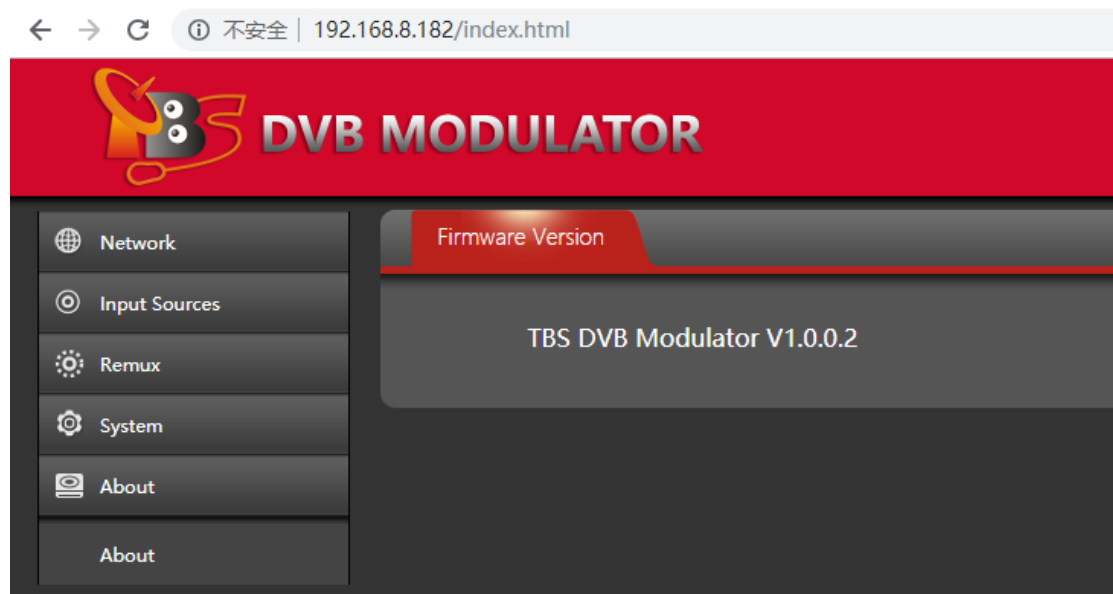
The Following will explain you how to configure TBS6104.

The source could be DVB tuner card, Network stream or local TS file.

1.Login:

The default username/password is “root/root”:

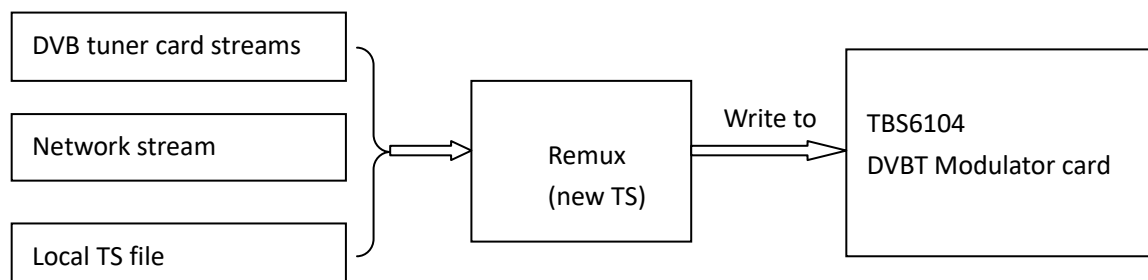
2: User interface:



1>Network: network setting

2>Input Sources: the source can be from DVB tuner card, Network stream, and local TS file

3>Remux: some settings which related to “channel-Mux” and DVBT modulate.



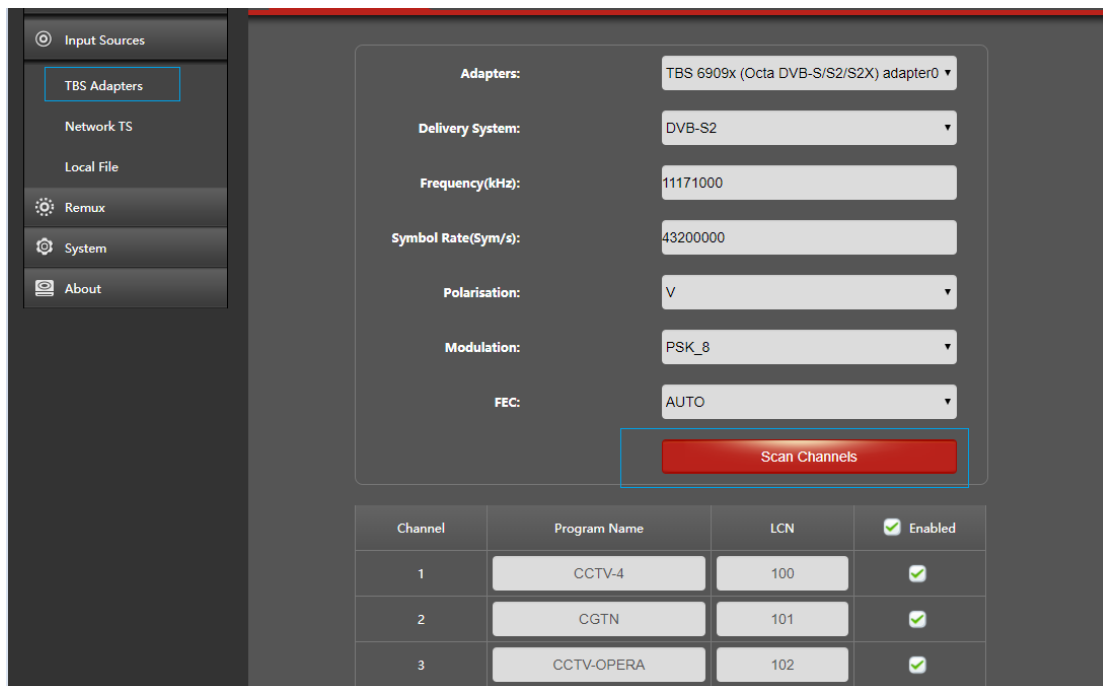
4>System: set new username & password for webUI

5>About: firmware version

Source from DVB tuner card

We have kinds of DVB tuner cards for different signals. For example, DVBS/S2, DVBT/C2, DVBT/T2, ATSC, ISDBT and etc. You can receive channels by these tuner cards and then send to our Modulator card.

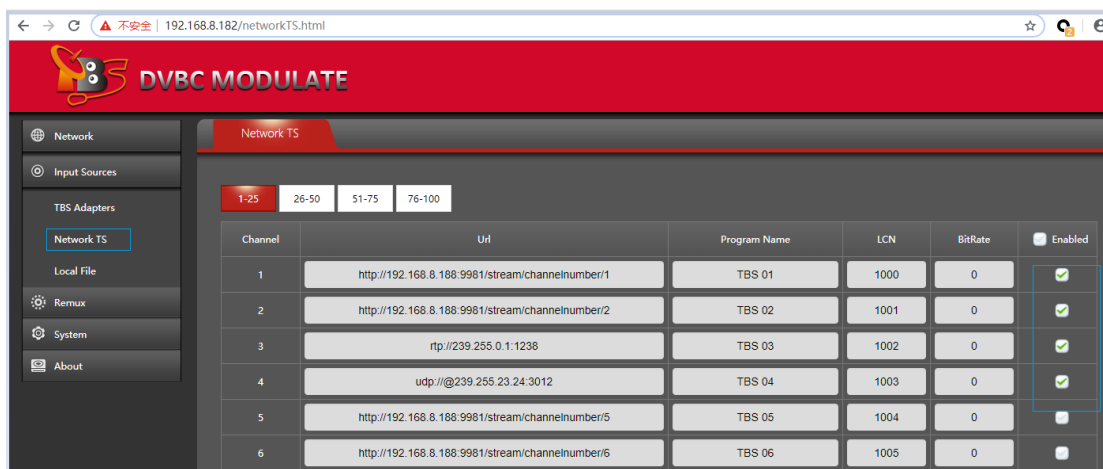
Here we'll take a satellite tuner card as an example:



Configure “fre.”, “pol.” “sr”, “modulator”, and click “Scan Channels”. When it’s locked, you’ll see some channels. Please choose which you’ll take it as the source of the DVBT modulator and “Apply”.

Network stream

We also support network stream input for DVBT modulator. http, rtp or udp stream is supported.



Local File

We support modulate local ts file. The TS file must put to this directory:

/usr/local/tbs/video/

For example,

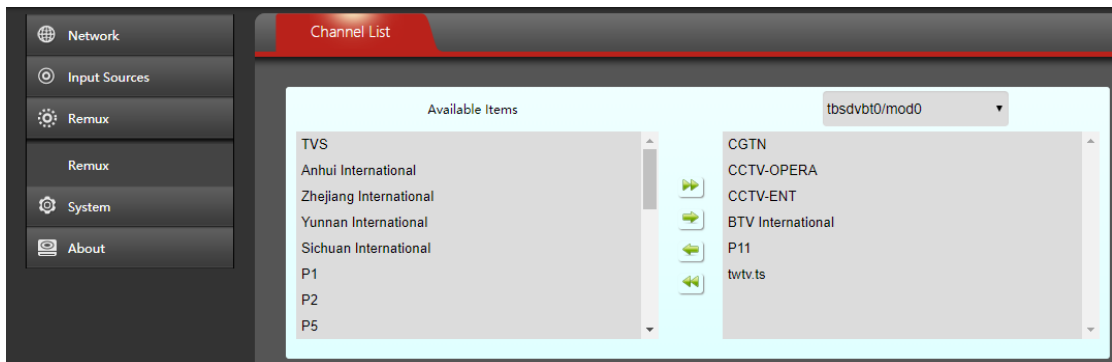
```
[root@localhost video]#  
[root@localhost video]# ls  
hopeTV.ts P22.ts twtv.ts  
[root@localhost video]#  
[root@localhost video]#  
[root@localhost video]#
```



Remux

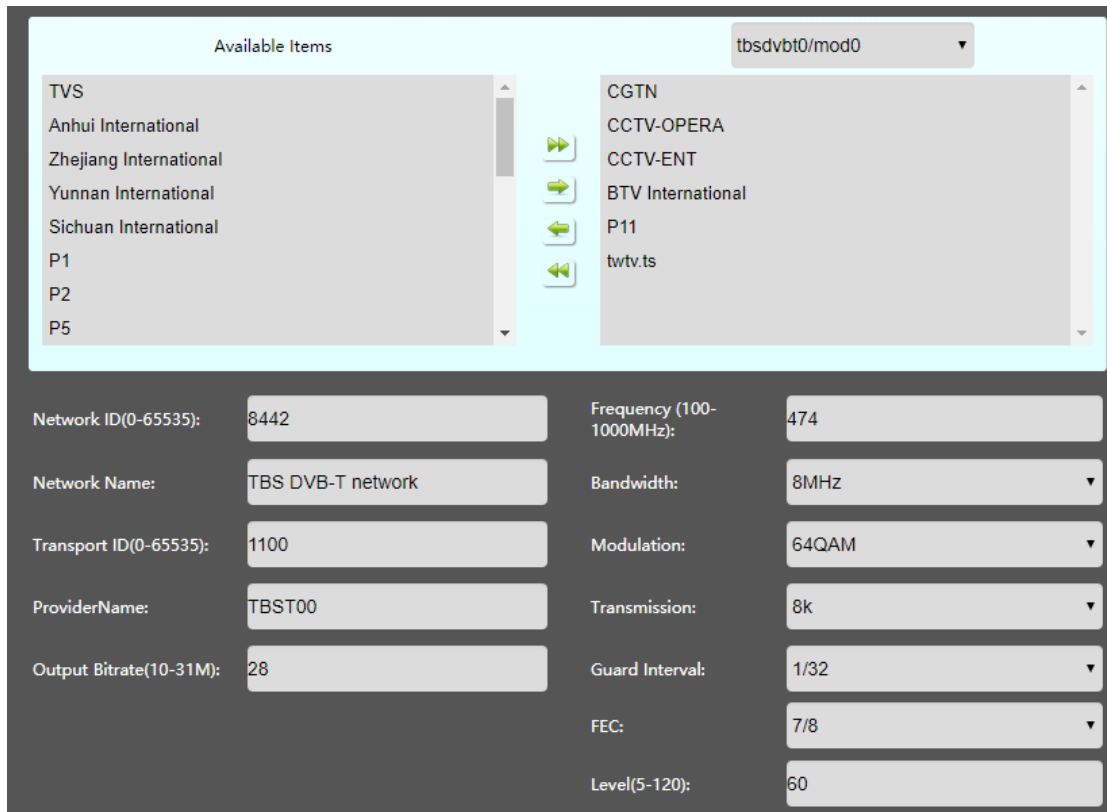
1.Channel-Mux:

If DVBT modulator card driver is correctly installed, you'll see some modulate device. Like this:



And these sources which from DVB tuner card, Network streams, Local TS file all will be list here. Just choose some of them to "Mux" to new TS (MPTS) for DVBT modulator card

2. DVBT parameters setting:



Frequency: this DVBT modulator card is a little special in frequency setting. For a same card, once the 1st RF device frequency is setting the rest 3 RF device will be set. This depends on Modulate chipset characteristic. For example, “tbsDVBT0” set to “474Mhz”, and bandwidth=8Mhz; the 2nd “tbsDVBT1” will be “482Mhz”; the 3rd “490Mhz”; and the 4th “498Mhz”. Step is 8Mhz.

$Fre(tbsdvbt0)=474Mhz;$
 $Fre(tbsdvbt1)=Fre(tbsdvbt0) + 8Mhz=482Mhz;$
 $Fre(tbsdvbt2)=Fre(tbsdvbt1) + 8Mhz=490Mhz;$
 $Fre(tbsdvbt3)=Fre(tbsdvbt2) + 8Mhz=498Mhz;$

Bandwidth: 6Mhz, 7Mhz, 8Mhz.

Bandwidth set to 6Mhz, then the “step” is 6Mhz; for example,

$Fre(tbsdvbt0)=641Mhz;$
 $Fre(tbsdvbt1)=Fre(tbsdvbt0) + 6Mhz=647Mhz;$
 $Fre(tbsdvbt2)=Fre(tbsdvbt1) + 6Mhz=653Mhz;$
 $Fre(tbsdvbt3)=Fre(tbsdvbt2) + 6Mhz=659Mhz;$

And set to “7Mhz”, the “step” should be 7Mhz.

Modulation: 16-QAM, 64-QAM, QPSK

Transmission: 2k, 8k

Guard Interval: 1/4, 1/8, 1/16, 1/32

FEC: 1/2, 2/3, 3/4, 5/6, 7/8

Level: signal level, 5-120. Set to a higher value, signal will be more stronger.

Output Bitrate: this value should be a little higher than the real data. For example, a ts which the real data is around 26M. So this option "Output Bitrate" please set to "28M" or higher.

Output Bitrate can't be set to a lower than the real data.

Last, do not forget to click "Apply" to start "Remux/Modulate". Or you can access to system to check "remux" process is running or not:

ps -aux | grep remux

```
lroot@localhost ~]# ps -aux | grep remux
root      14389 17.8  1.1 668132 40120 ?        Sl   17:21  0:25  ../../bin/./remux -T -a 0 -A 0 -f 650000000 -w 8 -x qam_64 -X 8 -G 32 -E 78 -N 60 -B 28 -c ./confi
./remuxT_0_0.conf -n ./config/remux_nitT_0_0.conf
root      15079 18.7  1.5 814876 52792 ?        Sl   17:22  0:24  ../../bin/./remux -T -a 0 -A 1 -f 658000000 -w 8 -x qam_64 -X 8 -G 32 -E 78 -N 60 -B 28 -c ./confi
./remuxT_0_1.conf -n ./config/remux_nitT_0_1.conf
root      15825 17.2  1.2 668132 41916 ?        Sl   17:22  0:20  ../../bin/./remux -T -a 0 -A 2 -f 666000000 -w 8 -x qam_64 -X 8 -G 32 -E 78 -N 60 -B 28 -c ./confi
./remuxT_0_2.conf -n ./config/remux_nitT_0_2.conf
root      16600 17.2  1.4 814876 51460 ?        Sl   17:22  0:18  ../../bin/./remux -T -a 0 -A 3 -f 674000000 -w 8 -x qam_64 -X 8 -G 32 -E 78 -N 60 -B 28 -c ./confi
./remuxT_0_3.conf -n ./config/remux_nitT_0_3.conf
root      17170  0.0  0.0 112724  2300 pts/1    S+   17:24  0:00  grep --color=auto remux
lroot@localhost ~]#
```

Any question about the DVBT Modulate card TBS6104 configuration, please write to us:

support@tbsdtv.com