FUTV4440B
4-in-1 QAM Modulator

User Manual

NMS Version: 5.12.3
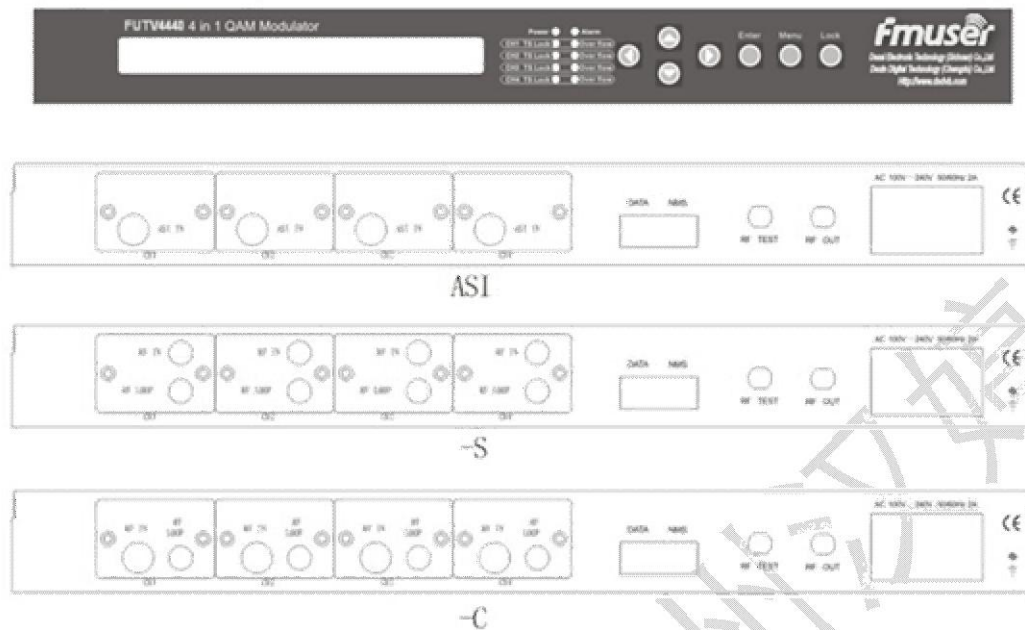
SW: V1.04

HW: V1.8

FMUSER International Group Inc

Directory

Chapter 1 Product Outline

1.1 Outlines

FUTV4440B 4 in 1 QAM is a cost effective integrated QAM modulator newly designed by FMUSER Company. This device is integrated up to 4 channel QAM modulating carrier outputs, in which each carrier has independent signal channel encoding and direct RF output. Therefore, the device is featured with excellent RF performance index. It supports 4 channel ASI inputs (4 QAM (J.83 A/B/C), 4 DVB-S tuner input or 4 DVB-S2 tuner input). Alternatively, this device can take various RF inputs of DVB-S/DVB-C/DVB-S2 signals by installing the relevant build-in tuners. Hence, one PCS 4 in 1 QAM modulator can work as 4 standalone QAM modulators, significantly reducing the network operators' head-end cost.

FUTV4440B can also support local and remote control to set its working parameters.

1.2 Features

l   Fully comply with DVB-C (EN300 429) and ITU-T J.83A/B/C;

l   4 adjacent channel QAM carrier wave

l   4 channels ASI input (4 QAM (J.83 A/B/C), 4 DVB-S tuner input or 4 DVB-S2 tuner input) and support 188/204 byte TS packet

l   DVB-S/DVB-S2/DVB-C RF input (optional)

l   Support accurate PCR adjusting

l   Support five QAM constellation(ITU-T J.83A) modes: 16/32/64/128/256 QAM,

l   Support QAM constellation(ITU-T J.83B/ITU-T J.83C) modes: 64 /256QAM

l   Symbol rate adjustment range: 5.0Mbps~9.0Mbps

l   Support PSI/SI editing function

l   RF output range: 30MHz~960MHz in 1.0 kHz step

l   RF ATT range: -16dBbm~0dBm in 0.5dB step

l   Support input de-multiplexing and PSI/SI editing

l   Support LCD display and keyboard

l   Excellent RF output performance index, MER 40db

l   Support network management(NMS/SNMP)

1.3 Specifications

Input	4 ASI input	**FUTV4440B-A**
	4 DVB-C tuner input	**FUTV4440B-C**
	4 DVB-S tuner input	**FUTV4440B-S**
	4 DVB-S2 tuner input	**FUTV4440B-S2**
Modulation parameters	QAM channel	4
	Standard	DVB-C(EN300 429)and ITU-T J.83A/ ITU-T J.83B/ ITU-T J.83C
	Symbol rate	5.0~9.0Mbps, 1kbps stepping
	Constellation	16 / 32 / 64 / 128 / 256QAM
	FEC	RS(204, 188)
RF Output	Interface	F type, 75 impedance
	Frequency range	30~960 MHz, 1khz stepping
	Output level	-16dbm~0dbm(per QAM carrier) 0.5db stepping
	MER	40db
	ACLR	– 55 dBc
System	Support LCD display, keyboard operation, and NMS/SNMP operation English and Chinese version interface conversion	
	Support Software Upgrading through Ethernet	
General	Dimensions(W×L×H)	482mm×455mm×44.5mm
	Approx weight	3.2Kg
	Temperature range	0~45 (Operating),-20~80 (Storage)
	Power Requirements	AC 110V±10%, 50/60Hz AC 220V±10%, 50/60Hz
	Power consumption	25W

Chapter 2 Appearance and Illustration

Indicator area: All the indicators will light on when the 4 in1 QAM modulator works at current state.

2.1 Front panel
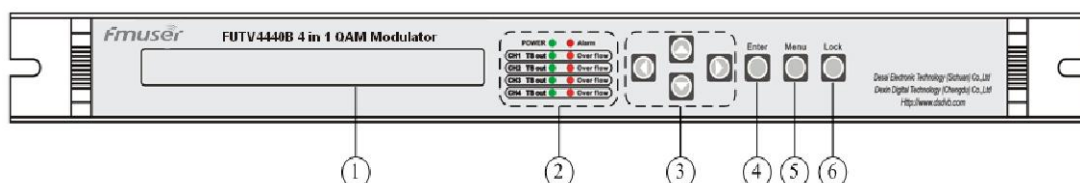
| 1	LCD Display	
2	Indicator Area	POWER Power Indicator Alarm Alarming Indicator CH1/2/3/4 TS Out Transportation Stream Indicator CH1/2/3/4 Over flow Over Flow Indicator
3	Up/Down/Left/Right Key	
4	Enter Confirmation Key	
5	Menu Key	
6	Locking Key	

2.2 Rear Panel: (The 4-in-1 QAM modulator can take various RF inputs of DVB-S/DVB-C/DVB-S2 signals by installing the relevant build-in tuners or ASI input optional.)

2.2.1 Rear Panel (ASI In)
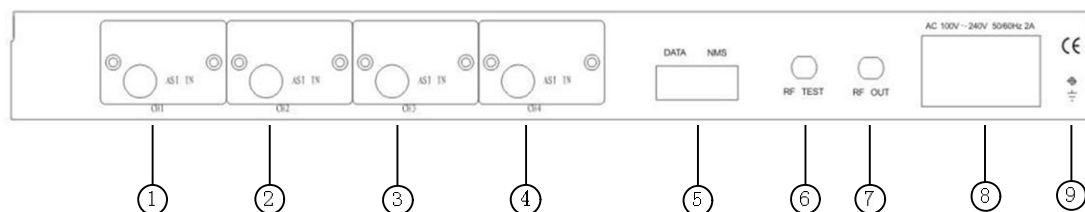
1	ASI IN 1	ASI Input Channel 1
2	ASI IN 2	ASI Input Channel 2
3	ASI IN 3	ASI Input Channel 3
4	ASI IN 4	ASI Input Channel 4
5	Ethernet	DATA Port & NMS Port
6	RF TEST	RF Test Interface
7	RF OUT	RF Out Interface
8	Power	Power Socket
9	Grounding	Grounding Pole

2.2.2 Rear Panel (DVB-C In)
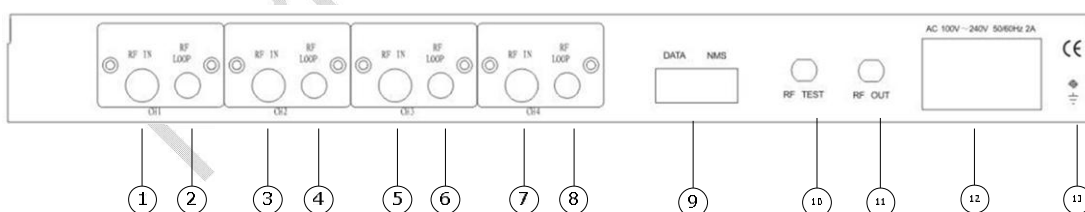
1	RF IN 1: RF In Channel 1
2	LOOP OUT 1: Loop Out Channel 1
3	RF IN 2: RF In Channel 2
4	LOOP OUT 2: Loop Out Channel 2

5	RF IN 3: RF In Channel 3
6	LOOP OUT 3: Loop Out Channel 3
7	RF IN 4: RF In Channel 4
8	LOOP OUT 4: Loop Out Channel 4
9	Ethernet: DATA Port & NMS Port
10	RF Test: RF Test Interface
11	RF out: RF output interface
12	Power Socket
13	Grounding pole

2.2.3 Rear Panel (DVB-S/S2 In)
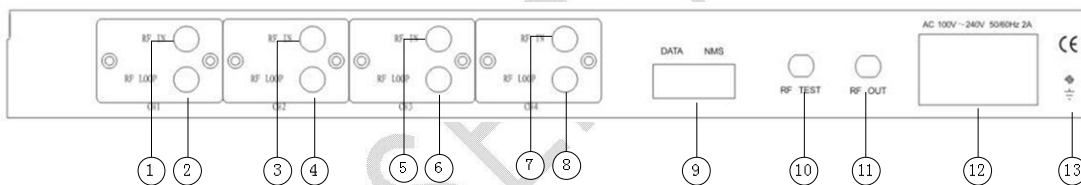
The rear panel description is same as 2.2.2 DVB-C in.

Chapter 3 Installation Guide

3.1 Acquisition check

When users open the package of the device, it is necessary to check items according to packing list. Normally it should include the following items:

l   FUTV4440B 4IN1 QAM Modulator

l   User's Manual

l   AC Power Cord

l   ASI/Tuner wire

If any item is missing, please inform local dealer.

3.2 Installation Preparation

When users install device, please follow the below steps. The details of installation will be described at the rest part of this chapter. Users can also refer rear panel chart during the installation.

The main content of this chapter including:

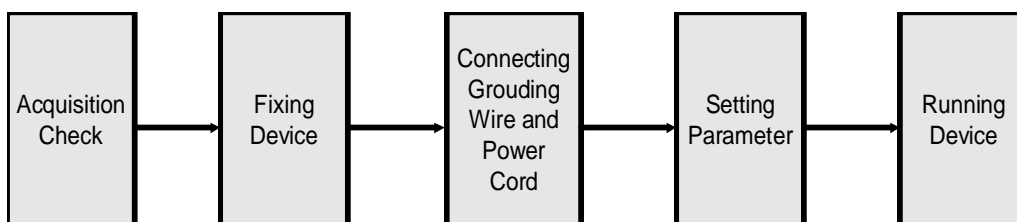Checking the possible device missing or damage during the transportation

Preparing relevant environment for installation

Installing 4IN1 QAM modulator

Connecting signal wires

Connecting communication port (if it is necessary)

3.2.1 Device's installation flow chat illustrated as following

Acquisition Check → Fixing Device → Connecting Grouding Wire and Power Cord → Setting Parameter → Running Device

3.2.2 Environment Requirement

Item	Requirement
Machine hall space	When user install machine frame array in one machine hall, the distance between 2 row of machine frames should be 1.2~1.5m and the distance to wall should be no less than 0.8m
Machine hall floor	Electric Isolation, Dust Free Volume receptivity of ground anti-static material:1×10^7~$1\times10^{10\Omega}$,Grounding current limiting resistance: $1M\Omega$ Floor bearing should be greater than $450Kg/m^2$
Environment temperature	5~40°C sustainable 0~45°C short time installing air-conditioning is recommended
Relative Humidity	20%~80% sustainable 10%~90% short time
Pressure	86~105KPa
Door & window	Installing rubber strip for sealing door-gaps and dual level glasses for window
Wall	It can be covered with wallpaper, or bright less paint.
Fire protection	Fire alarm system and extinguisher
Power	Requiring device power, air-conditioning power and lighting power are independent to each other. Device power requires AC power 220V 50Hz. Please carefully check before running.

3.2.3   Grounding Requirement

All function modules' good grounding designs are the base of reliability and

stability of device. Also, they are the most important guarantee of lightning

arresting and interference rejection. Therefore, system must follow this rule:

1. Coaxial cable's outer conductor and isolation layer should keep sound

electric conducting with the metal housing of device.

2. Grounding conductor must adopt copper conductor in order to reduce

high frequency impedance, and the grounding wire must be as thick and

short as possible.

3. The 2 terminals of grounding wire must make sure for well electric conducting, and process for antirust.

4. It is prohibited that users use other devices as part of grounding wire's electric circuit

3.2.3.1 Frame Grounding

All the machine frames should connect to protective copper strip. The grounding wire should be as short as possible and avoid circling. The section of the conjunction between grounding wire and grounding strip should be equal or greater than 25mm2.

3.2.3.2 Device Grounding

User can connect the device's grounding rod to frame's grounding strip with copper wire.

3.2.4 Wires' Connection

The power supply outlet is located at the right of rear panel, and the power switch is just above it. The protective grounding wire connective screw is located at the down-right side of power supply outlet.

1. Connecting power cord

2. User can insert one end into power supply outlet, while insert the other end to AC power.

3. Connecting grounding wire

4. When the device solely connects to protective ground, it should adopt independent way, say, sharing the same ground with other devices. When

the device adopts united way, the grounding resistance should be less than

1

F Caution:

Before connecting power cord to 4IN1 QAM modulator, user should set the

power switch to "OFF".

3.2.4.1 Signal wire connection of ASI IN

The data input cable of 4IN1 QAM Modulator is ASI cable, while the output

cable is the normal 75   coaxial cable. The illustration is as below: (The

device can only be operated through NMS.)

ASI cable   **coaxial cable (user-owned)**

Network cable (user-owned)

Chapter 4 Operation

4.1 Operation

FUTV4440B 4in1 QAM modulator's front panel is user operation interface.

Before operating, user can decide whether directly use the default setting or

customize the input and output parameters setting. The detail operations go

as follows:

Keyboard Function Description:

MENU: Canceling presently entered value, resuming previous

setting; Return to previous menu.

ENTER: Activating the parameters which need modifications,

or confirming the change after modification.

LEFT/RIGHT: To choose and set the parameters.

UP/DOWN: Modifying activated parameter or paging up/down when

parameter is inactivated.

LOCK: Lock the screen / cancel the lock state. After pressing

"LOCK" key, the system will question the users to save present

Setting or not. If not, the LCD will display the current

Configuration state.

4.2 Main Interface

After switching on the modulator, the LCD will display the following page:

Loading, please wait:
>>>>>>>>>>>>>>>>>>

The main interface is at "Locking" state after starting up. The main interface and parameters are displayed as follows (figure 1 and figure 2):

After switching on, the LCD will alternatively display the figure 1 and figure 2. User can press "Lock" key to enter into the main menu.

As display shown, the first row is the output frequency and inputting real-time bit rate of channel 1 and channel 2, while the second row is channel 3 and channel 4's.
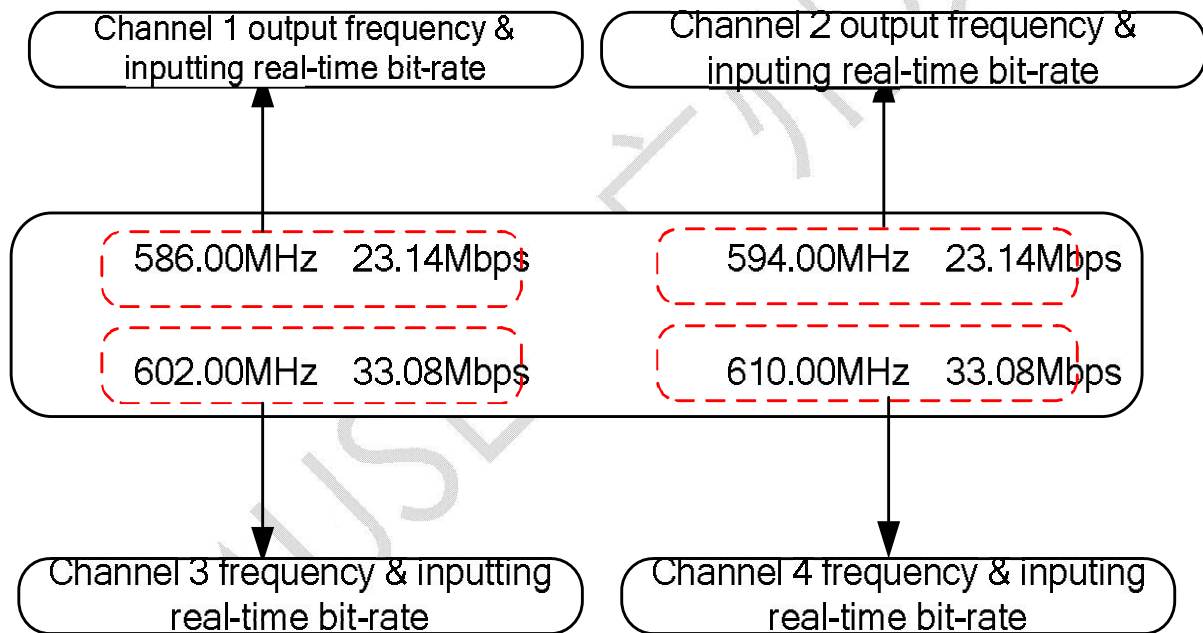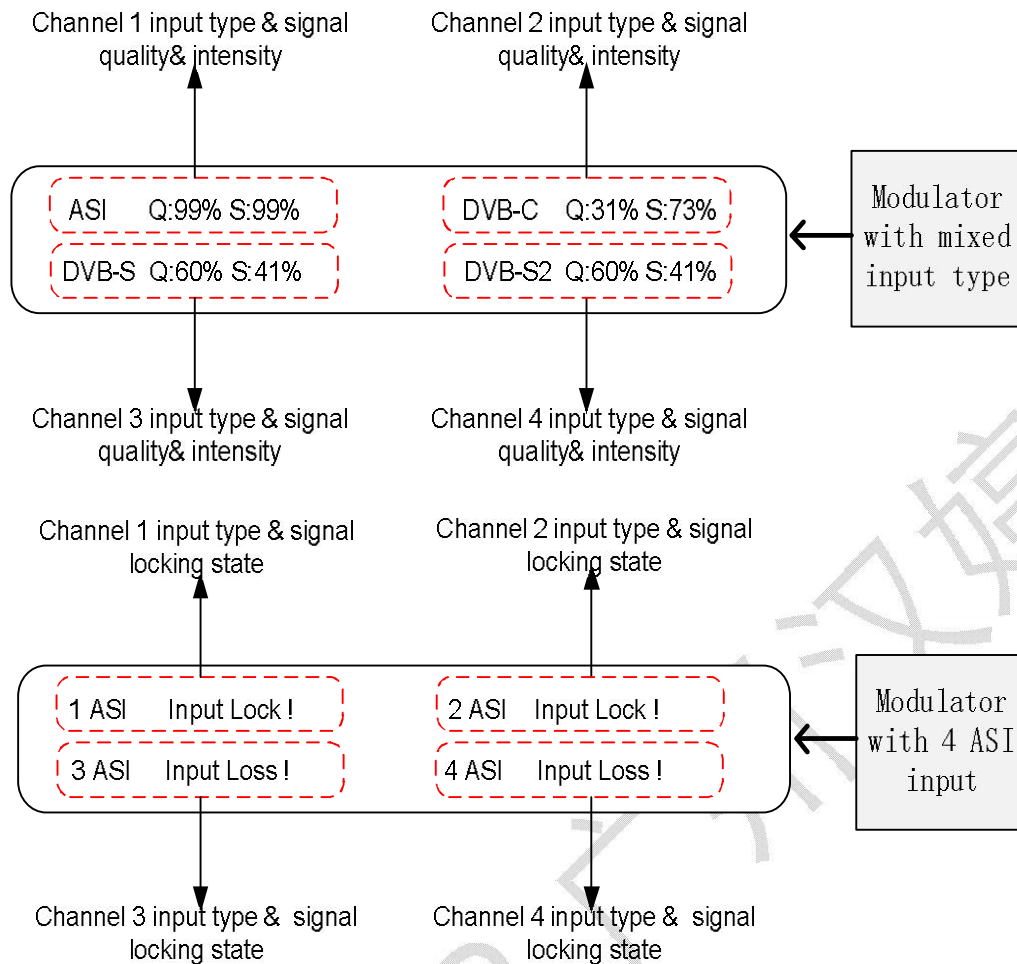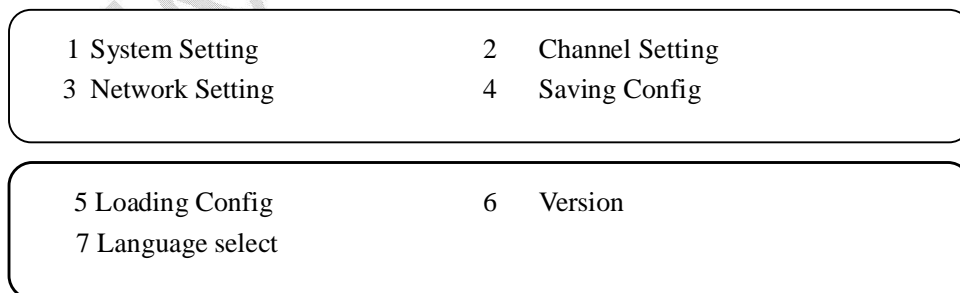

Channel 1 output frequency & inputting real-time bit-rate	Channel 2 output frequency & inputing real-time bit-rate
586.00MHz 23.14Mbps	594.00MHz 23.14Mbps
602.00MHz 33.08Mbps	610.00MHz 33.08Mbps
Channel 3 frequency & inputting real-time bit-rate	Channel 4 frequency & inputing real-time bit-rate

Figure 1

Channel 1 input type & signal quality& intensity

Channel 2 input type & signal quality& intensity

ASI   Q:99% S:99%

DVB-C   Q:31% S:73%

DVB-S Q:60% S:41%

DVB-S2 Q:60% S:41%

Modulator with mixed input type

Channel 3 input type & signal quality& intensity

Channel 4 input type & signal quality& intensity

Channel 1 input type & signal locking state

Channel 2 input type & signal locking state

1 ASI   Input Lock !

2 ASI   Input Lock !

3 ASI   Input Loss !

4 ASI   Input Loss !

Modulator with 4 ASI input

Channel 3 input type & signal locking state

Channel 4 input type & signal locking state

Figure 2

4.2.1 General Setting

Press "LOCK" key to enter the main menu, the LCD will display the following pages:

1 System Setting	2 Channel Setting
3 Network Setting	4 Saving Config

5 Loading Config	6 Version
7 Language select	

By pressing UP/DOWN/LEFT/DOWN key to choose the specified menu item, then pressing ENTER to enter the submenu.

4.2.2 System Setting

User can press ENTER to choose this item, UP/DOWN/LEFT/RIGHT to set

the parameters of the output RF. The system displays following pages:

| 1.1 | Frequency | 1.2 | Modulate Mode |
| 1.3 | Constellation | 1.4 | Symbol Rate |

| 1.5 | Bandwidth | 1.6 | RF Level |

4.2.2.1 Frequency

It refers to "start frequency". After entering the submenu by pressing

ENTER key, user can set the start frequency by moving the

UP/DOWN/LEFT/RIGHT key and then repressing ENTER to save.

| 1.1.1 | Frequency |
| | 586.00 MHz |

| 1.1.1 | Frequency |
| | 586.00 MHz |

The RF output range is from 48MHz~860MHz with 6/8M bandwidth. More

details will be inllustrated in the NMS operation.

4.2.2.2 Modulate Mode

Press "Modulate Mode" to enter the interface to select one modulate

standard according to the content displayed. As the FUTV4440B modulator

supports J.83A/DVB-C, J.83B, and J.83C standard, the display shows as

below:

> 1.2.1 Modulate Standard
> [J.83A/DVB-C   ]   J.83B   J.83C

4.2.2.3 Constellation

Press "Constellation" to enter the QAM modulation mode selection, ENTER

to the specified setting. The display shows as below:

> 1.3.1 Constellation J.83A/DVB-C
>   64QAM ↕

This is the modulate mode selected in menu 1.2.
It displays different content according to the mode
selected in menu 1.2.

There possible options are different according to the different modulate

standard set in 1.2. (J.83A/DVB-C: 16QAM, 32QAM, 64QAM, 128QAM and

256QAM; J.83B: 64QAM and 256QAM; J.83C: 64QAM and 256QAM). User

can press ENTER and move UP/DOWN key to choose the constellation as

needed, and then repress ENETER after modification to confirm.

Note: The more advanced QAM constellation mode, the higher transmission

efficiency and TS coding rate which the device can transport at the same

symbol rate. Accordingly, with the TS coding rate increasing, the signals'

anti-jamming capability will become weaker. Hence, those wired network

currently in effect usually adopt QAM modulation mode no exceeding

64QAM.

What needs to be pointed out is, the effective coding rate this modulator

can transport is limitary when the device works as different constellations

and symbol rates.

User can refer to the formula as below:

Max_input_bitrate = Symb_rate*qam_bits*188/204

Max input bit rate: the maximum effective inputting coding rate

Symb rate: the symbol rate

Qam_bits: the QAM bit when device works as current constellation (user can refer to the following table when device works as 6.875Msps symbol rate):

Constellation	qam_bits bit/symb	Symb_rate Msps	Max_input_bitrate Mbps
16	4		25.343
32	5		31.679
64	6	6.875	38.015
128	7		44.350
256	8		50.686

4.2.2.4 Symbol Rate

After entering the submenu by pressing ENTER key, user can set the symbol rate by moving the UP/DOWN/LEFT/RIGHT key and then repressing ENTER to confirm.

```
  1.4.1 Symbol Rate
    6.875Msps
```

The symbol rate range is from 5.0~7.0 Msps in 1ksps step.

Note: When users choose 6M as the frequency point bandwidth, the symbol rate should not exceed 5.217Msps;

When users choose 8M as the frequency point bandwidth, the symbol rate should not exceed 6.956Msps.

4.2.2.5 Bandwidth

After entering the submenu by pressing ENTER key, user can set the bandwidth by moving the LEFT/RIGHT key and then repressing ENTER to confirm.

```
1.5.1 Bandwidth
 *8MHz            6MHz
```

There are two possible options: 6MHz and 8MHz.

```
1.5.1 Bandwidth
 ?8MHz            6MHz
```

Therefore, the frequency interval should be integral multiple of 6MHz/8MHz.

User can refer to the formula as below:

 RF_BW=symb_rate*(1+roll_off)

 RF_BW   Frequency bandwidth

   symb_rate   Symbol rate

   roll_off   Roll off factor   according to EN300429/ITU-T J.83A   the roll off factor is 0.15

As the formula shown, user should set the symbol rate no exceeding 5.214Msps/6.956Msps to ensure the bandwidth for each channel no more than 6MHz/8MHz.

4.2.2.6 RF Level (Out Power/General attenuation setting)

After entering the submenu by pressing ENTER key, user can set the general attenuation by moving the UP/DOWN/LEFT/RIGHT key and then repressing ENTER to confirm.

```
1.6.1 Out Power
   +00.0          dBm
```

The total level attenuation range is from 0~31.5db in 0.5db step.

4.2.3 Channel Setting

User can select "Channel setting" in the main interface and then press ENETR to set the channel. The display show as below:

```
2.1 Channel 1              2.2 Channel 2
2.3 Channel 3              2.4 Channel 4
```

(To illustrate the 4 input options (ASI, DVB-C/S/S2), here we take channel 1 as ASI Input, channel 2 as DVB-C Input, channel 3 as DVB-S Input and Channel 4 as DVB-S2 Input.)

4.2.3.1 Channel 1 (ASI Input as an example)

User can choose channel 1 in the submenu by pressing ENTER, and the display shows as below:

2.1.1 Output Carrier   2.1.2 Attenuation

2.1.3 NIT Insertion   2.1.4 PID Filtering

4.2.3.1.1 Output carrier

User can decide whether to turn on the channel 1's output carrier.

By pressing ENTER after selecting the "Output Carrier", moving the LEFT/RIGHT key to set, repressing ENTER to confirm.

2.1.1.1 Output Carrier

  *On   Off

2.1.1.1 Output Carrier

  ?On   Off

Note: This submenu is used for turning on or turning off the carrier output of channel 1.

4.2.3.1.2 Output attenuation in channel 1

By pressing ENTER to enter into the attenuation setting in channel 1 submenu, repressing ENTER and moving UP/DOWN/LEFT/RIGHT key to set the parameters. The display shows as below:

2.1.2.1 Attenuation

  00.0 dB

2.1.2.1 Attenuation

  00.0 dB

The channel 1 output level attenuation is from 0~16db in 0.5db step.

4.2.3.1.3 NIT insertion

By pressing ENTER to enter into the NIT Insertion in channel 1 submenu, repressing ENTER key and moving LEFT/RIGHT key to choose. The display shows as below:

```
2.1.3.1 NIT Insertion
      On        *Off
```

```
2.1.3.1 NIT Insertion
      On        ?Off
```

Note: User can decide whether to make the inserted NIT table effective.

4.2.3.1.4 PID filtering

PIDs can take up immense bandwidth when passing the signal channels. This device provides user the function to filter some redundant PIDs as need. The display shows as below:

On: filtering

Off: allow passing

```
2.1.4.1 PID Filtering
      *On        Off
```

```
2.1.4.1 PID Filtering
      ?On        Off
```

User can move LEFT/RIGHT key to choose.

NOTE: User can decide whether to enable or disable the PID filtering

function.

4.2.3.2 Channel 2 (DVB-C In as an example)

User can choose channel 2 in the submenu by pressing ENTER, and the display shows as below:

```
2.2.1 Output Carrier              2.2.2 Attenuation
2.2.3 NIT insertion               2.2.4 PID filtering
```

```
2.2.5 Frequency                   2.2.6 QAM modulation mode
2.2.3 symbol rate
```

4.2. 3.2.1 Output Carrier   same as 4.2.3.1.1

4.2.3.2.2 Attenuation   same as 4.2.3.1.2

4.2.3.2.3 NIT Insertion   same as 4.2.3.1.3

4.2.3.2.4 PID Filtering   same as 4.2.3.1.4

4.2.3.2.5 Frequency

By pressing ENTER to enter into the Frequency in channel 2 submenus, repressing ENTER key and moving LEFT/RIGHT key to choose. The display shows as below:

```
2.2.5 Frequency
      586.00Mhz
```

```
2.2.5 Frequency
      586.00Mhz
```

Note: The submenu is only for setting the frequency of DVB-C signal.

4.2.3.2.6 QAM modulation mode

```
2.2.6 QAM modulation mode
    64 QAM
```

```
2.2.6 QAM modulation mode

    64QAM                          ↕
```

By pressing "ENTER" to select the modulation mode via the "UP" and "DOWN" button. The optional mode is 16QAM, 32QAM, 64 QAM, 128 QAM, 256 QAM. After modifying, pressing the "Enter" button to confirm.

4.2.3.2.7 Symbol rate

After entering the symbol rate setting of channel 2, user can set the symbol rate by moving the UP/DOWN/LEFT/RIGHT key and then repressing ENTER to confirm.

```
1.3.1 Symbol Rate
    6.875Msps
```

```
1.3.1 Symbol Rate
    6.875Msps
```

Note: The submenu is only used for demodulating the symbol rate of DVB-C signal.

4.2.3.3 Channel 3 (DVB-S In as an example)

User can choose "channel 3" in the submenu by pressing ENTER, and the display shows as below:

```
2.3.1 Output Carrier          2.3.2 Attenuation
2.3.3 NIT insertion           2.3.4 PID filtering
```

```
2.3.5 Downlink Frequency                    2.3.6 LNB frequency
2.3.7 Symbol Rate                           2. 3.8 LNB Voltage
```

```
2.3.9 22 KHZ switch
```

4.2.3.3.1 Output Carrier   same as 4.2.3.1.1

4.2.3.3.2 Attenuation   same as 4.2.3.1.2

4.2.3.3.3 NIT Insertion   same as 4.2.3.1.3

4.2.3.3.4 PID filtering   same as 4.2.3.1.4

4.2.3.3.5 Downlink Frequency

By pressing ENTER to enter into the "Downlink Frequency" in channel 3 submenus, repressing ENTER key and moving LEFT/RIGHT key to choose. The display shows as below:

```
2.3.5 Downlink Frequency
    03840 MHz
```

```
2.3.5 Downlink Frequency
    03840 MHz
```

Note: The submenu is only for setting the downlink frequency of the DVB-S signal needed to be demodulated.

4.2.3.3.6 LNB Frequency

By pressing ENTER to enter into the "LNB Frequency" in channel 3 submenus, repressing ENTER key and moving LEFT/RIGHT key to choose. The display

shows as below:

> 2.3.6   LNB Frequency
>   05150Mhz

> 2.3.6 LNB Frequency
>   051500Mhz

Note: The submenu is only for setting the LNB frequency of the DVB-S signal needed to be demodulated.

4.2.3.3.7 Symbol Rate

After entering the submenu of " Channel 3" by pressing ENTER key, user can set the symbol rate by moving the UP/DOWN/LEFT/RIGHT key and then repressing ENTER to confirm.

> 2.3.7   Symbol Rate
>   27.500Msps

> 2.3.7   Symbol Rate
>   <u>27.500</u>Msps

Note: the submenu is only for setting the symbol rate of the DVB-S signal needed to be demodulated.

4.2.3.3.8 LNB Voltage

By pressing ENTER to enter into the "LNB Voltage" in channel 3 submenus, repressing ENTER key and moving LEFT/RIGHT key to set. The display shows as below:

```
2.3.8   LNB Frequency
    * V (13V)   H (18V)
```

```
2.3.8   LNB Frequency
     V (13V) * H (18V)
```

By pressing "Enter" key, the "*" state will be changed to the to be selected state.

Note: The submenu is only for setting the "LNB Voltage" of the DVB-S signal needed to be demodulated.

4.2.3.3.9 22KHZ Switch

By pressing ENTER to enter into the "22 KHZ Switch" in channel 3 submenu, repressing ENTER key and moving LEFT/RIGHT key to set. The display shows as below:

```
2.3.9   22KHZ Switch
    *OFF      ON
```

```
2.3.9   22KHZ Switch
     OFF      ON
```

By repressing "Enter" key, the "*" state will be turned into the to be selected state "?".

Note: The submenu is only for setting whether to enable or disable the "22KHZ Switch" of the DVB-S signal needed to be demodulated.

4.2.3.4 Channel4 (DVB-S2 IN as an example)   same as 4.2.3.3. (Channel 3)

4.2.4 Network Setting

Press "Up/Down" to choose this item, "Enter" and "Left/Right" to set the parameters. The system displays following pages.

3.1 IP Address	3.2 Subnet Mask
3.3 Gateway	3.4 Console

3.5 MAC Address	3.6 NMS Port

Note: The MAC address is according to the factory setting, and it's unique.

Under the following submenus, there are parameters which can be set manually; user can press "Up/Down" to choose this item. "Enter" and "Left/Right" to set the parameters. The system displays following pages.

3.1 IP Address
   192.168.000.137

3.2 Subnet Mask
   255.255.255.000

3.3 Gateway
   192.168.000.001

3.4 Console Address
   192.168.000.211

3.5 MAC Address
   ffffffffffffffffffff

3.6 NMS Port
   02007

4.2.5 Save configuration

User can choose to save the current configured parameters by pressing ENTER key. The system displays following page:

> Saving, please wait:
> Erasing…….

4.2.6 Load configuration

At this menu, press LEFT/RIGHT key and ENTER to confirm.

> 5.1 Load Saved CFG   5.2 Factory Default

User can restore the device into the last saved configuration by choosing "5.1" and restore the device into factory configuration by choosing "5.2".

When user chooses "5.1" to load saved configuration, the display shows as below:

> Loading, please wait:
> >>>>>>>>>>>>>>>>

When user chooses "5.2" to restore the device into factory configuration, the display will automatically return to the main menu as below:

> 1   System Setting   2   Channel Setting
> 3   Network Setting   4   Saving Config

4.2.7 Version No.

User can check the hardware version and software version of the equipment.

>   Company Name   Electronic
>   SW   1.04   HW   1.8

Chapter 5 NMS Setting

Network Management System Profile

Network management system is applied to digital TV equipment operation, control and management and parameters setting, etc. It centralizes digital TV equipment through network.

5.1 Installation

Both NMS (based on UDP protocol) and SNMP (based on SNMP protocol) can be applied to manage the device. The software doesn't need special installation. User can just copy "Network Management Software X.XXY.exe" to the specified directory (X.XX is version number, Y represents language. For example: the version number of network management software 4.01E.exe is 4.01 English version) or place different versions of network management software to the same directory. When the network management software is running, it will generate two documents as follows:

Network management software X.XXY.log (It preserves the log file.)

Info. Bin (It's the user configuration data.)

5.2 Software Operation

5.2.1 Login Interface

A login interface will pop up firstly when the software is running and give user prompts to input user name and password, the menu shows as follows:

User can login the NMS by pressing **Confirm** key after inputting user name and password. Upon the inputs, the software will verify them with database record automatically. If both of them are correct, the main interface will appear. Both of the default user name and password are **admin**. (If the SNMP is applied, the default user name is **admin**, while no password needed.)

5.2.2 Main Interface
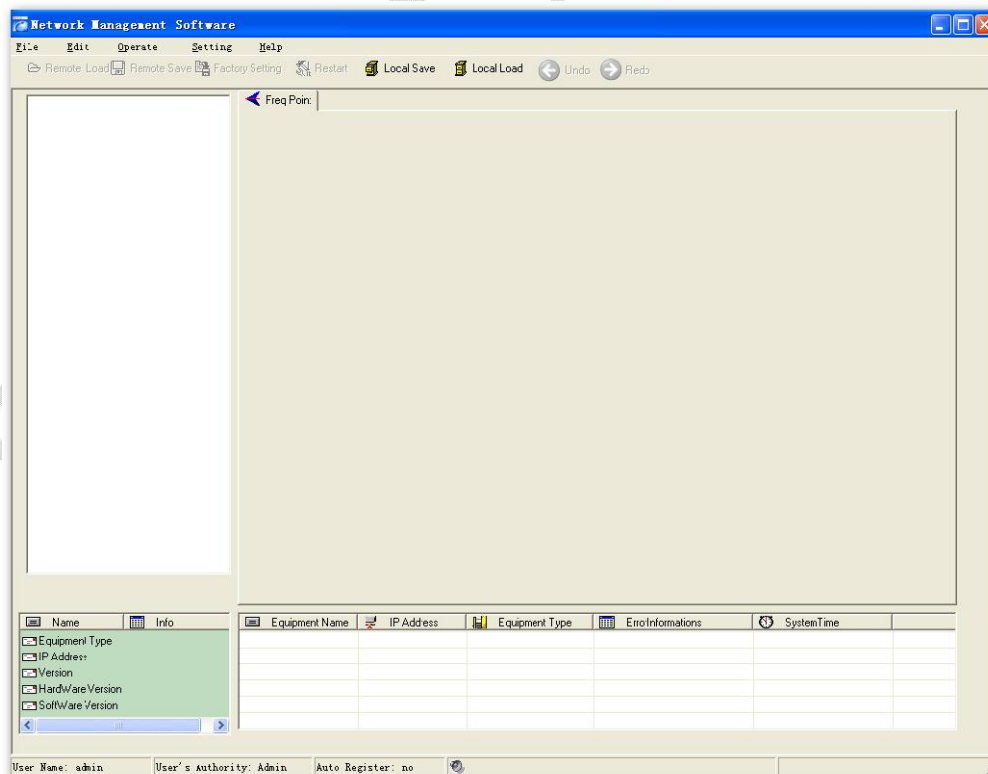
User can create a device node tree in the left column by adding, modifying and

deleting the device node. This software provides a powerful node operation function, and the user can edit various parameters in the device tree for management and classification.

5.2.3 Adding Frequency Point
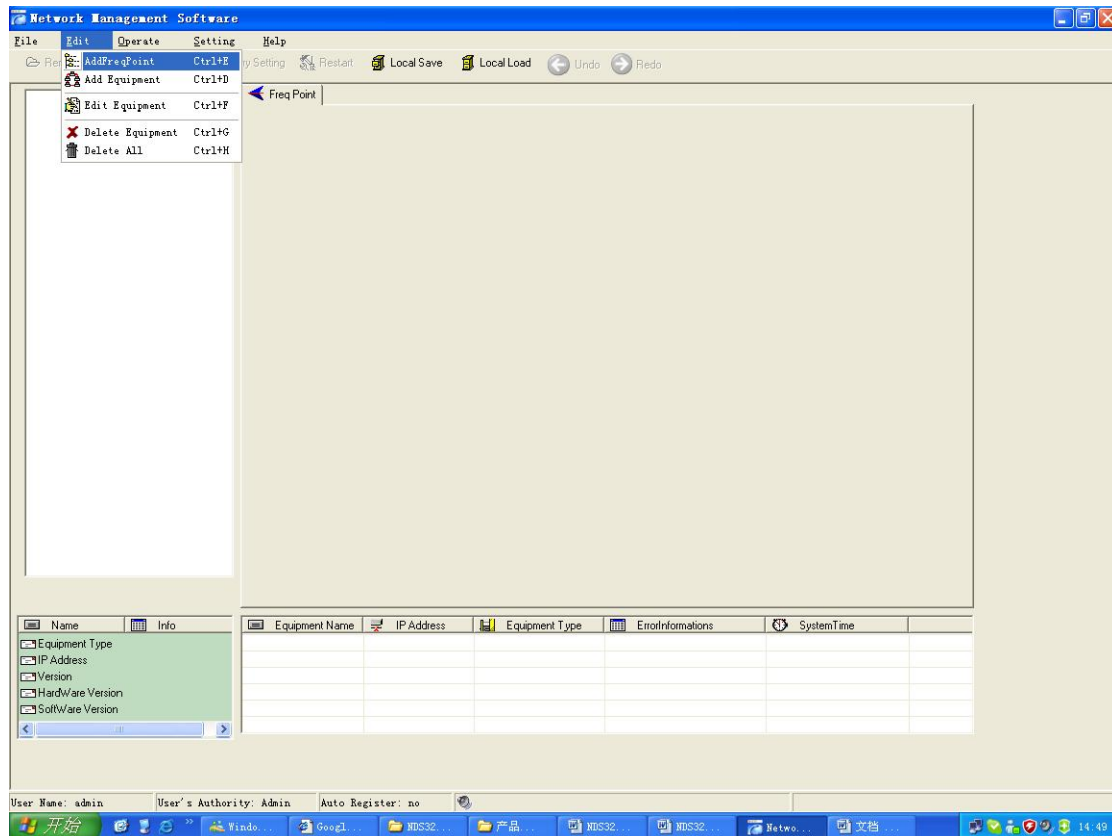
The Add Freq Point dialog box popes up when the user clicks the Add Freq Point item in the Edit pull down menu on the menu row. The device will confirm the given frequency while user clicks **OK**.

User can also click right mouse key to pop up the short-cut menu in device tree or in the left blank column, then the corresponding dialog box will pop up by choosing **Add Main Freq Point**. The device will confirm the given frequency while user clicks **OK**.
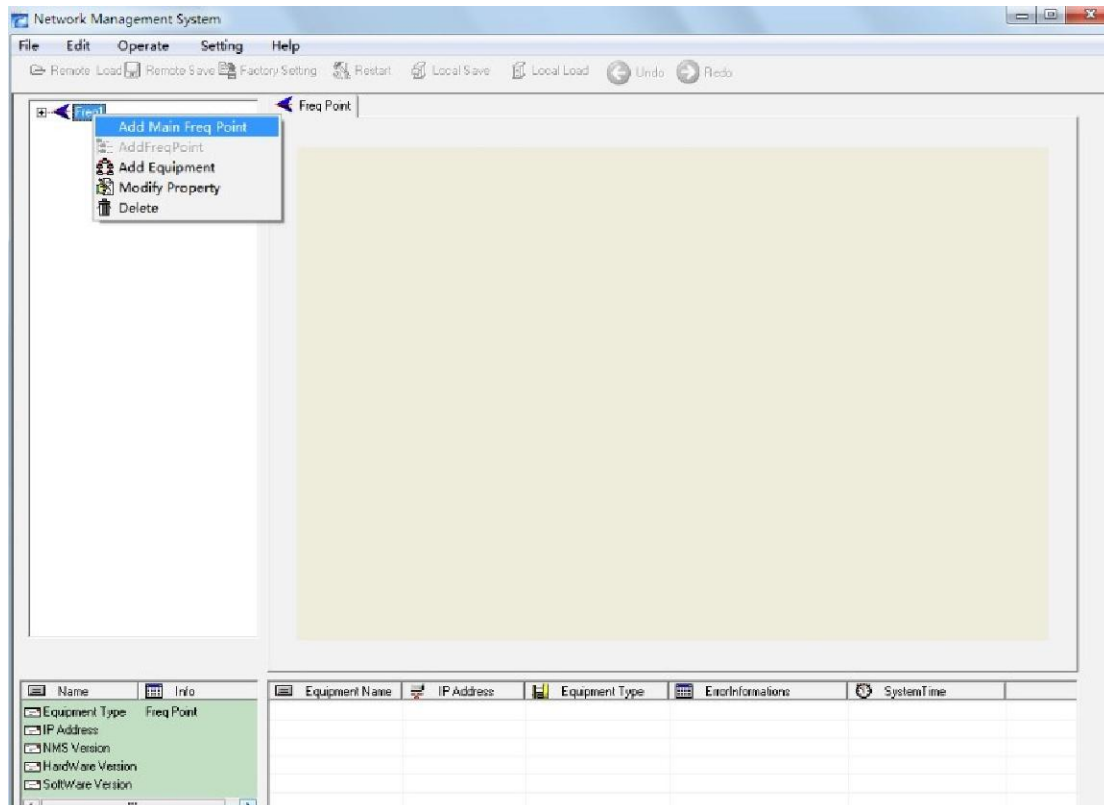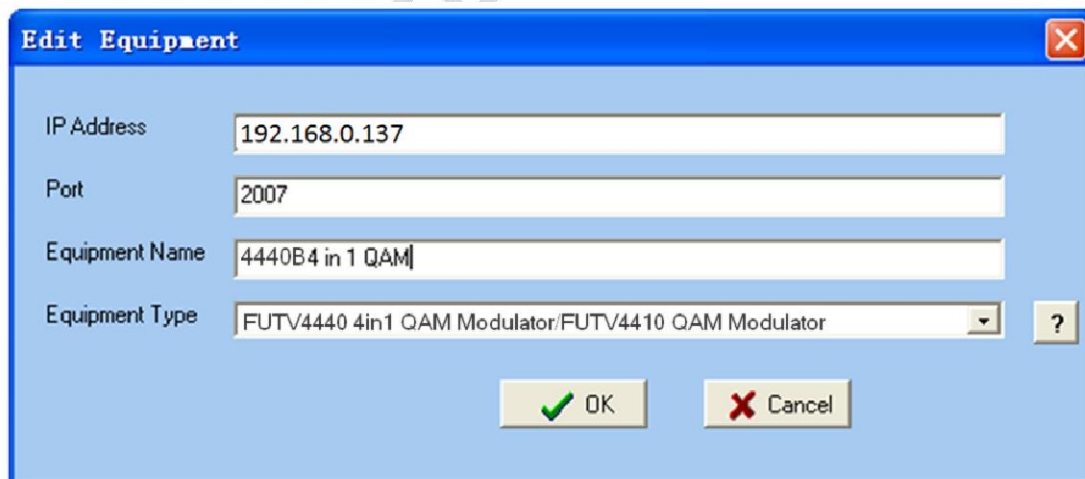
5.2.4 Adding Equipment under Given Frequency Point

User should choose the frequency point in advance, and then the dialog box of Add Equipment will pop up when user clicks "Add Equipment" item in the Edit pull down menu on the menu row.
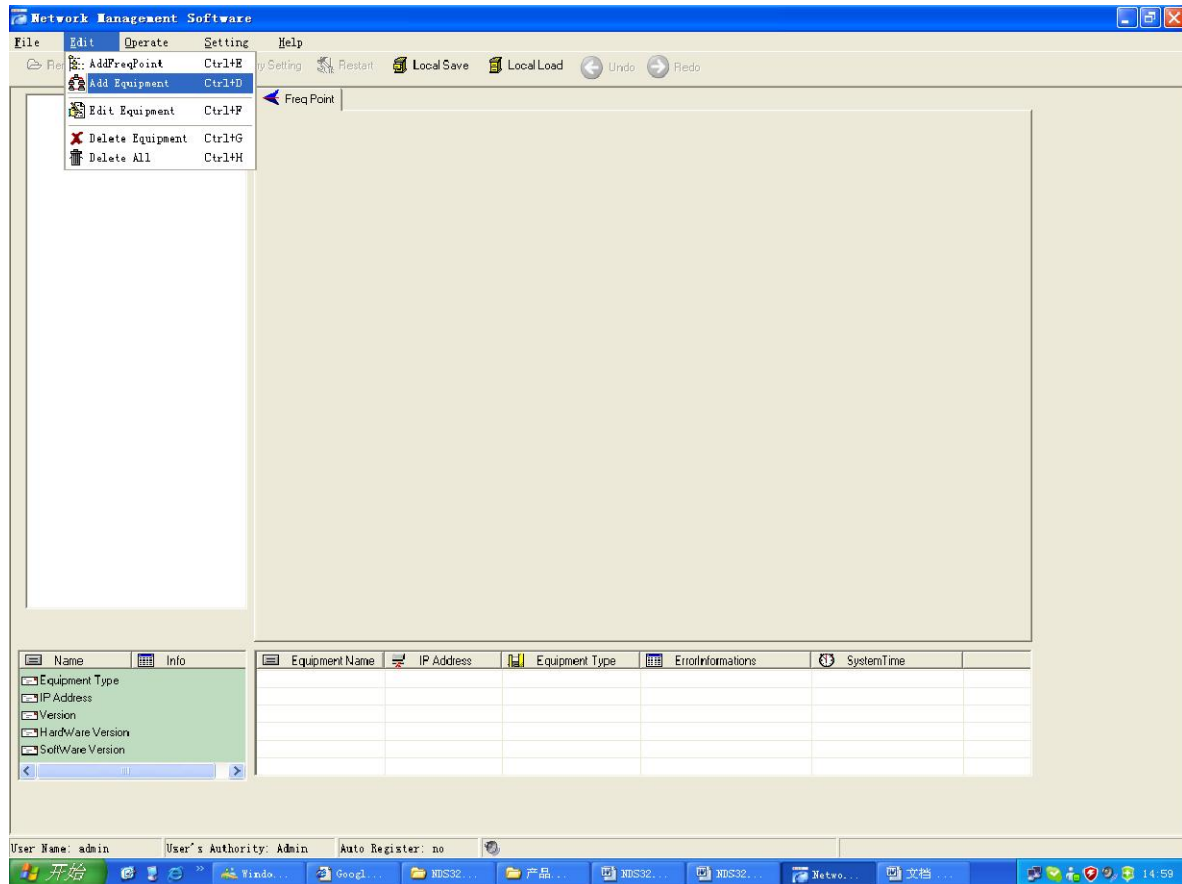
5.2.5 Edit Equipment Interface

User should follow the steps as below:

Choosing the connected equipment type in drop down list of "Equipment Type"

by clicking the "   "

l   Inputting the Equipment Name

l   Inputting the device IP Address

l   Inputting the device Port Number
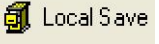
5.2.6 Delete Equipment

User can choose the equipment to be deleted in the left column, and then click the "delete" item in the pull down menu which appears by clicking the right mouse key.
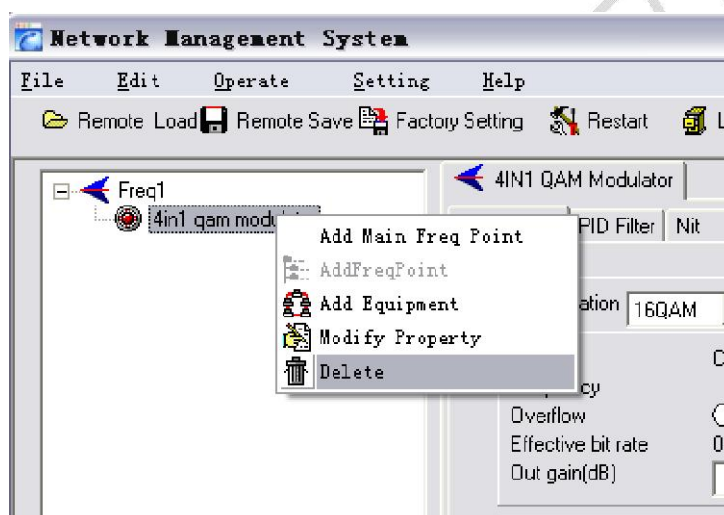
5.2.7 Save Configuration

After finishing all the parameters setting, user can click [Remote Save] button on the toolbar to save the modifications to the device's flash, while user can also reload the saved parameters from device's flash and refresh the device's parameters setting according to the loaded values by clicking [Remote Load]

Alternatively, user can also click the [Local Save] button on the toolbar to popup the "save file" dialog box, which gives prompts to save all the device's parameters as binary files in the computer's hard disk.
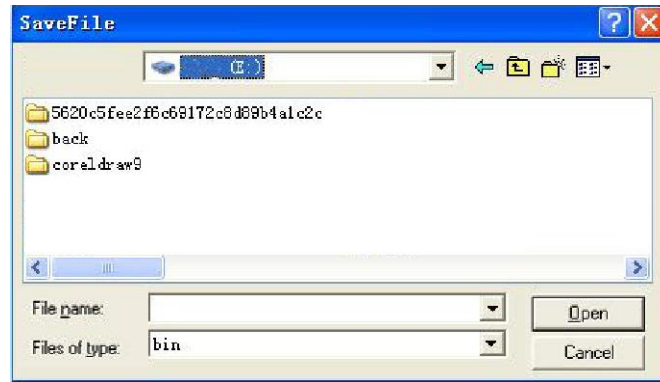
Similarly, user can choose to click the [Local Load] button on the toolbar to popup the read file dialog box, to read the stored binary file and set the device's parameters according to the loaded binary files.
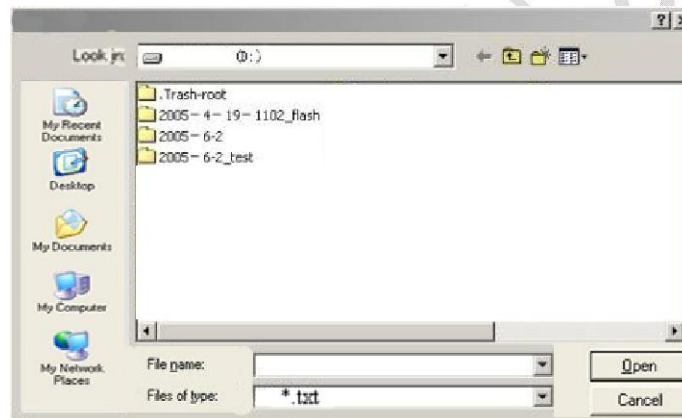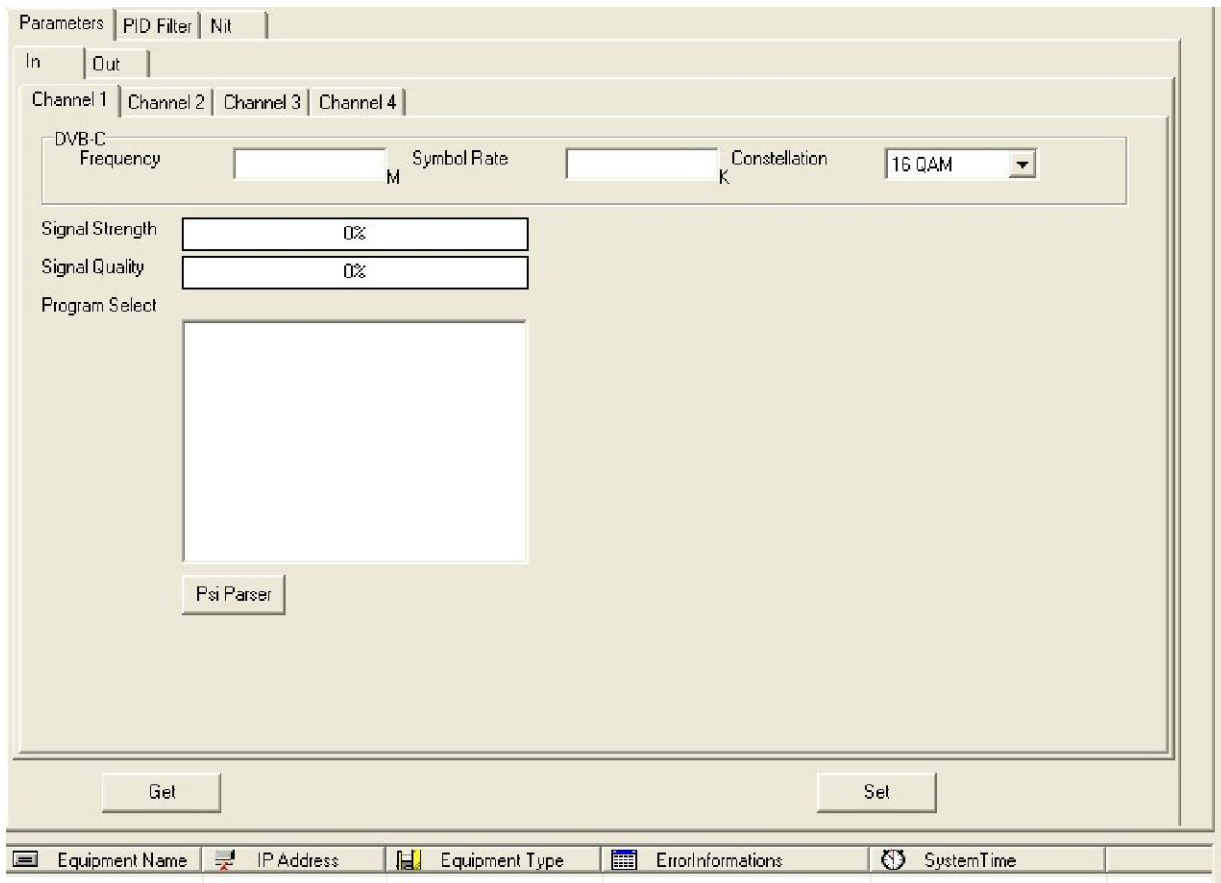
5.3 FUTV4440B 4in1 QAM Modulator Operation

User can choose the "3340B 4 in 1 QAM" in the device tree.

Set: making the current parameters shown in the NMS software, activate.

Get: reading the current device's activating parameters and show them on NMS software.

5.3.1 Parameter

5.3.1.1 IN

> **NOTE:**
>
> ***Parameters In Channel 1/2/3/4***: The channel interface presents different content automatically according to the signal-input ports. (see *5.3.1.1.1 5.3.1.1.4*)

5.3.1.1.1 ASI In (Refer to 4.2.3.1)
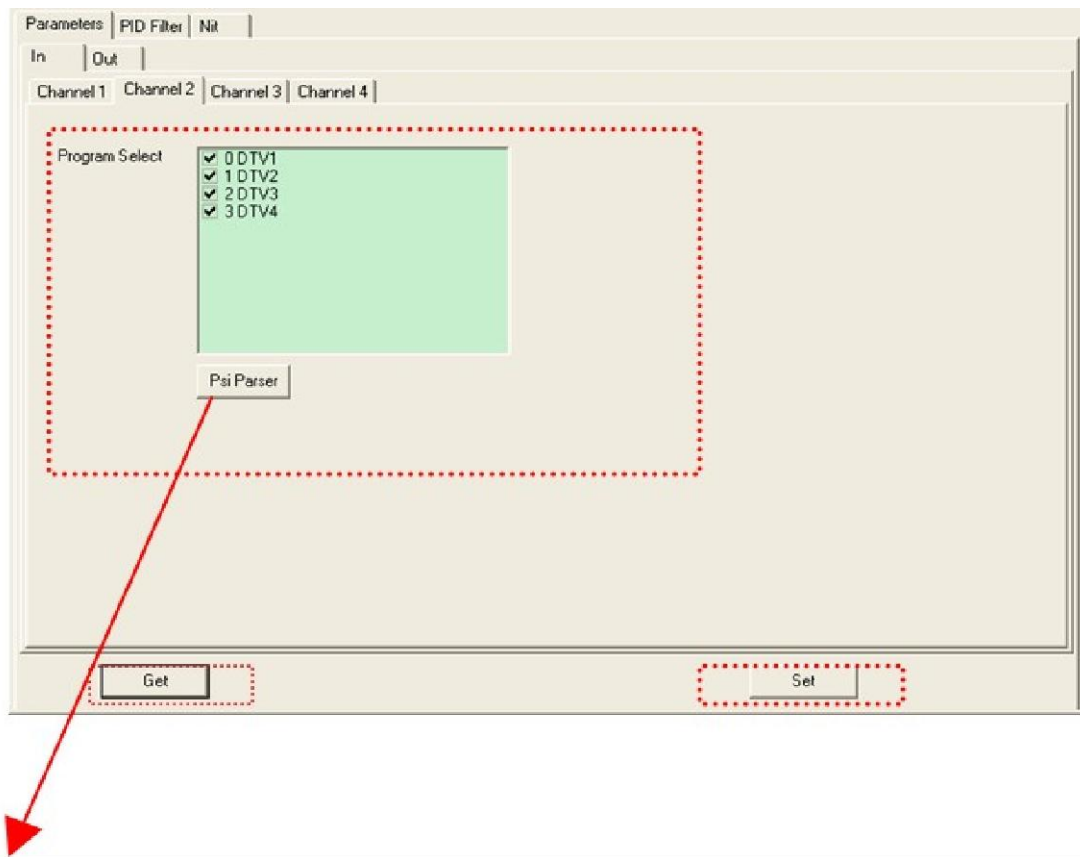
Program select: Selecting the programs that needed to output.
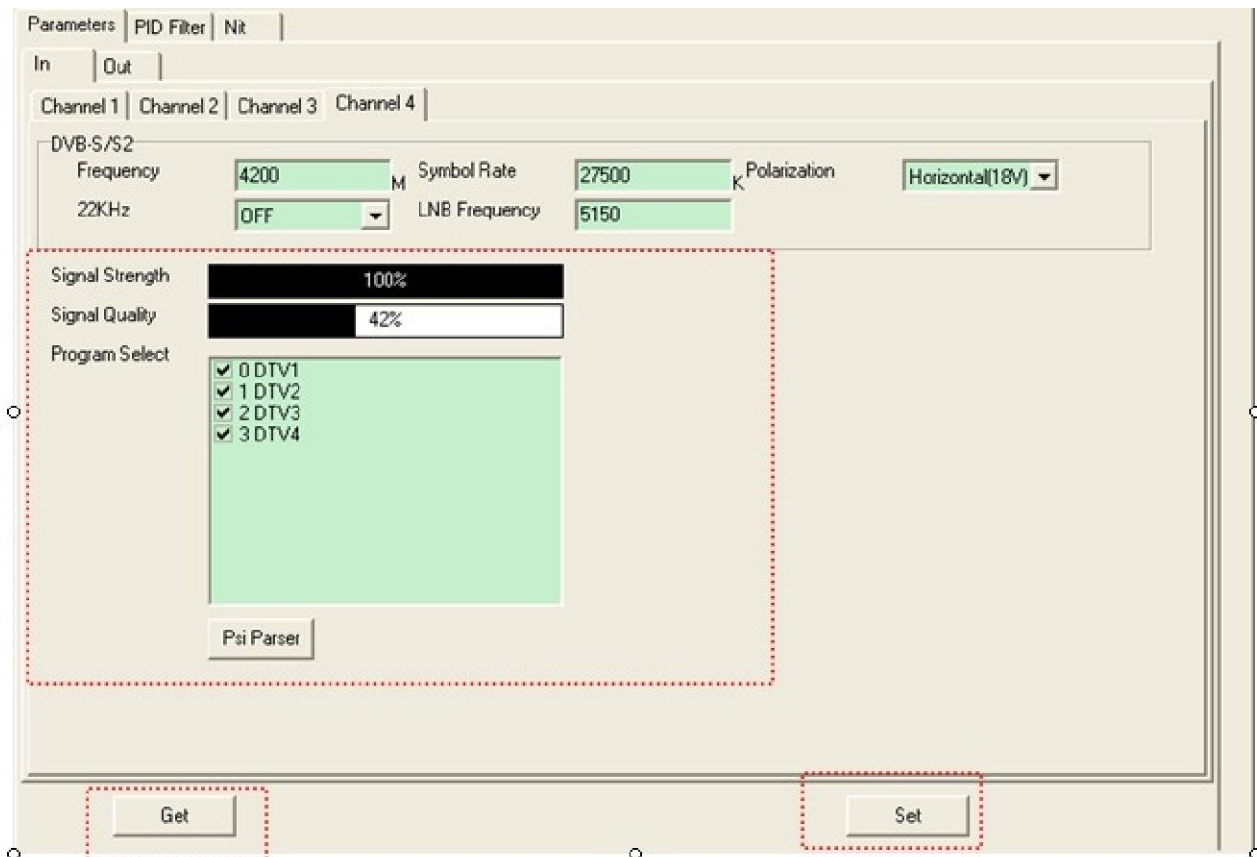
PSI Parser: Pressing this button to analyze the input programs

5.2.1.1.2 DVB-C in (Here taking channel 1 of DVB-C tuner input as an example)
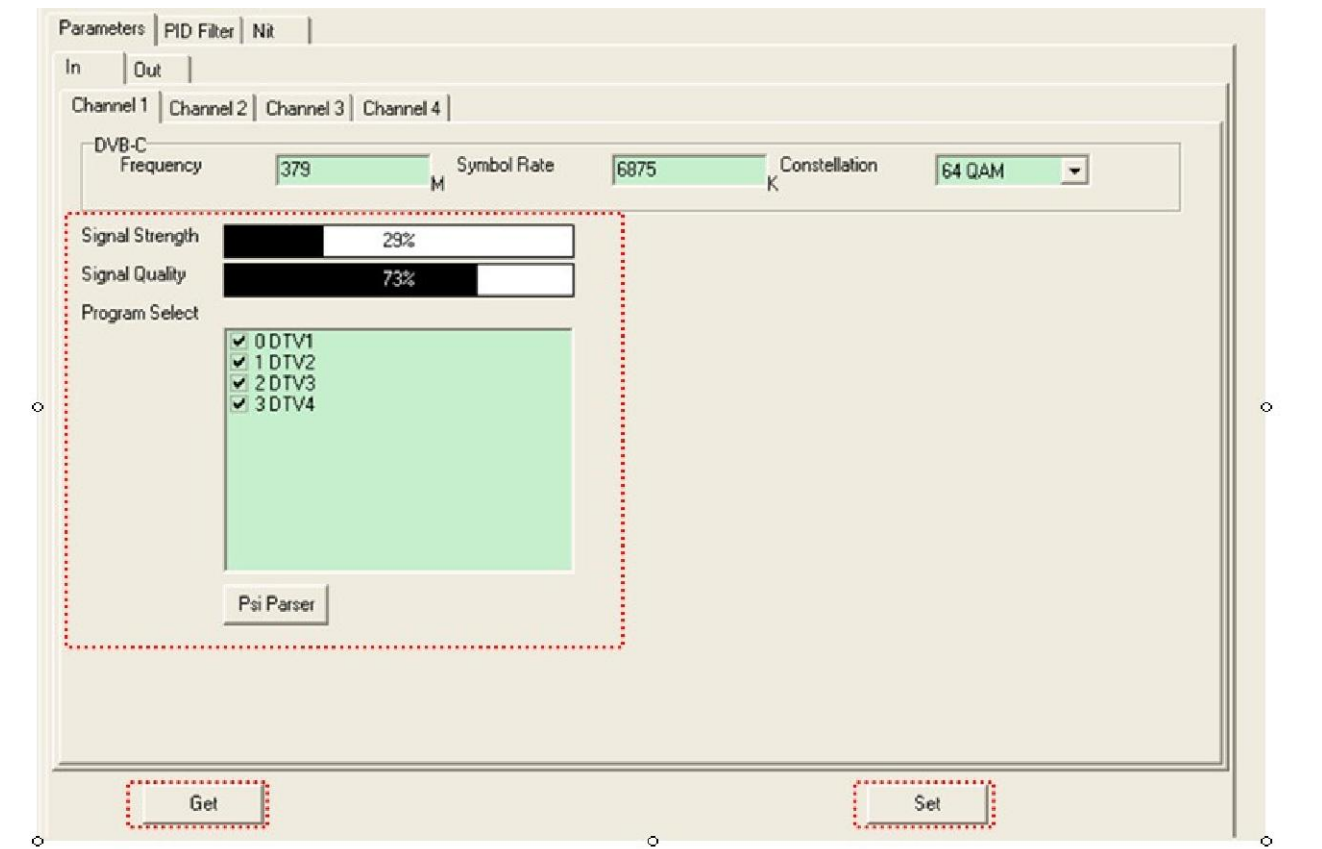
l   Frequency   &   symbol   rate   &   constellation   (refer   to 4.2.3.2.5&4.2.3.2.6&4.2.3.2.7)

l   Signal strength: indicating the input signal intensity

l   Signal quality: indicating the input signal quality

l   Program select: Selecting the programs that needed to be outputted

l   PSI Parser: Pressing this button to analyze the input programs

5.2.1.1.3 DVB-S In (Here taking channel 1 of DVB-S tuner input as an example)
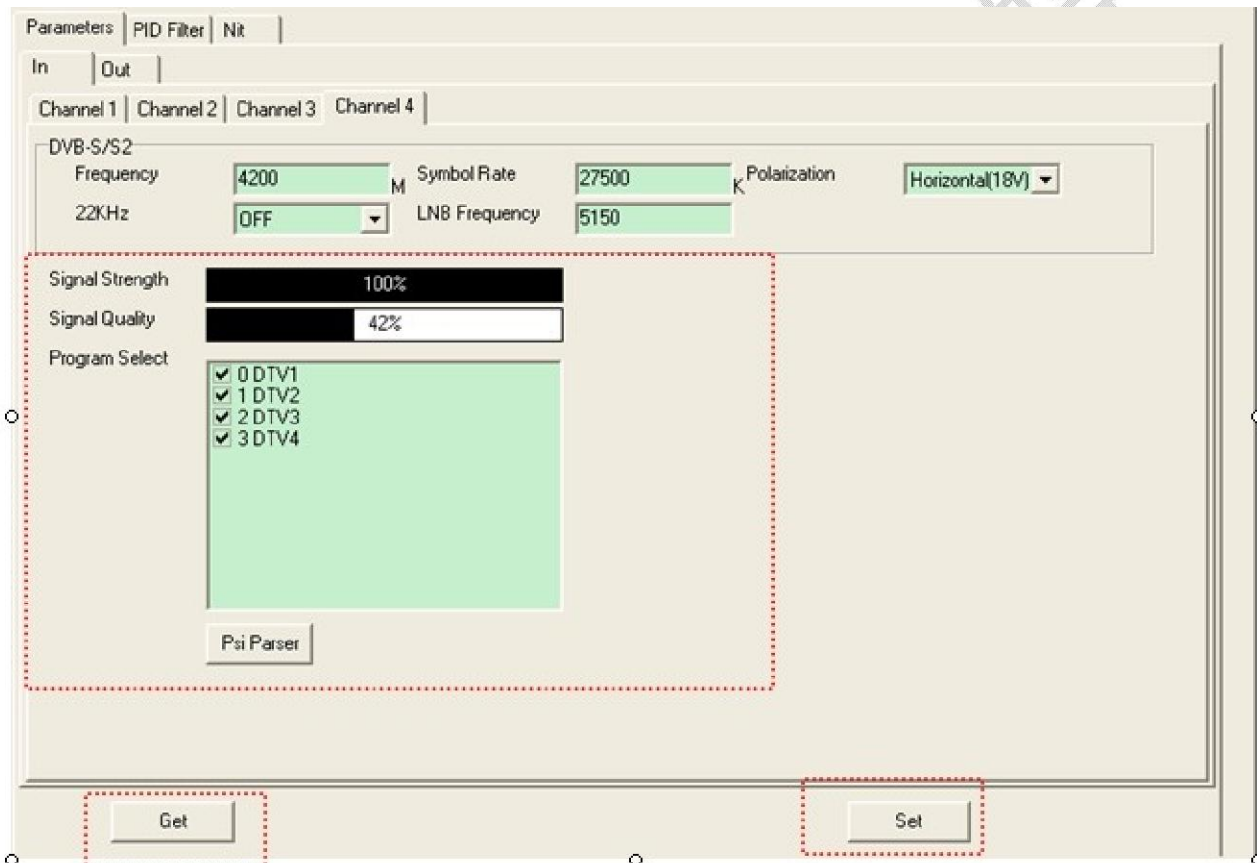
l Satellite freq&symbol rate: User should search the internet for program satellite information before setting the frequency; the symbol rate will change as satellite frequency changed.

l LNB Polarization: here are 2 points for selecting V(13v) and H(18v)

l Tuner 22 KHz: User can decide whether to switch the tuner frequency by selecting ON/OFF.

l LNB frequency: User should check the tuner installed in the satellite dish in advance to find the LNB frequency. It should be set equals to the frequency

shows on tuner.

l   Signal strength: indicating the input signal intensity

l   Signal quality: indicating the input signal quality

l   Program select: Selecting the programs that needed to be outputted

l   PSI Parser: Pressing this button to analyze the input programs

5.3.1.1.4 DVB-S2 In

l   The description of DVB-S2 tuner input is the same as the DVB-S tuner input.

5.3.1.2 OUT
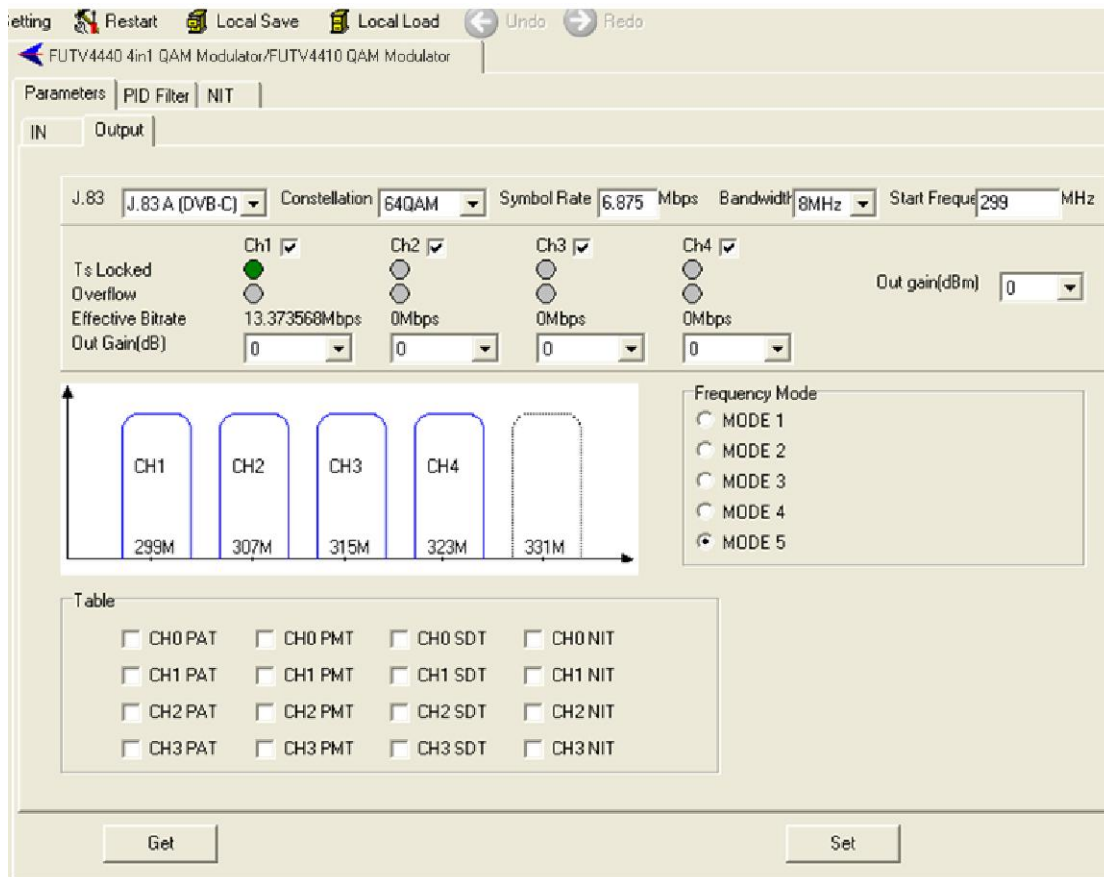
The 6 parameters here (J.83, constellation, symbol rate, bandwidth, start frequency and out gain) are general parameters, and effective for each channel.

5.3.1.2.1 J.83

This item is for selecting the modulating standard this device supports:
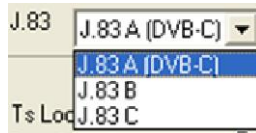
J.83A/DVB-C, J.83B, and J.83C.

5.3.1.2.1 Constellation (refer to 4.2.2.2)

QAM modulation mode

J.83A/DVB-C: 16QAM/32QAM/64QAM/128QAM/256QAM optional

J.83B: 64QAM/256QAM optional

J.83C: 64QAM/256QAM optional

5.3.1.2.3 Symbol rate (refer to 4.2.2.3)

5~7Msps

5.3.1.2.4 Bandwidth (4.2.2.4)

Frequency point bandwidth   6M and 8M optional

5.3.1.2.5 Start Freq

There are four activated channels with each one has its own center frequency.

Here the start frequency points to the channel 1's center frequency.

5.3.1.2.6 Outgain (refer to 4.2.2.5)

Total output level attenuation

User can see following description about start frequency:

The RF output frequency range is from 30MHz to 960MHz. Here the start

frequency, namely actually, user often say the centre frequency of TS output.

Therefore, user can only set the start frequency from 30MHz to 960MHz

(considering the 6/8MHz bandwidth optional).

Note: the start frequency discussed here means centre frequency

The display shows as below:
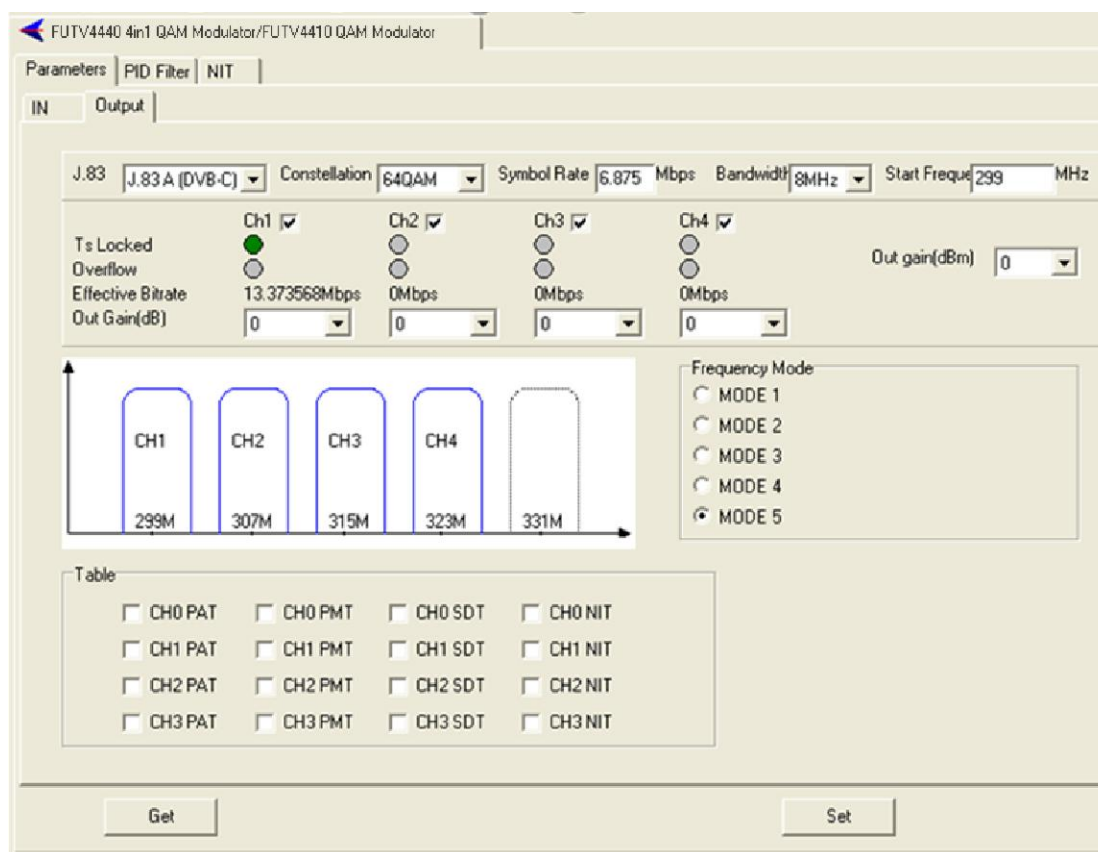
5.3.2 Output carrier (refer to 4.2.3.1.1)

User can decide how many channels' TS are being transported by selecting the

checkbox, and the channel selected will be closed. The illustrations are as

below:

5.3.3 TS Locked/Overflow

Green: TS Locked

Red: TS overflow

Grey: TS Loss
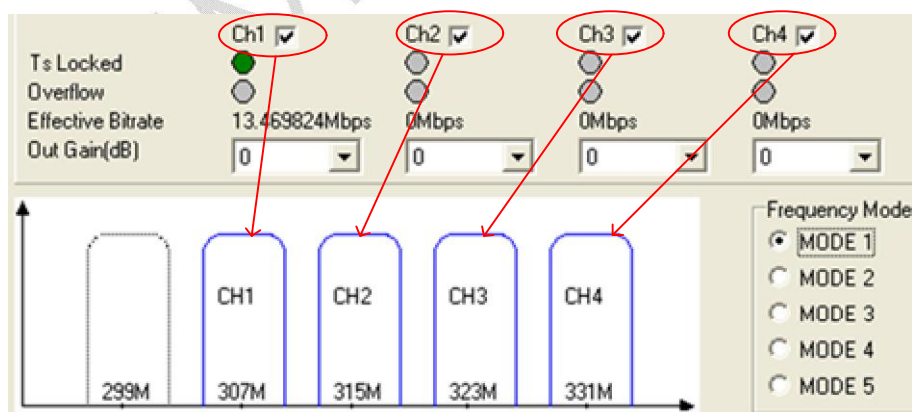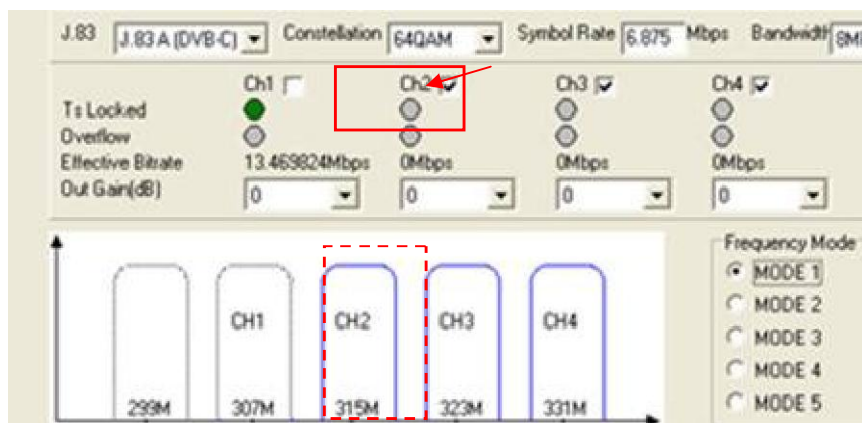
Grey: TS doesn't overflow
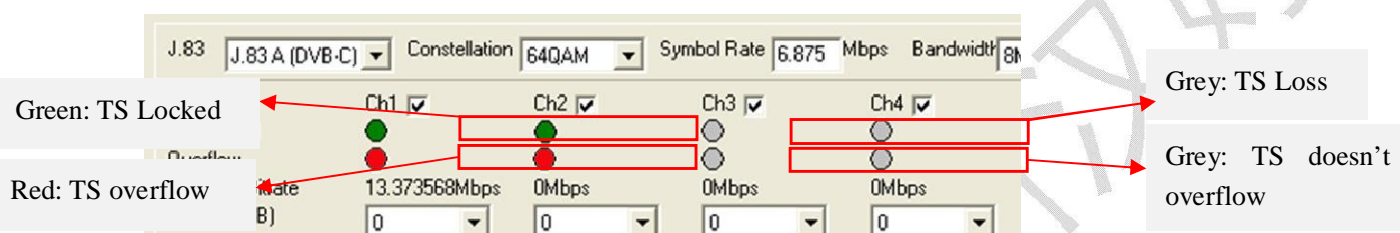
User can refer to the formula Max_input_bitrate =

Symb_rate*qam_bits*188/204 to estimate whether the effective bit rate is

above on the maximum value. If the input bit rate is exceeding, the over flow

indicator will be light on.

5.3.4 Effective bit rate
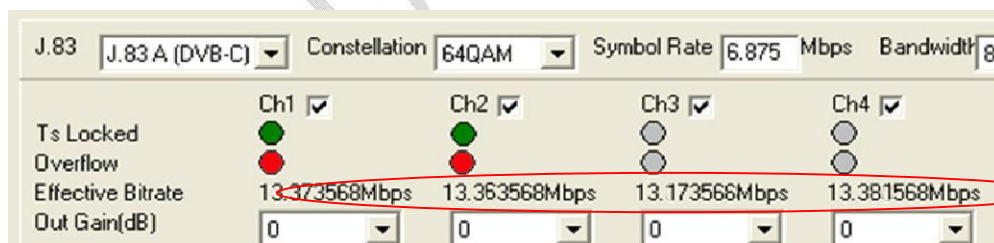
User can also refer to the maximum bit rate formula and table. The current

setting is 64 QAM constellations with 6.875Mbps symbol rate, so the maximum

bit rate should be 6.875Msps*6*188/204 38.015Mbps. Here user can see the

current input bit rate each channel is about 33.33, which can be named

effective bit rate.

5.3.5 Output level attenuation

The level attenuation for each channel equals to RF general out gain pluses

channel gain. The illustration shows as below:
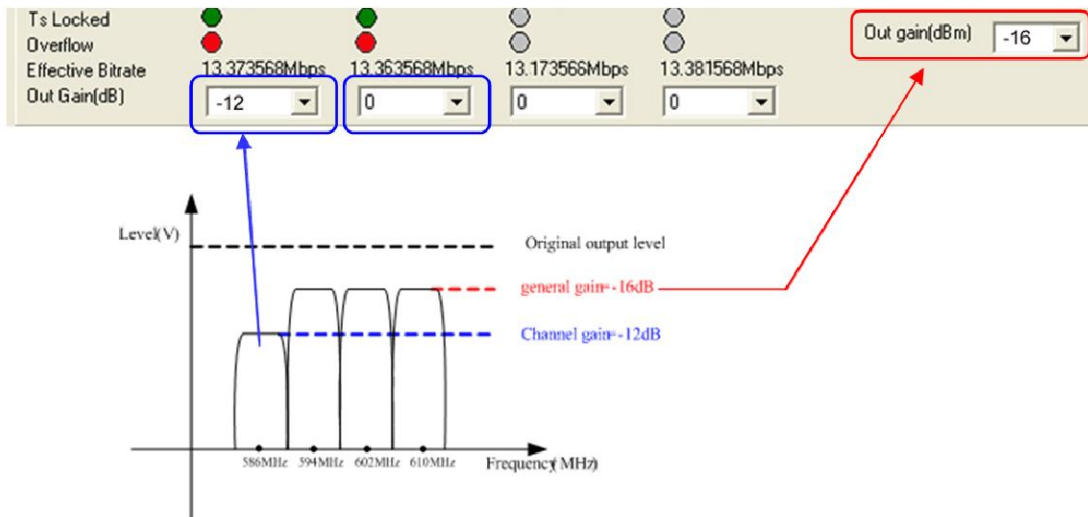
Note: For each channel, its out gain equals to the general out gain (circled by

red line) pluses the respective out gain (circled by blue line).

For example, the channel 1 out gain in above illustration=-16+ (-12) = -28(db)

5.3.6 Freq mode   frequency mode

There are 5 possible modes provided in the frequency mode area. User should

close anyone of them by selecting the checkbox to ensure the other four

channels unblocked. The displays show as below:

5.3.6.1 MODE 1
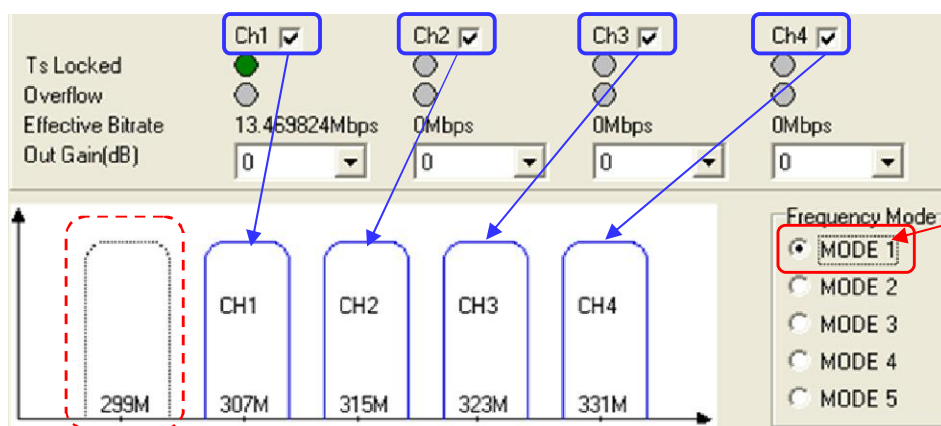
5.3.6.2 MODE 2
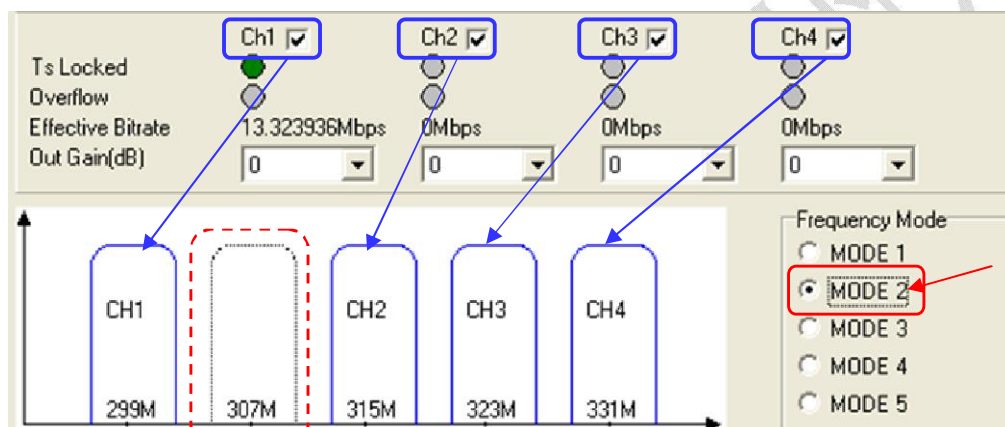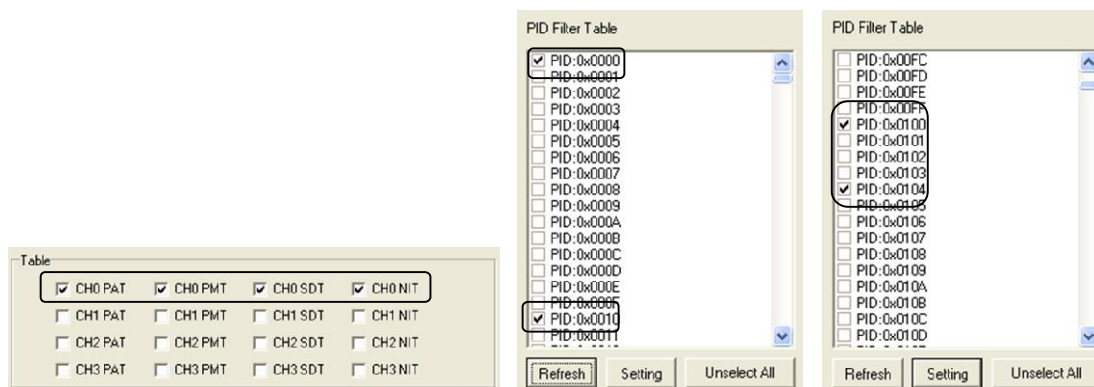

5.3.6.3 MODE 3
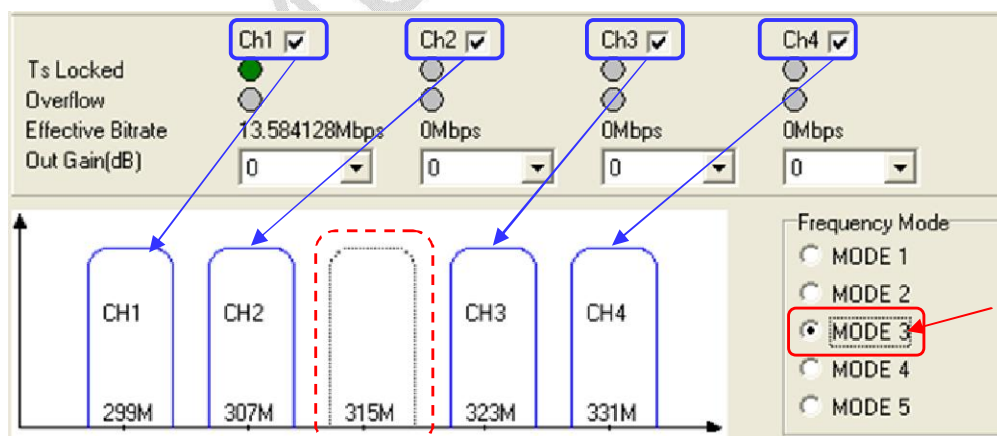
5.3.6.4 MODE 4
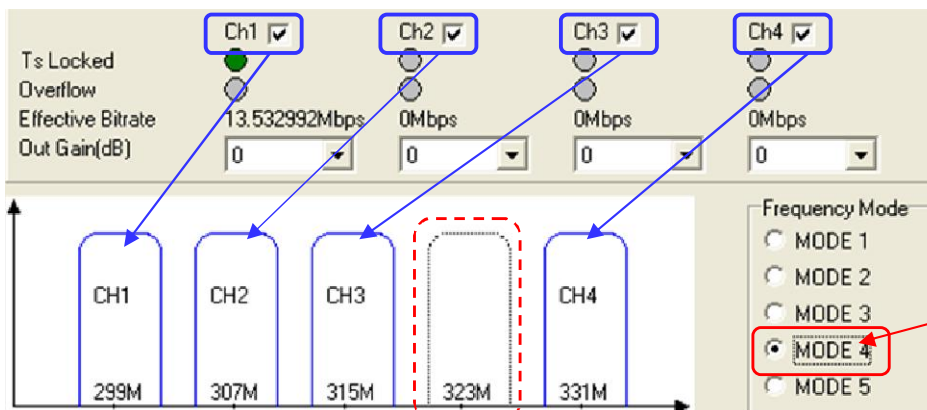
5.3.6.5 **MODE 5**
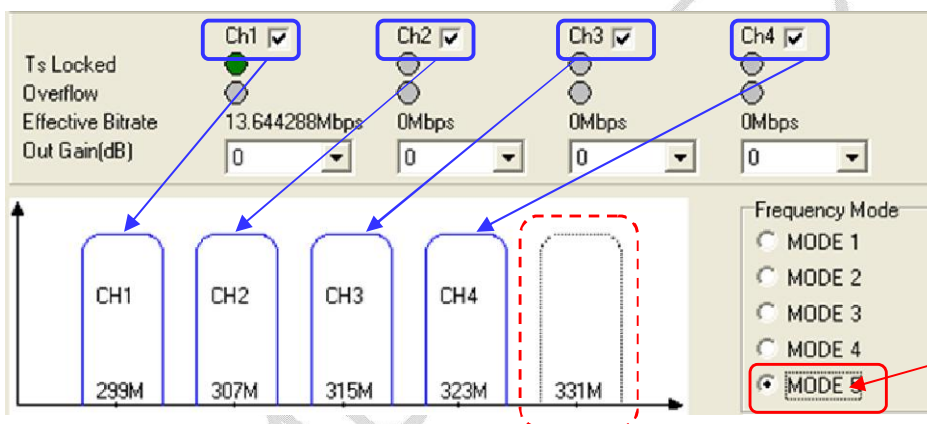
5.3.7 Tables

There are four PID tables provided for each channel to filter, mainly including PAT, PMT, SDT and NIT table. User can choose to filter the original PID as needed by selecting the checkboxes (left below), or they can also manually select the PID needs filtering in the PID filter table (right below).

5.3.8 PID Filter (refer to 4.2.3.1.4)

User can finish the original table filtering and new table inserting by following

the steps as below:

l   clicking "Psi/si parser" to get the original data

l   clicking "Psi edit" to create new data

l   selecting the checkboxes in Parameters interface to confirm filtering

l   clicking "set" to make the insertion/replacement effective

The displays show as below:
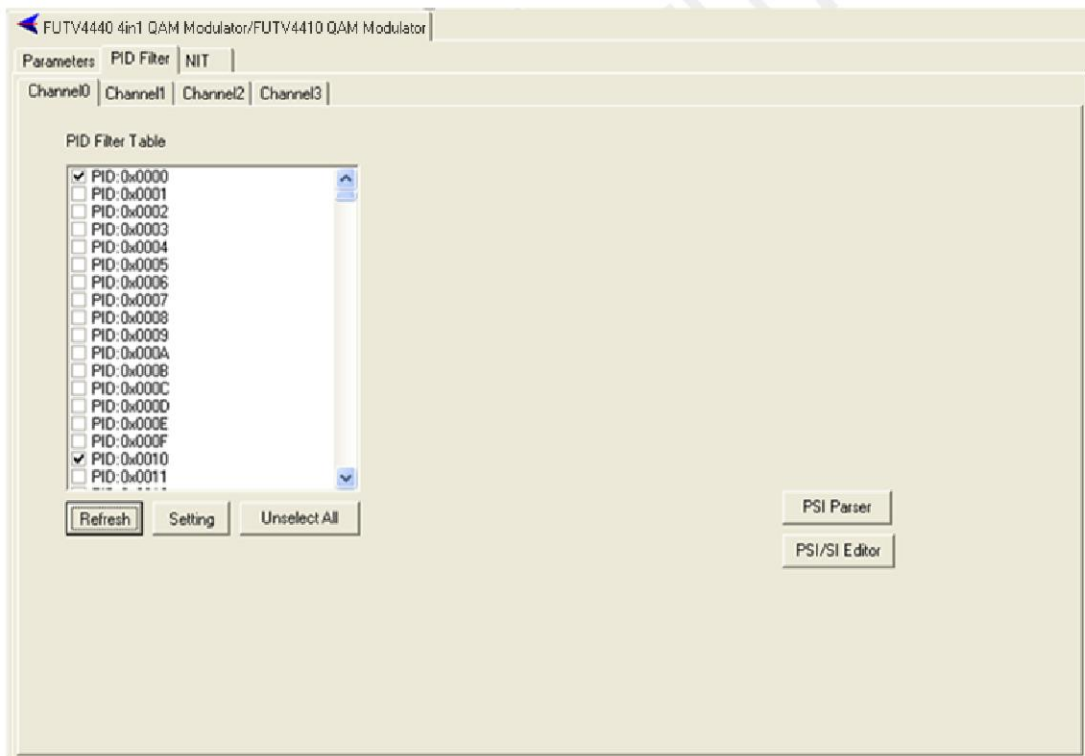
5.3.8.1 Refresh

User can refresh the data by clicking this button before confirmation

5.3.8.2 Setting

User can click this button to make the selections effective

5.3.8.3 Unselect all

User can cancel all the PID data by clicking this button

5.3.8.4 Psi Parser

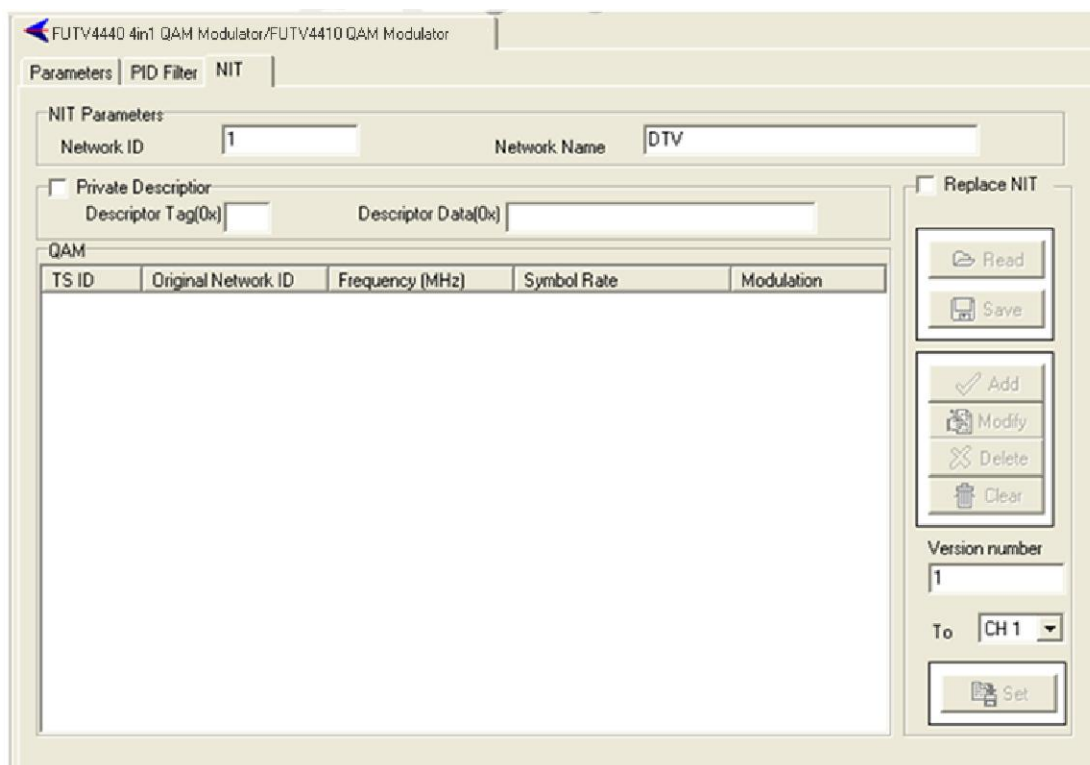User should clicking this button before editing new table

5.3.8.5 Psi Edit

Use can edit new PID data by entering the editor interface

5.3.9   NIT (refer to 4.2.3.1.3)

NIT: Network Information Table.

NIT table is a very important table for describing the network and TS.

FUTV4440 4in1 QAM Modulator has the function of editing a NIT table for the output.

5.3.9.1 NIT Parameters

User can set the network ID and network name in the field.

Network ID: the parameter describes the output TS's network ID

This is a 16-bit field which serves as a label to identify the delivery system, about which the NIT informs, from any other delivery system.

Network Name: the parameter describes the output TS's network name

Private Descriptor: this checkbox allows user to insert the private descriptor into the output TS. The private descriptor includes two parts. One is descriptor tag, and the other is descriptor information.

Descriptor tag: The descriptor tag is an 8-bit field which identifies each descriptor.

5.3.9.2 Editing NIT table

After selecting the checkbox, the NIT editing menu is active. And also the device will insert the NIT table into the output TS.
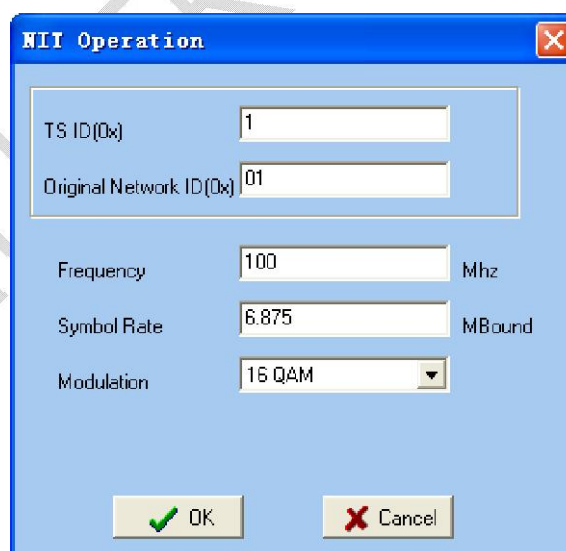
5.3.9.2.1 Read and Save

Those two buttons can trigger a window to load/save the saved NIT table file from/to a file on local computer hard disk.

What's more, user can also undo the lost or deleted NIT table by pressing READ button.

5.3.9.2.2 Add

By pressing the "Add" button, it will trigger an editing window as below. User can input the reference information in the illustration as below, and then click OK to confirm the addition.

5.3.9.2.3 Modify

The modify button will trigger a modify window and allow user to modify the selected items in the NIT table.

5.3.9.2.4 Delete

The Delete button will remove the selected items in the NIT table.

5.3.9.2.5 Clear

The Clear button will remove all the items in the NIT table.

5.3.9.2.6 Version number

5.3.9.2.7 To Ch?

User can choose to which channel the NIT table will be sent.

5.3.9.2.8 Send

Select this button to send the saved NIT table files to the modulator.

Chapter 6 Troubleshooting

FFor guarantee the products' quality, reliability and stability,all FMUSER products have been passed the testing and inspection before ship out factory. The testing and inspection scheme already covers all the Optical, Electronic and Mechanical criteria which have been published by FMUSER. To prevent potential hazard, please strictly follow the operation conditions.

Prevention Measure

l Installing the device at the place in which environment temperature between 0 to 45 °C

l Making sure good ventilation for the heat-sink on the rear panel and other heat-sink bores if necessary

l Checking the input AC voltage within the power supply working range and the connection is correct before switching on device

l Checking the RF output level varies within tolerant range if it is necessary

l Checking all signal cables have been properly connected

l Frequently switching on/off device is prohibited; the interval between every switching on/off must greater than 10 seconds.

Conditions need to unplug power cord

l Power cord or socket damaged.

l Any liquid flowed into device.

l Any stuff causes circuit short

l Device in damp environment

l Device was suffered from physical damage

l Longtime idle.

l After switching on and restoring to factory setting, device still cannot work

properly.

l Maintenance needed

Chapter 7 Packing List

l FUTV4440B 4in1 QAM modulator   1pcs

l User's manual   1pcs

l Power cord   1pcs

l ASI wire   4pcs