

# SUMAVISION

## Operating Instructions

Integrated Media Processing Platform  
Enhanced Multimedia Router



SUMAVISION TECHNOLOGIES CO., LTD.

# Introduction

## Version Description

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The product in this manual is:

Enhanced Multimedia Router—an integrated media processing platform

The version of this manual is V4.0.

This manual provides complete configuration introductions of EMR series. User can choose to read relevant parts of this manual according to the equipment purchased.

Any change or version upgrade of this manual will not notice again.

## The Agreements of the Instructions

Before reading the Instructions, please read the following agreements carefully:

### 1. Font and format

- ✓ The texts in the Instructions are prepared by using V Arial typeface;
- ✓ The first-level titles in the Instructions are prepared in bold using II Arial typeface, the second-level titles are prepared in bold using III Arial typeface, and the third-level titles are prepared in bold using IV Arial typeface;
- ✓ All the notes of the Instructions are prepared by using regular Arial, and are separated before and after the texts by using "=====";



### 2. Keyboard operation

- ✓ The Arial characters in "<>" refer to the key name or button name, for instance <Enter>, <Tab>, <Back Space> are refer to Return, Tab, Backspace respectively.
- ✓ <Key 1 + Key 2> refers to pressing the key 1 and key 2 on the keyboard at the same time, for instance <Ctrl+Alt+A> refers to pressing "Ctrl", "Alt" and "A" three keys at the same time.
- ✓ < Key 1, Key 2> refers to pressing Key 1 first on the keyboard, releasing, and then pressing Key 2, for instance <Alt, D> refers to pressing <Alt> key, after releasing the key and then pressing <D> key.


### 3. Mouse operation

- ✓ Click: Quickly press and release a mouse button.
- ✓ Double-click: Press twice quickly and release a mouse button.
- ✓ Drag: Hold down a mouse button, and move the mouse.

### 4. Signs

- ✓  Note, carefulness, warning and danger: to remind users the matters should be paid attention to in the day-to-day maintenance and operation.
- ✓  Description, prompts and tips: to necessarily add and describe the descriptions

of the operation contents.

- ✓  Help: to describe in detail the parts of the operation contents that it is not easy for users to understand.

## Target Readers

This manual introduces the functions and methods of using and maintaining the integrated media processing platform--EMR, and is applicable to the following readers:

- ✓ Digital video/audio engineering technicians
- ✓ Digital video/audio system administrators
- ✓ Digital video/audio system engineers

## Contact Us

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# Content

|                  |   |           |
|------------------|---|-----------|
| <b>CHAPTER 1</b> | <b>OVERVIEW .....</b>                                   | <b>1</b>  |
| 1.1              | NETWORK SOLUTION.....                                   | 1         |
| 1.2              | MAIN PERFORMANCE PARAMETERS .....                       | 2         |
| 1.3              | APPLICABLE STANDARDS .....                              | 5         |
| <b>CHAPTER 2</b> | <b>PRODUCT DESCRIPTIONS .....</b>                       | <b>6</b>  |
| 2.1              | PRODUCT IDENTIFICATION .....                            | 6         |
| 2.2              | APPEARANCE.....   | 6         |
| 2.2.1            | <i>Indicator</i> .....                                  | 7         |
| 2.2.2            | <i>LCD</i> .....  | 8         |
| 2.2.3            | <i>Liquid crystal key</i> .....                         | 8         |
| 2.2.4            | <i>Connector of the Device</i> .....                    | 9         |
| <b>CHAPTER 3</b> | <b>SAFETY PRECAUTIONS .....</b>                         | <b>11</b> |
| 3.1              | OUTLINE DIMENSIONS .....                                | 11        |
| 3.2              | WEIGHT .....  | 11        |
| 3.3              | ENVIRONMENTAL REQUIREMENTS.....                         | 11        |
| 3.3.1            | <i>Requirements on Transportation Environment</i> ..... | 11        |
| 3.3.2            | <i>Site room environmental requirements</i> .....       | 11        |
| 3.3.3            | <i>Heat Emission Descriptions</i> .....                 | 13        |
| 3.3.4            | <i>Power supply requirement</i> .....                   | 14        |
| <b>CHAPTER 4</b> | <b>INSTALLATION AND DEBUGGING.....</b>                  | <b>15</b> |
| 4.1              | UNPACKING AND CHECKING.....                             | 15        |
| 4.2              | INSTALLATION PRECAUTIONS .....                          | 15        |
| 4.3              | STEPS AND METHODS OF INSTALLATION.....                  | 15        |
| 4.4              | DEBUGGING.....  | 16        |
| 4.5              | METHODS FOR DEBUGGING AND TESTING .....                 | 17        |
| <b>CHAPTER 5</b> | <b>OPERATING METHODS.....</b>                           | <b>18</b> |
| 5.1              | WEB NETWORK MANAGEMENT.....                             | 18        |
| 5.1.1            | <i>Operating Method</i> .....                           | 18        |
| 5.1.2            | <i>System Setting</i> .....                             | 22        |
| 5.2              | SNMP NETWORK MANAGEMENT.....                            | 33        |
| 5.2.1            | <i>Operating Method</i> .....                           | 34        |
| 5.2.2            | <i>System configuration</i> .....                       | 36        |
| 5.3              | BOARD CARD DESCRIPTION .....                            | 38        |
| 5.3.1            | <i>Main GbE Card</i> .....                              | 39        |
| 5.3.2            | <i>5 Input ASI Card</i> .....                           | 56        |

|   |                                     |            |
|---|-------------------------------------|------------|
| 5.3.3   | 4 Output ASI Card .....             | 57         |
| 5.3.4   | ASI 5InOut Card .....               | 59         |
| 5.3.5   | DS3 adapter Card.....               | 68         |
| 5.3.6   | DS3 In4 Card.....                   | 75         |
| 5.3.7   | 6-Ch.QAM Card .....                 | 76         |
| 5.3.8   | DVB-T/H-4 Mod. Card .....           | 78         |
| 5.3.9   | DVB-S/S2 Mod. Card.....             | 84         |
| 5.3.10  | MPEG2 SD AENC Card.....             | 86         |
| 5.3.11  | MPEG2 SD DENC Card .....            | 88         |
| 5.3.12  | Analog SD ENC Card.....             | 91         |
| 5.3.13  | Digital ENC Card.....               | 93         |
| 5.3.14  | SD-ADEC Card .....                  | 94         |
| 5.3.15  | Descramble Card.....                | 98         |
| 5.3.16  | DVB-S2 Desc Card.....               | 102        |
| 5.3.17  | ABS-S Demod Card .....              | 109        |
| 5.3.18  | DVB-C Demod Card.....               | 112        |
| 5.3.19  | DVB-S2 Demod Desc Card .....        | 117        |
| 5.3.20  | 4-Ch.DVB-T2 Demod Card .....        | 127        |
| 5.3.21  | 4-Ch.DVB-S2 Demod card .....        | 130        |
| 5.3.22  | StatMux4 Card.....                  | 134        |
| 5.3.23  | CA01B Switch Card.....              | 139        |
| 5.3.24  | DS3 Switch Card .....               | 148        |
| 5.3.25  | RF Switch Card .....                | 154        |
| 5.3.26  | T2MI Replacer Card.....             | 160        |
| 5.3.27  | T2MI De-encap. Card.....            | 169        |
| <b>CHAPTER 6 INTRODUCTION FOR SENIOR FUNCTION .....</b>   |                                     | <b>183</b> |
| 6.1   | TABLE EDITING FUNCTION .....        | 183        |
| 6.1.1   | NIT table edition.....              | 183        |
| 6.1.2   | CAT table edition.....              | 199        |
| 6.1.3   | SDT table edition.....              | 209        |
| 6.2   | MASSIVE MODIFICATION FUNCTION ..... | 218        |
| 6.3   | OUTPUT SETTINGS .....               | 220        |
| 6.4   | BACKUP SETTINGS .....               | 221        |
| 6.4.1   | Service Backup .....                | 221        |
| 6.4.2   | Port Backup.....                    | 223        |
| 6.5   | SCRAMBLING SETTINGS .....           | 225        |
| 6.5.1   | Introduction to WEB Scrambling..... | 226        |
| 6.5.2   | Programme scrambling settings ..... | 229        |
| <b>CHAPTER 7 FAULT ANALYSIS AND TROUBLESHOOTING .....</b> |                                     | <b>233</b> |

|   |  |            |
|---|--|------------|
| 7.1   | ALARM INFORMATION .....                          | 233        |
| 7.1.1   | LCD does not display after powering on.....      | 234        |
| <b>CHAPTER 8</b>                                  | <b>MAINTENANCE .....</b>                         | <b>235</b> |
| 8.1   | MAINTENANCE METHOD .....                         | 235        |
| 8.2   | MAINTENANCE DETAILS .....                        | 235        |
| 8.3   | ROUTINE MAINTENANCE.....                         | 236        |
| 8.4   | MONTHLY MAINTENANCE .....                        | 237        |
| 8.5   | QUARTERLY MAINTENANCE .....                      | 237        |
| 8.6   | ANNUAL MAINTENANCE.....                          | 237        |
| 8.7   | CLEAN-UP AND MAINTENANCE .....                   | 238        |
| 8.8   | OPERATION AND MAINTENANCE .....                  | 238        |
| <b>CHAPTER 9</b>                                  | <b>STORAGE AND TRANSPORT.....</b>                | <b>239</b> |
| 9.1   | STORAGE .....                                    | 239        |
| 9.2   | TRANSPORT .....                                  | 239        |
| <b>ANNEX A-INTERFACE PARAMETER .....</b>          |  | <b>240</b> |
| <b>ANNEX B-DEVICE UPGRADE .....</b>               |  | <b>244</b> |
| <b>ANNEX C-UPGRADE OF SPECIAL BOARD CARD.....</b> |  | <b>247</b> |
| 1.  | DSP DRIVE UPGRADING METHOD FOR SD-ADEC CARD..... | 247        |
| <b>ANNEX D-WARNING INFORMATION.....</b>           |  | <b>248</b> |
| 1.  | WARNING LIST OF MAIN GBF CARD .....              | 248        |
| 2.  | WARNING LIST OF 5 INPUT ASI CARD .....           | 251        |
| 3.  | WARNING LIST OF 4 OUTPUT ASI CARD.....           | 252        |
| 4.  | WARNING LIST OF ASI 5INOUT CARD .....            | 253        |
| 5.  | WARNING LIST OF DS3 ADAPTER CARD .....           | 256        |
| 6.  | WARNING LIST OF DS3 IN4 CARD .....               | 259        |
| 7.  | WARNING LIST OF 6-CH.QAM CARD .....              | 260        |
| 8.  | WARNING LIST OF DVB-T/H-4 MOD. CARD .....        | 261        |
| 9.  | WARNING LIST OF DVB-S/S2 MOD. CARD .....         | 263        |
| 10.   | WARNING LIST OF MPEG2 SD AENC CARD .....         | 265        |
| 11.   | WARNING LIST OF MPEG2 SD DENC CARD.....          | 266        |
| 12.   | WARNING LIST OF ANALOG SD ENC CARD .....         | 267        |
| 13.   | WARNING LIST OF DIGITAL ENC CARD .....           | 268        |
| 14.   | WARNING LIST OF SD-ADEC CARD .....               | 270        |
| 15.   | WARNING LIST OF DESCRAMBLE CARD .....            | 272        |
| 16.   | WARNING LIST OF DVB-S2 DESC CARD .....           | 273        |
| 17.   | WARNING LIST OF ABS-S DEMOD CARD .....           | 274        |
| 18.   | WARNING LIST OF DVB-C DEMOD CARD .....           | 276        |

---

|     |   |     |
|-----|---|-----|
| 19. | WARNING LIST OF DVB-S2 DEMOD DESC CARD..... | 277 |
| 20. | WARNING LIST OF 4-CH.DVB-T2 DEMOD CARD..... | 278 |
| 21. | WARNING LIST OF 4-CH.DVB-S2 DEMOD CARD..... | 279 |
| 22. | WARNING LIST OF STATMUX4 CARD .....         | 280 |
| 23. | WARNING LIST OF CA01B SWITCH CARD.....      | 281 |
| 24. | WARNING LIST OF DS3 SWITCH CARD.....        | 283 |
| 25. | WARNING LIST OF RF SWITCH CARD.....         | 284 |
| 26. | WARNING LIST OF T2MI REPLACER CARD.....     | 287 |
| 27. | WARNING LIST OF T2MI DE-ENCAP. CARD .....   | 288 |
| 28. | WARNING LIST OF EMR.....                    | 290 |
| 29. | WARNING LIST OF SERVICE BACKUP.....         | 292 |
| 30. | WARNING LIST OF PORT BACKUP.....            | 294 |

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# Chapter 1 Overview

SUMAVISION Enhanced Multimedia Route, which can be abbreviated to EMR, is a new generation multi-media exchange platform. This device, which uses 1U card plug-in structure, and supports at most 6 boards (cards) as well as dual-power redundancy backup. The platform integrates multiple functions such as encoding, decoding, multiplexing, modulation, IP input/output and adaption, can be configured flexibly according to the different needs of users, and meet the vast number of operators' demands for integrated devices and multiple functions in the process of digital TV head-end platform construction sufficiently.

## 1.1 Network Solution

The typical networking of EMR is shown as Fig. 1-1 EMR Networking Diagram. EMR platform is matched with many cards to form flexible combinations. EMR platform is suitable for encoding and decoding, adaptation, and descrambling of reception and demodulation of the programming stage, and multiplexing, independent scrambling, adaptation and modulation, and signal switch of the back end. EMR may realize the full IP networking and backup of various levels and guarantee the efficient, safe and stable running of the whole system.

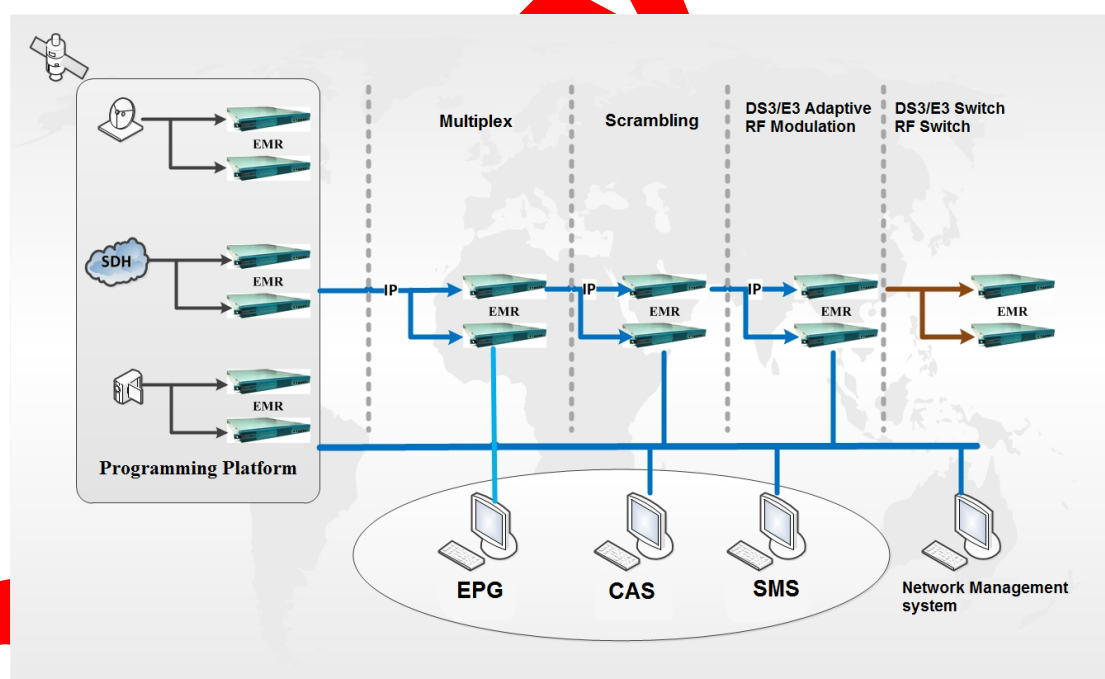


Fig. 1-1 EMR Networking Diagram

Fig. 1-1 EMR Networking Diagram, EMR receives and encodes & compresses the analog or digital TV video & audio signals; and can also receive and adapt the adaptive signals such as DS3 and ATM; additionally, it can receive and demodulate the satellite signals as TS, and transmit TS stream into the multiplex level, then multiplex with EPG information to become a standard DVB stream, which will be encrypted by the scrambler



and CAS, and modulated, finally transmitted on HFC network.

## 1.2 Main Performance Parameters

- Overall performance
  - Modularized plug-in design, 1U chassis and 6 slots;
  - Rich interface types: duplex billibit IP interface, configurable ASI I/O interface, DS3/E3 IO interface, DVB-C/S/S2/T/T2 demodulation receiving and modulation output interface, HD-SDI/SDI, CVBS and other video and audio interfaces;
  - Strong processing power and flexible re-multiplex capacity: data throughput capacity as high as 8.5Gbps;
  - Support the processing of PSI/SI under DVB standard and PSIP & ISDB under ATSC standard;
  - Support various safety backup mode: backup of program level, port level, Ethernet port level and equipment level;
  - Supports diversified user interfaces and managements: support Web control, support the emanager control based on SNMP v1/v2 and support Mib library for third party integration under SNMP v1/v2c standard;
- IP processing module
  - IP interface quantity: four GbE Internet accesses and 2+2 inputs and outputs;
  - IP interface type: SFP, support the single mode, multi-mode and electrical interface;
  - IP interface backup: input Ethernet port backup, output Ethernet port backup and output port backup;
  - IP encapsulation means: TS over RTP/UDP, TS packet length input adapts to 188/204 and output can be configured with 188/204;
  - Single Ethernet port supports 256 logical input/output ports at most; the maximum band width of single port is as high as 200Mbps;
  - Support various network management protocols as ARP, ICMP, IGMPv1/v2/v3 and etc.
  - Support the real-time code rate monitoring function of Internet access;
  - Support the forward error correction function and comply with the standards SMPTE 2022-1 and SMPTE 2022-2;

- Support the senior functions of IEEE 802.Q VLAN Tagging;
- TS Input
  - Support the automatic/manual search for PSI/SI table under DVB standard, PSIIP table under ATSC standard and ISDB;
  - Support the search for all PIDs (including the non-appointed PID);
  - Support the table preview and store function;
  - Support the inquiry for code rate, effective code rate and single PID code rate inputted into the system;
  - Adapt to 188/204;
- TS Output
  - Have the function of edition, altering and insertion for PSI/SI table;
  - Have the TDT/TOT table transmission function;
  - The maximum code rate output from the system via single port is as high as 213Mbps;
  - 188/204 configurable;
  - Have the PID value mapping function;
- Scrambling module
  - Independent scrambling module, independent control, simple and convenient web operation;
  - Scrambling for 542 ports at most;
  - Maximum 6,144 ECMs;
  - EIS supports DVB and OpenCAS standards;
  - Several ports can use the same EMM;
  - Each port supports the simulcrypt of six CASs;
- Descrambling and demodulating module
  - Have the CAM descrambling, BISS-1/E descrambling function;
  - Support the DVB-C/S/S2/T/T2 demodulation;
  - Demodulate QPSK, 16QAM, 32QAM, 128QAM, 256QAM, 16APSK and 32APSK modes;
  - Compatible to C/Ku wave band;

- Monitor signal strength, signal to noise ratio and error rate;
- T2MI de-multiplexing/encapsulation and appointed PLP\_ID de-multiplexing/de-encapsulation;
- Backup module
  - Program backup: authorize the controllable and backup modes;
  - Port backup: authorize the controllable and backup modes;
  - 1+1/2+2 GbE input backup: backup modes and arbitration conditions are available for setting;
  - 1+1/2+2 GbE output backup;
  - Senior backup for GbE UDP output port;
- EPG module
  - Editable: xml format;
  - Multiplex: automatic multiplex EIT information, filter EIT information and automatic match the TS Id/Net Id/service Id with output;
- Coding, decoding and transcoding module
  - Video: SD/HD, MPEG-2/H.264, 4:2:2/4:2:0, 10bit low latency and low bitrate;
  - Audio: MPEG-1 Layer2, AAC, Dobby 2.0/Dobby Plus 2.0, Four Audio Per Video and Audio Passthrough;
- Backboard module
  - Have the strong log recording function;
  - Have the clock synchronization SNTP function;
  - Have the complete warning management function;
  - Non-delay/low-delay design of backboard, maximum delay of 18us;
  - Support port-level transparent transmission of code stream
  - The Xml format is used for storing the parameter, which is convenient for analysis and off-line configuration and also can provide supports for compatibility of version parameters.
  - LCD display page, keypad control and LED state indication;
  - Completely independent control Internet access, scrambling Ethernet port and service Internet access;
  - The duplicate supply supports the hot plug;

- On-line and remote upgrade and convenient maintenance.

## 1.3 Applicable Standards

Table 1-1 List of standards

| Standard number         | Name of standard   |
|-------------------------|--|
| ISO/IEC 13818-2:2000    | Information technology – Generic coding of moving pictures and associated audio information: Video   |
| ETSI EN 300 421         | Digital Video Broadcasting(DVB);Framing structure, channel coding and modulation for 11/12 GHZ satellite services.(1997-08)  |
| ETSI EN 302 307         | Digital Video Broadcasting(DVB);Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, New Gathering and other broadband satellite applications(2004-06) |
| ETSI EN 300 429         | Digital Video Broadcasting (DVB);Framing Structure, Channel Coding and Modulation for Cable Systems (1997-08)  |
| ETSI EN 300 744         | Digital Video Broadcasting (DVB);Framing Structure, Channel Coding and Modulation for digital terrestrial television(2009-01)  |
| ETSI EN 302 755         | Digital Video Broadcasting (DVB);Frame structure channel coding and modulation for a second generation digital terrestrial television broadcasting system (2011-11)  |
| ETSI EN 300 468 V1.13.1 | Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems(2003-05)   |
| RFC 3376                | Internet Group Management Protocol   |
| RFC 3569                | An Overview of Source-Specific Multicast (SSM)   |
| RFC 2733                | An RTP Payload Format for Generic Forward Error Correction   |
| RFC 3550                | RTP: A Transport Protocol for Real-Time Applications   |
| SMPTE 2022-2-2007       | Unidirectional Transport of Constant Bit Rate MPEG-2 Transport Streams On IP Networks  |
| RFC826                  | An Ethernet Address Resolution Protocol or Converting Network Protocol Addresses to 48.bit Ethernet Address for Transmission on Ethernet Hardware  |
| RFC792                  | INTERNET CONTROL MESSAGE PROTOCOL DARPA INTERNET PROGRAM PROTOCOL SPECIFICATION  |

# Chapter 2 Product Descriptions

## 2.1 Product Identification

There are product name, model and manufacturer, etc. on the front panel of EMR, as shown in Fig. 2-1 EMR Front Panel.

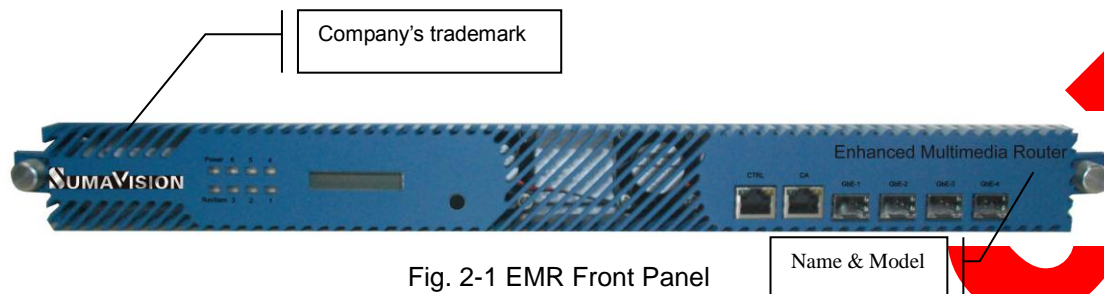


Fig. 2-1 EMR Front Panel

**Product name:** Integrated Media Processing Platform

**Model:** EMR3.0, as shown in Fig. 2-1 EMR Front Panel.

**Manufacturer:** Sumavision Technologies Co., Ltd., as shown in Fig. 2-1 EMR Front Panel.

**Identification description:** there's the ex-factory identification on the rear panel of the device, as shown in Fig. 2-2 Ex-factory Identification.



Fig. 2-2 Ex-factory Identification

Where, "S/N" refers to the ex-factory serial number, "EMR30B" stands for the device model and "0001" is the production code.

## 2.2 Appearance

EMR appearance is shown as Fig. 2-3 EMR Appearance.

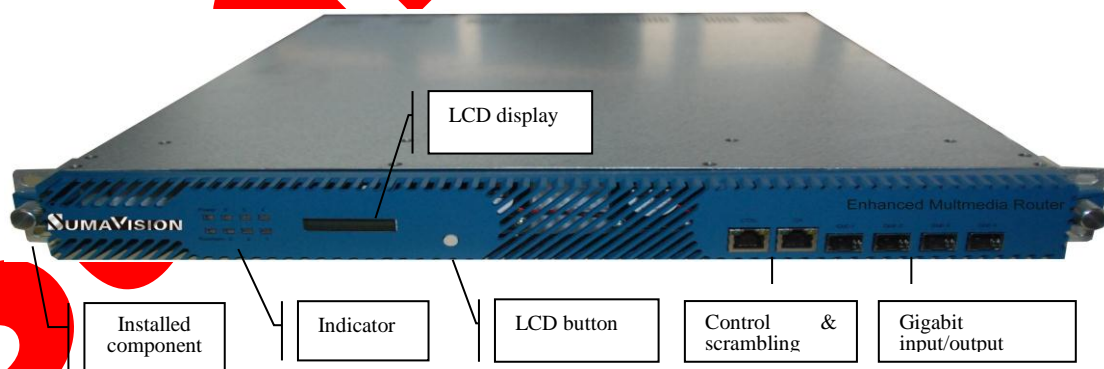


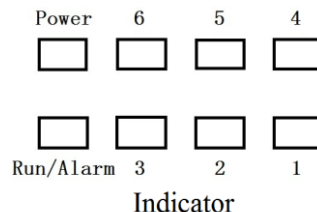
Fig. 2-3 EMR Appearance

- Press LCD button to display IP and subnet mask information of the device.

### 2.2.1 Indicator

There are 8 indicators on EMR front panel, including:

- **Power**
- **Run/Alarm**
- **Operating indicators (1-6)**



Connect to the power supply and turn on the power switch, the indicator of Power keep lighting.

When the device starts and operates normally, there is no abnormality, the indicator of Run/Alarm on the device panel will turn green.

When the device operates abnormally, the indicator of Run/Alarm on the device panel will turn red, which prompts the user that an error has occurred. When the backboard or gigabit master card encounters any abnormality, the run/alarm light will be lightened to be red. Please login the WEB network management of the device to check the alarm information to investigate the abnormality.

Operating indicators of 1 to 6 are used to indicate the operating status of slot 1 to 6 respectively, and the indicator of Alarm is used to indicate the device status.

After the device has been powered on, generally the indicator of power will keep lighting once the device is started.

Table 2-1 Description for the operating status of indicator 1 lists the operating status of indicator 1 by taking one MPEG2 analog encoding card in slot 1 as an example.

Table 2-1 Description for the operating status of indicator 1

| Operating indicator | No. | Encoder   | Signal source | Multiplexing or not | Indicator result | Slot   |
|---------------------|-----|-----------|---------------|---------------------|------------------|--------|
| Indicator 1         | 1   | Encoder 1 | Y             | Y                   | Green            | Slot 1 |
|                     |     | Encoder 2 | Y             | Y                   |                  |        |
|                     | 2   | Encoder 1 | Y             | Y                   |                  |        |
|                     |     | Encoder 2 | —             | N                   |                  |        |
|                     | 3   | Encoder 1 | —             | N                   |                  |        |
|                     |     | Encoder 2 | Y             | Y                   |                  |        |
|                     | 4   | Encoder 1 | —             | N                   |                  |        |
|                     |     | Encoder 2 | —             | N                   |                  |        |
|                     | 5   | Encoder 1 | —             | Y                   | Red              |        |
|                     |     | Encoder 2 | N             | Y                   |                  |        |
|                     | 6   | Encoder 1 | N             | Y                   |                  |        |
|                     |     | Encoder 2 | —             | Y                   |                  |        |

Indicator 1 can be divided into six kinds of status as shown in the table above, “Y” stands for normal or Yes; “N” refers to abnormal or No; “—” denotes the content has nothing to do with this item. The user may login the WEB network management of the device to check the [Alarm] page in the [General] to inquire the detailed alarm content.

The operating indicator of slot 2, 3, 4, 5 and 6 has the same status of indicator 1. Here no repeated description will be made.

Since the gigabit master card is not equipped with the independently alarm light, if lights 1-6 are all green but the Run/Alarm light is red, it is possible that the gigabit master card is abnormal, the rotational speed of the fan is abnormal or the voltage of the power module is abnormal.

## 2.2.2 LCD

EMR LCD displays the information of the device (network information, Warning information, Equipment sequence number, Connecting state of Main GbE Card Internet access, etc.).

## 2.2.3 Liquid crystal key

One key is provided nearby the EMR liquid crystal, which can be pressed for switching the displayed information. The operation method is as follows:

- Initialization of debugging state: press the key for 3s when starting the equipment. The equipment shall not load any daughter card and initialize the debugging mode;
- Recovery of default network parameter: press the key for 3s when starting the equipment to initialize the debugging mode. Release the key for 3s and press the same for 3s to initialize the default network parameter mode;
- Upgrade: press the key for more than 5s when electrifying the equipment; modify the IP address modification of the computer attached to the equipment to "192.168.1.254" and modify the subnet mask to "255.255.255.0"; and double click the "backboard upgrade document\kernel upgrade document\updata.bat" to upgrade kernel;
- Initialization of LCD backlight: if the LCD backlight is turned off during the normal operation of equipment, press the key the initialize the LCD backlight.
- Switch for displayed information on LCD: when the LCD backlight is illumed during the normal operation of equipment, the type of displayed information will be switched by keeping pressing on the key. If the key is pressed, the following display type will be circulated: warning information→network information→equipment sequence number→connection status for Main GbE Card Ethernet port→operation status of equipment

The category of information displayed on LCD is as shown in the table below:

Table 2-1 Type of information displayed on LCD

| Type of displayed information                                     | Display format                                   | Description   |
|---|--|---|
| Running state of equipment  | ALARM!/OK!                                       | Display when the LCD backlight is turned off.   |
| Warning information   | (x/y)alarm information                           | Highlight the default display category after the LCD backlight. y refers to the total warning number and x refers to the current warning sequence number. |
| network information: IP address/subnet mask                       | IP/MASK:xxx.xxx.xxx.xxx/n                        | Highlight the control interface IP address displayed on LCD and subnet mask and n refers to the prefix length.  |
| Equipment sequence number   | SN: backboard sequence number with 12 bit length | Highlight LCD display   |
| Connecting state of primary Gigabit Ethernet card Internet access | GbE:1101   | Highlight LCD display, 1 refers to connection and 0 refers to non-connection  |

- Return to the information head displayed currently: after highlighting the LCD backlight during the normal operation of equipment, keep pressing the key to switch to the new display information, release the key, and press the key again to display the information from the head to bottom again.
- Return to operation status display of equipment: operate without the key for 10s to return to display the operation status of equipment;
- LCD backlight extinguish: operate without the key for 30s to extinguish the LCD backlight.

## 2.2.4 Connector of the Device

SUMAVISION EMR rear panel adopts the form of sub-panels. 6 slots formed with 6 sub-panels can be handled independently, which can facilitate the plugging and un-plugging of sub-cards. Ground terminal, power switch are placed on the rear panel, see Fig. 2-4 Appearance of SUMAVISION EMR Rear Panel.

Definition of slot: lower left Slot 1; lower center Slot 2; lower right Slot 3; upper left Slot 4; upper center Slot 5; upper right Slot 6.

EMR card is flexible in settings and not limited in the slot (the port of some cards occupies two slots).



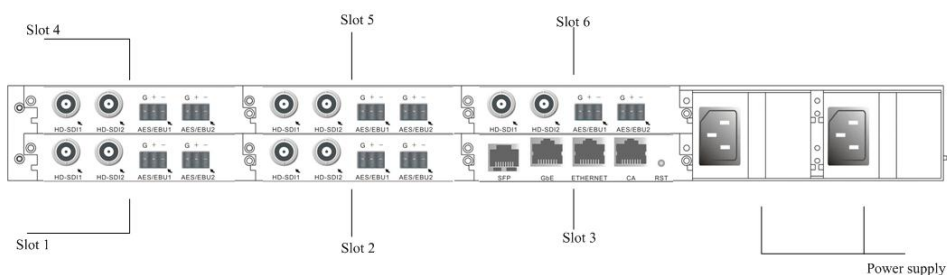


Fig. 2-4 Appearance of SUMAVISION EMR Rear Panel

- ☞ User can select to read relevant part of the Instructions according to the Platform settings purchased.
- ☞ The board card does not support the hot plugging.

### 2.2.4.1 Power socket

EMR provides two power sockets on the rear panel. The device will be powered on if the power lead is insert the power socket correctly.

The power sockets used by EMR fully conform to the international industrial standards, for detailed information, refer to Annex 3 Power Socket Parameters.

## Chapter 3 Safety Precautions

### 3.1 Outline Dimensions

EMR external structure is shown as Table 3-1 EMR Physical Parameters.

Table 3-1 EMR Physical Parameters

| Physical Parameters | Value (Unit)  |
|---------------------|---------------|
| Height              | 44.4mm (1U)   |
| Width               | 482.6mm (19") |
| Depth               | 564.7mm       |

### 3.2 Weight

The device weights <7.5kg, and its specific quality is related to the configurations of the device. Please be subject to the device actually purchased.

### 3.3 Environmental Requirements

#### 3.3.1 Requirements on Transportation Environment

The device must be handled prudently and carefully to avoid damages to the device. Ensure that people who transport, maintain or operate the device have professional skills and are familiar with the operation of device. If there's any question during the transport, maintenance and operation of the device, please contact the Aftersales Technical Support Department of Sumavision, with the way to contact referring to the foregoing contents.

The device is high-grade electronic product, and should be handled gently and kept away from falling or collision. And additionally, attention should be paid to the following:

- ✓ Please do not place this device on unstable trolleys, shelves, brackets or tables, otherwise, the device may fall and cause serious damages, which can lead to abnormal operation.
- ✓ During transportation, the trolley used to transport the device should be kept balance. When user has arrived at the designated location or have to stop on the way, ensure whether the trolley is reliable first, and then stop moving to avoid the falling of device, causing malfunction.
- ✓ Please arrange special person to transport or install this device, and avoid many persons participating in the transportation.

#### 3.3.2 Site room environmental requirements

- ✓ Site room area:

The front door and back door of the cabinet should leave at least 1.2m to 1.5m for opening the door or routine maintenance. The cabinet can not be installed against the wall,

and the distance between the cabinet side and the wall should be not less than 0.8m.

✓ Site room floor:

Site room floor should be non-conductive, dust-proof, and its surface smoothness error should be less than 2mm per square meter. The volume resistivity of anti-static material should range from  $1 \times 10^7 \Omega$  to  $1 \times 10^{20} \Omega$ , and the ground current-limiting resistor is  $1M\Omega$ . Floor load-bearing should be larger than  $450kg/m^2$ .

✓ Environment temperature:

The device can operate normally in the environment whose temperature ranges from  $10^\circ C$  to  $40^\circ C$ , and the places where conditions permit can install air-conditioning system for cooling.

✓ Relative humidity:

Normal working humidity:  $\leq 90\%$  ( $20^\circ C$ );

Allowed working humidity:  $\leq 95\%$  (without condensation).

✓ Environmental pressure:

86-105kpa.

✓ Site room doors and windows:

Doors and windows of the site room should be sealed with dust-proof rubber strips, and windows should be double-glazed and strictly sealed.

✓ Site room wall surface:

The wall surface of site room can use wallpapers or be printed with lusterless paint, however, powder coating is not suitable.

✓ Air cleanliness:

The requirements are shown as Table 3-2 Site room dust indicators and Table 3-3 Site room harmful gas indicators.

Table 3-2 Site room dust indicators

| Maximum diameter ( $\mu m$ )                      | 0.05             | 1.00            | 3.00             | 5.00             |
|---|------------------|-----------------|------------------|------------------|
| Maximum concentration (particles per cubic meter) | $14 \times 10^5$ | $7 \times 10^5$ | $24 \times 10^4$ | $13 \times 10^4$ |

Table 3-3 Site room harmful gas indicators

| Gas                                | Average (mg/m <sup>3</sup> ) | Max. (mg/m <sup>3</sup> ) |
|------------------------------------|------------------------------|---------------------------|
| Sulfur dioxide SO <sub>2</sub>     | 0.20                         | 1.50                      |
| Hydrogen sulfide, H <sub>2</sub> S | 0.01                         | 0.30                      |
| Nitrogen dioxide, NO <sub>2</sub>  | 0.04                         | 0.15                      |
| Ammonia, NH <sub>3</sub>           | 0.05                         | 0.15                      |
| Chlorine, Cl <sub>2</sub>          | 0.01                         | 0.30                      |

✓ Fire-fighting requirements:

Site room should be equipped with automatic fire alarm system, hand-held extinguishing system or fixed extinguishing system.

✓ Power supply requirements:

The devices, air-conditioning system and lighting system should have their own power system respectively.

### 3.3.3 Heat Emission Descriptions

There are two exhaust fans installed inside the EMR to lower the risen temperature caused by the working chips during the operation of the device.

EMR exhaust flow is shown as Fig. 3-1 Exhaust Diagram.

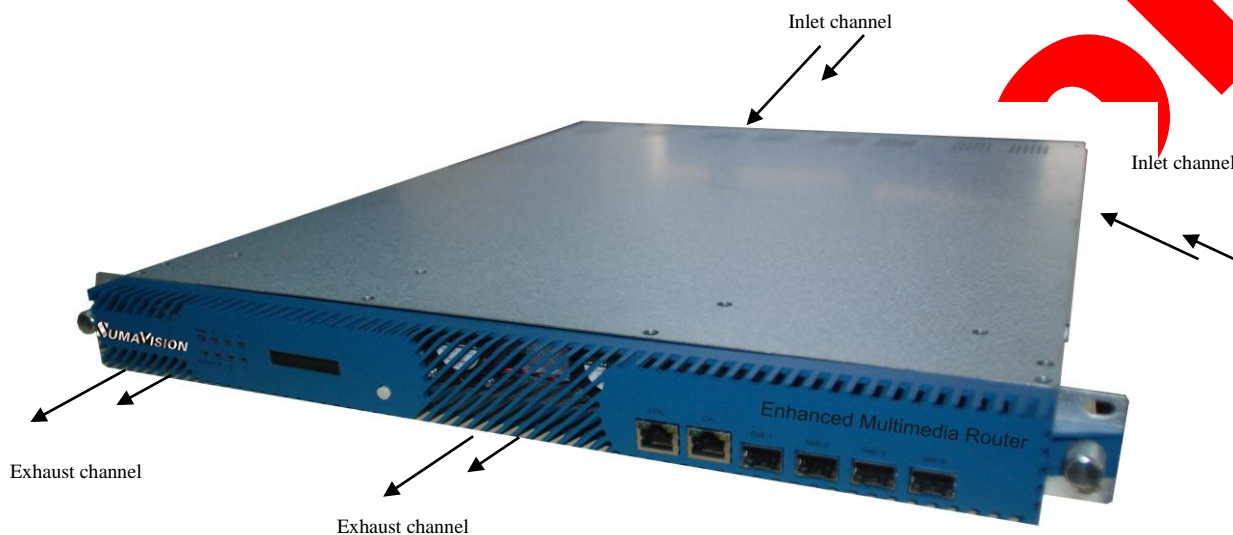


Fig. 3-1 Exhaust Diagram

Do not block the exhaust channel when installing the device.

### 3.3.4 Power supply requirement

Parameters for normal operation of EMR are shown as follows:

- ✓ Power supply:
  - Voltage: 100V-240V AC;
  - Power frequency: 50Hz-60Hz
- ✓ Power consumption: < 200W (Actual power associated with the device configuration)
- ✓ Nominal fuse: 2A
- ✓ Grounding: the device should be well grounded through the ground terminal.

=====

- ☞ The DC power supply can be used as the power source. The input voltage is 36-72V DC.

- ☞ The power supply supports the dual power redundancy configuration.

=====

## Chapter 4 Installation and Debugging

### 4.1 Unpacking and Checking

Please check whether the package of the device is damaged or not when receiving the device; in case of device's damage, please contact the carrier company or the After-sales Technical Support Department of Sumavision in a timely manner.

If you complete the installation and debugging of the device by yourself, please pay attention to the deformation of device and abnormal sound inside the device when unpacking the device; check whether the device model and name are in conformity with those specified in the contract; whether the serial number of device is identical to that in the *Delivery and Maintenance Certificate of Device*; and whether the power lead, connectors and fittings, operating instructions and Certificate of Fitness are completely contained in the package case of the device.

If the installation and debugging are conducted by the after-sales technical engineers of Sumavision, they will confirm the above-mentioned information with you.

You are required to sign and return the *Delivery and Maintenance Certificate of Device* to our company after confirming there's no problem upon the unpacking and inspection, and according to which we'll provide high-quality satisfactory after-sales services.

### 4.2 Installation Precautions

Check whether the environmental requirements in Section 3.3 of Chapter 3 have been met.

The device can be powered on for debugging after the installation is completed by following the installation steps.

### 4.3 Steps and Methods of Installation

EMR installed in 19-inch cabinets. On equipment installation, first open the box, take out the device. In order to make installation safe, make sure you install L brackets on the Cabinet first, and place the device installed on the L bracket, finally screw in the mounting parts will be seated in the Assembly of this equipment cabinets.as shown in Fig. 4-1 Assembly cabinet for EMR.

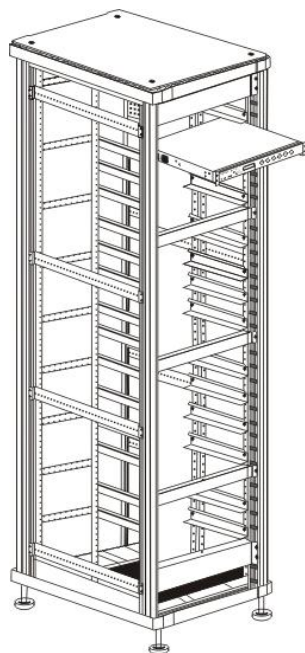


Fig. 4-1 Assembly cabinet for EMR

=====

☞ The device can be installed in any plug-in frame of the assembly cabinet. However, the general principle for arranging the location of the device is that the connection between various stand-alone devices should be arranged neatly on the assembly cabinet in accordance with the flow of signal.

=====

#### 4.4 Debugging

Preparations before configuration:

- The device should be stably fixed on the cabinet, and the operation environment is normal.
- The device should be connected to the ground very well.
- Check whether input video and audio signals are correct on the encoder side.
- The device has been connected to the power supply correctly.
- If network management is needed to control devices, please connect the device with the computer.

Device power-on inspection:

- Indicators of the device display normal.
- Standby interface is displayed on the LCD of the device.
- Device keys can respond normally.
- The fans of the device can operate normally without harsh noise.
- No abnormal sounds and offensive smell.

## 4.5 Methods for Debugging and Testing

EMR provides the function of Device IP address search through LCD display. The button can be used to light the LCD normally to facilitate the use by users.

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## Chapter 5 Operating Methods

This chapter mainly introduces the methods for system setting and use of EMR, which may be helpful for users to know initial knowledge about the system setting and operation steps of EMR. The system setting includes device IP, user management, factory reset and restart; and the operating method is composed of input setting, multiplexing setting and output interface operation.

### 5.1 Web Network Management

When setting the EMR the first time, searching IP address may be required, which can be realized through LCD on the front panel of the EMR by pressing the buttons, at this time, the LCD would display local device IP and subnet mask. Configure the computer IP to enable it to access the device IP. Enter the IP address of EMR in the IE browser: `http://IP_address/`, with the initial username as Admin and password as `sumavisionrd`. The network management page is shown as Fig. 5-1 EMR WEB Network Management Page.

ⓘ The browser must support HTML 4.0. Internet Explorer 8.0, Firefox and Chrome is recommended.



Fig. 5-1 EMR WEB Network Management Page

#### 5.1.1 Operating Method

EMR is the core head-end access device of digital TV. By configuring different board cards, users can finish encoding, decoding, QPSK demodulation, DVB-S2 demodulation and descrambling, QAM demodulation and descrambling, DS3 adaptive input/output,

QAM modulation output, ASI multiplexing and routing, IP multiplexing and routing, TS and IP signal scrambling, etc. To complete the configuration of device successfully, we'll describe basic operating processes of EMR through three parts: input section, multiplexing section and output interface section.

EMR functions can be divided into three parts:

- Part one is about the input section. In consideration that each board card can achieve different input functions, EMR input daughter card can be understood as a separate device. For example, the encoding card is equivalent to an encoder, QPSK card is equivalent to a satellite receiver, DS3 adapter card is equivalent to the adapter, and the five ASI input card functions like the multiplexer.
- Part two is about the Multiplexing section which would be realized in multiplexing page. The relationship between the input and output can be configured to achieve the service exchange between the input interface and output interface.
- Part three is about the output interface, which output configuration should be finished on the right side of the Multiplexing page.

To complete the configuration of EMR, the above-mentioned three functional modules should be configured step by step. At first, it shall configure relevant parameters of the board card such that the input board card can receive the input stream; then the multiplex interface shall be logged in; and operate according to the operation steps 5.1.1.2 Multiplexing Setting to realize the output of the program multiplexing output board card port.

#### 5.1.1.1 Input Part

Configured with different cards, EMR platform may receive different types of program sources. Details are:

- ASI input: EMR is configured with 5 Input ASI Card (see 5 Input ASI Card for configuration method) or ASI 5InOut Card (see ASI 5InOut Card for configuration method) to support ASI input;
- DS3/E3 input: EMR is configured with DS3 In4 Card (see DS3 In4 Card for configuration method) or DS3 adapter (see DS3 adapter for configuration method) to support DS3/E3 stream input;
- IP input: the Main GbE Card (see Main GbE Card for configuration method) equipped on the platform may provide IP input to the platform;
- RF input: EMR is configured with DVB-S2 Desc Card (see DVB-S2 Desc Card for configuration method) ,ABS-S Demod Card (see ABS-S Demod Card for configuration method) ,DVB-C Demod Card (see DVB-C Demod Card for configuration method) ,DVB-S2 Demod Desc Card (see DVB-S2 Demod Desc Card for configuration method) ,4-Ch.DVB-T2 Demod Card (see 4-Ch.DVB-T2 Demod Card for configuration method) or 4-Ch.DVB-S2 Demod card (see

- 4-Ch.DVB-S2 Demod card for configuration method) to support RF input;
- Analog video and audio input: EMR is configured with the MPEG2 SD AENC Card (see MPEG2 SD AENC Card for configuration method) or Analog SD ENC Card (see Analog SD ENC Card for configuration method) to support input and encoding of analog video and audio;
- Digital video and audio input: EMR is configured with the MPEG2 SD DENC Card (see MPEG2 SD DENC Card for configuration method) or Digital ENC Card (see Digital ENC Card for configuration method) to support encoding of digital video and audio.

### 5.1.1.2 Multiplexing Setting

The multiplexing page is shown as Fig. 5-2 Multiplexing Page of WEB Network Management. The selected board card on the left is used as input source, which is multiplexed to the output board card on the right by pressing the Multiplex button.

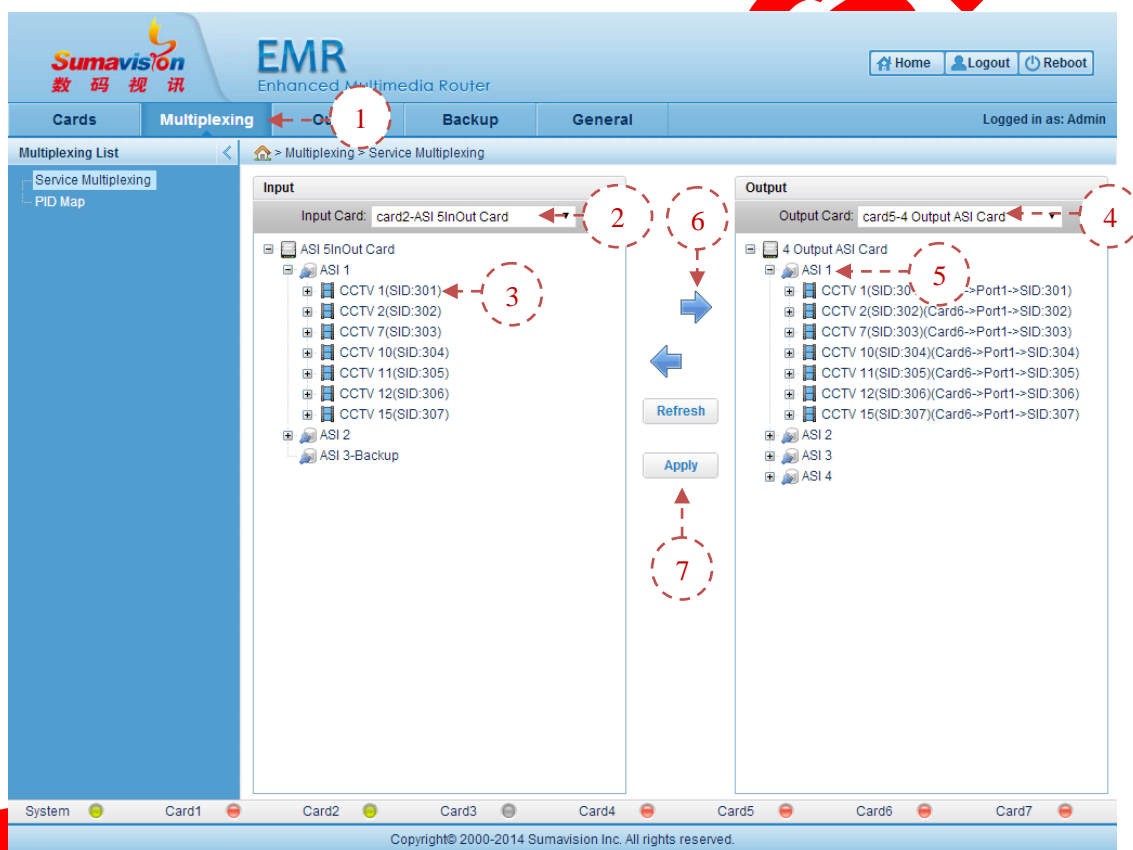


Fig. 5-2 Multiplexing Page of WEB Network Management

**Step 1:** Click “Multiplexing” in the network management page to navigate to the program multiplexing page;

**Step 2:** Choose the input card and wait for the Web network manager to automatically refresh the input list, or click the right button to navigate to the input port to manually refresh the input list;

**Step 3:** Select a program to be multiplexed;

- Step 4:** Select an output board card for multiplexing;
- Step 5:** Click a destination output port for multiplexing;
- Step 6:** Click Multiplex button;
- Step 7:** Click “Apply” to validate the Multiplexing relation.

- =====
- ④ EMR device supports automatic searching. The user may manually refresh the input list by clicking the right button on the input port or card to choose the corresponding menu;
  - ④ Click the mouse to choose the import port and click “Multiplexing” to make it complex for the input port of all programme.
  - ④ The input program existed in the output port, EMM, PID and non-appointed PID cannot be re-multiplexed to this port.
  - ④ If the output port or the input program, EMM or PID has been provided with the transparent transmission setting, it is unable to conduct the multiplex operation.
  - ④ When the output port limitation is exceeded, it may cause the failed multiplex operation. The maximum supporting number for program multiplex is 128. The maximum supporting number for EMM multiplex is 32. The maximum supporting number for PID multiplex is 32.
  - ④ If the input program, EMM, PID or non-appointed PID is used as the port backup, the multiplex operation cannot be realized.
  - ④ When the input program or the program containing the input PID is used as the program backup, it is unable to realize the multiplex operation.
  - ④ If the inputted PID is the video PID and the video PID already exists when outputting the program, it is unable to realize the multiplex operation.
  - ④ If the input program is encrypted and EMM is provided below the input port and is not provided below the output port, the EMM information below the input port can be automatically multiplexed to the output port when multiplexing the input program.
  - ④ The EMM multiplex is decided according to the value of CASID and CAPID. If the CASID and CAPID values of two EMMs under the same input port are the same, the multiplex of any EMM will cause the automatic multiplex of the other one.
  - ④ The port multiplex is only a shortcut operation on the page. In fact, it is equivalent to that the user has repeated to click the program multiplex and the non-appointed PID multiplex.
  - ④ The port multiplex does not introduce the EMM multiplex to the output port. But if the encrypted program is available in the program of the input port, EMM may be multiplexed to the output port with the input program.
  - ④ When PSI/SI table shows that it is opened, the PID of PSI/SI will be displayed below the input port. But the port multiplex shall not multiplex the PID below the

PSI/SI node to the output port.

☐ The port multiplex deletion is only a shortcut operation on the page. In fact, it is equivalent to that the user has repeated to delete the program multiplex and the EMM multiplex.

☐ The port multiplex deletion does not cause the deletion for non-appointed PID below the output port. The non-appointed PID can only be deleted independently or deleted by choosing the “Non-appointed PID”.

---

### 5.1.1.3 Output Interface

Configured with different cards, EMR platform may output diversified program streams. Details are:

- ASI output: EMR is configured with 4 Output ASI Card (see 4 Output ASI Card for configuration method), ASI 5InOut Card (see ASI 5InOut Card for configuration method) or StatMux4 Card (see StatMux4 Card for configuration method) to support ASI output;
- DS3/E3 output: EMR is configured with DS3 adapter Card (see DS3 adapter Card for configuration method) to support DS3/E3 stream output;
- IP output: the Main GbE Card (see Main GbE Card for configuration method) equipped on the platform may provide IP output;
- RF output: EMR is configured with 6-Ch.QAM Card (see 6-Ch.QAM Card for configuration method), DVB-S/S2 Mod. Card (see DVB-S/S2 Mod. Card for configuration method) or DVB-T/H-4 Mod. Card (see DVB-T/H-4 Mod. Card for configuration method) to support RF input;
- Decoded video and audio output: EMR is configured with SD-ADEC Card (see SD-ADEC Card for configuration method) to support the decoded video and audio output.

### 5.1.2 System Setting

The “General” menu includes 11 menus as follow: Network, Clock, TDT/TOT, PSI/SI, Alarm, Log, License, Version, Misc, Permission, and Configuration.

- Network: set IP address, gateway address, subnet mask and other network functions. Click “Apply” to complete the setting, as shown in Fig. 5-3 WEB Management Network Configuration.

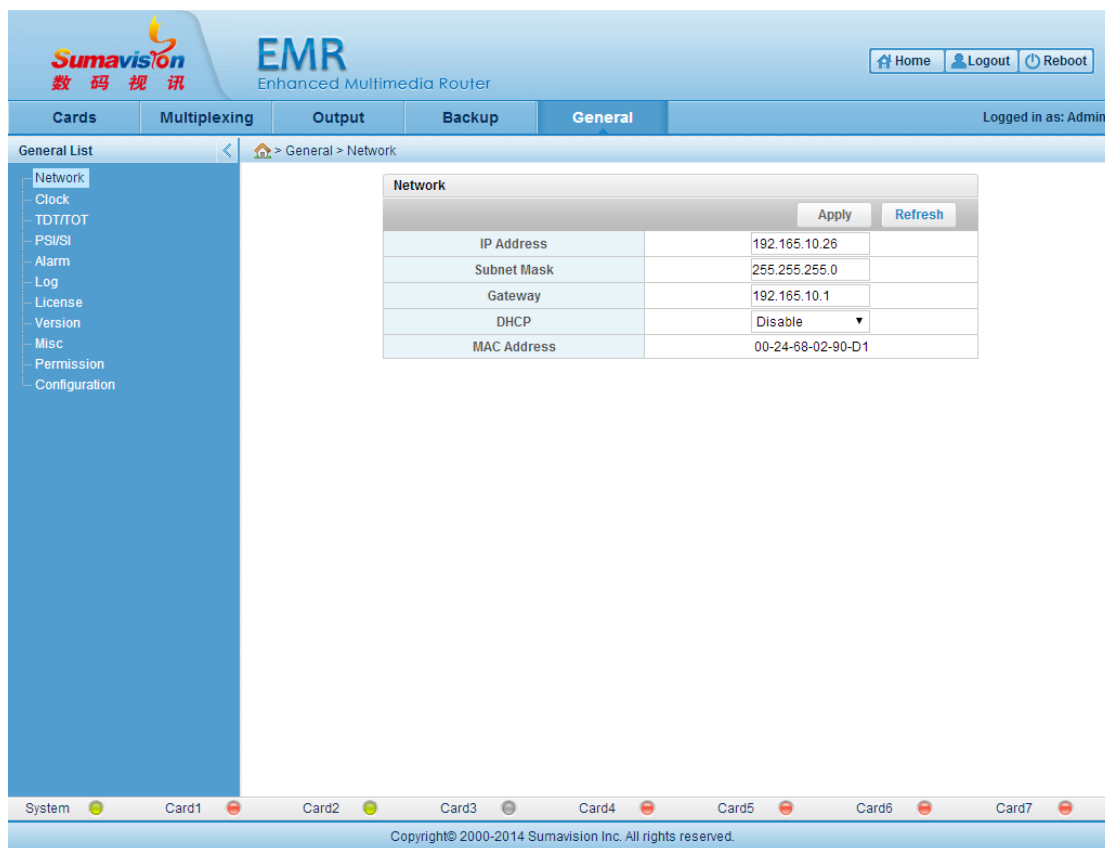


Fig. 5-3 WEB Management Network Configuration

Table 5-1 Network Parameter

| Parameter   | Range                                       | Default       |
|-------------|---|---------------|
| IP Address  | Unicast IP not including 127.XXX.XXX.XXX    | 192.168.1.100 |
| Subnet Mask | In accordance with the subnet mask standard | 255.255.255   |
| Gateway     | In the same network with IP Address         | 192.168.1.1   |
| DHCP        | Disable/Enable                              | Disable       |

- Clock: set the system time of the device or the time synchronization server to enable the device to automatically synchronize the system time by the synchronization interval. Click “Apply” to complete the setting, as shown in Fig. 5-4 WEB Management Clock Configuration;



Fig. 5-4 WEB Management Clock Configuration

Table 5-2 Clock Parameter

| Parameter                     | Range                       | Default       |
|-------------------------------|-----------------------------|---------------|
| SNTP Synchronization          | Disable/Enable              | Disable       |
| Main SNTP Server              | Valid IP address            | 192.165.52.21 |
| Backup SNTP Server            | Valid IP address            | 192.165.52.36 |
| Time Zone(Offset from UTC)    | [UTC – 12:00]~[UTC + 12:00] | [UTC + 8:00]  |
| Synchronization Interval(min) | 1~65535                     | 2             |
| Synchronization Timeout(s)    | 1~65                        | 1             |

- TDT/TOT: set the TDT/TOT form information of output of the gigabit master card. Click “Apply” to complete the setting, as shown in Fig. 5-5 WEB Management TDT/TOT Configuration;



Fig. 5-5 WEB Management TDT/TOT Configuration

Table 5-3 TDT/TOT Parameter

| Parameter                  | Range                                 | Default          |
|----------------------------|---------------------------------------|------------------|
| TDT                        | Off/On                                | Off              |
| TDT Interval(s)            | 0~30                                  | 10               |
| TDT                        | Off/On                                | Off              |
| TDT Interval(s)            | 0~30                                  | 10               |
| Country Code               | 3 capital English letters             | POL              |
| Country Region ID          | No Time Zone Expansion ~ Time Zone 60 | Time Zone 2      |
| Local Time Offset Polarity | 0/1                                   | 0                |
| Local Time Offset          | 0:0~13:59                             | 0:0              |
| Time of Change             | 1900/3/1-0:0:0~2100/2/28-23:59:59     | 2012/10/28-1:0:0 |
| Next Time Offset           | 0:0~13:59                             | 0:0              |



- PSI/SI: this page is used for setting the EMR searching mode and the searching distance between tables. Click “Apply” to complete the setting, as shown in Fig. 5-6 WEB Management PSI/SI Configuration.

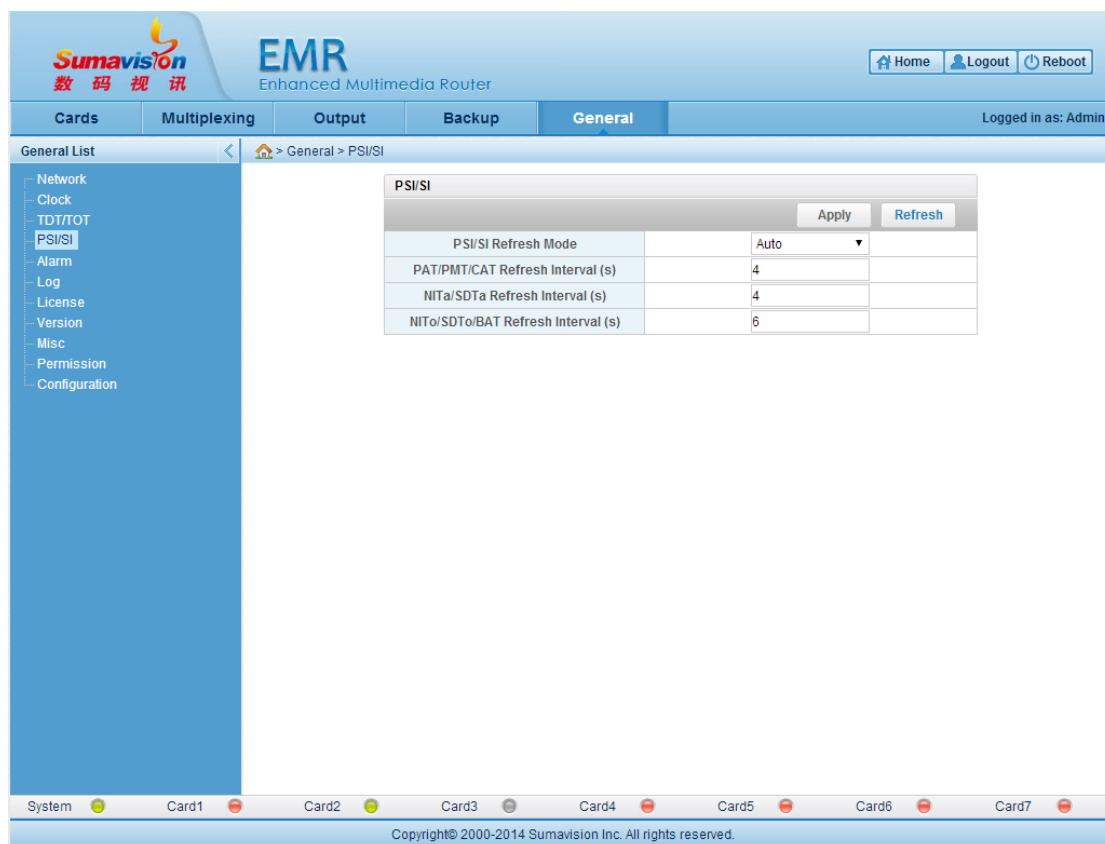


Fig. 5-6 WEB Management PSI/SI Configuration

Table 5-4 PSI/SI Parameter

| Parameter                         | Range       | Default |
|-----------------------------------|-------------|---------|
| PSI/SI Refresh Mode               | Auto/Manual | Manual  |
| PAT/PMT/CAT Refresh Interval(s)   | 0~50        | 4       |
| NITa/SDTa Refresh Interval(s)     | 0~50        | 4       |
| NITo/SDTo/BAT Refresh Interval(s) | 0~50        | 6       |

- Alarm: this page is used for inquiring EMR and warning information of each daughter card. It can set the warning IP, warning interval, language and the backup module warning switch. Click “Apply” to complete the setting, as shown in Fig. 5-7 WEB Management Alarm Configuration.

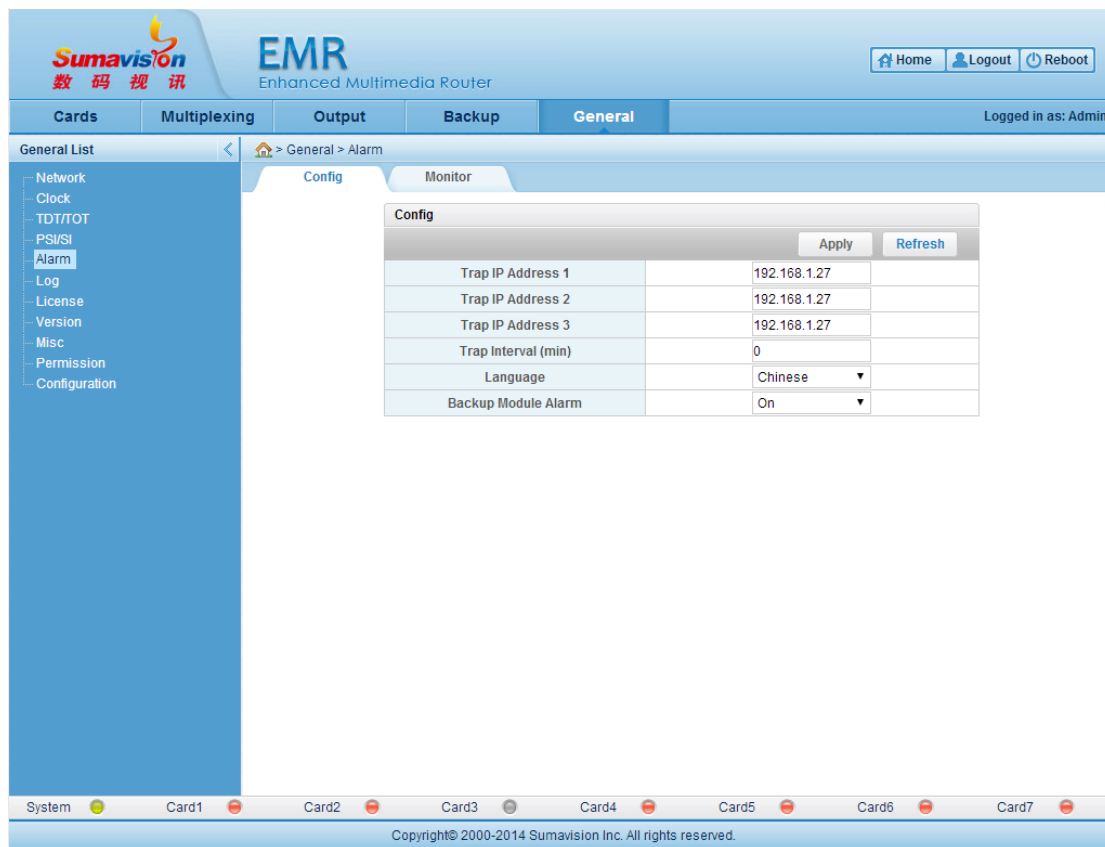


Fig. 5-7 WEB Management Alarm Configuration

Table 5-5 Alarm Parameter

| Parameter           | Range                                    | Default      |
|---------------------|--|--------------|
| Trap IP Address 1   | Unicast IP not including 127.XXX.XXX.XXX | 192.168.1.27 |
| Trap IP Address 2   | Unicast IP not including 127.XXX.XXX.XXX | 192.168.1.27 |
| Trap IP Address 3   | Unicast IP not including 127.XXX.XXX.XXX | 192.168.1.27 |
| Trap Interval (min) | 0~65535                                  | 0            |
| Language            | Chinese/English                          | English      |
| Backup Module Alarm | Off/On                                   | On           |

- Log: this page is used for inquiring EMR and warning information of each daughter card. It can sieve and display the log according to the condition. Click “Refresh” to inquire, as shown in Fig. 5-8 WEB Management Log page.

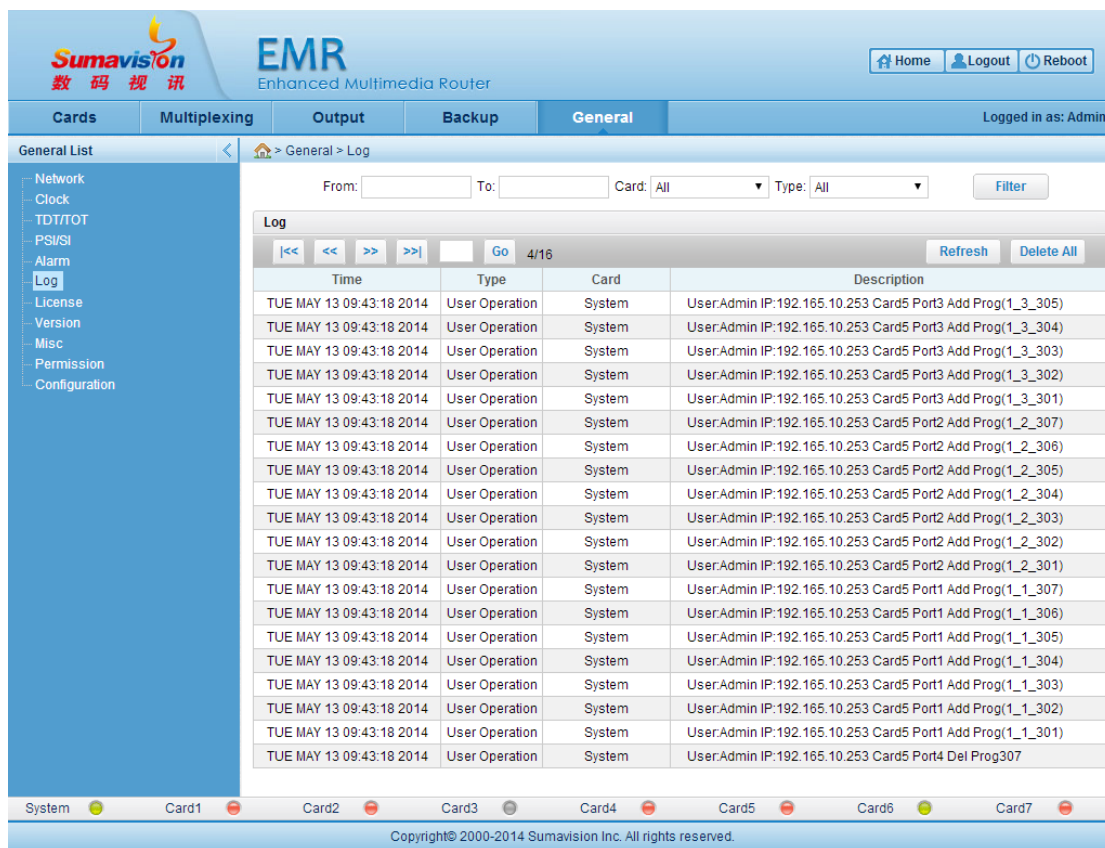


Fig. 5-8 WEB Management Log page

- License: this page is used for inquiring the EMR authorization status and setting the authorization code to change license status, Click “Apply” to complete the setting, as shown in Fig. 5-9 WEB Management License Configuration.



Fig. 5-9 WEB Management License Configuration

Table 5-6 License Parameter

| Parameter | Range  | Default           |
|-----------|--|-------------------|
| License 1 | Main GbE card mode: 1+1/2+2                          | 1+1               |
| License 2 | Backup: support/no support                           | no support        |
| License 3 | Old license mode: support/no support                 | no support        |
| License 4 | Number of main GbE card ports: 4~256<br>input/output | 4<br>input/output |
| License 5 | FEC of main GbE card: support/no support             | no support        |

- Version: click “Version” in “General” List to navigate to the page to inquire the version information of EMR and various daughter cards. Click “Refresh” to inquire, as shown in Fig. 5-10 WEB Management Version Information.



Fig. 5-10 WEB Management Version Information

- Misc: this page is used for setting the equipment name, the accounting period of code rate, the equipment mode and other system parameter. Click “Apply” to complete the setting, as shown in Fig. 5-11 WEB Management Misc Configuration.



Fig. 5-11 WEB Management Misc Configuration

Table 5-7 Misc Parameter

| Parameter                    | Range                  | Default     |
|------------------------------|------------------------|-------------|
| Device Name                  | 0~31 character long    | EMR3.0      |
| Service ID Format            | Decimal/Hexadecimal    | Hexadecimal |
| PID Format                   | Decimal/Hexadecimal    | Hexadecimal |
| Input PSI/SI Display         | Off/On                 | Off         |
| Output PSI/SI Version Number | Not Change/Auto Change | Not Change  |
| Bitrate Statistics Cycle     | 1s/0.5s/0.25s          | 1s          |
| Device Name                  | 0~31 character long    | EMR3.0      |
| Service ID Format            | Decimal/Hexadecimal    | Hexadecimal |
| PID Format                   | Decimal/Hexadecimal    | Hexadecimal |

- Permission: add or delete three kinds of users, including “Administrator”, “Power user” and “User”, as shown in Fig. 5-12 WEB Management Permission Configuration.

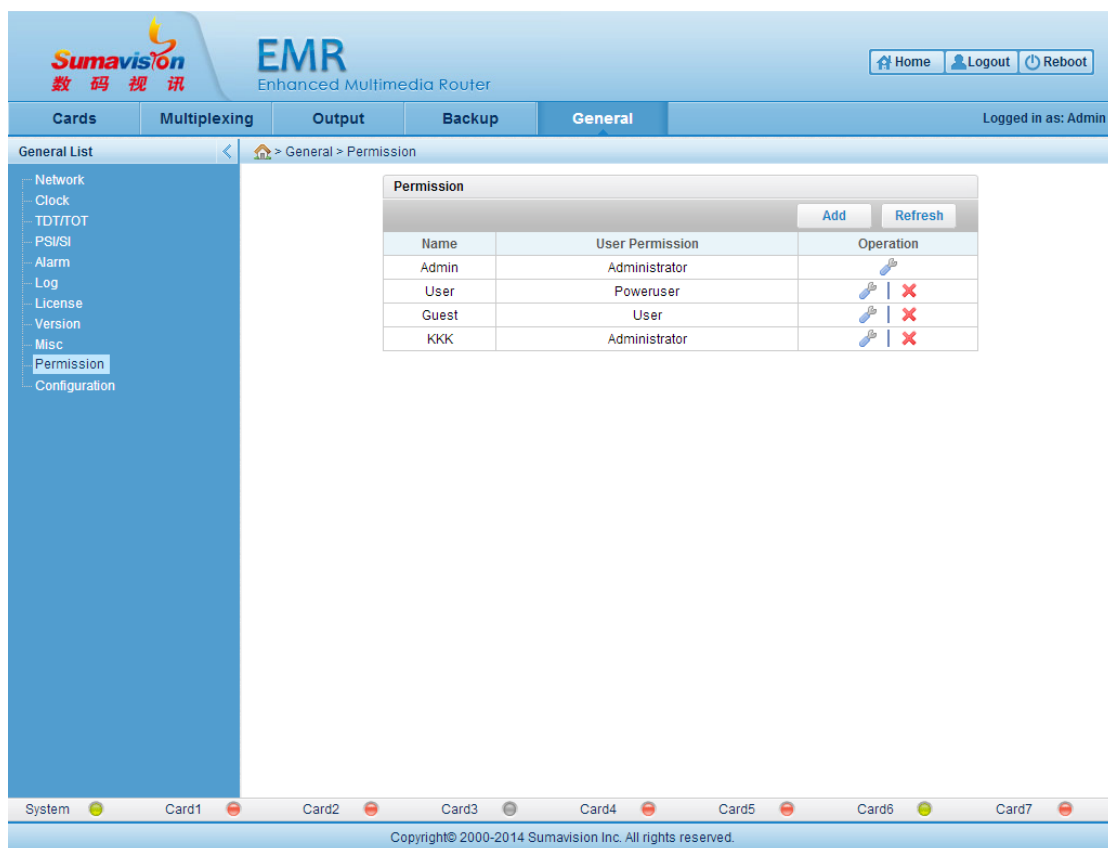


Fig. 5-12 WEB Management Permission Configuration

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- Configuration: this page is used for inputting and outputting equipment parameter and recovering the parameter to the default value, as shown in Fig. 5-13 WEB Management Parameter Configuration

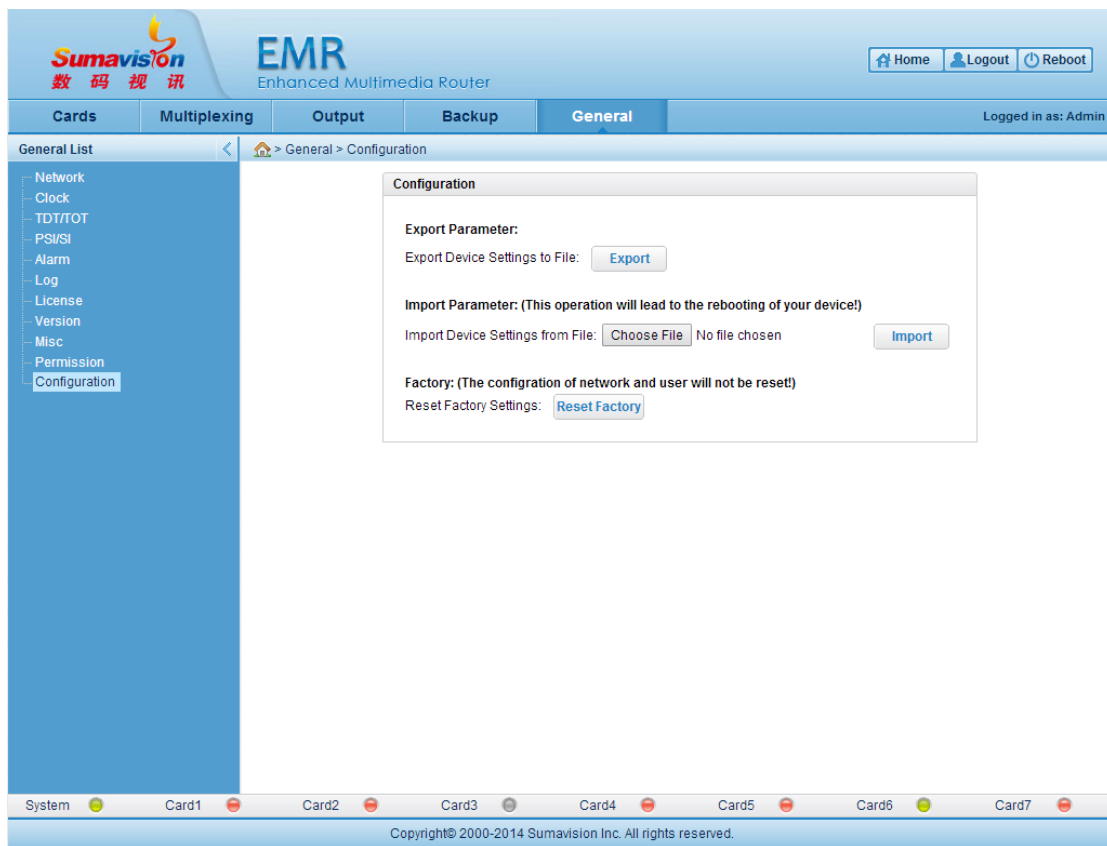


Fig. 5-13 WEB Management Parameter Configuration

## 5.2 SNMP Network Management

The EMR background software is embedded into the network management software eManager of Beijing Sumavision Technologies Co. Ltd., which uses the same SNMP communication protocol with the network management software. As a result, the user can manage the EMR when installing the network management software. When the SNMP network management is correctly installed, the SNMP network management can be started via the following operation.

=====

Once the simple network protocol and SNMP protocol are installed on the network management server and the computer with the SNMP software, the network management can be used and the warning and other equipment status messages can be obtained.

=====

**Step 1:** after starting the network management service end, right click the icon  on



the taskbar and choose <System Setting>. As shown in Fig. 5-14 Message for Setting Database of Network management Server, choose the database type, input database user and password and click the <Setting> button.

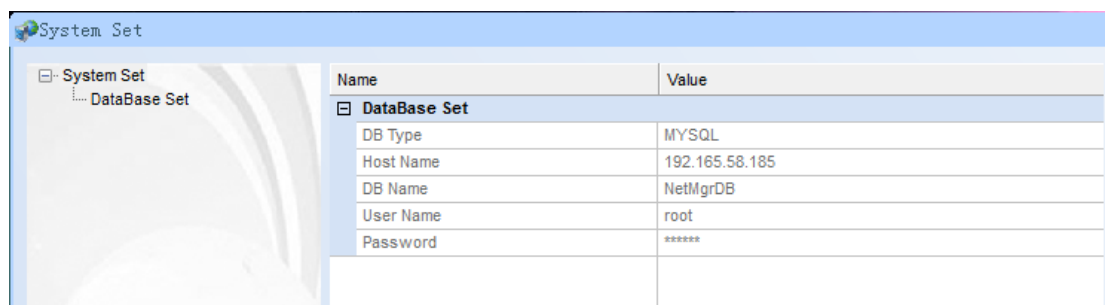



Fig. 5-14 Message for Setting Database of Network management Server

**Step 2:** run  **eManager Client** under the installation directory, start SNMP network management, input the user name and password. The initial password is Administrator and the password is “sumavision”. Fill in the server and the IP address. Click “OK” to start the SNMP network management, as shown in Fig. 5-15 Login Interface for SNMP Network management.

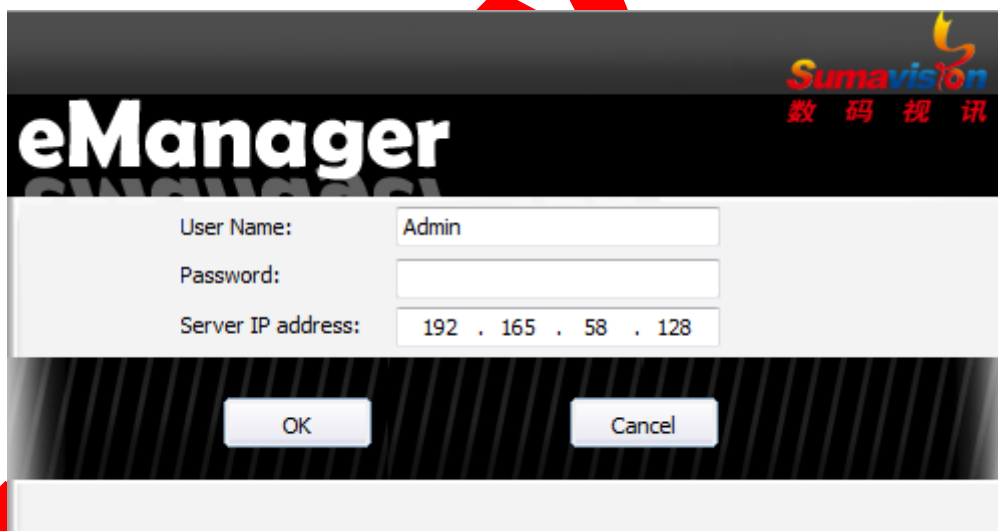


Fig. 5-15 Login Interface for SNMP Network management

## 5.2.1 Operating Method

### 5.2.1.1 Input Part

Configured with different cards, EMR platform may receive different types of program sources. Details are:

- ASI input: EMR is configured with 5 Input ASI Card (see 5 Input ASI Card for

configuration method) or ASI 5InOut Card (see ASI 5InOut Card for configuration method) to support ASI input;

- DS3/E3 input: EMR is configured with DS3 In4 Card (see DS3 In4 Card for configuration method) or DS3 adapter (see DS3 adapter for configuration method) to support DS3/E3 stream input;
- IP input: the gigabit master card (see gigabit master card for configuration method) equipped on the platform may provide IP input to the platform;
- RF input: EMR is configured with DVB-S2 Desc Card (see DVB-S2 Desc Card for configuration method) ,ABS-S Demod Card (see ABS-S Demod Card for configuration method) ,DVB-C Demod Card (see DVB-C Demod Card for configuration method) ,DVB-S2 Demod Desc Card (see DVB-S2 Demod Desc Card for configuration method) ,4-Ch.DVB-T2 Demod Card (see 4-Ch.DVB-T2 Demod Card for configuration method) or 4-Ch.DVB-S2 Demod card (see 4-Ch.DVB-S2 Demod card for configuration method) to support RF input,
- Analog video and audio input: EMR is configured with the MPEG2 SD AENC Card (see MPEG2 SD AENC Card for configuration method) or Analog SD ENC Card (see Analog SD ENC Card for configuration method) to support input and encoding of analog video and audio;
- Digital video and audio input: EMR is configured with the MPEG2 SD DENC Card (see MPEG2 SD DENC Card for configuration method) or Digital ENC Card (see Digital ENC Card for configuration method) to support encoding of digital video and audio.

### 5.2.1.2 Output Interface

Configured with different cards, EMR platform may output diversified program streams. Details are:

- ASI output: EMR is configured with 4 Output ASI Card (see 4 Output ASI Card for configuration method), ASI 5InOut Card (see ASI 5InOut Card for configuration method) or StatMux4 Card (see StatMux4 Card for configuration method) to support ASI output;
- DS3/E3 output: EMR is configured with DS3 adapter Card (see DS3 adapter Card for configuration method) to support DS3/E3 stream output;
- IP output: the Main GbE Card (see Main GbE Card for configuration method) equipped on the platform may provide IP output;
- RF output: EMR is configured with 6-Ch.QAM Card (see 6-Ch.QAM Card for configuration method), DVB-S/S2 Mod. Card (see DVB-S/S2 Mod. Card for configuration method) or DVB-T/H-4 Mod. Card (see DVB-T/H-4 Mod. Card for configuration method) to support RF input;
- Decoded video and audio output: EMR is configured with SD-ADEC Card (see


SD-ADEC Card for configuration method) to support the decoded video and audio output.

## 5.2.2 System configuration

When the SNMP network management is started, it needs to add the equipment at first and refresh the hardware at first and then the EMR can be managed. The steps are as follows:

**Step 1:** follow the following operation steps when the user requires adding the equipment:

Start the client end, click <view> and choose <equipment management>;

Right click in the margin of the right topology graph, choose <add>-<add equipment> or choose the <add equipment> under the “edition” menu bar or click the quick button ;

Input the equipment IP address in the pop-up equipment adding dialog box and click “Query”. If the equipment to be added is available and is on line, it shall automatic fill the drop-down box of “Device Type”, the “Device Name” and other necessary information; and click “OK”.

When the equipment icon is shown, move the cursor to the desired position and left click to add the equipment.

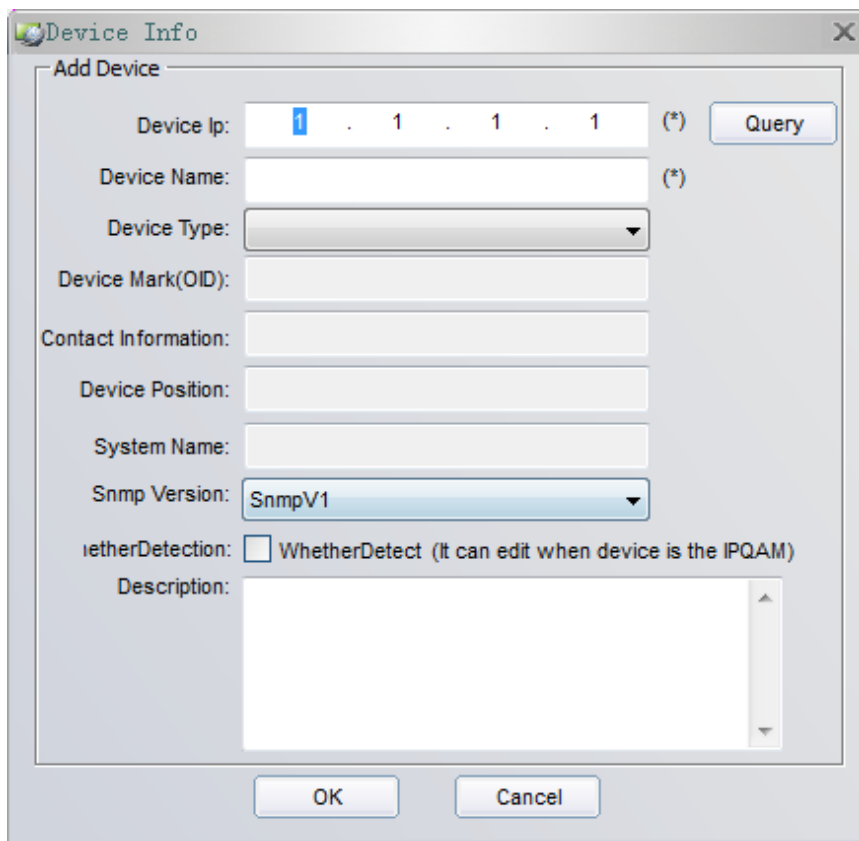


Fig. 5-16 Add Equipment

**Step 2:** Open the SNMP configuration window of equipment

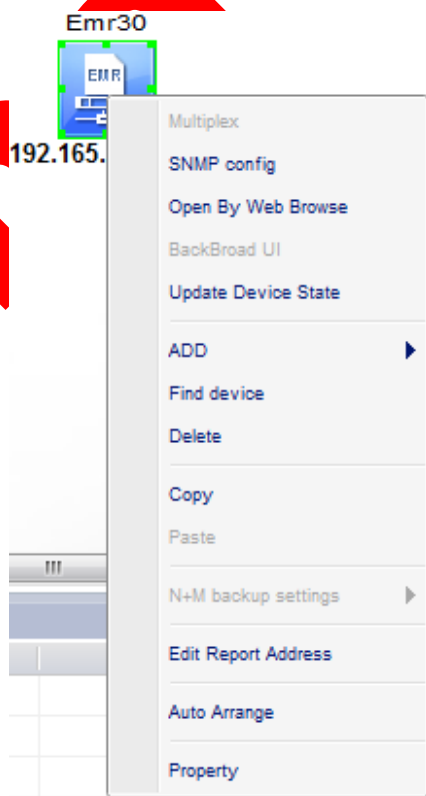


Fig. 5-17 Choose of SNMP Configuration Menu

Right click after choosing the equipment in the equipment management window and choose “SNMP config” in the pop-up right click menu to pop up the equipment parameter configuration interface.

**Step 3:** refresh equipment parameter. Click “Refresh Dev” to refresh the board card structure information of the current equipment. The effect after refresh is as shown below:

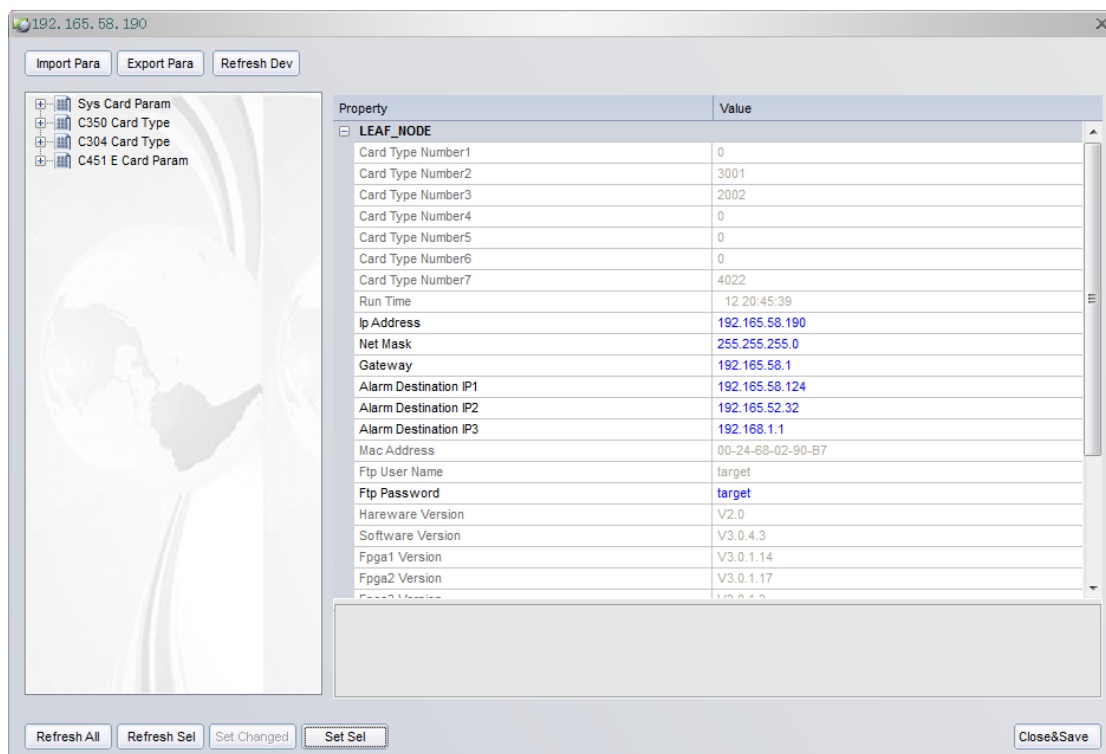


Fig. 5-18 Picture of effect after refreshing SNMP parameter

The tree structure on the left of the whole parameter modification interface refers to the board card structure information of the current equipment, while corresponding parameter information of each board card is as shown in the right. The user can view the parameter information of corresponding node by click corresponding node on the tree structure on the left board card.

### 5.3 Board Card Description

This section will introduce the board cards applied in EMR to help users understand the version information, status information and parameter settings of each kind of board card.

Some functions are available by purchasing corresponding authorization.

## 5.3.1 Main GbE Card

### 5.3.1.1 Interface

The main GbE card is provided by the EMR itself and is different from other board cards because the Main GbE Card occupies any card slot but is integrated with the EMR. The interface card has four Ethernet ports, from left to right, they are Gigabit input/output port 1, Gigabit input/output port 2, Gigabit input/output port 3 and Gigabit input/output port 4. Gigabit input/output Ethernet port 1 and 2 are used for the output and input of IP stream, while Gigabit input/output Ethernet port 3 and 4 are backup Ethernet port of the Gigabit input/output Ethernet port 1 and 2, which requires Gigabit module to connect the Gigabit line and the router for normal communication.

### 5.3.1.2 Function

The parameter page of the Main GbE Card is shown as Fig. 5-19 Main GbE card of Web Network Management:

| GbE | Link Status | Working Status |          | Total Bitrate |        | Effective Bitrate |        |
|-----|-------------|----------------|----------|---------------|--------|-------------------|--------|
|     |             | Input          | Output   | Input         | Output | Input             | Output |
| 1   | Link Up     | Active         | Active   | 0bps          | 0bps   | 0bps              | 0bps   |
| 2   | Link Up     | Active         | Active   | 0bps          | 0bps   | 0bps              | 0bps   |
| 3   | Link Down   | Inactive       | Inactive | 0bps          | 0bps   | 0bps              | 0bps   |
| 4   | Link Down   | Inactive       | Inactive | 0bps          | 0bps   | 0bps              | 0bps   |

Fig. 5-19 Main GbE card of Web Network Management

It includes four submenus below:

- **Monitoring:** used for displaying the input/output system code rate of each Ethernet port with the Main GbE Gigabit card, the effective code rate and other states;

- Input backup: used for setting the backup switch of Ethernet port 1 and 2 with the input backup function, the backup mode and the switch condition;
- Output backup: used for setting the backup switch of Ethernet port 1 and 2 with the input backup function;
- Routine: this page is used for setting the network parameter of four Ethernet ports with the Main GbE card and the warning switch.

Before using the Main GbE card, the gigabit module (gigabit electrical interface module of Cisco is recommended) shall be inserted into the input port of the Main GbE Card port, and the network parameter of each network interface of the Main GbE Card shall be set on the WEB network management. Static ARP and receiving and sending parameters may be set when the network interface parameter has been set according to the user's demand. Input and output backup parameter may be set when the sending and receiving parameter of all ports has been set according to the practical situation.

### 5.3.1.2.1 Ethernet port monitor

This interface is used for viewing the system code rate of each input and output port under the Ethernet port, the effective code rate and other state messages.

The screenshot shows the Sumavision EMR web interface. The main navigation bar includes 'Cards', 'Multiplexing', 'Output', 'Backup', and 'General'. The current page is 'Cards > Main GbE Card > GbE 1'. The left sidebar shows a tree view of network cards: Card1-5 Input ASI Card, Card2-4 Output ASI Card, Card3-6 Ch.QAM Card, and Main GbE Card. The Main GbE Card is expanded to show GbE 1, GbE 2, GbE 3, and GbE 4. The main content area shows the 'Monitor' tab for GbE 1, with a table displaying port statistics.

| Port | Sync Status | Total Bitrate | Effective Bitrate |
|------|-------------|---------------|-------------------|
| 1    | No Sync     | 0bps          | 0bps              |
| 2    | No Sync     | 0bps          | 0bps              |
| 3    | No Sync     | 0bps          | 0bps              |
| 4    | No Sync     | 0bps          | 0bps              |

Fig. 5-20 Ethernet port monitor of Main GbE card

### 5.3.1.2.2 Receiving Settings

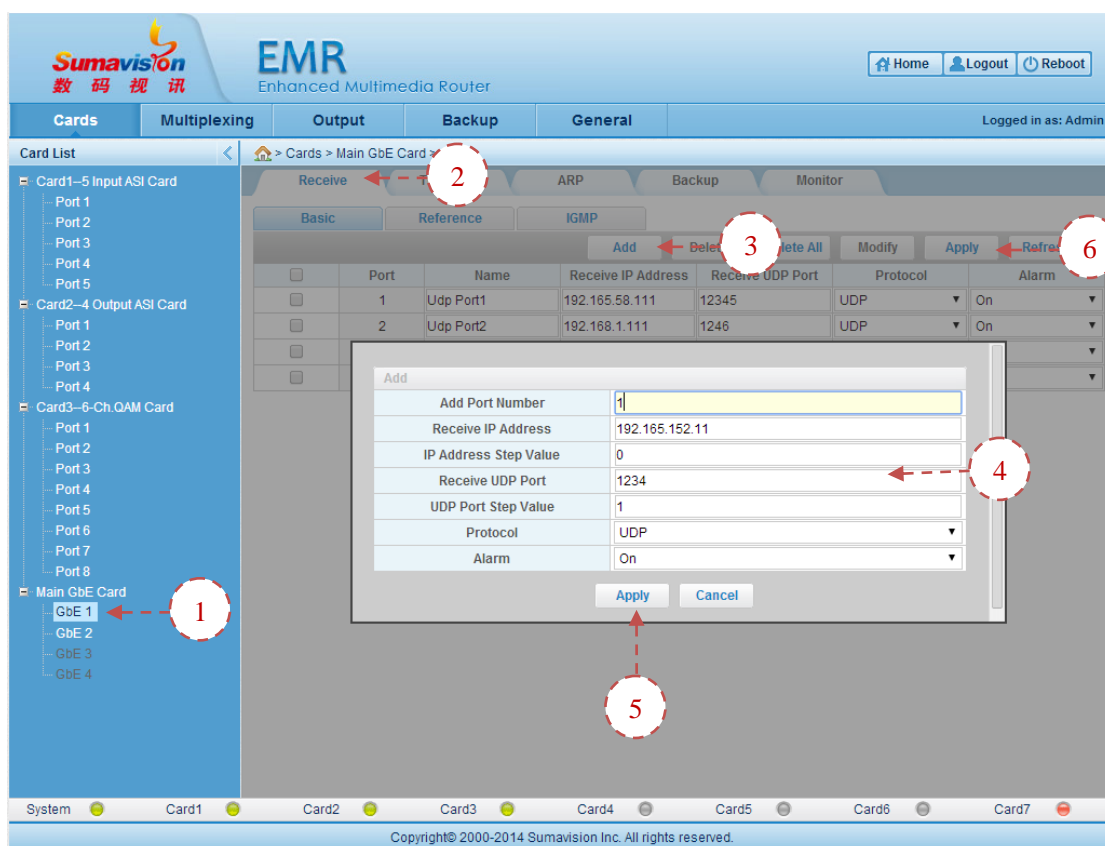


Fig. 5-21 Main GbE Card Receiving Settings

**Step 1:** Click “GbE n” of “Cards” of WEB network management to navigate to GbE n parameter settings page;

**Step 2:** Click “Receive” to navigate to receiving parameter settings page;

**Step 3:** Click “Add” in the page;

**Step 4:** Fill in the “Receive IP Address”, “Receive UDP Port”, “Protocol” and other parameters of the port in the popped up page according to the network planning. When the front-end sending IP and port are in the stepping relation, you may add the stepping value and add a batch of input ports;

**Step 5:** Click “Apply” below the added port to have the added port displayed in a list. You may directly modify the port parameter in the list if necessary;

**Step 6:** Click “Apply” in the page to validate the setting of receiving port in the list;



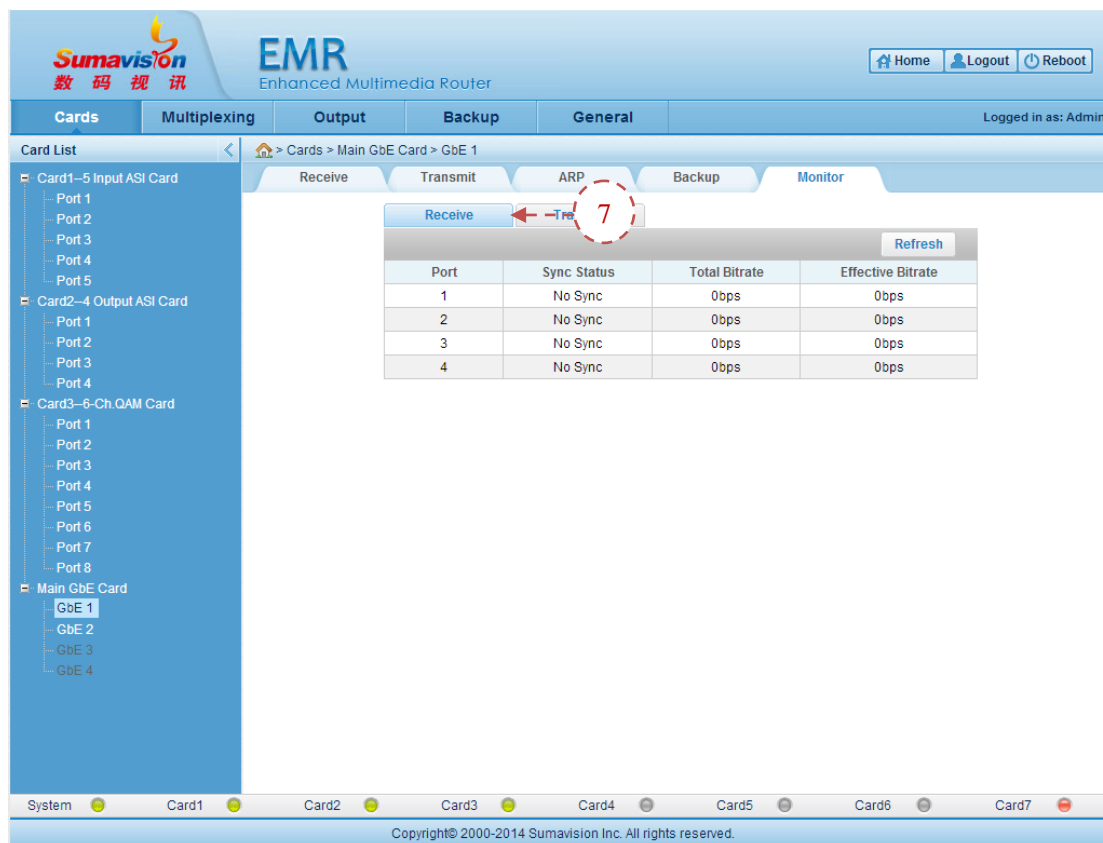


Fig. 5-22 Main GbE Card Receiving Monitor

**Step 7:** When the receiving parameter is configured and the network is connected, click “Main GbE card” in the “Cards” to switch to the information page of the Main GbE card to click “Receive” in the top of the page to check input information of each port.

#### Port deletion function:

When it requires deleting some ports, it can choose the check box in front of the port and click the “delete” on the page. Click “delete all” to directly delete all ports.

#### Batch port increase function:

This function supports the batch modification that several parameters can be modified at the same time. The setting method details are as shown in 6.2 Massive modification function.

#### Reference code rate setting function:

When the network transmission quality is relatively poor, it can open the reference switch on the reference code rate page and set the value which is slightly larger than the maximum system code rate accounted to make the calibration. It is advised that the set value is about 1/10,000 greater than the real code rate. When the inputted IP stream code rate mode is VBR, it must open the reference switch to make the calibration. The reference code rate setting shall be greater than the maximum value of the instant code rate. It shall be 20% greater than the maximum at best, as shown in the figure below:



Fig. 5-23 Main GbE Card Receiving Reference Settings

- ☞ A network interface of the Main GbE Card supports up to 256 receiving ports;
- ☞ When the gigabit network transmission protocol is RTP, please set even numbers of receiving ports;
- ☞ When the gigabit receiving adopts V3 version of IGMP protocol, “receiving mode and source IP1 and IP2 are available”, or the default settings shall prevail.

### 5.3.1.2.3 Transmitting settings



Fig. 5-24 Main GbE Card Sending Settings

**Step 1:** Click “GbE n” of “Cards” of WEB network management to navigate to GbE n parameter settings page;

**Step 2:** Click “Transmit” to navigate to sending parameter settings page;

**Step 3:** Click “Add” in the page;

**Step 4:** Fill in the “Destination IP Address”, “Destination UDP Port”, “Output”, “Bitrate Mode”, “Total Bitrate” and “Protocol” of the port in the popped up port page according to the network plan;

**Step 5:** Click “Apply” in the bottom of the added port to have the added port displayed in a list. You may directly modify the port parameter in the list if necessary;

**Step 6:** Click “Apply” in the page to validate the sending port settings in the list;



Fig. 5-25 Main GbE Card Transmit Monitor

**Step 7:** When Multiplexing of the output programme is finished and the network is connected, click “Main GbE card” in the “Cards” to switch to the information page of the Main GbE card to click “Transmit” in the top of the page to check output information of each port.

**Port deletion function:**

When it requires deleting some ports, it can choose the check box in front of the port and click the “delete” on the page. Click “delete all” to directly delete all ports.

**Batch port increase function:**

This function supports the batch modification that several parameters can be modified at the same time. The setting method details are as shown in 6.2Massive modification function.

It can also set the output packet length, the survival time (TTL), the service type and the number of TS packet in the IP packet page.

ⓘ When there are too many ports (e.g. 256 ports) and the IP address or port number of all ports are modified by IE browser, IE may alarm of no response. Please wait a moment before any operation.

After setting the input port, click Multiplex button in the “Multiplexing” in the top of the page to choose the Main GbE card as the output card, and choose the multiplexing of the input card for the output port corresponding to the Main GbE card according to the frequency point planning, and then click “Apply”. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting.

- ⊗ A network interface of the Main GbE Card supports up to 256 receiving ports;
- ⊗ A network interface of the Main GbE Card sends up to 256 multicast streams;
- ⊗ A sending port of the Main GbE Card sends up to 45 programs;
- ⊗ When the gigabit network transmission protocol is RTP, please set even numbers of sending ports;
- ⊗ The total system bit rate of all output ports of a network interface shall be no more than 960Mbps;

### 5.3.1.2.4 ARP parameter setting



Fig. 5-26 Main GbE Card ARP setting

**Dynamic ARP function:** display the unicast purpose of non-static setting and target MAC information under this Ethernet port.

**Static ARP function:** the user is allowed to set the target IP address and

corresponding MAC address. The equipment can directly use corresponding MAC address rather than sending APR REQUEST to obtain the target MAC when the target IP address is given.

**Step 1:** click WEB network management “GbE n” to log in the Ethernet port setting page;

**Step 2:** click the “ARP” on the page to log in the ARP setting interface;

**Step 3:** click the “Add” under the “Static” to pop up the add page;

**Step 4:** fill in the static ARP parameter as per as the network plan and click the “Apply” on the page to put into effect;

Click the “Dynamic” to view the ARP dynamic list.

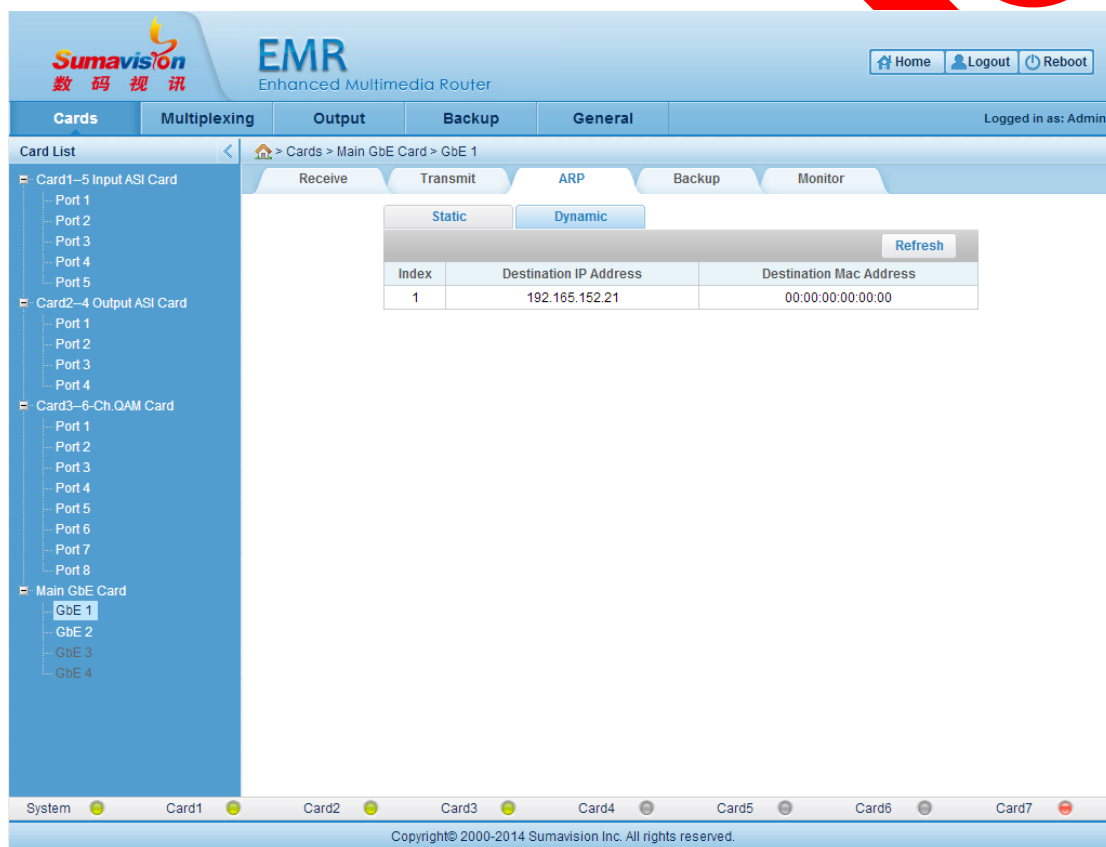


Fig. 5-27 Main GbE Card Dynamic ARP Monitor

### 5.3.1.2.5 Backup Settings

Other than supporting the Service backup and Port backup of EMR platform, the Main GbE Card also supports the backup of input and output network interface of the device, and the backup of output interface between devices. Each kind of backup settings is instructed below.

As for the four input network interfaces of the Main GbE Card, network interface 3 may be the backup of network interface 1 while network interface 4 may be the backup of

network interface 2.

**Input Ethernet port backup:**

Function description: for the four Ethernet ports with the Main GbE Cards, the Ethernet ports 1 and 3 are the backup of a 1+1 group and the Ethernet ports 2 and 4 are the backup of another 1+1 group. When the main and backup Ethernet ports receive the data both and detect the switch, one of the two Ethernet ports shall be involved in the multiplex in the back board.

The input contents of the main and backup Ethernet ports must be identical (including the PSI/SI table of the input stream, PID of elements). The receiving IP and ports may be different.

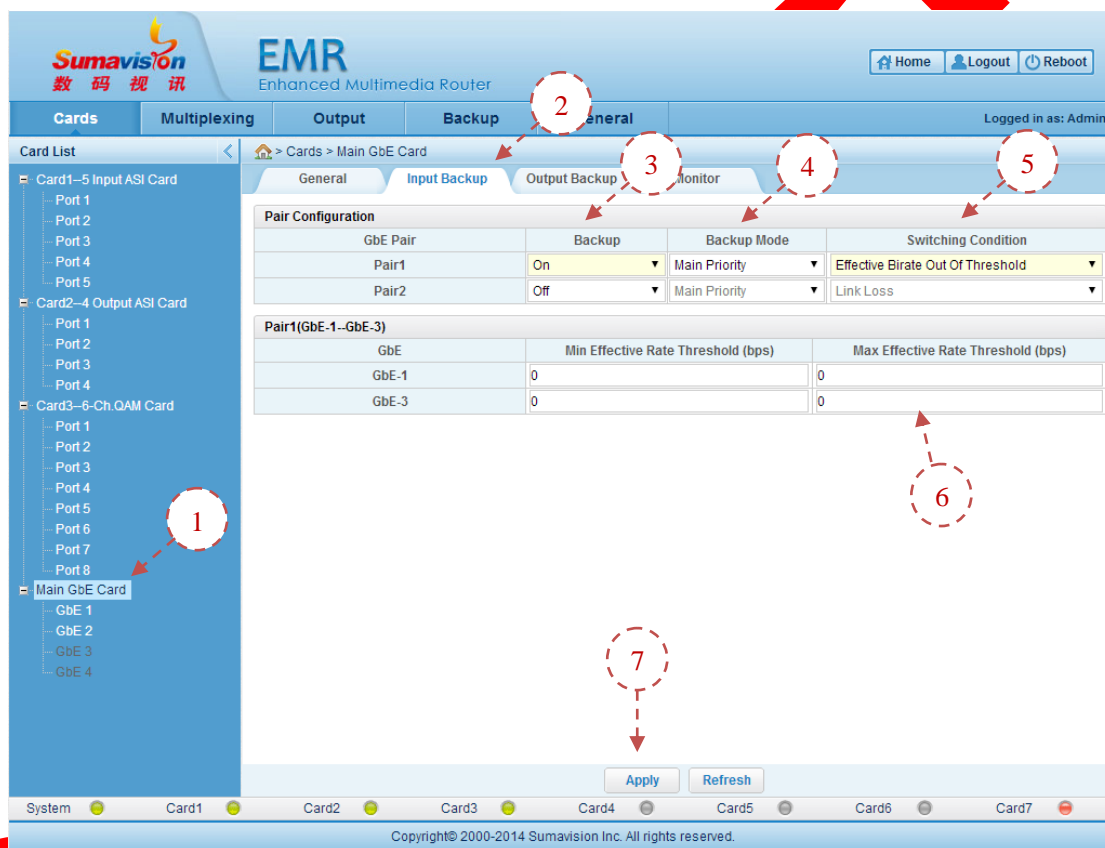


Fig. 5-28 Main GbE Card Input Ethernet port backup

**Step 1:** click WEB network management “Main GbE Card” to log in the board card page;

**Step 2:** click “Input Backup” to log in the backup setting page;

**Step 3:** click the backup switch option on the page to open backup switch of corresponding group; the group 1 refers to the main and standby backup of Ethernet ports

1 and 3, while the group 2 refers to the main and standby backup of the Ethernet ports 2 and 4.

**Step 4:** click the backup mode option on the page to choose the mode complying with the real application requirement. It can choose the “Main Priority”, “Floating”, “One-Way Switch”, “Assign Main” or “Assign Backup” as the backup mode. It is advised that the “Main Priority” mode shall be set during the normal use.

When the main route is abnormal and the backup route is normal, the “Main Priority” mode may be switched to the backup route. When the main route is recovered, the backup route may be switched to the main route.

When one route is abnormal in the “Floating”, the route may be switched to another one.

If the switch is made under the “One-way Switch” mode, it is impossible to switch to the main route.

The “Assign Main” or the “Assign Backup” can use the appointed Ethernet port.

**Step 5:** click the switching condition option on the page to choose the switching condition complying with the real application requirements. The switching conditions include the “Link Loss”, “System Bitrate is 0”, “Effective Bitrate is 0” and the “Effective Bitrate Out Of Threshold”. When the system detects the abnormality complying with the switching condition of the Ethernet, the main route shall be switched to the backup route.

**Step 6:** when the “Effective Bitrate Out Of Threshold” is chosen as the switch condition, it needs to set minimum and maximum code rate threshold value for the switch of the main route and the backup route.

**Step 7:** click the “Apply” on the page to put the backup setting into effect.

After the setting, click the “GbE n” and set the receiving parameter information of this backup Ethernet port on the “Receiving” page. The setting method is as shown in 5.3.1.2.2 Receiving Settings. It shall ensure that the main and backup route Ethernet port shall send the same program stream from the receiving front end. When the setting is done, the multiplex relationship of the back board shall directly deploy the input of the backup route to participate the multiplex output when the receiving of the main route is abnormal.

#### **Output Ethernet port backup:**

Function description: for the four Ethernet ports with the Main GbE Cards, the Ethernet ports 1 and 3 are the backup of a 1+1 group and the Ethernet ports 2 and 4 are the backup of another 1+1 group. The main and backup Ethernet ports must output the same stream at the same time. Different purposes and ports can be set when the main



and backup Ethernet ports output. The bearing content must be the same. When the backward equipment uses the received backup, two identical program sources are available.

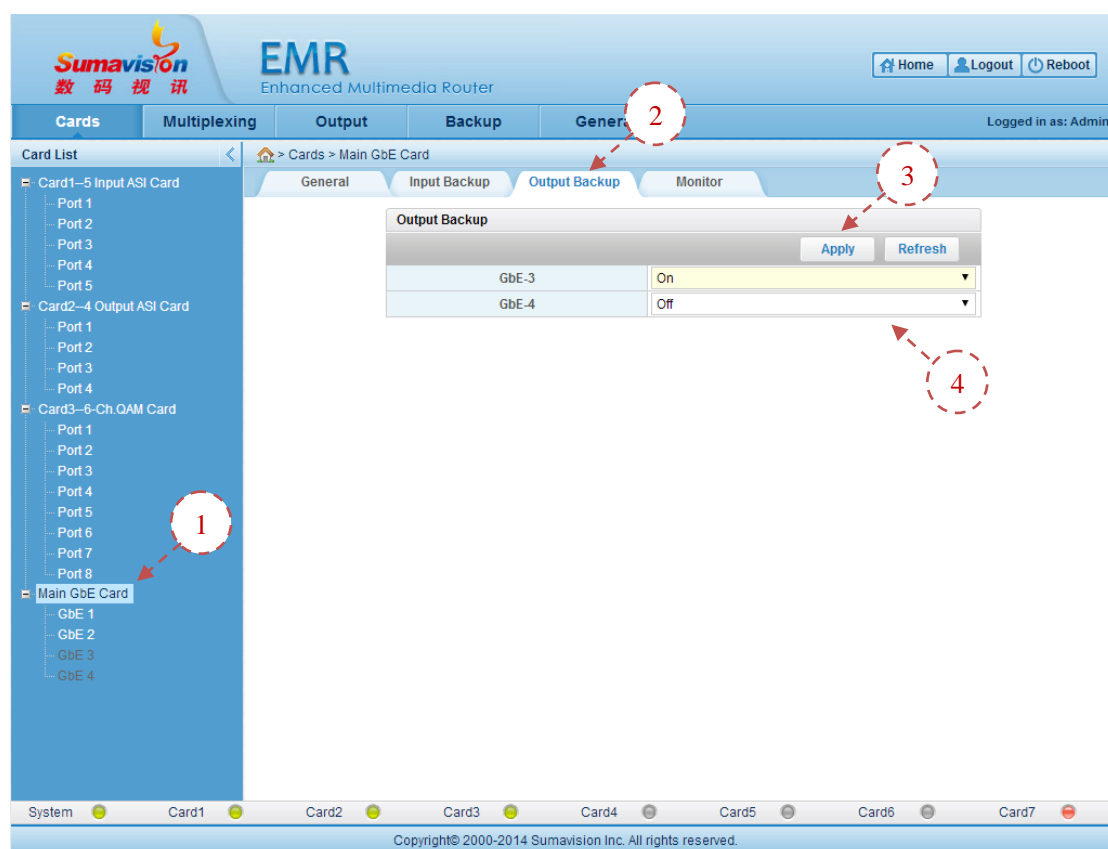


Fig. 5-29 Main GbE Card Output Ethernet port backup

**Step 1:** click WEB net manager “Main GbE Card” to log in the board card page;

**Step 2:** click “Output Backup” to log in the backup setting page;

**Step 3:** open corresponding backup switch on the page; the output of Ethernet 3 is the backup outputted by Ethernet port 1; and the output of Ethernet 4 is the backup outputted by Ethernet port 2.

**Step 4:** click the “Apply” on the page to put the backup setting into effect.

Click “GbE n” and set the transmission parameter information of this Ethernet for the standby route on the “Transmit” page. For the setting method, please refer to 5.3.1.2.3 Transmitting settings. When transmitting the program stream for the latter level, the program of the backup Ethernet port shall be identical to that of the main Ethernet port. No additional multiplex operation is required. When the backward equipment uses the received backup, two identical program sources are available.

#### Output port backup:

Function description: the two Ethernet ports shall realize the mutual communication to obtain the working status of each; then the arbitration is made by the main Ethernet port according to the status; and finally the on-off control and the backup are realized by sending the directive to each and the backup Ethernet port. The two Ethernet ports are not

limited to the two Ethernet ports of the same equipment. It also includes the backup between the Ethernet ports of different devices.

=====

- ④ One Ethernet port can be provided with 8 groups. The group working mode using the backup in the same Ethernet port must be identical, being the master equipment or the backup equipment. It can set different switching mode.
- ④ The Ethernet ports 3 and 4 do not support the output port backup. Only the Ethernet ports 1 and 2 support the output port backup.
- ④ It must ensure that the main and the backup Ethernet port can realize the mutual communication.
- ④ If the main Ethernet port is IGMP V3 and the source IP filtering is set, the backup Ethernet port must be IGMP V3 and the set source IP filtering must be identical to that of the main route.
- ④ When making the backup setting, the main route and the standby route must be consistent in the port quantity.
- ④ The target IP and the target port of main route and the standby route in the backup group must be identical.
- ④ If the main port switch is available on the backup network, the main port switch must be switched on. Namely, the main port switch and the backup function are exclusive to each other. When the main port switch is switched off, the backup mode cannot be selected. When the backup mode is selected, the main port switch cannot be switched off.

=====

Summarization



Fig. 5-30 Main GbE Card Output port Backup

**Step 1:** click WEB net manager “GbE n” to log in the Ethernet port page;

**Step 2:** click “Backup” to log in the output port backup setting page;

**Step 3:** click the work mode on the page option to select the “Main Device” or “Backup Device” according to the real application condition. The groups in the same Ethernet port, which initialize the backup, shall have the same work mode, being either the master equipment or the backup equipment. However, the different switch modes can be set.

**Step 4:** click the backup mode option on the page to choose the mode complying with the real application requirement. It can choose the “Main Priority”, “Floating”, “One-Way Switch”, “Assign Main” or “Assign Backup” as the backup mode.

When the main route is abnormal and the backup route is normal, the “Main Priority” mode may be switched to the backup route. When the main route is recovered, the backup route may be switched to the main route.

When one route is abnormal in the “Floating”, the route may be switched to another one.

If the switch is made under the “One-way Switch” mode, it is impossible to switch to the main route.

The “Assign Main” or the “Assign Backup” can use the appointed Ethernet port.

**Step 5:** fill the “Backup IP Address” and the “Backup UDP Port” on the page. Fill IP addresses of corresponding matched ports in the backup IP address bar of the master and backup equipment (the master equipment fills the IP address of the backup equipment in the backup IP address, while the backup equipment fills the IP of corresponding master equipment). The “Backup UDP Port” of the matched master equipment and backup equipment must be the same.

The “Backup UDP Port” is the communication port between the master Ethernet port and the backup Ethernet port. Please notice that the setting of such port cannot be identical to that of the transmission and receiving ports.

**Step 6:** fill the “Communication Timeout” and “Group Delay Time” on the page to reach the normal switch requirements of each group.

**Step 7:** click the “Apply” on the page to put the backup setting into effect.

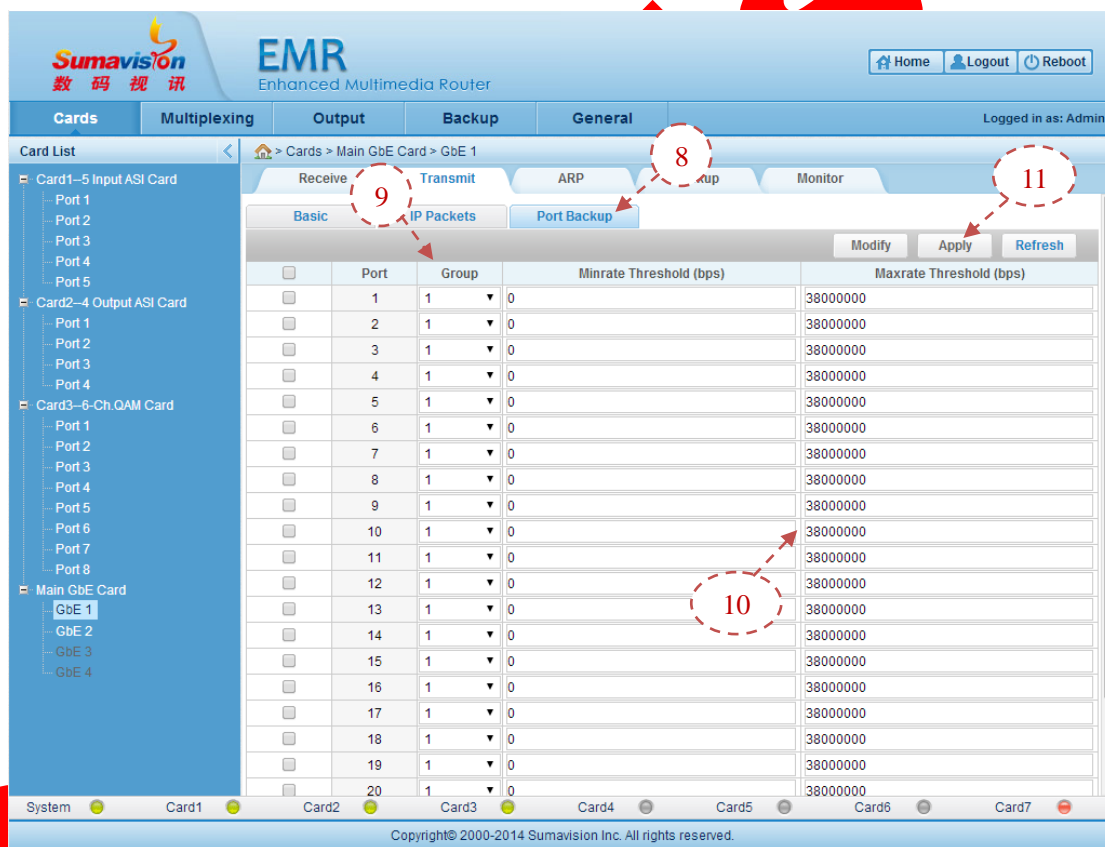


Fig. 5-31 Main GbE Card Transmit port backup

**Step 8:** click the “Transmit” on the “GbE n” of WEB net manager and click “Port Backup” to log in the output port setting page;

**Step 9:** click the backup group number option on the page to classify the output port according to the real application situation.

**Step 10:** set the minimum and maximum code rate threshold value for switch

between ports. When the code rate is beyond the threshold value, the route is deemed as abnormal and the switch shall be made.

**Step 11:** click the “Apply” on the page to put the backup setting into effect.

After setting the backup for output port of the master equipment, it shall log in the backup equipment net manager to set the backup parameter for output port of the backup equipment, backup group number for output port of backup equipment, the minimum code rate threshold and the maximum code rate threshold. The setting method is as the same as the aforesaid steps.

When the port on the main route equipment is abnormal, it shall notify the backup route equipment and made the switch according to the switch mode setting.

- =====
- ☞ Backup of output network interface and backup of input network interface are mutually exclusive that only one of them may be applied;
  - ☞ Other than the target IP, target port, output switch and alarm switch of the backup network interface that may be independently modified, any parameter shall be kept consistent with the value of the master network interface;
  - ☞ There is no switching mechanism of the backup of output network interface that it mainly provides the subsequent level of the user with a same input source.
- =====

### 5.3.1.3 Parameter

Table 5-8 Main GbE Card Receiving Parameter

| Parameter             | Range  | Default    |
|-----------------------|--|------------|
| Name                  | length of name 0~31  | Udp Port n |
| Add Port Number       | 1~256  | 1          |
| Receive IP Address    | self IP or multicast IP  | self IP    |
| IP Address Step Value | 0~255  | 0          |
| Receive UDP Port      | 1~65535  | 1234       |
| UDP Port Step Value   | 0~65534  | 1          |
| Protocol              | UDP/RTP  | UDP        |
| Alarm                 | On/Off   | On         |
| Receive Mode          | INCLUDE/EXCLUDE  | EXCLUDE    |
| Source IP Address 1   | 1.1.1.1~223.254.254.254<br>( 127.0.0.0~127.255.255.255 IANA reserved ) | 0.0.0.0    |
| Source IP Address 2   | 1.1.1.1~223.254.254.254<br>( 127.0.0.0~127.255.255.255 IANA reserved ) | 0.0.0.0    |
| Reference Bitrate     | 0~200000000  | 0          |
| Reference             | On/Off   | Off        |

Table 5-9 Main GbE Card Transmitting Parameter

| Parameter              | Range  | Default          |
|------------------------|--|------------------|
| Name                   | length of name 0~31  | Udp Port n       |
| Add Port Number        | 1~256  | 1                |
| Destination IP Address | unicast IP or multicast IP   | 192.165.52.100   |
| IP Address Step Value  | 0~255  | 0                |
| Destination UDP Port   | 1~65535  | 1234             |
| UDP Port Step Value    | 0~65534  | 1                |
| Total Bitrate          | 0~200000000  | 0                |
| Bitrate Mode           | CBR/VBR  | CBR              |
| Protocol               | UDP/RTP  | UDP              |
| Alarm                  | On/Off   | On               |
| Output                 | On/Off   | On               |
| Packet Format          | 188/204  | 188              |
| TTL                    | 1~255  | 255              |
| TOS                    | General services/Minimum cost/Highest reliability/Maximum throughput/Minimum delay | General services |
| TS Pkt Num             | 1~7  | 7                |
| Group                  | 1~8  | 1                |
| Minrate Threshold      | 0~200000000  | 0                |
| Maxrate Threshold      | 0~200000000  | 38000000         |

Table 5-10 Main GbE Card Output Port Backup Parameter

| Parameter             | Range   | Default               |
|-----------------------|---|-----------------------|
| Working Mode          | No Backup/Main Device/Backup Device                             | No Backup             |
| Backup Mode           | Assign Main/Assign Backup/Main Priority/One Way Switch/Floating | Main Priority         |
| Backup IP Address     | unicast IP  | 192.168.1.101         |
| Backup UDP Port       | 1~65535   | 4999+i(i is group No) |
| Communication Timeout | 100~65535   | 4000                  |
| Group Delay Time      | 0~65535   | 100                   |

Table 5-11 Main GbE Card Static ARP Parameter

| Parameter               | Range             | Default  |
|-------------------------|-------------------|----------|
| Destination IP Address  | unicast IP        | Need Add |
| Destination MAC Address | Legal MAC Address | Need Add |

Table 5-12 Main GbE Card General Parameter

| Parameter        | Range   | Default          |
|------------------|---|------------------|
| Net IP Address   | unicast IP not include 127.XXX.XXX.XXX  | 192.168.1.136    |
| Subnet Mask      | Legal Subnet Mask Address   | 255.255.255.0    |
| Gateway          | unicast IP not include 127.XXX.XXX.XXX , must the same subnet with Net IP Address                       | 192.168.1.36     |
| Speed and Duplex | Auto-Negotiation/1Gbps AN/SGMII 1Gbps Full/1Gbps Full/100Mbps Full/100Mbps Half/10Mbps Full/10Mbps Half | Auto-Negotiation |
| Alarm            | On/Off  | On               |
| IGMP Version     | IGMPv2/IGMPv3   | IGMPv2           |

Table 5-13 Main GbE Card Input Ethernet port backup Parameter

| Parameter                    | Range   | Default       |
|------------------------------|---|---------------|
| Backup                       | On/Off  | Off           |
| Backup Mode                  | Assign Main/Assign Backup/Main Priority/On Way Switch/Floating                          | Main Priority |
| Switching Condition          | Link Loss/System Bitrate is 0/Effective Bitrate is 0/Effective Bitrate Out Of Threshold | Link Loss     |
| Min Effective Rate Threshold | 0~1000000000, Cannot bigger than Max Effective Rate Threshold                           | 0             |
| Max Effective Rate Threshold | 0~1000000000, Cannot less than Min Effective Rate Threshold                             | 0             |

## 5.3.2 5 Input ASI Card

### 5.3.2.1 Interface

5 Input ASI Card provides 5 input interface of 75ΩBNC, for ASI input, as shown in Fig. 5-32 5 Input ASI Card:



Fig. 5-32 5 Input ASI Card

### 5.3.2.2 Function

The 5 Input ASI Card supports 5 ASI input routes. The ASI input shall be connected to the 5 Input ASI Card, the input program can be refreshed as per as the Setting Method for Multiplex in Section 5.1.1.2 Multiplexing Setting and the output is multiplexed finally.

5 Input ASI Cards supports 5-channel ASI input. You may check the current version and modify the parameter of 5 Input ASI Card through the WEB network management. The alarm switch of the card and each input port may be set in the page of parameter settings and each port may be set with a PID to monitor the bit rate. The input information of each port and the bit rate information of the PID are displayed in the status information

page.

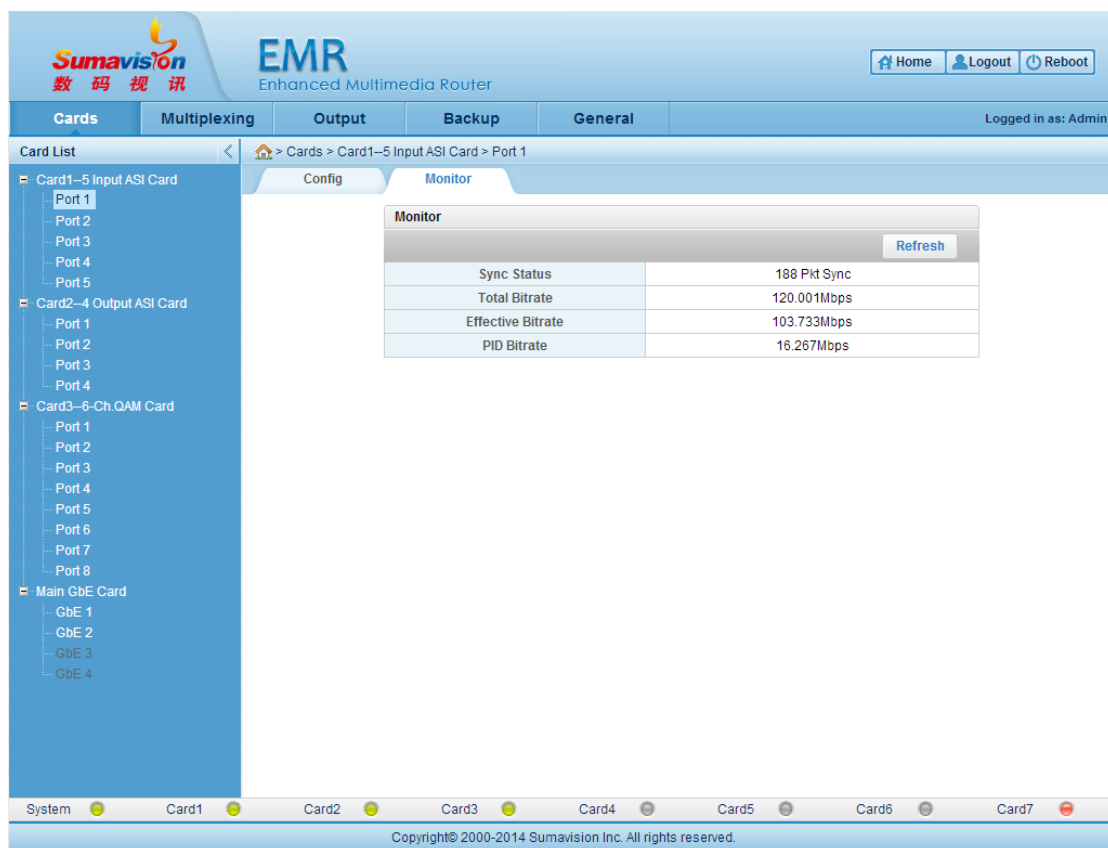


Fig. 5-33 5 Input ASI Card

### 5.3.2.3 Parameter

Table 5-14 5 Input ASI Card Parameter

| Parameter     | Range      | Default |
|---------------|------------|---------|
| Appointed PID | 0x0~0x1fff | 0x1fff  |
| Alarm         | On/Off     | On      |

### 5.3.3 4 Output ASI Card

#### 5.3.3.1 Interface

4 output ASI card provides 4 output interface of 75ΩBNC for ASI output, 1 Ethernet interface for connecting and communicating CAS, as shown in Fig. 5-34 4 Output ASI Card.



Fig. 5-34 4 Output ASI Card

#### 5.3.3.2 Function

The 4 output ASI card supports four ASI output routes. The input program can be multiplexed to the output port of the 4 output ASI card as per as the Setting Method for



Multiplex in Section 5.1.1.2 Multiplexing Setting, the appropriate system code rate can be set in corresponding port and the normal output can be made then.

The 4 output ASI card can realize the scrambling action for the program outputted by four ASI output routes via the scrambling Ethernet port of the back board and the board card. It can inquire the status information of each port on the 4 output ASI card, set the parameter and support the outputted rebirth PCR\_PID on the WEB network management. The port parameter setting page supports the setting of the warning switch, the code rate of output system as well as the output packet length. The board card parameter page can be used for setting the board card warning switch and check the scrambling Ethernet Port IP of the board card.

During the use, the rebirth PCR function shall be started as per as the following sequence. Multiplex the program to the output (exclusive of ECM and EMM, not greater than 22 programs) → parameter setting page for port of board card, turn on the rebirth PCR switch, submit → log in the rebirth PCR page, modify the final PCR\_PID to be modified and submit after the modification.

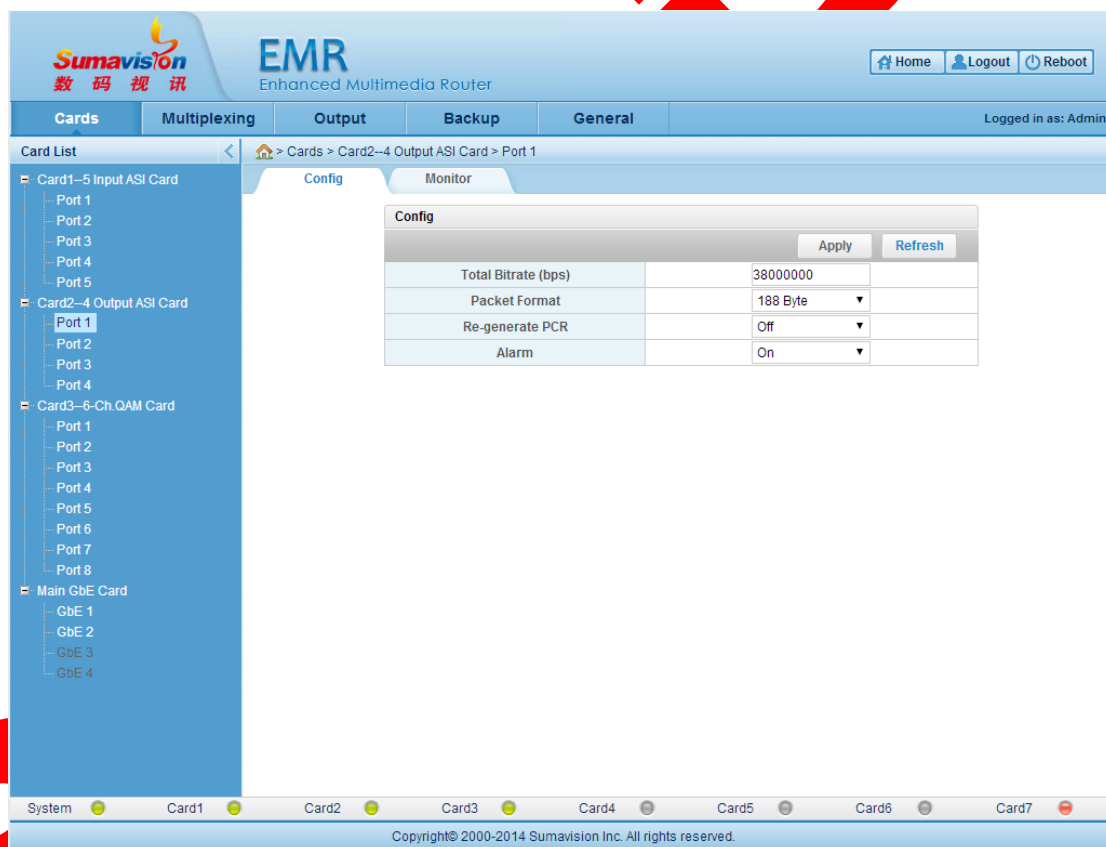


Fig. 5-35 4 Output ASI Card

### 5.3.3.3 Parameter

Table 5-15 4 Output ASI Card Parameter

| Parameter          | Range             | Default  |
|--------------------|-------------------|----------|
| Total Bitrate(bps) | 0~213000000       | 0        |
| Packet Format      | 188 Byte/204 Byte | 188 Byte |
| Re-generate PCR    | On/Off            | Off      |
| Alarm              | On/Off            | On       |
| PCR_PID            | 32-8191           | 8191     |

## 5.3.4 ASI 5InOut Card

### 5.3.4.1 Interface

ASI 5InOut Card provides 5 75ΩBNC ports, which are flexible for the ASI signal input/output, as shown in Fig. 5-36 ASI 5InOut Card.



Fig. 5-36 ASI 5InOut Card

### 5.3.4.2 Function

ASI 5InOut Card provides 5 BNC ports, each of which may be flexibly customized to be the input or output port. Other than the purpose of input and output card, it also supports two modes of Concentrator and Deconcentrator.

#### 5.3.4.2.1 Type of Input and Output Card

Set the “Card Type” in card parameter settings page as “ASI 5InOut Card”. Customize each port as the input or output port in Port Settings according to the purpose and click “Apply” to validate the settings.

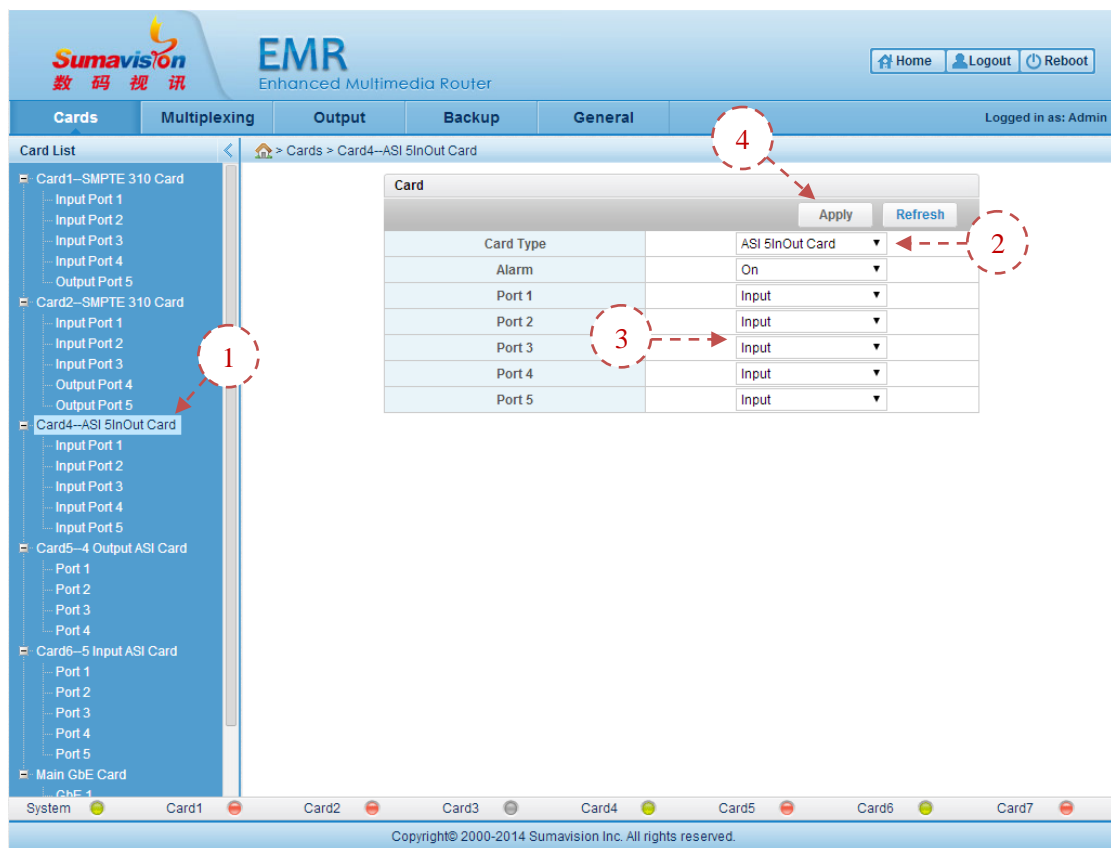


Fig. 5-37 ASI 5InOut Card

**Step 1:** Click “ASI 5InOut Card” of “Cards” of WEB network management to navigate to card settings page;

**Step 2:** Click “Card Type” to choose “ASI 5InOut Card”;

**Step 3:** Customize each port as “Input” or “Output” according to the demand;

**Step 4:** Click “Apply” to validate the parameter;

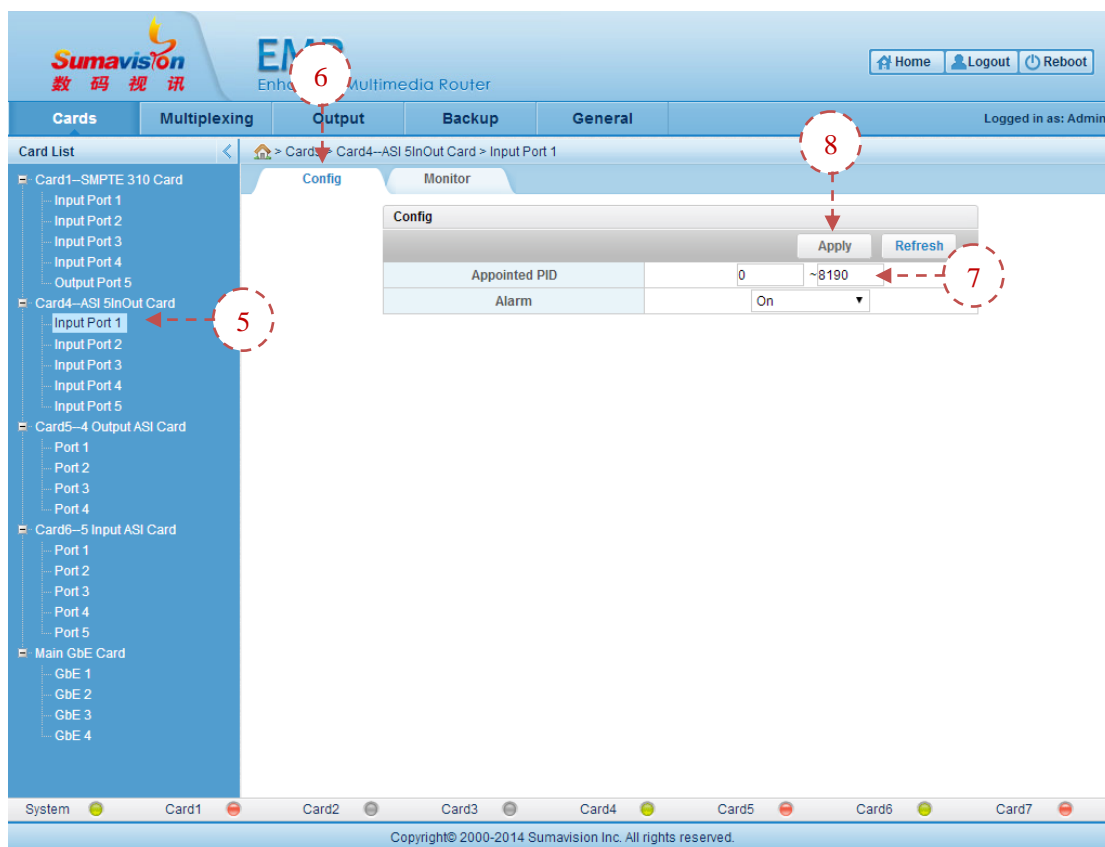


Fig. 5-38 ASI 5InOut Card Input Settings

**Step 5:** Click “Input Port n” of WEB network management to navigate to input port page;

**Step 6:** Click “Config” to navigate to setting page;

**Step 7:** Set the “Appointed PID” and “Alarm” switch of the input port;

**Step 8:** Click “Apply” to validate the parameter;

Sumavision



Fig. 5-39 ASI 5InOut Card Output Settings

**Step 9:** Click “Output Port n” of WEB network management to navigate to Output port page;

**Step 10:** Click “Config” to navigate to setting page;

**Step 11:** Set the “Total Bitrate”, “Packet Format”, “Alarm” switch and the “Re-generated PCR” switch of the output port;

**Step 12:** Click “Apply” to validate the parameter.

Finally, the ASI input shall be connected to ASI 5InOut Card input port, the input program can be refreshed as per as the Setting Method for Multiplex in Section 5.1.1.2 Multiplexing Setting and the output is multiplexed, the appropriate system code rate can be set in corresponding port and the normal output can be made then.

### 5.3.4.2.2 Type of Concentrator

ASI 5InOut Card may also be used as the Concentrator or Deconcentrator.

When it is used as the Concentrator, Port 1~4 are for the 4-channel input and Port 5 is for the output of the Concentrator.

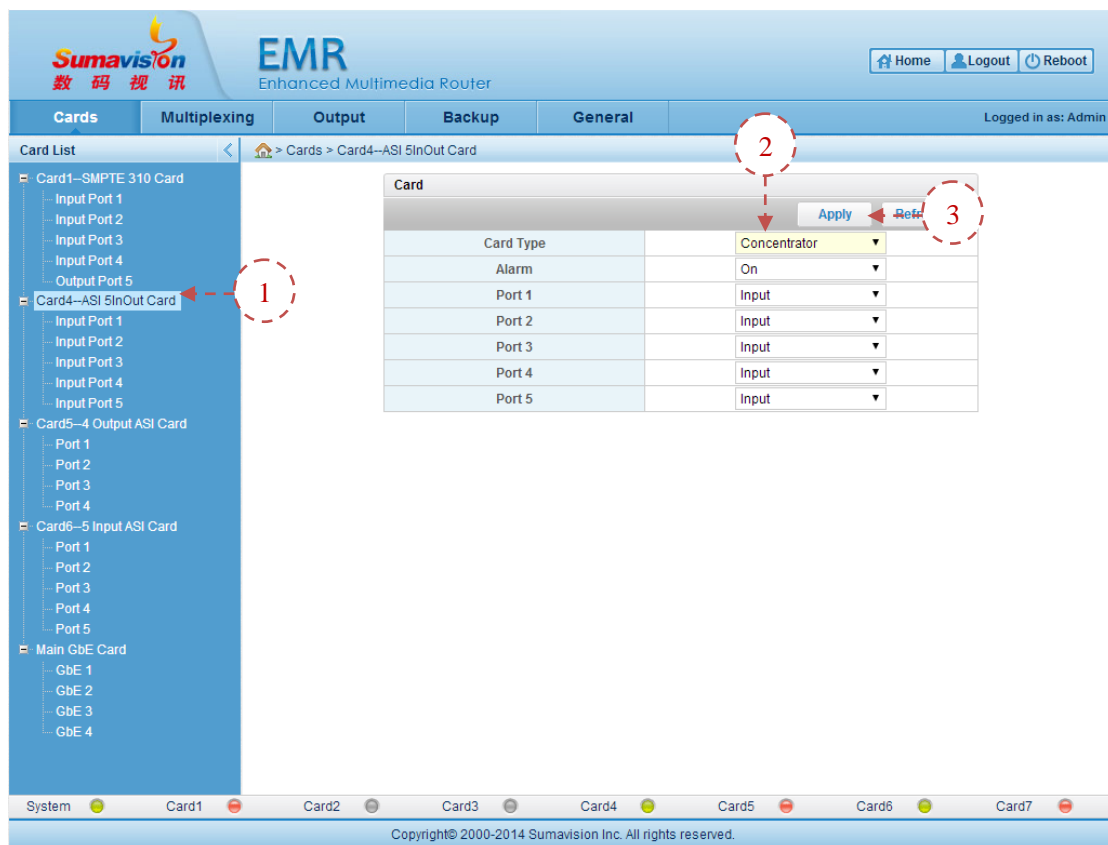


Fig. 5-40 ASI 5InOut Card Concentrator

**Step 1:** Click “ASI 5InOut Card” of “Cards” of WEB network management to navigate to card settings page;

**Step 2:** Click “Card Type” to choose “Concentrator”;

**Step 3:** Click “Apply” to validate the parameter;

Sumavision

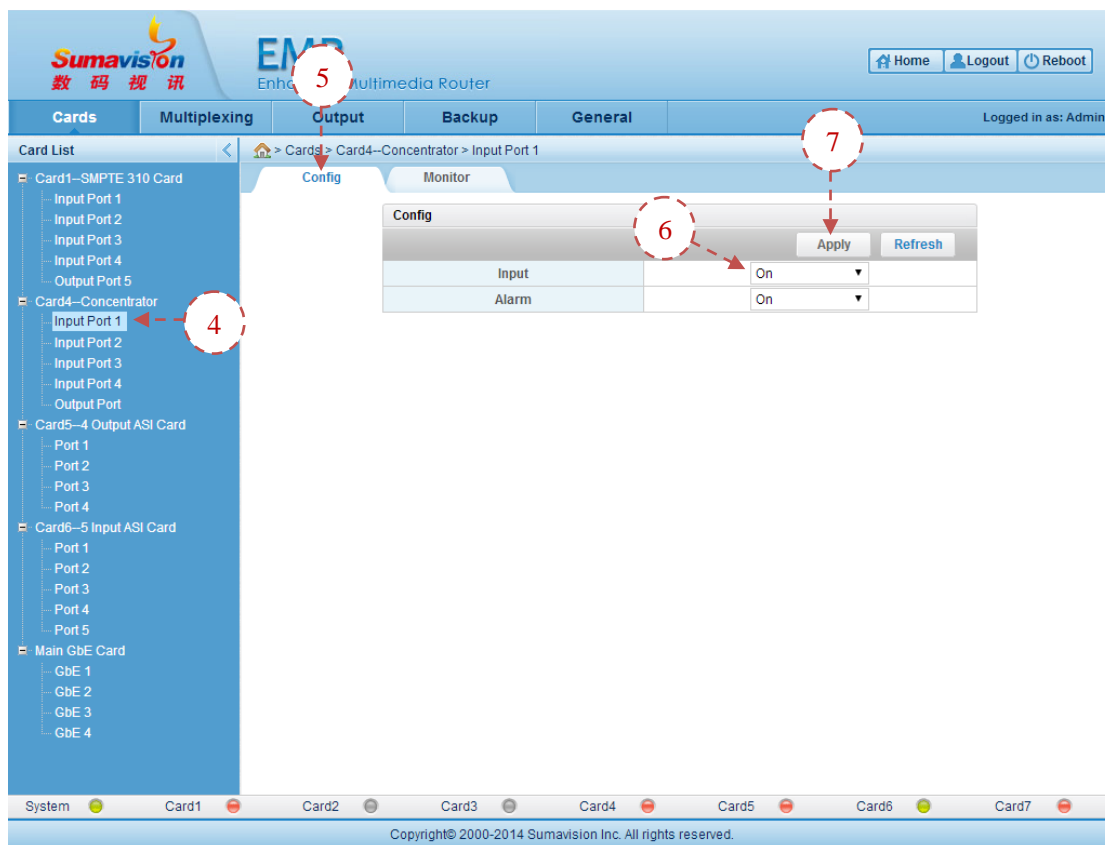


Fig. 5-41 ASI 5InOut Card Concentrator Input Settings

**Step 4:** Click “Input Port n” of WEB network management to navigate to input port page;

**Step 5:** Click “Config” to navigate to setting page;

**Step 6:** Set the “Input” switch and “Alarm” switch of the input port according to the demand;

**Step 7:** Click “Apply” to validate the parameter;

Connect the switched-on input port into corresponding ASI input source and then the concentrator can output normally.

### 5.3.4.2.3 Type of Deconcentrator

When it is used as the Deconcentrator, Port 1~4 are for the 4-channel output and Port 5 is for the input of the Deconcentrator.



Fig. 5-42 ASI 5InOut Card Deconcentrator

**Step 1:** Click “ASI 5InOut Card” of “Cards” of WEB network management to navigate to card settings page;

**Step 2:** Click “Card Type” to choose “Deconcentrator”;

**Step 3:** Click “Apply” to validate the parameter;

Sumavision





Fig. 5-43 ASI 5InOut Card Deconcentrator Input Settings

**Step 4:** Click “Input Port” of WEB network management to navigate to input port page;

**Step 5:** Click “Config” to navigate to setting page;

**Step 6:** Choose “Current Card” or “Others” as the input source. When “Others” is chosen, you may navigate to the transparent flow transmission of “Output” of WEB network management to enable the Concentrator to transparently transmit the flow to the Deconcentrator. The setting method details are as shown in 6.3Output Settings;

**Step 7:** Click “Apply” to validate the parameter;



Fig. 5-44 ASI 5InOut Card Deconcentrator Output Settings

**Step 8:** Click “Output Port n” of WEB network management to navigate to Output port page;

**Step 9:** choose the output signal and output packet size of the 4-channel output of the Deconcentrator according to the actual situation;

**Step 10:** Click “Apply” to validate the parameter.

When the shunt input source is set and connected correctly, the output port of corresponding shunt can output the normal shunt signal.

### 5.3.4.3 Parameter

Table 5-16 ASI 5InOut Card Parameter

| Parameter      |                               | Range   | Default        |
|----------------|-------------------------------|---|----------------|
| Alarm          |                               | On/Off  | On             |
| Card Type      |                               | ASI5InOut Card/<br>Concentrator/<br>Deconcentrator/<br>SMPTE 310  | Concentrator   |
| Input          | Appointed PID                 | 0~8191  | 0              |
|                | Alarm                         | On/Off  | On             |
| Output         | Total Bitrate(bps)            | 0~213000000   | 0              |
|                | Packet Format                 | 188 Byte/204 Byte   | 188 Byte       |
|                | Re-generate PCR               | On/Off  | Off            |
|                | Adjust PCR Structure          | On/Off  | Off            |
|                | Alarm                         | On/Off  | On             |
| Concentrator   | Output Bitrate (bps)          | 500000~205000000  | 100000000      |
|                | Packet Format                 | 188 Byte/204 Byte   | 188 Byte       |
|                | Output Multiplexing Delay(us) | 0~19418   | 0              |
|                | Input                         | On/Off  | On             |
|                | Alarm                         | On/Off  | On             |
| Deconcentrator | Input Source                  | Current Card/Others   | Current Card   |
|                | Packet Format                 | Auto/188 Byte/204 Byte  | Auto           |
|                | Alarm                         | On/Off  | On             |
|                | Output Signal Select          | Concentrator Input 1/<br>Concentrator Input 2/<br>Concentrator Input 3/<br>Concentrator Input 4/<br>Concentrator Output | Concentrator 1 |
|                | Packet Format                 | 188 Byte/204 Byte   | 188 Byte       |
|                | Alarm                         | On/Off  | On             |

### 5.3.5 DS3 adapter Card

#### 5.3.5.1 Interface

DS3 adapter Card provides 5 75ΩBNC ports supporting two-way adaptation of ASI and DS3. Definition of each port is shown in Fig. 5-45 DS3 adapter Card:



Fig. 5-45 DS3 adapter Card

### 5.3.5.2 Function

DS3 adapter Card provides 5 BNC ports, which are ASI\_OUT, ASI\_IN, DS3\_OUT1, DS3\_OUT2 and DS3\_IN from left to right. DS3 adapter supports two-way adapted output of ASI and DS3.

#### 5.3.5.2.1 Input setting

##### ASI input setting

When the ASI input is used, the input source shall be connected for the DS3 adapter Card ASI-IN.



Fig. 5-46 DS3 Adapter Card ASI Input Parameter Setting

**Step 1:** click the “ASI In” in the “DS3 adapter Card” of Web network management to log in the ASI input port to set the page;

**Step 2:** click the “Config” on the page to log in the setting page;

**Step 3:** choose “Input” switch to be “On” and set the “Appointed PID” value to be monitored;

**Step 4:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

The monitoring interface shall display the code rate information of the current receiving ASI input source.

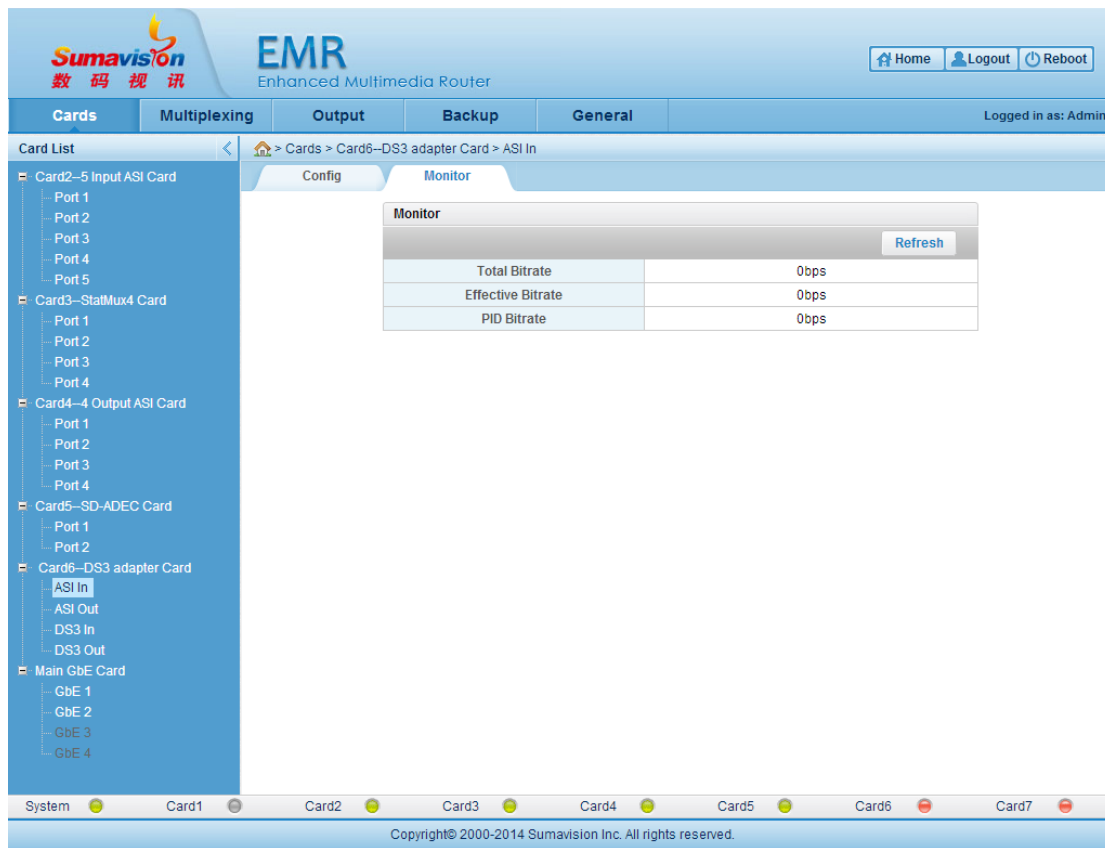


Fig. 5-47 DS3 Adapter Card ASI Input Monitor

## DS3 input setting

When the DS3 input is used, the DS3 input source shall be connected for the DS3 adapter Card DS3-IN.

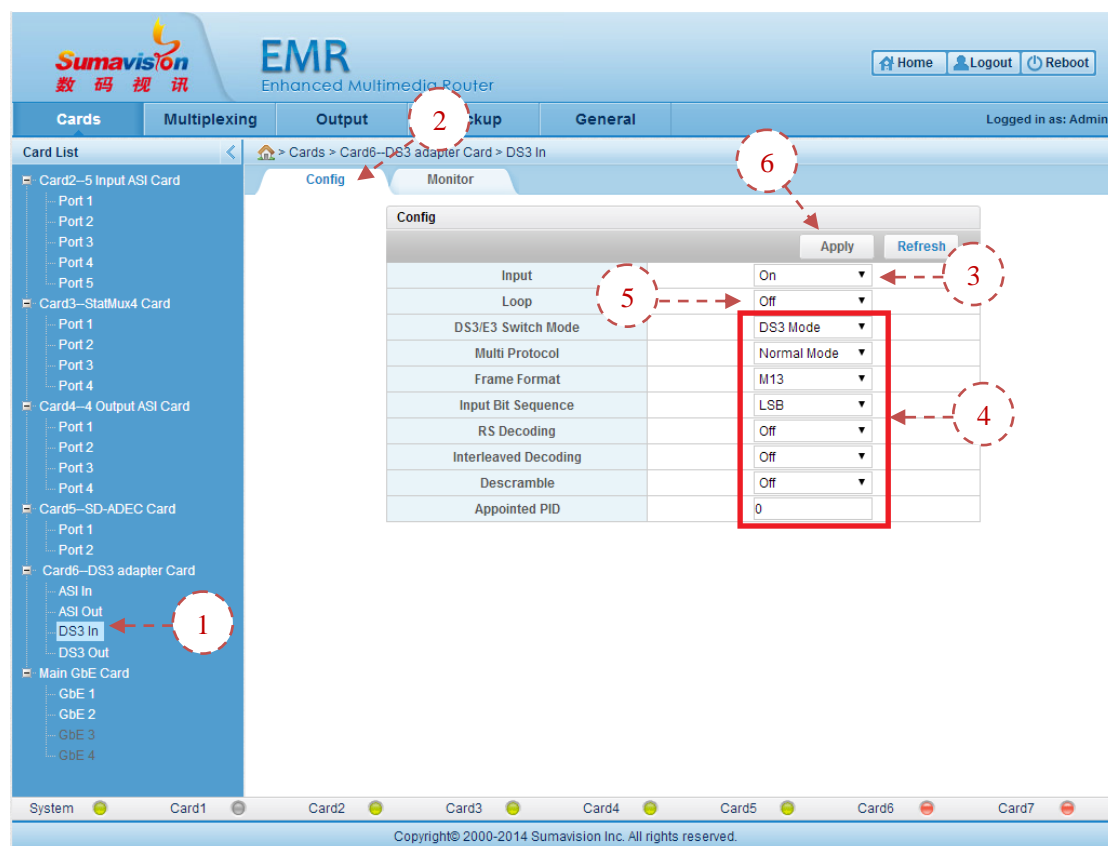


Fig. 5-48 DS3 adapter Card DS3 Input Parameter Setting

**Step 1:** click the “DS3 In” in the “DS3 adapter Card” of Web network management to log in the DS3 input port to set the page;

**Step 2:** click the “Config” on the page to log in the setting page;

**Step 3:** choose “Input” switch to be “On”;

**Step 4:** set the receiving parameter according to the DS3 input source, select the “DS3/E3 Switch Mode”, “Multi Protocol”, “Frame Format”, “Input Bit Sequence”, “RS Decoding”, “Interleaved Decoding” and “Descramble” to realize the normal signal receiving of DS3 input end and set the monitored “Appointed PID”;

**Step 5:** set the “Loop” switch according to the real application situation and choose to switch on or off the function;

Switch off “Loop” function: the ASI or DS3 input and output port of DS3 adapter card can be used for conducting the multiplexing operation both. Corresponding input source can be accessed to the ASI or DS3 input port as per as the neutral method. Multiplex the input program to the output port and set appropriate system code rate in corresponding

port to realize the normal output.

Switch on “Loop” function: the input port and the output port of the DS3 adapter card cannot be used for conducting the corresponding adaptation output rather than the multiplex operation. Namely, the input stream of the DS3 input port can be directly adapted to the output of the ASI output port, while the input stream of the ASI input port can be directly adapted to the output of the DS3 output port and the program is unable to be modified via the multiplex.

**Step 6:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

The monitoring interface shall display the code rate information of the DS3 input source which is received currently.

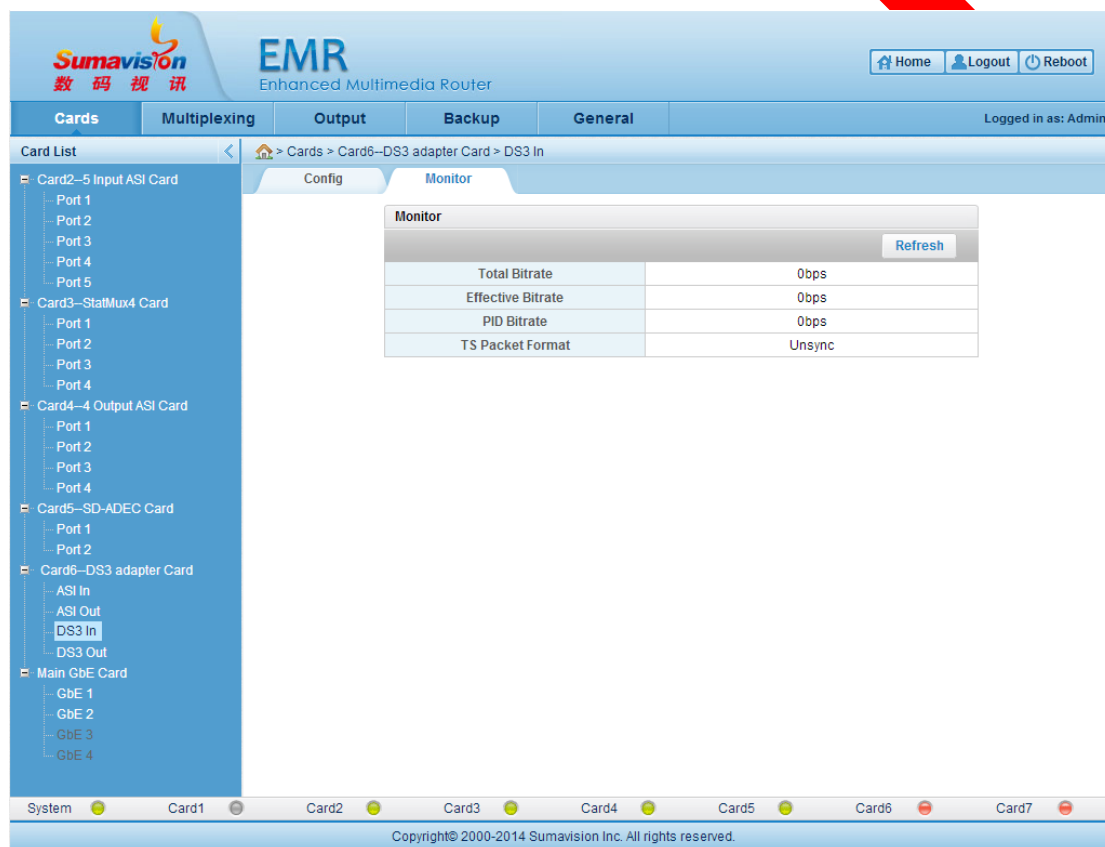


Fig. 5-49 DS3 adapter Card DS3 Input Monitor

### 5.3.5.2.2 Output setting

#### ASI output setting



Fig. 5-50 DS3 adapter Card ASI Output Parameter Setting

**Step 1:** click the “ASI Out” in the “DS3 adapter Card” of Web network management to log in the ASI output port to set the page;

**Step 2:** set the “Total Bitrate” of output port and choose correspondingly outputted “Packet Format”;

**Step 3:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

This page can display the effective code rate value outputted by ASI currently.



### DS3 output setting

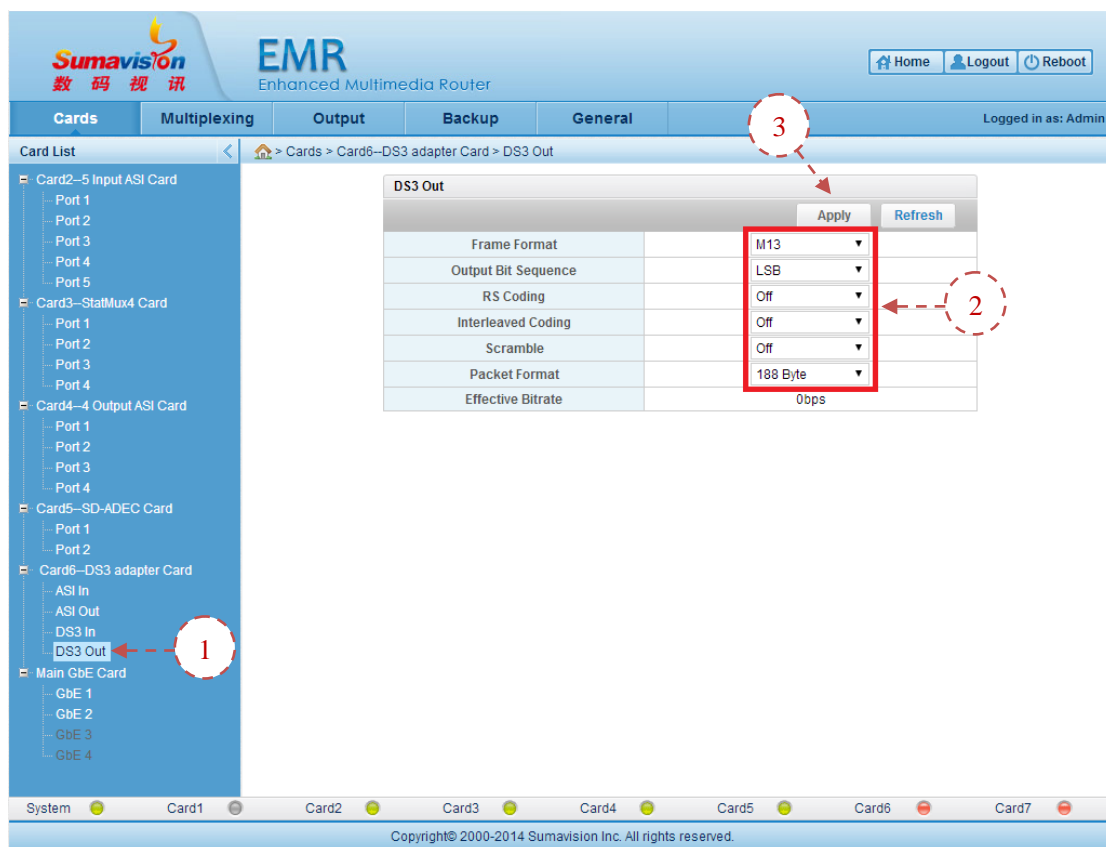


Fig. 5-51 DS3 adapter Card DS3 Output Parameter Setting

**Step 1:** click the “DS3 Out” in the “DS3 adapter Card” of Web network management to log in the DS3 output port to set the page;

**Step 2:** set the DS3 output parameter according to the demand of the real application, select the “Frame Format”, “Output Bit Sequence”, “RS Coding”, “Interleaved Coding”, “Scramble” and “Packet Format”.

**Step 3:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

This page can display the effective code rate value outputted by DS3 currently.

#### 5.3.5.3 Parameter

Table 5-17 DS3 Adapter Card ASI Parameter

| Parameter |                     | Range             | Default  |
|-----------|---------------------|-------------------|----------|
| Input     | Input               | On/Off            | On       |
|           | Appointed PID       | 0 ~ 8191          | 0        |
| Output    | Total Bitrate (bps) | 0~213000000       | 40000000 |
|           | Packet Format       | 188 Byte/204 Byte | 188 Byte |

Table 5-18 DS3 Adapter Card DS3 Parameter

| Parameter |                      | Range                        | Default     |
|-----------|----------------------|------------------------------|-------------|
| Input     | Input                | On/Off                       | On          |
|           | Loop                 | On/Off                       | Off         |
|           | DS3/E3 Switch Mode   | DS3 Mode/E3 Mode             | DS3 Mode    |
|           | Multi Protocol       | Normal Mode/Tandberg/NP Mode | Normal Mode |
|           | Frame Format         | No Frame/ C-bit/ M13         | M13         |
|           | Input Bit Sequence   | MSB/LSB                      | LSB         |
|           | RS Decoding          | On/Off                       | Off         |
|           | Interleaved Decoding | On/Off                       | Off         |
|           | Descramble           | On/Off                       | Off         |
|           | Appointed PID        | 0 ~ 8191                     | 0           |
| Output    | Frame Format         | No Frame/ C-bit/ M13         | M13         |
|           | Input Bit Sequence   | MSB/LSB                      | LSB         |
|           | RS Coding            | On/Off                       | Off         |
|           | Interleaved Coding   | On/Off                       | Off         |
|           | Scramble             | On/Off                       | Off         |
|           | Package Format       | 188 Byte/204 Byte            | 188 Byte    |

### 5.3.6 DS3 In4 Card

#### 5.3.6.1 Interface

DS3 In4 Card provides 4 75ΩBNC ports supporting 4-channel DS3 signal input, as shown in Fig. 5-52 DS3 In4 Card.



Fig. 5-52 DS3 In4 Card

#### 5.3.6.2 Function

ASI supports 4-channel DS3 stream input. Adjust the DS3 receiving parameter of each port according to the front-end sending parameter to ensure the consistent parameter and click “Apply” to normally receive the DS3 stream. The received programme may be made complex for other cards in the “Multiplexing” page of WEB network management. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting.



Fig. 5-53 DS3 In4 Card

### 5.3.6.3 Parameter

Table 5-19 DS3 In4 Card Parameter

| Parameter            | Range              | Default     |
|----------------------|--------------------|-------------|
| Input                | On/Off             | Off         |
| DS3/E3 Switch Mode   | DS3 Mode/E3 Mode   | DS3 Mode    |
| Input Bit Sequence   | MSB/LSB            | MSB         |
| Adaptation Protocol  | Normal Mode/TB6010 | Normal Mode |
| Frame Format         | No Frame/C-bit/M13 | No Frame    |
| RS Decoding          | On/Off             | Off         |
| Interleaved Decoding | On/Off             | Off         |
| Descramble           | On/Off             | Off         |
| Appointed PID        | 0 ~ 8191           | 0           |

### 5.3.7 6-Ch.QAM Card

#### 5.3.7.1 Interface

6-Ch.QAM Card provides one 6-adjacent-channel RF output interface for the output of modulated signals, and one Ethernet interface for connecting and communicating CAS, as shown in Fig. 5-54 6-Ch.QAM Card:

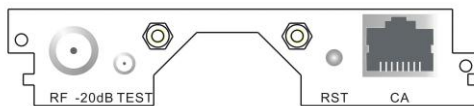


Fig. 5-54 6-Ch.QAM Card

### 5.3.7.2 Function

6-Ch.QAM Card contains a RF output port supporting 8-adjacent frequency output. It can multiplex the program of other input ports to this port and output the program from this port. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting. Set the QAM parameter until the real demand is satisfied. Turn on the RF switch to normally output the RF signal.

- The output frequency point quantity of QAM modulation card with 6 adjacent channels is determined by the authorization obtained. It supports the authorization of 1 to 8 frequency points.

WEB network management may check the status information of 6-Ch.QAM Card and set the card and QAM parameter, as shown in the figure below:



Fig. 5-55 6-Ch.QAM Card Parameter Config



Fig. 5-56 6-Ch.QAM Card Port Parameter Config

### 5.3.7.3 Parameter

Table 5-20 6-Ch.QAM Card Parameter

| Parameter             | Range                                 | Default       |
|-----------------------|---------------------------------------|---------------|
| Alarm                 | On/Off                                | On            |
| Select Scrambler      | 3.0 Scramble Module/<br>Scramble Card | Scramble Card |
| Channel Coding        | ANNEX_A/ ANNEX_B                      | ANNEX_A       |
| Channel BW            | 6MHz/8MHz                             | 8MHz          |
| Spectrum Inversion    | On/Off                                | Off           |
| RF                    | On/Off                                | Off           |
| Output Level(dBuV)    | 95~115                                | 100           |
| Output Frequency(KHz) | 52000~940000                          | 544000        |
| QAM Mode              | 64/128/256QAM                         | 64QAM         |
| Symbol Rate(Ksps)     | 5000~7000                             | 6875          |

### 5.3.8 DVB-T/H-4 Mod. Card

#### 5.3.8.1 Interface

DVB-T/H-4 Mod. Card provides a 4-frequency point output RF port to output the RF signal of DVB-T/H standard of modulated program stream, as shown in Fig. 5-57

DVB-T/H-4 Mod. Card:

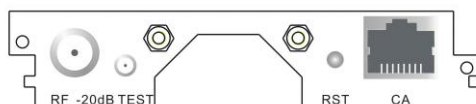


Fig. 5-57 DVB-T/H-4 Mod. Card

### 5.3.8.2 Function

The DVB-T/H-4 Mod. Card is provided with an RF output interface used for modulating output of 8 TS stream routes with four frequency points in stages. It can multiplex the program of other input ports to this port and output the program from this port. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting. Set the QAM parameter until the real demand is satisfied. Turn on the RF switch to normally output the RF signal.

WEB network management may check the status information of DVB-T/H-4 Mod. Card and set the card and QAM parameter, as shown in the figure below:

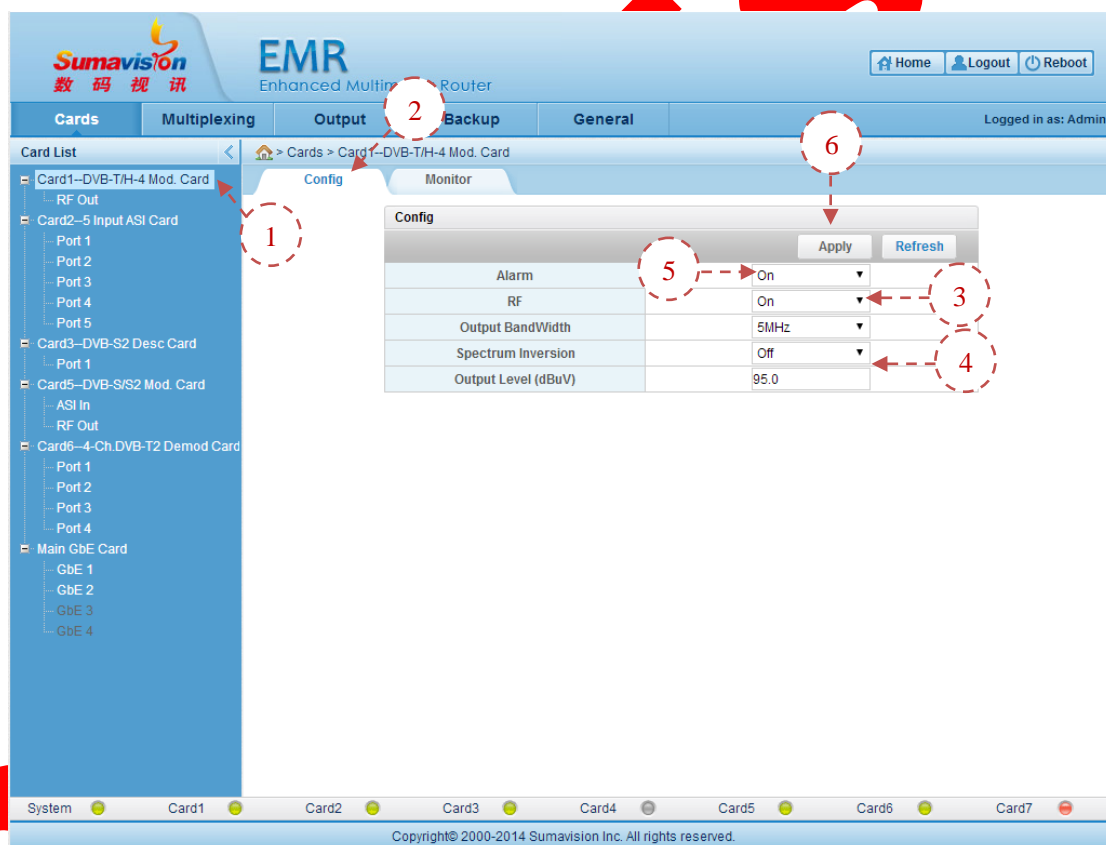


Fig. 5-58 DVB-T/H-4 Mod. Card Parameter Config

**Step 1:** Click “DVB-T/H-4 Mod. Card” of “Cards” of WEB network management to navigate to card settings page;

**Step 2:** Click “Config” to navigate to setting page;

**Step 3:** Open the “RF” switch;

**Step 4:** Set the “Output BandWidth” and “Spectrum Inversion”, and fill in the “Output

Level” according to the information of signal frequency point;

**Step 5:** Set the “Alarm” switch of the card to turn on or off the switch;

**Step 6:** After setting the parameter, click “Apply” to validate the parameter;

The monitoring interface shall display the status of the current output stream, etc.



Fig. 5-59 DVB-T/H-4 Mod. Card Monitor

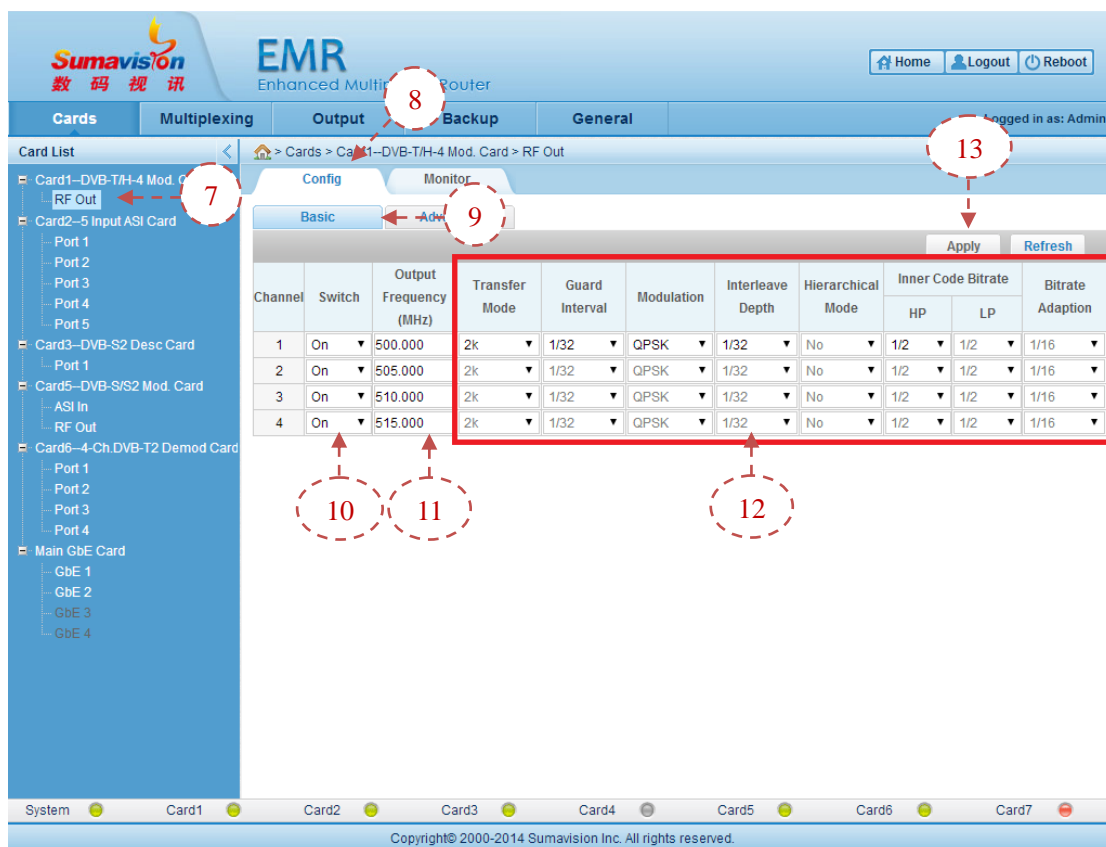


Fig. 5-60 DVB-T/H-4 Mod. Card RF Out Config Basic Parameter Setting

**Step 7:** Click “RF Out” of “DVB-T/H-4 Mod. Card” of WEB network management to navigate to port settings page;

**Step 8:** Click “Config” to navigate to setting page;

**Step 9:** Click “Basic” to navigate to Basic parameter setting page;

**Step 10:** Open the “Switch” of every channel;

**Step 11:** Set the “Output Frequency” according to the real application requirement;

**Step 12:** Set the “Transfer Mode”, “Guard Interval”, “Modulation”, “Interleave Depth”, “Hierarchical Mode”, “Inner Code Bitrate” and “Bitrate Adaption” according to the information of signal frequency point;

**Step 13:** After setting the parameter, click “Apply” to validate the parameter;

=====

□ The output frequency difference value between the output frequency points of DVB-T/H-4 modulation cards shall be greater than the band width.

□ When the output band width values are 5, 6, 7 and 8, the difference between the maximum frequency and the minimum one shall not be greater than 35MHz, 34MHz, 33MHz and 32MHz, respectively.

=====





Fig. 5-61 DVB-T/H-4 Mod. Card RF Out Config Advanced Parameter Setting

**Step 14:** click the “Advanced” on the page to log in the senior parameter setting page;

**Step 15:** set the senior function according to the demand, select the DVB-H signaling of port, cellular identification enable action, cellular identification, T.S. and MPE;

**Step 16:** After setting the parameter, click “Apply” to validate the parameter.

The monitoring interface shall display output code rate information of current output stream.



Fig. 5-62 DVB-T/H-4 Mod. Card RF Out Monitor

### 5.3.8.3 Parameter

Table 5-21 DVB-T/H-4 Mod. Card Parameter

| Parameter           | Range               | Default |
|---------------------|---------------------|---------|
| Alarm               | On/Off              | On      |
| RF                  | On/Off              | On      |
| Output BandWidth    | 5MHz/6MHz/7MHz/8MHz | 5MHz    |
| Spectrum Inversion  | On/Off              | Off     |
| Output Level (dBuV) | 90~120              | 95      |

Table 5-22 DVB-T/H-4 Mod. Card RF Out Parameter

| Parameter                 | Range                              | Default |
|---------------------------|------------------------------------|---------|
| Switch                    | On/Off                             | On      |
| Output Frequency (MHz)    | 42~870                             | 500     |
| Transfer Mode             | 2k/4k/8k                           | 2k      |
| Guard Interval            | (1/4)/ (1/8)/ (1/16)/ (1/32)       | (1/32)  |
| Modulation                | QPSK/16QAM/64QAM                   | QPSK    |
| Interleave Depth          | (1/4)/ (1/8)/ (1/16)/ (1/32)       | (1/32)  |
| Hierarchical Mode         | No/Alpha1/Alpha2/Alpha3            | No      |
| Inner Code Bitrate(HP/LP) | (1/2)/ (2/3)/ (3/4)/ (5/6) / (7/8) | (1/2)   |
| Bitrate Adaption          | On/Off                             | On      |
| DVB-H Signaling           | On/Off                             | Off     |
| Cell ID Enabled           | Enable/Disable                     | Disable |
| Cell ID                   | 0~65535                            | 0       |
| T.S. (HP/LP)              | On/Off                             | Off     |
| MPE (HP/LP)               | On/Off                             | Off     |

### 5.3.9 DVB-S/S2 Mod. Card

#### 5.3.9.1 Interface

DVB-S/S2 Mod. Card bases on EMR3.0 platform to provide functions of single-channel ASI input and single-channel RF output. It is used to modulate the program stream to the RF signal of DVB-S/S2 standard, as shown in Fig. 5-63 DVB-S/S2 Mod. Card:



Fig. 5-63 DVB-S/S2 Mod. Card

#### 5.3.9.2 Function

DVB-S/S2 Mod. Card bases on EMR3.0 platform to support 1-channel ASI input (no Multiplexing) and 1-channel RF modulated output. Its functions include: when “Backboard Muxing TS” is chosen, it may choose the input stream of other cards for modulated output and when “Local ASI TS” is chosen, it realizes the modulated output of the ASI input stream of the current card according to DVB-S/S2 modulation standard to output the frequency signal. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting. Parameter setting page of WEB network management is as follows:



Fig. 5-64 DVB-S/S2 Mod. Card

### 5.3.9.3 Parameter

Table 5-23 DVB-S/S2 Mod. Card Parameter

| Parameter                | Range  | Default             |
|--------------------------|--|---------------------|
| Alarm Switch             | ON/OFF   | ON                  |
| Input Source             | Backboard Muxing TS/Local ASI<br>TS                              | Backboard Muxing TS |
| Modulation Standard      | DVB-S/DVB-S2   | DVB-S               |
| FEC Rate & Constellation | (QPSK-1/2)/ (QPSK-2/3)/<br>(QPSK-3/4)/ (QPSK-5/6)/<br>(QPSK-7/8) | QPSK-1/2.           |
| FEC-Frame Type           | Normal/Short   | Normal              |
| Pilot                    | OFF/ON   | OFF                 |
| Roll off Factor          | 35%/25%/20%  | 35%                 |
| Symbol Rate (Ksps)       | 50-45000Ksps   | 27500               |
| Output Level (dBuV)      | 73-113dBuV   | 95                  |
| Output Frequency(KHz)    | 950000-2150000KHz  | 950000              |
| RF                       | ON/OFF   | ON                  |

### 5.3.10 MPEG2 SD AENC Card

#### 5.3.10.1 Interface

MPEG2 SD AENC Card provides the video input interface of 75ΩBNC, and provides audio input interface as the phoenix printed circuit board terminals of MINI COMBICON (MC) socket and plug, plug direction parallel with conductors axial. MPEG2 SD AENC Card is shown in Fig. 5-65 MPEG2 SD AENC Card:

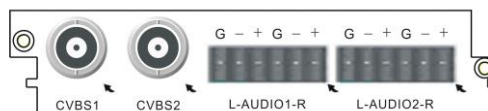


Fig. 5-65 MPEG2 SD AENC Card

#### 5.3.10.2 Function

MPEG2 SD AENC Card may code 2-channel analog signal to code the input analog video and analog audio to TS. The coded programme may be made complex for the output card in “Multiplexing” page of WEB network management. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting. WEB network management may set the coding parameter of MPEG2 SD AENC Card, as shown in the figure below:



Fig. 5-66 MPEG2 SD AENC Card

## 5.3.10.3 Parameter

Table 5-24 MPEG2 SD AENC Card Parameter

| Type      | Parameter             | Range  | Default      |
|-----------|-----------------------|--|--------------|
| Video     | Switch                | On/Off   | On           |
|           | No Source Control     | Color bar/No Output  | Color bar    |
|           | Format                | PAL/NTSC/AUTO/PAL-M/PAL-N/SECAM  | PAL          |
|           | Video Level           | 0-255  | 128          |
|           | Chroma Phase          | 0-255  | 128          |
|           | Black Level           | 0-255  | 128          |
|           | Chroma Gain           | 0-255  | 128          |
|           | Bitrate (bps)         | 1500000-15000000   | 4200000      |
|           | Bitrate Mode          | CBR/VBR  | CBR          |
|           | VBR (bps)             | 1300000-14800000   | 3800000      |
|           | GOP Structure         | III/IPP/IBP/IBBP   | IBBP         |
|           | Gop Size              | 4-30   | 12           |
|           | Aspect Ratio          | 4:3/16:9   | 4:3          |
|           | Resolution            | D1/(3/4D1)/HD1/SIF   | D1           |
| MP2 Audio | MP2 Coding            | On/Off   | On           |
|           | MP2 Mode              | stereo/joint stereo /Dual Channel/Single Channel   | stereo       |
|           | MP2 Volume            | -24db-6db  | 0            |
|           | MP2 Bitrate           | 64Kbps/96Kbps/112 Kbps/ 128Kbps/ 160Kbps/192 Kbps/224 Kbps/256 Kbps/ 320 Kbps/384Kbps  | 256Kbps      |
|           | MP2 Sample Rate       | 48kHz/44.1kHz/32kHz  | 48kHz        |
| AC3 Audio | AC3 Coding            | On/Off   | Off          |
|           | AC3 Mode              | 2/0 / 1/0  | 2/0          |
|           | AC3 Volume            | -20db-20db   | 0            |
|           | AC3 Bitrate           | 56Kbps/64Kbps/80Kbps/96Kbps/ 112 Kbps/ 128Kbps/ 160Kbps/ 192 Kbps/224 Kbps/256 Kbps/ 320 Kbps/384Kbps/448Kbps/ 512Kbps/576Kbps/640Kbps | 192Kbps      |
|           | AC3 Sample Rate       | 48kHz/44.1kHz/32kHz  | 48kHz        |
|           | AC3 Coding Delay (ms) | -500-500   | 0            |
| DRA Audio | DRA Coding            | On/Off   | Off          |
|           | DRA Mode              | stereo   | stereo       |
|           | DRA Bitrate           | 128Kbps/192Kbps  | 192Kbps      |
|           | DRA Sample Rate       | 48kHz  | 48kHz        |
|           | DRA Coding Delay (ms) | -500-500   | 300          |
| TS        | Multiplex             | On/Off   | On           |
|           | Service ID            | 1-65535  | Slot releted |
|           | Service Name          | 0~31 characters  | Slot releted |
|           | Service Provider      | 0~31 characters  | Slot releted |
|           | PCR PID               | 32-8190  | Slot releted |

|         |                 |                 |              |
|---------|-----------------|-----------------|--------------|
|         | PMT PID         | 32-8190         | Slot related |
|         | Video PID       | 32-8190         | Slot related |
|         | MP2 PID         | 32-8190         | Slot related |
|         | AC3 PID         | 32-8190         | Slot related |
|         | DRA PID         | 32-8190         | Slot related |
|         | CC              | On/Off          | Off          |
| VBI     | CC Even Field   | On/Off          | Off          |
|         | CC Odd Field    | On/Off          | Off          |
|         | TT              | On/Off          | Off          |
|         | Even Field Line | Line10-Line22   | Line 21      |
|         | Odd Field Line  | Line10-Line22   | Line 21      |
|         | TT PID          | 32-8190         | Slot related |
| General | Audio Select    | AC3 2.0/DRA 2.0 | AC3 2.0      |
|         | Alarm           | On/Off          | On           |

### 5.3.11 MPEG2 SD DENC Card

#### 5.3.11.1 Interface

The digital video input port of the MPEG2 SD DENC Card is 75ΩBNC port; the audio input port is MINI COMBICON (MC for short) socket and plug of PCB terminal of Phoenix, and the plugging direction is parallel to the wire axis. Distance between MC socket and plug is small, outline dimension is low, wiring capacity is abundant and the socket and plug are protected against incorrect plugging and dislocation, as shown in Fig. 5-67 MPEG2 SD DENC Card:



Fig. 5-67 MPEG2 SD DENC Card

#### 5.3.11.2 Function

MPEG2 SD DENC Card may code 2-channel digital signal to code the input digital video and analog audio to TS. The coded programme may be made complex for the output card in “Multiplexing” page of WEB network management. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting. WEB network management may set the coding parameter of MPEG2 SD DENC Card, as shown in the figure below:



Fig. 5-68 MPEG2 SD DENC Card

### 5.3.11.3 Parameter

Table 5-25 MPEG2 SD DENC Card Parameter

| Type      | Parameter         | Range  | Default    |
|-----------|-------------------|--|------------|
| Video     | Switch            | On/Off   | On         |
|           | Format            | PAL/NTSC/AUTO/PAL-M/PAL-N/SECAM  | PAL        |
|           | Bitrate Mode      | CBR/VBR  | CBR        |
|           | Bitrate (bps)     | 1500000-15000000   | 4200000    |
|           | VBR (bps)         | 1300000-14800000   | 3800000    |
|           | GOP Structure     | III/IPP/IBP/IBBP   | IBBP       |
|           | Gop Size          | 4-30   | 12         |
|           | Aspect Ratio      | 4:3/16:9   | 4:3        |
|           | Resolution        | D1/3/4D1/HD1/SIF   | D1         |
|           | No Source Control | Color bar/No Output  | Color bar  |
| MP2 Audio | MP2 Coding        | On/Off   | On         |
|           | MP2 Mode          | stereo/joint stereo /Dual Channel/Single Channel   | stereo     |
|           | Embedded Channel  | channel1,2/channel3,4/channel5,6/<br>channel7,8/channel9,10/channel11,12/<br>channel13,14/channel15,16 | channel1,2 |
|           | No Source Control | Silence/No output  | Silence    |
|           | MP2 Input         | Digital/Embedded   | Digital    |
|           | MP2 Volume        | -24db-6db  | 0          |



|                  |                              |  |                 |
|------------------|------------------------------|--|-----------------|
|                  | <b>MP2 Bitrate</b>           | 64Kbps/96Kbps/112 Kbps/ 128Kbps/<br>160Kbps/192 Kbps/224 Kbps/256 Kbps/<br>320 Kbps/384Kbps  | 256Kbps         |
|                  | <b>MP2 Sample Rate</b>       | 48kHz/44.1kHz/32kHz  | 48kHz           |
| <b>AC3 Audio</b> | <b>AC3 Coding</b>            | On/Off   | Off             |
|                  | <b>AC3 Mode</b>              | 2/0 / 1/0  | 2/0             |
|                  | <b>AC3 Volume</b>            | -20db-20db   | 0               |
|                  | <b>AC3 Input</b>             | Digital/Embedded   | Embedded        |
|                  | <b>AC3 Bitrate</b>           | 56Kbps/64Kbps/80Kbps/96Kbps/<br>112 Kbps/ 128Kbps/ 160Kbps/<br>192 Kbps/224 Kbps/256 Kbps/<br>320 Kbps/384Kbps/448Kbps/<br>512Kbps/576Kbps/640Kbps | 192Kbps         |
|                  | <b>AC3 Sample Rate</b>       | 48kHz/44.1kHz/32kHz  | 48kHz           |
|                  | <b>AC3 Coding Delay (ms)</b> | -500-500   | 0               |
| <b>DRA Audio</b> | <b>DRA Coding</b>            | On/Off   | Off             |
|                  | <b>DRA Mode</b>              | stereo   | stereo          |
|                  | <b>DRA Bitrate</b>           | 128Kbps/192Kbps  | 192Kbps         |
|                  | <b>DRA Input</b>             | Digital/Embedded   | Embedded        |
|                  | <b>DRA Sample Rate</b>       | 48kHz  | 48kHz           |
|                  | <b>DRA Coding Delay (ms)</b> | -500-500   | 300             |
| <b>TS</b>        | <b>Multiplex</b>             | On/Off   | On              |
|                  | <b>Service ID</b>            | 1-65535  | Slot releted    |
|                  | <b>Service Name</b>          | 0~31 characters  | Slot releted    |
|                  | <b>Service Provider</b>      | 0~31 characters  | Slot releted    |
|                  | <b>PCR PID</b>               | 32-8190  | Slot releted    |
|                  | <b>PMT PID</b>               | 32-8190  | Slot releted    |
|                  | <b>Video PID</b>             | 32-8190  | Slot releted    |
|                  | <b>MP2 PID</b>               | 32-8190  | Slot releted    |
|                  | <b>AC3 PID</b>               | 32-8190  | Slot releted    |
|                  | <b>DRA PID</b>               | 32-8190  | Slot releted    |
| <b>VBI</b>       | <b>CC</b>                    | On/Off   | Off             |
|                  | <b>CC Even Field</b>         | On/Off   | Off             |
|                  | <b>CC Odd Field</b>          | On/Off   | Off             |
|                  | <b>TT</b>                    | On/Off   | Off             |
|                  | <b>Even Field Line</b>       | Read only  | Line 21         |
|                  | <b>Odd Field Line</b>        | Read only  | Line 21         |
|                  | <b>TT PID</b>                | 32-8190  | Slot releted    |
|                  | <b>General</b>               | <b>Audio Select</b>  | AC3 2.0/DRA 2.0 |
|                  | <b>Alarm</b>                 | On/Off   | On              |

### 5.3.12 Analog SD ENC Card

#### 5.3.12.1 Interface

Analog SD ENC Card provides the video input interface of 75ΩBNC, and provides audio input interface as the phoenix printed circuit board terminals of MINI COMBICON (MC) socket and plug, plug direction parallel with conductors axial. Analog SD ENC Card is shown in Fig. 5-69 Analog SD ENC Card:

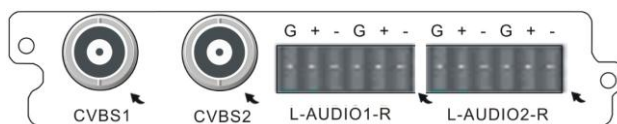


Fig. 5-69 Analog SD ENC Card

#### 5.3.12.2 Function

Analog SD ENC Card may code 2-channel analog signal to code the input analog video and analog audio to TS. The coded programme may be made complex for the output card in “Multiplexing” page of WEB network management. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting. WEB network management may set the coding parameter of Analog SD ENC Card, as shown in the figure below:

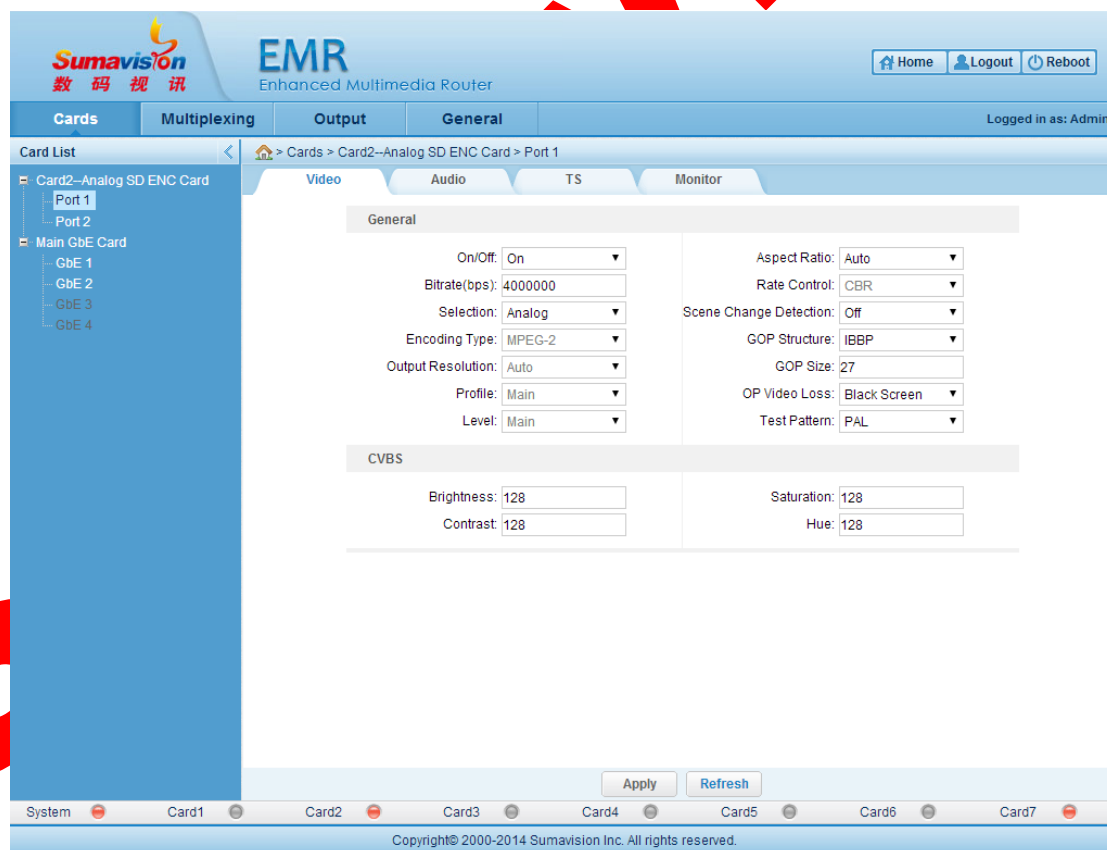


Fig. 5-70 Analog SD ENC Card

## 5.3.12.3 Parameter

Table 5-26 Analog SD ENC Card Parameter

| Type  | Parameter              | Range   | Default         |
|-------|------------------------|---|-----------------|
| Video | On/Off                 | On/Off  | On              |
|       | Bitrate(bps)           | 300000~60000000   | 4000000         |
|       | Selection              | SDI/Color Bar/Black Page  | SDI             |
|       | Encoding Type          | MPEG-2  | MPEG-2          |
|       | Output Resolution      | Auto  | Auto            |
|       | Profile                | Main  | Main            |
|       | Level                  | Main  | Main            |
|       | Aspect Ratio           | Auto/4:3/16:9   | Auto            |
|       | Rate Control           | CBR   | CBR             |
|       | Scene Change Detection | Off/On  | On              |
|       | GOP Structure          | IIII/IPPP/IBP/IBBP/IBBBP  | IBBP            |
|       | GOP Size               | 1~48  | 27              |
|       | OP Video Loss          | No Video PID/Color Bar/Black Page   | Color Bar       |
|       | Test Pattern           | PAL/NTSC  | PAL             |
|       | Brightness             | 0~255   | 128             |
|       | Saturation             | 0~255   | 128             |
|       | Contrast               | 0~255   | 128             |
| Hue   | 64~191                 | 128   |                 |
| Audio | Status                 | Encode/Off  | Encode          |
|       | Encoding Type          | AAC-LC/HE-AAC v1/HE-AAC V2/MPEG-1 Layer II/Dolby Digital/Dolby Digital Plus | MPEG-1 Layer II |
|       | LR Channel             | Analog/Test Tone  | Analog          |
|       | Bitrate                | 32kbps~384kbps  | 128kbps         |
|       | Volume(dB)             | -20~20  | 0               |
|       | Mode                   | Momo/Stereo   | Stereo          |
|       | Delay(ms)              | -500~1000   | 0               |
| TS    | Service ID             | 1-65535   | Slot releted    |
|       | Service Name           | 0~31 characters   | Slot releted    |
|       | Service Provider       | 0~31 characters   | Slot releted    |
|       | PMT PID                | 32-8190   | Slot releted    |
|       | PCR PID                | 32-8190   | Slot releted    |
|       | Video PID              | 32-8190   | Slot releted    |
|       | Audio 1 PID            | 32-8190   | Slot releted    |
|       | Audio 2 PID            | 32-8190   | Slot releted    |

### 5.3.13 Digital ENC Card

#### 5.3.13.1 Interface

The digital video input port and the audio input port of the Digital ENC Card are 75ΩBNC port, as shown in Fig. 5-71 Digital ENC Card:



Fig. 5-71 Digital ENC Card

#### 5.3.13.2 Function

Digital ENC Card may code 2-channel digital signal to code the input digital video and analog audio to TS. The coded programme may be made complex for the output card in “Multiplexing” page of WEB network management. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting. WEB network management may set the coding parameter of Digital ENC Card, as shown in the figure below.

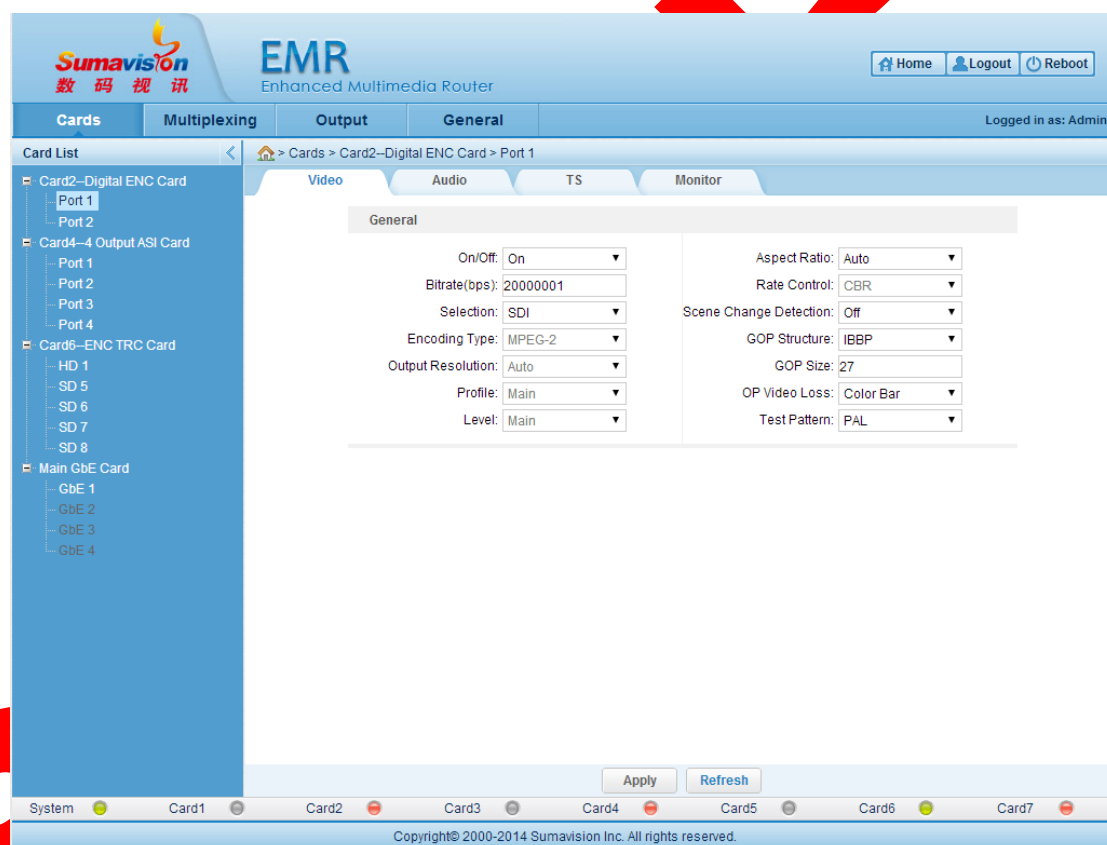


Fig. 5-72 Digital ENC Card

#### 5.3.13.3 Parameter

Table 5-27 Digital ENC Card Parameter

| Type             | Parameter              | Range   | Default         |
|------------------|------------------------|---|-----------------|
| Video            | On/Off                 | On/Off  | On              |
|                  | Bitrate(bps)           | 300000~60000000   | 4000000         |
|                  | Selection              | SDI/Color Bar/Black Page  | SDI             |
|                  | Encoding Type          | MPEG-2  | MPEG-2          |
|                  | Output Resolution      | Auto  | Auto            |
|                  | Profile                | Main  | Main            |
|                  | Level                  | Main  | Main            |
|                  | Aspect Ratio           | Auto/4:3/16:9   | Auto            |
|                  | Rate Control           | CBR   | CBR             |
|                  | Scene Change Detection | Off/On  | On              |
|                  | GOP Structure          | IIII/IPPP/IBP/IBBP/IBBBP  | IBBP            |
|                  | GOP Size               | 1~48  | 27              |
|                  | OP Video Loss          | No Video PID/Color Bar/Black Page/Freezing Frame                            | Color Bar       |
|                  | Test Pattern           | PAL/NTSC  | PAL             |
| Audio            | Status                 | Encode/Off  | Encode          |
|                  | Encoding Type          | AAC-LC/HE-AAC v1/HE-AAC V2/MPEG-1 Layer II/Dolby Digital/Dolby Digital Plus | MPEG-1 Layer II |
|                  | LR Channel             | SDI-Ch 1,2<br>SDI-CH 3,4<br>.....<br>SDI CH15,16<br>Test Tone               | SDI-Ch 1,2      |
|                  | Bitrate                | 32kbps~384kbps  | 128kbps         |
|                  | Volume(dB)             | -20~20  | 0               |
|                  | Mode                   | Momo/Stereo   | Stereo          |
|                  | Delay(ms)              | -500~1000   | 0               |
|                  | TS                     | Service ID  | 1-65535         |
| Service Name     |                        | 0~31 characters   | Slot releted    |
| Service Provider |                        | 0~31 characters   | Slot releted    |
| PMT PID          |                        | 32-8190   | Slot releted    |
| PCR PID          |                        | 32-8190   | Slot releted    |
| Video PID        |                        | 32-8190   | Slot releted    |
| Audio 1 PID      |                        | 32-8190   | Slot releted    |
| Audio 2 PID      |                        | 32-8190   | Slot releted    |

### 5.3.14 SD-ADEC Card

#### 5.3.14.1 Interface

SD-ADEC Card provides the video output interface of 75ΩBNC, and provides audio output interface as the phoenix printed circuit board terminals of MINI COMBICON (MC)

socket and plug, plug direction parallel with conductors axial. SD-ADEC Card is shown in Fig. 5-73 SD-ADEC Card:

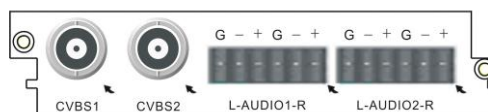


Fig. 5-73 SD-ADEC Card

### 5.3.14.2 Function

The SD-ADEC Card can be used for decoding the SD program, support the output of two video routes and two audio routes and decoding and outputting the TS stream to the television set or monitor. The decoded program can be selected via multiplex. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting. WEB network management may check the status information of SD-ADEC Card and set the card parameter.



Fig. 5-74 SD-ADEC Card Parameter

The board card “License” setting and the current “License Status” display can be realized on SD-ADEC Card setting interface. In addition, such interface can be used for upgrading the DSP drive and displaying the current status. The DSP drive upgrading method is as shown in DSP drive upgrading method for SD-ADEC Card.

- ④ The audio decoding type supported by the SD-ADEC Card requires corresponding authorization support. It can be realized by purchasing the authorization.
- ④ The authorization status is divided into “EAC3, HEAAC”, “HEAAC” or “AC3”, which support “All Audio Types”, “AAC Audio” or “Dolby Audio”, respectively.

When the SD-ADEC Card is used for decoding, it shall multiplex the program to be decoded in the multiplex interface to the output port of the SD-ADEC Card at first. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting. The introduction to board card parameter setting is as below:



Fig. 5-75 SD-ADEC Card Port Parameter Config

**Step 1:** click the “port n” in the “SD-ADEC Card” of WEB network management to log in the port setting page;

**Step 2:** click the “Config” on the page to log in the port setting page;

**Step 3:** click the “Decode” switch on the page to be “On” and select the Error Handle” and the “Sync Mode”;

**Step 4:** set the “Service” and choose corresponding program or “Custom”. When the

“Custom” decoding is selected, it needs to set corresponding “PCR PID”, “Video PID”, “Audio PID” and “Teletext PID” to realize the user-defined decoding;

**Step 5:** set “Video Decoding”, “Audio Decoding” and corresponding “VBI” parameter according to the demand of real application.

**Step 6:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

The monitoring interface can display relevant information of currently-decoded program.

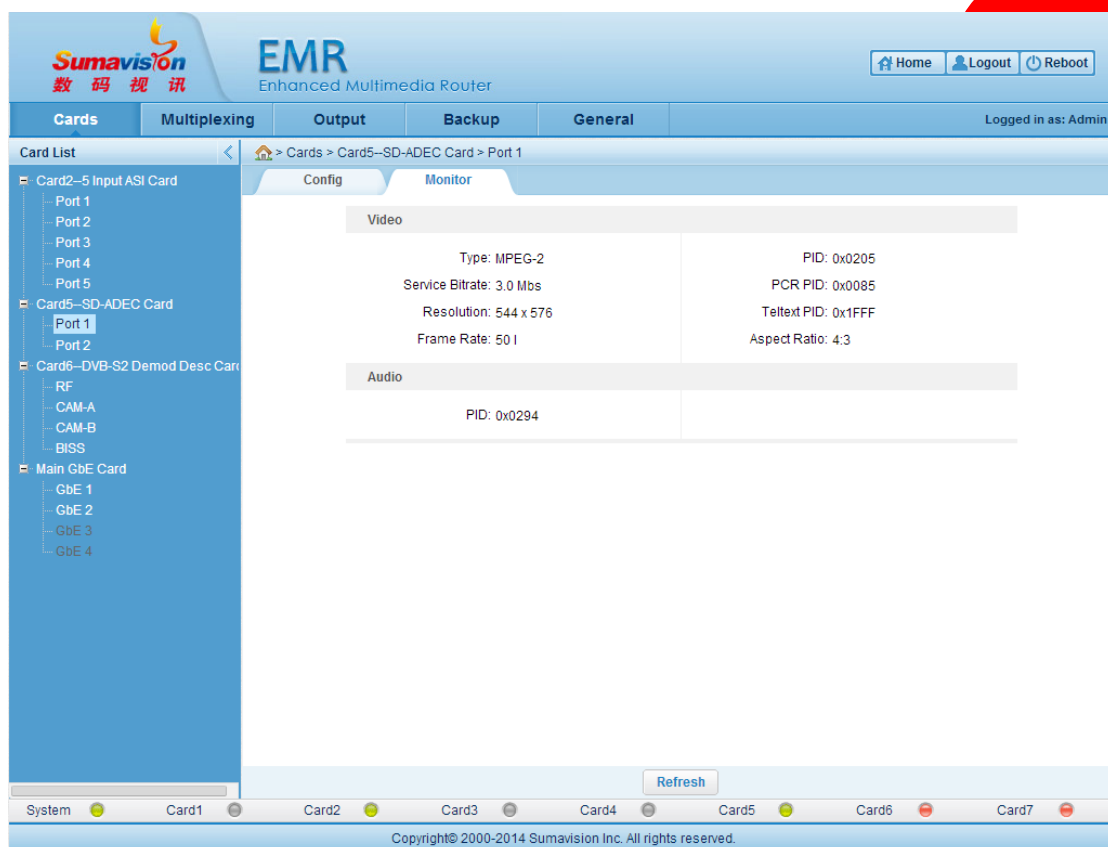


Fig. 5-76 SD-ADEC Card Port Monitor

### 5.3.14.3 Parameter



Table 5-28 SD-ADEC Card Parameter

| Type             | Parameter           | Range                                | Default     |
|------------------|---------------------|--------------------------------------|-------------|
| General          | Decode              | On/Off                               | On          |
|                  | Error Handle        | Freeze/Black/Colorbar/No Output      | Black       |
|                  | Sync Mode           | PCR Master/Video Master/Audio Master | PCR Master  |
| Service Decoding | Service             | Custom/Set Program                   | Set Program |
|                  | PCR PID             | 0~8191                               | 8191        |
|                  | Video PID           | 0~8191                               | 8191        |
|                  | Audio PID           | 0~8191                               | 8191        |
|                  | Teletext PID        | 0~8191                               | 8191        |
| Video Decoding   | Video Pattern       | Auto/PAL/NTSC/SECAM/PAL-N/PAL-M      | Auto        |
|                  | Aspect Ratio        | LetterBox/FullPage/centerCut         | LetterBox   |
|                  | Image Scaling       | Auto/4:3/16:9                        | Auto        |
| Audio Decoding   | Output Mute         | Normal/Mute                          | Normal      |
|                  | Vol Attenuation(dB) | 0~30                                 | 0           |
|                  | Audio Mode          | Stereo/Left Channel/Right Channel    | Stereo      |
| VBI              | CC                  | Off/On                               | Off         |
|                  | CC Delay(frame)     | 1~25                                 | 1           |

### 5.3.15 Descramble Card

#### 5.3.15.1 Interface

The Descramble Card can provide two CAM card slots for de-scrambling the back board programs, as shown in Fig. 5-77 Descramble Card:



Fig. 5-77 Descramble Card

#### 5.3.15.2 Function

The Descramble Card is used for de-scrambling the scrambled program received by the back board. The received de-scrambling program can be multiplexed to the Descramble Card via the multiplex interface. The clear stream is refreshed to other output ports of the backboard by its input port after being de-scrambled by the Descramble Card to realize the de-scrambling function. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting.

It can set the CAM de-scrambling parameter and the BISS de-scrambling parameter of the Descramble Card by the WEB network management.

### 5.3.15.2.1 CAM descrambling setting

When the CA scrambling program is found in the received program, it can set the descrambling information in the “CAM Setting” page. After the de-scrambling, the clear-stream program is the multiplex output. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting.

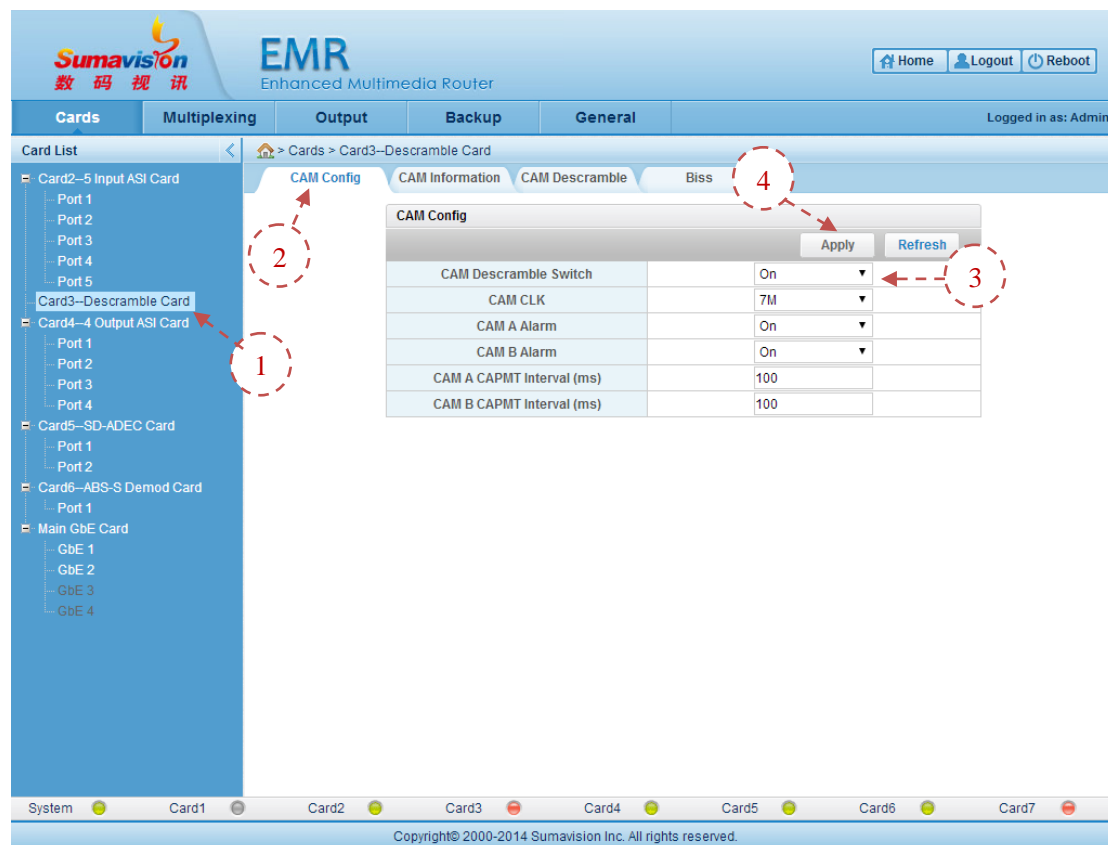


Fig. 5-78 Descramble Card CAM Config

**Step 1:** click WEB network management “Descramble Card” to log in the board card setting page;

**Step 2:** click the “CAM Config” on the page to log in the CAM setting page;

**Step 3:** choose “On” in the “CAM Descramble Switch; choose the “CAM CLK” according to the demand. Choose “On” via the Alarm switch of CAM card and set the CAPMT interval of CAM card.

**Step 4:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

When the CAM card is inserted on the board card, the CAM information page will show the CAS\_ID of corresponding card.



Fig. 5-79 Descramble Card CAM Descrambling

**Step 5:** click the “CAM Descramble” on the “Descramble Card” of WEB network management;

**Step 6:** choose the de-scrambling CAM card for each program;

**Step 7:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect. In this moment, the current de-scrambling status of program can be displayed on the de-scrambling location on the page.

### 5.3.15.2.2 BISS descrambling setting

When the BISS scrambling program is found in the received program, it can set the descrambling information in BISS. After the de-scrambling, the clear-stream program is the multiplex output. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting.



Fig. 5-80 Descramble Card BISS Setting

**Step 1:** click WEB network management “Descramble Card” to log in the board card setting page;

**Step 2:** click the “BISS” on the page to log in the BISS de-scrambling setting page;

**Step 3:** choose “On” on the “BISS Descramble” Switch;

**Step 4:** set the de-scrambling secrete key information, choose “Biss mode”, set the secrete “Key”, choose and set the “ID”;

**Step 5:** set the BISS program de-scrambling, fill the “Service ID” to be de-scrambled and choose corresponding secrete key;

**Step 6:** click the “Apply” on the page to put the setting parameter into effect.

### 5.3.15.3 Parameter

Table 5-29 Descramble Card CAM Descrambling Parameter

| Parameter                | Range                     | Default       |
|--------------------------|---------------------------|---------------|
| CAM Descramble Switch    | On/Off                    | Off           |
| CAM CLK                  | 7M/9M/12M/15M             | 7M            |
| CAM A Alarm              | On/Off                    | Off           |
| CAM B Alarm              | On/Off                    | Off           |
| CAM A CAPMT Interval(ms) | 0~255                     | 100           |
| CAM B CAPMT Interval(ms) | 0~255                     | 100           |
| CAM                      | No Descramble/CAM A/CAM B | No Descramble |

Table 5-30 Descramble Card BISS Descrambling Parameter

| Parameter                         | Range                                       | Default     |
|-----------------------------------|---|-------------|
| Biss Descramble                   | On/Off                                      | Off         |
| Biss Mode                         | Biss Mode 1/Biss Mode E                     | Biss Mode 1 |
| Key                               | (Length of Key should be between 12 and 16) | none        |
| ID Mode                           | Injected ID/Buried ID                       | Injected ID |
| ID                                | (Length of ID should be between 12 and 16)  | none        |
| Service ID                        | 0~65535                                     | 0           |
| Key Select                        | Key1~Key8                                   | Key1~Key8   |
| Select Key 1 For All The Programs | On/Off                                      | Off         |

### 5.3.16 DVB-S2 Desc Card

#### 5.3.16.1 Interface

DVB-S2 Desc Card provides 1 RF input port, 1 RF looping output port and 2 CAM card slots for the reception and descrambling of RF signal of DVB-S/DVB-S2 standard, as shown in Fig. 5-81 DVB-S2 Desc Card:

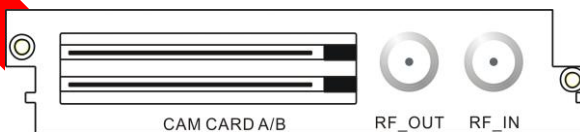


Fig. 5-81 DVB-S2 Desc Card

#### 5.3.16.2 Function

DVB-S2 Desc Card provides 1 RF input port and 1 RF looping output port for the reception and descrambling of DVB-S/DVB-S2 standard of RF signal.

WEB network management may set the receiving information, CAM descrambling parameter and BISS descrambling parameter of DVB-S2 Desc Card.

### 5.3.16.2.1 Receiving Parameter

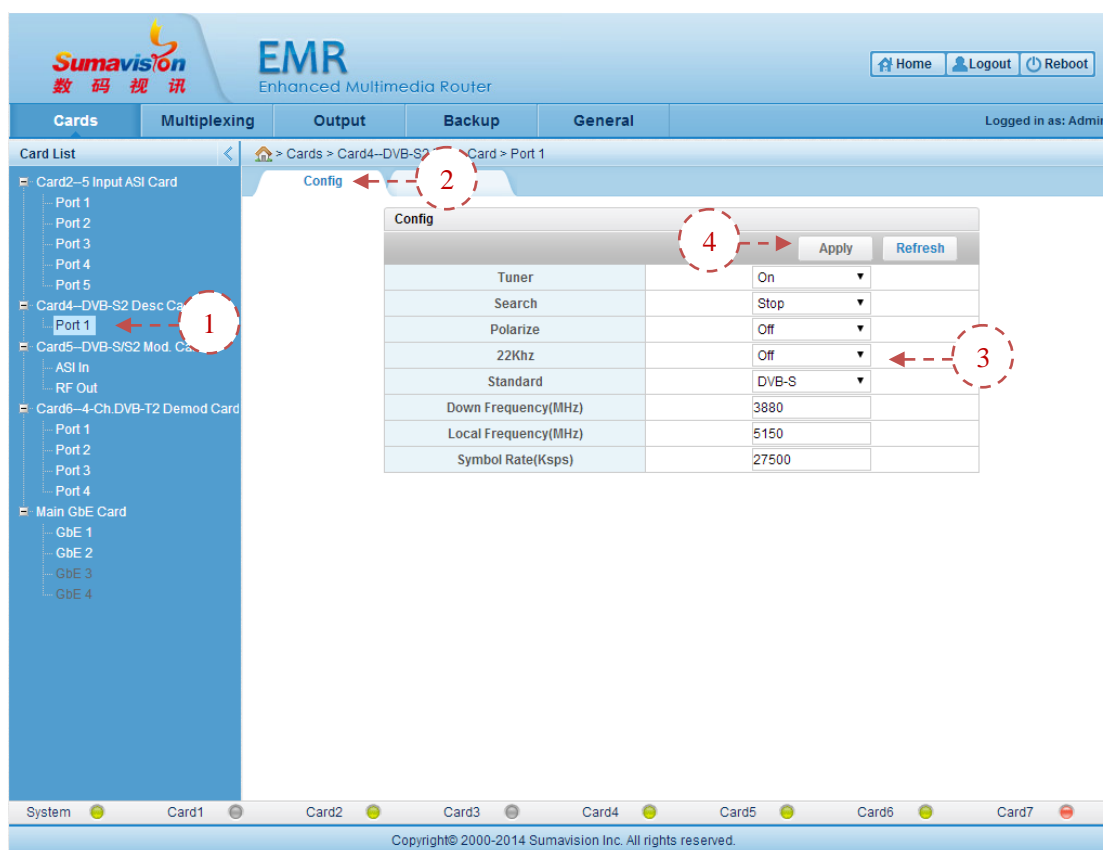


Fig. 5-82 DVB-S2 Desc Card Receiving Parameter Config

**Step 1:** Click “Port 1” of “DVB-S2 Desc Card” of WEB network management to navigate to port page;

**Step 2:** Click “Config” to navigate to setting page;

**Step 3:** Set the “Tuner” as “On” and choose the “Standard”, “Polarize” and “22Khz” according to the satellite programme to be received, and fill in the “Down Frequency”, “Local Frequency” and “Symbol Rate”;

**Step 4:** After setting the parameter, click “Apply” to validate the parameter;

If the parameter modification cause that the satellite signal cannot be locked, it can use the “Search” function to search the locking signal.

The monitoring interface shall display the code rate information which is currently received.

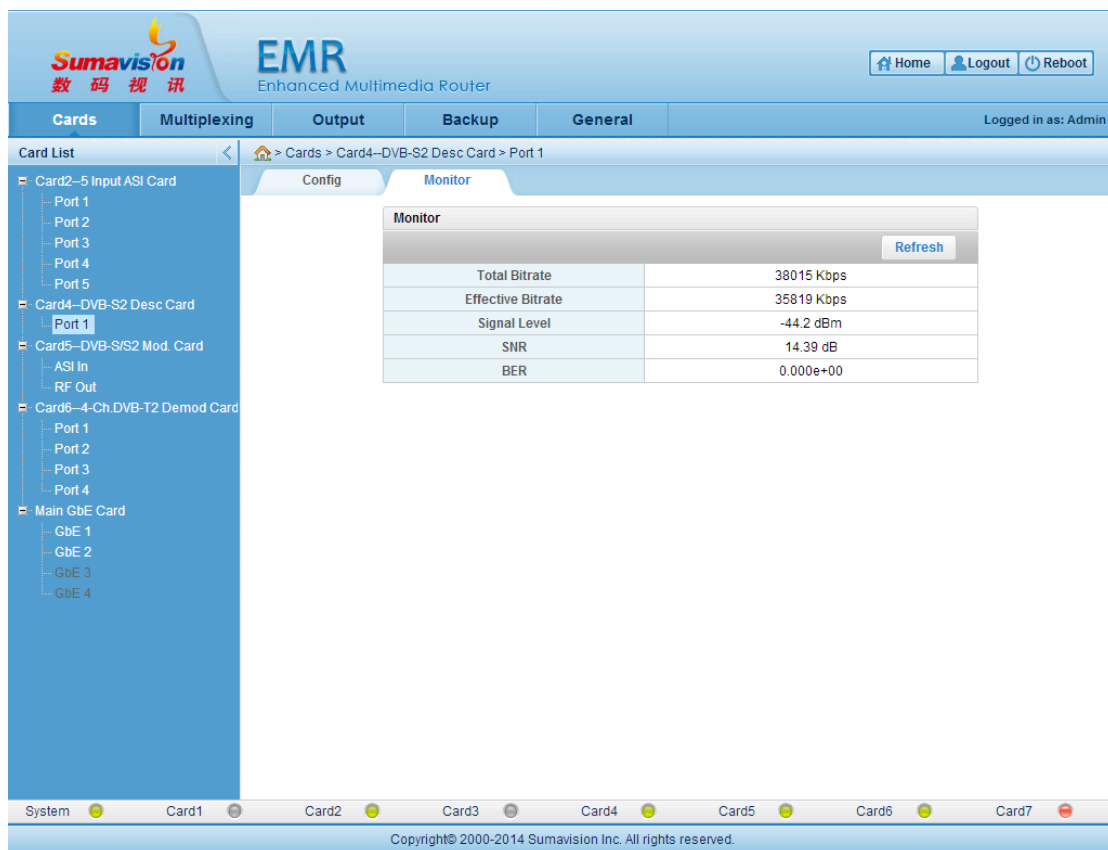


Fig. 5-83 DVB-S2 Desc Card Receiving Parameter Monitor

### 5.3.16.2.2 CAM Descrambling Settings

When the CA scrambling program is found in the received program, it can set the descrambling information in the “CAM Config” page. After the de-scrambling, the unscrambling stream programme will output in the output port. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting.

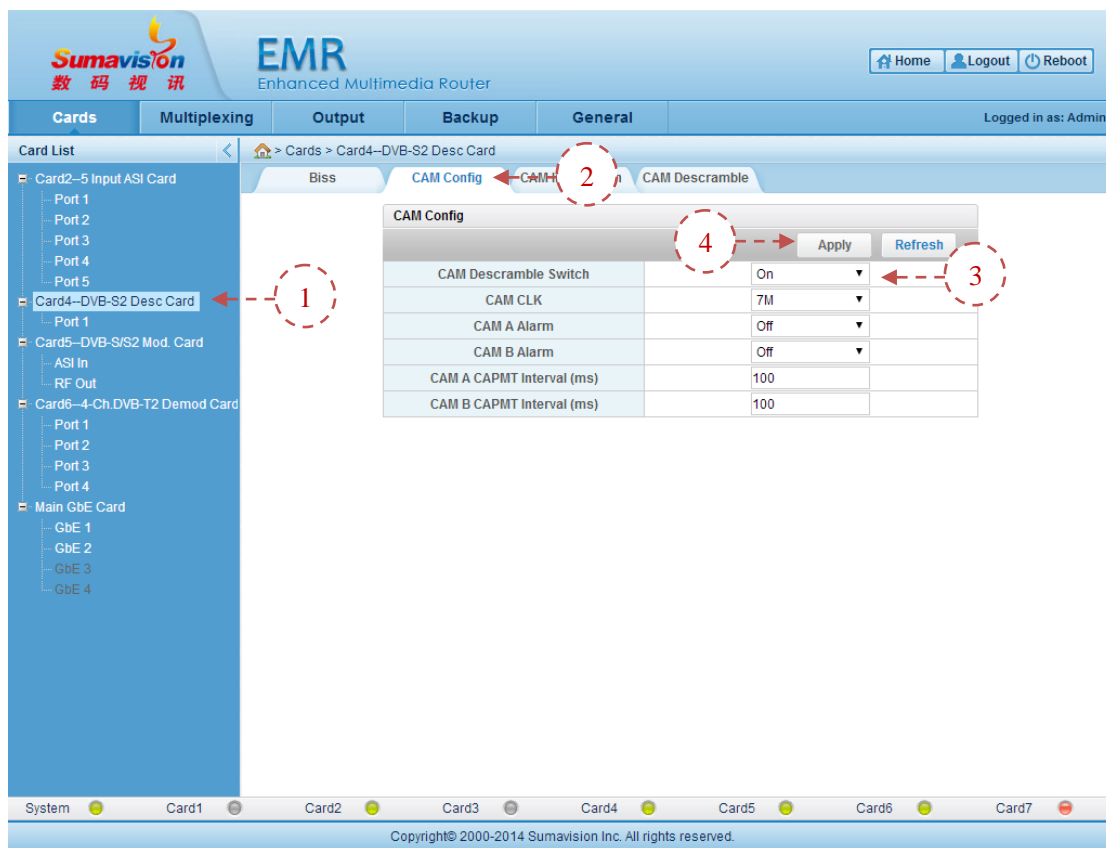


Fig. 5-84 DVB-S2 Desc Card CAM Descrambling Settings

**Step 1:** Click “DVB-S2 Desc Card” of WEB network management to navigate to the board card page;

**Step 2:** Click “CAM Config” to navigate to CAM setting page;

**Step 3:** Choose “On” in “CAM Descramble Switch”, choose “CAM CLK” according to the need and choose “On” of the alarm switch of the CAM card, then set other parameter of the port;

**Step 4:** After setting the parameter, click “Apply” to validate the parameter;

When the CAM card is inserted on the board card, the CAM information page will show the CAS\_ID of corresponding card.



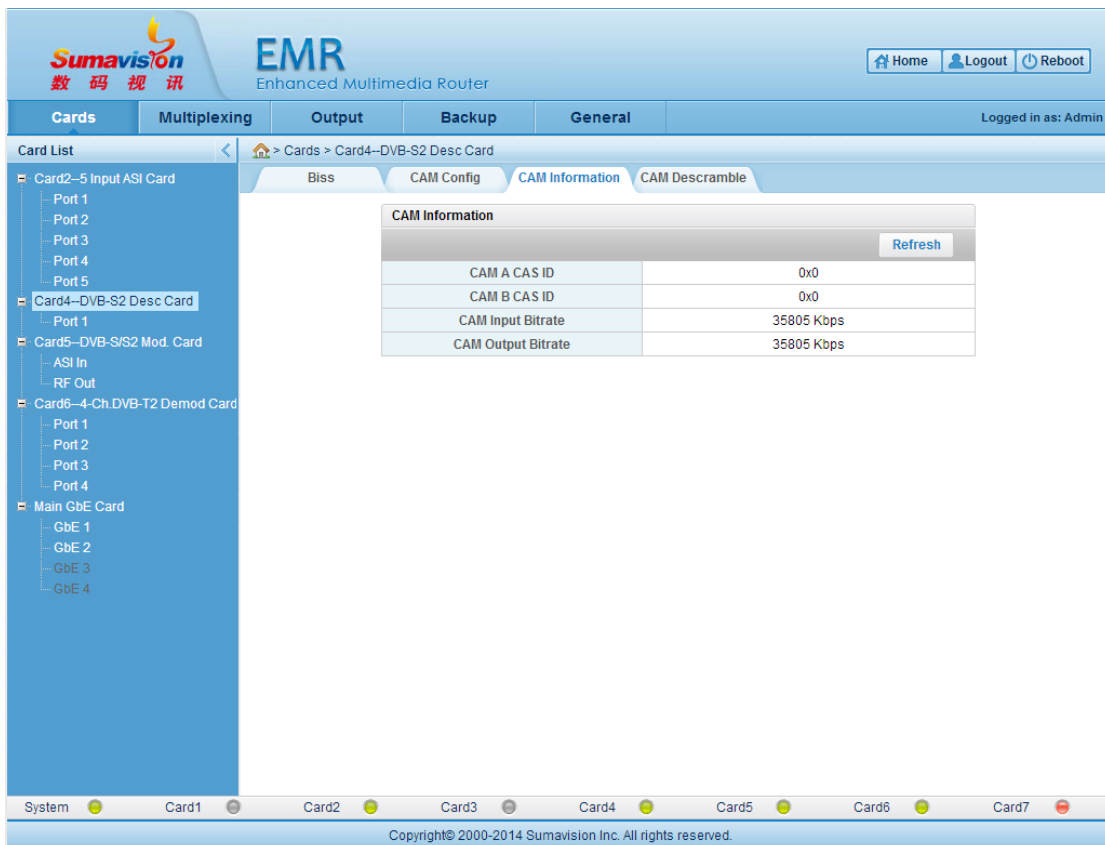


Fig. 5-85 DVB-S2 Desc Card CAM Information



Fig. 5-86 DVB-S2 Desc Card CAM Descramble

**Step 5:** Click “CAM Descramble” in the “DVB-S2 Desc Card” of WEB network management;

**Step 6:** Choose the CAM card for the descrambling of each programme;

**Step 7:** After setting the parameter, click “Apply” in the page to validate the parameter. The page will display the descrambling status of the programme.

### 5.3.16.2.3 BISS Descrambling Settings

When the BISS scrambling program is found in the received program, it can set the descrambling information in the “BISS” page. After the de-scrambling, the unscrambling stream programme will output in the output port. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting.

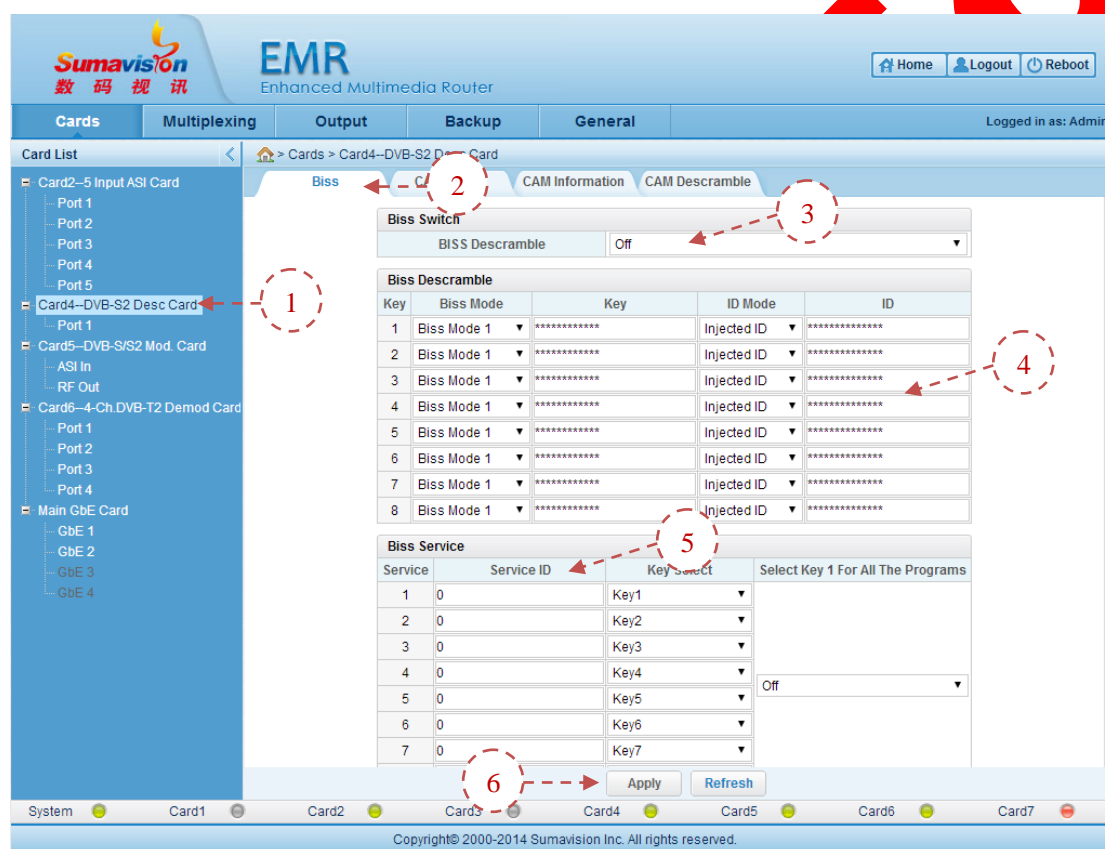


Fig. 5-87 DVB-S2 Desc Card BISS Descrambling Settings

**Step 1:** Click “DVB-S2 Desc Card” of WEB network management to navigate to the board card page;

**Step 2:** Click “BISS” to navigate to BISS setting page;

**Step 3:** Choose “On” of the “BISS Descramble” switch

**Step 4:** Set the descrambling key information, choose the “BISS Mode”, set the “Key”, and choose and set the “ID”;

**Step 5:** Set the BISS programme descrambling, fill in the “Service ID” of the BISS programme to be descrambled and choose the corresponding key;

**Step 6:** Click “Apply” to validate the parameter.

## 5.3.16.3 Parameter

Table 5-31 DVB-S2 Desc Card Receiving Parameter

| Parameter               | Range  | Default |
|-------------------------|--|---------|
| Tuner                   | On/Off   | Off     |
| Standard                | DVB-S/DVB-S2   | DVB-S   |
| Search                  | Stop/Start   | Stop    |
| Polarize                | Right/Left/Off   | Off     |
| 22KHz                   | On/Off   | Off     |
| Downlink Frequency(MHz) | 1~99999<br>( the difference of downlink Freq and Local Freq must be between 950~2150 ) | 4080    |
| Local Frequency(MHz)    | 1~99999<br>( the difference of downlink Freq and Local Freq must be between 950~2150 ) | 5150    |
| Symbol Rate(Ksps)       | 1000~45000   | 27500   |

Table 5-32 DVB-S2 Desc Card CAM Descrambling Parameter

| Parameter                | Range         | Default |
|--------------------------|---------------|---------|
| CAM Descramble Switch    | On/Off        | Off     |
| CAM CLK                  | 7M/9M/12M/15M | 7M      |
| CAM A Alarm              | On/Off        | Off     |
| CAM B Alarm              | On/Off        | Off     |
| CAM A CAPMT Interval(ms) | 0~255         | 100     |
| CAM B CAPMT Interval(ms) | 0~255         | 100     |
| CAM Descramble Switch    | On/Off        | Off     |

Table 5-33 DVB-S2 Desc Card BISS Descrambling Parameter

| Parameter                         | Range  | Default     |
|-----------------------------------|--|-------------|
| Biss Descramble                   | On/Off   | Off         |
| Biss Mode                         | Biss Mode 1/Biss Mode E<br>(Length of Key should be between 12 and 16) | Biss Mode 1 |
| Key                               | Injected ID/Buried ID  | none        |
| ID Mode                           | Injected ID/Buried ID  | Injected ID |
| ID                                | (Length of ID should be between 12 and 16)                             | none        |
| Service ID                        | 0~65535  | 0           |
| Key Select                        | Key1~Key8  | Key1~Key8   |
| Select Key 1 For All The Programs | On/Off   | Off         |

### 5.3.17 ABS-S Demod Card

#### 5.3.17.1 Interface

The ABS-S Demod Card is based on the EMR3.0 platform to provide two CAM card slots to the single route RF input for receiving and de-scrambling RF signal of direct broadcast satellite, as shown in Fig. 5-88 ABS-S Demod Card.



Fig. 5-88 ABS-S Demod Card

#### 5.3.17.2 Function

ABS-S Demod Card provides 1 RF input port for the reception and descrambling of the RF signal of ABS-S standard.

WEB network management may set the demodulating information of ABS-S Demod Card and the descrambling parameter of CAM.

##### 5.3.17.2.1 Receiving Parameter



Fig. 5-89 ABS-S Demod Card Receiving Parameter

**Step 1:** Click “Port 1” of “ABS-S Demod Card” of WEB network management to navigate to port page;

**Step 2:** Click “Config” to navigate to setting page;

**Step 3:** Set the “Tuner” as “On” and choose the “Standard”, “Polarize” and “22Khz” according to the satellite programme to be received, and fill in the “Down Frequency”, “Local Frequency” and “Symbol Rate”;

**Step 4:** After setting the parameter, click “Apply” to validate the parameter;

The monitoring interface shall display the code rate information which is currently received.

### 5.3.17.2.2 CAM Descrambling Settings

When the CA scrambling program is found in the received program, it can set the descrambling information in the “CAM Config” page. After the de-scrambling, the unscrambling stream programme will output in the output port. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting.

The screenshot shows the EMR web interface with the following elements:

- Header: Sumavision logo, EMR Enhanced Multimedia Router, Home, Logout, Reboot buttons. Logged in as: Admin.
- Navigation tabs: Cards, Multiplexing, Output, Backup, General.
- Card List (left sidebar):
  - Card2-5 Input ASI Card (Ports 1-5)
  - Card3- Descramble Card
  - Card4-4 Output ASI Card (Ports 1-4)
  - Card5-SD-ADEC Card (Ports 1-2)
  - Card6-ABS-S Demod Card** (Port 1) - highlighted with a red dashed circle and arrow labeled '1'.
  - Main GbE Card (GbE 1-4)
- Card6-ABS-S Demod Card CAM Config page:
  - Navigation: CAM Config (highlighted with a red dashed circle and arrow labeled '2'), CAM Descramble.
  - Buttons: Apply (highlighted with a red dashed circle and arrow labeled '4'), Refresh.
  - Table:
 

|                           |     |   |  |
|---------------------------|-----|---|--|
| CAM Descramble Switch     | On  | ▼ | ← (highlighted with a red dashed circle and arrow labeled '3') |
| CAM CLK                   | 7M  | ▼ |  |
| CAM A Alarm               | Off | ▼ |  |
| CAM B Alarm               | Off | ▼ |  |
| CAM A CAPMT Interval (ms) | 255 |   |  |
| CAM B CAPMT Interval (ms) | 255 |   |  |
- System status bar at the bottom shows System, Card1-7 with status indicators.

Fig. 5-90 ABS-S Demod Card CAM Descrambling Setting

**Step 1:** Click “ABS-S Demod Card” of WEB network management to navigate to the board card page;

**Step 2:** Click “CAM Config” to navigate to CAM setting page;

**Step 3:** Choose “On” in “CAM Descramble Switch”, choose “CAM CLK” according to the need and choose “On” of the alarm switch of the CAM card, then set other parameter of the port;

**Step 4:** After setting the parameter, click “Apply” to validate the parameter;

When the CAM card is inserted on the board card, the CAM information page will show the CAS\_ID of corresponding card.



Fig. 5-91 ABS-S Demod Card CAM Descramble

**Step 5:** Click “CAM Descramble” in the “ABS-S Demod Card” of WEB network management;

**Step 6:** Choose the CAM card for the descrambling of each programme;

**Step 7:** After setting the parameter, click “Apply” in the page to validate the parameter. The page will display the descrambling status of the programme.

### 5.3.17.3 Parameter

Table 5-34 ABS-S Demod Card Receiving Parameter

| Parameter               | Range            | Default |
|-------------------------|------------------|---------|
| Tuner                   | On/Off           | Off     |
| Search                  | Stop/Start       | Stop    |
| Polarize                | Right/Left       | Right   |
| 22KHz                   | On/Off           | Off     |
| Bypass Mode             | Demod/Descramble | Demod   |
| Downlink Frequency(MHz) | 1~65535          | 12020   |
| Local Frequency(MHz)    | 1~65535          | 10750   |
| Symbol Rate(Ksps)       | 1000~60000       | 28800   |

Table 5-35 ABS-S Demod Card CAM Descrambling Parameter

| Parameter                | Range                     | Default       |
|--------------------------|---------------------------|---------------|
| CAM Descramble Switch    | On/Off                    | Off           |
| CAM CLK                  | 7M/9M/12M/15M             | 7M            |
| CAM A Alarm              | On/Off                    | Off           |
| CAM B Alarm              | On/Off                    | Off           |
| CAM A CAPMT Interval(ms) | 0~255                     | 255           |
| CAM B CAPMT Interval(ms) | 0~255                     | 255           |
| CAM                      | No Descramble/CAM A/CAM B | No Descramble |

### 5.3.18 DVB-C Demod Card

#### 5.3.18.1 Interface

DVB-C Demod Card provides 1 RF input port and 2 CAM card slots for the reception and descrambling of DVB-C standard of RF signal, as shown in Fig. 5-92 DVB-C Demod Card:



Fig. 5-92 DVB-C Demod Card

#### 5.3.18.2 Function

DVB-C Demod Card provides 1 RF input port for the reception and descrambling of the RF signal of DVB-C standard.

WEB network management may set the demodulating information of DVB-C Demod Card and the descrambling parameter of CAM.

### 5.3.18.2.1 Receiving Parameter

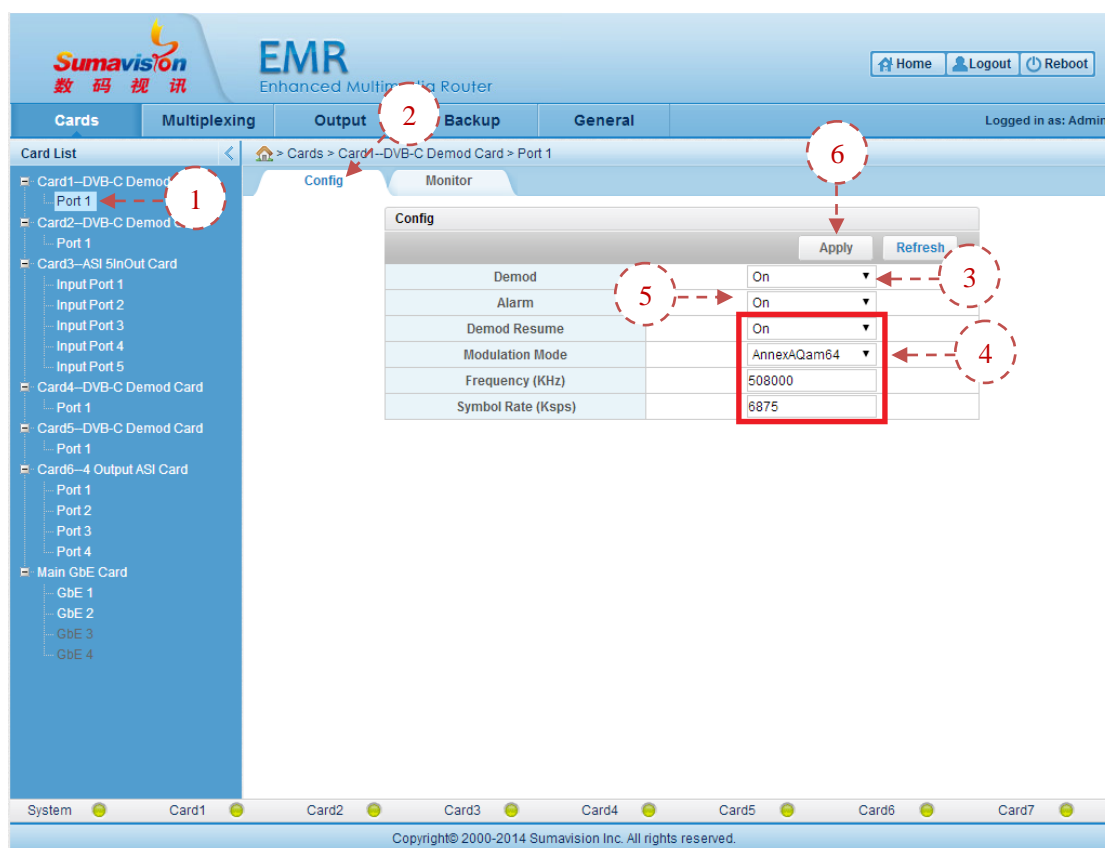


Fig. 5-93 DVB-C Demod Card Receiving Parameter

**Step 1:** Click “Port 1” of “DVB-C Demod Card” of WEB network management to navigate to port page;

**Step 2:** Click “Config” to navigate to setting page;

**Step 3:** Set “Demod” Switch as “On”;

**Step 4:** Choose the “Modulation Mode” according to the frequency point information of the QAM signal to be received, and fill in the “Frequency” and “Symbol Rate”;

**Step 5:** Set the “Alarm” switch of the card to turn on or off the switch.

**Step 6:** After setting the parameter, click “Apply” to validate the parameter;

The monitoring interface shall display the code rate information which is currently received.



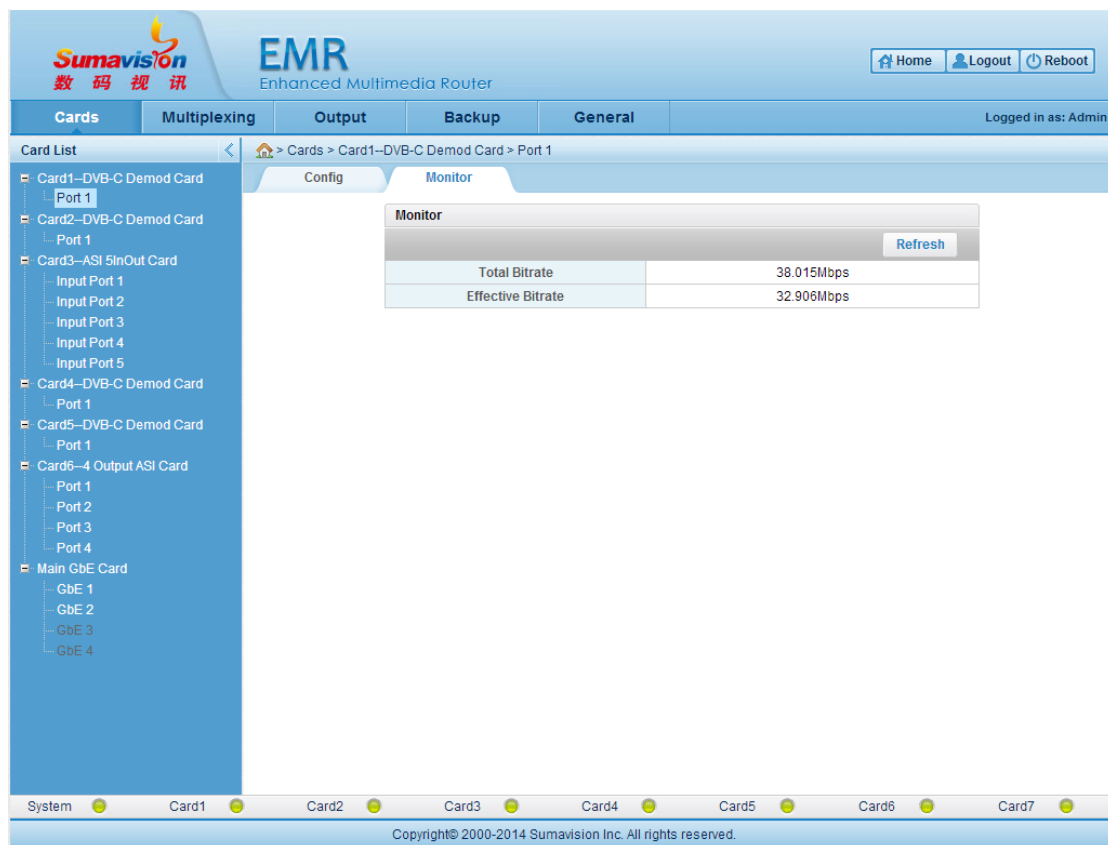


Fig. 5-94 DVB-C Demod Card CAM Setting

### 5.3.18.2.2 CAM Descrambling Settings

When the CA scrambling program is found in the received program, it can set the descrambling information in the “CAM Config” page. After the de-scrambling, the unscrambling stream programme will output in the output port. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting.

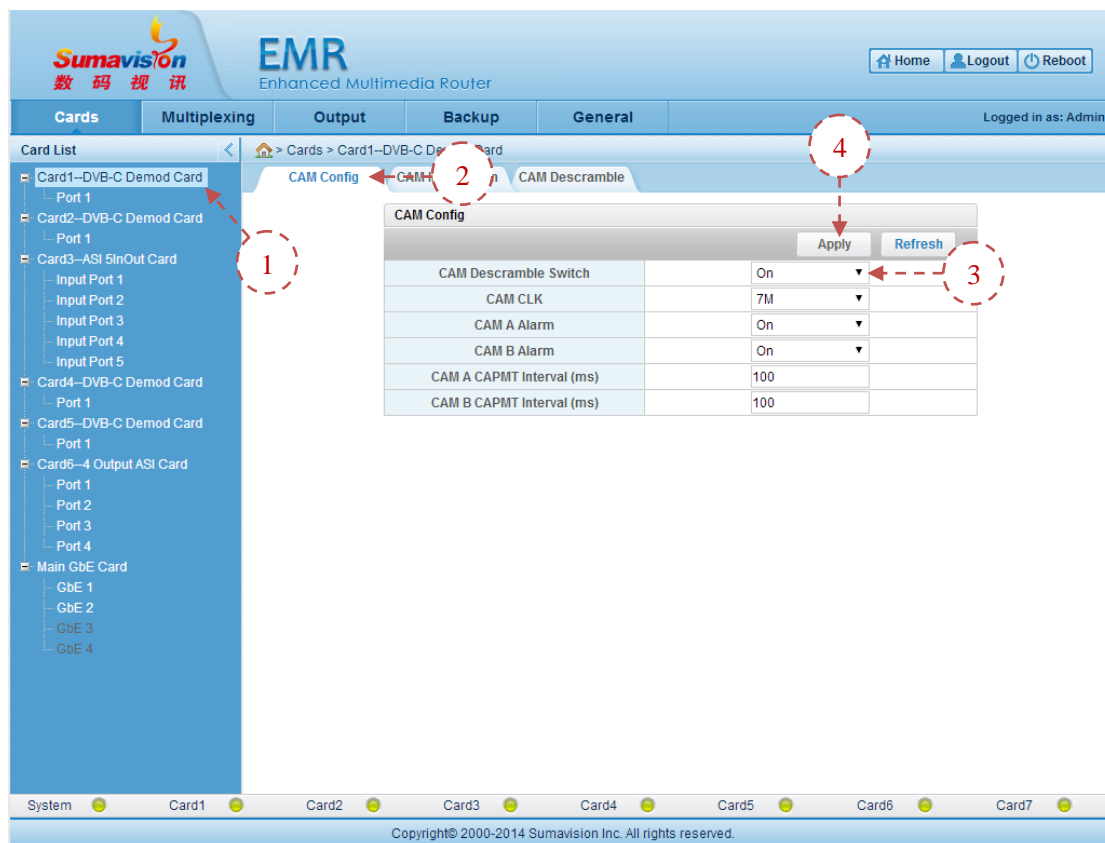


Fig. 5-95 DVB-C Demod Card CAM Descrambling Setting

**Step 1:** Click “DVB-C Demod Card” of WEB network management to navigate to the board card page;

**Step 2:** Click “CAM Config” to navigate to CAM setting page;

**Step 3:** Choose “On” in “CAM Descramble Switch”, choose “CAM CLK” according to the need and choose “On” of the alarm switch of the CAM card, then set other parameter of the port;

**Step 4:** After setting the parameter, click “Apply” to validate the parameter;

When the CAM card is inserted on the board card, the CAM information page will show the CAS\_ID of corresponding card.

Sumavision 数码视讯

EMR Enhanced Multimedia Router

Home Logout Reboot

Logged in as: Admin

Navigation: Cards | Multiplexing | Output | Backup | General

Card List: Card1--DVB-C Demod Card | Card2--DVB-C Demod Card | Card3--ASI 5InOut Card | Card4--DVB-C Demod Card | Card5--DVB-C Demod Card | Card6--4 Output ASI Card | Main GbE Card

Breadcrumb: Cards > Card1--DVB-C Demod Card

Tabs: CAM Config | CAM Information | CAM Descramble

Refresh

| CAM Information    |            |
|--------------------|------------|
| CAM A CAS ID       | 0x4ad2     |
| CAM B CAS ID       | 0x4ad2     |
| CAM Input Bitrate  | 27.291Mbps |
| CAM Output Bitrate | 27.291Mbps |

System Card1 Card2 Card3 Card4 Card5 Card6 Card7

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Fig. 5-96 DVB-C Demod Card CAM Information

Sumavision 数码视讯

EMR Enhanced Multimedia Router

Home Logout Reboot

Logged in as: Admin

Navigation: Cards | Multiplexing | Output | Backup | General

Card List: Card1--DVB-C Demod Card | Card2--DVB-C Demod Card | Card3--ASI 5InOut Card | Card4--DVB-C Demod Card | Card5--DVB-C Demod Card | Card6--4 Output ASI Card | Main GbE Card

Breadcrumb: Cards > Card1--DVB-C Demod Card

Tabs: CAM Config | CAM Information | CAM Descramble

Apply Refresh Show Detail

| Service ID | Service Name | CAM   | Descrambling Status  |
|------------|--------------|-------|----------------------|
| 1          | hnstv        | CAM A | Descrambling Success |
| 3          | SBN          | CAM A | Descrambling Success |
| 6          | BTV          | CAM B | Descrambling Success |
| 7          | HaiNan TV    | CAM B | Descrambling Success |

System Card1 Card2 Card3 Card4 Card5 Card6 Card7

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Fig. 5-97 DVB-C Demod Card CAM Descramble

**Step 5:** Click “CAM Descramble” in the “DVB-C Demod Card” of WEB network management;

**Step 6:** Choose the CAM card for the descrambling of each programme;

**Step 7:** After setting the parameter, click “Apply” in the page to validate the parameter. The page will display the descrambling status of the programme.

### 5.3.18.3 Parameter

Table 5-36 DVB-C Demod Card Parameter

| Parameter         | Range  | Default     |
|-------------------|--|-------------|
| Demod             | On/Off   | Off         |
| Alarm             | On/Off   | Off         |
| Modulation Mode   | AnnexAQam64/AnnexAQam128/AnnexAQam256/AnnexBQam64/AnnexBQam256 | AnnexAQam64 |
| Frequency(KHz)    | 52000~858000   | 554000      |
| Symbol Rate(Ksps) | 3500~7000  | 6875        |

Table 5-37 DVB-C Demod Card CAM Descrambling Parameter

| Parameter                 | Range         | Default |
|---------------------------|---------------|---------|
| CAM Descramble Switch     | On/Off        | Off     |
| CAM CLK                   | 7M/9M/12M/15M | 7M      |
| CAM A Alarm               | On/Off        | Off     |
| CAM B Alarm               | On/Off        | Off     |
| CAM A CAPMT Interval (ms) | 0~255         | 100     |
| CAM B CAPMT Interval (ms) | 0~255         | 100     |

### 5.3.19 DVB-S2 Demod Desc Card

#### 5.3.19.1 Interface

DVB-S2 Demod Desc Card provides 1 RF input port, 1 RF looping output port and 2 CAM card slots for the reception and descrambling of RF signal of DVB-S/DVB-S2 standard, as shown in Fig. 5-98 DVB-S2 Demod Desc Card:



Fig. 5-98 DVB-S2 Demod Desc Card

### 5.3.19.2 Function

#### 5.3.19.2.1 Receiving Parameter



Fig. 5-99 DVB-S2 Demod Desc Card Receiving Parameter Config

**Step 1:** Click “RF” of “DVB-S2 Demod Desc Card” of WEB network management to navigate to port page;

**Step 2:** Click “Config” to navigate to setting page;

**Step 3:** Set the “Tuner” as “On” and choose the “Standard”, “TS Change”, “22KHz”, “Polarize” and “DiSEqC” according to the satellite programme to be received, and fill in the “Downlink Frequency”, “Local Frequency”, “Symbol Rate” and “Appointed PID”;

**Step 4:** After setting the parameter, click “Apply” to validate the parameter;

If the parameter modification cause that the satellite signal cannot be locked, it can use the “Search” function to search the locking signal.

The monitoring interface shall display the code rate information which is currently received.

The screenshot shows the EMR (Enhanced Multimedia Router) web interface. The top navigation bar includes 'Cards', 'Multiplexing', 'Output', 'Backup', and 'General'. The user is logged in as 'Admin'. The main content area is titled 'Card List' and shows a tree view of cards. The selected card is 'Card6-DVB-S2 Demod Desc Card', and the 'Monitor' tab is active. The 'Monitor' table displays the following data:

| Monitor               |             |
|-----------------------|-------------|
| Total Bitrate         | 38.013Mbps  |
| Effective Bitrate     | 35.817Mbps  |
| PID Bitrate           | 2.195Mbps   |
| Signal Level          | -44.6 dBm   |
| SNR                   | 14 dB       |
| BER                   | <1.0e-7     |
| Channel Information 1 | Type: DVB-S |
| Channel Information 2 | Mode: QPSK  |
| Channel Information 3 | FEC: 3/4    |

Fig. 5-100 DVB-S2 Demod Desc Card Receiving Parameter Monitor

### 5.3.19.2.2 Selection of input source

The input of this card and the multiplexing input are both the options for the input source of DVB-S2 Demod Desc Card. When the option of input from this card is selected, the input ports CAM-A, CAM-B and BISS of the multiplexing interface shall display the program list inputted from this card according to the selection of the input source. The de-scrambling is realized by corresponding de-scrambling setting (the details are as shown in 5.3.19.2.3CAM Descrambling Settings and 5.3.19.2.4BISS Descrambling Setting). The required program can be multiplexed from the input ports CAM-A, CAM-B and BISS to the output port and outputted then. When selecting the multiplex input, it shall multiplex the input program to the output ports CAM-A, CAM-B and BISS from the multiplexing interface. By doing so, the multiplexed program list can be displayed on the input ports CAM-A, CAM-B and BISS. The de-scrambling can be realized by corresponding de-scrambling setting (the details are as shown in 5.3.19.2.3CAM Descrambling Settings and 5.3.19.2.4BISS Descrambling Setting). Finally, the required program is multiplexed to the output port via the input ports CAM-A, CAM-B and BISS and outputted from the output port. CAM descrambling setting. For the program multiplex method, refer to section 5.1.1.2Multiplexing Setting.

### 5.3.19.2.3 CAM Descrambling Settings

When the CA scrambling program is found in the received program, it can set the

program descrambling information in the “CAM-A” and “CAM-B” page. After the de-scrambling, the clear-stream program is the multiplex output. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting.



Fig. 5-101 DVB-S2 Demod Desc Card CAM Descrambling System Parameter Setting

**Step 1:** click “CAM-A” or “CAM-B” on the “DVB-S2 Demod Desc Card” of WEB network management to log in the CAM setting page;

**Step 2:** click the “System” on the page to log in the CAM System setting page;

**Step 3:** select the input source of de-scrambled program, select the “CAM Descramble” switch to be “On”, select the “Clock” according to the needs and set the “CaPmt Interval” and other relevant parameters.

**Step 4:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

When the CAM card is inserted on the board card, the CAM information page will show the CAS\_ID of corresponding card.



Fig. 5-102 DVB-S2 Demod Desc Card CAM Descrambling Program Setting

**Step 5:** click the “Program” in the “DVB-S2 Demod Desc Card” CAM setting page of the WEB network management to log in the program setting page;

**Step 6:** decide whether to adopt the de-scrambling action for each program;

**Step 7:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect. In this moment, the de-scrambling status of program can be displayed on the de-scrambling location on the page.

The monitoring interface can display the input/output system code rate of descrambled program and the effective code rate information.



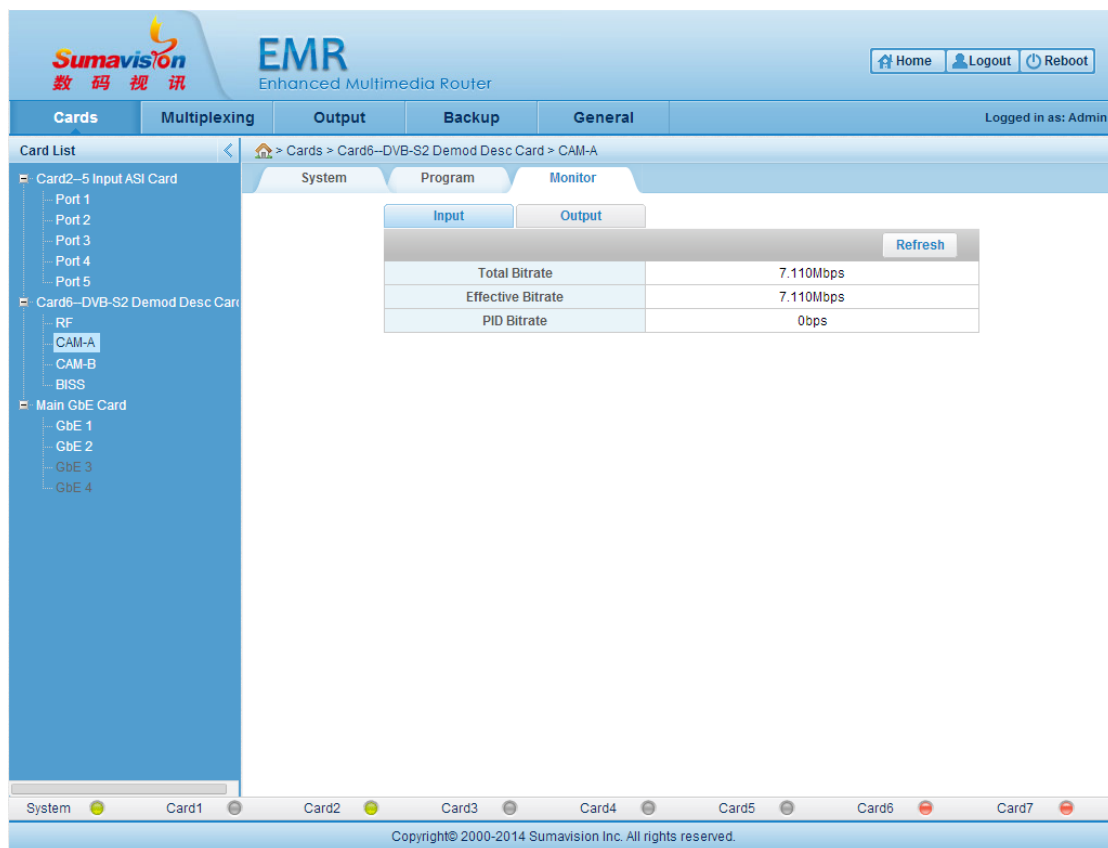


Fig. 5-103 DVB-S2 Demod Desc Card CAM Descrambling Monitor

### 5.3.19.2.4 BISS Descrambling Setting

When the BISS scrambling program is found in the received program, it can set the descrambling information in the "BISS" page. After the de-scrambling, the unscrambling stream programme will output in the output port. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting.

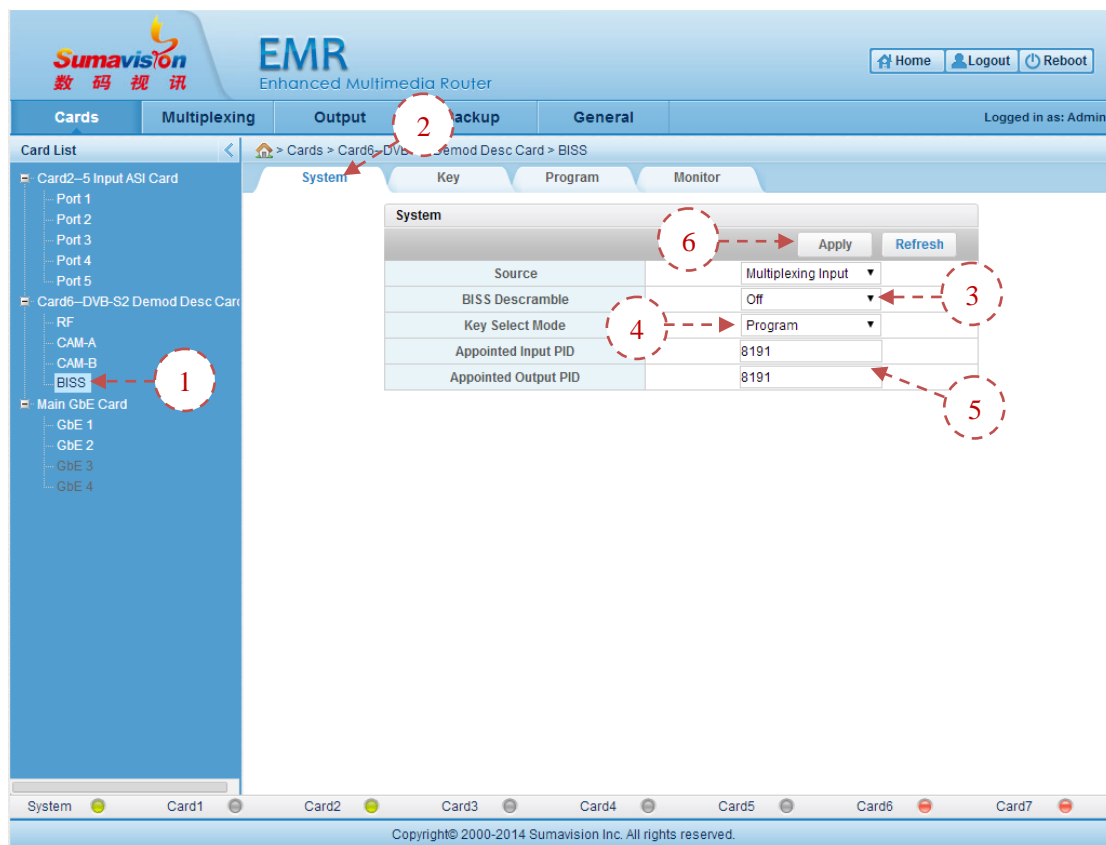


Fig. 5-104 DVB-S2 Demod Desc Card BISS Descrambling System Parameter Setting

**Step 1:** click the “BISS” on the “DVB-S2 Demod Desc Card” page of WEB network management to log in the BISS de-scrambling setting page;

**Step 2:** click the “System” on the page to log in the BISS descrambling system setting page;

**Step 3:** choose the input “source” of the de-scrambling program and set the “BISS Descramble” switch to be “On”.

**Step 4:** set the “Key Select Mode” to be “Global”, “Program” or “PID”;

“Global”: the same secrete key is used for de-scrambling all PIDs to be de-scrambled.

“Program Level”: the same secrete key is used for de-scrambling all PIDs under the same program;

“PID level”: one secrete key can be chosen to de-scramble each PID.

**Step 5:** set the “Appointed Input PID” and “Appointed Output PID” to monitor the code rate.

**Step 6:** click the “Apply” on the page to put the setting parameter into effect.



Fig. 5-105 DVB-S2 Demod Desc Card BISS Descrambling Key Setting

**Step 7** click the “Key” in the “DVB-S2 Demod Desc Card” BISS descrambling setting page of the WEB network management to log in the secret key setting page;

**Step 8:** click the “Add” on the page to pop up the BISS secret key adding and modification page;

**Step 9:** fill in the “Name” and “Key” and choose the “BISS Mode” and “ID Mode”;

**Step 10:** click the “Apply” on the page to finish the addition of secret key;


If is required to modify secret key, click  to log in the modification page. If the deletion is required, click the “Delete” and the “Delete All” to realize the deletion operation.



Fig. 5-106 DVB-S2 Demod Desc Card BISS Descrambling Program Setting

**Step 11:** click the “Program” in the “DVB-S2 Demod Desc Card” BISS de-scrambling setting page of the WEB network management to log in the program setting page;

**Step 12:** click the “Show Detail” on the page to spread the program secrete key selection page.

**Step 13:** set the BISS Descrambling “switch” of the descrambling program to be “On” and select corresponding secrete key according to the “Key Select Mode” to make the de-scrambling action.

**Step 14:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect. In this moment, the de-scrambling status of program can be displayed on the de-scrambling location on the page.

The monitoring interface can display the input/output system code rate of descrambled program and the effective code rate information.

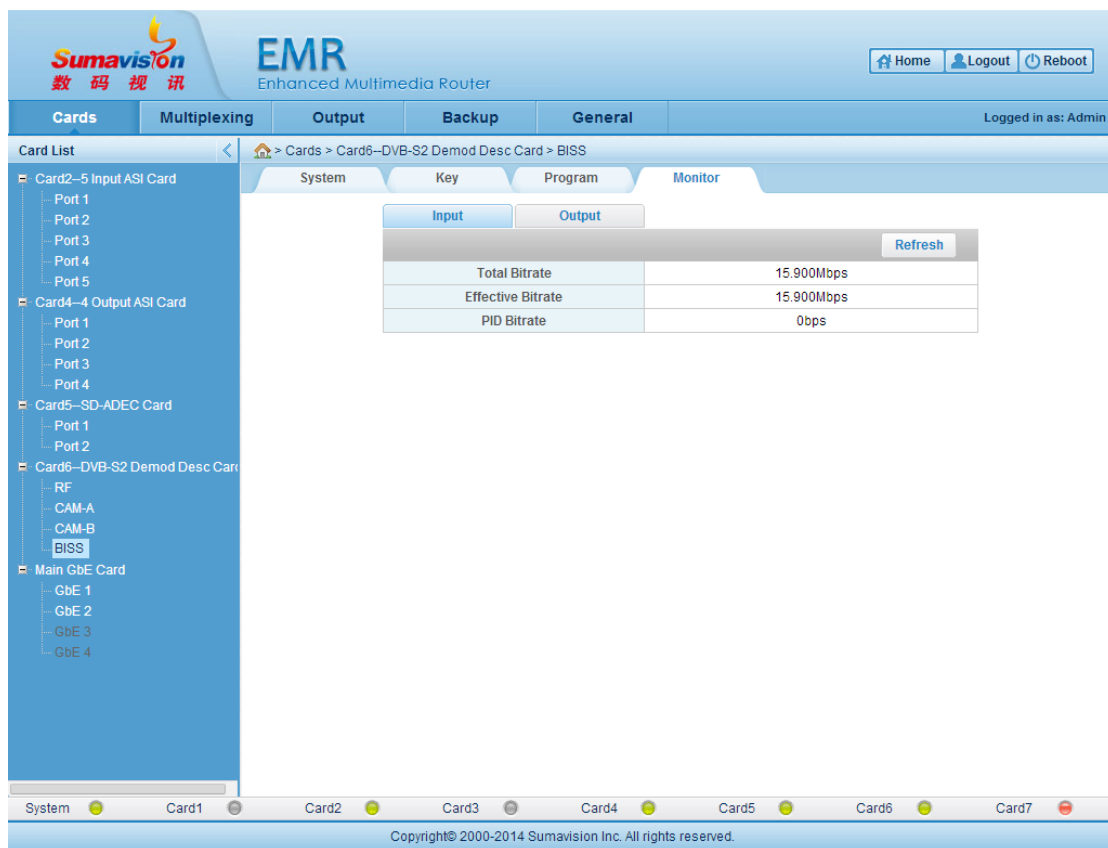


Fig. 5-107 DVB-S2 Demod Desc Card BISS Descrambling Monitor

### 5.3.19.3 Parameter

Table 5-38 DVB-S2 Demod Desc Card Receiving Parameter

| Parameter               | Range  | Default     |
|-------------------------|--|-------------|
| Tuner                   | Off/On   | Off         |
| Standard                | DVB-S/DVB-S2   | DVB-S       |
| TS Change               | Off/On   | Off         |
| 22KHz                   | Off/On   | Off         |
| Polarize                | Vertical/Horizontal/Off  | Off         |
| DiSEqC                  | Satellite 1/.../ Satellite 16  | Satellite 1 |
| Search                  | Stop/Start   | Stop        |
| Downlink Frequency(MHz) | 1~99999<br>( the difference of downlink Frequency and Local Frequency must be between 950~2150 ) | 4080        |
| Local Frequency(MHz)    | 1~99999<br>( the difference of downlink Frequency and Local Frequency must be between 950~2150 ) | 5150        |
| Symbol Rate(Ksps)       | 1000~45000   | 27500       |
| Appointed PID           | 0~8191   | 8191        |

Table 5-39 DVB-S2 Demod Desc Card CAM Descrambling Parameter

| Parameter            | Range                          | Default            |
|----------------------|--------------------------------|--------------------|
| Source               | Local Input/Multiplexing Input | Multiplexing Input |
| CAM Descramble       | Off/On                         | Off                |
| Clock (MHz)          | 6/7/9/12/15/17/20/25/27        | 7                  |
| CaPmt Interval (ms)  | 0~255                          | 100                |
| Appointed Input PID  | 0~8191                         | 8191               |
| Appointed Output PID | 0~8191                         | 8191               |

Table 5-40 DVB-S2 Demod Desc Card BISS Descrambling Parameter

| Parameter            | Range                                       | Default            |
|----------------------|---|--------------------|
| Source               | Local Input/Multiplexing Input              | Multiplexing Input |
| BISS Descramble      | Off/On                                      | Off                |
| Key Select Mode      | Global/Program/PID                          | Program            |
| Appointed Input PID  | 0~8191                                      | 8191               |
| Appointed Output PID | 0~8191                                      | 8191               |
| Name                 | (Length of Key should be between 12 and 16) | none               |
| BISS Mode            | Mode 1/Mode E                               | Mode 1             |
| Key                  | (Length of Key should be between 12 and 16) | none               |
| ID Mode              | Injected ID/Buried ID                       | Injected ID        |
| ID                   | (Length of Key should be 14)                | none               |

### 5.3.20 4-Ch.DVB-T2 Demod Card

#### 5.3.20.1 Interface

4-Ch.DVB-T2 Demod Card provides four RF input interfaces, for DVB-C/DVB-T/DVB-T2 standard RF signal reception. 4-Ch.DVB-T2 Demod Card is shown in Fig. 5-108 4-Ch.DVB-T2 Demod Card.

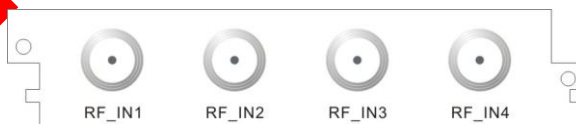


Fig. 5-108 4-Ch.DVB-T2 Demod Card

#### 5.3.20.2 Function

4-Ch.DVB-T2 Demod Card provides 4 RF input ports to receive the RF signal of DVB-C/DVB-T/DVB-T2 standard. WEB network management may check the current status and set the receiving parameter of the 4-Ch.DVB-T2 Demod Card. The input program can be refreshed as per as the Setting Method for Multiplex in Section 5.1.1.2 Multiplexing Setting and the output is multiplexed finally.

- The frequency point receiving quantity of the four-channel DVB-T2 demodulation and receiving card is decided by the authorization obtained. The authorization for four frequency points at most is supported.

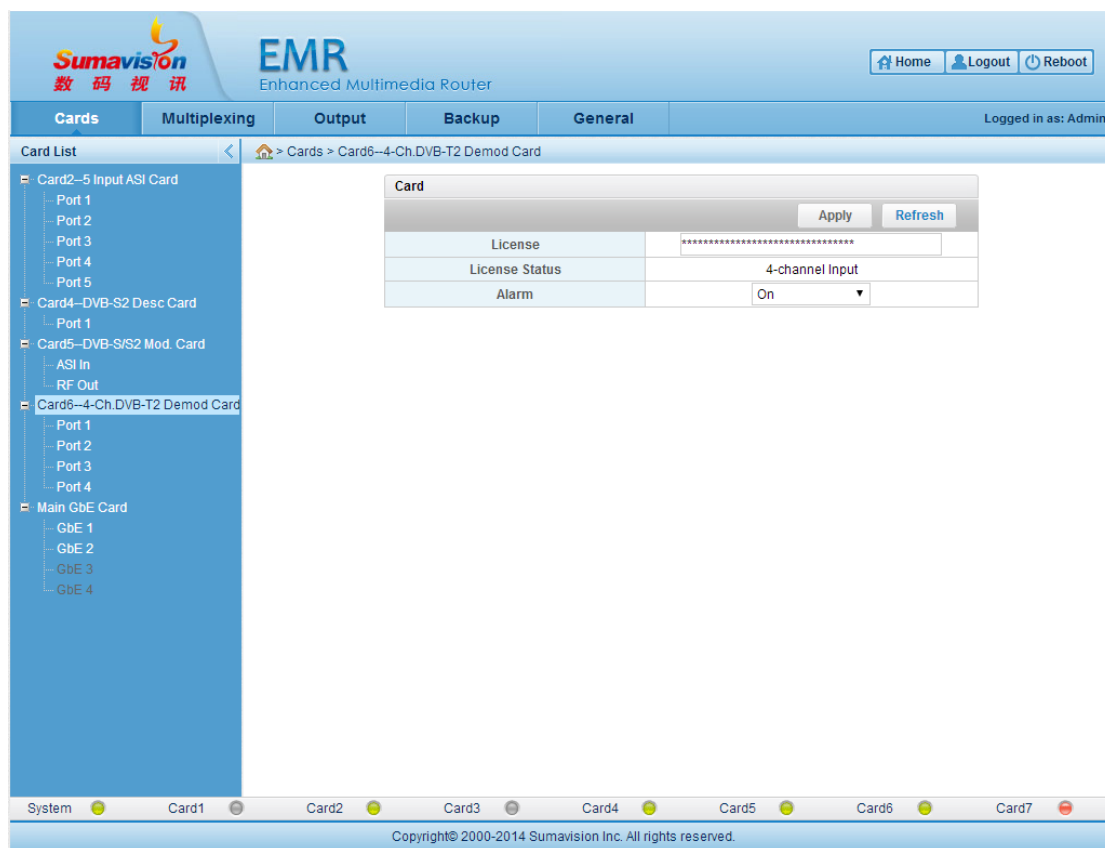


Fig. 5-109 4-Ch.DVB-T2 Demod Card Parameter

Set the “Alarm” switch of the card to turn on or off the switch. After setting the parameter, click “Apply” to validate the parameter;

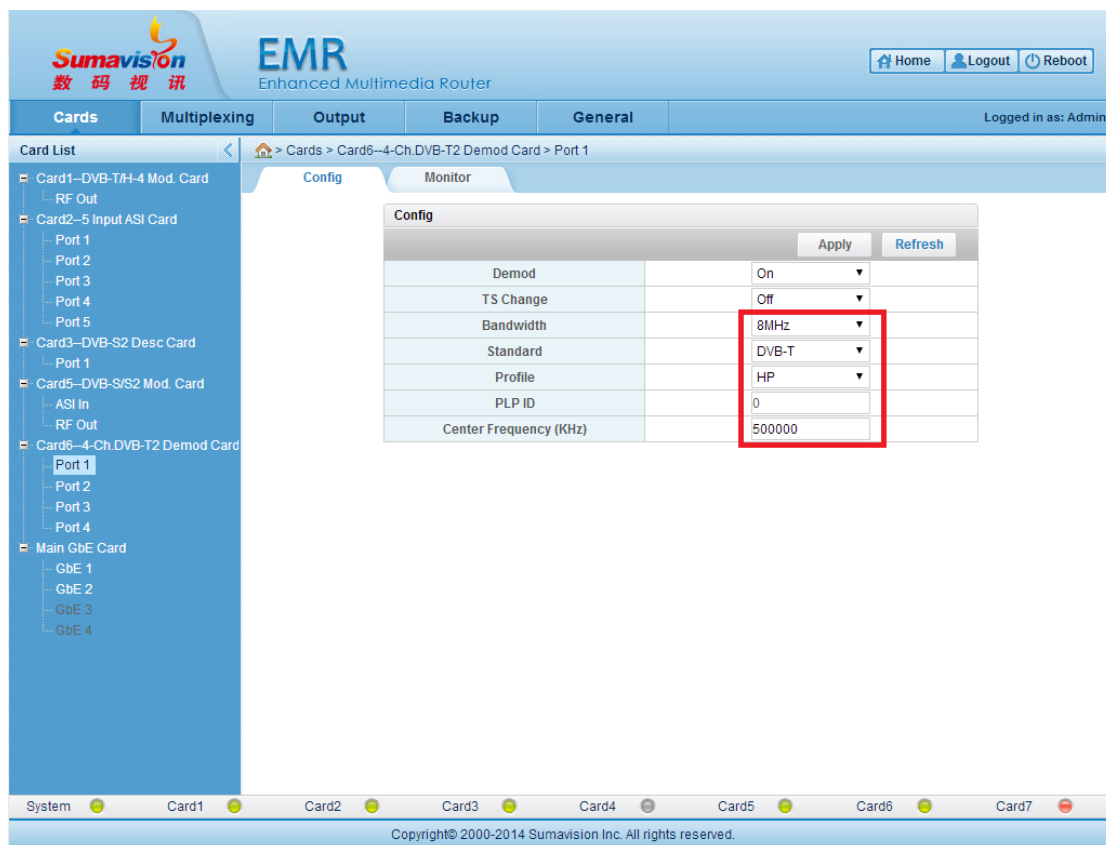


Fig. 5-110 4-Ch.DVB-T2 Demod Card Port Config

- Step 1:** Click “Port n” of “4-Ch.DVB-T2 Demod Card” of WEB network management to navigate to port settings page;
  - Step 2:** Click “Config” to navigate to setting page;
  - Step 3:** Open the “Demod” switch;
  - Step 4:** Set the “Bandwidth”, “Standard” and “Profile”, and fill in the “PLP ID” and “Center Frequency” according to the frequency point information of receiving program;
  - Step 5:** Click the “TS change” on the page, it can choose the “type1”, “type2” or “off”;
  - Step 6:** After setting the parameter, click “Apply” to validate the parameter;
- The monitoring interface shall display the code rate information which is currently received.



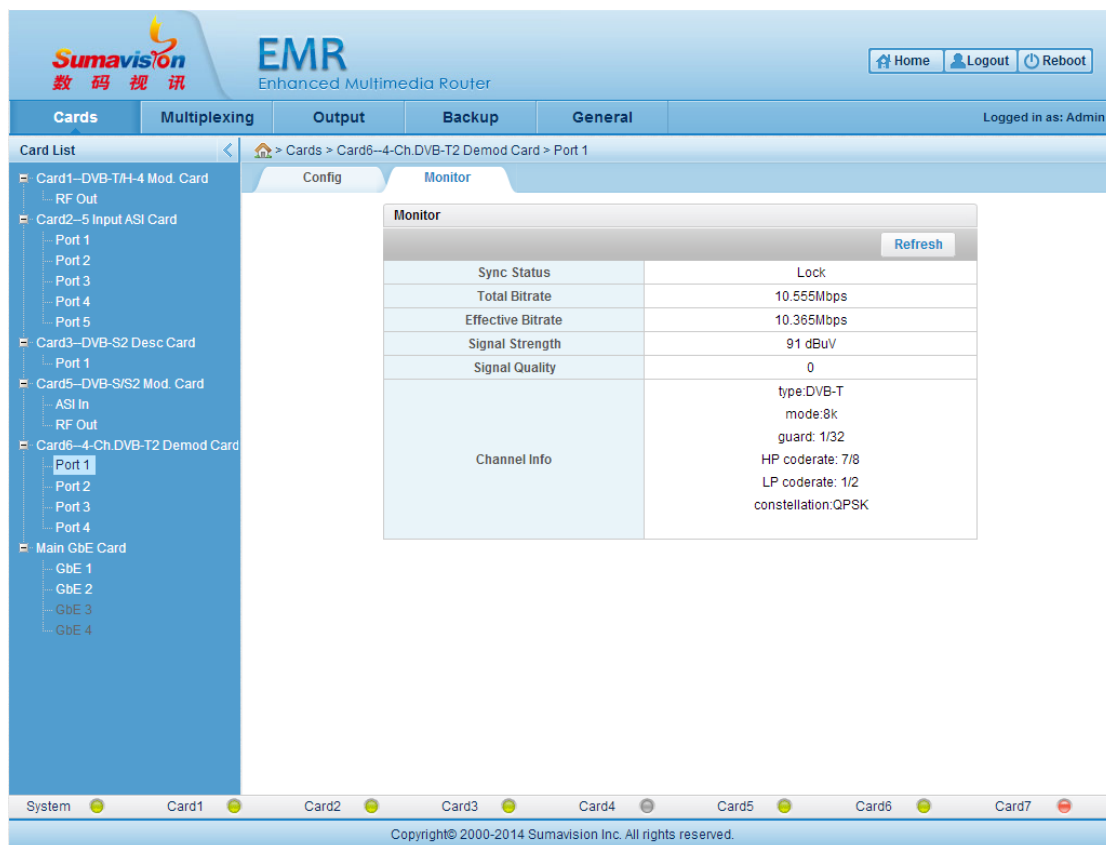


Fig. 5-111 4-Ch.DVB-T2 Demod Card Port Monitor

### 5.3.20.3 Parameter

Table 5-41 4-Ch.DVB-T2 Demod Card Parameter

| Parameter             | Range               | Default |
|-----------------------|---------------------|---------|
| Alarm                 | On/Off              | On      |
| Demod                 | On/Off              | Off     |
| Ts change             | Off/Type1/Type2     | Off     |
| Bandwidth             | 8MHz/7MHz/6MHz/5MHz | 8MHz    |
| Standard              | DVB-C/DVB-T/DVB-T2  | DVB-T2  |
| Profile               | HP/LP               | HP      |
| PLP ID                | 0~255               | 0       |
| Center Frequency(KHz) | 42000~870000        | 554000  |

### 5.3.21 4-Ch.DVB-S2 Demod card

#### 5.3.21.1 Interface

4-Ch.DVB-S2 Demod card provides four RF input interfaces for DVB-S/S2 standard RF signal reception, 4-Ch.DVB-S2 Demod card is shown in Fig. 5-112 4-Ch.DVB-S2 Demod card:



Fig. 5-112 4-Ch.DVB-S2 Demod card

### 5.3.21.2 Function

4-Ch.DVB-S2 Demod card provides 4 RF input ports for the reception of the RF signal of DVB-S/DVB-S2 standard. WEB network management may check the current status information and set the receiving parameter of the 4-Ch.DVB-S2 Demod card. The input program can be refreshed as per as the Setting Method for Multiplex in Section 5.1.1.2 Multiplexing Setting and the output is multiplexed finally.

#### 5.3.21.2.1 Receiving Parameter

The screenshot shows the EMR (Enhanced Multimedia Router) WEB interface. The breadcrumb trail is: Cards > Card2-4-Ch.DVB-S2 Demod card > Port 1. The configuration table is as follows:

|                          |                               |
|--------------------------|-------------------------------|
| Tuner                    | On                            |
| Standard                 | DVB-S                         |
| TS Change                | On                            |
| 22KHz                    | Off                           |
| Polarize                 | Horizontal                    |
| DiSeqC                   | Satellite 1 (Version 1.0/2.0) |
| Search                   | Stop                          |
| Symbol Rate (Ksps)       | 3570                          |
| Local Frequency (MHz)    | 5150                          |
| Downlink Frequency (MHz) | 3960                          |

Fig. 5-113 4-Ch.DVB-S2 Demod card Receiving Parameter Config

**Step 1:** Click “Port n” of “4-Ch.DVB-S2 Demod card” of WEB network management to navigate to port page;

**Step 2:** Click “Demod” to navigate to demodulation page;

**Step 3:** Click “Config” to navigate to Setting page;

**Step 4:** Set the “Tuner” as “On” and choose the “Standard”, “TS Change”, “Polarize”, “DiSeqC” and “22KHz” according to the satellite programme to be received, and fill in the “Downlink Frequency”, “Local Frequency” and “Symbol Rate”;

**Step 5:** After setting the parameter, click “Apply” to validate the parameter;

The monitoring interface shall display the code rate information which is currently received.

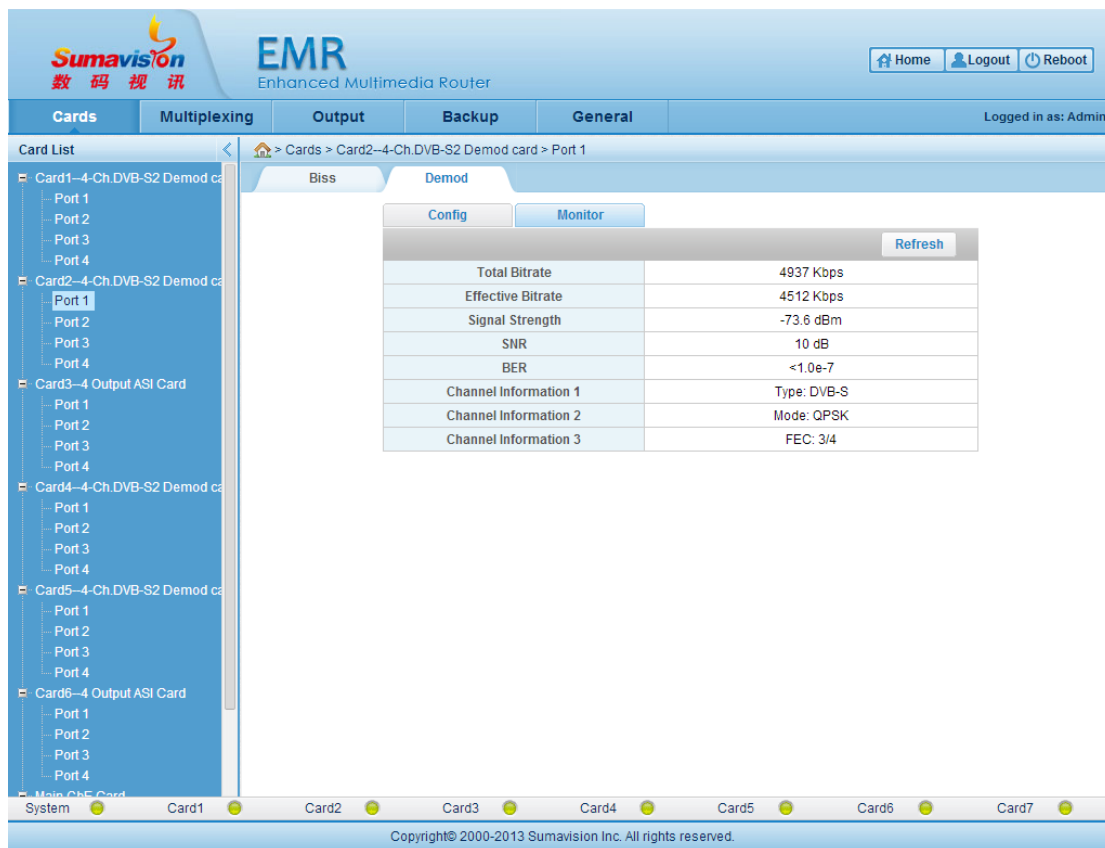


Fig. 5-114 4-Ch.DVB-S2 Demod card Receiving Parameter Monitor

### 5.3.21.2.2 BISS Descrambling Settings

When the BISS scrambling program is found in the received program, it can set the descrambling information in the "BISS" page. After the de-scrambling, the unscrambling stream programme will output in the output port. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting.

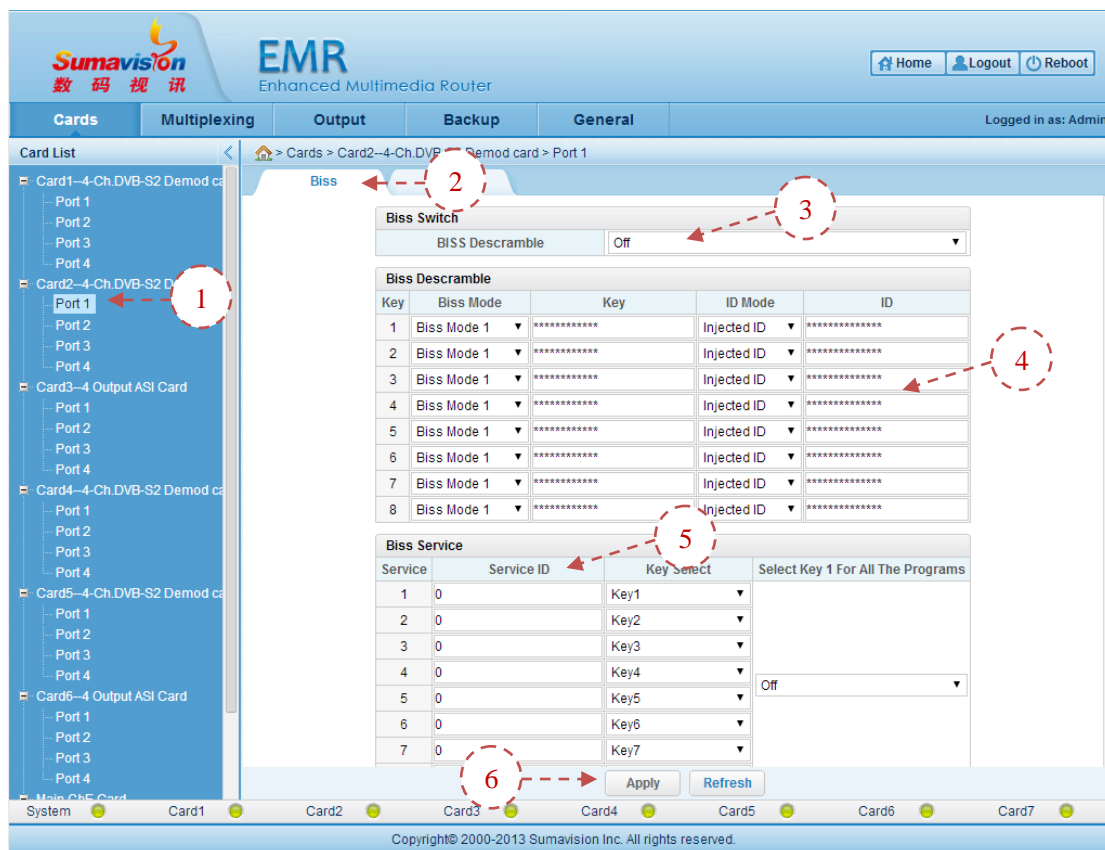


Fig. 5-115 4-Ch.DVB-S2 Demod card BISS Descrambling Settings

- Step 1:** Click “Port n” of WEB network management to navigate to port page;
- Step 2:** Click “BISS” to navigate to BISS setting page;
- Step 3:** Choose “On” of the “BISS Descramble” switch
- Step 4:** Set the descrambling key information, choose the “BISS Mode”, set the “Key”, and choose and set the “ID”;
- Step 5:** Set the BISS programme descrambling, fill in the “Service ID” of the BISS programme to be descrambled and choose the corresponding key;
- Step 6:** Click “Apply” to validate the parameter.

### 5.3.21.3 Parameter

Table 5-42 4-Ch.DVB-S2 Demod card Receiving Parameter

| Parameter               | Range  | Default                     |
|-------------------------|--|-----------------------------|
| Tuner                   | On/Off   | Off                         |
| Standard                | DVB-S/DVB-S2   | DVB-S                       |
| TS Change               | On/Off   | Off                         |
| 22KHz                   | On/Off   | Off                         |
| Polarize                | Vertical/Horizontal/Off  | Off                         |
| DiSEqC                  | Satellite 1~Satellite 4(Version1.0/2.0)<br>Satellite 1~Satellite 16(Version1.1/2.1)<br>Resend DiSEqC | Satellite 1(Version1.0/2.0) |
| Search                  | Stop/Start   | Stop                        |
| Symbol Rate(Ksps)       | 1000~45000   | 27500                       |
| Local Frequency(MHz)    | 1~99999  | 5150                        |
| Downlink Frequency(MHz) | 1~99999  | 4080                        |

Table 5-43 4-Ch.DVB-S2 Demod card BISS Descrambling Parameter

| Parameter                         | Range                                       | Default     |
|-----------------------------------|---|-------------|
| BISS Descramble                   | On/Off                                      | Off         |
| Biss Mode                         | Biss Mode 1/Biss Mode E                     | Biss Mode 1 |
| Key                               | (Length of Key should be between 12 and 16) | none        |
| ID Mode                           | Injected ID/Buried ID                       | Injected ID |
| ID                                | (Length of ID should be between 12 and 16)  | none        |
| Service ID                        | 0~65535                                     | 0           |
| Key Select                        | Key1~Key8                                   | Key1~Key8   |
| Select Key 1 For All The Programs | On/Off                                      | Off         |

### 5.3.22 StatMux4 Card

#### 5.3.22.1 Interface

The StatMux4 Card can provide four routes of 75ΩBNC interfaces for ASI signal output, as shown in Fig. 5-116 StatMux4 Card:



Fig. 5-116 StatMux4 Card

#### 5.3.22.2 Function

The StatMux4 Card is used for accounting multiplex of ASI output program and the fixed code rate output. This card supports the ASI code stream output of four routes. Once the program priority and the code rate are set according to the use condition, click “Apply”. The program can be multiplexed to the output port via the “Multiplex” interface of WEB network management and used as the output. For the program multiplex method, refer to

section 5.1.1.2 Multiplexing Setting.



Fig. 5-117 StatMux4 Card Parameter Setting

It can set the authorization code and the board card warning switch on the board card setting interface of the StatMux4 Card and such interface can display the current authorization status and the error rate.

=====

④ The processing power of the StatMux4 Card 4 is decided by the authorization. The maximum processing power refers to 30 SD program (one HD program is equivalent to five SD programs). The processing power can be realized by purchasing corresponding authorization.

=====

When the StatMux4 Card is used for statistic multiplex, it shall multiplex the program in the multiplex interface to the output port of the StatMux4 Card at first. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting. The introduction to board card parameter setting is as below:



Fig. 5-118 StatMux4 Card Port Config

**Step 1:** click the “Port n” in the “StatMux4 Card” of WEB network management to log in the port setting page;

**Step 2:** click the “Config” on the page to log in the setting page;

**Step 3:** set the “Total Bitrate” and the “Statistic Multiplex Bitrate” of the output port, select corresponding outputted “Packet Format” and set the “Re-generate PCR” and “Alarm” function to be on or off.

**Step 4:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

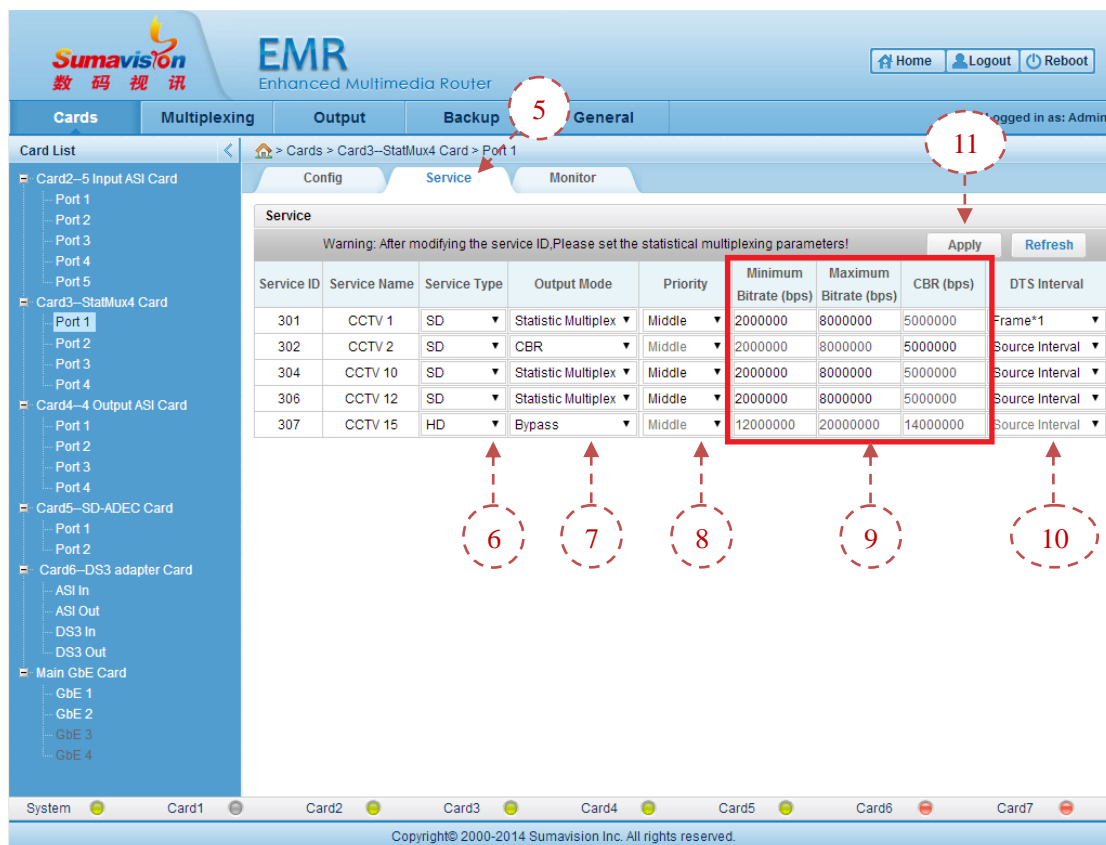


Fig. 5-119 StatMux4 Card Service Setting

**Step 5:** click the “Service” on the page to log in the program setting page;

**Step 6:** set the “Service Type” of corresponding program to be “SD” or “HD”;

**Step 7:** set the program “Output Mode” to be “Bypass”, “Statistic Multiplex” or “CBR” according to the real application situation;

“Bypass”: no treatment is made to the program and the direct output is made as per as the original code rate.

“Statistic Multiplex”: the adjustment is made to the code rate according to corresponding priority, maximum code rate and minimum code rate setting and then the output is made.

“CBR”: the output is made according to the fixed code rate setting.

**Step 8:** set the program “Priority” based on the importance degree of program. The “Priority” can be divided into five levels, including the “High”, “Higher”, “Middle”, “Lower” and “Low”.

**Step 9:** set the code rate parameter according to the output mode selected for the program. When the “Statistic Multiplex” mode is selected, set the “Minimum Bitrate” and the “Maximum Bitrate” to limit the code rate fluctuation rage. When the “CBR” mode is selected, set the “CBR” Bitrate value to output the program as per as the code rate setting.



**Step 10:** set the “DTS Interval” according to the real application demand and choose the “Source Interval” or “Frame\*1”.

**Step 11:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

The monitoring interface shall display relevant code rate information of current output port.

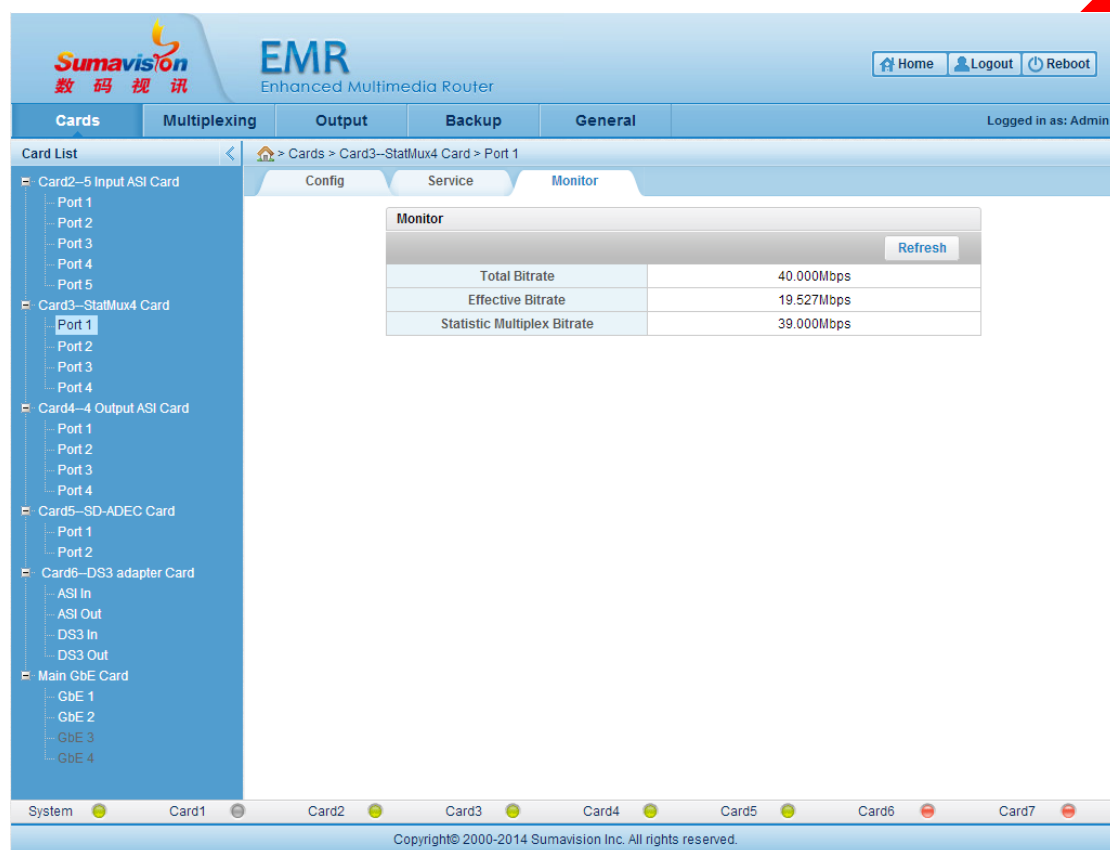


Fig. 5-120 StatMux4 Card Port Monitor

### 5.3.22.3 Parameter

Table 5-44 StatMux4 Card Parameter

| Parameter      | Range       | Default   |
|----------------|-------------|-----------|
| License Status | 0~30SD-Cell | 30SD-Cell |
| Alarm          | On/Off      | On        |

Table 5-45 StatMux4 Card Port Parameter

| Parameter                        | Range           | Default |
|----------------------------------|-----------------|---------|
| Total Bitrate(bps)               | 0~200000000     | 0       |
| Statistic Multiplex Bitrate(bps) | 0~200000000     | 0       |
| Packet Format                    | 188Byte/204Byte | 188Byte |
| Re-generate PCR Alarm            | Off/On          | Off     |
| Alarm                            | Off/On          | On      |

Table 5-46 StatMux4 Card Service Parameter

| Parameter       | Range   | Default                             |
|-----------------|---|-------------------------------------|
| Service Type    | SD/HD   | SD                                  |
| Output Mode     | Bypass/Statistic Multiplex/CBR                          | Bypass                              |
| Priority        | Low/Lower/Middle/Higher/High                            | Middle                              |
| Minimum Bitrate | SD : 2000000~8000000bps ;<br>HD :10000000~18000000bps ; | SD : 2000000bps<br>HD : 12000000bps |
| Maximum Bitrate | SD : 2000000~8000000bps ;<br>HD :12000000~32000000bps ; | SD : 5000000bps<br>HD : 20000000bps |
| CBR             | SD : 2000000~8000000bps ;<br>HD :10000000~32000000bps ; | SD : 8000000bps<br>HD : 14000000bps |
| DTS Interval    | Source Interval/Frame * 1                               | Source Interval                     |

### 5.3.23 CA01B Switch Card

#### 5.3.23.1 Interface

The CA01B Switch Card provides 3 ASI input interfaces and 2 ASI outputs for backup switch of ASI signal programs, as shown in Fig. 5-121 CA01B Switch Card:

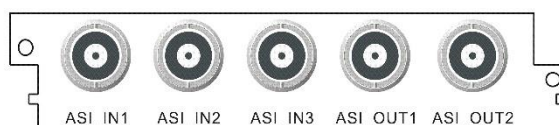


Fig. 5-121 CA01B Switch Card

#### 5.3.23.2 Function

The CA01B Switch Card can be used for backup and switch of ASI input signal program. The card supports the three-route ASI code stream input. When the main and backup pad parameters are set according to the use condition, click “Apply” to normally realize the switch of backup. The program of the main route can be outputted to the output port via the “Multiplexing” interface of WEB network management. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting.

##### 5.3.23.2.1 Board card setting

In addition to the back board backup function, the CA01B Switch Card also has several functions in equipment power-off situation and abnormality, as the power-off selection, three-route abnormality selection and the output port 2 section. It has the convenient use. In addition, the CA01B Switch Card has the port and program code rate abnormality switch function. It can realize the switch on the condition that the PID code rate, the video and the audio are abnormal.

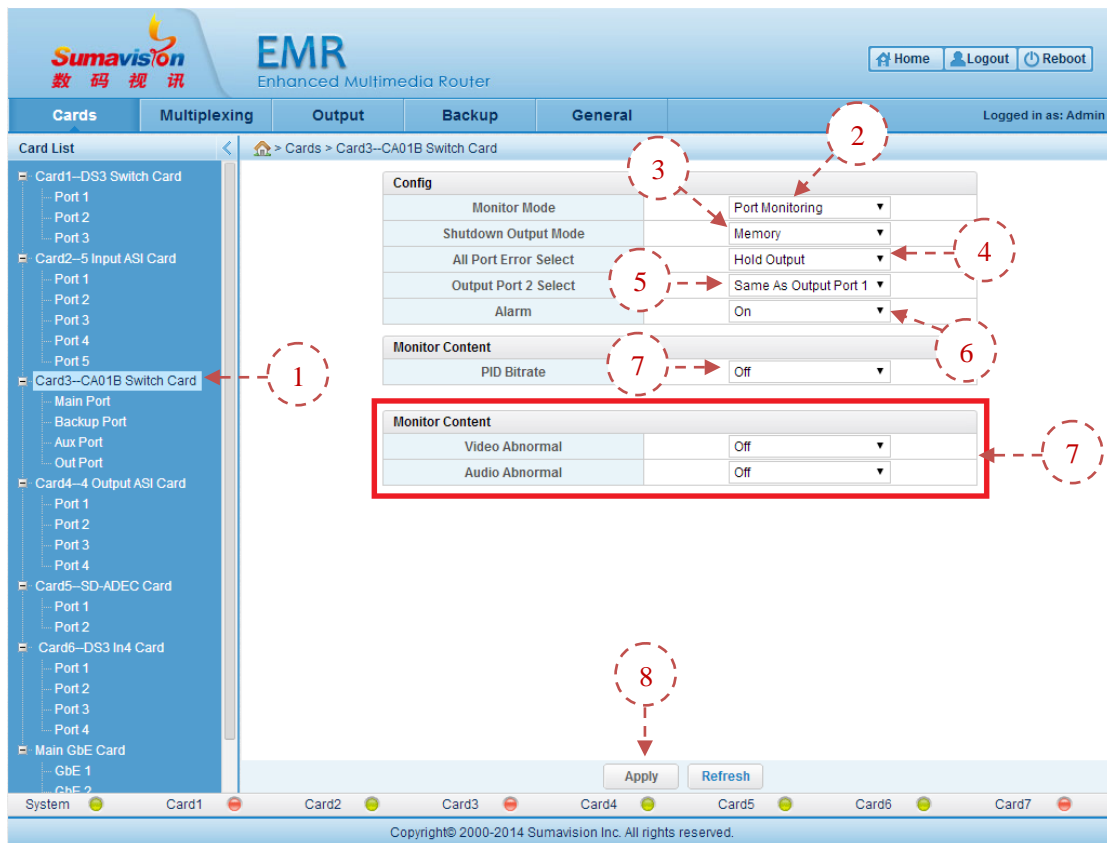


Fig. 5-122 CA01B Switch Card Parameter Setting

**Step 1:** click WEB network management “CA01B Switch Card” to log in the board card page;

**Step 2:** click the “Monitor Mode” option on the page and select the “Port Monitoring” or “Program Monitoring” switch mode according to the actual application requirement.

**Step 3:** click the “Shutdown Output Mode” on the page, choose “Memory” and the output shall be remained in the state before the equipment power-off; choose “Same As Input Port 1”, “Same As Input Port 2” or “Same As Input Port 3”; and the output is chosen as the input stream of port after equipment power-off.

**Step 4:** click the “All Port Error Select” option on the page. When the “Hold Output” is selected, the three input ports are abnormal and the program stream is outputted from the current port as still. When the “Cut Output” is selected, the three input ports are abnormal and the output is turned off.

**Step 5:** click “Output Port 2 Select” option on the page. When the “Same As Output Port 1” is selected, the output port 2 shall output the program stream as the same as that of the output port 1. When the “Same As Input Port 1”, “Same As Input Port 2” or “Same As Input Port 3” is selected, the output port 2 shall output the input stream of the selected port.

**Step 6:** click the “Alarm” switch option on the page and choose to turn “On” or “Off”

warning function.

**Step 7:** when the “Port Monitoring” option is selected under the monitoring mode, the “PID Bitrate” is displayed on the monitoring content, as shown in the above figure. If this function is initialized, the PID code rate of the port shall be monitored and used as the switch basis for abnormality judgment of port. When the “Program Monitoring” is selected under the monitoring mode, the monitoring content shall be changed to the “Video Abnormal” and “Audio Abnormal” in the above red box. If this function is initialized, the audio and video program shall be monitored and used as the switch basis for judgment of program abnormality.

**Step 8:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

### 5.3.23.2.2 Output port setting:

The code rate of output system, the output format and the warning switch can be set on the switch card of the output port interface of CA01B Switch Card.

The screenshot displays the EMR (Enhanced Multimedia Router) web interface. The main navigation tabs are Cards, Multiplexing, Output, Backup, and General. The current page is 'Output Port' for Card3-CA01B Switch Card. The configuration table is as follows:

| Parameter           | Value    |
|---------------------|----------|
| Total Bitrate (bps) | 0        |
| Alarm               | On       |
| Packet Format       | 188 Byte |
| Effective Bitrate   | 0bps     |

Fig. 5-123 CA01B Switch Card Output Port Parameter Setting

**Step 1:** click the “Output Port” in the web network management “CA01B Switch Card” to log in the output port setting page;

**Step 2:** set the “Total Bitrate” on the page and the code rate range of the output

system is 0-200,000,000bps;

**Step 3:** click the “Packet Format” option on the page to choose the “188 Byte” or “204 Byte” output;

**Step 4:** click the “Alarm” switch option on the page and choose to turn “On” or “Off” warning function.

**Step 5:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

It can view the real outputted effective code rate.

### 5.3.23.2.3 Port backup

The port backup of CA01B Switch Card is based on the port backup function of the back board. It shall select the “Port Monitoring” option as per as the step 2 operation in 5.3.23.2.1Board card setting. Click the “apply” to initialize the port monitoring function. The backup relationship between the master equipment and the backup equipment is as shown in 6.4.2Port Backup. The pad port setting method is as shown in 6.4.1Service Backup in details. In addition, the port backup of the CA01B Switch Card can realize the monitoring to PID code rate and the switch. The main and backup pad port shall support the monitoring of two PIDs. In this time, it needs to set the multi-program pad playing function for the pad port. To realize the PID monitoring function, it shall follow the step 7 operation of 5.3.23.2.1Board card setting: turn on the PID code rate switch, click “Apply” and turn on the “PID Bitrate” monitoring function.

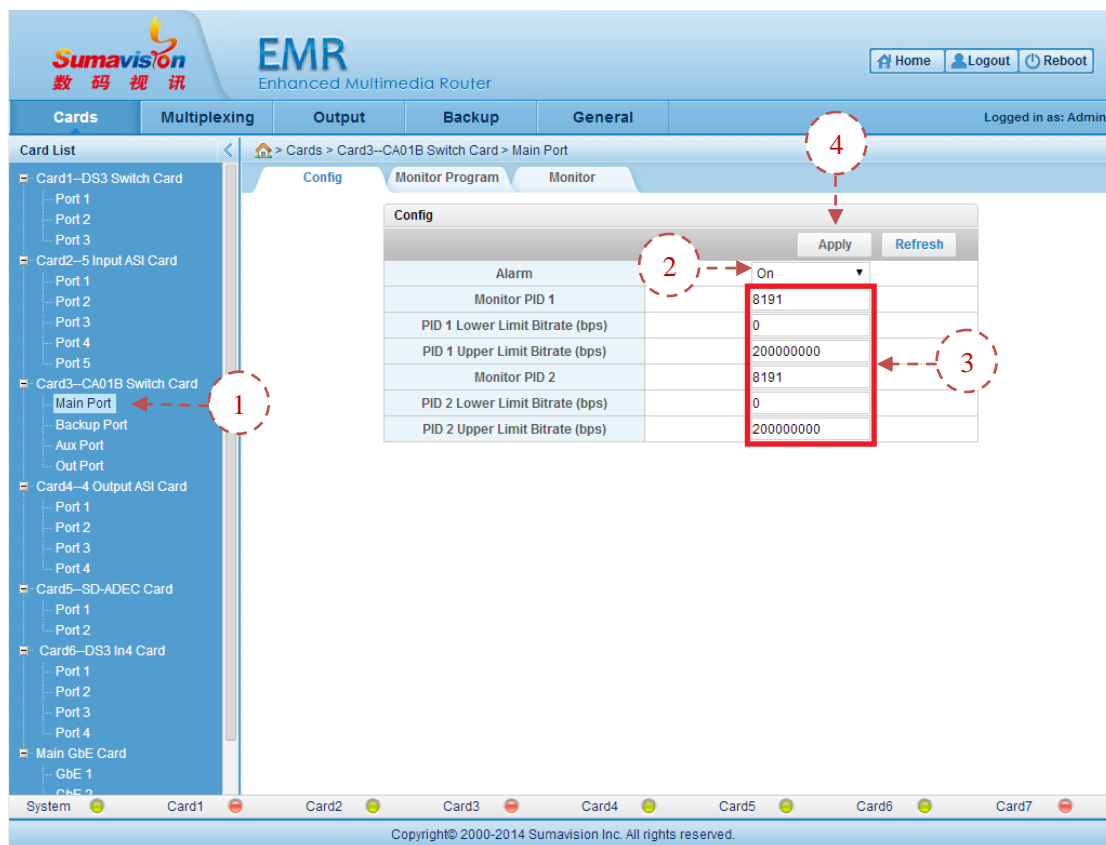


Fig. 5-124 CA01B Switch Card Output Port Parameter Setting

**Step 1:** click the “Main Port”, the “Backup Port” or the “Aux Port” in the web network management “CA01B Switch Card” to log in the port setting page;

**Step 2:** click the “Alarm” switch option on the page and choose to turn “On” or “Off” warning function.

**Step 3:** set the “Monitor PID”, “PID Lower Limit Bitrate” and “PID Upper Limit Bitrate” on the page. When the code rates of two PIDs are beyond the upper limit and the lower limit of corresponding PID code rate, it is believed that the port is abnormal and the switch shall be made.

**Step 4:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

When the single program pad playing option is used on the pad port, it needs to click the “Program Research” on the bottom to refresh the page. When the input program names are totally shown in the “Aux Program Select”, it can select one program from the drop-down box to duplicate the program. In addition, it shall fill the “Independent PCR Count” and the “Video Carry PCR Count” according to the real condition of the backup program to realize the backup.

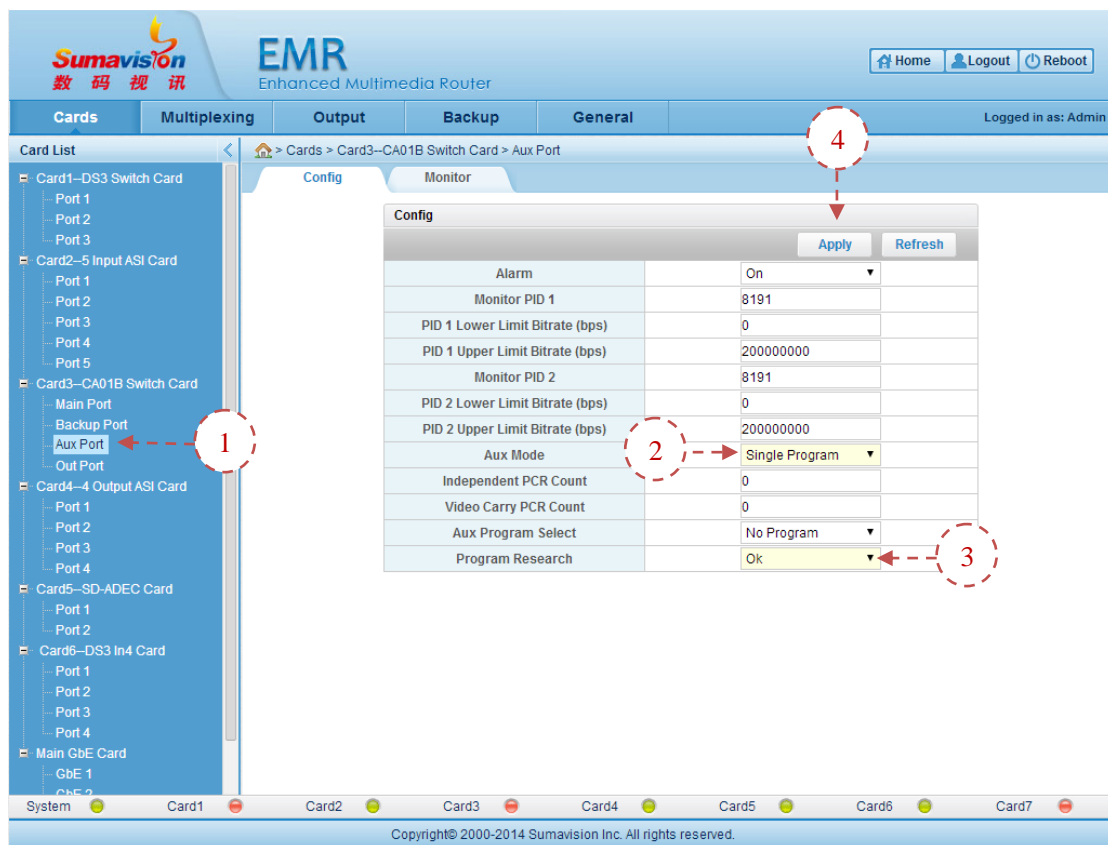


Fig. 5-125 CA01B Switch Card Single Program Pad Playing Function

**Step 1:** click the “Aux Port” in the web network management “CA01B Switch Card” to log in the Pad Port setting page;

**Step 2:** click the “Aux Mode” option on the page and choose the “Single Program” option.

**Step 3:** click the “Program Research” option on the page and select “On”.

**Step 4:** click the “Apply” on the page after setting the parameter to search the table.

Sumavision

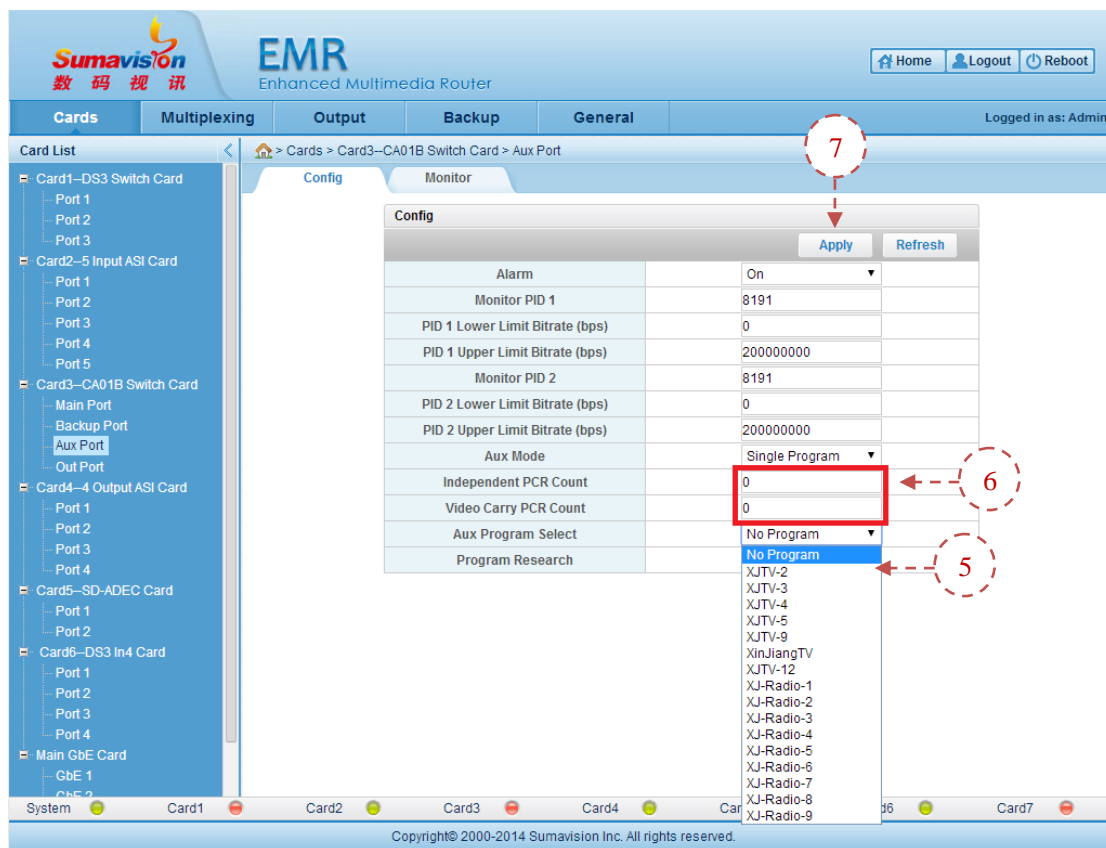


Fig. 5-126 CA01B Switch Card Single Program Pad Playing Searching List

**Step 5:** click the “Aux Program Select” option after searching the list and choose the pad playing program from the list.

**Step 6:** fill the “Independent PCR Count” and “Video Carry PCR Count” according to the real condition of the main route program;

**Step 7:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

=====

The single program pad playing function supports 16 programs at most. Namely, the sum of the “Independent PCR Count” and the “Video Carry PCR Count” shall not be greater than 16.

=====



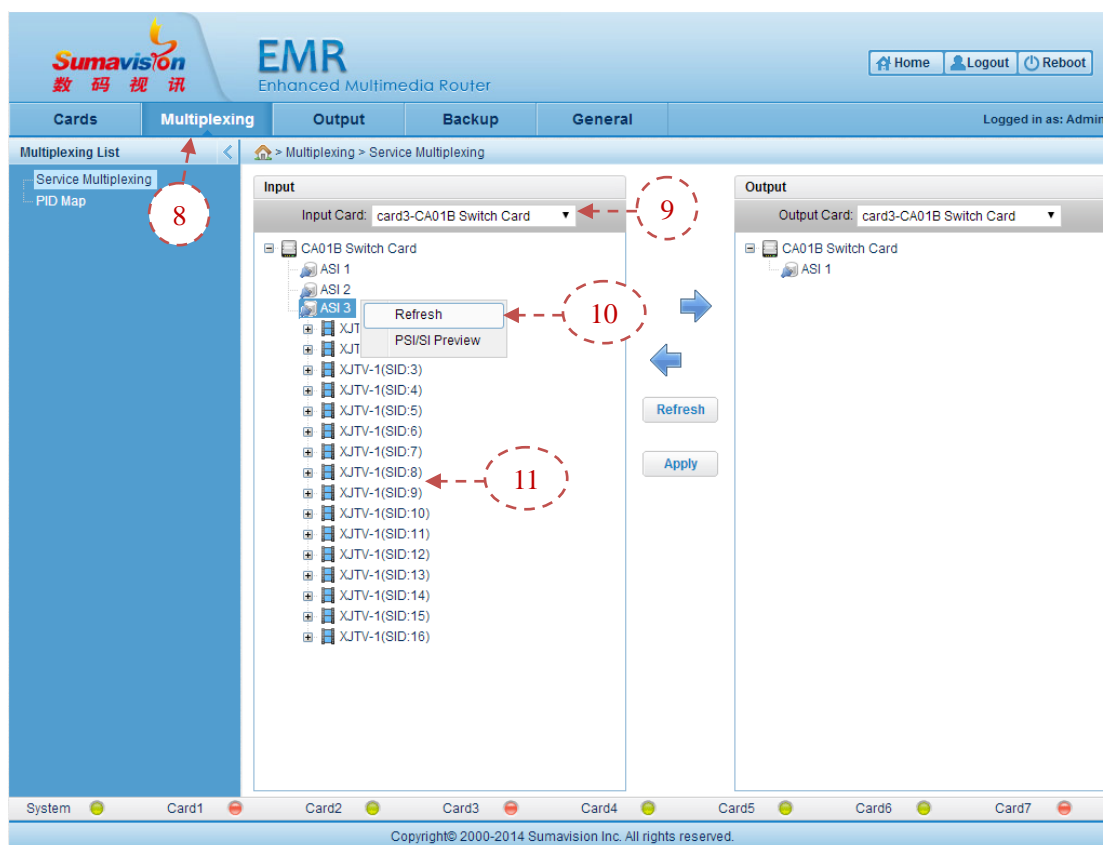


Fig. 5-127 CA01B Switch Card Single Program Pad Playing Function Multiplexing

**Step 8:** click the “Multiplexing” of the network management interface to log in the program multiplex interface;

**Step 9:** select “CA01B Switch Card” to view the input port;

**Step 10:** right click the “ASI 3” port and manually select and refresh the input list

**Step 11:** display the appointed single program with corresponding number on the port after the refreshing and realize the program backup operation of backboard (pad playing of single program). The program setting method for back board is as shown in 6.4.1Service Backup.

#### 5.3.23.2.4 Program backup

The program backup of CA01B Switch Card is based on the program backup function of the back board. It shall select the “Program Monitoring” option as per as the step 2 operation in 5.3.23.2.1Board card setting. Click the application to initialize the program monitoring function. The program backup relationship between the master port and the backup port is as the same as the program backup setting method of the back board. For details, refer to 6.4.1Service Backup. In addition, the program backup of CA01B Switch Card can be used for monitoring the audio and video and make the switch then. The main and backup ports support the monitoring for 8 videos or audios. To realize the video and audio monitoring function, it needs to follow the step 7 operation in 5.3.23.2.1Board card

setting: turn on the video abnormality switch or audio abnormality switch and click “Apply” to switch on corresponding monitoring function.

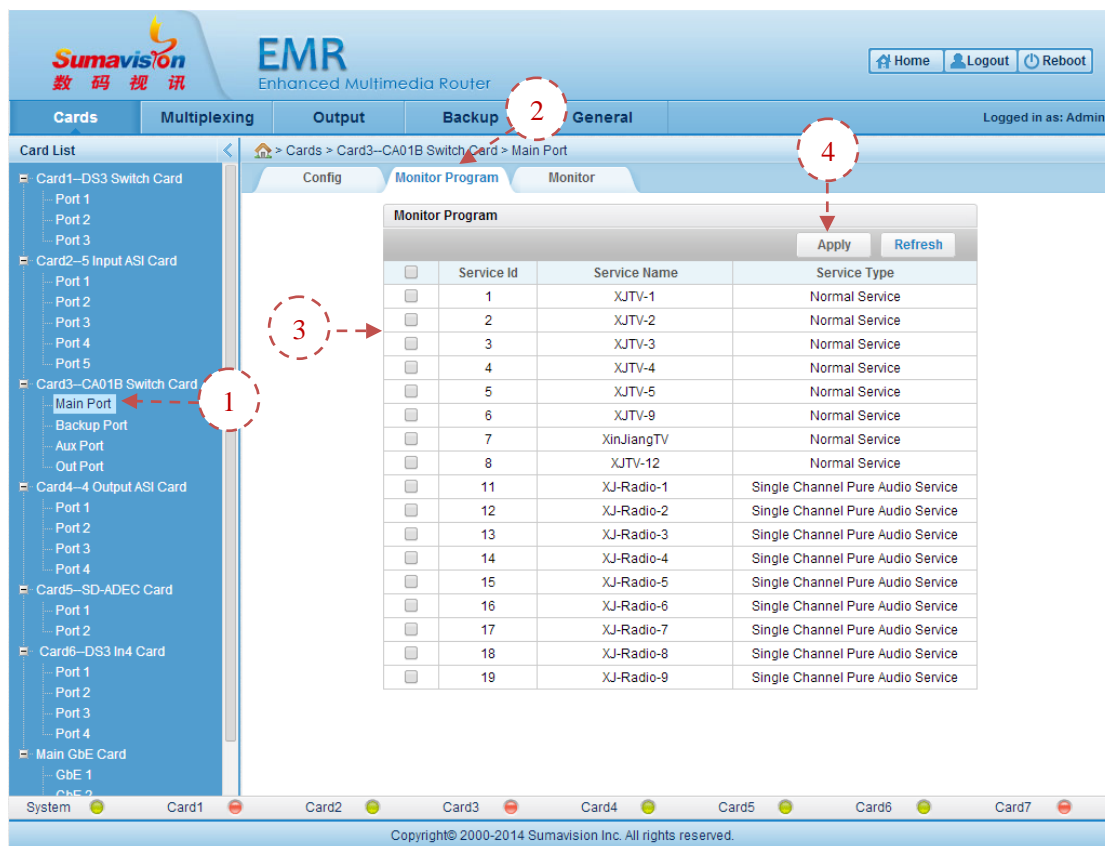


Fig. 5-128 CA01B Switch Card Monitor Program

**Step 1:** click the “Main Port” or the “Backup Port” in the web network management “CA01B Switch Card” to log in the port setting page;

**Step 2:** click the “Monitor Program” on the page to log in the monitoring program page;

**Step 3:** check the program which is the audio and video monitoring target. When the audio is mute or the video is composed of the color bar, it is believed that the program is abnormal.

**Step 4:** after checking, click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

- ☐ The program monitoring function can support the monitoring for the video or audio of 8 programs at most.
- ☐ The audio must be monitored in such a way that it is ensured that the program is a pure audio one and no video is given.

### 5.3.23.3 Parameter

Table 5-47 CA01B Switch Card Parameter

| Parameter             | Range   | Default               |
|-----------------------|---|-----------------------|
| Monitor Mode          | Program Monitoring/Port Monitoring  | Port Monitoring       |
| Shutdown Output Mode  | Memory/Same As Input Port 1/ Same As Input Port 2/ Same As Input Port 3                 | Memory                |
| All Port Error Select | Hold Output/Cut Output  | Hold Output           |
| Output Port 2 Select  | Same As Output Port 1/ Same As Input Port 1/ Same As Input Port 2/ Same As Input Port 3 | Same As Output Port 1 |
| Alarm                 | On/Off  | On                    |
| PID Bitrate           | On/Off  | Off                   |
| Video Abnormal        | On/Off  | Off                   |
| Audio Abnormal        | On/Off  | Off                   |

Table 5-48 CA01B Switch Card Output Port Parameter

| Parameter          | Range            | Default  |
|--------------------|------------------|----------|
| Total Bitrate(bps) | 0 ~ 2000000000   | 0        |
| Alarm              | On/Off           | On       |
| Package Format     | 188 Byte/204Byte | 188 Byte |

Table 5-49 CA01B Switch Card Input Port Parameter

| Parameter                          | Range                           | Default          |
|------------------------------------|---------------------------------|------------------|
| Alarm                              | On/Off                          | On               |
| Monitoring PID 1(2)                | 0~8191                          | 8191             |
| PID 1(2) Lower Limit Bitrate(bps)  | 0~2000000000                    | 0                |
| PID 1(2) Upper Limit Bitrate (bps) | 0~2000000000                    | 0                |
| Aux Mode                           | Multiple Program/Single Program | Multiple Program |
| Independent PCR Number             | 0 ~ 16                          | 0                |
| Video PCR Number                   | 0 ~ 16                          | 0                |
| Aux Program Select                 | No Program /Program List        | No Program       |
| Program Search                     | Cancel/Ok                       | Cancel           |

## 5.3.24 DS3 Switch Card

### 5.3.24.1 Interface

The DS3 Switch Card provides 3 DS3 input interfaces and 2 DS3 outputs for backup switch of DS3 signal programs, as shown in Fig. 5-129 DS3 Switch Card:



Fig. 5-129 DS3 Switch Card

### 5.3.24.2 Function

The DS3 Switch Card can be used for backup and switch the DS3 input signal. The card supports the three-route DS3 code stream input. When the three ports and the backup parameters are set according to the use condition, click “Apply” to normally realize the switch of backup. The two output ports shall automatically output the current stream as per as the real backup situation. No multiplexing operation is required.

#### 5.3.24.2.1 Board card setting

The DS3 Switch Card can realize the automatic switch by judging the code rate within the PID range and can realize the switch function via the manual function. The main route priority mode can be selected during automatic switch. This card also supports DS3 and E3 signal backup switch.

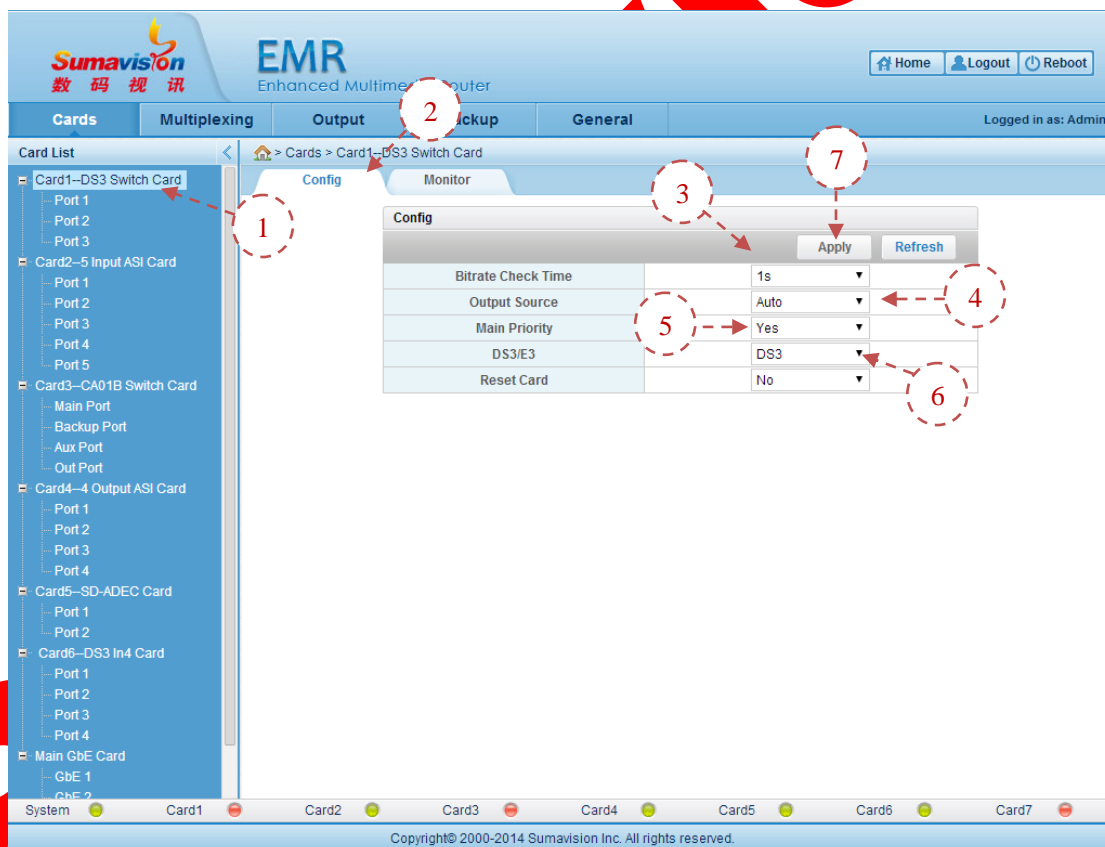


Fig. 5-130 DS3 Switch Card Config

**Step 1:** click WEB network management “DS3 Switch Card” to log in the board card page;

**Step 2:** click the “Config” on the page to log in the setting page;

**Step 3:** click the “Bitrate Check Time” on the page to select the time meeting the real application requirements. The “1s”, “1/2s”, “1/4s” or “1/8” is available;

**Step 4:** click the “Output Source” option on the page. When the “Auto” is selected, the automatic switch mode is initialized and the automatic switch will be made between the ports according to the real setting condition. When “DS3 1”, “DS3 2” or “DS3 3” is selected, it will output the program stream of the selected input port and no switch shall be made.

**Step 5:** click the “Main Priority” option on the page and choose whether to open the priority mode of the main route.

When the main route is abnormal and the backup route is normal, the “Main Priority” mode may be switched to the backup route. When the main route is recovered, the backup route may be switched to the main route.

**Step 6:** click the “DS3/E3” option the page and choose corresponding mode according to the input source.

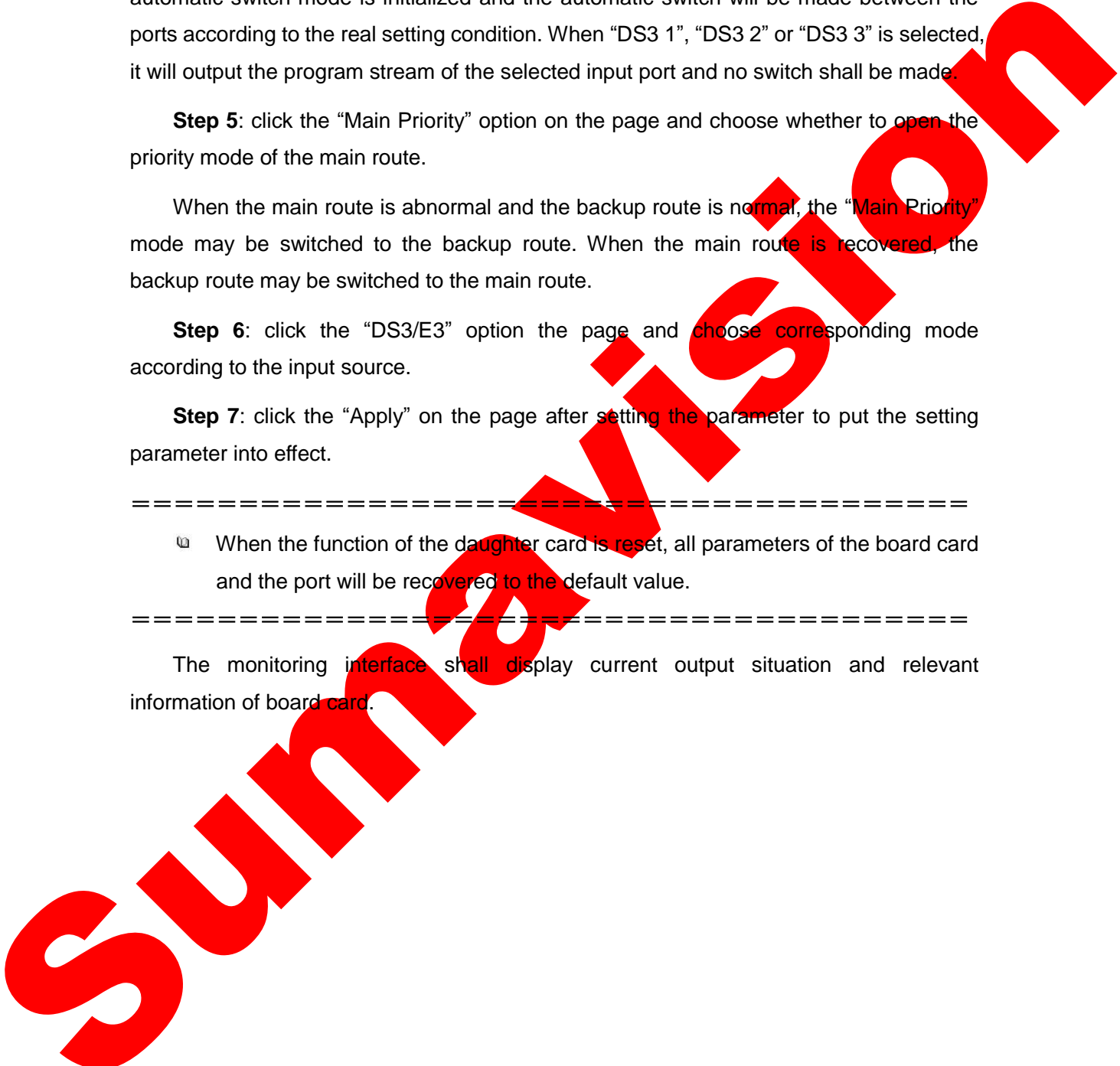
**Step 7:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

=====

- ☐ When the function of the daughter card is reset, all parameters of the board card and the port will be recovered to the default value.

=====

The monitoring interface shall display current output situation and relevant information of board card.



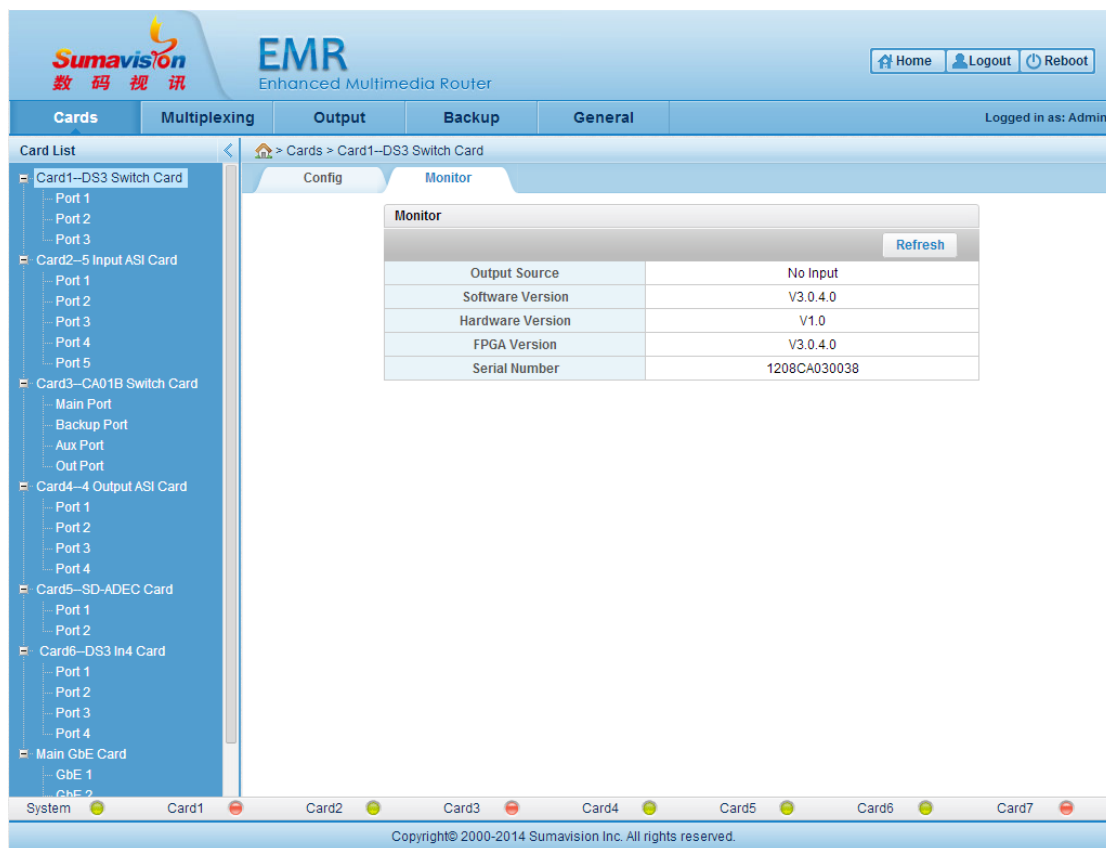


Fig. 5-131 DS3 Switch Card Monitor

### 5.3.24.2.2 Port setting

The PID upper and lower limit, the minimum code rate and other receiving parameters can be set on the input port interface of the DS3 Switch Card. When the normal reception is made on the input end, it shall judge the code rate value within the PID range. If the code rate is less than the minim code rate setting, it is believed that the port is abnormal and the switch shall be made. The manual mode is not affected by such switch. The stream received by the input port of the user shall be outputted.

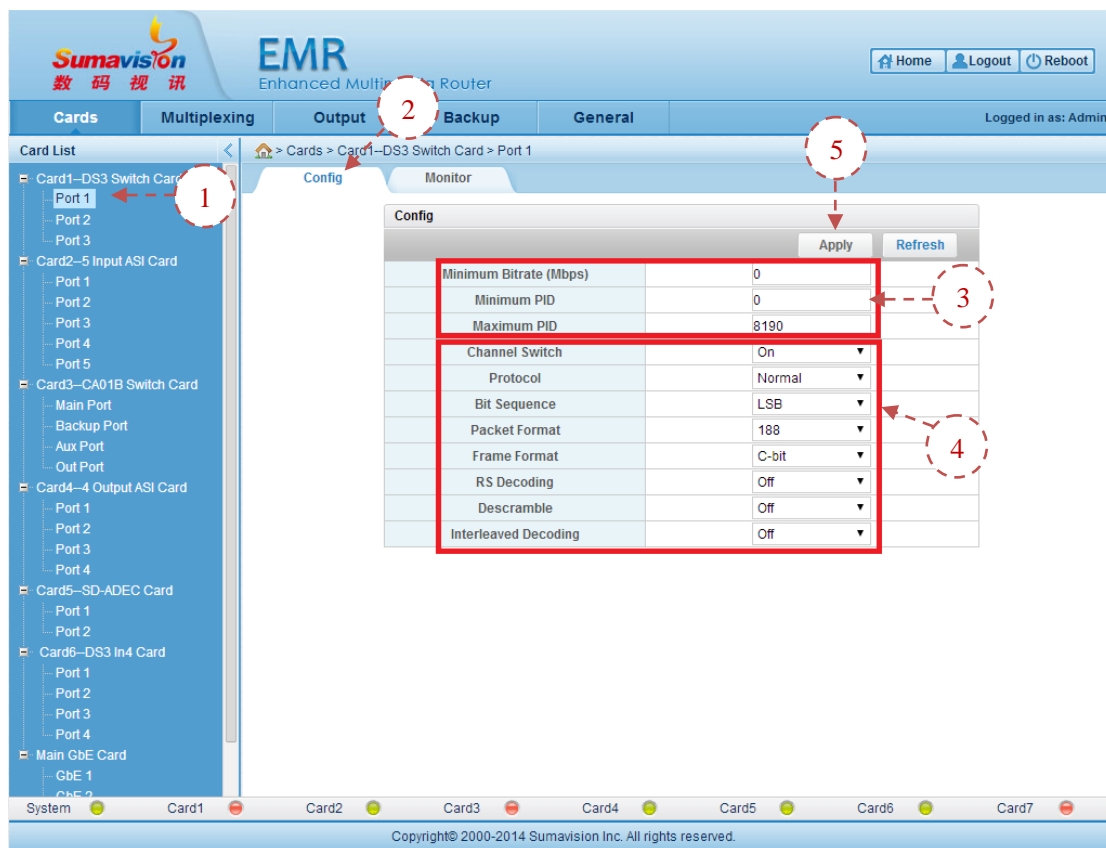


Fig. 5-132 DS3 Switch Card Port Config

**Step 1:** click the “Port 1” in the “DS3 Switch Card” of WEB network management to log in the port page;

**Step 2:** click the “Config” on the page to log in the port setting page;

**Step 3:** set the “Minimum Bitrate”, the “Minimum PID” and the “Maximum PID” on the page. When the code rate within the PID range is less than the “Minimum Bitrate”, it is believed that the port is abnormal and the switch shall be made.

**Step 4:** set the “Channel Switch” to be “On”. Set the “Protocol”, “Bit Sequence”, “Packet Format”, “Frame Format”, “RS Decoding”, “Descramble” and “Interleaved Decoding” according to the parameter setting of the last input source.

**Step 5:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

The monitoring interface shall display the code rate information of the input source which is received currently.

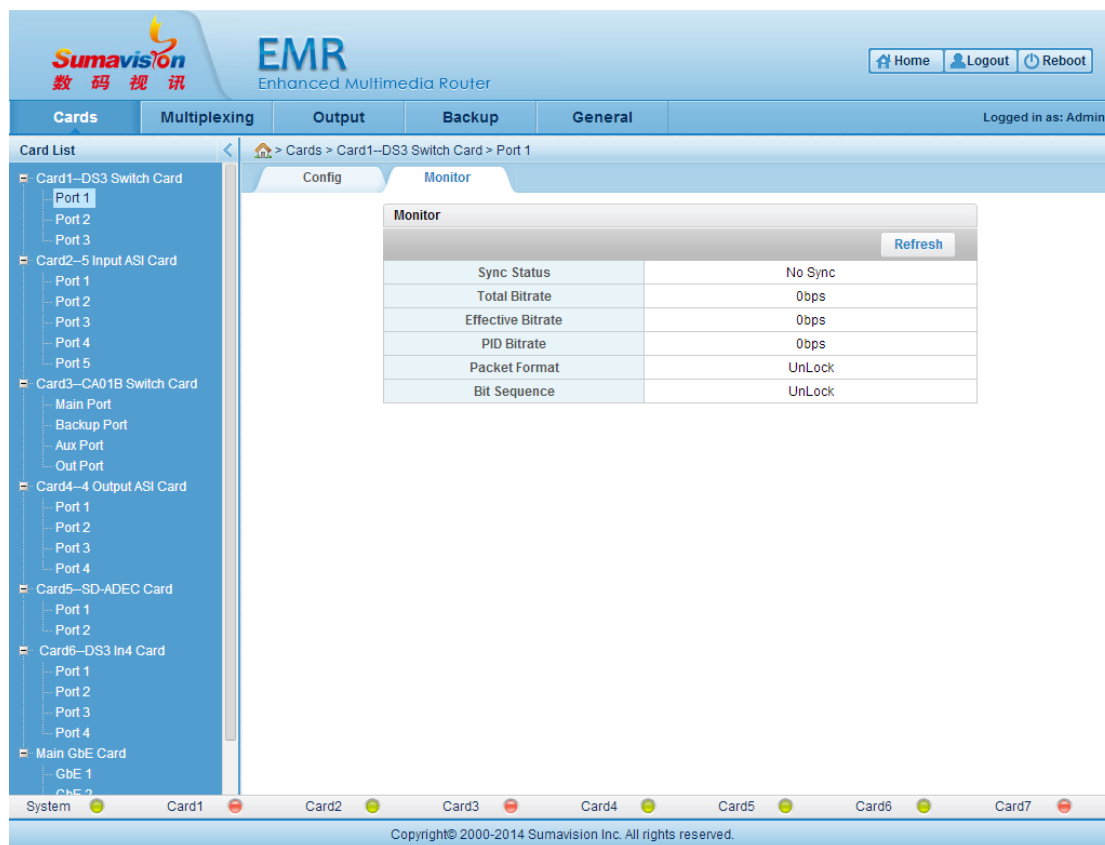


Fig. 5-133 DS3 Switch Card Port Monitor

The setting method of ports 2 and 3 are identical to that of port 1. No description is additionally given hereby.

=====

☐ This board card is provided with the power-off memory function that the normal output can be remained after the power failure.

=====

### 5.3.24.3 Parameter

Table 5-50 DS3 Switch Card Parameter

| Parameter          | Range                   | Default |
|--------------------|-------------------------|---------|
| Bitrate Check Time | 1/8s / 1/4s / 1/2s / 1s | 1s      |
| Output Source      | Auto/DS3 1/DS3 2/DS3 3  | Auto    |
| Main Priority      | No/Yes                  | Yes     |
| DS3/E3             | DS3/E3                  | DS3     |
| Reset Card         | No/Yes                  | No      |



Table 5-51 DS3 Switch Card Input Port Parameter

| Parameter             | Range              | Default |
|-----------------------|--------------------|---------|
| Minimum Bitrate(Mbps) | 0~200              | 0       |
| Minimum PID           | 0 ~ 8191           | 0       |
| Maximum PID           | 0 ~ 8191           | 8190    |
| Channel Switch        | On/Off             | On      |
| Protocol              | Normal/ Tandberg   | Normal  |
| Bit Sequence          | MSB/LSB            | MSB     |
| Package Fromat        | 188/204            | 188     |
| Frame Format          | No Frame/C-bit/M13 | C-bit   |
| RS Decoding           | On/Off             | Off     |
| Descramble            | On/Off             | Off     |
| Interleaved Decoding  | On/Off             | Off     |

### 5.3.25 RF Switch Card

#### 5.3.25.1 Interface

The RF Switch Card provides 2 RF input interfaces, 1 RF output interface and 1 ASI output for backup switch of RF signal programs, as shown in Fig. 5-134 RF Switch Card

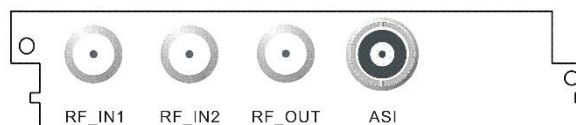


Fig. 5-134 RF Switch Card

#### 5.3.25.2 Function

The RF Switch Card can be used for backup and switch the RF input signal. The card supports the two-route RF signal input. When the main and backup port parameters and the backup parameters are set according to the use condition, click “Apply” to normally realize the switch of backup. The RF output port shall automatically output the current stream according to the real backup condition. The output code stream of ASI output port is identical to that of the RF output port, which can be used for monitoring. The board card requires no multiplex operation.

##### 5.3.25.2.1 Board card setting

The RF Switch Card can realize the automatic switch by judging the code rate value within the PID range or by judging the level fluctuation size. It can also realize the switch by manual selection. When making the automatic switch, it can choose the “Main Priority” mode.

When switching the level threshold, it can manually or automatic obtain the reference level. If the level fluctuation is greater than the level switch threshold setting, it is believed that the route is abnormal and the switch shall be made. The manual mode is not affected

by this action. The stream received by the input port of the user shall be outputted.

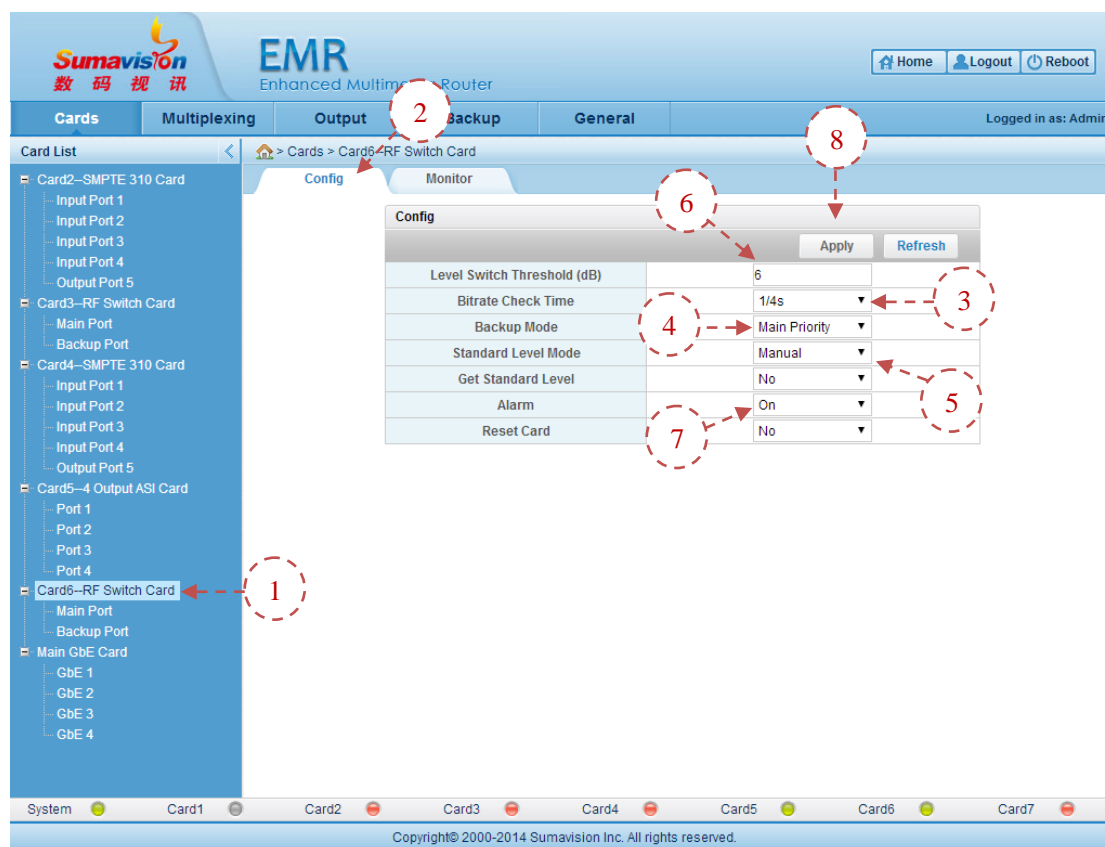


Fig. 5-135 RF Switch Card Parameter Setting

**Step 1:** Click WEB network management “RF Switch Card” to log in the board card page;

**Step 2:** click the “Config” on the page to log in the setting page;

**Step 3:** click the “Bitrate Check Time” on the page to select the time according to the real application requirements. The “2s”, “1s”, “1/2s” or “1/4s” is available;

**Step 4:** click the backup mode option on the page to choose the mode complying with the real application requirement. It can choose the “Main Priority”, “Floating”, “One-Way Switch”, “Assign Main” or “Assign Backup” as the backup mode. It is advised that the “Main Priority” mode shall be set during the normal use.

When the main route is abnormal and the backup route is normal, the “Main Priority” mode may be switched to the backup route. When the main route is recovered, the backup route may be switched to the main route.

When one route is abnormal in the “Floating”, the route may be switched to another one.

If the switch is made under the “One-way Switch” mode, it is impossible to switch to the main route.

The “Assign Main” or the “Assign Backup” can use the appointed Ethernet port.

**Step 5:** click the “Standard Level Mode” option the page, select “Auto” and then the equipment shall automatically obtain the level once after each time period. If select “Manual”, it needs to set “Get Standard Level” option to be “Yes”. Once this setting is applied, the manual obtainment is made once. The level obtains by the two situations can be displayed on the port “Monitor” interface.

**Step 6:** set the “Level Switch Threshold” on the page. When the equipment detects that the difference between the real level and the reference level is greater than the threshold, it is believed that the port is abnormal and the switch shall be made.

**Step 7:** click the “Alarm” switch option on the page and choose to turn “On” or “Off” warning function.

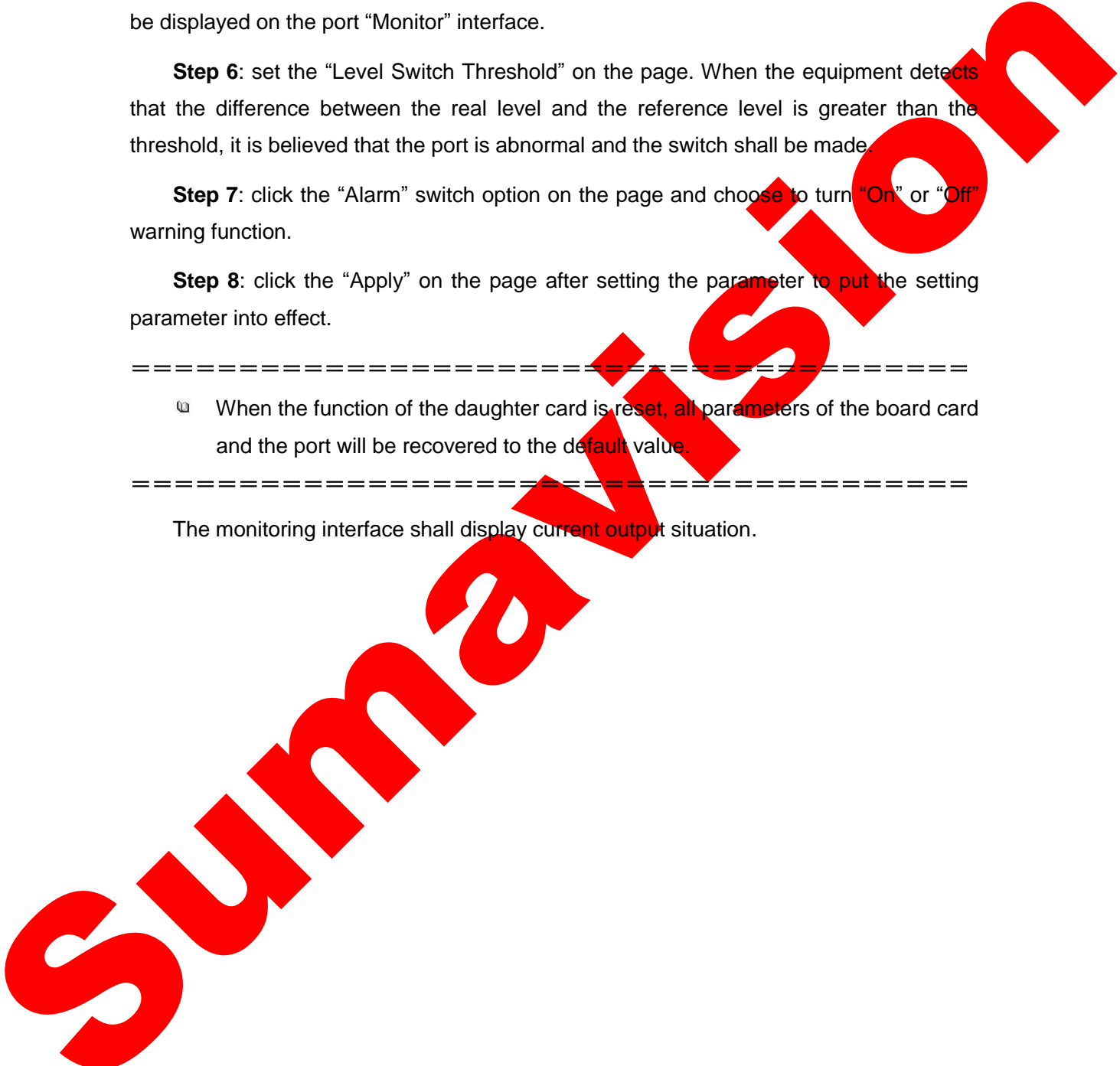
**Step 8:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

=====

- ☐ When the function of the daughter card is reset, all parameters of the board card and the port will be recovered to the default value.

=====

The monitoring interface shall display current output situation.



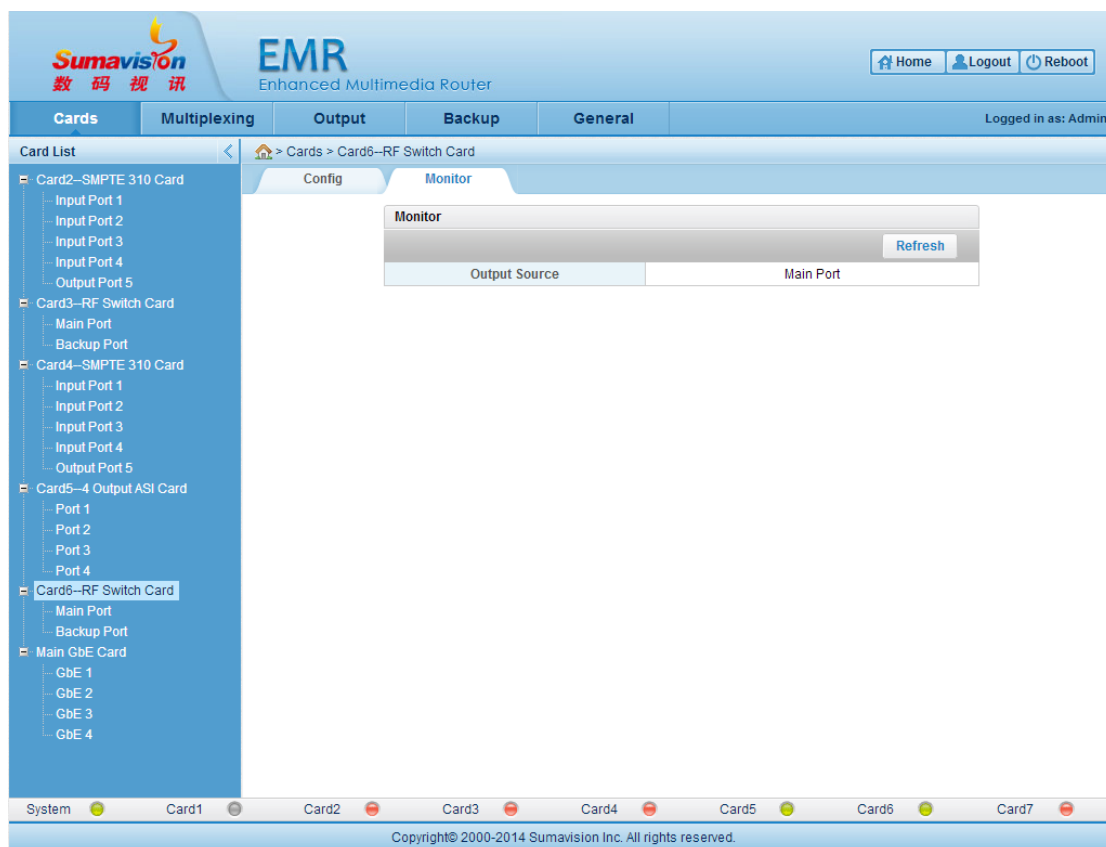


Fig. 5-136 RF Switch Card Monitor

### 5.3.25.2 Main and backup route setting

The PID upper and lower limit, the minimum code rate and other receiving parameters can be set on the main and backup route setting interface of the RF Switch Card. When the normal reception is made on the input end, it shall judge the code rate value within the PID range. If the code rate is less than the minim code rate setting, it is believed that the port is abnormal and the switch shall be made. The manual mode is not affected by such switch. The stream received by the input port of the user shall be outputted.



Fig. 5-137 RF Switch Card Port Parameter Setting

**Step 1:** click the “Main Port” or the “Backup Port” in the “RF Switch Card” in the web network management to log in the port page;

**Step 2:** click the “Config” on the page to log in the port setting page;

**Step 3:** set the “Minimum Bitrate Thredhold”, “Minimum PID” and “Maximum PID” on the page. When the code rate within the PID range is less than the “Minimum Code Rate”, it is believed that the port is abnormal and the switch shall be made.

**Step 4:** set the “Frequency”, “Symbol Rate”, “Signal Type” and “Modulation mode” according to the input source of the front-end device.

**Step 5:** click the “Apply” on the page after setting the parameter to put the setting parameter into effect.

The monitoring interface shall display the code rate information of the current input source, the reference level, the input level and other messages.



Fig. 5-138 RF Switch Card Port Monitor

This board card is provided with the power-off memory function that the normal output can be remained after the power failure.

### 5.3.25.3 Parameter

Table 5-52 RF Switch Card Parameter

| Parameter                   | Range   | Default       |
|-----------------------------|---|---------------|
| Level Switch Threshold (dB) | 1~11  | 6             |
| Bitrate Check Time          | (1/4s)/(1/2s)/1s/2s   | 1s            |
| Backup Mode                 | Assign Main / Assign Backup / Main Priority / One Way Switch / Floating | Main Priority |
| Standard Level Mode         | Manual / Auto   | Manual        |
| Get Standard Level Alarm    | No/Yes  | No            |
| Reset Card                  | On/Off  | On            |
|                             | No/Yes  | No            |

Table 5-53 RF Switch Card Port Parameter

| Parameter                       | Range               | Default |
|---------------------------------|---------------------|---------|
| Minimum Bitrate Threshold (bps) | 0~200000000         | 0       |
| Minimum PID                     | 0 ~ 8191            | 0       |
| Maximum PID                     | 0 ~ 8191            | 8191    |
| Frequency (KHz)                 | 52000 ~ 858000      | 554000  |
| Symbol Rate (Kbaud)             | 3500 ~ 7000         | 6875    |
| Signal Type                     | Digital / Analog    | Digital |
| Modulation Mode                 | QAM64/QAM128/QAM256 | QAM64   |

### 5.3.26 T2MI Replacer Card

#### 5.3.26.1 Interface

The T2MI Replacer Card is used for providing the ASI input interface and three ASI output interfaces for T2MI code stream of the main route and the backup route, as shown in Fig. 5-139 T2MI Replacer Card.



Fig. 5-139 T2MI Replacer Card

#### 5.3.26.2 Function

The T2MI Replacer Card is used for replacing the PLP level stream of T2MI OVER TS. This card can directly output to the equipment of the latter level after replacing the input of this card and can be cooperated and used with the input cards (as 5 Input Card, Main GbE Card, the demodulation card and the like) and the output cards (as the 4 Output Card and the Main GbE Card). The use and cooperation is convenient and flexible.

##### 5.3.26.2.1 Routine setting of board card

This page can be used for setting the board card warning switch, searching timeout of T2MI package and replacing relevant parameters, as shown in the figure below:



Fig. 5-140 T2MI Replacer Card General Parameter Setting

**Step 1:** click the “Cards” option on the Web network management page.


**Step 2:** click the “Card n-T2MI Replacer Card”;

**Step 3:** click “General”;

**Step 4:** set the “Alarm” switch, the code rate switch of “Replacement Output Total Bitrate”, the T2MI Packet Searching Overtime Time and Replaced Output Total Bitrate Value;

**Step 5:** click the “Apply” to put the setting into effect;

=====

 Once the code rate of replacement output system and the code rate switch of replacement output system are used together, the code rate setting can be valid when the switch is turned on. In general, the switch is turned off. When the code rate of the input source has a high fluctuation, the switch can be turned on and a code rate is set for the replacement output system (such code rate shall be greater than the valid code rate) to stabilize the code rate of the replacement output system.

=====



### 5.3.26.2.2 Input setting

The T2MI Replacer Card is provided with two input interfaces. It can directly input from this card to finish the main route PLP replacement and it can support the transparent transmission input of other input cards.

Two input configuration methods are illustrated below:

#### I. Input of this card

When the input is made via this card, it can connect the main route T2MI code stream for the replacement card ASI-IN1 of T2MI and connect the backup route T2MI code stream for the replacement card ASI-IN2.

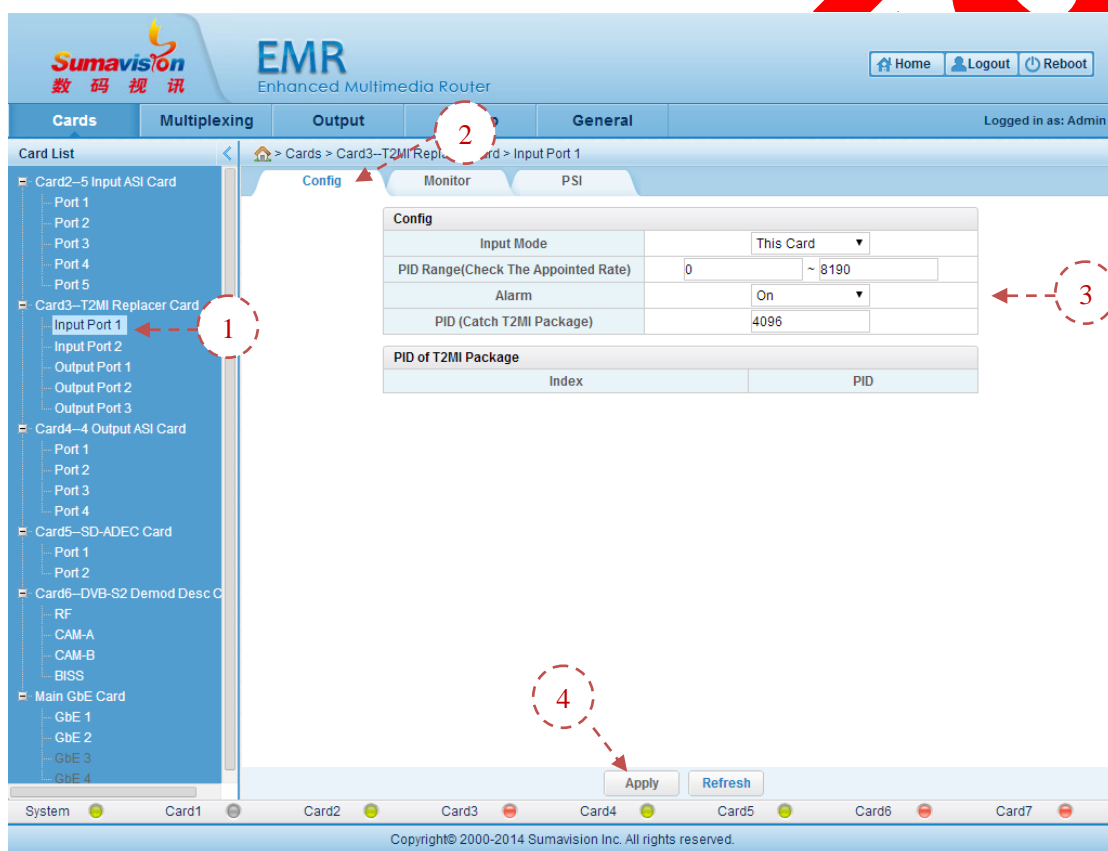


Fig. 5-141 T2MI Replacer Card Input Port Config

- Step 1:** click the “Input Port” of “T2MI Replacer Card” of WEB network management;
- Step 2:** click the “Config” on the right page;
- Step 3:** choose and setting the input parameter according to the use condition;
- Step 4:** click the “Apply” at the bottom of the page to put the setting into effect after the setting;

- After setting the PID range, it can view the code rate of this PID range on the monitoring interface. The PID setting (capturing T2MI packet) is used for analyzing the inputted T2MI code stream by board card. It needs to set the PID value based on the actual T2MI value (in theory, the T2MI can be loaded into various PID, which is 0x1000 in general (default value)).

## II. Inputs of other cards

When the inputs of other cards are used, the T2MI code streams of the main route and the backup routes shall be transmitted to the input board card on the equipment (as the 5 Input ASI Card and the like):

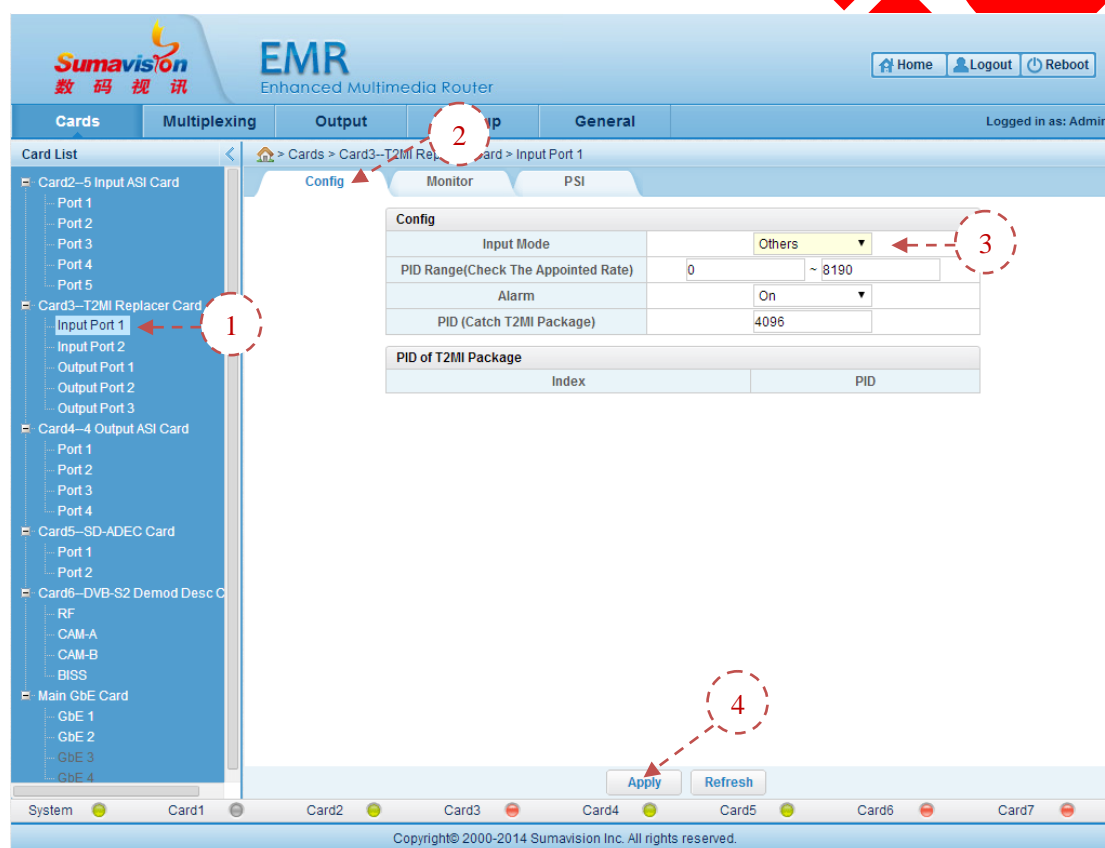


Fig. 5-142 T2MI Replacer Card Input Port Config

- Step 1:** click the "Input Port" of "T2MI Replacer Card" of WEB network management;
- Step 2:** click the "Config" on the right page;
- Step 3:** choose "Others" for "Input Mode";
- Step 4:** click the "Apply" at the bottom of the page to put the setting into effect after the setting;

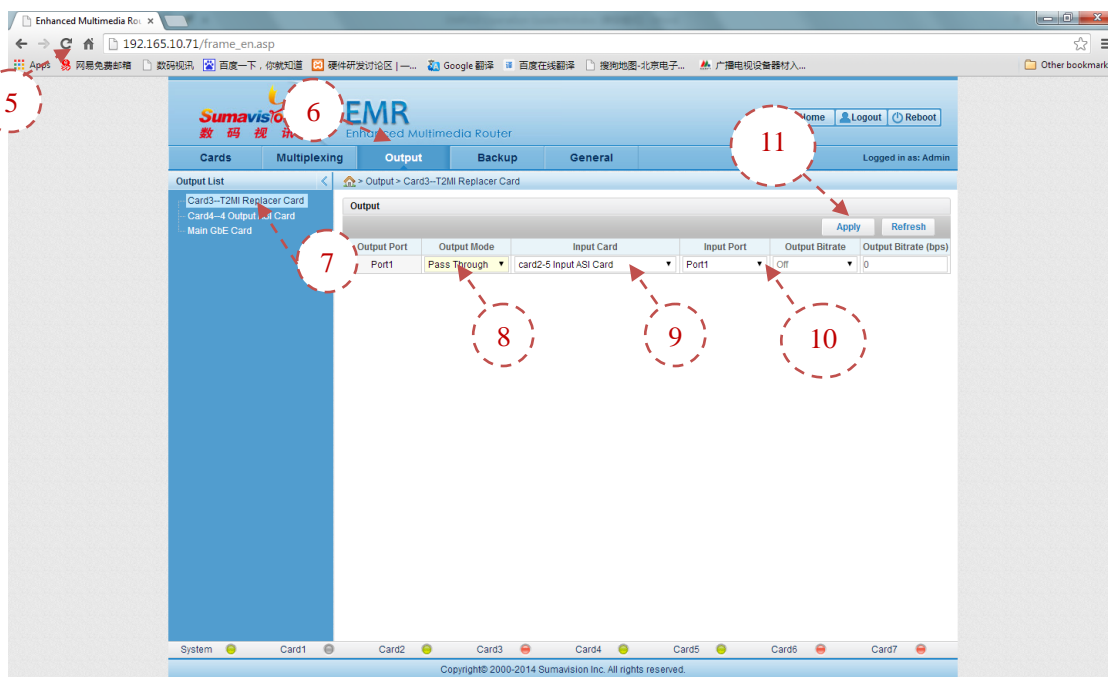


Fig. 5-143 T2MI Replacer Card Setting 2 via Transparent Transmission Input of Other Cards

**Step 5:** click IE browser to refresh the bottom (or press F5 on the keypad to refresh the page)

**Step 6:** click “Output” of WEB network management;

**Step 7:** click “Card n-T2MI Replacer Card” on the left of the page;

**Step 8:** choose the output mode as the “Pass Through”;

**Step 9:** choose the transparent transmission input board card;

**Step 10:** choose the transparent transmission input port;

**Step 11:** click the “Apply” on the page to put the setting into effect after the setting;

### 5.3.26.2.3 PLP level stream replacement setting

When the input source is connected to the T2MI Replacer Card and the reception is set, it can view the PLP information of the two input routes in the monitoring information of two input ports. In this moment, it can log in the PLP replacement interface of the board card to set the PLP replacement. The method is as follows:

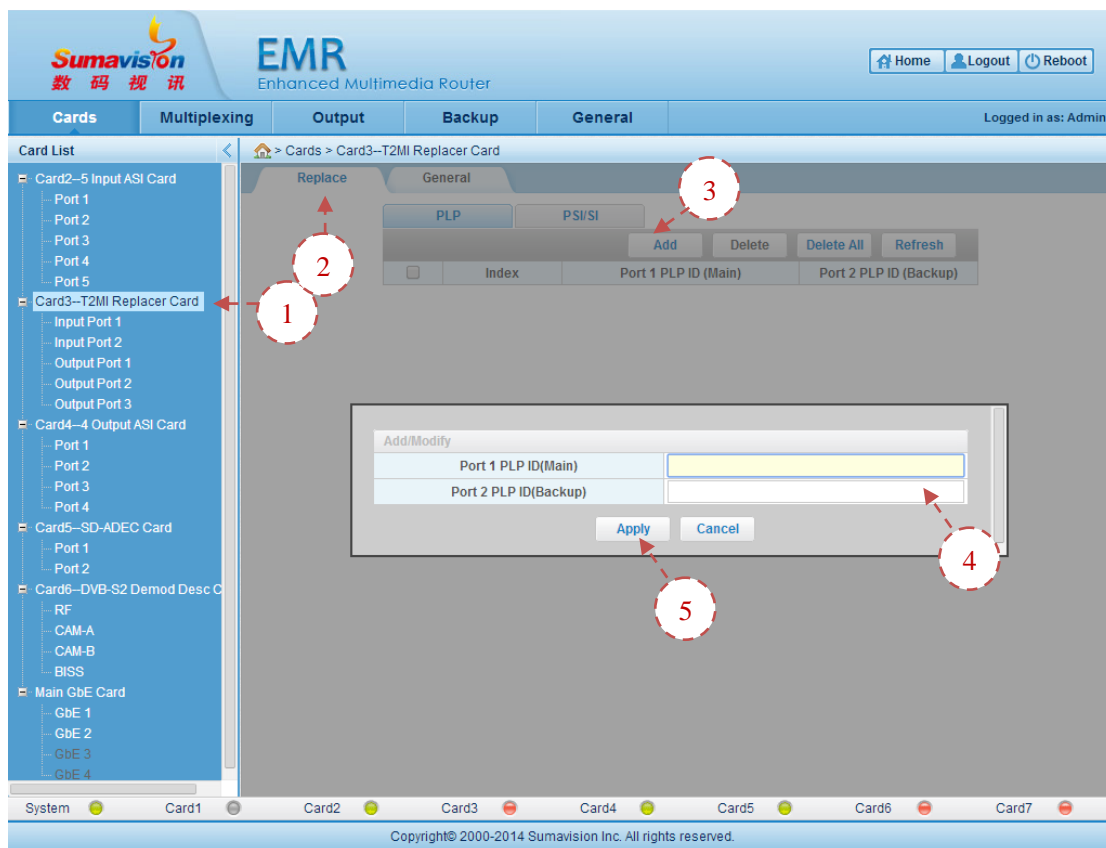


Fig. 5-144 T2MI Replacer Card PLP Replacement Setting

**Step 1:** click the “Card n-T2MI Replacer Card” on the web network management board card list;

**Step 2:** click the “Replace” on the right page;

**Step 3:** click “Add” on the page;

**Step 4:** fill the PLP ID of the main and backup route to be replaced in the pop-up page;

**Step 5:** click the “Apply” at the bottom of the page to put the setting into effect after the setting;

### 5.3.26.2.4 Output setting

The T2MI Replacer Card is provided with three ASI output interfaces. The card supports the direct output of the replaced T2MI code stream and source code stream and supports the transparent transmission and output from other output cards (as the 4 Output ASI card and etc.).

Two output configuration methods are illustrated below:

#### I. Output of this card

The T2MI Replacer Card has three ASI output ports. The ASI-OUT1 is used for

outputting the replaced T2MI code stream; the ASI-OUT2 is used for selectively outputting the replacement stream or ASI-IN1 input stream; and the ASI-OUT3 is used for selectively outputting the replacement stream or ASI-IN2 input stream.

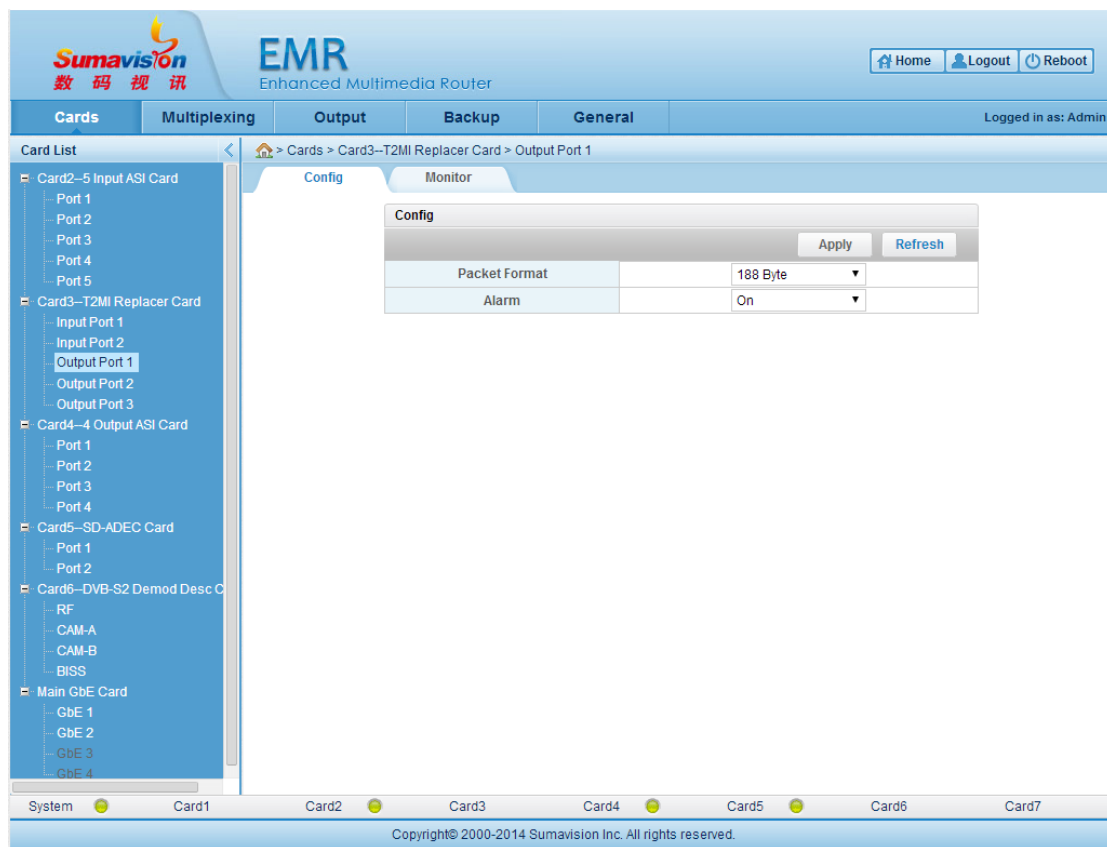


Fig. 5-145 T2MI Replacer Card Output 1 Config (Replacement Stream)

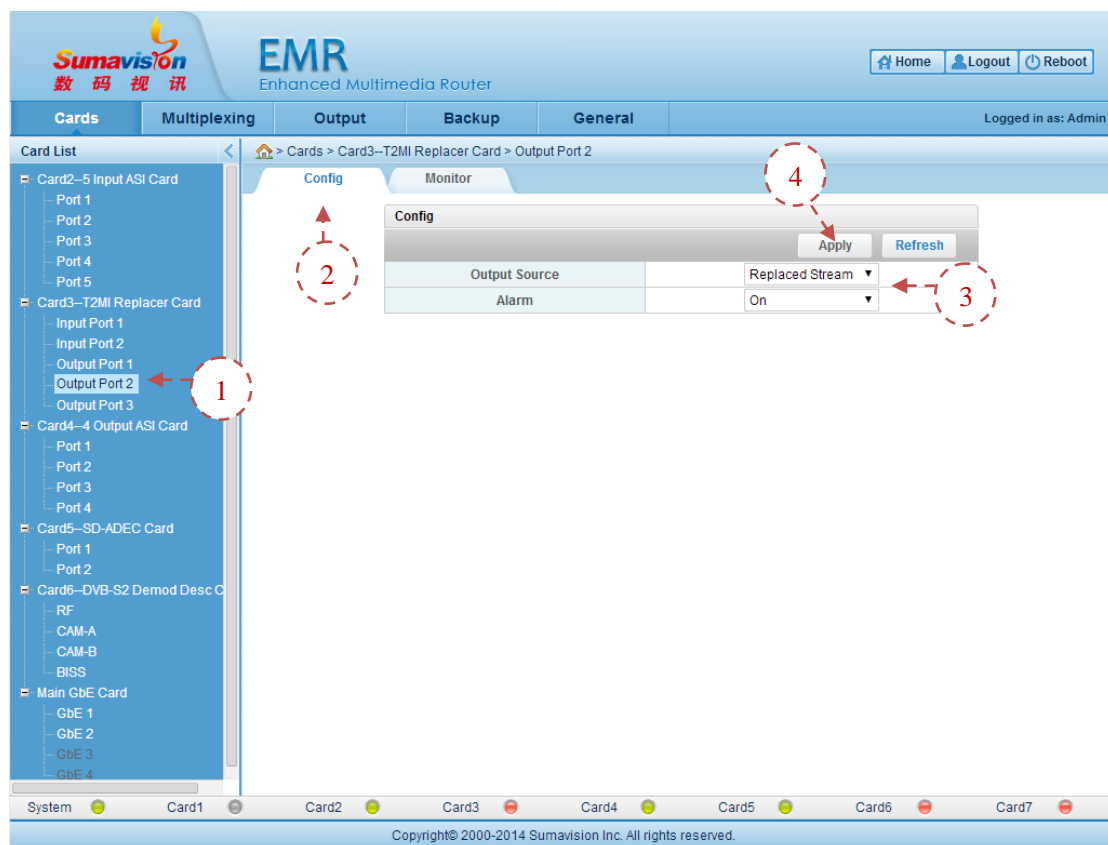


Fig. 5-146 T2MI Replacer Card Output 2/3 Config (replacement stream or input source)

**Step 1:** click the “Output Port 2” of T2MI Replacer Card on the web network management board card list;

**Step 2:** click “Config” on the page;

**Step 3:** select “Replaced Stream” or “Input Port 1” according to the demanded “Output Source”;

**Step 4:** click the “Apply” at the upper of the page to put the setting into effect after the setting;

## II. Output of other cards

The T2MI Replacer Card can provide support to transparently output the replaced T2MI code stream from other output cards. The setting can be made according to the following methods.



Fig. 5-147 T2MI Replacer Card Output via Other Cards

- Step 1:** click the “Output” on the over the WEB network management of equipment;
- Step 2:** click the output card on the left of the page;
- Step 3:** set the output mode of the card output port to be “Pass Through”;
- Step 4:** choose “Card n- T2MI Replacer Card” on the input board card;
- Step 5:** click the “Apply” at the upper of the page to put the setting into effect after the setting.

### 5.3.26.3 Parameter

Table 5-54 T2MI Replacer Card General Parameter

| Parameter                                | Range       | Default |
|--|-------------|---------|
| Alarm                                    | On/Off      | On      |
| Replaced Output Total Bitrate            | On/Off      | Off     |
| T2MI Packet Searching Overtime Time (s)  | 1~255       | 2       |
| Replaced Output Total Bitrate Value(bps) | 0~213000000 | 0       |

Table 5-55 T2MI Replacer Card Input Parameter

| Parameter                           | Range            | Default             |
|-------------------------------------|------------------|---------------------|
| Input Mode                          | This Card/Others | This Card           |
| PID Range(Check The Appointed Rate) | 0~8191           | 0(Min.); 8190(Max.) |
| Alarm                               | On/Off           | On                  |
| PID(Catch T2MI Package)             | 0~8191           | 4096                |

Table 5-56 T2MI Replacer Card Output Parameter

| Parameter     | Range   | Default         |
|---------------|---|-----------------|
| Packet Format | 188 Byte/204 Byte                               | 188 Byte        |
| Output Source | Replaced Stream/Input Port 1, menu for output 2 | Replaced Stream |
| Alarm         | On/Off  | On              |

### 5.3.27 T2MI De-encap. Card

#### 5.3.27.1 Interface

The T2MI De-encap. Card can be used for de-multiplexing the T2-MI Over TS stream to obtain several PLP audio and video TS streams contained in the T2-MI data packet and further conduct the following audio and video treatment, as shown in Fig. 5-148 T2MI De-encap. Card.



Fig. 5-148 T2MI De-encap. Card

#### 5.3.27.2 Function

The T2MI De-encap. Card can be used for de-multiplexing the T2-MI Over TS stream to obtain several PLP audio and video TS streams contained in the T2-MI data packet and further conduct the following audio and video treatment. This T2MI De-encap. Card can directly output to the equipment of the latter level after inputting the de-scrambling output from this card and can be cooperated and used with the input cards (as 5 Input Card, Main GbE Card, the demodulation card and the like) and the output cards (as the 4 Output Card and the Main GbE Card). The use and cooperation is convenient and flexible.

##### 5.3.27.2.1 Input setting

The T2MI De-encap. Card is provided with one input interface. It can directly input the T2MI de-scrambling output from this card it can support the transparent transmission input of other input cards.

Two input configuration methods are illustrated below:

#### I. Input of this card

When the input is made via this card, it can connect the T2MI code stream requiring



the de-multiplexing treatment for the de-multiplexing card ASI-IN of T2MI.

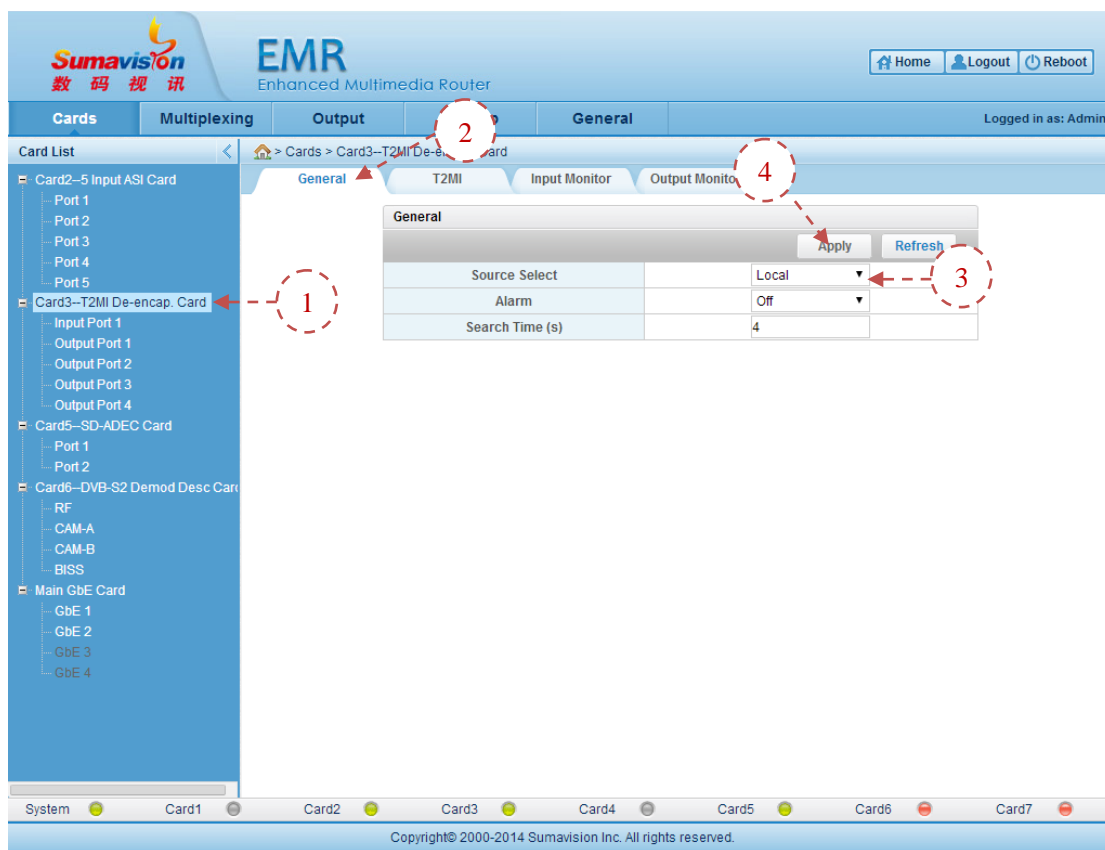


Fig. 5-149 T2MI De-encap. Card General Parameter Setting

**Step 1:** click the T2MI De-encap. Card on the web network management board card page;

**Step 2:** click the “General” on the right page;

**Step 3:** choose the “Source Select” to be “Local”;

**Step 4:** click the “Apply” at the upper of the page to put the setting into effect after the setting;



Fig. 5-150 T2MI De-encap. Card Input Monitor

**Step 5:** click the “Input Monitor” on the page to check the input message.

## II. Inputs of other cards

When the inputs of other cards are used, it shall make the setting in such a way that the T2MI code streams received by other input cards of equipment are transparently transmitted to the T2MI De-encap. Card.

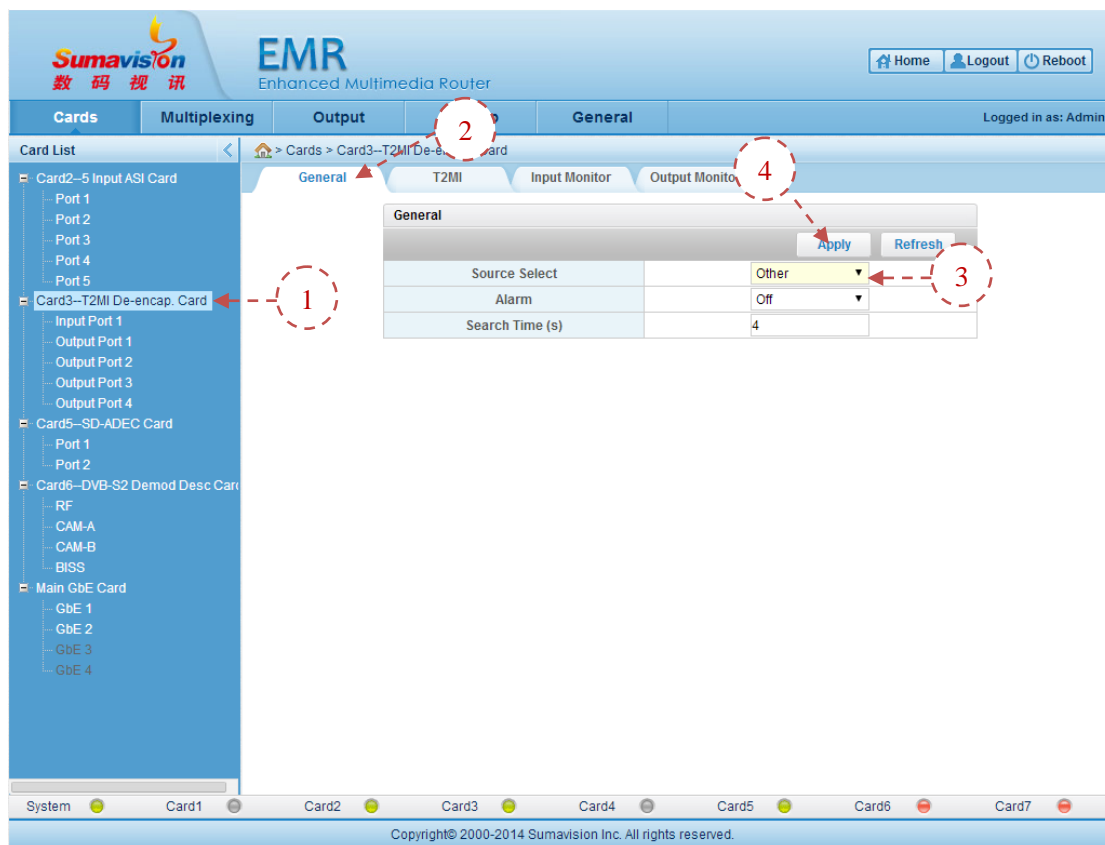


Fig. 5-151 T2MI De-encap. Card General Parameter Setting

- Step 1:** click the “T2MI De-encap. Card” on the web network management board card page;
- Step 2:** click the “General” on the right page;
- Step 3:** choose the “Source Select” to be “Other”;
- Step 4:** click the “Apply” at the upper of the page to put the setting into effect after the setting;

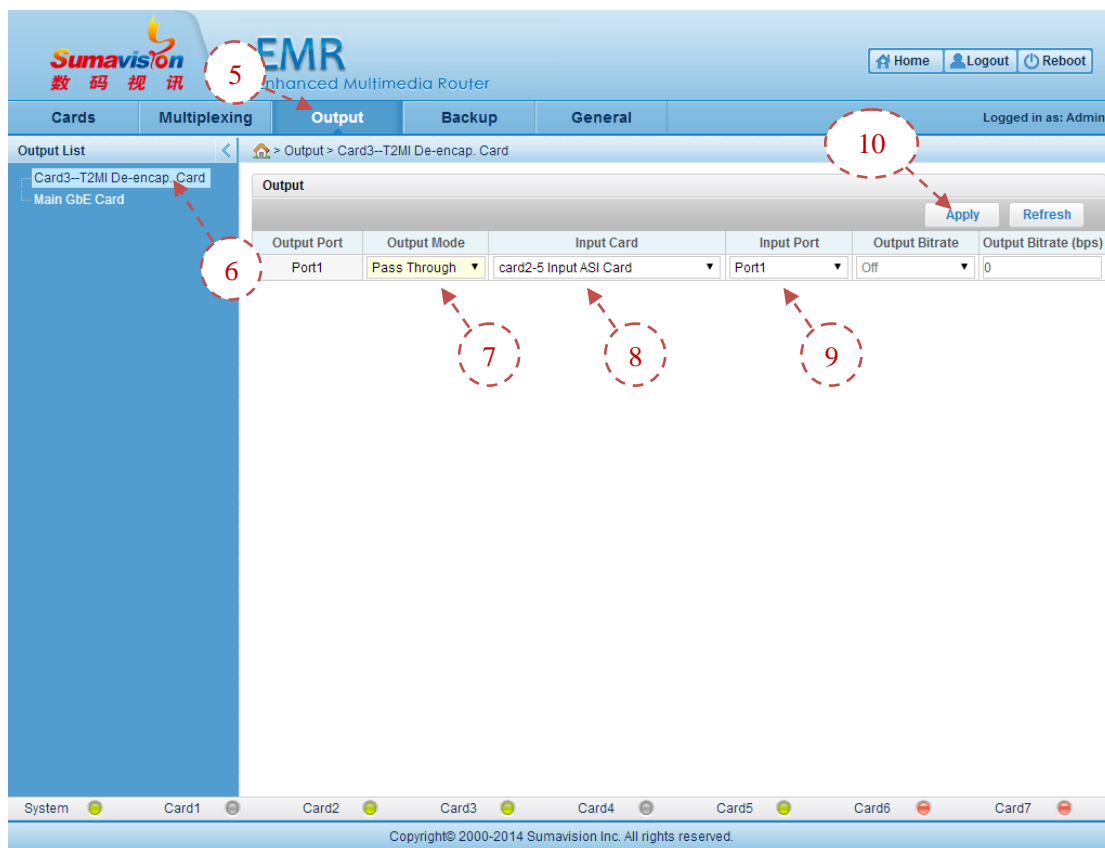


Fig. 5-152 T2MI De-encap. Card Setting via Transparent Transmission Input of Other Cards

- Step 5:** click “Output” of WEB network management;
- Step 6:** click “Card n-T2MI De-encap. Card” on the left of the page;
- Step 7:** choose the output mode as the “Pass Through”;
- Step 8:** choose the transparent transmission input board card;
- Step 9:** choose the transparent transmission input port;
- Step 10:** click the “Apply” at the upper of the page to put the setting into effect after the setting;



Fig. 5-153 T2MI De-encap. Card Input Monitor

**Step 11:** click the “Input Monitor” on the page to check the input message.

### 5.3.27.2.2 T2MI de-multiplexing setting

When the setting of receiving T2MI code stream via the T2MI De-encap. Card is made, it can set the de-multiplex parameter. The setting method is as follows:

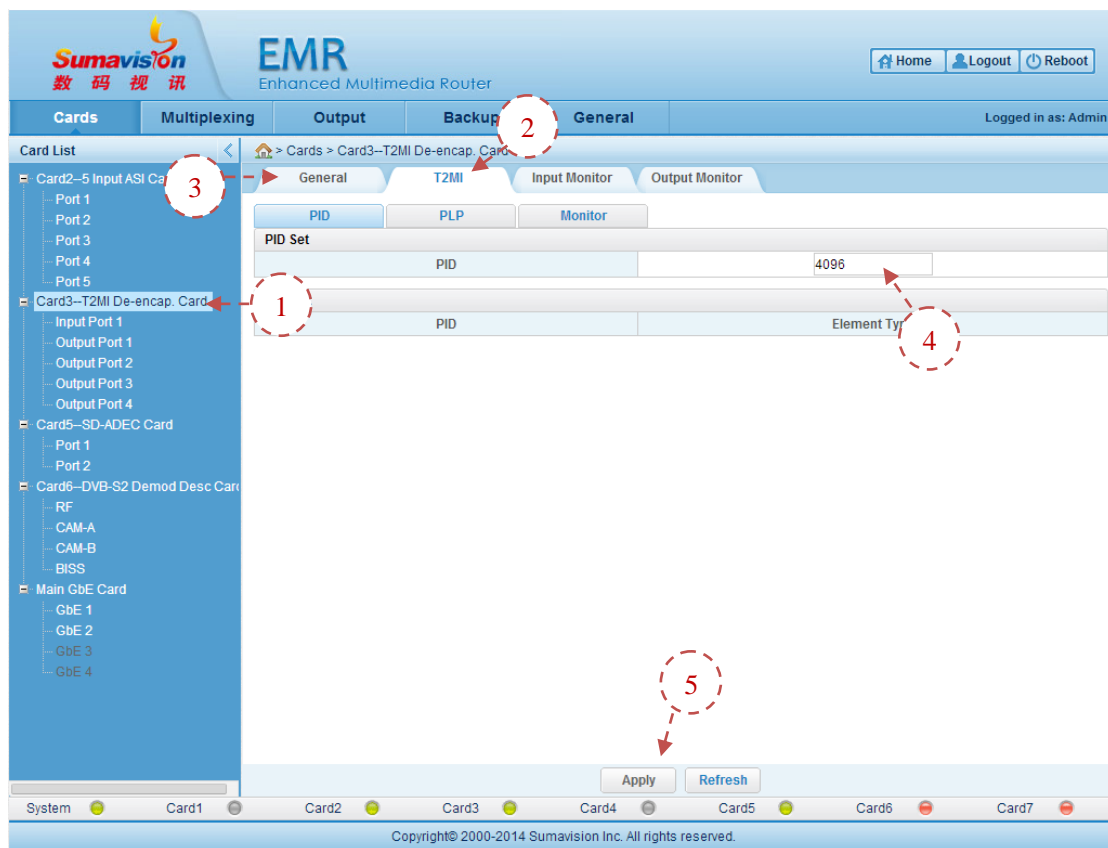


Fig. 5-154 T2MI De-encap. Card T2MI PID Setting

**Step 1:** click the “Card n-T2MI De-encap. Card” on the web network management board card list;


**Step 2:** click the “T2MI” on the right page;

**Step 3:** click “PID” on the page;

**Step 4:** fill T2MI “PID”;

**Step 5:** click the “Apply” at the bottom of the page to put the setting into effect after the setting;

=====

 The PID setting (T2MI PID) is used for analyzing the inputted T2MI code stream by board card. It needs to set the PID value based on the actual T2MI value (in theory, the T2MI can be loaded into various PID, which is 0x1000 in general (default value 4096 in decimal system)).

=====

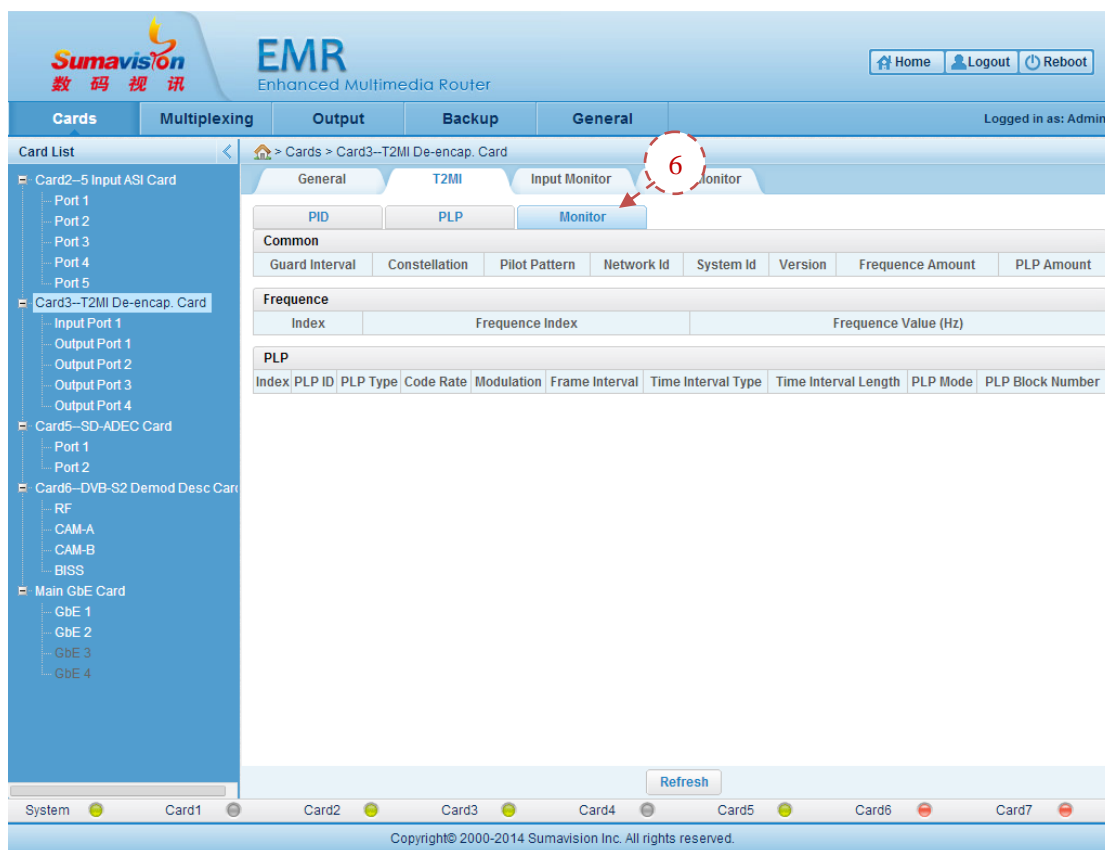


Fig. 5-155 T2MI De-encap. Card T2MI Monitor

**Step 6:** click “Monitor” on the page to check the PLP information of T2MI code stream;

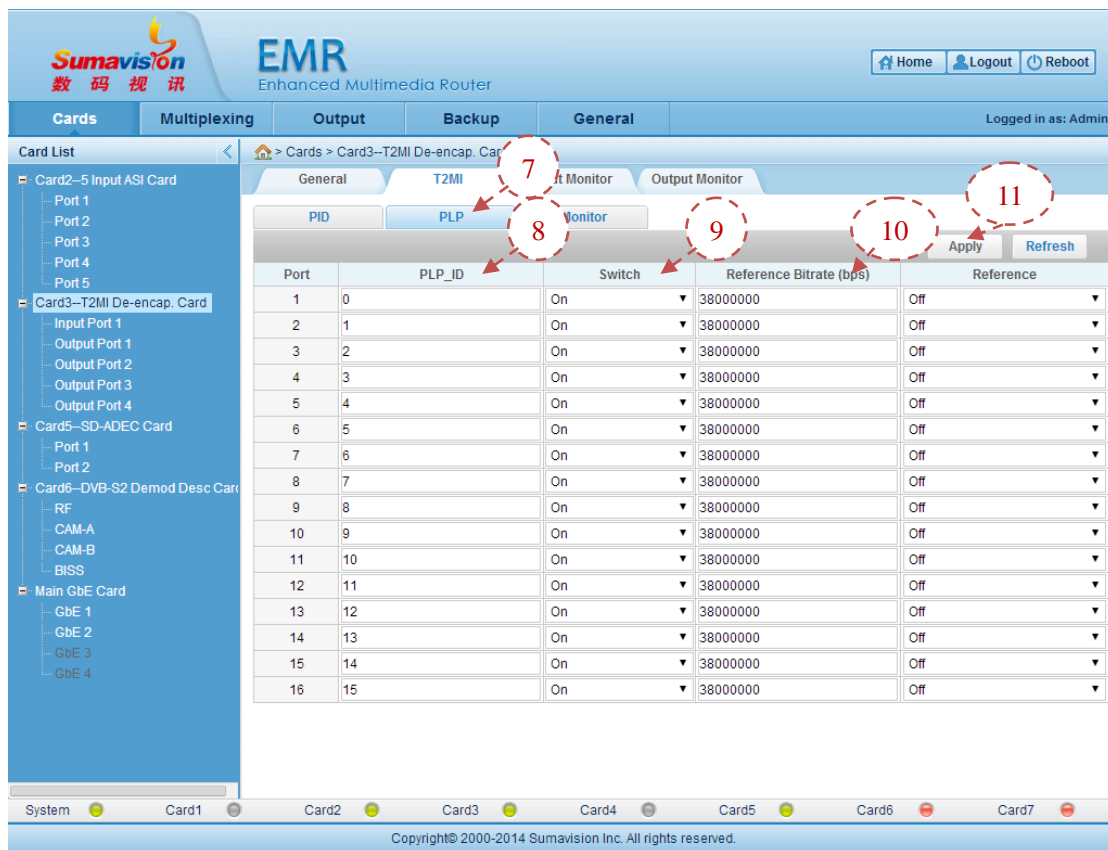



Fig. 5-156 T2MI De-encap. Card T2MI PLP Setting

- Step 7:** click "PLP" on the page;
- Step 8:** set PLP\_ID (default value is 0-15 and no change shall be made generally);
- Step 9:** set the channel switch (turned on in default);
- Step 10:** set the reference code rate and the reference switch (once the reference switch is turned on, the code rate setting is valid);
- Step 11:** click the "Apply" at the bottom of the page to put the setting into effect after the setting;

=====

 When the reference code rate and the reference switch are cooperated and used together, the code rate setting is valid when the switch is turned on. In general, the switch is turned off. When the code rate of the port has a high fluctuation, the switch can be turned on and a reference code rate is set for the replacement output system (such code rate shall be greater than the valid code rate) to stabilize the code rate of the output system.

=====





Fig. 5-157 T2MI De-encap. Card T2MI Output Monitor

**Step 12:** click “Output Monitor” on the page to check the TS stream information after de-multiplexing T2MI.

### 5.3.27.2.3 Output setting

The T2MI De-encap. Card is provided with four output interfaces, which can be used for selecting and outputting the original T2MI code stream or de-scrambled TS code rate, respectively. At the same time, the board card provides supports to multiplex the de-scrambled TS stream to the output of other output cards or transparently output the other output cards.

Two output configuration methods are illustrated below:

#### I. Output of this card

The T2MI De-encap. Card is provided with four output ports, all of which can be used for selecting and outputting the original T2MI code stream or de-scrambled TS code rate. The configuration method is illustrated by taking the output port 1 as the example.

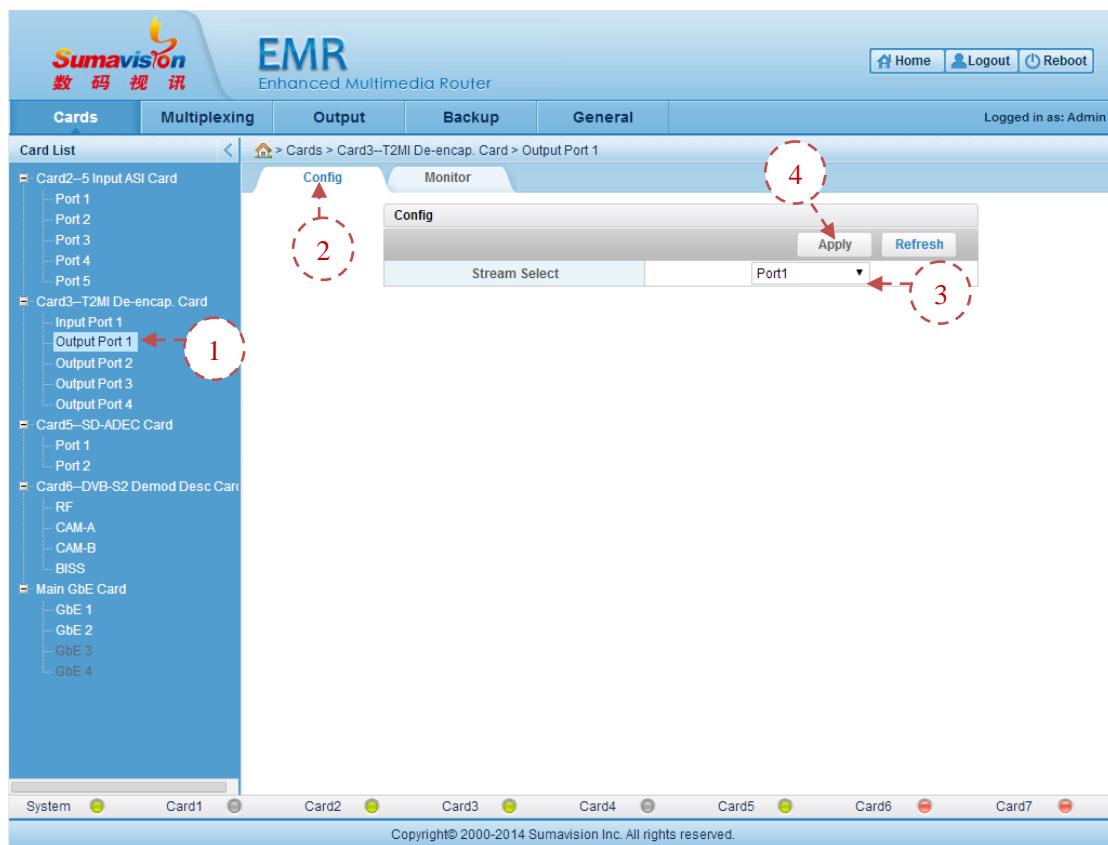


Fig. 5-158 T2MI De-encap. Card Output Port 1 Setting

- Step 1:** click the “Output Port 1” of “T2MI De-encap. Card” on the web network management board card list;
- Step 2:** click “Config” on the page;
- Step 3:** choose output according to the demand “Stream Select”;
- Step 4:** click the “Apply” at the upper of the page to put the setting into effect after the setting;

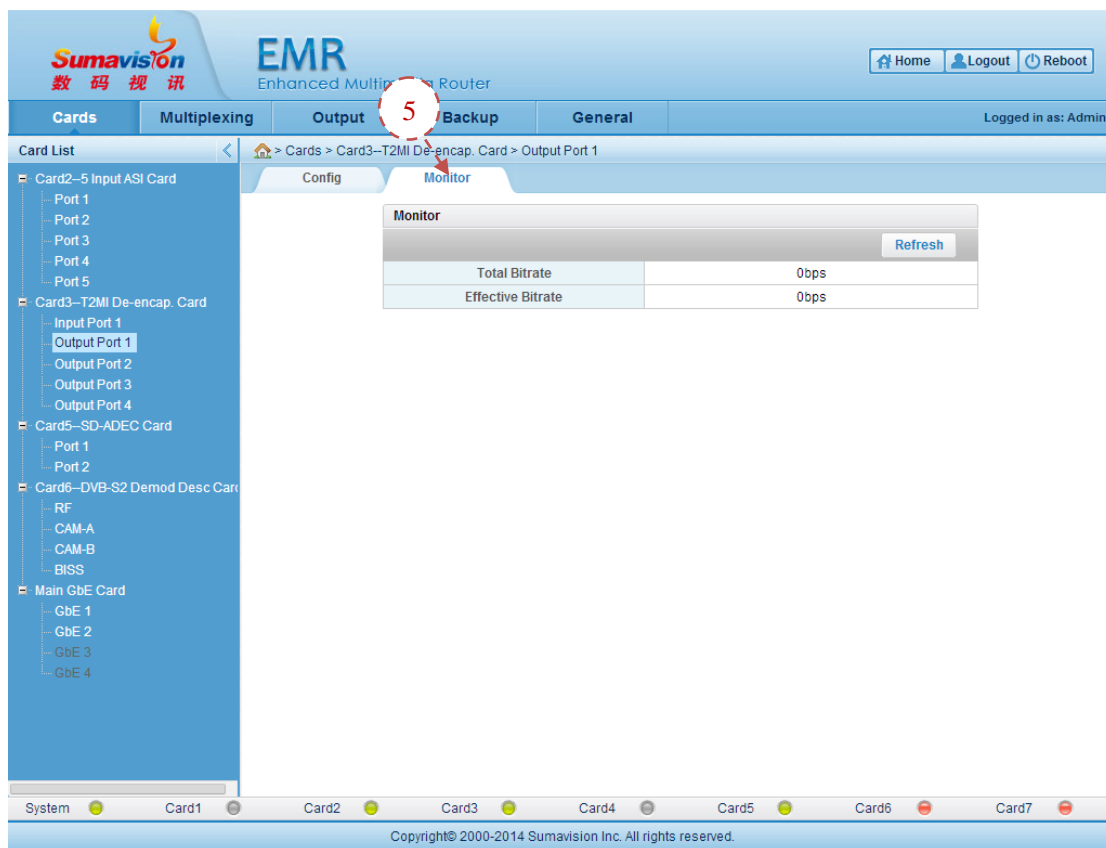


Fig. 5-159 T2MI De-encap. Card Output Port Monitor

**Step 5:** click the “Monitor” on the page after the setting to check the code rate outputted from the system and the effective code rate.

## II. Output of other cards

The T2MI De-encap. Card provides supports to multiplex the de-scrambled TS code stream to the output of other output cards or transparently output the TS code stream from other output cards. For the program multiplex method, refer to section 5.1.1.2 Multiplexing Setting. The transparent output shall be set as per as the following method.

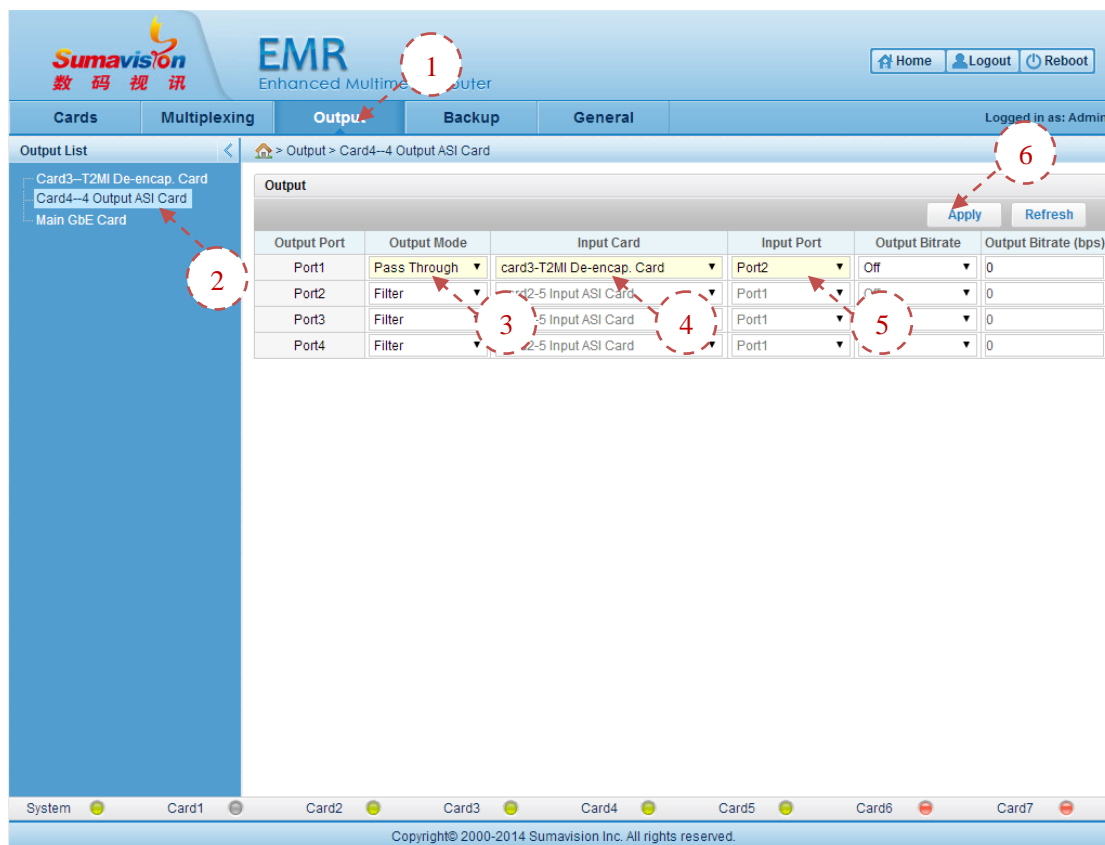


Fig. 5-160 T2MI De-encap. Card Stream via Transparent Transmission Input of Other Cards

- Step 1:** click the “Output” on the over the WEB network management of equipment;
- Step 2:** click the output card on the left of the page;
- Step 3:** set the output mode of the card output port to be “Pass Through”;
- Step 4:** choose “Card n- T2MI De-encap. Card” on the input board card;
- Step 5:** select necessary port for input port (de-scrambled TS stream, the port is 1-16);
- Step 6:** click the “Apply” at the upper of the page to put the setting into effect after the setting;

### 5.3.27.3 Parameter

Table 5-57 T2MI De-encap. Card General Parameter

| Parameter      | Range       | Default |
|----------------|-------------|---------|
| Source Select  | Local/Other | Local   |
| Alarm          | On/Off      | Off     |
| Search Time(s) | 0~255       | 4       |

Table 5-58 T2MI De-encap. Card T2MI Parameter

| Parameter         | Range       | Default  |
|-------------------|-------------|----------|
| PID               | 0~8191      | 4096     |
| PLP_ID            | 0~255       | 0~15     |
| Switch            | On/Off      | On       |
| Reference Bitrate | 0~213000000 | 38000000 |
| Reference         | On/Off      | Off      |

Table 5-59 T2MI De-encap. Card Output Port Parameter

| Parameter     | Range   | Default   |
|---------------|---|---|
| Stream Select | Port1;Port2;Port3;Port4;Port5;Port6;Port7;Port8;Port9;<br>Port10;Port11;Port12;Port13;Port14;Port15;Port16;<br>Local; Other | Port1, for Output Port 1;<br>Port2, for Output Port 2;<br>Port3, for Output Port 3;<br>Port4, for Output Port 4 |

SummaVisio

## Chapter 6 Introduction for Senior Function

Some functions listed in this section are available by purchasing corresponding authorization.

### 6.1 Table editing function

This function can realize the addition, deletion and edition for PSI/SI table of the appointed port. The examples of NIT, CAT and SDT are illustrated below.

#### 6.1.1 NIT table edition

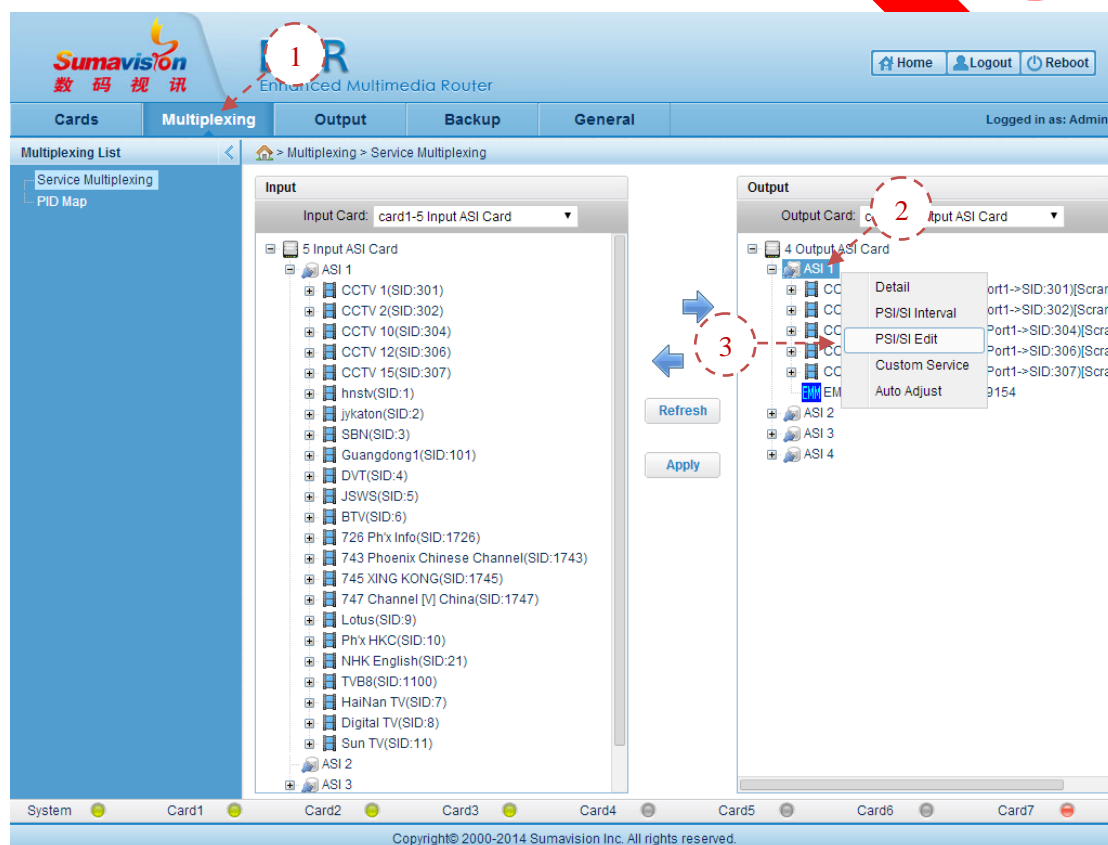


Fig. 6-1 Log-in of PSI/SI Edition Interface

**Step 1:** click the “Multiplexing” on the WEB network management page to log in the program multiplex interface;

**Step 2:** right click the output port to be edited;

**Step 3:** select the “PSI/SI Edit” on the pop-up menu to log in the table edition interface;

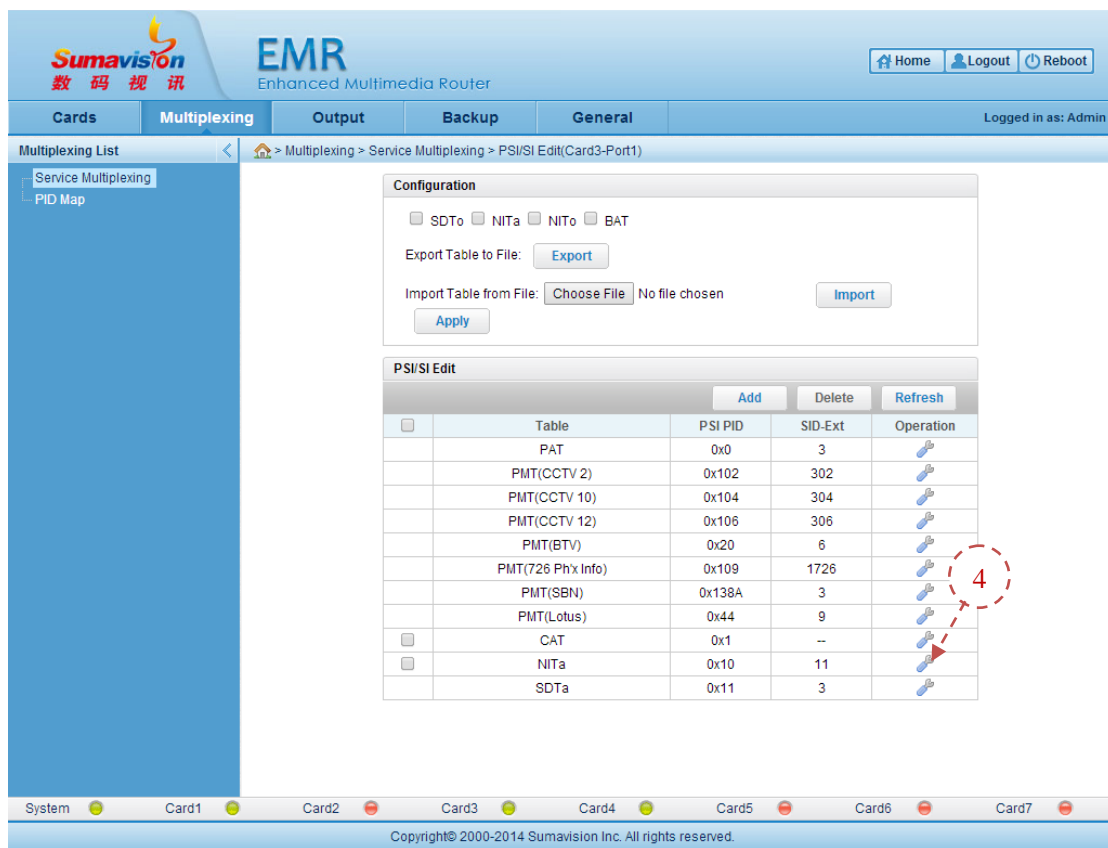


Fig. 6-2 PSI/SI Edition Interface

**Step 4:** click in the NIT table operation bar to log in the edition interface of NIT table;

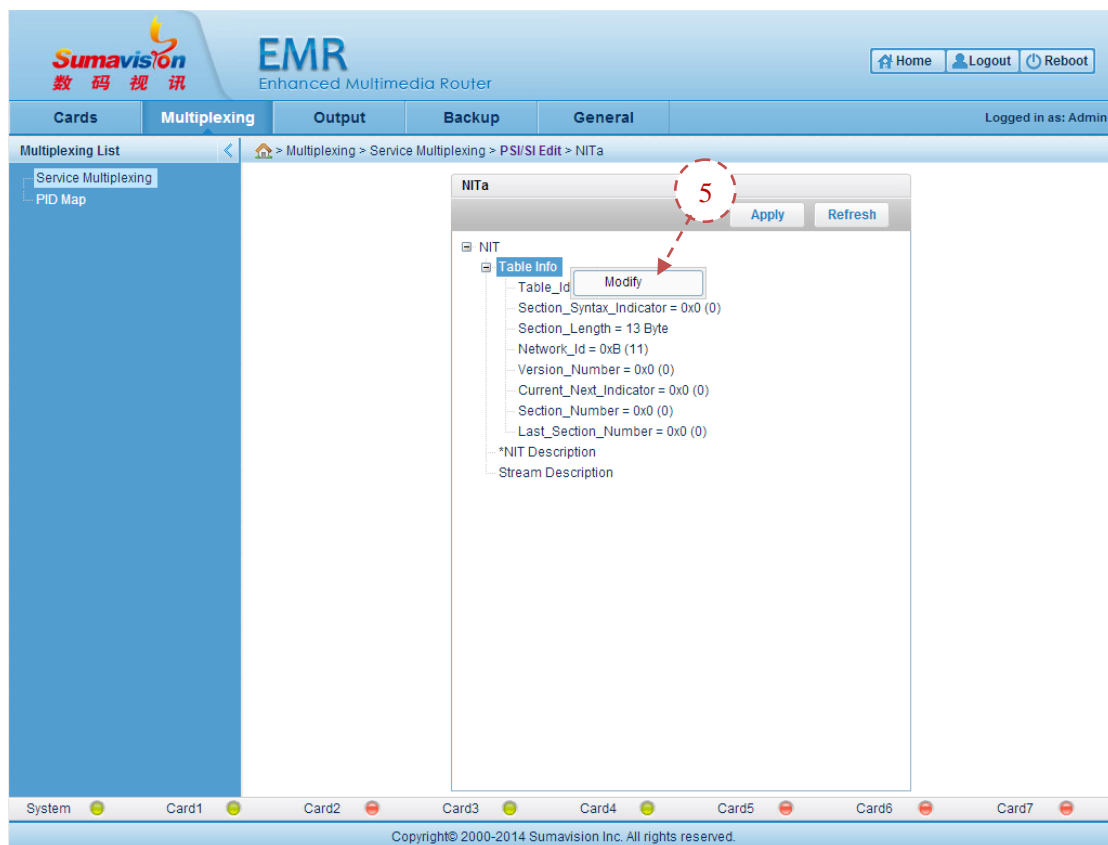


Fig. 6-3 NIT Table Edition Interface (modification of Table Info)

**Step 5:** right click the “Modify” below the “Table Info” node to pop up the modification box.

Summary





Fig. 6-4 NIT Table Info Edition Interface

**Step 6:** modify information of corresponding table, click “OK” and save the modification;

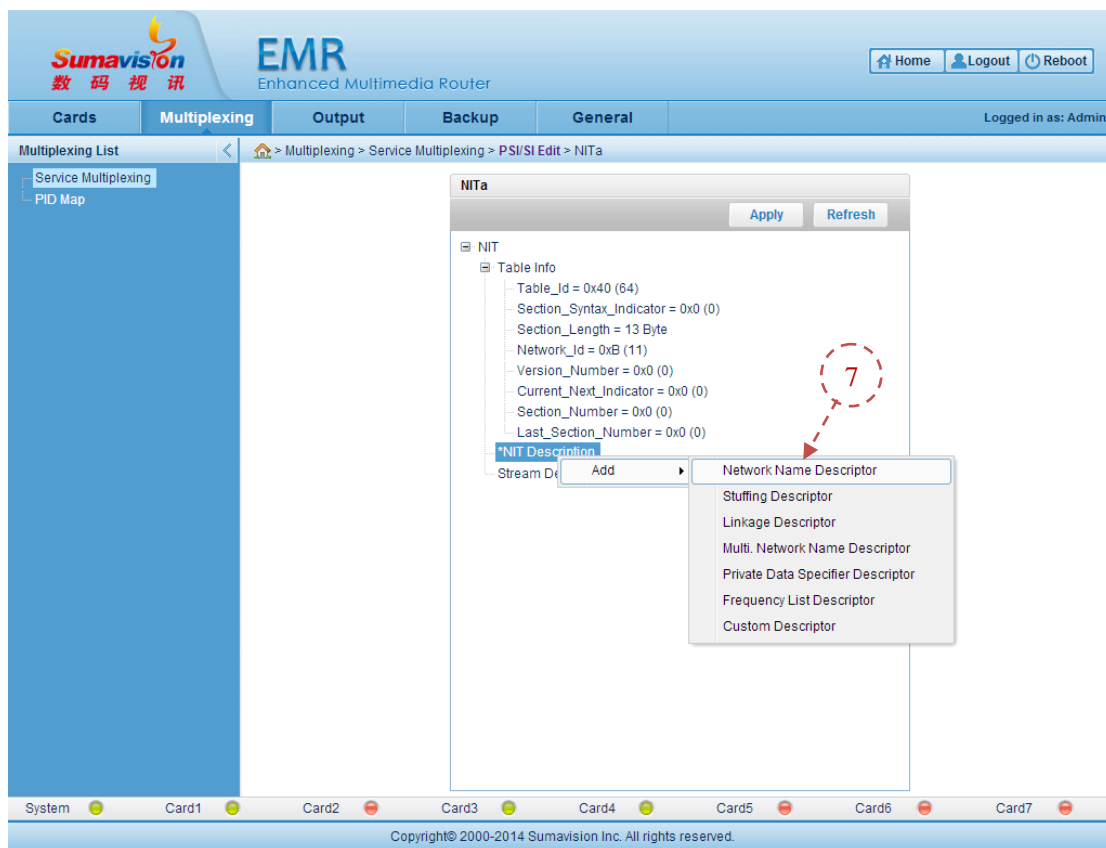


Fig. 6-5 NIT Table Edition Interface (Addition of NIT Description)

**Step 7:** right click the “NIT Description” node and choose corresponding descriptor below “Add” to pop up the modification box of this descriptor.

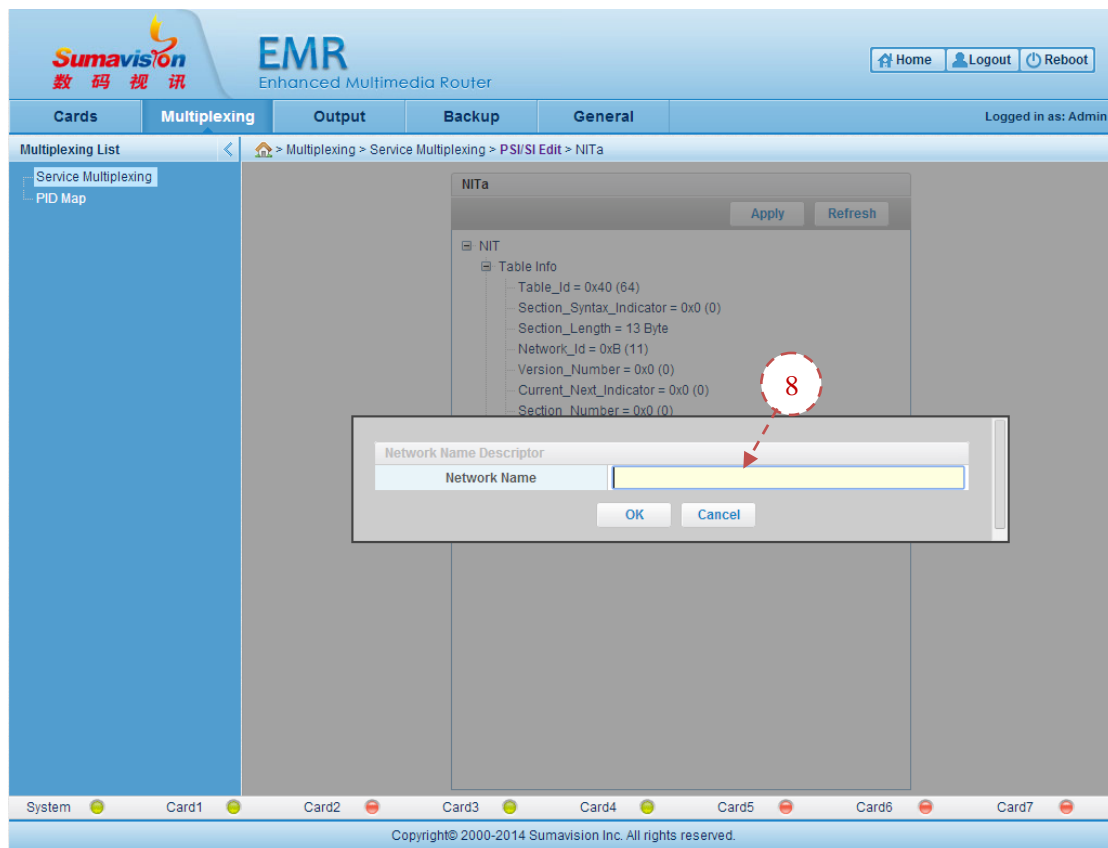


Fig. 6-6 NIT Table Descriptor Addition Interface

**Step 8:** modify corresponding descriptor information and click “OK” to save the added descriptor;

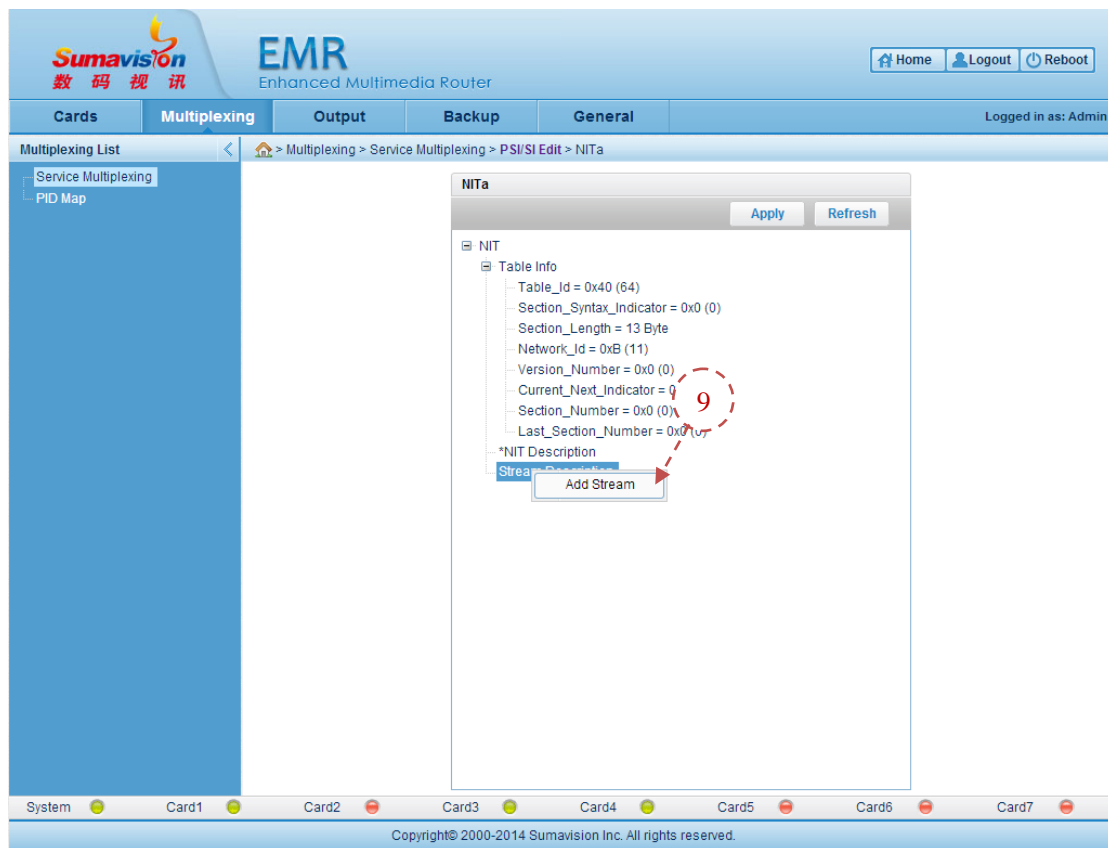


Fig. 6-7 NIT Table Edition Interface (Stream Description)

**Step 9:** right click “Add Stream” in the “Stream Description” node to pop up the modification box for stream addition;

Suma

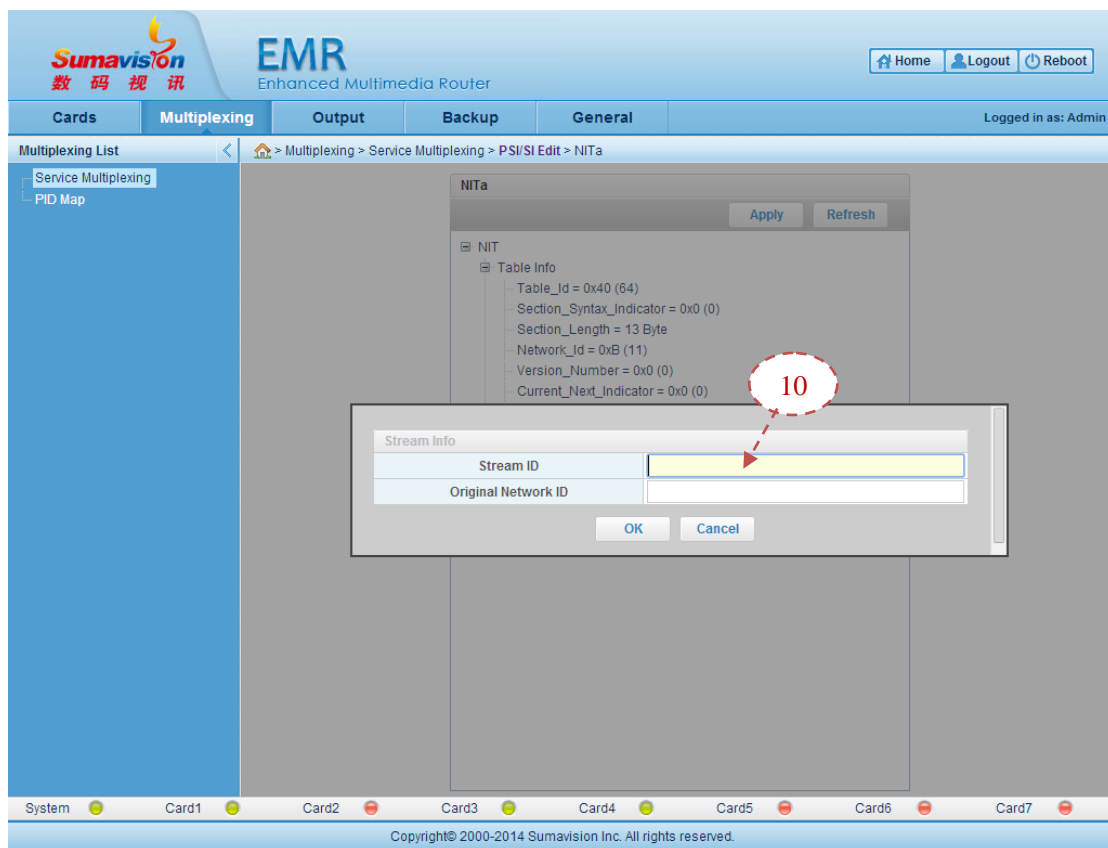


Fig. 6-8 NIT Table Stream Addition Interface

**Step 10:** fill in corresponding stream information and click “OK” to save the stream information added;

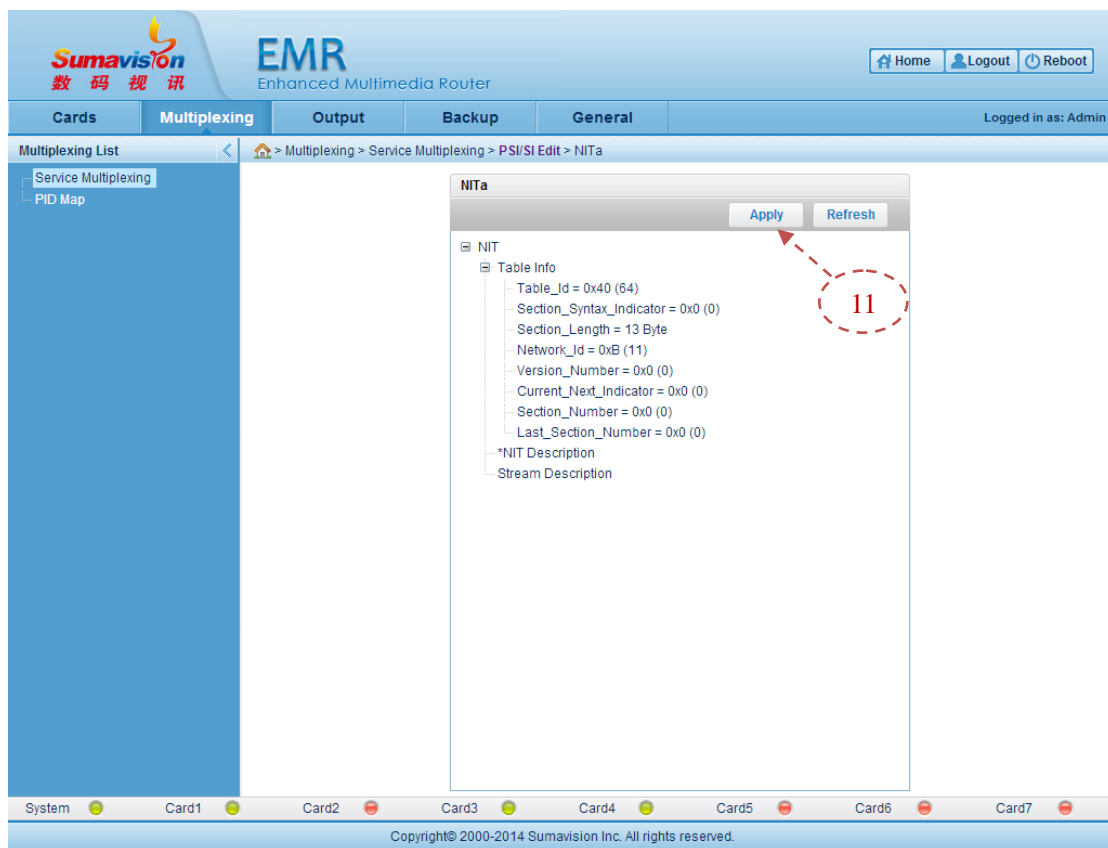


Fig. 6-9 NIT Table Edition Interface

**Step 11:** after finishing the steps 5 to 10 and click “Apply” to save the aforesaid modification and addition operation.

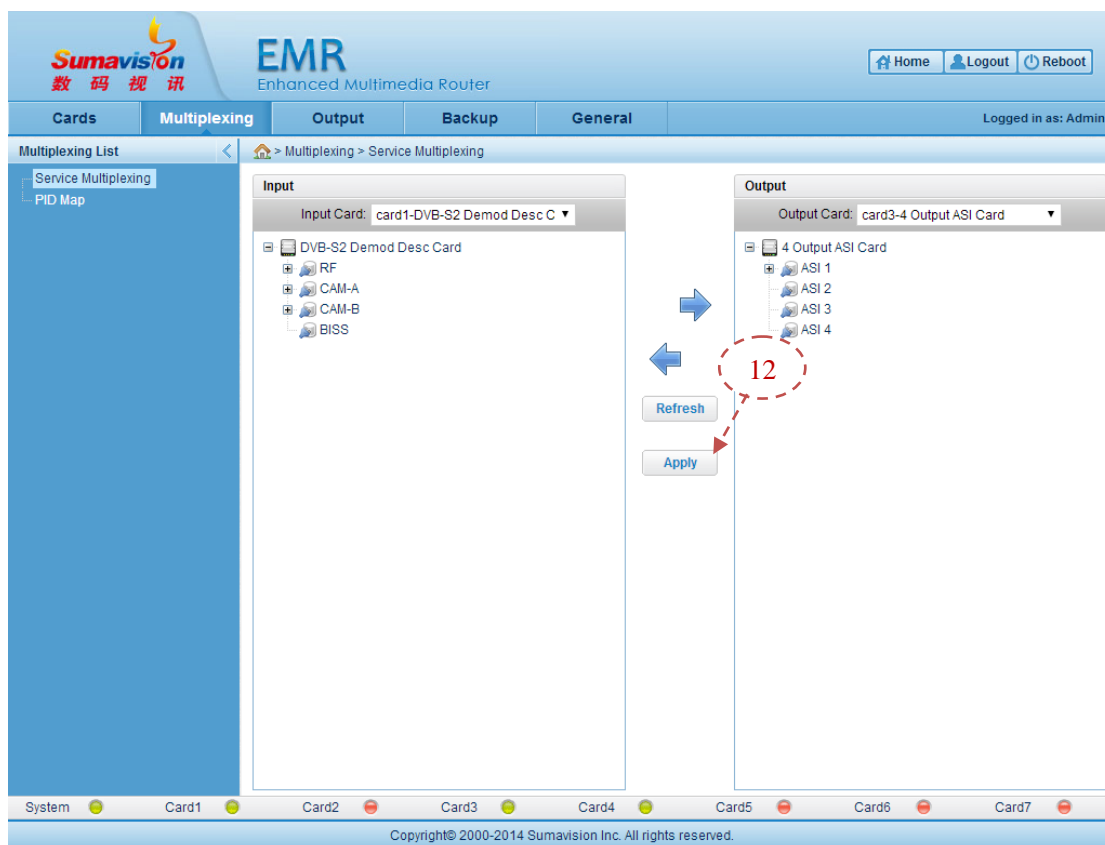


Fig. 6-10 Validity of NIT Table Edition (Multiplex Interface)

**Step 12:** return to the “Multiplexing” interface and click “Apply” to put the NIT table edition operation into effect.

### 6.1.1.1 Associate other frequency points by the main frequency point

The association of other frequency points by the main frequency point is the common operation of NIT table edition. The introduction is hereby specially given.

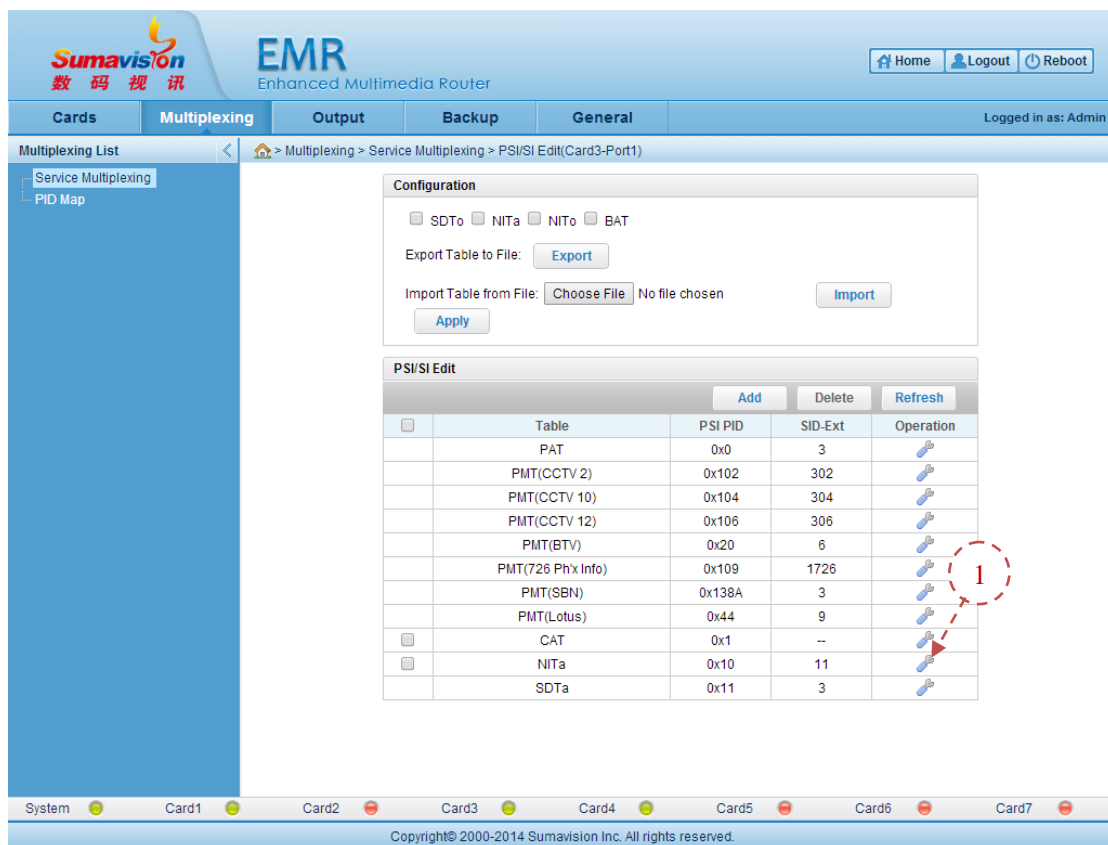


Fig. 6-11 PSI/SI Edition Interface

**Step 1:** click in the NIT table operation bar of main frequency point to log in the edition interface of main frequency point NIT table;

Summary



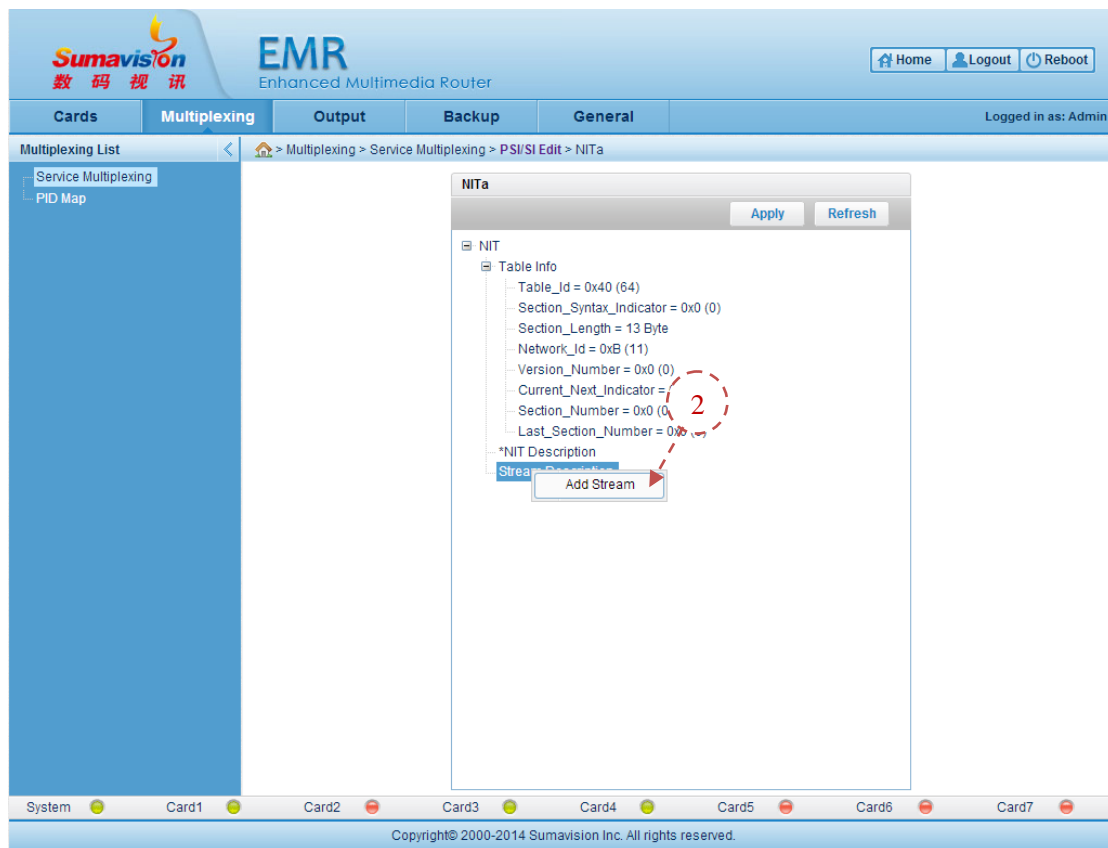


Fig. 6-12 NIT Table Edition Interface (Stream Description)

**Step 2:** right click “Add Stream” in the “Stream Description” node to pop up the modification box for stream addition;

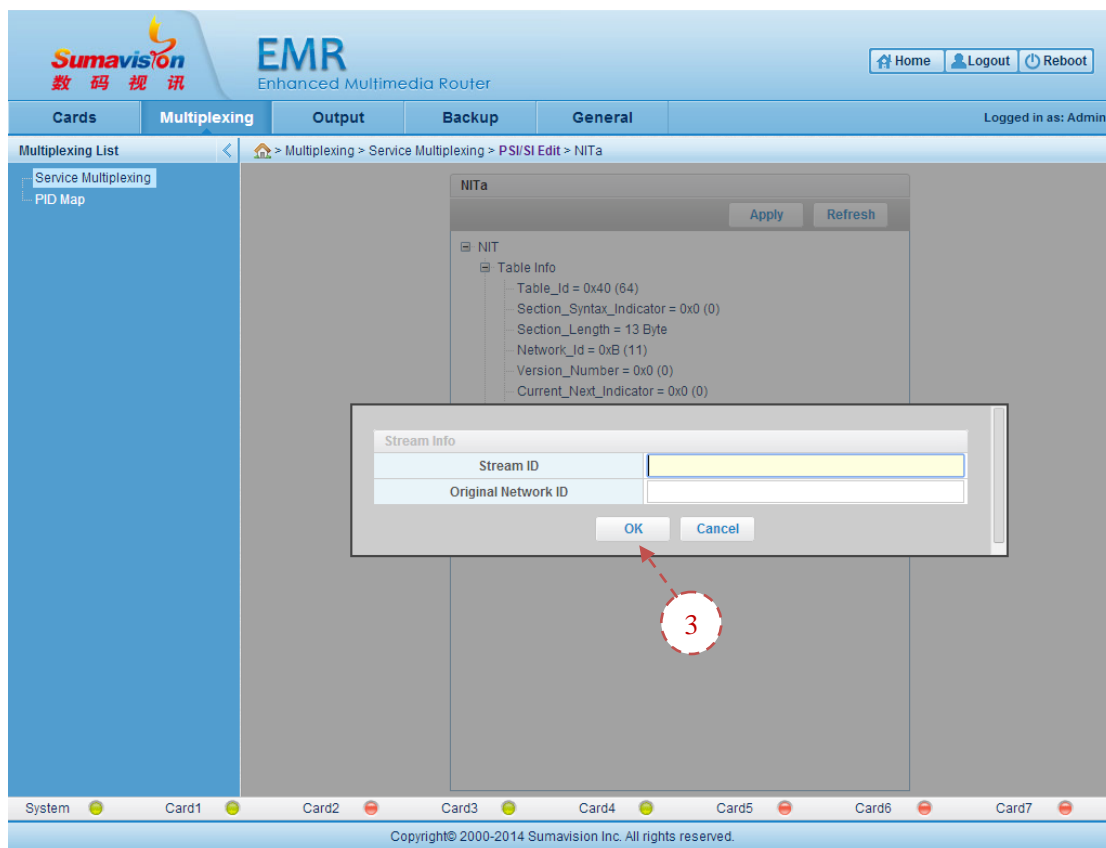


Fig. 6-13 NIT Table Stream Addition Interface

**Step 3:** fill in corresponding stream information to be associated and click “OK” to save the stream information added;

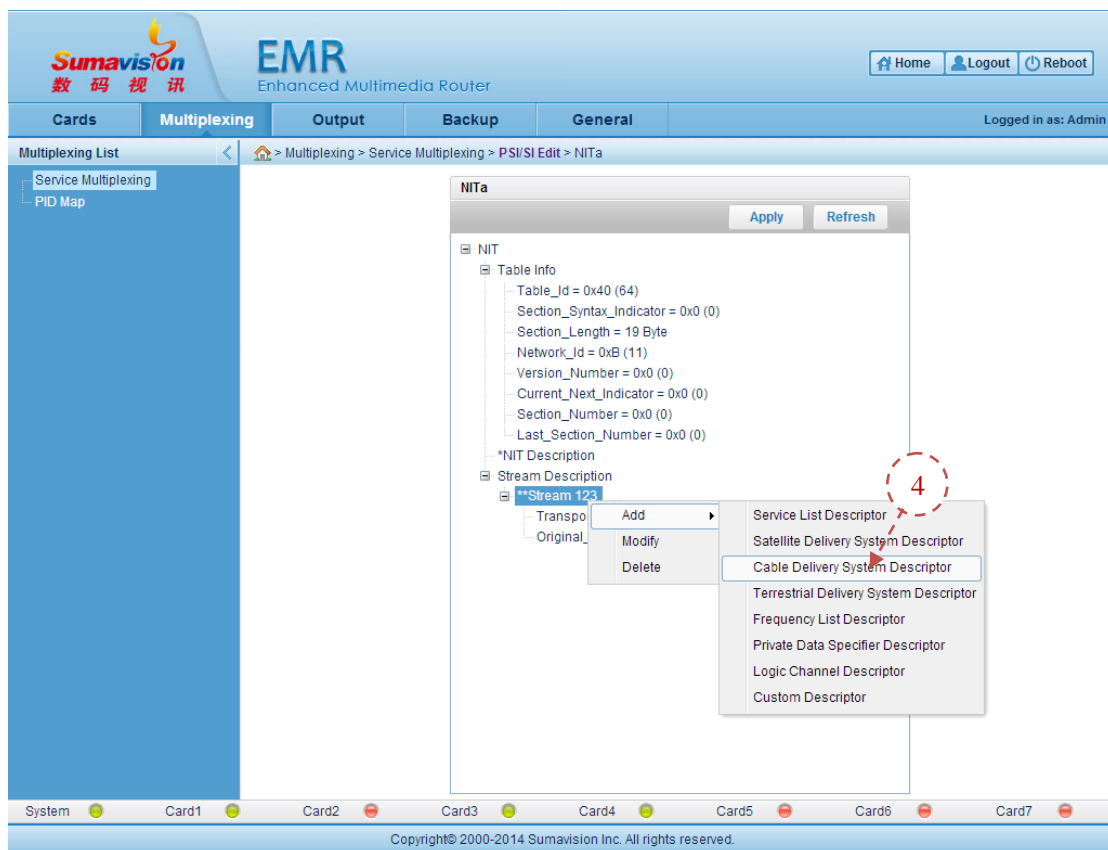


Fig. 6-14 NIT Table Stream Addition Descriptor Interface

**Step 4:** right click the added “Stream” node and select corresponding descriptor to be added according to the real application environment. The demonstration is given by taking the “Cable Delivery System Descriptor” as the example.

Summation

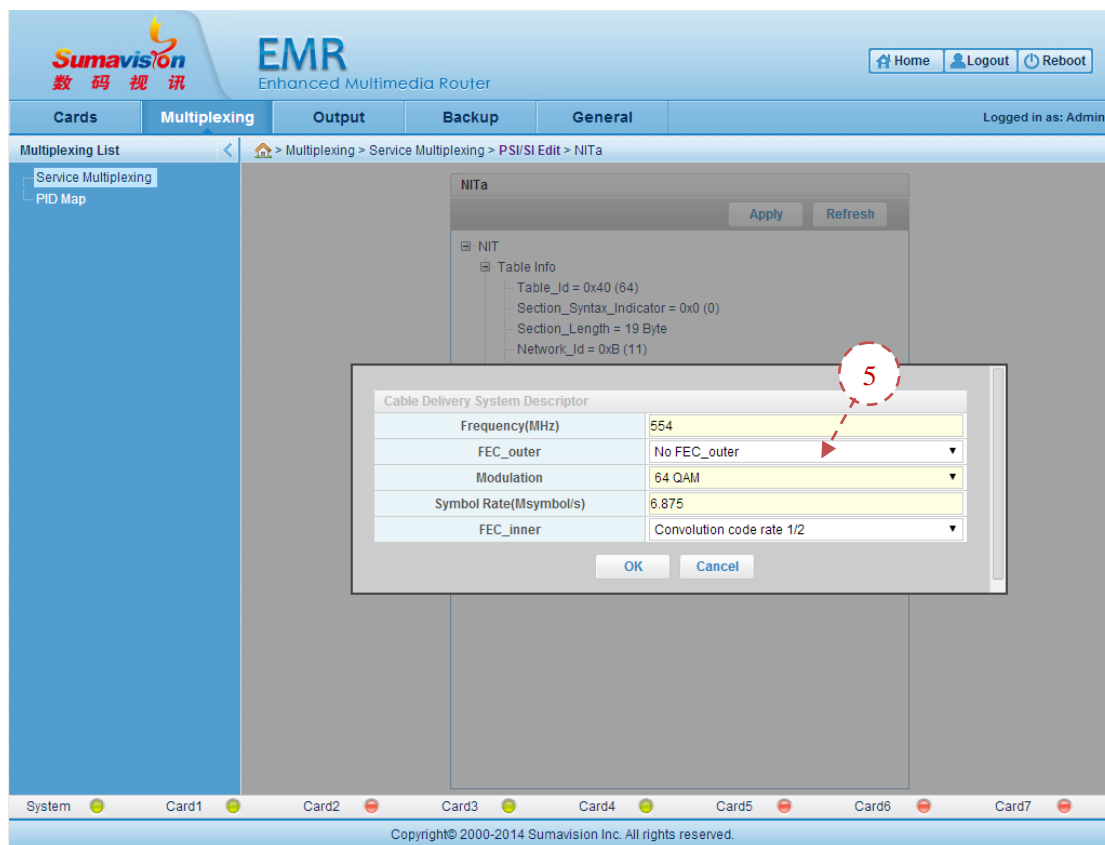


Fig. 6-15 Interface for Adding Cable Delivery System Descriptor in NIT Table

**Step 5:** select or fill in the “Frequency”, “FEC\_outer”, “Modulation”, “Symbol Rate” and “FEC\_Inner” of the frequency point to be associated according to the real application environment. Click “OK” to finish the addition;

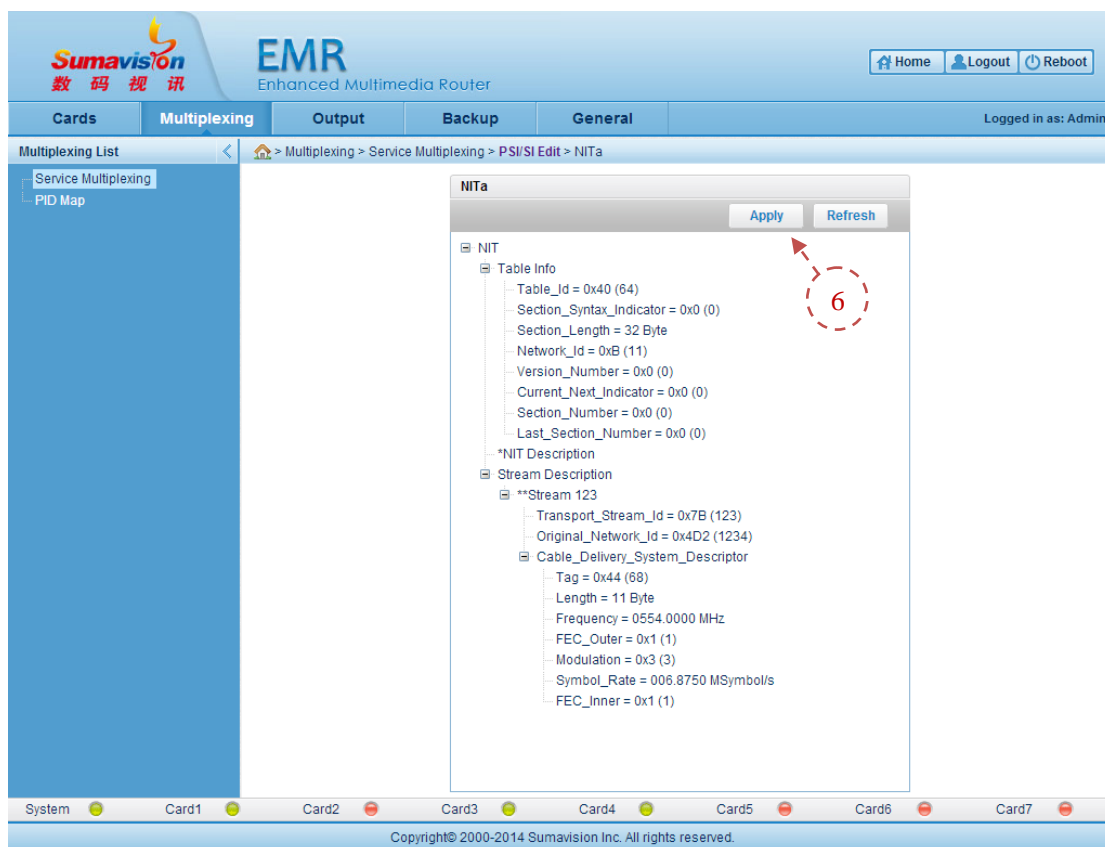


Fig. 6-16 NIT Table Edition Interface

Step 6: click “Apply” to store the aforesaid modification and addition operation;



Fig. 6-17 Validity of NIT Table Edition (Multiplex Interface)

**Step 7:** return to the “Multiplexing” interface and click “Apply” to put the associated operation into effect.

If it needs to associate other frequency points, repeat the aforesaid steps to realize the addition.

### 6.1.2 CAT table edition

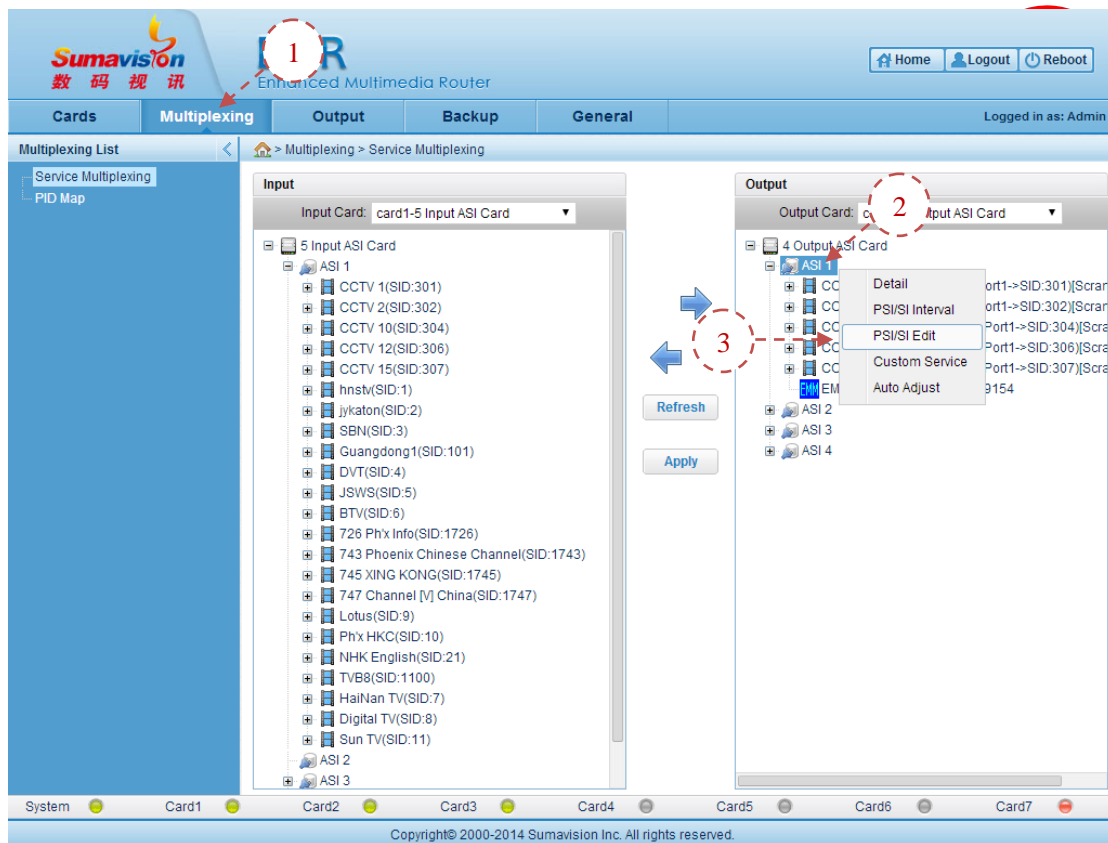


Fig. 6-18 Log-in of PSI/SI Edition Interface

**Step 1:** click the “Multiplexing” on the WEB network management page to log in the program multiplex interface;

**Step 2:** right click the output port to be edited;

**Step 3:** select the “PSI/SI Edit” on the pop-up menu to log in the table edition interface;

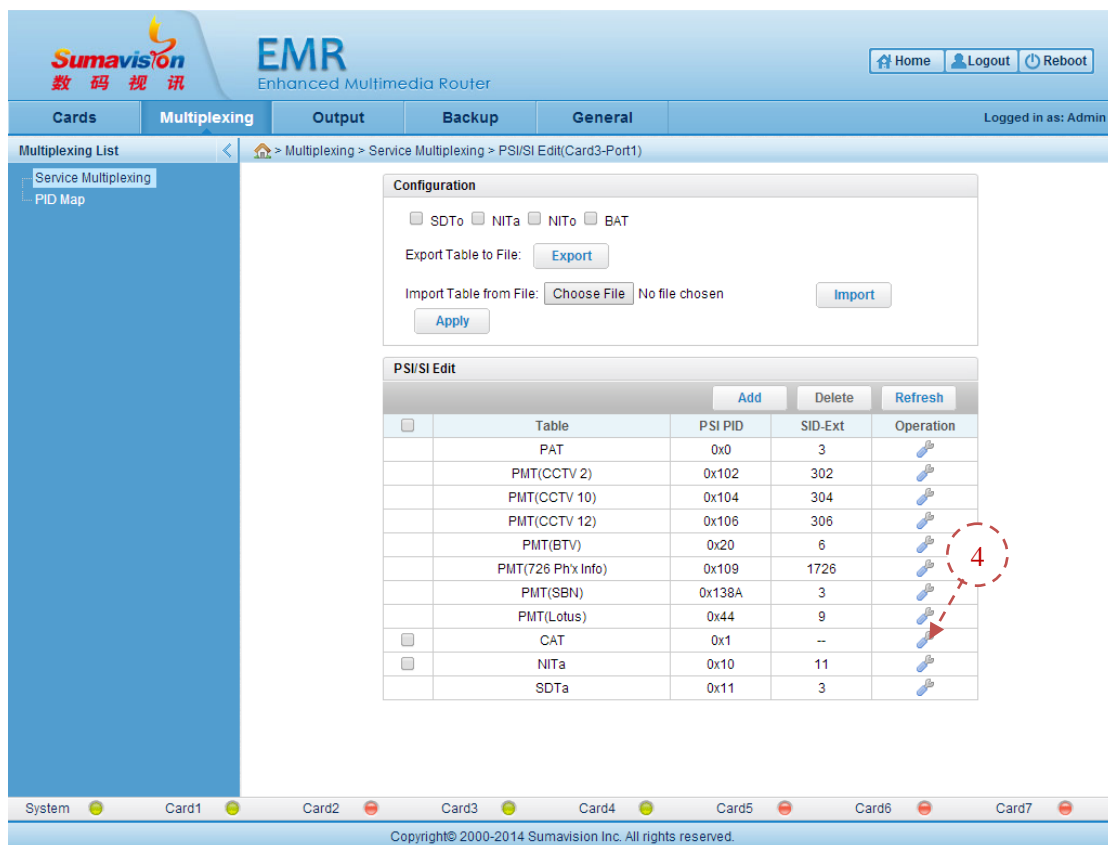


Fig. 6-19 PSI/SI Edition Interface

**Step 4:** click in the CAT table operation bar to log in the edition interface of CAT table;

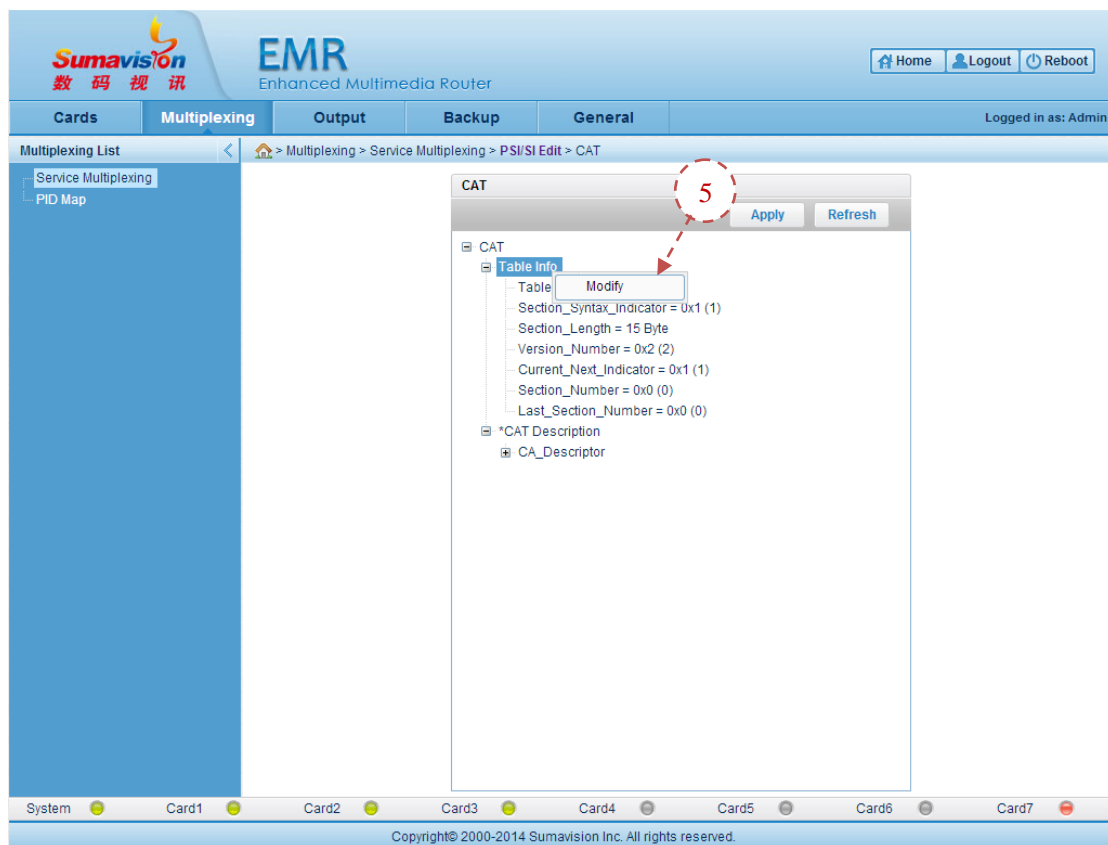


Fig. 6-20 CAT Table Edition Interface (modification of Table Info)

**Step 5:** right click the “Modify” below the “Table Info” node to pop up the modification box.

Summary



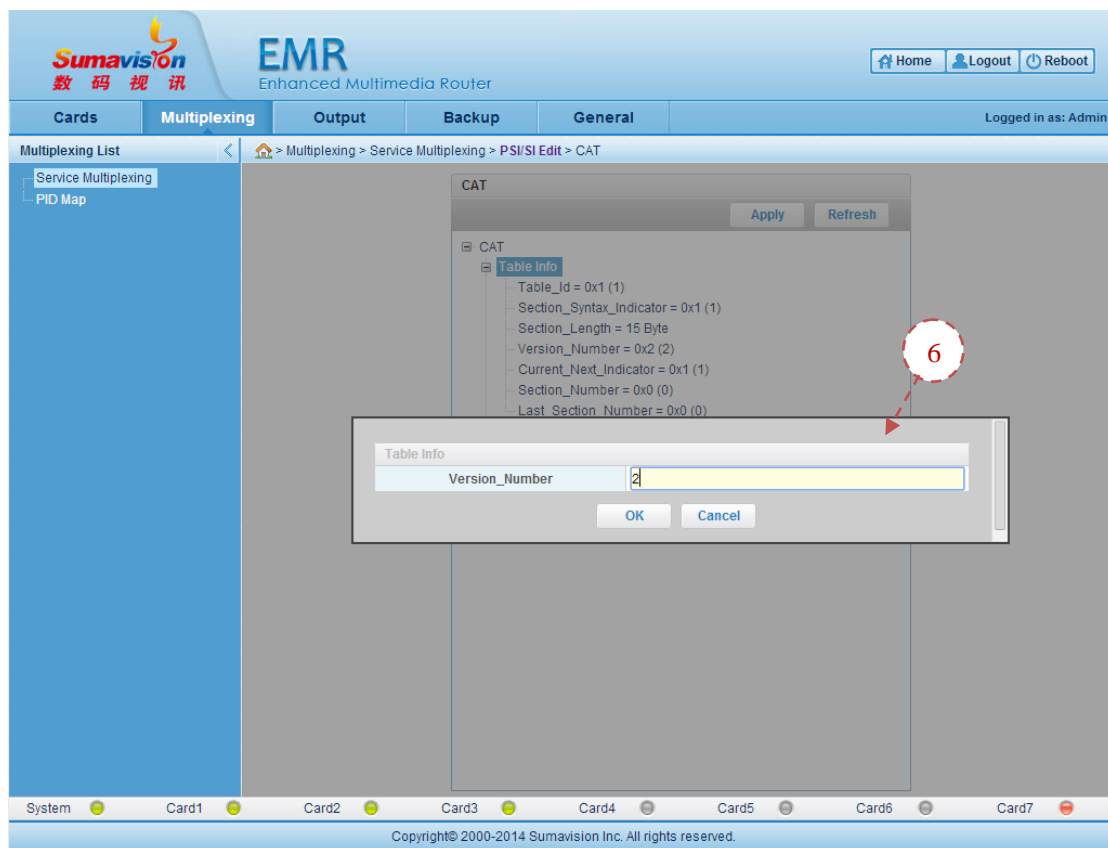


Fig. 6-21 CAT Table Info Edition Interface

**Step 6:** modify information of corresponding table, click “OK” and save the modification;

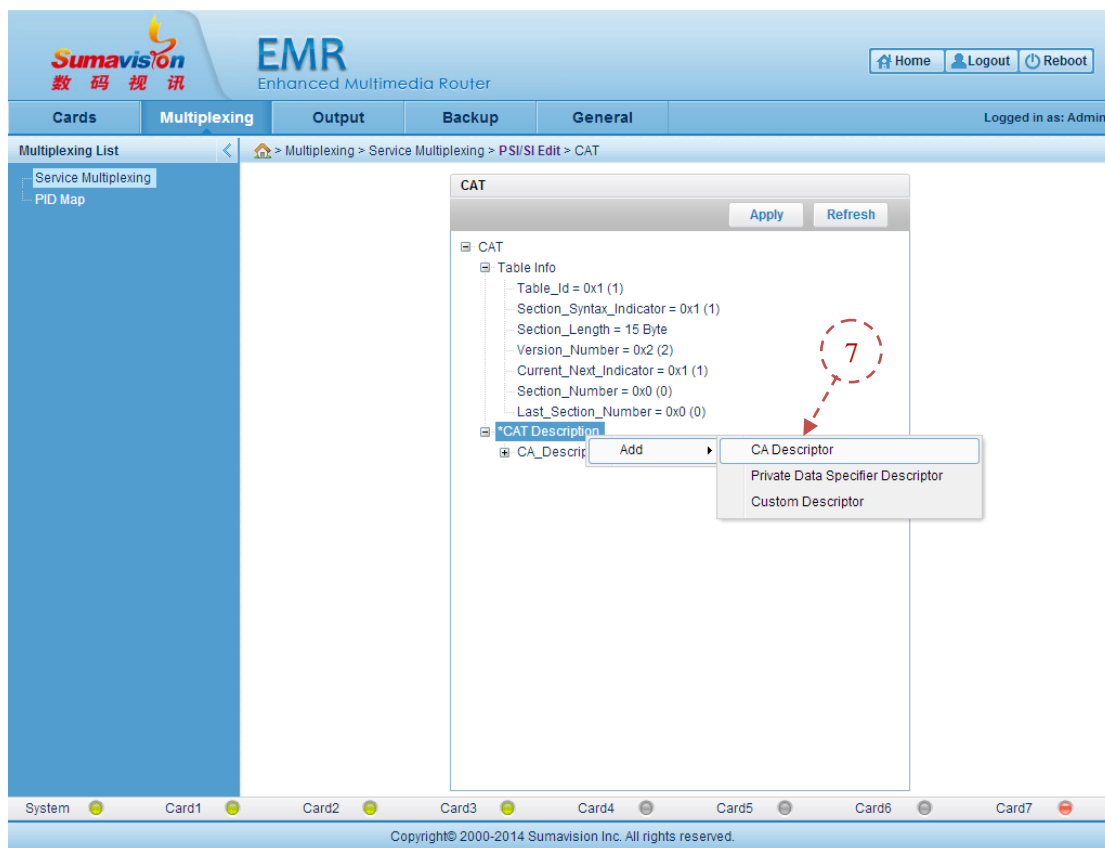


Fig. 6-22 CAT Table Edition Interface (Addition of CAT Description)

**Step 7:** right click the “CAT Description” node and choose corresponding descriptor below “Add” to pop up the modification box of this descriptor.

Summary

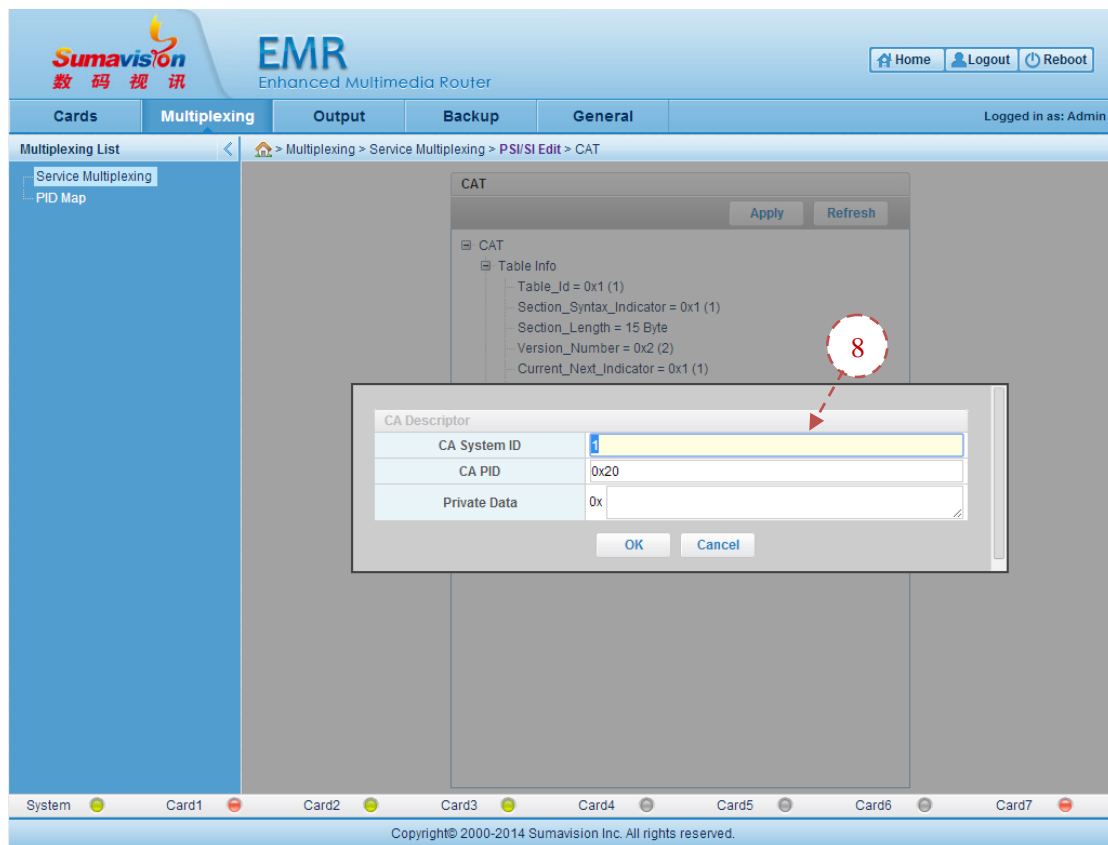


Fig. 6-23 CAT Table Descriptor Addition Interface

**Step 8:** modify corresponding descriptor information and click “OK” to save the added descriptor;

Summary

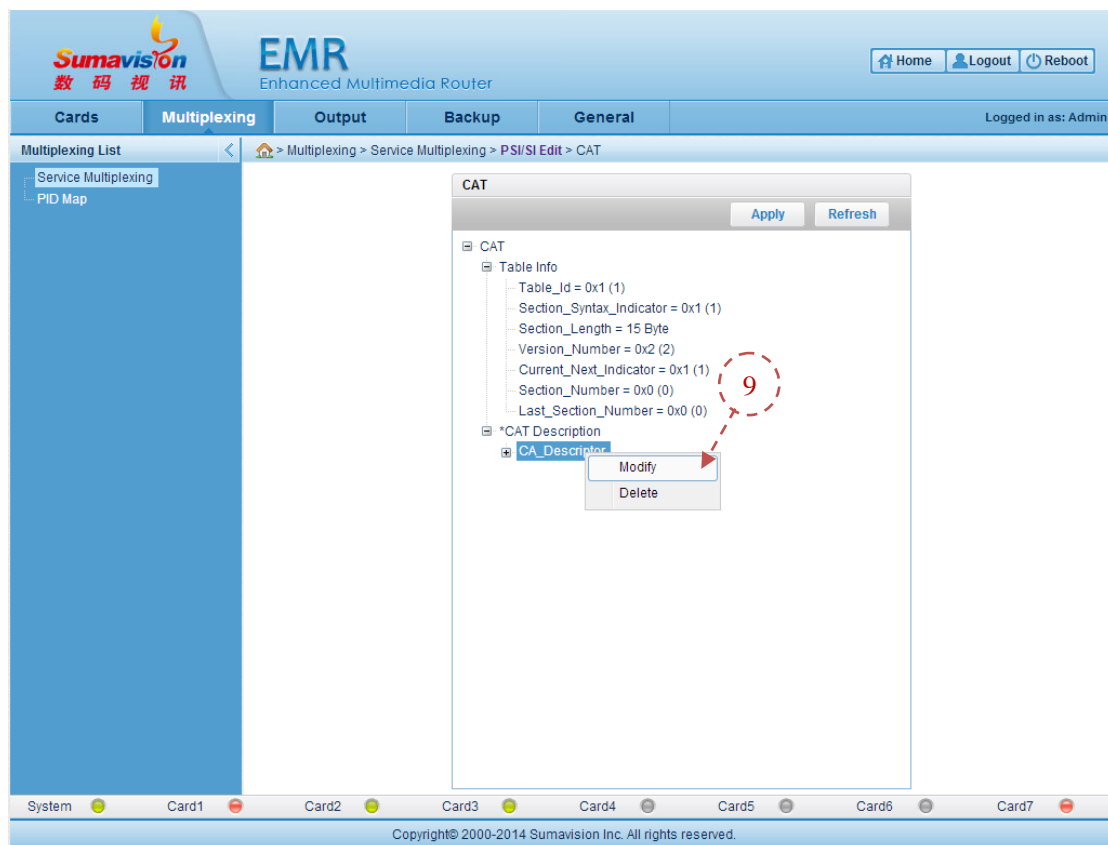


Fig. 6-24 CAT Table Edition Interface (CA\_Descriptor Modify)

**Step 9:** right click “CA\_Descriptor” node and “Modify” or “Delete” corresponding descriptor .Select the “Modify” to pop up the modification box for table edition;

Suma

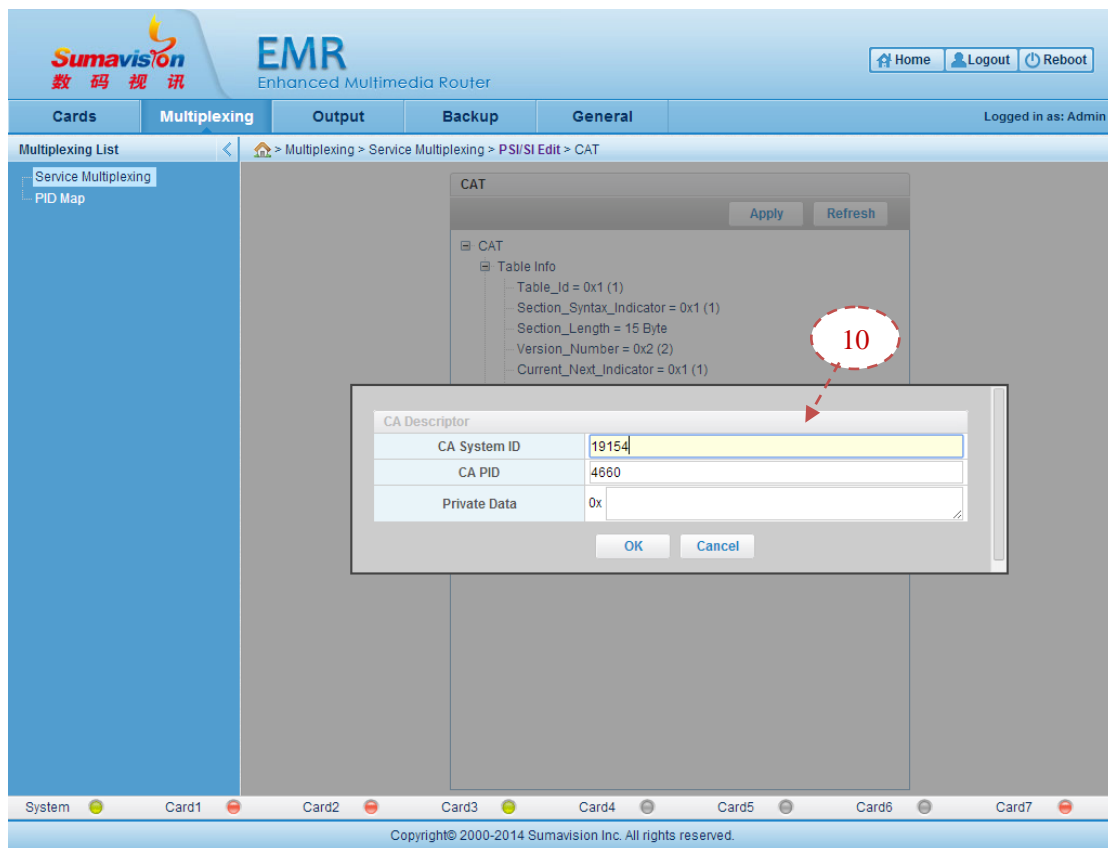


Fig. 6-25 CAT Table Edition Interface

**Step 10:** edit the corresponding stream information and click “OK” to save the stream information;

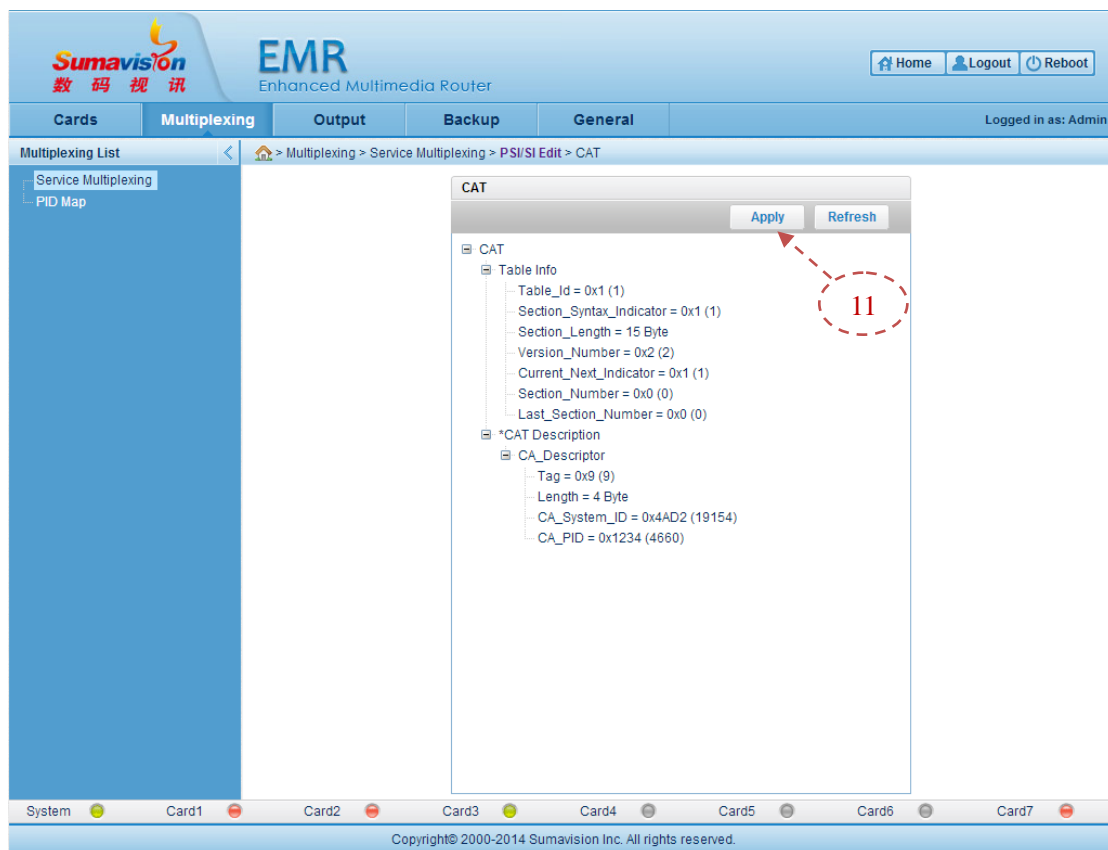


Fig. 6-26 CAT Table Edit Interface

**Step 11:** after finishing the steps 5 to 10 and click “Apply” to save the aforesaid modification and addition operation.

Summar



Fig. 6-27 Validity of CAT Table Edition (Multiplex Interface)

**Step 12:** return to the “Multiplexing” interface and click “Apply” to put the CAT table edition operation into effect.

### 6.1.3 SDT table edition

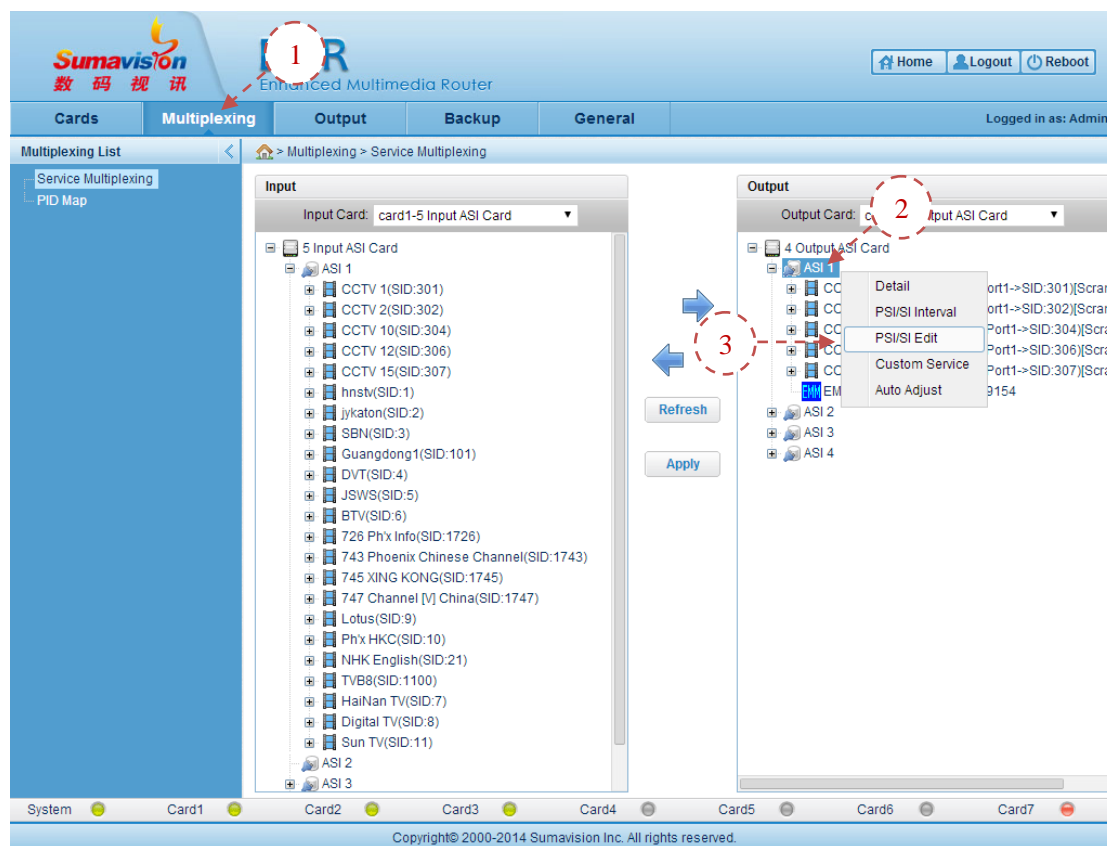


Fig. 6-28 Log-in of PSI/SI Edition Interface

**Step 1:** click the “Multiplexing” on the WEB network management page to log in the program multiplex interface;

**Step 2:** right click the output port to be edited;

**Step 3:** select the “PSI/SI Edit” on the pop-up menu to log in the table edition interface;



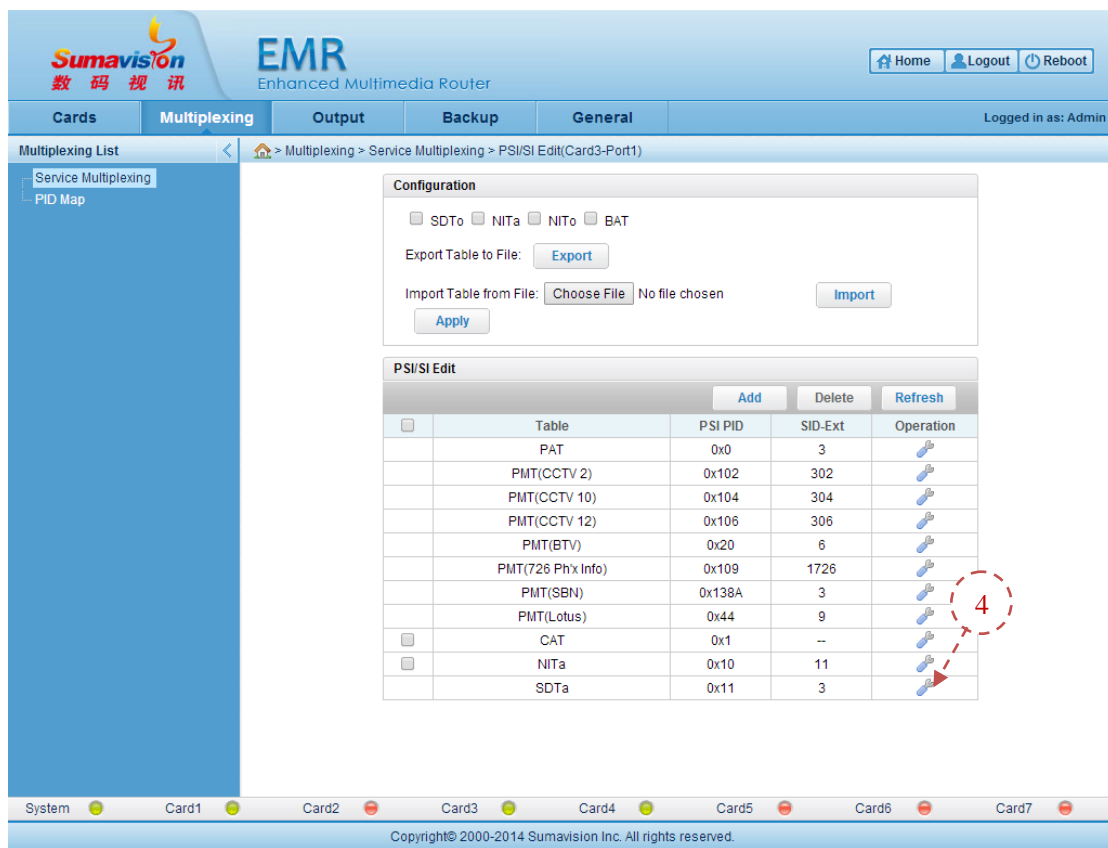


Fig. 6-29 PSI/SI Edition Interface

**Step 4:** click in the SDT table operation bar to log in the edition interface of SDT table;

Summary

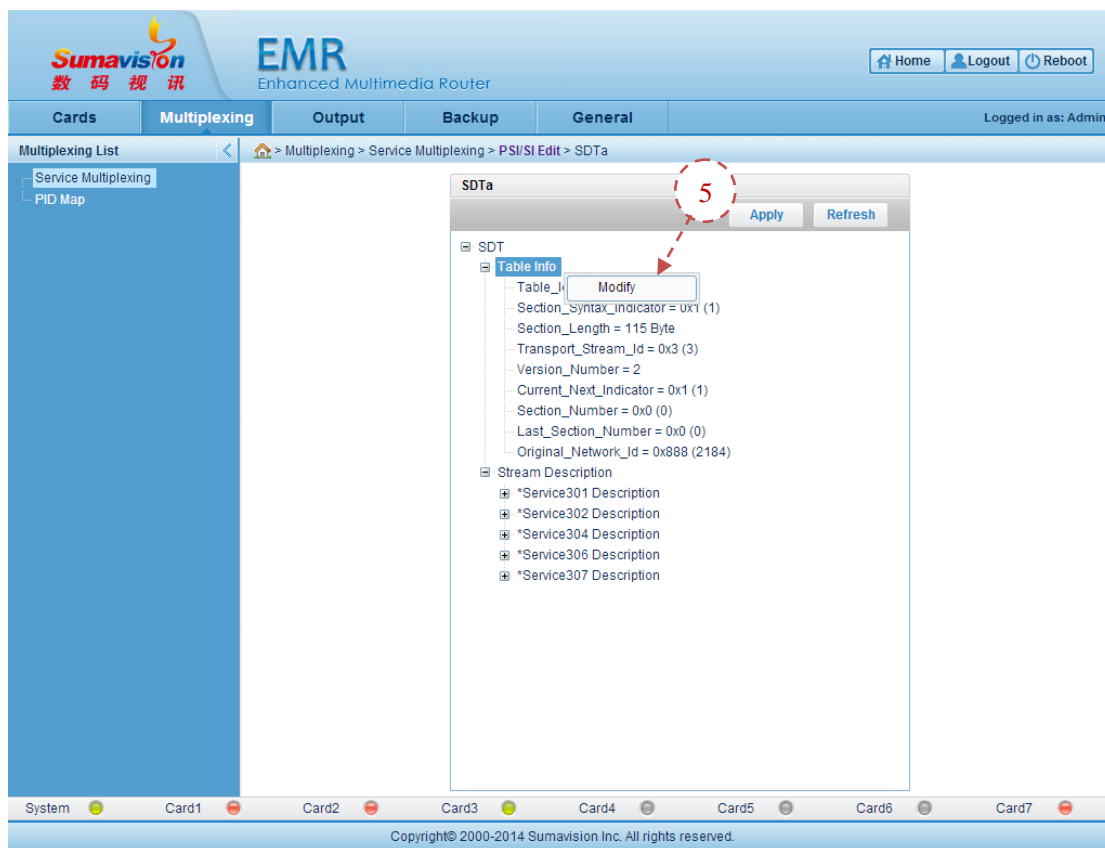


Fig. 6-30 SDT Table Edition Interface (modification of Table Info)

**Step 5:** right click the “Modify” below the “Table Info” node to pop up the modification box.

Summary

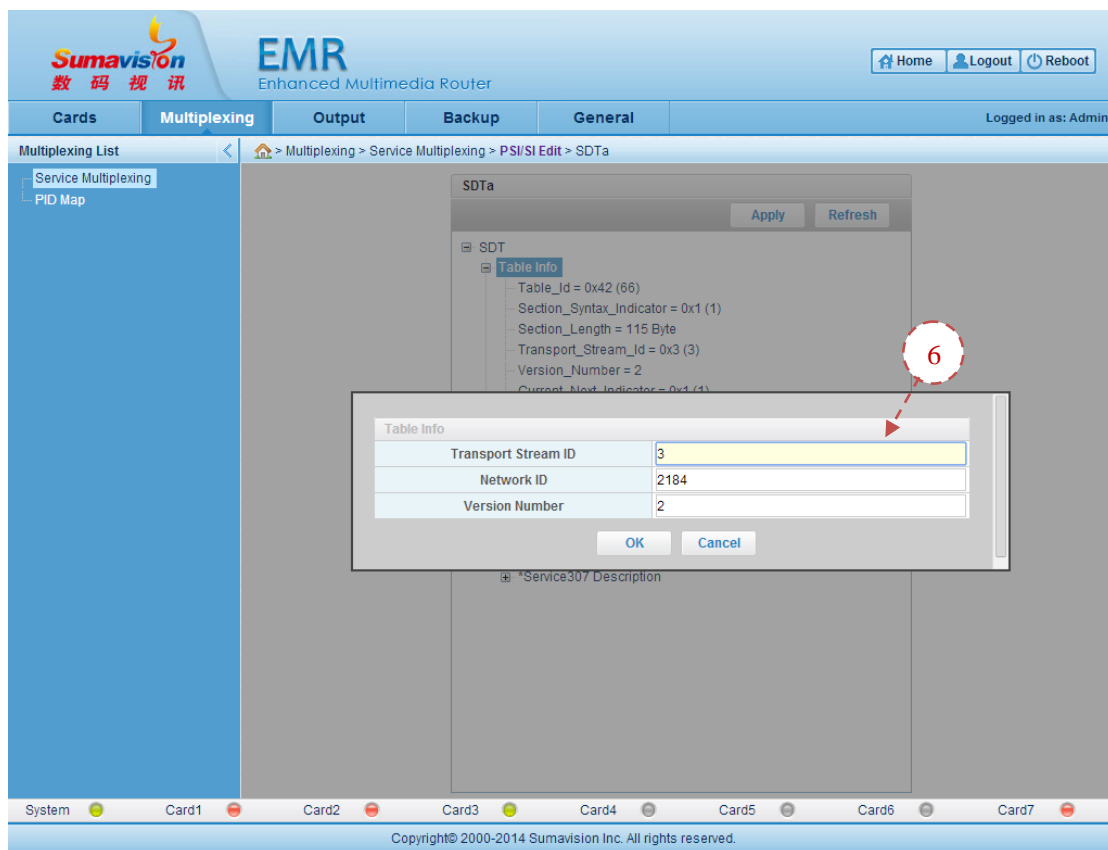


Fig. 6-31 SDT Table Info Edition Interface

**Step 6:** modify information of corresponding table, click “OK” and save the modification;

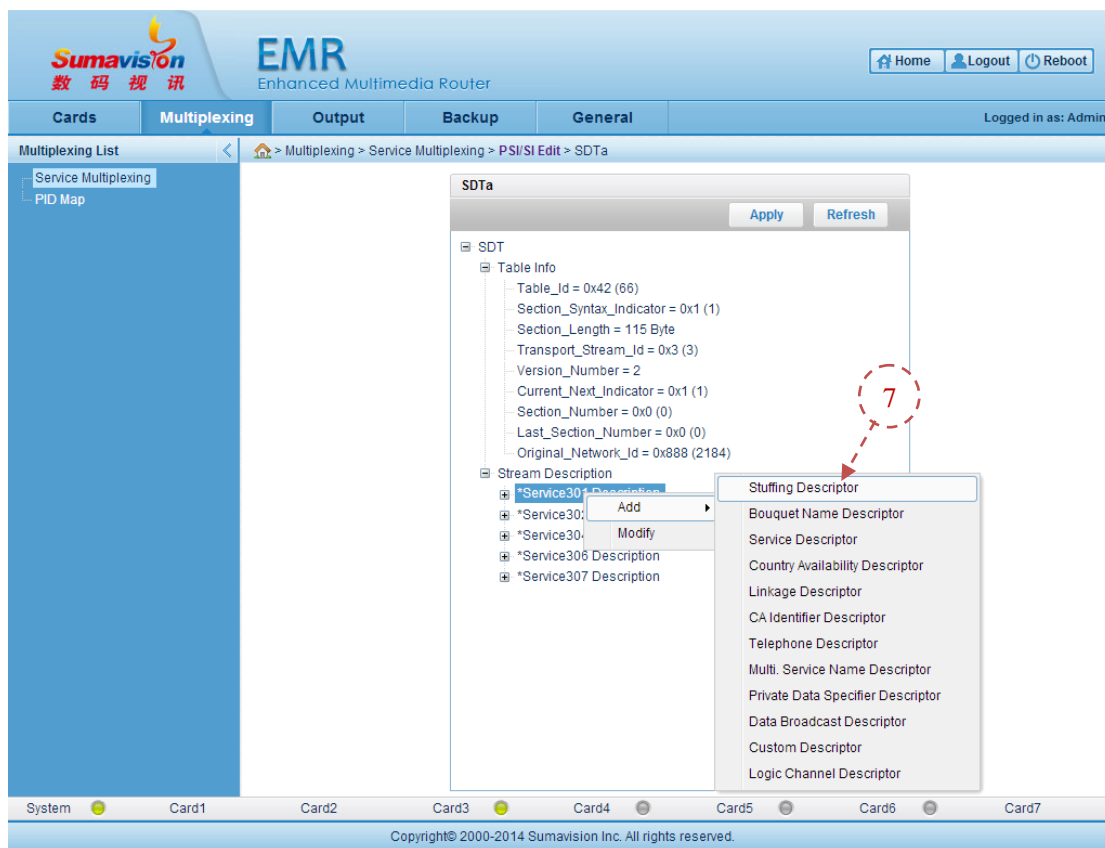


Fig. 6-32 SDT Table Edition Interface (Addition of Service Description)

**Step 7:** right click the “Service Description” node and choose corresponding descriptor below “Add” to pop up the modification box of this descriptor.

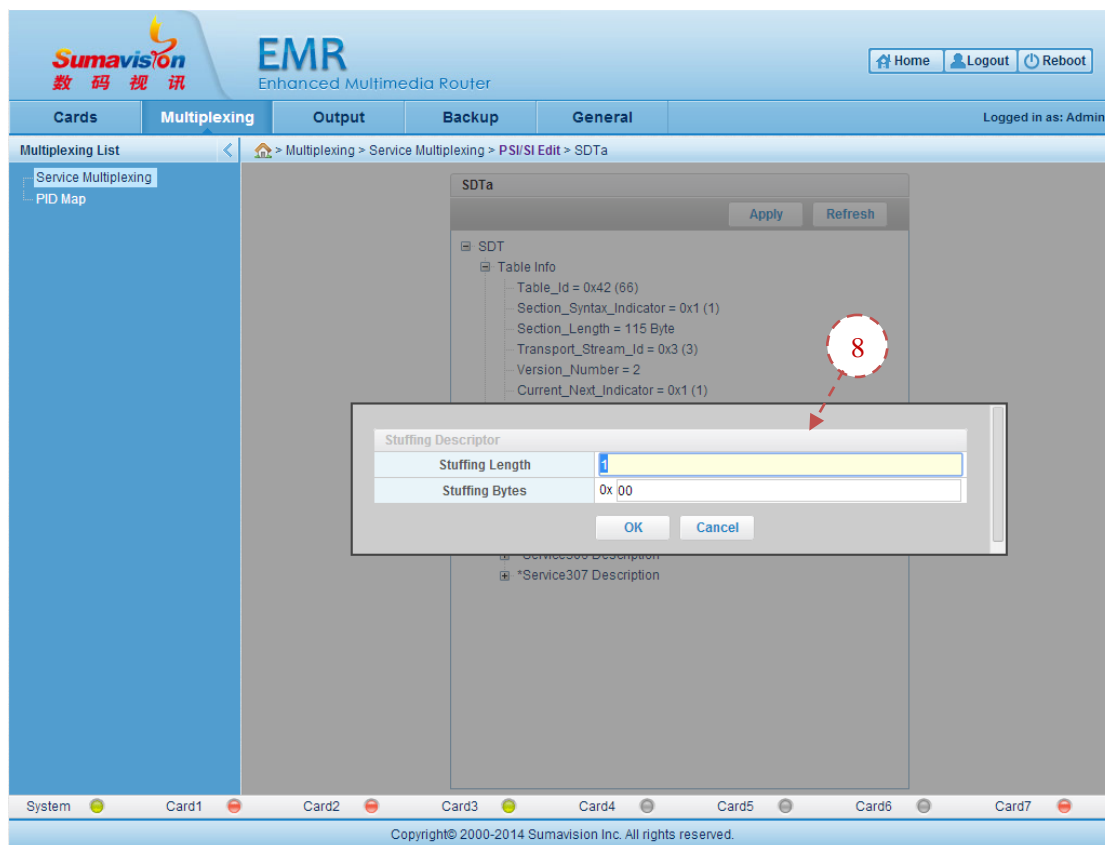


Fig. 6-33 SDT Table Descriptor Addition Interface

**Step 8:** modify corresponding descriptor information and click “OK” to save the added descriptor;

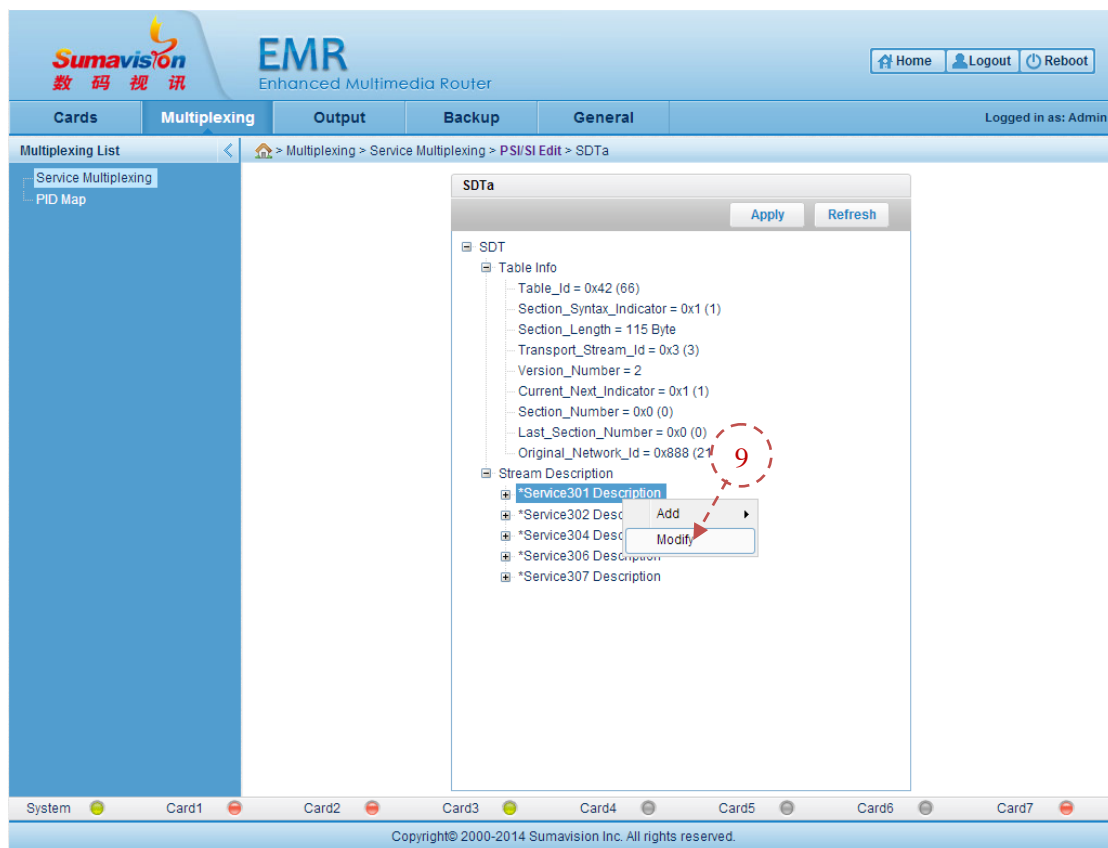


Fig. 6-34 SDT Table Edition Interface (CA\_Descriptor Modify)

**Step 9:** right click “Service Descriptor” node and choose corresponding descriptor below “Modify” to pop up the modification box for table edition;

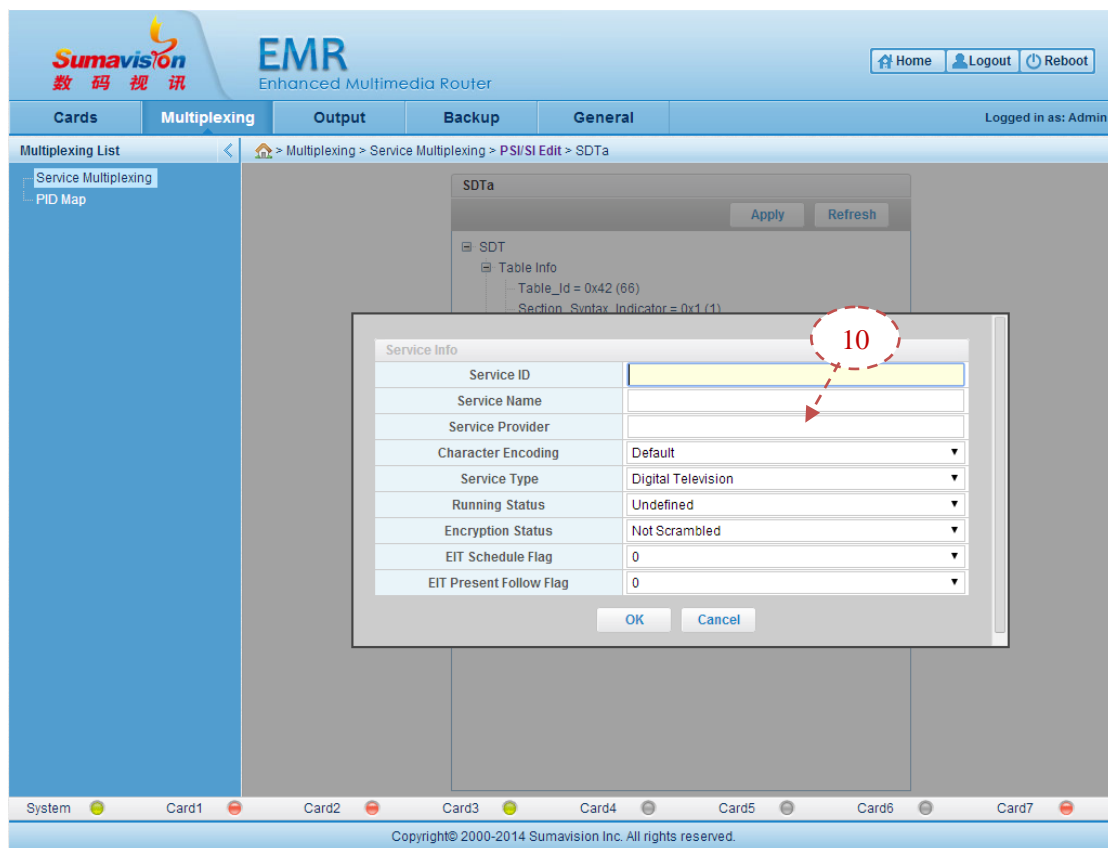


Fig. 6-35 SDT Service Information Edition Interface

**Step 10:** edit the corresponding stream information and click “OK” to save the stream information;

Summary

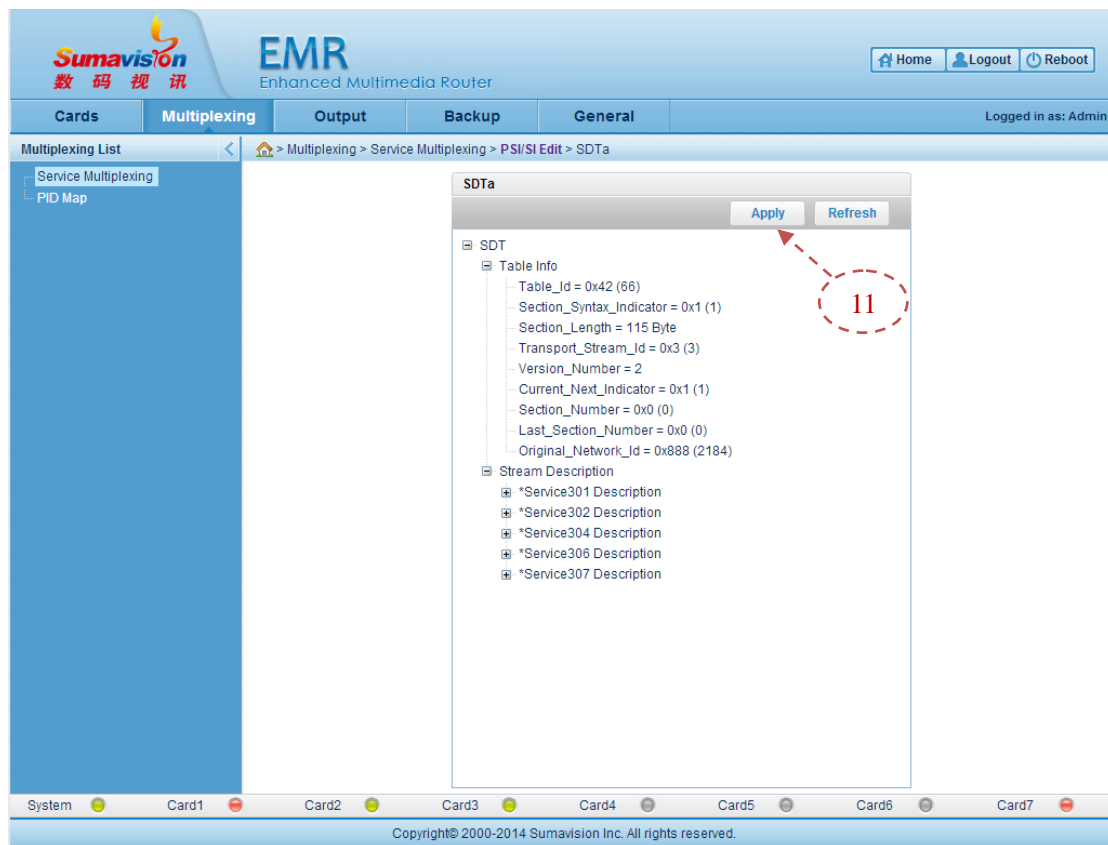


Fig. 6-36 SDT Table Edit Interface

**Step 11:** after finishing the steps 5 to 10 and click “Apply” to save the aforesaid modification and addition operation.

Suma



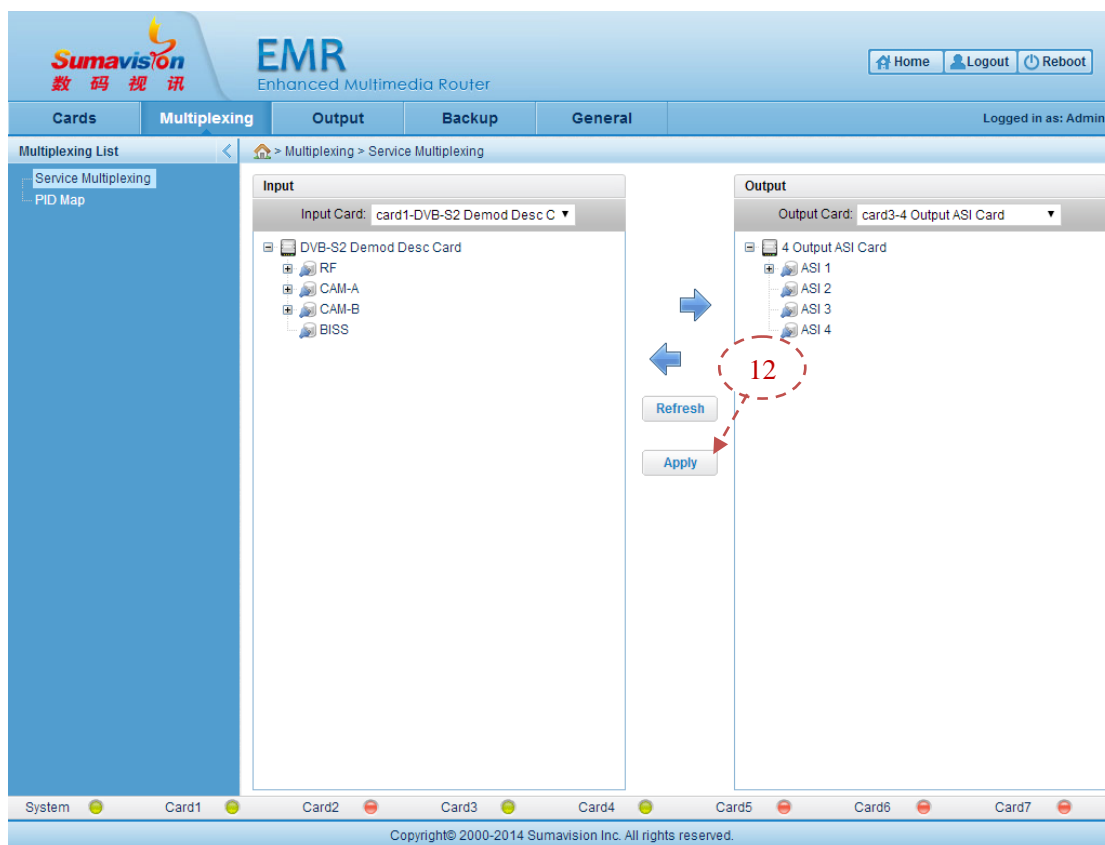


Fig. 6-37 Validity of SDT Table Edition (Multiplex Interface)

**Step 12:** return to the “Multiplexing” interface and click “Apply” to put the SDT table edition operation into effect.

## 6.2 Massive modification function

Some board cards are provided with the massive modification function. It can modify several parameters groups at the same time. The illustration is made to the massive modification method by taking the receiving setting of the Main GbE Card.

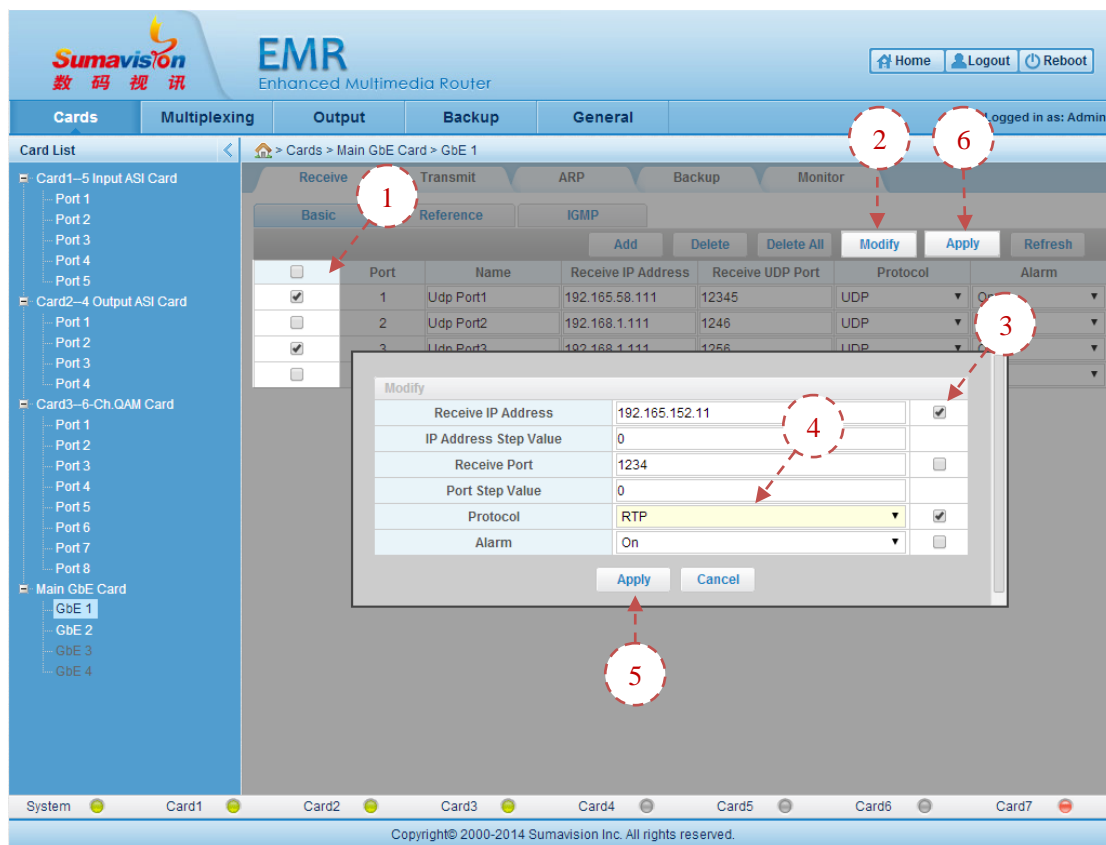


Fig. 6-38 Massive modification setting for Web network management

**Step 1:** click the check box on the left of the WEB network management page and check the port desired to have the massive modification action;

**Step 2:** click the “Modify” on the page to pop up the massive modification page;

**Step 3:** click the check box popped up on the right of the massive modification page and check the parameter to have the massive modification action;

**Step 4:** modify the parameter modified in batches according to the real demand;

**Step 5:** click the “Apply” button below the massive modification page to finish corresponding parameter modification;

**Step 6:** click the “Apply” on the page to put the parameter setting modified in batch into effect.

When there are too many ports (e.g. 256 ports) and the IP address or port number of all ports are modified by IE browser, IE may alarm of no response. Please wait a moment before any operation.

### 6.3 Output Settings

For the port mapping function of transparent transmission function, the output port can directly output the input stream of corresponding port after adding corresponding transparent transmission relationship and no modification is made to the input stream, as shown in Fig. 6-39 Output Setting Interface for Web Network management.



Fig. 6-39 Output Setting Interface for Web Network management

**Step 1:** click the “Output” in the network management interface to log in the output setting interface;

**Step 2:** click the board card to be set on the left output table to log in the board card transmission setting interface;

**Step 3:** Set the “Output Mode” of corresponding output port as “Pass-Through”;

**Step 4:** Select the board card where the output source to be passed through is located;

**Step 5:** Select the port corresponding to the input source to be passed through;

**Step 6:** Click “Apply” button to make the pass-through relationship valid.

- ☐ Some cards do not support the output rate control. These cards are displayed in gray and unavailable for setting.
- ☐ If the multiplexing relationship has been set for the input port or the output port, the transparent transmission operation cannot be made. It must remove the multiplex relationship of corresponding port and conduct the transparent transmission operation.

## 6.4 Backup settings

EMR is the core access device in the front end of digital TV and the backup settings support both Service backup and port backup. Steps of settings of the Service backup and port backup are instructed below.

- ☐ The backup function is available only after purchasing corresponding authorization. Otherwise, the backup interface is unavailable and the backup setting cannot be made.

### 6.4.1 Service Backup

Function description: the two programs in the back board, satisfying certain conditions, can be used for realizing the 1+1 program backup switch.

- ☐ The programs involved in the backup of the output port cannot share PCR with other programs.
- ☐ The main program stream and backup program stream must have the consistent structure, including the combination mode of video, audio, PCR and ECM.
- ☐ The programs sharing one video or audio cannot be involved in the backup.
- ☐ The backup program can be used as the backup of one program on one output port rather than the backup of several programs. For example, if six programs are available on one port, the backup shall be made for one program rather than 6 programs.
- ☐ The 1+1 program backup is available for 256 groups at most.

Steps of settings are:

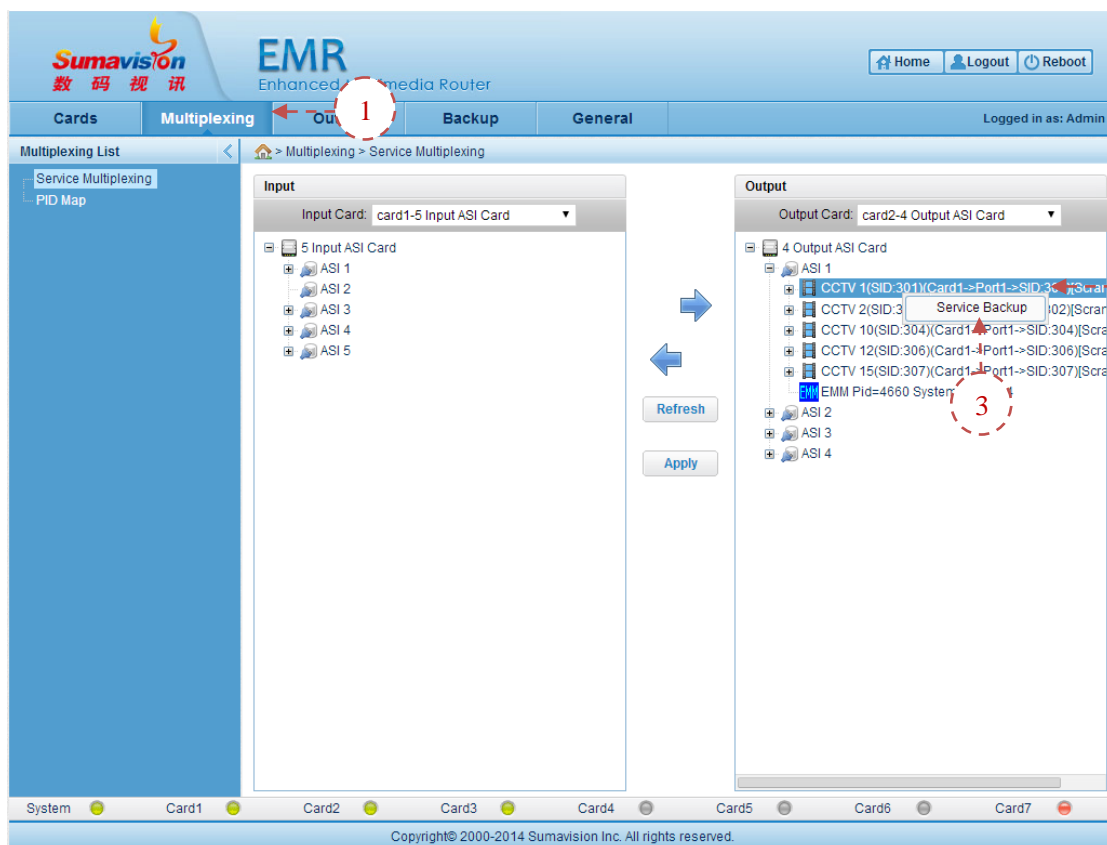


Fig. 6-40 Service Backup

- Step 1:** Click “Multiplexing” to navigate to the programme multiplexing page;
- Step 2:** Click the right button to choose the programme to be backed up from the list of output programme and choose “Service Backup”;
- Step 3:** Choose “Service Backup” from the popped up options to navigate to the page of service backup;

Summary

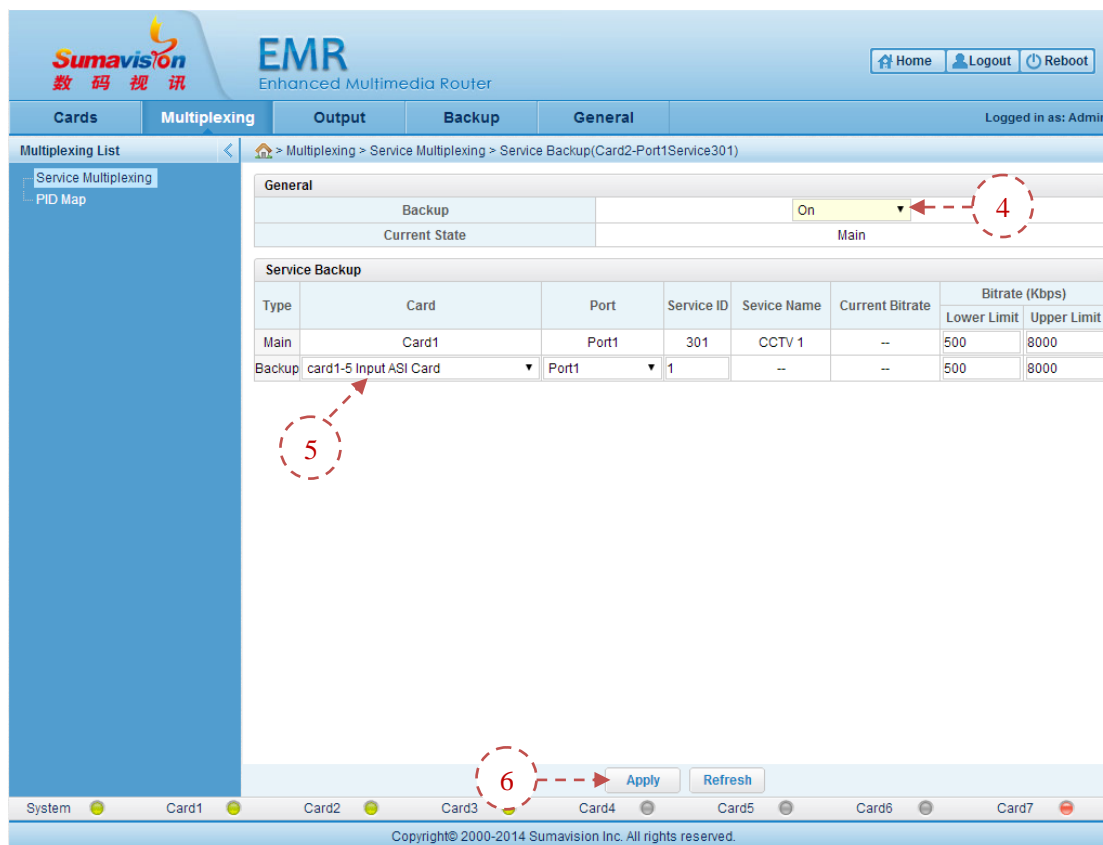


Fig. 6-41 Service Backup


**Step 4:** Choose “On” of the “Backup” Switch;

**Step 5:** Choose the card and port for the service backup, fill in the “Service ID” and set the “Lower Limit Bitrate” and “Upper Limit Bitrate” of the master and backup channel of programme;

**Step 6:** Click “Apply” to validate the parameter;

Once the master channel of programme becomes abnormal and the valid bit rate of the programme is beyond the set maximum or minimum bit rate of the programme, the device will automatically switch to the multiplexing output of the backup channel of programme to guarantee the normal output.

=====

 When setting the backup relationship, it may set the main and backup switch delay for the backup and the backup main switch delay to realize corresponding switch requirements. The two parameters are within 0-65,535 in seconds.

=====

### 6.4.2 Port Backup

Functional description: the 1+1 port backup switch can be made for the any two ports in the back board.

- It is required that the main port and the back port shall have identical contents.
- The 1+1 port backup is available for 256 groups at most.
- When one port is used as the backup port, such port cannot be used for multiplexing and transparent transmission.
- The main port and the backup port must support the identical transparent transmission types that both of the two support the transparent transmission or not. However, some ports do not support the transparent transmission. Such ports cannot support the transparent transmission and support the backup of multiplexed port at the same time, but can be used as the backup of the ports with same attributes.

Steps of settings are:

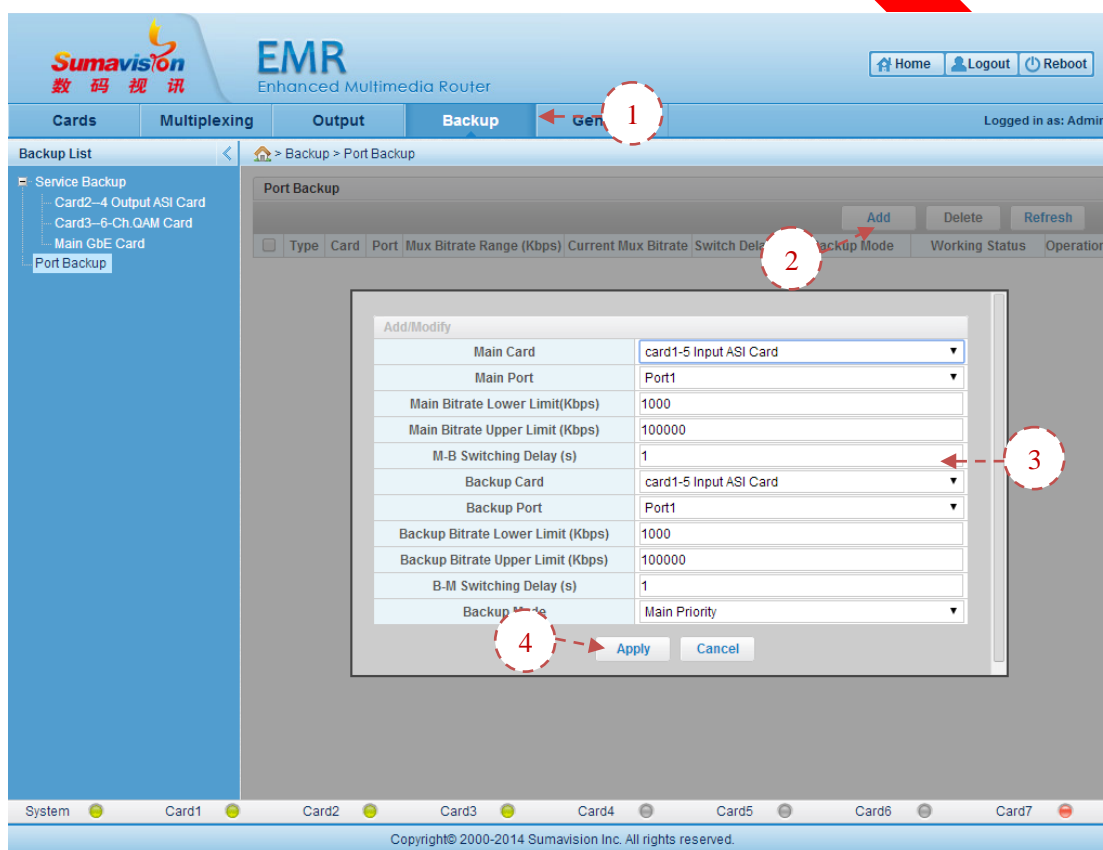


Fig. 6-42 Port Backup

**Step 1:** Click “Port Backup” in the pull-down menu of “Backup” to navigate to the port backup settings page;

**Step 2:** Click “Add” to pop up the port backup adding page;

**Step 3:** Choose the card and port for the port backup, set the maximum and minimum switching bit rate of the master and backup channel of programme, choose “Main Priority” of the delay backup mode, and set the delay of the switching between master and backup channel as 1s;

**Step 4:** Click “Apply” to validate the parameter;

- =====
- ⓘ The port involved in the programme multiplexing may not be set as the port of backup channel. Once set as the port of backup channel, the programme of the port may no longer be used in the multiplexing output.
- =====

After setting the port multiplexing, click “Programme Multiplexing” in the “Multiplexing Settings” to return to the programme multiplexing page, and the port of backup channel will be marked.

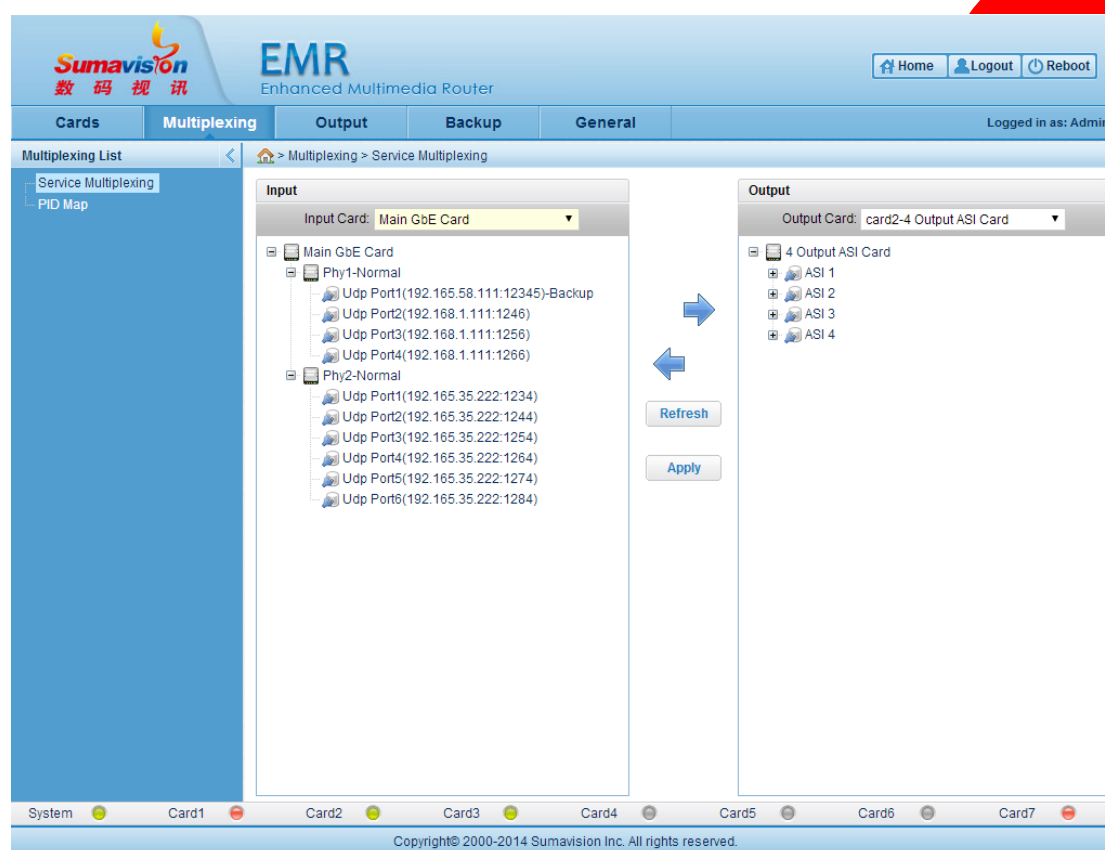


Fig. 6-43 Port Backup

Once the port of master channel becomes abnormal and the valid bit rate of the port is beyond the set maximum or minimum bit rate, the device will automatically switch to the multiplexing output of the port of backup channel to guarantee the normal output.

## 6.5 Scrambling settings

It introduces the scrambling settings of EMR.

EMR scrambling is set by the scrambling network interface marked with CA on the front panel of the device. IP of the scrambling network interface may be checked in “Others” in “System Parameter” of WEB network management of EMR.



## 6.5.1 Introduction to WEB Scrambling

Connect the scrambling network interface by the computer via the exchanger, fill in the IE address of the scrambling network interface in the address field of the IE browser, and click “Enter” to navigate to the scrambling configuration management of EMR.

Click “English” in the page to input the username and password in the popped up box (default username: Admin; default password: sumavisionrd) to navigate to the scrambling configuration web page, which consists of pages of “System”, “Program Scramble”, “Port Set”, “CAS Set”, “EMM Set” and “Logout”.



Fig. 6-44 Scramble Module Interface

Fig. 6-45 Scramble Module System Parameter

“System” mainly sets the network parameter of the scrambling module, input the authorization code, check the version information and status of the device, administer the user and reboot the device.



Fig. 6-46 Programme Scramble

“Program Scramble” mainly searches the programme, navigate to the appointed port, sets the programme scrambling switch and parameters of SCGID, ECMPID and AC.

**SCG ID:** ID value of SCG (scrambling control group)

**CAS ID:** ID value of CAS (conditional access system);

**ECM PID:** PID value of ECM (Entitlement Control Message);

**Access Criteria Data:** AC data, produced by CAS server;

**ECM Private Description:** the private description for ECM is listed in PMT table.

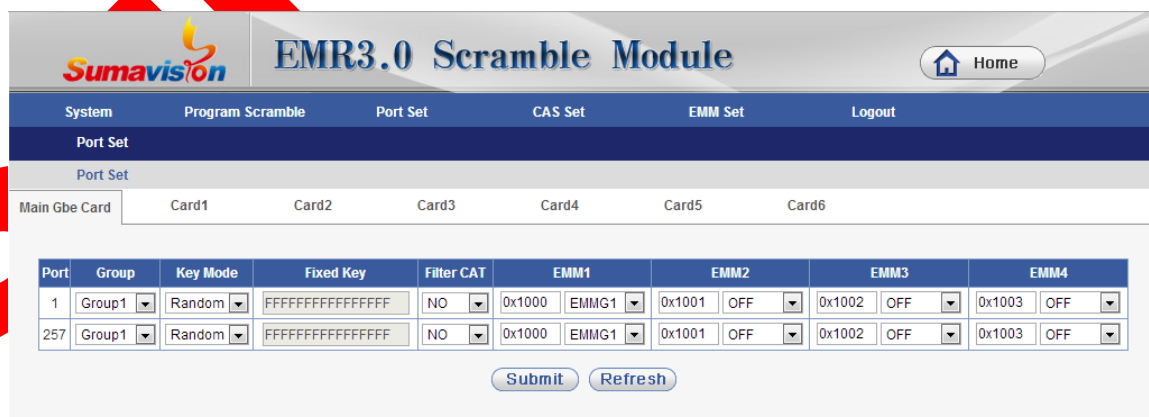


Fig. 6-47 Port Set

“Port Set” mainly sets parameters of the grouping and key mode of the port, EMMPID

settings and EMMG.

**Group:** choose corresponding group number;

**Key Mode:** choose to output the secrete key at random or use the fixed value;

**Fixed Key:** fixed value of secrete key

**EMM:** EMM refers to the entitlement management message. This option is used for setting PID of EMM and EMM used by port.

The screenshot shows the 'CAS Set' configuration page in the EMR3.0 Scramble Module. At the top, there is a navigation bar with 'System', 'Program Scramble', 'Port Set', 'CAS Set', 'EMM Set', and 'Logout'. Below this, the 'CAS Set' section contains several form fields: 'Select Group' (dropdown menu set to 'Group1'), 'CA Version' (dropdown menu set to 'NO.2'), 'EIS Switch' (dropdown menu set to 'OFF'), and 'EIS Port' (text input set to '8000'). There is also a 'CW Period(s)' field set to '10'. Below these fields is a table with 5 columns: 'Param List', 'No.1 CA', 'No.2 CA', 'No.3 CA', and 'No.4 CA'. The table contains 8 rows of parameters for each CA channel. At the bottom of the form are 'Submit' and 'Refresh' buttons.

| Param List       | No.1 CA        | No.2 CA        | No.3 CA        | No.4 CA        |
|------------------|----------------|----------------|----------------|----------------|
| CA Switch        | ON             | OFF            | OFF            | OFF            |
| CAS-ID           | 0x4AD2         | 0x4AD2         | 0x4AD2         | 0x4AD2         |
| Sub-CAS-ID       | 0x1            | 0x1            | 0x1            | 0x1            |
| ECM-ChannelID    | 1              | 1              | 1              | 1              |
| Main ECMG-IP     | 192.165.58.105 | 192.165.58.105 | 192.165.58.105 | 192.165.58.105 |
| Main ECMG-Port   | 2000           | 2000           | 2000           | 2000           |
| Backup ECMG-IP   | 192.168.2.10   | 192.168.2.11   | 192.168.2.12   | 192.168.2.13   |
| Backup ECMG-Port | 2001           | 2101           | 2201           | 2301           |

Fig. 6-48 CAS Set

“CAS Set” mainly sets parameters of the communication with CAS server, including CA version number, key cycle, EIS settings, CAS communication parameters, and IP and port of ECMG. It supports up to four simulcrypt.

**Select Group:** it requires CA to provide the mark;

**CA Version:** CA version number, provided by CA

**CW Period:** conversion circle of secrete key;

**EIS Switch:** EIS function switch;

**EIS Port:** TCP port number for EIS communication;

**CAS-ID:** CAS number, provided by CA;

**Sub-CAS-ID:** Sub-CAS number, provided by CA;

**ECM-Channel ID:** ECM channel ID, provided by CA;

**Main and Backup ECMG-IP:** IP address of ECM generator, provided by CA

**Main and Backup ECMG-Port:** TCP port of ECM generator, provided by CA

| EMMG No. | EMMG Switch | CAS-ID | Sub-CAS-ID | EMMG Mode | TCP Port | UDP Port | EMMG BitRate | CA Version | EMM Private Description |
|----------|-------------|--------|------------|-----------|----------|----------|--------------|------------|-------------------------|
| No.1     | ON          | 0x4AD2 | 0x1        | TCP       | 3000     | 3000     | 500          | NO.2       | 0x                      |
| No.2     | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3001     | 3001     | 500          | NO.2       | 0x                      |
| No.3     | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3002     | 3002     | 500          | NO.2       | 0x                      |
| No.4     | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3003     | 3003     | 500          | NO.2       | 0x                      |
| No.5     | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3004     | 3004     | 500          | NO.2       | 0x                      |
| No.6     | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3005     | 3005     | 500          | NO.2       | 0x                      |
| No.7     | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3006     | 3006     | 500          | NO.2       | 0x                      |
| No.8     | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3007     | 3007     | 500          | NO.2       | 0x                      |
| No.9     | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3008     | 3008     | 500          | NO.2       | 0x                      |
| No.10    | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3009     | 3009     | 500          | NO.2       | 0x                      |
| No.11    | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3010     | 3010     | 500          | NO.2       | 0x                      |
| No.12    | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3011     | 3011     | 500          | NO.2       | 0x                      |
| No.13    | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3012     | 3012     | 500          | NO.2       | 0x                      |
| No.14    | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3013     | 3013     | 500          | NO.2       | 0x                      |
| No.15    | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3014     | 3014     | 500          | NO.2       | 0x                      |
| No.16    | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3015     | 3015     | 500          | NO.2       | 0x                      |

Fig. 6-49 EMM Set

“EMM Set” mainly sets parameters of EMMG, including EMMG switch, CASID and Sub\_CASID, EMMG communication code, communication port, EMM bit rate, CA version number, etc.

**CAS-ID:** CAS number, provided by CA;

**Sub-CAS-ID:** Sub-CAS number, provided by CA;

**EMMG communication mode:** EMM network communication mode, TCP or TCP+UDP;

**TCP communication port:** EMM TCP network communication port;

**UDP communication port:** EMM UDP network communication port;

**EMMG Bitrate:** code rate of EMM data

**CA Version:** CA version number, provided by CA

**ECM Private Description:** the private description for ECM is listed in PMT table.

### 6.5.2 Programme scrambling settings

Operation procedures are:

**Step 1:** Search the programme information in the “Programme Scramble” page;



Fig. 6-50 Programme searching

**Step 2:** Set CAS parameters, which are provided by CAS server, in “CAS Settings” according to the actual situation;



Fig. 6-51 CAS Parameter Setting

**Step 3:** Set EMMG parameters, which are provided by CAS server, in the EMM setting page;

| EMMG  | EMMG Switch | CAS-ID | Sub-CAS-ID | EMMG Mode | TCP Port | UDP Port | EMMG BitRate | CA Version | EMM Private Description |
|-------|-------------|--------|------------|-----------|----------|----------|--------------|------------|-------------------------|
| No.1  | ON          | 0x4AD2 | 0x1        | TCP       | 3000     | 3000     | 500          | NO.2       | 0x                      |
| No.2  | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3001     | 3001     | 500          | NO.2       | 0x                      |
| No.3  | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3002     | 3002     | 500          | NO.2       | 0x                      |
| No.4  | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3003     | 3003     | 500          | NO.2       | 0x                      |
| No.5  | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3004     | 3004     | 500          | NO.2       | 0x                      |
| No.6  | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3005     | 3005     | 500          | NO.2       | 0x                      |
| No.7  | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3006     | 3006     | 500          | NO.2       | 0x                      |
| No.8  | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3007     | 3007     | 500          | NO.2       | 0x                      |
| No.9  | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3008     | 3008     | 500          | NO.2       | 0x                      |
| No.10 | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3009     | 3009     | 500          | NO.2       | 0x                      |
| No.11 | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3010     | 3010     | 500          | NO.2       | 0x                      |
| No.12 | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3011     | 3011     | 500          | NO.2       | 0x                      |
| No.13 | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3012     | 3012     | 500          | NO.2       | 0x                      |
| No.14 | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3013     | 3013     | 500          | NO.2       | 0x                      |
| No.15 | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3014     | 3014     | 500          | NO.2       | 0x                      |
| No.16 | OFF         | 0x4AD2 | 0x1        | TCP+UDP   | 3015     | 3015     | 500          | NO.2       | 0x                      |

Submit Refresh

Fig. 6-52 EMM Parameter Setting

**Step 4:** Set the CAS group, EMMPID and the corresponding EMMG of each port in the port settings page;

Select Card: Card7:Main GbE Card

| Port | Group  | Key Mode | Fixed Key      | EMM1           | EMM2          | EMM3          | EMM4          | EMM5          | EMM6          |
|------|--------|----------|----------------|----------------|---------------|---------------|---------------|---------------|---------------|
| 1    | Group1 | Random   | FFFFFFFFFFFFFF | 0x3E8<br>EMMG1 | 0x1001<br>OFF | 0x1002<br>OFF | 0x1003<br>OFF | 0x1004<br>OFF | 0x1005<br>OFF |
| 2    | OFF    | Random   | FFFFFFFFFFFFFF | 0x3E8<br>EMMG  | 0x1001<br>OFF | 0x1002<br>OFF | 0x1003<br>OFF | 0x1004<br>OFF | 0x1005<br>OFF |

Submit Refresh

Fig. 6-53 Port Setting

**Step 5:** Return to the programme scrambling page and navigate to the corresponding port to set the scrambling parameter of the programme under this port, set the PID of ECM and set the AC parameter according to the requirement of CAS;

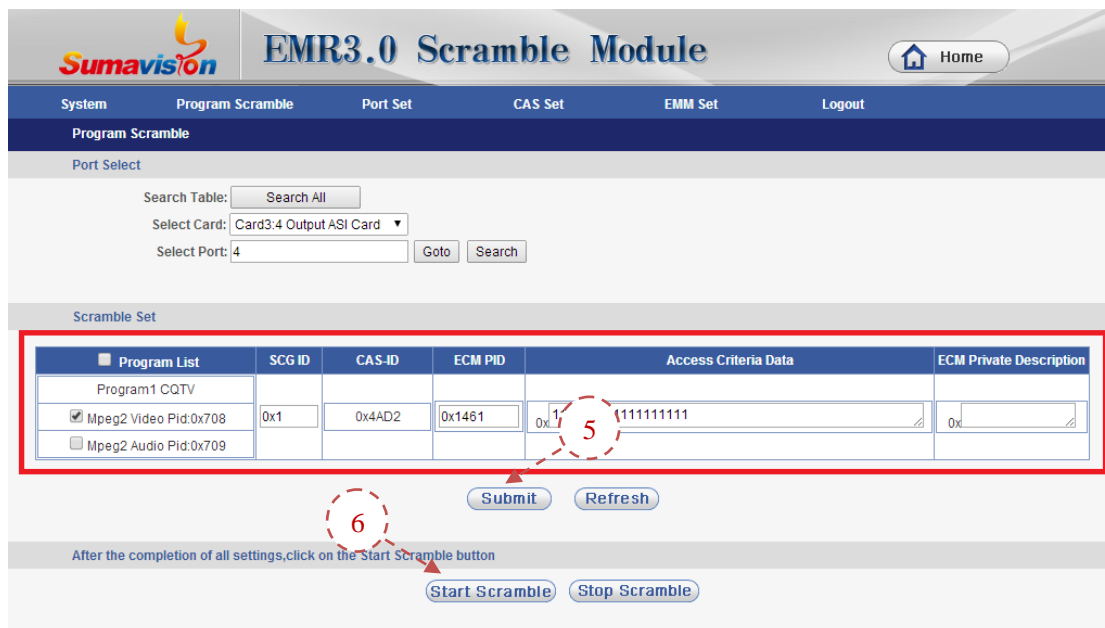


Fig. 6-54 Programme Parameter Setting

**Step 6:** After setting programme scrambling parameters of all ports, click “Start Scramble” to enable the scrambling module to scramble all programmes;

=====

- ☐ Please strictly follow sequences listed above;
- ☐ CAS settings and EMM settings will only be validated after rebooting. It is suggested to reboot the device after all settings in the first time of setting;
- ☐ It must click “Start to Scramble” after modifying the program scrambling information to put such action into effect. Otherwise, the black page may be caused.
- ☐ It must click “Start to Scramble” after changing the program planning and searching the program again to realize the normal scrambling work of programs on other ports.
- ☐ A limitation is made to avoid deleting of ECM and EMM produced by the scrambling board. It is not allowed to delete the ECM and EMM produced by the scrambling board.
- ☐ As the EMM multiplex, the deletion of EMM multiplex is decided according to the value of CASID and CAPID. If the CASID and CAPID values of two EMMs under the same output port are the same, the multiplex of any EMM will cause the automatic multiplex of the other one. The deletion of any EMM will cause the deletion of the other one.

=====

# Chapter 7 Fault Analysis and Troubleshooting

## 7.1 Alarm Information

When EMR runs abnormally, the alarm indicator on the front panel of the device will light, and the Web network management will provide a variety of abnormality alarm to prompt the users to facilitate the investigation and solve the problems. Users can search the WEB network management alarm on the device and parameters of the menu to make a preliminary judgment on the reasons causing EMR alarm and take appropriate measures. If users fail to solve the problem of EMR abnormality by themselves, they can call the After-sales Technical Support Department of Sumavision.

The EMR alarm information is shown as Table 7-1 Troubleshooting of EMR Common Faults or Abnormity

Table 7-1 Troubleshooting of EMR Common Faults or Abnormity

| Fault   | Reason  | Solution   |
|---|---|--|
| LCD does not display or working indicator is not on after powering on | The power lead is poorly connected;                                     | Replace the power lead.  |
|   | The fuse on the power socket is broken.                                 | Replace the fuse.  |
| ASI 5-channel input card fails to refresh any input signals.          | No input signal is available.   | Check the line for input signal.<br>Check the input signal sources.            |
| ASI 4-channel output card fails to output the decoding normally       | The output program stream decoding turns out no video & audio frequency | Check the multiplexing program sources.  |
|   | The output program stream decoding turns out mosaic.                    | Check the output system bit rate.  |
| The QAM modulation card output can't be received by STB               | QAM output level is too high.   | Lower the level or increase the number of attenuators.                         |
|   | Wrong parameters of the STB are set.                                    | Set parameters matching with QAM again.  |
| Network interface of Main GbE Card is unconnected                     | Network interface is unconnected with the module or cable               | Check the network settings and network cable connection of the Main GbE Card.  |
| The Main GbE Card inputs no system bit rate                           | The input program stream is interrupted.                                | Check head-end program sources and network cable connection.                   |
| The destination IP of the Main GbE Card is unreachable.               | The connection with the sending device is broken.                       | Check the network settings of destination device and network cable connection. |
| The Main GbE Card outputs no valid bit rate.                          | The input program stream is interrupted.                                | Check whether the multiplexing program sources are normal.                     |



## 7.1.1 LCD does not display after powering on

### Reasons for such fault:

- ✓ The LCD module of the device is broken;
- ✓ The power lead is poorly contacted;
- ✓ The fuse on the power socket is broken.

### Solution:

EMR can be allowed to leave the factory only if the test ensures that all function indicators meet the requirements. Therefore it is almost unlikely that the LCD module of the device is broken, thus this cause can be excluded; check the power lead of the device to confirm whether there's any damage to the surface of the power lead, check the quality of power socket to confirm whether the supply voltage is normal.

In case of fault in the power lead, suggest replacing the power lead to ensure smooth signal transmission inside the power lead;

If the problem is unsolved at still, please contact the after-service technique department of Beijing Sumavision Technologies Co. Ltd.

Sumavision

# Chapter 8 Maintenance

## 8.1 Maintenance method

To make the EMR operate under the best operating status, extend the service life of device, discover and eliminate the potential problems in time, and ensure normal operation of the device, the routine maintenance must be carried out regularly.

The EMR should be maintained according to the following rules.

- Must prepare for the detailed device maintenance target plan.

The EMR should be checked and maintained every day. If not, some small failures will develop into worse, so proper daily inspection, monthly inspection, quarterly inspection and annual inspection plans should be developed according to the operation features of the device, including the maintenance and inspection class in every period (class I maintenance, class II maintenance and class III maintenance) and detailed maintenance contents.

- Appoint the maintenance person.

It is the key for the device maintenance. The combination mode of “one person inspection and several persons” inspection” is recommended for EMR maintenance.

- Establish the device maintenance archive.

The individual maintenance archive should be kept since the EMR is purchased till it is abandoned. The maintenance and repair should be recorded in details. The replaced and changed parts and wire should be marked on the circuit diagram and device maintenance archive, so the diagram is consistent with the actual device. Meanwhile, it can facilitate others to maintain and repair the device.

## 8.2 Maintenance details

The following details should be paid attention to in the routine maintenance of EMR device.

- The transmission device is of great importance, and should have trained person for the routine maintenance.
- Keep the site room clean, dustproof and damp-proof.
- Follow the “Device Maintenance Target Plan” for routine inspection and test of the device, and record the checking results.
- Wipe the dustproof mesh of the fan every week. If the surface temperature of the device is too high, check whether the dustproof mesh of the fan is blocked.
- The device is inspected according to the specifications & instruction manual of Sumavision Technologies Co., Ltd. The man-made accident should be prevented.
- Wear the anti-static bangle when operating the device hardware.

- The connection between other devices in the cabinet and EMR should not be plugged-in or unplugged freely; to plug-in or unplug the connection, you're required to mark the original location for plugging.
- If EMR can be controlled in the control center by using the network management software, the network management password of EMR should be strictly managed and regularly changed, which is only distributed to the responsible maintenance person. The administrator password can only be known by the responsible maintenance person.
- Installing other software in the computer for network management system transmission and playing games with such computer are strictly prohibited; the computer with network management system should be installed the real-time virus detection software for regular virus killing.
- The computer with network management system uses UPS for power supply and regular data backup will be conducted.
- Don't reset the device easily and change the service data.
- For any alarm with unidentified reasons, please contact the After-sales Technical Support Department of Sumavision Technologies Co., Ltd.

### 8.3 Routine maintenance

Refer to Table 8-1 Routine maintenance.

Table 8-1 Routine maintenance

| Maintenance type                    | Maintenance contents                        | Operation guide  | Reference standard  | Reference maintenance hour (man×hour) |
|-------------------------------------|---|--|---|---------------------------------------|
| Inspect external environment        | Power supply of site room (DC/AC)           | Check the power monitoring system or test the power output voltage | The voltage output is normal. The power gives no exception alarm.                     | 0.05                                  |
|                                     | Temperature of site room                    | Measure temperature  | Temperature range: 5-40°C; 15°C-30°C is recommended                                   |                                       |
|                                     | Humidity of site room                       | Measure relative humidity  | Relative humidity: 20%-80%; 40%-65% is recommended.                                   |                                       |
| Inspect the device operation status | Indicator status on the device panel        | Observe the indicator of the device panel.                         | Only power indicator is on under normal operation. The operation indication keeps on. | 0.1                                   |
| Inspect the device operation status | Service tel. status (2-3 times every month) | Test the calling.  | Addressing call and conference call support normal communications.                    | 0.1                                   |

## 8.4 Monthly maintenance

Refer to Table 8-2 Monthly maintenance.

Table 8-2 Monthly maintenance

| Maintenance type           | Maintenance contents       | Operation guide                   | Reference standard                                     | Reference maintenance hour (man×hour) |
|----------------------------|----------------------------|-----------------------------------|--|---------------------------------------|
| Check external environment | Cabinet cooling hole state | Check the state of cooling holes. | Keep clean around the cooling holes, without any mess. | 0.1                                   |

## 8.5 Quarterly Maintenance

Refer to Table 8-3 Quarterly maintenance.

Table 8-3 Quarterly maintenance

| Maintenance type              | Maintenance contents          | Operation guide                             | Reference standard   | Reference maintenance hour (man×hour) |
|-------------------------------|-------------------------------|---|--|---------------------------------------|
| Inspect the cabinet cleanness | Inspect the cabinet cleanness | Observe the inside and outside the cabinet. | The cabinet surface is clean. There is no much dust inside the cabinet. Otherwise, the cabinet should be cleaned                 | 0.5                                   |
| Inspect the device cleanness  | Inspect the device cleanness  | Observe device surface                      | There no much dust outside the device. Otherwise, it should be cleaned. Watch out the external wiring of the device in cleaning. | 0.5                                   |

## 8.6 Annual Maintenance

Refer to Table 8-4 Annual maintenance.

Table 8-4 Annual maintenance

| Maintenance type  | Maintenance contents               | Operation guide  | Reference standard  | Reference maintenance hour (man×hour) |
|---|------------------------------------|--|---|---------------------------------------|
| Inspect grounding, ground cable and power lead connection | Check the earth resistance         | Use the earth resistance tester for testing.   | The joint grounding resistance is less than 1 ohm.  | 1                                     |
|   | Check the ground cable connection. | Inspect whether the ground cable is reliably and securely connected to the ground cable group of the office. | (1) The connection is secure and reliable.<br>(2) No wire aging exists.<br>(3) No erosion exists on the ground cable group, with proper anti-corrosion. | 0.2                                   |
|   | Inspect the power lead connection  | Inspect whether the power lead is reliably and securely connected to the power lead of the office.           | (1)The connection is secure and reliable.<br>(2)No wire erosion and aging exist.  | 0.2                                   |

## 8.7 Clean-up and maintenance

Pay attention to the following contents for the clean-up and maintenance of the device.

- Clean the working site; wipe the device shell with a soft cloth. The water cannot be penetrated into the device.
- Do not plug in and out all connection cables with current without instructions.
- Check whether the cable is pressed or pulled by the heavy object, whether the plug and socket are connected tightly, ensure that the cable is not extruded by the external force and is placed in order. The connection part is under good contact.
- Check whether the device and cable label are missing and incorrect. Keep the label intact and correct.
- Check whether the engineering document is complete and correct. Keep the engineering document complete for check at any time.

## 8.8 Operation and maintenance

Pay attention to the following contents for the maintenance when the device is operating.

- Check whether the ground cable and power supply are normal. Ensure the power supply works properly before turning on the power.
- Sequence for starting the device: start the power supply of peripheral devices, and power on the cabinet, and ensure the device for signal input works normally before starting EMR.
- Sequence for device shutdown: contrary to the sequence for starting the device. Power off the EMR, and then other devices.
- Observe the indicators on front panel of EMR and observe the system running in the studio and the control room. In case of any abnormality, the maintenance instructions in this chapter can be referred for solution as soon as possible.
- Before the system is used, power on and inspect the system, adjust the peripheral device, and guarantee that the EMR functions are normal.
- The local configuration can't be changed without instructions. The configuration can only be changed by the professional operator.
- Do not place the EMR in highly noisy environment.

## Chapter 9 Storage and Transport

### 9.1 Storage

Requirement:

Humidity:  $\leq 95\%$  (20°C) ;

Temperature: -20°C~60°C

Don't store with corrosive liquids and gases.

Don't place the device nearby strong electromagnetic fields.

Prohibit infection by radioactive substances.

### 9.2 Transport


EMR is packaged by using the special packaging of Sumavision. In case of intact packaging, such transportation modes like highway, railway, airline and shipping are acceptable. In case of damaged packaging, the device should be transported after being packaged by professional electronic product transportation companies.

During the transportation, the device should be handled gently to avoid throwing, falling or severe collision, and kept the labeling on the package upward.

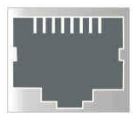
Sumavision

# Annex A-Interface Parameter


Annex 1 Parameters of input/output ASI interface

|                            |                              |                                   |  |
|----------------------------|------------------------------|-----------------------------------|--|
| Electrical characteristics | Normal impedance             | 75Ω                               | Its appearances can be shown as the figure below:<br><br> |
|                            | Frequency range              | 0-2GHz                            |  |
|                            | Voltage rating               | 500 VRMS (Sea-level Max.)         |  |
|                            | Dielectric withstand voltage | 1500 VRMS (Sea-level Min.)        |  |
|                            | VSWR                         | 1.5 (Max)                         |  |
| Material characteristics   | Main part and metal fittings | Nickel plating                    |  |
| Mechanical characteristics | Insertion force              | Max. acrotorque 2.5 lbs           |  |
|                            | Pullout force                | Maximum axial tensile force 3 lbs |  |
|                            | Nut pulling force            | Min. 100 lbs                      |  |
|                            | Centric pin thrust           | Min. 6 lbs                        |  |
|                            | Durability                   | More than 500 times drawing       |  |



Annex 2 Ethernet interface connector parameters

|                            |                                    |                                 |  |
|----------------------------|------------------------------------|---------------------------------|--|
| Electrical characteristics | Maximum current                    | 2 amps                          | Its appearances can be shown as the figure below:<br><br> |
|                            | Insulation resistance              | 5000 megohms                    |  |
|                            | Signal pin DC resistance           | 30 milli-ohms @100 mA           |  |
|                            | Metal shell shielding force        | Min. 20dB (20-200MHz)           |  |
|                            | Applicable ambient temperature     | -50 ~ +105 °C                   |  |
| Material characteristics   | Signal pin contact surface plating | Metal shell, tin-plated         |  |
|                            | Filler                             | UL90V-0 retardant thermoplastic |  |
| Mechanical characteristics | Durability                         | 750 times                       |  |
|                            | Insertion/pullout force            | Max. 5 lbs                      |  |

Annex 3 Power Socket Parameters

|                |  |  |
|----------------|--|--|
| GB 1002-1996   | Types, basic parameters and dimensions of single phase plugs and socket-outlets for household and similar purposes | Its appearances can be shown as the figure below:<br><br> |
| GB 2099.1-1996 | Plugs and Socket-outlets for Household and Similar Purposes — Part1: General Requirements                          |  |



Annex 4 MC Socket Parameter

|   |   |                                   |  |
|---|---|-----------------------------------|--|
| Shape   | Dimension [mm]  | 7.62 (3 holes)<br>19.05 (6 holes) | The appearance and shape are as shown below:<br><br><br><br>Interface of analog audio |
|   | Pin pitch [mm]  | 3.81                              |  |
|   | Diameter of welding pin [mm]                                  | 1.20                              |  |
|   | Dimension of welding pin [mm×mm]                              | 0.8×0.8                           |  |
| Technical data specified in ICE and DIN VDE               | Group category of insulation material                         | IIIa                              | <br><br>Interface of digital audio  |
|   | Installation category (over-voltage category)/pollution grade | III/3                             |  |
|   | Rated voltage [V]   | 125.00                            |  |
|   | Impulse withstand voltage [kV]                                | 2.50                              |  |
|   | Rated current [A]   | 8.00                              |  |
|   | Maximum load current/each bit [A]                             | 8.00                              |  |
|   | Type of insulation material                                   | PBT                               |  |
| According to the flame retardant rating specified in UL94 | V0  |                                   |  |
| Approved data   | UL/CUL: [V]/[A]/AWG   | 300/8/-                           |  |
| Rated voltage/rated current/wire gage                     | CSA: [V]/[A]/AWG  | 300/8/-                           |  |

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Annex 5 MC Plug Parameter

|  |   |                                  |   |
|--|---|----------------------------------|---|
| Shape  | Dimension [mm]  | 7.62 (3 holes)<br>19.05(6 holes) | The appearance and shape are as shown below:  |
|  | Pin pitch [mm]  | 3.81                             |   |
| Technical data specified in ICE and DIN VDE            | Group category of insulation material                         | I                                |                                |
|  | Installation category (over-voltage category)/pollution grade | III/3                            |   |
|  | Rated voltage [V]   | 125                              |   |
|  | Impulse withstand voltage [kV]                                | 2.5                              |   |
|  | Rated current/rated cross section [A]/[mm <sup>2</sup> ]      | 8/0.5                            | Interface of analog audio<br> |
|  | Maximum load current/cross section [A]/[mm <sup>2</sup> ]     | 8/0.5                            |   |
|  | Type of insulation material                                   | PA                               |   |
|  | According to the flame retardant rating specified in UL94     | V0                               |   |
| Approved data<br>Rated voltage/rated current/wire gage | UL/CUL: [V]/[A]/AWG   | 300/8/30-14                      | Interface of digital audio  |
|  | CSA: [V]/[A]/AWG  | 300/8/28-16                      |   |

Summary

Annex 6 RF Interface Parameter

|                            |                                      |                                       |   |
|----------------------------|--------------------------------------|---------------------------------------|---|
| Electrical characteristics | Standard impedance                   | 75Ω                                   | The appearance and shape are as shown below:  |
|                            | Frequency range                      | 0-3 GHz                               |   |
|                            | Rated voltage                        | 500 VRMS (maximum for the sea level)  |   |
|                            | Withstand voltage of electric medium | 1500 VRMS (minimum for the sea level) |   |
|                            | Standing-wave ratio of voltage       | 1.5 (maximum)                         |   |
| Property of material       | Main body, metal accessory           | Nickel plating                        |  |
| Mechanical feature         | Insertion force                      | Maximum torque: 2.5 lbs               |   |
|                            | Pull force                           | Maximum axis tension: 3 lbs           |   |
|                            | Tension of nut                       | 100 lbs (minimum)                     |   |
|                            | Push force of center pin             | 6 lbs (minimum)                       |   |
|                            | Durability                           | At least 500 pulls                    |   |

Summary

# Annex B-Device Upgrade

**Step 1:** View device IP through the LCD panel, as show in Fig. 9-1 EMR Front Panel

When the LCD backlight is illumed during the normal operation of equipment, the type of displayed information will be switched by keeping pressing on the key. If the key is pressed, the following display type will be circulated: warning information→network information→equipment sequence number→connection status for primary Gigabit card Ethernet port→operation status of equipment. The above method can be used for checking the network information of equipment.



Fig. 9-1 EMR Front Panel

**Step 2:** Login the device ftp with ftp tool, as show in Fig. 9-2 FTP Upload, empty the original file. To preserve the original parameters, do not delete the files under para folder, and then upload new upgrade files.

=====

- ☐ It is advised that the FileZilla (version V2.2.30) shall be used as the ftp tool software.
- ☐ Among the upgrade files, the folders ack\_board, web, webserver and applnit.txt are the required folder of the system. Once these folders are deleted, the normal utilization of equipment cannot be realized. The folder C451E\_GBEMULTI is the relevant folder for front end primary Gigabit card of equipment.
- ☐ When upgrading the daughter card file, it shall upload the files in corresponding web folder of the daughter card.

=====

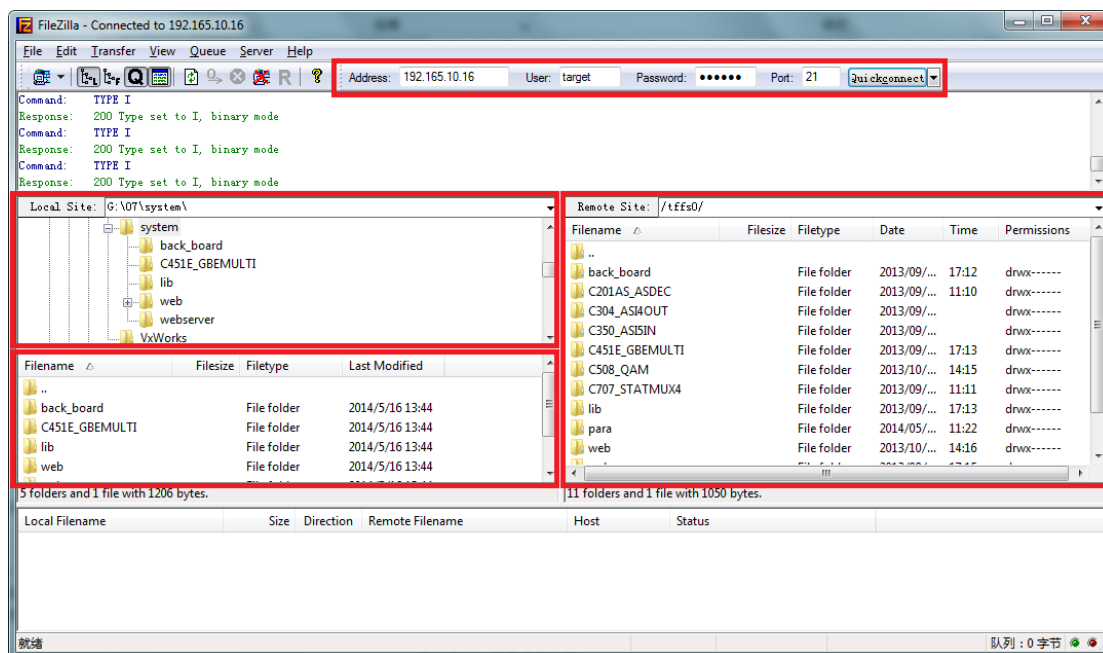


Fig. 9-2 FTP Upload

The utilization methods of FileZilla are as follows:

1. Fill in equipment IP in the 'Address' bar of the software, respectively fill 'target' in the 'User Name' and 'Password'. The port number is 21. Click the quick link button to connect the equipment.
2. Select the folder of the upgrading document in the local bar.
3. Choose the file or folder to be uploaded from the folder bar, drag the same into the remote bar or right click the upgrade file to choose the uploading action in the right click menu.
4. The indication will be shown in the remote bar after uploading the file.

**Step 3:** Use the online upgrade tool, as show in Fig. 9-3 Online Upgrade Tool, enter the device IP for upgrade.

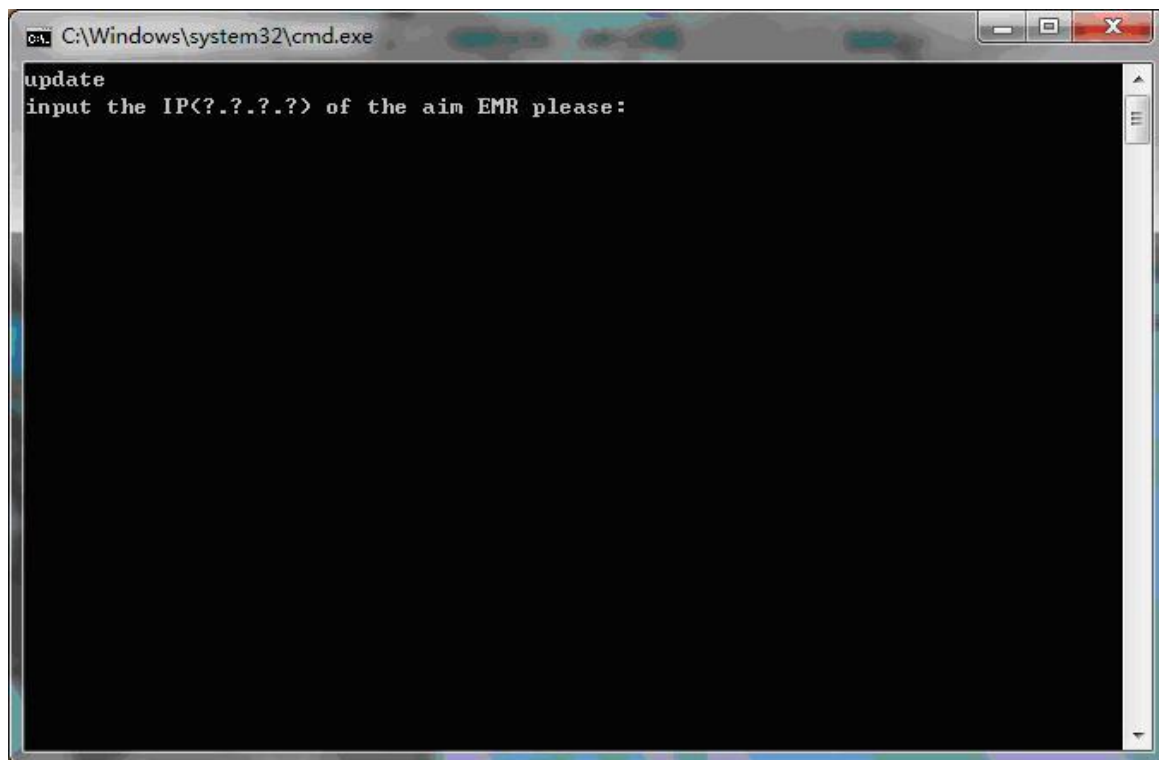


Fig. 9-3 Online Upgrade Tool

The device will restart automatically after completing the upgrade. As show in Fig. 9-4 Online Upgrade Complete

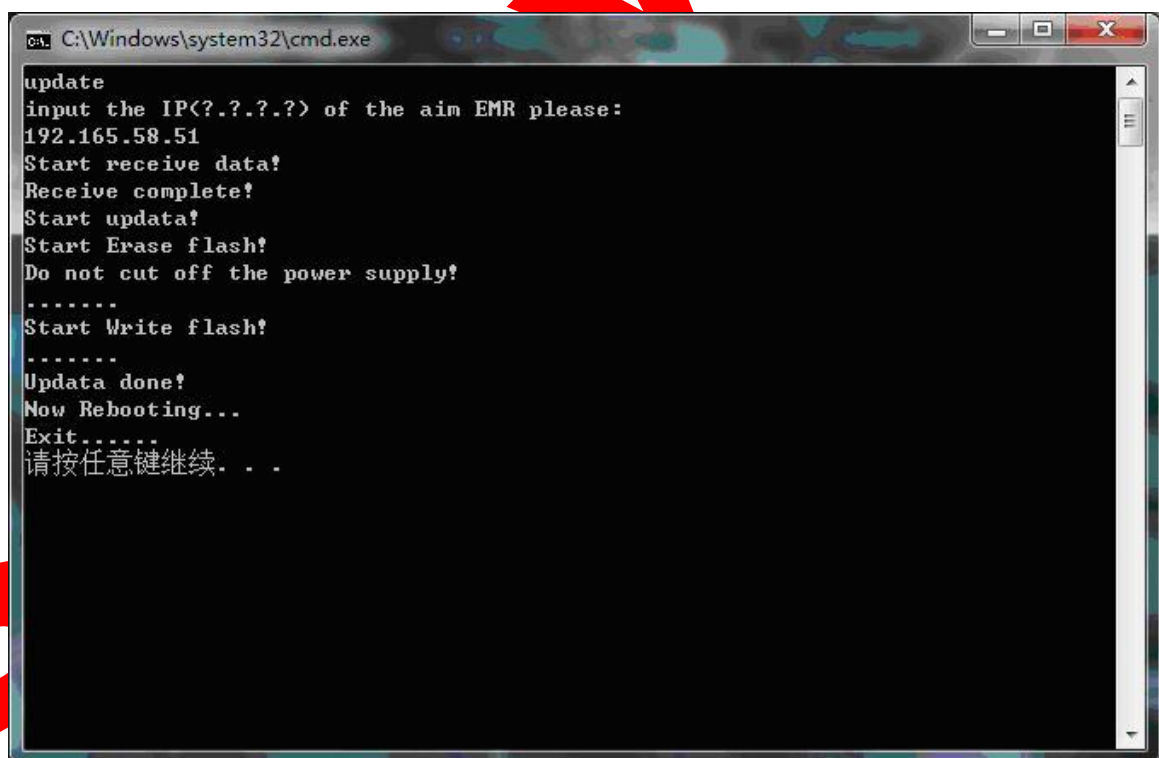


Fig. 9-4 Online Upgrade Complete

# Annex C-upgrade of special board card

## 1. DSP drive upgrading method for SD-ADEC Card

Display two upgrade menus on the web network management board card interface of the SD-ADEC Card.

| 板卡         |             |
|------------|-------------|
| 授权码        | *****       |
| 授权状态       | SD          |
| DSP1驱动升级   | 不升级 ▼       |
| DSP1硬件支持功能 | EAC3, HEAAC |
| DSP2驱动升级   | 不升级 ▼       |
| DSP2硬件支持功能 | EAC3, HEAAC |

One is used for inquiring the audio decoding type supported by the current decoding chip. In general, the following three conditions are available, “EAC3, HEAAC”、 “HEAAC” or “AC3”, which respectively means the support for “All Audio Types”, “ACC Audio” or “Dolly Audio”.

The other menu option is used for upgrading the audio drive. If the query result is “HEAAC”, it means that only “AC Drive Upgrade” can be put into effect, while other options are invalid. For “AC3”, it means that only the “AAC Drive Upgrade” option can be put into effect. For “EAC3 and HEAAC”, no options can be put into effect.

After the upgrade, the inquiry result shall be turned into the newly-supported audio decoding type.

Precautions;

- The new and old drive program files shall be both loaded in the EMR file system with the file names of bslotimg.bin and bslotimg\_ac3.bin, respectively. If corresponding files are unavailable, the upgrade is not allowed.
- The drive upgrade option shall not be set with other options of the network management.
- The drive upgrade lasts for about half a minute. The H60 decoding chip will be reset during this period and no image is outputted. It shall make no operation to the decoding card in this period.
- It shall avoid to frequent use the audio drive upgrade function.

# Annex D-Warning Information

## 1. Warning list of Main GbE Card

|   | Warning display            | Warning reason/triggering condition   | Resolution   |
|---|----------------------------|---|--|
| 1 | FPGA Configure failed      | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file.   | Replace the correct logical configuration file and restart the equipment.  |
| 2 | FPGA No Response           | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal. | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of equipment  |
| 3 | Input No System Bit rate   | Reason: the port is involved in the multiplex, but the stream is not received and no TS packet is detected.<br><br>Triggering: multiplex to the output port and cut off the input source.   | Check whether the front-end transmitting source is abnormal, check whether the network connection is abnormal, check whether the receiving end setting is correct and check whether the input source is connected. |
| 4 | Input Overflow             | Reason: the inputted cache is unable to store sufficient data. The port is involved in the multiplex and the DDR overflow flag bit 1 is received.<br><br>Triggering: generally, this situation is caused when no response is given by FPGA.   | Detect whether the front-end transmission source is normal.<br><br>Check whether FPGA gives any response or whether the hardware fails   |
| 5 | Input No Effective Bitrate | Reason: the port is involved in the multiplex, but the valid code rate is 0. However, no valid TS packet is detected, except  | Check whether the valid code rate is provided on the front-end transmitting source.  |

|    |                                  |  |  |
|----|----------------------------------|--|--|
|    |                                  | <p>the empty packet. No valid code rate is provided.</p> <p>Triggering: when the configuration parameter is given from input to the output, the inputted signal is changed to the empty packet and only the table is left only.</p>        | Check whether the empty data packet is found in the input source.  |
| 6  | Output Overflow                  | <p>Reason: the data from the back board to the port exceeds the code rate setting of the output system that the overflow is caused in the output buffering area.</p> <p>Triggering: the code rate of output system is excessively low.</p> | Check whether the code rate of the output system is almost identical to the valid code rate and change the code rate of the output system to be the maximum value. |
| 7  | Net Link Down                    | Reason: the network line is not inserted for the Ethernet port.  | Check the connection condition of network wire port.   |
| 8  | Gateway Unresolved               | Reason: unicast is transmitted and the target IP and the IP of this Ethernet port are not in the same network segment. The gateway of the target IP is inaccessible.   | Check the network setting  |
| 9  | IP Conflict                      | Reason: the Ethernet port IP is as the same as other IP addresses of the same network  | Check the IP addresses of all devices connected to the network   |
| 10 | Cannot find 88E1111              | Reason: the 88E1111 chip is unavailable. It is the problem of the hardware.  | Return to the factory and repair   |
| 11 | Static ARP List MAC Set Error    | Reason: the MAC address setting is wrong, simply.  | Set the correct MAC address  |
| 12 | Backup IP Unreachable            | Reason: the network link between the master equipment and the backup equipment fails and the communication between the two is unable to be realized.   | Check the link between the master equipment and the backup equipment.  |
| 13 | Net Receive No System Bitrate    | Reason: the system code rate received by the Ethernet port is 0 when inputting the backup of Ethernet port.  | Check the front-end transmission source, network environment and receiving setting.  |
| 14 | Net Receive No Effective Bitrate | Reason: the valid code rate received by Ethernet port is   | Check the front-end transmission source,   |



|    |  |   |   |
|----|--|---|---|
|    |  | 0 when inputting the backup of Ethernet port.   | network environment and receiving setting.  |
| 15 | Net Receive Effective Bitrate Not In Threshold Range | Reason: the valid code rate received by Ethernet is beyond the code rate threshold setting when inputting the backup of Ethernet port.  | Check the front-end transmission environment and the environment of master route or backup route                                      |
| 16 | Switch To Backup Net                                 | Reason: the main Ethernet port is switched to the backup Ethernet port when the switching condition is realized.  | Check the abnormality of main route   |
| 17 | Destination Unresolved                               | Reason: unicast is provided and the target IP is inaccessible   | Check the target IP address setting and the environment of network link   |
| 18 | Backup Group Port Effective Bitrate Underflow        | Reason: the valid code rate transmitted by the UDP port during the backup of the output port is smaller than the minimum code rate threshold setting.   | Check whether the minimum code rate threshold setting is wrong.   |
| 19 | Backup Group Port Effective Bitrate Overflow         | Reason: the valid code rate transmitted by the UDP port during the backup of the output port is greater than the maximum code rate threshold setting.   | Check whether the minimum code rate threshold setting is wrong.   |
| 20 | Port Backup Group Port Number Is Not Equal           | Reason: when making the output port backup, it is required that the UDP ports in the master equipment and the backup equipment must be consistent in number. If not, the warning will be given. | Set the same UDP port quantity for corresponding group of master equipment and backup equipment (modify the backup group of UDP port) |
| 21 | UDP Port Number Exceed Range authority               | Reason: the UDP port to be added is beyond the UDP port number authorization purchased with the equipment   | Purchase the senior authorization again   |

## 2. Warning list of 5 Input ASI Card

|   | Warning display            | Warning reason/triggering condition   | Resolution   |
|---|----------------------------|---|--|
| 1 | FPGA Configuration Failure | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file.   | Replace the correct logical configuration file and restart the equipment.  |
| 2 | FPGA No Response           | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal.   | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of equipment  |
| 3 | Input No Total Bitrate     | Reason: the port is involved in the multiplex, but the stream is not received and no TS packet is detected.<br><br>Triggering: multiplex to the output port and cut off the input source.   | Check whether the front-end transmitting source is abnormal, check whether the network connection is abnormal, check whether the receiving end setting is correct and check whether the input source is connected. |
| 4 | Input No Effective Bitrate | Reason: the port is involved in the multiplex, but the valid code rate is 0. However, no valid TS packet is detected, except the empty packet. No valid code rate is provided.<br><br>Triggering: when the configuration parameter is given from input to the output, the inputted signal is changed to the empty packet and only the table is left only. | Check whether the valid code rate is provided on the front-end transmitting source.<br><br>Check whether the empty data packet is found in the input source.   |
| 5 | Input Overflow             | Reason: the inputted cache is unable to store sufficient data. The port is  | Detect whether the front-end transmission  |

|  |  |  |  |
|--|--|--|--|
|  |  | involved in the multiplex and the DDR overflow flag bit 1 is received.<br><br>Triggering: generally, this situation is caused when no response is given by FPGA. | source is normal.<br><br>Check whether FPGA gives any response or whether the hardware fails |
|--|--|--|--|

### 3. Warning list of 4 Output ASI Card

|   | Warning display             | Warning reason/triggering condition   | Resolution   |
|---|-----------------------------|---|--|
| 1 | FPGA Configuration Failure  | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file.   | Replace the correct logical configuration file and restart the equipment.  |
| 2 | FPGA No Response            | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal. | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of equipment  |
| 3 | Output No Total Bitrate     | Reason: the data with the input card is multiplexed/transparently transmitted to this port, but no TS packet is outputted.<br><br>Triggering: the data of back board is sent to this port, but the code rate setting of the output system is 0.   | Check whether the code rate setting of the output system is 0.   |
| 4 | Output No Effective Bitrate | Reason: it is detected that no valid data is provided from the back board to this port and the PSI/SI table is outputted only.<br><br>Triggering: the TS stream multiplexed/transparently transmitted to this port is   | Check whether corresponding input program is normal and whether the valid PID mapping is available. If the valid PID program is unavailable, the program stream shall be multiplexed again or the normal |

|   |                 |   |  |
|---|-----------------|---|--|
|   |                 | cut off.  | program stream shall be replaced. If the program code rate is excessively low (less than 200K), the warning may be given.  |
| 5 | Output Overflow | Reason: the data from the back board to the port exceeds the code rate setting of the output system that the overflow is caused in the output buffering area.<br><br>Triggering: the code rate of output system is excessively low. | Check whether the code rate of the output system is almost identical to the valid code rate and change the code rate of the output system to be the maximum value. |

#### 4. Warning list of ASI 5InOut Card

|   | Warning display                      | Warning reason/triggering condition   | Resolution  |
|---|--------------------------------------|---|---|
| 1 | FPGA Configuration Failure           | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file.   | Replace the correct logical configuration file and restart the equipment.   |
| 2 | FPGA No Response                     | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal. | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of equipment |
| 3 | SMPTE310 Crystal Oscillator Abnormal | Reason: the SMPTE310 function is available on the card 355, but the dedicated SMPTE310 crystal oscillator is not welded.<br><br>Triggering: remove the dedicated SMPTE310 crystal oscillator which is welded on the card 355 and choose the   | Weld the SMPTE310 crystal oscillator on the card 355.   |

|   |                             |   |  |
|---|-----------------------------|---|--|
|   |                             | SMPTE310 function.  |  |
| 4 | Output Bitrate Overflow     | Reason: the data from the back board to the port exceeds the code rate setting of the output system that the overflow is caused in the output buffering area.<br><br>Triggering: the code rate of output system is excessively low.   | Check whether the code rate of the output system is almost identical to the valid code rate and change the code rate of the output system to be the maximum value.   |
| 5 | Output No Effective Bitrate | Reason: it is detected that no valid data is provided from the back board to this port and the PSI/SI table is outputted only.<br><br>Triggering: the TS stream multiplexed/transparently transmitted to this port is cut off.        | Check whether corresponding input program is normal and whether the valid PID mapping is available. If the valid PID program is unavailable, the program stream shall be multiplexed again or the normal program stream shall be replaced. If the program code rate is excessively low (less than 200K), the warning may be given. |
| 6 | Input No Total Bitrate      | Reason: the port is involved in the multiplex, but the stream is not received and no TS packet is detected.<br><br>Triggering: multiplex to the output port and cut off the input source.   | Check whether the front-end transmitting source is abnormal, check whether the network connection is abnormal, check whether the receiving end setting is correct and check whether the input source is connected.   |
| 7 | Input Sync Error            | Reason: the port is multiplexed to the output, but the input is not synchronized;<br><br>Triggering: use the stream which has the code rate of input system and fails in synchronization  | Check whether the input source is correct  |
| 8 | Input No Effective Bitrate  | Reason: the port is involved in the multiplex, but the valid code rate is 0. However, no valid TS packet is detected, except the empty packet. No valid code rate is provided.<br><br>Triggering: when the configuration parameter is | Check whether the valid code rate is provided on the front-end transmitting source.<br><br>Check whether the empty data packet is found in the input source.   |

|    |                          |  |  |
|----|--------------------------|--|--|
|    |                          | given from input to the output, the inputted signal is changed to the empty packet and only the table is left only.  |  |
| 9  | Input Bitrate Overflow   | Reason: the inputted cache is unable to store sufficient data. The port is involved in the multiplex and the DDR overflow flag bit 1 is received.<br><br>Triggering: generally, this situation is caused when no response is given by FPGA.  | Detect whether the front-end transmission source is normal.<br><br>Check whether FPGA gives any response or whether the hardware fails                           |
| 10 | Input Bitrate Abnormal   | Reason: the input for opened port of combiner is less than 500K or greater than 200M, or the ratio between the minimum code rate and the maximum one is greater than 20;<br><br>Triggering: the input port of the combiner is opened, the input setting is less than 500K or greater than 200M, or the ratio between the minimum code rate and the maximum one is greater than 20; | Check the input source which shall be greater than 500K but less than 200M and the ratio between minimum code rate and the maximum code rate is greater than 20; |
| 11 | PSI Tables Sent Abnormal | Reason: the table interval is not 0, but the logical disclosure is not ready. The logical resource is insufficient or the table information is excessively large.<br><br>Triggering: the signal source with high table information content is multiplexed to the port and outputted.   | Reduce the transmission quantity of table information. Transmit no insignificant table information.  |

## 5. Warning list of DS3 adapter Card

|   | Warning display                  | Warning reason/triggering condition  | Resolution   |
|---|----------------------------------|--|--|
| 1 | G.703 RS Decode Abnormally       | Reason: the coding function of DS3 transmitting end is turned off, the output packet length is selected to be 204 and the receiving end decoding function is turned on.<br><br>Triggering: the coding function of DS3 transmitting end is turned off, the output packet length is selected to be 204 and the receiving end decoding function is turned on. | Set the RS coding and decoding switch of the input source port and the receiving port as the same. |
| 2 | ASI Input Sync Error             | Reason: the port is multiplexed to the output, but the ASI input is not synchronized;<br><br>Triggering: use the stream which has the code rate of ASI input system and fails in synchronization   | Check whether the ASI input source is correct  |
| 3 | G.703 Input Sync Error           | Reason: the port is multiplexed to the output, but the DS3 input is not synchronized;<br><br>Triggering: use the stream which has the code rate of DS3 input system and fails in synchronization   | Check whether the DS3 input source is correct  |
| 4 | ASI Input No Effective Bitrate   | Reason: the ASI input code rate for opening the switch ASI input system is 0.<br><br>Triggering: pull up the ASI input   | Check whether the ASI input is abnormal  |
| 5 | G.703 Input No Effective Bitrate | Reason: the DS3 input code rate for opening the switch DS3 input system is 0.<br><br>Triggering: pull up the DS3 input   | Check whether the DS3 input is abnormal  |
| 6 | G.703 Frame Format Error         | Reason: the DS3 input is switched on and the frame format of DS3 input stream is unmatched with the frame format setting (C-bit and  | If the input is not synchronized, check whether the frame format setting is set to be the          |

|    |                                |  |  |
|----|--------------------------------|--|--|
|    |                                | <p>M13 become the frame format)</p> <p>Triggering: the frame format parameter and the inputted frame format setting are different or the frame format is set to be the frame and the DS3 input is ensured to be unsynchronized.</p>  | <p>frame.</p> <p>If the input is synchronized, check whether the frame format setting is consistent to the input stream.</p>   |
| 7  | No Response                    | <p>Reason:</p> <p>1) FPGA configuration fails and the logical operation of daughter card is wrong;</p> <p>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.</p> <p>Triggering: it is detected that the status register of the daughter card logic is abnormal.</p> | <p>1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.</p> <p>2) Return and repair of equipment</p>   |
| 8  | FPGA Configuration Failure     | <p>Reason: failed logic configuration of daughter card</p> <p>Triggering condition: FTP fails to upload the correct FPGA configuration file.</p>   | <p>Replace the correct logical configuration file and restart the equipment.</p>   |
| 9  | Mainboard Version Incompatible | <p>Reason: the back board version is low or high;</p> <p>Triggering: degrade the back board version to the last series</p>   | <p>Upgrade the back board to the version compatible to the daughter card</p>   |
| 10 | Bus Rate Abnormal              | <p>Reason: the bus code rate detected by the back board is 2Mbps greater than the bus code rate read by the logic.</p> <p>Triggering: unable to realize the manual triggering</p>  | <p>Restart the logic</p>   |
| 11 | ASI Input Overflow             | <p>Reason: the loop-back is switched on and the valid code rate inputted by ASI is greater than the code rate of DS3 or E3 system, or the ASI input system code rate in the transparent stream mode is greater than the code rate of DS3 or E3 system.</p> <p>Triggering: open the</p>                     | <p>Check whether the code rate of ASI input system is greater than the code rate of DS3 or E3 system in the transparent stream mode.</p> <p>Check whether the valid code rate of ASI input is greater than the code rate of DS3 or E3 system in the non-transparent stream</p> |



|    |                                   |  |   |
|----|-----------------------------------|--|---|
|    |                                   | loop-back and set the valid code rate of ASI input to be 50Mbps.   | mode.   |
| 12 | ASI Output No Effective Bitrate   | Reason: the multiplex output is available on the ASI output port, but no valid audio and video code rates are available.<br><br>Triggering: multiplex from the input card 5 to ASI output and pull up the input of the input card 5.   | Check whether the program multiplexed to the ASI output exists. If not, this multiplex shall be deleted or the multiplex shall be substituted by other existing programs. |
| 13 | G.703 Output No Effective Bitrate | Reason: the multiplex output is available on the DS3 output port, but no valid audio and video code rates are available.<br><br>Triggering: multiplex from the input card 5 to DS3 output and pull up the input of the input card 5.   | Check whether the program multiplexed to the DS3 output exists. If not, this multiplex shall be deleted or the multiplex shall be substituted by other existing programs. |
| 14 | ASI Output Overflow               | Reason: the ASI output port maps the multiplex DDR overflow<br><br>Triggering: the multi-route program is multiplexed to the ASI output port when the loop-back is switched on such that the total valid code rate of the program exceeds the system code rate set by the ASI output port. | Delete some multiplex programs of ASI output port   |
| 15 | G.703 Output Overflow             | Reason: the DS3 output port maps the multiplex DDR overflow<br><br>Triggering: the multi-route program is multiplexed to the DS3 output port when the loop-back is switched on such that the total valid code rate of the program exceeds the system code rate set by the DS3 output port. | Delete some multiplex programs of DS3 output port   |

## 6. Warning list of DS3 In4 Card

|   | Warning display            | Warning reason/triggering condition  | Resolution  |
|---|----------------------------|--|---|
| 1 | No Response                | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal.                            | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of equipment |
| 2 | FPGA Configuration Failure | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file.  | Replace the correct logical configuration file and restart the equipment.   |
| 3 | Bus Rate Abnormal          | Reason: the bus code rate detected by the back board is 2Mbps greater than the bus code rate read by the logic.<br><br>Triggering: unable to realize the manual triggering   | Restart the logic   |
| 4 | G.703 Input Sync Error     | Reason: the port is multiplexed to the output, but the DS3 input is not synchronized;<br><br>Triggering: use the stream which has the code rate of DS3 input system and fails in synchronization   | Check whether the DS3 input source is correct   |
| 5 | G.703 RS Decode Abnormally | Reason: the coding function of DS3 transmitting end is turned off, the output packet length is selected to be 204 and the receiving end decoding function is turned on.<br><br>Triggering: the coding function of DS3 transmitting end is turned off, the output packet length is selected to be 204 and the receiving | Set the RS coding and decoding switch of the input source port and the receiving port as the same.                                  |

|   |                          |  |   |
|---|--------------------------|--|---|
|   |                          | end decoding function is turned on.  |   |
| 6 | G.703 Frame Format Error | Reason: the DS3 input is switched on and the frame format of DS3 input stream is unmatched with the frame format setting (C-bit and M13 become the frame format)<br><br>Triggering: the frame format parameter and the inputted frame format setting are different or the frame format is set to be the frame and the DS3 input is ensured to be unsynchronized. | If the input is not synchronized, check whether the frame format setting is set to be the frame.<br><br>If the input is synchronized, check whether the frame format setting is consistent to the input stream. |

### 7. Warning list of 6-Ch.QAM Card

|   | Warning display  | Warning reason/triggering condition   | Resolution   |
|---|------------------|---|--|
| 1 | Output Overflow  | Reason: the valid code rate outputted by the port is higher than the system code rate;<br><br>Triggering: the valid code rate multiplexed to the output port is greater than the system code rate.  | Reduce the valid code rate outputted by the port multiplex or modify the modulation mode, protection interval or internal code rate to increase the system code rate.  |
| 2 | FPGA No Response | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br><br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal. | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br><br>2) Return and repair of equipment  |
| 3 | High Temperature | Reason: the radiation of board card is not in time or the output power of board card is abnormal such that the board card temperature is greater than 70°C.<br><br>Triggering: remove the chassis fan   | Check whether the radiation fan of equipment and the board card have the normal work. If the fan has poor radiation, please replace the fan. If the short circuit is found on the board card, it shall replace the board card. |

|   |                           |  |   |
|---|---------------------------|--|---|
| 4 | PSI Tables Sent Abnormal  | Reason: the table interval is not 0, but the logical disclosure is not ready. The logical resource is insufficient or the table information is excessively large.<br><br>Triggering: the signal source with high table information content is multiplexed to the port and outputted. | Reduce the transmission quantity of table information. Transmit no insignificant table information.                             |
| 5 | Output Level Abnormal     | Reason: the RF output level adjustment is wrong or the level output exceeds the setting value;<br><br>Triggering: the level of C508 card is adjusted to be abnormal via the debugging software 511S V4.exe.  | Turn off and turn on RF switch again or replace the modulation card. Or, adjust the level of debugging software V4.exe of 511S. |
| 6 | Output No System Bit rate | Reason: the data with the input card is multiplexed/transparently transmitted to this port, but no TS packet is outputted.<br><br>Triggering: the data of back board is sent to this port, but the code rate setting of the output system is 0.                                      | Check whether the code rate setting of the output system is 0.  |

## 8. Warning list of DVB-T/H-4 Mod. Card

|   | Warning display             | Warning reason/triggering condition   | Resolution   |
|---|-----------------------------|---|--|
| 1 | Output Overflow             | Reason: the valid code rate outputted by the port is higher than the system code rate;<br><br>Triggering: the valid code rate multiplexed to the output port is greater than the system code rate.                        | Reduce the valid code rate outputted by the port multiplex or modify the modulation mode, protection interval or internal code rate to increase the system code rate.                                    |
| 2 | Output No Effective Bitrate | Reason: it is detected that no valid data is provided from the back board to this port and the PSI/SI table is outputted only.<br><br>Triggering: the TS stream multiplexed/transparently transmitted to this port is cut | Check whether corresponding input program is normal and whether the valid PID mapping is available. If the valid PID program is unavailable, the program stream shall be multiplexed again or the normal |

|   |                            |   |   |
|---|----------------------------|---|---|
|   |                            | off.  | program stream shall be replaced. If the program code rate is excessively low (less than 200K), the warning may be given.           |
| 3 | Output No System Bit rate  | Reason: the data with the input card is multiplexed/transparently transmitted to this port, but no TS packet is outputted.<br><br>Triggering: the data of back board is sent to this port, but the code rate setting of the output system is 0.   | Check whether the code rate setting of the output system is 0.  |
| 4 | FPGA No Response           | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal. | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of equipment |
| 5 | FPGA Configuration Failure | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file.   | Replace the correct logical configuration file and restart the equipment.   |
| 6 | PSI Tables Sent Abnormal   | Reason: the table interval is not 0, but the logical disclosure is not ready. The logical resource is insufficient or the table information is excessively large.<br><br>Triggering: the signal source with high table information content is multiplexed to the port and outputted.        | Reduce the transmission quantity of table information. Transmit no insignificant table information.                                 |
| 7 | Output Level Abnormal      | Reason: the RF output level adjustment is wrong or the level output exceeds the setting value;<br><br>Triggering: the level of C508T card is adjusted to  | Turn off and turn on RF switch again or replace the modulation card. Or, adjust the level of debugging software V4.exe of 511S.     |

|   |                  |  |  |
|---|------------------|--|--|
|   |                  | be abnormal via the debugging software 511S V4.exe.  |  |
| 8 | High Temperature | Reason: the radiation of board card is not in time or the output power of board card is abnormal such that the board card temperature is greater than 70℃.<br><br>Triggering: remove the chassis fan | Check whether the radiation fan of equipment and the board card have the normal work. If the fan has poor radiation, please replace the fan. If the short circuit is found on the board card, it shall replace the board card. |

## 9. Warning list of DVB-S/S2 Mod. Card

|   | Warning display           | Warning reason/triggering condition   | Resolution   |
|---|---------------------------|---|--|
| 1 | Output Overflow           | Reason: the data from the back board to the port exceeds the code rate setting of the output system that the overflow is caused in the output buffering area.<br><br>Triggering: the code rate of output system is excessively low.             | Check whether the code rate of the output system is almost identical to the valid code rate and change the code rate of the output system to be the maximum value.   |
| 2 | Output No Valid Bit rate  | Reason: it is detected that no valid data is provided from the back board to this port and the PSI/SI table is outputted only.<br><br>Triggering: the TS stream multiplexed/transparently transmitted to this port is cut off.                  | Check whether corresponding input program is normal and whether the valid PID mapping is available. If the valid PID program is unavailable, the program stream shall be multiplexed again or the normal program stream shall be replaced. If the program code rate is excessively low (less than 200K), the warning may be given. |
| 3 | Output No System Bit rate | Reason: the data with the input card is multiplexed/transparently transmitted to this port, but no TS packet is outputted.<br><br>Triggering: the data of back board is sent to this port, but the code rate setting of the output system is 0. | Check whether the code rate setting of the output system is 0.   |
| 4 | FPGA No Response          | Reason:<br>1) FPGA configuration fails  | 1) Replace the correct logical configuration file. It is unnecessary to restart  |

|   |                                      |   |   |
|---|--------------------------------------|---|---|
|   |                                      | <p>and the logical operation of daughter card is wrong;</p> <p>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.</p> <p>Triggering: it is detected that the status register of the daughter card logic is abnormal.</p>                             | <p>the equipment.</p> <p>2) Return and repair of equipment</p>  |
| 5 | FPGA Configuration Failure           | <p>Reason: failed logic configuration of daughter card</p> <p>Triggering condition: FTP fails to upload the correct FPGA configuration file.</p>  | <p>Replace the correct logical configuration file and restart the equipment.</p>  |
| 6 | ARM Initial Failure/ ARM No Response | <p>Reason: the card application program, bootloader or kernel upgrade file is unavailable or is wrong.</p> <p>Triggering: remove the logical file dvbss2Card.out.gz from ftp and restart the equipment.</p>   | <p>Upgrade the correct card application program, bootloader or kernel again.</p>  |
| 7 | PSI Tables Sent Abnormal             | <p>Reason: the table interval is not 0, but the logical disclosure is not ready. The logical resource is insufficient or the table information is excessively large.</p> <p>Triggering: the signal source with high table information content is multiplexed to the port and outputted.</p> | <p>Reduce the transmission quantity of table information. Transmit no insignificant table information.</p>  |
| 8 | Output Level Abnormal                | <p>Reason: the RF output level adjustment is wrong or the level output exceeds the setting value;</p> <p>Triggering: the level of C507s card is adjusted to be abnormal via the debugging software IPQAM3.0 configure.exe.</p>  | <p>Turn off and turn on RF switch again or replace the modulation card. Or, adjust the level of debugging software configure.exe of IPQAM3.0.</p> |
| 9 | High Temperature                     | <p>Reason: the radiation of board card is not in time or the output power of board card is abnormal such that the board card temperature</p>  | <p>Check whether the radiation fan of equipment and the board card have the normal work. If the fan has poor radiation, please</p>                |

|  |  |   |  |
|--|--|---|--|
|  |  | is greater than 70°C.<br>Triggering: remove the chassis fan | replace the fan. If the short circuit is found on the board card, it shall replace the board card. |
|--|--|---|--|

## 10. Warning list of MPEG2 SD AENC Card

|   | Warning display            | Warning reason/triggering condition   | Resolution  |
|---|----------------------------|---|---|
| 1 | FPGA Configuration Failure | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file.   | Replace the correct logical configuration file and restart the equipment.   |
| 2 | FPGA No Response           | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal. | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of equipment |
| 3 | Video Format Error         | Reason:<br>1) the format of the inputted video is invalid;<br>2) The format of the inputted video is unmatched with the video format setting  | 1) Replace the input source<br>2) Modify the video format parameter   |
| 4 | Video No Input             | Reason:<br>1) no video input<br>2) Invalid video input  | Replace the input source  |



## 11. Warning list of MPEG2 SD DENC Card

|   | Warning display            | Warning reason/triggering condition   | Resolution  |
|---|----------------------------|---|---|
| 1 | FPGA Configuration Failure | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file.   | Replace the correct logical configuration file and restart the equipment.   |
| 2 | FPGA No Response           | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal. | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of equipment |
| 3 | Video Format Error         | Reason:<br>1) the format of the inputted video is invalid;<br>2) The format of the inputted video is unmatched with the video format setting  | 1) Replace the input source<br>2) Modify the video format parameter   |
| 4 | Video No Input             | Reason:<br>1) no video input<br>2) Invalid video input  | Replace the input source  |
| 5 | MPEG2 AES/EBU No Input     | Reason: the MP2 audio switch is turned on and the AES/EBU audio input is selected at the same time. But no input is given by the AES/EBU audio or the AES/EBU is not locked.  | Replace the input source<br>Modify MP2 audio parameter setting  |
| 6 | AC3 AES/EBU No Input       | Reason: the AC3 audio switch is turned on and the AES/EBU audio input is selected at the same time. But no input is given by the AES/EBU audio or the AES/EBU is not locked.  | Replace the input source<br>Modify AC3 audio parameter setting  |
| 7 | DRA AES/EBU No Input       | Reason: the DRA audio switch is turned on and the   | Replace the input source<br>Modify DRA audio  |

|    |                               |   |  |
|----|-------------------------------|---|--|
|    |                               | AES/EBU audio input is selected at the same time. But no input is given by the AES/EBU audio or the AES/EBU is not locked.  | parameter setting  |
| 8  | MPEG2 Embedded Audio No Input | Reason: the MP2 audio switch is turned on and the embedded audio input is selected at the same time. But no input is given by the embedded audio or the embedded audio is not locked. | Replace the input source<br>Modify MP2 audio parameter setting |
| 9  | AC3 Embedded Audio No Input   | Reason: the AC3 audio switch is turned on and the embedded audio input is selected at the same time. But no input is given by the embedded audio or the embedded audio is not locked. | Replace the input source<br>Modify AC3 audio parameter setting |
| 10 | DRA Embedded Audio No Input   | Reason: the DRA audio switch is turned on and the embedded audio input is selected at the same time. But no input is given by the embedded audio or the embedded audio is not locked. | Replace the input source<br>Modify DRA audio parameter setting |

## 12. Warning list of Analog SD ENC Card

|   | Warning display                                     | Warning reason/triggering condition  | Resolution  |
|---|---|--|---|
| 1 | Analog SD ENC Card X Video Y No Input               | Reason:<br>1) no correct video source is connected, or 2) it is in the 'No DSP Response' status<br>Triggering: 1) when the video coding switch is turned on, no video input is given or the HD video source is not supported; 2) upgrade file and the board card is in the 'No DSP Response' status. | 1) Once the SD video source is connected, the warning disappears.<br>2) The warning disappears after the upgrade.       |
| 2 | Analog SD ENC Card X Video Y Input Resolution Error | Reason: 1) no correct video source is connected, or 2) it is in the 'No DSP Response' status<br>Triggering: when one port is   | 1) Once the input source with the correct resolution is connected, the warning disappears.<br>2) The warning disappears |

|   |                                      |   |  |
|---|--------------------------------------|---|--|
|   |                                      | never accessed to the correct input source when the daughter card is electrified or re-upgraded, the alarming will be given. For example, when the equipment is started after the power failure, if one port is never accessed to the correct input source, the non-inputting and wrong resolution warning is given. If the correct input source is accessed, the warning will disappear. If the input source is pulled up again, only the non-input warning is given. If the soft restart is made again with the web, the wrong resolution warning is never outputted. | after the upgrade.   |
| 3 | Analog SD ENC Card X DSP No Response | Reason: during the DSP upgrade process, no normal work is made.<br>Triggering: upload the upgrade program to realize the file system upgrade. Before finishing the DSP upgrade, the 'No DSP Response' warning is displayed.   | Once the upgrade is finished and the normal work of DSP is made, the warning disappears. |
| 4 | Analog SD ENC Card X DDR Y Overflow  | Reason: DDR overflow<br>Triggering: one complicated video source coding code rate is set to be very low (as 300kbps), the GOP structure shall choose the full frame I (it holds to other GOP structures). This warning will be outputted after a waiting time (the detailed time is relevant to the video source).  | Made the modification to set a high code rate and the warning disappears.                |

### 13. Warning list of Digital ENC Card

|   | Warning display                     | Warning reason/triggering condition   | Resolution   |
|---|-------------------------------------|---|--|
| 1 | Digital ENC Card X Video Y No Input | Reason:<br>1) no correct video source is connected, or<br>2) it is in the 'No DSP | 1) Once the SD video source is connected, the warning disappears.<br>2) The warning disappears |

|   |   |  |   |
|---|---|--|---|
|   |   | <p>Response' status</p> <p>Triggering:</p> <p>1) when the video coding switch is turned on, no video input is given or the HD video source is not supported;</p> <p>2) Upgrade file and the board card is in the 'No DSP Response' status.</p>   | after the upgrade.  |
| 2 | Digital ENC Card X Video Y Input Resolution Error | <p>Reason:</p> <p>1) no correct video source is connected, or 2) it is in the 'No DSP Response' status</p> <p>Triggering: when one port is never accessed to the correct input source when the daughter card is electrified or re-upgraded, the alarming will be given. For example, when the equipment is started after the power failure, if one port is never accessed to the correct input source, the non-inputting and wrong resolution warning is given. If the correct input source is accessed, the warning will disappear. If the input source is pulled up again, only the non-input warning is given. If the soft restart is made again with the web, the wrong resolution warning is never outputted.</p> | <p>1) Once the input source with the correct resolution is connected, the warning disappears.</p> <p>2) The warning disappears after the upgrade.</p> |
| 3 | Digital ENC Card X DSP No Response                | <p>Reason: during the DSP upgrade process, no normal work is made.</p> <p>Triggering: upload the upgrade program to realize the file system upgrade. Before finishing the DSP upgrade, the 'No DSP Response' warning is displayed.</p>   | Once the upgrade is finished and the normal work of DSP is made, the warning disappears.  |
| 4 | Digital ENC Card X DDR Y Overflow                 | <p>Reason: DDR overflow</p> <p>Triggering: one complicated video source coding code rate is set to be very low (as 300kbps), the GOP structure shall choose the</p>  | Made the modification to set a high code rate and the warning disappears.   |

|  |  |   |  |
|--|--|---|--|
|  |  | full frame I (it holds to other GOP structures). This warning will be outputted after a waiting time (the detailed time is relevant to the video source). |  |
|--|--|---|--|

#### 14. Warning list of SD-ADEC Card

|   | Warning display            | Warning reason/triggering condition  | Resolution   |
|---|----------------------------|--|--|
| 1 | DSP Initial Failure        | The video chip is not initialized and the DSP initialization failure warning is given.   | Confirm whether the H60 decoding chip is complete and whether the booter and flash are successfully programmed.                      |
| 2 | DSP No Response            | When the communication between ARM and H60 of decoding card is abnormal, no response is given by DSP.  | Check whether AMR and DSP are matched in version.  |
| 3 | FPGA Reset                 | When the FPGA chip is abnormal, namely, the reading value of the logic register is anything but 0x5A5A, the FPGA resetting warning is given.                   | Detect FPGA chip and hardware to check whether the hardware fails  |
| 4 | FPGA Configuration Failure | When the FPGA initialization fails, the FPGA configuration failure warning will be given.  | Replace the correct logical configuration file   |
| 5 | Input Bitrate Abnormal     | When the absolute value between the code rate of decoding card and the back board code rate is less than 2M, the input code rate abnormality warning is given. | Check whether the contact between the decoder card and the back board is good.   |
| 6 | Video No Input Bitrate     | When the video code rate is less than 256Kbps, the warning of no video input code rate is given.   | Check whether the input source is cut off.   |
| 7 | Video Scrambled            | When the video program is scrambled, the warning that the video is scrambled is given.   | Change the program again. C201AS shall not decode the scrambled program.   |
| 8 | Video Decode Error         | When the video status returned by H60 decoding chip is BAD_L0, BAD_L1, BAD_L2 or DEAD, the video decoding mistake warning                                      | Check the program source quality; check whether the data packet of video is lost; check whether the PCR of program source is normal; |

|    |                        |  |  |
|----|------------------------|--|--|
|    |                        | is give.   | and check whether the program source can comply with the standard.   |
| 9  | Audio No Input Bitrate | When the audio code rate is less than 32Kbps, the warning of no audio input code rate is given.  | Check whether the input source is cut off.   |
| 10 | Audio Scrambled        | When the scrambled audio program is multiplexed, the Warning of scrambled audio is given.  | Change the program again. C201AS shall not decode the scrambled program.   |
| 11 | Audio Not Supported    | When the following audio types are given ( AAC LC, Dolby, MPEG L1, MPEG L2, MPEG L3, WMA, Dolby-Plus), the warning that the audio is not supported can be outputted.                     | Check the audio stream type multiplexed to the program card. If the audio type is as the same as those listed on the left, the decoding shall not be applied.<br>Check whether the input source is normal. |
| 12 | Audio Decode Error     | When the mpeg audio decoding detects that the audio buffering level is greater than 10,000, namely the buffering level is abnormal, the audio decoding mistake warning may be outputted. | Check the program source quality and whether the data packet of audio is missed.   |
| 13 | Audio Output Abnormal  | When the PCM data outputted by H60 is 0 within a continuous 30s period, the audio output abnormality warning can be outputted.   | Check the program source quality and whether the data packet of audio is missed.   |

## 15. Warning list of Descramble Card

|   | Warning display           | Warning reason/triggering condition   | Resolution   |
|---|---------------------------|---|--|
| 1 | FPGA No Response          | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal. | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of equipment                  |
| 2 | CAM Card x No Inserted    | The de-scrambling switch is turned on and the de-scrambling program is set. The CAM card is not inserted.   | Insert the CAM card in corresponding slot.   |
| 3 | CAM Card x CASID Dismatch | The CASID is unmatched. It is likely that the inserted CAM card does not support the CASID setting the de-scrambling program.   | Insert the CAM card corresponding to de-scrambling program.  |
| 4 | CAM Card x Unlock         | The CAM card is not locked or no code rate is given by the output.  | Detect that the signal source is ok and then insert the CAM card again or replace the same.  |
| 5 | No EMM                    | No code rate is given by EMM.   | Check the input source and check whether the code rate is given by EMM.  |
| 6 | Descramble Abnormal       | It fails to de-scramble the program. The detailed reasons are as shown in the de-scrambling page.   | Check the program source, the de-scrambling setting, the IC authorization or the CAM card according to the prompt message on the de-scrambling page. |

## 16. Warning list of DVB-S2 Desc Card

|   | Warning display            | Warning reason/triggering condition   | Resolution   |
|---|----------------------------|---|--|
| 1 | Demodulator Unlock         | The demodulation switch and the Warning switch of the input port are turned on and the signal is not locked. It is likely that the signal wire is not connected or the parameter setting is wrong.  | Check whether the input source signal is normal and check whether the frequency point parameter setting is correct.                      |
| 2 | No Response                | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal. | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of equipment      |
| 3 | FPGA Configuration Failure | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file.   | Replace the correct logical configuration file and restart the equipment.  |
| 4 | Input Abnormal             | When the demodulation input detects that the data package is lost (more than 20 times per second generally), the warning may be outputted.  | Check the input signal wire; check the input signal source; insert the signal wire and etc. again; or replace the card to make the test. |
| 5 | CAM Card x No Inserted     | The de-scrambling switch is turned on and the de-scrambling program is set. The CAM card is not inserted.   | Insert the CAM card in corresponding slot.   |
| 6 | CAM Card x CASID Dismatch  | The CASID is unmatched. It is likely that the inserted CAM card does not support the CASID setting the de-scrambling program.   | Insert the CAM card corresponding to de-scrambling program.  |
| 7 | CAM Card x Unlock          | The CAM card is not locked or no code rate is given by the output.  | Detect that the signal source is ok and then insert the CAM card again or replace the same.  |



|   |                     |   |  |
|---|---------------------|---|--|
| 8 | No EMM              | No code rate is given by EMM.   | Check the input source and check whether the code rate is given by EMM.  |
| 9 | Descramble Abnormal | It fails to de-scramble the program. The detailed reasons are as shown in the de-scrambling page. | Check the program source, the de-scrambling setting, the IC authorization or the CAM card according to the prompt message on the de-scrambling page. |

## 17. Warning list of ABS-S Demod Card

### De-scrambling correlation

|   | Warning display           | Warning reason/triggering condition   | Resolution   |
|---|---------------------------|---|--|
| 1 | CAM Card x No Inserted    | The de-scrambling switch is turned on and the de-scrambling program is set. The CAM card is not inserted.                     | Insert the CAM card in corresponding slot.   |
| 2 | CAM Card x CASID Dismatch | The CASID is unmatched. It is likely that the inserted CAM card does not support the CASID setting the de-scrambling program. | Insert the CAM card corresponding to de-scrambling program.  |
| 3 | CAM Card x Unlock         | The CAM card is not locked or no code rate is given by the output.  | Detect that the signal source is ok and then insert the CAM card again or replace the same.  |
| 4 | No EMM                    | No code rate is given by EMM.   | Check the input source and check whether the code rate is given by EMM.  |
| 5 | Descramble Abnormal       | It fails to de-scramble the program. The detailed reasons are as shown in the de-scrambling page.                             | Check the program source, the de-scrambling setting, the IC authorization or the CAM card according to the prompt message on the de-scrambling page. |

### Demodulation correlation

|   | Warning display                   | Warning reason/triggering condition   | Resolution   |
|---|-----------------------------------|---|--|
| 1 | Demodulator Unlock                | The demodulation switch and the Warning switch of the input port are turned on and the signal is not locked. It is likely that the signal wire is not connected or the parameter setting is wrong.  | Check whether the input source signal is normal and check whether the frequency point parameter setting is correct.                      |
| 2 | FPGA No Response                  | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal. | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of equipment      |
| 3 | FPGA Configuration Failure        | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file.   | Replace the correct logical configuration file and restart the equipment.  |
| 4 | Demodulator Abnormal              | When the demodulation input detects that the data package is lost (more than 20 times per second generally), the warning may be outputted.  | Check the input signal wire; check the input signal source; insert the signal wire and etc. again; or replace the card to make the test. |
| 5 | Demodulator Error                 | When the demodulation input detects that the PAT table content is wrong, it is likely that the tuner mistake causes the abnormality of demodulation data.   | Wait the board card to recover or restart the equipment.   |
| 6 | Demodulator Initial Failure       | The demodulation chip of board card fails in the initialization. It is likely that the hardware fails.  | Restart the equipment or replace the card slot. If it is still unable to solve the problem, replace the card.                            |
| 7 | Demodulator Configuration Failure | The operation of demodulating and searching signal and configuring frequency, symbol rate and other   | Replace the card slot or card to solve this problem.   |

|  |  |                   |  |
|--|--|-------------------|--|
|  |  | parameters fails. |  |
|--|--|-------------------|--|

## 18. Warning list of DVB-C Demod Card

### De-scrambling correlation

|   | Warning display           | Warning reason/triggering condition   | Resolution   |
|---|---------------------------|---|--|
| 1 | CAM Card x No Inserted    | The de-scrambling switch is turned on and the de-scrambling program is set. The CAM card is not inserted.                     | Insert the CAM card in corresponding slot.   |
| 2 | CAM Card x CASID Dismatch | The CASID is unmatched. It is likely that the inserted CAM card does not support the CASID setting the de-scrambling program. | Insert the CAM card corresponding to de-scrambling program.  |
| 3 | CAM Card x Unlock         | The CAM card is not locked or no code rate is given by the output.  | Detect that the signal source is ok and then insert the CAM card again or replace the same.  |
| 4 | No EMM                    | No code rate is given by EMM.   | Check the input source and check whether the code rate is given by EMM.  |
| 5 | Descramble Abnormal       | It fails to de-scramble the program. The detailed reasons are as shown in the de-scrambling page.                             | Check the program source, the de-scrambling setting, the IC authorization or the CAM card according to the prompt message on the de-scrambling page. |

### Demodulation correlation

|   | Warning display    | Warning reason/triggering condition  | Resolution  |
|---|--------------------|--|---|
| 1 | Demodulator Unlock | The demodulation switch and the Warning switch of the input port are turned on and the signal is not locked. It is likely that the signal wire is not connected or the parameter setting is wrong. | Check whether the input source signal is normal and check whether the frequency point parameter setting is correct.                 |
| 2 | FPGA No Response   | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may                 | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of equipment |

|   |                            |   |   |
|---|----------------------------|---|---|
|   |                            | fail.<br>Triggering: it is detected that the status register of the daughter card logic is abnormal.                                      |   |
| 3 | FPGA Configuration Failure | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file. | Replace the correct logical configuration file and restart the equipment. |

## 19. Warning list of DVB-S2 Demod Desc Card

|   | Warning display                 | Warning reason/triggering condition   | Resolution   |
|---|---------------------------------|---|--|
| 1 | No Response                     | The working status of daughter card is abnormal.  | Check the upgrade file name of board card, re-upgrade or replace the card slot and restart.  |
| 2 | FPGA No Response                | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal. | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of equipment            |
| 3 | FPGA Configuration Failure      | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file.   | Replace the correct logical configuration file and restart the equipment.  |
| 4 | Sub-Processor Upgrade ... [xxx] | For prompt warning, [xxx] refers to the detailed link. If ERROR is followed, it means that the link is wrong. Trigger when upgrade the daughter Arm card.   | This prompt is given for each upgrade. If the ERROR is given, it may be the mistake of file and it needs to check whether the file is correct. |
| 5 | Demodulator Unlock              | The demodulation switch and the Warning switch of the input port are turned on and the signal is not locked.  | Check whether the input source signal is normal and check whether the frequency point parameter  |

|    |                                  |   |  |
|----|----------------------------------|---|--|
|    |                                  | It is likely that the signal wire is not connected or the parameter setting is wrong.   | setting is correct.  |
| 6  | BISS Descramble Abnormal         | It fails to de-scramble the program. The detailed reasons are as shown in the de-scrambling page.                             | Check whether the key is correct.  |
| 7  | Biss Error Service(s) : sx s xxx | The program is not successfully de-scrambled.   | Check whether the key is correct.  |
| 8  | CAM Card x No Inserted           | The de-scrambling switch is turned on and the de-scrambling program is set. The CAM card is not inserted.                     | Insert the CAM card in corresponding slot.   |
| 9  | CAM Card x CASID Dismatch        | The CASID is unmatched. It is likely that the inserted CAM card does not support the CASID setting the de-scrambling program. | Insert the CAM card corresponding to de-scrambling program.  |
| 10 | CAM Card x Unlock                | The CAM card is not locked or no code rate is given by the output.  | Detect that the signal source is ok and then insert the CAM card again or replace the same.  |
| 11 | No EMM                           | No code rate is given by EMM.   | Check the input source and check whether the code rate is given by EMM.  |
| 12 | CAM Card x Descramble Abnormal   | It fails to de-scramble the program. The detailed reasons are as shown in the de-scrambling page.                             | Check the program source, the de-scrambling setting, the IC authorization or the CAM card according to the prompt message on the de-scrambling page. |

## 20. Warning list of 4-Ch.DVB-T2 Demod Card

|   | Warning display  | Warning reason/triggering condition  | Resolution  |
|---|------------------|--|---|
| 1 | Input Unlock     | The demodulation switch and the Warning switch of the input port are turned on and the signal is not locked. It is likely that the signal wire is not connected or the parameter setting is wrong. | Check whether the input source signal is normal and check whether the frequency point parameter setting is correct.       |
| 2 | FPGA No Response | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation  | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of |

|   |                            |   |   |
|---|----------------------------|---|---|
|   |                            | is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal. | equipment   |
| 3 | FPGA Configuration Failure | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file.                         | Replace the correct logical configuration file and restart the equipment. |
| 4 | Input Abnormal             | When the demodulation input detects that the PAT table content is wrong, it is likely that the tuner mistake causes the abnormality of demodulation data.         | Wait the board card to recover or restart the equipment.                  |

## 21. Warning list of 4-Ch.DVB-S2 Demod card

### Demodulation correlation

|   | Warning display            | Warning reason/triggering condition   | Resolution  |
|---|----------------------------|---|---|
| 1 | Demodulator Unlock         | The demodulation switch and the Warning switch of the input port are turned on and the signal is not locked. It is likely that the signal wire is not connected or the parameter setting is wrong.  | Check whether the input source signal is normal and check whether the frequency point parameter setting is correct.                 |
| 2 | FPGA No Response           | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal. | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of equipment |
| 3 | FPGA Configuration Failure | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct  | Replace the correct logical configuration file and restart the equipment.   |

|   |                |   |  |
|---|----------------|---|--|
|   |                | FPGA configuration file.  |  |
| 4 | Input Abnormal | When the demodulation input detects that the PAT table content is wrong, it is likely that the tuner mistake causes the abnormality of demodulation data. | Wait the board card to recover or restart the equipment. |

## 22. Warning list of StatMux4 Card

|   | Warning display             | Warning reason/triggering condition   | Resolution   |
|---|-----------------------------|---|--|
| 1 | FPGA Configuration Failure  | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file.   | Replace the correct logical configuration file and restart the equipment.  |
| 2 | FPGA No Response            | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal. | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of equipment  |
| 3 | Output No Effective Bitrate | Reason: it is detected that no valid data is provided from the back board to this port and the PSI/SI table is outputted only.<br><br>Triggering: the TS stream multiplexed/transparently transmitted to this port is cut off.  | Check whether corresponding input program is normal and whether the valid PID mapping is available. If the valid PID program is unavailable, the program stream shall be multiplexed again or the normal program stream shall be replaced. If the program code rate is excessively low (less than 200K), the warning may be given. |
| 4 | Output overflow             | Reason: the data from the back board to the port exceeds the code rate setting of the output system that the overflow is caused in the output buffering area.   | Check whether the code rate of the output system is almost identical to the valid code rate and change the code rate of the output system to be the maximum  |

|   |                          |  |   |
|---|--------------------------|--|---|
|   |                          | Triggering: the code rate of output system is excessively low.   | value.  |
| 5 | PSI Tables Sent Abnormal | Reason: the table interval is not 0, but the logical disclosure is not ready. The logical resource is insufficient or the table information is excessively large.<br><br>Triggering: the signal source with high table information content is multiplexed to the port and outputted. | Reduce the transmission quantity of table information. Transmit no insignificant table information. |
| 6 | Program Scrambled        | Reason: the scrambled program is combined with the non-directly-connected program.   | Remove the scrambling program. C707 process no scrambling program.                                  |

### 23. Warning list of CA01B Switch Card

|   | Warning display          | Warning reason/triggering condition   | Resolution  |
|---|--------------------------|---|---|
| 1 | FPGA No Response         | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal. | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br><br>2) Return and repair of equipment |
| 2 | PSI Tables Sent Abnormal | Reason: PSI disclosure wait is time-out.<br><br>Triggering: the manual triggering is unable to be realized. Generally, it is caused by the busy system task.  | Check whether the task has occupied excessive resources (check by the R&D staff)  |
| 3 | Port p Unlock            | Reason: the warning switch is turned on the input port is not synchronized.<br><br>Triggering: pull up input or the port parameter setting is wrong   | Check whether the input is normal and whether the cable wire is complete.   |



|   |                                  |   |   |
|---|----------------------------------|---|---|
| 4 | Port p PID 1/2 Bitrate Underflow | <p>Reason: the input is switched on and the code rate of port PID1 (PID 2) is less than the minimum code rate setting.</p> <p>Triggering: increase the minimum code rate of PID until it is greater than the PID code rate or decrease the maximum code rate until it is less than the PID code rate.</p> | <p>Check whether the PID code rate limit is appropriate. Check whether the input stream is normal.</p>  |
| 5 | Port p Program i Video Abnormal  | <p>Reason: the checked program i video is the color bar.</p> <p>Triggering: open the program and video abnormality monitoring switch, turn of the warning switch, check the program i monitoring and ensure that the inputted video is the color bar.</p>   | <p>Check whether the input video is the color bar. Generally, the input of the coding card is cut off and the coding card is configured to be the cut-off color bar output.</p>   |
| 6 | Port p Program i Audio Abnormal  | <p>Reason: the checked program i audio is mute.</p> <p>Triggering: open the program and audio abnormality monitoring switch, turn of the warning switch, check the program i monitoring and ensure that the inputted audio is mute.</p>   | <p>Check whether the input audio is mute. Generally, the input of the coding card is cut off and the coding card is configured to be the mute cut-off output.</p>   |
| 7 | Output No Effective Bitrate      | <p>Reason: it is detected that no valid data is provided from the back board to this port and the PSI/SI table is outputted only.</p> <p>Triggering: the TS stream multiplexed/transparently transmitted to this port is cut off.</p>   | <p>Check whether corresponding input program is normal and whether the valid PID mapping is available. If the valid PID program is unavailable, the program stream shall be multiplexed again or the normal program stream shall be replaced. If the program code rate is excessively low (less than 200K), the warning may be given.</p> |
| 8 | Output Overflow                  | <p>Reason: the data from the back board to the port exceeds the code rate setting of the output system that the overflow is caused in the output buffering area.</p>  | <p>Check whether the code rate of the output system is almost identical to the valid code rate and change the code rate of the output system to be the maximum</p>  |

|  |  |  |        |
|--|--|--|--------|
|  |  | Triggering: the code rate of output system is excessively low. | value. |
|--|--|--|--------|

## 24. Warning list of DS3 Switch Card

|   | Warning display            | Warning reason/triggering condition   | Resolution  |
|---|----------------------------|---|---|
| 1 | Port Bitrate Underflow     | Reason: the input is switched on and the code rate of port PID is less than the minimum code rate setting.<br><br>Triggering: the PID range is narrowed such that the PID code rate is less than the minimum code rate.   | Check whether the PID range is appropriate and whether the minimum code rate is excessively high. Check whether the input stream is normal. |
| 2 | Port Sync Error            | Reason: the input channel is turned on and the input port is not synchronized.<br><br>Triggering: pull up input or the port parameter setting is wrong  | Check whether the input is normal. If yes, check whether the port parameter is identical to the input stream.                               |
| 3 | FPGA Configuration Failure | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file.   | Replace the correct logical configuration file and restart the equipment.   |
| 4 | Port Decode Error          | Reason: the RS decoding is wrong.<br><br>Triggering: the input channel is turned on and the source end RS code is switched on, the input RS decoding function of DS3 three-to-two switch card is switched on and the source end and the DS3 three-to-two switch card have different interleaving coding settings. Or, the source end RS coding is switched off, the output packet length setting is 204 and the RS coding function of switch card is switched on. | Check whether the source end setting and the receiving end setting are consistent.  |
| 5 | Switch To Port 2           | Reason: the output source is in the automatic mode. When the channel 1 is   | Manually switched to port 1 or check the input of the input port 1 to ensure that   |

|   |                  |  |  |
|---|------------------|--|--|
|   |                  | <p>abnormal, while the channel 2 is normal, it will automatic switch to the channel 2.</p> <p>Triggering: the automatic switch mode is set. The input port 1 is pulled up and the input port 2 is remained normal.</p>   | <p>the input is normal and no warning is given.</p>  |
| 6 | Switch To Port 3 | <p>Reason: the output source is in the automatic mode. When the channels 1 and 2 are abnormal, while the channel 3 is normal, it will automatic switch to the channel 3.</p> <p>Triggering: the automatic switch mode is set. The input ports 1 and 2 are pulled up and the input port 3 is remained normal.</p> | <p>Manually switched to port 1 or check the input of the input port 1 to ensure that the input is normal and no warning is given.</p>    |
| 7 | No Input         | <p>Reason: the three input routes are abnormal or turned off and there are not output given.</p> <p>Triggering: the three input routes are turned off or the parameter is modified such that the abnormality is caused. Or, the manual output route is chosen and the input of this route is turned off.</p>     | <p>Check whether the three routes are totally abnormal or turned off. Modify the parameter to ensure at least one route is abnormal.</p> |

## 25. Warning list of RF Switch Card

|   | Warning display        | Warning reason/triggering condition  | Resolution   |
|---|------------------------|--|--|
| 1 | Port Bitrate Underflow | <p>Reason: the input is switched on and the code rate of port PID is less than the minimum code rate setting.</p> <p>Triggering: the PID range is narrowed such that the PID code rate is less than the minimum code rate.</p> | <p>Check whether the PID range is appropriate and whether the minimum code rate is excessively high. Check whether the input stream is normal.</p> |
| 2 | Port Sync Error        | <p>Reason: the input channel is turned on and the input port is not synchronized.</p> <p>Triggering: pull up input or the port parameter setting is</p>  | <p>Check whether the input is normal. If yes, check whether the port parameter is identical to the input stream.</p>                               |

|   |                                  |   |   |
|---|----------------------------------|---|---|
|   |                                  | wrong   |   |
| 3 | Port Signal Error                | Reason: the input signal type and the signal type setting are inconsistent.<br><br>Triggering: the normal digital signal is inputted and the correct RF parameter to synchronize the ports. Set the signal type to be the analog one.   | Set the signal type to be the digital one or set the RF parameter of port to be other values such that the ports are not synchronized.                    |
| 4 | FPGA Configuration Failure       | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file.   | Replace the correct logical configuration file and restart the equipment.   |
| 5 | Port Input No level              | Reason: no input or the input level is less than 85dBu;<br><br>Triggering: the input is pulled up or the modulator output is turned off.  | Check whether the modulator output is normal. If the output is provided, check whether the input RF line is normal and whether the two ends of tightened. |
| 6 | Port Input Level Too High        | Reason: the absolute difference value between the input level value of the port and the reference level of the port is greater than the level switch threshold;<br><br>Triggering: increase the level of input RF stream to be greater than the reference level and reduce the level switch threshold.  | Check whether the level switch threshold is low or whether the input level is excessively high or whether the reference level is updated.                 |
| 7 | Port Input Level a little Low    | Reason: the absolute difference value between the input level value of the port and the reference level of the port is 0.6 times greater than the level switch threshold and less than the level switch threshold.<br><br>Triggering: decrease the level of input RF stream to be greater than the reference level and reduce the level switch threshold. | Check whether the level switch threshold is low or whether the input level is low or whether the reference level is updated.                              |
| 8 | Port Input Level a little higher | Reason: the absolute difference value between the input level value of the port and the reference level   | Check whether the level switch threshold is low or whether the input level is high or whether the   |

|    |   |   |   |
|----|---|---|---|
|    |   | <p>of the port is 0.6 times greater than the level switch threshold and less than the level switch threshold.</p> <p>Triggering: increase the level of input RF stream to be greater than the reference level and reduce the level switch threshold.</p>  | reference level is updated.   |
| 9  | Port Input Level Too Low                      | <p>Reason: the absolute difference value between the input level value of the port and the reference level of the port is greater than the level switch threshold;</p> <p>Triggering: decrease the level of input RF stream to be lower than the reference level and reduce the level switch threshold.</p>       | Check whether the level switch threshold is low or whether the input level is excessively low or whether the reference level is updated.  |
| 10 | The reference level is not confirmed manually | <p>Reason: the reference level of the port is not confirmed;</p> <p>Triggering: the daughter card is reset and no other operation is made.</p>  | It needs to confirm the reference level during the first use or after resetting the daughter card.  |
| 11 | Port 1 Switch To Port 2                       | <p>Reason: the output source is in the automatic mode. When the main route is abnormal, while the backup route is normal, it will automatic switch to the backup route.</p> <p>Triggering: the automatic switch mode is set. The main route input is pulled up and the backup route input is remained normal.</p> | Manually switch to the main route or check main route input to ensure that the main route input is normal and no warning is given. In addition, it shall ensure that the main route is switched on with priority. |

## 26. Warning list of T2MI Replacer Card

|   | Warning display                  | Warning reason/triggering condition   | Resolution   |
|---|----------------------------------|---|--|
| 1 | FPGA No Response                 | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br><br>Triggering: it is detected that the status register of the daughter card logic is abnormal.   | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of equipment                          |
| 2 | FPGA Configuration Failure       | Reason: failed logic configuration of daughter card<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file.   | Replace the correct logical configuration file and restart the equipment.  |
| 3 | Input Scrambled                  | Reason: the inputted T2MI stream is scrambled;<br><br>Triggering: one scrambled T2MI stream is found.   | Check whether the input source is scrambled  |
| 4 | Group Input No Input             | Reason: the code rate of T2MI input system is 0;<br><br>Triggering: cut off the input source  | Check whether the input source is correct  |
| 5 | ASI Input Port No Total Bitrate  | Reason: the port is involved in the multiplex, but the valid code rate is 0. However, no valid TS packet is detected, except the empty packet. No valid code rate is provided.<br><br>Triggering: when the configuration parameter is given from input to the output, the inputted signal is changed to the empty packet and only the table is left only. | Check whether the valid code rate is provided on the front-end transmitting source.<br><br>Check whether the empty data packet is found in the input source. |
| 6 | ASI Output Port No Total Bitrate | Reason: the data with the input card is multiplexed/transparently transmitted to this port, but   | Check whether the code rate setting of the output system is 0.   |

|   |                             |   |   |
|---|-----------------------------|---|---|
|   |                             | no TS packet is outputted.<br>Triggering: the data of back board is sent to this port, but the code rate setting of the output system is 0.                   |   |
| 7 | Group Port No Total Bitrate | Reason: the code rate outputted to the PLP system of back board is 0;<br>Triggering : the code rate outputted to the PLP system of back board is set to be 0; | Check the code rate setting outputted to the PLP system of back board |

## 27. Warning list of T2MI De-encap. Card

|   | Warning display            | Warning reason/triggering condition   | Resolution   |
|---|----------------------------|---|--|
| 1 | FPGA No Response           | Reason:<br>1) FPGA configuration fails and the logical operation of daughter card is wrong;<br>2) The equipment operation is abnormal. If the restart is invalid, the hardware may fail.<br>Triggering: it is detected that the status register of the daughter card logic is abnormal. | 1) Replace the correct logical configuration file. It is unnecessary to restart the equipment.<br>2) Return and repair of equipment                      |
| 2 | FPGA Configuration Failure | Reason: failed logic configuration of daughter card<br>Triggering condition: FTP fails to upload the correct FPGA configuration file.   | Replace the correct logical configuration file and restart the equipment.  |
| 3 | Input Scrambled            | Reason: the inputted T2MI stream is scrambled;<br>Triggering: use the T2MI stream to conduct the test   | Check whether the input source is scrambled. The scrambled stream cannot be used for PLP replacement.  |
| 4 | Input No Total Bitrate     | Reason: the port is involved in the multiplex, but the valid code rate is 0. However, no valid TS packet is detected, except the empty packet. No valid code rate is provided.  | Check whether the valid code rate is provided on the front-end transmitting source.<br>Check whether the empty data packet is found in the input source. |

|    |                             |   |  |
|----|-----------------------------|---|--|
|    |                             | Triggering: when the configuration parameter is given from input to the output, the inputted signal is changed to the empty packet and only the table is left only.   |  |
| 5  | Input Sync Error            | Reason: the port input is out of synchronization;<br><br>Triggering: use the T2MI which has the code rate of input system and fails in synchronization to conduct the test  | Check whether the input source is correct  |
| 6  | Input No Effective Bitrate  | Reason: no valid code rate in inputted from the port;<br><br>Triggering: use the T2MI which has the code rate of input system and has no invalid code rate to conduct the test  | Check whether the valid code rate is available in the input source   |
| 7  | Input Bitrate Overflow      | Reason: the inputted cache is unable to store sufficient data. The port is involved in the multiplex and the DDR overflow flag bit 1 is received.<br><br>Triggering: generally, this situation is caused when no response is given by FPGA. | Detect whether the front-end transmission source is normal.<br><br>Check whether FPGA gives any response or whether the hardware fails |
| 8  | Output Bitrate Overflow     | Reason: the valid code rate outputted by PLP after replacement is higher than the system code rate;<br><br>Triggering: use one PLP valid code rate which is higher than the T2MI stream of system code rate                                 | Check whether the code rate in PLP of input source is correct  |
| 9  | Output No Effective Bitrate | Reason: no valid code rate is outputted from the port;<br><br>Triggering: use the T2MI without any valid code rate to conduct the test  | Check the input source   |
| 10 | Code Rate Not Equal         | Reason: the PLP coding rates for replacement of port 1 and 2 are equivalent to each other;<br><br>Triggering: find two  | Replace the input source or substitute the PLP   |



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|    |                     | sources with different PLP code rate to make the replacement.  |  |
| 11 | Group PLP Not Exist | Reason: one or two PLPs used for replacement in the port 1 and port 2 is unavailable.<br><br>Triggering: when the PLP replacement is made, pull up one input source or replace one input source which does not have any PLP. | Check the input source or replace the input source |

## 28. Warning list of EMR

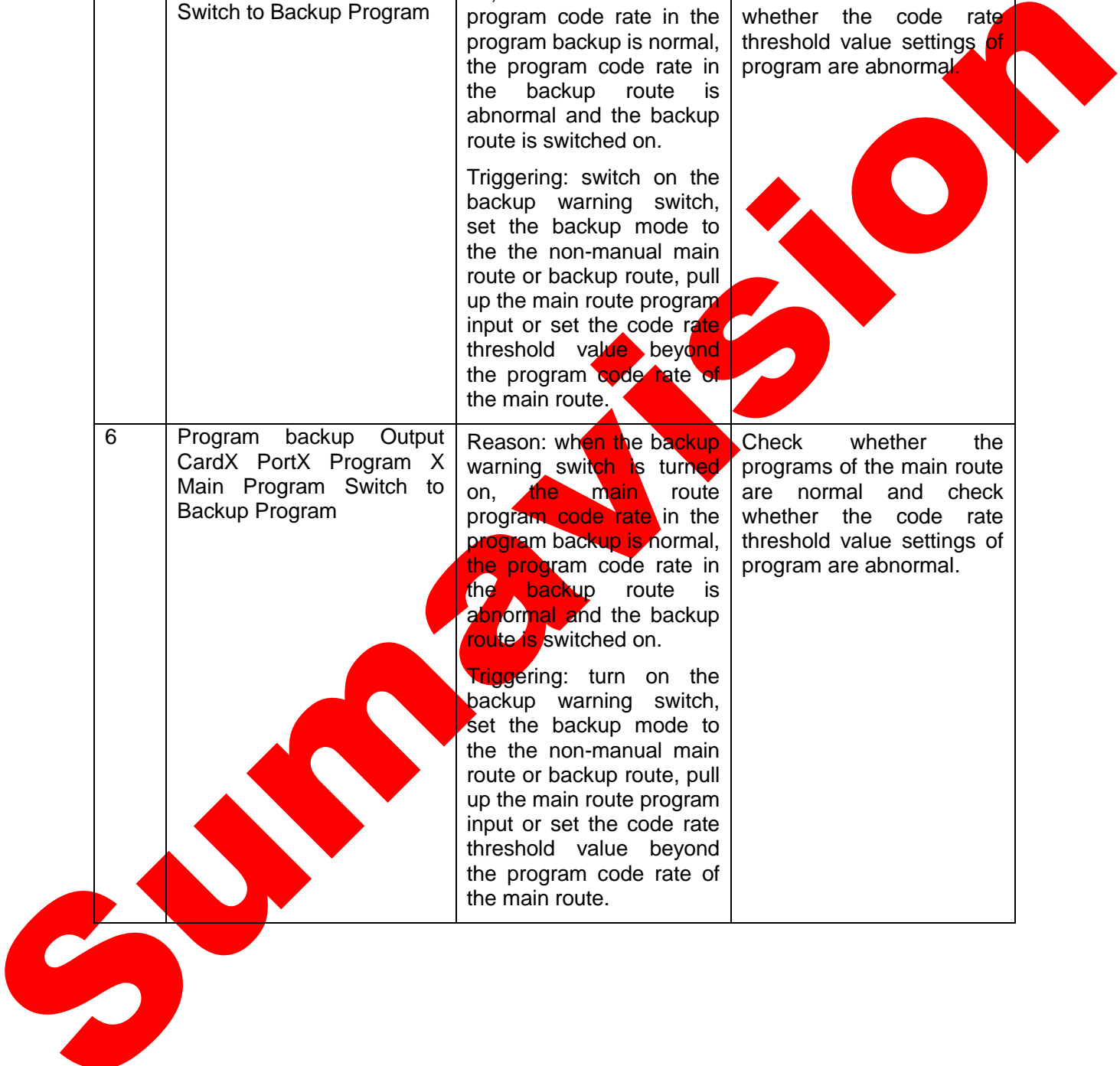
|   | Warning display                            | Warning reason/triggering condition   | Resolution  |
|---|--|---|---|
| 1 | BackBoard FPGA 1/2/3 Configuration Failure | Reason: logic configuration fails<br><br>Triggering condition: FTP fails to upload the correct FPGA configuration file.   | Replace the correct logical configuration file  |
| 2 | BackBoard SNTP Sync Error                  | Reason: the synchronization with the main and backup clock server fails.<br><br>Triggering condition: the clock synchronization server IP address is wrong or relevant service of server is switched off.   | Check whether the IP setting of the EMR server is correct and whether all NTP services on the server are switched on.   |
| 3 | BackBoard Power Unit 1/2 Abnormal          | Reason: the output voltage of power source module exceeds the normal range.<br><br>Triggering: the dual power source is chosen, but only power source is available. Or, the power source 1/2 is chosen, but only the power source 2/1 is available. | Set the power source configuration in the routine->other page to be identical to that of the real power source  |
| 4 | BackBoard Fan 1/2 Abnormal                 | Reason: the fan revolving speed exceeds 50% of the revolving speed setting or is less than 50% of the revolving speed setting.<br><br>Triggering condition: EMR fails to detect the revolving   | Visually judge whether the fan is rotated or whether the revolving speed is high; check whether the power line of the fan is connected or loosen; or replace the new fan; |

|    |  |   |  |
|----|--|---|--|
|    |  | speed of fan  |  |
| 5  | BackBoard Boot Abnormal:<br>Read EEPROM Failed       | Reason: failure to read EEPROM on back board<br><br>Triggering condition: the configuration information is not correctly programmed on the EEPROM of back board or the drive program is not matched.                | It needs to programm the correct configuration information on EEPROM on the back board when delivering the back board. Upgrade to the new version. |
| 6  | BackBoard Boot Abnormal:<br>EEPROM ID Invalid        | Reason: the EEPROM configuration information of back board is wrong.<br><br>Triggering condition: no configuration information is correctly programmed on EEPROM on backboard.                                      | It needs to programm the correct configuration information on EEPROM on the back board when delivering the back board.                             |
| 7  | BackBoard Boot Abnormal:<br>EEPROM Not Encrypted     | Reason: EEPROM model of back board is wrong.<br><br>Triggering condition: EEPROM model of back board is wrong or the drive program is wrong.  | Return to the factory and replace (only applicable for a small quantity of devices sold oversea, which has been delivered a short time ago)        |
| 8  | BackBoard Boot Abnormal:<br>Time Authorization Error | Reason: the time authorization is due.<br><br>Triggering condition: the operation time of equipment exceeds the authorization time.   | Purchase the new time authorization again (only applicable for the version using the time authorization)   |
| 9  | BackBoard Boot Abnormal:<br>Read MAC Failed          | Reason: fails to read MAC on back board<br><br>Triggering condition: MAC address is not correctly programmed on the backboard   | It needs to programm the correct MAC address on the backboard when being delivered.  |
| 10 | BackBoard Boot Abnormal:<br>MAC Invalid              | Reason: the MAC on the back board and the primary Gigabit card is not valid completely.<br><br>Triggering condition: total 5 MAC addresses of the back board and the primary Gigabit cars are not completely valid. | It needs to programm the correct MAC addresses on the main control Ethernet port on the back board and four GbE Ethernet ports when delivering.    |

## 29. Warning list of Service Backup

|   | Warning display  | Warning reason/triggering condition  | Resolution  |
|---|--|--|---|
| 1 | CardX GbEX PortX<br>Program X Main Program<br>Bitrate Abnormal   | Reason: when the backup warning switch is turned on, the main route program code rate in the program backup is beyond the threshold value range.<br><br>Triggering: open the backup warning switch, pull up the main route program input or set the threshold value beyond the real program code rate. | Check whether the programs of the main route are normal and check whether the code rate threshold value settings of program are abnormal. |
| 2 | CardX PortX ProgramX<br>Main Program Bitrate<br>Abnormal         | Reason: when the backup warning switch is turned on, the main route program code rate in the program backup is beyond the threshold value range.<br><br>Triggering: open the backup warning switch, pull up the main route program input or set the threshold value beyond the real program code rate. | Check whether the programs of the main route are normal and check whether the code rate threshold value settings of program are abnormal. |
| 3 | CardX GbEX PortX<br>Program X Backup Program<br>Bitrate Abnormal | Reason: when the backup warning switch is turned on, the backup program code rate in the program backup is beyond the threshold value range.<br><br>Triggering: open the backup warning switch, pull up the backup program input or set the threshold value beyond the real program code rate.         | Check whether the backup programs are normal and check whether the code rate threshold value settings of program are abnormal.            |
| 4 | CardX PortX ProgramX<br>Backup Program Bitrate<br>Abnormal       | Reason: when the backup warning switch is turned on, the backup program code rate in the program backup is beyond the threshold value range.<br><br>Triggering: open the backup warning switch, pull up the backup   | Check whether the backup programs are normal and check whether the code rate threshold value settings of program are abnormal.            |

|   |  |   |   |
|---|--|---|---|
|   |  | program input or set the threshold value beyond the real program code rate.   |   |
| 5 | Program backup Output CardX GbEX PortX Program X Main Program Switch to Backup Program | Reason: when the backup warning switch is turned on, the main route program code rate in the program backup is normal, the program code rate in the backup route is abnormal and the backup route is switched on.<br><br>Triggering: switch on the backup warning switch, set the backup mode to the the non-manual main route or backup route, pull up the main route program input or set the code rate threshold value beyond the program code rate of the main route. | Check whether the programs of the main route are normal and check whether the code rate threshold value settings of program are abnormal. |
| 6 | Program backup Output CardX PortX Program X Main Program Switch to Backup Program      | Reason: when the backup warning switch is turned on, the main route program code rate in the program backup is normal, the program code rate in the backup route is abnormal and the backup route is switched on.<br><br>Triggering: turn on the backup warning switch, set the backup mode to the the non-manual main route or backup route, pull up the main route program input or set the code rate threshold value beyond the program code rate of the main route.   | Check whether the programs of the main route are normal and check whether the code rate threshold value settings of program are abnormal. |



### 30. Warning list of Port Backup

|   | Warning display  | Warning reason/triggering condition  | Resolution   |
|---|--|--|--|
| 1 | CardX GbEX PortX Bitrate Abnormal                                  | <p>Reason: when the backup warning switch is turned on the port multiplex or the valid code rate of transparent-transmission output is beyond the threshold value.</p> <p>Triggering: after turning on the backup warning switch and multiplexing the port, the minimum code rate setting of the threshold value is greater than the real code rate or the maximum code rate of threshold value is less than the real code rate.</p> | Check whether the valid code rate of multiplex or transparent transmission is normal; set the code rate threshold value in the reasonable range. |
| 2 | CardX PortX Bitrate Abnormal                                       | <p>Reason: when the backup warning switch is turned on the port multiplex or the valid code rate of transparent-transmission output is beyond the threshold value.</p> <p>Triggering: after opening the backup warning switch and multiplexing the port, the minimum code rate setting of the threshold value is greater than the real code rate or the maximum code rate of threshold value is less than the real code rate.</p>    | Check whether the valid code rate of multiplex or transparent transmission is normal; set the code rate threshold value in the reasonable range. |
| 3 | Port backup Main CardX GbEX PortX Switch to BackupCardX GbEX PortX | <p>Reason: when the backup warning switch is turned on and the port backup switch conditions are realized, the backup route shall be switched on.</p> <p>Triggering: open the backup warning switch, set the backup mode to be the non-manual main route or backup route. The main route and the backup route are normally inputted and the main</p>   | Check whether the main route input is normal; set the code rate threshold value in the reasonable range.   |

|   |   |  |  |
|---|---|--|--|
|   |   | route input is pulled up.  |  |
| 4 | Port backup Main CardX<br>PortX Switch to<br>BackupCardX PortX      | Reason: when the backup warning switch is turned on and the port backup switch conditions are realized, the backup route shall be switched on.<br><br>Triggering: turn on the backup warning switch, set the backup mode to be the non-manual main route or backup route. The main route and the backup route are normally inputted and the main route input is pulled up. | Check whether the main route input is normal; set the code rate threshold value in the reasonable range. |
| 5 | Port backup Main CardX<br>GbEX PortX Switch to<br>BackupCardX PortX | Reason: when the backup warning switch is turned on and the port backup switch conditions are realized, the backup route shall be switched on.<br><br>Triggering: turn on the backup warning switch, set the backup mode to be the non-manual main route or backup route. The main route and the backup route are normally inputted and the main route input is pulled up. | Check whether the main route input is normal; set the code rate threshold value in the reasonable range. |
| 6 | Port backup Main CardX<br>PortX Switch to<br>BackupCardX GbEX PortX | Reason: when the backup warning switch is turned on and the port backup switch conditions are realized, the backup route shall be switched on.<br><br>Triggering: turn on the backup warning switch, set the backup mode to be the non-manual main route or backup route. The main route and the backup route are normally inputted and the main route input is pulled up. | Check whether the main route input is normal; set the code rate threshold value in the reasonable range. |