



EM800 Digital Multimedia Platform User Manual

V1.0

Beijing Communicate Technologies Inc.

2010-6

Preface

Beijing Compunicate Technologies Inc. is China's leading supplier of DVB head-end products and solutions.

Compunicate was founded in January 1997 by several scientists, experts, Ph.D holders with background in image compression and digital video broadcast technology. Since 1996, Compunicate has begun to participate in the establishment of digital TV standards and the research and development of corresponding products and systems, accumulating a wealth of experience in the field of digital TV.

In recent years, we have been actively cooperating with related instruction departments of the national digital television industry, and actively participating in the standards of Chinese digital TV studies and settings, which include core technology standards such as Audio Video Standard (AVS), Conditional Access (CA), Interactive TV Receiving.

Compunicate has established quality guarantee system according to the international standard and has gained ISO9001 certificate, which increases the company's competitiveness and establishes a firm basis for its sustainable development.

Compunicate insists on the independent R&D. Its products include different parts of head-end infrastructure and value-added service platforms of digital TV, including:

Encoder	Digital Playout System
Multiplexer	Mosaic Generator
Scrambler	Object Carousel Generator
QAM Modulator	Digital Program Inserter
CAS	DTV Logo Inserter
PMM	Still Picture Broadcasting
SMM	Karaoke System
SI-EPG System	DTV-Mobile Short Message Platform

Our conditional access products are the ones which first meet the DVB Simulcrypt Standards in China. And New Vision Mosaic System is the first global integrated navigation system with whole functions. Our products hold the first market share compared with similar products.

With the birth and growth of China's digital television, Compunicate has formed a positive engineer culture, which pursues innovation and excellence, pays attention to commitment and practice. We are willing to cooperate with colleagues in the industry to promote a healthy and orderly development in digital television industry.

Introduction

About this manual

This manual describes the configurations and operational approaches of Compunicate EM800 digital multimedia platform in details.

Please read this manual carefully, and then you will be able to operate the EM800 digital multimedia platform correctly.

The suitable version: Hardware V1.0

Software V1.0

Document structure

This manual includes the following contents:

1. **Product description:** Introduce the basic principles and penal structure of the product.
2. **Operation guide:** Introduce how to use network management and panels to complete the functions.

This manual Tips



Warning

Warn that maloperation may result in equipment failure.



Attention

Remind the user of how to prevent damage to hardware or loss of data.



Note

Note signals important information that requires special attention

Terminology

TS: Transport Stream

SPTS: Single Program Transport Stream, it means there are only related streams of one program existing in one TS stream.

MPTS: Multiple Program Transport Stream, it means there are streams of multiple programs existing in one TS stream.

ASI: Asynchronous Serial Interface

DCT: Discrete Cosine Transform

GOP: Group of Pictures

SPI: Synchronous Parallel Interface

VBR: Variable Bit Rate

CBR: Constant Bit Rate



Attention:

Please use high quality cable and confirm good connection.

Please make sure your power meets requirement, don't use power line without grounding.

Please don't open the lid.

Please leave space in the machine to ensure good heat dissipation.

The company reserves the right to modify the manual without notice, keep constantly the right to improve the accuracy adequacy and integrity of information in manual. For incorrect use without the manual, we assume no liability. In addition, only our clients are eligible for post-sale support. We hope that the users browse the company's website to obtain the latest information on this product, and enjoy good after-sale service.

Content

PREFACE.....	2
CHAPTER 1 PRODUCT DESCRIPTION.....	6
1.1 PRODUCT INTRODUCTION	6
1.2 OVERALL FUNCTION FEATURES	7
1.3 ENCODER CARD FUNCTION FEATURES	7
1.4 EM800 INTERFACE	8
1.5 FRONT PANEL	8
1.6 MENU STRUCTURE.....	10
1.7 BACK PANEL	11
CHAPTER 2 OPERATION GUIDE.....	12
2.1 PANEL OPERATION GUIDE.....	12
2.1.1 Start up	12
2.1.2 Network configuration	13
2.1.3 Factory reset	13
2.1.4 Lock keyboard	13
2.1.5 Password configuration	15
2.2 NETWORK MANAGEMENT GUIDE	16
2.2.1 Search online device	17
2.2.2 Enter configuration.....	18
2.2.3 Output configuration	19
2.2.4 Forward program	21
2.2.5 Login conservation.....	22

CHAPTER 1 PRODUCT DESCRIPTION

1.1 Product introduction

EM800 is a brand new digital media platform of Compunicate. This platform adopts the computer card design, 1U device has the functions of encoding, multiplexing and scrambling. It supports 8 MPEG-2/H.264 encoding at most, 16 ASI input multiplexing and scrambling at most, and gigabit IP output. This manual is only related to the contents of encoding.

This product applies to the construction and expansion digital TV head-end system, has the advantages of stable performance, good compatibility, high integration, and easy to operate etc, can save a lot of maintenance costs and space for the operators.



Figure 1-1 EM800 encoder external view

1.2 Overall function features

- Each device supports 5 slots, 4 of them can freely configure encoder card and ASI input card, the rest one is used for output.
- Supporting ASI output or giga IP output
- IP encoding output is accordance with RTP or UDP protocol
- Local monitoring: button and LCD display screen
- Remote monitoring: TCP/IP, XML protocol.

1.3 Encoder card function features

MPEG-2 encoder card

- MPEG-2 4:2:0 MP@ML Video encoding
- Video input mode NTSC/PAL adaptive
- MPEG-1 LayerII Audio Encoding (sampling frequency 32KHz, 44.1KHz, 48KHz)
- Supporting mono, double mono, stereo, joint stereo
- Output code rate mode: VBR、CBR

H.264 encoder card

- H.264 HP@L4 Video encoding(sampling frequency 48KHz)
- Video input NTSC/PAL adaptive
- MPEG-1 LayerII Audio Encoding(sampling frequency 48KHz)
- Supporting AAC Audio Encoding (optional)
- Supporting mono, stereo
- Output code rate mode: VBR、CBR

1.4 EM800 interface

Input card	Analog MPEG-2 Encoder Card	Video	2 CVBS
		Audio	2 analog audio
	Digital (SDI) MPEG-2 Encoder Card	Video	2 SDI
		Audio	2 SDI embedded audio
	Analog H.264 SD Encoder Card	Video	2 CVBS
		Audio	2 analog audio
	Digital (SDI) H.264 HD/SD Encoder Card	Video	2 SDI video
		Audio	2 SDI embedded audio
Output card	ASI input card		4 ASI input (2 Mirrors)
	ASI output card	ASI	4 ASI output
		IP	1 100M/10M network management
	Giga IP output card	ASI	2 ASI output
		IP	1 100M/10M network management interface 1 1000M network management interface

1.5 Front panel

The layout of front panel is shown as figure 1.5. It includes one LCD display screen, 4 rows of indicators and 6 buttons to form the front panel. Respective descriptions are as follows:

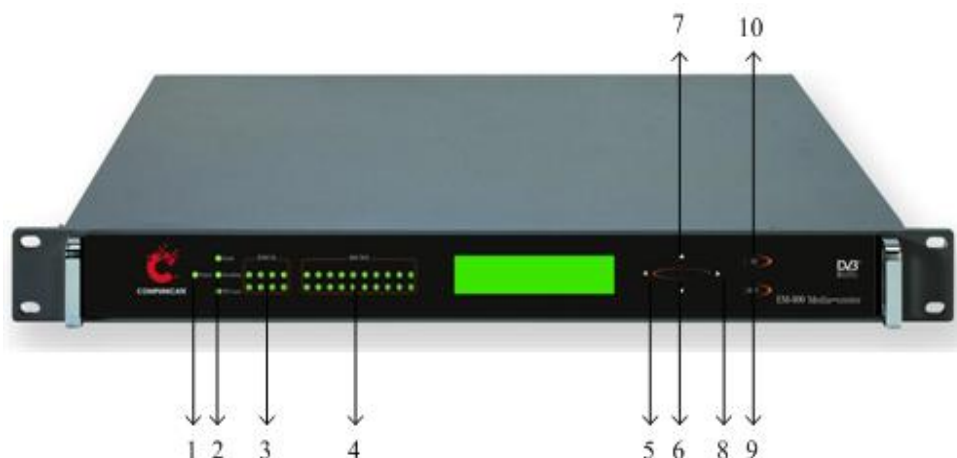


Figure 1.5 EM800 front panel

➤ **Six buttons**

◀ ▼ ▲ ▶ MENU, OK are used to choose menu and configure parameters.

The respective functions corresponding to digit 5、6、7、8、9、10 are:

[▼] change value and parameters

[▲] change value and parameters

[▶] move cursor towards to the right

[◀] move cursor towards to the left

[OK] 1) setting parameter: confirm current configuration is effective and return to the upper menu.

2) browsing menu: enter into the selected submenu.

[MENU] 1) setting parameter: keep current configuration and return to the upper menu.

2) Browsing menu: return to the previous menu.

➤ **Four rows of indicators, corresponding to 1、2、3、4**

Indicator 1: power light, on: the encoder is powered up;

Indicator 2: status light, a) error indicator, b) overflow indicator, c) PID lose indicator.

Indicator 3: encoding status light

The 8 encoding status lights are respectively corresponding to 8 encoding.

All of them are on: it means this encoding is chosen and signal source is locked.

Half of them are on: it means this encoding isn't chosen.

Off: it means there is no encoder card.

Flash: it means this coding is chosen and signal source is unlocked.

Indicator 4: multiplexing input status light

1.6 Menu structure

The operation menu is divided into three levels, shown as figure 1.6:

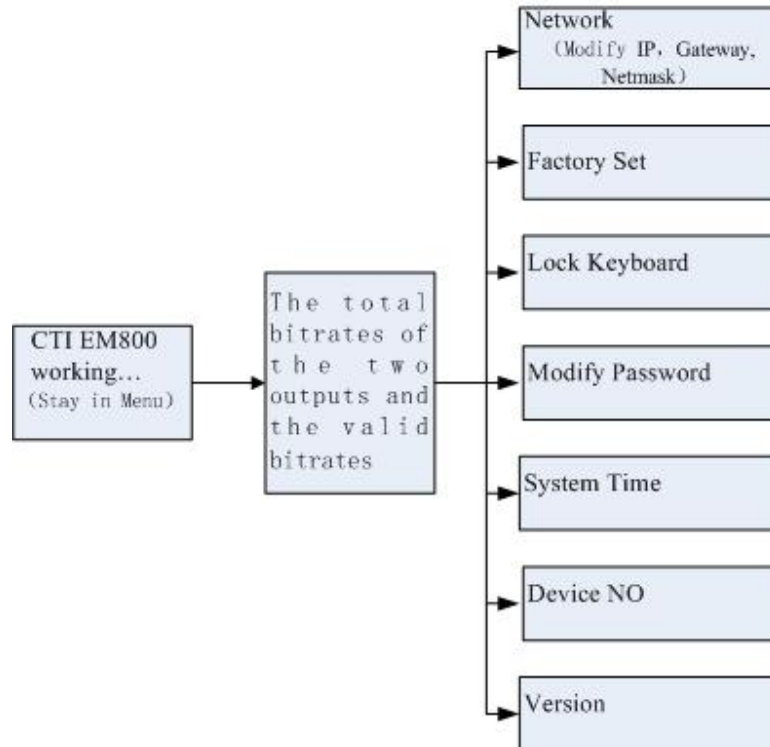


Figure 1.6

1.7 Back panel

If there are multiple cards in a device, including CVBS input and SDI input, the sequence of corresponding network management is shown as figure 1.7:

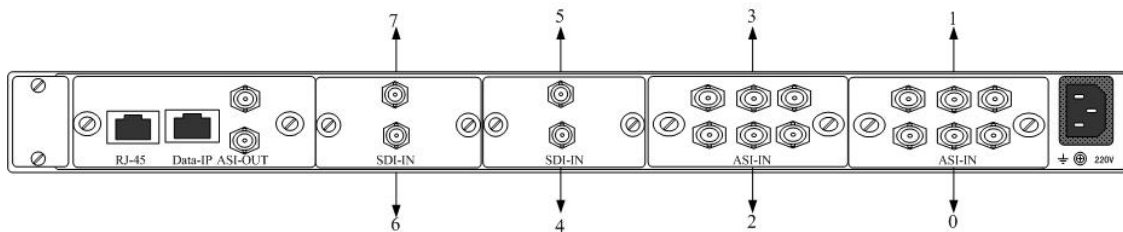


Figure 1.7

Thereinto, 0、1、2、3、4、5、6 and 7 are corresponding to Import-0、Import-1、Import-2、Import-3、Import-4、Import-5、Import-6 and Import-7 in network management.

CHAPTER 2 OPERATION GUIDE

2.1 Panel operation guide

This encoder is easy to operate. It can work after connecting to input and output lines and power. If you need to change the work environment and parameter settings, use the buttons with the guide of menu displayed on the screen.



Attention

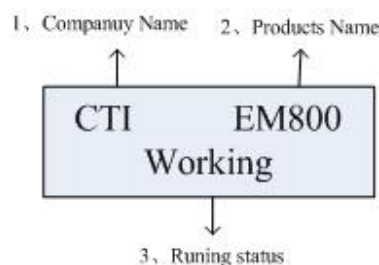
1. limited by the number of words shown, it could not display all menu items of the same-level at one time. Press “↑↓”these two buttons to switch among brother menu items in a certain order.
2. Only in the final level menu can you modify the parameters. Click "OK" button into lower level menu when it is not the final level menu, and choose more detailed items or modify their parameters in lower level.
3. There are many choices for entering into lower level menu from superior menu. It will enter into the submenu item which is most recently changed or browsed.
4. Entering into the final level menu, if modification is allowed, modify the parameters and press the "OK" to confirm. If you don't want to change the original parameters, click "MENU" to return to the upper level.
5. When coding is in progress, on matter which menu you are at, LCD screen will automatically go back to the main interface over certain time (5 minutes), which is the initial status.

2.1.1 Start up

Power on to start up the encoder, it will display the uploading status:



The encoder automatically encodes after starting up, it will display a resident interface as follows:

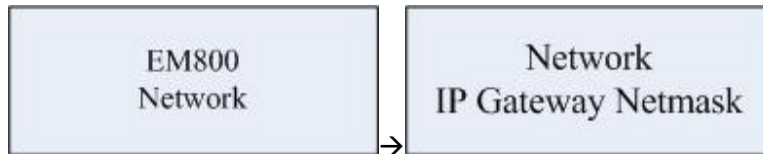


➤ Operation

1. Switch from “resident interface” to “network, factory reset, lock buttons, modify password” menu: double click “MENU” button. “Resident interface” is equivalent to the top level of the whole menu.
2. Switch from “network, factory reset, lock buttons, modify password” menu to “resident interface”: click “MENU” button.

2.1.2 Network configuration

- Options: IP、Gateway



As above figure, click “OK” button to enter:

IP: 192.168.1.3

Gateway: 192.168.1.1

Netmask: 255.255.255.0

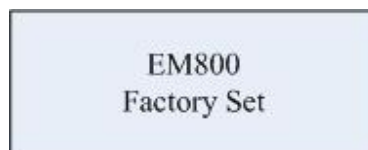


Note

The factory default IP of EM800 digital multimedia platform is 200.121.2.169.
Network configuration can only be operated in panels, and cannot be modified.

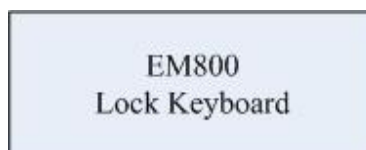
2.1.3 Factory reset

- After complementing “factory set”, click “OK” button, wait for several seconds, the device parameters will recover to factory default.



2.1.4 Lock keyboard

- After locking system, the set password takes effect, shown as follows:



- After locking system, when user press “MENU” button enter menu from resident



interface, enter password as prompt, shown as the following interface:

A light blue rectangular box with a thin black border. Inside, the text 'Password:' is followed by a horizontal line for input.

- If the password is incorrect, press “OK” key to prompt that user password is incorrect, which is shown as the following interface; press “MENU” key to switch to password input interface.

A light blue rectangular box with a thin black border. It contains two lines of text: 'Input times left:2' on the top line and 'Password:' followed by a horizontal line for input on the bottom line.

- If password is correct, press “OK” key to enter system menu interface, the system unlocking in successful. After that, user press “MENU” to enter menu directly, it won't prompt to enter password any more. If need to lock the system again, complement “Lock KeyBoard” menu.

2.1.5 Password configuration

- “Modify password” description:
- After complementing this menu, it will display the following interface:

EM800 Modify Password	Old PW: _____ New PW: _____
--------------------------	--------------------------------

- Enter “←→↑↓” in “-”. When entering each one, the corresponding “-” will become “*” and the cursor will move back a bit.
- Password is defined 8 characters;
The initial password is “↑↑↑↓↓↓↓↓”, it is the factory default password and can be modified.
- When the cursor is in any position, press “MENU” key to quit current configuration and return to the upper menu.

2.2 Network management guide

Operation steps process:

Search online device → input and output configuration (include input and output) → forward program → login conservation

Interface description

Double click EM800.exe, it will display figure 4-1:

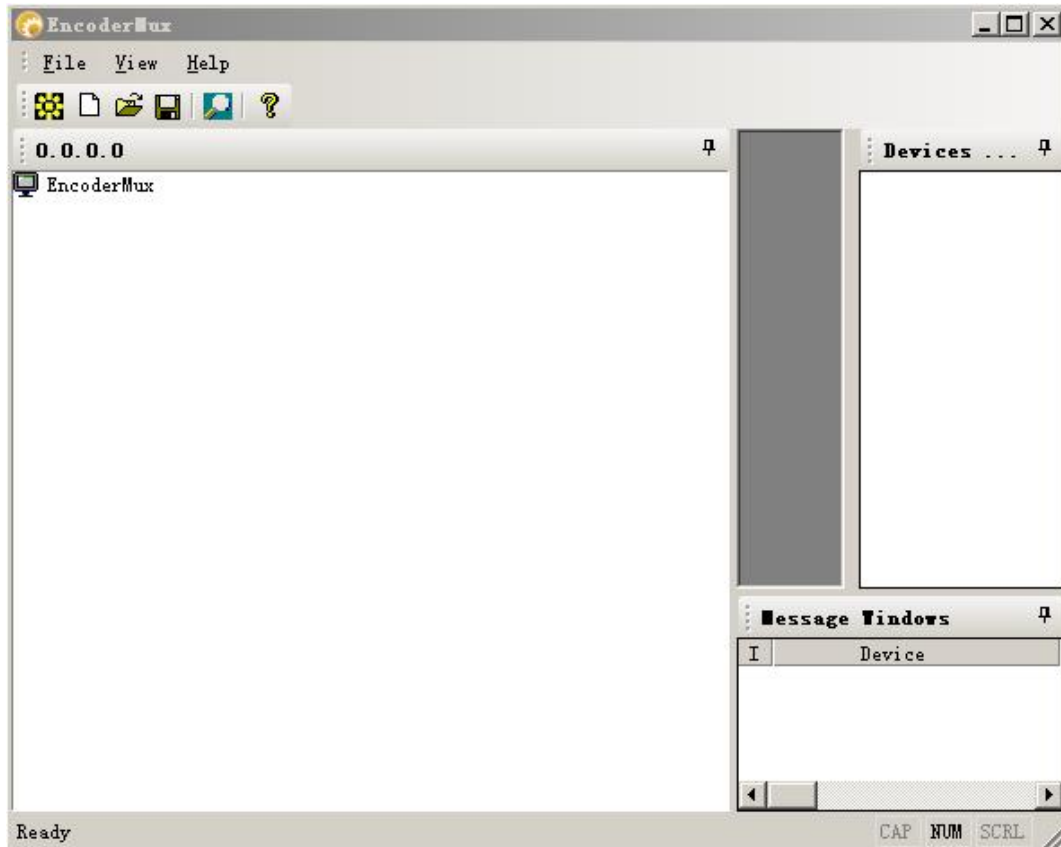





Figure 4-1


The interface in figure 4-1 can be divided into three parts: the upper part is the available toolbar , the left of the lower part displays the device numbers which are connected to the network, the right of the upper part displays encoder parameters, and the right of the lower part displays the status of encoder output interface.

In the toolbar, icon  is to create a new encoder.

Icon  is to open file, the opened file is the file saved in this device after user modifying encoder parameter.

Icon  is to save the modified parameter to this device.

Icon  is the mark to log in network management software.

Icon  is the refresh mark. If the device is not connected after login, press this key to find the device which just logs in without display.

It displays the encoder number on the left of the interface. Each encoder has a corresponding IP address and a green light.

It displays the detailed parameters which can be modified of the encoder on the right of the interface. In the parameter list, the video bitrate cannot be modified. When setting video total bitrate, the system will automatically generate video bitrate, other parameters can operate according to the above system prompts. If the setting goes beyond system specified range, it will prompt a prompt dialogbox to show how to complete modification.

It displays output status of the encoder on the right of the interface to report the encoder's current status: that is, whether the login is correct or not, whether there is video resource input or not, the time of information, etc. From this window, you can obtain encoder working status intuitively.

2.2.1 Search online device

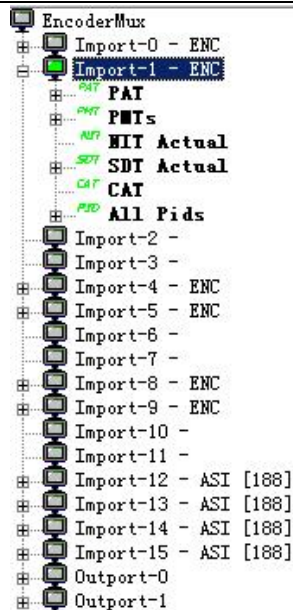
Right click "Devices list" on the right, shown as following figure:



After clicking, it will show up the following window:

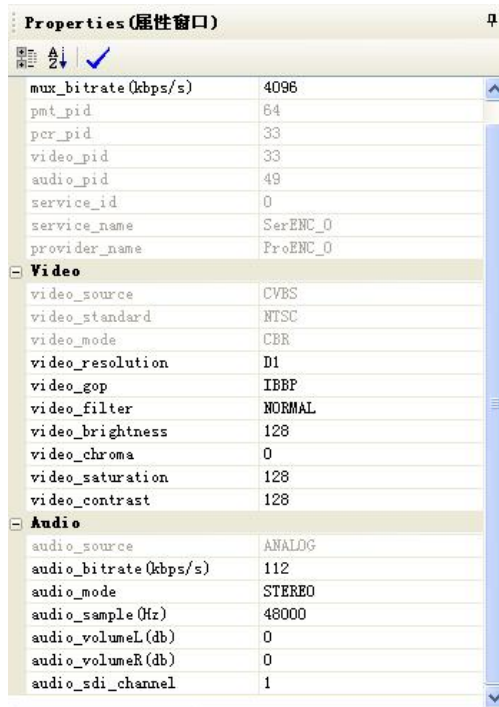


Enter IP address in the above address, it must be in the same network segment with encoder. At the time, it will display the corresponding encoder information on the left:



2.2.2 Enter configuration

Click “PMT” in input port, it will display the following interface on the right of the window:



Properties (属性窗口)	
mux_bitrate (kbps/s)	4096
pmt_pid	64
pcr_pid	33
video_pid	33
audio_pid	49
service_id	0
service_name	SerENC_0
provider_name	ProENC_0
Video	
video_source	CVBS
video_standard	NTSC
video_mode	CBR
video_resolution	D1
video_gop	IBBP
video_filter	NORMAL
video_brightness	128
video_chroma	0
video_saturation	128
video_contrast	128
Audio	
audio_source	ANALOG
audio_bitrate (kbps/s)	112
audio_mode	STEREO
audio_sample (Hz)	48000
audio_volumeL (db)	0
audio_volumeR (db)	0
audio_sdi_channel	1

Services:

Mux_bitrate(kbps/s): configure input bit rate, the scope is 1000-15000

Video:

Video_resolution: D1/HALFD1/SIF/QSIF for options.

Video_gop:IBBP/IBP/IP/I for options

Video_filter:NORMAL/SOFT/SHARP for options

Video_brightness: the scope is 0-255

Video_chroma: the scope is -128~+128

Video_saturation:0-255

Video_contrast:0-255

Audio:

Audio_bitrate(kbps/s):32/48/56/64/96/112/128/160/192/224/256/320/384 for options

Audio_mode:SINGLE/DUAL/STEREO/JOINTSTEREO for options

Audio_sample:32000/44100/48000 for options

Audio_volumeL(db): the scope is -50~12

Audio_volumeR(db): the scope is -50~12

Audio_sdi_channel:1/2/3/4 for options

2.2.3 Output configuration

Click output-0 on the left, it will display the following window on the right:



Properties (属性窗口)	
Output-0	
set_bitrate (kbps/s)	24691
valid_bitrate (kbps/s)	4030
ts_len	188
ip_addr	0.0.0.0
ip_port	0

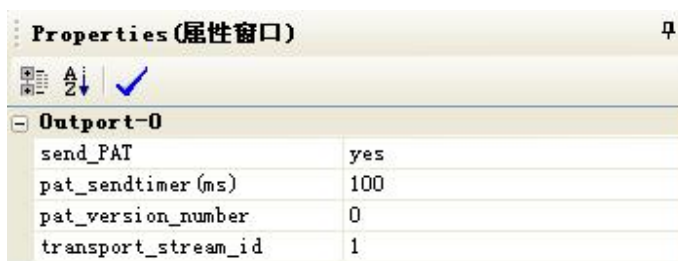
Set_bitrate(): configure the total bitrate of port 0.

Ts_len: choose the length of data package, 188 or 244 for options.

Ip_addr: if it uses network output, enter multicast address, such as 224.2.2.2.

IP_port: enter multicast port, such as 1234 etc.

Click PAT, it will display the following interface:



Properties (属性窗口)	
Output-0	
send_PAT	yes
pat_sendtimer (ms)	100
pat_version_number	0
transport_stream_id	1

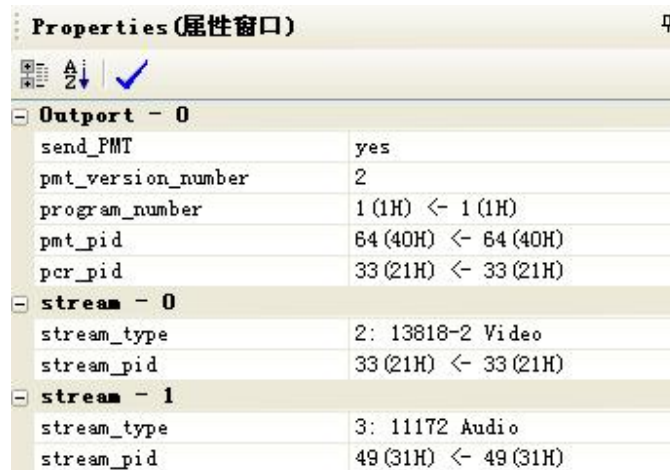
Send_PAT: choose whether to send PAT table or not

Pat_sendtimer(ms): sending time span

Pat_version_number: pat version number

Transport_stream_id: TS stream number

Click IN-1 under the PMT of output port, it will display the following window:



Properties (属性窗口)	
Output - 0	
send_PMT	yes
pmt_version_number	2
program_number	1 (1H) <- 1 (1H)
pmt_pid	64 (40H) <- 64 (40H)
pcr_pid	33 (21H) <- 33 (21H)
stream - 0	
stream_type	2: 13818-2 Video
stream_pid	33 (21H) <- 33 (21H)
stream - 1	
stream_type	3: 11172 Audio
stream_pid	49 (31H) <- 49 (31H)

Send_PMT: choose whether to send PMT table or not, yes is to send, no is not to send.

Pmt_version_number: pmt version number, the scope is 0-15

Program_number: program number, the scope is 0-65535

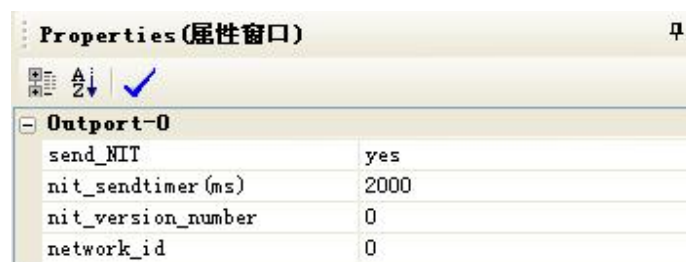
Pmt_pid: can modify manually, also can maintain the default value, but cannot repeat, the scope is 20-8191.

Pcr_pid: can modify manually, also can maintain the default value, but cannot repeat, the scope is 20-8191

Stream_type: TS stream type

Stream_id: can modify manually, also can maintain the default value, but cannot repeat.

Click NIT, it will display the following interface in the right window:



Properties (属性窗口)	
Output-0	
send_NIT	yes
nit_sendtimer (ms)	2000
nit_version_number	0
network_id	0

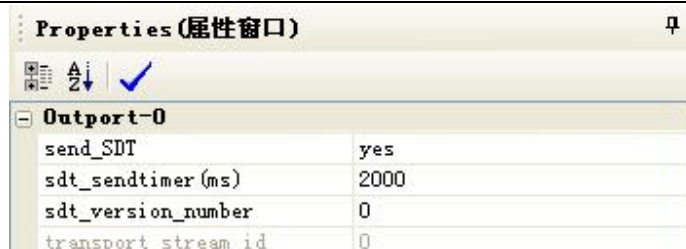
Send_NIT: choose whether to send NIT table or not, yes is to send, no is not to send.

Nit_sendtimer(ms): 2000

Nit_version_number: NIT version number, the scope is 0-15

Network_id: network identification number, the scope is 0-65535

Click SDT, it will display the following interface in the right window:

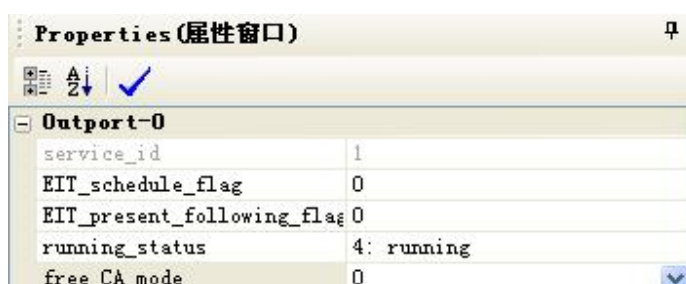


Send_SDT: choose whether to send SDT table or not, yes is to send, no is not to send.

SDT_sendtimer(ms): 2000

SDT_version_number: NIT version number, the scope is 0-15.

Click service_id under SDT, it will display the following interface in the right window:



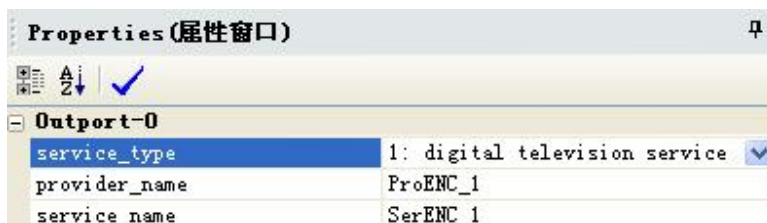
EIT_schedule_flag: 0/1 for options

EIT_present_following_flag: 0/1 for options

Running_status: operational status

Free_CA_mode: 0/1 for options, 0 is not to scramble, 1 is to scramble.

Click desc under service_id, it will display the following interface in the right window:



Service_type: service type, choose from the drop-down menu

Provider_name: provider name, enter according to requirement.

Service_name: service name, enter according to requirement.

2.2.4 Forward program

If there are input signals, the small computer icon will be green, unfold, and right click PMT, shown as the following figure:



If need to output from 0, choose Transfer to output-0 (forward all the services to output port 0).



If need to forward from 1, choose Transfer to output-1(forward all the services to output port 1)。

If need to forward to two output ports at the same time, choose both of the above two.

Attention:

If need to forward to two output ports at the same time, configure program video pid manually, and make sure program video pid of these two ports are the same, otherwise, there is now output.

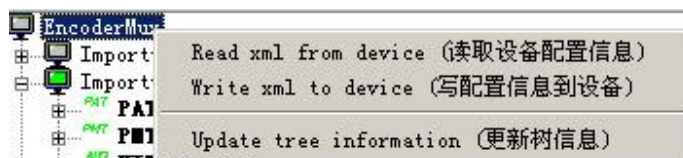
2.2.5 Login conservation

After configuration, click , then click , it will show up login dialogbox. For the sake of security, only administrators know the password. The interface is shown as figure 4-2:



Enter password, then click login.

Then click Encoder-Mux on the left, it will pop up the following window:



Click Write xml to device (write configuration information to device), all the configurations take effect.