OMP500 OTT/IPTV Encoding/Transcoding Platform User Manual

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About Wellav

Wellav Technologies Ltd. is a leading global provider of professional video delivery solutions. The company is committed to developing and manufacturing world-class video processing, monitoring equipment and solutions to help video service providers address real business challenges in video distribution via HFC and IP-based network. The company is headquartered in Huizhou, China with 500 employees in 2 operation centers and over 10 regional sales/support offices around different continents. With global service, Wellav provides system integration and technical expertise to support more than 2000 CATV, FTTH, IPTV/OTT, Satellite/Terrestrial, Broadband service providers to deliver high-quality video programs to hundred millions of viewers around the world. More information about Wellav is available at the company's website, www.wellav.com.

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Overview

This user manual describes the installation, deployment and operation steps of OMP500 from Wellav Technologies Ltd (hereinafter referred to as Wellav).

Specific products of OMP500 include:

Product model/name (Categories)	Product description
OMP500	Any-service Real-time Encoding/Transcoding System
WMS	Real-time Encoding/Transcoding web-based management tool

For the convenience of easy installation and debugging OMP500, the manual will show the step-by-step installation guide and debugging instruction for you. Wellav will also solve all around the various problems encountered in the process of using such products by means of on-site & remote training, product technical support, and so forth.

1. Access to OMP system

OMP500 system performs its management and operation through Wellav Management System (hereinafter refer to as WMS). The WMS is already embedded into the OMP system before leaving the factory if you purchase the all-in-one machine, or we will send the installation package of software to you separately if you have your own server which is capable . The realization of operation and setting of OMP system are all required through WMS.

Important notes:

- **If you have multiple OMP500 and want to install them in the same network, please pay special attention to the network configuration and avoid any IP address conflict. How to change network setting will be described in detail as follows.**

1.1 Access to WMS

When OMP system is installed for the first time, user can log in WMS by its default IP address:

Important note:

- **User needs to confirm that management workstation (PC) must be in the same network as OMP.**
- **User needs to confirm that the default IP address of OMP can be access to (can be confirmed by ping way).**

WMS default IP setting:

ETH0:
IP address: 192.168.254.1

Subnet mask: 255.255.255.0

Default gateway: 192.168.254.255

ETH1:
IP address: 192.168.253.1

Subnet mask: 255.255.255.0

Default gateway: 192.168.253.255

When http://192.168.254.1 or http://192.168.253.1 inputted in the URL address in the browser, user can see WMS login page interface.

2. WMS Description

2.1 Management workstation (PC) configuration

2.1.1 Start web browser

Management workstation must install a Web browser. It is recommended to use Microsoft Internet Explorer 8.0 (or higher), Firefox3.0 (or higher). JavaScript function of the browser need to be enabled. The steps of enabling JavaScript function are shown below:

- Internet Explorer Setting:

Go to Internet explorer Menu, select “Tools →Internet option →Security →Custom level →Security setting interface →Scroll down to pull down slider →To “script” → Active scripting →Select “enable”

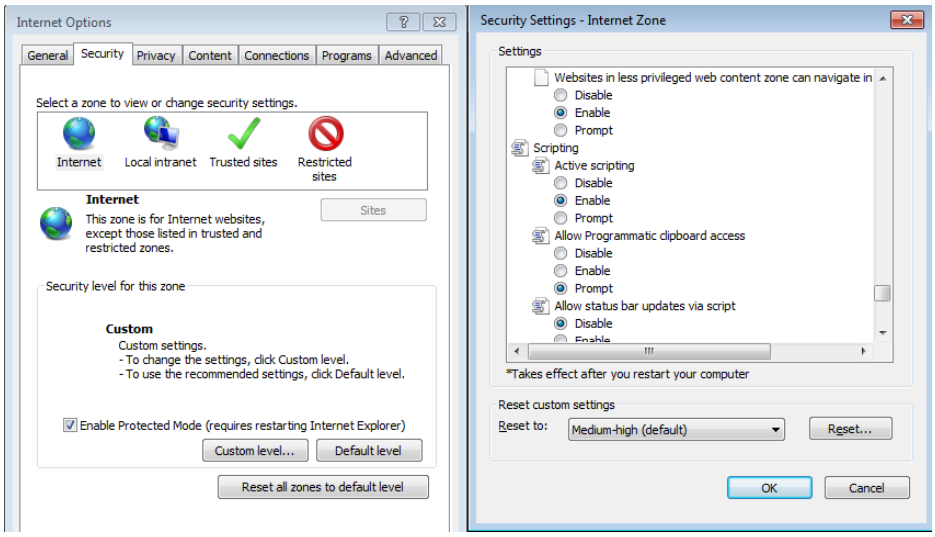


Figure 1: Enable JavaScript function in the Internet explorer

- Firefox Setting:

Go to menu: “Tools→ Option→ Content →Tick to “Enable JavaScript”.

Figure 2: Enable JavaScript function of Firefox

Or you can input “about:config” in the address bar →Search “javascript.enabled” to check whether your Firefox browser enable the java script if your Firefox’s version is relatively newer

In addition, if you need to turn off the password memory function to prevent unauthorized login, please execute the following operations:

- Internet Explorer Setting:

Go to menu: Tools →Internet Option →Content→ Automatically complete →Settings → All options are canceled

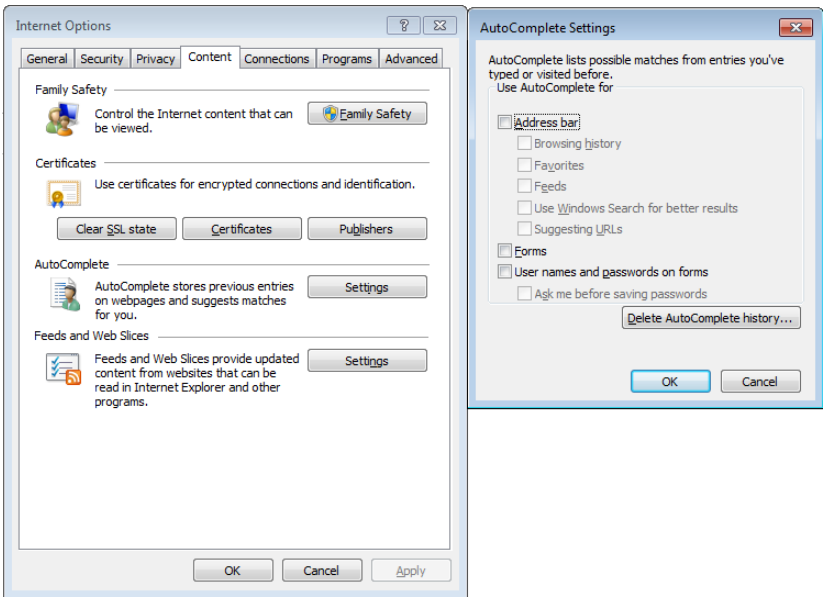


Figure 3: Turn off password automatic memory function in Internet Explorer

- Firefox Setting:

Go to menu: “Tools →Option →Security → Password →Cancel tick before the option of “Remember website password”

Figure 4: Turn off password automatic memory function in Firefox

Or if your Firefox's version is relatively newer, you can go to: Option →Privacy & Security → Login and Passwords →Cancel tick the option of "Ask to save logins and passwords for websites"

2.1.2 Login WMS

Input default IP address in the browser, and enter into WMS login window. The default login administrator's name and password are both "**admin**".

Figure 5: Login WMS interface

2.1.3 Introduction to interface layout:

Picture below shows the main interface after login WMS, which is divided into five parts:

1. The first part shows the company's logo and product name;

2. The second part consists of the interface of switching languages, and the "About" to get software version information, the "Help" to get support and the "Log Out" button to exit the system;

3. The third part of the system is status bar, displays the current login account, whether the system running has the Alarm and the current time of the system;

4. The fourth part is the main menu window;

5. The fifth part includes storage space management and system status.

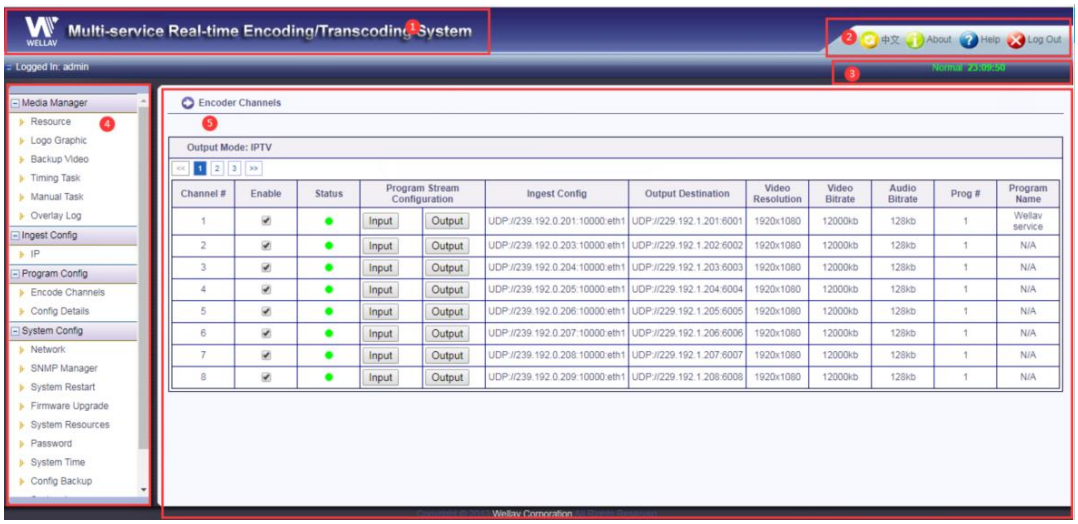


Figure 6: WMS Home page in OMP

2.1.4 Use correct login password

The factory setting account, password and username are the same “**admin**”. So it is recommended that the user modifies firstly the password for his own account after first login.

2.2 Change system language

WMS supports in both Chinese and English languages, after the user connects to WMS, before or after his landing can change the language type of the system.

Before the user logs in WMS, please click “Chinese” or “English” in the login Window to change the corresponding language type.

After the user logs in, please click and select “Chinese” or “English” at the upper right corner of WMS, and then click “OK” or “Confirm” button in the pop-up window, it just becomes the appropriate language type as shown in following diagram.

Figure 7: Language window in changing interface

2.3 Modify login password

Click the “Password” submenu in “System Config” menu on the left side of the page, and enter to modifying the System Password window as shown in following diagram. In this window, first enter the current password, then enter the new password and confirm it again, click “Set Password”, you can complete the password modification.

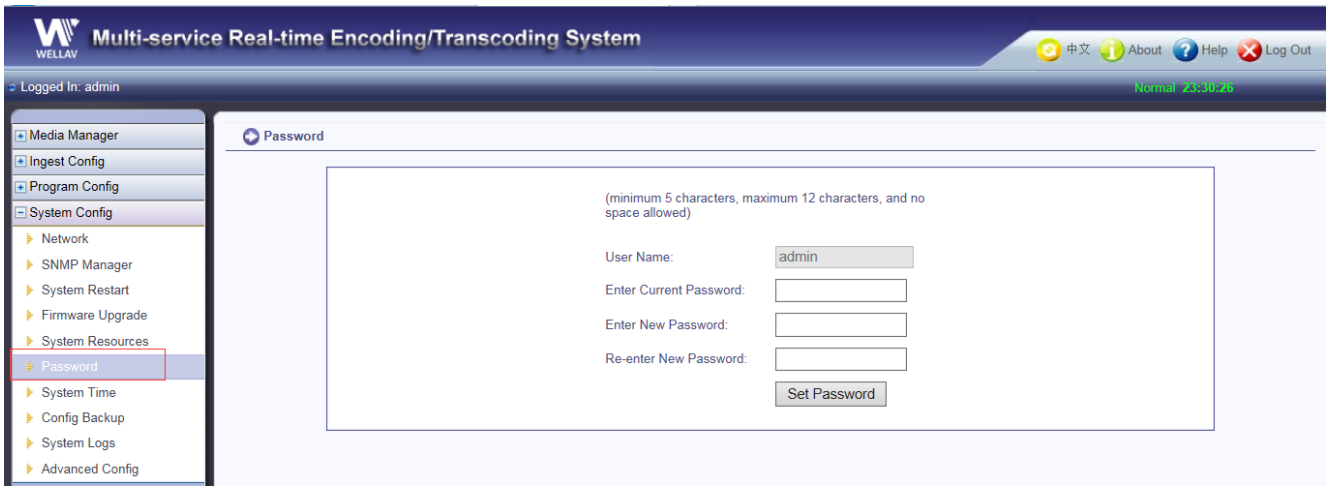


Figure 8: Modify password window

3. WMS management

3.1 Network Configuration

Network Configuration is the first step in the system management, only system network is configured properly then can the user operate the OMP system by system management Interface. The user can land WMS system management interface in accordance with the factory default IP setting provided by the System Specification, after your correct landing system, click “System Config” menu in the menu on the left side, and then select the “Network”, you can carry out the Network Configuration.

This network Configuration refers to configuration for the IP address of the OMP system itself. Please note that there are several different IP addresses in the parameter configuration process of the OMP system as shown in following diagram:

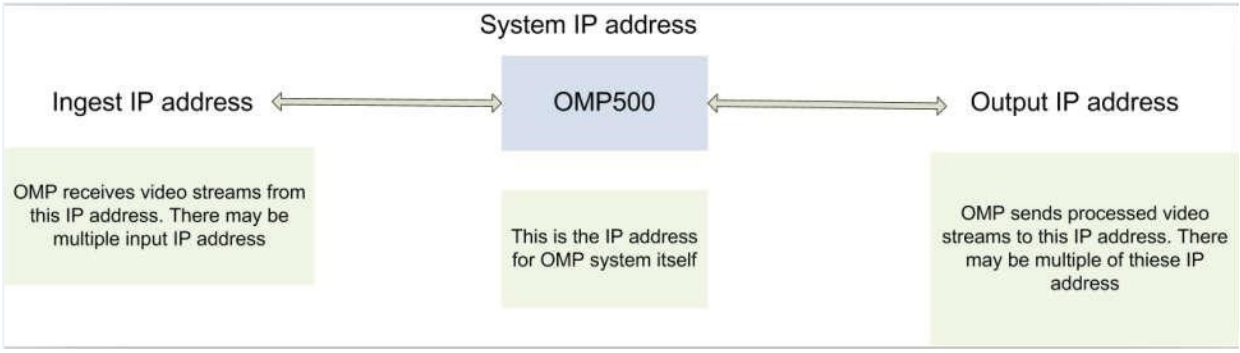


Figure 9: IP address explanation

3.1.1 Configuration of dual network ports (option)

The user can customize the operating mode of the dual network ports, i.e. two network ports are all working port. The specific location of the network port is different with different hardware platforms. From one side of the OMP system away from the power supply, two physical network ports are classified a group in the left ---- NIC1, as well as the two physical network ports are classified a group in its right side ---- NIC2.

Click on the network configuration submenu, it will appear in the two parts of the network configuration, and the input and output network interfaces on the right side. The user can configuration one of parts as the input port, and the other is an output Port to distinguish the input / output data stream areas, and the input / output ports can be set as different network segments, to facilitate the user’s work in different Network Segments. NIC1 and NIC2 can all become the login IP address of WMS (as shown in following diagram).

User can reset the IP address, subnet mask and default gateway through the network configuration page, and then click setting finish, click Submit button, as a result the new setting is completed. After submission is successful, the system will automatically reboot, please follow the new IP address to access the device management interface after rebooting.

- **Important note**: once the IP address is changed successfully, user can use the new IP address to access WMS.

User can now modify the network configuration of management workstation, and reconnect the OMP system to verify whether the new configuration takes effect.

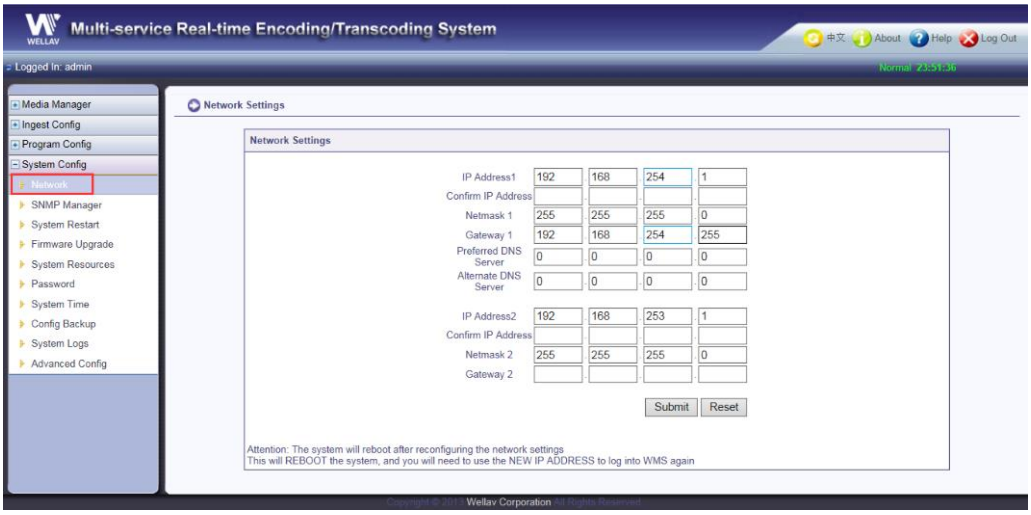


Figure 10: Network Configuration page

3.1.2 Multi-network port configuration (option)

The user can customize the work mode of multi-network Interface, namely, it contains two or more NICs, and two network interfaces of one NIC are back up for each other as control Port, other NIC ports are used as a video input and output ports. The specific location of the network Port is different with different hardware platforms. Generally from one side of the OMP system away from the power toward the right, they are NIC1, NIC2, NIC3, NIC4, NIC5 and NIC6 by turns.

The system can control network Port binding or non-binding mode through license. Network Port binding mode means that two network interfaces in one of three NICs are backup each other. Network Port non-binding mode has three NICs, six network interfaces, one of which has respective separate IP address for the user option as the input or output port. Click on the Network Configuration submenu, will show the Network Configuration on the right side. The user needs to specify the IP addresses of multi-block NICs, can set different network segments, which is user-friendly in different network segments. Any IP address can be used as the login IP address of WMS as shown in following diagram:

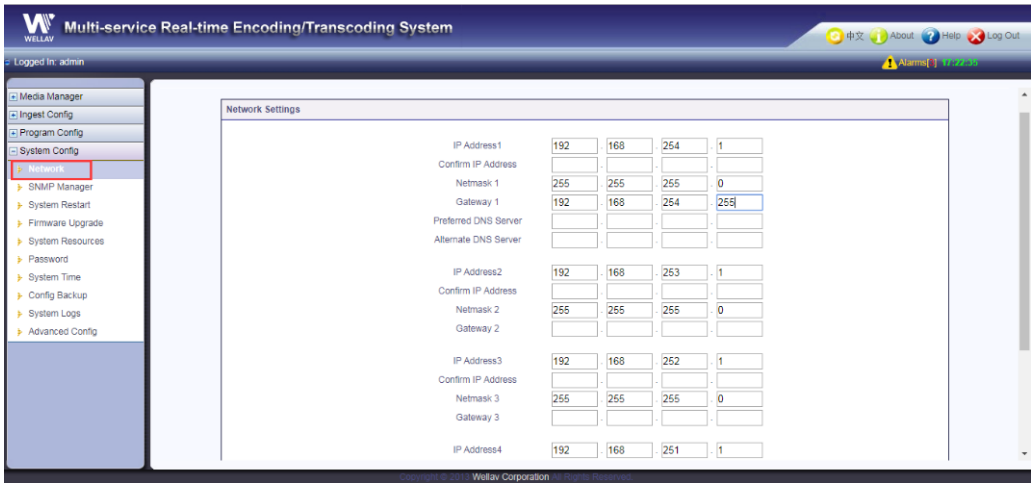


Figure 11: Network Configuration page

The user needs to specify the video input network Port in “IP Ingest configuration” page as shown in following diagram:

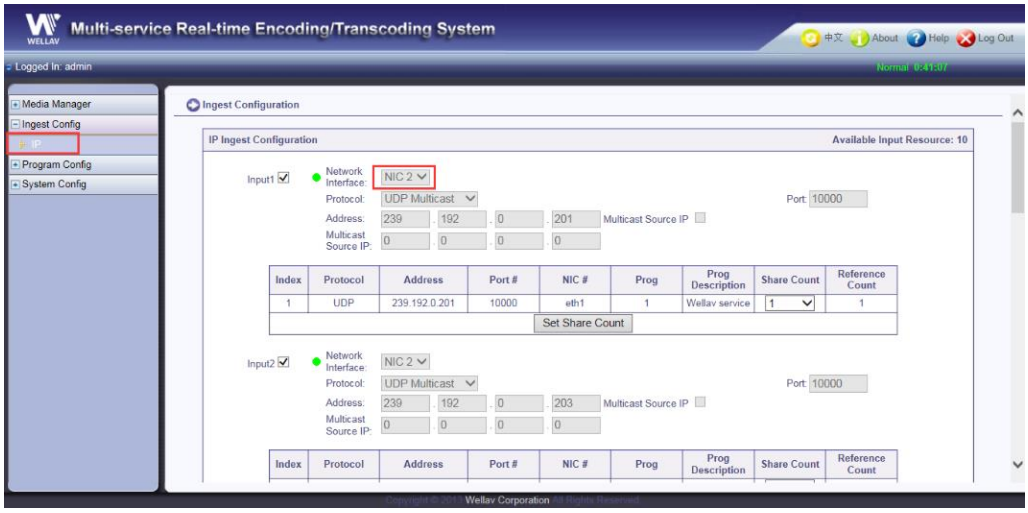


Figure 12: IP input Source configuration

The user needs to specify which network Port the output video streams through in the output webpage as shown in following diagram:

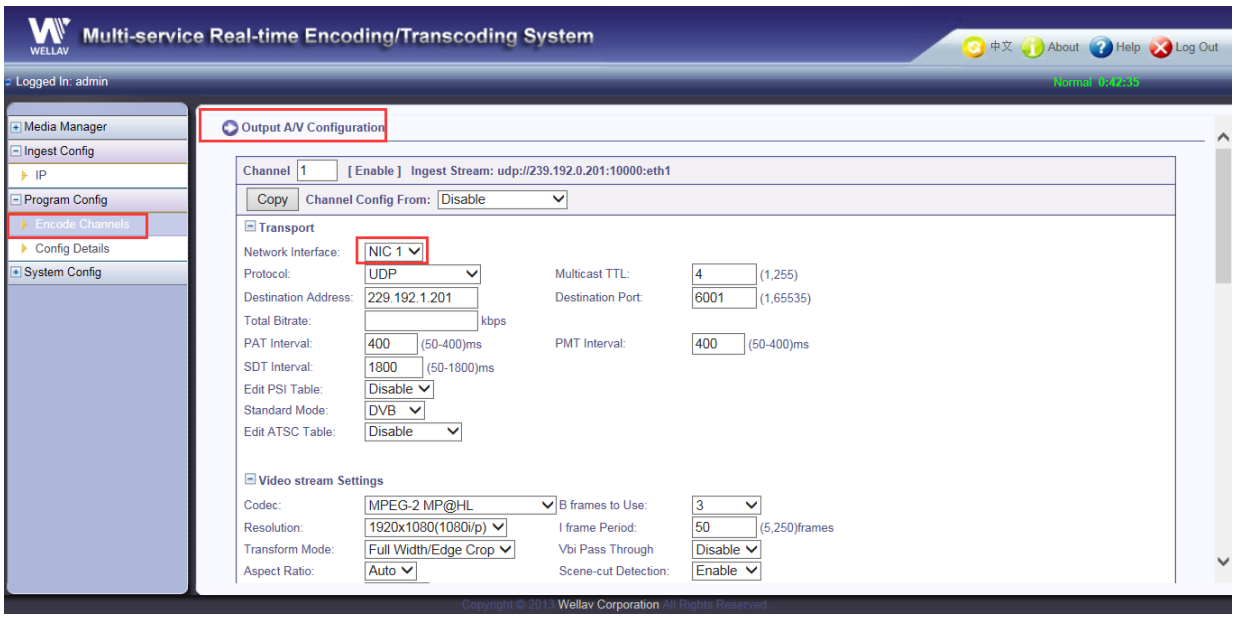


Figure 13: Channel output

3.2 System Upgrade management

- Important note: all the encoding and transcoding tasks should be stopped before upgrading.

System software needs to upgrade from time to time, to restore the loopholes in the system and add new product features. The OMP500 system upgrade is very simple, and all the encoding and transcoding tasks should be stopped before upgrading.

Please refer to the following System Upgrade process:

3.2.1 Quick Upgrade Guide

Download the HW info file from WebGUI →Send the HW info file to Wellav's support to get license upgrade file→ Get the installation package of software from Wellav's support →Stop all the encoding and transcoding tasks → System firmware upgrade

3.2.2 Upgrade steps

Download the HW info file

Click the "Firmware Upgrade" item on the left menu →input the device name→ click "Download" to get the license configure file

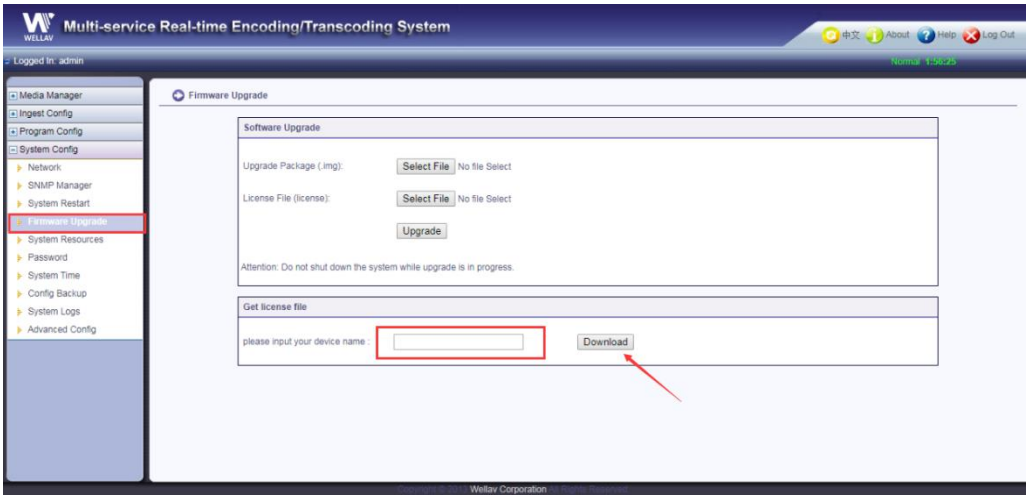


Figure 14: Get the HW info file

System firmware upgrade

After get the software installation package and license upgrade file from Wellav, then you can process the firmware upgrade. That means you need to import the right HW info file(license) and upgrade package(.img) at the same time in the page to complete the upgrade.

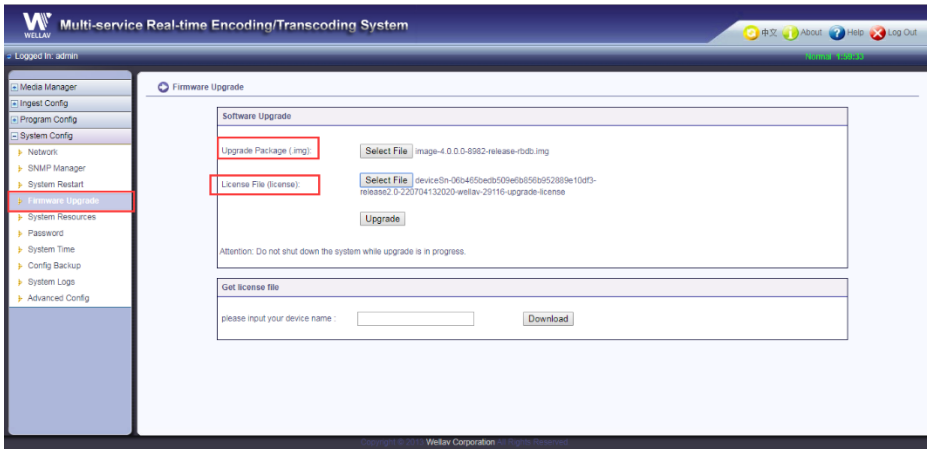


Figure 15: Import the upgrade package and HW info file

3.3 Change System Time

OMP system provides the change and automatic correction module of System Time. User can change system time under the “System Config” menu, through manually modification or automatically sync up with Internet time:

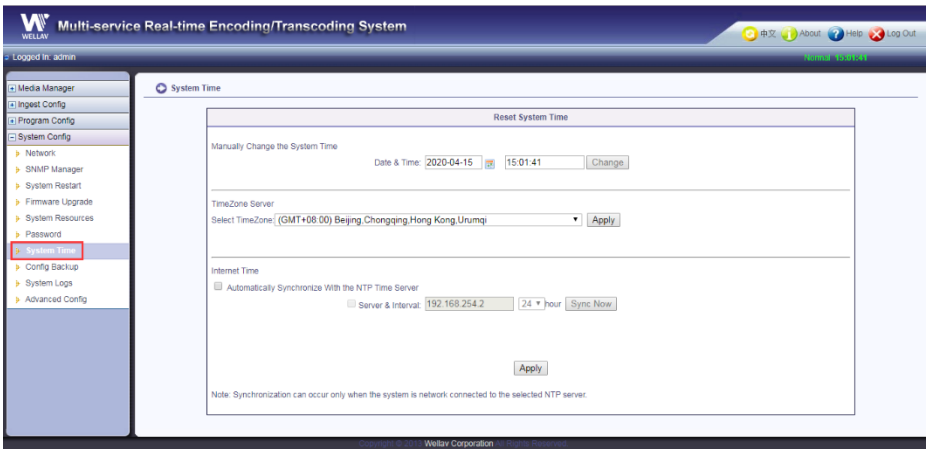


Figure 16: Modify system Time

3.4 Restart or close the system

Reboot option of the system is under the “System Config” option, the option provides the function of Reboot and system turn-off for the user.

Figure 17: Reboot and turn off the system

Note: Do not cut off the power before the OMP completely turn off. User shall manually cut off the power supply until the OMP fan stops completely (3-5min approximately after clicking the “Turn Off System” button).

3.5 Restore factory settings

If you want to do factory settings for the system, please get support from Wellav, there are no restore menus in the WebGUI, Wellav’s technician will support you to finish that via some commands from the background.

After restore factory settings, all configurations are initialized in the OMP system:

- Restore as default Network Configuration for the system --- ETH0: 192.168.254.1, subnet mask: 255.255.255.0, gateway: 192.168.254.255.
- Restore the system default encoding/transcoding scheme
- Empty logs
- Delete import and export packages
- Empty business configuration contents
- Restore default password - username “admin” and password “admin”
- Restore default time

3.6 Basic System Configuration information

User can check the product serial number, software/hardware version, and other basic information of the system through “About” button:

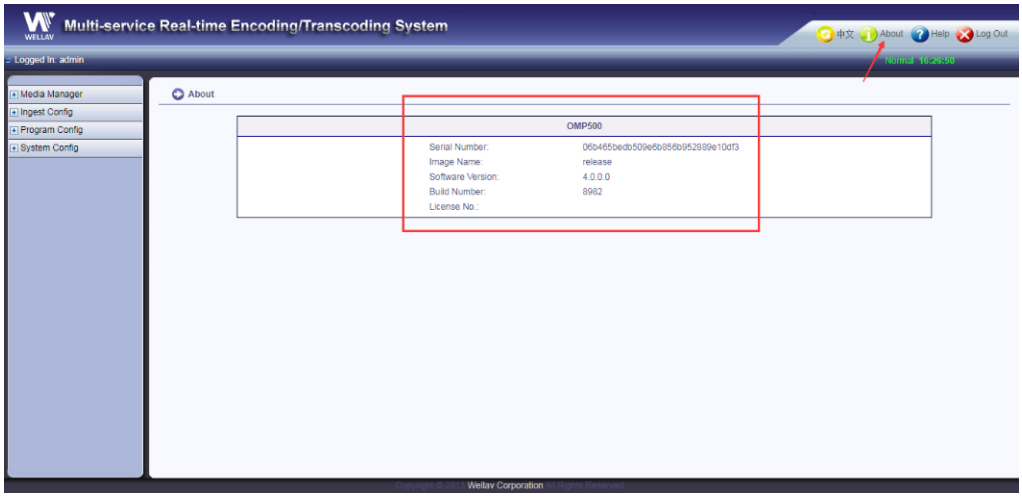


Figure 18: About

3.7 Read serial number of device

Each OMP system has a unique serial number. The serial number can be checked through 2 ways:

- Through the label attached on the machine

- Through “About” menu in WMS

3.8 Read system log

System logs recorded the history of the system, you can clear or save the log via WebGUI

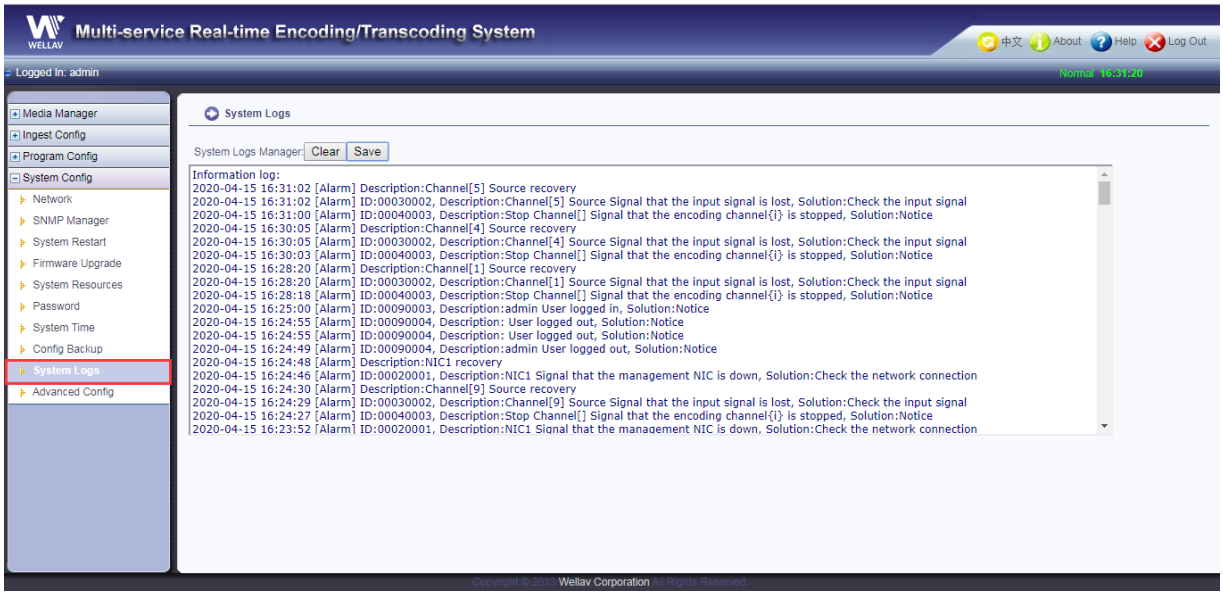


Figure 19: System Logs

Note: the size of the log content is limited, generally it may be kept several months, so it is recommended that the user saves regularly logs in a separate file as a historical record for the query in the future.

3.9 System Alarms

OMP500 once starts, will monitor system hardware’s status including the system temperature, fan speed, input signal, and network connection signal, and so on, and input and output of core coding in real-time and uninterrupted. If the system occurs in abnormality, it will issue alarms report. Under the normal circumstance the user sees “normal running” word in green at the upper right of the management system, indicating the system without alarms.

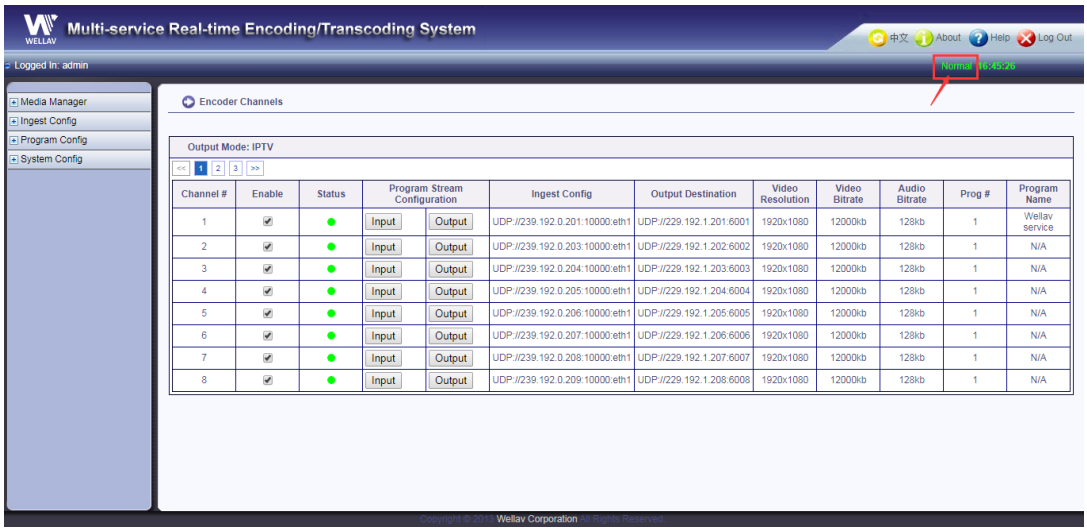


Figure 20: Normal running - without alarms

If above word becomes yellow “Alarms”, it means that the system met some issues, like the temperature is too high, and signal source is lost, and so on. When the user clicks on the “Alarms”, the system will show the details with opening another page:

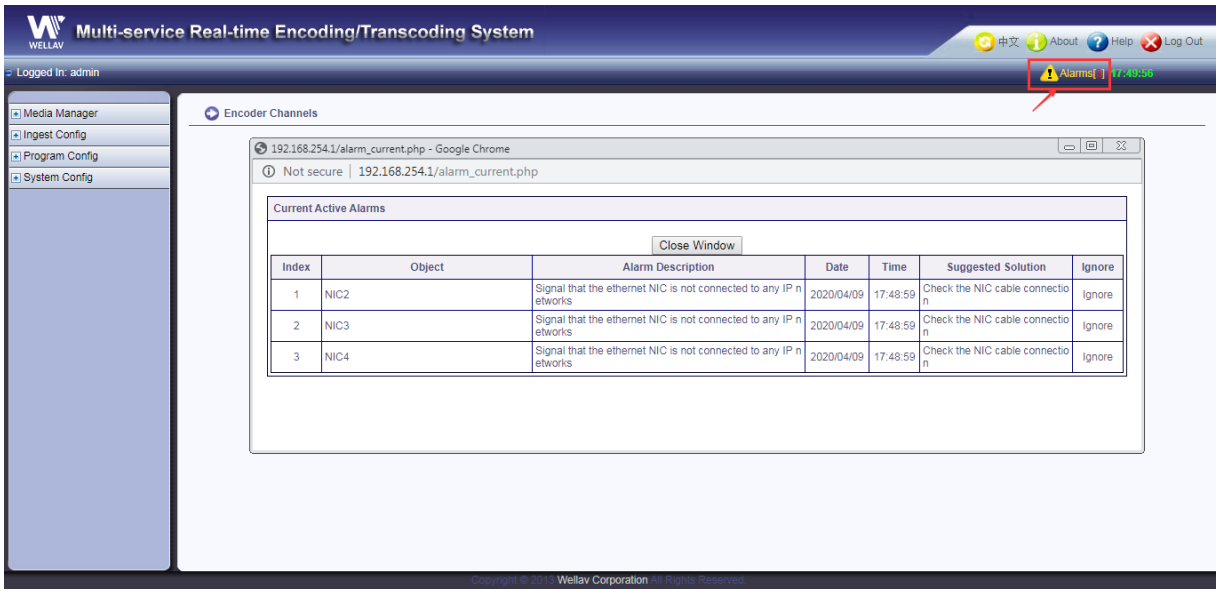


Figure 21: Alarm pop-up window

The user can select system recommended method or other effective methods to release the alarms, also click the Ignore button to ignore the alarms. When the user selects Ignore, the alarms message is ignored, and the system interface displays a normal running state, but the alarm situation still objectively exists.

3.10 Advanced Config

OMP500 system allows the user enable or disable Telnet/SNMP port

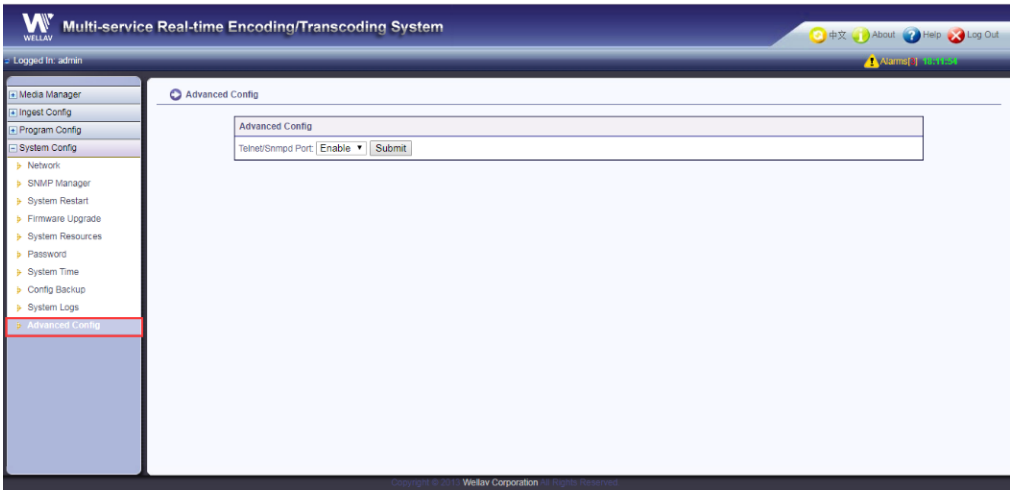


Figure 22: Advanced Config

3.11 Monitor through SNMP

Use SNMP monitoring

OMP500 supports SNMP monitoring status, the user can use the SNMP user-end (such as MG-SOFT MIB Browser) to monitor multiple OMP status.

Use OMP MIB

The user can get OMP MIB by technical support or business, save WELLAV-MONITOR-MIB.txt to a local computer folder.

The user can use any MIB browser to view the OMP MIB, wherein we use the MG-SOFT (1) as demonstration.

Download MG-SOFT MIB Browser and install.

Compile MIB

a. Start →All Programs →MG-SOFT MIB Browser → MIB Compiler
b. Compile MIB library, file→ compile and select WELLAV-MONITOR-MIB.txt mib file
c. After compiling, select save all, and then click on “OK”
d. Close MIB Compiler

View SNMP information

a. Start → All Programs→ MG-SOFT MIB Browser→ select MIB Browser
b. Select WELLAV-MONITOR-MIB and upload in the MIB column
c. Enter IP address of OMP system in the Query column, can conduct RMON OMP information
d. Select Action→ contact and polling Wellav branch under the mib tree, it can be finished

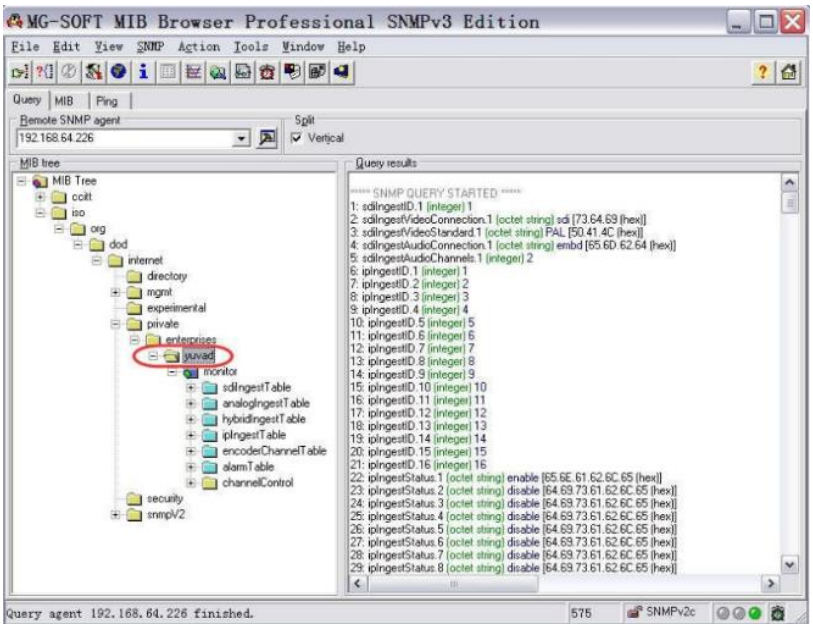


Figure 23: View Wellav information

e. Select action→ contact and polling the Internet branch under the mib tree, can query NIC Network Information, the host branch can query the storage and hard disk partition information.

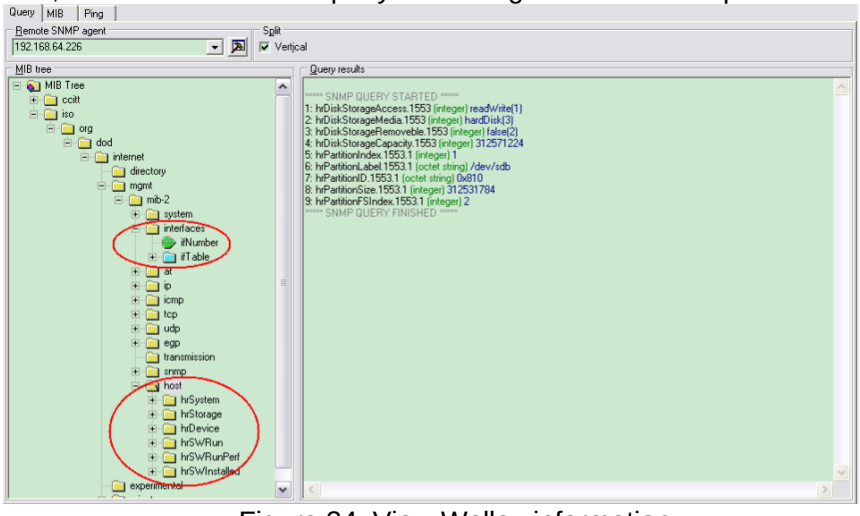


Figure 24: View Wellav information

Set the channel state through SNMP

a. Find channel Control branch in a mib tree, there are the channel start channel enabling and the channel stop node respectively.

b. Put mouse on the Channel Start right key, select the Set, Set dialog box can appear just in, the user simply needs to fill out the enabled channel IP in Value To Set column, clicks the Set button, can control the enabling of the channel. The channel IP must correspond to the actual channel starting at 1.

c. Put mouse on the Channel Stop right key, select the Set, Set dialog box can appear just in, the user simply needs to fill out the enabled channel IP in Value To Set column, clicks the Set button, can control the enabling of the channel. The channel IP must correspond to the actual channel starting at 1.

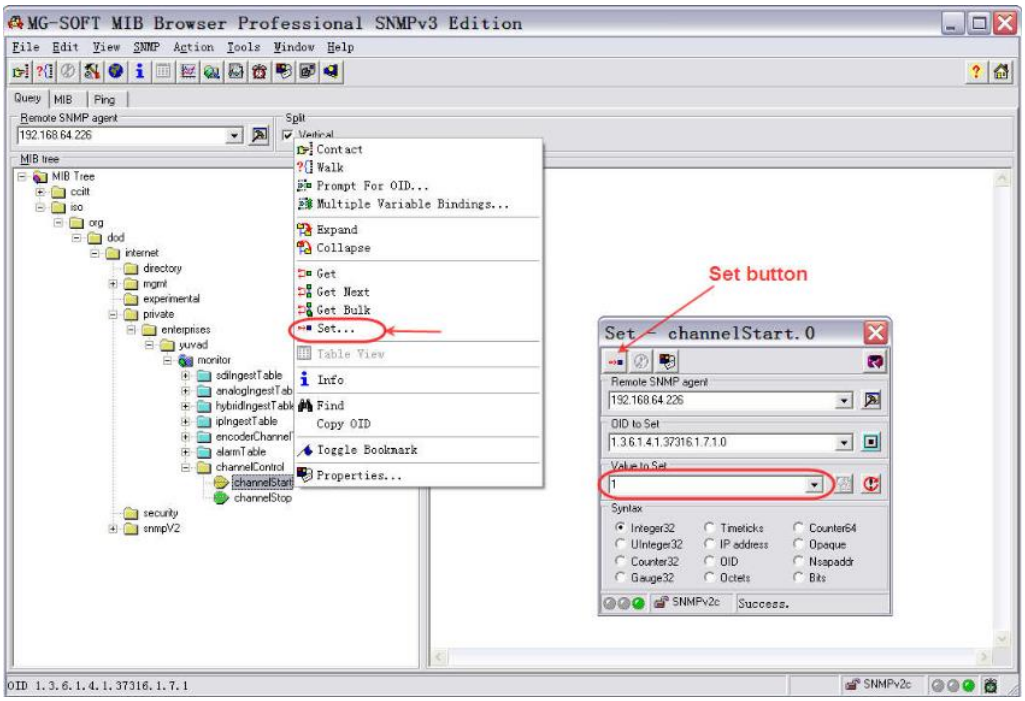


Figure 25: Set the channel state

3.12 System resources

As for offline products, the system provides real-time CPU and memory usage for the user view:

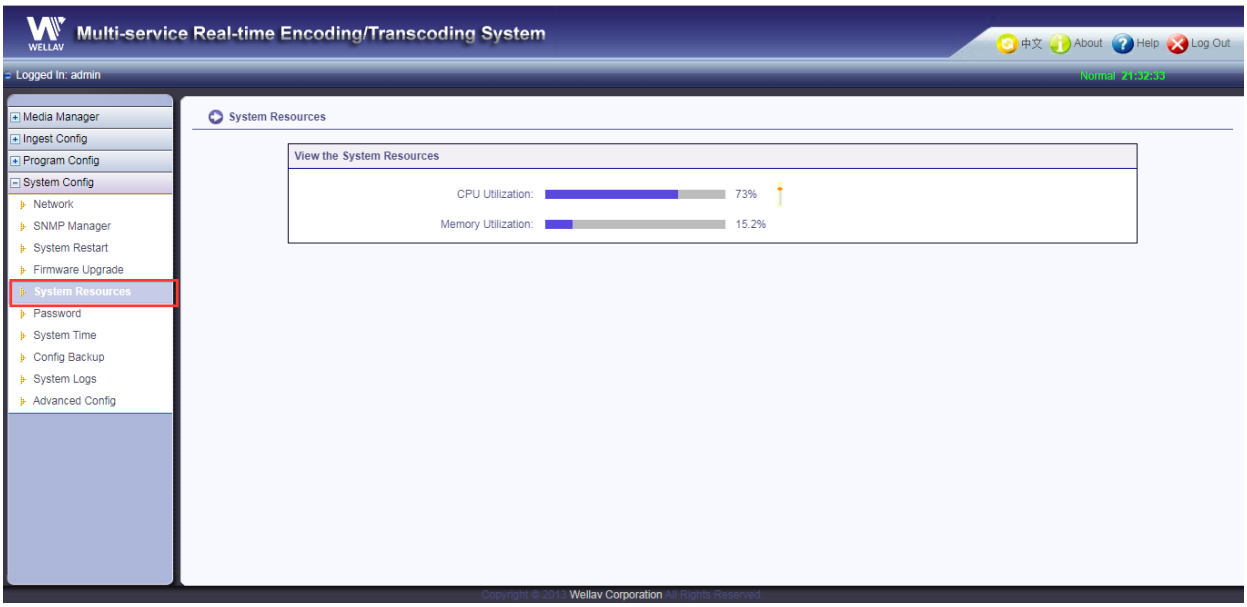


Figure 26: CPU and memory usage

3.13 Config backup

Superimposed and spots system has specific system backup features. The user can realize the backup or service configuration through the configuration of the import and export functions.

Note: the system will automatically restart after the system restores or reinstalls the import backup.

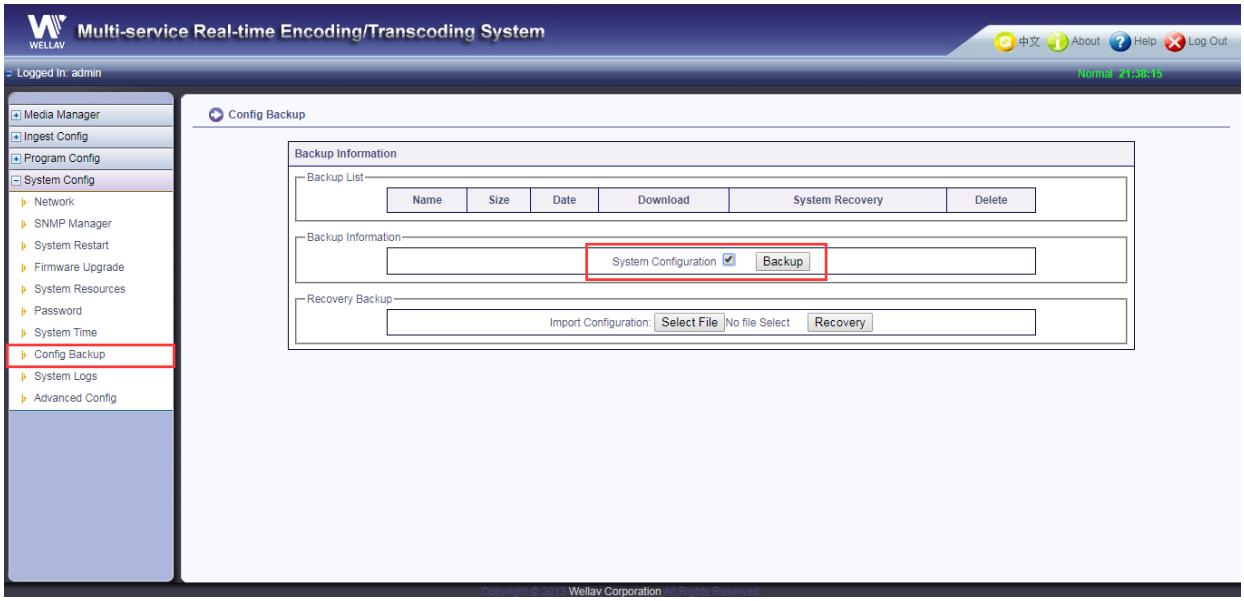


Figure 27: System config backup

System backup carries out backup for system presetting, input configuration and coding channel.

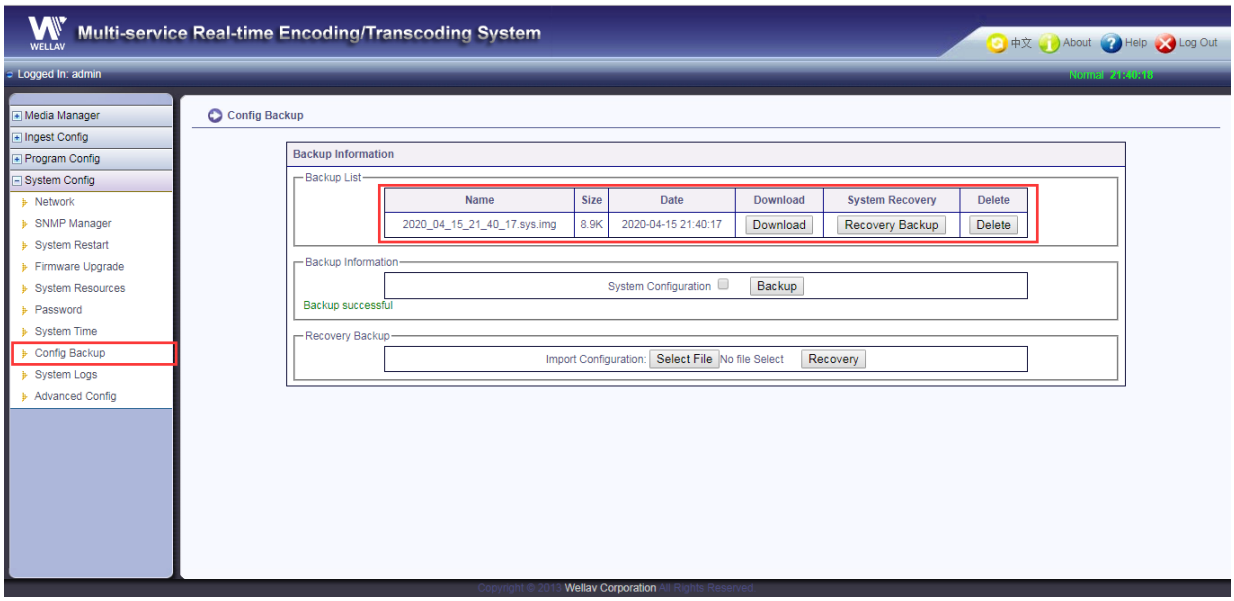


Figure 28: Backup system configuration

Operational procedure:

- **Backup**: click on this function key, the user can realize system backup feature and generate backup list;;
- **Download**: after configuration is backup, you can download the file to local for save, suffix name of the files is .img, it is user-friendly for reuse;
- **System recovery**: can save some backup in the system, the system will restore itself after click;
- **Delete**: supports backup deletion, saves resources;
- **Recovery**: after user import the backup file, click this Recovery can recover the configuration as the import file.

4. Encoding/Transcoding system configuration

Encoding/Transcoding configuration is the most basic configuration in the OMP500 system, after the user logs in the system, first needs to configure the input mode, and then enter the program and output encoding/transcoding parameters for the encoding/transcoding channel configuration. Various input and output parameters are only correctly configured, the system correctly transcodes and outputs to the lower end of the device that can be ensured that.

After user administrator logs in WMS, can find two major items of encoding/transcoding scheme in the main menu zone: the Encode Channels and Config Details are shown in the Figure below. The Encode Channels is used mainly in the channel configuration, program select, output audio and video configuration and so on. Config Details is mainly used for the selection and configuration of the input source.

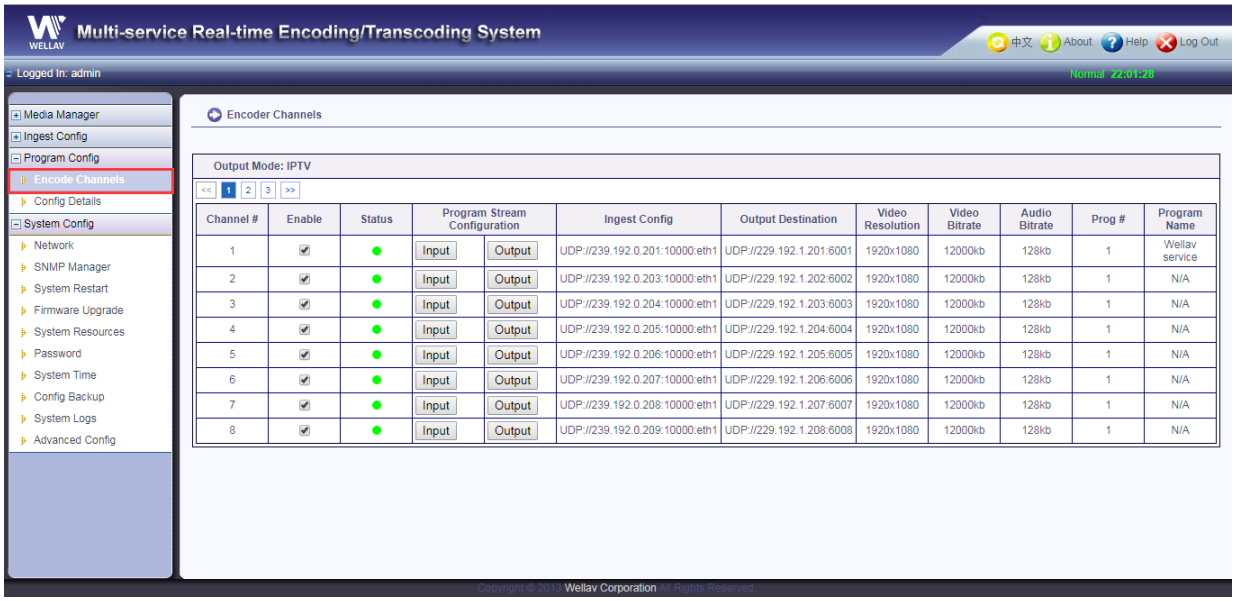


Figure 29: Encode Channels

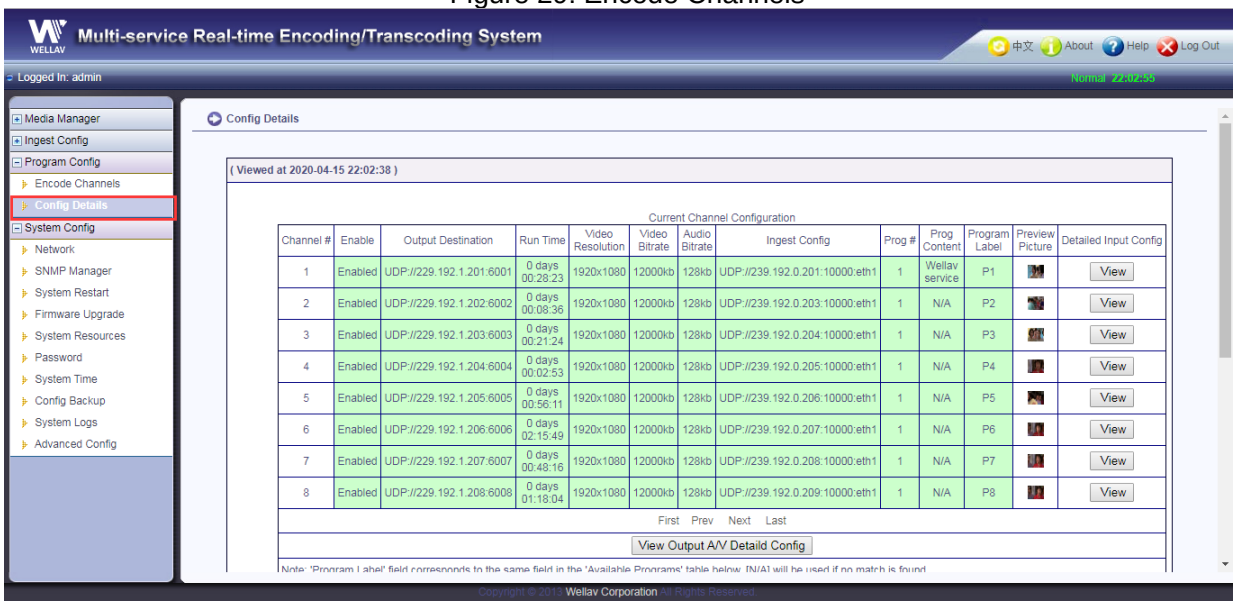


Figure 30: Config Details

4.1 Ingest Config

This section describes how to configure the IP input for the user.

The number of IP input interfaces of system default is the same as number of channels license allows. Each interface supports input of various protocols such as UDP Unicast, UDP Multicast, RTP Unicast, RTP Multicast, TCP, RTMP,NMS, TS over HTTP, RTSP, FLV over HTTP, HLS. The only mark of each IP address and port is an input interface. The system specifies that the port code must be between 1 and 65535 as shown in the following diagram:

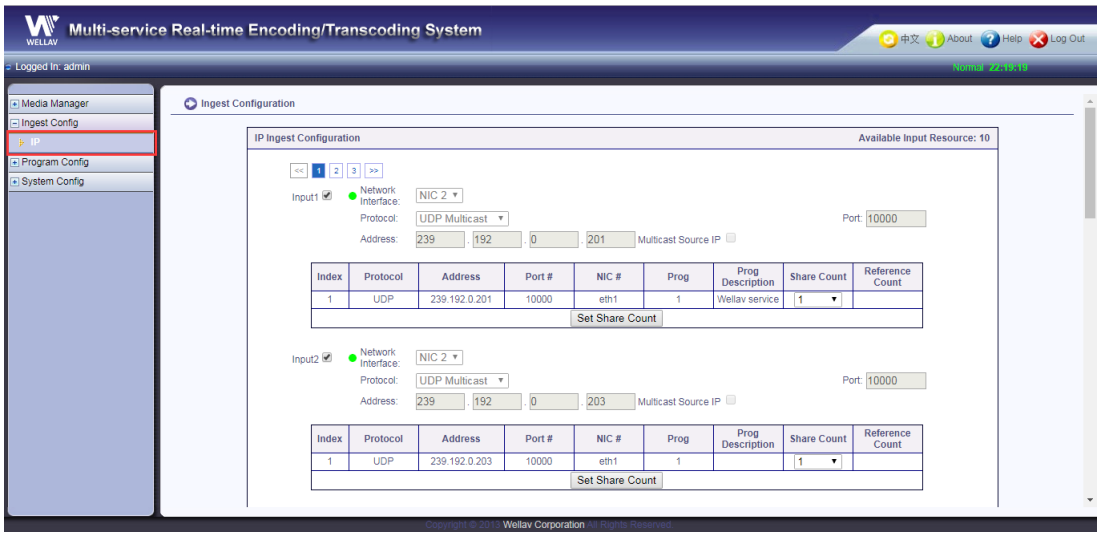


Figure 31: Ingest Config

After the user has configured the address and the port IP input, needs to tick within the box in front of the input channel to activate the input port. If there is data through the port, then the channel logo is green as shown in above diagram, but if there is no data through the port, then the channel logo is orange. If the video source the system received is multicast, the system supports IGMPv3 protocol, the user can tick the IP address of equipment to input and send video source after the v3 protocol box. The user can send UDP Unicast or Multicast by the owned equipment, after the IP address of the owned equipment is changed, please restart the Host device.

The user needs to configure the RTMP input, can directly enter the server domain name or IP address, FMS path. It also needs to be noted that: when the user needs to enter the server domain name, please firstly in system configuration network configuration fills in the DNS address, restarts the encoding/transcoding system to make the network address take effect, this moment the domain name and address can be used effectively.

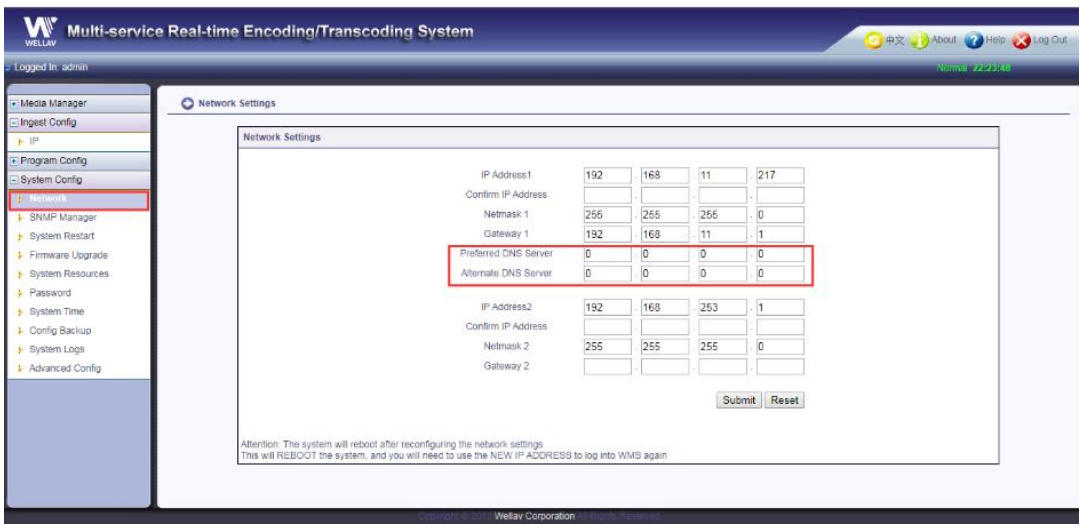


Figure 32: DNS Config

In addition, the user can also set the number of input shared channel. If it is not specifically set, this system default value is 1 i.e. the multichannel can use the signal source, but it cannot guarantee that the synchronization of all channel outputs. If the user needs a multichannel synchronous output, then needs to set this value. If the user needs four channels to share the same signal source at the same time, the shared number should be set to 4, because OMP500 supports up to 16 channels, the optional value is 1 - 16. If the user needs multichannel synchronous output, should disable “scene handover detection” and “I frame interval” should be set to the same value. When IP input source is used, the video streaming is in normal input circumstance, the shared channel selection bar can only exist. The shared number is shown in the diagram:

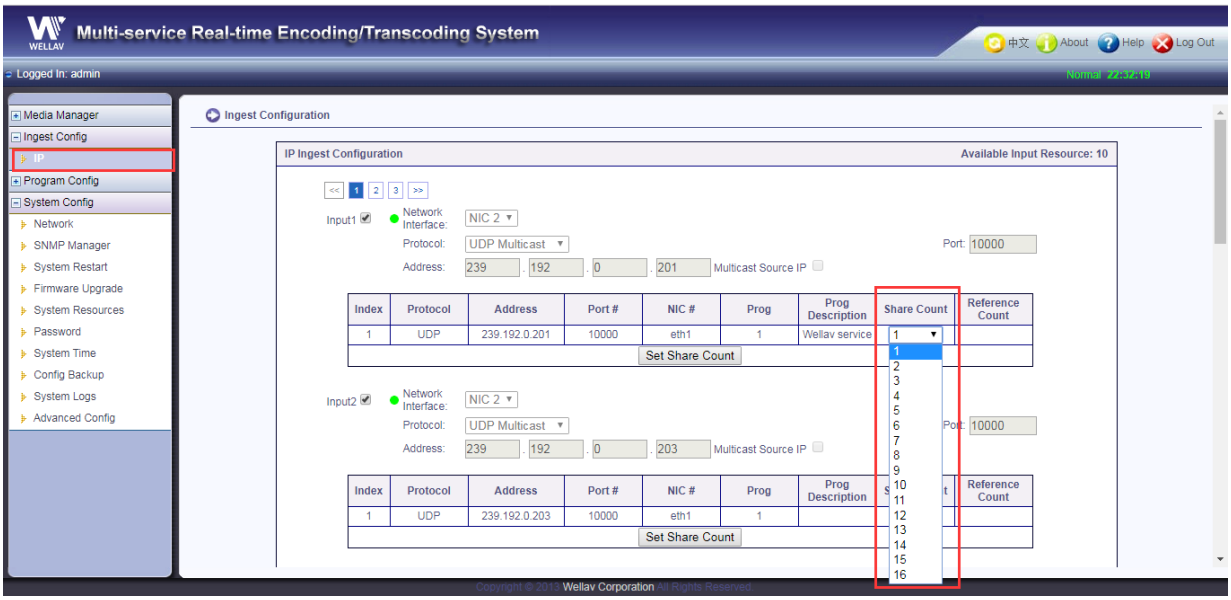


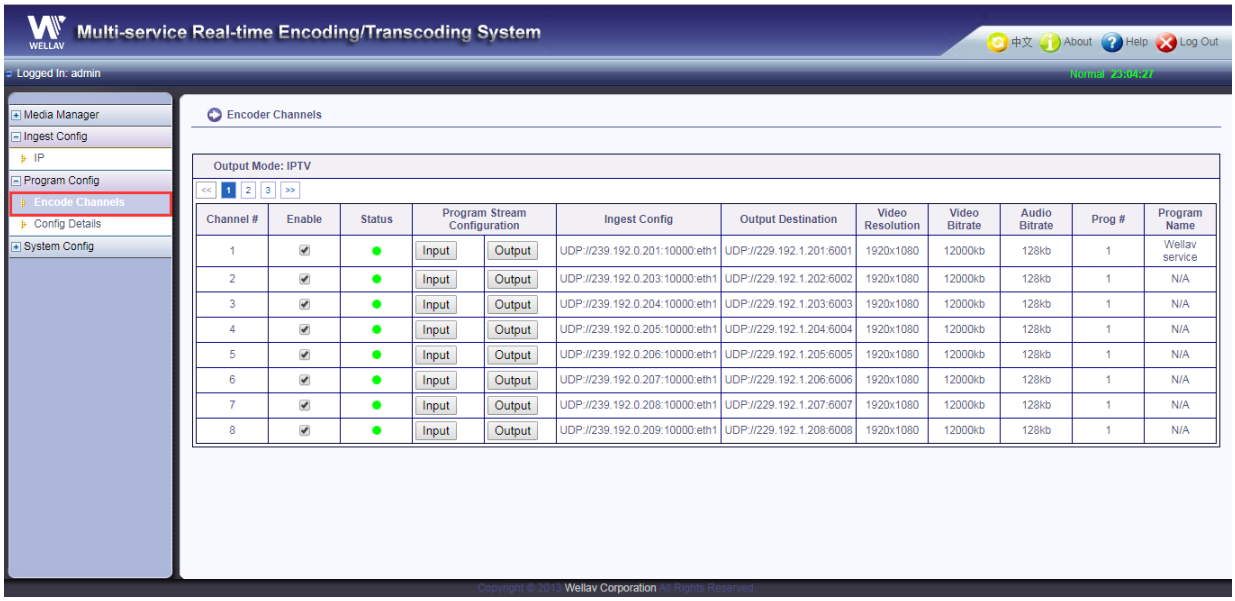
Figure 33: IP Share Count

4.2 Program configuration

After the input configuration of the system is correctly completed, the next step is that the user can click the Encode Channels option on the left-hand column to configure the input and output parameters of the encoding/transcoding system, and have an overview about the input and output by clicking Config Details from left column

4.2.1 Encode Channels

When the user selects and enters the Encode Channels, it will show the running status and basic info of all the channels.



Channel #	Enable	Status	Program Stream Configuration		Ingest Config	Output Destination	Video Resolution	Video Bitrate	Audio Bitrate	Prog #	Program Name
1	☑	●	Input	Output	UDP://239.192.0.201:10000:eth1	UDP://229.192.1.201:6001	1920x1080	12000kb	128kb	1	Wellav service
2	☑	●	Input	Output	UDP://239.192.0.203:10000:eth1	UDP://229.192.1.202:6002	1920x1080	12000kb	128kb	1	N/A
3	☑	●	Input	Output	UDP://239.192.0.204:10000:eth1	UDP://229.192.1.203:6003	1920x1080	12000kb	128kb	1	N/A
4	☑	●	Input	Output	UDP://239.192.0.205:10000:eth1	UDP://229.192.1.204:6004	1920x1080	12000kb	128kb	1	N/A
5	☑	●	Input	Output	UDP://239.192.0.206:10000:eth1	UDP://229.192.1.205:6005	1920x1080	12000kb	128kb	1	N/A
6	☑	●	Input	Output	UDP://239.192.0.207:10000:eth1	UDP://229.192.1.206:6006	1920x1080	12000kb	128kb	1	N/A
7	☑	●	Input	Output	UDP://239.192.0.208:10000:eth1	UDP://229.192.1.207:6007	1920x1080	12000kb	128kb	1	N/A
8	☑	●	Input	Output	UDP://239.192.0.209:10000:eth1	UDP://229.192.1.208:6008	1920x1080	12000kb	128kb	1	N/A

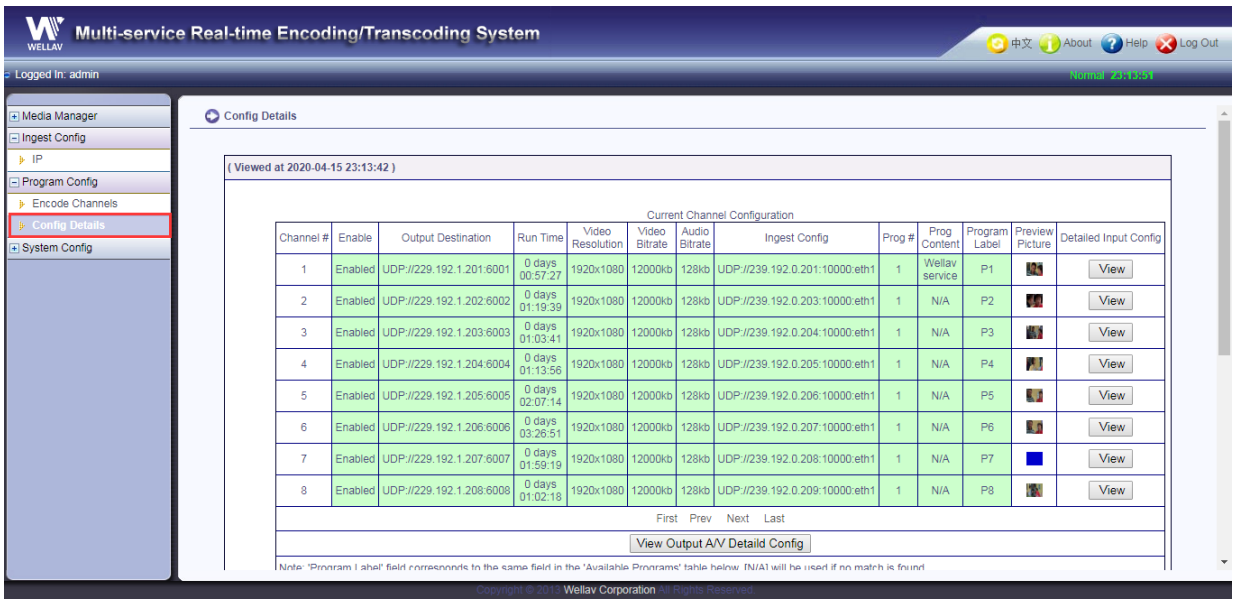
Figure 34: Encode Channels

The user needs to select a channel for configuration, after relevant input and output parameters are configured; the user needs to tick the enable box to active the channel.

After the channel is started normally, the user can see the green indicator light in the status bar. If the start of channel fails, or the channel occurs in abnormal, the status bar will display orange status light. It issues alarms at the same time, the user needs to remove the fault and restore the encoding/transcoding channel according to the alarms message

4.2.2 Config Details

The system provides the detailed information list of encoding/transcoding channel in the Config Details page. The user can understand the input and output configuration situation and running situation of all channels in current system through the page.



Channel #	Enable	Output Destination	Run Time	Video Resolution	Video Bitrate	Audio Bitrate	Ingest Config	Prog #	Prog Content	Program Label	Preview Picture	Detailed Input Config
1	Enabled	UDP://229.192.1.201:6001	0 days 00:57:27	1920x1080	12000kb	128kb	UDP://239.192.0.201:10000:eth1	1	Wellav service	P1		View
2	Enabled	UDP://229.192.1.202:6002	0 days 01:19:39	1920x1080	12000kb	128kb	UDP://239.192.0.203:10000:eth1	1	N/A	P2		View
3	Enabled	UDP://229.192.1.203:6003	0 days 01:03:41	1920x1080	12000kb	128kb	UDP://239.192.0.204:10000:eth1	1	N/A	P3		View
4	Enabled	UDP://229.192.1.204:6004	0 days 01:13:56	1920x1080	12000kb	128kb	UDP://239.192.0.205:10000:eth1	1	N/A	P4		View
5	Enabled	UDP://229.192.1.205:6005	0 days 02:07:14	1920x1080	12000kb	128kb	UDP://239.192.0.206:10000:eth1	1	N/A	P5		View
6	Enabled	UDP://229.192.1.206:6006	0 days 03:26:51	1920x1080	12000kb	128kb	UDP://239.192.0.207:10000:eth1	1	N/A	P6		View
7	Enabled	UDP://229.192.1.207:6007	0 days 01:59:19	1920x1080	12000kb	128kb	UDP://239.192.0.208:10000:eth1	1	N/A	P7		View
8	Enabled	UDP://229.192.1.208:6008	0 days 01:02:18	1920x1080	12000kb	128kb	UDP://239.192.0.209:10000:eth1	1	N/A	P8		View

Figure 35: Config Details

And the system provides detailed Audio/Video output info for all channels.

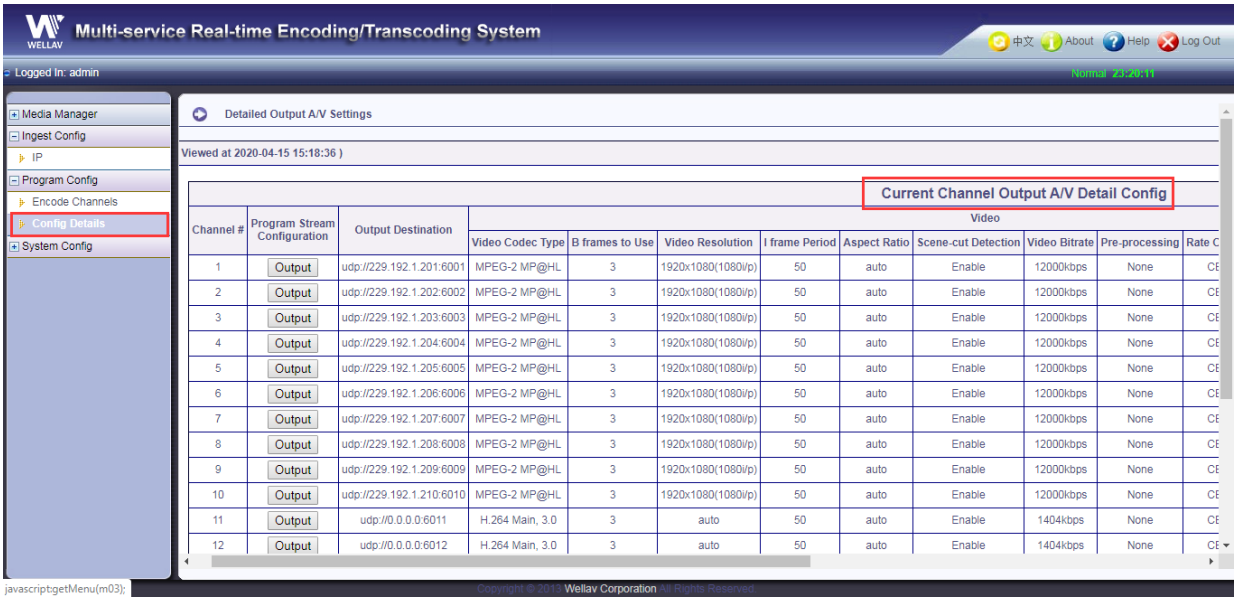


Figure 36: Output A/V Detail Config

4.2.3 Input program selection

Encode Channels →click “Input” button →Select ingest stream →Apply

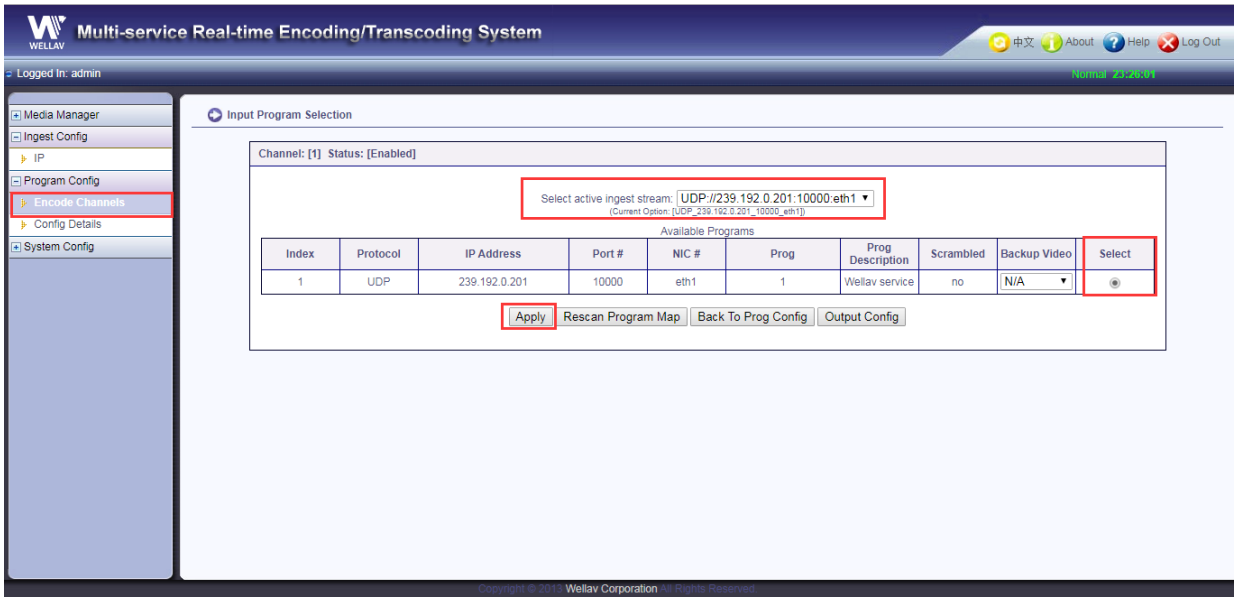


Figure 37: Input program selection

4.2.4 Output parameter configuration

This section will explain how to set up audio and video encoding/transcoding parameters step by step. Proper setting audio and video parameters will enable you to get the best audio and video effects at lowest bit stream case.

Furthermore, the partial configuration also relates to the network transmission. Because the OMP500 system uses RTP or UDP and so on output code stream, only by appropriate setting transmission target address, can it ensure the normal running of the system.

The user can click the “Output” button or the “Output config” button and then enter the output parameter configuration page. For audio and video encoding/transcoding system, it includes the output protocol, video and audio output configuration parameters as shown in the following diagram:

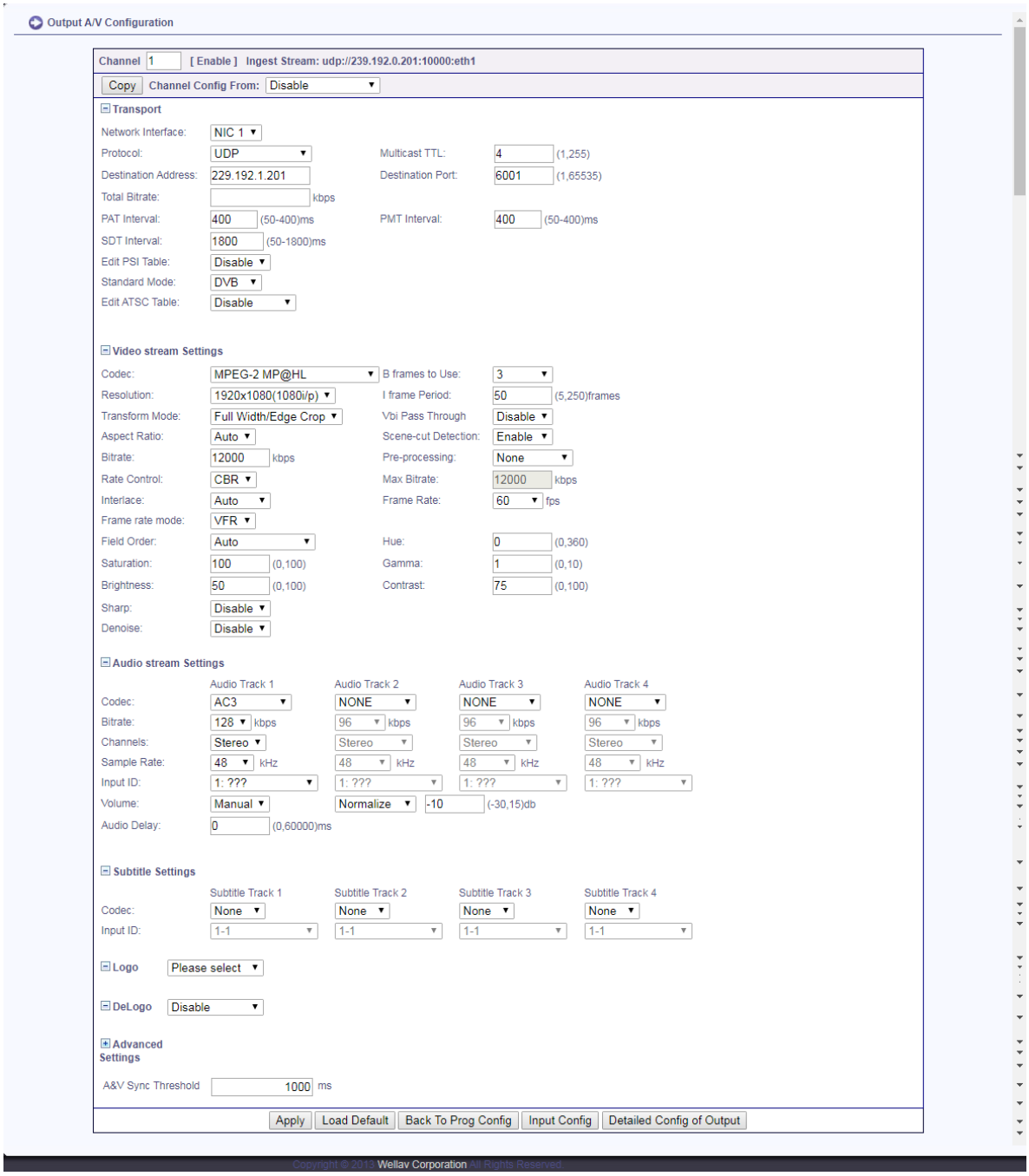


Figure 38: Audio/video/subs configuration page

4.2.5 Setting Output

Transport protocol

The OMP system provides UDP, RTP, RTSP, NMS, RTMP, HLS, HSS,DASH and so on transport protocols for output. The user can select in the drop-down menu of the transport protocols.

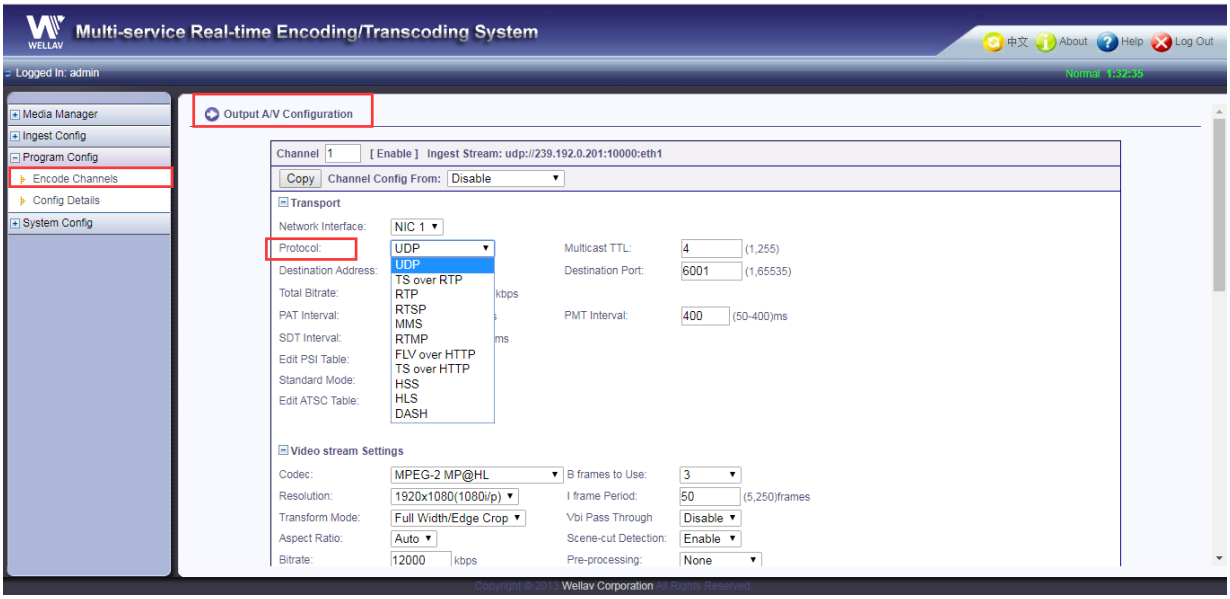


Figure 39: Selection in drop-down menu of transport protocol for output

UDP mode

In this mode, the OMP500 system strings the transport streams into the payload of UDP packet, distinguishes the terminal IP device according to the terminal IP address. This mode supports unicast and multicast video streaming.

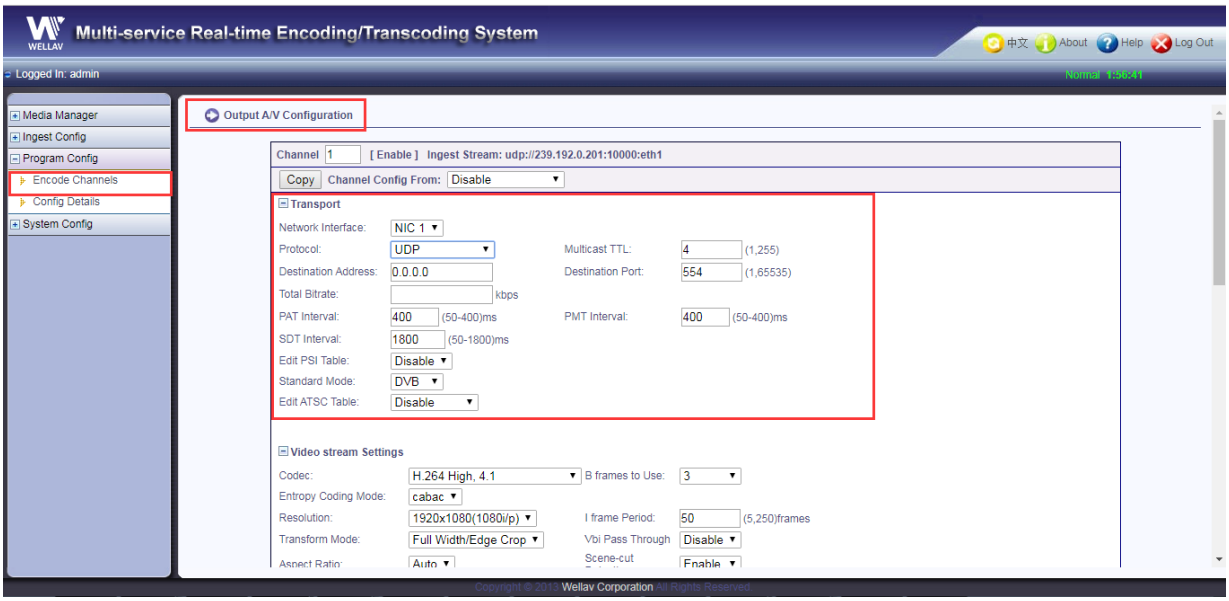


Figure 40: UDP output

RTP mode

In this mode, the OMP500 system will take advantage of the transport protocol of RTP (Real-time Transport Protocol or abbreviated RTP) to transmit audio and video streaming on the network. Sub-layer of the RTP protocol is transported through UDP multicast or unicast.

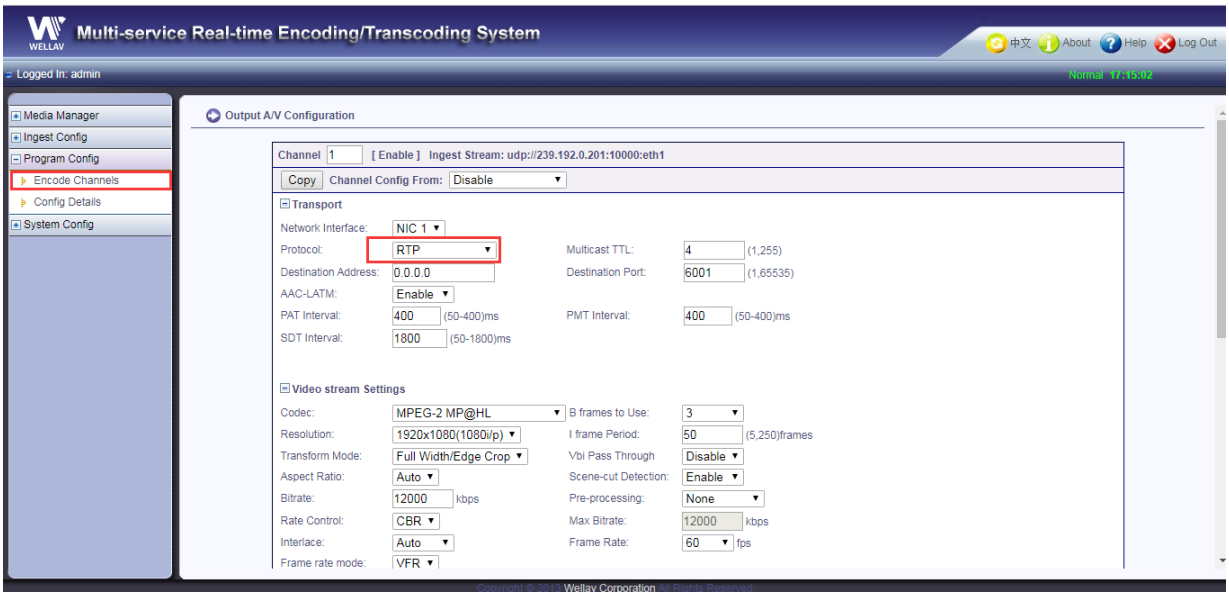


Figure 41: RTP output

RTSP mode

OMP500 system supports RTSP (Real Time Streaming Protocol). RTSP is used to control the audio or video multimedia string streaming protocols, and allows simultaneous multi-string streaming demand control, network communication protocol is not within its defined range, and server-side can choose free to use TCP or UDP to transport the string streaming content in transmission. The user selects the transmission mode, can receive live or on-demand programs through the terminal connection to the server.

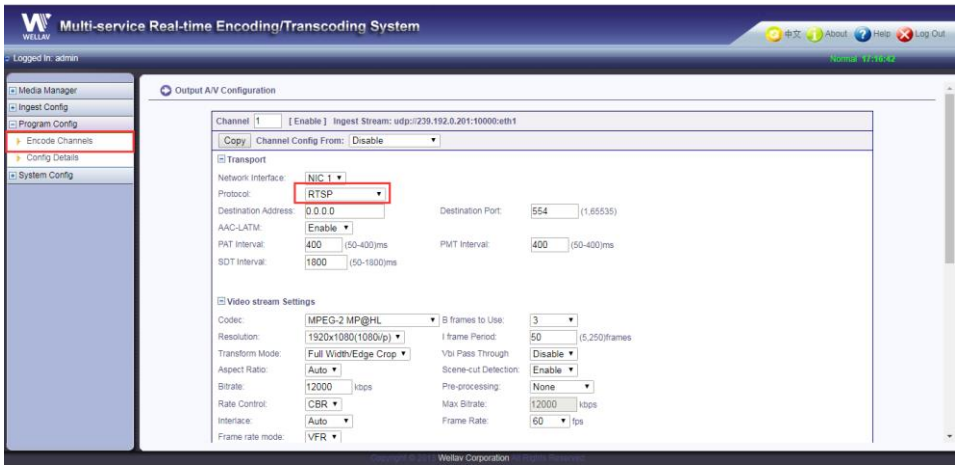


Figure 42: RTSP output

HTTP (MMS) mode

The OMP500 system supports Microsoft Media Server protocol, compresses the audio and video encoding/transcoding by MMS mode, then uses http mode to transport the user's decoder by MMS protocol. Encoding/Transcoding system provides the preview page, the user can watch the output program in real-time, clicks on the' MMS' link to open the browser interface, can watch the real time output program as shown in the following Figure.

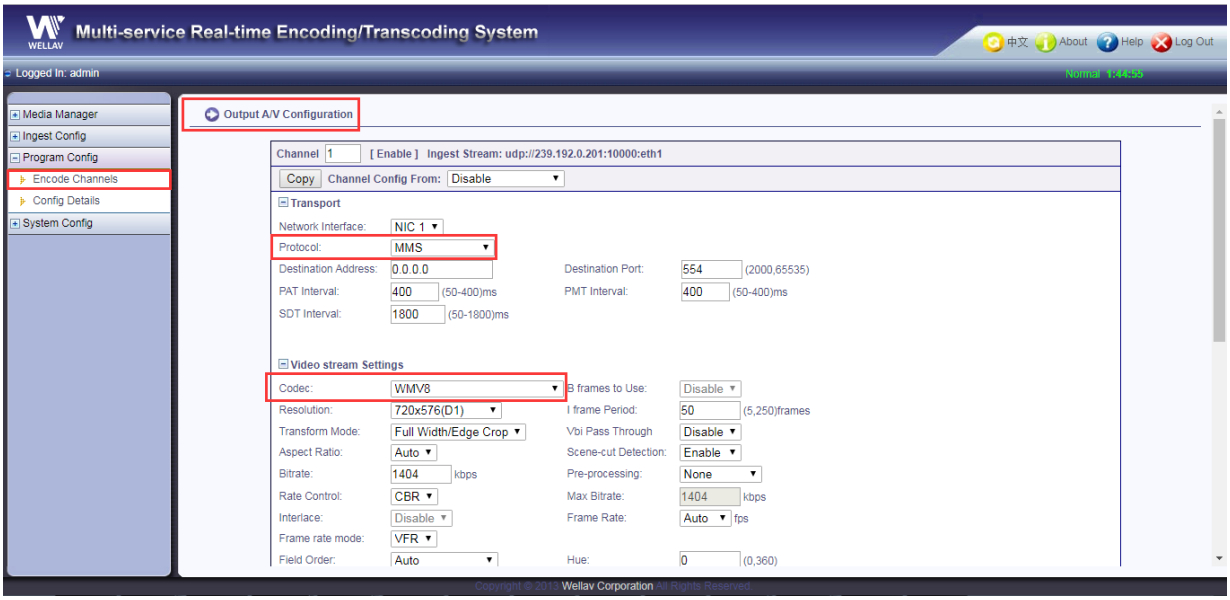


Figure 43: HTTP (MMS) output

RTMP mode

OMP500 system supports RTMP (Routing Table Maintenance Protocol), real-time messaging protocol. Real Time Messaging Protocol is developed the private protocol by Adobe Systems Company for audio, video and data transmission between Flash Player and server. It is characterized by clear text protocol working on TCP, uses port 1935. FMS stands for the abbreviation of Flash Media Server, Adobe's FMS is a multimedia application platform, on which you can achieve a variety of applications such as on-demand, live, interactive multimedia of multimedia streaming. Because Adobe Flash Player has extensive network application, FMS becomes the server-side main application platform of many multimedia applications. The user fills in the IP address of the Flash Server in the FMS address of Transfer Protocol through structures FMS, the IP address of the backup FMS (does not fill in that means he does not use it) in the FMS address 2. If output configuration is filled two FMS, encoding/transcoding system will output to two FMS servers. FMS path is composed mainly of application name / instance name / stream name, the default value of the FMS port is generally 1935. After it is submitted successfully and the channel is started, the top of the page provides the fast connection address, in which the user can watch output. The address is FMS1 output address. Click 'RTMP' link to open a browser interface, the user can watch the real-time output program (backup output cannot preview) as shown in the following Figure.

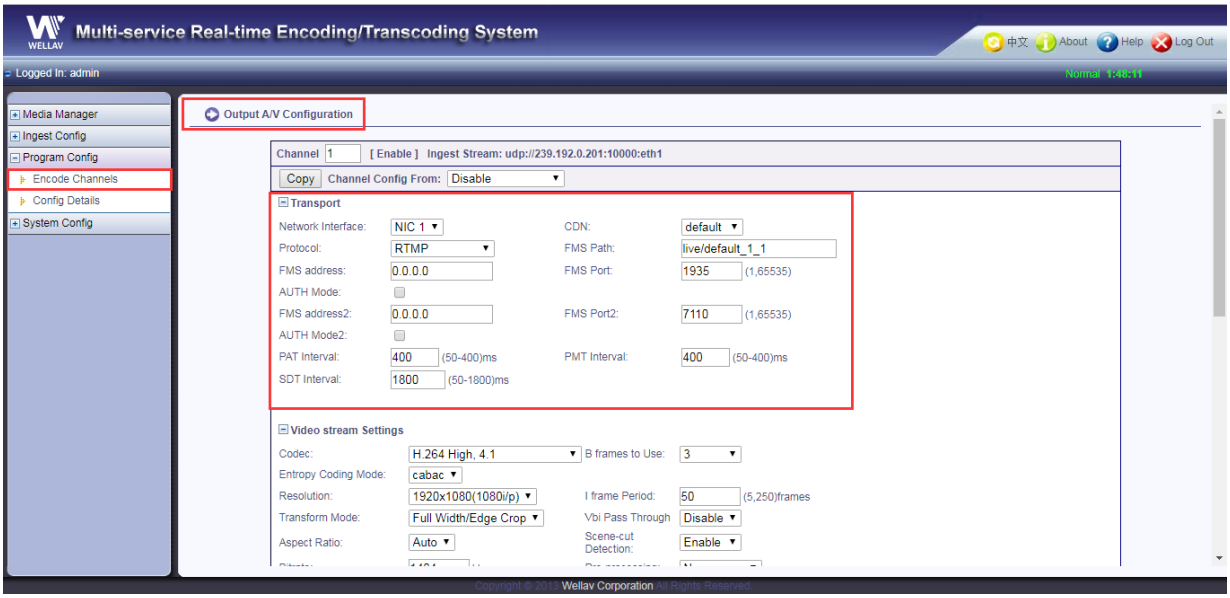


Figure 44: RTMP output

HTTP (FLV) mode

The OMP500 system supports FLV format output. FLV is the abbreviation of FLASH VIDEO, the encoding/transcoding system can encapsulate the H.264 encoding/transcoding audio and video program into FLV format, the user side can receive output through Http mode. Encoding and Transcoding system provides preview page, the user directly clicks on the ‘FLV’, can watch the real time output program.

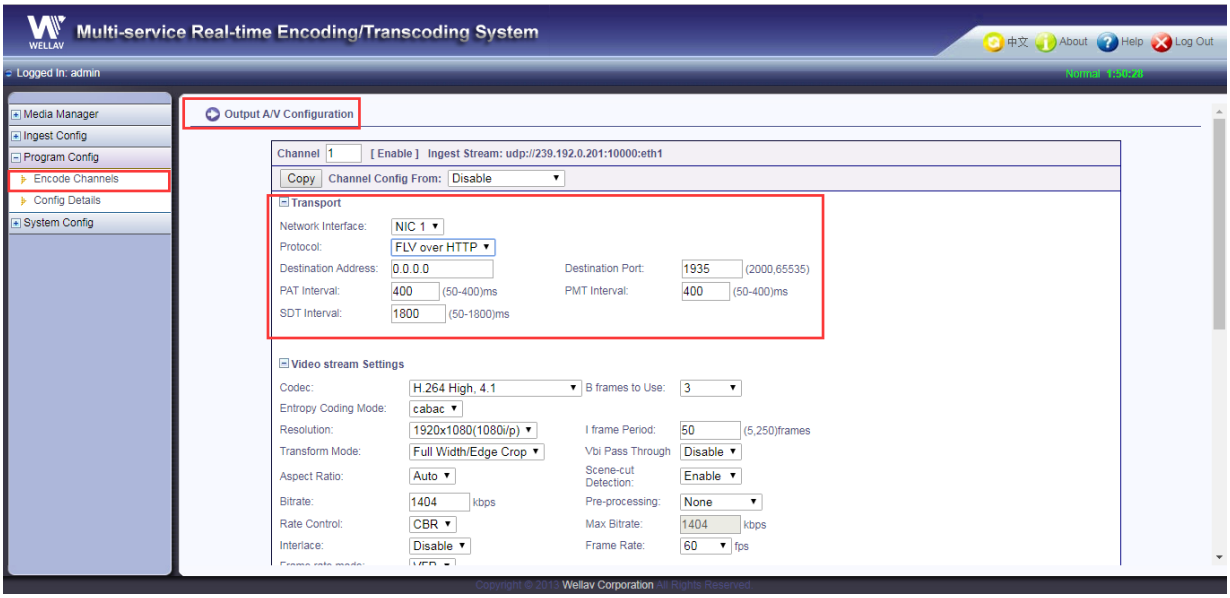


Figure 45: FLV over HTTP output

HTTP(TS) mode

The OMP500 system supports HTTP (TS) format output. Trans-coder can encapsulate MPEG2 or H264 encoding/transcoding audio and video programs into ts format, transports the user side by http mode. Trans-coder provides preview page, the user directly clicks ‘TS’, can watch the real-time output program. The preview relates to compatible player of browser, if it cannot broadcast, please click on the right key ‘TS’ to copy the url address, and select other player to play.

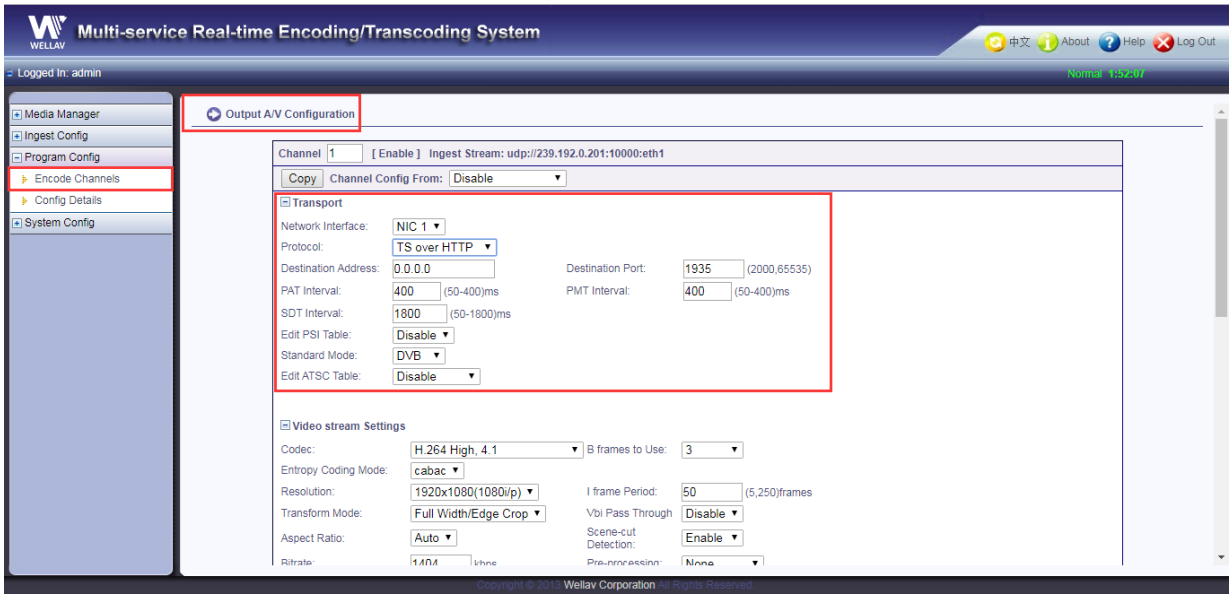


Figure 46: TS over HTTP output

TS over RTP mode

The OMP500 system supports TS over RTP format output. Trans-coder encapsulates audio and video programs into ts format, and transmits audio and video streaming in the network by RTP transport protocol. The sub-layer of RTP protocol transports with UDP multicast or unicast.

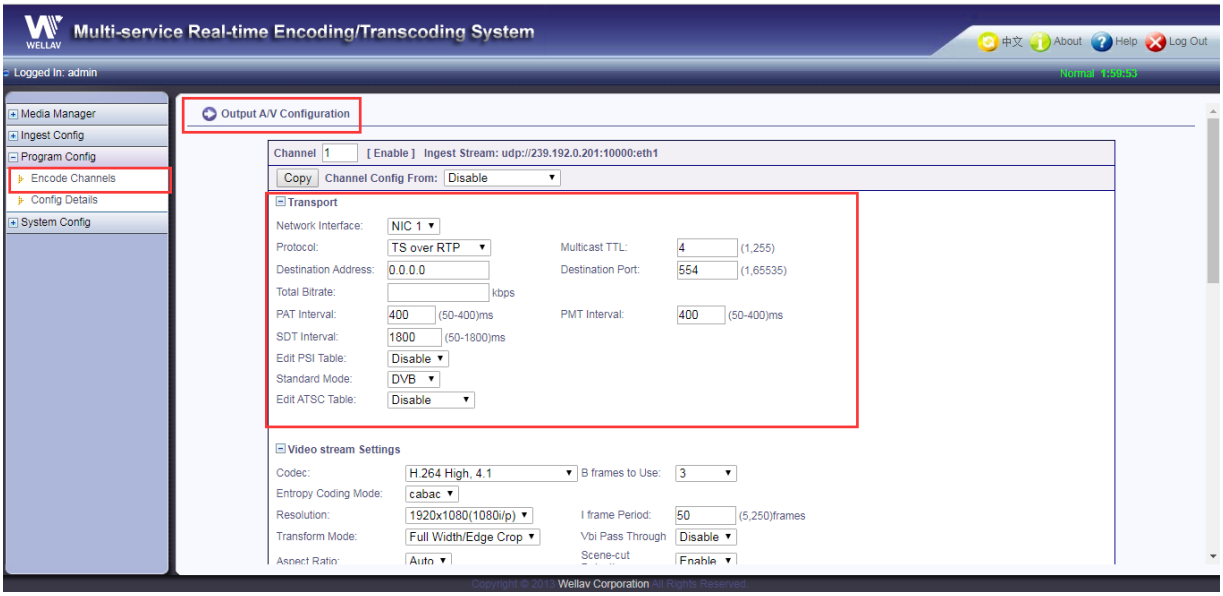


Figure 47: TS over RTP output

HSS(IIS smooth stream) mode

The OMP500 systems supports IIS smooth stream output. IIS supports multimedia function (NET SHOW), can use the built-in security of Windows NT Server and NTFS file system to set up the powerful and flexible Internet / Intranet site. Encoding/Transcoding system can push H.264 encoding/transcoding audio and video programs towards IIS, the user side can receive output through Http mode. The server address should be filled in the IP address of IIS, the filled publishing point and target port should be corresponding with the settings on the IIS.

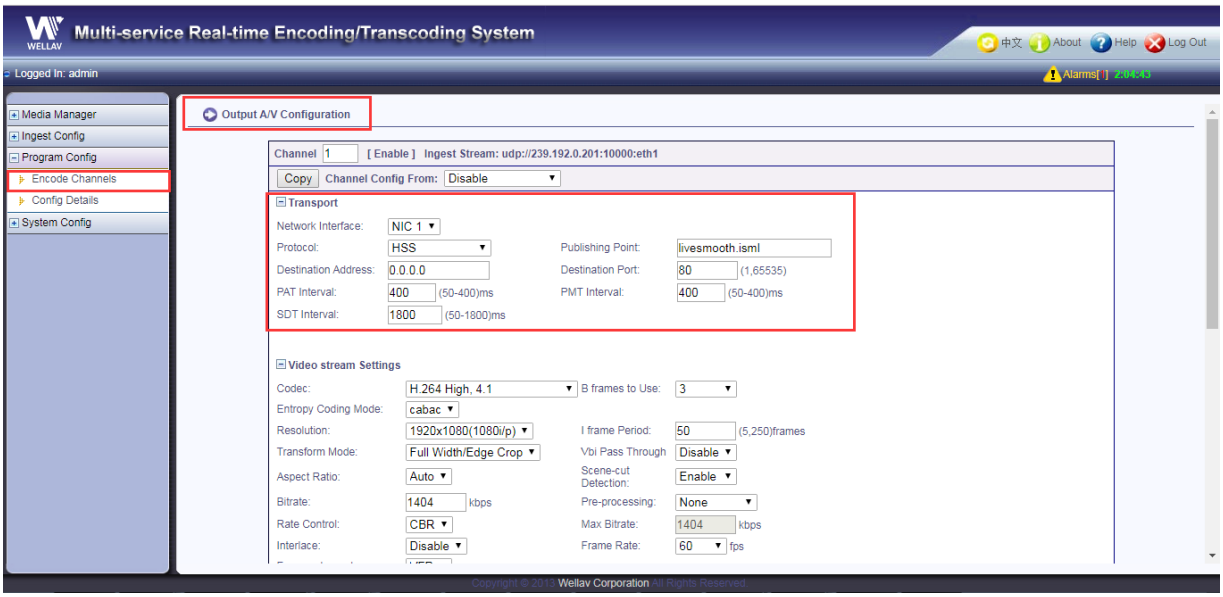


Figure 48: HSS output

HLS mode

The OMP500 system supports HLS output mode, the user can choose three kinds of mount protocols: nfs, cifs, local to mount to different web servers, in order to output TS Segmented files or adapt to both requirements of bit rate output. The user needs to fill in correctly the IP address, mount directory, mount username and password of the mount host, to ensure that the web server can be used normally, this channel can enable successful. If the filled information is incorrect, or web server network barriers, when channel is started, it will prompt that: the channel cannot start properly, please check the configuration.

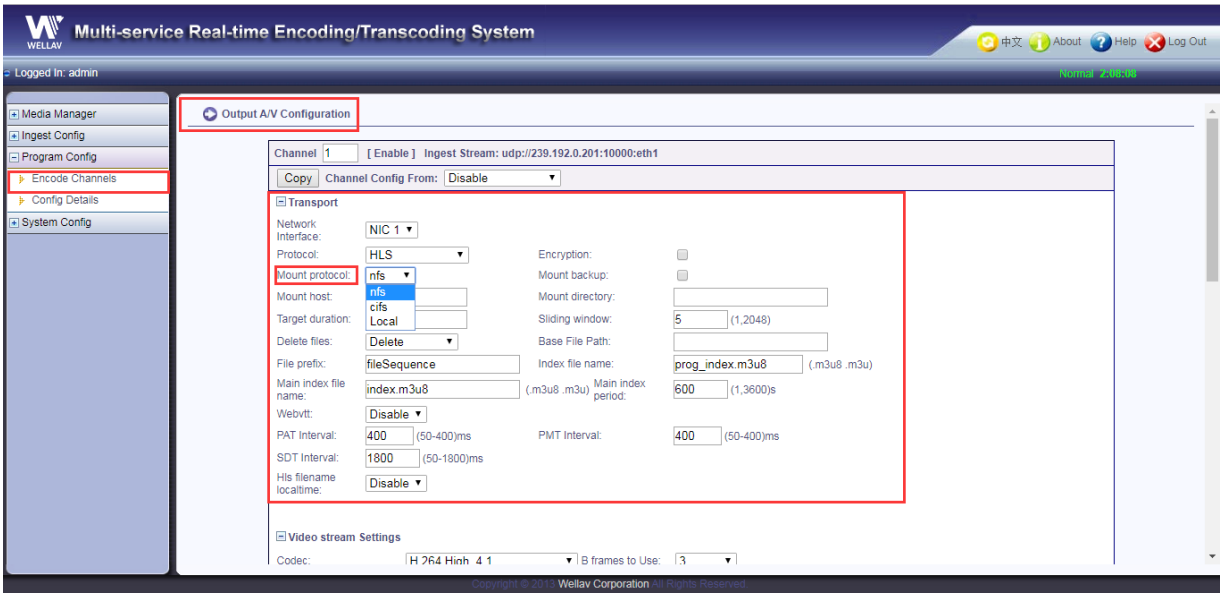


Figure 49: HLS output

Mode 1: nfs

Features: nfs mount protocol depends on TCP or UDP protocol, its advantages are that the failure impact is not great, it does not require filling in username and password, and connects to the nfs network storage server

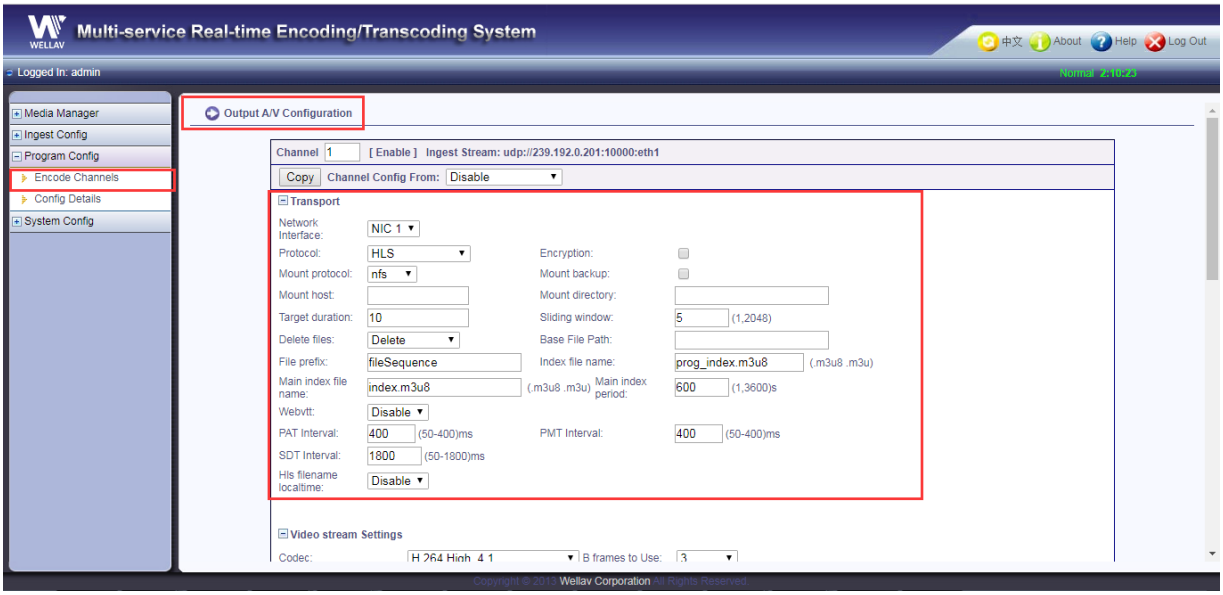


Figure 50: nfs mode

- Encryption: is option, the user needs to fill in the urm server address, encryption cycle, resource ID, whether encryption, as well as encryption cycle, resource ID are related to the urm server settings, as long as OMP is consistent with the server settings. If the server is not set encryption, the user does not need to tick the encryption item.
- Mount protocol: the user selects nfs, cifs or webdav, confirms according to the using environment.
- Mount host: the user fills in the network store server IP.
- Mount directory: the user fills in the name of the shared folder, its format is / upload.
- Mount backup: is option, if the user segments the same source into two network storage servers, can tick this item, and fill out the IP address and mount directory of the backup server.
- Target duration: is the playing duration in fragment length of segment, the unit is second.
- Mobile window: channel corresponds to the total number of segments the system saves under the mount server directory.
- Vanishing file: channel corresponds that whether the system automatically deletes earlier saved segments to maintain the total number of segments, after it reaches the number of mobile window under the mount server directory.
- Basic directory: i.e. channel corresponds to directory, the user creates directory corresponding to each output under the mount directory, which is the corresponding directory of mount directory, if it is saved in the mount directory, “/” should be filled out here.
- Segmented file prefix: defaults as file Sequence, the user can customize, that is, segment is saved for fileSequence_1.ts.
- Main index: is the total index of channel master configuration segmented, default is index.m3u8, the user can customize it, the suffix can be m3u8 or m3u, that is, the main index of the generated segmented is index.m3u8 under basic directory.
- Main index cycle: is main index update cycle, the unit is second, its optional item fills in 1-3600 seconds, the system regularly updates random code.
- Segmented index: each encoding/transcoding outputs parameter segmented sub-index, the default is

prog_index.m3u8, the user can customize it, the suffix can be m3u8 or m3u, that is, the generated segmented index is prog_index.m3u8 under basic directory.

Mode 2: cifs

Features: cifs mount protocol depends on TCP / IP, the protocol requires high network transmission reliability, the user must fill in the username and password, and connect to cifs network storage server.

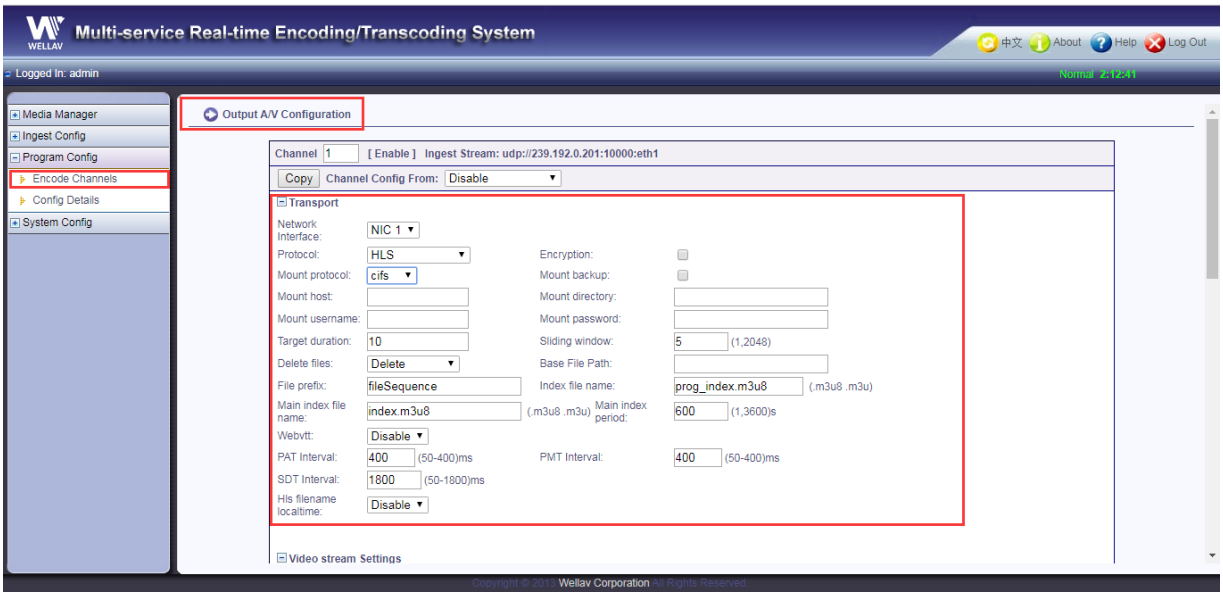


Figure 51: cifs mode

- Encryption: is option, the user needs to fill in the urm server address, encryption cycle, resource ID, whether encryption, as well as encryption cycle, resource ID are related to the urm server settings, as long as OMP is consistent with the server settings. If the server is not set encryption, the user does not need to tick the encryption item.
- Mount protocol: the user selects nfs, cifs or webdav, confirms according to the using environment.
- Mount host: the user fills in the network store server IP.
- Mount directory: the user fills in the name of the shared folder, its format is / upload.
- Mount username: is username of mount server setting, and needs to be filled in the same.
- Mount password: is password of mount server setting, and needs to be filled in the same.
- Mount backup: is option, if the user segments the same source into two network storage servers, can tick this item, and fill out the IP address and mount directory of the backup server.
- Target duration: is the playing duration in fragment length of segment, the unit is second.
- Mobile window: channel corresponds to the total number of segments the system saves under the mount server directory.
- Vanishing file: channel corresponds that whether the system automatically deletes earlier saved segments to maintain the total number of segments, after it reaches the number of mobile window under the mount server directory.

- Basic directory: i.e. channel corresponds to directory, the user creates directory corresponding to each output under the mount directory, which is the corresponding directory of mount directory, if it is saved in the mount directory, “/” should be filled out here.
- Segmented file prefix: defaults as file Sequence, the user can customize, that is, segment is saved for fileSequence_1.ts.
- Main index: is the total index of channel master configuration segmented, default is index.m3u8, the user can customize it, the suffix can be m3u8 or m3u, that is, the main index of the generated segmented is index.m3u8 under basic directory.
- Main index cycle: is main index update cycle, the unit is second, its optional item fills in 1-3600 seconds, the system regularly updates random code.
- Segmented index: each encoding/transcoding outputs parameter segmented sub-index, the default is prog_index.m3u8, the user can customize it, the suffix can be m3u8 or m3u, that is, the
  generated segmented index is prog_index.m3u8 under basic directory.

Mode 3-Local

Features: WebDAV mount protocol depends on HTTP, in terms of the user who needs to release a lot of content, the user applies WebDAV that can reduce dependence on the CMS system, and be freer for creation, easier in upload, download. The user must fill in the username, password and mount port, and connect WebDAV network storage server.

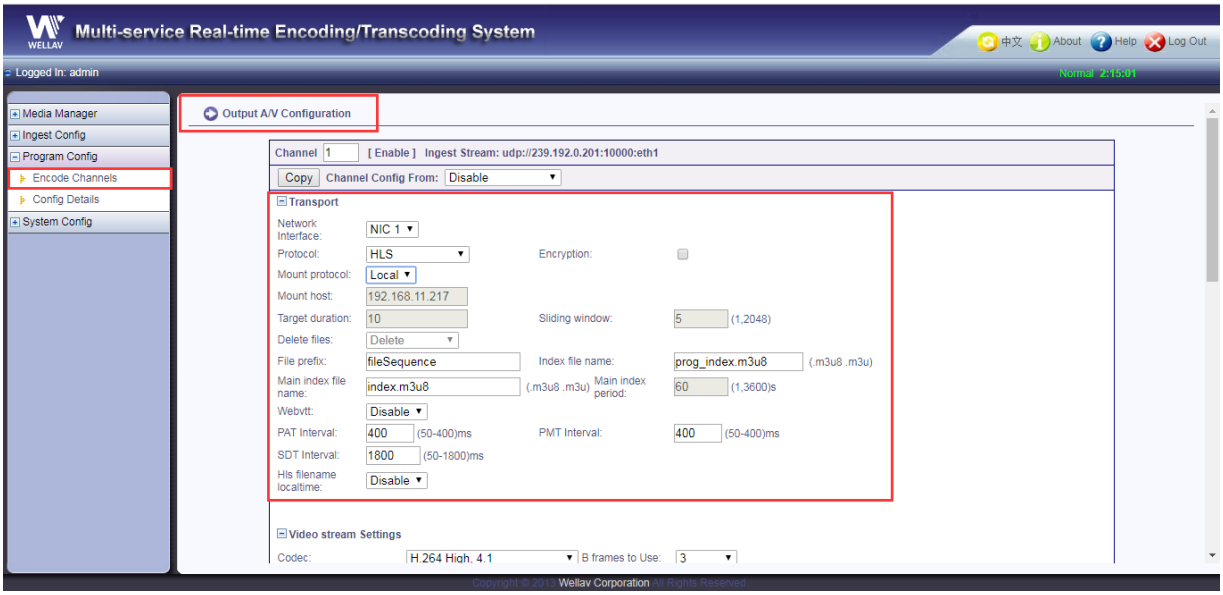


Figure 52: local mode

- Encryption: is option, the user needs to fill in the urm server address, encryption cycle, resource ID, whether encryption, as well as encryption cycle, resource ID are related to the urm server settings, as long as OMP is consistent with the server settings. If the server is not set encryption, the user does not need to tick the encryption item.
- Mount protocol: the user selects nfs, cifs or webdav, confirms according to the using environment.
- Mount host: the user fills in the network store server IP.
- Mount directory: the user fills in the name of the shared folder, its format is / upload.
- Mount port: is port of mount server setting, and needs to be filled in the same.

- Mount username: is username of mount server setting, and needs to be filled in the same.
- Mount password: is password of mount server setting, and needs to be filled in the same.
- Mount backup: is option, if the user segments the same source into two network storage servers, can tick this item, and fill out the IP address and mount directory of the backup server.
- Target duration: is the playing duration in fragment length of segment, the unit is second.
- Mobile window: channel corresponds to the total number of segments the system saves under the mount server directory.
- Vanishing file: channel corresponds that whether the system automatically deletes earlier saved segments to maintain the total number of segments, after it reaches the number of mobile window under the mount server directory.
- Basic directory: i.e. channel corresponds to directory, the user creates directory corresponding to each output under the mount directory, which is the corresponding directory of mount directory, if it is saved in the mount directory, "/" should be filled out here.
- Segmented file prefix: defaults as file Sequence, the user can customize it, that is, segment is saved for fileSequence_1.ts. The user can fill out zott_${id}_${seq}_${curtime}_${bitrate}.ts through self-defining, i.e. the generated segmented file name is zott_a_1_20120917T105847_1072.ts.
- Main index: is the total index of channel master configuration segmented, default is index.m3u8, the user can customize it, the suffix can be m3u8 or m3u, that is, the main index of the generated segmented is index.m3u8 under basic directory.
- Main index cycle: is main index update cycle, the unit is second, its optional item fills in 1-3600 seconds, the system regularly updates random code.
- Segmented index: each encoding/transcoding outputs parameter segmented sub-index, the default is prog_index.m3u8, the user can customize it, the suffix can be m3u8 or m3u, that is, the
  generated segmented index is prog_index.m3u8 under basic directory.

Transport Target Address

The target address range varies depending on the transport protocol that users select.

UDP multicast mode

In this mode, the terminal IP address is set to multicast IP devices portfolio. The multicast IP address must be limited between 224.0.0.0 and 239.255.255.255.

UDP unicast mode

In this mode, the terminal IP address refers to a single IP device.

Importance: the terminal IP address should not between 224.0.0.0 and 239.255.255.255 in the unicast mode.

RTP mode

In this mode, the rule of target address is as same as the UDP mode.

RTSP:

In this mode, just fill in the port and not necessary to fill in the target address.

HTTP (MMS)

In this mode, just fill in the port and not necessary to fill in the target address.

HTTP (FLV)

In this mode, just fill in the port and not necessary to fill in the target address.

Port Number

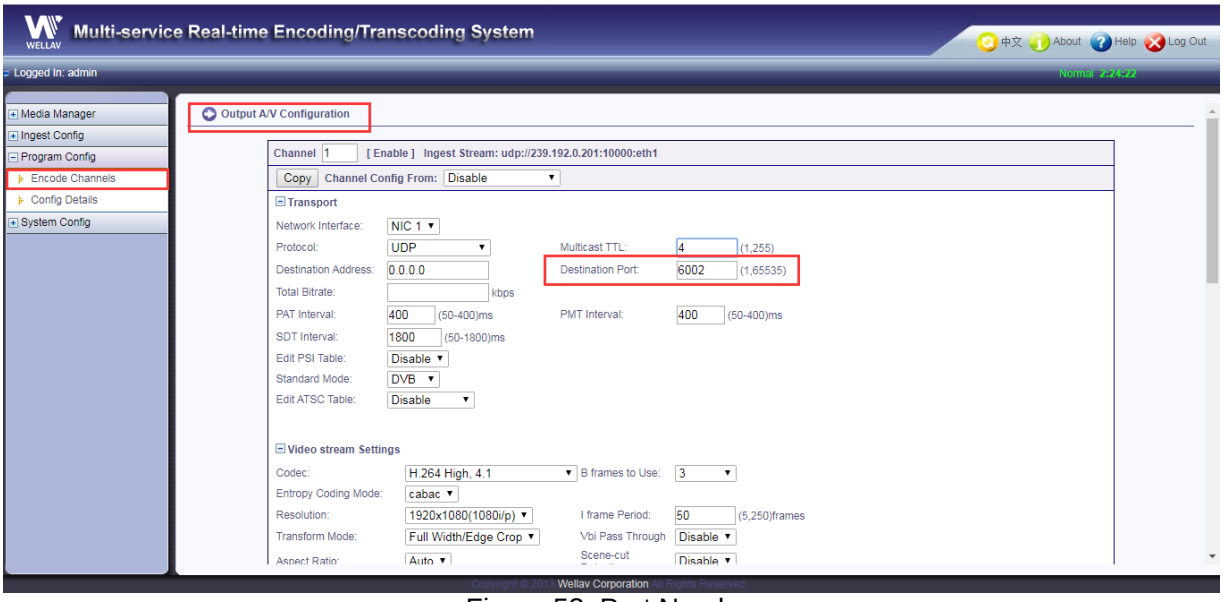


Figure 53: Port Number

Port setting refers to the setting of the terminal port number.

Multicast TTL

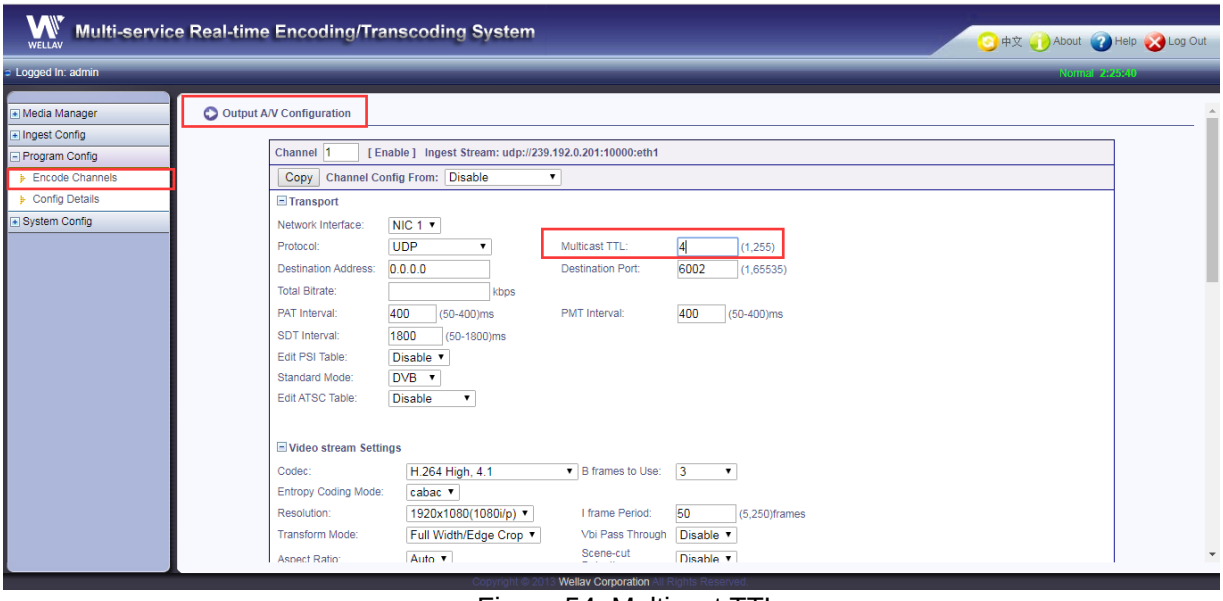


Figure 54: Multicast TTL

TTL (Time to Live) manages the time-to-live of the IP packets, avoiding the permanent loop caused by routing errors. When packets pass through the network, routers will reduce the TTL of each packet; when the TTL is reduced to zero, then the packet will be discarded. Routers assign domain value to every interface; only when the packet's TTL is longer than the interface's domain value, would the packet be transported. When a packet passes through the router that assigns specific domain value, the packet's TTL will not be reduced as per the domain value and it only

compares to the specific domain value. (As mentioned above, the TTL will be reduced by 1 as the packet every time passes through the router).

The following is the TTL domain values and the corresponding ranges:

0 is only for the same host, and cannot be output by any interface

1 is only for the same sub-network, and cannot be transported by routers <32 is only for the same site, organization and department. <64 is only for the same region.

<128 is only for the same continent.

<255 can be used anywhere around the worldwide

Edit PSI Table

When selecting UDP protocol output in the IPTV mode, users can select whether to specify PSI information (Program Special Information), which includes program number, PID, service providers' name, and so on. Notes: in general, the PCR PID's value should be the same as the video PID; the prefix of"0x" means it is a hexadecimal number, as shown in the following Figure.

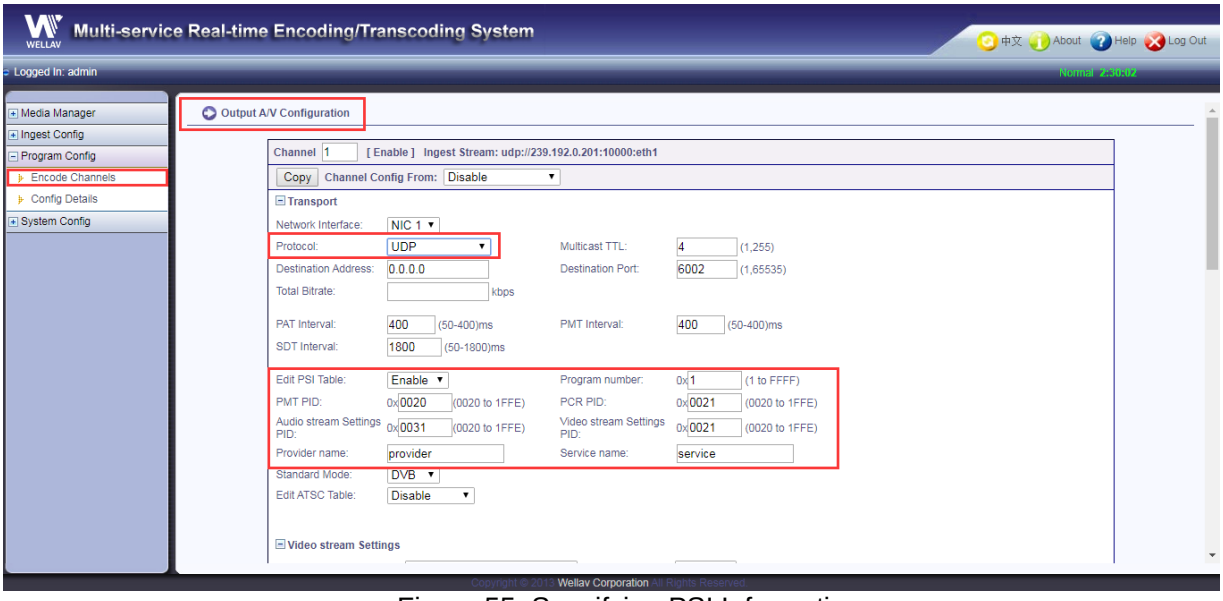


Figure 55: Specifying PSI Information

PSI (Program Special Information) is the information used for setting parameter to decode MPEG-2 program in the receiving end, including the PID regulation about video, audio and data

- Program number: users define the program's number 1-FFFF (hexadecimal);
- PID: a term of digital TV multiplex system. PID (Packet IDdentifier) is like a file name in the digital TV multiplex system and we can call it "identifier code transmission package";
- PMT PID: PMT's PID--- program_map_PID, which refers to the PID that the channel used for PMT's PID;
- PCR PID: the clock synchronous PID code (i.e. PCR PID code);
- Audio PID: audio PID code;
- Video PID: video PID code, which should be the same as PCR PID;
- Provider name: name of the program provider；

- Service name: users define the service's name.

4.2.6 Parameter configuration for video output

Codec type

The current version of OMP system supports the following basic encoding types: H.264 Baseline, Main, High, H.263, WMV8, MPEG4 as well as and MPEG-2. Bellow is the Main Profile for SD product to transcode and it will be preset as benchmark Main 2.2. If supporting B frame, then 0-5 can be selected.

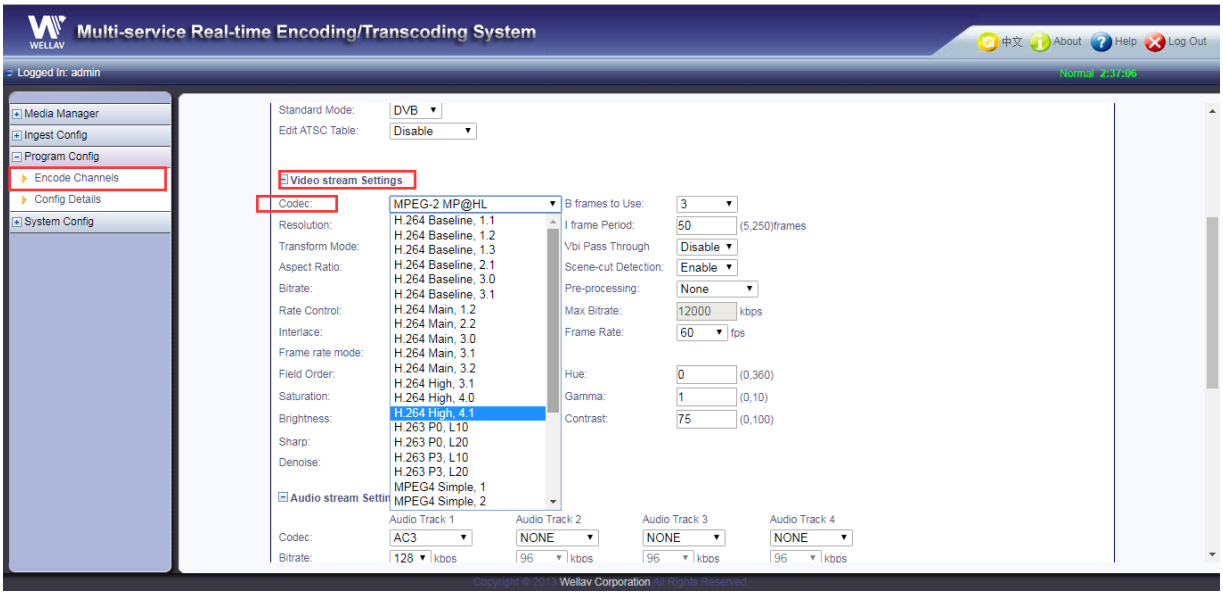


Figure 56: Video Codec

Resolution

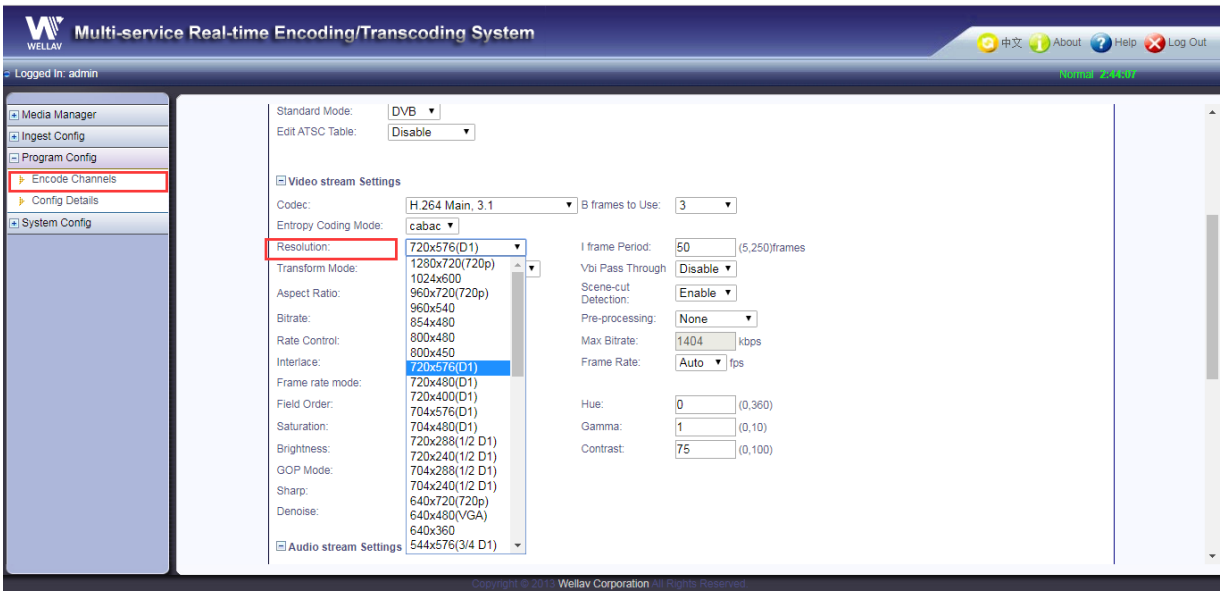


Figure 57: the Common Video Resolution

This encoding system can support the common video resolution, such as D1, Half D1 and CIF, which can be selected by users themselves.

I Frame Interval

The input interval of key frames is depended on the frame interval setting. The larger the interval value is, the less the input number of key frames is; vice versa. Key frame is the video signal frame

that has no temporary reference frame when encoding. When the system is in fast forward and fast rewind, the key frame is used for supporting video data. Therefore, the smaller the key frame interval is, the easier the downstream devices, such as video encoding and transcoding system as well as the personal video recorder, gets video signals. However, the key frames usually occupy more bit rates, which will slightly damage the video quality.

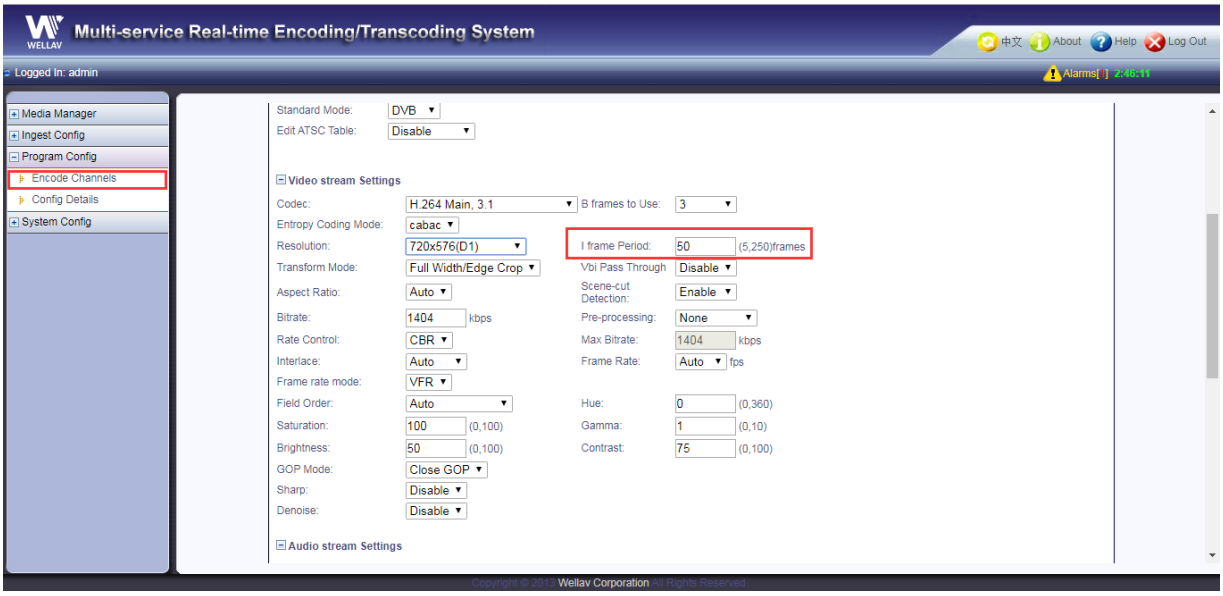


Figure 58: Key Frame Interval

It is recommended that the key frame interval is set to the maximum value in the broadcast level or the multicast applications; and the interval shall be short in the video-on-demand environment, so that the users can select and watch the video randomly.

Aspect Ratio

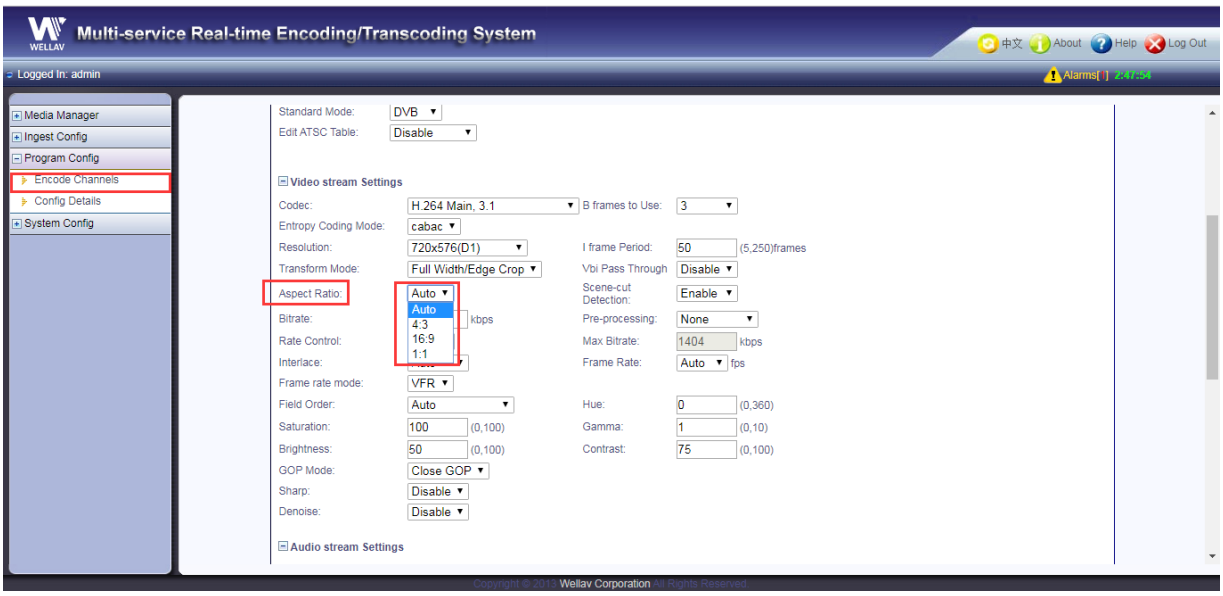


Figure 59: Output Aspect Ratio

This feature is used for specifying the aspect ratio of the output video stream.

Scene-cut Detection

With this feature, encoding algorithm will determine the change of video scenes more accurately and will inset key frames in the appropriate place. This feature will make the encoding system control the bit rate more accurately, thereby generating better video stream.

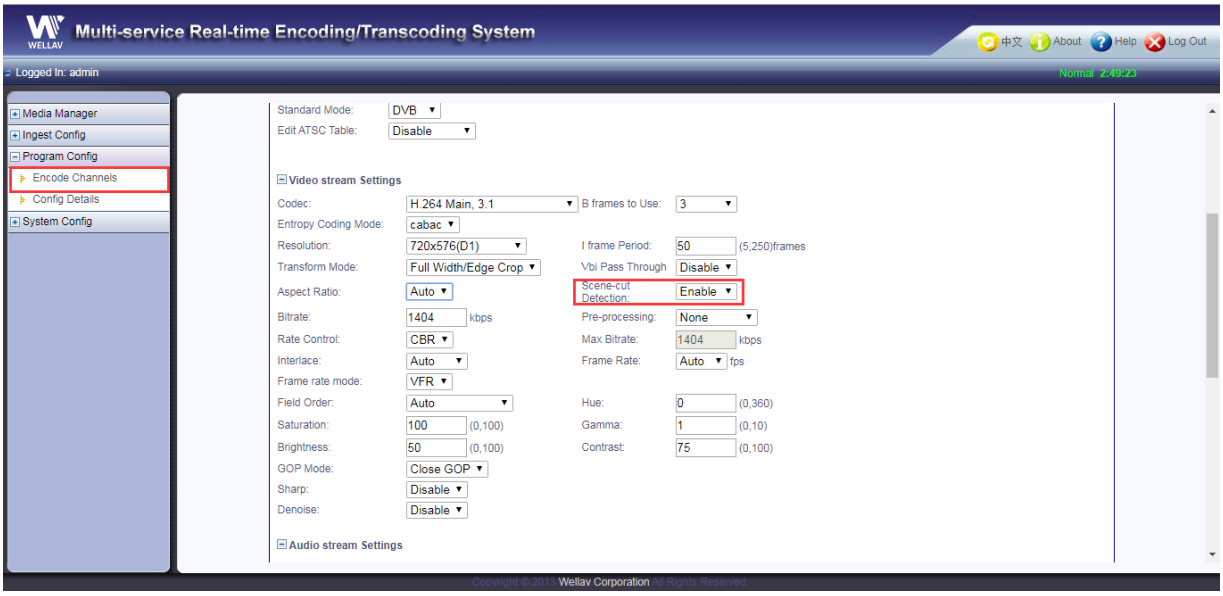


Figure 60: Scene Switch

Video bit rate

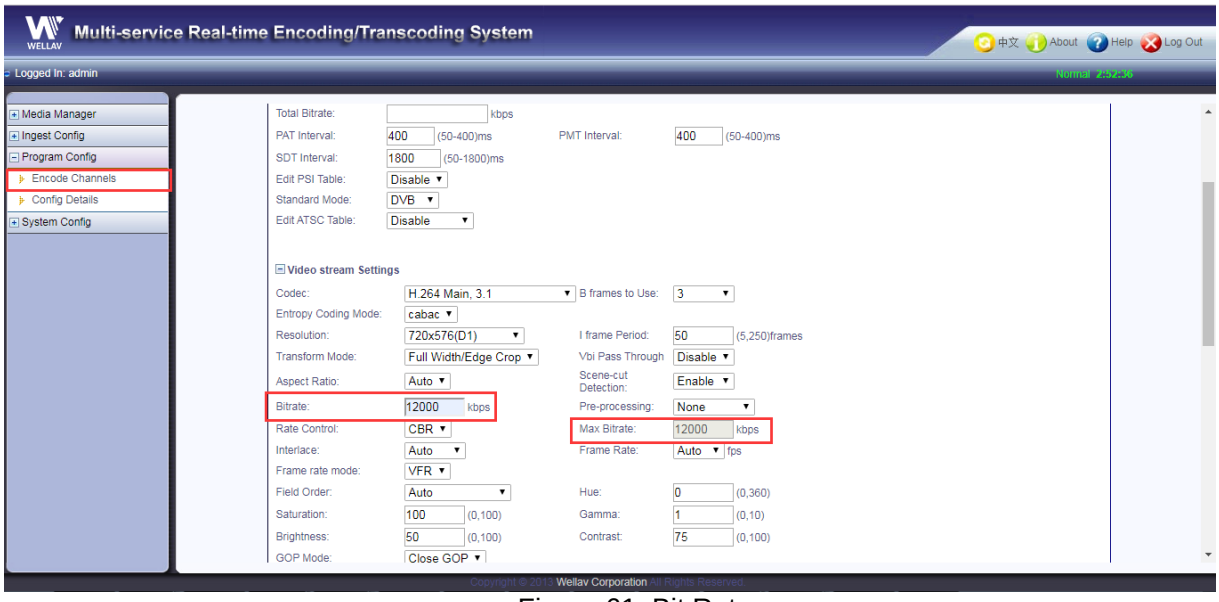


Figure 61: Bit Rate

The bit rate here is just used for setting the video stream. The bit rate has different setting range depending on the encoding types. Users can move the mouse onto the input box and then the range of the video bit rate will be prompted. If the bit rate that users set is out of the range, then the system will warn users and refuse their submission. Now the system can support SD H.264 video bit rate from 10k to 4000k and MPEG-2 MP@ML video bit rate from 400k to 15000k

Notes: the final bit rate output value from the system is the sum of the audio, video and system overheads (typically about 8%).

Interlaced Pre-Processing

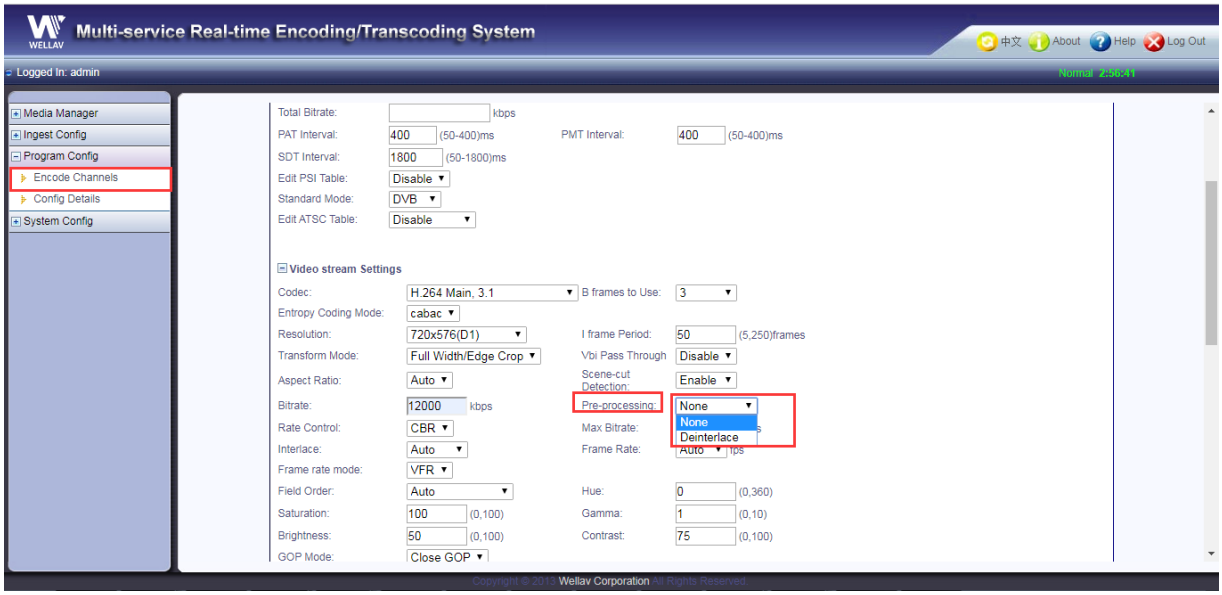


Figure 62: Interlaced Pre-Processing

For the video with the resolution of 1/2 D1, the interlaced pre-processing is set as “None” by default, meaning do nothing with the video; however, users can select “Deinterlace” by themselves.

Bit Rate Control

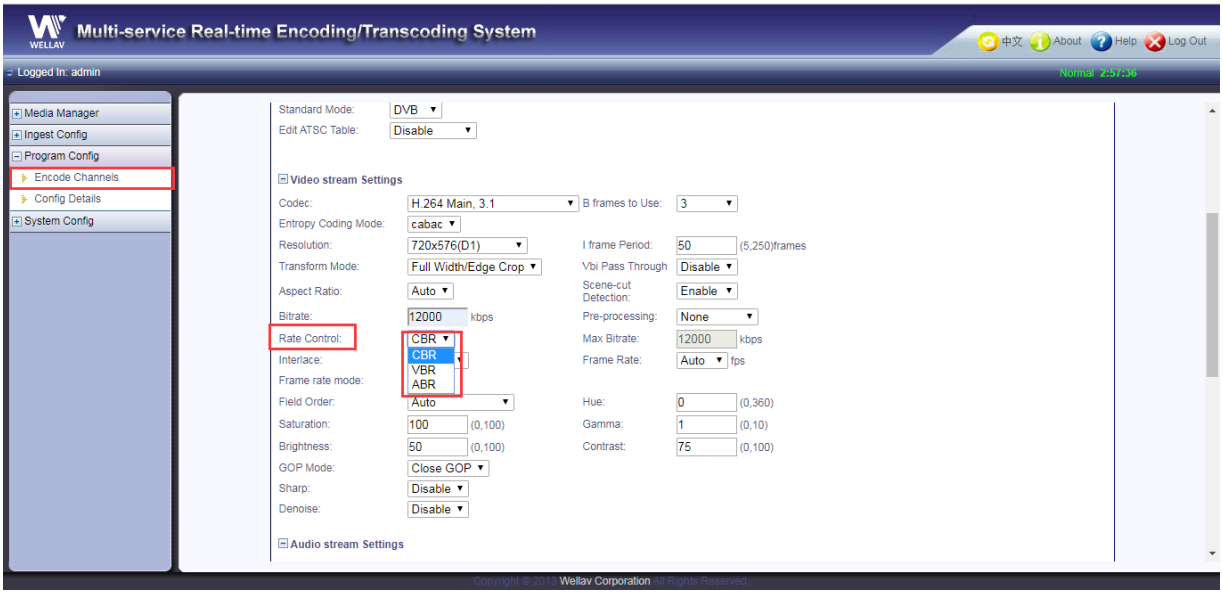


Figure 63: Bit Rate Control

The current version of OMP bit rate control can support both Constant Bit Rate (CBR) and Variable Bit Rate (VBR). When selecting Variable Bit Rate, a maximum bit rate value can be set. This maximum bit rate value will be default as the current video bit rate value and the maximum bit rate cannot greater than the maximum video bit rate in that encoding type. When selecting Average Bit Rate (ABR)，then the current bit rate should be the average bit rate of the output video stream.

Frame Rate

The system supports different frame rates, the frame rate range varies depending on the product series. Users can select on demand.

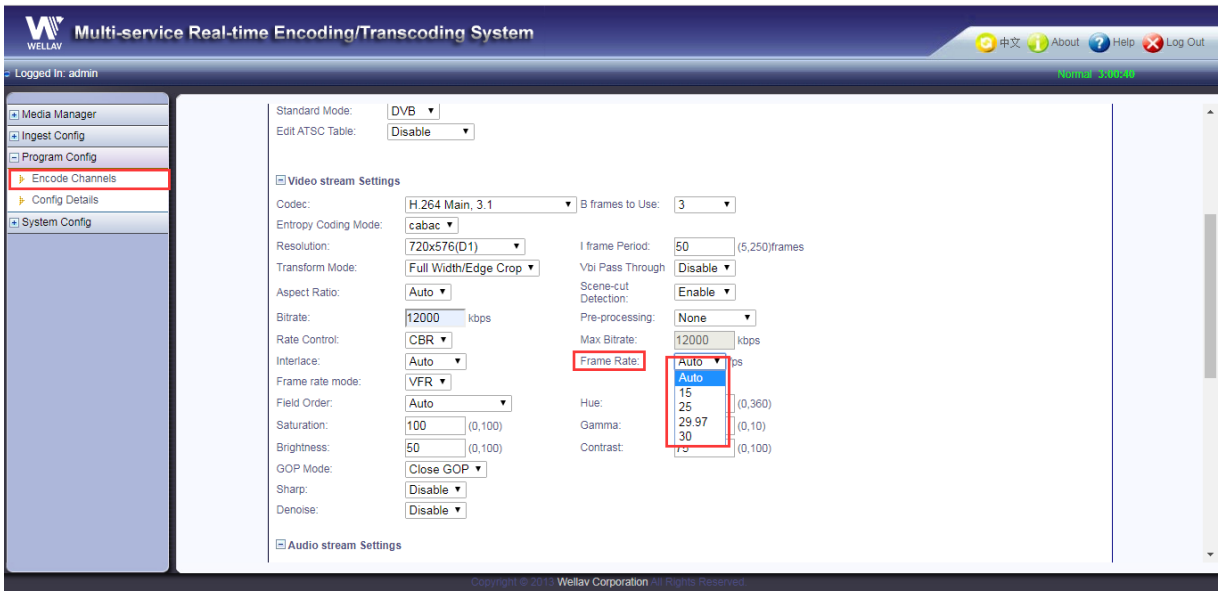


Figure 64: Frame Rate

Interlaced encoding

Select the encoding type of the output signal: interlaced encoding or progressive encoding.

- Enable: make interlaced encoding to the input signals
- Auto: adjust automatically with the input source
- Disable : make progressive encoding to the input signals

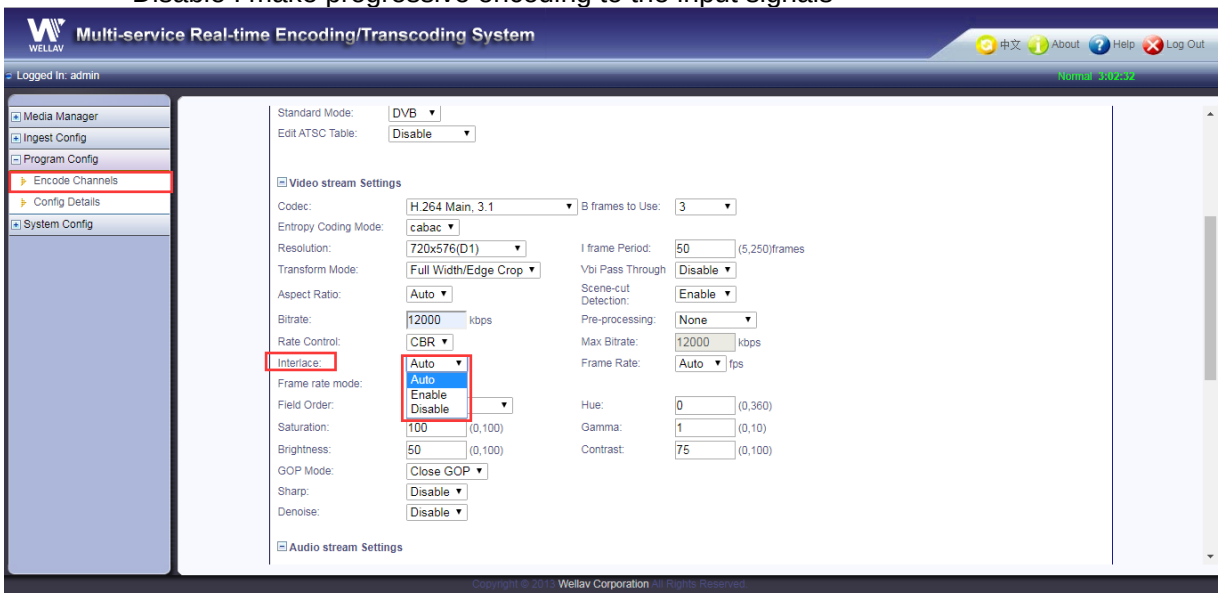


Figure 65: Interlaced Encode

Field Order

Selecting the field order of the output signals; if users select “Auto”, then the system will adjust automatically with the input source.

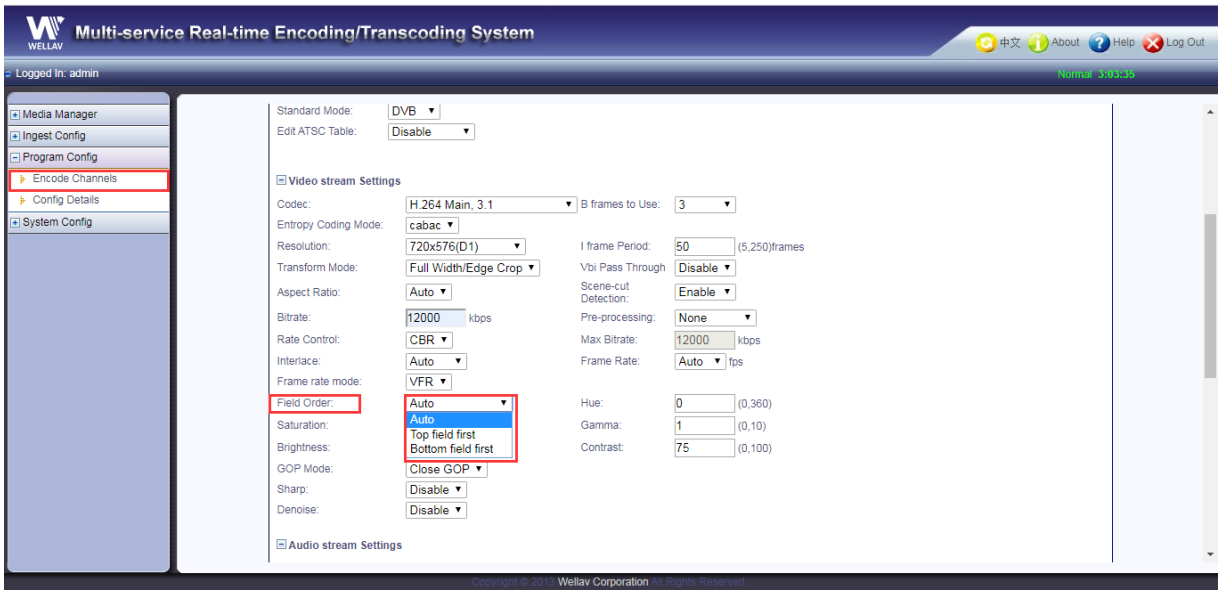


Figure 66: Field Order

Up/Down Conversion Mode

When the resolution of output video is different from the input video, the output video should follow the following rules:

- None: no change with the output
- Edge-trimming up and down/Edge-trimming with both sides: make the output video meet with the current output resolution by trimming edge
- Edge-adding up and down/Edge-adding to both sides: make the output video meet with the current output resolution by adding edge
- Stretch Deformation/Squeeze Deformation: make the output video meet with the current output resolution by deformation

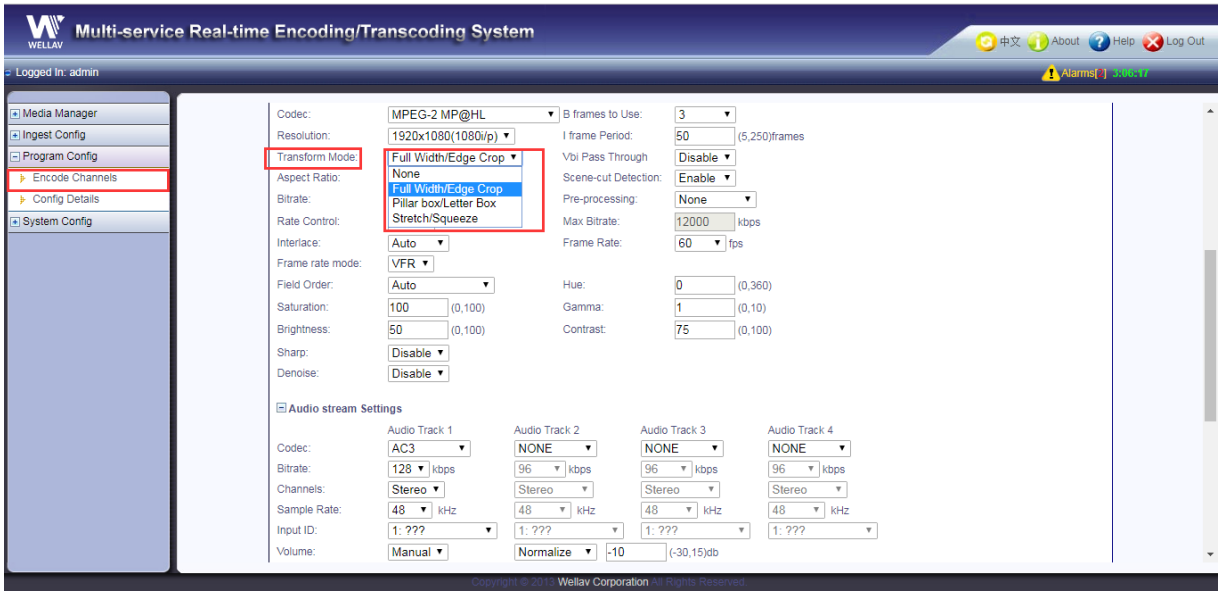


Figure 67: Up/Down Conversion Mode

Hue/Saturation/Gamma/Brightness/Contrast

Users can set the video parameter on the page, including Hue/ Saturation/ Gamma/ Brightness/ Contrast

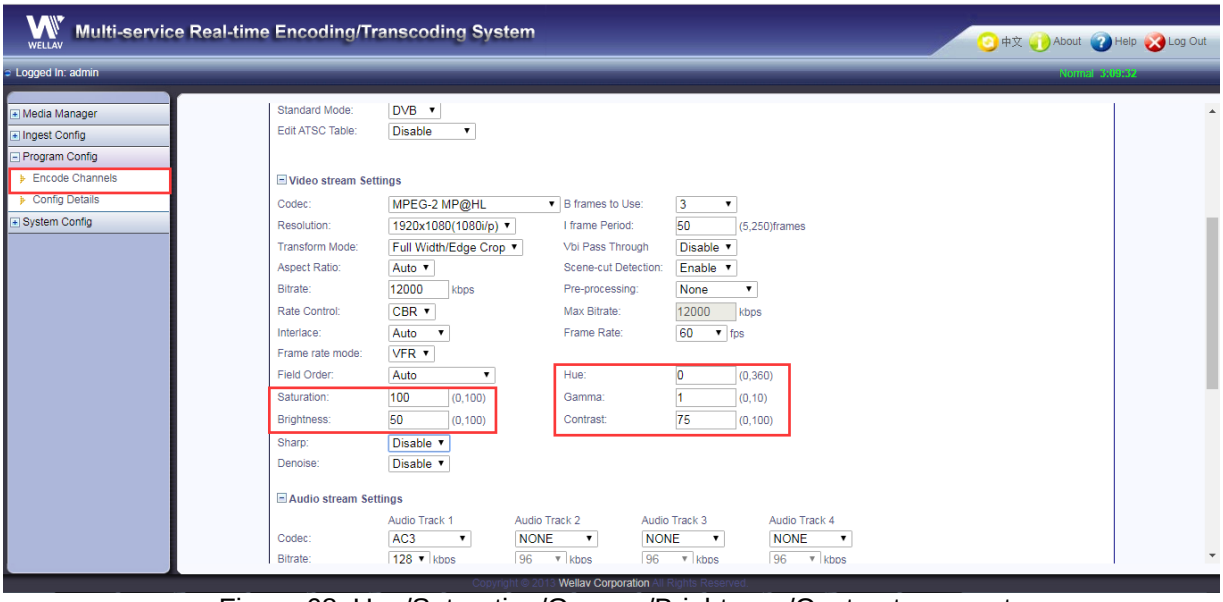


Figure 68: Hue/Saturation/Gamma/Brightness/Contrast parameter

Sharp

Users can enable or disable sharp

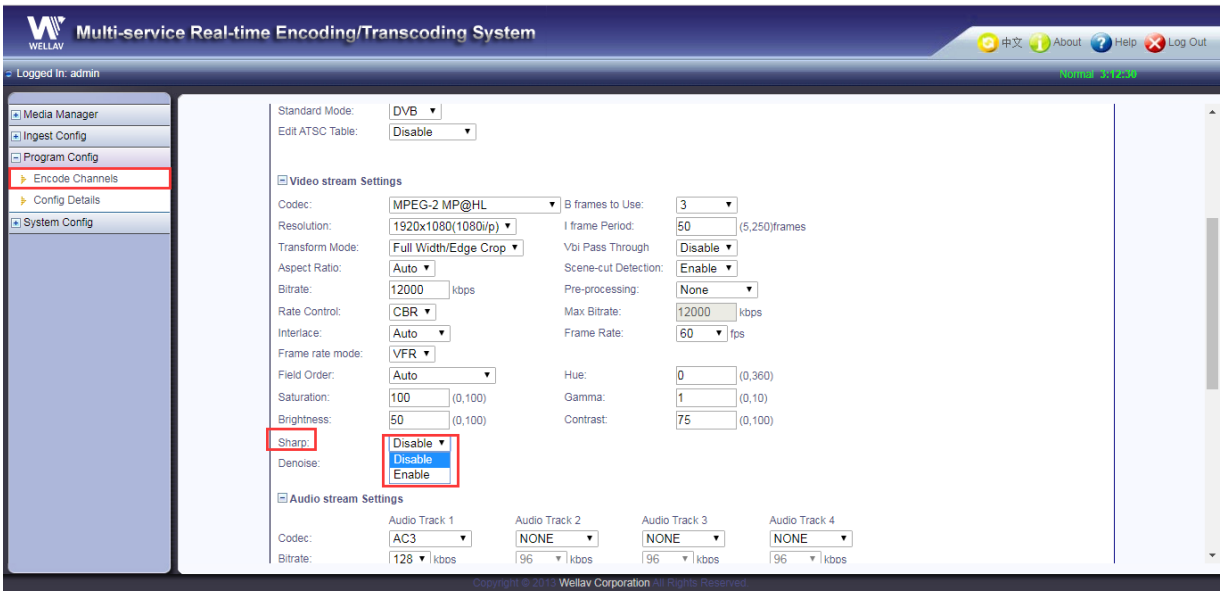


Figure 69: Sharp

Denoise

Users can enable or disable denoise

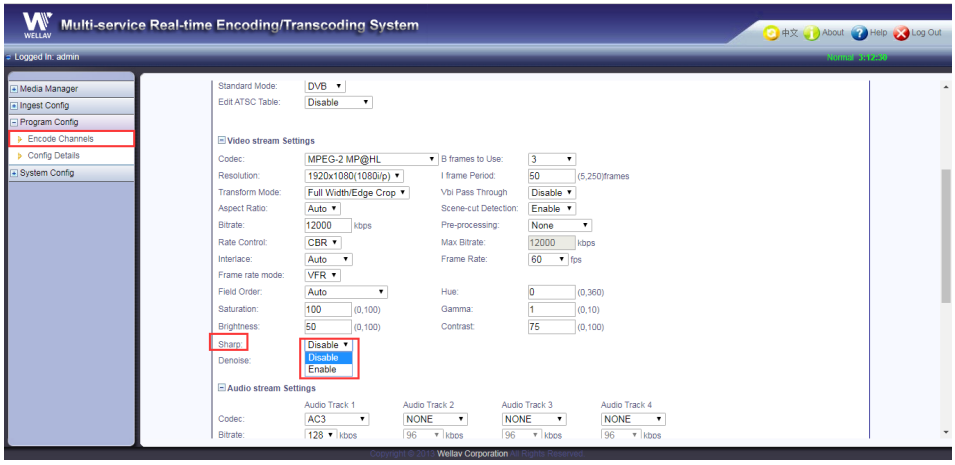


Figure 70: Denoise

4.2.7 Parameter configuration for audio output

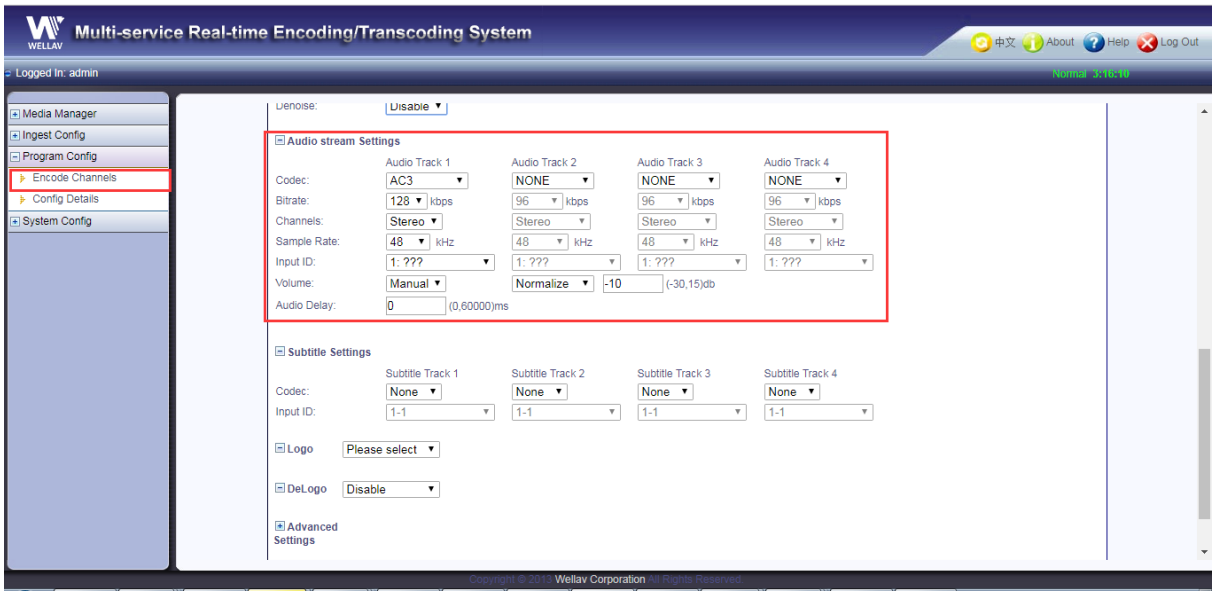


Figure 71: Audio Parameter Configuration

Audio encoding Type

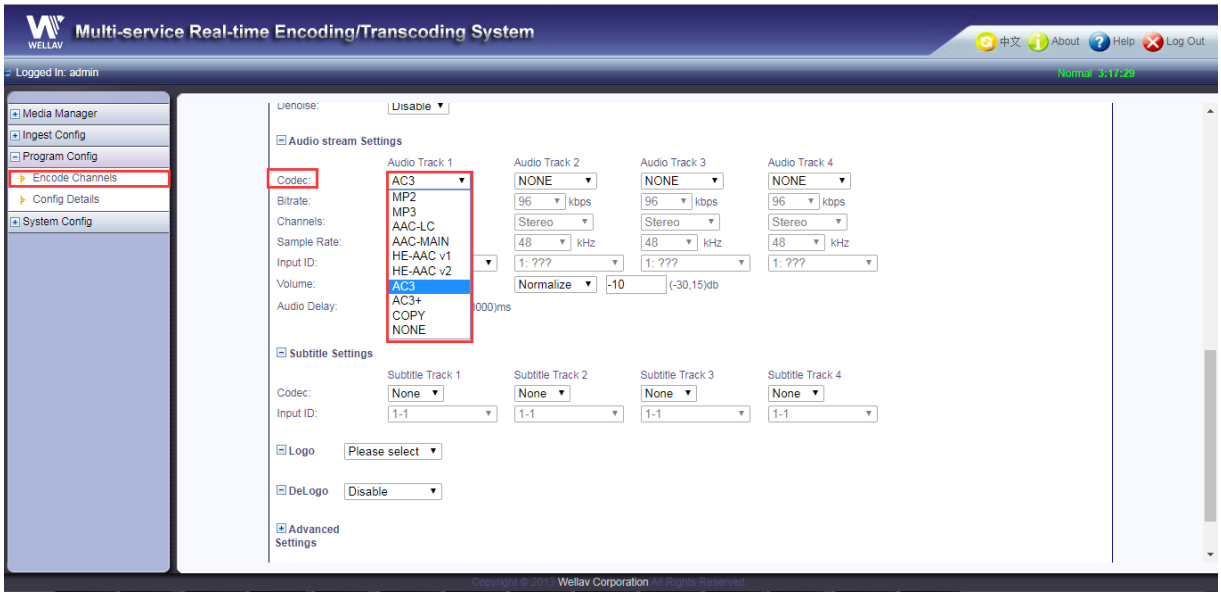


Figure 72: Audio Transcoding Type

The current version of omp500 can support several formats, such as MP2, MP3, DRA, AAC-MAIN, AAC-LC, HE－AAC, AMR, AC3 and AC3+. The system also supports “None”, that is to say, no audio will be output from the system.

Sound Channel

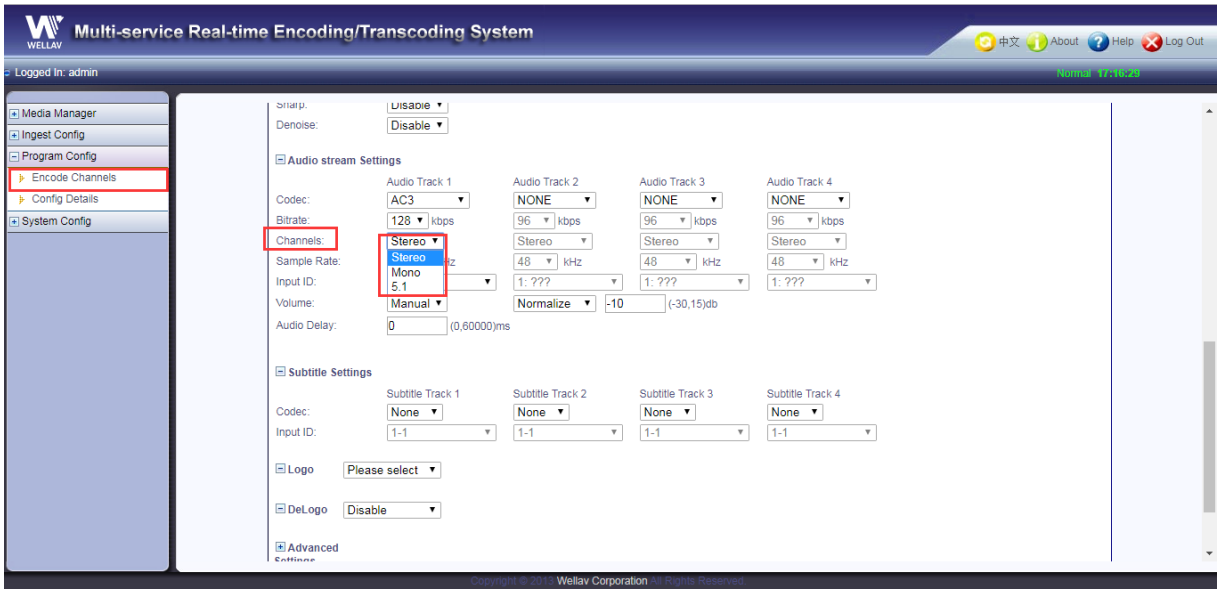


Figure 73: Drop-Down Menu for Sound Channel

There are 3 options in the drop-down menu for the sound channel: Mono, stereo and 5.1. In Mono mode, the two audio channels will be merged into one single mono.

MP2 ： Stereo/Dual Mono/Mono

MP3： Stereo/Mono

AAC-LC： Stereo/Mono/7.1

AAC-MAIN: Stereo/Mono/5.1

HE-AAC v1:Stereo/Mono

HE-AAC v2:Stereo

AC3: Stereo/Mono/5.1

AC3+: Stereo/Mono/5.1

Audio Bit Rate

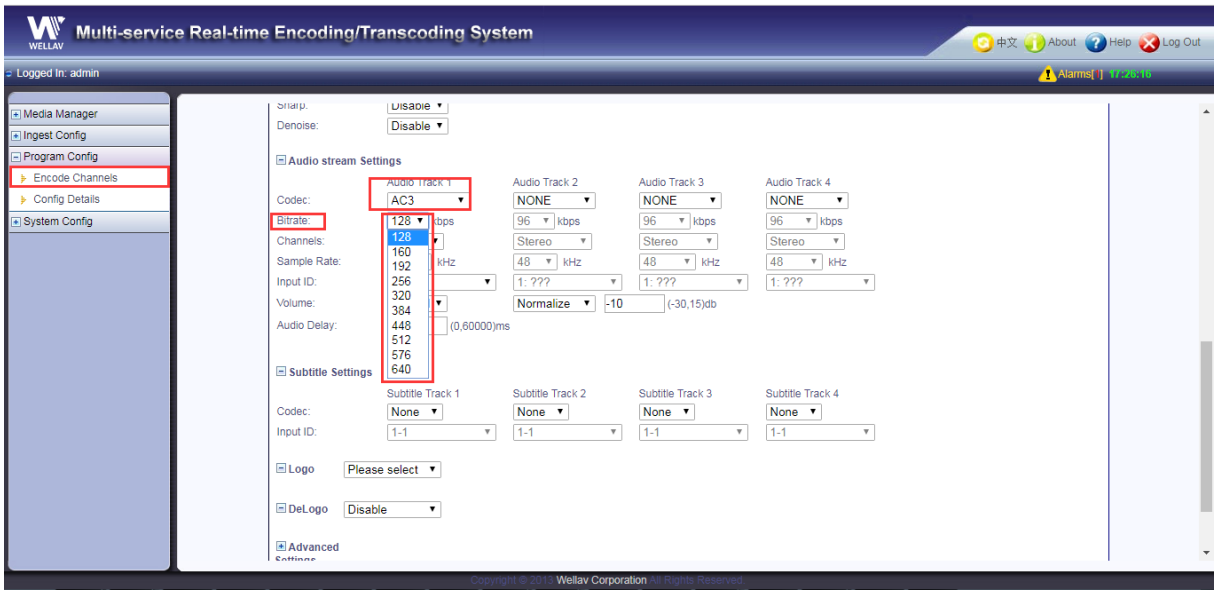


Figure 74: Drop-Down Menu for Bit Rate

The selection of audio bit rate is related to the method of audio encoding. When users select encoding method in the drop-down menu for audio bit rate, the drop-down menu will show the

corresponding audio bit rate. Users can select the audio bit as per their actual demands and bandwidth requirements.

MP2: 32/48/56/64/96/112/128/160/192/224/256 kbps

MP3: 32/48/56/64/80/96/112/128/160/192/224/256/320 kbps

AAC-LC:12/16/32/40/48/56/64/80/96/128 kbps

AAC-MAIN:64/80/96/128/160/192/256 kbps

HE-AAC v1:8/10/12/16/20/24/32/48/56/64/80/96/112/128 kbps

HE-AAC v2:8/10/12/16/20/24/28/32/40/44/48/64/80 kbps

AC3: 128/160/192/256/320/384/448/512/576/640 kbps

AC3+:128/160/192/256/320/384/448/512/576/640 kbps

Sampling Rate

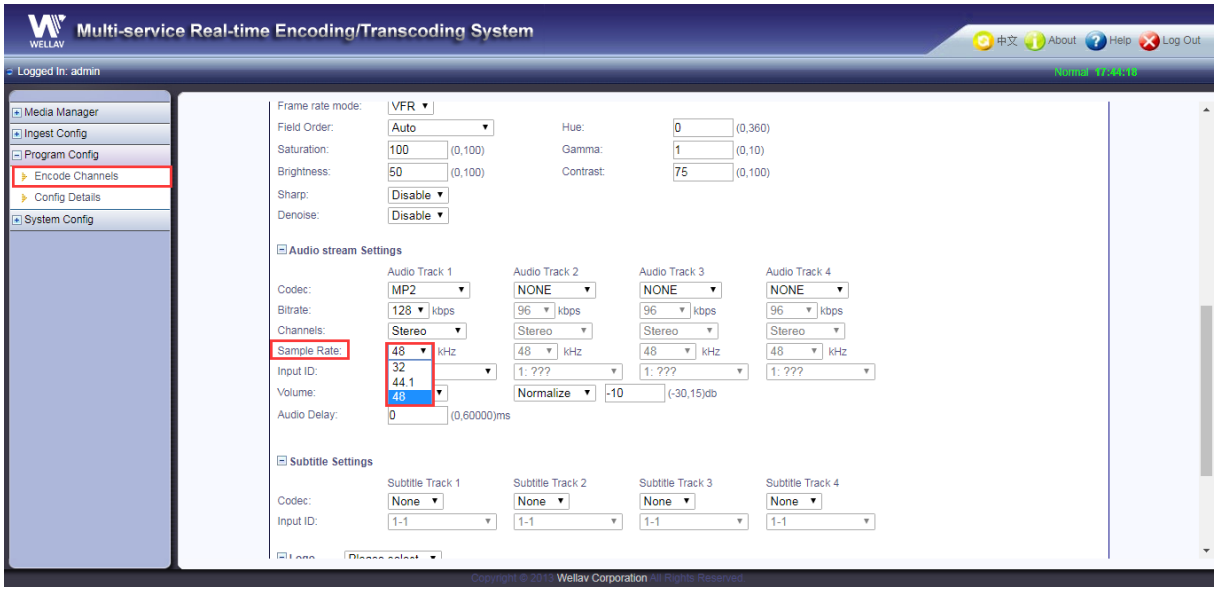


Figure 75: Drop-Down Menu for Sampling Rate

Sampling Rate is used for determining the input audio sampling frequency. The higher the sampling frequency is, the better the input audio quality gets. However, the higher sampling rate generally requires higher bit rate to transcode audio.

MP2 ： 32/44.1/48 KHz

MP3： 32/44.1/48 KHz

AAC-LC： 11.025/12/16/22.05/24/32/44.1/48 KHz

AAC-MAIN: 32/44.1/48/64 KHz

HE-AAC v1:32/44.1/48 KHz

HE-AAC v2:32/44.1/48 KHz

AC3: 32/44.1/48 KHz

AC3+: 48 KHz

Volume

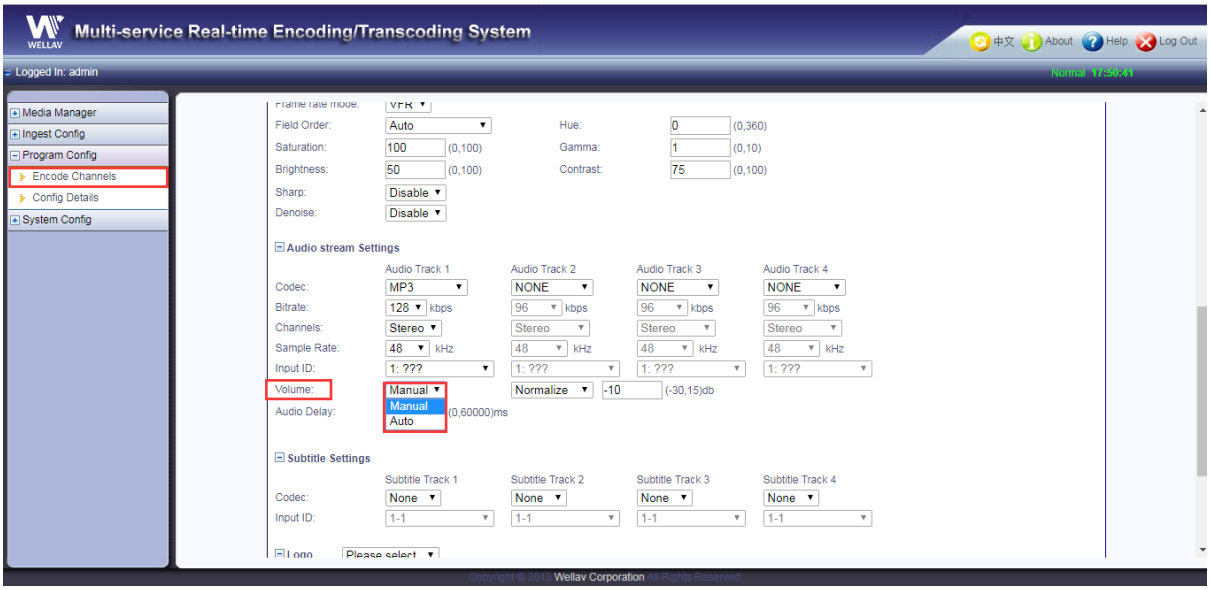


Figure 76: Volume Selection

The volume should be set between -30~15 db(0%-600% of the volume) for adjusting the volume of the input audio. The volume will be reflected on the audio stream's volume that has been transcoded. It will be 100 by default without any adjustment of the volume.

Audio Delay

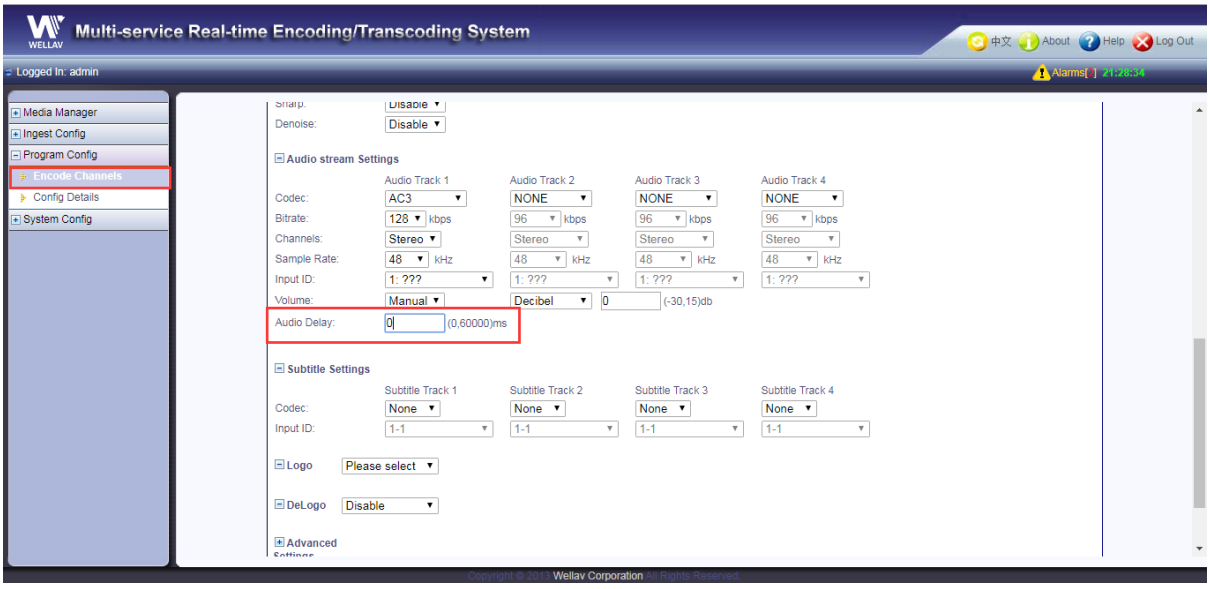


Figure 77: Audio Delay

The audio delay can set between 0~60000 ms

Multi-subtitle and Multi-track

The system supports TS source input with multi-subtitle and multi-track; users can select "transparent transmission" or "encoding transport" for audio and can select "source subtitle" or "no subtitle output" for subtitle. This feature cannot be used without the permission of the vendors.

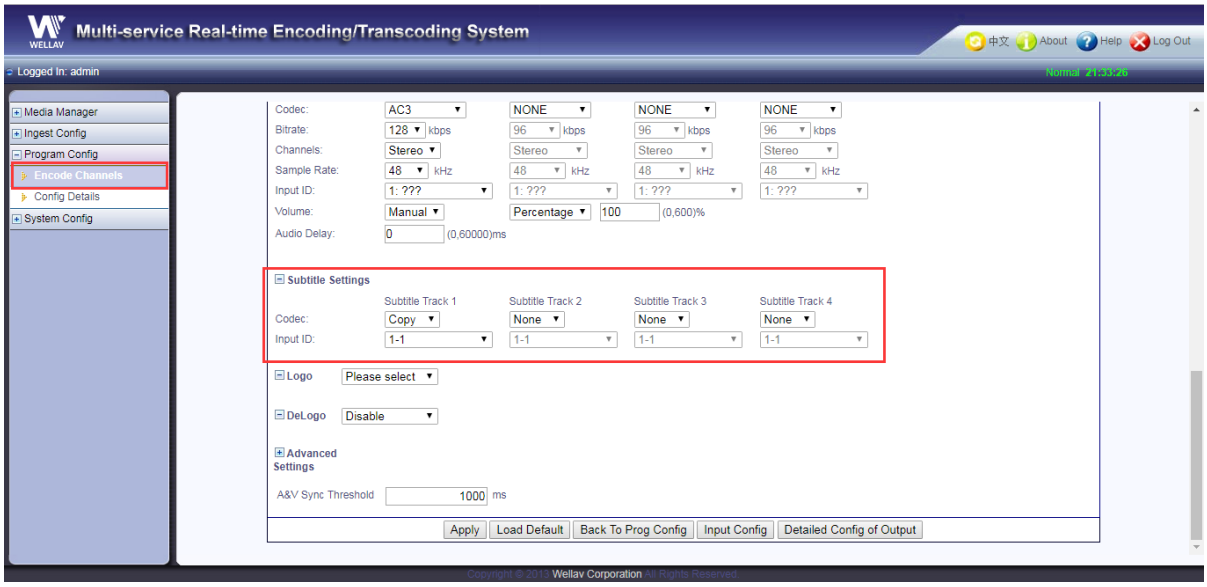


Figure 78: Multi-subtitle and Multi-track Setting

The system can make “transparent transmission” for each audio channel in the original bit stream. After transparent transmission, the properties of each audio channel will be the same as the original bit stream. For example, if the audio encoding format of the original bit stream is “MPEG1 Layer2”, then the audio encoding format after transparent transmission should also be ”MPEG1 Layer2”; if the audio encoding format of the original bit stream is “DVB AC-3”, then the audio encoding format after transparent transmission should also be “DVB AC-3”, rather than “ATSC AC-3”. Now the system can support three encoding formats for the audio transparent transmission: MPEG1 Layer2, MPEG-2 AAC and AC-3. The system also can support transparent transmission with 4-channel audio.

The system can make transparent transmission for the subtitles on each channel in the original bit stream and after that the encoding format and the language of the subtitles on each channel will be the same as the original bit stream.

It can support transparent transmission with 4-channel audio for three kinds of subtitle transcoding formats: DVB Subtitle, Teletext and Closed Caption. It can support HLS WebVTT subtitle.

Examples:

Input Source	Requirements for Output Stream	Users Behaviors
Track 1-mp2 (Chinese)	Track 1-mp2 (Chinese)	In the 1st column of track setting, selecting “copy” in the “transcoding type” and selecting “ID1” in the “audio input”
Track 2-mp3 (English)	Track 2-AC3 (English)	In the 2nd column of track setting, selecting “AC3” in the “transcoding type” and selecting “ID2” in the “audio input”
Track 3-AC3 (German)	Track 3-mp2 (French)	In the 3rd column of track setting, selecting “copy” in the “transcoding type” and selecting “ID4” in the “audio input”
Track 4-mp2 (French)	Track 4 (no sound)	In the 4th column of audio setting, selecting “none” in the “transcoding type”
Subtitle 1-Chinese	Subtitle 1-Chinese	In the 1st column of subtitle setting, selecting “copy” in the “transcoding type” and selecting “ID1” in the “subtitle input”

Subtitle 2-English	Subtitle 2-none	In the 2nd column of subtitle setting, selecting “none” in the “transcoding type”
Subtitle 3-German	Subtitle 3-French	In the 3rd column of subtitle setting, selecting “copy” in the “transcoding type” and selecting “ID4” in the “subtitle input”
Subtitle 4-French	Subtitle 4-none	In the 4th column of subtitle setting, selecting “none” in the “transcoding type”

Logo and De-Logo

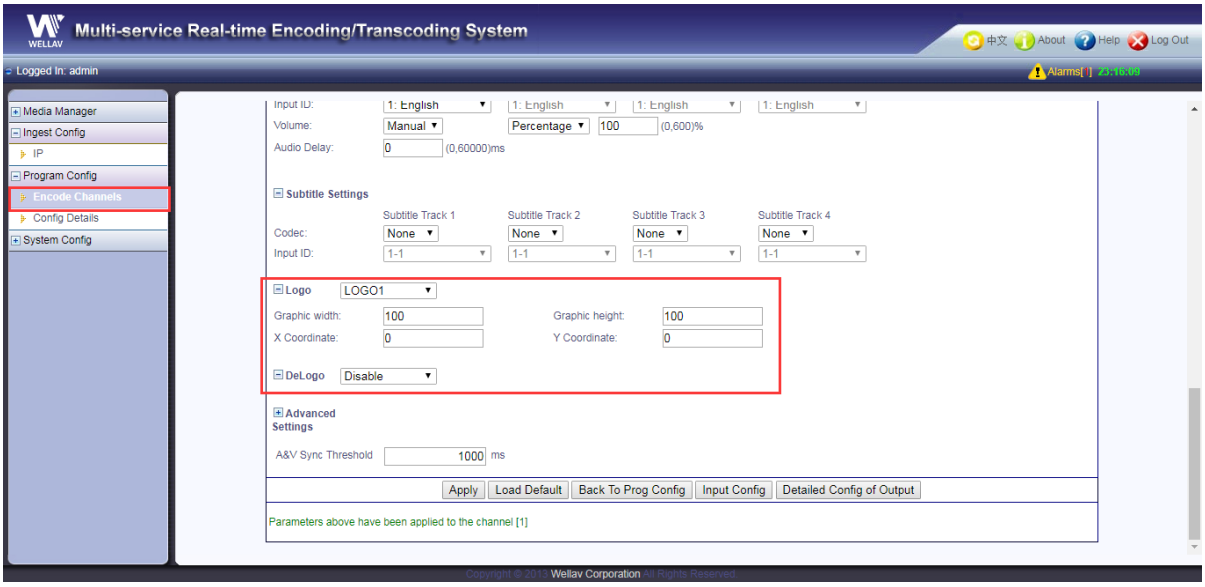


Figure 79: Logo and De-Logo

The OMP500 system supports to insert and remove logo

Advanced Settings

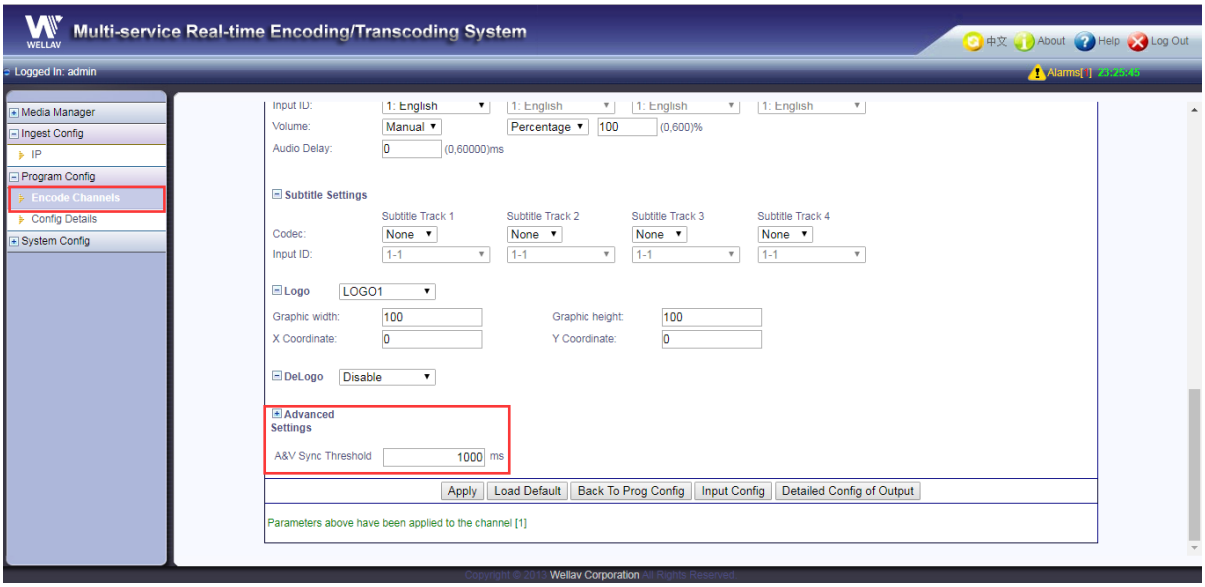


Figure 80: Advanced settings

In the advanced settings, the OMP500 system supports to revise the audio & video sync threshold

5. Media Manager

5.1 Resource

5.1.1 Resource Upload

Add Subtitle

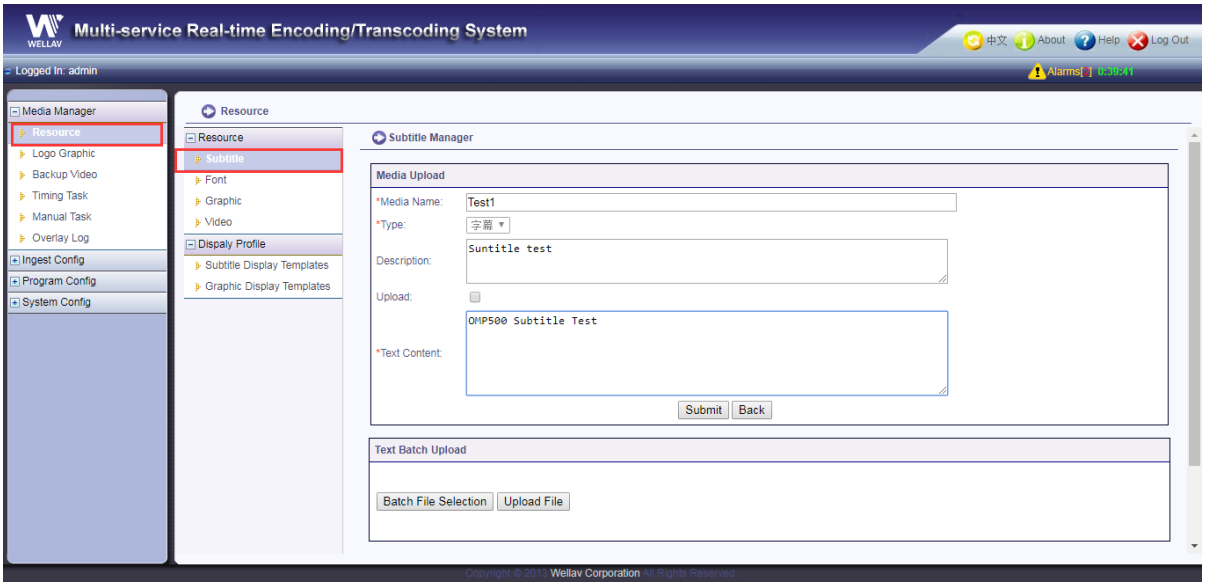


Figure 81: Add Subtitle

The OMP500 supports to upload subtitles resource to the system.

Add Font

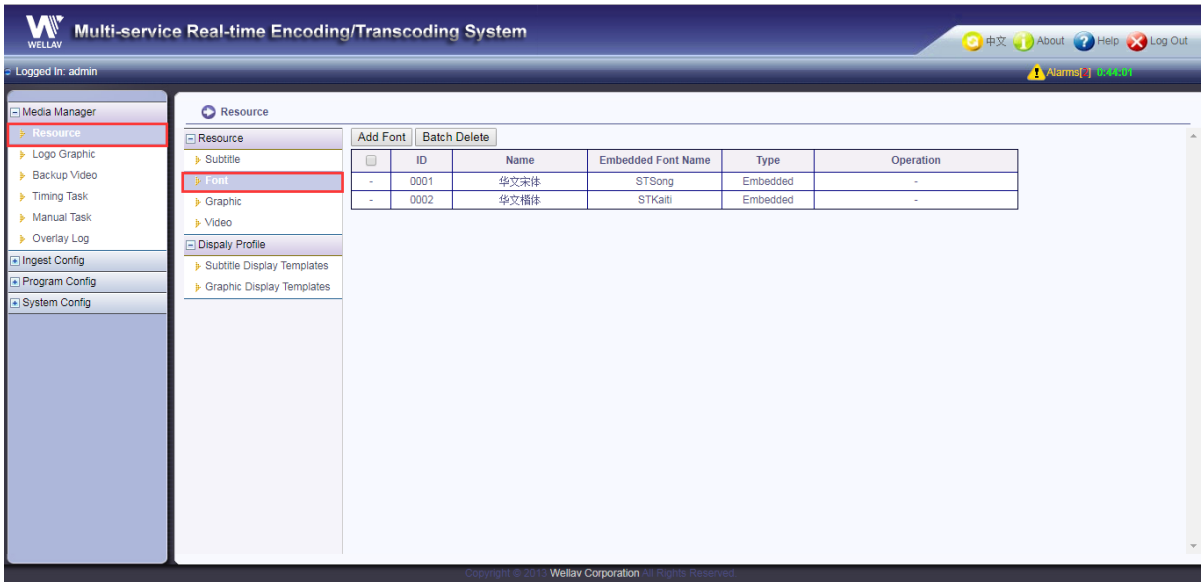


Figure 82: Add Font

The OMP500 supports to upload fonts source to the system, there are 2 embedded fonts existed.

Add Graphic

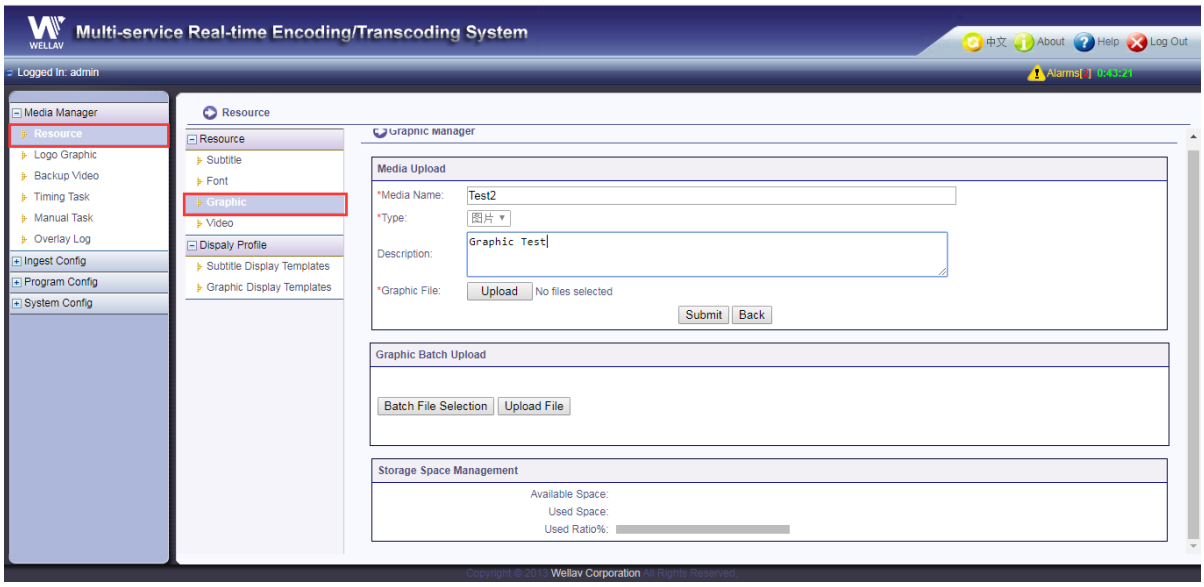


Figure 83: Add Graphic

The OMP500 supports to upload graphic source to the system.

Add Video

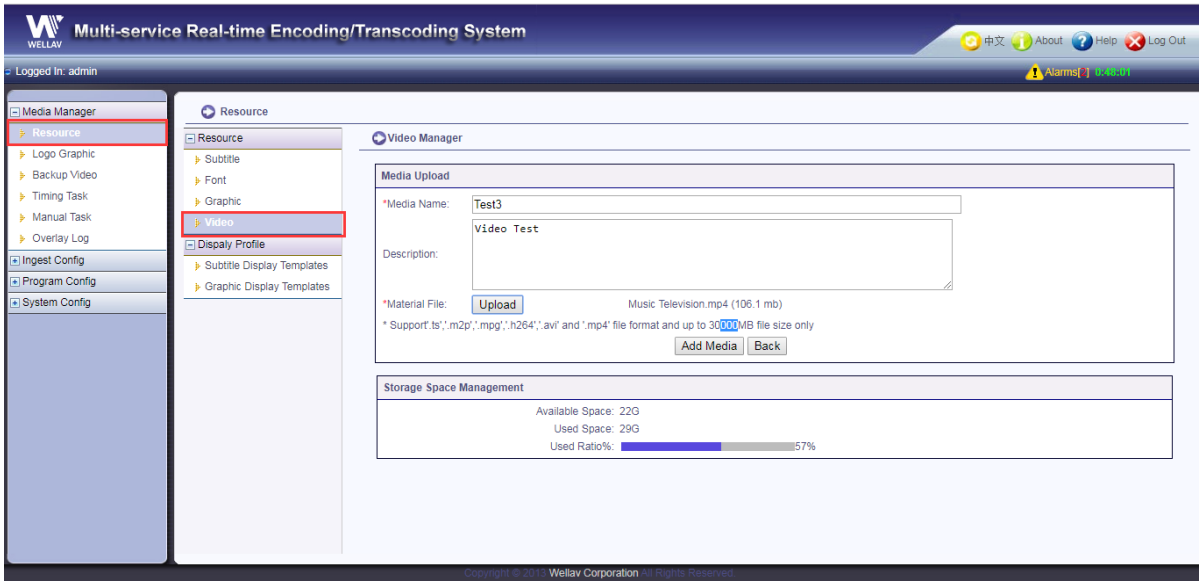


Figure 84: Add Video

The OMP500 supports to upload video source to the system.

5.1.2 Display profile

Subtitle Display Templates

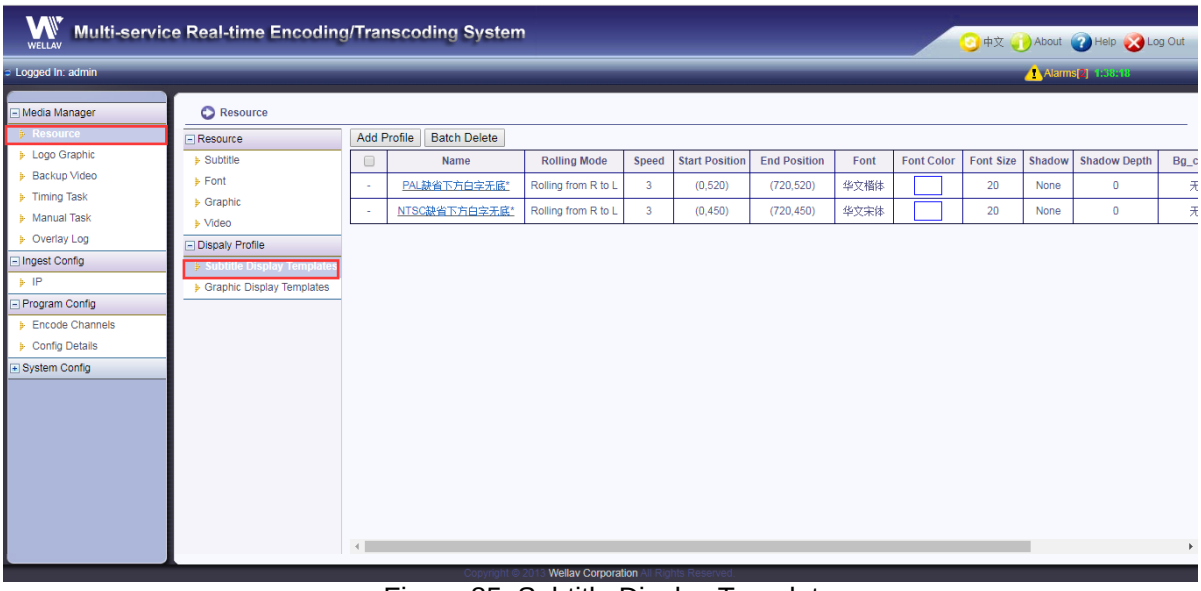


Figure 85: Subtitle Display Templates

The OMP500 has two embedded default display templates for subtitles, and the system supports to add user-defined subtitle display templates.

Graphic Display Templates

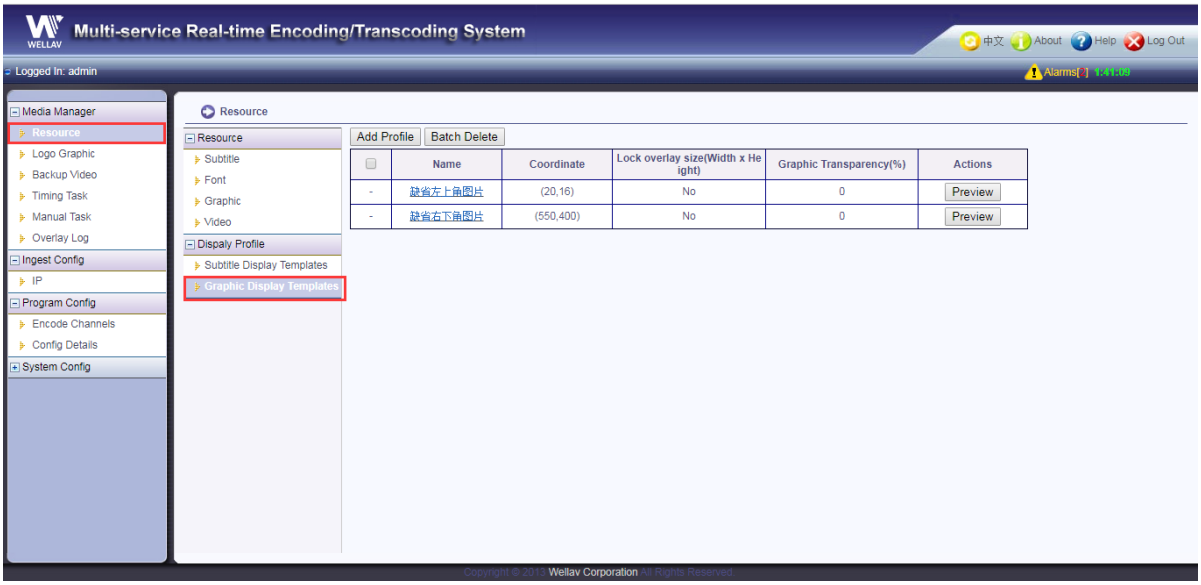


Figure 86: Graphic Display Templates

The OMP500 has two embedded default display templates for graphics, and the system supports to add user-defined graphic display templates.

5.2 Logo Graphic

The OMP500 supports to upload multiple logo resources.

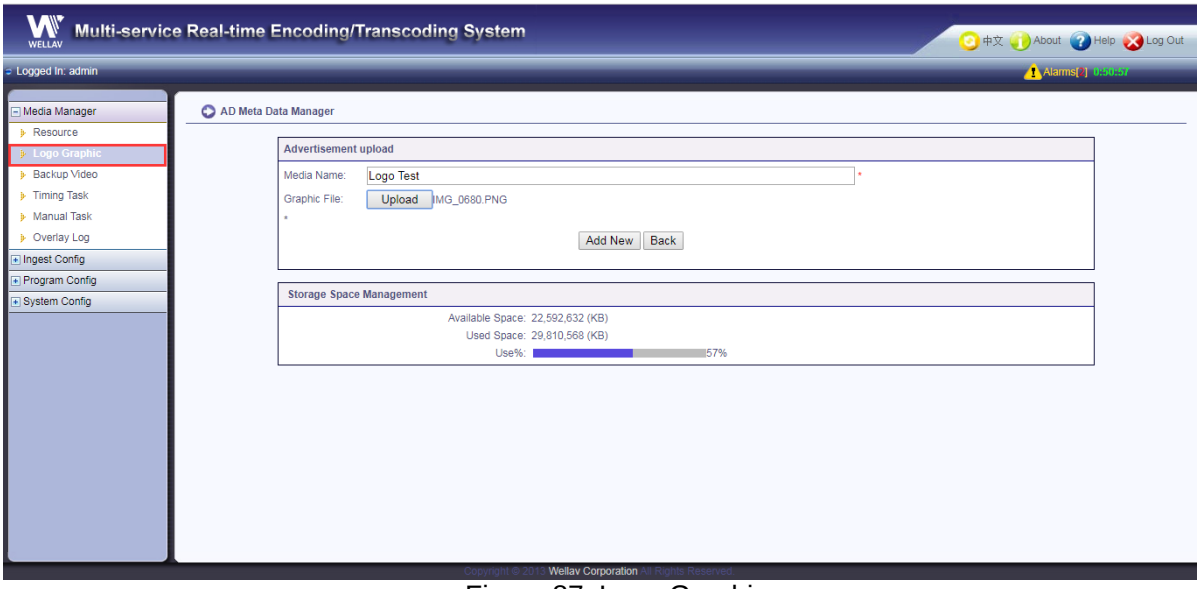


Figure 87: Logo Graphic

5.3 Backup Video

The OMP500 supports to upload multiple video resources.

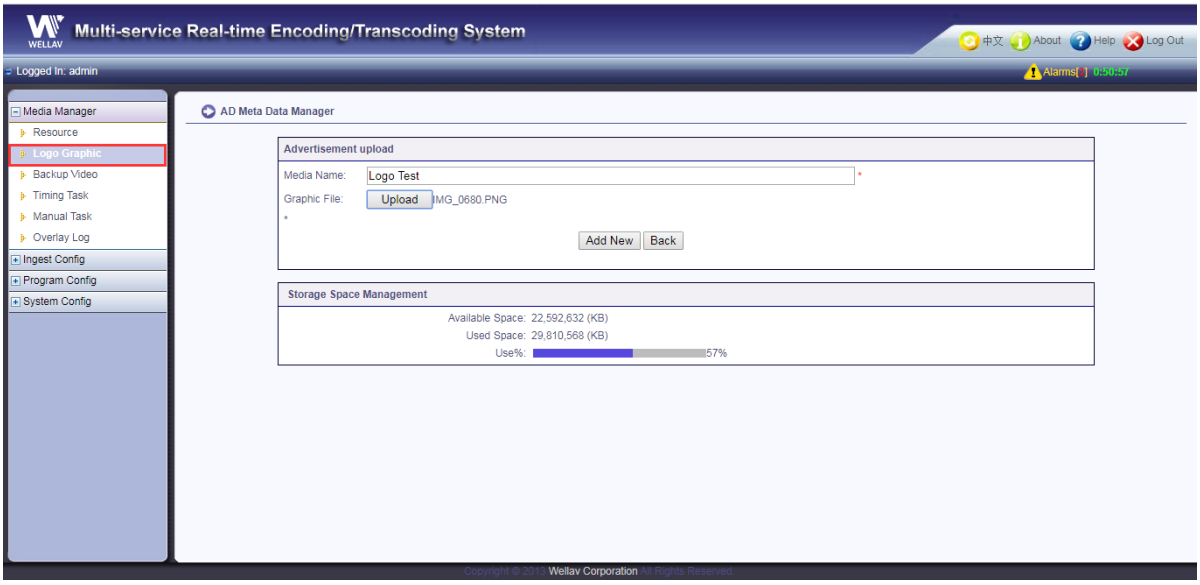


Figure 88: Backup Video

5.4 Timing Task

5.4.1 Task type

Subtitle Overlay

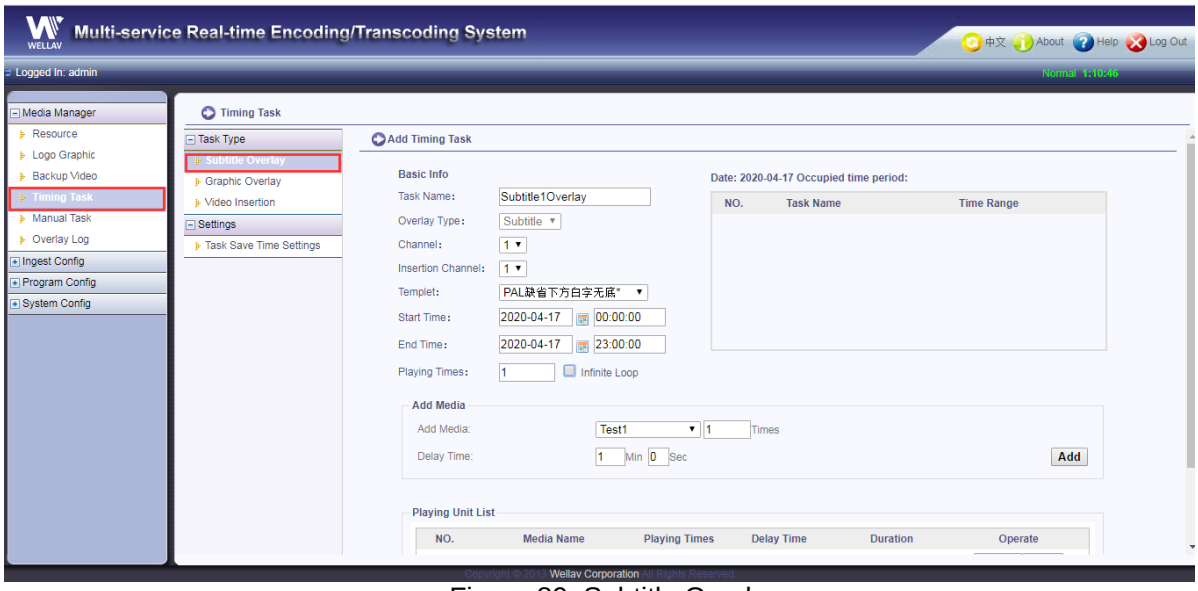


Figure 89: Subtitle Overlay

The OMP500 supports to overlay subtitles periodically.

Graphic Overlay

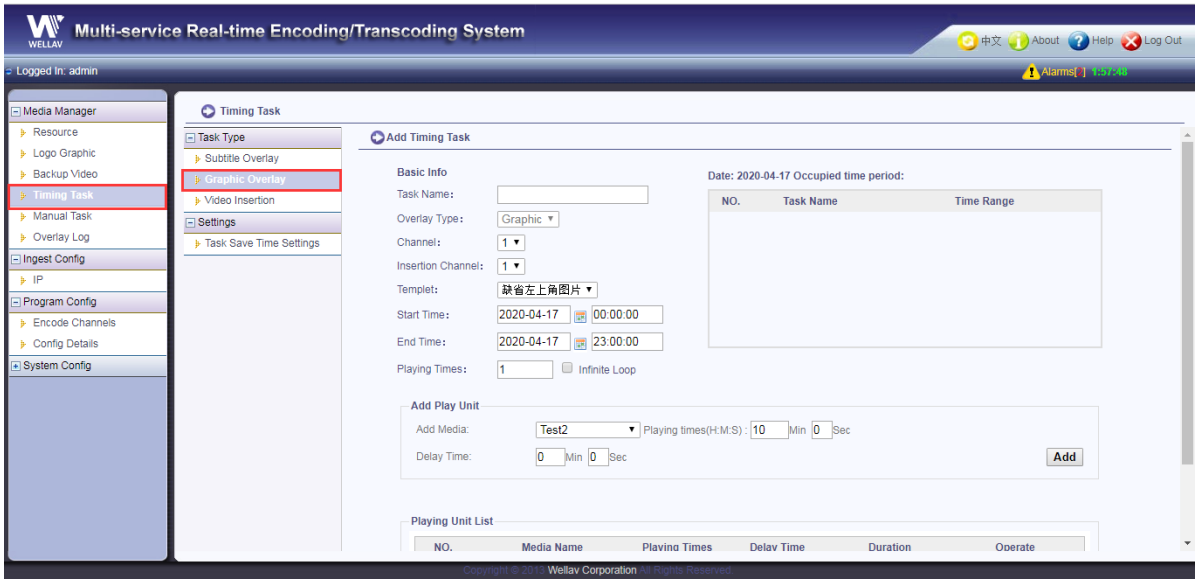


Figure 90: Graphic Overlay

The OMP500 supports to overlay graphic periodically.

Video Insertion

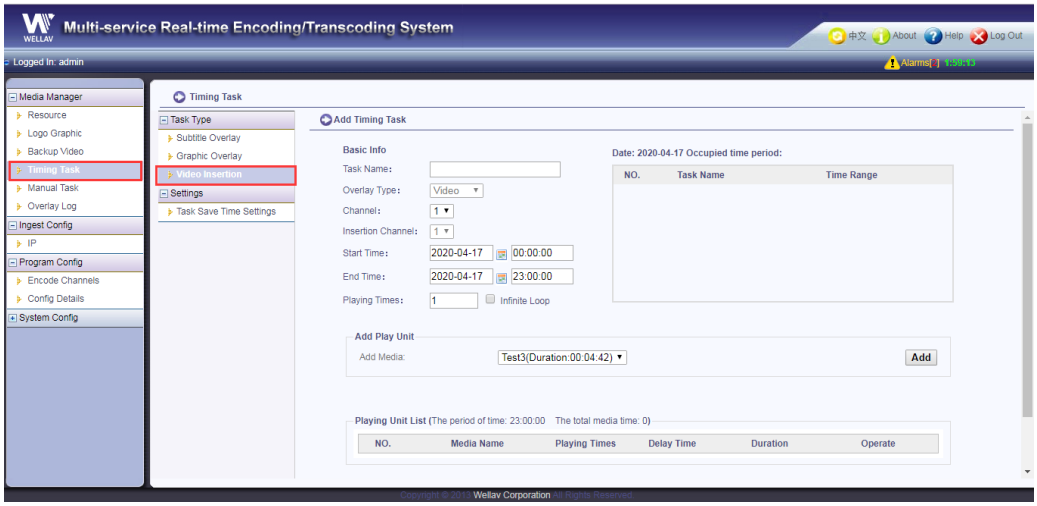


Figure 91: Video Insertion

The OMP500 supports to insert video periodically.

5.4.2 Settings

Task Save Time Settings

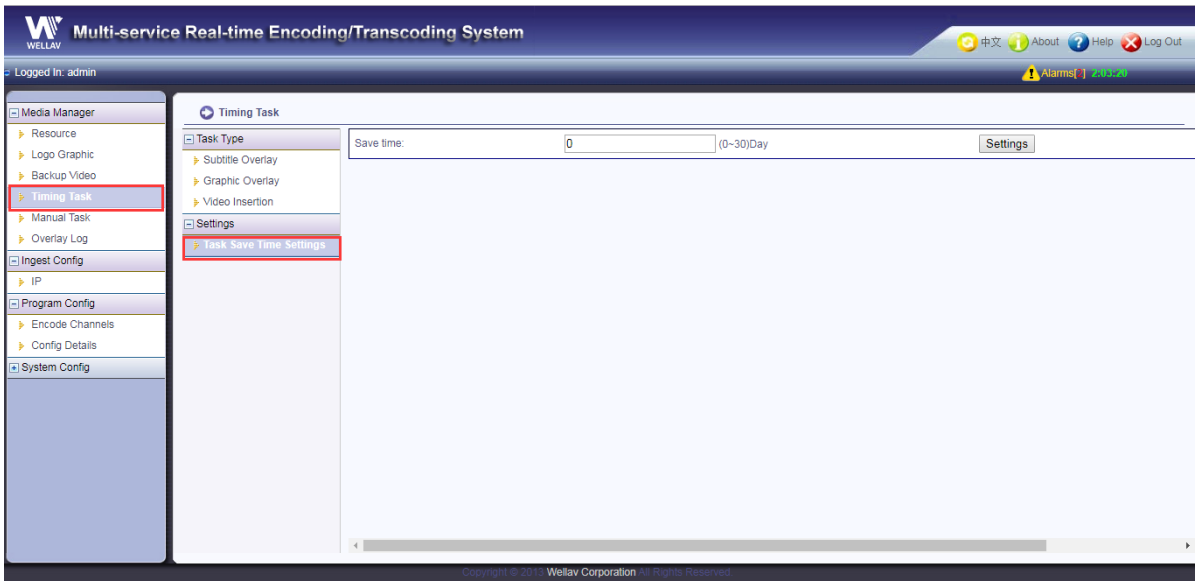


Figure 92: Task Save Time Settings

The OMP500 supports to save all the tasks 0~30 days

5.5 Manual Task

Similar to timing tasks

5.6 Overlay Log

The OMP500 supports to set up, delete and query the system log

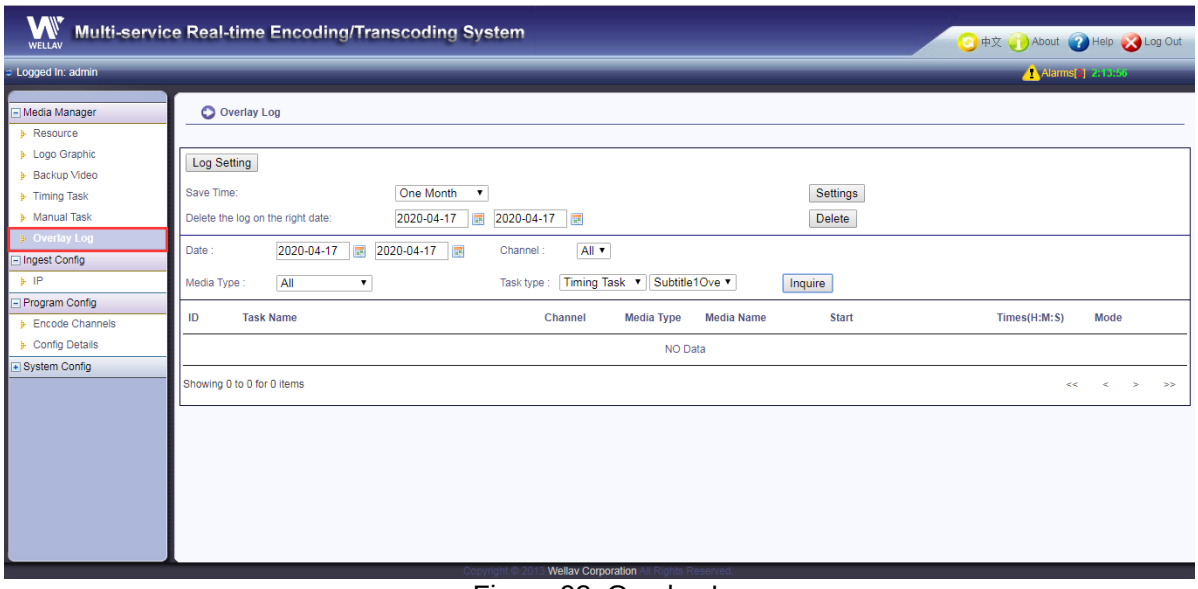


Figure 93: Overlay Log

6. FAQ

The MGMT port cannot be connected?

- Check whether the power cord is connected correctly.
- Check whether the default IP address of ETH0 is pingable, it should be 192.168.254.1;
- Confirm there is no IP conflict in the network;
- Use the browser of Internet Explorer 8.0 or higher, or Firefox 3.0 or higher;
- Contact customer service from Wellav for help

How to restart the system and restore the factory settings?

- Refer to section 3.4 on how restart the system
- Contact customer service on how to restore the system

How to calculate the rate of the output stream?

- OMP output stream contains video stream and audio stream. The accurate calculation of output TS requires the sum of video stream rate and audio stream rate and plus 3% of the sum. TS head data used contain video stream and audio stream. For example, if the audio stream rate is 96Kbps and the video stream rate is 1.2Mbps, then the total output flow rate (including TS head data) is (96Kbps +1.2 Mbps) * 1.03 = 1.335 Mbps. This is the precise calculation of output stream rate of OMP.

How to re-obtain the current configuration parameters?

- WMS management interface, if you click on the network configuration or the coding channel output configuration button / link, OMP will provide current running parameter configuration and display the configuration page. You can further modify the parameters, click on "Apply" (submit) button to confirm the new configuration.

Why are there compressed color lump?

- This is usually due to lower rate and higher video complexity. To address this problem, you can increase the rate; if the problem still exists after that, reboot the system.

Why there is no sound?

- Check the audio settings from WMS management interface

Why the system can only conduct the coding configuration on one input program stream when multiple input program streams are available in the system?

When it is set to the DVB mode, the system can only select a Multiple Programs Transport Stream (MPTS) and can only progress the programs in the MPTS, and the program after being processed can be compounded into MPTS for output. If it needs to progress multiple MPTS or SPTS, the system must be set to IPTV mode and then conduct the processing.

- To output the adaptive streaming, it needs the third-party software.
- Start the output main configuration and proxy first, configure them as RTMP output, and configure the FMS address as the IP address of the third-party server.
- Start the channel and receive the adaptive streaming from the third-party server connected.

7. Contact

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+86-752-2760230

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marketing@wellav.com

Website:
http://www.Wellav.com

Address:
No.1, Shunchang Road, Huinan Hi-Tech Industrial Park, Zhongkai Hi-Tech Development Zone, Huizhou, Guangdong, China 516025