DMP900

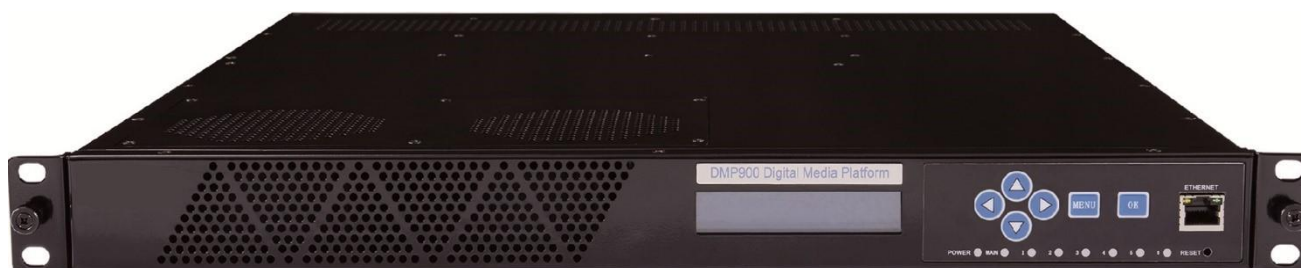## Digital Media Platform

User Guide

Revision History

Date	Version	Description	Author
1/1/2011	1.0	First Draft	TZ
12/27/2012	1.06	New Module Introduction Added	NY
4/9/2013	1.07	New Module Introduction Added	TZ
1/15/2015	1.10	New Module Introduction Added	AY
8/30/2016	2.0−N	New Web User Interface	HL
12/5/2016	2.1-N	Add Power specification, NIT NOTE, EN4SC-xM2Axx	HL
6/28/2017	2.2-N	Update introduction for new modules	HL
1/22/2018	2.3-N	New Module Introduction Added	DA

This guide contains some symbols to call your attention.

DANGER	The DANGER symbol calls your attention to a situation that, if ignored, may cause physical harm to the user.
CAUTION	The CAUTION symbol calls your attention to a situation that, if ignored, may cause damage to Our product.
NOTE	The NOTE symbol calls your attention to important information.
TIP	The TIP symbol calls your attention to additional information that, if followed, can make procedures more efficient.
Red Arrow	The Red Arrow symbols point to import details mention the context above or below an image.
Blue Arrow	The Blue Arrow symbol indicates the motion path of an item in an operation step.
Thick Arrow	The thick Arrow symbol calls your attention to a serials of operation steps mentioned in the context.

This guide also contains the following text conventions.

Bold Italic	The bold Italic text indicates a button to click, an item in the drop-down menu to select, or a certain item in the UI.

Safety Instructions

- Read these instructions
- Keep these instructions
- Follow all instructions
- Heed all warnings
- Do not use this unit near water.
- Only use a damp cloth to clean chassis
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions
- This unit is grounded through the power cord grounding conductor. To avoid electrocution, do not remove the power cord before the outlet is switched off or unplugged. If the plug does not fit into your outlet, consult an electrician for replacement of the outlet.
- Route power cords and other cables so that they are not likely to be damaged.
- Only use attachments/accessories specified by the manufacturer.
- Do not wear hand jewelry or watch when troubleshooting high current circuits.
- Do not work on the system during periods of lightning.
- Refer all servicing to qualified service personnel. Servicing is required when this unit has been damaged in any way.
- **Damage Requiring Service**: Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
    - When the power-supply cord or plug is damaged.
    - If liquid has been spilled, or objects have fallen into the product.
    - If the product has been exposed to rain or water.
    - If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of the controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
    - If the product has been damaged in any way.
- **Replacement Parts**: When replacement parts are required, be sure the service technician uses replacement parts specified by the manufacturer. Unauthorized part substitutions made may result in fire, electric shock or other hazards.

SAFETY PRECAUTIONS

There is always a danger present when using electronic equipment.

Unexpected high voltages can be present at unusual locations in defective equipment and signal distribution systems. Become familiar with the equipment that you are working with and observe the following safety precautions.

- Every precaution has been taken in the design of the products to ensure that it is as safe as possible. However, safe operation depends on you the operator.

- Always be sure your equipment is in good working order. Ensure that all points of connection are secure to the chassis and that protective covers are in place and secured.

- Never work alone when working in hazardous conditions. Always have another person close by in case of an accident.

- Always refer to the manual for safe operation. If you have a question about the application or operation contact the manufacturer for assistance.

Electrostatic Discharge (ESD) Caution:

- Always wear an ESD-preventive wrist or ankle strap when handling electronic components.

- Handle cards by the faceplates and edges only. Avoid touching the printed circuit board and connector pins.

- Avoid touching any electronic components while holding any module in hands.

 Danger of explosion if battery is incorrectly replaced.

Contents

Part 1 Panel Overview

1.1 Front Panel

DMP900 is a powerful, platform-based and multipurpose video-processing product. Equipped with six hot-swappable modules, DMP900 supports almost any video delivery requirement with any combination of receiving, de-scrambling, transcoding, re-multiplexing/grooming, scrambling, modulating and IP/ASI turn around for service providers.

1. Cooling Air Intake
2. LCD Screen
3. RJ45 Management Port
4. Power Alarm Indicator
   - Flashing red - One of the Power Supply Unit is disconnected or malfunctioning
   - Green - Normal running status

   Mainboard communication status indicator
   - Red - Mainboard loading failure
   - Flashing Red - Alarm for high temperature inside the chassis
   - Green - Normal running status

   Module Status Indicators for slot 1 to slot 6
   - Flashing green - Initializing this module
   - Green - Normal running status
   - Red - Initialization Failure due to hardware defection, software missing (when a new module is inserted, and there is no software for this module in the chassis), or other malfunction conditions.

5. Up, Down, Left, Right, Menu, OK buttons

1.2 Rear Panel

1. Dual AC Power Supply
2. Slots for maximum 6 modules

Note the position of each slot on rear panel. Fasten the modules in the chassis by screws to avoid loose connection between the modules and mainboard.

Port Sequence on the Modules

Take 4-channel HDMI encoding module for example, from left to right the ports are port1, port2, port3 and port4.
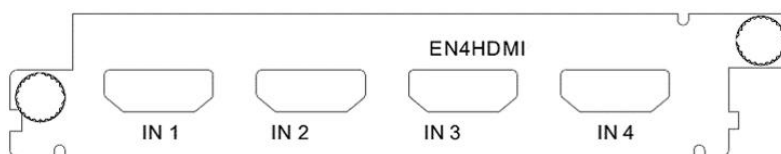
The DMP00 is cooled via forced induction through the front of the unit and exhausted through the slots in the rear of the chassis. The DMP900 is equipped with a temperature controlled status indicator. If the temperature inside the chassis exceeds 50°C (the default alarm threshold) the mainboard status indicator will be flashing red on the front panel.

Part 2 Installation

2.1 Rack Installation

The DMP900 is designed to be mounted in a standard 19" rack. It takes 1RU of rack space. To install it into a rack, please use the following steps:

1. Determine the desired position in the rack for the DMP00. Make sure that the air intake on the top of the unit and the exhausts on the back of the unit will not be blocked.
2. Install the brackets at desired position if there's no supporting plate in the rack.
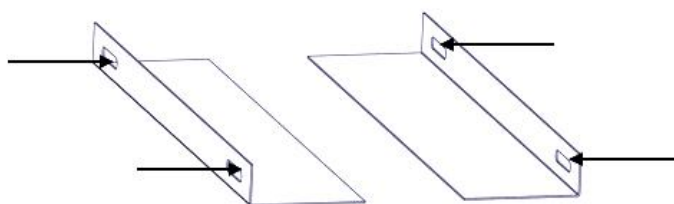
3. Insert the rack mount clips into place over the mounting holes in the rack.
4. Slide the DMP900 into the position in the rack.
5. Secure the chassis to the rack by installing the four supplied screws through the front mounting holes and tightening.
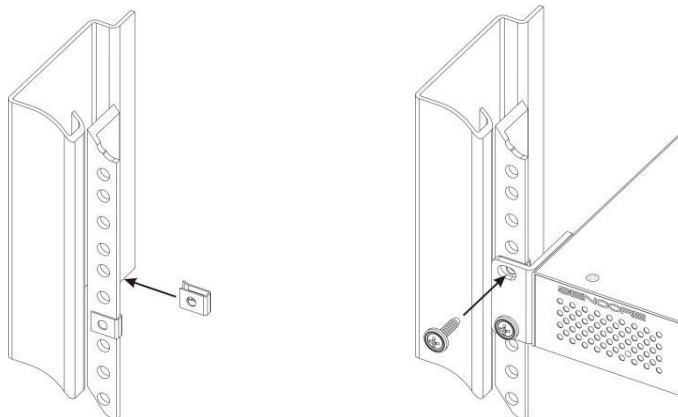
2.2 AC Power Connection

Please only use the supplied 3-prong power connector or one with equal specifications. NEVER tamper with or remove the grounding pin. This could cause damage to DMP900, personnel, or property. Make sure the power outlet is switched off before plug or unplug the power cable from the back panel of DMP900.

Dual Redundant Power Supply Specification:

AC INPUT   100~240V, 47~63Hz, 2~4A, 275W

⚠️ When you take the equipment from a cold condition into a much warmer and humid condition, the equipment should be acclimated to the warm and humidity condition for at least 30 minutes. Powering up a non-acclimated unit may lead to shortcut or other damage to electronic components.

🔅 A professional UPS system is recommended for better performance of your content distribution system.

2.3 Configuring Network via Front Panel

The following chart presents the Menu Structure on the Front Panel:

Main Menu	Ethernet	Host IP Address
		Host Subnet Mask
		Host Gateway
		Host MAC Address
		Trap IP Address1
		Trap IP Address2
	System	Language
		Factory Setting
		Power Alarm
	Version	Mainboard Version
		Sub board/Slot Version

To configure DMP900 network, use the following steps:

1. Press **MENU** button to enter Main Menu.
2. Use **Up**, **Down**, **OK** button to navigate and enter submenus.
3. In order to change the addresses, press **OK** button to enter edit mode. When a short line appears under editable digit, press **Up** or **Down** button to change the digit, then press **Left** or **Right** button to edit next digit. Press **OK** button to confirm and exit edit mode.
4. Press **MENU** at any time to return to previous menu.

Part 3 Web GUI

3.1 Web GUI Overview

3.1.1 Connecting to the Management Port

Factory network settings of the Management Port:

- IP address   192.168.1.98
- Subnet Mask   255.255.255.0
- Gateway   192.168.1.1

Use the following step to access the Web GUI in a browser.

- Connect both DMP900's management port and the computer's Ethernet port to a switch by CAT5 straight-through cables. If you do not have a switch, you can connect the computer directly to DMP900's management port.

- Set the IP address of the laptop/computer in the same network with the DMP900 management IP address. For example, you can set the computer's IP address to 192.168.1.98.

- Check the physical connection via Command Prompt (Try to click the Windows Menu Icon in the corner of the desktop, and hit "CMD ", then press "Enter", you will open the Command Prompt). Type "ping 192.168.1.98" or "ping 192.168.1.98 –t" and press "Enter" to check reply status. Stable and constant replies from 192.168.1.98 (management computer's IP address) indicate a reliable physical connection. See the following image.

3.1.2 Logging into the Web GUI

Type the DMP management IP address into the URL field of any recommended browser (IE8 or above, Firefox, and Google Chrome) to access the logon page. By default, the admin user account is admin with password admin. Click *Login* or strike Enter on the keyboard to login to the GUI.
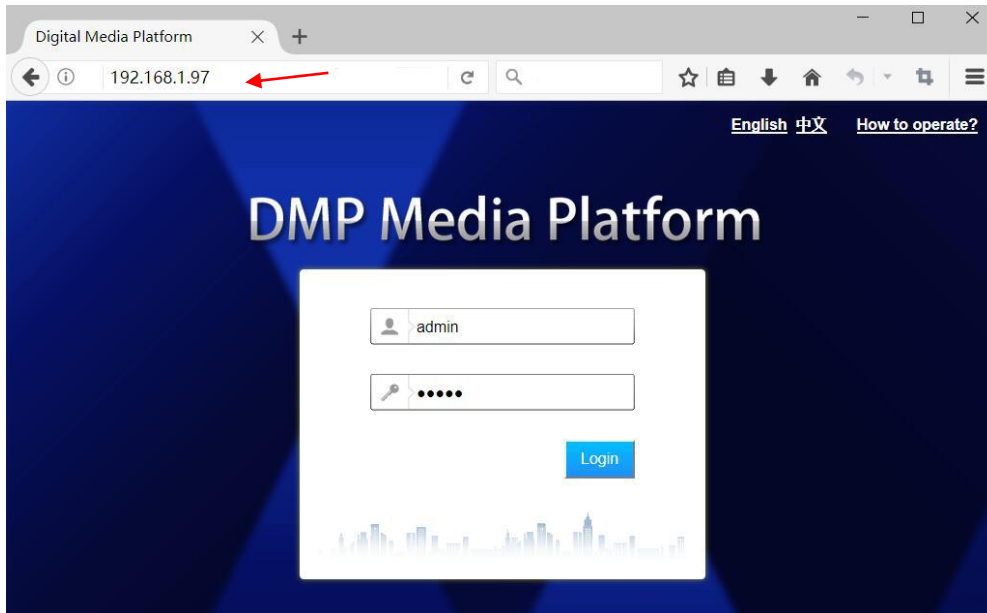
After a successful login, you will always enter the status overview page, where you can check the real-time status of:

- The input and output rate of each slot
- The running status of each module
- The temperature in the chassis

📄 We use only IE, Firefox and Chrome for testing procedures. If you use other browsers, like Microsoft Edge, you may encounter incomplete UI layouts, and configure setting in these browsers may lead to errors.

3.1.3 Dropdown Menu Overview

On the top of the Web UI, you will find a couple of menu items. Move the cursor to each item to navigate through the dropdown menus. Menu item with a small white arrow on the right contains submenu items.

Menu **Status** pages summarize the input and output bitrate in each board.

Menu **Module Configuration** is where you set input and output parameters for each board.

Menu **Service Configuration** is where to distribute services.

Menu **Equipment Configuration** includes the basic settings for a DMP900 unit.

3.1.4 Service Configuration

Service Configuration page, see the following image, is the main page to distribute input and output services. In the input and output areas, only the slots with modules successfully loaded are visible, except the scrambler which is hidden in Output Area and it is configurable by right-clicking the programs in output ports. Board 1 in this page refers to the module in slot 1. Board 2 refers to the module in slot 2, and so on.

Functions of the Main Buttons In this page:

Click **Refresh** to refresh input and output configuration or parameters. There are also **Refresh** buttons of the same function in other pages.

Click **Apply** to apply the configuration you have just done. There are also **Apply** buttons in other pages. Click **Apply** buttons every time you complete the settings in these pages.

Click **Save** to save all the configurations into the flash memory. Only in this way will the DMP900 be able to restore all the configurations after power recycling.

Click **Clear All** to erase the configurations in **Service Configuration**. This operation does not remove the configurations saved in flash memory unless you click **Save** after **Clear All** is done.

The login session will expire in 5 minutes without any active operation. Please click Apply at least once every 5 minutes; otherwise, your work in the last few minutes might be futile because the login session has stopped without notice.

3.2 Basic Operations

3.2.1 Configuring Network

Configuring the network parameters is the always the first step to configure a head-end unit. Go to ***Equipment Configuration > System***. As you can see in the following image, you are able to assign a static IP address to DMP900.

IP Address	192.168.001.098
Subnet Mask	255.255.255.000
Gateway	192.168.001.001
Trap IP Address1	000.000.000.000 ☐ Enable
Trap IP Address2	000.000.000.000 ☐ Enable
EIT Mux	Disable
NIT/SDT Bypass	Disable
Output TS Standard	DVB
Mac Address	A0-69-86-00-21-6E
Mainboard Hardware Version	2.0
SIP Filter	Disable
Temperature threshold	50
Bitrate statistics config by pid	Slot: 1 Stream ID: 1 PID(Hex): 0000
Priority Encoding	GB2312

| Apply | Refresh | Default | Reboot | Clear Power Alarm |

Click ***Apply*** to activate settings in this page.

Click ***Refresh*** to acquire the system settings that is applied.

Click ***Default*** to restore factory settings. The unit will reboot by itself after factory setting is done. And only the management IP address will remain after reboot. You may also find ***Default*** buttons in other pages. Click these buttons to perform factory settings for a module seperately If you do not want to factory set the whole unit. You should always click ***Reboot*** after ***Default*** is done.

Click ***Reboot*** to restart this unit. You may also find ***Reboot*** in other pages. Click these buttons to reboot a module seperately.

Click ***Clear Power Alarm*** to clear the alarm for power supply.

If you change the IP address of the DMP900 in System page and click Apply, this unit will restart itself to activate the new IP address.

3.2.2 Configuring Input

Before configuring the input, please plug in an input cable with valid signals.

Steps to configure ASI input:

1. Go to **Module configuration > ASI**, set Port 1 and Port 2 as input ports. Click **Apply** before you go to the next step. Then two input ports are available in ASI module. See the following image.

2. Go to **Service Configuration**. Right click the TS1 under Board6 [ASI] on the left of this page.

3. Click **Scan TS (DVB)** or **Scan TS (ATSC)** to search the input.
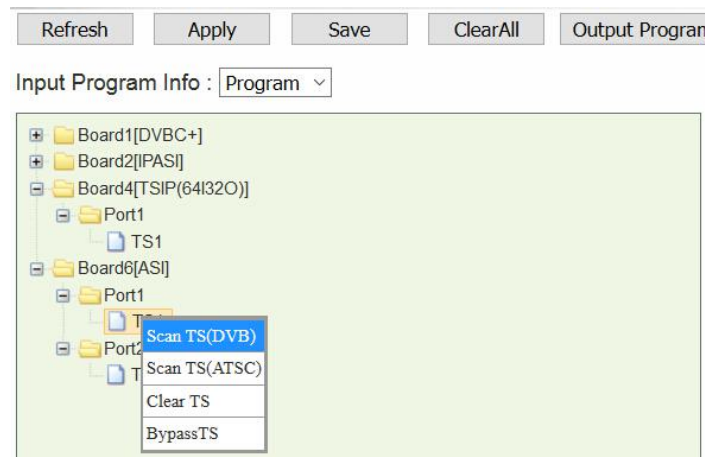
Before you configure input, go to **Equipment Configuration > System**, and set the **Output TS Standard**. By default, it is DVB. See 3.2.5

Batch Scan

When an input port contains multiple TS, use Batch Scan to search Multiple TS in sequence to avoid repetitive operation.
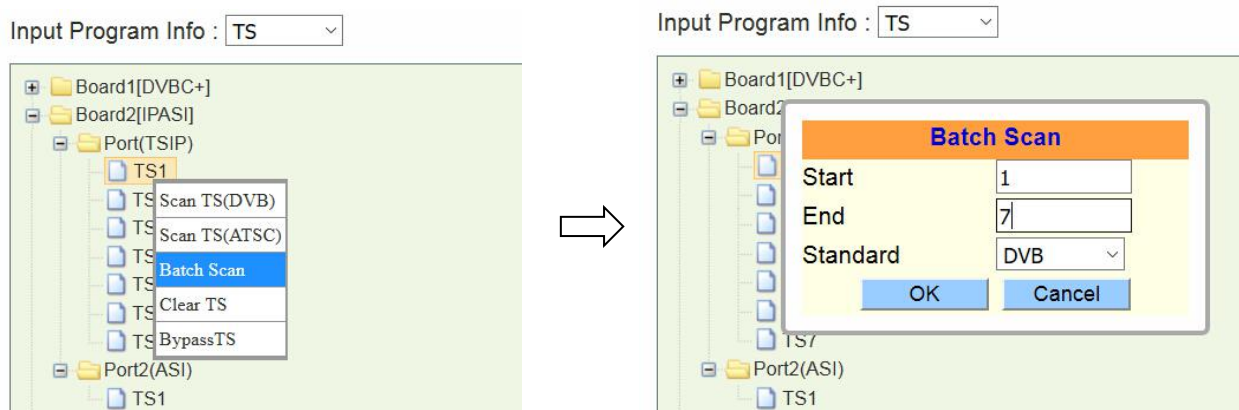
Batch Scan is really a convenient function especially used to search multiple TSIP input channels. So you do not have to do it one by one. Note before you use this function, please go to **Status > TSIP** and verify all the input channels you are going to batch scan present input bitrates.

Delete the input TS

See the image above. The **Clear TS** option is right under **Batch Scan**. If you have an input TS scanned, you will see the services and PID included in this TS. Right-click on the TS, and click **Clear TS** to delete a scanned TS.

Bypass the input TS

Right-click an input TS and click **Bypass TS** to pass it to the output. The bypassed TS will not be multiplexed. See the following image, a *[Bypass TS] follows the scanned TS1 as a mark.
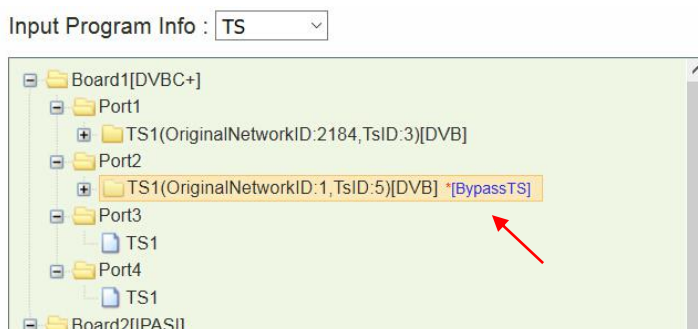
To configure the input of other modules, follow the similar steps as how you configure ASI and TSIP input. Summary of the steps:

1. Connect input cables
2. Open input channels and set input parameters.
3. Scan TS
4. Click **Apply**

3.2.3 Configuring Output

Verify the output ports are enabled in **Module Configuration**. Use the following two ways to create output TS:

Drag TS to TS

Click an input TS; drag and drop it to an output TS. Click **Apply**. Click **Save** if necessary. See the following Image, there is a TS coming from Board6 ASI input, and a TS is to be created in Board4 TSIP output port.
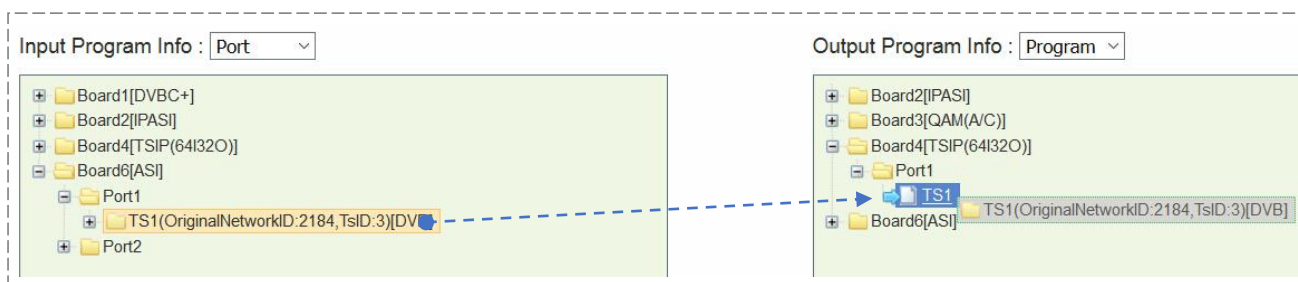
Drag Programs to Programs

Right-click an output TS. Click **Add TS** to edit **Original Network ID** and **TS ID** for this new TS. Click **OK** to confirm, then an empty TS is created.
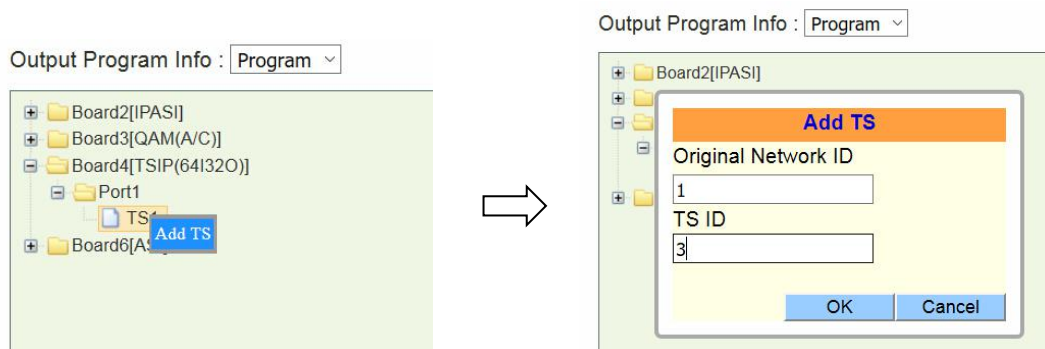
Click a program in the input port, drag and drop it to Program (0 Services) in the output configuration area.

Click **Apply**. Click **Save** if necessary.
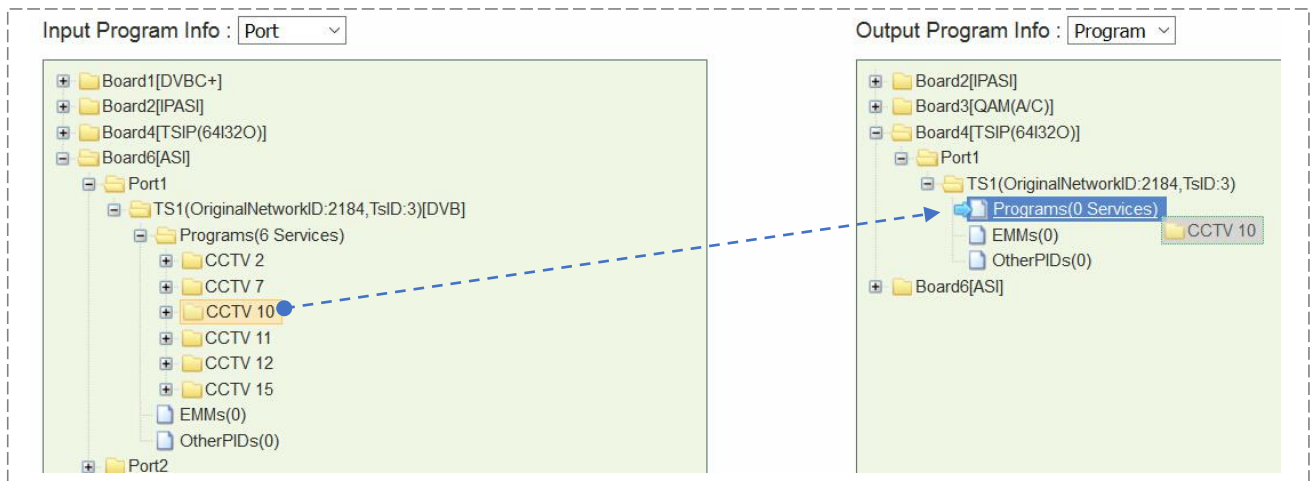
Go to **Status > TSIP (64I32O)** to verify the **Effective Bitrate** in the corresponding output channel.

Go to **Module Configuration > TSIP (64I32O) > Output*Channel (1-16)**. See the following image. Set the **Constant Rate** 2 Mbps higher than the output **Effective Bitrate** you to avoid overflow. For example, if the Effective Bitrate of ASI output TS1 is 3.822 Mbps, set Constant Rate 6 Mbps. Click **Apply** at the bottom of this page.

If the **Constant Bitrate** is lower than the **Effective Bitrate**, it will cause packet loss, and the **Effective Bitrate** of the corresponding TS will be highlighted in red. See the following image.

Slot 4:TSIP(64I32O) Status			
TS Bitrate Overview			
Channel	Input (Mbps)	Channel	Output (Mbps)
	Effective Bitrate		Effective Bitrate
1	0.000	1	4.220
2	0.000	2	4.551
3	0.000	3	5.786
4	0.000	4	5.226
5	0.000	5	4.695

📄 **EMM** and **Other PIDs** (EIT, SDT, TDT and other PIDs) can be output by drag-and-drop procedures.

3.2.4 Delete an Output TS/Program/PID

Move the cursor to a TS, Program or PID until a red icon (✖) appears. Click the red icon to delete the service or PID. Click **Apply** before next step.

Output Program Info : Program ▾
- ⊞ 📁 Board2[IPASI]
- ⊞ 📁 Board3[QAM(A/C)]
- ⊟ 📁 Board4[TSIP(64I32O)]
  - ⊟ 📁 Port1
    - ⊟ 📁 TS1(OriginalNetworkID:1,TsID:3)✖
      - ⊟ 📁 Programs(2 Services)
        - ⊞ 📁 CCTV 10
        - ⊞ 📁 CCTV 12 ✖
      - 📄 EMMs(0)
      - 📄 OtherPIDs(0)
- ⊞ 📁 Board6[ASI]

Output Program Info : Program ▾
- ⊞ 📁 Board2[IPASI]
- ⊞ 📁 Board3[QAM(A/C)]
- ⊟ 📁 Board4[TSIP(64I32O)]
  - ⊟ 📁 Port1
    - ⊟ 📁 TS1(OriginalNetworkID:1,TsID:3)
      - ⊟ 📁 Programs(2 Services)
        - ⊞ 📁 CCTV 10
        - ⊟ 📁 CCTV 12
          - 📄 ServiceID:306
          - 📄 PMTPID:262
          - 📄 PCRPID:8190
          - 📄 ServiceType:1
          - 📄 ES:517(StreamType:2-Video(MPEG2)) ✖
          - 📄 ES:700(StreamType:4-Audio--chi)
      - ⊟ 📁 EMMs(1)
        - 📄 EMMPID:193(CASID:2469)✖
      - 📄 OtherPIDs(0)
- ⊞ 📁 Board6[ASI]

3.2.5 Version Information/Upgrade

Version Information/Upgrade page presents the software information. Check *Advanced* to view all the software that are loaded in this unit.

Version Information				
Module Name	Components	Current Software Version	Compatible Software Version	Hardware Version
Mainboard	Mainboard	V5.7.98	V5.7.98	V2A(0002)
DVBC+	DVBC+	V60.1.1	V60.1.0	V2B(0110)
IPASI	IPASI	V60.3.12	V60.3.0	V5A(0001)
QAM(A/C)	QAM(A/C)	V60.1.1	V60.1.0	V5B(2000)
TSIP(64I32O)	TSIP(64I32O)	V60.1.2	V60.1.0	V4B(0000)
ASI	ASI	V60.1.11	V60.1.0	V3B(0001)

☐ Advanced

[_____] [Browse...]

[Upgrade] [Scan Flash] [Erase All]

Updating software

Click *Browse* to select the software. Then click *Upgrade* to start update process.

If it is a mainboard upgrade, DMP900 will reboot itself after upgrade is finished. If it is module upgrade, Go to *Module Configuration* and click *Reboot* to load the module again.

Always contact the manufacturer if you have any software problem. Do not click *Erase All* to delete all the software unless instructed to do so.

Do not upgrade any software unless instructed to do so. Do not disconnect the management cable or power off the device during update process.

3.2.6 License

License Information					
	Slot	Chip ID	Board Type	License Info	Last Update Time
○	0	0x3327561304000047	Mainboard	Full License	2015-11-17
○	1	0x3348feef040000ce	DVBC+	Full License	2015-4-23
○	2	0x3379992a05000047	IPASI	Max Input Channel:64,Max Output Channel:32	2016-2-19
○	3	0x33a1d66f050000c5	QAM(A/C)	Max Channel:8	2016-3-23
○	4	0x338084f904000011	TSIP(64I32O)	Max Input Channel:64,Max Output Channel:32	2016-6-16
○	6	0x33344c9b04000041	ASI	Full License	2015-3-11

[_____] [Browse...]

[Upgrade License] [Export License]

15

License page is where to check and update licenses. Note slot 0 refers to the Mainboard.

Updating License

1. Click *Browse* to select a license file.
2. Click the circle to select a slot number, then click *Export License* to save the license in the computer. Better name the license files as dmp98main.License, so that you know which license is for which module in which unit.
3. Send the license file to our sales for update.
4. Once you have the new license file. Click *Browse* to select a license file in the computer, then click *Upgrade License* to enter update process. When the update process succeeded, a manual restart is required to activate the new license.

The license file is unique for each module. You are not supposed to export a license file from one unit and upgrade it in another unit. Contact our sales if you need license updates.

3.2.7 Import/Export Configuration

Export the configuration of a unit, then you can Import it to this unit for fast configuration recovery when needed. To import the whole configuration from the sample unit to other duplicate units, the module types and their positions in the duplicate units should be exactly the same with that in the sample unit.
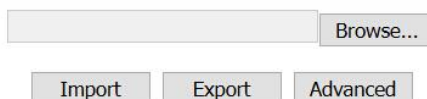
3.2.8 Login User Management

By default, the administrator user name and password are both admin. If the admin password is lost or admin user is deleted, you will have to perform factory setting on the front panel by pressing the buttons to restore the default login account. In that case, you will lose the configuration of this unit.

3.2.9

Log

Log records the operations and activities of a DMP900. We may request an exported log file from user for troubleshooting or other use.

3.3 Advanced Operations

3.3.1 Edit Output TS

Right-click any output TS and select **Edit TS Info**.
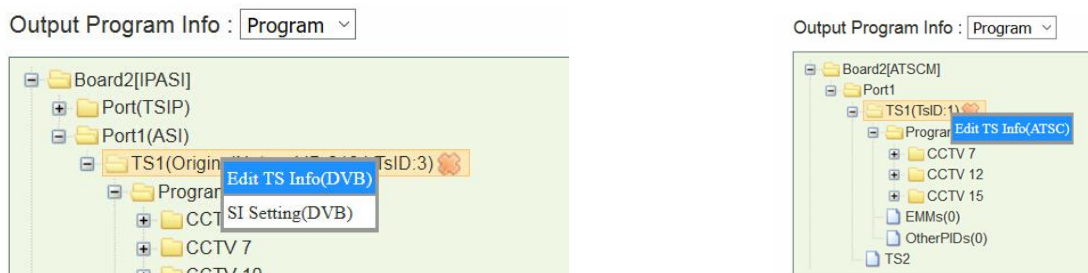
When the **Output TS Standard** in the **System** page is DVB, you have the following editable items.

Name	Range	Name	Range
Original Network ID	0~65535	Service Type	0~255
TS ID	0~65535	ES PID	32~8190
Service Name	Max 32 letters	Priority	1, 2, 3
Provider Name	Max 32 letters	Running Status	0~7
Service ID	0~65535	Free CA Mode	0~1
PMT PID	32~8190	EIT Schedule Flag	0~1
PCR PID	32~8190	EIT Present Following Flag	0~1

PID 8191 is taken as the PID for null (stuffing) packets.

When the *Output TS Standard* in the *System* page is ATSC, you have the following editable items.

Name	Range	Name	Range
Service Name	Max 32 letters	**ES PID**	32~8190
Service ID	0~65535	**Running Status**	0~7
Channel Number	Format: x-x	**Free CA Mode**	0~1
Channel TS ID	0~65535	**EIT Schedule Flag**	0~1
PCR PID	32~8190	**EIT Present Following Flag**	0~1
Service Type	0~255		

3.3.2 Edit Service Information for DVB Output

Right-click an output TS to enter *SI Setting (DVB)*.
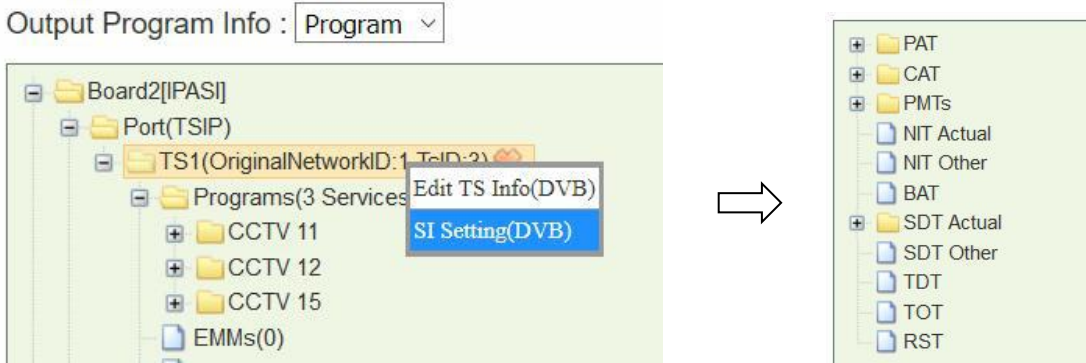
Add Network Information Table (NIT)

See the following image. Board3 [QAM A/C] is streaming output TS1, TS2 and TS3. Original Network ID is 1. TS1 ID is 1, and TS2 with ID 2, TS3 ID 3. TS1 frequency is 474000 KHz, and TS2 482000 KHz, TS3 490000 KHz. 474 MHz (TS1) is the center frequency.

Steps to add NIT:

1. Right-click **NIT Actual** to edit **Network ID** and **Network Name**.

2. Right-click **_transport_streams_** to add TS1 (Original Network ID:1 and TS ID:1) .

3. Right-click **_transport_descriptors_** in **_transport_stream_id:1_** to add **_Cable Descriptor_** for TS1.
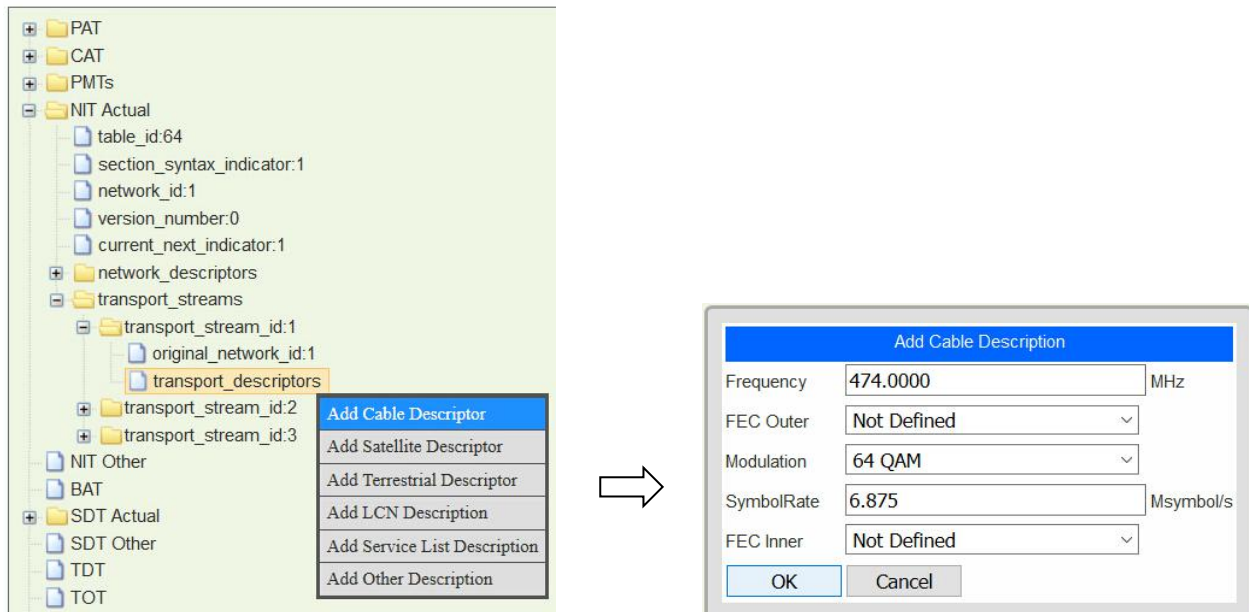
4. Repeat step 2 to add TS2 and TS3. Repeat step 3 to add cable descriptors for these two TS'.

5. Click **Apply,** and go to **Service Configuration** page, click **Apply** again.

Right-click **version_number** to change its value if necessary. Once you have added NIT, you are able to export it. Wherever you can find the cross icon (🟠), you can click this icon to delete that item.

Add Logical Channel Number (LCN)

LCN is used to sequence the channels in the Set Top Box. See the following image, we have a NIT tree with Cable Descriptors added in **transport_stream_id:1**, **transport_stream_id:2**, **transport_stream_id:3**.
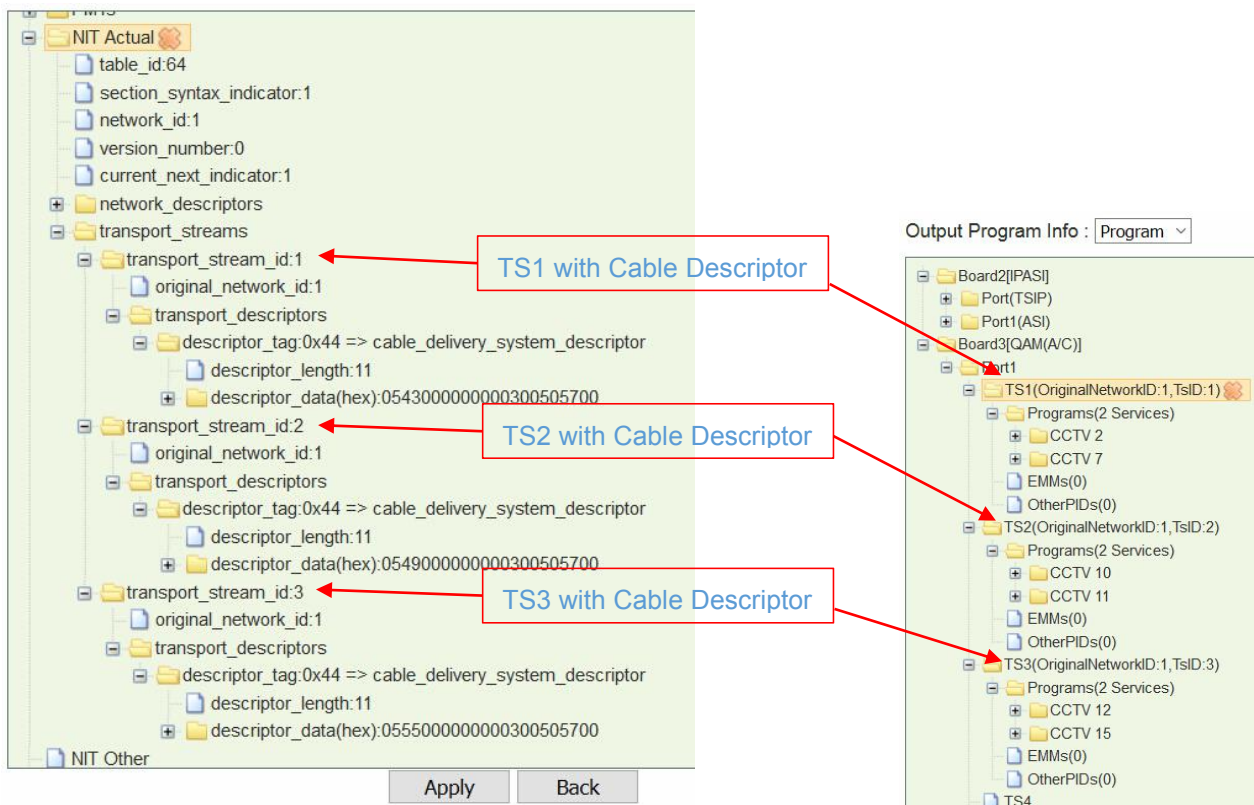
Steps to add LCN for the output services (CCTV2, CCTV7, CCTV10, CCTV11, CCTV 12, and CCTV15):

1. Right-click **transport_descriptors** under *transport_stream_id:1*, then select *Add LCN Description* to enter edit page.
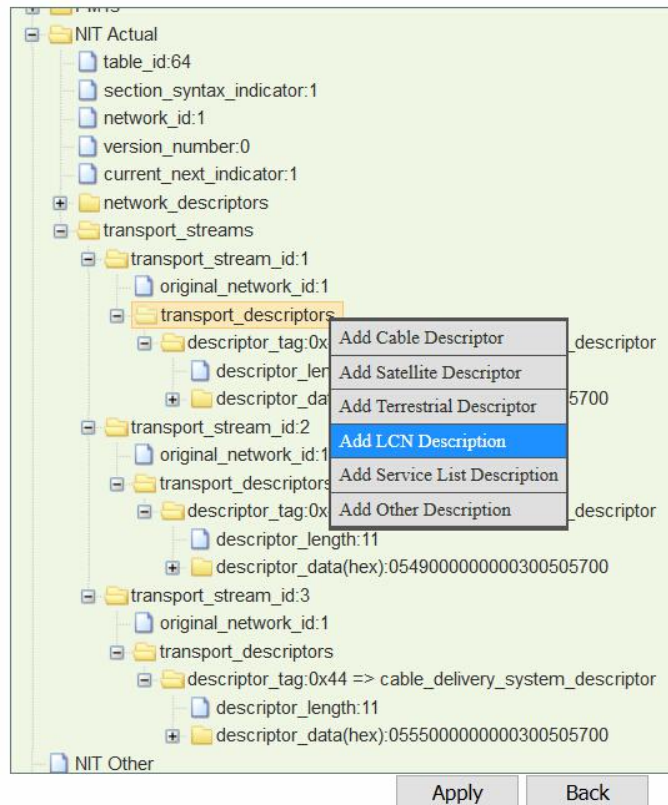
2. Select **Board1 [QAM (A/C)] Port1 TS1** by clicking the circle in front of it. Then CCTV2 and CCTV7 in TS1 will be in **Services** on the right side. Click **Add** in front of CCTV2 (service ID 302) and CCTV7 (service ID 303), they will be added to LCN edit list. Edit LCN in **Logic Channel Number** text filed. Click **Add** and **Exit**.

3. Check the LCN descriptors of CCTV2 and CCTV7 that you configured.
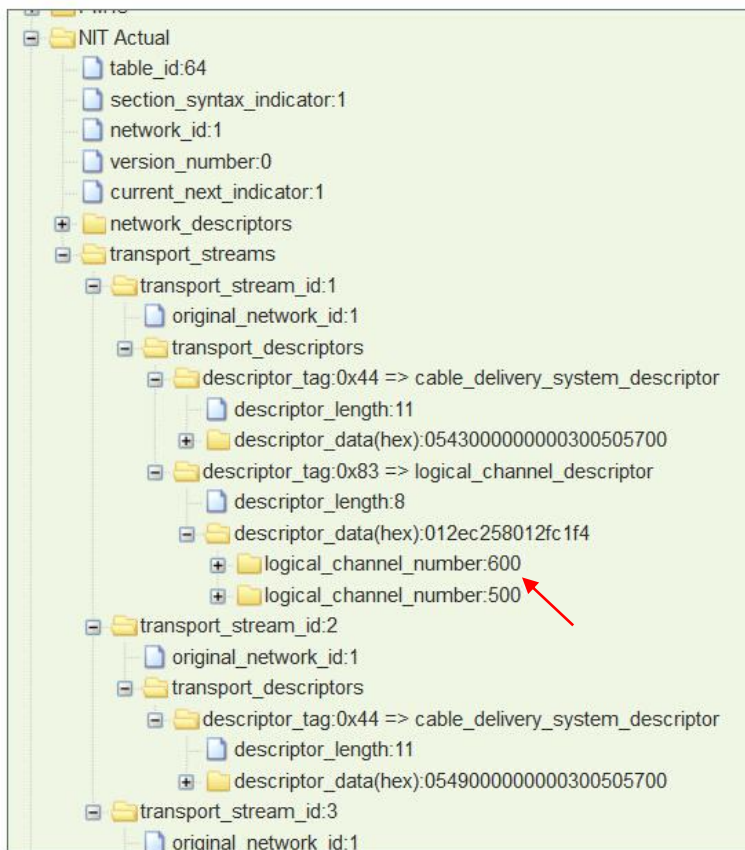
4. Right-click *transport_descriptors* under *transport_stream_id:2*, then select *Add LCN Description* to enter edit page. Select *Board1 [QAM (A/C)] Port1 TS2* add LCN for CCTV10 (service ID 304) and CCTV10 (service ID 305). Click *Add* and *Exit*.

5. Repeat step 4 to add LCN for CCTV12 and CCTV15 under *transport_stream_id:3*. Once you have added LCN for these 6 services, click *Apply* in the following page.

```
⊟ 📁 NIT Actual
      📄 table_id:64
      📄 section_syntax_indicator:1
      📄 network_id:1
      📄 version_number:0
      📄 current_next_indicator:1
   ⊞ 📁 network_descriptors
   ⊟ 📁 transport_streams
      ⊟ 📁 transport_stream_id:1
            📄 original_network_id:1
         ⊟ 📁 transport_descriptors
            ⊟ 📁 descriptor_tag:0x44 => cable_delivery_system_descriptor
                  📄 descriptor_length:11
               ⊞ 📁 descriptor_data(hex):05430000000000300505700
            ⊟ 📁 descriptor_tag:0x83 => logical_channel_descriptor
                  📄 descriptor_length:8
               ⊟ 📁 descriptor_data(hex):012ec258012fc1f4
                  ⊞ 📁 logical_channel_number:600
                  ⊞ 📁 logical_channel_number:500
      ⊟ 📁 transport_stream_id:2
            📄 original_network_id:1
         ⊟ 📁 transport_descriptors
            ⊟ 📁 descriptor_tag:0x44 => cable_delivery_system_descriptor
                  📄 descriptor_length:11
               ⊞ 📁 descriptor_data(hex):05490000000000300505700
            ⊟ 📁 descriptor_tag:0x83 => logical_channel_descriptor
                  📄 descriptor_length:8
               ⊟ 📁 descriptor_data(hex):0130c1900131c12c
                  ⊞ 📁 logical_channel_number:400
                  ⊞ 📁 logical_channel_number:300
      ⊟ 📁 transport_stream_id:3
            📄 original_network_id:1
         ⊟ 📁 transport_descriptors
            ⊟ 📁 descriptor_tag:0x44 => cable_delivery_system_descriptor
                  📄 descriptor_length:11
               ⊞ 📁 descriptor_data(hex):05550000000000300505700
            ⊟ 📁 descriptor_tag:0x83 => logical_channel_descriptor
                  📄 descriptor_length:8
               ⊟ 📁 descriptor_data(hex):0132c0c80133c064
                  ⊞ 📁 logical_channel_number:200
                  ⊞ 📁 logical_channel_number:100
📄 NIT Other
```

	Apply	Back

6. Go to *Service Configuration*.
   Click *Apply* and *Save*.

3.3.3 Upgrading Set Top Box through OTA

To update the software for a number of STB's, use the following steps:

1. Feed the update stream to SMP by the embedded ASI or IP port.
2. Drag the update PID to QAM output port. See the following image, an update stream is taken as other PID 8001 in SMP.

3. Add update descriptor in the NIT. Go to **SI Edit** page of the center TS. Add **Network Descriptor** by right click on **network_descriptors**. Generally, the descriptor is from STB manufacturer.

4. Go to **Service Configuration**. Click **Apply** and **Save**.

5. Exit to **Service Configuration**, and click **Apply**.

Part 4 Module Configuration

4.1 Input and Output Modules

4.1.1 TSIP

TSIP is short for TS over IP. There two Gigabit RJ45 ports and two SFP (Small Form-factor Pluggable) ports on this module. The leftmost RJ45 port and the left SFP port are main I/O ports. The rightmost RJ45 port and the right SFP port only provide backup output.

TSIP Module Configuration menu overview:

Module Configuration > TSIP (64I32O) > Setup

Name	Range	Name	Range
IP Address	192168.1.34	**Speed Mode**	Auto
Subnet Mask	255.255.255.0		100M-Duplex
Gateway	192.168.1.1		100M-Half
			1000M-Half
			1000M-Duplex
IGMP Version	V1, V2, V3	**Enable Input**	Off, On
IGEM Auto Report	Off, On	**Enable Output**	Off, On
IGMP Report Period (s)	60	**Enable Backup Port**	Off, On

Module Configuration > TSIP (64I32O) > Input

Enable Input TS channel. Configure multicast IP address, source port, and protocol (RTP, UDP).

Channel	Channel Enable	Source IP Address	Source Port	Protocol	Col Port Matching	Row Port Matching	IGMPV3 Configuration
1	☑	227.40.50.60	1234	UDP	Disable	Disable	Configuration
2	☑	227.40.50.61	1234	UDP	Disable	Disable	Configuration
3	☑	227.40.50.62	1234	UDP	Disable	Disable	Configuration
4	☑	227.40.50.63	1234	UDP	Disable	Disable	Configuration
5	☑	227.40.50.64	1234	UDP	Disable	Disable	Configuration
6	☐	227.40.50.65	1234	UDP	Disable	Disable	Configuration
7	☐	227.40.50.66	1234	UDP	Disable	Disable	Configuration
8	☐	227.40.50.67	1234	UDP	Disable	Disable	Configuration
9	☐	227.40.50.68	1234	UDP	Disable	Disable	Configuration
10	☐	227.40.50.69	1234	UDP	Disable	Disable	Configuration
11	☐	227.40.50.70	1234	UDP	Disable	Disable	Configuration
12	☐	227.40.50.71	1234	UDP	Disable	Disable	Configuration
13	☐	227.40.50.72	1234	UDP	Disable	Disable	Configuration
14	☐	227.40.50.73	1234	UDP	Disable	Disable	Configuration
15	☐	227.40.50.74	1234	UDP	Disable	Disable	Configuration
16	☐	227.40.50.75	1234	UDP	Disable	Disable	Configuration

Apply   Refresh   Previous page   Next page

Module Configuration > TSIP (64I32O) > Output

Enable output TS channel. Configure multicast destination IP address, source port, and protocol.

Channel	Enable Channel	Source Port	Dest IP Address	Dest Port	Protocol	Encap Num TS Packets	Time To Live	Constant Rate(Mbps)	Enable VLAN	VLAN ID	Enable Dest MAC	Dest MAC
1	☑	10000	227.10.20.80	1234	UDP	7	128	3.000	Disable	1	Disable	00-00-00-00-00-00
2	☑	10000	227.10.20.81	1234	UDP	7	128	25.000	Disable	1	Disable	00-00-00-00-00-00
3	☑	10000	227.10.20.82	1234	UDP	7	128	4.000	Disable	1	Disable	00-00-00-00-00-00
4	☑	10000	227.10.20.83	1234	UDP	7	128	25.000	Disable	1	Disable	00-00-00-00-00-00
5	☑	10000	227.10.20.84	1234	UDP	7	128	25.000	Disable	1	Disable	00-00-00-00-00-00
6	☐	10000	227.10.20.85	1234	UDP	7	128	25.000	Disable	1	Disable	00-00-00-00-00-00
7	☐	10000	227.10.20.86	1234	UDP	7	128	25.000	Disable	1	Disable	00-00-00-00-00-00
8	☐	10000	227.10.20.87	1234	UDP	7	128	25.000	Disable	1	Disable	00-00-00-00-00-00
9	☐	10000	227.10.20.88	1234	UDP	7	128	25.000	Disable	1	Disable	00-00-00-00-00-00
10	☐	10000	227.10.20.89	1234	UDP	7	128	25.000	Disable	1	Disable	00-00-00-00-00-00
11	☐	10000	227.10.20.90	1234	UDP	7	128	25.000	Disable	1	Disable	00-00-00-00-00-00
12	☐	10000	227.10.20.91	1234	UDP	7	128	25.000	Disable	1	Disable	00-00-00-00-00-00
13	☐	10000	227.10.20.92	1234	UDP	7	128	25.000	Disable	1	Disable	00-00-00-00-00-00
14	☐	10000	227.10.20.93	1234	UDP	7	128	25.000	Disable	1	Disable	00-00-00-00-00-00
15	☐	10000	227.10.20.94	1234	UDP	7	128	25.000	Disable	1	Disable	00-00-00-00-00-00
16	☐	10000	227.10.20.95	1234	UDP	7	128	25.000	Disable	1	Disable	00-00-00-00-00-00

Advanced Setting ☐

Apply   Refresh   Previous page   Next page

The **Constant Rate** should be about 2 Mbps higher than the **Effective Bitrate** listed in the **Status > TSIP (64I32O)** menu. In that case, the bitrate of inserted null packets will be around 2 Mbps.

Better not enable unemployed channels, since the enabled channels without services still output null packets at Constant Bitrate.

Select **Advanced Setting** to configure backup port. The backup feature is available only when the main channels are transferring services.

Advanced Setting ☑

Backup Port

Channel	Dest IP Address	VLAN ID	Dest MAC
1	227.20.20.80	1	00-00-00-00-00-00
2	227.20.20.81	1	00-00-00-00-00-00
3	227.20.20.82	1	00-00-00-00-00-00
4	227.20.20.83	1	00-00-00-00-00-00
5	227.20.20.84	1	00-00-00-00-00-00
6	227.20.20.85	1	00-00-00-00-00-00
7	227.20.20.86	1	00-00-00-00-00-00
8	227.20.20.87	1	00-00-00-00-00-00
9	227.20.20.88	1	00-00-00-00-00-00
10	227.20.20.89	1	00-00-00-00-00-00
11	227.20.20.90	1	00-00-00-00-00-00
12	227.20.20.91	1	00-00-00-00-00-00
13	227.20.20.92	1	00-00-00-00-00-00
14	227.20.20.93	1	00-00-00-00-00-00
15	227.20.20.94	1	00-00-00-00-00-00
16	227.20.20.95	1	00-00-00-00-00-00

Apply   Refresh   Previous page   Next page

The backup port duplicates the output streams in the main port respectively. If you set the backup **Dest IP Address** the same with the main port, do not connect main port and backup port to the same VLAN to avoid conflicts.

Constant Rate of any output channel/TS/port ought to be set manually about 2 Mbps higher than the **Effective Bitrate** in the corresponding output channel/TS/port, since the **Effective Bitrate** might fluctuates a little bit. If you set the **Constant Rate** much higher that the **Effective Bitrate**, there will be lots of null packets in the output transport stream.

Module Configuration > TSIP (64I32O) > Output > FEC

Channel	Enable FEC	Col FEC Only	Interleave Mode	FECL	FECD
1	Disable	YES	Annex_a	4	5
2	Disable	YES	Annex_a	4	5
3	Disable	YES	Annex_a	4	5
4	Disable	YES	Annex_a	4	5
5	Disable	YES	Annex_a	4	5
6	Disable	YES	Annex_a	4	5
7	Disable	YES	Annex_a	4	5
8	Disable	YES	Annex_a	4	5
9	Disable	YES	Annex_a	4	5
10	Disable	YES	Annex_a	4	5
11	Disable	YES	Annex_a	4	5
12	Disable	YES	Annex_a	4	5
13	Disable	YES	Annex_a	4	5
14	Disable	YES	Annex_a	4	5

Apply   Refresh

Module Configuration > TSIP (64I32O) > Output > Batch Set

Batch Set is an efficient feature to Enable/Disable output ports with consecutive IP addresses.

All Channels	Start Channel (32) - End Channel (32)	Channel Enable	Dest IP Address		Dest Port		Constant Rate
☐	1 - 32	Off	227.10.20.80	Auto Assign	1234	Same	25.000

☐ Protocol	☐ Source Port	☐ Enable VLAN	☐ Enable FEC	☐ Col FEC Only	☐ Interleave Mode	☐ FECL	☐ FECD
UDP	10000	Off	Disable	NO	Annex_b	4	5

☐ Encap Num TS Packets	☐ Time To Live	☐ VLAN ID	☐ Enable Dest MAC	☐ Dest MAC
1	128	1	Disable	00-00-00-00-00-00

Apply   Refresh

Channel List

Channel	Channel Enable	Dest IP Address	Dest Port	Constant Rate(Mbps)	Protocol	Source Port	VLAN	VLAN ID	FEC	Col FEC Only	Interleave Mode	FECL	FECD	Encap Num TS Packets	Time To Live	Enable Dest MAC	Dest MAC
1	Enable	227.10.20.80	1234	3.000	UDP	10000	Disable	1	Disable	YES	Annex a	4	5	7	128	Disable	00-00-00-00-00-00
2	Enable	227.10.20.81	1234	25.000	UDP	10000	Disable	1	Disable	YES	Annex a	4	5	7	128	Disable	00-00-00-00-00-00
3	Enable	227.10.20.82	1234	4.000	UDP	10000	Disable	1	Disable	YES	Annex a	4	5	7	128	Disable	00-00-00-00-00-00
4	Enable	227.10.20.83	1234	25.000	UDP	10000	Disable	1	Disable	YES	Annex a	4	5	7	128	Disable	00-00-00-00-00-00
5	Enable	227.10.20.84	1234	25.000	UDP	10000	Disable	1	Disable	YES	Annex a	4	5	7	128	Disable	00-00-00-00-00-00
6	Disable	227.10.20.85	1234	25.000	UDP	10000	Disable	1	Disable	YES	Annex a	4	5	7	128	Disable	00-00-00-00-00-00
7	Disable	227.10.20.86	1234	25.000	UDP	10000	Disable	1	Disable	YES	Annex a	4	5	7	128	Disable	00-00-00-00-00-00
8	Disable	227.10.20.87	1234	25.000	UDP	10000	Disable	1	Disable	YES	Annex a	4	5	7	128	Disable	00-00-00-00-00-00
9	Disable	227.10.20.88	1234	25.000	UDP	10000	Disable	1	Disable	YES	Annex a	4	5	7	128	Disable	00-00-00-00-00-00

4.1.2 TSIP+

TSIP+ is an enhanced TSIP module with extra memory card which supports more TS channels and can adjust the PCR better. You may assign different IP address to the main port and backup port. Its configuration pages are similar to TSIP. Please refer to chapter 4.1.1.

Module Configuration > TSIP+ > Setup

IP Address	192.168.1.34
Subnet Mask	255.255.255.0
Gateway	192.168.1.1
IGMP Version	IGMP V3
IGMP Auto Report	Off
IGMP Report Period (s)	60
Speed Mode	Auto
CBR/VBR	CBR
PCR Adjust Mode	Wellav Adjust Mode
MAC Address	A0-69-86-00-F3-04

Backup Port

IP Address	192.168.0.88
Subnet Mask	255.255.255.0
Gateway	192.168.0.1
Mode	256IO(Port1)
MAC Address	A0-69-86-00-F3-03

| Apply | Refresh | Default | Reboot | Power Off | UpgradeFirmware |

4.1.3 ASI

ASI is a 4-channel ASI I/O module. Each ASI port can be set as either input port or output port separately.

Module configuration > ASI

Name	Range	Description
Type	Input, Output	Select to determine the port to be input or output.
Constant Rate (Mbps)	0~100	Max rate of ASI is 100Mbps
PCR Adjust Mode	Wellav Adjust Mode Real-time Stamp Mode	

4.1.4 IPASI

IPASI module is a combination of TSIP and ASI. The leftmost RJ45 port is an I/O port, and the rightmost RJ45 port only provides backup output. The two ASI ports can be set as either input or output port separately. Please refer to chapter 4.1.1 and 4.1.3.

4.1.5 DVBC

DVBC is a 4-channel DVBC receiving module.

Module Configuration > DVBC

Name	Range
Frequency (KHz)	48000~870000
Symbol Rate (KSym/s)	3000~7000
Constellation	QAM16/32/64/128/256
Lock Status	Lock/Un-lock

Status > DVBC

4.1.6 DVBS2

DVBS2 is a 4-channel DVBS2 receiving module.

Module Configuration > DVBS2 (V2)

Name	Range	Description
Mode	4CH Mode(Normal)	4CH Mode: QPSK, 8PSK
	2CH Mode(Advanced)	2CH Mode: QPSK, 8PSK, 16APSK, 32 APSK.
Symbol Rate (Ksym/s)	1000~45000	
LNB Type	Single Band	

	Dual Band	
Band Selection	Auto	
	Forced Low	
	Forced High	
Bias	Disable/Enable	Available in Port2 and Port4
Polarization	13V (V)	Vertical
	18V (H)	Horizontal
Lock Status	Lock/Un-lock	To indicate the input is locked or not.

Contact service provider for input information or visit www.lyngsat.com for the latest information of satellite Radio & TV channels.

4.1.7 DVBT2

DVBT2 is a 4-channel DVBT/DVBT2 receiving module.

Module Configuration > DVBT2

Name	Range	Description
Tuner Mode	DVB-T	DVB-T: QPSK, 16/64QAM
	DVB-T2	DVB-T2: QPSK, 16/64/256QAM
Frequency(KHz)	48000~862000	
Bandwidth	6M, 7M, 8M	Depends on the standard in your country.
PLP Mode	A, B	Available when Tuner Mode is DVB-T2.
PLP ID		Available when PLP Mode is B.

4.1.8 8VSB

8VSB is a 4-channel 8VSB receiving module.

Module Configuration > ATSC

Name	Range	Description
Channel	57~803MHz	Refer to American ATSC (8-VSB) Channel List

4.1.9 QAM

QAM module supports modulating 8 adjacent channels. The left connector is for local monitoring.

Module Configuration > QAM

RF Level(dBuV)	90
Bandwidth	8M
(#1-4)SymbolRate(KBaud)	6875
(#5-8)SymbolRate(KBaud)	6875
Spectrum Shaping	Disable

#	Enable	Frequency(KHz)	Constellation	Max Rate(Mbit)
1	Enable	474000	QAM64	38.015
2	Enable	482000	QAM64	38.015
3	Enable	490000	QAM64	38.015
4	Enable	498000	QAM64	38.015
5	Enable	506000	QAM64	38.015
6	Enable	514000	QAM64	38.015
7	Enable	522000	QAM64	38.015
8	Enable	530000	QAM64	38.015

Apply	Refresh	Default	Reboot	Power Off

Name	Range	Name	Range
RF Level(dBuV)	90~106	**Enable**	Disable, Enable
Bandwidth	6M, 7M, 8M	**Frequency (KHz)**	47000~862000
Symbol Rate (KBaud)	4400~6956	**Constellation**	QAM64/128/256
Spectrum Shaping	Disable, Enable	**Max Rate (Mbit)**	Automatically calculated

4.1.10 IQAM

IQAM module supports modulating 16 non- adjacent channels.

Module Configuration > IQAM

RF Level(dB)	0
RF Template	Frequency
Channel Plan	STD

	Mode	Constellation	SymbolRate(Kbaud)	Bandwidth	Max Rate(Mbps)
Channel(1-8)	Annex A	64QAM	6875.000	8M	38.02
Channel(9-16)	Annex A	64QAM	6875.000	8M	38.02

	Enable	Channel Select	Frequency(MHz)	Interleave Mode	RF Level(dB)
1	Enable	Empty	200.000	I=8,J=16	82
2	Enable	Empty	208.000	I=8,J=16	82
3	Enable	Empty	216.000	I=8,J=16	82
4	Enable	Empty	224.000	I=8,J=16	82
5	Enable	Empty	232.000	I=8,J=16	82
6	Enable	Empty	240.000	I=8,J=16	82
7	Enable	Empty	248.000	I=8,J=16	82

Apply	Refresh	Default	Reboot	Power Off

4.1.11 OFDM

OFDM is a 4 channel modulating module. The left connector is for local monitoring.

Module Configuration > OFDM

Name	Range	Name	Range
Bandwidth	6M, 7M, 8M	**Guard Interval**	1/4, 1/8, 1/16, 1/32
RF Level(dBuV)	90~109	**Mode**	2k, 8k
Spectrum Shaping	Disable/Enable	**Constellation**	QPSK, QAM16/64
Enable	Disable/Enable	**FEC HP**	1/2, 2/3, 3/4, 5/6, 7/8
Frequency (KHz)	40000~862000	**Max Rate (Mbit)**	Automatically calculated

4.1.12 8VSBM

8VSBM is compliant with the modulation method used for broadcast in the ATSC digital television standard.

Module Configuration > ATSCM

Name	Range	Description
RF level	80~107 dB -27~0 dBm	
Spectrum Shaping	Disable, Enable	
Channel Plan	OTA, STD, IRC, HRC	
Channel Select	57~803 MHz	
Frequency (KHz)	44000~999000	

4.1.13 HDMI/SDI Decoder

HDMI/SDI Decoder supports decoding 2 programs in two HDMI ports and two SDI ports.

Module Configuration > HDMI/SDI Decoder

Name	Range	Name	Range
Aspect Ratio Conversion	Automatic	**Output Resolution**	1920x1080_50i/60p/59.94p/
	4:3 Letterbox		59.94i/60i/30p/29.97p/24p
	4:3 Pan and Scan		1280x720_60p/50p/59.94p
	16:9 Letterbox		720x480_60i
	16:9 Pan and Scan		720x576_50i
Audio Volume (0-49)	0~49		

One decoder channel decodes only one service.

4.1.14 Decoder-CC

Decoder-CC supports decoding 2 programs in two HDMI ports or two SDI ports with CC(closed caption). SDI 1 and HDMI 1 output the decoded video/audio of program1 while SDI 2 and HDMI 2 output the decoded video/audio of program 2.
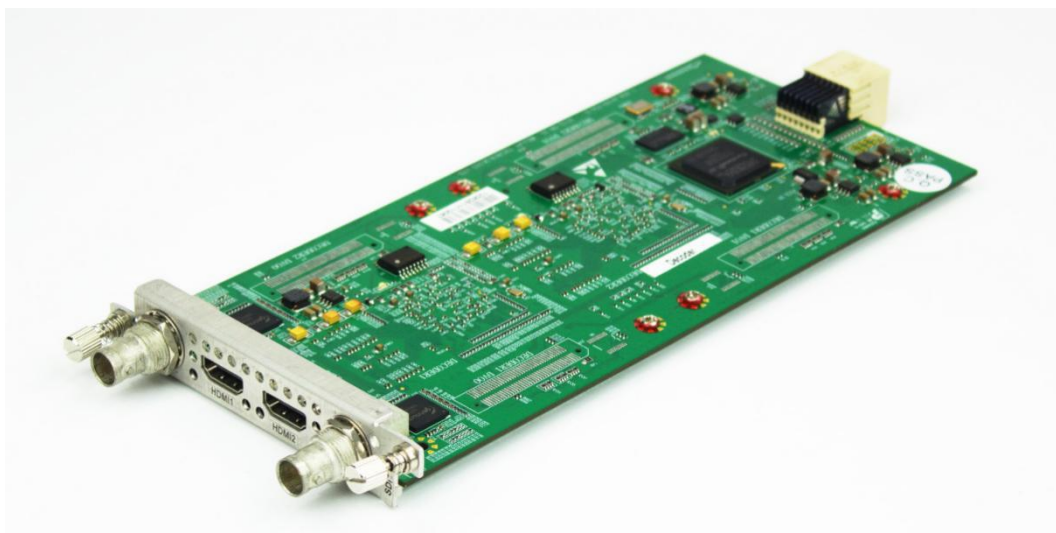
Module Configuration > Decoder-CC

	Port1	Port2
Aspect Ratio Conversion	Auto	Auto
Output Resolution	1280x720_59.94p(Use for 29.97p)	1280x720_59.94p(Use for 29.97p)
Fail Mode	Still Image	Still Image

Audio Volume[0-49]	0	0
Mixer	Stereo	Stereo
Audio Prefered Language1	No audio	No audio
Audio Prefered Language2	No audio	No audio

SDI		
SD EIA 708-B	Enable	Enable
Line	9	9
SD VBI L21 Captions	Enable	Enable
HD EIA 708-B	Enable	Enable
Line	9	9
Audio Group 1 Pair 1	Off	Off
Audio Group 1 Pair 2	Off	Off

Apply	Refresh	Default	Reboot	UpgradeFirmware

Some of the items have optional settings:

Name	Range	Name	Range
Aspect Ratio Conversion	Automatic	**Output Resolution**	1920x1080_50i/60p/59.94p/
	4:3 Letterbox		59.94i/60i/30p/29.97p/24p
	4:3 Pan and Scan		1280x720_60p/50p/59.94p
	16:9 Letterbox		720x480_60i
	16:9 Pan and Scan		720x576_50i
Fail Mode	Still Image, Black Screen	**Audio Volume (0-49)**	0~49
Mixer	Stereo, Left, Right, Mono, Dual	**Line**	4~19
Audio Group	Off, Audio1 PCM, Audio2 PCM		

Steps to decode services

- Go to **Service Configuration**, right-click on the TS1/TS2 under Decoder-CC module. Click **Add TS** to generate an empty TS in Port1. An empty TS contains 0 service.
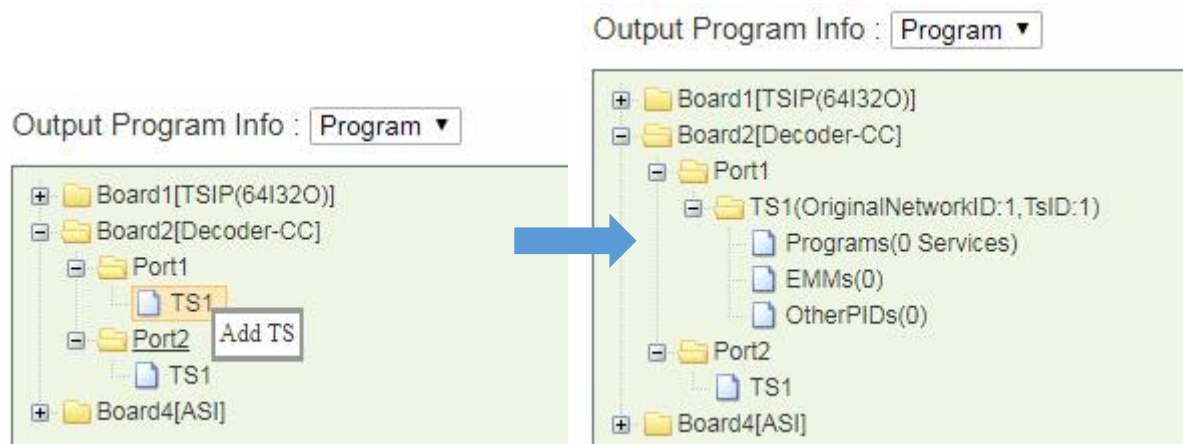
- Long click on a service in the input TS, and drag it to the **Programs** tab under the "Decoder-CC Port1 TS1". Drop it until a blue arrow appears on the left handside of the **Programs** tab. Finally we should Click **Apply** button to save the setting. Please refer to the following image. There is an input stream in TSIP Port1 TS1. After drag-and-drop operation, you can see one service td HD Phx Infonews Channel under "Decoder-CC Port1 TS1".
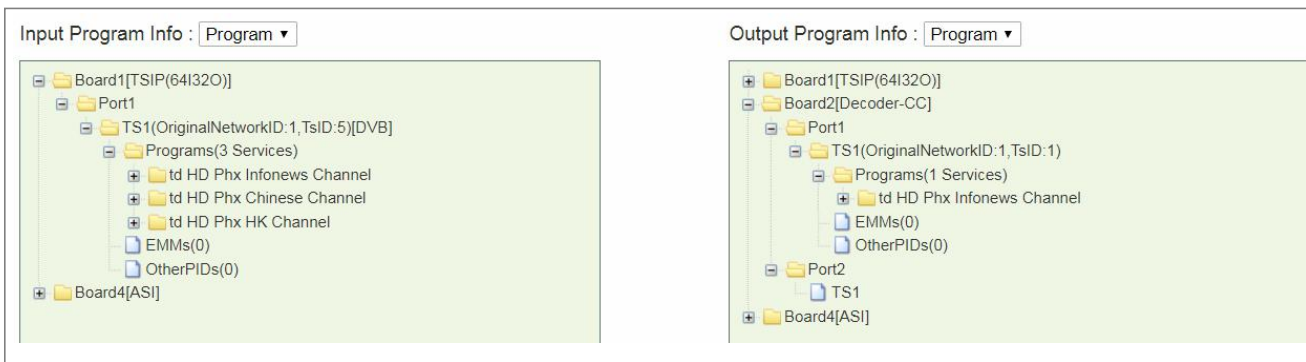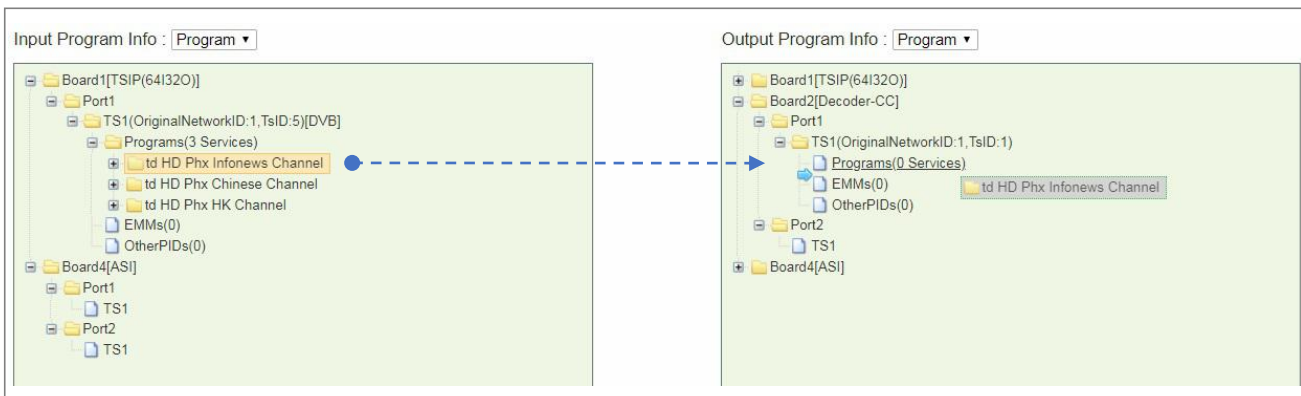
 One Decoder Port decodes only one service.

4.1.15 ASI-Switch

ASI-Switch is a 3in2out board for ASI input redundancy application. The three ports on the right are primary, secondary (it could be a copy of the main), and fail-safe input. The two ports on the left are both output 1 and output 2 interfaces.

Steps to get input services:

1. Connect ASI cables with valid signals to the three ASI input ports.
2. Go to **Service Configuration**, scan the three input TS. You will see the input TS' as in the following image.
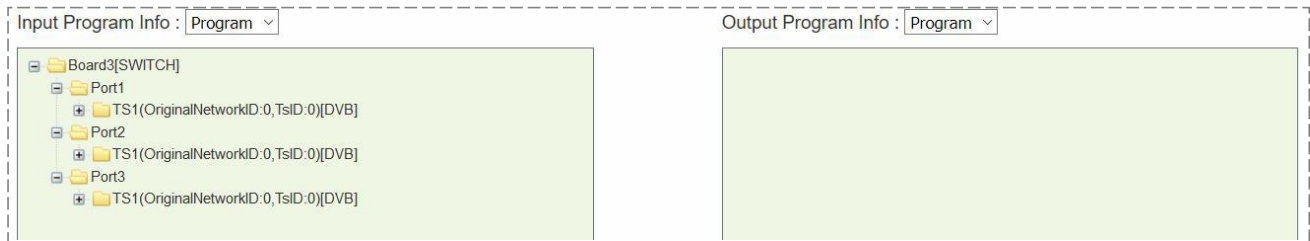
3. Click **Apply** and **Save** button in this page.
4. Go to **Module Configuration > SWITCH**. Set the switching conditions and thresholds.

Module Configuration > SWITCH > Backup

By default, **Switch level settings** is **Port-level**, and **Port-switch mode selection** is **Automatic switch**. See the following image. **Automatic switch** means this unit will monitor the input according to the conditions that has been checked in **Port-switch condition selection**.

Some options in *Port automatic switch settings:*

Automatic switch mode	Use **Primary program first**, this module will activate switch function. Select **Switch Lock** to disable this feature.
Min/Max total bitrate of primary, secondary and fail-safe port	Configure Minimum and Maximum rates to define the normal rate ranges for the input ports.
Switch-back delay	Once the primary recovered, this module will switch to primary input after a scheduled period.

If you use *Manual switch* for *Port switch mode selection*, the UI will be the following image.

If you choose *Program-level* for *Switch level settings*, as you can see in the following image, you will need to configure *Program-switch condition selection* and *Program Setup*.

Program-switch condition selection

	Condition
☐	Continuous count error of video
☐	Continuous count error of audio
Normal continuous count error frequency	(0 - 10 ⊞)/200ms
☐	Video bit rate is beyond normal range.
☐	Audio bit rate is beyond normal range.
☐	Program is not de-scrambled.

Program Setup

☐	Index	ProgramBackup	Fail-safeProgram	Primary audio bit rate range(Mbps)		Primary video bit rate range(Mbps)		Secondary audio bit rate range(Mbps)		Secondary video bit rate range(Mbps)		Switch-back delay (s)	Switch mode
				Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum		
☐	1	CCTV 2(302)	TV 2(302)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0 ⊞	Auto-Primary program ∨
☐	2	CCTV 2(302)	TV 2(302)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0 ⊞	Auto-Primary program ∨
☐	3	CCTV 2(302)	TV 2(302)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0 ⊞	Auto-Primary program ∨
☐	4	CCTV 2(302)	TV 2(302)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0 ⊞	Auto-Primary program ∨

Apply   Default   Reboot

Module Configuration > SWITCH > Output

OutputSetup

ASI Out 1 bit rate	30.000
Other ouput ports bit rate	30.000
Output stream selection of other output ports	Same signal output as ∨
Passthrough mode for power-off	Passthrough ASI In 1 ∨

Apply

ASI Out 1 bitrate	Configure the constant bitrate for the output ASI port 1. This constant rate should be larger than the effective rate of the input streams.
Other output port bitrate	Configure the constant bitrate for the output ASI port 2. This constant rate should be larger than the effective rate of the input streams.
Output stream selection of other output ports	ASI Switch module will output one of the following four inputs even the whole unit is off: Same signal output as ASI Out 1, Pass-through ASI In 1 (Primary), Pass-through ASI In 2 (Secondary), Pass-through ASI In 3 (Fail-safe)
Pass-through mode for power off	ASI Switch module will output one of the following three inputs even the whole unit is off: Pass-through ASI In 1 (Primary), Pass-through ASI In 2 (Secondary), Auto

4.1.16 DS3

DS3 is a 4-channel input/output module for SDH/PDH transmission network.
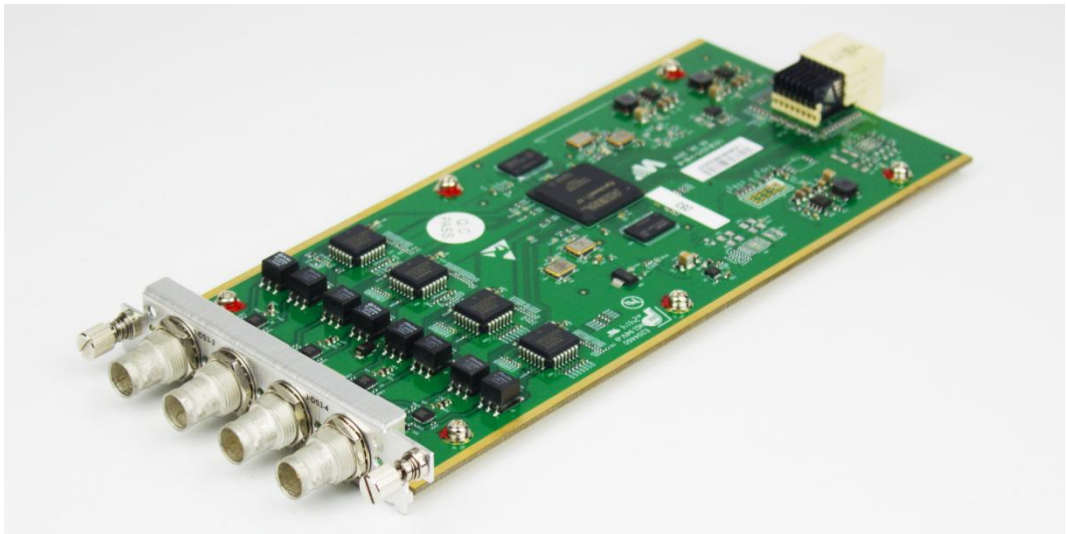
Module Configuration > DS3

Name	Range	Description
Type	Input, Output	Configure a DS3 port to be input or output
Protocol	One, Two, Three, Four	DS3 interface protocol
FEC	Disable, Enable	

4.1.17 ISDBT

ISDBT is a 4-channel receiving module that fully complies with ISDBT standard.

Module Configuration > ISDBT

Name	Range	Description
Frequency (KHz)	48000~862000	
Bandwidth	6M, 7M, 8M	

4.2 Encoding Modules

4.2.1 EN4AV-4M2B

EN4AV-4M2B is a 4-channel CVBS encoder that supports H.264 and MPEG-2 encoding. It can be licensed to support MPEG-2 encoding only.

Module Configuration > EN4AV-4M2B

	Port1	Port2	Port3	Port4
Video Encoder Type	MPEG2	MPEG2	MPEG2	MPEG2
Audio Encoder Type	MPEG1 Layer II	MPEG1 Layer II	MPEG1 Layer II	MPEG1 Layer II
Video Encode Mode	CBR	CBR	CBR	CBR
Video Max Encode Rate(Payload)(Kbps)	6000	6000	6000	6000
Video Min Encode Rate(Payload)(Kbps)	1000	1000	1000	1000
Video Encode Rate(Payload)(Kbps)	4000	4000	4000	4000
Audio Encode Rate(Payload)(Kbps)	128K	128K	128K	128K
Total Encode Rate(Payload)(Kbps)	4128	4128	4128	4128
Audio Volume (dB)	0.0	0.0	0.0	0.0

Advanced Setting ☑

Name	Range	Name	Range
Video Encoder Type	H264, MPEG2	**PCR PID**	32~8190
Audio Encoder Type	OFF,MPEG1_Layer2, MPEG4_AAC AC3 (optional), MPEG2_AAC	**Video PID**	32~8190
Video Encode Mode	CBR, VBR	**Audio PID**	32~8190
Video Max Encode Rate	1.5~2 times of Video Encode Rate	**PMT PID**	32~8190
Video Min Encode Rate	0~0,75times of Video Encode Rate	**Program Name**	Max 32 letters
Video Encode Rate	600~6000	**Provider Name**	Max 32 letters
Audio Encode Rate	64~384	**Video Vlc Mode**	CABAC, CAVLC
Total Encode Rate	Automatically Calculated	**Video Profile**	Main, High
Audio Volume	0~8	**Video Level**	3.0, 3.1, 3.2, 4.0, 4.1, 4.2
GOP Structure	IBBP, IPPP, IBP	**Brightness**	0~255
GOP Size	6~63	**Contrast**	0~255
GOP Close	Enable, Disable	**Saturation**	0~255
		Hue	-180~180

4.2.2 EN4SDI-2M2A

EN4SDI-2M2A module supports encoding 2 H.264 HD/SD channels or 2 MPEG-2 SD channels via SDI/CVBS input. AAC and AC3 audio encoding is available with optional hardware and license.

Module Configuration > EN4SDI-2M2A

	Sub-module 1:H264/MPEG2	Sub-module 2:MPEG1_Layer_ll
	Port1	**Port2**
Video Source	SDI	SDI
Video Encoder Type	MPEG2	MPEG2
Video Encode Rate(Payload)(Kbps)	4000	4000
Video Encode Mode	CBR	CBR
Video Max Encode Rate(Payload)(Kbps)	6000	6000
Video Min Encode Rate(Payload)(Kbps)	1000	1000

	Audio1	**Audio2**	**Audio3**	**Audio4**
Audio Source	SDI1-Audio1/2	SDI2-Audio1/2	SDI1-Audio1/2	SDI2-Audio1/2
Audio Encoder Type	MPEG1_Layer2	MPEG1_Layer2		
AC3 AC Mode	1+1(L,R)	1+1(L,R)	1+1(L,R)	1+1(L,R)
Audio Encode Rate(Payload)(Kbps)	128	128	128	128
Belong To	Program1	Program2	Program1	Program2
Audio Volume (dB)	0.00	0.00	0.00	0.00
Audio PID	67	131	195	259

Name	Range	Name	Range
Video Source	SDI CVBS	**Aspect Ratio**	Automatic, 16x9_LetterBox 16x9_CutOff, 4x3_PillarBox
Video Encoder Type	H264, MPEG2	**Video Standard**	Auto, Downscale
Video Encode Rate (Payload)(Kbps)	600~6000	**PCR PID**	32~8190
Video Encode Mode	CBR, VBR	**Video PID**	32~8190
Video Max Encode Rate (Payload)(Kbps)	1.5~2 times of Video Encode Rate	**Service PID**	32~8190
Video Min Encode Rate (Payload)(Kbps)	0~0,75 times of Video Encode Rate	**PMT PID**	32~8190
Audio Source		**Program Name**	Max 32 letters
Audio Encoder Type	OFF, MPEG1_Layer2 AC3 (optional)	**Provider Name**	Max 32 letters

	MPEG2_AAC MPEG4_AAC		
AC3 AC Mode	1+1	**Latency adjustment (ms)**	Enter a value to adjust the audio and video synchronization. Enter a positive value to delay audio encoding.
Audio Encode Rate (Payload)(Kbps)	64~384	**Vlc Mode**	CABAC CAVLC
Belong to	Program-1	**Profile**	Main, High
Audio Volume	0~8	**Level**	3.0, 3.1, 3.2, 4.0, 4.1, 4.2
Audio PID	32~8190	**Sample Rate**	32KHZ, 44.1KHZ,48KHZ
GOP Structure	IBBP, IPPP, IBP	**Brightness**	0~255
GOP Size	6~63	**Contrast**	0~255
GOP Close	Enable, Disable	**Saturation**	0~255
		Hue	-180~180

4.2.3 EN4HDMI-xM2A

EN4HDMI-4M2A supports encoding 4 H.264/MPEG-2 SD channels or 4 H.264 HD channels. EN4HDMI-2M2A supports encoding 2 H.264/MPEG-2 SD channels or 2 H.264 HD channels. AAC and AC3 audio encoding is available with optional hardware and license.

Module Configuration >
EN4HDMI-4M2A

	Sub-module 1:M2A		Sub-module 2:M2A	
	Port1	**Port2**	**Port3**	**Port4**
Video Encoder Type	H264	H264	H264	H264
VLC Mode	CABAC	CABAC	CABAC	CABAC
Profile	Main	Main	Main	Main
Level	4.0	4.0	4.0	4.0
Video Encode Rate(Payload)(Kbps)	4000	4000	4000	4000
Video Encode Mode	CBR	CBR	CBR	CBR
Video Max Encode Rate(Payload)(Kbps)	6000	6000	6000	6000
Video Min Encode Rate(Payload)(Kbps)	1000	1000	1000	1000

Audio Encoder Type	MPEG1_Layer2	MPEG1_Layer2	MPEG1_Layer2	MPEG1_Layer2
AC3 AC Mode	1+1(L,R)	1+1(L,R)	1+1(L,R)	1+1(L,R)
Audio Encode Rate(Payload)(Kbps)	128	128	128	128
Audio Volume	0	0	0	0
Audio PID	259	131	67	195

Advanced Setting ☑

GOP Structure	IBBP	IBBP	IBBP	IBBP
GOP Size	15	15	15	15
GOP Close	Disable	Disable	Disable	Disable
Sample Rate	48KHZ	48KHZ	48KHZ	48KHZ
Video Standard	Auto	Auto	Auto	Auto
Aspect Ratio	Auto	Auto	Auto	Auto

PCR PID	260	132	68	196
Video PID	258	130	66	194
PMT PID	257	129	65	193

Program Name	Program-1	Program-2	Program-3	Program-4
Provider Name	Encoder	Encoder	Encoder	Encoder
Source Check	Disable	Disable	Disable	Disable
Encoder Rate Check	Disable			

Apply	Refresh	Default	Reboot	UpgradeFirmware	Power Off

Name	Range	Name	Range
Video Encoder Type	H264, MPEG2	GOP Structure	IPPB, IPPP, IBP
VLC Mode	CABAC, CAVLC	GOP Size	6~63
Profile	Main, High	GOP Close	Disable, Enable
Level	3.0, 3.1, 3.2, 4.0, 4.1, 4.2	Sample Rate	32KHZ, 44.1KHZ, 48KHZ
Video Encode Rate (Payload)(Kbps)		Video Standard	Auto Downscale
Video Encode Mode	CBR, VBR	Aspect Ratio	Automatic 16x9_LetterBox 16x9_CutOff 4x3_PillarBox
Video Max Encode Rate (Payload)(Kbps)	1.5~2 times of Video Encode Rate	PCR PID	32~8190
Video Min Encode Rate (Payload)(Kbps)	0~0,75 times of Video Encode Rate	Video PID	32~8190
Audio Encoder Type	OFF, MPEG1_Layer2 AC3 (optional) MPEG2_AAC MPEG4_AAC	PMT PID	32~8190
AC3 AC MODE	1+1(L, R) 1/0(C) 2/0(L, R)	Program Name	Max 32 letters
Audio Encode Rate (Payload)(Kbps)	48~448	Provider Name	Max 32 letters
Audio Volume	0~8	Source Check	Disable, Enable
Audio PID	32~8190	Encoder Rate Check	Disable, Enable

The **Status >EN4HDMI** only presents the **Video Resolution** when of the input content is protected by HDCP. In that case, the **Total Bitrate** and **Effective Bitrate** will be 0.000 Mbps and Scan TS will fail.

4.2.4 EN2SDI-2H

EN2SDI-2H is a 2-channel H.264/MPEG-2 HD/SD encoder via SDI/CVBS input.

Module Configuration > EN2SDI-2H

	Sub-module 1:MPEG2	Sub-module 2:MPEG1_Layer_ll
	Port1	**Port2**
Video Source	SDI	SDI
Video Encoder Type	MPEG2	MPEG2
Video Encode Rate(Payload)(Kbps)	10000	10000
Video Encode Mode	CBR	CBR

	Audio1	**Audio2**
Audio Source	SDI1-Audio1/2	SDI2-Audio1/2
Audio Encoder Type	MPEG1_Layer2	MPEG1_Layer2
Audio Encode Rate(Payload)(Kbps)	128	128
Belong To	Program1	Program2
Audio Volume (dB)	0.00	0.00
Audio PID	67	131

Name	Range	Name	Range
Video Source	SDI, CVBS	**Video PID**	32~8190
Video Encoder Type	H264, MPEG2	**PMT PID**	32~8190
Video Encode Rate (Payload)(Kbps)	600~20000	**Service ID**	0~65535
Video Encode Mode	CBR, VBR	**Program Name**	Max 32 letters
Audio Source	L1-XLR1-R1,SDIx-Audio1/2 SDIx-Audio3/4,SDIx-Audio5/6 SDIx-Audio7/8	**Provider Name**	Max 32 letters
Audio Encoder Type	OFF, MPEG1_Layer2 AC3 (optional), MPEG2_AAC MPEG4_AAC	**Latency Adjustment (ms)**	Enter a positive value to delay audio encoding.

Belong to	Progrma-1	Profile	Main, High
Audio Volume	0~8	Level	3.0, 3.1, 3.2, 4.0, 4.1, 4.2
Audio PID	32~8190	Sample Rate	32KHZ, 44.1KHZ,48KHZ
GOP Structure	IPPB, IPPP, IBP	Brightness	0~255
GOP Size	6~63	Contrast	0~255
GOP Close	Disable, Enable	Saturation	0~255
Aspect Ratio	Auto, 16x9_LetterBox 16x9_CutOff, 4x3_PillarBox	Hue	-180~180
Video Standard	Auto, Downscale	EIA 708	Disable, Enable
PCR PID	32~8190		

4.2.5 EN4SC-4M2A

EN4SC-4M2A is a 4-channel H.264 and MPEG-2 encoding module with 4 SDI/CVBS ports. An extra MPEG1-L2 audio encoding is optional for each channel. AAC (HE/LC) and AC3 are available if enabled in license.

Module Configuration > EN4SC-4M2A01

	Sub-module 1:MPEG2		Sub-module 2:MPEG2	
	Port1	**Port2**	**Port3**	**Port4**
Video Source	SDI	SDI	SDI	SDI
Video Encoder Type	MPEG2	MPEG2	MPEG2	MPEG2
Video Encode Rate(Payload)(Kbps)	4000	4000	4000	4000
Video Encode Mode	CBR	CBR	CBR	CBR
Video Max Encode Rate(Payload)(Kbps)	6000	6000	6000	6000
Video Min Encode Rate(Payload)(Kbps)	1000	1000	1000	1000

	Audio1	**Audio2**	**Audio3**	**Audio4**
Audio Source	SDI1-Audio1/2	SDI2-Audio1/2	SDI3-Audio1/2	SDI4-Audio1/2
Audio Encoder Type	MPEG1_Layer2	MPEG1_Layer2	MPEG1_Layer2	MPEG1_Layer2
AC3 AC Mode	1+1(L,R)	1+1(L,R)	1+1(L,R)	1+1(L,R)
Audio Encode Rate(Payload)(Kbps)	128	128	128	128
Belong To	Program1	Program2	Program3	Program4
Volume (dB)	0.00	0.00	0.00	0.00
Audio PID	67	131	195	259

Audio Switch | On

	Audio5	**Audio6**	**Audio7**	**Audio8**
Audio Source	SDI1-Audio1/2	SDI2-Audio1/2	SDI3-Audio1/2	SDI4-Audio1/2
Audio Encoder Type	MPEG1_Layer2	MPEG1_Layer2	MPEG1_Layer2	MPEG1_Layer2
Audio Mode	Stereo	Stereo	Stereo	Stereo
Audio Encode Rate(Payload)(Kbps)	128	128	128	128
Belong To	Program1	Program2	Program3	Program4
Volume (dB)	0.00	0.00	0.00	0.00
Audio PID	323	387	451	515

Advanced Setting ☑

GOP Structure	IBBP	IBBP	IBBP	IBBP
GOP Size	15	15	15	15
GOP Close	Disable	Disable	Disable	Disable
Aspect Ratio	Auto	Auto	Auto	Auto
Video Standard	Auto	Auto	Auto	Auto
PCR PID	68	132	196	260
Video PID	66	130	194	258
PMT PID	65	129	193	257
Service ID	1	1	1	1
Program Name	Program-1	Program-2	Program-3	Program-4
Provider Name	Encoder	Encoder	Encoder	Encoder
Latency Adjustment (ms)	0	0	0	0
VLC Mode	CABAC	CABAC	CABAC	CABAC
Profile	Main	Main	Main	Main
Level	Level 4.0	Level 4.0	Level 4.0	Level 4.0
Sample Rate	48KHz	48KHz	48KHz	48KHz
Brightness (0 - 255)	128	128	128	128
Contrast (0 - 255)	128	128	128	128
Saturation (0 - 255)	128	128	128	128
Hue (-180 - 180)	0	0	0	0
Same PID for PCR and Video	☐	☐	☐	☐

Name	Range	Name	Range
Video Source	SDI, CVBS	GOP Structure	IBBP/IPPP/IBP
Video Encoder Type	H264, MPEG2	GOP Size	6~63
Video Encode Rate	600~15000	GOP Close	Disable, Enable
Video Encode Mode	CBR, VBR	Aspect Ratio	Auto
Audio Source	SDI1-Audio1/2(SDI) SDI1-Audio3/4(SDI) SDI1-Audio5/6(SDI) L1-XLR1-R1(CVBS) No Audio	Video Standard	Auto HD_DOWNSCALE_720x576i50 HD_DOWNSCALE_720x480I60 HD_DOWNSCALE_704X480I60 HD_DOWNSCALE_544X480I60
Video Min Encode	0~3000	PCR PID	32~8190
Video Max Encode Rate (Payload)Kbps	6000~8000	Video PID	32~8190
Audio Encoder Type	AC3, MPEG1_Layer2 MPEG2_AAC MPEG4_AAC	PMT PID	32~8190
AC3 AC Mode	1+1(L,R)	Service ID	1
Audio Encode Rate	64~384	Program Name	Program-x
Belong To	Program x/ None	Provider Name	Encoder
Volume(dB)	0~4	Latency Adjustment	-500~3000
Audio PID	32~8190	VLC Mode	CABAC, CAVLC
Audio Source	L1-XLR1-R1, No Audio	Profile	Main, High
Audio Encoder Type	MPEG1_Layer2	Level	3.0, 3.1, 3.2, 4.0, 4.1, 4.2
Audio Mode	Stereo/Dual/Mono	Sample Rate	48KHz
Audio Encode Rate	64~384	Brightness(0~255)	0~255
Belong To	Program x/ None	Contrast (0~255)	0~255
Volume(dB)	0~4	Saturation(0~255)	0~255
Audio PID	32~8190	Hue(-180~180)	-180~180
		Same PID for PCR and Video	Yes/No

4.2.6 EN5-4H/1U

Module Configuration > EN5-4H/1U

Work Mode	SDI(HD X4)		Signal Lost Processing	blue screen	

Channel 1 | Channel 2 | Channel 3 | Channel 4

TS Setting					
Resolution	Auto		Frame Ration	Auto	
Program Number	1		Provider Name	encoder	
Service Name	program-0		PMT PID	4096	
PCR PID	512				

Video Basic Setting					
Video PID	256		Format	4:2:0	
Bit Depth	8		Profile	Main Still Picture	
Level	Auto		Tier	Main	
Bitrate(Kbps)	14500				

☑ Advanced Setting

Advanced Setting	Enable		High Speed Mode	Default(4k:High-Speed. oth	
GOP Size(GOP_N)	32		P_AS_L0_B	L0 B picture	
Adaptive GOP	not insert		IDR Interval	5	
GOP Hierarchy	Enable		IP Period(GOP_M)	4	
Closed GOP	Close		Adaptive Quantization	Off	
CPB Delay	Default(3s)		VBR Converge	Off	

Name	Range	Name	Range
Work Mode	SDI (HD x4) SDI (4K x1)	**Signal Lost Processing**	Blue screen
Resolution	1920x1080_422_10_60P/59.94P/ 60I/59.94I/50P/50I/30I/29.97P 1920x1080_420_10_60P/59.94P 1920x1080_422_8_60P/59.94P/ 60I/59.94I 1280x720_422_10_60P/59.94P 1280x720_422_8_60P/59.94P 720x576_420_8_50I 720x480_420_8_60I/59.94I	**Frame Ration**	Auto 23.94 29.97 59.94
Video PID		**Format**	4:2:0, 4:2:2
Bit Depth	8 10	**Profile**	Main, Main 10, Main Still Picture Main 4:2:2 10
Level	Auto, 4.0, 5.0, 5.1, 5.2, 6.0, 6.1, 6.2	**Tier**	Main, High
Bitrate (Kbps)			
Advanced Setting	Enable, Disable	**High Speed Mode**	Default (4k:High-Speed, others: Normal-Speed), Mode1 (4k,2k High-Speed. others: Normal-Speed), Mode2 (4k,2k,720p High-Speed. others: Normal-Speed)
GOP Size (GOP_N)		**P_AS_L0_B**	P picture, L0 B picture
Adaptive GOP	Not insert, insert	**IDR Interval**	0, 1, 2, 3, 4, 5
GOP Hierarchy	Enable, Disable	**IP Period (GOP_M)**	1, 2, 4
Closed GOP	Close, Open	**Adaptive Quantization**	Off, On
CPB Delay	Default (3s), 0.5s,1s, 3s	**VBR Converge**	Off, On

Name	Range	Name	Range
Availability	Enable, Disable	**Audio PID**	
Audio Source	SDI1_12, SDI1_34 SDI1_56, SDI1_78	**Type**	MPEG1 LAYER2 AC3/EAC3 AAC
Channel Layout	Mono, Stereo, Surround	**Bitrate (Kbps)**	32, 48, 56, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384
Delay (ms)		**Dolby Mode**	Dolby Digital Plus
AAC Version	MPEG2, MPEG4	**AAC Profile**	LC, HE, HE_V2
Volume SDI12 (dB)	-12~12	**Volume SDI34 (dB)**	-12~12
Volume SDI56 (dB)	-12~12	**Volume SDI78 (dB)**	-12~12

4.3 Transcoding Modules

4.3.1 TC4-xM2A

TC4-xM2A module refers to TC4-2M2A or TC4-4M2A modules. TC4-2M2A supports transcoding to 2 H.264 HD/SD channels or 2 MPEG-2 SD channels. TC4-4M2A supports transcoding to 2 H.264 HD/SD channels or 4 MPEG-2 SD channels. AAC and AC3 audio encoding is available with optional hardware and license.

Module Configuration >TC4-XM2A01

	Channel 1	Channel 2	Channel 3	Channel 4
Video Encode Rate(Payload)(Kbps)	3000	3000	3000	3000
Audio Encode Rate(Payload)(Kbps)	192K	192K	192K	192K
Advanced Setting ☑				
Audio Volume(Transcode) (-63-0)(dB)	-30	-30	-30	-30
GOP Structure	IBBP	IBBP	IBBP	IBBP
GOP Size	15	15	15	15
GOP Close	Disable	Disable	Disable	Disable
Same PID for PCR and Video ☐				
Output Resolution	720x480_60i	720x480_60i	720x480_60i	720x480_60i
Video Encoder Type	MPEG2	MPEG2	MPEG2	MPEG2
Video Profile	Main	Main	Main	Main
Video Level	Level 4.0	Level 4.0	Level 4.0	Level 4.0
Video Vlc Mode	CABAC	CABAC	CABAC	CABAC
Audio Encoder Type	MPEG1 Layer2	MPEG1 Layer2	MPEG1 Layer2	MPEG1 Layer2
AC3 AC Mode	1+1(L,R)	1+1(L,R)	1+1(L,R)	1+1(L,R)
Aspect Ratio Conversion	Automatic	Automatic	Automatic	Automatic
Video Encode Mode	CBR	CBR	CBR	CBR
Video Max Encode Rate(Payload)(Kbps)	6000	6000	6000	6000
Video Min Encode Rate(Payload)(Kbps)	1000	1000	1000	1000
Latency Adjustment(ms)	1900	1900	1900	1900
SDHD	4SD			

Apply	Refresh	Default	Reboot	Upgrade(Decoder)	Upgrade(Encoder)	Power Off

Name	Range	Name	Range
Video Encode Rate	600~15000	Video Profile	Main, High
Audio Encode Rate	64~384	Video Level	3.0, 3.1, 3.2, 4.0, 4.1, 4.2
Audio Volume	0~8	Video Vlc Mode	CABAC, CAVLC
GOP Structure	IPPB, IPPP IBP	Audio Encoder Type	OFF, MPEG1_Layer2, AC3 MPEG2_AAC, MPEG4_AAC
GOP Size	6~63	AC3 AC Mode	1+1(L, R), 1/0(C), 2/0(L, R)
GOP Close	Disable, Enable	Aspect Ratio Conversion	Automatic, 16x9_LetterBox 16x9_CutOff, 4x3_PillarBox 4x3_CutOff
Output Resolution	720x480_60i 720x576_50i 1920x1080_60i/50i 1208x720_60p/50p	Latency Adjustment (ms)	Enter a value to adjust the audio and video synchronization. Enter a positive value to delay audio encoding. Enter a negative value to hasten audio encoding.
Video Encoder Type	H264, MPEG2	SDHD	4SD/2HD channel mode.

Drag a program to a TC4 output port for transcoding process. The transcoded program will be in the corresponding TC4 input port. Then the transcoded program can be sent to an output port.
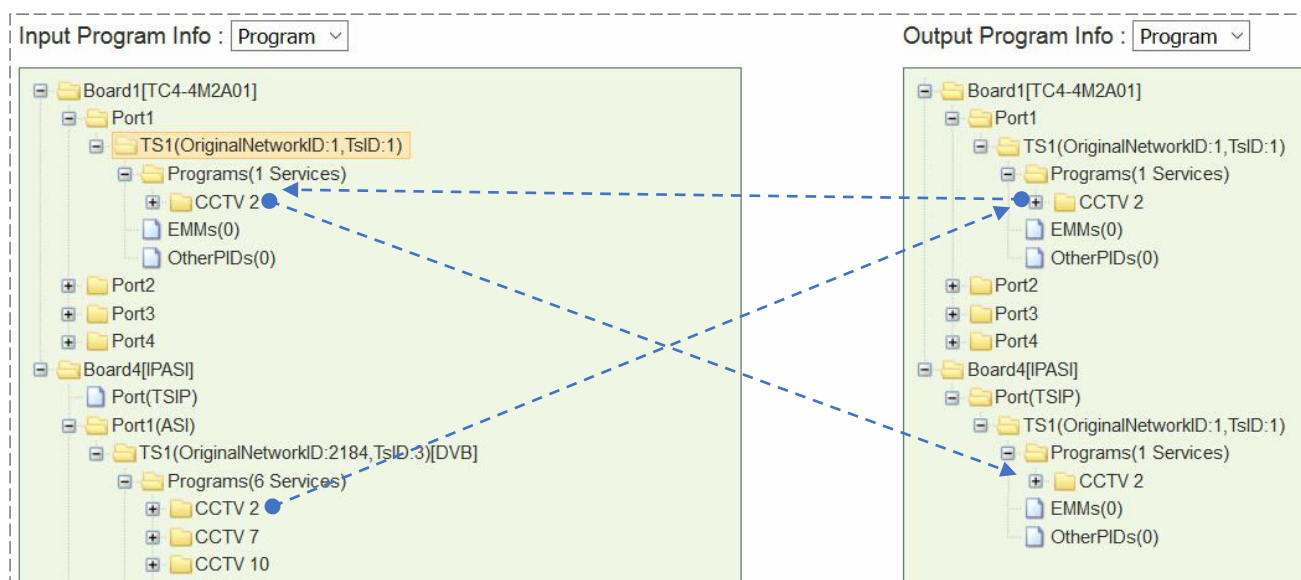
4.4 Scrambling/Descrambling Modules

4.4.1 CI Descrambling

One CI module allows the user to insert two pairs of CAM and smartcard into two independent slots. The top slot is slot 1. The bottom slot is slot2. The user can either select Auto Reset or click Reboot to reset CAM modules. MMI button is used to read CAM and smartcard information.

Module Configuration > CI

Configuring Service Descrambling

In the following image, a TS that contains 9 scrambled services comes from ASI input port.

1. Go to ***Status > CI*** and check the ***CAM Insert Status, CAM Initialization status, CAM Name, and CA System ID***. Take the following figure for example, the CAM module is successfully loaded in CI Port.

Slot 3:CI Status	
TS Bitrate Overview	
	Port1
Input Effective Bitrate(Mbps)	35.79
Output Effective Bitrate(Mbps)	35.41
Output Total Bitrate(Mbps)	63.85
CAM Insert Status	Inserted
CAM Init Status	Succeeded
CAM Name	NOVEL SUPERTV-SMIT
CA System ID	18946 ⌄

2. Go to **Service Configuration**. Bypass the input TS and drag it to output **Board3 [CI]** on the right side. Then on the left side in **Board3 [CI] Port1** the processed TS is listed as an input again.

3. Right-click a program in the output CI port to descramble this service by the CAM in Port 1. **[Descramble]** follows the service that is descrambled as a mark. To cancel the descrambling process for the service, right-click it and click **Non-descramble**. Click **Apply**.

Output Program Info : Program ⌄

- Board3[CI]
  - Port1
    - TS1(OriginalNetworkID:2184,TsID:3) *[BypassTS]
      - Programs(6 Services)
        - CCTV 2
        - CCTV 7
        - CCTV 10
        - CCTV 1 [Descramble]
        - CCTV 12
        - CCTV 15
      - EMMs(1)
      - OtherPIDs(0)
  - Port2

⇒

Output Program Info : Program ⌄

- Board3[CI]
  - Port1
    - TS1(OriginalNetworkID:2184,TsID:3) *[BypassTS]
      - Programs(6 Services)
        - CCTV 2
        - CCTV 7
        - CCTV 10[Descramble] [Non-descramble]
        - CCTV 11
        - CCTV 12
        - CCTV 15
      - EMMs(1)
      - OtherPIDs(0)
  - Port2

4. Drag the service that has been descrambled from input **Board3 [CI], Port1** to output port.
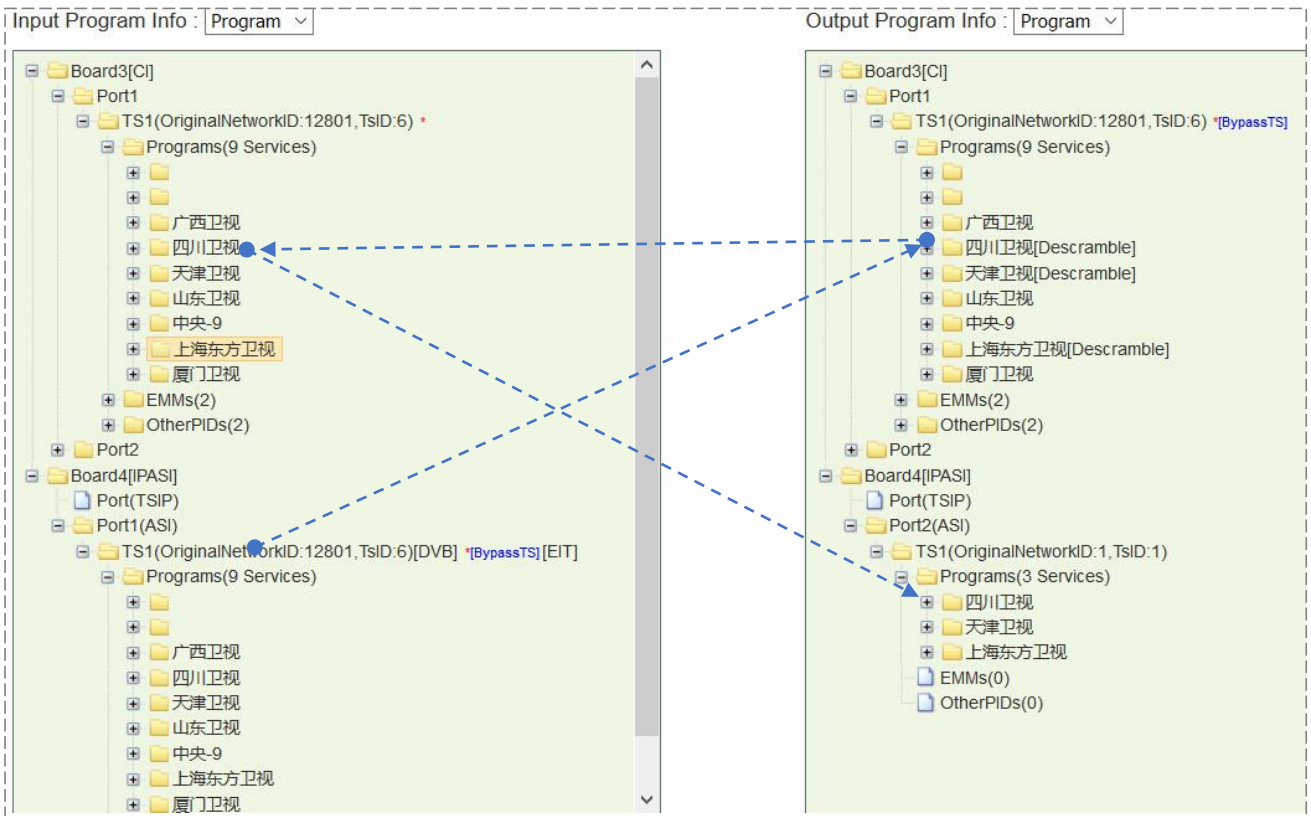
5. Go to **Status > CI**, check the **Service Descramble Status**. In the following figure, three services are descrambled successfully.

4.4.2 CI-BISS Descrambling

CI module can be converted to CI-BISS module by a different license and loading CI-BISS module software. BISS descrambling does not require any CAM module. Use the similar way as in Chapter 4.2.1 CI Descrambling to configure CI-BISS Descrambling.

1. Bypass the input TS and drag it to output CI port.

2. Right-click a program and click **BISS-Descramble**.
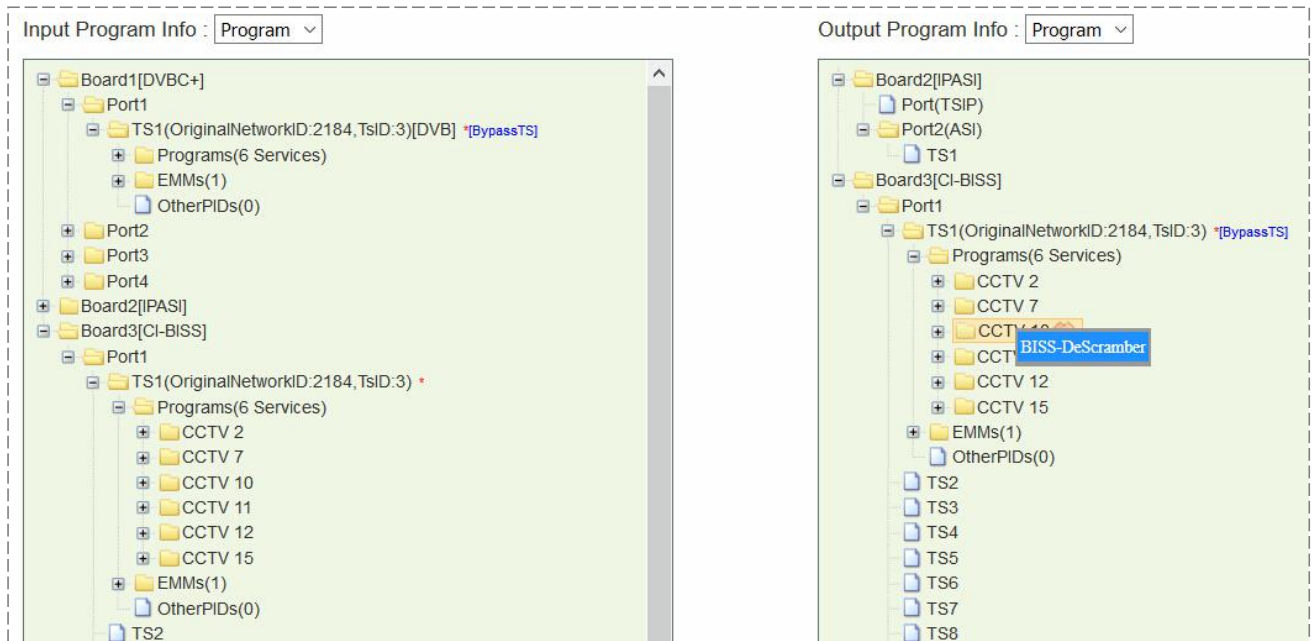
3. Configure **BISS Mode** and **BISS Key** (and Injected ID in BISS-E Mode). Click **Apply** and then click **Back** to return to **Service Configuration. [BISS_1]** and **[BISS_E]** follow the descrambled services as a label.

CI-BISS

#	Service ID	Service Name	BISS Mode	BISS-1/BISS-E Key	Inject ID
1	302	CCTV 2	BISS-1	000000000000	
2	303	CCTV 7	BISS-1	000000000000	
3	304	CCTV 10	BISS-E	0000000000000000	00000000000000
4	305	CCTV 11	BISS-E	0000000000000000	00000000000000
5	306	CCTV 12	NoDescramber		
6	307	CCTV 15	NoDescramber		

Apply   Back

4. Drag the descrambled services to output port.
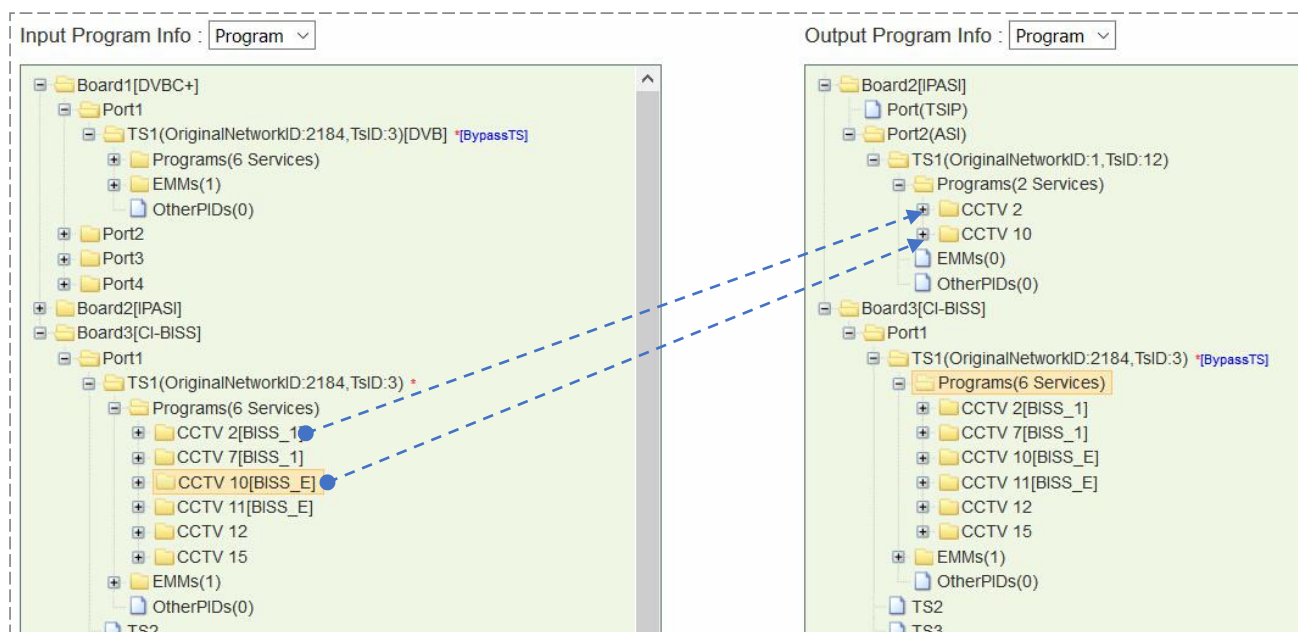
5. Check descrambling status in **Status > CI**.

📄 To ensure CA PMT is updated in CI, better bypass the input TS before drag it to CI. Otherwise, descrambling process may fail.

4.4.3 Scrambler+

The scrambler+ module is use to work with CAS systems to encrypt programs. It supports scrambling up to 150 services. Besides, it support BISS-1/BISS-E scrambling without extra license. AES-CBC mode is optional.

The following figure gives an overview of Scrambler+ menu structure.
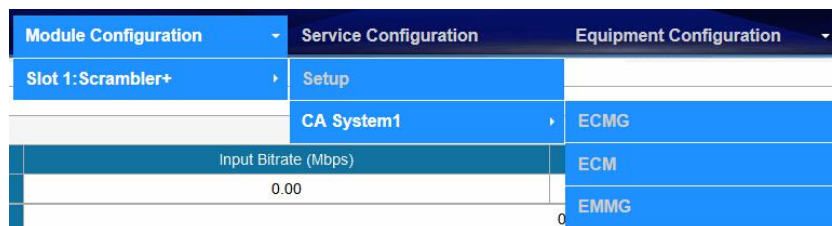
Configuring Scrambler+ Setup

Go to **Module Configuration >Setup**. Enter the **IP Address, Subnet Mask, Gateway**, and **Speed Mode** for this scrambler. The **IP Address** should be in the same network with that of the CAS server. The **Speed mode** should be the same with the Ethernet of CAS server. Turn on **CA System 1** and keep unused **CA Systems** Off. Use a cross-through RJ45 cable to connect scrambler to CAS server's Ethernet port. Check the connection by pinging scrambler's IP address in the Command Prompt of CAS server.

Configuring ECMG connection.

Enter **System ID, Sub System ID** (keep it 0 if not required), **ECMG IP Address,** and **ECMG Port.** Click **Apply**. Check **ECMG Communication Status** in **Status >Scrambler+.** When the connection is liable, the status is a green Connected. See in the following figure.

Configuring EMMG connection.

Enter **EMMG TCP Port**, **EMMG UDP Port** (keep it 0 if EMM Send Type is TCP), **EMM Send Type**, **EMM PID**, and **EMM Bandwidth**. Click **Apply.** Check **EMMG Communication Status** in **Status >Scrambler+.** When the connection is stable, the status should be a green Connected.
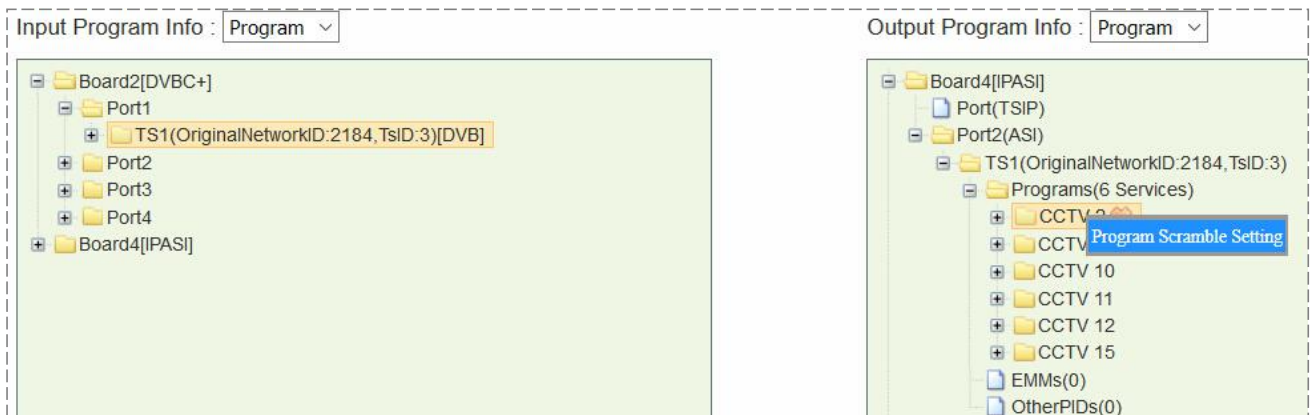
Configuring ECM

Add the AC Data that is created in CAS server into ECM List.

Scrambling Programs

Once the ECMG, EMMG connection is done and ECM is added, go to **Service Configuration** and right-click a program in output port to **Program Scramble Setting**.

Select **Slot** (the slot in which Scrambler+ is installed), **CA Stream ID** for each program and click **Apply** to scramble them. Go to **Status > Scrambler+** and check **ECM Count**. The count number should be the same with the number of scrambled programs.

To cancel the scrambling process for a scrambled program, go to **Program Scramble Setting** again, set **Slot** to **None** and apply **Non-scramble** for this program.

BISS-1/BISS-E Scrambling

BISS scrambling does not require a CAS server. Right-click an output program to **Program Scrambling Setting**. Select **BISS-1/BISS-E** in **Scrambling Type** and enter BISS keys to scramble the programs.

Part 5 Appendices

Appendix A - Abbreviations

8VSB	Vestigial sideband modulation with 8 discrete amplitude levels
16VSB	Vestigial sideband modulation with 16 discrete amplitude levels
AAC	Advanced Audio Coding
AC-3	Also known as Dolby Digital
ASI	Asynchronous Serial Interface
ATSC	Advanced Television Systems Committee
AV	Audio Video
BAT	Bouquet Association Table
BER	Bit Error Ratio
Bit Rate	The rate at which the compressed bit stream is delivered
BNC	British Naval Connector
CAM	Conditional Access Module
CAT	Conditional Access Table
CAT6	Category 6 – Cable standard for gigabit Ethernet
CBR	Constant Bitrate
CI	Common Interface
CVBS	Composite Video Broadcast Signal
dB	Decibel
DVB	Digital Video Broadcasting
EIT	Event Information Table
EPG	Electronic Program Guide
FEC	Forward Error Correction
GOP	Group of Pictures
HD	High Definition
HDCP	High-bandwidth Digital Content Protection
HDMI	High Definition Multimedia Interface

I/O	Input/output
Kbps	1000 bit per second
LCN	Logical Channel Number
LNB	Low-Noise Block
LO	Local Oscillator
Mbps	1,000,000 bits per second
MER	Modulation Error Ratio
MIB	Management Information Base
MPTS	Multi-program Transport Stream
NIT	Network Information Table
OFDM	Orthogonal Frequency-Division Multiplexing
PAT	Program Association Table
PCR	Program Clock Reference
PID	Packet Identifier
PMT	Program Map Table
PSI	Program Specific Information
PSU	Power Supply Unit
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase-Shift Keying
SD	Standard Definition
SDI	Serial Digital Interface
SDT	Service Description Table
SI	Service Information
SNMP	Simple Network Management Protocol
SNR	Signal Noise Ration
SPTS	Single Program Transport Stream
TDT	Time and Date Table
TS	Transport Stream
VBR	Variable Bitrate

Appendix B – Modules Available In Different Regions

Check the following sheet to find out which modules are available in certain regions.

Module Name	North America	Europe	Other
TSIP	✓	✓	✓
TSIP+	✓	✓	✓
ASI	✓	✓	✓
IPASI	✓	✓	✓
DVBC	✓	✓	✓
DVBS2	✓	✓	✓
DVBT2		✓	✓
8VSB	✓		✓
QAM-A/C		✓	✓
QAM-B	✓		✓
IQAM	✓		✓
OFDM		✓	✓
8VSBM	✓		✓
HDMI/SDI Decoder		✓	✓
Decoder-CC	✓		✓
ASI-Switch	✓		✓
DS3			✓
ISDBT			✓
EN4AV		✓	✓
EN4SDI		✓	✓
EN4HDMI	✓	✓	✓
EN2SDI-2H	✓	✓	✓
EN4SC	✓		✓
EN5-4H/1U	✓		✓
TC4	✓	✓	✓
CI	✓	✓	✓
CI-BISS	✓	✓	✓
Scrambler+	✓	✓	✓
SQAM			✓
ENASDI-4S			✓
TCAVS			✓
Decoder AVS+			
LQAM-A/C			✓
LQAM-B	✓		✓

✓ **Available**

Appendix C - Warranty

We warrants this instrument against defects from any cause, except acts of God and abusive use, for a period of 1 (one) year from date of purchase. During this warranty period, we will correct any covered defects without charge.

Appendix D - After-Sales Support

Please contact our sales/regional representatives for any help, product information, and troubleshooting.

Returning Products for Service

The DMP00 is a delicate piece of equipment and needs to be serviced and repaired by the manufacturer. In order to expedite this process please carefully read the following items.

- Confirm the required component

Before any product can be returned for service, the client ought to contact our sales representatives and after-sales support department by means of email to confirm the need to return the product or part of the product.

- Collect the Serial Numbers to obtain RMA Number

Serial Number (SN) is printed on a label on the chassis and modules. To create a RMA number, SN must be submitted to support department. Once the RMA number has been issued to the client, the unit/component needs to be packaged and shipped back to the manufacturer. It's best to use the original box and packaging for the product but if this not available, check with the service department for the proper packaging instructions. RMA Number should be specified in the delivery bill or written on the package.

Do not return any power cables or accessories unless instructed to do so.