

SMP100

User Guide










V2.0-N

Revision History

Date	Version	Description	Author
2/30/2013	1.0	First Draft	AY
12/05/2016	1.06	New UI	MS
6/30/2017	2.0-N	Module Update	HL

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.

<i>Bold Italic</i>	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.
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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 provider 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.

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Part 1 SMP100 Chassis Overview

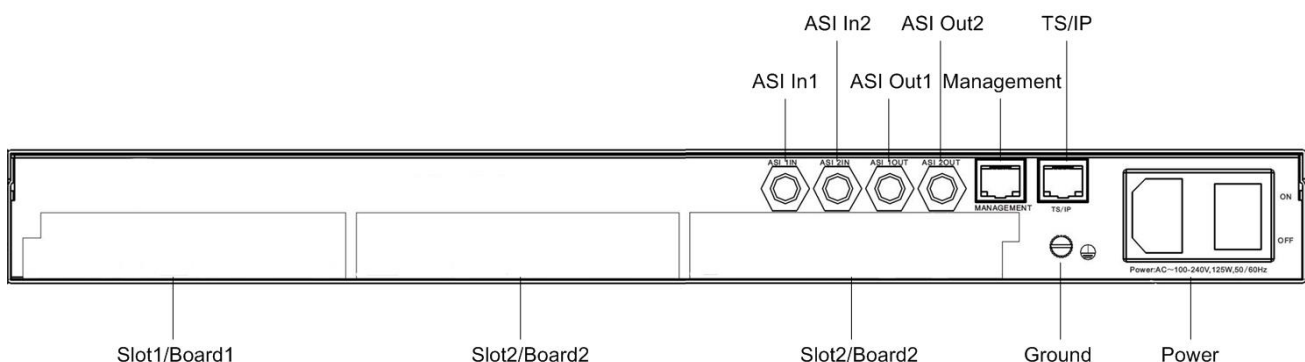
1.1 Front Panel

SMP100 is a 1-U multi-purpose content delivery platform. Equipped with three hot-swappable modules, SMP100 supports almost any video delivery application with flexible combination of receiving, de-scrambling, transcoding, re-multiplexing/grooming, scrambling, modulating and IP/ASI turn around.



1. Indicators (For Power, ASI, TS/IP and decoder status)
 - Red or Flashing Red : Error
 - Green: Normal
 - Flashing Green: Initialing or loading a board
2. LCD Screen
3. Up, Down, Left, and Right buttons
4. Menu, OK, and Esc buttons

1.2 Rear Panel



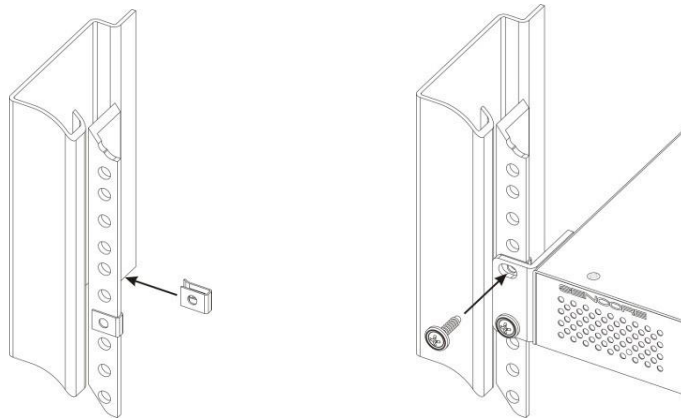
Note the position of each slot on rear panel. Fasten the modules in the chassis by screws to avoid loose connection between the modules and mainboard.

Part 2 Rack Installation

Rack Installation

The SMP100 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 SMP100. 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 SMP100 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.



AC Power Connection

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 the equipment, personnel, or property. Make sure the power outlet is switched off before plug or unplug the power cable from the back panel. Power unit is designed to work under condition of AC100~240V, 50/60Hz. Max consumption is 50W.



When you move this device from a cold condition into a warmer condition, it 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.

Part 3 Web GUI

3.1 Web GUI Overview

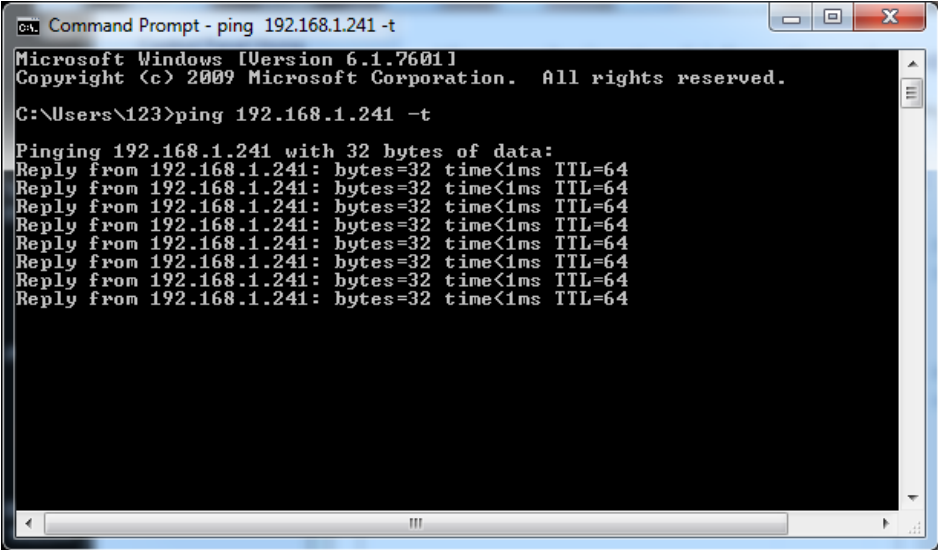
3.1.1 Connecting to the Management Port

Factory network settings of the Management Port:

- IP address 192.168.1.241
- 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 SMP100'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 SMP100's management port.
- Set the IP address of the laptop/computer in the same network with the SMP100 management IP address. For example, you can set the computer's IP address to 192.168.1.242.
- 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 192.168.1.241" or "ping 192.168.1.241 -t" and press "Enter" to check reply status. Stable and constant replies from 192.168.1.242 (management computer's IP address) indicate a reliable physical connection. See the following image.

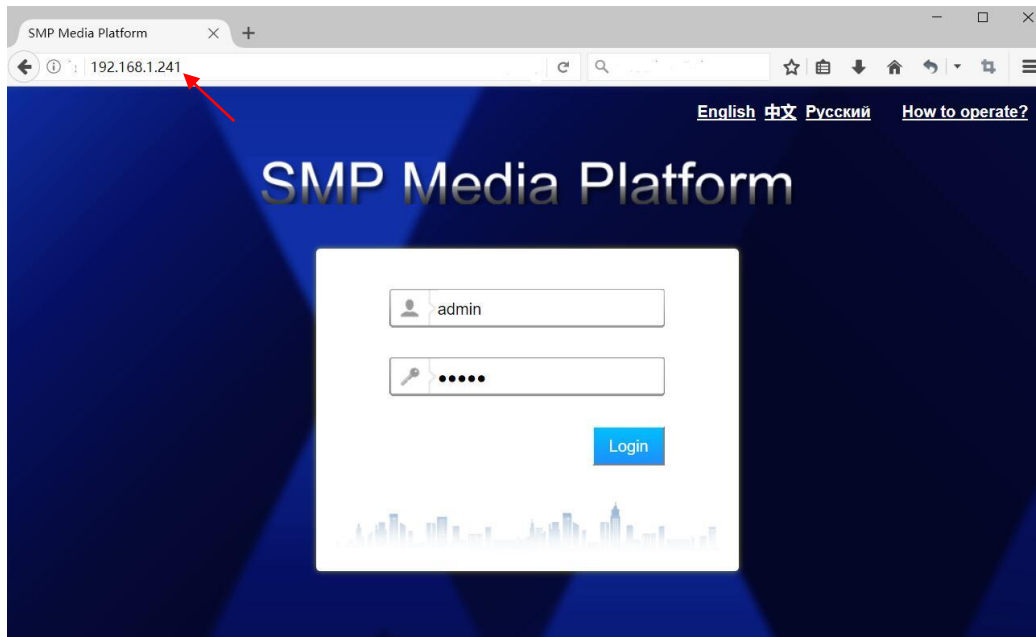


```
cmd. Command Prompt - ping 192.168.1.241 -t
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\123>ping 192.168.1.241 -t

Pinging 192.168.1.241 with 32 bytes of data:
Reply from 192.168.1.241: bytes=32 time<1ms TTL=64
Reply from 192.168.1.241: bytes=32 time<1ms TTL=64
Reply from 192.168.1.241: bytes=32 time<1ms TTL=64
Reply from 192.168.1.241: bytes=32 time<1ms TTL=64
Reply from 192.168.1.241: bytes=32 time<1ms TTL=64
Reply from 192.168.1.241: bytes=32 time<1ms TTL=64
Reply from 192.168.1.241: bytes=32 time<1ms TTL=64
Reply from 192.168.1.241: bytes=32 time<1ms TTL=64
```

3.1.2 Logging into the Web GUI



Type the SMP 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.



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

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 SMP100 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.

Menu and Main Buttons

The screenshot displays the Service Configuration interface. At the top, a navigation bar includes 'Status', 'Module Configuration', 'Service Configuration' (active), 'Equipment Configuration', and 'Logout'. Below this are 'Refresh', 'Apply', 'Save', and 'ClearAll' buttons. The interface is split into two main sections: 'Input Area' and 'Output Area'. The 'Input Area' shows a tree structure for Board4[AS][Embedded], with a dropdown for 'Input Program Info' set to 'Program'. It lists Port1, TS1, Programs(6 Services), and various CCTVs. The 'Output Area' shows a tree structure for Board2[QAM(AVC)], with a dropdown for 'Output Program Info' set to 'Program'. It lists Port1, TS1, Programs(3 Services), and various CCTVs. Blue arrows point to specific elements in both panels with labels: 'Slot and Module Name', 'TS', 'Service Group', 'Program Name', 'Other PID Group', 'Port and Port Number', and 'Quick Sort'.

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 SMP100 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 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 SMP100.

IP Address	192.168.001.241	
Subnet Mask	255.255.255.000	
Gateway	192.168.001.001	
Trap IP Address1	000.000.000.000	<input type="checkbox"/> Enable
Trap IP Address2	000.000.000.000	<input type="checkbox"/> Enable
EIT Mux	Disable	
NIT/SDT Bypass	Disable	
CAT Bypass	Disable	
Output TS Standard	DVB	
PAT/PMT Send Interval(ms)	100	
SDT Send Interval(ms)	100	
Mac Address	A0-69-86-01-A7-B4	

Apply Refresh Default Reboot

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 separately. 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 separately.



If you change the IP address of the SMP100 in System page and click Apply, this unit will restart itself to activate the new IP address.

3.2.2 Configuring Input

Embedded ASI Input

There are four built-in ASI interfaces on the back panel of the SMP100 chassis.

Steps to configure an ASI input:

1. Go to **Module Configuration > ASI [Embedded]**. Enable an input channel or port. Since the function of each ASI port is not editable, see the following image, you do not have to open or close an ASI port. Port 1 and 2 are input ports. Port 3 and 4 are output ports.

ASI[Embedded]				
	Port1	Port2	Port3	Port4
Type	Input	Input	Output	Output
Constant Rate(Mbps)	34.037	34.037	34.037	34.037
Backup(Port1 as Main Port2 as Backup)	Off			

2. Connect an ASI cable to ASI 1 IN interface.
3. Go to **Status > ASI [Embedded]** and verify the input bitrate of ASI port 1.

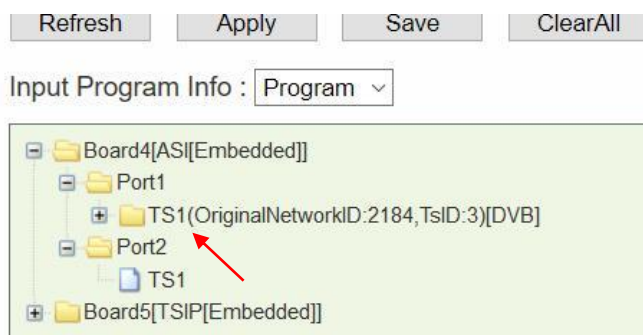
Slot 4:ASI[Embedded] Status				
TS Bitrate Overview				
Input (Mbps)			Output (Mbps)	
Port	Total Bitrate	Effective Bitrate	Port	Effective Bitrate
Port1	39.97	28.49	Port3	0.00
Port2	0.00	0.00	Port4	0.00

4. Go to **Service Configuration**. Right click the TS1 under Board4 [ASI] on the left of this page. Click **Scan TS (DVB)** or **Scan TS (ATSC)** to search the input.

Input Program Info :

- Board4[ASI[Embedded]]
 - Port1
 - TS1
 - Scan TS(DVB)
 - Scan TS(ATSC)
 - Clear TS
 - BypassTS
 - Port2
- Board5[TS]
 - Port1
 - TS1

After a few seconds you will see a TS1 under **Port 1, Board4**. You click the plus icon (+) in front of TS1 to see the detailed list of all services. Click the minus icon (-) to hide the details.



Before you configure input, go to **Equipment Configuration > System**, and set the **Output TS Standard**. By default, it is DVB.

Embedded TSIP Input

By default, the input and output TSIP channels are closed.

Steps to configure an IP input:

1. Go to **Module Configuration > TSIP [Embedded] > Setup**. Set the network parameters of the built-in TSIP module. Click **Apply** in this page before next step.

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			
Enable Input	On			
Enable Output	On			
FEC Enable	Off			
MAC Address	A0-69-86-01-A7-B5			

2. Go to **Module Configuration > TSIP [Embedded] > Channel (1-16)**. Check the boxes under **Channel Enable** to open IP input channels. Enter the **Source IP Address**, **Source Port** and **Protocol** (UDP/RTP). Click **Apply** in this page before next step.

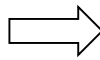
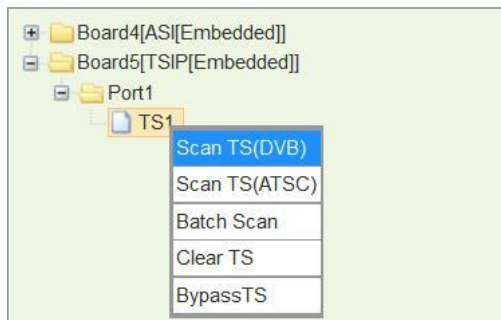
Channel	Channel Enable	Source IP Address	Source Port	Protocol	Col Port Matching	Row Port Matching	IGMPV3 Configuration
1	<input checked="" type="checkbox"/>	227.10.20.80	1234	UDP	Disable	Disable	Configuration
2	<input type="checkbox"/>	227.40.50.61	1234	UDP	Disable	Disable	Configuration
3	<input type="checkbox"/>	227.40.50.62	1234	UDP	Disable	Disable	Configuration
4	<input type="checkbox"/>	227.40.50.63	1234	UDP	Disable	Disable	Configuration
5	<input type="checkbox"/>	227.40.50.64	1234	UDP	Disable	Disable	Configuration

- Connect the IP cable to the TS/IP port on the back panel of the SMP100.
- Go to **Status > TSIP [Embedded]**. Verify the bitrates in the input channels.

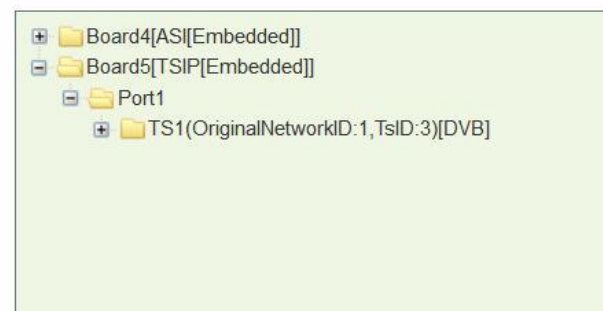
Slot 6: TSIP[Embedded] Status					
TS Bitrate Overview					
Channel	Input (Mbps)		Channel	Output (Mbps)	
	Effective Bitrate			Effective Bitrate	
1	14.37		1	0.00	
2	0.00		2	0.00	
3	0.00		3	0.00	

- Go to **Service Configuration** page. Scan the **TS1** under **Port1, Board5**. Click **Apply** in this page before next step.

Input Program Info :

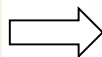
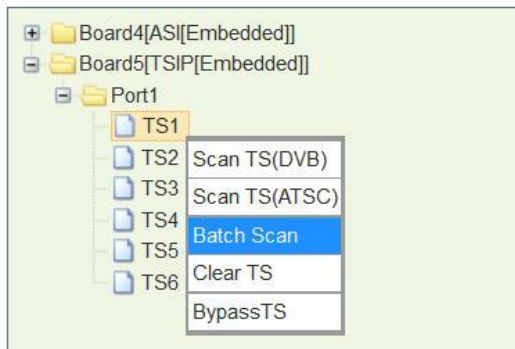


Input Program Info :

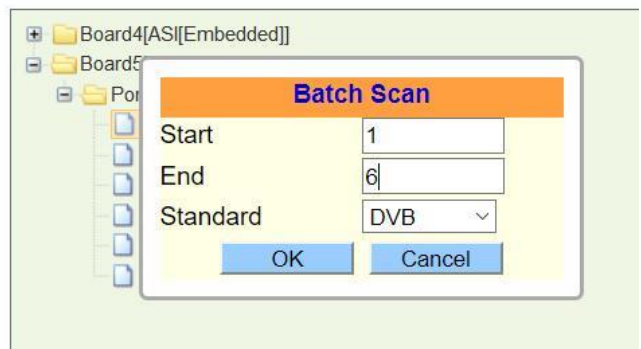


Use **Batch Scan** in the following image to get more than one input TS' by one scan step. Note before you use this shortcut function, go to **Status > TSIP [Embedded]**, verify all the input channels you are going to **Batch Scan** present input bitrates.

Input Program Info :



Input Program Info :



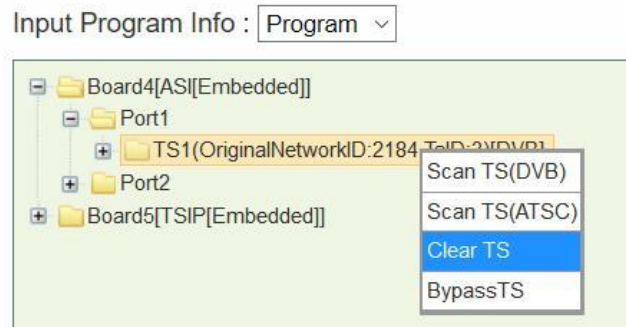
To configure the input of other modules, follow the similar steps as how you configure ASI and TSIP input. Summary of the steps:

- Connect input cables
- Open input channels and set input parameters.
- Scan TS
- Click **Apply**

3.2.3 Clear and Bypass the Input

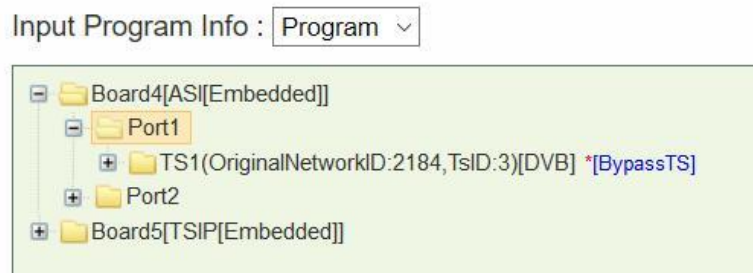
Clear the input TS

Use the **Clear TS** option right under **Batch Scan** to remove an input TS.

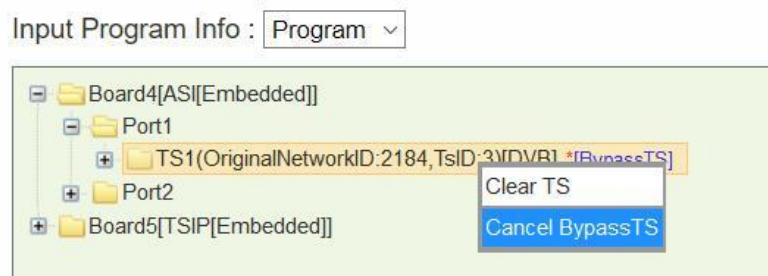


Bypass the input TS

Use the **Bypass TS** option to pass a whole TS to the output port or channel. A bypassed TS will not be multiplexed. See the following image, a blue ***[Bypass TS]** follows the TS1 as a mark.



To cancel **Bypass TS**, right-click the TS and select **Cancel Bypass TS**.



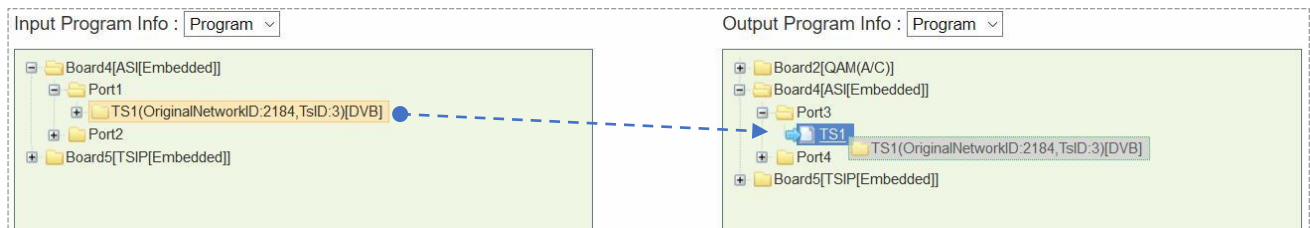
3.2.4 Configuring Output

Embedded ASI Output

Use the following two ways to create output TS:

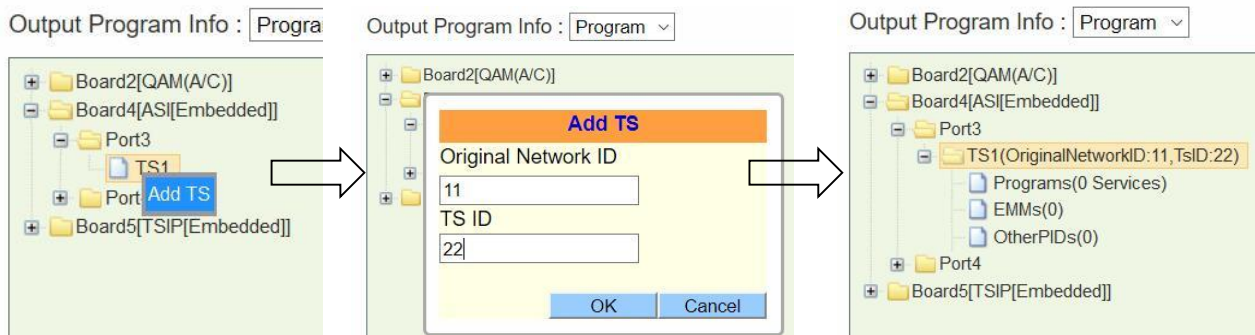
1. Drag TS to TS

Click an input TS; drag and drop it on an empty output TS. Click **Apply**. See the following Image.

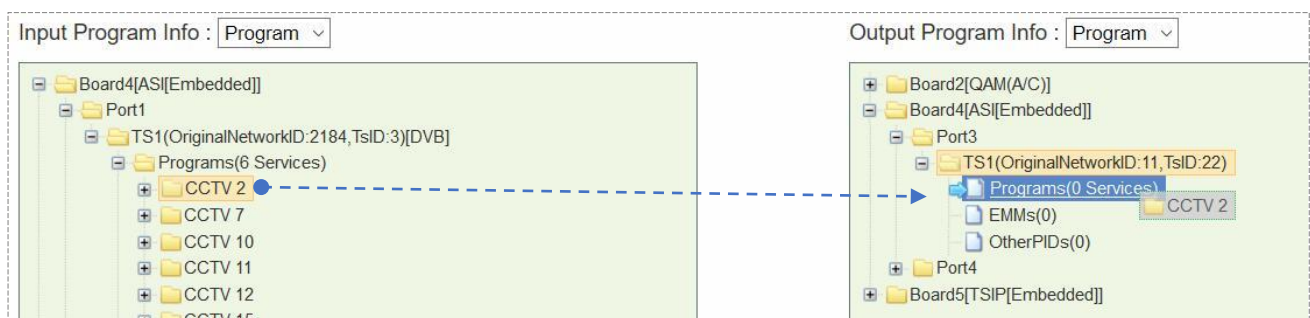


2. Drag Programs to Programs

Right-click an output TS. Click **Add TS** to assign **Original Network ID** and **TS ID** for this new TS. Click **OK**, then an empty TS is created.



Click a service in the input port, drag and drop it on **Program (0 Services)** in the output area.



Click **Apply** before next step.


Go to **Status > ASI [Embedded]**. Verify the output **Effective Bitrate** of this ASI port.

Slot 4:ASI[Embedded] Status				
TS Bitrate Overview				
Input (Mbps)			Output (Mbps)	
Port	Total Bitrate	Effective Bitrate	Port	Effective Bitrate
Port1	39.97	28.34	Port3	5.18
Port2	0.00	0.00	Port4	0.00

Go to **Module Configuration > ASI [Embedded]**. Set the Constant rate of this port. Click **Apply**.

ASI[Embedded]


	Port1	Port2	Port3	Port4
Type	Input	Input	Output	Output
Constant Rate(Mbps)	34.037	34.037	6	34.037
Backup(Port1 as Main Port2 as Backup)	Off			

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

Embedded TSIP Output

The steps to configure IP output are similar to the ways to configure ASI output:

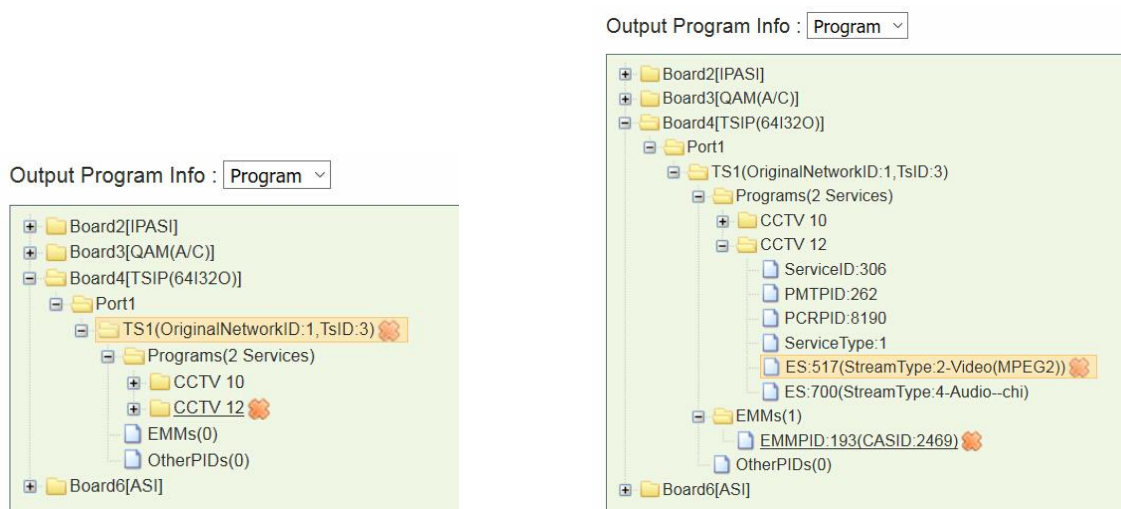
1. Go to **Module Configuration > TSIP [Embedded]**. Open output channels and set output parameters.
2. Distribute services in **Service Configuration** page.
3. Verify the output bitrate in **Status**.
4. Set the **Constant Rate** in **Module Configuration** for the output channels.

 If the **Constant Rate** is lower than the **Effective Bitrate** at a time, it will cause packet loss issue. In that case, the **Effective Bitrate** of the corresponding output 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

3.2.5 Delete an Output TS/Program/PID

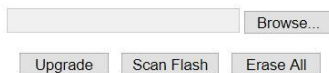
Move the cursor to a TS, Program or PID until a red icon (✖) appears. Click the red icon to delete the service or PID. Click **Apply** before next step.



3.2.6 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	V4.2.47	V4.2.47	V2B(0000)
QAM(A/C)	QAM(A/C)	V60.1.1	V60.1.0	V5B(2000)
<input checked="" type="checkbox"/> Advanced				
Type	Description	Software Version		
0x02	ASI	V60.1.2		
0x05	DVBS2	V60.1.13		
0x2D	8QAM(A/C)	V60.1.1		



Updating software

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

If it is a mainboard upgrade, SMP100 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 provider 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.

3.2.7 License

License Information					
	Slot	Chip ID	Board Type	License Info	Last Update Time
<input checked="" type="radio"/>	0	0x3397578c0500005d	Mainboard	Fully License	2017-3-4
<input type="radio"/>	2	0x3338d68f050000f1	QAM(A/C)	Max Channel:8	2017-6-28
<input type="radio"/>	4	0xa069860000026001	ASI[Embedded]	Fully License	2011-4-22
<input type="radio"/>	5	0xa069860000026002	TSIP[Embedded]	Max Input Channel:64,Max Output Channel:12	2012-7-29

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 smp241main.License, so that you know which license is for which module in which unit.
3. Send the license file to the provider 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 your provider if you need license updates.

3.2.8 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.

Note

Import: Restore configuration from file.

Export: Export the current configuration to a file, this file serves as a backup and will be useful when restoring the configuration.

3.2.9 Login User Management

Change Password
 Create a User

Change UserName
 Delete a User

User Name	admin
Password	•••••
New Password	
Confirm New Password	

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.

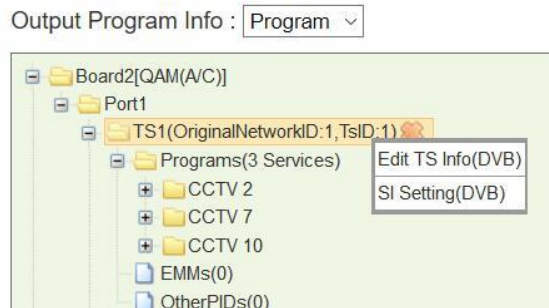
3.2.10 Log

Log records the operations and activities of a SMP100. 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.

Original Network ID				Ts ID								
2184				3								
#	Service Name	Provider Name	Service ID	PMT PID	PCR PID	Service Type	ES PID	Priority	Running Status	Free CA Mode	EIT schedule flag	EIT present following flag
1	CCTV 2	CCTV	302	258	8190	1	513 Video(MPEG2) 660 Audio	1	4	0	0	0
2	CCTV 7	CCTV	303	259	8190	1	514 Video(MPEG2) 670 Audio	1	4	0	0	0
3	CCTV 10	CCTV	304	260	8190	1	515 Video(MPEG2) 680 Audio	1	4	0	0	0
4	CCTV 11	CCTV	305	261	8190	1	516 Video(MPEG2) 690 Audio	1	4	0	0	0
5	CCTV 12	CCTV	306	262	8190	1	517 Video(MPEG2) 700 Audio	1	4	0	0	0
6	CCTV 15	CCTV	307	263	8190	1	518 Video(MPEG2) 710 Audio	1	4	0	0	0
Other PIDs												
	33		36		39							
Please apply and save your setting after complete setting in Service Configuration page.												

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.

Channel TS ID												
#	Service Name	Service ID	Channel Number(Major-Minor)	Channel TS ID	PCR PID	Service Type	ES PID		Running Status	Free CA Mode	EIT schedule flag	EIT present following flag
1	CCTV 7	303	1-1	1	8190	1	514	Video(MPEG2)	4	0	0	0
							670	Audio				
2	CCTV 12	306	1-2	1	8190	1	517	Video(MPEG2)	4	0	0	0
							700	Audio				
3	CCTV 15	307	1-3	1	8190	1	518	Video(MPEG2)	4	0	0	0
							710	Audio				

Please apply and save your setting after complete setting in Service Configuration page.

Apply Back

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)**.

Output Program Info :

Board2[QAM(A/C)]

- Port1
 - TS1(OriginalNetworkID:1,TsID:1)
 - Programs(3 Services)
 - CCTV 2
 - CCTV 7
 - CCTV 10
 - EMMs(0)
 - OtherPIDs(0)

➔

- PAT
- CAT
- PMTs
 - NIT Actual
 - NIT Other
 - BAT
- SDT Actual
 - SDT Other
 - TDT
 - TOT
 - RST

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. TS ID's are 1, 2 and 3. The frequency of TS1 is 474000 KHz, and TS2 482000 KHz, TS3 490000 KHz. Suppose 474 MHz (TS1) is the center frequency.

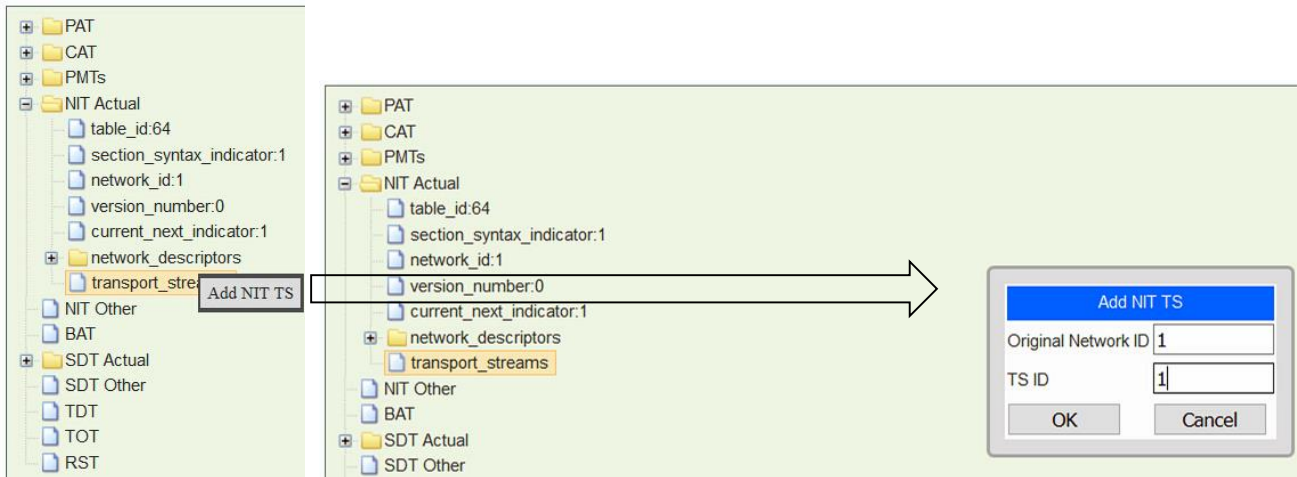
Output Program Info :

#	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

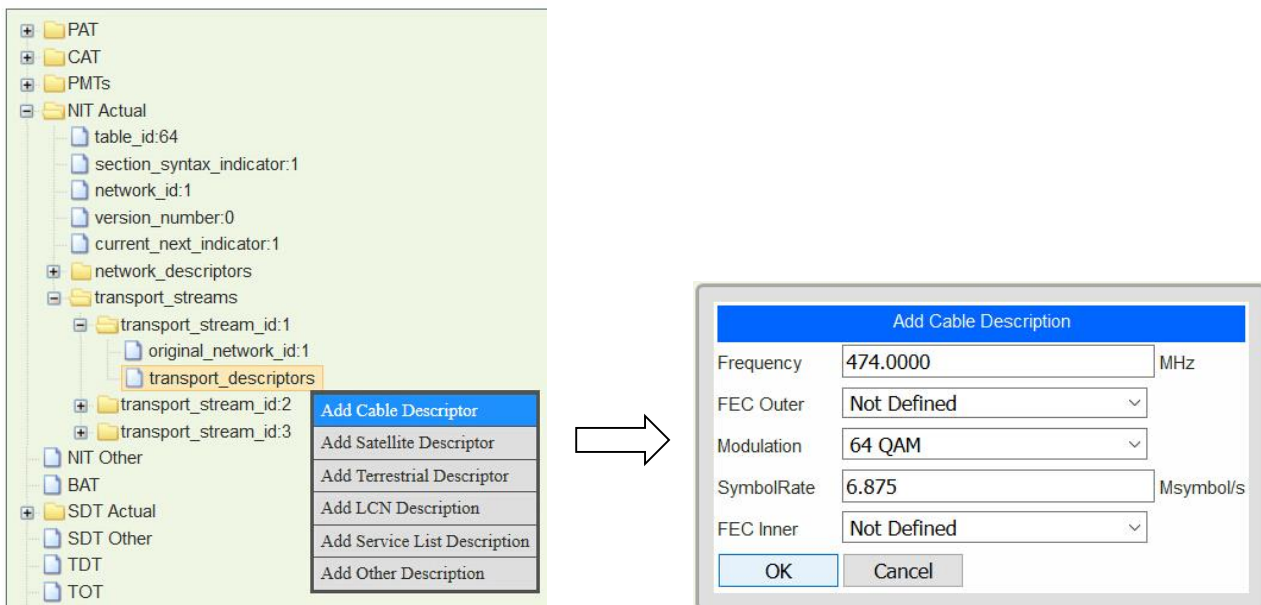
Steps to add NIT:

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.



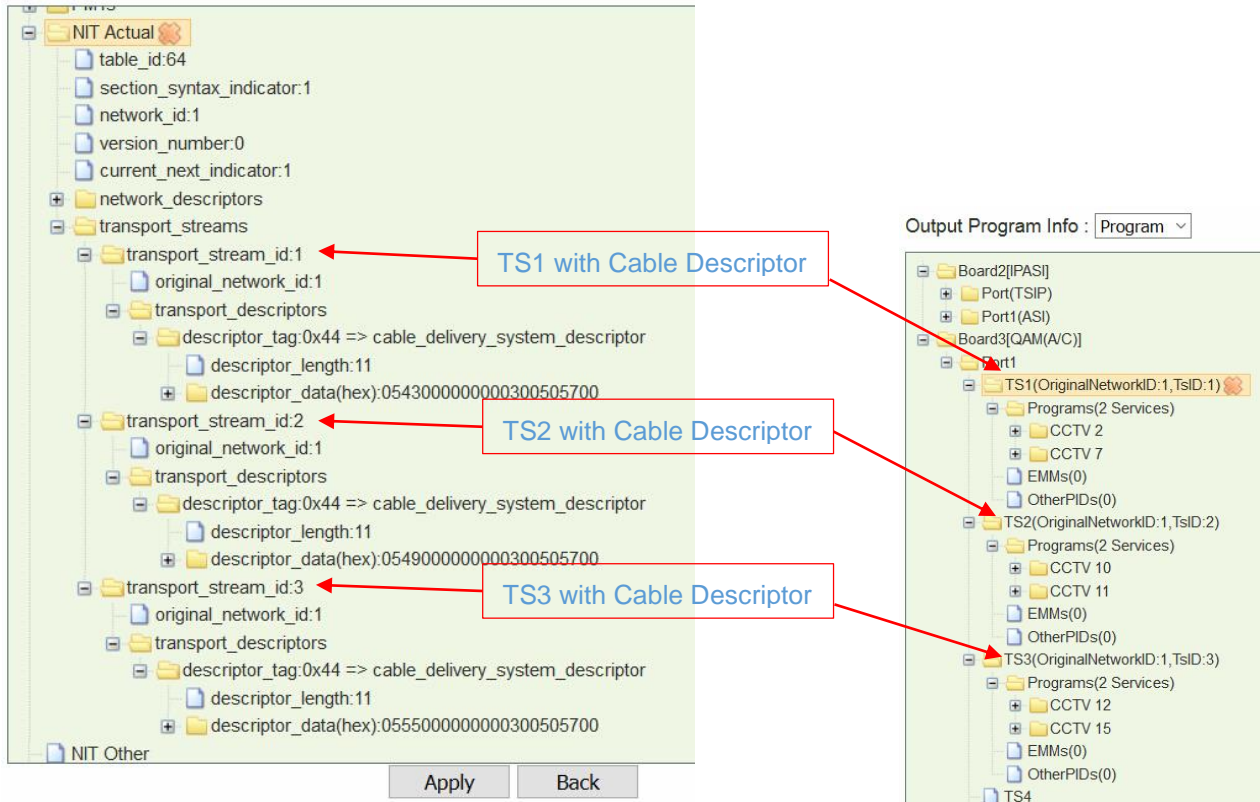
4. Repeat Step 2 to add TS2 and TS3. Repeat Step 3 to add cable descriptors for these two TS'.
5. Click **Apply**, and go to **Service Configuration** page, click **Apply** again.



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.

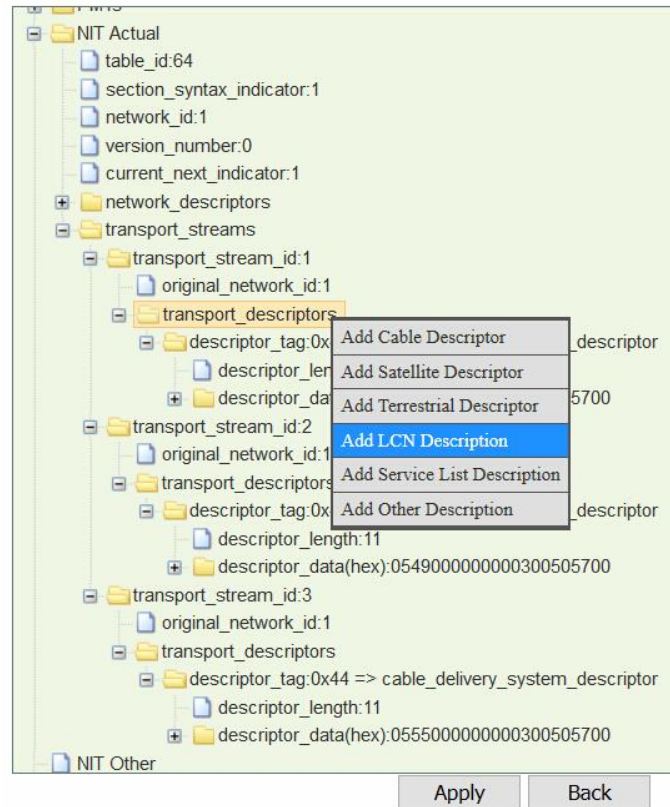
Add Logical Channel Number (LCN)

LCN is used to sequence the channels in the Set Top Box. See the following image, we have a SI 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** box on the right side. Click **Add** in front of CCTV2 (service ID 302) and CCTV7 (service ID 303), they will be added to **LCN** box. Enter numbers in **Logic Channel Number** text field. Click **Add**, then **Exit**.

Please apply and save your setting after complete setting in Service Configuration page.

Board TS List

	Board	Port	TS
<input checked="" type="radio"/>	Board1[QAM(A/C)]	Port1	TS1
<input type="radio"/>	Board1[QAM(A/C)]	Port1	TS2
<input type="radio"/>	Board1[QAM(A/C)]	Port1	TS3

Services

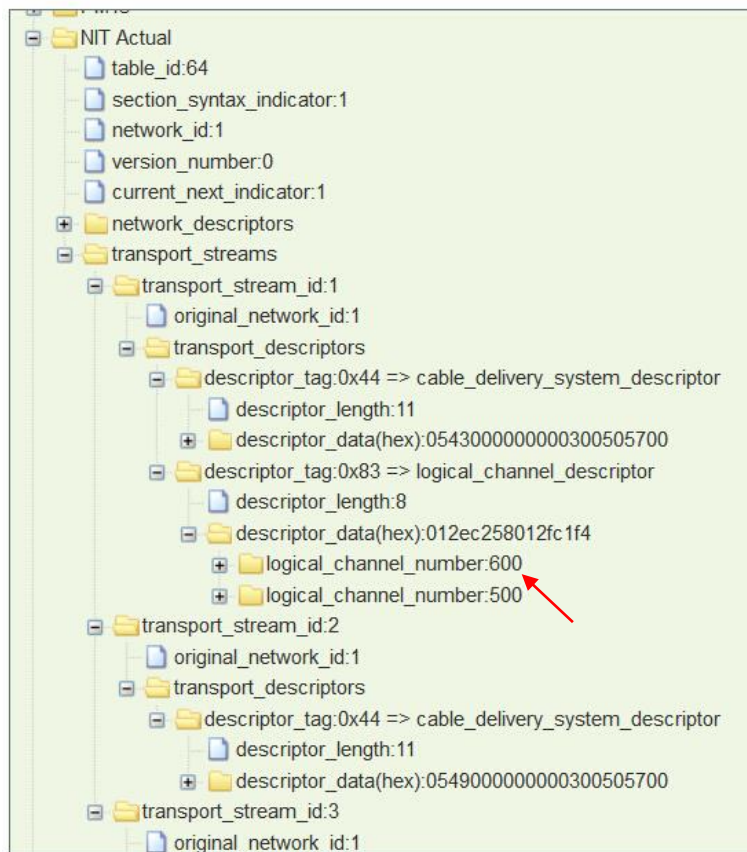
	Service Name	Service ID	Service Type
Add	CCTV 2	302	1 -> Digital Television Service
Add	CCTV 7	303	1 -> Digital Television Service

LCN

Service ID	Logic Channel Number	Visible Service Flag	Delete All
<input type="text" value="302"/>	<input type="text" value="600"/>	<input type="text" value="1"/> ▾	Delete
<input type="text" value="303"/>	<input type="text" value="500"/>	<input type="text" value="1"/> ▾	Delete

Add
Exit

3. Check the LCN descriptors of CCTV2 and CCTV7 that you configured.



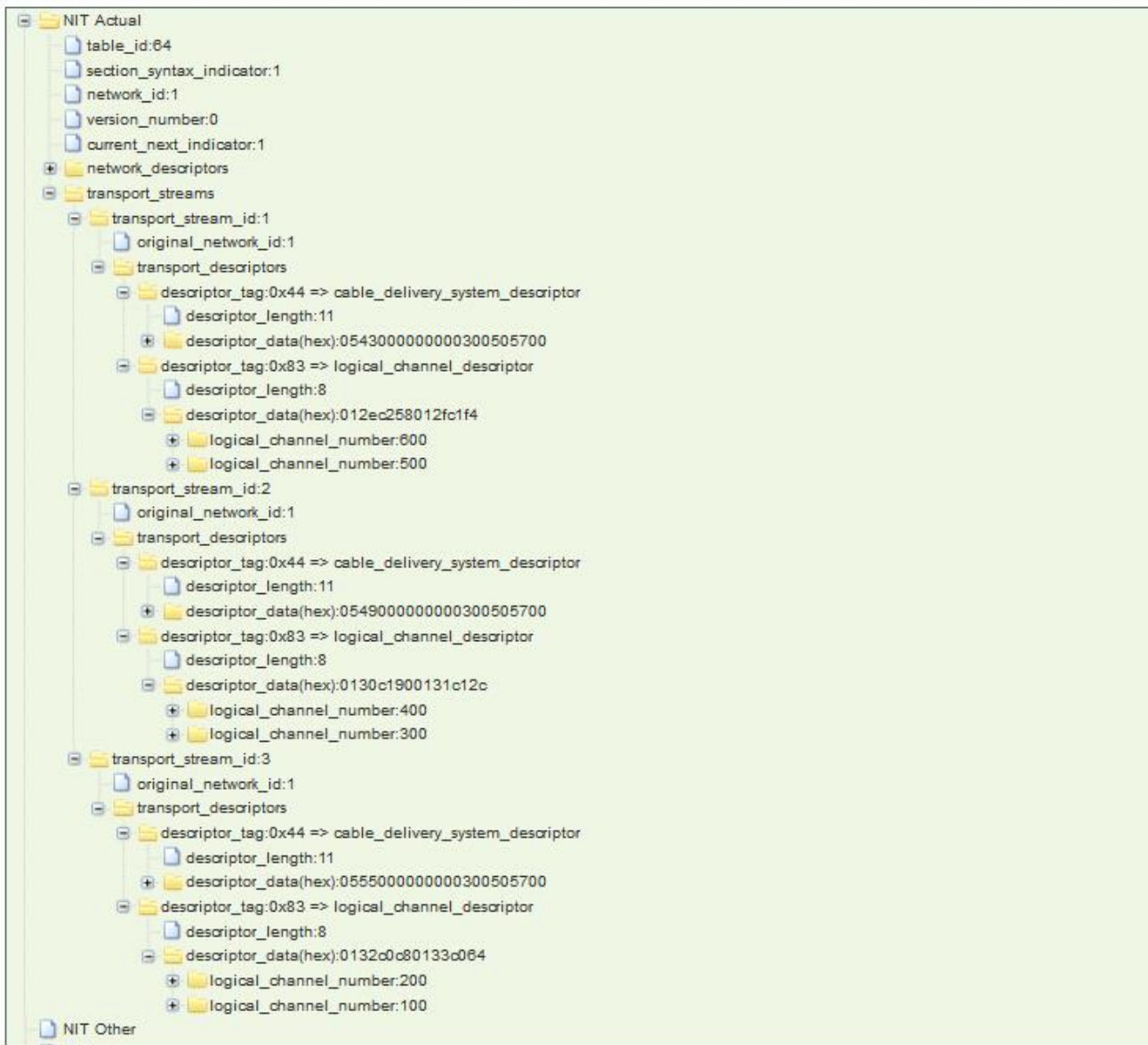
4. Right-click **transport_descriptors** under **transport_stream_id:2**, then select **Add LCN Description**. Select **Board1 [QAM (A/C)], Port1, TS2** add LCN for CCTV10 (service ID 304) and CCTV10 (service ID 305). Click **Add** and **Exit**.

Please apply and save your setting after complete setting in Service Configuration page.

Board TS List				Services			
Board	Port	TS	Add All	Service Name	Service ID	Service Type	
<input type="radio"/> Board1[QAM(A/C)]	Port1	TS1	<input type="button" value="Add"/>	CCTV 10	304	1 -> Digital Television Service	
<input checked="" type="radio"/> Board1[QAM(A/C)]	Port1	TS2	<input type="button" value="Add"/>	CCTV 11	305	1 -> Digital Television Service	
<input type="radio"/> Board1[QAM(A/C)]	Port1	TS3					

LCN			
Service ID	Logic Channel Number	Visible Service Flag	Delete All
304	400	1	Delete
305	300	1	Delete

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.



Apply

Back

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

Part 4 Module Configuration

4.1 Input and Output Modules

4.1.1 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

ASI				
	Port1	Port2	Port3	Port4
Type	Input	Input	Output	Output
Constant Rate(Mbps)	36.000	36.000	36.000	36.000
PCR Adjust Mode	Wellav Adjust Mode			

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	

4.1.2 DVBC

DVBC is a 4-channel DVBC receiving module.



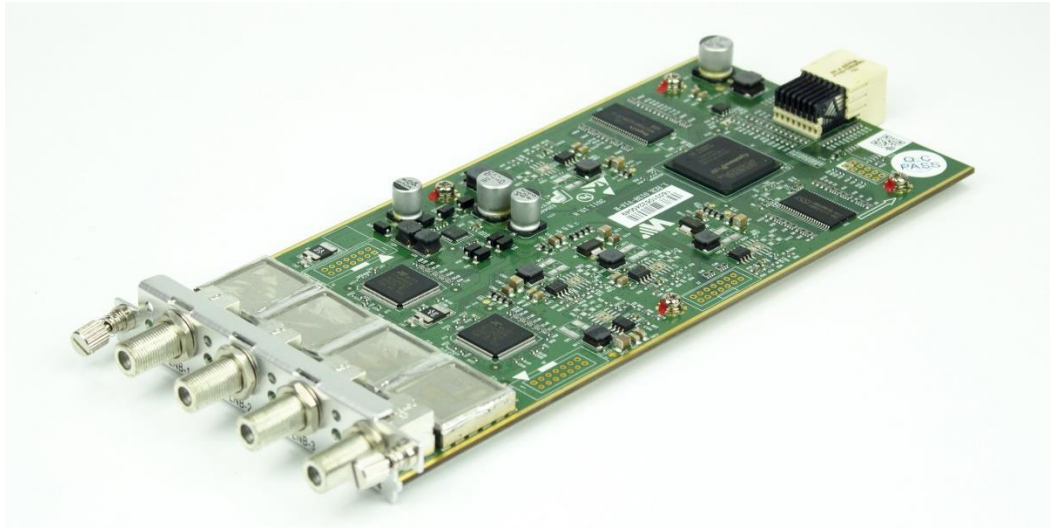
Module Configuration > DVBC

DVBC+				
Port	Frequency(KHz)	SymbolRate (KSym/s)	Constellation	Lock Status
1	208000	6875	Qam64	Lock
2	474000	6875	Qam128	Un-lock
3	474000	6875	Qam128	Un-lock
4	474000	6875	Qam128	Un-lock

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

4.1.3 DVBS2

DVBS2 is a 4-channel DVBS2 receiving module.



Module Configuration > DVBS2 (V2)

DVBS2V2				
	Port1	Port2	Port3	Port4
Mode	4CH Mode(Normal) <input type="button" value="v"/>			
Frequency (MHz)	11060	11060	11060	11060
SymbolRate (KSym/s)	27500	27500	27500	27500
LNB Type	Single Band <input type="button" value="v"/>	Single Band <input type="button" value="v"/>	Single Band <input type="button" value="v"/>	Single Band <input type="button" value="v"/>
Band Selection	Auto <input type="button" value="v"/>	Auto <input type="button" value="v"/>	Auto <input type="button" value="v"/>	Auto <input type="button" value="v"/>
LO Low LNB Frequency (MHz)	9750	9750	9750	9750
LO High LNB Frequency (MHz)	10600	10600	10600	10600
Bias	Disable <input type="button" value="v"/>	Disable <input type="button" value="v"/>	Disable <input type="button" value="v"/>	Disable <input type="button" value="v"/>
Polarization	13V (V) <input type="button" value="v"/>	13V (V) <input type="button" value="v"/>	13V (V) <input type="button" value="v"/>	13V (V) <input type="button" value="v"/>
Lock Status	Un-lock	Un-lock	Un-lock	Un-lock

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.

4.1.4 DVBT2

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



Module Configuration > DVBT2

DVBT2					
Port	Tuner Mode	Frequency(KHz)	Bandwidth	PLP Mode	PLP ID
1	DVB-T2	574000	8M	A	
2	DVB-T2	574000	8M	A	
3	DVB-T2	574000	8M	A	
4	DVB-T2	574000	8M	A	

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.

4.1.5 8VSB

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



Module Configuration > ATSC

ATSC	
Port	Channel
1	CH14-473MHz ▾
2	CH14-473MHz ▾
3	CH14-473MHz ▾
4	CH14-473MHz ▾

Advanced Setting

Scan Delay Time(s)

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

4.1.6 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

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

4.1.7 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

4.1.8 OFDM

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



Module Configuration > OFDM

Bandwidth	8M
RF Level(dBuV)	90
Spectrum Shaping	Disable

	1	2	3	4
Enable	Enable	Enable	Enable	Enable
Frequency(KHz)	474000	482000	490000	498000
Guard Interval	1/32	1/32	1/32	1/32
Mode	Mode 2k	Mode 2k	Mode 2k	Mode 2k
Constellation	QPSK	QPSK	QPSK	QPSK
FEC HP	1/2	1/2	1/2	1/2
Max Rate(Mbps)	4.980	4.980	4.980	4.980

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

4.1.9 8VSBM

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



Module Configuration > ATSCM

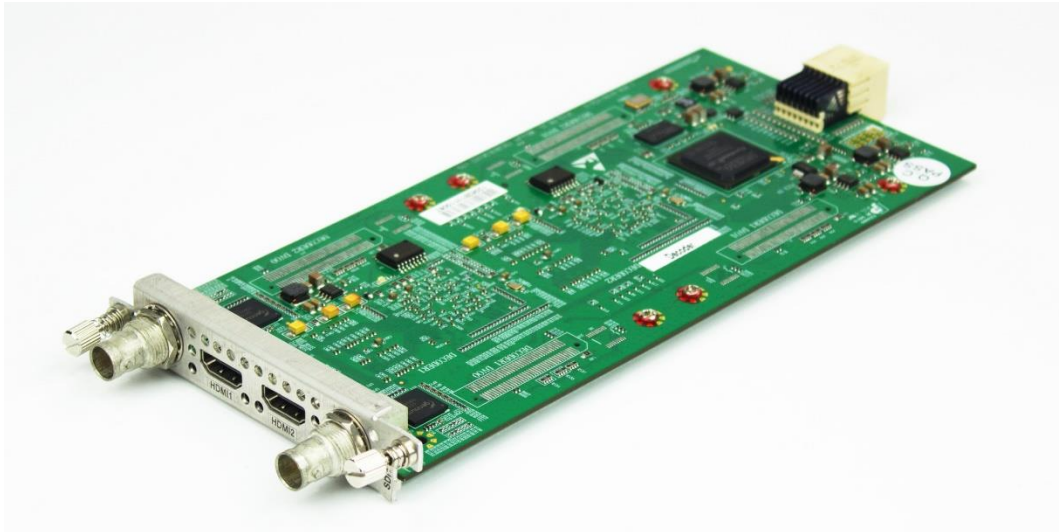
RF Level	90	dB	-17	dBm
Spectrum Shaping	Disable			
Channel Plan	OTA			

#	Enable	Channel Select	Frequency(KHz)
1	Enable	CH14-473MHz	473000
2	Enable		479000

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

4.1.10 HDMI/SDI Decoder

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



Module Configuration > HDMI/SDI Decoder

	Port1	Port2
Aspect Ratio Conversion	Automatic	Automatic
Output Resolution	1920x1080_50i	1920x1080_50i
Audio Volume (0-49)	30	30

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



One decoder channel decodes only one service.

4.1.11 Decoder-AV



Module Configuration > Decoder-AV

	Port1	Port2	Port3	Port4
Aspect Ratio Conversion	Auto	Auto	Auto	Auto
Output Video Resolution	720x576_50i	720x576_50i	720x576_50i	720x576_50i
Audio Volume(0-49)	30	30	30	30
Mixer	Stereo	Stereo	Stereo	Stereo

Name	Range	Name	Range
Aspect Ration Conversion	4:3 Letterbox	Audio Volume	0~49
	4:3 Pan and Scan		
	16:9 Letterbox		
	16:9 Pan and Scan		
Output Video Resolution	720x576_50i	Mixer	Stereo, Left, Right, Mono, Dual
	720x480_60i		



One decoder channel decodes only one service.

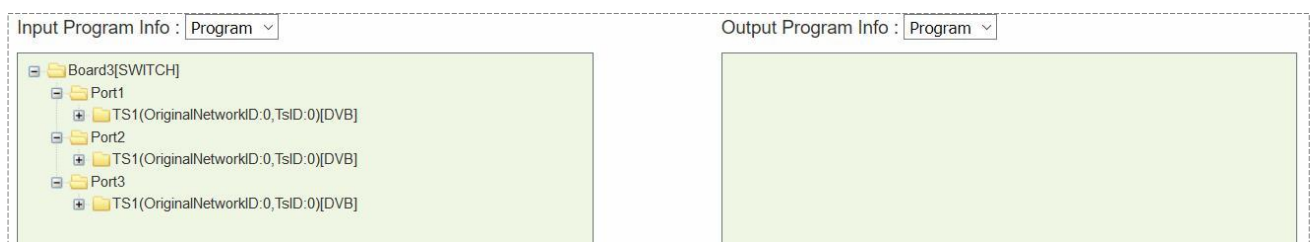
4.1.12 ASI-Switch



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**.

Switch level settings

Level
Port-level ▾

Port-switch mode selection

Port-switch mode selection
Automatic switch ▾

Port-switch condition selection

	Condition
<input checked="" type="checkbox"/>	Abnormal total bit rates
<input checked="" type="checkbox"/>	Synchronization loss or error
<input type="checkbox"/>	PAT missing

Port automatic switch settings

Automatic switch mode	Primary program first ▾
Min. total bit rates of primary port(Mbps)	0.000
Max. total bit rates of primary port(Mbps)	50.000
Min. total bit rates of secondary port(Mbps)	0.000
Max. total bit rates of secondary port(Mbps)	50.000
Min. total bit rates of fail-safe port(Mbps)	0.000
Max. total bit rates of fail-safe port(Mbps)	50.000
Switch-back delay (s)	0 ▾

Apply
Default
Reboot

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.

Switch level settings

Level
Port-level ▾

Port-switch mode selection

Port-switch mode selection
Manual switch ▾

Manual port-switch settings

Output source port settings
ASI In 1 (Primary) ▾

Apply
Default
Reboot

If you choose **Program-level** for **Switch level settings**, the UI will be like this:

Program-switch condition selection	
<input type="checkbox"/>	Condition
<input type="checkbox"/>	Continuous count error of video
<input type="checkbox"/>	Continuous count error of audio
Normal continuous count error frequency	(0 - 10)/200ms
<input type="checkbox"/>	Video bit rate is beyond normal range.
<input type="checkbox"/>	Audio bit rate is beyond normal range.
<input type="checkbox"/>	Program is not de-scrambled.

ProgramSetup													
■	Index	ProgramBackup	Fail-safeProgram	Primary audio bit rate		Primary video bit rate		Secondary audio bit rate		Secondary video bit rate		Switch-back delay (s)	Switch mode
				range(Mbps)	range(Mbps)	range(Mbps)	range(Mbps)	range(Mbps)	range(Mbps)				
				Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum		
<input type="checkbox"/>	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
<input type="checkbox"/>	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
<input type="checkbox"/>	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
<input type="checkbox"/>	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

As you can see in the image above, you have to configure **Program-switch condition selection** and **Program Setup**.

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

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

4.2 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

Advanced Setting

GOP Structure	IBBP	IBBP	IBBP	IBBP
GOP Size	15	15	15	15
GOP Close	Disable	Disable	Disable	Disable
PCR PID	68	132	196	260
Video PID	66	130	194	258
Audio PID	67	131	195	259
PMT PID	65	129	193	257
Program Name	Program-1	Program-2	Program-3	Program-4
Provider Name	Encoder	Encoder	Encoder	Encoder
Video Vlc Mode	CABAC	CABAC	CABAC	CABAC
Video Profile	Main	Main	Main	Main
Video Level	Level 3.1	Level 3.1	Level 3.1	Level 3.1
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

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_II
	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	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

Advanced Setting

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

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_II
	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

Advanced Setting

GOP Structure	IBBP	IBBP
GOP Size	15	15
GOP Close	Disable	Disable
Aspect Ratio	Auto	Auto
Video Standard	Auto	Auto
PCR PID	68	132
Video PID	66	130
PMT PID	65	129
Service ID	1	1
Program Name	Program-1	Program-2
Provider Name	Encoder	Encoder
Latency Adjustment (ms)	0	0
Profile	High	High
Level	Level 4.0	Level 4.0
Sample Rate	48KHz	48KHz
Brightness (0 - 255)	128	128
Contrast (0 - 255)	128	128
Saturation (0 - 255)	128	128
Hue (-180 - 180)	0	0
EIA 708	Disable	Disable

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		

4.3 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 <input checked="" type="checkbox"/>				
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 <input type="checkbox"/>				
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)

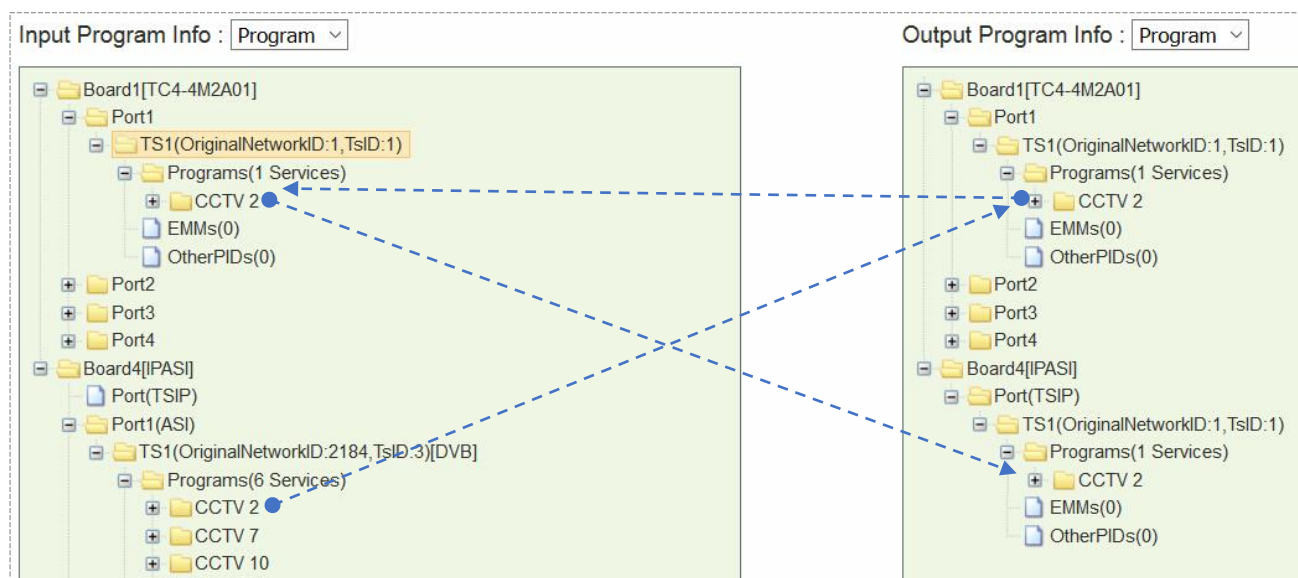
Upgrade(Encoder)

Power Off

Name	Range	Name	Range
Video Encode Rate (Payload)(Kbps)	600~15000	Video Profile	Main, High
Audio Encode Rate (Payload)(Kbps)	64~384	Video Level	3.0, 3.1, 3.2, 4.0, 4.1, 4.2
Audio Volume (Transcode)(dB)	0~8	Video Vlc Mode	CABAC, CAVLC
GOP Structure	IPPB IPPP IBP	Audio Encoder Type	OFF, MPEG1_Layer2 AC3 (optional) 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
Same PID for PCR and Video		Video Max Encode Rate (Payload)(Kbps)	
Output Resolution	720x480_60i 720x576_50i 1920x1080_60i/50i 1208x720_60p/50p	Video Min Encode Rate (Payload)(Kbps)	
Video Encoder Type	H264, MPEG2	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.
		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

CI					
	TS Clock	Constant Rate(Mbps)	Auto Reset	Auto Resend CA PMT	Mode
Slot1	9MHz	64.000	<input type="checkbox"/>	<input type="checkbox"/>	CBR
Slot2	9MHz	64.000	<input type="checkbox"/>	<input type="checkbox"/>	CBR

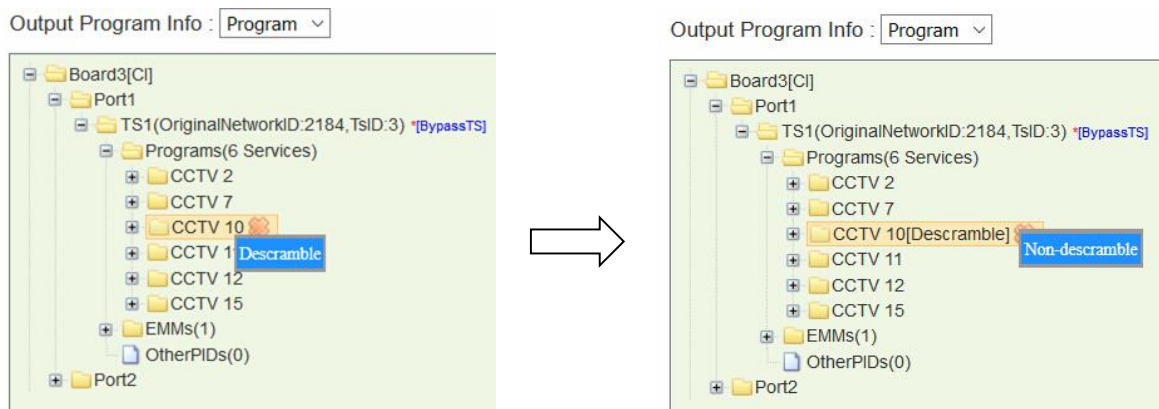
Configuring Service Descrambling

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

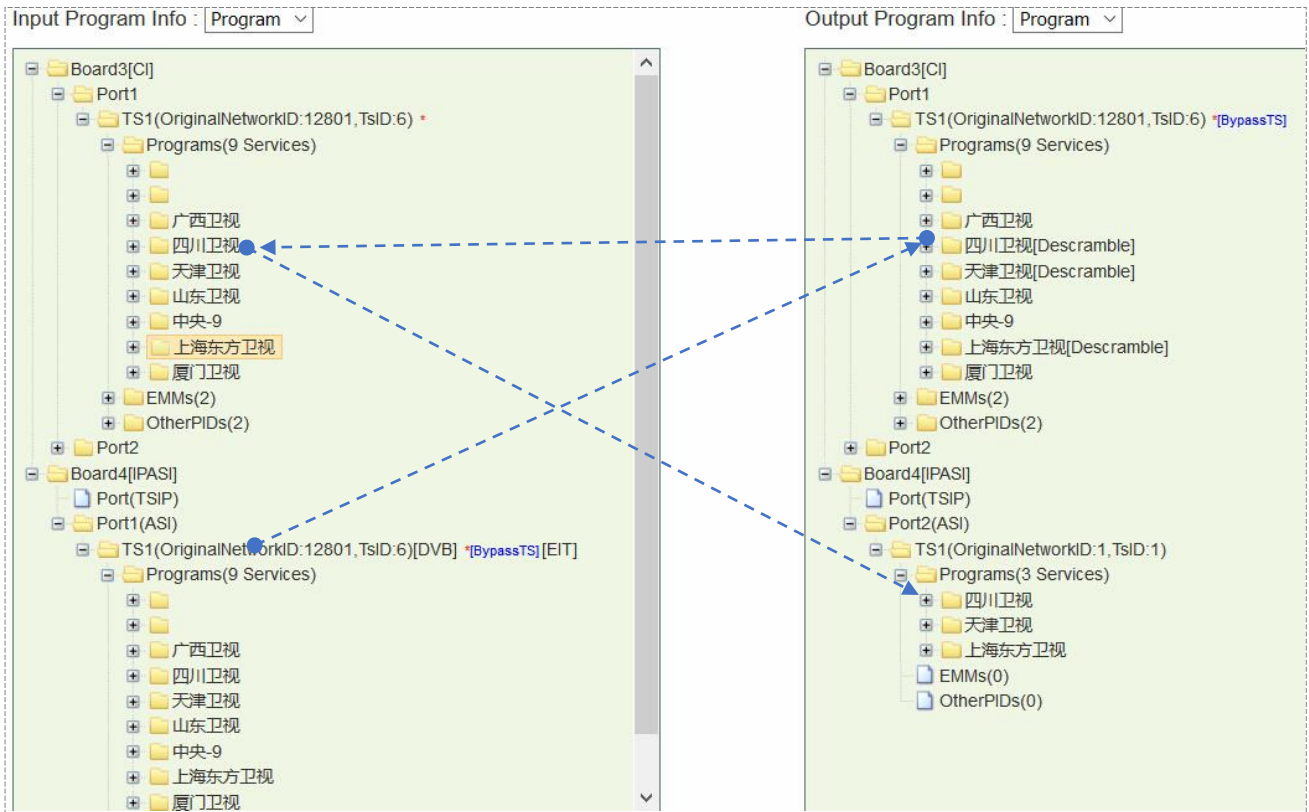
1. Go to **Status > CI** and check the **CAM Insert Status, CAM Initialization status, CAM Name, and CA System ID**. Take the following figure for example, the CAM module is successfully loaded in CI Port.

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

- 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.
- 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**.



- Drag the service that has been descrambled from input **Board3 [CI], Port1** to output port.



- Go to **Status > CI**, check the **Service Descramble Status**. In the following figure, three services are descrambled successfully.

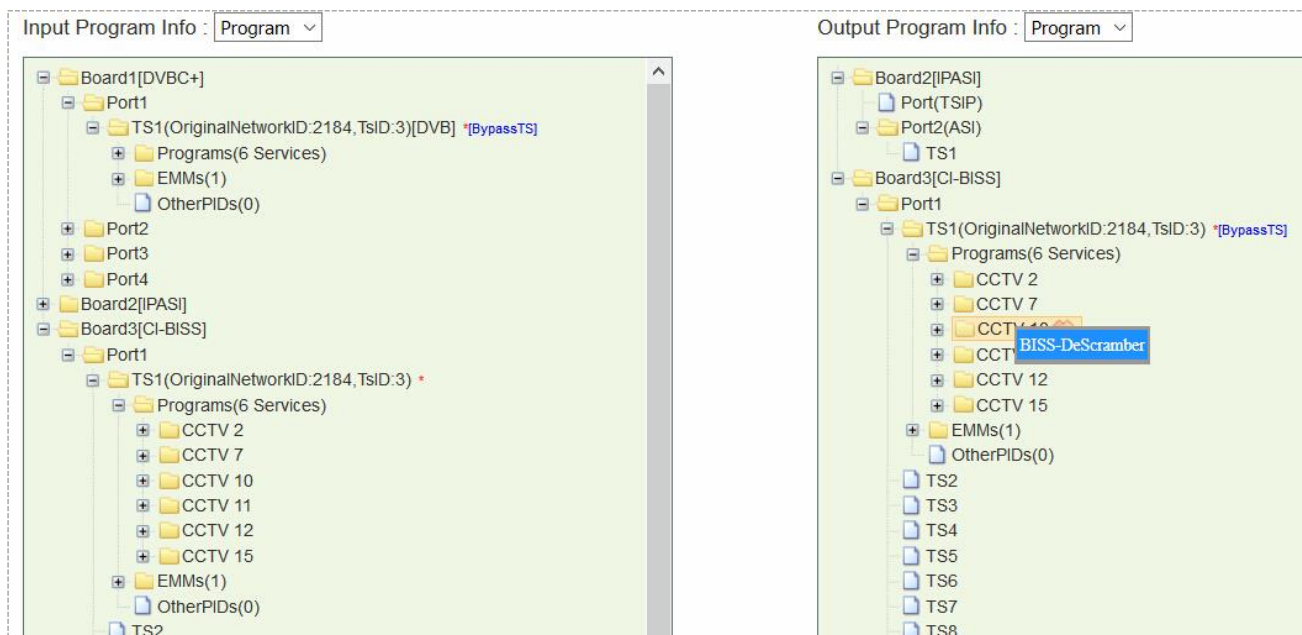
Slot 3:CI Status		
TS Bitrate Overview		
	Port1	Port2
Input Effective Bitrate(Mbps)	35.79	0.00
Output Effective Bitrate(Mbps)	35.41	0.00
Output Total Bitrate(Mbps)	63.85	0.00
CAM Insert Status	Inserted	Inserted
CAM Init Status	Succeeded	Failed
CAM Name	NOVEL SUPERTV-SMIT	EMPTY
CA System ID	18946	0
CC Error	In:0, Out:0	In:0, Out:0
Service Descramble Status	Service ID: 602, Video PID: 801, Succeed	
	Service ID: 604, Video PID: 803, Succeed	
	Service ID: 601, Video PID: 800, Succeed	

Refresh

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**.

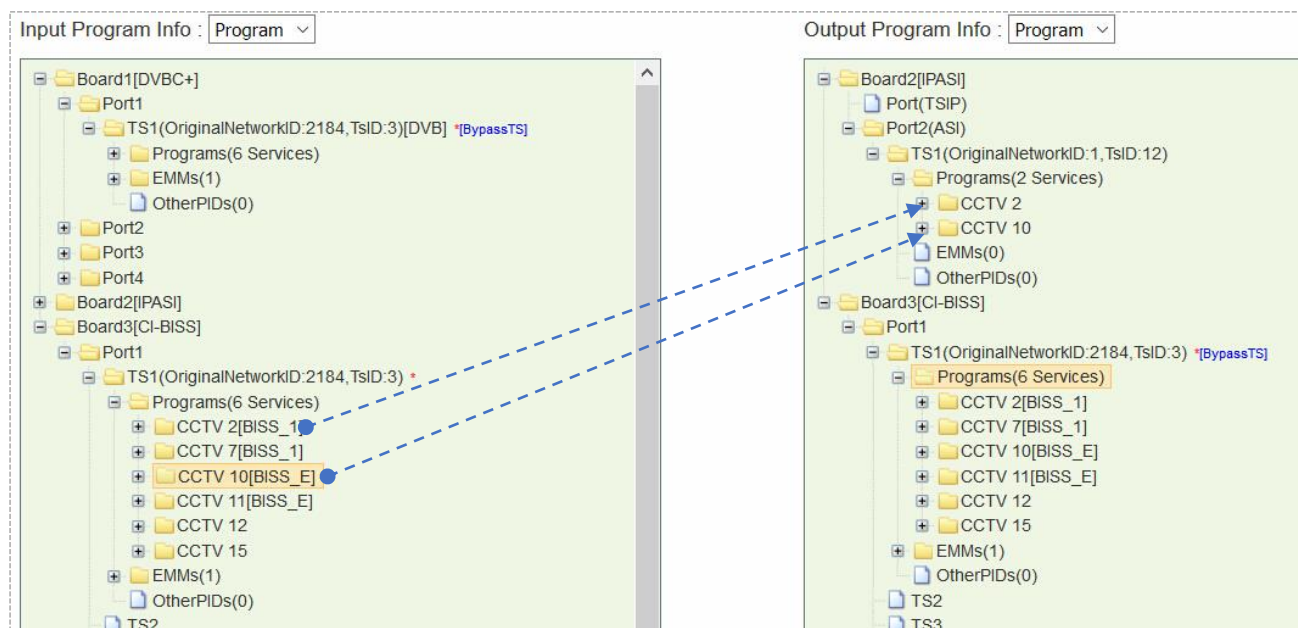


3. Configure **BISS Mode** and **BISS Key** (and Injected ID in BISS-E Mode). Click **Apply** and then click **Back** to return to **Service Configuration**. **[BISS_1]** and **[BISS_E]** follow the descrambled services as a label.

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**.



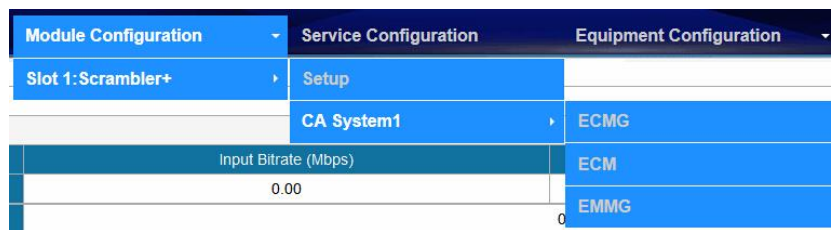
To ensure CA PMT is updated in CI, better bypass the input TS before drag it to CI. Otherwise, descrambling process may fail.

4.2.3 Scrambler

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



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.

Setup	
IP Address	0 . 0 . 0 . 0
Subnet Mask	0 . 0 . 0 . 0
Gateway	0 . 0 . 0 . 0
Mac Address	A0-69-86-00-DF-B5
Speed Mode	1000M-DUPLEX
Crypto Period	20
CA System 1	On
CA System 2	Off
CA System 3	Off
CA System 4	Off

Apply Refresh Default Reboot Power Off

Configuring ECMG connection.

ECMG1	
System ID	DEC: 0 HEX: 0
Sub System ID	0
ECMG IP Address	0 . 0 . 0 . 0
ECMG Port	0

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.

Communicate Status				
CA System	ECMG	EMMG	ECM Count	EMM Count
1	Connected	Connected	0	1058360
2	Closed	Closed	0	0
3	Closed	Closed	0	0
4	Closed	Closed	0	0

PHY		
Link	Speed	Duplex
Link Up	100 Mbps	Full-duplex

Configuring EMMG connection.

EMMG1

EMMG TCP Port	<input type="text" value="0"/>
EMMG UDP Port	<input type="text" value="0"/>
EMM Send Type	TCP ▼
EMM PID	<input type="text" value="0"/>
EMM Bandwidth	<input type="text" value="0"/>

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

ECM Stream ID	<input type="text" value="7"/>
ECM ID	<input type="text" value="7"/>
ECM PID	<input type="text" value="4006"/>

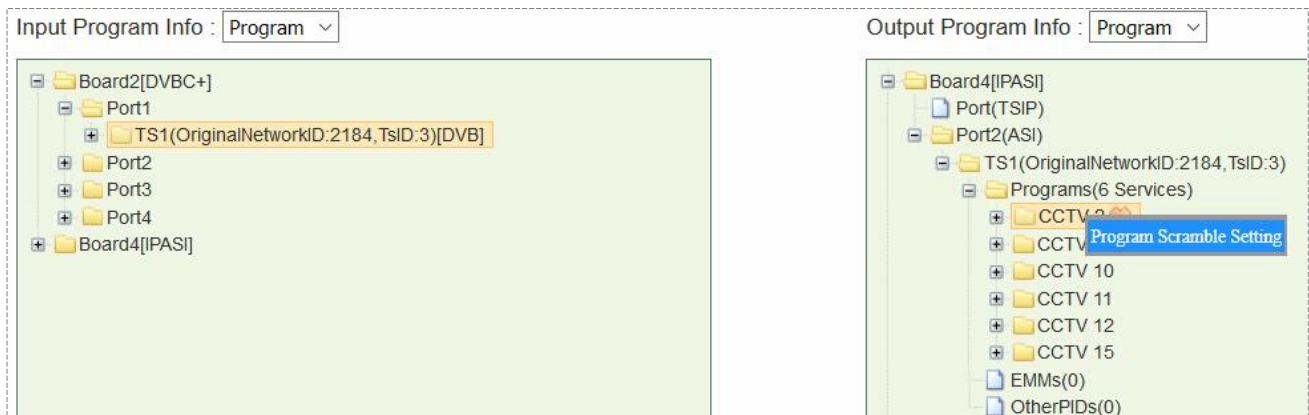
AC Data(Hex)	<input type="text" value="0001000100060006"/>	<input type="button" value="Add"/>
--------------	---	------------------------------------

ECM1 List				
ECM Stream ID	ECM ID	ECM PID	AC Data(Hex)	Delete
1	1	<input type="text" value="4000"/>	<input type="text" value="0001000100010001"/>	<input type="checkbox"/>
2	2	<input type="text" value="4001"/>	<input type="text" value="0001000100020002"/>	<input type="checkbox"/>
3	3	<input type="text" value="4002"/>	<input type="text" value="0001000100030003"/>	<input type="checkbox"/>
4	4	<input type="text" value="4003"/>	<input type="text" value="0001000100040004"/>	<input type="checkbox"/>
5	5	<input type="text" value="4004"/>	<input type="text" value="0001000100050005"/>	<input type="checkbox"/>
6	6	<input type="text" value="4005"/>	<input type="text" value="0001000100060006"/>	<input type="checkbox"/>

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.

Batch Set

Start	End	Scrambling Type	BISS-1/BISS-E Key (HEX)	Injected ID	Slot	CA1Stream ID	CA2Stream ID	CA3Stream ID	CA4Stream ID
1	1	CAS CW	000000000000	000000000000	None	Non-descramt	Non-descramt	Non-descramt	Non-descramt

Same Assign
 Auto Assign
 Same Assign
 Auto Assign
 Same Assign
 Auto Assign
 Same Assign
 Auto Assign
 Same Assign
 Auto Assign

Batch Set

NO.	Service ID	Service Name	Slot	Scrambling Type	CAS Type	BISS-1/BISS-E Key(HEX)	Injected ID	CA1 Stream ID	CA2 Stream ID	CA3 Stream ID	CA4 Stream ID
1	302	CCTV 2	Slot1	CAS CW	DVB	000000000000	000000000000	1	Non-descramt	Non-descramt	Non-descramt
2	303	CCTV 7	Slot1	CAS CW	DVB	000000000000	000000000000	2	Non-descramt	Non-descramt	Non-descramt
3	304	CCTV 10	Slot1	CAS CW	DVB	000000000000	000000000000	Non-descramt	Non-descramt	Non-descramt	Non-descramt
4	305	CCTV 11	None	CAS CW	DVB	000000000000	000000000000	Non-descramble	Non-descramt	Non-descramt	Non-descramt
5	306	CCTV 12	None	CAS CW	DVB	000000000000	000000000000	2	Non-descramt	Non-descramt	Non-descramt
6	307	CCTV 15	None	CAS CW	DVB	000000000000	000000000000	3	Non-descramt	Non-descramt	Non-descramt

Apply Refresh Back

To cancel the scrambling process for a scrambled program, go to **Program Scramble Setting** again, change **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 for SMP100 in certain regions.

Module Name	North America	Europe
TSIP+	✓	
DVBC	✓	
DVBS2	✓	✓
DVBT2		✓
8VSB	✓	
QAM-A/C		✓
QAM-B	✓	
IQAM	✓	
OFDM		✓
8VSBM	✓	
HDMI/SDI Decoder	✓	✓
EN4SDI		✓
EN4HDMI	✓	✓
EN2SDI-2H	✓	✓
TC4	✓	✓
CI		✓
CI-BISS	✓	
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 SMP100 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.