

H-12HDMI-QAM-IPLL



About This Manual

Intended Audience

This user manual has been written to help people who have to use, to integrate and to install the product. Some chapters require some prerequisite knowledge in electronics and especially in broadcast technologies and standards.

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Chapter 1 Introduction

1.1 Product Overview

The Thor Broadcast H-12HDMI-QAM-IPLL Encoder-RF Modulator is a professional high capacity solution for any headend that requires integration of encoding, multiplexing, scrambling and modulating. It supports 12 HDMI and 12 CC inputs, one DVB-C tuner input and 512 IP input through Data1 (GE) port. It also supports DVB-C RF out with 16 non-adjacent carries and supports 16 MPTS which mirror the 16 carriers through the Data2 (GE) output port. To meet customers' various requirements, it is also equipped with 1 ASI output as mirror of one of RF output carriers. Managed through any modern web browser, each encoder can be independently adjusted for bitrate, codecs, and video image qualities. Encoding support for the MPEG-2, or H.264, codec along with Dolby AC/3 audio ensure that the programs generated by this encoder can be used around the world on a global scale.

1.2 Key Features

- 12 HDMI inputs with MPEG2 & MPEG4 AVC/H.264 Encoding
- 12 CC (Closed Caption) inputs
- 1DVB-C (ATSC optional) tuner input for re-mux
- 512 IP(DATA1 port only) input over UDP and RTP protocols
- MPEG1 Layer II, MPEG2-AAC, MPEG4-AAC, Dolby Digital AC3 (2.0) encoding (Optional), AC3 (2.0/5.1) passthrough
- 16 groups multiplexing/Scrambling/DVB-C modulating
- 1 ASI out as mirror of one of RF output carriers
- 16 MPTS IP (DATA2 port only) output over UDP, RTP/RTSP
- PID remapping/ accurate PCR adjusting/PSI/SI editing and inserting
- Control via web management, and easy updates via web

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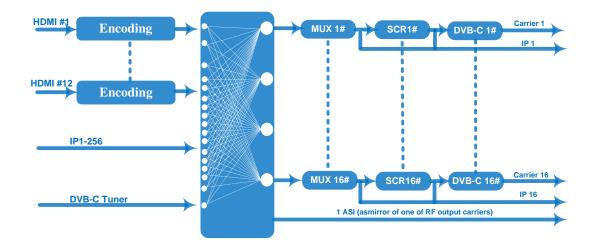
1.3 Specifications

Input 12 CC(closed caption) input, BNC interface 1 DVB-C(ATSC optional) Tuner for re-mux, F type interface 512 IP input over UDP and RTP, DATA1, RJ45 Input 1920*1080_60p, 1920*1080_50p,1920*1080 Input 1920*1080_60i, 720*576_50i 1920*1080_60p, 1920*1080_50p,1920*1080 1920*1080_60p, 1920*1080_50p,1920*1080 1920*1080_60i, 720*576_50i 1920*1080_60p, 1920*1080_50p,1920*1080 1920*1080_60p, 1920*1080_50p,1920*1080					
Input 1 DVB-C(ATSC optional) Tuner for re-mux, F type interface 512 IP input over UDP and RTP, DATA1, RJ45 Input 1920*1080_60p, 1920*1080_50p,1920*1080 Input 1920*1080_50i, 1280*720_60p, 1280*720_5 720*480_60i, 720*576_50i 1920*1080_60p, 1920*1080_50p,1920*1080					
Input 1920*1080_60p, 1920*1080_50p,1920*1080 1920*1080_50i, 1280*720_60p, 1280*720_5 720*480_60i, 720*576_50i 1920*1080_60p, 1920*1080_50p,1920*1080					
Input 1920*1080_50i, 1280*720_60p, 1280*720_5 720*480_60i, 720*576_50i 1920*1080_60p, 1920*1080_50p, 1920*1080					
720*480_60i, 720*576_50i 1920*1080_60p, 1920*1080_50p,1920*1080	0P,				
1920*1080_60p, 1920*1080_50p,1920*1080					
1920*1080_50i, 1440*1080_60i, 1440*1080_	_60i,				
	_50i,				
1280*720_60p, 1280*720_50P, 720*576_50p),				
Resolution 720*576_50i, 720*576_30p, 720*576_25p,					
720*480_60p, 720*480_60i,720*480_30p,					
Output 720*480_25p,320*240_60p,320*240_50p,					
320*240_30p, 320*240_25p,320*180_60p, 3	20*180_50p,				
Video 320*180_30p, 320*180_25p,	-				
960*540_50i, 704*576_50i,704*480_60i, 640	0*576_50i				
640*480_60i, 544*576_50i,544*480_60i,					
Encoding MPEG2 & MPEG4 AVC/H.264					
0.8~19Mbps for H.264 encoding					
Bit-rate 1~19Mbps for MPEG-2 encoding	1~19Mbps for MPEG-2 encoding				
Rate Control CBR/VBR	CBR/VBR				
GOP Structure GOP B Frame: 0-3, GOP P Frame: 0-6	GOP B Frame: 0-3, GOP P Frame: 0-6				
Advanced De interleasing, poise reduction	De-interlacing, noise reduction				
Pretreatment					
MPEG1 Layer II, MPEG2-AAC, MPEG4-AAC,					
Encoding Dolby Digital AC3 (2.0) encoding (Optional),					
Audio AC3 (2.0/5.1) passthrough					
Sampling rate 48KHz					
Bit-rate 64Kbps-320kbps each channel					
Maximum PID 180 input per channel					
Remapping					
Multiplexing PID remapping (automatically or manually)					
Function Accurate PCR adjusting					
Generate PSI/ SI table automatically					
Maximum 4					
simulcrypt CA					
Scrambling Standard ETR289, ETSI 101197, ETSI 103197					
Connection Local/remote connection					
Modulation QAM Channel: 16 non-adjacent carriers output (maximu	ım bandwidth				
Modulation 192MHz)					

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		H-1	2HDMI-QAM	-IPLL					
		Standard	: EN300 42	9/ITU-T J.83A/B					
	DVB-C	MER: ≥ 4	40db						
		RF frequ	ency: 50~9	60MHz, 1KHz step					
		RF outpu	t level: -20	~+10dbm, 0.1db step					
		Symbol	Symbol Rate: 5.0Msps~7.0Msps, 1ksps stepping						
				J.83A	J.83B				
		Constella	ation	16/32/64/128/256QAM	64/256 QAM				
		Bandwid	lth	8M	6M				
	RF output (F type interface)								
C4	1 ASI output as mirror of one of RF output carriers								
Stream output	16 MPTS output over UDP and RTP/RTSP as mirror of 16 DVB-C carriers,								
	1*1000M Base-T Ethernet interface								
	Network management (WEB)								
System function	English								
	Ethernet software	e upgrade							
	Dimension (W×L	L×H)	482mm×4	40mm×44mm					
Miscellaneous	Environment		0~45℃(w	ork); -20~80°C (Storage)					
	Power requirement	nts	AC 110V:	± 10%, 50/60Hz, AC 220 ± 1	0%, 50/60Hz				

1.4 Flow Chart





1.5 Appearance and Description

RF test	RF out
AC 100V-24 1V 501	
1	
1	2 3 4 5 6 7 8 9 RF test and RF out port 1<
2	Power supply and Grounding Pole
2	Power supply and Grounding Pole
2 3	Power supply and Grounding Pole12 HDMI and 12 CC input port
2 3 4	Power supply and Grounding Pole12 HDMI and 12 CC input portReset Key
2 3 4 5	Power supply and Grounding Pole12 HDMI and 12 CC input portReset KeyLED Indicators
2 3 4 5 6	Power supply and Grounding Pole12 HDMI and 12 CC input portReset KeyLED IndicatorsASI output portDATA Port (DATA1 and DATA2 for IP stream input/output, DATA 3 for

Front and Rear Panel Illustration

Chapter 2 Installation Guide

Please use caution when operating this device in order to abstain from any possible injuries during installation. For this reason, please read all details listed below and make sure you use caution before proceeding to operate and use this device.

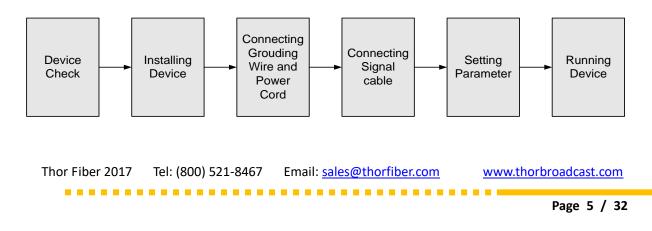
2.1 General Precautions

- Must be operated and maintained free of dust or debris.
- The cover should be securely fastened, do not open the cover of the products when the power is on.
- After installation, securely stow away all loose cables, external antenna, and others.

2.2 Power precautions

- When you connect the power source, make sure it is grounded correctly so it doesn't cause an overload.
- Avoid operating on a wet floor in the open. Make sure the extension cable is in good condition.
- Make sure the power switch is off before you start to install the device.

2.3 Device's Installation Flow Chart Illustrated as following



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2.4 Environment Requirement

ltem	Requirement
Machine Hall Space	When user installs machine frame array in one machine hall, the distance between 2 rows of machine frames should be 1.2~1.5m and the distance against wall should be no less than 0.8m.
Machine Hall Floor	Electric Isolation, Dust Free Volume resistivity of ground anti-static material: $1X10^7 \sim 1X10^{10}\Omega$, Grounding current limiting resistance: $1M\Omega$ (Floor bearing should be greater than $450Kg/m^2$)
Environment Temperature	5~40°C(sustainable), 0~45°C(short time), installing air-conditioning is recommended
Relative Humidity	20%~80% sustainable 10%~90% short time
Pressure	86~105KPa
Door & Window	Installing rubber strip for sealing door-gaps and dual level glasses for window
Wall	It can be covered with wallpaper, or paint.
Fire Protection	Fire alarm system and extinguisher
Power	Requiring device power, air-conditioning power and lighting power are independent to each other. Device power requires AC 110V±10%, 50/60Hz or AC 220V±10%, 50/60Hz. Please carefully check before running.

2.5 Grounding Requirement

- ✓ It is important to keep this device grounded to ensure all of the modules function correctly. Correctly grounding the device will also help prevent any electrical interference, lightening. Etc. Also it helps reject minor interference that may disrupt the devices ability to function smoothly. General rule of them, make sure the device is grounded when installing anywhere.
- ✓ Always use copper wire. When applied correctly the ground must be wrapped

well to ensure maximum conduction so it can reduce any high frequencies. The copper ground wire should also be as short and thick as possible

- ✓ Installer must make sure that the two ends of the ground are well conducted and have appropriate anti-rust properties.
- ✓ It is prohibited to use any other device as part of the grounding electric circuit.
- ✓ The area of the conduction between the ground wire and device's frame should be no less than 25 m^2 .

Chapter 3 WEB NMS Operation

You must connect the Encoder Modulator to a PC in order to setup the configuration, to control and set configure the settings you must plug the device into web NMS Port. Users should ensure that the computer's IP address is different from this device's IP address; otherwise, it would cause IP conflict.

3.1 Login

The default IP address of this device is 192.168.0.136.

Connect the PC (Personal Computer) and the device with net cable, and use ping command to confirm they are on the same network segment.

I.G. the PC IP address is 192.168.99.252, we then change the device IP to 192.168.99.xxx (xxx can be 1 to 254 except 252 to avoid IP conflict).

Use web browser to connect the device with PC by inputting the Encoder Modulator's IP address in the browser's address bar and press Enter.

It will display the Login interface as Figure-1. Input the Username and Password (Both the default Username and Password are "admin".) and then click "LOGIN" to start the device setting.

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	×
2	http://192.168.0.136
	admin
	•••••

Figure-1

3.2 Operation

H-

Summary→Status

When we login into encoder module, it displays the status interface as Figure-2.

ast.com	2018-05-25 15:51:58 [EN 中文] [Exit]
DEVICE INFORMATION DEVICE	
Module 4	
Module 5	Version: 1.00.15H Build 182.00 May 21 2018
Module 6 Hardwar	
	Version: 1.0.2
► TS Config System	Version: 3.02.1.63
Scrambler	oduct ID: 03544100-00000010-00000000000000
► Modulator P	
System Network Password User can click any	item here to enter interface to check
► Firmware	
► Date Time information or set	the parameters.

Figure-2

...................

Monitor→Input Status

> Module

Clicking "Input Status \rightarrow Module", it displays the interface where users can check the encoding status of each module as Figure-3.

broadcast.com	ator					2018-05-25 1	15:52:18
I € R Z	INPUT STA	TUS					
DADCAST 3		Module	Data1				
atus		Module	Data				
tor		Modulo Info (Als	rm/Active/Total): 0/6/6				
out Status							
tput Status		Module	Channel	Status	Channel	Status	Bit(Act/Max)
neters		1	Encoder 1	•	Encoder 2	•	0.1/0.1 Mbps
m		2	Encoder 1	•	Encoder 2	•	0.1/0.1 Mbps
		3	Encoder 1	•	Encoder 2	۲	0.1/0.1 Mbps
		4	Encoder 1	•	Encoder 2	۲	0.1/0.1 Mbps
		5	Encoder 1	•	Encoder 2	•	37.4/37.4 Mbps
		6	Encoder 1	•	Encoder 2	۲	0.1/0.1 Mbps
		6	Encoder 1	٠	Encoder 2	٠	0.1/0.1 Mbps

Figure-3

Data1

Clicking "Input Status \rightarrow Data1", it displays the interface where users can check the Data1 input status after adding IP input from data1 port in the "TS Config", and the interface displays the following as shown in Figure-4.

	INPUT STA	TUS					201	8-05-25 15:52	2:36 [EN 中文] [Exit]
BROADCAST 5 Summary Status		Module	Data1						
Monitor		Channel Info.(Al	arm/Active/Total): 0/0	1/0	Total E	Bitrate: 0.0/0.0			
Input Status Output Status		Channel	IP Address	Port	Protocol	IGMP	Multicast	Status	Bit(Act/Max)
Parameters System									

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Figure-4

Monitor→Output Status

≻ QAM

Clicking "Output Status \rightarrow QAM", it displays the interface where users can check the QAM output status of each carrier as Figure-5.

www.thor					2018-05-25	15:53:16 [EN 中文
	UT STATUS					
imary	QAM IP					
tatus						
itor	Channel Info.(Ala	rm/Active/Total): 0/16/16				
put Status	Channel	Frequency	Constellation	Symbol Rate	Status	Bit(Act/Max)
utput Status	1	195 MHz	256 QAM	5361 Ksps	۲	0.0/38.8 Mbps
ameters tem	2	201 MHz	256 QAM	5361 Ksps	۲	0.0/38.8 Mbps
	3	207 MHz	256 QAM	5361 Ksps	۲	0.0/38.8 Mbps
	4	213 MHz	256 QAM	5361 Ksps	٠	0.0/38.8 Mbps
	5	219 MHz	256 QAM	5361 Ksps	•	37.3/38.8 Mbps
	6	225 MHz	256 QAM	5361 Ksps	•	0.0/38.8 Mbps
	7	231 MHz	256 QAM	5361 Ksps	•	0.0/38.8 Mbps
	8	237 MHz	256 QAM	5361 Ksps	•	0.0/38.8 Mbps
	9	243 MHz	256 QAM	5361 Ksps	•	0.0/38.8 Mbps
	10	249 MHz	256 QAM	5361 Ksps	•	0.0/38.8 Mbps
	11	255 MHz	256 QAM	5361 Ksps	•	0.0/38.8 Mbps
	12	261 MHz	256 QAM	5361 Ksps	•	0.0/38.8 Mbps
	13	267 MHz	256 QAM	5361 Ksps	•	0.0/38.8 Mbps
	14	273 MHz	256 QAM	5361 Ksps	•	0.0/38.8 Mbps
	15	279 MHz	256 QAM	5361 Ksps	•	0.0/38.8 Mbps
	16	285 MHz	256 QAM	5361 Ksps	•	0.0/38.8 Mbps

Figure-5

> IP

Clicking "Output Status \rightarrow IP", it displays the interface where users can check the IP output status after adding IP output in the "IP stream" interface, and it displays as Figure-6.

				H-12	HDMI-QA	M-IPLL				
Encoder Modula	ator									
broadcast.com							201	18-05-25	15:53:35	[EN 中文] [Exit
TH O R Z	OUTPUT ST	ATUS								
BROADCAST 3 Summary Status		QAM	IP							-
Monitor		Channel Info.(Alarm/Active/Total)	: 0/0/0		Total Bitrate: 0.0/0.0				
 Input Status Output Status 		Channel	IP Address	Port	Protocol	Null PKT Filter	Data1	Data2	Status	Bit(Act/Max)
System										
	•					11				

Figure-6

Parameters → Module 1-6

Encoder 1

This encoder modulator supports up to 6 modules, and each module has 2 HDMI inputs. From the menu on left side of the webpage, clicking "Module1-6 \rightarrow Encoder 1", it displays the information of 1st encoding channel (Figure-7) where users can configure the video and audio encoding parameters.

Encoder Modulat	or						
www.thorbroadcast					2018-05-25 15:58:	39 [EN 中文] [Exit	1
	HDMI						
Summary Monitor Parameters	Encoder 1	Encoder 2 Syst	tem				
Module 1	Video						
Module 2 Module 3 Module 4 Module 5 Module 6 Tuner TS Config	Video Format: GOP B Frame: Low Delay: DTS Delay: H.264 Profile:	H.264 2 Normal 200 High Profile	<pre> (<=3) (0 ~ 255) </pre>	Bitrate: GOP P Frame: Aspect Ratio: Manual Resolution: Out Resolution:	12.00 4 Auto	Mbps (0.8 ~ 19)	General settin for the Encodir program: Us
Scrambler Modulator IP Stream	H.264 Level:	Level 4	-	CC Switch:	Off	•	can edit any ite
System Network Password Configuration	Format: Gain: Program	Мред2 100	▼ (0-400%)	Bitrate: Dialog Normalization	128 Kbps : 31	▼ (-311)dB	listed as needec
 Firmware Date Time Log 	Program Output: Service Provider: PMT PID:	V-Provider 0x00c9		Service Name: Service Number: PCR PID:	TV-1101 1101 0x00cc		Program informati read area
	Video PID:	0x00cb		Audio PID:	0x00ca		
	Video Lock: Bitrate:	00Mbps		Video Resolution: Rom Ver:	unknown 3.206		
	The lig	ht will turi	n green	if	Apply		

Similarly, clicking "Encoder 2", it displays the information of the 2nd encoding channel

> System

Clicking "System", it displays the interface where users can check module and TS out information, and save or restore the module configuration as Figure-8.

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www.thorbr					2018-05-25 15:59:16	[EN 中文][E
	HDMI					
T HÇ RZ	HDIVII					
BROADCAST 5						
Summary						
Monitor		Encoder 1 E	incoder 2 System			
Parameters			·			
Module 1		Module Info.				
Module 2		C 6 11 1	5 40 D 11 4 45 D 40 0047 40 50	20 H I M I	0.2	
Module 3		Software Version:	5.10 Build 1.15 Sep 18 2017-13:52			
Module 4		System Version:	0.1	Module ID:	1	
Module 5		TS Out Info.				
Module 6		13 Out lino.				
▶ Tuner		Output Bitrate:	54.000 Mbps	TS ID:	1	
TS Config		ON ID:	1			
Scrambler		Bitrate:	0.101/54.000 Mbps			
Modulator		Diriate.	0.101/34.000 Mbps			
► IP Stream						
System					Apply	
▶ Network						
Password		Configuration				
Configuration						
▶ Firmware		Save Restor	re Factory Set			
Date Time						
► Log						
		When you change the para	ameter,you shoud save configurat	ion ,otherwise the new con	figuration will lost after	
		reboot.				
					Save config	

Figure-8

Parameters → **Tuner:**

Clicking "Tuner", it displays the interface where users can configure the Tuner input parameters as Figure-9.



ncoder Modulator						
w.thorbroadcast.com					2018-05-25 16:00:54 [E	N 中文][E)
TH Q RZ	TUNER CC	NFIGURATION				
BROADCAST 3 Summary Monitor	#	Tuner	TS Lock	Signal	Param	Action
Module 1 Module 2	1	ATSCT	0.000 Mbps	Quality: 0% Strength: 0%	Frequency: 750.000 M	Edit
Module 3 Module 4 Module 5 Module 6		CH 1 Config			×	
Tuner TS Config Scrambler Modulator			Frequency: 750.0	00 MHz		
▶ IP Stream					Apply Close	
Network Password Configuration Firmware Date Time						
► Log						

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Figure-9

Parameters → TS Config:

Clicking "TS Config", it displays the interface where users can configure the TS output parameters.

➤ TS Config→Output TS X:

Clicking "Output TS X", it displays the interface where users can select the TS output carrier (Figure-10)

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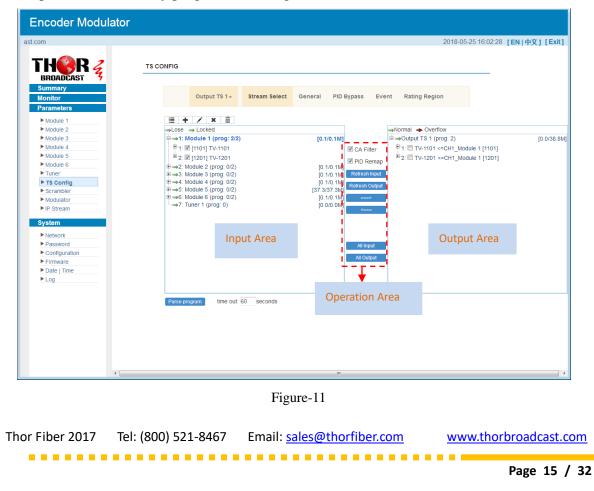
.

	TS CONFIG					2018-05-25 16:01:56	[[[]]]]]]
Summary							
Monitor		Output TS 1+	Stream Select	General PID	Bypass Eve	nt Rating Region	
Parameters		Output TS 1					
Module 1	≣ +	Output TS 2					
Module 2	⇒Lose «	Output TS 3				→Normal → Overflow	
Module 3	⊟ ⇒1: M			[0.1/0.1M]		⊟ ⇒Output TS 1 (prog: 2)	[0.0/38.8]
Module 4	[⊕] 1: ☑	Output TS 4			CA Filter	1: TV-1101 <= CH1_Module 1 [1101]	
Module 5	±-2: 🔽	Output TS 5			PID Remap		
Module 6	⊞ ⇒2: M	Output TS 6		[0.1/0.1M]	·		
▶ Tuner	⊞ ⇒3: M	Output TS 7		[0.1/0.1M]			
► TS Config	⊞ ⇒4: M ⊞ ⇒5: M	Output TS 8		[0.1/0.1M]			
Scrambler	E ⇒6: M	Output TS 9		[37.6/37.6M] [0.1/0.1M]			
Modulator	→7: TL	Output TS 10		[0.0/0.0M]			
► IP Stream					<===		
System		Output TS 11					
▶ Network		Output TS 12					
Password		Output TS 13					
Configuration		Output TS 14			All Input		
 Firmware 		Output TS 15			All Output		
Date Time		Output TS 16					
Log							
0							
	Parse prog	ram time out:	60 seconds				

Figure-10

➤ TS Config→Stream select:

Clicking "Stream select", it displays the interface where users can select program(s) to multiplex out and modify program info. (Figure-11)



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Configure 'Input Area' and 'Output Area' with buttons in 'Operation Area'. Instructions are as below:

- + : To add input channel which come from Data 1
- . To edit the input channel
- **X** : To delete the input channel
- i : To delete all inputs channel
- →Lose → Locked : To check input IP lock or not, green means current IP locked
- →Normal → Overflow: To check current TS overflow or not, red color means current TS
- overflow, need to reduce program
- CA Filter : To filter/not filter the source CA information
- ^ℤ PID Remap : To enable/disable the PID remapping
- Refresh Input To refresh the input program information
- Refresh Output To refresh the output program information
- Select one input program first and click this button to transfer the selected program to the right box to output.
- Similarly, user can cancel the multiplexed programs from the right box.
- All Input To select all the input programs
- All Output To select all the output programs

Parse program To parse programs

Program Modification:

The multiplexed program information can be modified by clicking the program in the 'output' area. For example, when $clicking^{\oplus_{1:} \square \text{ TV-1101 } <=CH1_Module 1 [1101]}$, it triggers a dialog box (Figure 12) where users can input new information.

n-	12HDMI-QA	M-IPLL
Program Information		[close]
Program From Input:	CH1_Module 1 [1101]	
Service Name:	TV-1101	
Major Channel Number:	1	
Minor Channel Number:	1	
Source Id:	1	
Short Name:	prog1	
Program Number:	1001	
Logic Channel Number:	1	
Service Type:	0x01	
Service Provider:	TV-Provider	
PMT Descriptor Tag:	💷 0x00	
PMT Descriptor Data:		(Hex)
	0x0020	
	0x0021	
	0x0022	
MPEG-1 Audio PID:	0x0023	

> TS Config→General:

Clicking "General", it displays the interface where users can set stream output information, NIT insert/VCT insert and other information. (Figure-13)

					2018-05	-25 16:02:46 [EN 中文]
T HWR Z	TS CONFIG					
BROADCAST 3						
Summary						
Monitor	Output TS 1 -	Stream Select	General	PID Bypass Event	Rating Region	
Parameters						
Module 1	Stream					
Module 2	Output Mode:	Mux out -		PAT Insert:	V	
Module 3	SDT Insert:	Mux out 🔹		BAT Insert:	V	
Module 4						
Module 5 Module 6	Share BAT:			CAT Insert:	V	
Tuner	PMT Insert:	\checkmark		TS ID:	1	
► TS Config	ON ID:	1		PCR Correct	\checkmark	
▶ Scrambler	PCR Speed BW	1	-	PCR State BW	1 •	
▶ Modulator						
► IP Stream	NIT					
System	NIT Insert:	Not insert	-			
▶ Network	VCT					
Password	Modulation Mode:	4		VCT Mode:	TVCT -	
	VCT Insert:	·		vor mode.		
	ver insen:					_
	тот/тот					
	TDT/TOT Insert:	V		TOT Descriptor Insert:	disable -	
	IPTV Sync(SPTS)					
	IPTV Sync:			Sync Period:	300 S	Sec
					Apply	

Figure-13

➤ TS Config→PID Bypass:

Clicking "PID Bypass", it displays the interface as Figure-14 where user can add PIDs to be passed, click the "+" symbol, input current IP channel number, then input current IP source Pid and output Pid which is customer needed , then click "set"

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2HDMI-QAM-IPLL					
Encoder Modulator					
roadcast.com					2018-05-25 16:03:12 [EN 中文] [Exit]
loadcast.com					2010-03-23 10:03:12 [EN +X] [EN]
TH () R 🛃	TS CONFIG				
BROADCAST 3					
Summary	0.00	put TS 1 - Stream Select	General PID Bypass	Event Rating Region	_
Monitor	Out	put 15 1 + Stream Select	General PID Bypass	Event Rating Region	H
Parameters					
Module 1	Index	Input Channel Input PID(0x)	Output PID(0x)		
Module 2	1			li -	
Module 3					
Module 4					
Module 5				Set	Del-All
Module 6					
▶ Tuner					
► TS Config					
▶ Scrambler					
Modulator					
► IP Stream					
System					
▶ Network					
Password					
Configuration					
 Firmware 					
 Date Time 					
Log					
P Log					

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Figure-14

#### > Event:

Clicking "Event", it displays the interface as Figure-15 where users can set the upcoming events (programs). This function is only supported in ATSC RF output.

| Parameters         Module 1         Module 2         Module 3         Module 4         Module 6         Ymar         Ts Configuration         Stant Time         Duration(sec)         Title         Title         Configuration         Presend         System         Network         Password         Configuration         Inter         Title         Inter         Inter         Value         Inter         Value         Inter         Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Parameters         Module 1         Module 2         Module 3         Module 4         Module 6         Tuner         Stramber         Stramber         Modulator         IP Stream         System         Network         Password         Configuration         Index Dimension Name         Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module 2 Module 4 Module 4 Module 6 Module 6 Module 6 Module 6 Module 7 Module 7 Module 7 Module 7 Module 7 Module 7 Modula 7 Modula 7 Modulator P Stream Configuration Event ID: 0x0001 Start Time: 2018/05/25-16.04.12 Duration(sec) Title: Index Dimension Name Value Index Dimension Name Value I EntreAudience Value I I EntreAudience Value I I EntreAudience Value I I EntreAudience Value IIII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Module 2       Module 3         Module 4       Module 5         Module 6       Image: Event ID         Start Time       Duration(sec)         Title       Image: Event ID         Start Time       Duration(sec)         Start Time       Duration(sec)         Start Time       Duration(sec)         Start Time       Duration(sec)         Vector K       Event ID:         Password       Duration(sec)         Firmware       Index         Date Time       Index         Log       Intervaluence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <ul> <li>Module 3</li> <li>Module 4</li> <li>Module 5</li> <li>Module 6</li> <li>Tuner</li> <li>TS Config</li> <li>Scrambler</li> <li>Modulator</li> <li>IP Stream</li> <li>System</li> <li>Network</li> <li>Configuration</li> <li>Configuration</li> <li>Configuration</li> <li>Title</li> <li>Duration(sec): 3600</li> <li>Title:</li> <li>Duration(sec): 3600</li> <li>Title:</li> <li>Index Dimension Name</li> <li>Value</li> <li>Index Dimension Name</li> <li>Index Dimension Name</li> <li>Value</li> <li>V</li></ul> | <ul> <li>Module 3</li> <li>Module 4</li> <li>Module 5</li> <li>Module 5</li> <li>Module 6</li> <li>Tuner</li> <li>Ts Config</li> <li>Scrambler</li> <li>Modulator</li> <li>IP Stream</li> <li>System</li> <li>System</li> <li>Network</li> <li>Password</li> <li>Configuration</li> <li>Title</li> <li>Index Dimension Name</li> <li>Value</li> <li>Index Dimension Name</li> <li>Value</li> <li>Index Dimension Name</li> <li>Value</li> <li>Index Dimension Name</li> <li>Mone</li> <li>Mone</li></ul> |
| Module 4 Module 6 Module 6 Stant III Start Time Duration(sec) Title  Module 6 Start III Configuration Configuration PSteam Strambler Event ID: 0x0001 Event ID: 0x0001 Start Time: 2018/05/25-16.04.12 Duration(sec): 3600 Title: Password Configuration Firmware Index Dimension Name Value Index Othersion Name Value Index           | Module 4 Module 5 Module 5 Module 6 Funer Scrambler Modulator IV Presem System System Vework Password Password Firmware Log                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Module 4       Inters       Event ID       Start Time       Duration(sec)       Title       Image: Configuration         Module 5       Nodule 6       Time       Configuration       Image: Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Module 5 Module 5 Module 5 Module 5 Module 6 Tuner Tisconfig Scrambler Scrambler Modulator IPStream System System Network Password Date   Time Log                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Module S           Module G           > Tuner           > Ts Config           > Strambler           > Modulator           > P Steam           System           > Network           > Password           Configuration           Title:           > Firmware           > Datel Time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Module 5         Module 6         Tuner         > Scrambler         Modulator         > IP Stream         System         Start Time:         2018/05/25-16.04.12         Duration(sec):         3600         Password         Filmware         Date   Time         Log                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| ► Tuner           ► Ts config           ► Scrambler           ► Modulator           ► PStream           Event ID:           System           System           Network           Password           Configuration           Title:           Firmware           Index         Dimension Name           Value           + EntreAudience                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Tuner         ▶ Tagender         > Scrambler         > Modulator         > IP Stream         System         > Network         > Password         > Password         > Firmware         > Date  Time         > Log                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| ► Strambler       Configuration       [close]         ► Modulator       ► P Stream       Event ID:       0x0001         System       Start Time:       2018/05/25-16.04.12       Duration(sec);       3600         ► Network       Duration(sec);       3600       Title:       Event ID:       Filterand         ► Password       Title:       Index       Dimension Name       Value       €         ► Firmware       1       EntreAudience       ▼ None       1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Image: Scandiger Strandber       Configuration       [close]         Modulator       FP Stream       Event ID:       0x0001         System       Start Time:       2018/05/25-16.04-12         Network       Duration(sec):       3600         Password       Title:       Index Dimension Name       Value         P Immer       Index Dimension Name       Value       1         Elog       IntreAudience       None       Image: Content Start                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Scrambler         Configuration         [close]           Modulator         Image: Strate Str                                                                                       | Scrambler Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Event ID: 0x0001 Start Time: 2016/05/25-16.04.12 Duration(sec): 3600 Password Password Configuration Index Dimension Name Value Firmware Log                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| ► Modulator         Event ID: 0x0001           ► P Stream         Start Time: 2018/05/25-16.04:12           ► Network         Duration(sec): 3600           ► Password         Title:           ► Configuration         Index Dimension Name           ► Firmware         Index Dimension Name           ► Datel Time         1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ► Modulator         Event ID:         0x0001           System         Start Time:         2018/05/25-16.04.12           ► Network         Duration(sec):         3600           ► Password         Title:            ► Configuration         Index         Dimension Name         Value           ► Jate   Time         1         EntireAudience         ▼ None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| IP Stream         Event ID:         0x0001           System         Start Time:         2018/05/25-16.04:12           Network         Duration(sec):         3600           Password         Title:         Image: Comparison Name         Value           Firmware         Index         Dimension Name         Value           Date   Time         None         1         EntreAudience         None         1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | IP Stream     Event ID:     0x0001       System     Start Time:     2018/05/25-16.04.12       Network     Duration(sec):     3660       Password     Title:       Configuration     Index     Dimension Name       Value     +       Date   Time     1     EntireAudience                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| System     Start Time: 2018/05/25-16.04.12       Network     Duration(sec): 3600       Password     Title:       > Configuration     Title:       > Firmware     Index     Dimension Name       > Date   Time     1     EntireAudience                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | System     Start Time:     2018/05/25-16.04.12       Network     Duration(sec):     3600       Password     Title:     Index Dimension Name       Value     +       Pate   Time     1     EntireAudience       Log     Index Dimension Name     Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Network     Duration(sec): 3600       Password     Title:       Configuration     Index       Firmware     Index       Date  Time     1       EntireAudience     None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Network     Duration(sec):     3600       Password     Title:       Configuration     Index     Dimension Name       Value     1       EntireAudience     None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| ▶ Password     Title:       ▶ Configuration     Index Dimension Name       ▶ Firmware     Index Dimension Name       ▶ Datel Time     1       EntireAudience     None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Password     Title:       Configuration     Index       Firmware     Index       Date   Time     1       EntireAudience     None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| ▶ Configuration     ►       ▶ Firmware     Index     Dimension Name       ▶ Date   Time     1     EntireAudience                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Configuration  Firmware Index Dimension Name Value  Date   Time 1 EntireAudience None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| ▶ Firmware         Index         Dimension Name         Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ▶ Firmware     Index     Dimension Name     Value       ▶ Date   Time     1     EntireAudience     ▼       ▶ Log                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| ▶ Date   Time 1 EntireAudience → None → 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Date   Time     1 EntireAudience     None     ①                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ▶ Log                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| ▶ Log                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| Set Del-All                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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|-------------------|
| H-12HDMI-QAM-IPLL |
| <br>              |

#### ➢ Rating Region:

Clicking "Rating Region", it displays the interface as figure-16 where user can classify the input programs. This function is only supported in ATSC RF output.

| www.thorbro                                         |                                     |                                        |         |                     |    |       | 2018-05-2                       | 516:03:49 <b>[EN 中文] [Exit]</b> |                  |
|-----------------------------------------------------|-------------------------------------|----------------------------------------|---------|---------------------|----|-------|---------------------------------|---------------------------------|------------------|
| Summary<br>Parameters                               | TS CONFIG                           | Dutput TS 1 - Stream Select            | General | PID Bypass Eve      | nt | Ratir | ng Region                       | —                               |                  |
| Module 1 Module 2                                   | +<br>Unde                           |                                        |         | ed Scale Rating Num |    |       | Configuration                   |                                 |                  |
| Module 3 Module 4 Module 5                          | 1 2 3                               | EntireAudience<br>Dialogue<br>Language | 0       | 6<br>2<br>2         |    | Û     | Region Nam                      |                                 |                  |
| Module 6 Tuner TS Config                            | 4 5                                 | Sex<br>Violence                        | 0       | 2                   |    | Û     | Dimension Nam<br>Graduated Scal | e: 1                            | •                |
| Scrambler     Modulator     IP Stream               | 6<br>7<br>8                         | Children<br>FantasyViolence<br>MPAA    | 0       | 3<br>2<br>9         |    | â     | Index     Abbrev       1        | Value                           | +<br>11<br>11    |
| System                                              | Configuration                       |                                        |         |                     |    |       | 3 TV-G<br>4 TV-PG<br>5 TV-14    | TV-G<br>TV-PG<br>TV-14          | 1<br>1<br>1<br>1 |
| Network     Password     Configuration     Firmware | Region Name:                        | U.S.(50 States+Possessions)            |         | []                  |    |       | 6 TV-MA                         | TV-MA                           | iii Set          |
| Date   Time     Log                                 | Dimension Name:<br>Graduated Scale: | 0                                      | •       |                     |    |       |                                 |                                 |                  |
|                                                     | 1 Value                             | le                                     | +       |                     |    |       |                                 |                                 |                  |
|                                                     |                                     |                                        | Set     | Del-All             |    |       |                                 |                                 |                  |
|                                                     | L                                   |                                        |         |                     |    |       |                                 |                                 |                  |

Figure-16

#### **Parameters** → **Scrambler:**

Clicking "Scrambler", it displays the interface as Figure-17 where user can configure parameters to scramble the programs. Scr CH1-16 is corresponding to Output TS1-16 respectively.

| Encoder Modulator        |                  |           |             |                       |                  |                         |
|--------------------------|------------------|-----------|-------------|-----------------------|------------------|-------------------------|
| .com                     |                  |           |             |                       | 2018-05          | -25 16:05:07 [EN 中文] [E |
|                          | PROGRAM SCRAMBLE |           |             |                       |                  |                         |
| Summary<br>Monitor       | Scr CH 1 -       | CAS 1 CAS | 2 CAS 3 CAS | 3 4                   |                  |                         |
| Parameters               |                  |           |             |                       |                  |                         |
| Module 1                 | the same         | CH 1      | All prg.    | CAS Enable 🗐          | ECMG 💮 EMMG 💮    |                         |
| Module 2 Module 3        | E 0. EE TV 4004  | CH 2      | Ð           | ECMG IP Address:      | 192.168.3.101    |                         |
| Module 4                 | Scr              | CH 3      | -           | ECMG Port:            | 3001             |                         |
| Module 5                 |                  | CH 4      |             | ECM CH ID:            | 1                |                         |
| Module 6     Tuner       |                  | CH 5      |             | ECM AHEAD:            | 8000 ms          |                         |
| ► TS Config              |                  | CH 6      |             | Stream Share AC:      |                  |                         |
| ▶ Scrambler              |                  | CH 7      |             | EMM PID:              | 0x1ff1           |                         |
| Modulator                |                  | CH 8      |             | EMMG Port:            | 2001             |                         |
| ► IP Stream              | Scr              | CH 9      |             | EMMG Mode:            | TCP -            |                         |
| System                   | Scr              | CH 10     |             | Super CAS ID:         | 0x70020001       |                         |
| ▶ Network                | Scr              | CH 11     |             | Protocol Version:     | 2 🗸              |                         |
| ► Password               | Scr              | CH 12     |             |                       |                  |                         |
| ► Configuration          | Scr              | CH 13     |             | Scrambler IP Address: | 192.168.3.136    |                         |
| Firmware     Date   Time | Scr              | CH 14     |             | Pmt Private:          | 0x0000000        |                         |
| ► Log                    | Scr              | CH 15     |             | Cas Private:          | 0×00000000       |                         |
|                          | Scr              | CH 16     |             | Crypto. Period:       | 10 sec.(0~65535) |                         |
|                          |                  |           |             | Current Period:       | 0                |                         |
|                          |                  |           |             |                       |                  |                         |
|                          |                  |           |             | Set Program A         | C Table Set CAS  |                         |

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Figure-17

# **Parameters** → **Modulator**:

ί.,

Clicking "Modulator", it displays the Modulator Configuration screen as Figure-18. Here user can set modulating parameters.

|                                   | MODULATOR  |                                          |               |                           |                          |                        | 2018-05-25 1 | 6:06:10 <b>[EN]</b> | 中文][Exit]      |
|-----------------------------------|------------|------------------------------------------|---------------|---------------------------|--------------------------|------------------------|--------------|---------------------|----------------|
| BROADCAST 3<br>Summary<br>Monitor | Center Fre | quency: 240.000 MH<br>arriers): -1.0 dBm | łz            | Standard: J<br>Channel In | .83B<br>fo.(Alarm/Active | ( <b>Total):</b> 0/16/ | /16          |                     |                |
| Parameters                        | #          | Frequency                                | Constellation | Symbol Rate               | Gain Offset              | Status                 | Bit(Act/Max) | Z 📥                 |                |
| Module 1                          | 1          | 195.000 MHz                              | 256 QAM       | 5361 Ksps                 | 0.0 dB                   | •                      | 0.0/38.8 M   | 2                   | Quickly Config |
| Module 2 Module 3                 |            | 100.000 Miliz                            | 200 @/11/     | 000110000                 | 0.0 45                   |                        | 0.0700.0 M   |                     |                |
| Module 3                          | 2          | 201.000 MHz                              | 256 QAM       | 5361 Ksps                 | 0.0 dB                   | ۲                      | 0.0/38.8 M   |                     |                |
| Module 5                          | 3          | 207.000 MHz                              | 256 QAM       | 5361 Ksps                 | 0.0 dB                   |                        | 0.0/38.8 M   | 1                   |                |
| Module 6                          |            |                                          |               |                           |                          | -                      |              |                     |                |
| ► Tuner                           | 4          | 213.000 MHz                              | 256 QAM       | 5361 Ksps                 | 0.0 dB                   | ۲                      | 0.0/38.8 M   | · 🖌 🛏               |                |
| TS Config                         | 5          | 219.000 MHz                              | 256 QAM       | 5361 Ksps                 | 0.0 dB                   |                        | 37.3/38.8 M  | 1                   | Channel Confi  |
| Scrambler                         |            |                                          |               |                           |                          | -                      |              |                     |                |
| Modulator                         | 6          | 225.000 MHz                              | 256 QAM       | 5361 Ksps                 | 0.0 dB                   | •                      | 0.0/38.8 M   | _                   |                |
| ► IP Stream                       | 7          | 231.000 MHz                              | 256 QAM       | 5361 Ksps                 | 0.0 dB                   |                        | 0.0/38.8 M   | 1                   |                |
| System                            |            |                                          |               |                           |                          |                        |              |                     |                |
| ▶ Network                         | 8          | 237.000 MHz                              | 256 QAM       | 5361 Ksps                 | 0.0 dB                   | •                      | 0.0/38.8 M   |                     |                |
| Password                          | 9          | 243.000 MHz                              | 256 QAM       | 5361 Ksps                 | 0.0 dB                   | •                      | 0.0/38.8 M   | 1                   |                |
| Configuration                     |            |                                          | 050 0444      | 5004.14                   |                          | -                      |              |                     |                |
| ▶ Firmware                        | 10         | 249.000 MHz                              | 256 QAM       | 5361 Ksps                 | 0.0 dB                   | •                      | 0.0/38.8 M   |                     |                |
| Date   Time   Log                 | 11         | 255.000 MHz                              | 256 QAM       | 5361 Ksps                 | 0.0 dB                   | ۲                      | 0.0/38.8 M   | 1                   |                |
| LUg                               | 12         | 261.000 MHz                              | 256 QAM       | 5361 Ksps                 | 0.0 dB                   | •                      | 0.0/38.8 M   | 2                   |                |
|                                   | 12         | 201.000 Miliz                            | 200 QAM       | 0001 Kapa                 | 0.0 00                   |                        | 0.0/30.0 M   | ~                   |                |
|                                   | 13         | 267.000 MHz                              | 256 QAM       | 5361 Ksps                 | 0.0 dB                   | ۲                      | 0.0/38.8 M   |                     |                |
|                                   | 14         | 273.000 MHz                              | 256 QAM       | 5361 Ksps                 | 0.0 dB                   | •                      | 0.0/38.8 M   | 2                   |                |
|                                   | 15         | 279.000 MHz                              | 256 QAM       | 5361 Ksps                 | 0.0 dB                   | •                      | 0.0/38.8 M   | 1                   |                |
|                                   | 16         | 285.000 MHz                              | 256 QAM       | 5361 Ksps                 | 0.0 dB                   | •                      | 0.0/38.8 M   | 2                   |                |
|                                   |            |                                          |               |                           |                          | -                      |              |                     |                |



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| H-12HDMI-QAM-IPLL |   |
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When users click "quickly config" button, it triggers a dialog box (Figure -19) where users can set all channels configration.

| Standard:            | J.83B    | •                  |
|----------------------|----------|--------------------|
| Level(All Carriers): | -1.0     | (-20 ~ +10 dBm)    |
| Channel Enable:      | <b>V</b> |                    |
| Start Frequency:     | 195.000  | (50 ~ 960 MHz)     |
| Bandwidth:           | 6.000    | MHz                |
| Constellation:       | 256 QAM  | •                  |
| Symbol Rate:         | 5361     | (5000 ~ 7000 Ksps) |
| Gain offset:         | 0.0      | (-10 ~ 0 dB)       |

Figure-19

When users click "Channel config" button, it triggers a dialog box (Figure-20) where users can set the corresponding channel configration.

| Standard:            | J.83B   | •                  |
|----------------------|---------|--------------------|
| Level(All Carriers): | -1.0    | (-20 ~ +10 dBm)    |
| Channel Enable:      | V       |                    |
| Frequency:           | 195.000 | (50 ~ 960 MHz)     |
| Constellation:       | 256 QAM | •                  |
| Symbol Rate:         | 5361    | (5000 ~ 7000 Ksps) |
| Gain offset:         | 0.0     | (-10 ~ 0 dB)       |

Figure-20

# **Parameters** → **IP Stream:**

This encoder modulator supports TS to output in IP (16 MPTS) format through DATA 2 port and 1 ASI out as mirror of one RF output carriers.

Clicking "IP Stream", it displays the interface where to set IP out parameters and choose the ASI out channel (Figure-21).

| ncoder Modulato            | r           |    |                            |      |          |            |                 |        |                   |         |                                  |
|----------------------------|-------------|----|----------------------------|------|----------|------------|-----------------|--------|-------------------|---------|----------------------------------|
| www.thorbroadcast          |             |    |                            |      |          |            |                 | 201    | 18-05-25 16:07:58 | [EN]中文] | [Exit]                           |
| ſH <b>(}</b> R <b></b> {   | IP STREAM   |    |                            |      |          |            |                 |        |                   |         |                                  |
| BROADCAST 3                |             | #  | IP Address                 | Port | Protocol | Pkt Length | Null PKT Filter | Status | Bit(Act/Max)      | Z 🕂     | Quickly Confi                    |
| Monitor                    |             | 1  | 224.2.2.2                  | 2001 | UDP      | 7          |                 | ۲      | 0.0/38.8 M        | Z       |                                  |
| Parameters                 |             | 2  | 224.2.2.2                  | 2002 | UDP      | 7          |                 |        | 0.0/38.8 M        | /       |                                  |
| Module 1                   |             | 3  | 224.2.2.2                  | 2003 | UDP      | 7          |                 |        | 0.0/38.8 M        | 2       |                                  |
| Module 2 Module 3          |             |    |                            |      |          |            |                 |        |                   | _       |                                  |
| Module 4                   |             | 4  | 224.2.2.2                  | 2004 | UDP      | 7          |                 | ۲      | 0.0/38.8 M        |         |                                  |
| Module 5                   |             | 5  | 224.2.2.2                  | 2005 | UDP      | 7          |                 | ۲      | 37.3/38.8 M       | 2       |                                  |
| Module 6     Tuner         |             | 6  | 224.2.2.2                  | 2006 | UDP      | 7          |                 | ٠      | 0.0/38.8 M        | 1       |                                  |
| TS Config                  |             |    |                            |      |          |            |                 |        |                   |         | Channel Conf                     |
| ▶ Scrambler                |             | 7  | 224.2.2.2                  | 2007 | UDP      | 7          |                 | ۲      | 0.0/38.8 M        | P       | <ul> <li>Channel Conf</li> </ul> |
| Modulator                  |             | 8  | 224.2.2.2                  | 2008 | UDP      | 7          |                 | ۲      | 0.0/38.8 M        | 1       |                                  |
| ▶ IP Stream                |             | 9  | 224.2.2.2                  | 2009 | UDP      | 7          |                 | ۲      | 0.0/38.8 M        | 1       |                                  |
| System                     |             | 10 | 224.2.2.2                  | 2010 | UDP      | 7          |                 |        | 0.0/38.8 M        | 2       |                                  |
| ▶ Network                  |             |    |                            |      |          |            |                 |        |                   |         |                                  |
| Password                   |             | 11 | 224.2.2.2                  | 2011 | UDP      | 7          |                 | ۲      | 0.0/38.8 M        | 2       |                                  |
| Configuration     Firmware |             | 12 | 224.2.2.2                  | 2012 | UDP      | 7          |                 | ۲      | 0.0/38.8 M        | 1       |                                  |
| Date   Time                |             | 13 | 2                          | 3    | UDP      | 7          |                 |        | 0.0/38.8 M        | 2       |                                  |
| ►Log                       |             |    | 3 4                        |      |          |            |                 | -      |                   |         |                                  |
|                            |             | 14 | 5                          | *    | UDP      | 7          |                 | ۲      | 0.0/38.8 M        |         |                                  |
|                            |             | 15 | 7                          | 5    | UDP      | 7          |                 | ۲      | 0.0/38.8 M        | 2       |                                  |
|                            |             | 16 | 9<br>10                    | 6    | UDP      | 7          |                 | ۲      | 0.0/38.8 M        | 2       |                                  |
|                            | ASI OUT(OPT |    | 11<br>12<br>13<br>14<br>15 |      |          |            |                 |        |                   |         |                                  |

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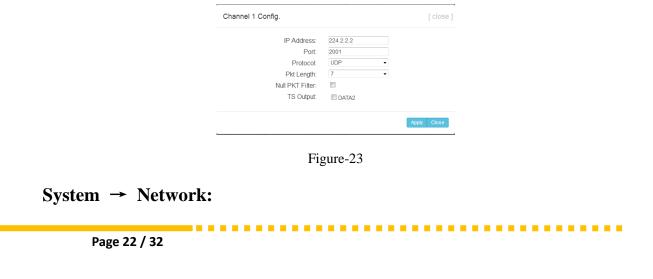


When users click "Quickly Config" button, it triggers a dialog box (Figure-22) where users can set all channels MPTS configration simultaneously.

| IP Address:      | 224.2.2.2 |  |
|------------------|-----------|--|
| Port:            | 2001      |  |
| Step:            | 1         |  |
| Protocol:        | UDP 🔹     |  |
| Pkt Length:      | 7 •       |  |
| Null PKT Filter: |           |  |
| TS Output:       | DATA2     |  |



When users click "Channel Config" button, it triggers a dialog box (Figure-23) where users can set corresponding MPTS channel configration.



| <br>              |  |
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Clicking "Network", it displays the interface as Figure-24 where to set network parameters.

| Encoder Modulator        |                                                   |                                        |
|--------------------------|---------------------------------------------------|----------------------------------------|
| www.thorbroadca          |                                                   | 2018-05-25 16:08:53 <b>[EN 中文] [Ex</b> |
|                          | NETWORK                                           |                                        |
| Summary<br>Monitor       | NMS                                               |                                        |
| Parameters               | IP Address                                        | : 192.168.0.136                        |
| System                   | Subnet Mask                                       |                                        |
| ▶ Network                | Gateway                                           | : 192.168.0.1                          |
| Password                 | Web Manage Port                                   |                                        |
| Configuration            | MAC Address                                       | : 20:18:04:24:17:30                    |
| Firmware     Date   Time |                                                   |                                        |
| ► Log                    |                                                   | Apply                                  |
|                          | Scrambler<br>IP Address<br>Subnet Mask<br>Gateway | : 255.255.255.0                        |
|                          |                                                   | Apply                                  |
|                          | DATA-1                                            |                                        |
|                          | IP Address                                        | : 192.168.2.136                        |
|                          | Subnet Mask                                       | : 255.255.255.0                        |
|                          | Gateway                                           | : 192.168.2.1                          |
|                          | MAC Address                                       | : 20:28:04:24:17:30                    |
|                          |                                                   | Apply                                  |
|                          |                                                   |                                        |
|                          |                                                   |                                        |

Figure-24

## System → password

Clicking "Password", it displays the screen as Figure-25 where to set the login account and password for the web NMS.

| Encoder Modulato                 | or the second                                                                                                                                 |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| www.th                           | 2018-05-25 16:09:03 <b>[EN]</b>                                                                                                                                                                                                                 |
| TH <b>®</b> R 孝                  | PASSWORD                                                                                                                                                                                                                                        |
| BROADCAST                        |                                                                                                                                                                                                                                                 |
| Summary<br>Monitor<br>Parameters | Modify the login name and password to make the device safely If forget the name or password, you can reset it by<br>keyboard. The default login name and password is "admin" Also please note the capital character and lowercase<br>character. |
| System  Network                  |                                                                                                                                                                                                                                                 |
| ▶ Password                       | Current UserName: admin                                                                                                                                                                                                                         |
| Configuration     Firmware       | Current Password:                                                                                                                                                                                                                               |
| Date   Time                      | New UserName:                                                                                                                                                                                                                                   |
| ► Log                            | New Password:                                                                                                                                                                                                                                   |
|                                  | Confirm New Password:                                                                                                                                                                                                                           |
|                                  | Apply                                                                                                                                                                                                                                           |
|                                  | Confirm New Password:                                                                                                                                                                                                                           |
|                                  | Apply                                                                                                                                                                                                                                           |

Figure-25

# System → Configuration:

Clicking "Configuration", it displays the screen as Figure-26 where to save/ restore/factory setting/ backup/ load your configurations.

| www.tl                     | 2018-05-25 16:09:14 [EN 中文] [E)                                                                              |
|----------------------------|--------------------------------------------------------------------------------------------------------------|
| TH <b>W</b> R Z            | CONFIGURATION                                                                                                |
| BROADCAST 3<br>Summary     |                                                                                                              |
| Monitor                    | Save Restore Factory Set Backup Load                                                                         |
| Parameters<br>System       |                                                                                                              |
| ▶ Network                  | When you change the parameter, you shoud save configuration ,otherwise the new configuration will lost after |
| Password     Configuration | reboot.                                                                                                      |
| ► Firmware                 |                                                                                                              |
| Date   Time     Log        | Save config                                                                                                  |
|                            |                                                                                                              |
|                            |                                                                                                              |
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|                            |                                                                                                              |
|                            |                                                                                                              |
|                            |                                                                                                              |
| 544M.doe* - WPS 文字         |                                                                                                              |
| 544M.doc* - WPS 文字         |                                                                                                              |
| 144M.doc*-WPS文字            |                                                                                                              |
| i44M.doc*-WPS 文孝           | Figure-26                                                                                                    |
| 544M.doc* - WPS文字          | Figure-26                                                                                                    |
| 544M.doc* - WPS 文字         | Figure-26                                                                                                    |

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| 1 |                   |  |
|---|-------------------|--|
|   | H-12HDMI-QAM-IPLL |  |
|   |                   |  |

#### System → Firmware:

Clicking "Firmware", it displays the screen as Figure-27 where to update firmware for this encoder modulator.

| Encoder Modulator                                                                  |                                                                                                        |                                                                  |                                    |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------|
|                                                                                    |                                                                                                        |                                                                  | 2018-05-25 16:09:30 [EN 中文] [Exit] |
| Summary<br>Monitor<br>Parameters<br>System<br>Network<br>Password<br>Configuration | upgrade. If you use a wrong file, the device ma                                                        | ot turn off the power, otherwise the device will not work.       |                                    |
| ▶ Firmware<br>▶ Date   Time<br>▶ Log                                               | Current Software Version:<br>Current Hardware Version:<br>step 1: select type:<br>step 2: select file: | 1.00.15H Build 182.00 May 21 2018<br>1.1.2<br>Host<br>页波远 未选择文件。 | lipgrade                           |
|                                                                                    |                                                                                                        |                                                                  |                                    |

Figure-27

#### System→ Date/Time:

Clicking "Date/Time", it displays the screen as Figure-28 where to set date and time for the device.

| Encoder Modulat      | or          |                            |                                                |
|----------------------|-------------|----------------------------|------------------------------------------------|
|                      |             |                            | 2018-05-25 16:09:40 <b>[EN   여</b>             |
|                      | DATE   TIME |                            |                                                |
| Summary<br>Monitor   |             |                            | 1970-01-01 00:19:36                            |
| Parameters<br>System |             | Timezone:<br>NTP Server 1: | (GMT) Greenwich Mean Time, Dublin, Edinburgh 👻 |
| Network              |             | NTP Server 2:              |                                                |
| Password             |             | NTP Server 3:              |                                                |
| Configuration        |             | NTP Server 4:              |                                                |
| Firmware             |             | NTP Server 5:              |                                                |
| Date   Time     Log  |             |                            |                                                |
| P LOg                |             |                            | Set Timezone Set NTP Update from browser       |
|                      |             |                            |                                                |
|                      |             |                            |                                                |
|                      |             |                            |                                                |
|                      |             |                            |                                                |
|                      |             |                            |                                                |
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|                      |             |                            |                                                |
|                      |             |                            |                                                |
|                      |             |                            |                                                |

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Figure-28

#### System→ Log:

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Clicking "Log", it displays the log interface as Figure-29 where to check or export the Kernel/System log.

| www.tl           | 2018-05-25 16:09:52 [EN]中                                                                                                                          |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| ~                |                                                                                                                                                    |
| $\mathbb{R}^{2}$ | LOG                                                                                                                                                |
| ADCAST 3         |                                                                                                                                                    |
|                  |                                                                                                                                                    |
| nary             | Log Type: Kernel Log - Auto Refresh: 0 - Export                                                                                                    |
| or               |                                                                                                                                                    |
| neters           | [ 0.000000] Booting Linux on physical CPU 0x0                                                                                                      |
| n                | [ 0.00000] Linux version 3.19.0-xilinx (root@iccalhost.localdomain) (gcc version 4.9.1 (Sourcery CodeBench Lite 2                                  |
|                  | 0.000000 CPU: ARWy7 Processor [413fc090] revision 0 (ARMy7), cr=18c5387d                                                                           |
| ork              | [ 0.000000] CPU: PIPT / VIPT nonallasing data cache, VIPT aliasing instruction cache<br>[ 0.000000] Machine model: xinx.zynq-7000                  |
| vord             | 0.000000 (mai.me.seved 16 Mills at 0x0800000                                                                                                       |
| juration         | 0.000000 Memory policy: Data cache writealloc                                                                                                      |
| are              | 0.0000001 On node 0 totalpages: 65536                                                                                                              |
| Time             | 0.000000) free area init node: node 0, pgdat 40596180, node mem map 4fdf0000                                                                       |
|                  | 0.0000001 Normal zone: 512 pages used for memmap                                                                                                   |
|                  | 0.000000] Normal zone: 0 pages reserved                                                                                                            |
|                  | 0.000000] Normal zone: 65536 pages, LIFO batch:15                                                                                                  |
|                  | [ 0.000000] PERCPU: Embedded 9 pages/cpu @4fdd3000 s8128 r8192 d20544 u36864                                                                       |
|                  | [ 0.000000] pcpu-alloc: s8128 r8192 d20544 u36864 alloc=9*4096                                                                                     |
|                  | [ 0.000000] pcpu-alloc: [0] 0 [0] 1                                                                                                                |
|                  | [ 0.000000] Built 1 zonelists in Zone order, mobility grouping on. Total pages: 65024                                                              |
|                  | <ul> <li>0.000000] Kernel command line: console=ttyPS0,115200 root=/dev/ram rw earlyprintk</li> </ul>                                              |
|                  | [ 0.00000] log_but_len individual max cpu contribution: 131072 bytes                                                                               |
|                  | 0.000000] log_but_len total cpu_extra contributions: 131072 bytes                                                                                  |
|                  | [ 0.00000] log_but_len min size: 131072 bytes                                                                                                      |
|                  | [ 0.000000] log_buf_len: 262144 bytes<br>[ 0.000000] early log buf free: 129664(98%)                                                               |
|                  | 0.000000 early log but ree: 129664(98%)<br>0.0000001 PID hash table entries: 1024 (order: 0, 4096 bytes)                                           |
|                  | 0.000000 Pentry cache hash table entries: 1024 (10ter: 0, 4096 bytes)     0.000000 Pentry cache hash table entries: 32756 (order: 5, 131072 bytes) |
|                  | 0.000000 Inode-cache hash table entries: 16384 (order: 4, 6536 bytes)                                                                              |
|                  | 0.000000) Memory: 225984K/262144K available (3790K kernel code, 219K rwdata, 1488K rodata, 192K init, 291K                                         |
|                  | 0.0000001 Virtual kernel memory layout:                                                                                                            |
|                  | [ 0.000000] vector : 0xfff10000 - 0xfff11000 ( 4 kB)                                                                                               |
|                  | [ 0.000000] fixmap : 0xffc00000 - 0xfff00000 (3072 kB)                                                                                             |
|                  | [ 0.00000] vmalloc : 0x50800000 - 0xff000000 (2792 MB)                                                                                             |
|                  | [ 0.000000] lowmem : 0x40000000 - 0x50000000 (256 MB)                                                                                              |
|                  | [ 0.00000] pkmap : 0x3fe00000 - 0x40000000 ( 2 MB)                                                                                                 |
|                  | [ 0.000000] modules : 0x3f000000 - 0x3fe00000 ( 14 MB)                                                                                             |
|                  | [ 0.000000] .text : 0x40008000 - 0x4052fa98 (5279 kB)                                                                                              |
|                  | F_0.0000001 WH+0v40520000 0v40520000 (400 HD)                                                                                                      |



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# **Chapter 4 Troubleshooting**

THOR'S ISO9001 quality assurance system has been approved by the CQC organization. We guarantee the products' quality, reliability and stability. All THOR products haven passed all testing and manual inspections before they are shipped out. The testing and inspection scheme already covers all the Optical, Electronic and Mechanical criteria which have been published by THOR. To prevent a potential hazard, please strictly follow the operation conditions.

#### **Prevention Measures**

- Installing the device in a place where the environmental temperature is between 0 to 45 °C
- Making sure the unit has plenty of ventilation for the heat-sink on the rear panel; and other heat-sink bores if necessary
- Checking the AC input within the power supply and ensure it is working, the connection is correctly installed before switching on device
- Checking the RF output levels to stay within a tolerable range, if it is necessary
- > Checking all signal cables have been properly connected
- Frequently switching on/off device is prohibited; the interval between every switching on/off must be greater than 10 seconds.

#### Conditions needed to unplug power cord

- Power cord or socket damage.
- Any liquid that got into the device.
- Any stuff that could cause a circuit short
- Device in damp environment
- > Device has suffered from physical damage; i.e. it fell off a rack.
- ➢ Longtime idle.
- > After switching on and restoring to factory setting, device still won't work properly.
- Maintenance needed on device

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H-12HDMI-QAM-IPLL

Chapter 5 Packing List

Thor 12 HDMI HD Encoder-RF Modulator

HDMI cable

Power Cord

For Further Tech Support 1-800-521-Thor(8467) support@thorfiber.com