

12 Channel HDMI or SDI CATV RF Modulator IP Encoder QAM/ATSC/DVB-T/ISDB-T

H-12HDMI-QAM-IPLL



H-12HDMI-QAM-IPLL H-12HDMI-ATSC-IPLL H-12HDMI-DVB-T-IPLL H-12HDMI-ISDB-T-IPLL

H-12SDI-QAM-IPLL



H-12SDI-QAM-IPLL H-12SDI-ATSC-IPLL H-12SDI-DVB-T-IPLL H-12SDI-ISDB-T-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

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.

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



Specifications

	12 HDMI inputs						
Transit	12 CC(closed cap	12 CC(closed caption) input, BNC interface					
Input	1 DVB-C(ATSC	optional) T	uner for re-mux, F type interface				
	512 IP input over	r UDP and F	RTP, DATA1, RJ45				
			1920*1080_60p, 1920*1080_50p,1920*1080_60i,				
		Input	1920*1080_50i, 1280*720_60p, 1280*720_50P,				
			720*480_60i, 720*576_50i				
			1920*1080_60p, 1920*1080_50p,1920*1080_60i,				
			1920*1080_50i, 1440*1080_60i, 1440*1080_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, 320*180 50p,				
Video			320*180 30p, 320*180 25p,				
			960*540 50i, 704*576 50i,704*480 60i, 640*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					
	Rate Control	CBR/VBR					
	GOP Structure	GOP B Frame: 0-3, GOP P Frame: 0-6					
	Advanced						
	Pretreatment	De-interlacing, noise reduction					
		MPEG1 L	ayer II, MPEG2-AAC, MPEG4-AAC,				
	Encoding	Dolby Digital AC3 (2.0) encoding (Optional),					
Audio		AC3 (2.0/	AC3 (2.0/5.1) passthrough				
	Sampling rate	48KHz					
	Bit-rate	64Kbps-32	20kbps each channel				
	Maximum PID	100	1 1				
	Remapping	180 input	per channel				
Multiplexing		PID remap	oping (automatically or manually)				
	Function	Accurate I	PCR adjusting				
		Generate I	PSI/ SI table automatically				
	Maximum						
	simulcrypt CA	4					
Scrambling	Standard	ETR289, I	ETSI 101197, ETSI 103197				
	Connection	Local/rem	ote connection				
		QAM Cha	nnel: 16 non-adjacent carriers output (maximum bandwidth				
Modulation		192MHz)					



		Standard	l: EN300 42	9/ITU-T J.83A/B				
	DVB-C	MER: ≥ 4	40db					
		RF frequ	ency: 50~9	60MHz, 1KHz step				
		RF outpu	ut level: -20	~+10dbm, 0.1db step				
		Symbol	Rate: 5.0Ms	ps~7.0Msps, 1ksps stepping				
				J.83A	J.83B			
		Constella	ation	16/32/64/128/256QAM	64/256 QAM			
		Bandwid	dth	8M	6M			
	RF output (F type	e interface)						
Streem entrot	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 manage	etwork management (WEB)						
System function	English							
	Ethernet software	e upgrade						
	Dimension (W×I	L×H)	482mm×4	40mm×44mm				
Miscellaneous	Environment		0~45℃(w	ork); -20~80°C (Storage)				
	Power requireme	ents	AC 110V:	± 10%, 50/60Hz, AC 220 ± 10	0%, 50/60Hz			

Flow Chart





Appearance and Description

Front and Rear Panel Illustration

RF test RF o	
AC 100V-24 7V 50/60Hz 2	PA HOM7 HOM8 HOM9 PDM10 PDM10 HOM11 PDM11 PDM111 PDM1111 PDM1111 PDM1111 PDM1111 PDM1111 PDM1111 PDM1111 PDM1111 PDM1111 PDM11111 PDM11111 PDM11111 PDM111111 PDM11111111 <thp< td=""></thp<>
0 (
1	RF test and RF out port
2	Power supply and Grounding Pole
3	12 HDMI and 12 CC input port
4	Reset Key
5	LED Indicators
6	ASI output port
7	DATA Port (DATA1 and DATA2 for IP stream input/output, DATA 3 for
	upgrading modules)
8	NMS port for web-based management
9	RF in and Loop out port



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.

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.

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.

Device's Installation Flow Chart Illustrated as following





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.

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.

Login

TH®R

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.



Operation

Summary→Status

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

Encoder Modu	lator	
ast.com	2018-05-25 15:51:58 [EN 中文] [Exit]	
Status Monitor Monitor Monitor Monitor Module 1 Module 2 Module 3 Module 3 Module 4	DEVICE INFORMATION	
Module 5	Software Version: 1.00.15H Build 182.00 May 21 2018	
Module 6	Hardware Version: 1.1.2	
▶ Tuner	Web Version: 10.2	mation
► TS Config		mation
Scrambler	System Version: 3.02.1.63	
Modulator	Product ID: 03544100-000000010-000000000	
► IP Stream	Uptime: 0 Day-00:01:55	
System		
Network	User can click any item here to enter	1
Password		
Configuration	the corresponding interface to check	1
Firmware		
Date Time	information or set the parameters.	
► Log		

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.



Encoder Modul	ator						
www.thorbroadcast.com						2018-05-25 1	5:52:18
	INPUT STAT	US					
Summary		Module	Data1				
Status Monitor		Module Info.(Alarn	n/Active/Total): 0/6/6				
Input Status Output Status		Module	Channel	Status	Channel	Status	Bit(Act/Max)
Parameters		1	Encoder 1	۲	Encoder 2	۲	0.1/0.1 Mbps
System		2	Encoder 1	٠	Encoder 2	•	0.1/0.1 Mbps
		3	Encoder 1	٠	Encoder 2	•	0.1/0.1 Mbps
		4	Encoder 1	۲	Encoder 2	•	0.1/0.1 Mbps
		5	Encoder 1	۲	Encoder 2	۲	37.4/37.4 Mbps
		6	Encoder 1	۲	Encoder 2	٠	0.1/0.1 Mbps
	·			11			,

Figure-3

Data1

Clicking "Input Status → 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.

TH O R 🛃	INPUT S	TATUS					201	0 00 20 10.02.00	
BROADCAST 3 Summary		Module	Data1						
Monitor		Channel Info.(A	larm/Active/Total): 0/	0/0	Total E	Bitrate: 0.0/0.0			
 Input Status Output Status 		Channel	IP Address	Port	Protocol	IGMP	Multicast	Status	Bit(Act/Max)
Parameters Sustem									
System									
	4								
				Figure-	4				



Monitor→Output Status

≻ QAM

Clicking "Output Status→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]
	TPUT STATUS					
ROADCAST	QAM IP					
Status	Channel Info.(Ala	rm/Active/Total): 0/16/16				
Input Status	Channel	Frequency	Constellation	Symbol Rate	Status	Bit(Act/Max)
Output Status	1	195 MHz	256 QAM	5361 Ksps	•	0.0/38.8 Mbps
rameters	2	201 MHz	256 QAM	5361 Ksps	•	0.0/38.8 Mbps
stem	3	207 MHz	256 QAM	5361 Ksps	•	0.0/38.8 Mbps
	4	213 MHz	256 QAM	5361 Ksps		0.0/38.8 Mbps
	5	219 MHz	256 QAM	5361 Ksps	۲	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
	10	005 1411	000 0000	5004 14		0.0000.0.14

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.

Adcast.com	Channel Info.(Ala	nrm/Active/Total): 0/()/0 Port Protoco	Total Bitrate: 0.0/0.0	2018-05-25 Data1 Data2	15:53:35 Status	[EN 中文] [Exit]
Summary Status Monitor Pinput Status Parameters System	Channel Info.(Ala	rm/Active/Total): 0/0	V0 Port Protoco	Total Bitrate: 0.0/0.0	Data1 Data2	Status	Bit(Act/Max)
BROADCAST 5 Summary Status Status Monitor Input Status Output Status Parameters System	QAM IP Channel Info.(Ala Channel I	arm/Active/Total): 0/0)/0 Port Protoco	Total Bitrate: 0.0/0.0	Data1 Data2	Status	Bit(Act/Max)
Status Monitor Input Status Output Status Parameters System	Channel Info.(Ala	arm/Active/Total): 0/0)/0 Port Protoco	Total Bitrate: 0.0/0.0	Data1 Data2	Status	Bit(Act/Max)
Monitor Input Status Output Status Parameters System	Channel Info.(Ala	arm/Active/Total): 0/0)/0 Port Protoco	Total Bitrate: 0.0/0.0	Data1 Data2	Status	Bit(Act/Max)
Output Status Output Status Parameters System	Channel	IP Address	Port Protoco	I Null PKT Filter	Data1 Data2	Status	Bit(Act/Max)
Parameters System							
System							

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→Encoder 1", it displays the information of 1st encoding channel (Figure-7) where users can configure the video and audio encoding parameters.



www.thorbroadcast	HDMI				2018-05-25 15:58:39)[EN 中文]	[Exit]		
BRUADCAST 7 Summary Monitor Parameters	Encoder 1	Encoder 2 Syste	em						
Module 2 Module 3 Module 4 Module 5 Module 6 Tuner TS Config Scrambler Modulator	Video Format: GOP B Frame: Low Delay: DTS Delay: H.264 Profile: H.264 Level:	H 264 2 Normal 200 High Profile Level 4	▼ (<=3) ▼ (0 ~ 255) ▼	Bitrate: GOP P Frame: Aspect Ratio: Manual Resolution: Out Resolution: CC Switch:	12.00 4 Auto 720'576_501 Off	Mbps (0.8 ~ 19) (<=6) •	ш	General settir for the Encodi program: U can edit any ite	ing sei em
IP Stream System Network Password	Format: Gain:	Mpeg2 100	▼ (0-400%)	Bitrate: Dialog Normalization:	128 Kbps -31	▼ (-311)dB		listed as needed	d.
 Configuration Firmware Date Time Log 	Program Program Output Service Provide PMT PID: Video PID:	: IV r: TV-Provider 0x00c9 0x00cb		Service Name: Service Number: PCR PID: Audio PID:	TV-1101 1101 0x00cc 0x00ca		•	Program informat read area	i)
	Stātus Video Lock: Bitrate:	00Mbps		Video Resolution: Rom Ver:	unknown 3.206	¹			
	The li there from	ght will turn is source module.	ាgreen i inputtinរូ	f	Apply		-		

Figure-7

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.



Encoder Modulator		
www.thorbr	2018-05-25 15:59:16 [EN]	中文] [Exit
	номі	_
Summary Monitor	Encoder 1 Encoder 2 System	
Parameters		
Module 1	Module Info.	
Module 2	Software Version: 5.10 Build 1.15 Sep 18 2017-13:52:30 Hardware Version: 0.3	
Module 3	System Version: 0.1 Module ID: 1	
Module 5		
Module 6	TS Out Info.	
▶ Tuner	Output Bitrate: 54,000 Mbps TS ID: 1	
► TS Config		
Scrambler		
Modulator	Bitrate: 0.101/54.000 Mbps	
▶ IP Stream		
System	Apply	
▶ Network		
Password	Configuration	
Configuration	Paula Destara Estat	
Firmware	Save Restore Factory Set	
Date Time		
► Log	When you change the parameter, you shoud save configuration ,otherwise the new configuration will lost after reboot.	
	Save config	
1	m	

Figure-8

Parameters → **Tuner**:

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



Encoder Modulator						
www.thorbroadcast.com					2018-05-25 16:00:54 [E	N 中文] [Exit]
THÍP 7	TUNER CO					
2	TONER CO	NFIGURATION				
BRUADCAST 7						
Summary	#	Tuner	TS Lock	Signal	Param	Action
Monitor						
Parameters			0.000 Mbps	Quality: 0%		
Module 1	1	AISCI	0.000 mppa	Strength: 0%	Frequency: 750.000 M	Edit
Module 2						
Module 3	,					
Module 4		CH 1 Config			× 🔶	
Module 5						
Module 6						
► TS Config		_				
Scrambler		F	requency: 750.000	MHZ		
Modulator						
► IP Stream						
- II Odcam				Ar	oply Close	
System						
▶ Network	,					
Password						
Configuration						
▶ Firmware						
▶ Date Time						
► Log						
٠				III		+

Figure-9

Parameters → **TS** Config:

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

> TS Config \rightarrow Output TS X:

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



BROADCAST 3 Summary Monitor		Output TS 1 -	Stream Select	General PID	Bypass Eve	ent Rating Region	
Parameters > Module 1 > Module 2 > Module 3 > Module 4 > Module 5 > Module 6 > Tuner > Transfer > Module 1 > Module 6 > Tuner > Scambler > Modulator > IP Stream System > Network > Password > Configuration > Tirme	Image: Loss = Image: Loss = <t< th=""><th>Output TS 1 Output TS 2 Output TS 3 Output TS 4 Output TS 5 Output TS 6 Output TS 6 Output TS 7 Output TS 8 Output TS 9 Output TS 10 Output TS 11 Output TS 13 Output TS 14 Output TS 15 Output TS 14</th><th></th><th>[0.1/0.1M] [0.1/0.1M] [0.1/0.1M] [37.6/37.6M] [0.1/0.1M] [0.0/0.0M]</th><th>CA Filter FID Remap Refresh Input Refresh Output</th><th>Normal</th><th>[0.0/38</th></t<>	Output TS 1 Output TS 2 Output TS 3 Output TS 4 Output TS 5 Output TS 6 Output TS 6 Output TS 7 Output TS 8 Output TS 9 Output TS 10 Output TS 11 Output TS 13 Output TS 14 Output TS 15 Output TS 14		[0.1/0.1M] [0.1/0.1M] [0.1/0.1M] [37.6/37.6M] [0.1/0.1M] [0.0/0.0M]	CA Filter FID Remap Refresh Input Refresh Output	Normal	[0.0/38
	Parse prog	ram time out: (50 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)

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 time out 60 seconds time limitation of parsing input programs

Program Modification:

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



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)
PMT PID:	0x0020	
PCR PID:	0x0021	
MPEG-4 Video PID:	0x0022	
MPEG-1 Audio PID:	0x0023	



➤ TS Config→General:

Clicking "General", it displays the interface where users can set stream output

Encoder Modulator 2018-05-25 16:02:46 [EN | 中文1 [Exit] TH**Q**R 🗧 TS CONFIG BROADCAST Output TS 1 -Stream Select General PID Bypass Event Rating Region Stream Module 1 Module 2 Output Mode: Mux out 👻 PAT Insert: 7 Module 3 BAT Insert: V Module 4 SDT Insert: V Module 1 CAT Insert: 5 Share BAT: Module 6 PMT Insert: V TS ID: ON ID: PCR Correct V ► TS Config 1 • PCR Speed BW PCR State BW Scramb Modulato NIT ► IP Stream NIT Insert: Not insert • Network VCT ▶ Password Modulation Mode: 4 VCT Mode: TVCT VCT Insert: ["" TDT/TOT TDT/TOT Insert: V TOT Descriptor Insert: disable IPTV Sync(SPTS) IPTV Sync: Sync Period: 300 50

information, NIT insert/VCT insert and other information. (Figure-13)

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"



Encoder Modulator					
broadcast.com				2018-05-2	25 16:03:12 [EN 中文] [Ex
TUMD 2					
INSRZ	TS CONFIG				
BROADCAST					
Summary					
Monitor	Output TS	I → Stream Select Gener	al PID Bypass Event	Rating Region	
Parameters					
	Index Innut	Channel Janut DID(0u) Output	DID(0)		
Module 2	index input	Channel input Pib(0x) Output			
Module 3			W		
Module 4					
Module 5				Pot Dol All	
Module 6				Set	
▶ Tuner					
► TS Config					
▶ Scrambler					
Modulator					
► IP Stream					
System					
▶ Network					
Password					
Configuration					
► Firmware					
Date Time					
▶ Log					

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.

	TS CONFIG								
Summary Monitor		Output TS 1 -	Stream	Select General	PID Bypass	Event	Rating Region		
Module 1 Module 2 Module 3	Selec	t Prg.:	1:TV-1101		Selec	ct the	programs	which are mu	ltiple
Module 4 Module 5 Module 6		Event ID	Start Tin	ne Duration(sec)	Title				
Tuner TS Config Scrambler Modulator		Configura	tion				[close]		
▶ IP Stream System		s	Event ID: tart Time:	0x0001 2018/05/25-16:04:12					
Network Password Configuration		Dura	tion(sec): Title:	3600					
Firmware Date Time Log		1 Dimen	sion Name Audience	Value • None		+ •			
						Set	Del-All		
			,	Figure-15					

> Rating Region:

TH 🔁 R

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							2018-05-25	16:03:49 [EN 中文] [Exit]	
H Q R 2	TS CONFIG								
BRDADCAST 7 ummary									
lonitor		Output TS 1 - Stream Selec	t General P	D Bypass	Event Ratin	ng Regi	on		
arameters		-							
Module 1	1 de	Dimension Name	Graduated	cale Rating Nu	m /				_
Module 3	1	EntireAudience	1	6		Cor	nfiguration		
Module 4	2	Dialogue	0	2	1 1		12 N 12		
Module 5	3	Language	0	2	1 1		Region Name	U.S.(50 States+Possessions)	
Module 6	4	Sex	0	2	1	D	imension Name	EntireAudience	
Tuner	5	Violence	0	2	1	G	sraduated Scale	1	
TS Config	6	Children	1	3	1 1	Index	Abbrev	Value	+
Modulator	7	FantasyViolence	0	2	1 1	1			
IP Stream	8	MPAA	1	9		2	None	None	
in ouroant	I I I I I I I I I I I I I I I I I I I					3	TV-G	TV-G	
iystem						4	TV-PG	TV-PG	
▶ Network	Configuration			[close]		5	TV-14	TV-14	
Password						<u>е</u>	12-1025	1 Y MPS	
Configuration	Region Name:	U.S.(50 States+Possessions)							
Firmware	Dimension Name					-			548
Date Time	Oraduated Scale:	0							
▶ Log	Graduated Scale.	U	•						
	Index Abbrev Val	ue	+						
	1								
			Set	Del-All					

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.

"H ere r 2	PROGRAM SCRAMBLE			2018-05-25 16:0	5:07 [EN 中又]
BROADCAST 3 ummary Ionitor	SCT CH 1 CAS 1 CAS 2	CAS 3 CA	S 4		
Ardintelers Module 1 Module 2 Module 3 Module 3 Module 5 Module 6 T Grant S Crantiper Modula 6 S Crantiper Modulator P Stream ystem Network P Sasword Configuration F Imware Date Time Log	Program select (0/2) Sor CH 1 ⊕ 1: ☑ TV-1101 Sor CH 2 ⊕ 2: ☑ TV-1201 Sor CH 3 Sor CH 4 Sor CH 5 Sor CH 6 Sor CH 6 Sor CH 7 Sor CH 8 Sor CH 9 Sor CH 10 Sor CH 10 Sor CH 12 Sor CH 13 Sor CH 13 Sor CH 14 Sor CH 15	All prg. C	CAS Enable C ECMG IP Address: ECMG IP Address: ECMG HD: ECM AHEAD: Stream Share AC: EMM PID: EMMG Port: EMMG Mode: Super CAS ID: Protocol Version: Scrambler IP Address: Pmt Private: Cas Private:	ECMG EMMIG 192 166.3.101 3001 1 8000 ms 0.1111 2001 TCP • 0x70020001 2 • 1192.168.3.136 0x00000000 0x00000000	
	SET CH 10		Current Period:	0 C Table Set CAS	

Figure-17

Parameters → **Modulator:**

TH 🔁 R

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

							2010-00-2010	LOCIO [EN]	+X][[[]]]
HYRZ	MODULATOR								
BRUADCAST 7	Center Fre	quency: 240.000 MH	łz	Standard: J	.83B				
Aonitor	Level(All C	arriers): -1.0 dBm		Channel In	fo.(Alarm/Active	(Total): 0/16	/16		
arameters	#	Frequency	Constellation	Symbol Rate	Gain Offset	Status	Bit(Act/Max)		
Module 1									Quickly Config
Module 2	1	195.000 MHz	256 QAM	5361 Ksps	0.0 dB	۲	0.0/38.8 M	1	
Module 3	2	201.000 MHz	256 QAM	5361 Ksps	0.0 dB		0.0/38.8 M	1	
Module 4									
Module 5	3	207.000 MHz	256 QAM	5361 Ksps	0.0 dB	•	0.0/38.8 M	1	
Tuner	4	213.000 MHz	256 QAM	5361 Ksps	0.0 dB		0.0/38.8 M	1	
► TS Config		010 000 181-	050.0411	5004 1/1-1	0.0.10		07.000.011		Channel Confi
Scrambler	5	219.000 MHz	256 QAM	5361 Ksps	0.0 dB	•	37.3/38.8 M	1	
▶ Modulator	6	225.000 MHz	256 QAM	5361 Ksps	0.0 dB		0.0/38.8 M	1	
► IP Stream	7	231.000 MHz	256 QAM	5361 Ksps	0.0 dB		0.0/38.8 M	1	
System	8	237 000 MHz	256 QAM	5361 Ksps	0.0 dB		0.0/38.8 M	1	
▶ Network		Lor.ooo mile	200 00 00	0001110000	0.0 0.0	-	0.0/00.0 11	2	
▶ Password	9	243.000 MHz	256 QAM	5361 Ksps	0.0 dB	۲	0.0/38.8 M	1	
Configuration	10	249 000 MHz	256 QAM	5361 Ksps	0.0 dB		0.0/38.8 M	1	
Date Time									
► Log	11	255.000 MHz	256 QAM	5361 Ksps	0.0 dB	۲	0.0/38.8 M	1	
5	12	261.000 MHz	256 QAM	5361 Ksps	0.0 dB	•	0.0/38.8 M	1	
	13	267.000 MHz	256 QAM	5361 Ksps	0.0 dB		0.0/38.8 M	1	
	14	273.000 MHz	256 QAM	5361 Ksps	0.0 dB		0.0/38.8 M	1	
	15	279.000 MHz	256 QAM	5361 Ksps	0.0 dB		0.0/38.8 M	2	
	16	285.000 MHz	256 QAM	5361 Ksps	0.0 dB		0.0/38.8 M	1	
								L	



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:	V	
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)



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:		
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).



IP STREAM										
	#	IP Address	Port	Protocol	Pkt Length	Null PKT Filter	Status	Bit(Act/Max)	2 🕂	Quickly Conf
	1	224.2.2.2	2001	UDP	7		۲	0.0/38.8 M	77	
	2	224.2.2.2	2002	UDP	7		۲	0.0/38.8 M	1	
	3	224.2.2.2	2003	UDP	7			0.0/38.8 M	/	
	4	224 2 2 2	2004	LIDP	7			0.0/38.8 M	1	
	-	224.2.2.2	2005	UDD	7			27 2/20 0 M		
	5	224.2.2.2	2005		-		-	37.3/30.0 W		
	6	224.2.2.2	2006	UDP	/			0.0/38.8 M		Channel Car
	7	224.2.2.2	2007	UDP	7		•	0.0/38.8 M		 Channel Con
	8	224.2.2.2	2008	UDP	7		۲	0.0/38.8 M		
	9	224.2.2.2	2009	UDP	7		۲	0.0/38.8 M	2	
	10	224.2.2.2	2010	UDP	7		۲	0.0/38.8 M	2	
	11	224.2.2.2	2011	UDP	7		۲	0.0/38.8 M	1	
	12	224.2.2.2	2012	UDP	7		۲	0.0/38.8 M	2	
	13	1 2	3	UDP	7			0.0/38.8 M	/	
	14	4	1	UDP	7			0 0/38 8 M	/	
	15	6	-	UDP	7			0.0/29.9.M	-	
	10	- 8	_				-	0.0/30.0 M		
	16	10	2	UDP	/			0.0/38.8 M	~	
		12								
		3 4 5 6 7 8 9 10 11 11 12 13 14 15 16	3 224 222 4 224 222 5 224 222 6 224 222 7 224 222 8 224 222 9 224 222 10 224 222 11 224 222 12 224 222 13 2 3 14 5 6 7 15 6 7 16 8 10 11 12	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	1 1	3 224 222 2003 UOP 7 Image: Control of the control



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.

Channel 1 Config.		[close
IP Address:	224.2.2.2	
Port:	2001	
Protocol:	UDP -	
Pkt Length:	7 -	
Null PKT Filter:		
TS Output:	DATA2	
		Apply Close



System → Network:

Tel: (800) 521-8467

Email: sales@thorfiber.com

https://thorbroadcast.com



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

Encoder Modulato	pr		
www.thorbroadca		2018-05-25 16:08:53 [EN 中文	(] [8
	NETWORK		
Summary	NMS		
Monitor	IB Addres	100 100 100	
System	Subnet Mas	255 255 255 0	
▶ Network	Gatewa	: 192 168 0 1	
▶ Password	Web Manage Por	80	
Configuration	MAC Addres	: 20:18:04:24:17:30	
Firmware Date Time			
Log		Apply	
	Scrambler		
	IP Addres	192.168.3.136	
	Subnet Mas	: 255.255.255.0	
	Gatewa	192.168.3.1	
		Apply	
	DATA-1		
	IP Addres	192.168.2.136	
	Subnet Mas	: 255.255.255.0	
	Gatewa	192.168.2.1	
	MAC Addres	: 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.

www.th	2018-05-25 16:09:03 [EN]中	文]
BROADCAST	PASSWORD	
Summary Monitor Parameters System	Modify the login name and password to make the device safely. If forget the name or password you can reset it by keyboard The default login name and password is "admin" Also please note the capital character and lowercase character.	
Network Password Configuration	Current UserName: admin	
 Firmware Date Time 	New UserName:	
► Log	New Password:	
	Apply	

Figure-25

System → Configuration:

Tel:

THOR

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	[[Exit]
PROADCACT 2	CONFIGURATION	
Summary		
Monitor	Save Restore Factory Set Backup Load	
Parameters		
System		
▶ Network	When you change the parameter, you shoud save configuration ,otherwise the new configuration will lost after reheat	
Password	TEDUL.	
Configuration		
Pare LTime		
► Log	Save config	
44M.doe* - WPS 文字		
44M.doc*-WPS 文字		
44M.doc* - WPS 文字	Figure-26	
44M.doc* - WP5 文字	Figure-26	
44M.doc* - WPS 文字	Figure-26	
44M.doc* - WPS 文字	Figure-26	
44M.doc*-WPS文字	Figure-26	



System → Firmware:

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

pr.
2018-05-25 16:09:30 [EN 中文] [Exit
 Warning: 1. Upgrade firmware(software and hardware) to get new function, please choose the right firmware to upgrade. If you use a wrong file, the device may not work. 2. Upgrade will keep a long time please do not turn off the power, otherwise the device will not work. 3. After upgrade you must reboot device manually.
Current Software Version: 1.00 15H Build 182.00 May 21 2018 Current Hardware Version: 1.1.2 step 1: select type: Host step 2: select file: jjjg在,,来选择文件。
Upgrade

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 Modulate	or			
	DATE TIME		2018-05-25 16:09:40 [EN 	又][Exit]
		Timezone: NTP Server 1: NTP Server 2: NTP Server 3: NTP Server 5:	1970-01-01 00:19:36 (GMT) Greenwich Mean Time, Dublin, Edinburg⊁ ▼	
► Date Time ► Log			Sel Timezone Sel NTP Updale from browser	

Figure-28

System→ Log:

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

Encoder Modulator	
www.fl	2018-05-25 16:00-52 FENT (#文) FEN
VF VF VF.U	
THORR Z	LOG
Summary	Ing Type: Kemel Ing + Auto Refeesh 0 + Event
Monitor	Leg types to the tensor of tensor of the tensor of
Parameters	0.000000J Booing Linux on physical CPU 0x0
System	0.000000 Linto Vestion 5. Is ownink (Congristicalitoticationian) (Vestion 4.3.1 (Source) Codebenci Lite 2 0.000001 CPU: ARM/Y Processor (Laterophic evision 0.4RM/Y) createrostard
Network	0.000000 CPU: PIPT / VIPT nonaliasing data cache. VIPT aliasing instruction cache
Password	0.000000] Machine model: xinx.zynq-7000
Configuration	[0.000000] cma: Reserved 16 MiB at 0x0d800000
Firmware	[0.00000] Memory policy: Data cache writealloc
Date LTime	[0.000000] On node 0 totalpages: 65536
blan	[0.000000] free_area_init_node: node 0, pgdat 40596180, node_mem_map 4fdf00000
P LOg	[0.000000] Normal zone: 512 pages used for memmap
	[0.000000] Normal zone: 0 pages reserved
	0.000000] Normal zone: 65336 pages, LIFO batch 15
	0.000000] PERCPU: Embedded 9 pages/cpu @4tdd3000 s8128 r8192 d20544 u36864
	[0.000000] pcpL=alloc: ss128 rs192 d20544 u36864 alloc=9*4096
	[0.000000] ptpt-alloc. [0] 0 [0] 1 [0.000000] ptpt-alloc. [0] 0 [0] 1
	C.000000 Bit in 2 Direkts in 2 Direkter indomy grouping Vii. Total pages. 80224 C.0.000001 Kin radiomad line: conselectiveS0 115200 const-idevicam pre extructiveK
	0.000000 reflected initial maximum consideration and the company of the comp
	0.000000 log buf len total cou extra contributions: 13/072 bytes
	0.0000001 log buf len min size: 131072 bytes
	0.000000] log buf len: 262144 bytes
	0.000000] early log buf free: 129664(98%)
	0.000000] PID hash table entries: 1024 (order: 0, 4096 bytes)
	 [0.000000] Dentry cache hash table entries: 32768 (order: 5, 131072 bytes)
	 [0.000000] Inode-cache hash table entries: 16384 (order: 4, 65536 bytes)
	[0.000000] Memory: 225984K/252144K available (3790K kernel code, 219K rwdata, 1488K rodata, 192K init, 291K
	[0.000000] Virtual kernel memory layout:
	[0.00000] vector : 0xffff0000 - 0xffff1000 (4 kB)
	[0.00000] txmap : 0xffc00000 - 0xfff00000 (3072 KB)
	0.000000] vmalic: 0x508000000 - 0xf0000000 (2/92 Mb)
	0.0000001 IoWmmm: 0x400000000 (256 MB)
	[0.00000] pkmap .0x3e00000 - 0x4000000 (2 MB)
	[0.000000] INOURIES. 0.31000000 - 0.31000000 (14 mB)





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



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

Tel: (800) 521-8467