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Thor Fiber 2016

# A Note from Thor Broadcast about this Manual

### **Intended Audience**

This user manual has been written to help people who have to use, 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 Product Overview**

## 1.1 Outline

The Thor Broadcast new Edge QAM Modulator is a new 1 RU chassis headend in a box that will ingest IP feeds and convert to a QAM channel lineup of your choosing. The latest gen unit has an inclusive chassis that no longer uses blades but does all necessary functioning preloaded to successfully convert IP streams to 16 (or 32- model dependent) QAM channels to create your own efficient IPTV headend into an RF headend. This powerhouse will scramble, multiplex, and modulate up to 16 or 32 channels that supports a maximum 1024 IP TS streams through the 2 GE ports and output 16 or 32 non-adjacent carriers (50MHz~960MHz) via the single RF output interface on the rear of the unit. High performance encoding means you can now distribute countless channels into the bandwidth of 16 QAM carriers.

## **1.2 Key Features**

- ✤ 2 GE input, SFP interface
- Supports up to 1024 channels TS over UDP/RTP, unicast and multicast, IGMP v2\v3
- Max 840Mbps for each GE input
- Accurate PCR adjusting
- CA PID filtering, remapping and PSI/SI editing
- Up to 180 PIDS remapping per channel
- DVB general scrambling system (ETR289), simulcrypt standards ETSI 101 197 and ETSI 103 197
- 16 multiplexed or scrambled TS over UDP/RTP/RTSP output
- ✤ 16 non-adjacent QAM carriers output, compliant to DVB-C (EN 300 429) and ITU-T J.83 A/B
- \* RS (204,188) encoding
- NMS Web-based Network management



**1.4 Carrier Setting Illustration** 



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# **1.5 Specifications**

	Input	512×2 IP input, 2 100/1000M Ethernet Port (SFP)				
Input	Transport Protocol Transport Protocol V2/V3					
	Transmission Rate	Max 840Mbps for each GE input				
	Input Channel	1024				
	Output Channel	16				
Mux	Max PIDs	180 per channel				
IVIUX		PID remapping(auto/manually optional)				
	Functions	PCR accurate adjusting				
		PSI/SI table automatically generating				
e 11:	Max simulscrypt CA	4				
Scrambling	Scramble Standard	ETR289, ETSI 101 197, ETSI 103 197				
Parameters	Connection	Local/remote connection				
	QAM Channel	16 non-adjacent carriers				
	Modulation Standard	EN300 429/ITU-T J.83A/B				
Parameters	Symbol Rate	5.0~7.0Msps, 1ksps stepping				
	Constellation	16, 32, 64, 128, 256QAM				
	FEC	RS (204, 188)				
	Interface	1 F-type output port for 16 carriers, $75\Omega$				
	RF Range	50~960MHz, 1kHz stepping				
<b>RF Output</b>	Output Level	-20dBm~+10dBm(87~117dbµV), 0.1dB stepping				
	MER	≥ 40dB				
	ACLR	-60 dBc				
TS output	16 IP output over UDP/	RTP/RTSP, unicast/multicast, 2 100/1000M Ethernet				
15 Output	Ports					
System	Network management	software (NMS)				
	Demission	420mm×440mm×44.5mm (WxLxH) – 1RU				
	Weight	3kg				
General	Temperature	0~45°C(operation), -20~80°C(storage)				
General	Power Supply	AC 100V±10%, 50/60Hz or AC 220V±10%, 50/60Hz				
	Consumption	15.4W				

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# **Chapter 2 - Appearance**

## 2.1 Frontal View:



## 2.2 Rear Panel Illustration:



1	NMS/CAS: network management port and CA data port
2	RF output port
3	Reset IP: Reset webmaster IP address, recover to default IP address
4	Link/Act Indicators
5	Data Input/Output 1/2 (SFP)
6	Power switch
7	AC Power Socket
8	Ground



## **Chapter 3 Installation Guide**

## 3.1 In the Box

When you open the Thor Edge QAM powerhouse, please check all items according to packing list. Normally it should include the following items:

- ➢ H-IPRF-16/32QAM
- User's Manual
- Power Cord

If any item is missing with the list above, please contact Thor Broadcast – 1-800-521-8467

## **3.2 Installation Preparation**

The main steps of the installation include:

- > Checking the possible device for missing pieces or damage from transport
- > Preparing relevant environment/rack for installation
- Installing the IP to QAM Modulator
- Connecting signal cables
- Connecting communication port (if it is necessary) ; (it is necessary <sup>©</sup>)

## 3.2.1 Device's Installation Flow Chart Illustrated as follows:





## **3.2.2 Environment**

ltem	Requirement
Machine Hall Space	When installing unit on rack, 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, HVAC 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
Fire Protection	Fire alarm system and extinguisher
Power	Device power, HVAC and lighting should be independent to each other. Device power requires AC 110V±10%, 50/60Hz or AC 220V±10%, 50/60Hz. Please carefully check before running.



## 3.2.3 Grounding

- ✓ 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.
- $\checkmark$  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 4 Web NMS Management**

This is literally how you control the device; there is no front interface with D-Pad

### 4.1 Login

The factory default IP address is 192.168.0.136 and users can connect the device and web NMS through this IP address.

Connect the PC (Personal Computer) and the device with a net cable, and use ping command to confirm they are on the same network segment. For instance, the PC IP address is 192.168.99.252, we then change the device IP to 192.168.99.xxx (xxx can be 0 to 255 except 252 to avoid IP conflict). Launch the web browser an input the device 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.

H-IPRF-QAM-16	СН		
elcome to use Web Manager			2017-03-02 14:18:28 [Exit]
Summary  Status  Parameters  TS Config	DEVICE INFORMATION		
Modulator IP Stream  System Network Password Configuration		BROADCAST	
Firmware	System Information		
	Software Version:	8.41.30NE Build 200.00 Feb 20 2017	
	Hardware Version:	0.140.0.0	
	Web Version:	1.11	
	System Version:	1.10.1.50	
	Product ID:	0d031601-00000010-000000000000000000000000	
	Serial Number:		
	Manufacturing Date:		
	Uptime:	1 Day-23:13:01	
		Figure-I	

This is the front splash screen with details on your unit – Status & Summary



## 4.2 Operation

## 4.2.1 Summary

When we confirm the login, it displays the summary interface as Figure-2.

elcome to use Web Manag				20
Summary ▶ Status	DEVICE INFORMATION			
Parameters	Quatam Information	7		
► TS Config	System mornation			
▶ Scrambler		Software Version:	1.11 Build 200.00 Jun 4 2016	
► Modulator		Hardware Version:	0.90.0.0	
► IP Stream		Web Version:	1.10	
System		System Version:	1.10.1.50	
▶ Network		Product ID:	0d031600-00000010-0000000-00000000	
▶ Password		Uptime:	0 Day-01:17:32	
► Configuration				
► Firmware				
- Log				
Click any item he	are to enter the			
click any rechnic	the to enter the			
corresponding ir	nterface to			
check informatic	on or set the			
parameters.				

Figure-2

## 4.2.2 Parameters

#### Parameters $\rightarrow$ TS Config:

Click "TS Config", it displays the interface where users can configure the output TS parameters in this interface. (Figure-3)



Figure-3

### > Output TS X

From the menu on top of the webpage, click "Output TS X", it'll display the interface as in Figure-4. Select the output TS channels.

Summary TS CONFIG	
Parameters         Output           ▶ 175 Config         > Grapher           > Modulator         > Output           > IP Stream         Output           System         Output           > Network         Output           > Configuration         Output           > Configuration         Output           > Log         Output	tput TS 1- Stream Select General PID Bypass  to select output TS channel 1-16  rog: 6/7)  [34.7/50.0M]  CA Filter  PID Remap Retex houd Retex

#### > Stream Select

From the menu on top of the webpage, click "Stream Select", it displays the interface where you can choose the programs to Mux. (Figure-5)

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TH <b>@</b> R	H-IPRF-1	6QA
welcome to us		2016-06
Summary > Status	TS CONFIG	
Parameters TS Config	Output TS 1+ Stream Select General PID Bypass	
Scrambler     Modulator     IP Stream		
System ► Network ► Password ► Configuration ► Firmware ► Log	■ IORE       IORE <td>32.7/38.0M]</td>	32.7/38.0M]
	Input Area Output Area	
	Parse program time out: 60 seconds	
	Figure-5	
nfigure 'Input Area' a	nd 'Output Area' with buttons in 'Operation Area'. Instruction	ons ai
CA Filter : Enable/disal	ble the CA Filter function. By clicking the box, you can filter	the ir
oid disturbing the dev	vices scrambling function.	
<sup>PID Remap</sup> : To enable/dis	sable the PID remapping	
Refresh Input Refresh the	input program information	
effect Output Rofroch the	output program information	
Select one	input program first and click this button to transfer the sele	ected
ne right box to output.		
You can can	cel the multiplexed programs from the right box.	
All Input To select all	the input programs	
All Output To select all	I the output programs	
arse program To parse pro	ograms fime out seconds time limitation of parsing input programs	ams

#### Program Modification:

The multiplexed program information can be modified by clicking the program in the 'output' area. For example, when clicking<sup>1cctv2<</sup>, it triggers a dialog box (Figure 6) where you can input new information.

TH <sup>®</sup> R				H-IPRF-16QAM
	Program Information		[close]	
	Program From Input:	CH1_GE1_224.2.2	2.2:1234 [302]	
	Service Name:	CCTV 2	_	
	Program Number:	101		
	Service Type:	0x01		
	Service Provider:	CCTV		
	PMT Descriptor Tag:	0x00		
	PMT Descriptor Data:		(Hex)	
	PMT PID:	0x0020		
	PCR PID:	0x0021		
	MPEG-2 Video PID:	0x0022		
	MPEG-2 Audio PID:	0x0023		
			Apply Close	
	Fi	igure 6		

## > General

From the menu on the top of the webpage, click "General", it displays the interface where you can set parameters for each output channel. (Figure-7)

welcome						2016
Summary	CONFIG					
► Status						
► TS Config	Output TS 1- St	tream Select General	PID Bypass			
Modulator	Stream					
► IP Stream	Output Mode: Mu	ry out	PAT Insort			
System	SDT Insert:	N OUL	BAT Insert:			
▶ Network	Share BAT:		CAT Insert:	V		
Password     Configuration	PMT Insert:		TDT Insert:	V		
► Firmware	TOT Insert:		TS ID:	1		
► Log	ON ID: 1		PCR Correct	V		
	PCR Speed BW 0	•	PCR State BW	0	•	
	NIT					
	NIT Insert:		Private Data:	☑ 0×00000000		
	Network ID: 1		Network Name:	network-1		
	Version Mode: Aut	tomatic 👻	Version Number:	0	(0-31)	
	Index TS ID	ON ID Frequency	Constellation	Symbol Rate	+ 🏛	
	VOT					
	VCT Insert:		Modulation Mode:	4		
						Apply
						•
						Add description
		Figure-7				
		U				
	Add				· •	
Click 🚞 and then click	to apply	the modifie	ed param	eters.(F	igure-8)	
	NIT Descriptor			[ close	1	
	יסו פד.	1				
	1510.					
	ON ID:	1				
	Frequency:	450.000	MHz			
	Constallation	16 OAM	~			
	Constellation:	TO GAM				
	Symbol Rate:	6875	Ksps			
	FEC Inner:	1/2 conv.	*			
	r Eo miller.					
	FEC Outer:	not outer FEC	*			
			A	ld Close		
				10 01038		
or Fiber 2016 Tel· (200) 5	21-8467 F	mail: sales@tho	rfiber com		http://www	w thorbroadcast (
51 HSCI 2010 ICI. (000) 5	210-70/ LI	man. saics@th0				w.thorbroaddat.t
oor Fiber 2016 Tel: (800) 5	21-8467 E	mail: sales@tho	orfiber.com		http://ww	w.thorbroadca



Figure-8

### > PID Pass

From the menu on the top of the webpage, click "PID Pass", to display the interface where to add the PIDs which need pass through. (Figure-9)

welcoi		20
Summany		
Parameters	CONFIG	
► TS Config		
► Scrambler	Output TS 1 - Stream Select General PID Rypass	
Modulator		
- in Suballi	Index Input Channel Input PID@x) Output PID@y)	
System		
Network		
Configuration		
► Firmware		Set De-All
► Log		

Figure-9

### Parameters → Scrambler:

From the menu on left side of the webpage, clicking "Scrambler", it displays the interface where users can choose the programs to scramble. (Figure-10)

Immary       Scramble channe         irameters       Immary         'Scrambler       Scrambler         Modulator       Immary         'Pstream       Ser CH 2- Imstream         'Pterm       Ser CH 2- Imsterm         'Pterm	All proj CAS 3 CAS 4 All proj CAS Enable C ECMG P Address: 192.16 ECMG P Address: 192.16 ECMG CH ID: 1 Stream Share AC: 0 EMMG Port: 500 CHMG Port: 500 CHMG Port: 500 Protocol Version: 2 IP Address: 192.16 Cypto. Period: 5 Current Period: 0 Stef Program AC Table	CA channel select  CA channel se
---	--	--

Figure-10

#### Parameters $\rightarrow$ Modulator:

From the menu on left side of the webpage, click 'Modulator', it will display the interface as shown

in Figure-11 where to set RF output parameters.

arameters       Center Frequency:       Standard:       J334(DVB-C)       Click to standard:       Click to standar:       Click to standar:       Cli	Status									
TS Config       Channel Info.(Alarm/Active/Total): 0/16/16       Click to state       Click to sta	arameters	Center Freque	ency: 710.000 MHz		Standard: J.	B3A(DVB-C)				
Scramber       Channel       Frequency       Constellation       Symbol Rate       Gain offset       Status       Bit(Act/Max)       Channel       Channel         1       650.000 MHz       64 QAM       6875 Ksps       0.0 dB       3.4.7/38.0 M       2       QAM OU         2       658.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       QAM OU         3       666.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       paramet         Configuration       Firmware       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       paramet         10       674.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       paramet         10g       662.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       Click tog         10g       70       698.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       Channel         11       730.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       Channel         11       730.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M	TS Config	Level(All Carr	iers): 0.0 dBm		Channel Info	.(Alarm/Active/To	otal): 0/16/16			Click to set a
Modulator       Pisteam       1       650 000 MHz       64 QAM       6875 Ksps       0.0 dB       9.34.738 0.M       2       QAMI out         2       658 000 MHz       64 QAM       6875 Ksps       0.0 dB       9.0738.0 M       2       paramet         3       666 000 MHz       64 QAM       6875 Ksps       0.0 dB       9.0738.0 M       2       paramet         4       674 000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       paramet         5       682 000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       paramet         10       674 000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       Click to stress         10       7       698 000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       Channel         9       714 000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       Channel         9       714 000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       Channel         10       722 000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       Chann	Scrambler	Channel	Frequency	Constellation	Symbol Pate	Gain offect	Status	Bit(Act/Max)		chonnole DE
1       650 000 MHz       647 G Ksps       0.0 dB       3.4733 0.00       2       OQAM output         2       658 000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       paramet         3       666 000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       paramet         2       658 000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       paramet         2       658 000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       paramet         2       668 000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       Click to st         2       68 000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       Click to st         7       698 000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       Click to st         9       714.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0 <td< td=""><td>P Stream</td><td>Chamer</td><td>Frequency</td><td>constellation</td><td>Symbol Rate</td><td>Gamonset</td><td>Status</td><td>Bit(Acomax)</td><td> <u>-</u></td><td>channels Kr</td></td<>	P Stream	Chamer	Frequency	constellation	Symbol Rate	Gamonset	Status	Bit(Acomax)	<u>-</u>	channels Kr
2       658.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0M       Paramet         3       666.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0M       Paramet         2       658.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0M       Paramet         3       666.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0M       Paramet         2       68       0.001 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0M       Paramet         2       68       690.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0M       Paramet         10       7       698.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0M       Paramet         10       722.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0M       Paramet         11       730.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0M       Paramet         11       730.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0M       Paramet         11       730.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0M       Paramet <td>4</td> <td>1</td> <td>650.000 MHz</td> <td>64 QAM</td> <td>6875 Ksps</td> <td>0.0 dB</td> <td>•</td> <td>34.7/38.0 M</td> <td></td> <td>OAM outpu</td>	4	1	650.000 MHz	64 QAM	6875 Ksps	0.0 dB	•	34.7/38.0 M		OAM outpu
3       666 000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       parametric         20nfguration       4       674.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       Click to state         5       682.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.038.0 M       2       Click to state       Click to state       2       2       Click to state       2 <t< td=""><td>stem</td><td>2</td><td>658.000 MHz</td><td>64 QAM</td><td>6875 Ksps</td><td>0.0 dB</td><td>۲</td><td>0.0/38.0 M</td><td></td><td>Q in outpu</td></t<>	stem	2	658.000 MHz	64 QAM	6875 Ksps	0.0 dB	۲	0.0/38.0 M		Q in outpu
4       674 000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       Click to stand         10       680.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       Click to stand         10       77       688.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       Click to stand         11       776.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       0utput         11       722.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       1         12       738.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       1         13       74.6000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       1         13       74.6000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       1         13       74.6000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       1         14       754.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       1	Network	3	666.000 MHz	64 QAM	6875 Ksps	0.0 dB	•	0.0/38.0 M	i	parameters
immare       0 <td>onfiguration</td> <td>4</td> <td>674 000 MHz</td> <td>64 OAM</td> <td>6875 Ksps</td> <td>0.0 dB</td> <td></td> <td>0.0/38.0 M</td> <td></td> <td></td>	onfiguration	4	674 000 MHz	64 OAM	6875 Ksps	0.0 dB		0.0/38.0 M		
og       5       682.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       2       Click to stand         6       690.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       2       Click to stand         7       698.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       2       Channel         8       706.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       2       Channel         9       714.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       2       0 <t< td=""><td>irmware</td><td></td><td></td><td></td><td></td><td>0.0 40</td><td></td><td>0.0100.0 m</td><td></td><td></td></t<>	irmware					0.0 40		0.0100.0 m		
6       690.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       Crick to stand         7       698.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       Channel         8       706.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       Channel         9       714.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       Output         10       722.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       Output         11       730.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       Output         12       738.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       Output         13       746.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       Output         13       746.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       Output         14       754.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       Output	og	5	682.000 MHZ	64 QAM	6875 Ksps	0.0 dB	•	0.0/38.0 M	i.s.	Click to est.
7       638.000 MHz       640 AM       6875 Ksps       0.0 dB       0.0/38.0M       //       Channel         8       706.000 MHz       640 AM       6875 Ksps       0.0 dB       0.0/38.0M       //       Output         9       714.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0M       //       Output         10       722.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0M       //       //         11       730.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0M       //       //         12       738.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0M       //       //         13       746.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0M       //       //         14       754.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0M       //       //		6	690.000 MHz	64 QAM	6875 Ksps	0.0 dB	۲	0.0/38.0 M	<b>_</b>	Click to set
8       706.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       //       Output         9       714.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       //       Output         10       722.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       //       Output         11       730.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       //         12       738.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       //         13       746.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       //         14       754.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       //		7	698.000 MHz	64 QAM	6875 Ksps	0.0 dB	۲	0.0/38.0 M		channel RE
9       714.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       /       Output         10       722.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       /       /         11       730.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       /       /         12       738.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       /       /         13       746.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       /       /         14       754.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       /       /		8	706.000 MHz	64 QAM	6875 Ksps	0.0 dB	•	0.0/38.0 M	21	charmerta
10       722.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       //         11       730.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       //         12       738.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       //         13       746.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       //         14       754.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       //		9	714.000 MHz	64 QAM	6875 Ksps	0.0 dB	•	0.0/38.0 M	1	output
11       730.000 MHz       64 QAM       6675 Ksps       0.0 dB       0.0/38.0 M       ////////////////////////////////////		10	722.000 MHz	64 QAM	6875 Ksps	0.0 dB	٠	0.0/38.0 M	21	
12       738.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M       ////////////////////////////////////		11	730.000 MHz	64 QAM	6875 Ksps	0.0 dB	٠	0.0/38.0 M	- 2	
13       746.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M          14       754.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M          15       76.000 MHz       64 QAM       6875 Ksps       0.0 dB       0.0/38.0 M		12	738.000 MHz	64 QAM	6875 Ksps	0.0 dB	۲	0.0/38.0 M	_ Z .	
14 754.000 MHz 64 QAM 6875 Ksps 0.0 dB • 0.0786.0 M		13	746.000 MHz	64 QAM	6875 Ksps	0.0 dB	•	0.0/38.0 M	- 21	
		14	754.000 MHz	64 QAM	6875 Ksps	0.0 dB	۲	0.0/38.0 M	1	
12 / DZ UUU MIDZ DA UAW DD / 2 NSDS U U DD U U / 20 U W Z		15	762 000 MHz	64 QAM	6875 Kapa	0.0 dB		0.0/38.0 M	- /1	
		16	770.000 MHz	64 QAM	6875 Ksps	0.0 dB		0.0/38.0 M		





Quickly Config.		[ close ]
Standard:	J.83A(DV	B-C) 🔻
Level(All Carriers):	0.0	(-20 ~ +10 dBm)
Channel Enable:	<b>V</b>	
Start Frequency:	650.000	(30 ~ 900 MHz)
Bandwidth:	8.000	MHz
Constellation:	64 QAM	•
Symbol Rate:	6875	(5000 ~ 7000 Ksps)
Gain offset:	0.0	(-10 ~ 0 dB)
		Apply Close
-		
Channel 1 Config.		[close]
Standard:	J.83A(DVB-	C) 🔨
Level(All Carriers):	-10.0	(-12 ~ +13 dBm)
Channel Enable:		
Frequency:	474 000	(30 ~ 900 MHz)
Constellation:	64 OAM	v
Symbol Rate:	6875	(5000 ~ 7000 Ksps)
Gain offset	0.0	(-12 ~ 0 dB)
Gain onset.	0.0	](=12 = 0.00)
		Apply Close

#### Parameters $\rightarrow$ IP Stream:

Thor's Edge QAM supports TS to output in IP (16\*MPTS) format through the DATA port.

Click 'IP Stream', it will display the interface as shown in Figure-12 where to set IP out parameters.

-										
se Web Ma										
	IP STREAM									
		Channel Info	(Alarm/Active/Tota	I): 0/1/16						
		Channel	IP Address	Port	Protocol	Pkt Length	Null PKT Filter	Status	Bit(Act/Max)	/
		onumer	il Address		11010001	r ni zerigin	-	otatas	Dir(Abbillity)	
		1	224.2.2.2	2001	UDP	7		•	32.5/38.0 M	
		2	224.2.2.2	2002	UDP	7		۲	0.0/38.0 M	1
		3	224.2.2.2	2003	UDP	7			0.0/38.0 M	1
		4	224.2.2.2	2004	UDP	7		٠	0.0/38.0 M	1
		5	224.2.2.2	2005	UDP	7			0.0/38.0 M	1
		6	224 2 2 2	2006	IIDP	7	m		0.0/38.0 M	1
		-	201.0.0.0	2000	100	-			0.0/00.0 M	
		1	224.2.2.2	2007	UDP	/			0.0/38.0 M	
		8	224.2.2.2	2008	UDP	7			0.0/38.0 M	1
		9	224.2.2.2	2009	UDP	7		۲	0.0/38.0 M	1
		10	224.2.2.2	2010	UDP	7		۲	0.0/38.0 M	1
		11	224.2.2.2	2011	UDP	7		٠	0.0/38.0 M	1
		12	224.2.2.2	2012	UDP	7	8		0.0/38.0 M	1
		12	224 2 2 2	2012	LIDR	7			0.0/28.0 M	-
		13	224.2.2.2	2013	ODP	-		-	0.0/30.0 M	
		14	224.2.2.2	2014	UDP	7			0.0/38.0 M	1
		15	224.2.2.2	2015	UDP	7		۲	0.0/38.0 M	
		16	224.2.2.2	2016	UDP	7			0.0/38.0 M	1



Channel 1 Config.		[ close ]
Enable:		
Source Select:	Scrambed TS	~
IP Address:	224.2.2.2	
Port:	2001	
Protocol:	UDP	×
Pkt Length:	7	×
Null PKT Filter:		
		Apply Close

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2016.

#### System → Network:

Click 'Network', it will display the interface as shown in Figure-13 where to set network parameters.

nary				
115	NETWORK			
neters	NMS			
Config				
mbler		IP Address:	10.0.0.104	
		Subnet Mask:	255.0.0.0	
_		Gateway:	10.0.0.1	
		Web Manage Port:	80	
		MAC Address:	20:3f:12:34:56:78	
figuration				
				Арр
	Scrambler			
		IP Address:	192.168.19.197	
		Subnet Mask:	255.255.255.0	
		Gateway:	192,168,19,1	
				App
				_
	DATA			
		IP Address:	192 168 100 100	
		Subnet Mask:	255 255 255 0	
		Gateway:	192 168 100 1	
		MAC Addross:	20-46-12-34-66-79	
		TS Output:	20.41.12.34.50.70	
		i s output:		
				App

Figure-13

System → Password:

Thor

From the menu on left side of the webpage, click "Password", it will display the screen as shown in Figure-14 where to set the login account and password for the web NMS.

Summary	PASSWORD				
Status Parameters TS Config Scrambler	Modify the login name and password is "admi	and password to make the on" Also please note the cap	tevice safely.If forget the name or pass tal character and lowercase character.	word, you can reset it by keyboard. The (	lefault login name
Modulator  IP Stream  System  Network  Password  Configuration		Current UserName: Current Password: New UserName: New Password: Confirm New Password:	admin		
.og		Confirm New Password:			Apply
		Figure	-14		
5 Te	l: (800) 521-8467	Email: sale	es@thorfiber.com	http://v	/ww.thorbroa



### System $\rightarrow$ Configuration:

From the menu on left side of the webpage, click "Configuration", it will display the screen as Figure-

15 where to set your configurations for the device.

Summary         • Status         Parameters         • Status         • Status	nt		201
Status         Premetre         • 13 Config         Standber         • Notadar         • Patram         • Patram         • Patram         • Patram         • Configuration         • Configuration         • Configuration         • Log			
Status   Parameters   * Sta Config   * Scanded:   * Moduator   * Pisteram     * Network   * Standed   * Configuration   * Firmaare   • Log     Status	Summary	CONFIGURATION	
Parameters     • TS Config   • Strambler   • Modulator   • P Bream   • Network   • Password   • Configuration   • Firmware   • Log	► Status		
<ul> <li>► TS Config</li> <li>► Scrambler</li> <li>► Configuration</li> <li>► Passord</li> <li>► Configuration</li> <li>► Primare</li> <li>► Log</li> </ul>	Parameters		
<ul> <li>Scrambler</li> <li>Moduator</li> <li>Petanit</li> <li>Passwort</li> <li>Configuration</li> <li>Firmare</li> <li>Tog</li> </ul>	► TS Config	Save Restore Factory Set Backup Load I> Select areas	
<ul> <li>Modulator</li> <li>Posteam</li> <li>Posteam</li> <li>Network</li> <li>Password</li> <li>Contiguration</li> <li>Firmare</li> <li>Log</li> </ul>	► Scrambler		
▶ Pstream         When you change the parameter.you shoud save configuration ,otherwise the new configuration will lost after reboot.         ▶ Password         ▶ Configuration         ▶ Inimware         ▶ Log	Modulator		
System  Notwork  Configuration  Firmware  Log	► IP Stream	When you change the parameter, you shoud save configuration ,otherwise the new configuration will lost after reboot.	
<ul> <li>Network</li> <li>Password</li> <li>Configuration</li> <li>Firmware</li> <li>Log</li> </ul>	System		
> Passood ▶ Configuration > Firmare > Log	▶ Network		
▶ Configuration ▶ Firmware ▶ Log	▶ Password	Sav	e config
> Log	► Configuration		
►Log	► Firmware		
	► Log		

#### Figure-15

#### System $\rightarrow$ Firmware:

From the menu on left side of the webpage, click "Firmware", it will display the screen as shown in

Figure-16 where to update firmware for the device.

velcome to use Web Manage				2016
Summary FIRMWA	ARE			
Parameters  TS Config  Scrambler  Modulator  P Stream  System	Warning: 1. Upgrade firmware(software and hardware may not work. 2. Upgrade will keep a long time please do n 3. After upgrade you must reboot device ma	) to get new function, please choose the right firm of turn off the power, otherwise the device will not nually.	vare to upgrade if you use a wrong file, the device work.	
Network     Password     Configuration     Firmware     Log	Current Software Version: Current Hardware Version: File:	1.11 Build 200.00 Jun 4 2016 0.90.0.0 <b>减凭</b> 未选择文件。		
			Upgrade	
ber 2016 Tel: (800) 521-	-8467 Email: sale	es@thorfiber.com	http://www.thorbro	adcas



Figure-16

#### System $\rightarrow$ Log:

From the menu on left side of the webpage, click "Log", it will display the screen as shown in

Figure-17 where to check the "Log".

gement	20
Summary Status	To select "Kernel log" and "System Log"
Status  Status  Parameters  TS Config  Scrambler  Modulator  P Stream  Network  Password  Configuration  Firmware  Log	Log Tipe: Kernel Log Auto Refesh: 0 Fund Log Tipe: Kernel Log Auto Refesh: 0 Fund 1 0000001 Kernel Log Auto Refesh: 0 Fund 1 0000001 CPU: PRT / VPT nonalisen (note) (n
	0.0000000 [vg_Dut]_ent individual max_cup contribution: 113072 bytes         0.0000000 [vg_Dut]_ent individual max_cup contribution: 113072 bytes         0.0000000 [vg_Dut]_ent individual max_cup contribution: 131072 bytes         0.0000000 [vg_Dut]_ent individual max_cup contribution: 131072 bytes         0.000000 [vg_Dut]_ent min size: 131072 bytes         0.000000 [vg_Dut]_ent re: 256144 bytes         0.000000 [vg_Dut]_ent re: 256244 bytes         0.000000 [vg_Dut]_ent re: 25644(98%)         0.000000 [vg_Dut]_ent re: 25644(98%)         0.000000 [vg_Dut]_ent re: 25644(98%)         0.000000 [vg_Dut]_ent re: 25644(98%)         0.000000 [vg_Dut]_ent re: 25643(98%)         0.000000 [vg_Dut]_ent re: 256363(order: 5, 131072 bytes)         0.000000 [vg_Dut]_ent re: 256383(order: 6, 131072 bytes)         0.0000000 [vfutual kernel memory 339184/3393216k available (3790K kernel code, 219K rvdata, 1272K rodata, 192K init, 291K bss, 17648K reserved, 16384K cn         0.0000000 [vfutual kernel memory 139047         0.0000000 [vfutual kernel memory 139047         0.0000000 [vfutual kernel memory 139047         0.0000000 [vfutual kernel memory 139048         0.





## **Chapter 5 - 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 6 Packing list

Thor Broadcast IP QAM Modulator	1 pc
User's Manual	1 pc
Power Cord	1 pc

# Thor Fiber & Thor Broadcast Los Angeles CA 1-800-521-8467 ext 2 for Support