

User Manual



1 IP to Analog Modulator

H-IP-32RF

H-IP-32RF



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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H-IP-32RF



Directory

Chapter 1 Product Overview 1
1.1 Key Features 1
1.2 Specifications1
1.3 Appearance and Illustration2
Front panel Illustration 2
Rear Panel Illustration:
Chapter 2 Installation Guide 4
2.1 Acquisition Check 4
2.2 Installation Preparation 4
3.1 Login
3.2 Operation7
Chapter 4 Troubleshooting 15
Chapter 5 Packing list

Chapter 1 Product Overview

1.1 Key Features

- Support OSD (Logo and Caption) insertion, CC/Subtitle/Teletext
- Support program info modify, multiple audio select
- 2 GE ports (max 64 IP input over MPTS/SPTS), Max 840Mbps for each GE input
- Support HEVC/H.265, H.264/AVC, MPEG-2 TS Decapsulation
- Processing of up to 32 IP multicast groups of a Gigabit Ethernet MPEG TS into up

to 32 standard PAL or NTSC or SECAM TV programs (SECAM is under

development)

- 32 non-adjacent or adjacent carriers output within 400MHz
- Support Web-based Network management

	Interface/rate	2 GE ports (max 64 IP input)				
	Interface/fate	Max 840Mbps for each GE input				
	Stars and	UDP, UDP / RTP, 1-7 packets, FEC, SPTS,				
Input	Stream	MPTS				
	Transport Protocol	UDP/RTP, Unicast and multicast, IGMP V2/V3				
	Packet Length	188 / 204 Bytes				
	X7 : J	HEVC/H.265, H.264/AVC Level 4.1 HP,				
	video	MPEG-2 MP@HL				
	Audio MPEG-1/2 Layer 1/2, (HE-)AAC,AC					
	Data Teletext, Teletext subtitles, DVB Subtitlin					
		HEVC/H.265:				
		1080@60P,1080@60I,1080@50P,1080@50I,7				
Decoding Parameters		20@60P,720@50P				
		H.264/AVC:				
Tarameters	Deschriens	H.264/AVC: 1080@60I,1080@50P,1080@50I,1080@30P,1				
1 arameters	Resolutions	H.264/AVC: 1080@60I,1080@50P,1080@50I,1080@30P,1 080@25P ,				
T arameters	Resolutions	H.264/AVC: 1080@60I,1080@50P,1080@50I,1080@30P,1 080@25P , 720@60P,720@50P,576@50I,480@60I				
T arameters	Resolutions	H.264/AVC: 1080@60I,1080@50P,1080@50I,1080@30P,1 080@25P , 720@60P,720@50P,576@50I,480@60I MPEG2:				
T arameters	Resolutions	H.264/AVC: 1080@60I,1080@50P,1080@50I,1080@30P,1 080@25P , 720@60P,720@50P,576@50I,480@60I MPEG2: 1080@60I,1080@50I,				
T arameters	Resolutions	H.264/AVC: 1080@60I,1080@50P,1080@50I,1080@30P,1 080@25P , 720@60P,720@50P,576@50I,480@60I MPEG2: 1080@60I,1080@50I, 720@60P,720@50P,576@50I,480@60I				

1.2 Specifications

1

	Number of channels	up to 32			
	Connectors	75Ω , F-jack			
	Frequency range	47 – 862MHz, digital modulation process			
	Output Bandwidth	400MHz			
	Output level	maximum 112dB µ V			
Modulation	Return loss	\geq 14dB			
Parameters	Spurious frequency dist.	$\geq 60 dB$			
	Stereo cross talk	> 55dB			
	Residual carrier accuracy	1%			
	TV standard	PAL B/G/D/K/M/N, NTSC M/J/4.43,			
	I V standard	SECAM (under development)			
	Video-signal to noise ratio	$\geq 60 dB$			
	Management	1 x 100 Base-T Ethernet (RJ 45)			
Network Interface	Data	2 x 1000 Base-T Ethernet (RJ 45)			
	Protocol	IEEE802.3 Ethernet, RTP, ARP, IPv4, TCP/UDP, HTTP, IGMPv2/v3			
	Image resolution	up to 1080i			
	CNR	60 dB (after internal combining)			
Others	SNR	> 53 dB (after internal combining)			
	Sampling frequency	48, 44.1, 32			
	Output volume adjustment	0 - 100 %			
	Demission	420mm×440mm×44.5mm (WxLxH)			
Conoral	Temperature	0~45°C(operation), -20~80°C(storage)			
General	Power Supply	AC100V±10%, 50/60Hz or AC 220V±10%,50/60Hz			

1.3 Appearance and Illustration

Front panel Illustration



Rear Panel Illustration:



1	NMS: network management port
2	Power Indicator
3	Grounding
4	AC Power Socket
5	Power switch
6	Data Input
7	RF output port
8	RF test port

Chapter 2 Installation Guide

2.1 Acquisition Check

When user opens the package of the device, it is necessary to check items according to packing list. Normally it should include the following items:

- H-IP-32RF 32 in 1 IP to Analog Modulator
- User's Manual
- Power Cord

If any item is missing or mismatching with the list above, please contact local dealer.

2.2 Installation Preparation

When users install device, please follow the below steps. The details of installation will be described at the rest part of this chapter. Users can also refer rear panel chart during the installation.

The main steps of the installation include:

- Checking the possible device missing or damage during the transportation
- Preparing relevant environment for installation
- Installing H-IP-32RF, 32 in 1 IP to Analog Modulator
- Connecting signal cables
- Connecting communication port (if it is necessary)

2.2.1 Device's Installation Flow Chart Illustrated as follows:



2.2.2 Environment Requirement

Item	Requirement			
	4			
Tel: (800) 521-8467	Email: sales@thorfiber.com	https://thorbroadcast.com		

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 (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 brightness less 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 power 220V $\pm 10\%$ 50/60Hz or 110V $\pm 10\%$ 50/60Hz. Please carefully check before running.			

2.2.3 Grounding Requirement

- All function modules' good grounding is the basis of reliability and stability of devices. Also, they are the most important guarantee of lightning arresting and interference rejection. Therefore, the system must follow this rule.
- Coaxial cables' outer conductor and isolation layer should keep proper electric conducting with the metal housing of device.
- Grounding conductor must adopt copper conductor in order to reduce high frequency impedance, and the grounding wire must be as thick and short as possible.
- Users should make sure the 2 ends of grounding wire well electric conducted and be antirust.
- It is prohibited to use any other device as part of grounding electric circuit
- The area of the conduction between grounding wire and device's frame should be no less than 25mm².

2.2.4 Frame Grounding

All the machine frames should be connected with protective copper strip. The grounding wire should be as short as possible and avoid circling. The area of the conduction between grounding wire and grounding strip should be no less than 25mm².

2.2.5 Device Grounding

Connecting the device's grounding rod to frame's grounding pole with copper wire.

2.3 Wire's Connection

2.3.1 Power cord connection

The power socket is located on the right of rear panel, and the power switch is on the left of front panel. User can plug one end of the power cord to the socket and insert the other end to AC power. When the device solely connects to protective ground, it should adopt independent way, say, share the same ground with other devices. When the device adopts united way, the grounding resistance should be smaller than 1Ω .

• **Caution:** Before connecting power cord to H-IP-32RF

, user should set the power switch to "OFF".

2.3.2 Signal and NMS Cable Connection

The signal connections include the connection of input signal cable and the connection of output signal cable. The details are as follows:

- H-IP-32RF Cable Illustration:
- **RF Input/Loop Cable Illustration:**



• NMS Cable illustration (CAT5):



Chapter 3 Web NMS Management

This device does not support the LCD operation, and the modification can only be operated under Web NMS.

3.1 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 displays 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.

		x
?	http://192.168.0.136 : Webserver"	
Login :	admin]
Password:	••••	
	Log in	

Figure-1

3.2 Operation

3.2.1 Summary

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

rement				
Jonion				
Summany				
Summary	Status			
► Status				
Parametere				
Farameters		System Information		
IP Input		-,		
Modulator			Software Version:	1.31 Build 158.00 Dec 14 2019
Decoder			Hardware Version:	12.7
System			Web Version:	1.07
System			Contrary Manufactor	44.0.22
Network			System version:	4.1.0.23
Account			Product ID:	12c00015e4b0c04
Configuration			Uptime:	0 Day-00:27:10
Firmware				
► Log				
Reboot				

Figure-2

3.2.2 Parameters

Parameters \rightarrow **IP Input:**

Click "IP Input", it displays the interface as Figure-3. Users can select the output TS channels. Click "+" to add IP input, and then select one channel to parse. It will display the interface where users can choose the programs to output and program info re-set.

Summary Status	IP Input
Parameters IP Input Modulator Deceders	CH 01 CH 02 CH 03 CH 04 CH 05 CH 06 CH 07 CH 08 CH 09 CH 10 CH 11 CH 12 CH 13 CH 14 CH 15 CH 16 CH 07 CH 18 CH 19 CH 20 CH 21 CH 22 CH 22 CH 24 CH 25 CH 26 CH 26 CH 27 CH 28 CH 29 CH 30 CH 31 CH 32
Decoder System Network Account	Image: Image
 Configuration Firmware Log Reboot 	Input Area
	Parse program time out: 60 seconds



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

+ : To add input channel which come from Data 1 or Data 2 or Data Module (front panel)

: To edit the input channel

- X : To delete the input channel
- i : To delete all inputs channel

8



Program Modification:

The multiplexed program information can be modified by clicking the program in the "output area". For example, when clicking ^B1: CCTV 13 <=CH1_GE1_224.2.2.2:2006 [506], it triggers a dialog box as below where users can set the program info.

Program Information	[close]
Program From Input:	CH1_GE1_224.2.2.2:2006 [506]
Service Name:	CCTV 13
Audio Track:	Track 1 eng
CC Switch:	OFF •
Subtitle Switch:	OFF 👻
Teletext Switch:	Teletext 1 eng
	Apply Close

Parameters \rightarrow **Modulator:**

Clicking "Modulator", it will display the interface as Figure-4 where to set RF output parameters. The output bandwidth capacity is 400MHz. Make sure the difference between the starting frequency and end frequency will not exceed 400MHz.

ers	Center Frequenc	y: 65.750 MHz	Level(All Carriers): 5.0	dBm		
ator	Channel Info.(Act	ive/ lotal): 1/32				
er	#	Video Carrier Frequency	Channel Level	Audio Gain	Modulation Enable	
	1	65.750 MHz	5.0 dB	0.0 dB	•	
ĸ	2	73.750 MHz	5.0 dB	0.0 dB	•	
t	3	81.750 MHz	5.0 dB	0.0 dB	٠	
re	4	89.750 MHz	5.0 dB	0.0 dB	٠	
	5	97.750 MHz	5.0 dB	0.0 dB	•	
	6	105.750 MHz	5.0 dB	0.0 dB	•	
	7	113.750 MHz	5.0 dB	0.0 dB	•	
	8	121.750 MHz	5.0 dB	0.0 dB	٠	
	9	129.750 MHz	5.0 dB	0.0 dB	•	
	10	137.750 MHz	5.0 dB	0.0 dB	٠	
	11	145.750 MHz	5.0 dB	0.0 dB	•	
	12	153.750 MHz	5.0 dB	0.0 dB	•	
	13	161.750 MHz	5.0 dB	0.0 dB	•	
	14	169.750 MHz	5.0 dB	0.0 dB	•	
	15	177.750 MHz	5.0 dB	0.0 dB	•	
	16	185.750 MHz	5.0 dB	0.0 dB	•	
	17	193 750 MHz	5.0 dB	0.0 dB		

Figure-4

Parameters \rightarrow **Decoder:**

This function is to monitor status of decoding. It displays the interface as Figure-5.

Summary	Decoder			
Parameters	#	Program Name	Decode Version	Decode Status
► IP Input	1	CCTV 13	01.05.0b	•
Modulator Decoder	2	NONE	01.05.0b	•
System	3	NONE	00.00.00	•
Network	4	NONE	00.00.00	
Configuration	5	NONE	00.00.00	
Firmware	6	NONE	00.00.00	
▶ Reboot	7	NONE	00.00.00	
	8	NONE	00.00.00	
	9	NONE	01.05.0b	
	10	NONE	01.05.0b	
	11	NONE	01.05.0b	•
	12	NONE	01.05.0b	
	13	NONE	01.05.0b	٠
	14	NONE	01.05.0b	•
	15	NONE	01.05.0b	•
	16	NONE	01.05.0b	

Figure-5

Parameters \rightarrow **OSD**:

Clicking "OSD", it displays the interface where to configuration the OSD parameters (Figure-6)



Figure-6



Figure-7

and an antipart of the second	ption	CH 0.1 0 13101 2 CH 2	Select channel 1/2/3//32 apply the logo insertion, or you can select "all" to apply all channels	

Figure-8

3.2.3 System

System → Network:

Click 'Network', it displays the interface as Figure-9 where to set network parameters.

140	iork	
us		
neters	NMS	
nput dulator	IP Address: 192.168.105.162	ify IP input addre
oder	Subnet Mask: 255,255,0	J Partine
m	Gateway: 192,168.0.1	
	Web Manage Port: 80	
count	MAC Address: 20:19:12:17:13:55	
nfiguration		
nware		
J boot		
	DATA	
	IP Address: 1 192 169 1 126	oort IP address
	Subnet Mack: DCC DCC DCC DC	Joit II dddiess
	Gateway: 192 168 1 1	
	MAC Address: 20:29:12:17:13:55	
	DATA-2	
	IP Address: 192.168.2.137	
	Subnet Mask: 255.255.0	
	Gateway: 192.168.2.2	
	MAC Address: 20.30.12.34.30.70	

Figure-9

System → Account:

Click "Account", it displays the screen as Figure-10 where to set the login Username and password for the web NMS.

Summary ▶ Status	Account	
Parameters IP Input Modulator	It is required to login the web interface of the device in case it need modify Username and Password. The default Username and Password is "admin".	
Modulation Decoder System Network Account Configuration Firmware	Current Username: admin Current Password: New Username: New Password: Confirm New Password: C	
► Log ► Reboot		Apply

Figure-10

System → Configuration:

Click "Configuration", it displays the screen as Figure-11 where to set your configurations for the device.

Summary Status	Configuration	
Parameters ▶ IP Input	Save Restore Factory Set Backup Load Select areas	
Modulator Decoder System	When you change the parameter you should save configuration .otherwise the new configuration will lost after reboot.	
Network Account		
Configuration Firmware Log		Save
▶ Reboot		

Figure-11

System → Firmware:

Click "Firmware", it displays the screen as Figure-12 where to update firmware for the device.

Summary Status	Firmware	
Parameters IP Input Modulator Decoder System Network	 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. Do not operate the page during the upgrade process. 4. After upgrade. you must reboot device manually. 	
Account Configuration Firmware Log Reboot	Current Software Version: 1.31 Build 158.00 Dec 14 2019 Current Decoder Version: 01.05 0b CPU And Decoding Upgrade: Open Browse	
	Upp Current Hardware Version: 1.2.7 FPGA Upgrade: Open Browse	ade
	Logi Logi	ade

Figure-12

System → Log:

Click "Log", it displays the screen as Figure-13 where to check the "Log".

Summary	To select "Kernel log" and "System Log"
► Status	
Parameters	I
▶ IP Input	Log Type: Kernel Log Auto Refresh: 0 Export Export
▶ Modulator	[0.000000] Booting Linux on physical CPU 0x0
▶ Decoder	[0.000000] Linux version 4.14.14-licheepi-zero (laijianyong@dxkj-Super-Server) (gcc version 6.3.1 20170109 (Linaro GCC 6.3-2017.02)) #3 SMP Mon Sep 30 17:18:06 CST 201
Decoder	[0.000000] CPU: ARMv7 Processor [410fc075] revision 5 (ARMv7), cr=10c5387d
System	[0.000000] CPU: div instructions available: patching division code
N Mada and	[0.000000] CPU: PIPT / VIPT nonaliasing data cache, VIPT allasing instruction cache
Network	0.000000] OF: fdt: Machine model: Lichee Pi Zero with Dock
Account	0.000000] Memory policy: Data cache writealloc
Configuration	0.000000 On hode 0 totalpages: 16384
▶ Firmware	0.000000J tree_area_init_node: node 0, pgdat c0/95/180, node_mem_map c31/a000
► Log	0.000000 Normal zone: 128 pages used for memmap
▶ Reboot	0.000000 Normal zone: 0 pages reserved
	0.000000 Normalizane. 15354 pages, LIFO baich.3
	0.000000 jranouni, tast init dunie
	[0.00000] jetzpia. Eniberuario jageskipta (jetoleguo soli 40 16 192 de2004 do3030
	C.000000 put 1 znaliste mohiliku gravning on Total page: 18258
	E. 0.000000 Kernel command line: console=th/s0 115200 earlyrinik panic=5 rootwait mtdparts=spi0.0.1M(uboot).64k(dtb).4M(kernel)(roots).root=31:03.nv rootfstype=iffs2
	O 0000001 PID bash table entries: 256 (order -2 1024 bytes) O 0000001 PID bash table entries: 256 (order -2 1024 bytes)
	0.0000001 Dentry cache hash table entries: 8192 (order: 3. 32768 bytes)
	0.000000] Inde-cache hash table entries: 4096 (order: 2, 16384 bytes)
	0.0000001 Memory: 56088K/65536K available (5120K kernel code, 243K rwdata, 1228K rodata, 1024K init, 253K bss. 9448K reserved, 0K cma-reserved, 0K highmem)
	0.000000] Virtual kernel memory layout:
	0.000000] vector : 0xffff0000 - 0xffff1000 (4 kB)
	[0.000000] fixmap : 0xffc00000 - 0xfff00000 (3072 kB)
	[0.000000] vmalloc : 0xc4800000 - 0xff800000 (944 MB)
	[0.000000] lowmem : 0xc0000000 - 0xc4000000 (64 MB)
	[0.000000] pkmap : 0xbfe00000 - 0xc0000000 (2 MB)
	[0.000000] modules · 0xbf000000 _ 0xbfe00000 / 14 MR)

Figure-13

System → Reboot:

Click "Reboot", it displays the screen as Figure-14 where to check the "Reboot".

Summary	Reboot	
Status		
Parameters		
▶ ID Input	Some configuration will work after reboot the device, such as Firmware update.	
▶ Modulator		
▶ Decoder		
		Reboo
System		
Network		
▶ Account		
Configuration		
Firmware		
▶ Log		
▶ Reboot		

Figure-14

Chapter 4 Troubleshooting

Quality assurance system has been approved by CQC organization. For guarantee the products' quality, reliability and stability. All THOR products have been passed the testing and inspection before ship out factory. The testing and inspection scheme already covers all the Optical, Electronic and Mechanical criteria which have been published by THOR.

Prevention Measure

- Installing the device at the place in which environment temperature between 0 to 45 °C
- Making sure good ventilation for the heat-sink on the rear panel and other heat-sink bores if necessary
- Checking the input AC voltage within the power supply working range and the connection is correct before switching on device
- Checking the RF output level varies within tolerant 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 greater than 10 seconds.

Conditions need to unplug power cord

- Power cord or socket damaged.
- Any liquid flowed into device.
- Any stuff causes circuit short
- Device in damp environment
- Device was suffered from physical damage
- Longtime idle.
- After switching on and restoring to factory setting, device still cannot work properly.
- Maintenance needed

Chapter 5 Packing list

•	H-IP-32RF	1 pc
•	Power Cord	1 pc
•	Grounding Cable	1 pc