



H-MPEG2-H264-E2

About This Manual

Intended Audience

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

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Chapter 1 Introduction

1.1 Product Overview

H-MPEG2-H264-E2 Mpeg-2/ H.264 HD Encoder is the new broadcasting audio & video encoding device with powerful functionality. It is equipped with multiple video input interfaces (HDMI, SDI, YPbPr and CVBS) and audio input interfaces (AES, BNC and XLR) to make it possible to compatible with different signal sources.

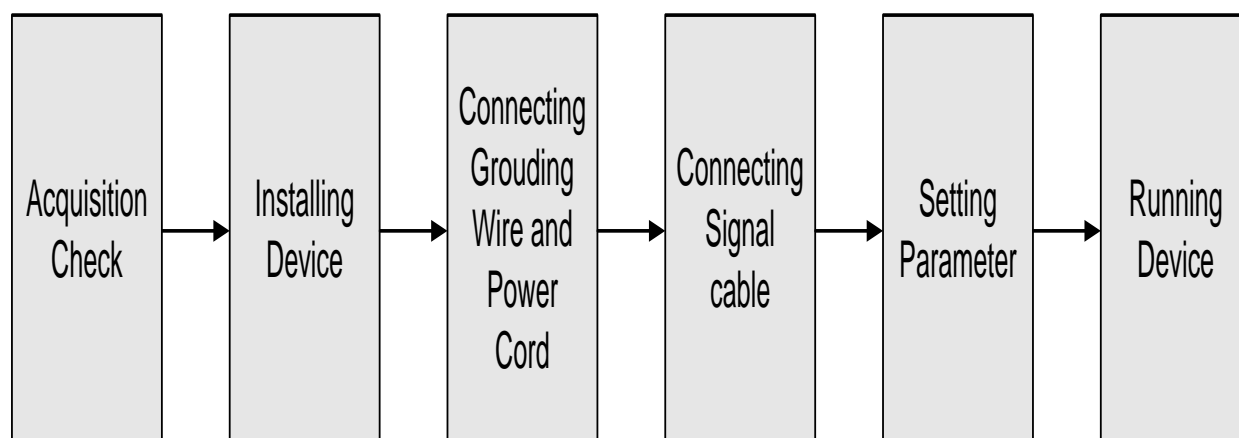
Multiple audio and video encoding formats are available to meet customers' various requirements. It supports 2 stereo to mix with the video to form a stream output. The encoded program will finally output in TS through ASI/IP port.

H-MPEG2-H264-E2 is also featured with OSD (QR code, LOGO and Caption) insertion function and can display multiple elements at same time. Operator can insert advertisement picture, own LOGO, special QR code, Text content in encoding process independent of STB. It will bring more profit for product user(optional).

Key Features

- Support QR code, LOGO, OSD inserted(Language Supported: English for more languages please consult us...)(Optional)
- MPEG-2 HD/SD and MPEG-4 AVC/H.264 HD/SD video encoding
- MPEG1 Layer II, HE-AAC (v1&v2), LC-AAC and DD AC3 audio encoding
- Support DD AC3 audio passthrough (for SDI in) (Optional)
- Support 2 stereo audio encoding
- Support ASI output and IP over UDP and RTP output
- Support 1080I,720P, 480I, 576I video resolution and downscale transform
- Support video buffer, free to switch video sources (all video interface available)
- Support CC (closed caption), EIA 608 and EIA 708 (for CVBS and SDI in)
- LCD / keyboard control and web management
- Support low latency

Inner Principle Chart



Tech Specifications

Video	Interface	1×HDMI, 1×HD-SDI, 1×YpBPr and 1×CVBS(only for CC)		
	Resolution	Input	Output	Interface Applicable
		1920×1080p@60/59.94	1920×1080p@60,	SDI, HDMI
		1920×1080p@50	1920×1080p@50	
		1920×1080i@60/59.94	1920×1080i @60	SDI, HDMI, YpbPr
		1920×1080i @50	1920×1080i @50	
		1280×720p@60/59.94	1280×720p@60	
		1280×720p@50	1280×720p@50	
		720×576i@50	720×576i @50	SDI, HDMI
		720×480i@60	720×480i @60	
	Encoding	MPEG-2 HD/SD, MPEG-4 AVC/H.264 HD/SD		
	Bitrate Range	2.5 – 19.00 Mbps		
	Rate Control	CBR/VBR		
	GOP Structure	IP, IBBP, IBBBP		
	Chroma	4:2:0		
Audio	Interface	2×XLR, 2×AES, 2×BNC, 1×SDI (support maximum 2 stereos synchronous processing), 1×HDMI,		
	Encoding	MPEG-1 Layer II, HE-AAC (v1&v2), LC-AAC, DD AC3 pass-through (for SDI and HDMI in)		
	Sampling rate	48KHz		
	Bit-rate	32Kbps~384Kbps		
Stream Input		2 ASI Input for remix		
Stream output		2×ASI output ports, BNC interface		
		2 IP (MPTS) over UDP / RTP /RTSP, 1000 Base-T Ethernet interface*2 with independent IP addresses (multicast/unicast)		
System function		LCD/keyboard and web management		
		Language: English		

General	Ethernet software upgrade	
	Dimensions	482mm×405mm×44.5mm (W × D × H)
	Temperature	0~45℃ (Operation), -20~80℃ (Storage)
	Power	AC110V±10%, 50/60Hz; AC 220V±10%, 50/60Hz
	Consumption	16W

1.2 Appearance and Description

Front Panel Illustration



- ① LCD window
- ② Indicators
- ③ Up and down, left and right navigation buttons
- ④ Enter button: for confirm
- ⑤ Menu button: for back step
- ⑥ Lock button: press to lock set

Rear Panel Illustration



- ① AES input connector (for two channel digital stereo)
- ② Balanced Audio input connector
- ③ Unbalanced Audio input connector
- ④ YPbPr & CVBS video input connectors
- ⑤ SDI input connector (Audio input embedded)
- ⑥ HDMI input connector (Audio input embedded)
- ⑦ ASI input, ASI output
- ⑧ NMS connector for connecting Web management on PC
- ⑨ DATA Ports for IP stream output
- ⑩ Power Switch/Fuse

Chapter 2 Installation Guide

This section is to explain the cautions the users must know in some case that possible injure may bring to users when it's used or installed. For this reason, please read all details here and make in mind before installing or using the product.

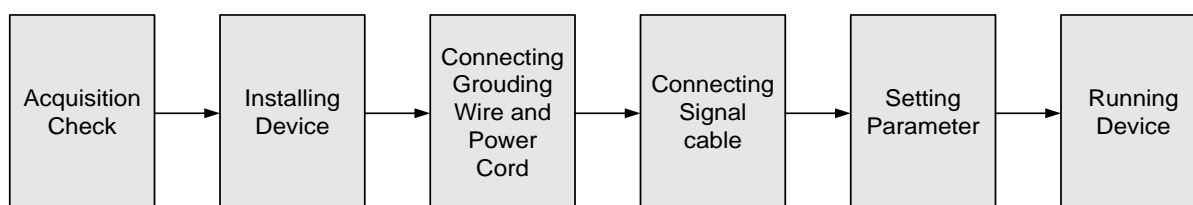
2.1 General Precautions

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

2.2 Power precautions

- ✓ When you connect the power source, make sure if it may cause overload.
- ✓ Avoid operating on a wet floor in the open. Make sure the extension cable is in good condition
- ✓ Make sure the power switch is off before you start to install the device

2.3 Device's Installation Flow Chart Illustrated as following



2.4 Environment Requirement

Item		Requirement
Machine Space	Hall	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: $1 \times 10^7 \sim 1 \times 10^{10} \Omega$, Grounding current limiting resistance: $1 \text{M}\Omega$ (Floor bearing should be greater than 450Kg/m^2)
Environment Temperature	$5 \sim 40^\circ\text{C}$ (sustainable) , $0 \sim 45^\circ\text{C}$ (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 $110\text{V} \pm 10\%$, 50/60Hz or AC $220\text{V} \pm 10\%$, 50/60Hz. Please carefully check before running.

2.5 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.
- ✓ 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 25 mm^2 .

Chapter 3 Front Panel Operation

H-MPEG2-H264-E2 front panel is user operation interface where users configure the device manually. The LCD is a 2-line * 40-character back-lit dot-matrix user interface with pushbuttons for **UP**, **DOWN**, **LEFT**, **RIGHT**, **ENTER**, **MENU**, and **LOCK** for front panel control.

User can decide whether to directly use the factory setting, or customize the input/output parameters and etc.

Keyboard Function Description

LEFT/RIGHT: choose and set the parameters

UP/DOWN: choose parameters or page up/down.

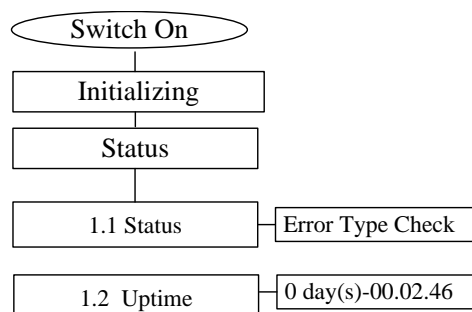
MENU: cancel present entered value, return superior setting;

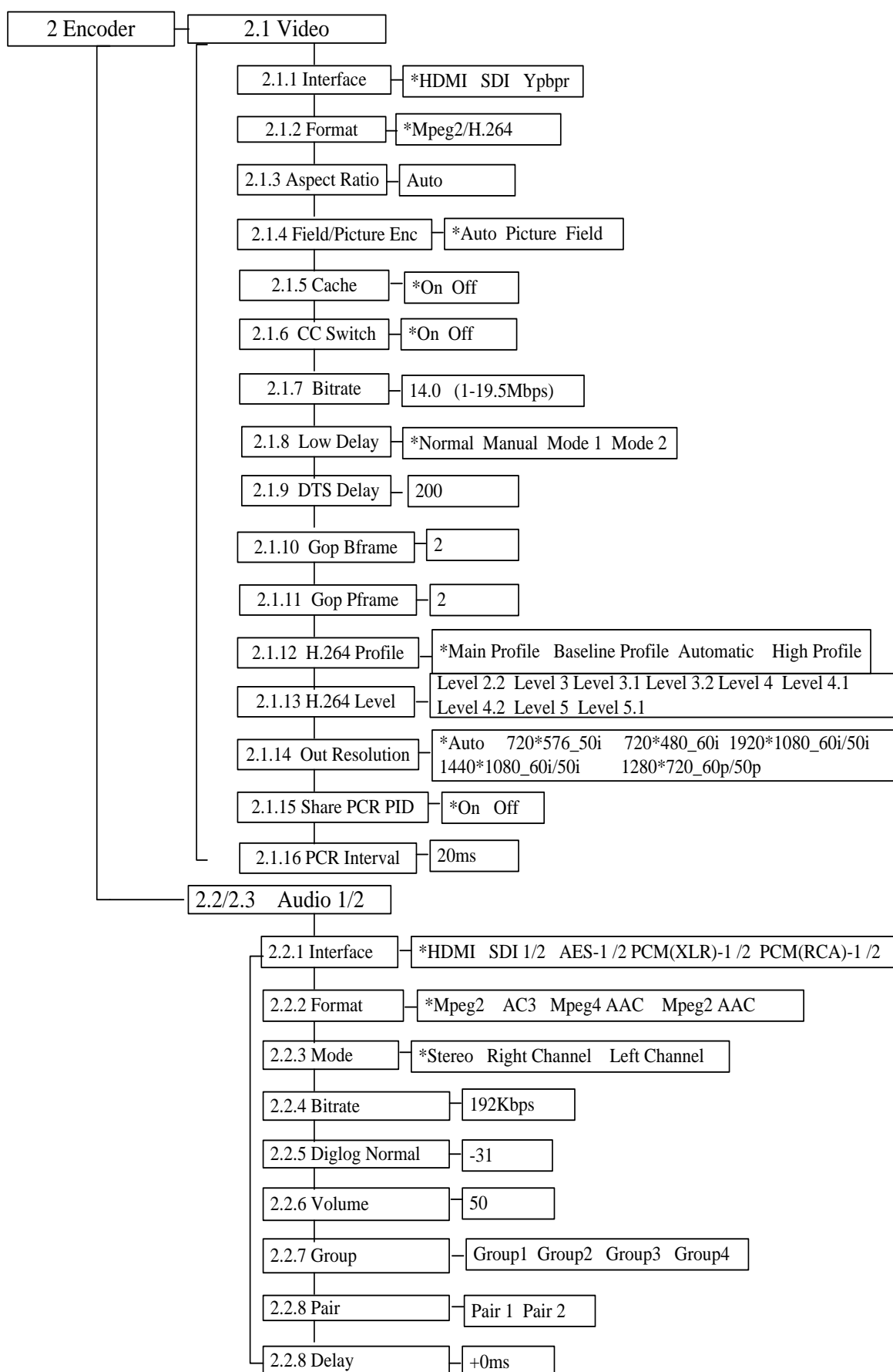
ENTER: activate the parameters which need modification and setting

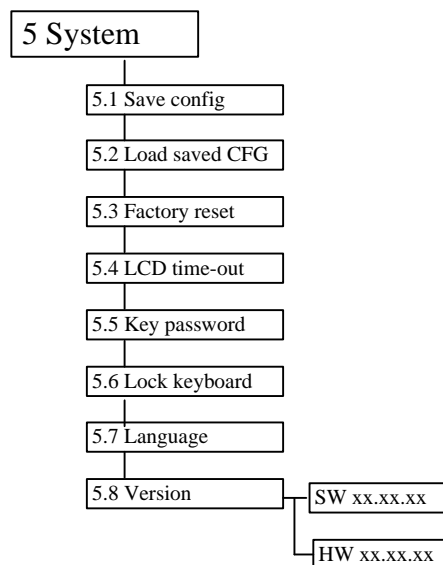
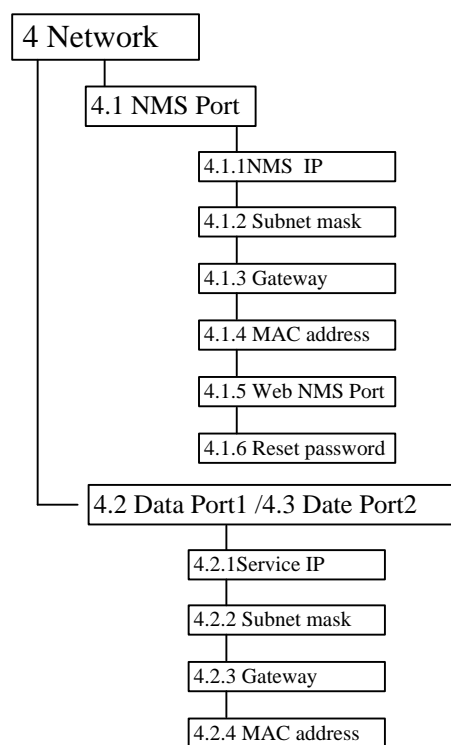
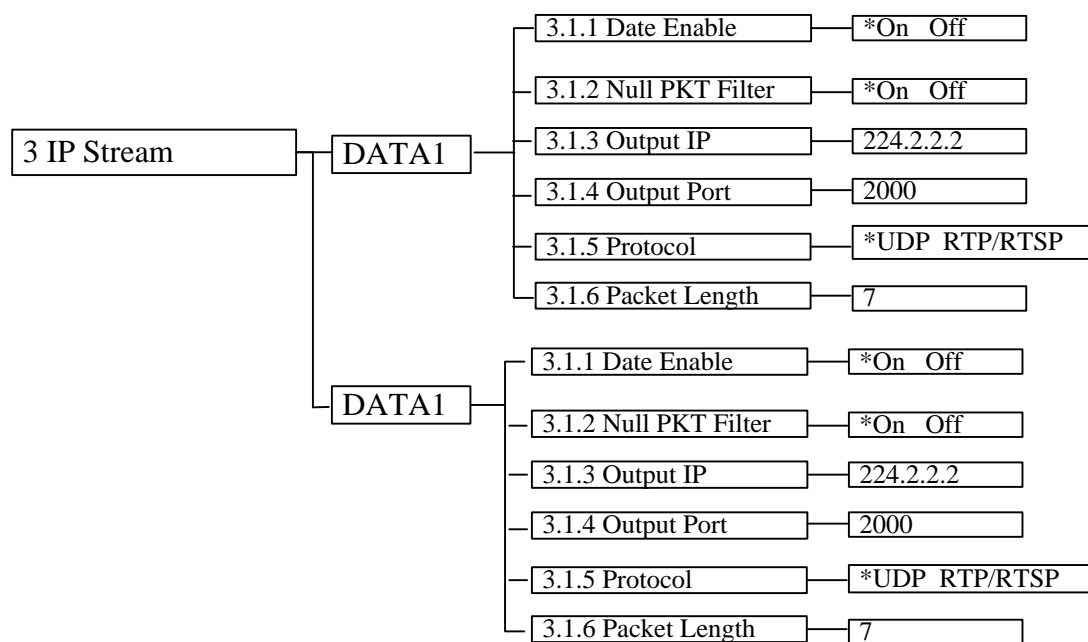
LOCK: Lock the screen / cancel the lock state .After pressing lock key, the system will question the users to save or not .If not, the LCD will display the current configuration

3.1 LCD Menus

An overview of the LCD menus:







Chapter 4 WEB NMS Operation

User can not only use front panel to set configuration, but also control and set the configuration with a PC (Personal Computer) by connecting the device to web NMS Port. User should ensure that the computer's IP address is different from the H-MPEG2-H264-E2's IP address; otherwise, it would cause IP conflict.

4.1 login

The default IP address of this device is 192.168.0.136. Connect the PC and the device with net cable, and use ping command to confirm they are on the same network segment.

Use web browser to connect the device with PC by inputting the device'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.

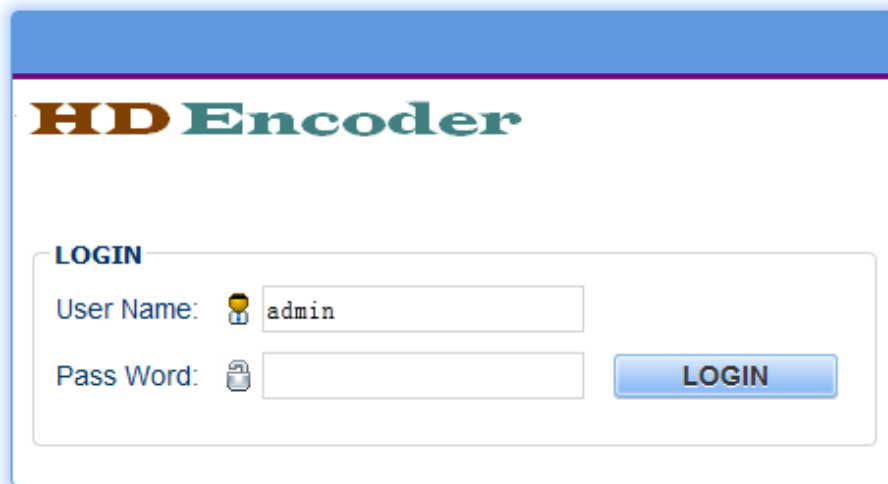


Figure-1

4.2 Operation

➤ Parameter ->Status

When we confirm the login, it displays the Status interface as Figure-2 where user can view the system information.

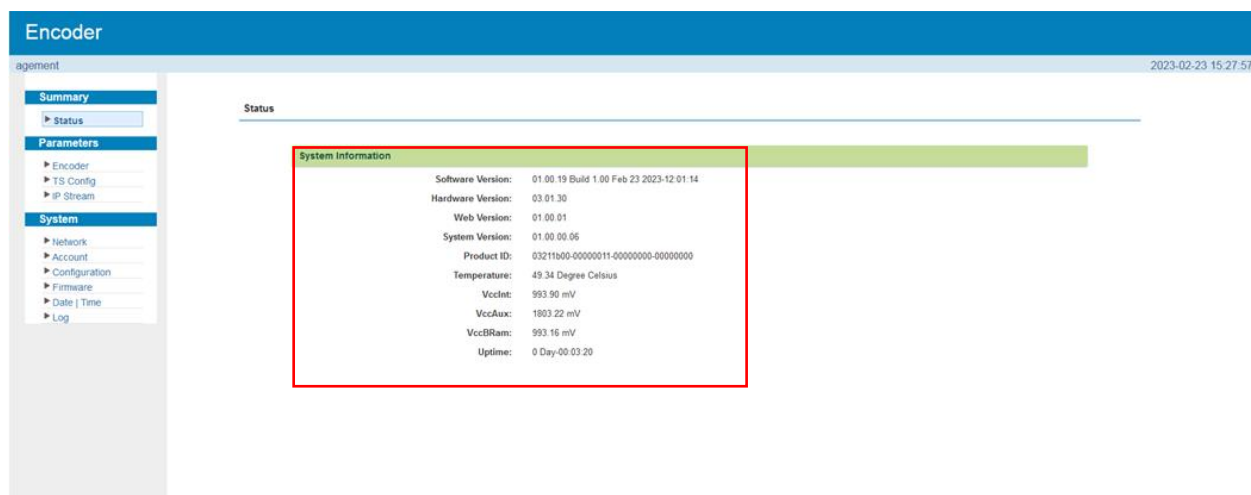


Figure-2

➤ Parameter -> Encoder

Click “Encoder” on the top column and it displays interface as Figure-3. User can set the Encoder parameters.

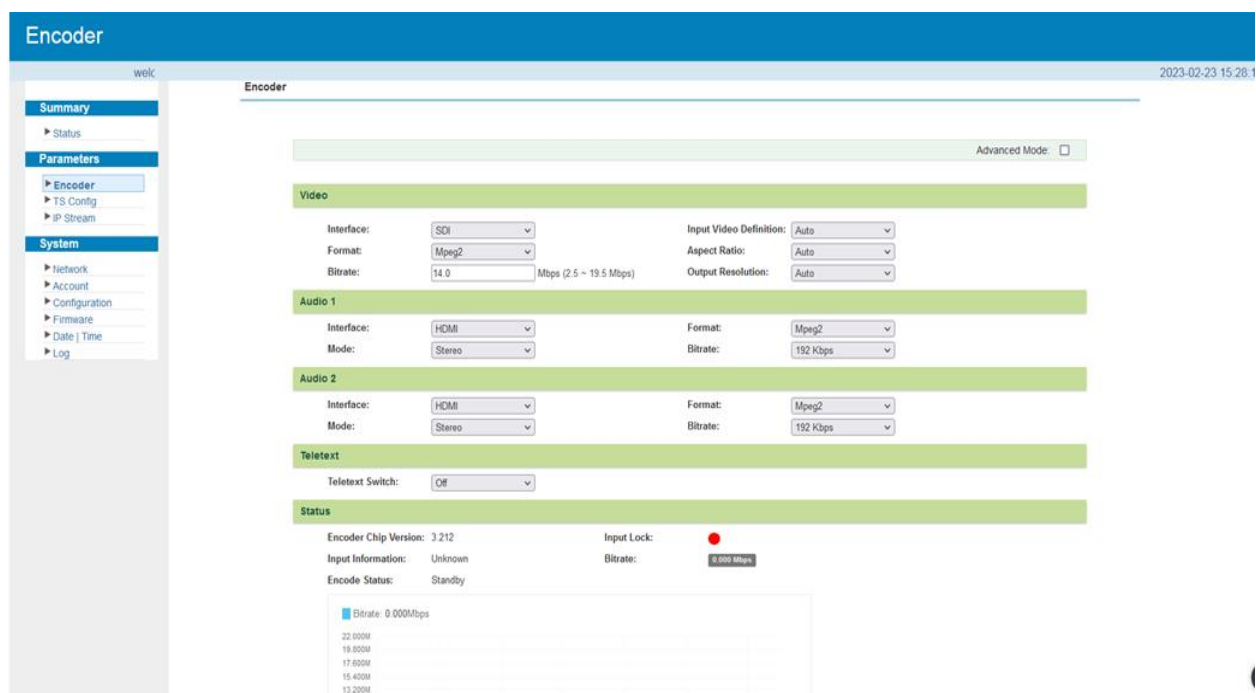


Figure-3

Encoder

welcom 2023-02-27 10:57

Summary

► Status

Parameters

► Encoder

► TS Config

► IP Stream

System

► Network

► Account

► Configuration

► Firmware

► Date | Time

► Log

Encoder

Advanced Mode: ☒

Video

Interface: HDMI Format: Mpeg2 Bitrate: 14.0 Mbps (2.5 ~ 19.5 Mbps)

Aspect Ratio: Auto

Output Resolution: Auto

CC Switch: Off

Cache: On

H.264 Level: Level 4

DTS Delay: 200 (1 ~ 500)

GOP PFrame: 1 (<= 6)

PCR Interval: 20 (1 ~ 500ms)

Field/Picture Encoding: Auto

H.264 Profile: Main Profile

Low Delay: Normal

GOP Bitrate: 7 (<= 3)

Share PCR PID: ☐

Audio 1

Interface: HDMI Format: Mpeg2 Bitrate: 192 Kbps

Mode: Stereo

Volume: 50 (0 ~ 100)

Group: Group 1

Delay: 0 (-1000 ~ 1000ms)

Pair: Pair 1

Audio 2

Interface: HDMI Format: Mpeg2 Bitrate: 192 Kbps

Mode: Stereo

Volume: 50 (0 ~ 100)

Delay: 0 (-1000 ~ 1000ms)

Figure-3

Parameter -> Encoder-> Video Setting

Video input interface: HDMI, SDI, CVBS, YPbPr optional.

Video

Interface: SDI Input Video Definition: Auto

Format: YPbPr Aspect Ratio: Auto

Bitrate: 14.0 Mbps (2.5 ~ 19.5 Mbps) Output Resolution: Auto

Figure-3

Video Format Mpeg-2/H.264. Bitrate range: 2.5-19Mbps

Video

Interface: SDI

Format: Mpeg2

Bitrate: 14.0 Mbps (2.5 ~ 19.5 Mbps)

on: Auto

Aspect Ratio: Auto

Output Resolution: Auto

Figure-3

Aspect Ratio:

SD Video input can choose Aspect Ratio from 4:3 and 16:9. HD Video input only can choose 16:9.

Output Resolution:

NDS 3211B support output resolution: 720*576_50i/720*480_60i/1920*1080_60i

1440*1080_60i/50i /1280*720_60p/50p

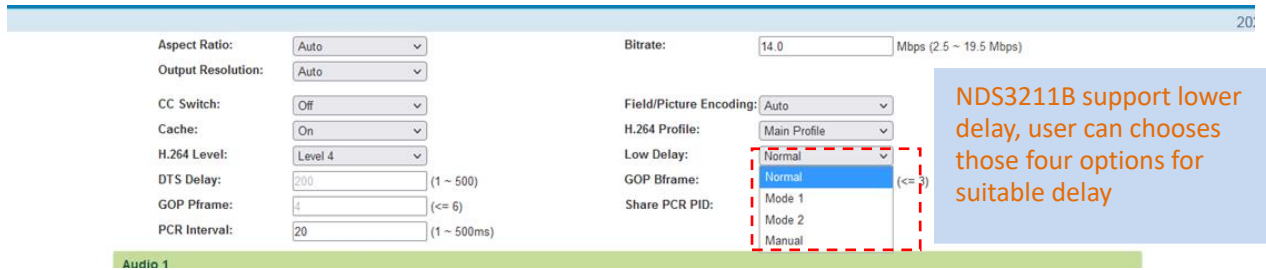


Figure-3

Parameter -> Encoder->Audio

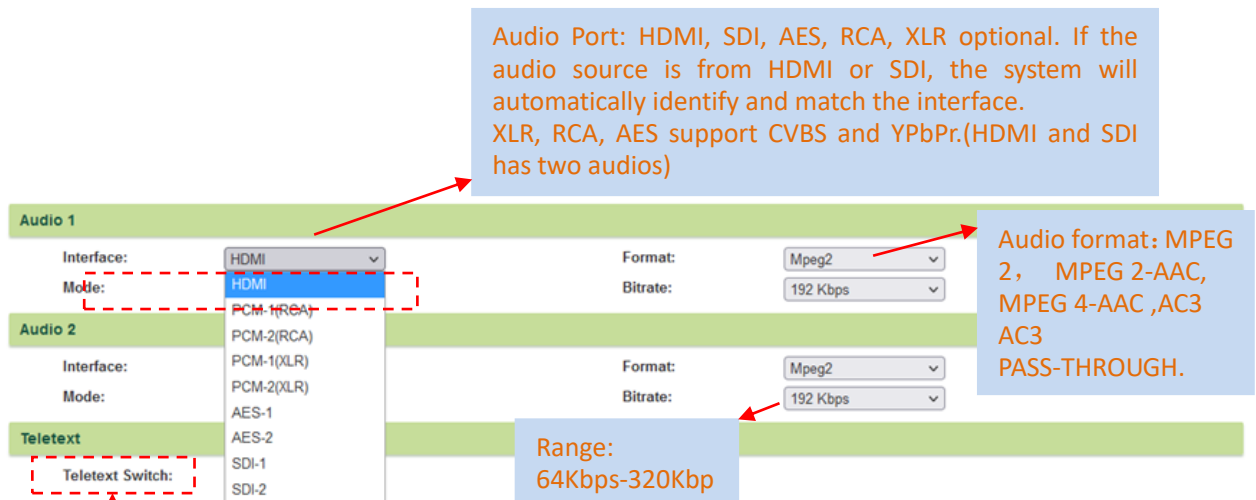


Figure-3

Closed Caption (CC):

Note: H-MPEG2-H264-E2 supports CC from CVBS and SDI input.

None: not to insert the CC into the output stream

All: The device will automatically identify the Closed Caption Standard among 608B, 608FLD1, 608FLD2 and 708B.

Chroma sampling:

Select one Chroma Sample mode from the 2 options listed. They are applicable for both MPEG2 and H.264 encoding mode.

Video Buffer:

H-MPEG2-H264-E2 support video buffer which makes it free to switch video sources. If enable video buffer, the time of system latency will be raised about 100ms.

➤ Parameter -> TS config> Stream Select

From the menu on left side of the webpage, clicking “TS Config”, it displays the interface where users can multiplex the programs from the encoder and ASI inputs.

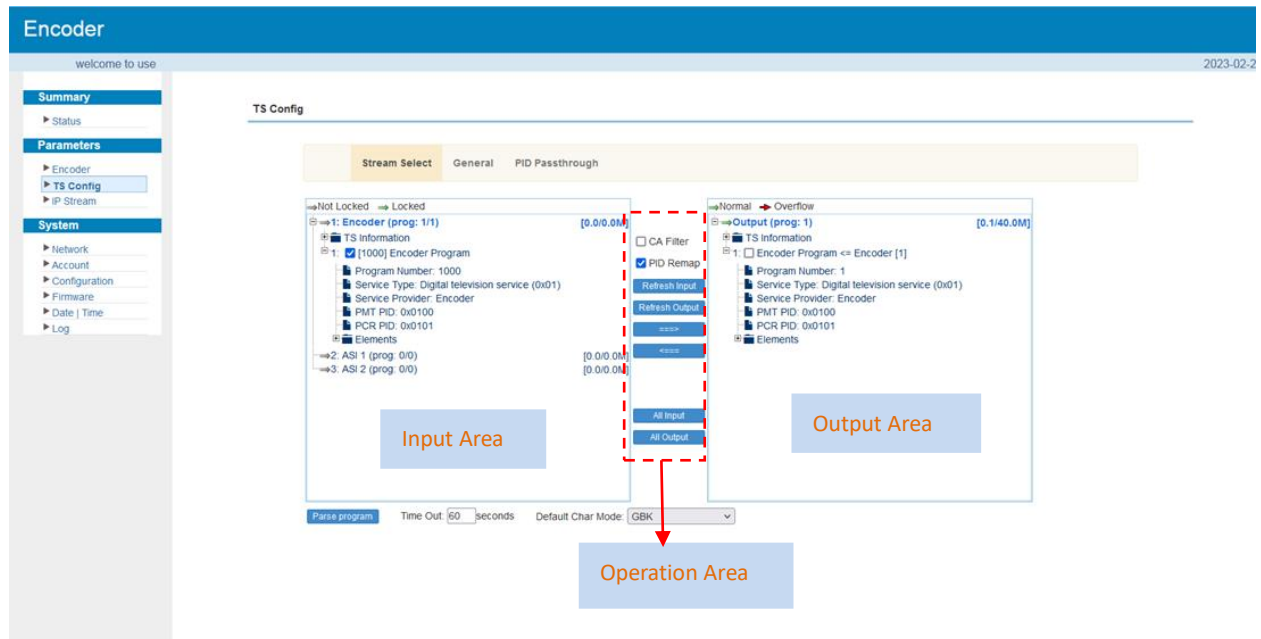


Figure-4

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

⇒Not Locked ⇒ 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 reduce program

☒ 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

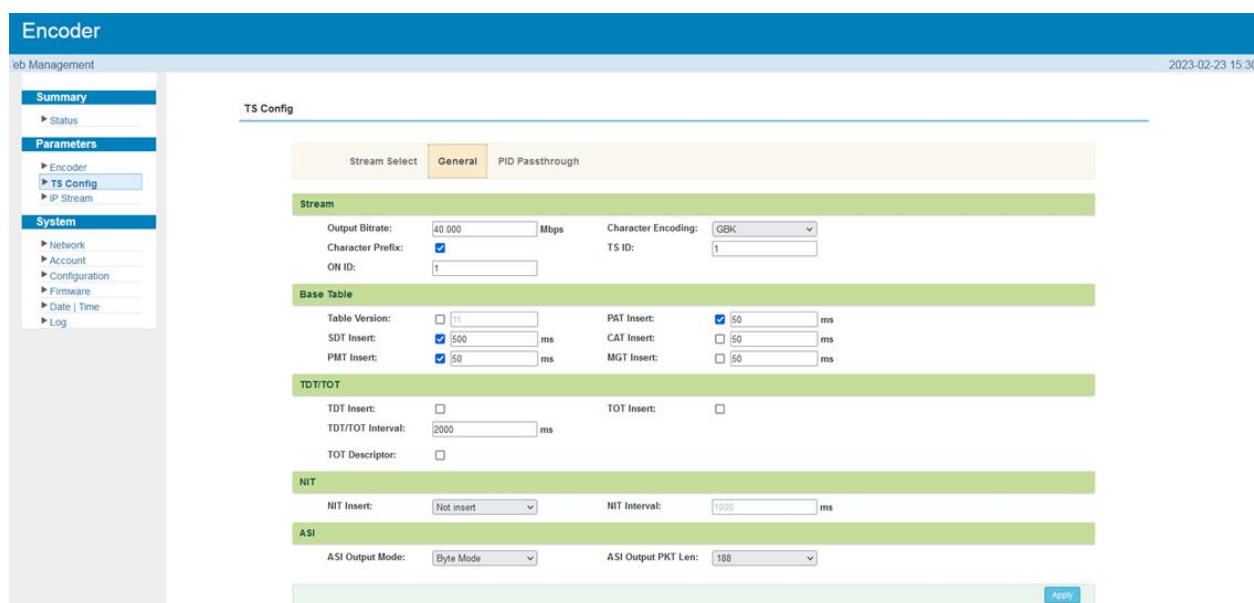
All Output To select all the output programs

Parse program To parse programs time out: 60 seconds time limitation of parsing input programs

Parameter -> TS config -> General

From the TS Config menu on up side of the webpage, clicking “General”, it displays the interface where users can set Output Bitrate, Character Encoding and TDT/TOT/NIT tables.

(Figure-5)



The screenshot shows the 'Encoder' interface with a sidebar menu on the left containing 'Summary', 'Parameters', 'System', and 'Log'. The 'Parameters' section is expanded, showing 'Encoder', 'TS Config', and 'IP Stream'. The 'TS Config' tab is selected, displaying the 'General' configuration for a stream. The 'Stream' section includes 'Output Bitrate' (40,000 Mbps), 'Character Encoding' (GBK), 'Character Prefix' (checked), 'TS ID' (1), and 'ON ID' (1). The 'Base Table' section includes 'Table Version' (1), 'SDT Insert' (checked, 500 ms), 'PMT Insert' (checked, 50 ms), 'PAT Insert' (checked, 50 ms), 'CAT Insert' (checked, 50 ms), and 'MGT Insert' (checked, 50 ms). The 'TDT/TOT' section includes 'TDT Insert' (checked), 'TDT/TOT Interval' (2000 ms), and 'TOT Insert' (checked). The 'NIT' section includes 'NIT Insert' (Not insert) and 'NIT Interval' (1000 ms). The 'ASI' section includes 'ASI Output Mode' (Byte Mode) and 'ASI Output PKT Len' (188). An 'Apply' button is at the bottom right.

Figure-5

Parameter -> TS config -> Pass-through

From the TS Config menu on up side of the webpage, clicking “Pass-through”, it displays the interface where users can set PID. (Figure-6)

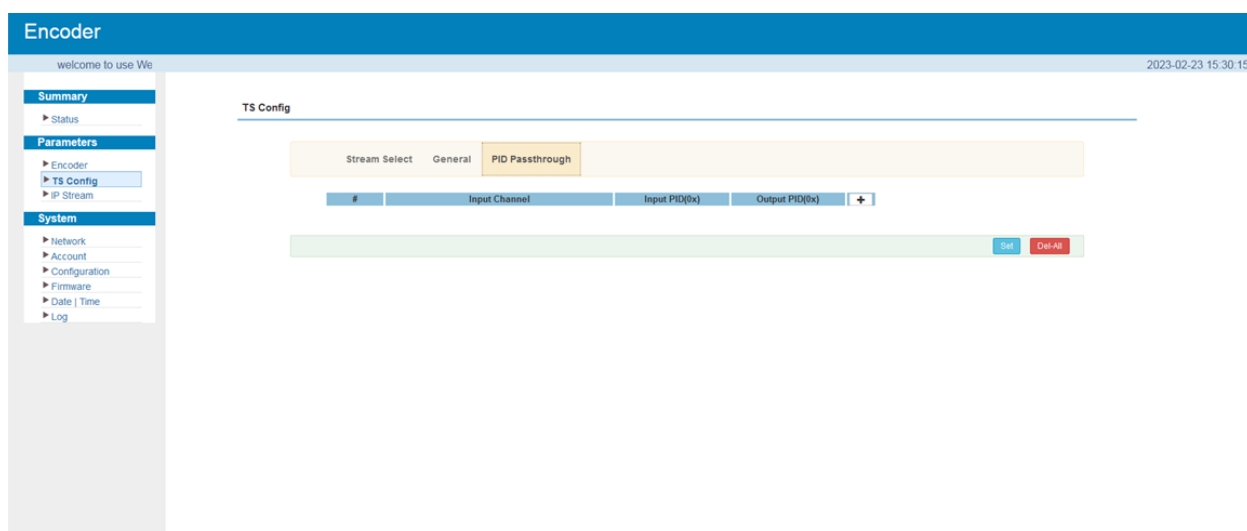


Figure-6

➤ Parameter -> IP stream

H-MPEG2-H264-E2 supports TS to output in IP format through the DATA1 (only one MPTS) or DATA2 port. The output programs information in MPTS. Clicking “IP Stream”, it displays the interface where to set IP out parameters (Figure-7).

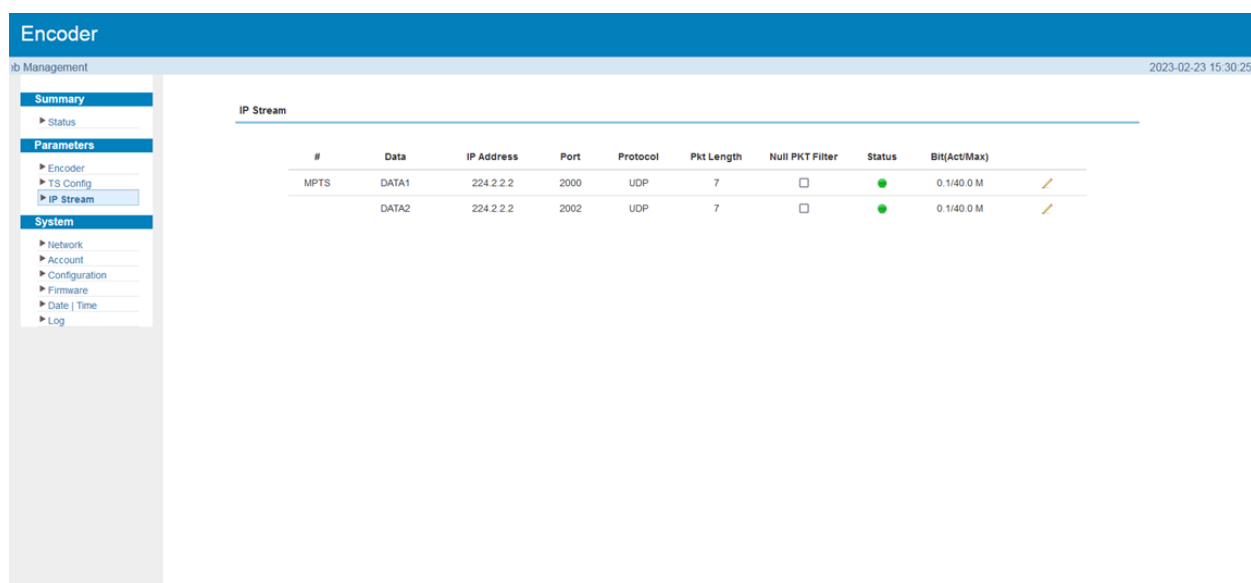


Figure-7

When users click “Channel config” button, it triggers a dialog box where users can set the corresponding channel configuration.

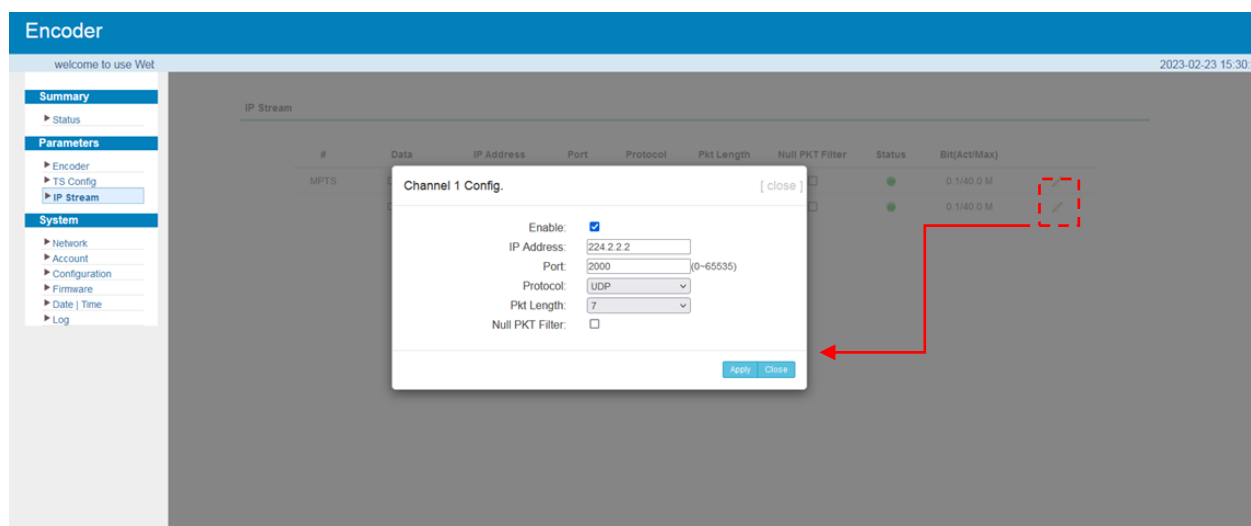


Figure-7

➤ System -> Network

Clicking “Network”, it displays the interface as Figure-8 where to set network parameters.

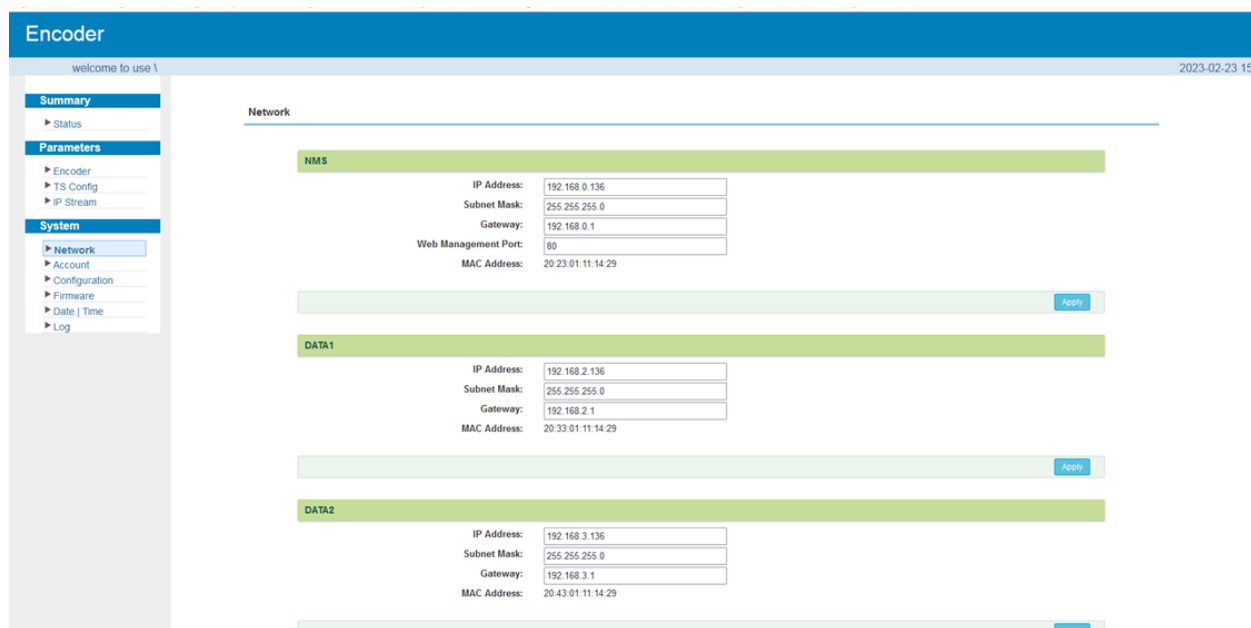


Figure-8

➤ System -> Account

Clicking “Account”, it displays the interface as Figure-9 where to set use-name and password of the equipment.

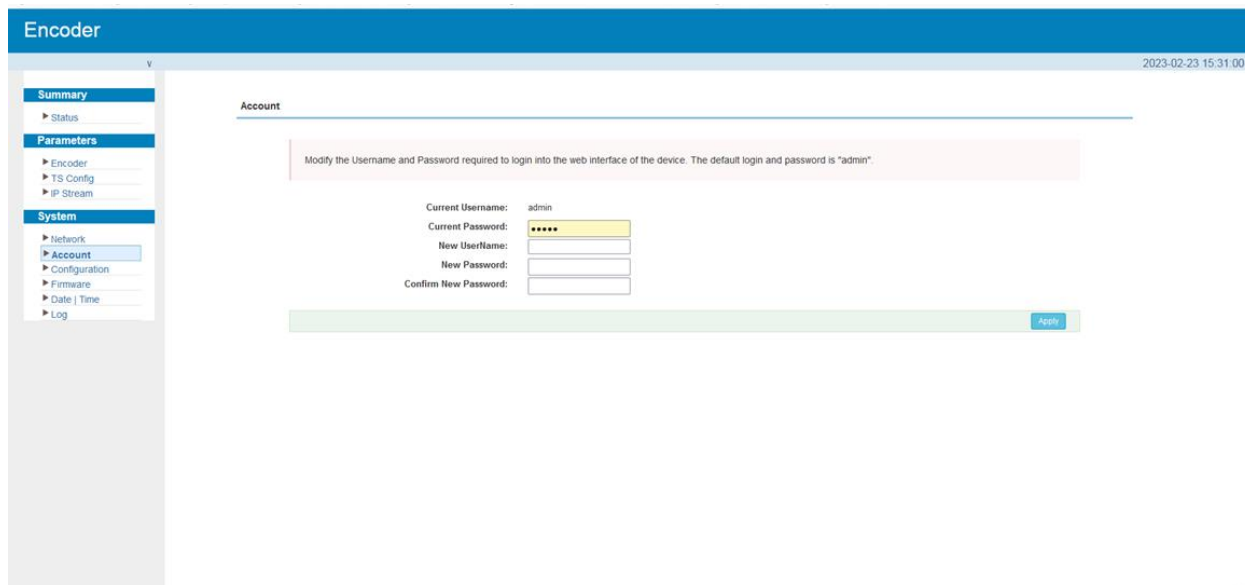


Figure-9

➤ System -> Configuration

Clicking “Configuration”, it displays the screen as Figure-10 where to save/ restore/factory setting/ backup/ load your configurations.

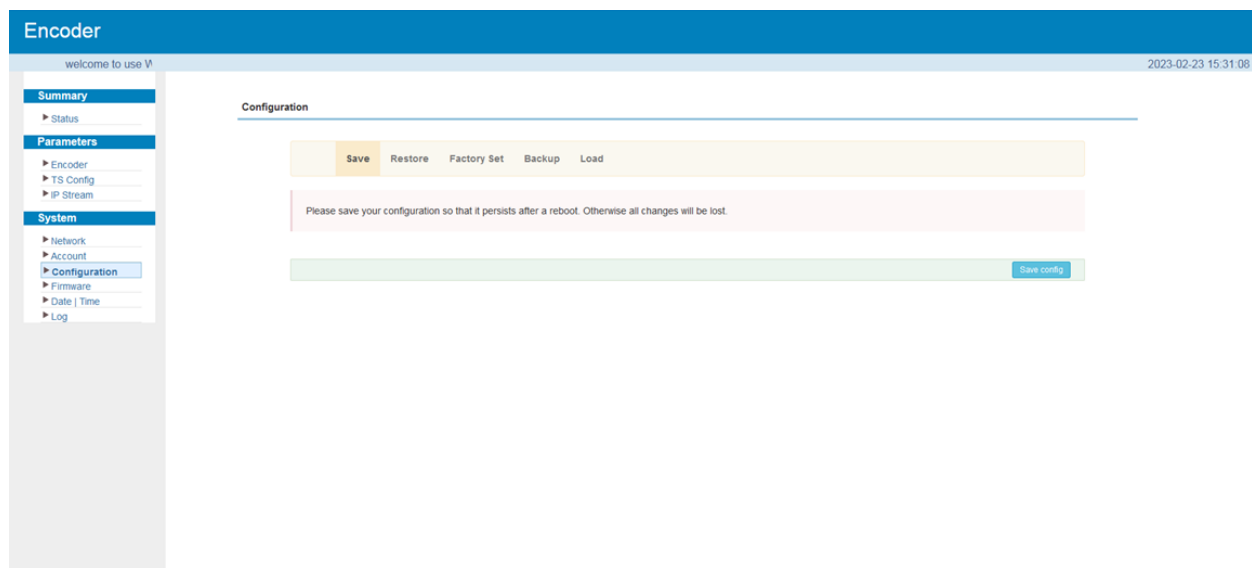


Figure-10

➤ System -> Firmware

Clicking “Firmware”, it displays the screen as Figure-11 where to update firmware for the encoder.

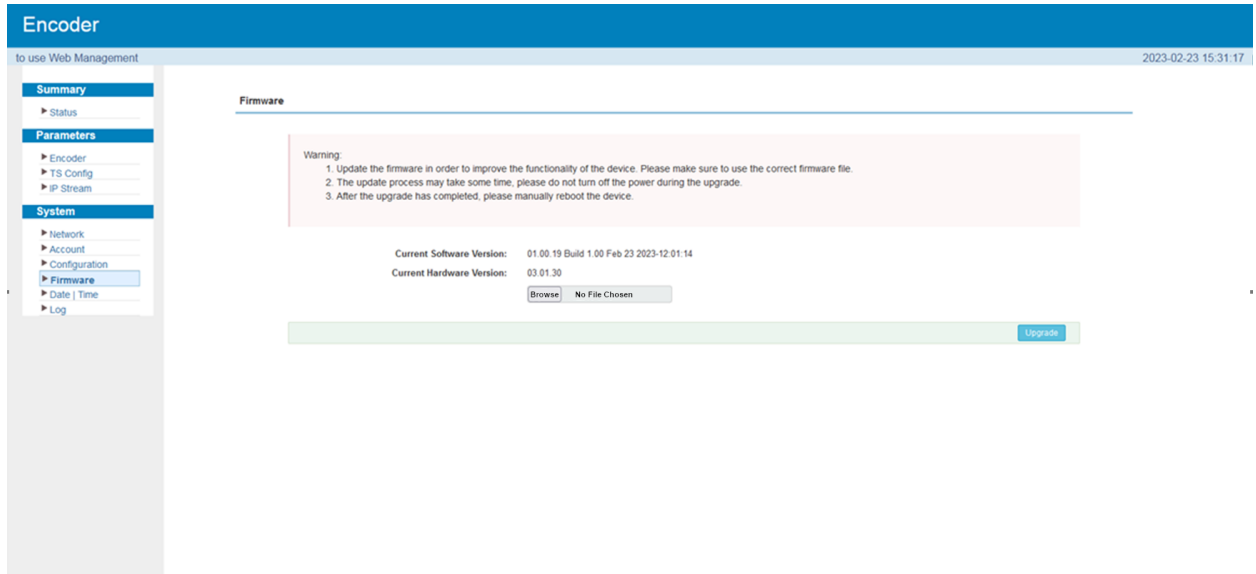


Figure-11

➤ System -> Date/Time

Clicking “Date/Time”, it displays the screen as Figure-12 where to set date and time for the device.

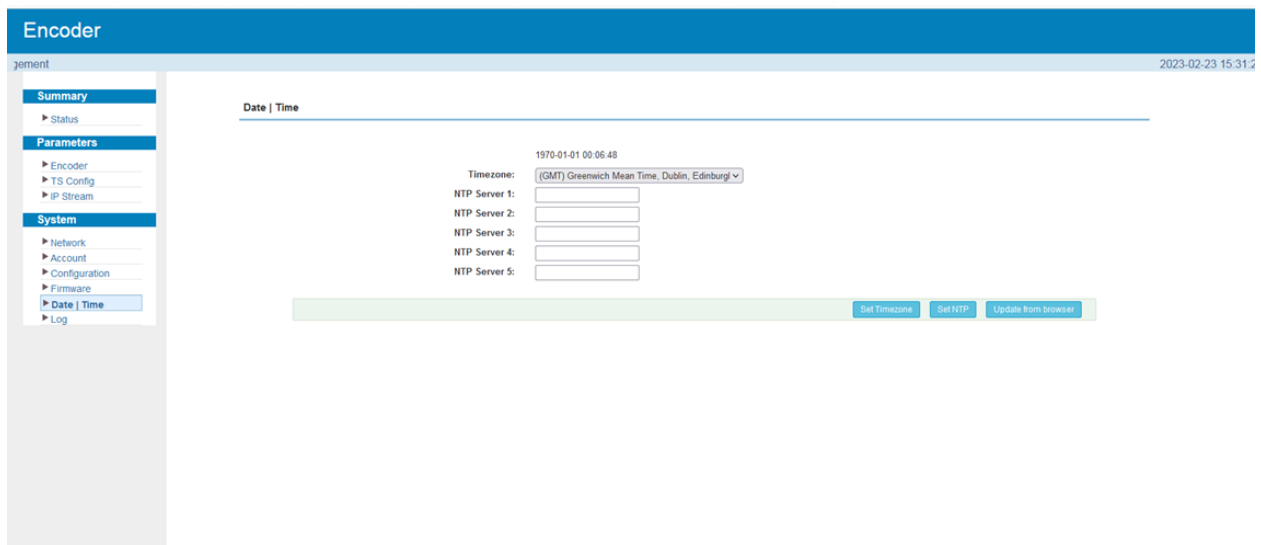


Figure-12

➤ System -> Log

Clicking “Log”, it displays the log interface as Figure-13 where to check or export the Kernel/System log.

Encoder

welcome to use Web Mana

2023-02-21

Summary

Status

Parameters

Encoder

TS Config

IP Stream

System

Network

Account

Configuration

Firmware

Date | Time

Log

Log

Log Type: Kernel Log

Auto Refresh: 0

Export

```

[ 0.000000] Kernel Log
[ 0.000000] System Log
[ 0.000000] CPU: ARMv7 Processor [413f090] revision 0 (ARMv7), cm=18c5387d
[ 0.000000] CPU: PPT / VPT / VPT nonaliasing data cache, VPT aliasing instruction cache
[ 0.000000] Machine model: xlnx.zynq-7000
[ 0.000000] cma: Reserved 16 MiB at 0x04000000
[ 0.000000] Memory policy: Data cache writealloc
[ 0.000000] On node 0 totalpages: 65536
[ 0.000000] free_area_init_node: node 0, pgdat 40689a40, node_mem_map 4fd0000
[ 0.000000] Normal zone: 512 pages used for memmap
[ 0.000000] Normal zone: 0 pages reserved
[ 0.000000] Normal zone: 65536 pages, LIFO batch: 15
[ 0.000000] PERCPU: Embedded 10 pages/cpu @4fd1000 s8512 r8192 d24256 u40960
[ 0.000000] pcpu-alloc: s8512 r8192 d24256 u40960 alloc=10*4096
[ 0.000000] pcpu-alloc: [0] 0 [0] 1
[ 0.000000] Built 1 zonelists in Zone order, mobility grouping on. Total pages: 65024
[ 0.000000] Kernel command line: console=ttyPS0,115200
[ 0.000000] log_buf_len individual max cpu contribution: 131072 bytes
[ 0.000000] log_buf_len total cpu_extra contributions: 131072 bytes
[ 0.000000] log_buf_len min size: 131072 bytes
[ 0.000000] log_buf_len: 262144 bytes
[ 0.000000] early log buf free: 129688(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: 222616K/262144K available (4534K kernel code, 249K rdata, 1668K rodata, 212K init, 309K bss, 23144K reserved, 16384K cma-reserved, 0K highmem)
[ 0.000000] Virtual kernel memory layout:
[ 0.000000] vector : 0xffff0000 - 0xffff1000 ( 4 KB)
[ 0.000000] fixmap : 0xffc00000 - 0xffff0000 (3072 KB)
[ 0.000000] vmalloc : 0x50800000 - 0xffff0000 (2792 MB)
[ 0.000000] lowmem : 0x40000000 - 0x50800000 (256 MB)
[ 0.000000] pmem : 0x3fe00000 - 0x40000000 ( 2 MB)
[ 0.000000] modules : 0x3f000000 - 0x3fe00000 ( 14 MB)
[ 0.000000] text : 0x40008000 - 0x40516dc8 (6204 KB)

```

Figure-13

Chapter 5 Troubleshooting

THOR's ISO9001 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. To prevent potential hazard, please strictly follow the operation conditions.

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 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 6 Packing List

H-MPEG2-H264-E2 H.264/H.265 HD Encoder

User Manual

HDMI Cable

SDI Cable

YPbPr Cable

CVBS Cable

XLR adapter Cables

RCA adapter Cables

Power Cord