NDS3306I 6 in 1 ISDB-T Modulator
User Manual

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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.

Disclaimer

The contents of this document are subject to revision without notice due to continued progress in methodology, design and manufacturing. DEXIN shall have no liability for any error or damage of any kind resulting from the use of this document.

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Chapter 1 Product Overview

1.1 Outline

NDS3306I 6 in 1 ISDB-T modulator is the latest generational Mux-modulating device developed by DEXIN. It has 6 multiplexing channels and 6 (ISDB-Tb) modulating channels, and supports maximum 192 IP input through the 3 GE ports and 6 non-adjacent carriers (50MHz~960MHz) output through the RF output interface. The device is also characterized with high integrated level, high performance and low cost. This is very adaptable to newly generation DTV broadcasting system.

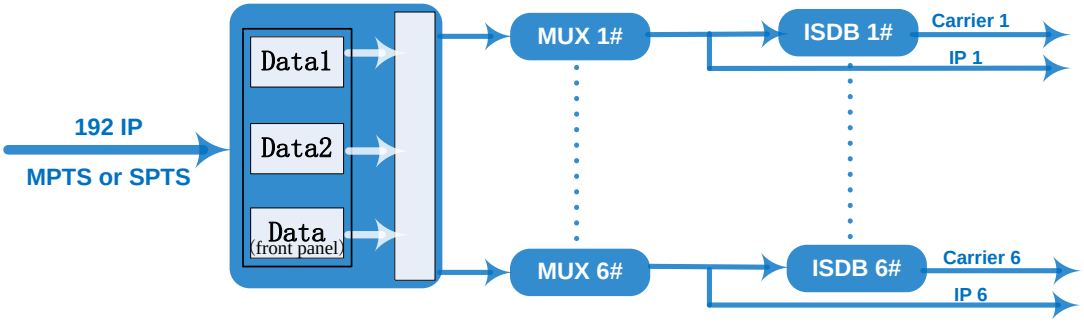
1.2 Key Features

- **3 GE ports (max 192 IP in):**

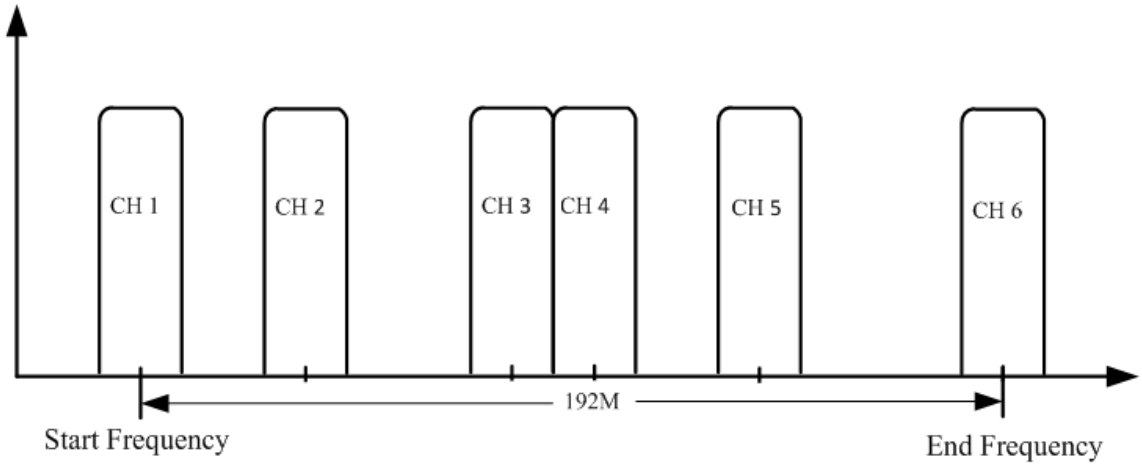
  Data1 & Data2 bi-directional ports, max 192 IP in, 6 IP out

  Data port (located on front panel), max 128 IP in
- **Max 840Mbps for each GE input**
- **Supports accurate PCR adjusting**
- **Supports CA filtering, PID remapping and PSI/SI editing**
- **Supports up to 180 PIDS remapping per channel**
- **Support 6 IP output through Data1 & Data2 over UDP/RTP/RTSP**
- **6 non-adjacent carriers output, compliant to ISDB-Tb (ARIB STD-B31)**
- **Support Web-based Network management**

1.3 Inner Structure



1.4 Carrier Setting Illustration



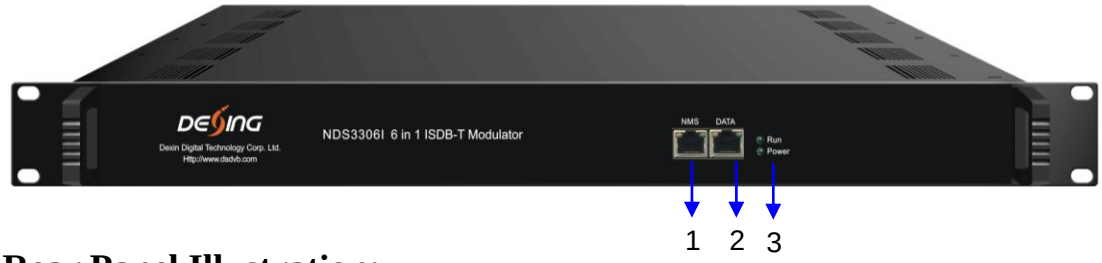
1.5 Specifications

Input	Input	Max 192 IP input through 3 (front-panel Data port, Data 1 and Data 2) 100/1000M Ethernet Port (SFP interface optional). Each Data1 or Data 2 port can input max 192 IP, while front-panel Data port can input max 128 IP
	Transport Protocol	TS over UDP/RTP, unicast and multicast, IGMP V2/V3
	Transmission Rate	Max 840Mbps for each GE input
Mux	Input Channel	192
	Output Channel	6
	Max PIDs	180 per channel
	Functions	PID remapping (auto/manually optional)
		PCR accurate adjusting
		PSI/SI table automatically generating
Modulation Parameters	Standard	ARIB STD-B31
	Bandwidth	6M
	Constellation	QPSK, 16QAM, 64QAM
	Guard Interval	1/32, 1/16, 1/8, 1/4
	Transmission Mode	2K, 4K, 8K
	Code rate	1/2, 2/3, 3/4, 5/6, 7/8
	MER	≥40dB
	RF frequency	50~960MHz, 1KHz step
	RF output level	-20dBm~+10dBm(87~117dbμV), 0.1dB stepping
RF Output	Interface	1 F typed output port for 6 carriers, 75Ω

		impedance
	ACLR	-50 dBc
TS output	6 IP output over UDP/RTP/RTSP, unicast/multicast, 2 (Data1& Data2) 100/1000M Ethernet Ports	
System	Network management software (NMS) supporting	
General	Demission	420mm×440mm×44.5mm (WxLxH)
	Weight	3kg
	Temperature	0~45℃(operation), -20~80℃(storage)
	Power Supply	AC 100V±10%, 50/60Hz or AC 220V±10%, 50/60Hz
	Consumption	15.4W

Chapter 2 Physical Presentational Statement

2.1 Front panel Illustration:



2.2 Rear Panel Illustration:

1	NMS/CAS: network management port and CA data port
2	DATA input port
3	Indicators
4	Grounding
5	Power switch
6	AC Power Socket
7	RF output port
8	Reset IP: Reset webmaster IP address, recover it to default IP address
9	Data Input /Output 1/2

Chapter 3 Installation Guide

3.1 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:

- NDS3306I 6 in 1 ISDB-T Modulator
- User's Manual
- Power Cord

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

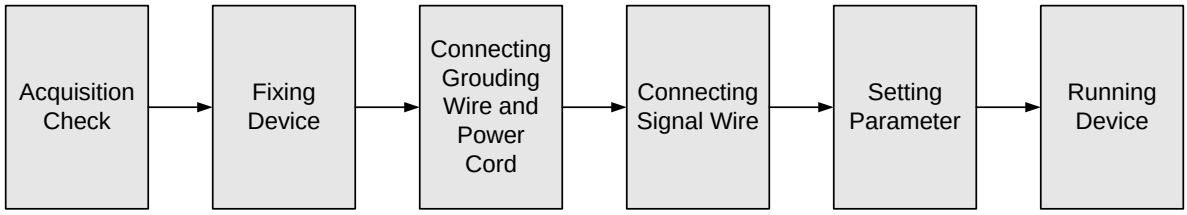
3.2 Installation Preparation

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 NDS3306I 6 in 1 ISDB-T Modulator
- Connecting signal cables
- Connecting communication port (if it is necessary)

3.2.1 Device's Installation Flow Chart Illustrated as follows:



3.2.2 Environment Requirement

Item	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: $1X10^{7}$~$1X10^{10\Omega}$, Grounding current limiting resistance: 1M (Floor bearing should be greater than 450Kg/㎡)
Environment Temperature	5~40℃(sustainable), 0~45℃(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 ±10% 50/60Hz or 110V ±10% 50/60Hz. Please carefully check before running.

3.2.3 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 25mm^2.

3.2.4 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 25mm^2.

3.2.5 Device Grounding

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

3.3 Wire's Connection

3.3.1 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 NDS3306I 6 in 1 ISDB-T Modulator, user should set the power switch to "OFF".

3.3.2 Signal and NMS Cable Connection

The signal connections include the connection of input signal cable and the connection of output signal cable.

Chapter 4 Web NMS Management

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

4.1 Login

The default IP address of this device is 192.168.0.136.

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.

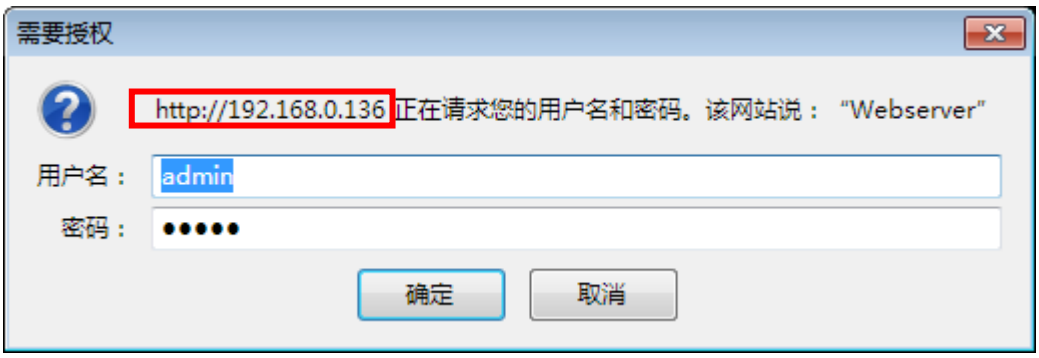


Figure-1

4.2 Operation

4.2.1 Summary

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

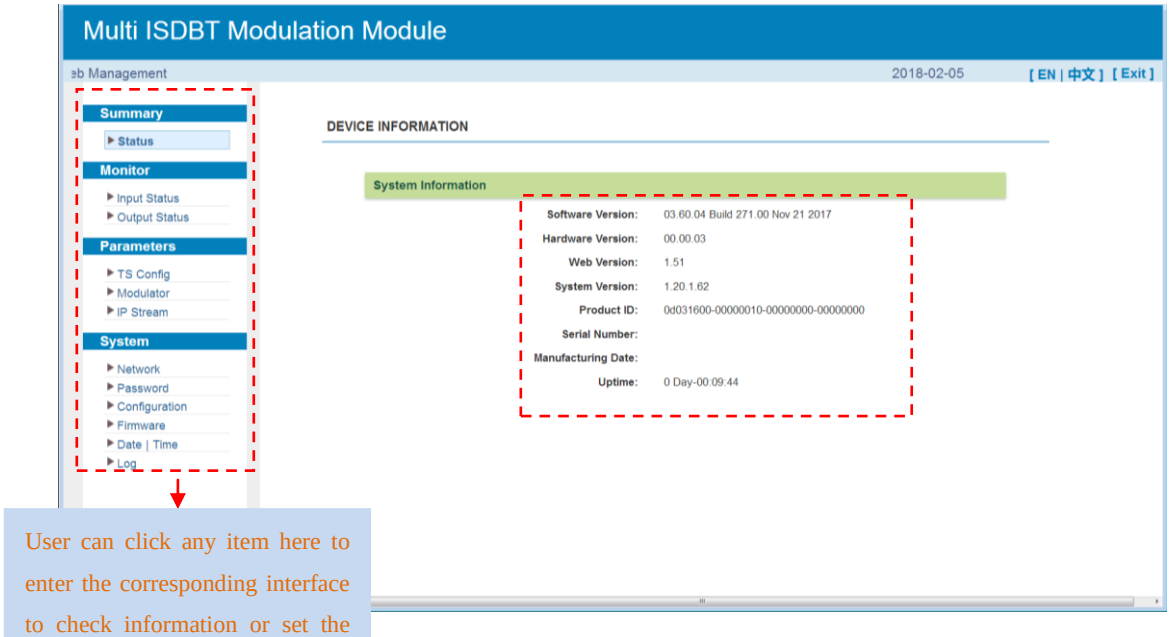


Figure-2

4.2.2 Monitor

Monitor → Input Status:

Clicking “Input Status”, it will display the interface as Figure-3 where users can check the input status of Data1 and Data 2. Users need to add IP in “TS Config” part. Otherwise, it will monitor nothing.

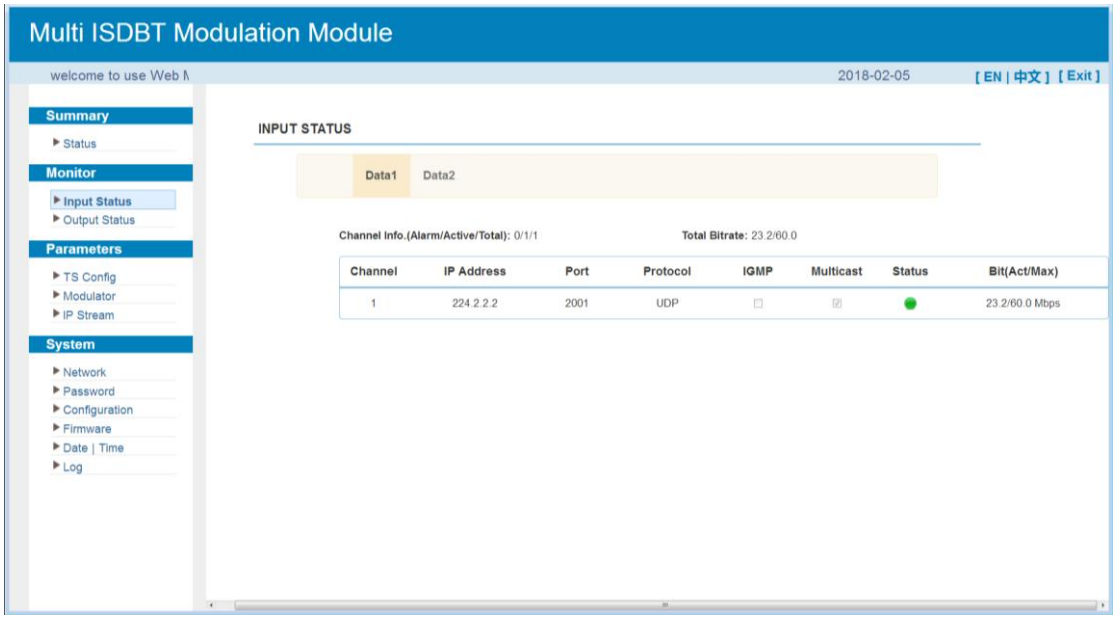


Figure-3

Monitor → Output Status:

Clicking “Output Status”, it will display the interface as Figure-4/5 where users can check

output status of the 6 carriers and 6 IPs. User need to enable the output status in "Modulator" and "IP Stream" part. Otherwise, it will monitor nothing.

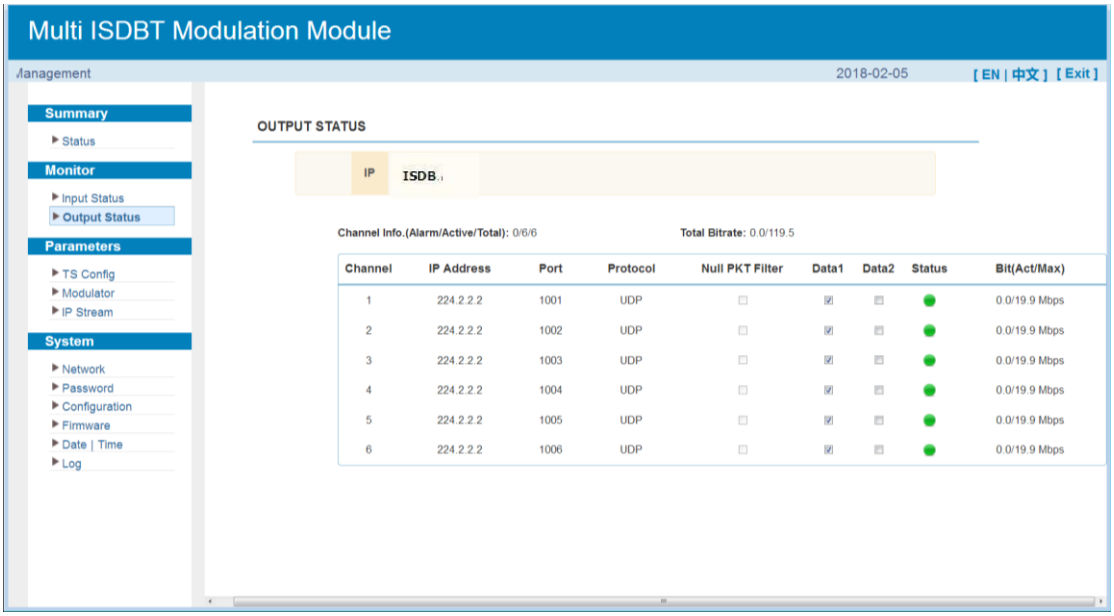


Figure-4

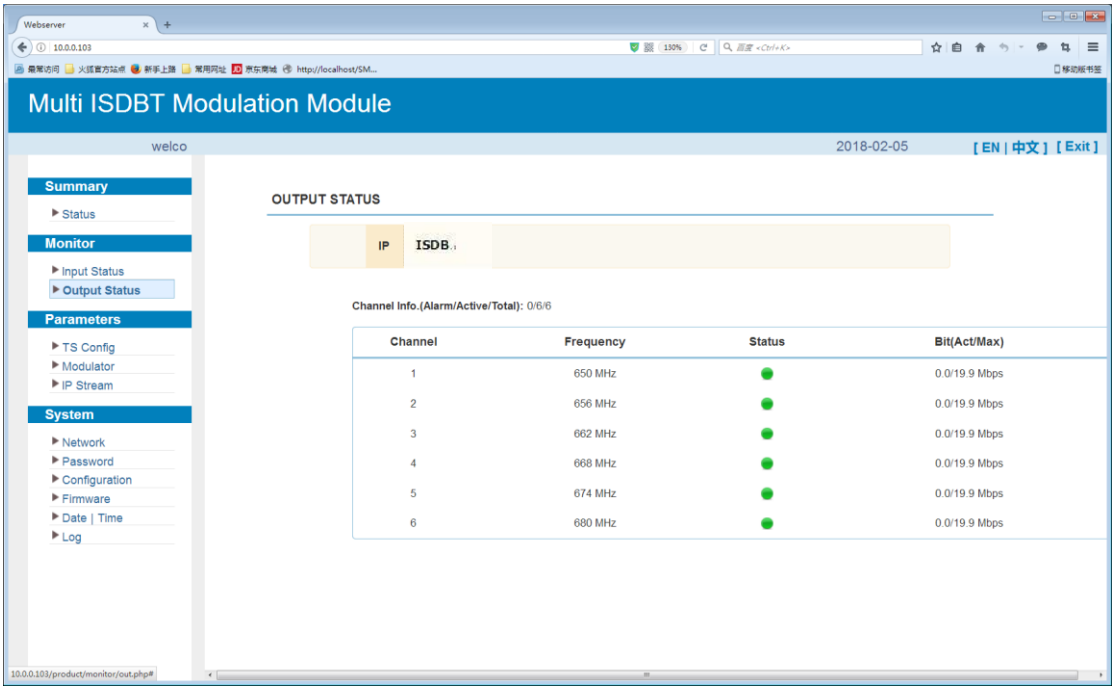


Figure-5

4.2.3 Parameters

Parameters → TS Config:

Click "TS Config", it will display the interface where users can configure the output TS parameters in this interface. (Figure-6)

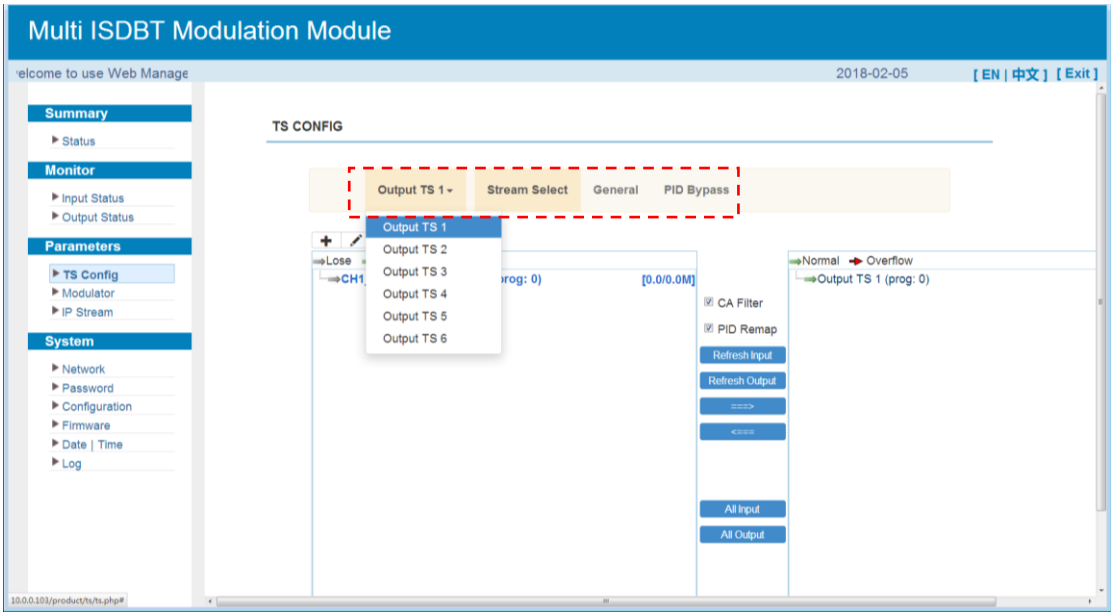


Figure-6

➢ Output TS X

Clicking “Output TS X”, it will display the interface as Figure-7. Users can select the output TS channels.

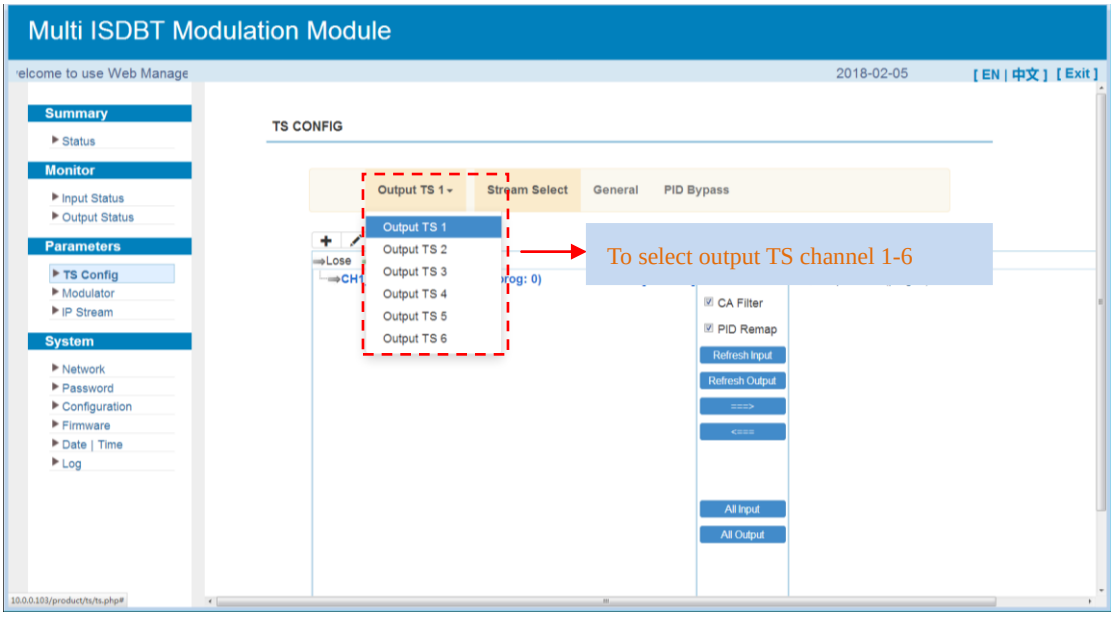


Figure-7

➢ Stream Select

Clicking “Stream Select”, it will display the interface where users can choose the programs to Mux out. (Figure-8)

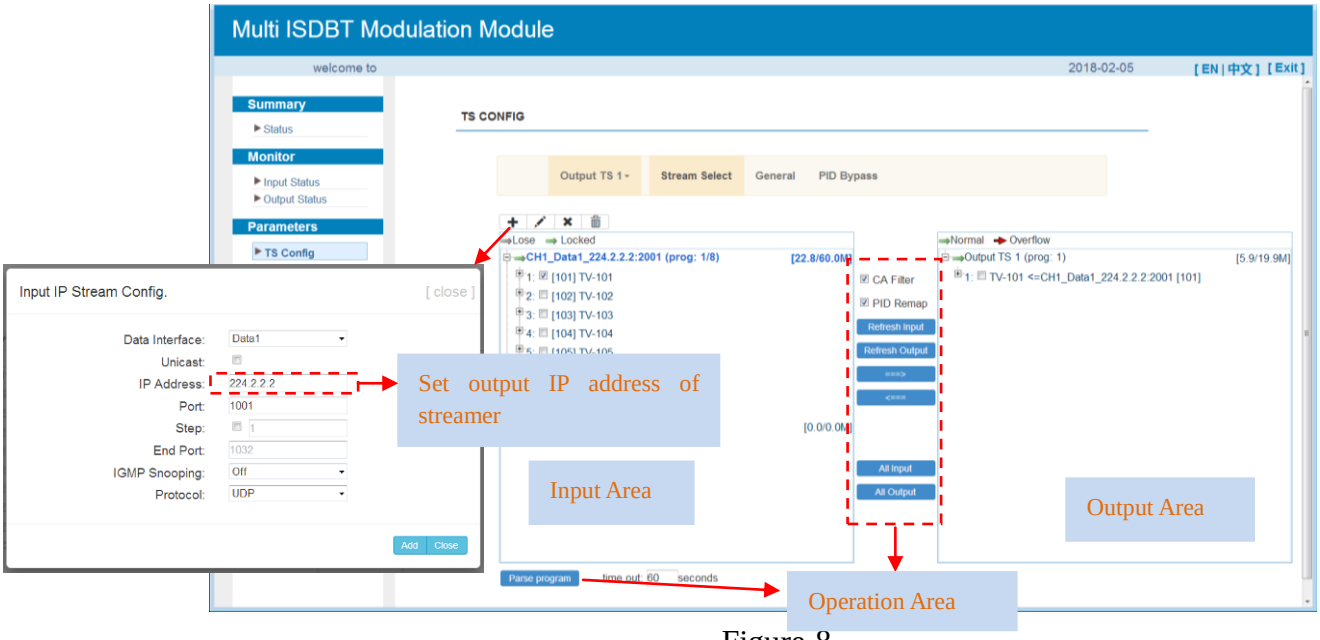


Figure-8

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

: To add input channel which come from Data1 or Data 2 or Data/Module

: To edit the input channel

: To delete the input channel

: 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 reduce program

CA Filter ： Enable/disable the CA Filter function. Clicking the box, user can filter the input CA to avoid disturbing with the device scrambling function.

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 1: TV-101 <=CH1_Data1_224.2.2.2:2001 [101] , it triggers a dialog box (Figure 9) where users can input new information.

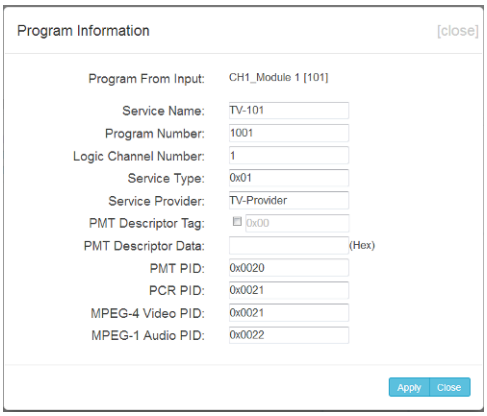


Figure-9

➢ General

Clicking "General", it will display the interface where users can set parameters for each output channel. (Figure-10)

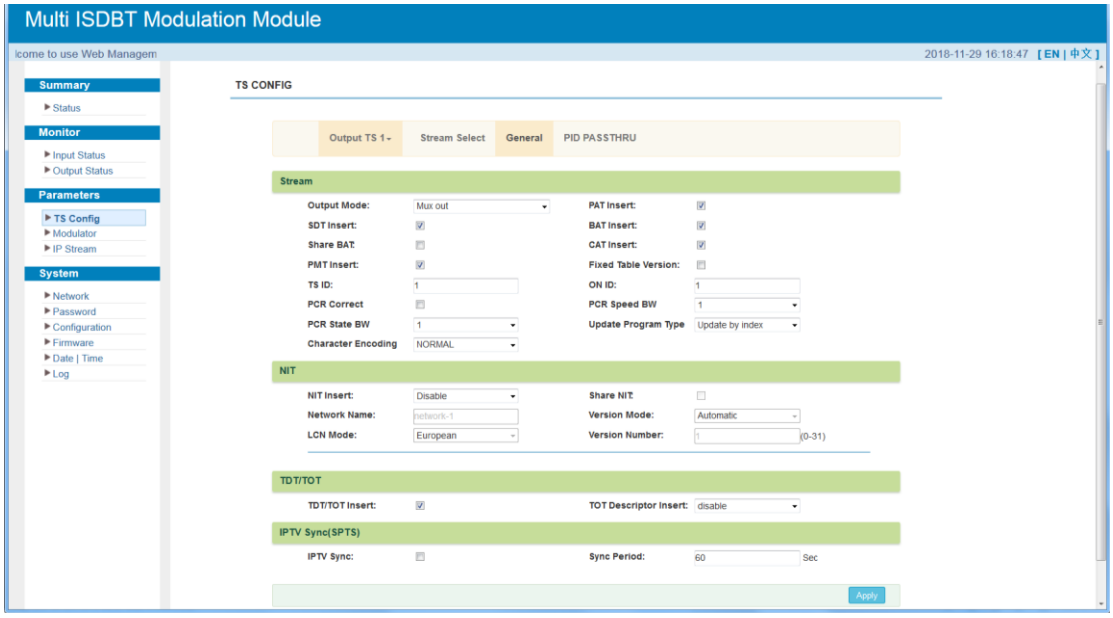


Figure-10

➢ PID Pass

Clicking "PID Bypass", it will display the interface as Figure-11 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” to apply the parameters.

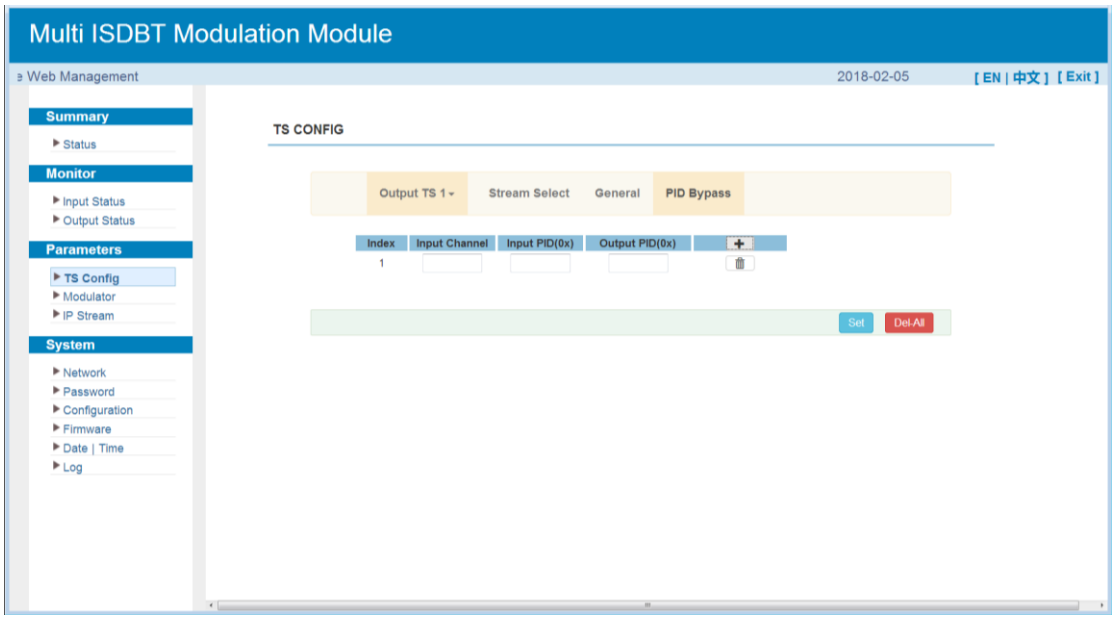


Figure-11

Parameters → Modulator:

Clicking ‘Modulator’, it will display the interface as Figure-12 where to set RF output parameters.

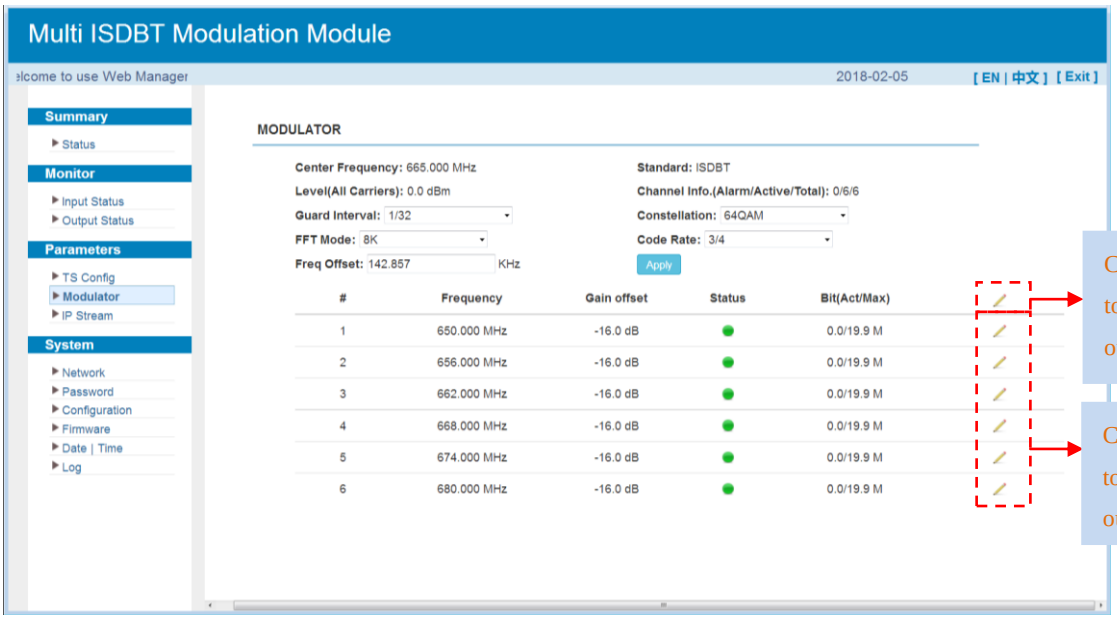
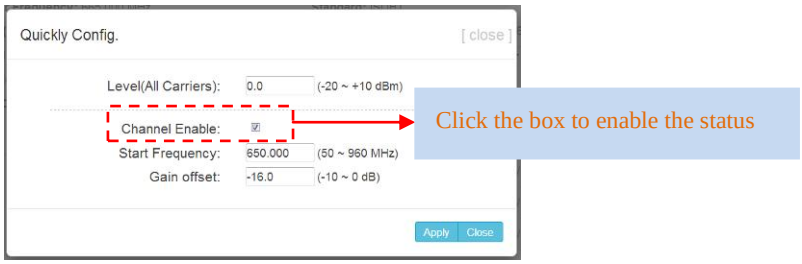


Figure-12

When users click “quickly config” button, it triggers a dialog box as follow where users can set all channels configration.



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

Parameters → IP Stream:

NDS3306I supports TS to output in IP (6*MPTS) format through the DATA port.

Clicking ‘IP Stream’, it will display the interface as Figure-13 where to set IP out parameters.

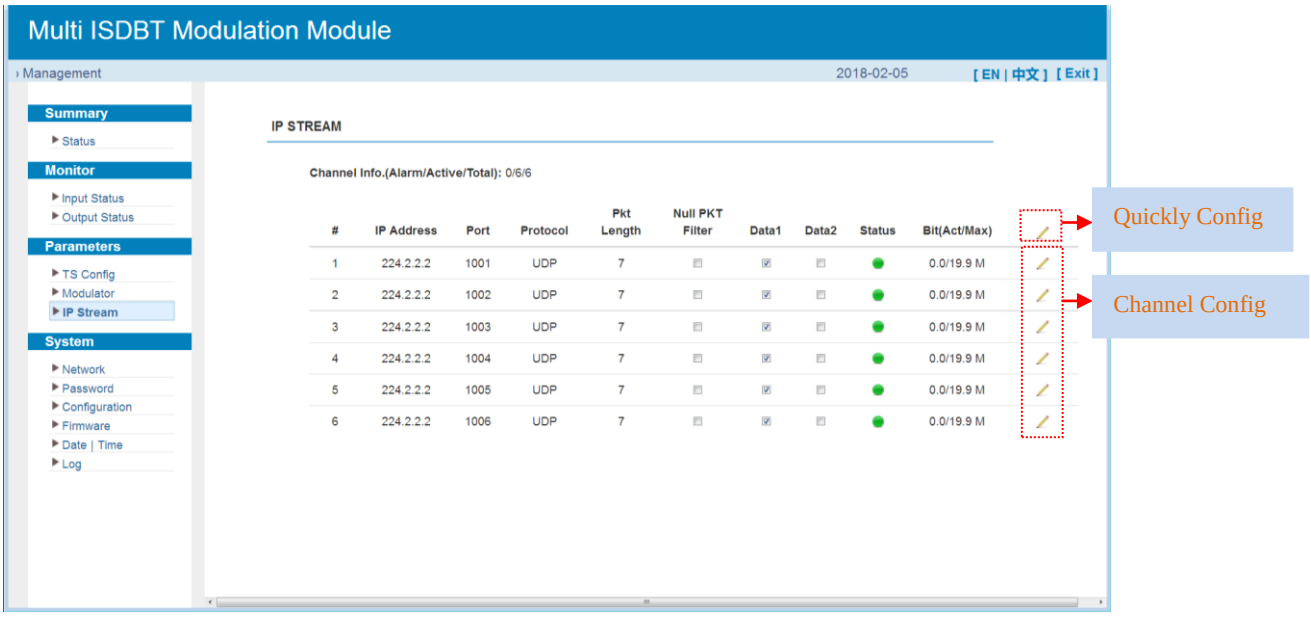
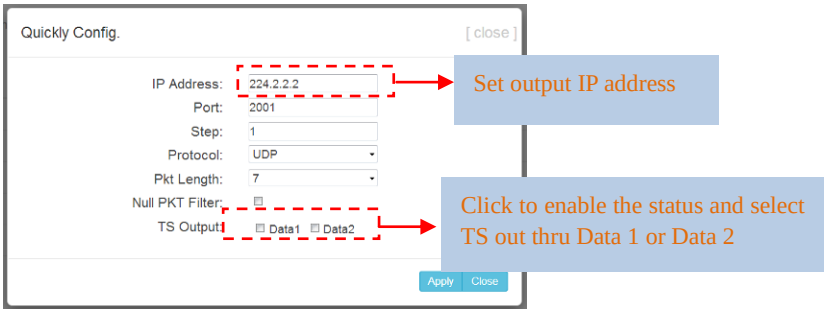
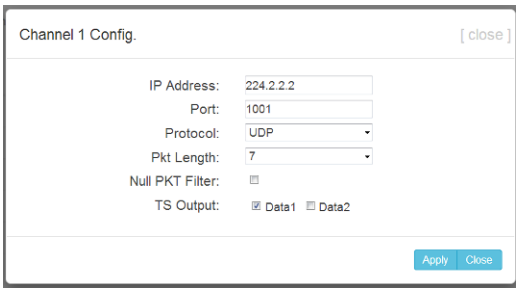


Figure-13

When users click “Quickly Config” button, it triggers a dialog box where users can set all channels MPTS configration simultaneously.



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



4.2.4 System

System → Network:

Clicking 'Network', it will display the interface as Figure-14 where to set network parameters.

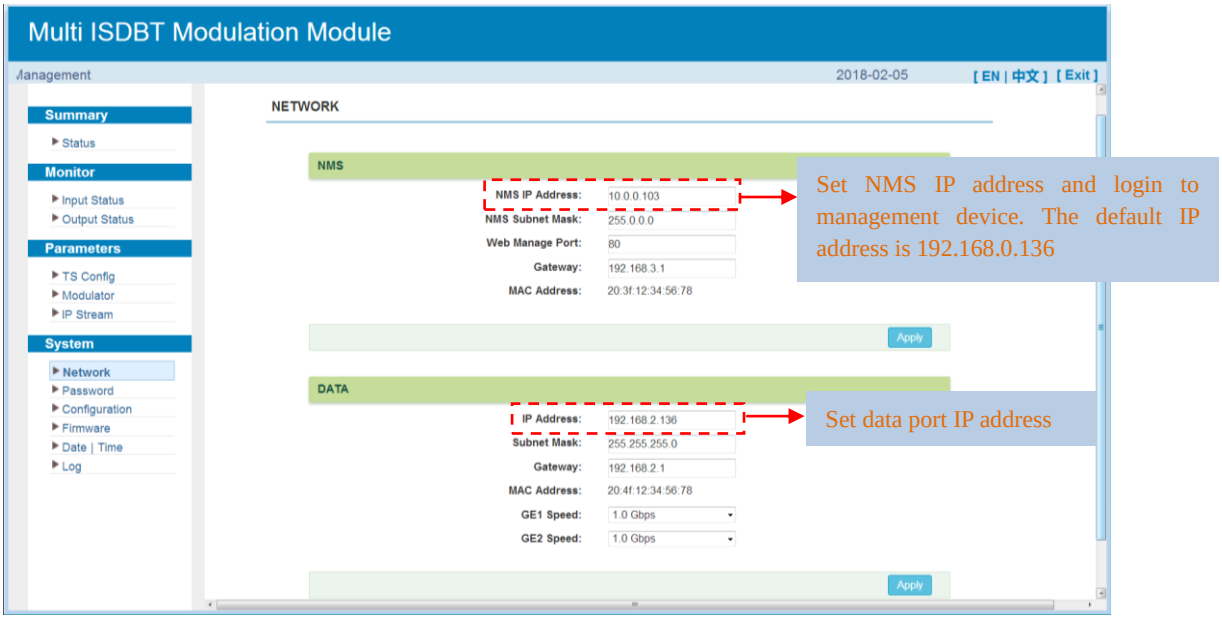


Figure-14

System → Password:

Clicking "Password", it will display the screen as Figure-15 where to set the login account and password for the web NMS.

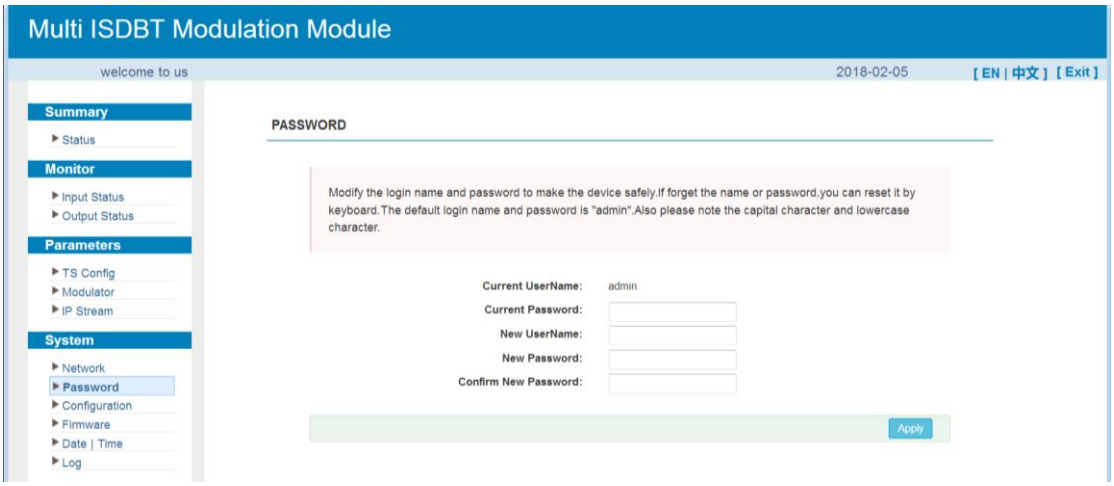


Figure-15

System → Configuration:

Clicking "Configuration", it will display the screen as Figure-16 where to set your configurations for the device.

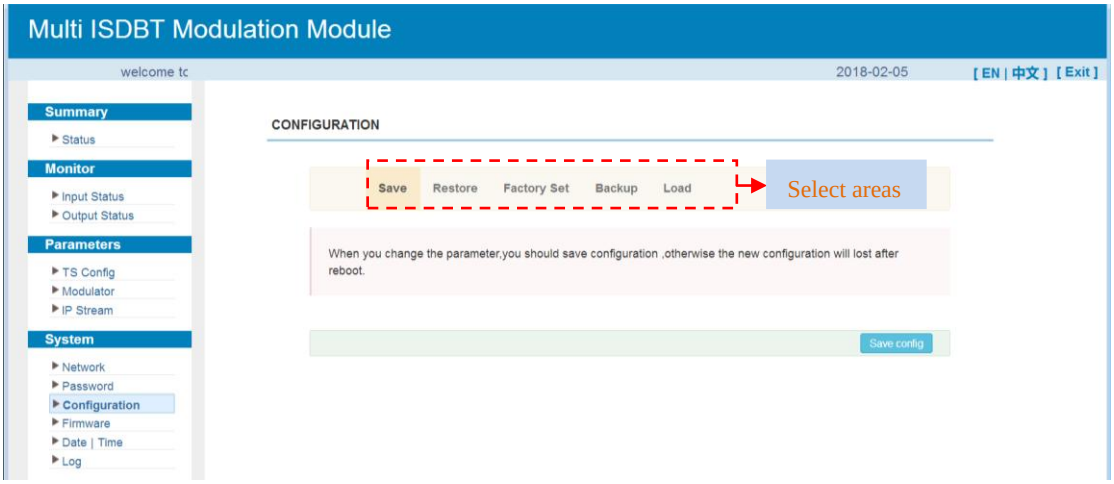


Figure-16

System → Firmware:

Clicking "Firmware", it will display the screen as Figure-17 where to update firmware for the device.

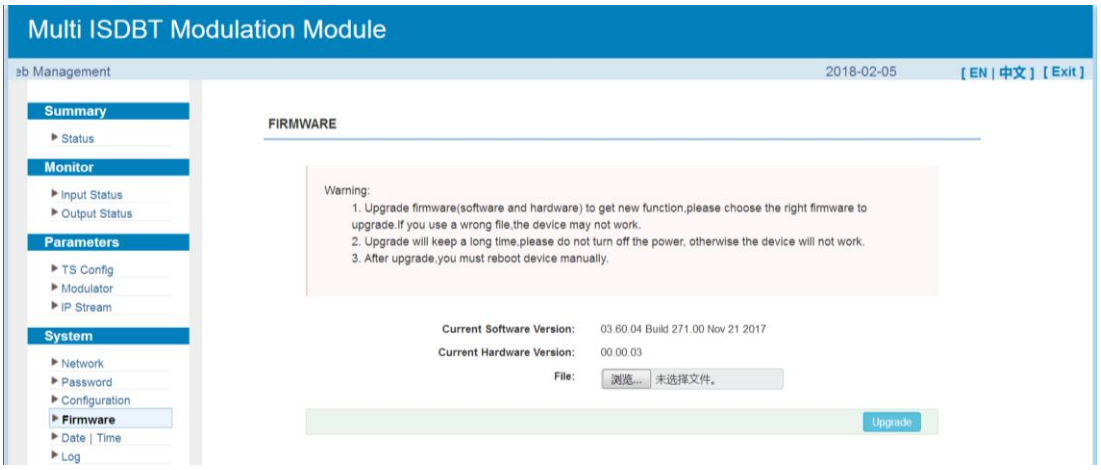


Figure-17

System → Date/Time:

Clicking "Date/Time", it will display the interface as Figure-18 where users can set date/time for this device.

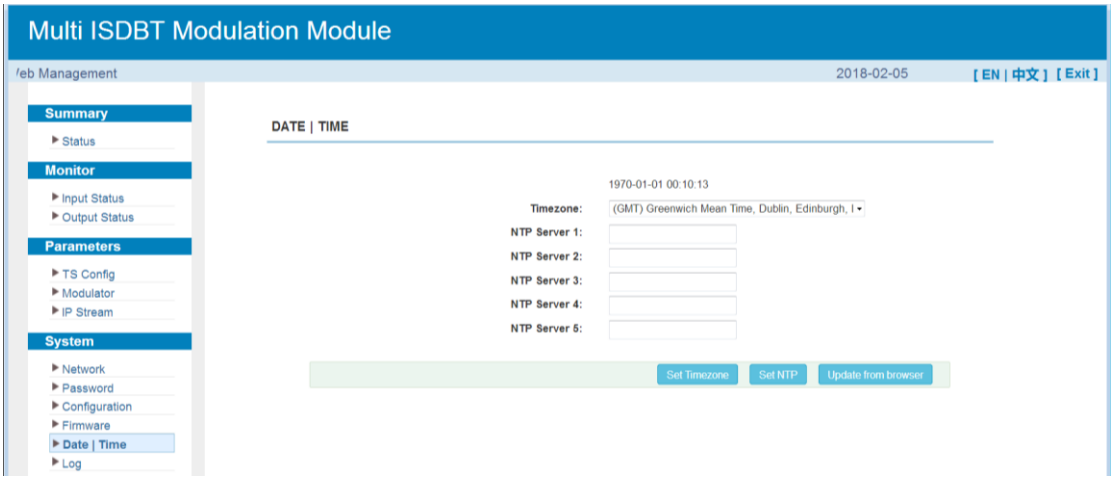


Figure-18

System → Log:

Clicking "Log", it will display the screen as Figure-19 where to check the "Log".

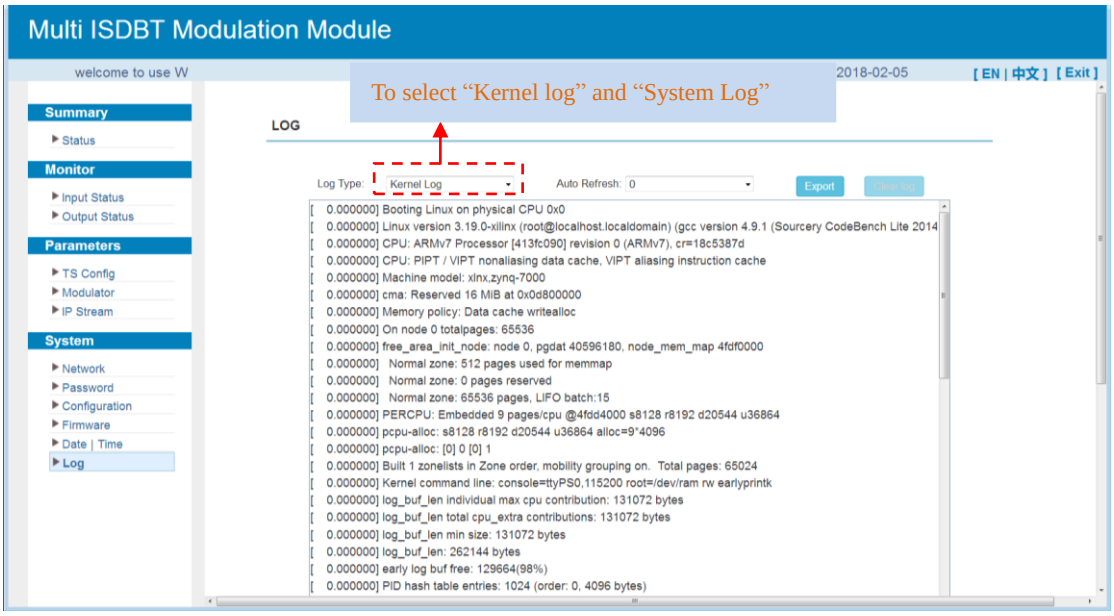

Multi ISDBT Modulation Module
welcome to use W
2018-02-05
[EN | 中文] [Exit]
To select “Kernel log” and “System Log”
Summary
Status
Monitor
Input Status
Output Status
Parameters
TS Config
Modulator
IP Stream
System
Network
Password
Configuration
Firmware
Date | Time
Log
LOG
Log Type: Kernel Log
Auto Refresh: 0
Export
Clearing
[0.000000] Booting Linux on physical CPU 0x0
[0.000000] Linux version 3.19.0-xilinx (root@localhost.localdomain) (gcc version 4.9.1 (Sourcery CodeBench Lite 2014
[0.000000] CPU: ARMv7 Processor [413fc090] revision 0 (ARMv7), cr=18c5387d
[0.000000] CPU: PIPT / VIPT nonaliasing data cache, VIPT aliasing instruction cache
[0.000000] Machine model: xlnx,zynq-7000
[0.000000] cma: Reserved 16 MiB at 0x0d800000
[0.000000] Memory policy: Data cache writealloc
[0.000000] On node 0 totalpages: 65536
[0.000000] free_area_init_node: node 0, pgdat 40596180, node_mem_map 4fdf0000
[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 9 pages/cpu @4fdd4000 s8128 r8192 d20544 u36864
[0.000000] pcpu-alloc: s8128 r8192 d20544 u36864 alloc=9*4096
[0.000000] pcpu-alloc: [0] 0 [0] 1
[0.000000] Built 1 zonelists in Zone order, mobility grouping on. Total pages: 65024
[0.000000] Kernel command line: console=ttyPS0,115200 root=/dev/ram rw earlyprintk
[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: 129664(98%)
[0.000000] PID hash table entries: 1024 (order: 0, 4096 bytes)

Figure-19

Chapter 5 Troubleshooting

DEXIN's ISO9001 quality assurance system has been approved by CQC organization. For guarantee the products' quality, reliability and stability. All DEXIN 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 DEXIN. 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 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