POLYTRON®

2x HDMI to DVB-S2 / IP
HD Encoder & DVB-S2 Modulator

HDM 2 S01

C E

User Manual

0901795

Directory
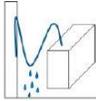
Mounting and safety instructions

Attention
The rated voltage stated on the device must correspond with the mains voltage. The instructions for operating the device must be observed.

Grounding and potential equalization
Please establish grounding and perform potential equalization before initial startup.

Connection cable
Always install the connection cables with a loop so that no condensed water can penetrate along the cable.

Select installation site
Install only on a solid, plane and at most fire-resistant surface. Avoid strong magnetic fields in the surroundings. Too strong heat effect or accumulation of heat will have an adverse effect on the durability. Don't mount directly over or nearby heating systems, open fire sources or the like, where the device is exposed to heat radiation or oil vapours. Don't block the ventilation slots of devices fitted with fans or heatsinks, as this will cause heat to build up inside the devices and may cause fire. Free air circulation is absolutely necessary to permit the device to function properly. It's imperative to observe the mounting position!

Moisture
Protect the device from high humidity, dripping and splashing water. If there is condensation, wait until the device is completely dry. Operating environment according to the specified IP protection class.

Caution! Danger of life!
According to the currently valid version of EN 60728-11, coaxial receiving and distribution systems must meet the safety requirements regarding grounding, potential equalization, etc., otherwise damage to the product, fire or other hazards may occur. Electrical fuses may only be replaced by authorised specialist persons. For the replacement of electric fuses, only same type and amperage have to be used. In case of damage the device has to be taken out of service.

Mounting and service works
May be only done by authorized staff according to the rules of technology. Devices have to be switched off before starting any maintenance or service work. In order to guarantee interference immunity, all device covers must be screwed tight again after opening.

Thunderstorm
Do not carry out maintenance or repair work on the device due to higher risk of lightning strike.

Ambient temperature
Operation and storage only within the specified temperature range.

Termination
Not used receiver and trunk line outputs have to be terminated with 75 Ohm-resistors.

Caution! Laser beam -> risk of accidents due to blinding!
Don't look into the laser beam or at direct reflexes of reflecting or polished surfaces. There is a danger of injury to the eyes.

Recycling
All of our packaging materials (packaging, identification sheet, plastic foil and bag) are fully recyclable.

Chapter 1 Introduction

1.1 Product Overview

HDM 2 S01 DVB-S/S2 products are POLYTRON's all-in-one devices which integrate encoding and modulation to convert V/A signals into DVB-S/S2 RF output. It adopts inner drawer-type structural design which greatly facilitates the change of different encoding modules as needed.

The signals source could be from satellite receivers, closed-circuit television cameras, Blue-ray players, and antenna etc. With its various inputs available and special modulation index, POLYTRON HDM 2 S01 series encoder modulators are especially adequate for inserting DVB-S/S2 signal in the cable system to add programs in the DVB-S/S2 TVs or STBs.

1.2 Key Features

- **Adequate for cable system**
- **2x independent HDMI inputs; 1x RF in for RF mix**
- **MPEG4 AVC H.264 HD video encoding**
- **DVB-S/S2 RF out; IP out**
- **Modular design; pluggable encoding modules**
- **LCD display, Remote control and firmware**
- **Web-based NMS management; Updates via web**

1.3 Principle Chart

1.4 Specifications

Typ / Type	HDM 2 S01
Artikel-Nr. / Article no.	5741658
Videoformat / Video Encoding	H.264/AVC High Profile Level 4.0 (HD) (MPEG 4)
Eingänge / Inputs	2x HDMI & 1x RF
Auflösung / Resolution	1920x1080_60P ; 1920x1080_50P 1920x1080_60i ; 1920x1080_50i 1280x720_60P ; 1280x720_50P
Audioformat / Audio Encoding	MPEG1 Layer II
Sampling Rate / Sample rate	48 KHz
Bit rate	64, 96, 128, 192, 256, 320 kbps
Ausgang / Output	DVB-S/S2
Symbolrate	0,05...40 Msps
Constellation	QPSK, 8PSK
Fehlerschutz / FEC	1/**2**,**2**/3,3/4,5/6,7/8 (DVB-S QPSK); 1/**2**,3/5,**2**/3,3/4,4/5,5/6,8/9,9/10 (DVB-S2 QPSK); 3/5,**2**/3,3/4,5/6,8/9,9/10 (DVB-S2 8PSK)
MER	≥ 40 dB
Ausgangsfrequenz / RF frequency	950...1050 MHz, 1 kHz Step
Ausgangspegel / RF output level	-30...-10 dBm (81...97 dBµV); 0,1 dB step
IP-Anschlüsse / IP connectors	RJ 45 Ethernet LAN
IP-Verschlüsselungsstandard / IP encoding standard	ETSI TS102034
IP-Datenstrom / IP type of streaming	IPv4 Multicast
Stromversorgung / Power supply	100...240 VAC
Betriebstemperatur / Operation temp.	0...45 °C
Maße (B x H x T) / Dimensions (W x H x D)	250 x 268 x 44 mm

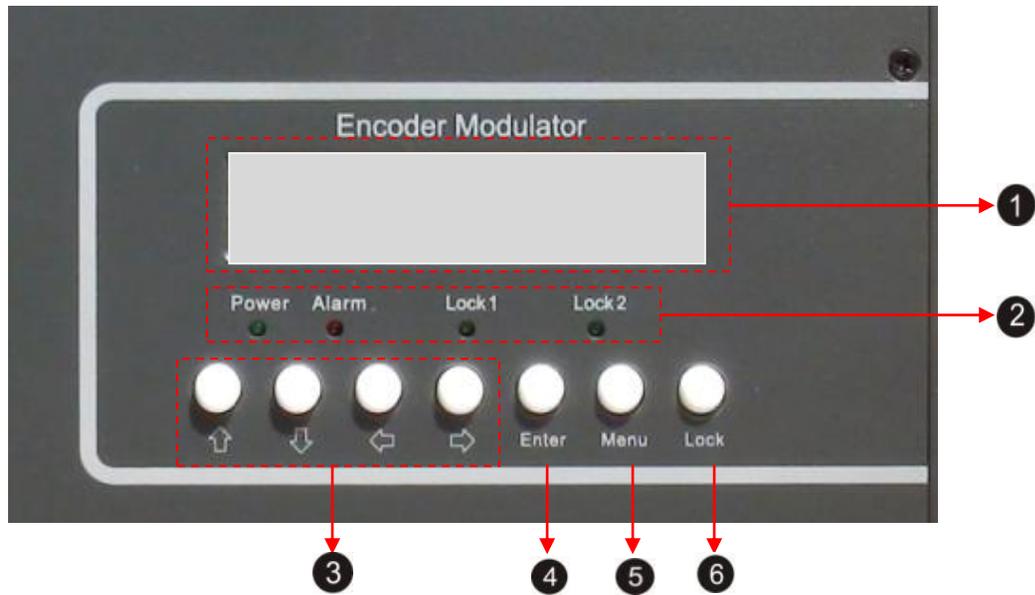## 1.5 Appearance and Description

Front Panel Illustration

① **NMS port**
② **DATA port**
③ **RF Input Interface**
④ **RF Output Interface**

Rear Panel Illustration

① **HDMI Input Interface group (HDMI 1 & 2)**
② **Power Switch**
③ **Fuse**
④ **Power supply Slot**

Up Panel Illustration

① **LCD window**

② **Power , Alarm and TS Lock   Indicators**

③ **Up and Down, Left and Right Buttons**

④ **Enter Button: for confirm**

⑤ **Menu Button: for back step**

⑥ **Lock Button: press to lock set**

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.
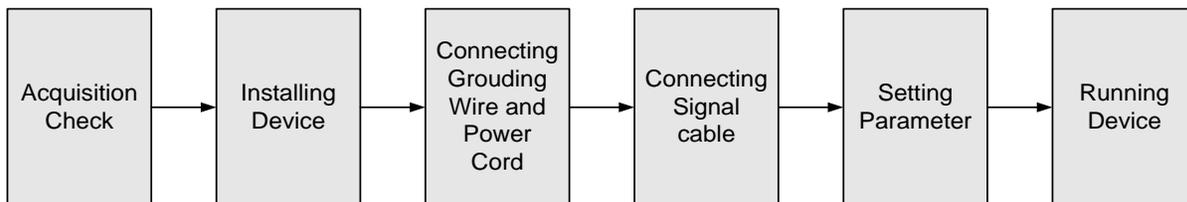
2.1 General Precautions

✓ 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

Acquisition Check	→	Installing Device	→	Connecting Grouding Wire and Power Cord	→	Connecting Signal cable	→	Setting Parameter	→	Running Device

2.4 Environment Requirement

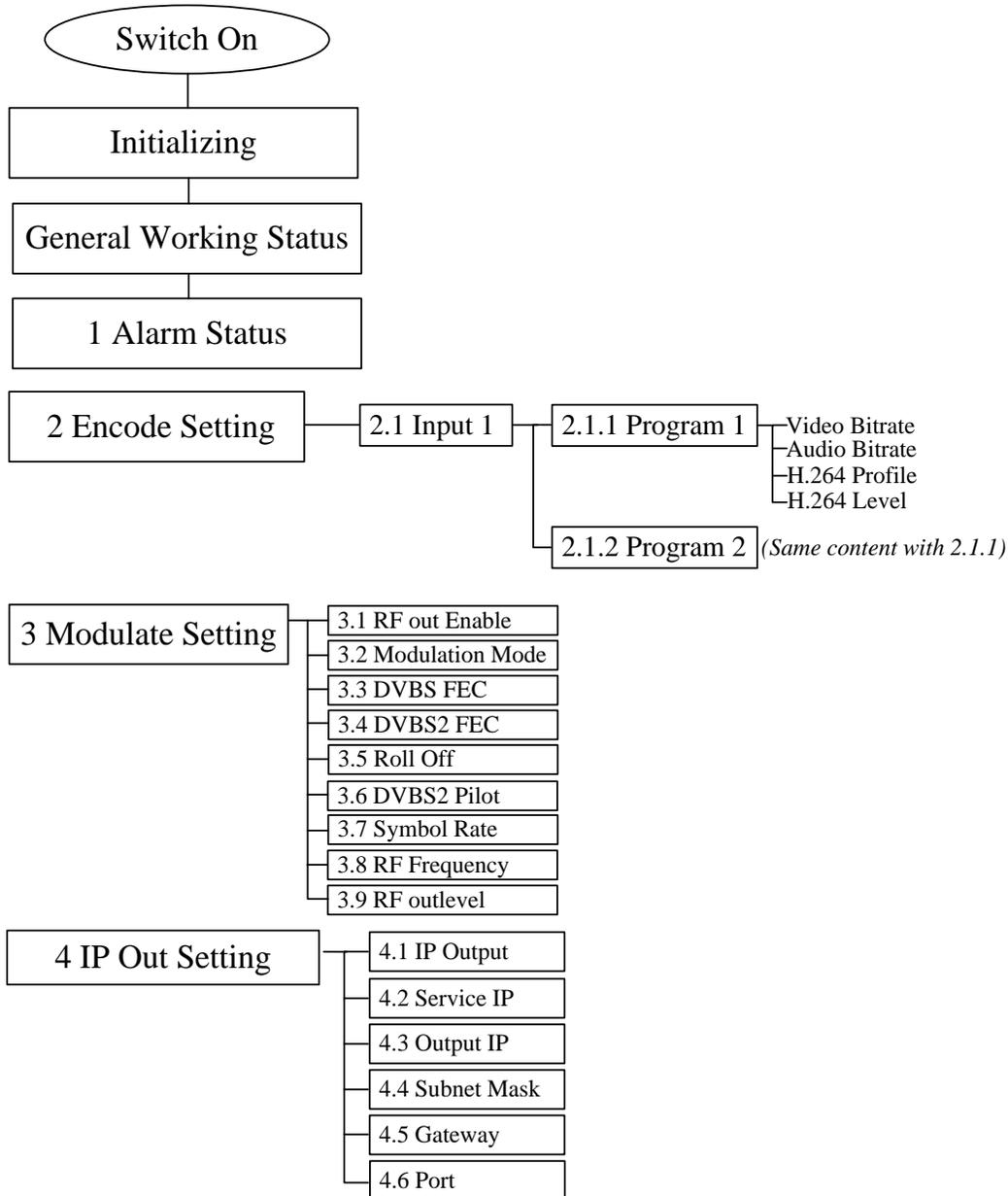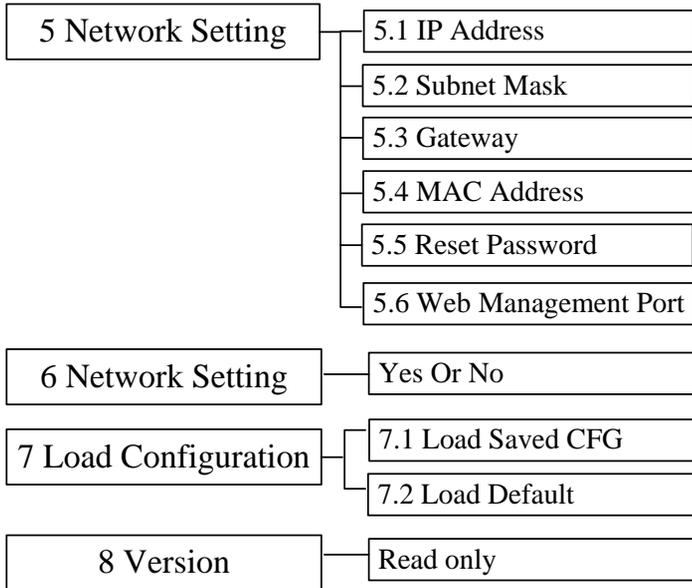| Item	Requirement
Machine Hall Space	When user installs machine frame array in one machine hall, the distance between 2 rows of machine frames should be 1.2~1.5m and the distance against wall should be no less than 0.8m.
Machine Hall Floor	Electric Isolation, Dust Free Volume resistivity of ground anti-static material: $1X10^{7}$~$1X10^{10}\Omega$, Grounding current limiting resistance: $1M\Omega$ (Floor bearing should be greater than 450Kg/m²)
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 110V±10%, 50/60Hz or AC 220V±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 Operation

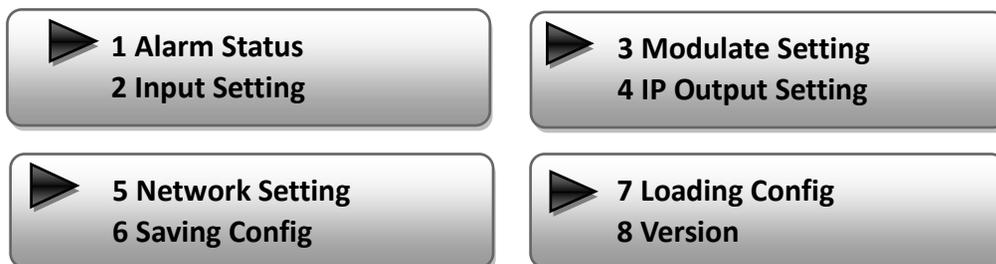## 3.1 LCD Menus

An overview of the LCD menus:

```
        ( Switch On )
              |
       [ Initializing ]
              |
  [ General Working Status ]
              |
      [ 1 Alarm Status ]
              |
   [ 2 Encode Setting ]───[ 2.1 Input 1 ]───┬──[ 2.1.1 Program 1 ]──┬─Video Bitrate
                                             |                       ├─Audio Bitrate
                                             |                       ├─H.264 Profile
                                             |                       └─H.264 Level
                                             |
                                             └──[ 2.1.2 Program 2 ] (Same content with 2.1.1)


   [ 3 Modulate Setting ]──┬─[ 3.1 RF out Enable ]
                           ├─[ 3.2 Modulation Mode ]
                           ├─[ 3.3 DVBS FEC ]
                           ├─[ 3.4 DVBS2 FEC ]
                           ├─[ 3.5 Roll Off ]
                           ├─[ 3.6 DVBS2 Pilot ]
                           ├─[ 3.7 Symbol Rate ]
                           ├─[ 3.8 RF Frequency ]
                           └─[ 3.9 RF outlevel ]


   [ 4 IP Out Setting ]──┬─[ 4.1 IP Output ]
                         ├─[ 4.2 Service IP ]
                         ├─[ 4.3 Output IP ]
                         ├─[ 4.4 Subnet Mask ]
                         ├─[ 4.5 Gateway ]
                         └─[ 4.6 Port ]
```

5 Network Setting	5.1 IP Address
	5.2 Subnet Mask
	5.3 Gateway
	5.4 MAC Address
	5.5 Reset Password
	5.6 Web Management Port

6 Network Setting	Yes Or No
7 Load Configuration	7.1 Load Saved CFG
	7.2 Load Default
8 Version	Read only

3.2 Initial Status

Switch on the device and after a few seconds' initialization, it presents start-up pictures as below:

Start up... ⟹ Start OK... ⟹
DVB-S2	XXX.00MHz
X.XXMbps	X.XXMbps
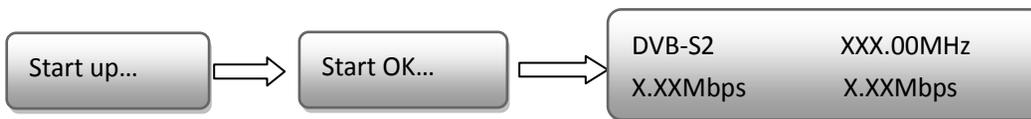
● **DVB-S2:** indicate the modulation standard of this device.

● **XXX.XX MHz** indicates the current output frequency (Range: 950~1050MHz).

● **X.XX Mbps**: indicate the encoding bit rate of the 1 HDMI channel respectively.

3.3 General Settings for Main Menu

Press "Lock" key on the front panel to enter the main menu. The LCD will display the following pages where user can configure the parameters for the device:

▶ 1 Alarm Status
 2 Input Setting

▶ 3 Modulate Setting
 4 IP Output Setting

▶ 5 Network Setting
 6 Saving Config

▶ 7 Loading Config
 8 Version

User can press UP/DOWN buttons to specify menu item, and then press ENTER to enter the submenus as below:

1) Alarm Status

The alarm indicator will turn on if there is no A/V signals inputting or outputting bit rate overflows. User then can enter this menu to check the error type.

2) Encode Setting

Under this submenu, the LCD will show "2.1 Input 1", "2.2 Input 2" and "2.3 ASI".

| ▶ 2.1 Input 1 2.2 Input 2 | ▶ 2.3 ASI |

"2.1 Input 1" include two HDMI input port. 2.2 and 2.3 are not applicable. User could select one channel as the signal source and set the related video & audio parameters.

▶ 2.1 Input 1

⬇

▶ 2.1.1 Program 1

⬇

▶ Video Bit Rate
Audio Bit Rate

→ Video Bit Rate
08.000 Mbps

→ ▶ 64 Kbps
96 Kbps

▶ H.264 Profile
H.264 Level

→ ▶ High Profile
Main Profile

→ ▶ Level 4
Level 4.1
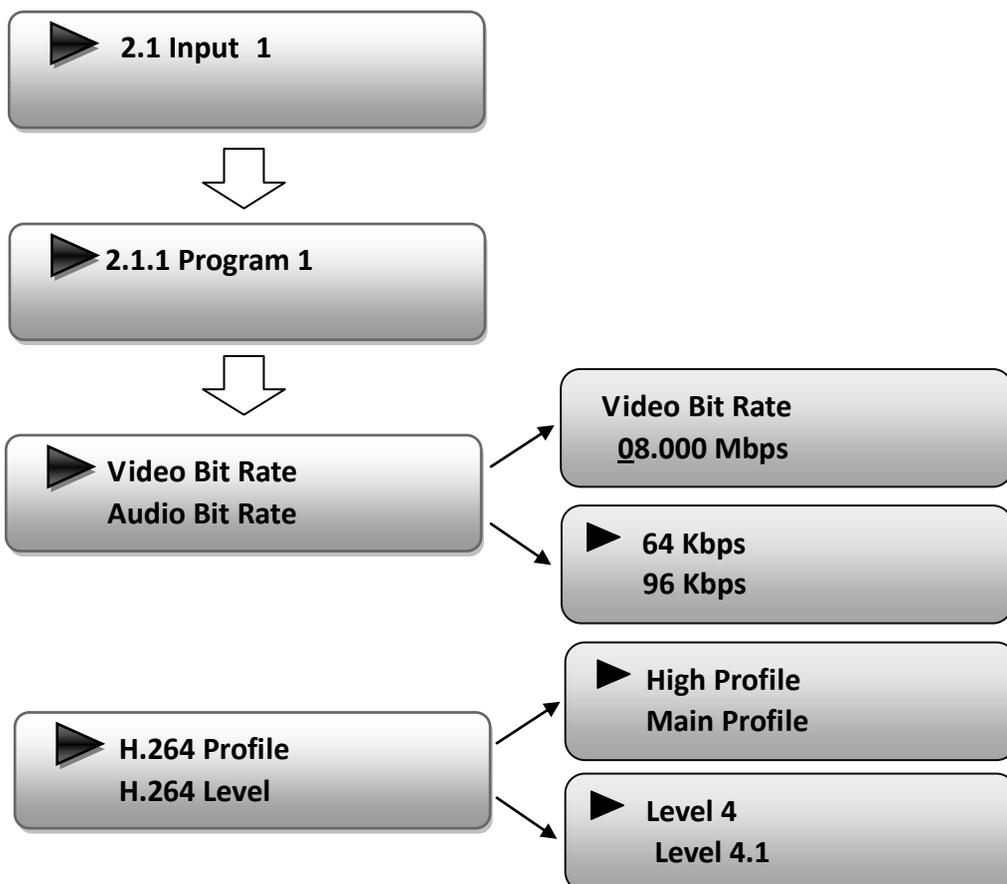
3) Modulator Setting

When entering "Modulator Setting" submenu, user can find below different parameters can be set and the LCD window would show as below:

▶ 3.1 RF out Enable 3.2 Modulation Mode	▶ 3.3 DVBS FEC 3.4 DVBS2 FEC
▶ 3.5 Roll off 3.6 DVBS2 Pilot	▶ 3.7 Symbol Rate 3.8 RF Frequency
▶ 3.9 RF outlevel	
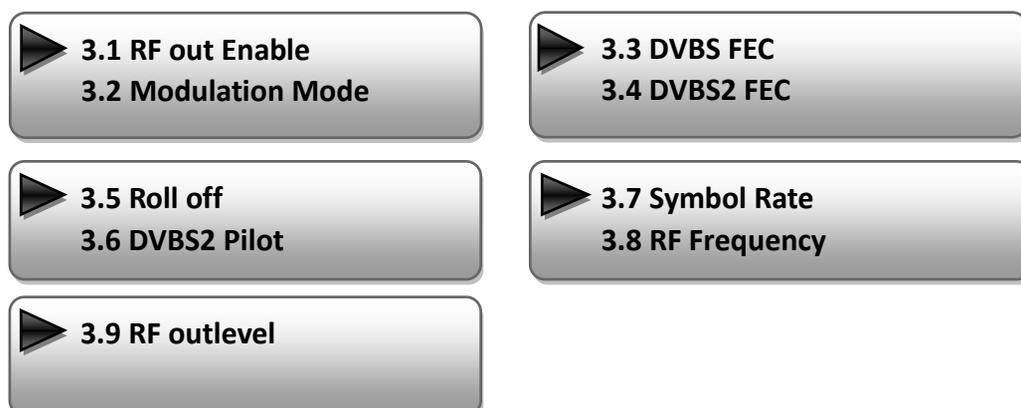
➢ **RF out Enable:** User can choose to output the RF or not under this menu.

```
RF out Enable
▶ OFF    ON
```

➢ **Modulate Mode:** HDM 2 S01 has 3 modulating modes provided: DVB-S, DVB-S2-QPSK and DVB-S2-8PSK.

```
Modulate Mode
▶ DVB-S
```

➢ **DVB-S/S2 FEC (Forward Error Correction):** User can select one FEC by pressing RIGHT/LEFT key.

```
DVB-S FEC
▶ 1/2
```

NOTE: DVB-S QPSK: 1/2, 2/3, 3/4, 5/6, 7/8

DVB-S2 QPSK: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10

DVB-S2 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10

➢ **Roll Off:** User can enter this menu to select roll-off factory shown as below by pressing right/left key and to confirm by pressing Lock key. Different factory has different effect on the max input bit rate.

```
Roll OFF
▶ 0.35
```

NOTE: DVB-S and DVB-S2: 0.35Msps

DVB-S2 QPSK and 8PSK: 0.35, 0.25, 0.2Msps

➢ **DVB-S2 Pilot:** The DVB-S2 Pilot can be switched on or off through this menu.

```
DVB-S2 Pilot
▶ On        Off
```

NOTE: DVB-S2-QPSK or DVB-S2-8PSK must be selected as the modulate mode under menu 3.2, and then it can be workable.

➢ **Symbol Rate:** user can enter this menu to modify symbol rate by pressing right/left and up/down key and to confirm by pressing Lock key

```
        Symbol Rate
        17.500 Mbps
```
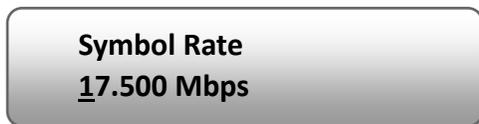
NOTE: DVB-S and DVB-S2 QPSK: 0.05-40.0Msps

DVB-S2 8PSK: 0.05-26.0Msps

➢ **RF Frequency:** The RF output frequency range is from 950 to 1050MHz with 1K stepping. Users then can press LEFT/RIGHT/UP/DOWN button to adjust the frequency and confirm by pressing ENTER button.

```
        Symbol Rate
        1000.000 MHz
```

➢ **RF out level:** The RF attenuation range is from -30db~-10db. After entering this setting submenu, user can shift UP/DOWN/LEFT/RIGHT key to set the output level and press ENTER to confirm.

```
        RF Out Level
           -10.0db
```

4) IP Output Setting

HDM 2 S01 encoder & modulator also support IP output. Users can enter 4.1 to decide whether to turn the IP port on or off, and enter to the rest menu items to set the corresponding parameters.

```
▶  4.1 IP Output              ▶  4.3 Output IP
   4.2 Service IP                4.4 Subnet Mask
```

```
▶  4.5 Gateway                ▶  4.7 FLT Null PKT
   4.6 Port
```

```
IP Output                     Service IP
OFF  ▶   ON                   192.168.002.137
```

```
Output IP                     Subnet mask
224.002.002.002               255.255.255.000
```

```
Gateway                       Port
192.168.002.000               01234
```

```
FLT Null PKT
OFF  ▶   ON
```

5) Network setting

After enter Network Setting, there are three submenus shows as the following LCD displays.

▶ **5.1 IP Address**
5.2 Subnet Mask

▶ **5.3 Gateway**
5.4 MAC Address

▶ **5.5 Reset Password**
5.6 Web Manage Port
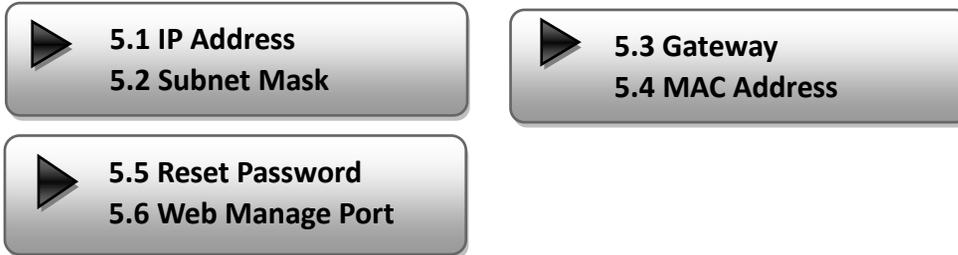
User can press "UP/DOWN" to choose this item and "ENTER" & "LEFT/RIGHT" to set the parameters.

IP Address
192.168.000.136

Subnet Mask
255.255.255.000

Gateway
192.168.000.001

MAC Address
ffffffffffffffffffff

Reset Password?
Yes ▷ NO

Web Manage Port
00080
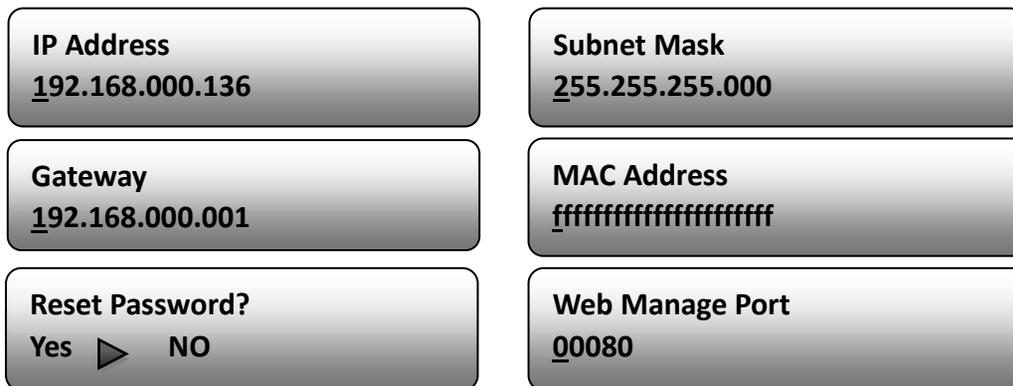
NOTE: The MAC address is according to the factory setting, and it is unique.

6) Saving Configuration

Users can enter Saving Configuration submenu for saving settings. Choose yes and press ENTER to confirm.

Save Configuration?
Yes ▶ No
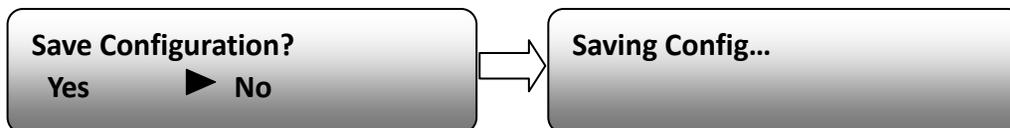
⟹ **Saving Config...**

7) Loading Configuration

At this menu, user can press UP/DWON key to select and repress ENTER to confirm. User can restore the device into the last saved configuration by choosing "7.1" and restore the device into factory configuration by choosing "7.2" the display will show as below:

▶ **7.1 Load Saved CFG**
7.2 Load Default

⬇

Load Saved CFG?
Yes ▶No

⟹ **Loading Config...**
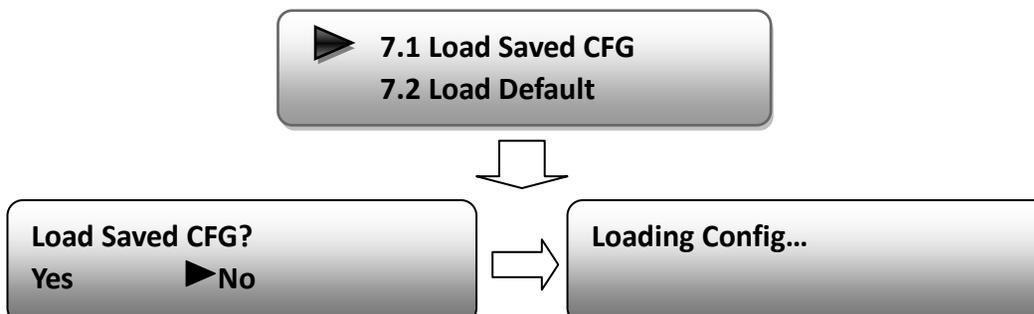
8) Version

User can check the software version and hardware version of this equipment under this submenu.

```
Encoder Modulator
      SW X.XX           HW X.X
```

Chapter 4 WEB NMS Operation

User not only can use front buttons to set configuration, but also can control and set the configuration in computer by connecting the device to web NMS Port. User should ensure that the computer's IP address is different from the HDM 2 S01's IP address; otherwise, it would cause IP conflict.

4.1 login

The default IP address of this device is 192.168.0.136. (We can modify the IP through the front panel.)

Connect the PC (Personal Computer) and the device with net cable, and use ping command to confirm they are on the same network segment.

I.G. the PC IP address is 192.168.99.252, we then change the device IP to 192.168.99.xxx (xxx can be 0 to 255 except 252 to avoid IP conflict).

Use web browser to connect the device with PC by inputting the Encoder & Modulator's IP address in the browser's address bar and press Enter.

It will display the Login interface as Figure-1. Input the Username and Password (Both the default Username and Password are "admin".) and then click "LOGIN" to start the device setting.
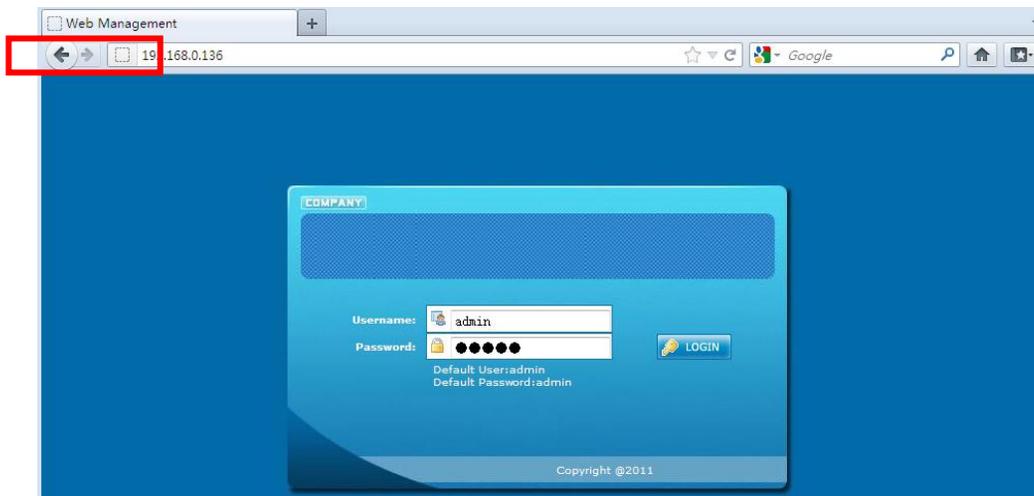
Figure-1

4.2 Operation

Welcome

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

Device standard and name

It displays the signal source interface and displays real-time encoding bit rate of corresponding input channel.

User can click any item here to enter the corresponding interface to check information or set the parameters.

TS indicators—Green light indicates the TS is normal, which otherwise turns to red.

Figure-2

Input 1

From the menu on left side of the webpage, clicking "Input 1", it displays the information of the programs from the 2 HDMI input as Figure-3.

Figure-3

Help   For user to turn to refer detailed explanation of terms on this interface.

Default   Click this button to apply the default setting of Input 1.

Apply   Click this button to apply the modified parameters.

IP Output

Click "IP Output" from the left menu, it will display the screen as Figure-4 where to set the multicast IP Output address for the device if needed and set the IP output for the programs.

After setting the parameters, click "Apply" to save the setting.
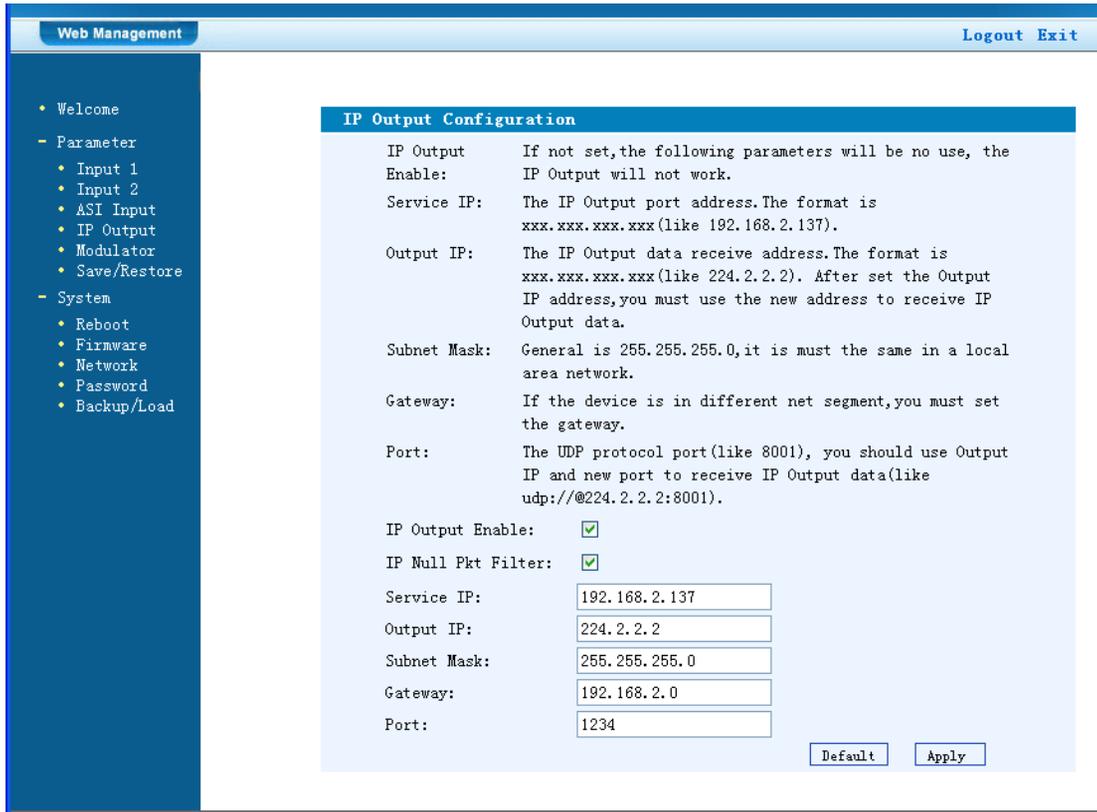
Figure-4

Modulator Setting

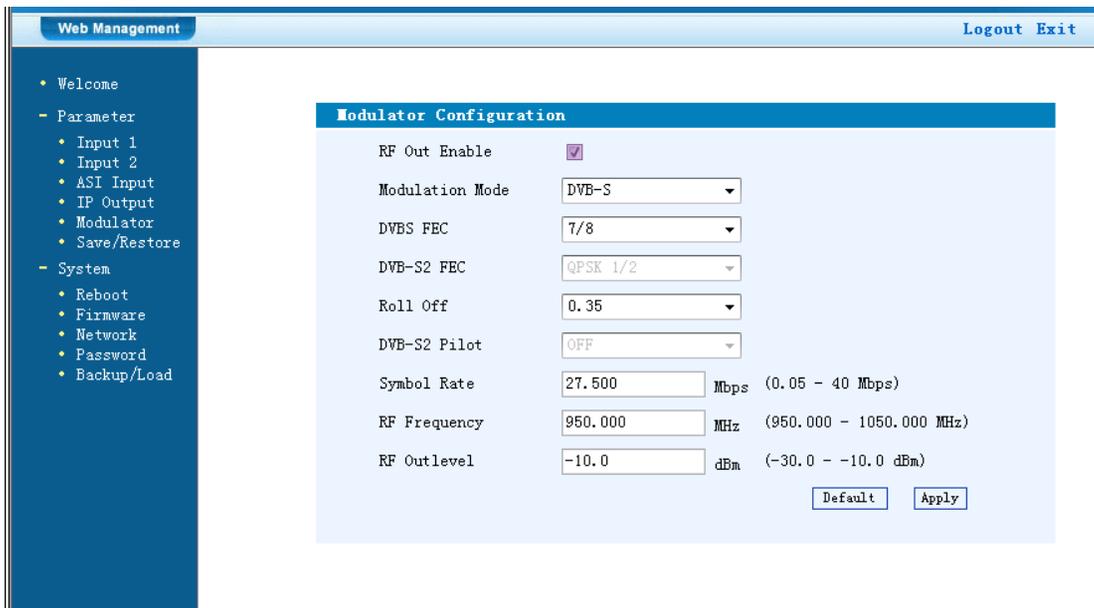After setting all the parameters, user needs to click on "Apply" to save the Modulator parameters.

Figure-5

Save/Restore

Clicking "Save/Restore" from the menu, it will display the screen as Figure-6 where can save the configuration permanently to the device. Click "Save Configuration", for store the data permanently to the device.

By using "Restore Configuration" user can restore the latest saved configuration to the device.

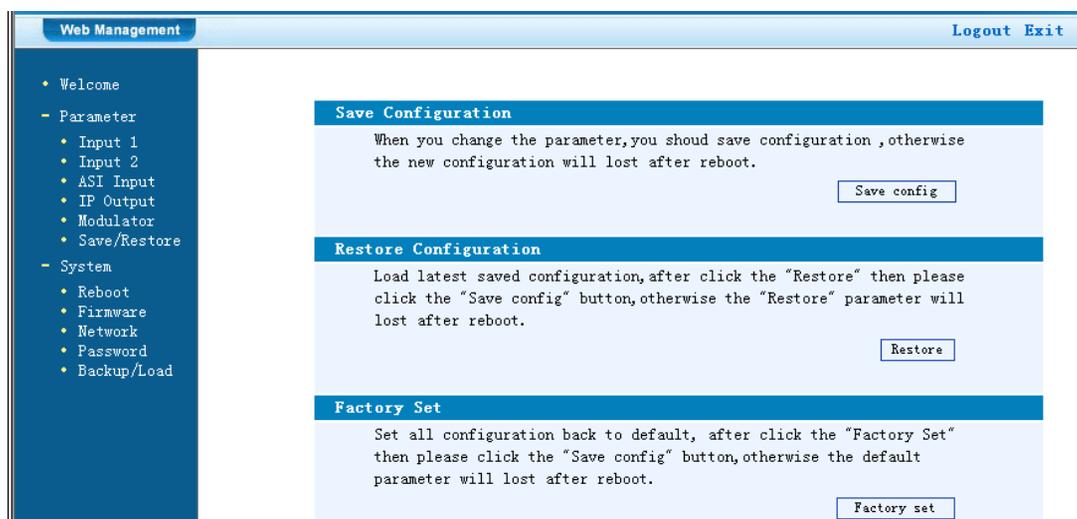By using "Factory Set" user can import the default factory configuration.

Figure-6

Restart the Device

Click "Reboot" from the menu, the screen will display as Figure-7. Here when clicking "Reboot" box, it will restart the device automatically.
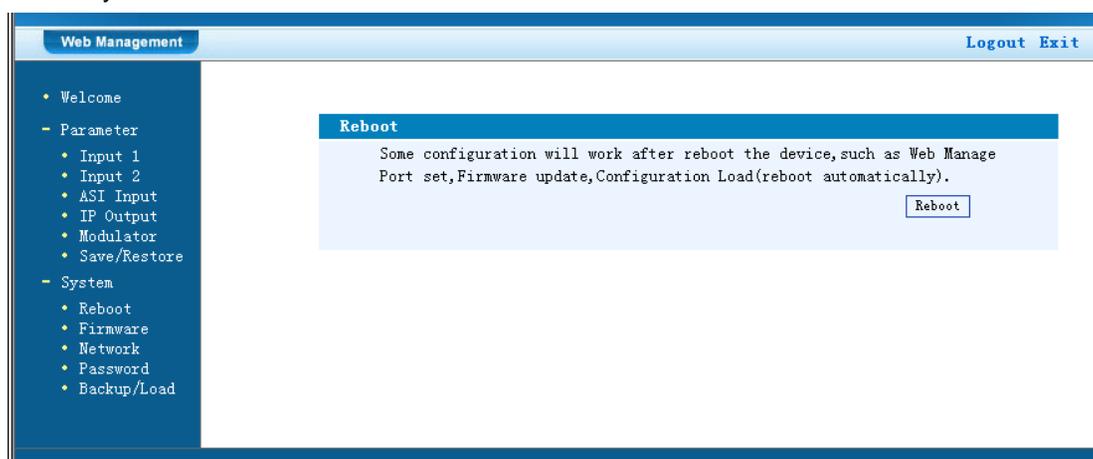

Figure-7

Update the Device

Click "Firmware" from the menu it will display the screen as Figure-8. Here user can update the device by using the update file.

Click "Browse" to find the path of the device update file for this device then click "Update" to update the device.

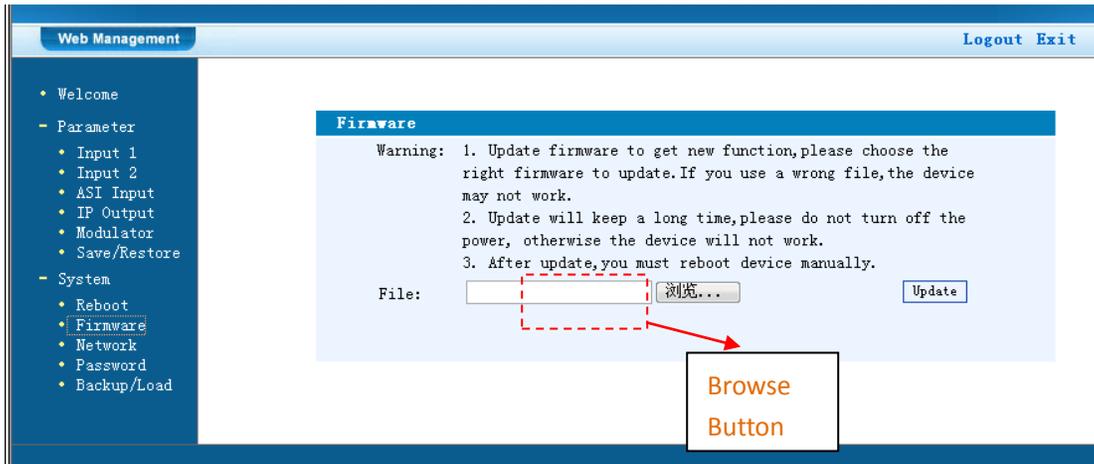After updating the device, user needs to restart the device by using Reboot option.

Figure-8

Network

When user clicks "Network", it will display the screen as Figure-9. It displays the network information of the device.

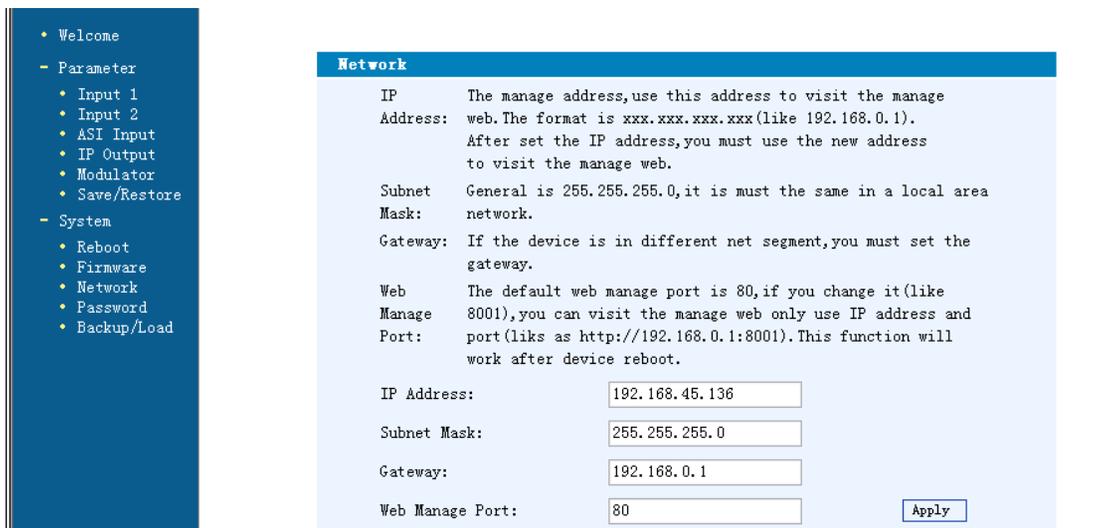Here user can change the device network configuration as needed.

Figure-9

Change Password

When user clicks "Password", it will display the password screen as Figure-10. Here user can change the Username and Password for login to the device.

After putting the current and new Username and Password, click Apply" to save the configuration.
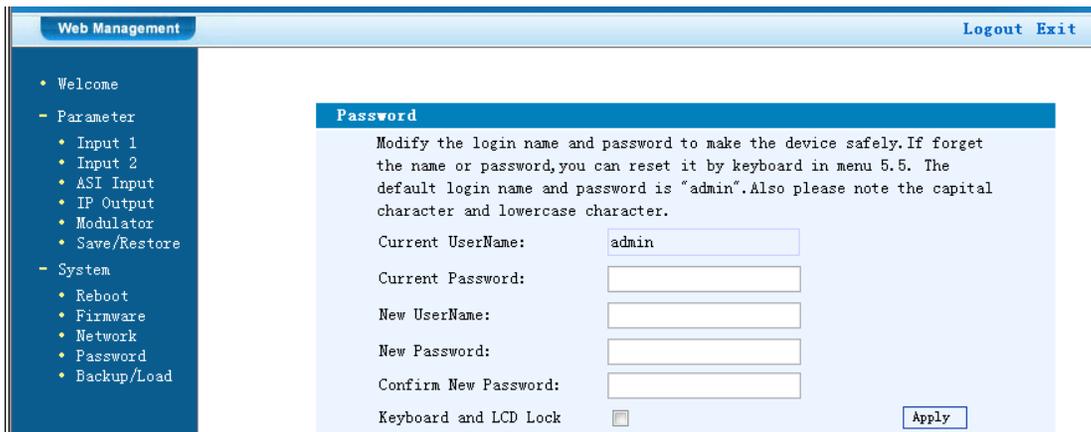
Figure-10

➢ Keyboard and LCD Lock: If it is marked with "√"，the LCD and keyboard will be locked to avoid unexpected modification or view of the device information and configurations. User can't operate the keyboard & LCD while only the device IP address can be noted in the LCD window.

```
IP Address
192.168.000.136
```

Backup/Load

Click "Backup/Load" from the menu, it will display the screen as Figure-11.

Backup Configuration – To back up the device configuration file to a folder

Load Configuration – If user needs to load the old configuration to the device, click "Browse" and find the backup configuration file path. After selecting the file, click "Load File" to load the backup file to the device.
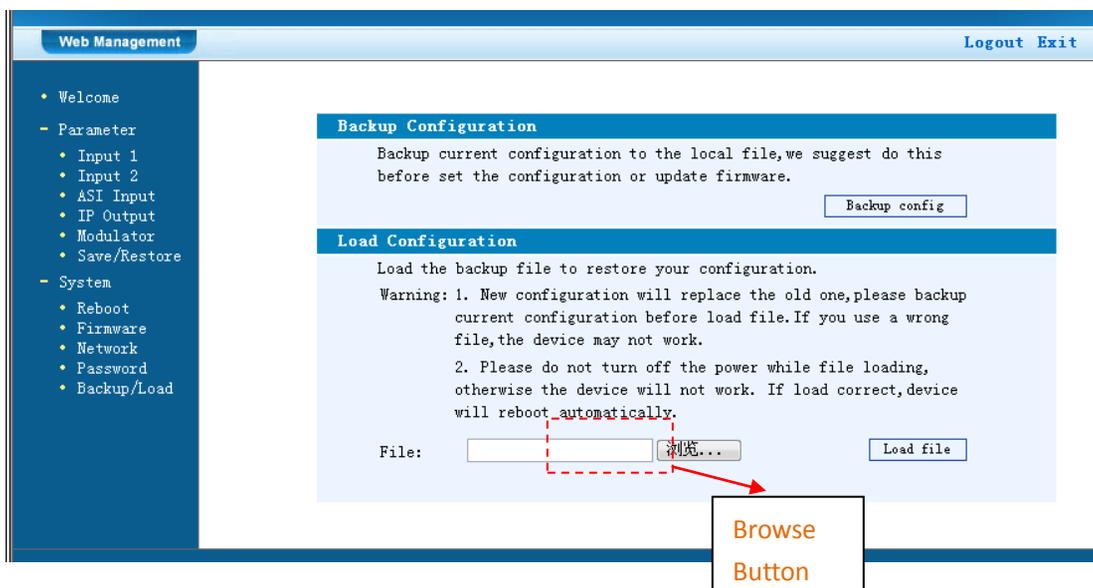

Browse Button

Figure-11

Chapter 5 Troubleshooting

All POLYTRON 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 POLYTRON. 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.

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Technische Änderungen vorbehalten
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