PBI Pro Broadband Inc.

Professional HD/SD IRD and Processor Module

DMM-1510P

User Manual

http://www.pbi-china.com

Notices

WARRANTY

This warranty does not cover parts which may become defective due to misuse of the information contained in this manual.

Read this manual carefully and make sure you understand the instructions provided. For your safety, be aware of the following precautions.

WARNING! IMPORTATNT SAFETY INSTRUCTIONS

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING

• To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

• To avoid explosion danger, do not dispose of batteries in an open fire.

CE MARK FOR EUROPEAN HARMONISED STANDARDS

The CE mark which is attached to these products means it conforms to EMC Directive (89/336/EEC) and Low Voltage Directive (73/23/EEC).

IMPORTANT INFORMATION

Please retain the original packaging, should it be necessary at some stage to return the unit.

Disposal of Old Electrical and Electronic Equipment (Applicable in the European Union and other European countries with separate collection systems)

This symbol on the product or on its packaging indicates that this product shall not be treated as household waste. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local Civic Office, your household waste disposal service, or the shop where you purchased the product.

COPYRIGHTS

Television programs, movies, video tapes, discs, and other materials may be copyrighted. Unauthorized recording of copyrighted material may be against the copyright laws in your region. Also, use of this product with cable television transmissions may require authorization from the cable television operator or transmitter/owner.

VENTILATION

• Do not expose the product to high temperatures, such as placing it on top of other product that produce heat or in places exposed to direct sunlight or spot lights.

• The ventilation slots on top of the product must be left uncovered to allow proper airflow into the unit.

• Do not stand the product on soft furnishings or carpets.

• Do not stack electronic equipment on top of the product.

• Do not place the product in a location subject to extreme changes in temperature. The temperature gradient should be less than 10 degrees C/hour.

• Place the product in a location with adequate ventilation to prevent the build-up of heat inside the product. The minimum ventilation space around the unit should be 7 cm. The ventilation should not be impeded by covering the ventilation openings with items, such as newspapers, table cloth, curtains, etc.

POWER SOURCES

• The product is not disconnected from the AC power source (mains) as long as it is connected to the power outlet or wall socket, even if the product is turned off.If the product will not be used for a long period of time, disconnect it from the AC power outlet or wall socket.

Before Using the Device

Thank you for purchasing DMM-1400PM professional IRD and trans-modulator module. This User Manual is written for operators/users of the DMM-1400PM to assist in installation and operation. Please read this user manual carefully before installation and use of the device.

FOR YOUR SAFETY

This equipment is provided with a protective earthing ground incorporated in the power cord. The main plug shall only be inserted in a socket outlet provided with a protective earth contact. Any interruption of the protective conductor, inside or outside the device, is likely to make the device dangerous. Do not remove the covers of this equipment. Hazardous voltages are present within this equipment and may be exposed if the covers are removed. Only Beijing Jaeger trained and approved service engineers are permitted to service this equipment.

The supplied AC power cable must be used to power the device. If the power cord becomes damaged it must be replaced. No operator serviceable parts inside. Refer servicing to Beijing Jaeger trained and approved service engineers. For the correct and safe use of the device, it is essential that both operating and servicing personnel follow generally accepted safety procedures in addition to the safety precautions specified in this manual. Whenever it is likely that safety protection is impaired, the device must be made in-operative and secured against unintended operation. The appropriate servicing authority must be informed. For example, safety is likely to be impaired if the device fails to perform the intended measurements or shows visible damage.

WARNINGS

- The mounting environment should be relatively dust free, free of excessive vibration and the ambient temperature between 0C° to 40C°. Relative humidity of 20% to 80% (non-condensed) is recommended.
- Avoid direct contact with water.
- Never place the equipment in direct sunlight.
- The outside of the equipment may be cleaned using a lightly dampened cloth. Do not use any cleaning liquids containing alcohol, methylated spirit or ammonia etc.
- For continued protection against fire hazard, replace line fused only with same type.
- Air intake for cooling is achieved via holes at the side of the device and the fans inside. The air flow should not be obstructed. Therefore, the device has to be placed on a flat surface, leaving some space at the sides of the device.

- When in operation, the internal temperature should not exceed the limit of 70C°.

DMM-1510P
Professional HD/SD IRD and Processor Module

1. Overview

As the up-to-date PBI's professional IRD and HDTV Processor of DMM1000 series, DMM-1510P succeeds all functions from DMM-1500P, and exceeds the previous generation in terms of performance & functionality. DMM-1510P could support two AC-3 audios pass-through over SDI and AES-EBU. The integrated decoder complies with MPEG-4 (AVC high profile level 4.1) and MPEG-2 (MP@ML&MP@HL) standards. Depending on the hardware configuration, DMM-1510P is able to support various optional of reception for DVB-T2/T, DVB-S2/S, DVB-C, DTMB, ASTC, ISDB-T, TS over IP, and ASI input. Equipped with two CI slots, multi-descramble could be achieved by working with professional CAMs. The descrambled stream could be delivered to ASI output, built-in re-multiplexer and IP Output. Meantime, the decoded video could be outputted via HDMI, SDI with embedded audio, and CVBS (down scaled) interfaces. The built-in re-multiplexer could accept transport streams from tuner, ASI input, IP input and the descrambled stream from CI slots, and re-multiplexed stream could be highly customized through the user-configurable PSI/SI regenerator. The compact design and powerful decoding ability make DMM-1510P one of the most competitive modules in DMM1000 series.

2. Features

■ Factory optional for DVB-S2/S/C/T2/T, DTMB, ISDB-T and ATSC demodulations

■ MPEG-2（MP@ ML& MP@HL）and MPEG 4 Part 10 (AVC high profile level 4.1) standards compliant and decoding

■ Wide choice of I/O interfaces, including ASI input/output, CVBS output, HDMI output, SD/HD-SDI output (embedded 2 pairs stereos audio), 10M/100M/1000M TS over IP input/output

■ PLS(Physical Layer Signalling) and ISI(Input Stream Identifier) function available on DVB-S2 tuner

■ Single or Multi PLP(Physical Layer Pipe) function available on DVB-T2 tuner

■ Built-in 1 TS re-multiplexer

■ BISS 1 or BISS E decryption

■ Dynamic PMT detection and automatic update

■ Support Tuner, ASI input and TS over IP input redundancy

■ VBI TELETEXT, WSS and Closed Caption support over analog output or embedded in SDI

■ 10M/100M/1000M Ethernet TSoIP Input and Output

■ UDP/RTP & Unicast/Multicast for TS over IP input and output

■ DVB (MPTS) and IPTV (SPTS) mode IP output

■ Control and surveillance over WEB or HDMS software remotely

■ Two DVB-CI slots, support multiple programs decryption

■ Software up-gradable in the field easily through USB or update remotely by Web interface

■ Support two pairs of PCM audio embedded in SDI output or pass through

■ Support NTP(Network Time Protocol)

■ Support 16 groups of parameters configuration preset

■ RSSI, received Eb/No & BER available on Web interface

3. Technical Specifications

Tuner Input	
DVB-S/S2	
Connector Type	1×F type female 75Ω for Input
Input Frequency Range	950 ~ 2150MHz
Input Level	-25 ~ -65dBm
Symbol Rate	1 ~ 45MBaud
Roll-off Factor	DVB-S QPSK: 0.35
	DVB-S2 8PSK: 0.35, 0.25, 0.2
FEC Code Rate	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
LNB Polarity Selection Voltage	0, 13V, 18V selectable
LNB Band Selection Tone	0/22KHz selectable
Satellite Selection Command	DiSEqC 1.0
PLS(Physical Layer Scrambling)	Option
ISI(Input Stream Identifier)	Option
DVB-T/T2	
Connector Type	1×F type female 75Ω for Input
Input Frequency	104 ~ 862MHz (VHF/UHF)
Input Level	-20 ~ -70dBm
Constellation	DVB-T: QPSK, 16QAM, 64QAM
	DVB-T2: QPSK, 16QAM, 64QAM, 256QAM
Bandwidth	6MHz, 7MHz, 8MHz
FFT Mode	DVB-T: 2K/8K
	DVB-T2: 1K, 2K, 4K, 8K, 16K, 32K
Guard Interval	DVB-T: 1/4, 1/8, 1/16, 1/32
	DVB-T2: 1/4, 5/32, 1/8, 5/64, 1/16, 1/32, 1/64, 1/128
FEC Code Rate	DVB-T: 1/2, 2/3, 3/4, 5/6, 7/8
	DVB-T2: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6
Input Return Loss	7dB (typ.)
DVB-C	
Connector Type	1×F type female 75Ω for Input
Input Frequency Range	51 ~ 862MHz
Input Level	45 ~ 75dBμV
Symbol Rate	1 ~ 7Mbaud（ITU J.83 Anne× A）
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Bandwidth	6MHz, 7MHz, 8MHz

Input Return Loss	7dB (typ.)
TS over IP	
Connector Type	2×RJ-45, 10M/100M/1000M Base-T for TS/IP
Effective Bit Rate	1. Main Port: 200Mb/s for full duplex without ProMPEG FEC, Spare Port: Backup of the Main Port 2. Main Port: 500Mb/s for 32xSPTS IP out only Spare Port: Backup of the Main Port
Protocol	UDP/RTP, Multicast/Unicast, IGMPv3, ARP
TS Processing	
TS Input Management	Demu× and Remu× among Tuner, ASI Input and TS/IP Input
TS Output Management	Demu× and Remu× for ASI output
Service and PID Management	Remu×, filtering and remapping
PSI/SI	PSI/SI table regeneration, PMT and SDT edition
Descrambler	DVB Common Scrambling Algorithm (CSA)
BISS Mode	BISS-1, BISS-E
Common Interface	Double PCMCIA slots, compatible with major CA CAMs in the market
ASI Output	
Connector Type	1xBNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Output Bit Rate	≤200Mb/s
TS Processing	TS Re-multiple×ed from Tuner, ASI Input and TS/IP Input
A/V Decoding	
Video Standard	MPEG-2(MP@ ML for SD, MP@HL for HD)
	MPEG 4/H.264 AVC Part 10 (MP@L3 for SD, HP@L4.1 for HD)
Audio Standard	MPEG-1 Layer-I/II, MPEG-2 Layer-II
	LC-AAC, HE-AAC
HDMI Output	
Standard	1×HDMI 1.3 interface (up to 1080i)
Video Resolution and Frame Rate	1080i×30, 1080i×29.97, 1080i×25,720p×60,720p×59.94, 720p×50, 480p×60, 576p×50, 576i×25, 480i×29.97
Audio Embedded	1×stereo
HD/SD-SDI Output	
Connector Type	1xBNC, female, 75Ω
Standard	SMPTE 259M, 270 Mb/s for SD, SMPTE 292M, 1.485 Gbit/s for HD
Level	800mV p-p
Video Resolution and Frame Rate	1080i×30, 1080i×29.97, 1080i×25, 720p×60, 720p×59.94, 720p×50, 576i×25, 480i×29.97
Video PID Bit Rate	≤50Mb/s

Digital Audio Output	
Connector Type	SDI embedded
Number of Output	2 pairs of audio PCM downmix or passed through by SDI
Audio Sampling Rate	32K, 44.1K and 48 KHz
Analog Audio Output	
Connector Type	1×DB9 female with 2 pairs of BNC adaptor 75Ω
Output Mode	Left, Right, Dual Mono, Stereo
Number of Output	2 x stereos audio outputs for BNC cables, or
	1 x stereo audio outputs for XLR
Cross Talk Among Channels	>70dB
THD	<0.3% @ 400Hz, 1KHz test tone
Frequency Response	±0.5dB over 20Hz ~ 18KHz
Analog Video Output	
Connector Type	1×BNC
CVBS Standard	NTSC, PAL, and SECAM
Video PID Bit Rate	≤50Mb/s
Norminal Output Level	1.0 Vp-p±5% (with standard test stream)
Frequency Response	<±1 dB, at 5.5 MHz for PAL/SECAM, 4.2MHz for NTSC and 15MHz for HD YPbPr
Chroma-Luma Delay	<±30 ns
Field Time Distortion	<2%
Line Time Distortion	<1%
Short Time Distortion	<2%
Differential Gain	<3%
Differential Phase	<2°
Ancillary Data Processing	
Subtitle	DVB, EBU
VBI	Tele×t, WSS
Closed Caption	EIA 608, EIA 708
SDI Embedded	Teletext, WSS, Closed Caption
Redundancy	
Redundancy Port	among Tuner, ASI input and TS/IP input
Switching Condition	TS Sync Loss or no PAT packet
Switching Mode	Main, Spare
Control & Management	
Connector Type	1×RJ-45, 10M/100M Base-T, for equipment IP Control
Remote Control	SNMP v1/v2, HTTP (Web Interface), Proprietary HDMS (Headend Device Management System)
Local Control	Handset display and 6-key keypad with VGA interface

Equipment Upgrade	WEB HTTP or USB or Telnet
Physical	
Power Supply	DC 3.3V/5V/12V
Power Consumption	20W
Operating temperature	0 ~ 45℃
Storage temperature	-10 ~ 60℃
Operating Humidity	10 ~ 90%, non-condensed

4. Order Information

Model	Tuner	DMM-1510P-20x						DMM-1510P-22x						DMM-1510P-30x						DMM-1510P-32x					
		S2	T2	ISDB	ATSC	DTMB	DS3	S2	T2	ISDB	ATSC	DTMB	DS3	S2	T2	ISDB	ATSC	DTMB	DS3	S2	T2	ISDB	ATSC	DTMB	DS3
Input	DVB-S2	●						●						●						●					
	DVB-T2		●						●						●						●				
	ISDB			●						●						●						●			
	ATSC				●						●						●						●		
	DTMB					●						●						●						●	
	DS3						●						●						●						●
	ASI In x1			●						●						●						●			
	CI x2			●						●						●						●			
Output	ASI Out x1			●						●						●						●			
	HD/SD SDI x1															●						●			
	SD SDI x1			●						●															
	HDMI x1			●						●						●						●			
	CVBS x1			●						●						●						●			
	Audio L/R x2			●						●						●						●			
	Audio XLR x1			*						*						*						*			
TSoIP	GbE RJ45 x2									●												●			
USB	USB x2			●						●						●						●			
Control	RJ45 x1			●						●						●						●			

5.Block Diagram
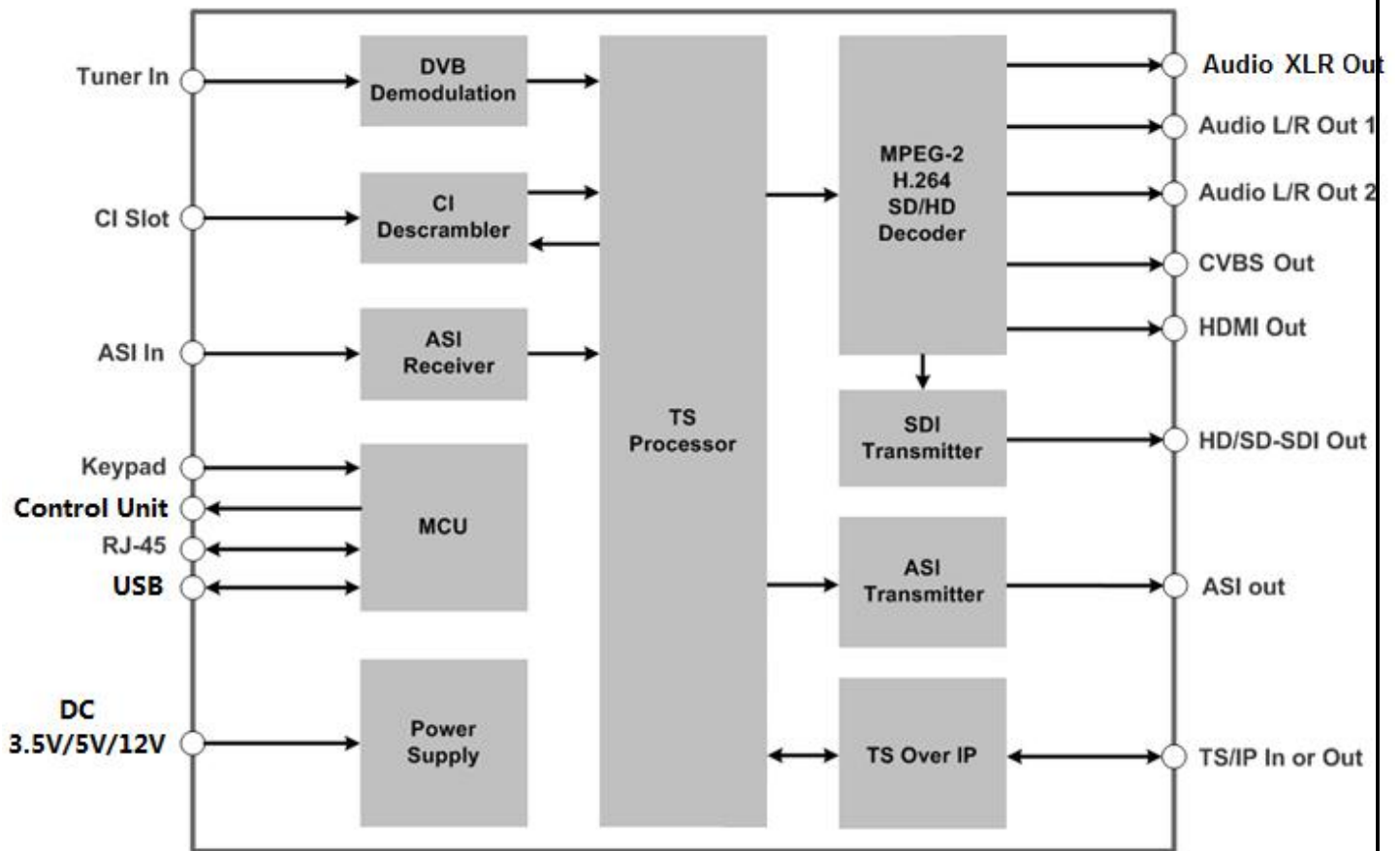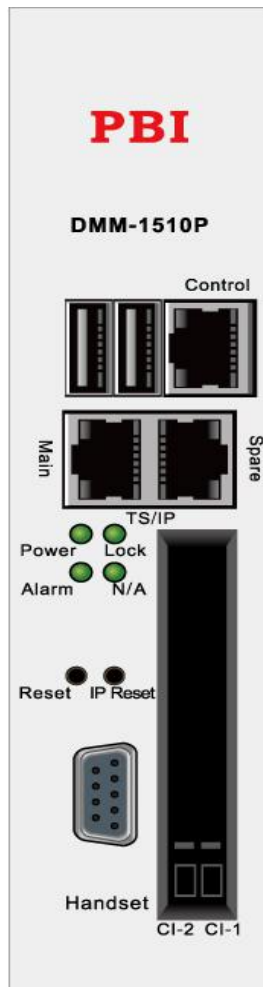
A1 USB	2 USB ports for software upgrade
A2 Control	Network management interface for remote control
A3 Power	Power indicator, green light on means power supply is working well
A4 Lock	Tuner input indicator, green light on means signal from tuner input is locked
A5 Reset	Used to reboot the module
A6 TS/IP	GbE interface for TS over IP
A7 Handset	Used to connect the DMM-1000CU for controlling the module.
A8 Common Interface	Used to insert CI CAM module, maximum 2 CI modules

6.2 Rear panel

B1 Tuner in   Tuner signal input

B2 ASI in   ASI input port

B3 SDI/ASI Out   SD or HD Serial Digital Video output port

B4 ASI Out   ASI output ports in mirror

B5 CVBS   CVBS BNC video output port

B6 HDMI   High Definition Multimedia Interface output port

B7 Audio   AES/EBU and Balance Audio output port

7 Management Ethernet Port

The Management port is used to remote control and supervise the equipment through IP, it is also for the software update. Its factory settings are as following:

- IP address:10.10.70.48
- Sub Mask:255.255.255.0
- Gateway:10.10.70.1

Both web based control software and proprietary HDMS software are using this port.

Notice: When apply default settings to DMM-1510P, the above settings for IP will not be affected. This is for maintaining the connectivity of the unit to the IP Network.

7.1 TS over IP Ethernet Port

The TS over IP ports are an option by adding a daughter board onto main board. The default settings are as following:

- Main IP address:10.10.10.10
- Spare IP address: 10.10.10.20
- Sub Mask:255.255.255.0
- Gateway:10.10.10.1

OPERATION

Handset Control

Getting Started

After successful installation and connecting handset with DMM-1510P, user can switch on the power supply. The equipment will check the hardware and software versions, then the product name and its IP address will be shown in the LCD screen.

```
Professional IRD
IP: 10.10.70.48
```
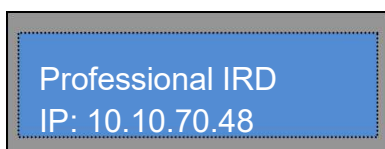
The IP address of the equipment can be changed in the **System** menu. Go into the **Local Setup** submenu, user can set IP address, network mask and IP gateway. Press ENTER to select the option, and use LEFT or RIGHT to move the cursor between digits and use UP or DOWN to change the value until the right value, then press ENTER to save the settings.

```
IP Address
10.10.70.48
```

```
Network Mask
255.255.255.0
```

```
Gateway
10.10.70.1
```
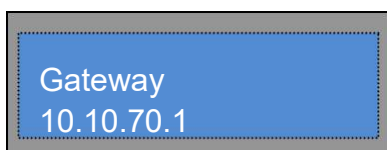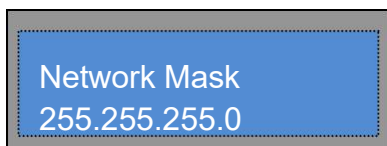
Customers can use UP, DOWN, LEFT,RIGHT, ENTER, EXIT keys from handset to navigate in the menus, set and save parameters.

8 Main menu

User can press ENTER into the main menu. In the main menu, there are 3 sub-menu, Press UP/DOWN to switch between the sub-menus.

Status

Configuration

System

After go into every sub-menu, you can press LEFT or RIGHT to move the cursor, then use UP or DOWN to change the value, and then you can press ENTER to save the settings.
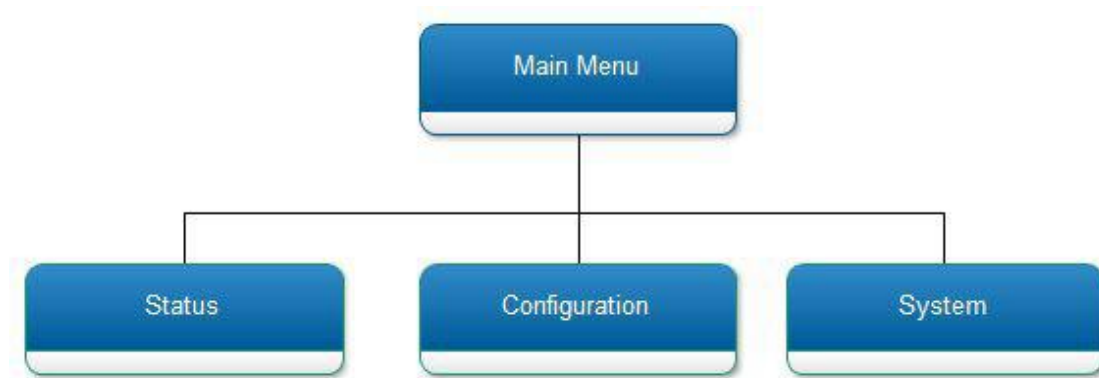
Table : Main Menu Description

Submenu Name	Description
Status	Show the status of input and output, for example tuner RSSI status, the bitrate of ASI input, A/V decoding status and so on.
Configuration	Configure and monitor the parameters of input and output, including Tuner, ASI and TS over IP input, also including CI settings, AV decoder,
System	Check and set system settings and read the equipment information, and make the default factory setting and so on.

8.1 Status Menu

In the **Inputs** menu, user can configure and monitor the parameters of Tuner and TS over IP input (only when the TS/IP streaming board is installed). Choose **Inputs** and press UP or DOWN to scroll the sub-menus, press ENTER to go into the sub-menus. There are several sub-menus to configure:

8.1.1 TS Status

8.1.2 Decoder Status

8.1.3 CI Status

8.1.4 Reumx Status

8.1.5 USB Status

8.1.6 Tuner Status
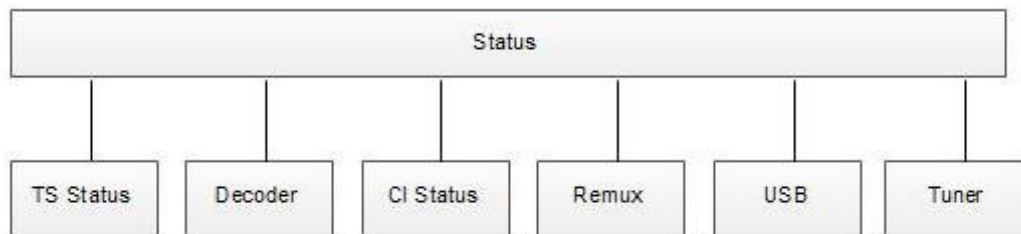
Table : Inputs Menu Description for DVB-S2 Tuner

Submenu Name	Description	
TS Status	ASI Input	To display the TS bitrate of ASI input
	Tuner	To display the TS bitrate of Tuner input
	CI	To display the TS bitrate of CI input
	IP Input	To display the TS bitrate of IP input
Decoder Status	Decoding Status	To display the video and audio decoding status.
	Service Info	To display the decoding service information.
	Video Info	To display the decoding service video
	Audio Info	To display the decoding service audio
CI Status	CI Slot-1	To display the slot1 CAM name.
	CI Slot-2	To display the slot2 CAM name.
	Max BitRate	To display the total bitrate.

	Valid BitRate	To display the valid bitrate.
	Strength	To display the signal strength.
Tuner Status	C/N	To display the C/N.
	Eb-N0	To display the Eb-N0 value.
	BER	To display the BER.
USB Status	To display the USB status	

8.2 Configuration menu

In the Outputs menu, user can configure and monitor the parameters of output, including CI settings, AV decoder, ASI output and so on. Press UP or DOWN to scroll the sub-menus, press ENTER to go into the sub-menus. There are 6 sub-menus to configure:

8.2.1 Tuner

8.2.2 Decoder

8.2.3 ASI-1 Output

8.2.4 TS over IP

8.2.5 Remux

8.2.6 CI

8.2.7 BISS

8.2.8 Redundancy

8.2.9 SDI
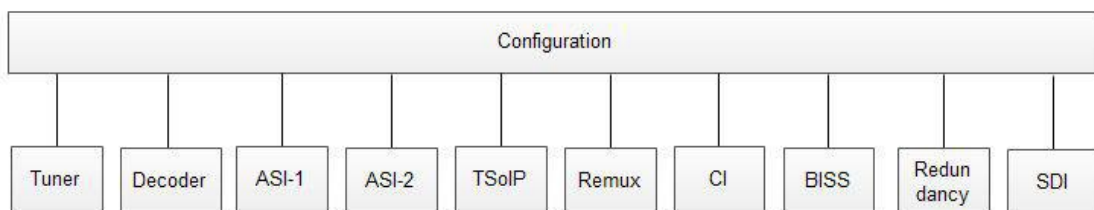
Tuner	
LNB Lo Frequency	xxxxx MHz
Statellite FREQ	xxxxx MHz
Symbol Rate	xxxxxx KBaud
LNB Voltage	OFF/13V/18V
LNB 22KHz	Disable/Enable
DiSEqC	DiSEqC OFF/Port A/Port B/Port C/Port D
Freq Offset High	1000KHz ~ 5000KHz
Freq Offset Low	-5000KHz ~ -1000KHz

ASI-1 Output	
ASI-1 Source	Tuner/ASI-1 In/ASI-2 In/IP IN/CI/BISS

ASI-2 Output	
ASI-2 Source	Tuner/ASI-1 In/ASI-2 In/IP IN/CI/BISS

Remux	
Switch	Disable/Enable
Max Bit Rate	xxxxxx Kbps
TS ID	xxxxx
Program	Program List

Decoder	
Source	Tuner/ASI-1 In/ASI-2 In/IP IN/CI/BISS
Program	Program List
Video	◆Video Standard: Auyo/1080i30/1080i29.97/1080i25/720p60/720p59.94/720p50/480p60/576p50/576i25/480i29.97
	◆ Aspect Ratio: Auto/4:3 Full/ 4:3 Letterbox/ 16:9 Full/ 16:9 Pillarbox
	◆ Subtitle Mode: Disable/ DVB Subtitle/ EBU Subtitle
	◆ Subtitle Lang: Language List
	◆ Failure Mode: Last Screen/ Black Screen
	◆ Closed Caption: Disable/Enable
	◆ CVBS SUB: CVBS PAL SUB/ CVBS NTSC SUB
Audio	◆ Audio-1 Level: -55 ~ +8
	◆ Audio-1 Mode: Auto/Stereo/Mono/ Left/Right
	◆ Audio-1 Priority Audio list
	◆ Audio-2 Level: -55 ~ +8
	◆ Audio-2 Mode: Auto/Stereo/Mono/ Left/Right
	◆ Audio-2 Priority Audio list
Mode	Manual Selection/ First Service
A/V Alarm Switch	Video Alarm Switch/ Audio Alarm Switch

CI	
Source	Tuner/ASI-1 In/ASI-2 In/IP IN/CI/Remux
CAM Name	◆ CI Slot-1: No Module/CAM Name
	◆ CI Slot-2: No Module/CAM Name
Setup	Program List
CI CLK/Max Bitrate	Auto/5MHz/6MHz/7MHz/8MHz/9MHz/10MHz/11MHz/12MHz/13MHz
CI Monitor	Disable/Enable

TS over IP	
Giga IP Mode	Full Duplex/ Double Multi DVB/ 32 IPTV Dual Out
Gigabit In	◆ Uni/Multicast: Multicast/unicast
	◆ Source Identify: Disable/Enable
	◆ Uni/Multicast Addr: xxx.xxx.xxx.xxx
	◆ Uni/Multicast Port: xxxxx
	◆ TS CLK Recovery: Auto/Fixed Rate
Gigabit Out	◆ Giga Out Switch: Disable/Enable
	◆ TS Source: Tuner/ASI-1 In/ASI-2 In/IP IN/CI/ BISS/Remux
	◆ Protocol: UDP/RTP
	◆ TS Pkts Per UDP: 1~7
	◆ Time to Live: 1~255
	◆ Type of Service: Normal/Min Delay/ Max Throughput/ Max Reliability/ Min Monetary Cost
	◆ Uni/Multicast Addr: xxx.xxx.xxx.xxx
	◆ Uni/Multicast Port: xxxxx

SDI	
Emb Aud Switch	Disable/Enable
Emb Aud Mapping	SDI Ch-1&2
	SDI Ch-1&2 Level
	SDI Ch-3&4
	SDI Ch-3&4 Level
	SDI Ch-5&6
	SDI Ch-5&6 Level
	SDI Ch-7&7
	SDI Ch-7&8 Level
Closed Caption Mode	Disable/Enable
Teletext Mode	Disable/Enable

BISS	
Source	Tuner/ASI-1 In/ASI-2 In/IP IN/Remux
Setup	Program List
Mode	Mode 0/Mode 1/ Mode E
Mode 1	Mode 1 Key: xxxxxxxxxxxx
Mode E	◆ Mode E ID: xxxxxxxxxxxxxx ◆ Mode E Key: xxxxxxxxxxxxxxxx

Redundancy	
Switch	Disable/Enable
Main Port	Tuner/ASI-1 In/ASI-2 In/IP IN
Backup Port	Tuner/ASI-1 In/ASI-2 In/IP IN
Main CH Unlock Time	xx s
Main CH Recover Time	xx s
Backup Mode	Auto/User Define

Table : Outputs Menu Description

Submenu Name	Description	
Tuner (Default: DVB-S2)	LNB LO Frequency	To configure the local oscillator frequency according to the right satellite, its range is from 1000 to 26,500MHz.
	Satellite Frequency	To configure the satellite down link frequency according to the right satellite, its range is from 1000 to 26,500MHz.
	Symbol Rate	To configure the symbol rate of QPSK signal, its range is from 1000 to 45,000KBaud.
	LNB Voltage	To select the correct LNB voltage output from the F-connector, user can choose from Off, 13V and 18V.
	LNB 22KHz	To activate the LNB 22KHz control signal to the LNB, user can select between On and Off.
	DiSEqC	To configure the DiSEqC control, user can select Port A, Port B, Port C, Port D or DiSEqC OFF.
	PLS Gold Code	To configure the PLS gold code, its range is from 0 to 262,141.
	Freq Offset High	To ensure the tuner locks the specific signal, its range is from 1000K to 5,000KHz.

Decoder	Freq Offset Low	To ensure the tuner locks the specific signal, its range is from -5,000K to -1,000KHz. The condition is req Offset **Low < Real IF - Setting IF < Freq Offset High?**	
	LNB LO Frequency	To configure the local oscillator frequency according to the right satellite, its range is from 1000 to 26,500MHz.	
	Satellite Frequency	To configure the satellite down link frequency according to the right satellite, its range is from 1000 to 26,500MHz.	
	Symbol Rate	To configure the symbol rate of QPSK signal, its range is from 1000 to 45,000KBaud.	
	LNB Voltage	To select the correct LNB voltage output from the F-connector, user can choose between Off, 13V and 18V.	
CI	CI Source	To configure the CI descramble source, user can select Tuner Input, ASI Input, Input, IP Input or Remux Input.	
	CI Setup	To set which programs should be descrambled by CI slot1 or CI slot2.	
	CI CAM Name	To check what kind of CAMs have been inserted.	
	CA Filter	**This function is only for the ISI tuner to remap the CAT, ECM and EMM.**	
Decoder	Source	To configure the decoder source, user can select Tuner Input, ASI Input,IP Input or Remux Input.	
	Program	To configure which program should be decoded.	
	Video	To configure the video properties, such as the screen ratio, resolution, VBI issues and so on.	
	Audio	To configure the audio properties, such as the audio PID, output level and so on.	

	Mode Selection	To configure which program should be decoded when the decoder source is changed, user can select between First
	A/V Alarm Switch	To enable or disable the A/V alarm, user can choose between On and Off.
ASI Output	ASI Source	To select the ASI output source.
TS over IP	Giga IP Mode	To select the IP board work mode, it supports 3 different mode..
	Gigabit In	To configure the IP input parameters.
	Gigabit Out	To configure the IP output parameters.
	Gigabit Local	To configure the IP address and gateway.
Remux	Remux Switch	To enable or disable the Remux function.
	Max Bit Rate	To set the Max bit rate of the Remux output.
	TS ID	To set the TS ID.
	Program List	To select which services will be output by
BISS	BISS Source	To select the BISS source, user can select Tuner Input, ASI Input, or IP Input.
	Program Setup	To select the BISS program from list.
	BISS Mode	To select the BISS mode, user can choose
Redundancy	Main Port	To configure the main output source, user canselect Tuner Input, ASI Inputor IP Input.
	Backup Port	To configure the backup output source, user can select Tuner Input, ASI Input, or IP Input. The backup port can not select the same source as main port.
	Main CH Unlock Time	To define the condition of the backup port.
	Main CH Recover Time	To define the condition when the main port

	Backup Mode	To configure the decoder output mode, user can select between Auto and User Define Program.
SDI	Emb Audio Switch	To enable or disable the embedded audio,
	Emb Audio Mapping	To configure the SDI embedded audio from
	Closed Caption Mode	To configure the Closed Caption mode over SDI, user can select between Auto, Line21,
	Teletext Mode	To configure the embedded teletext mode

8.3 System menu

In this menu, you can check and set system settings, read the equipment information, make the default factory setting and so on. There are several submenus, including Local setup, Trap IP address, Unit name, Properties, Factory settings, Optional function and Machine Type. Use UP or DOWN key to scroll the submenu, and press ENTER to go into each submenu.

- **Version Info**
- **IP Control**
- **Device Label**
- **Factory settings**
- **Machine Type**
- **Upgrade**
- **LCD Language**
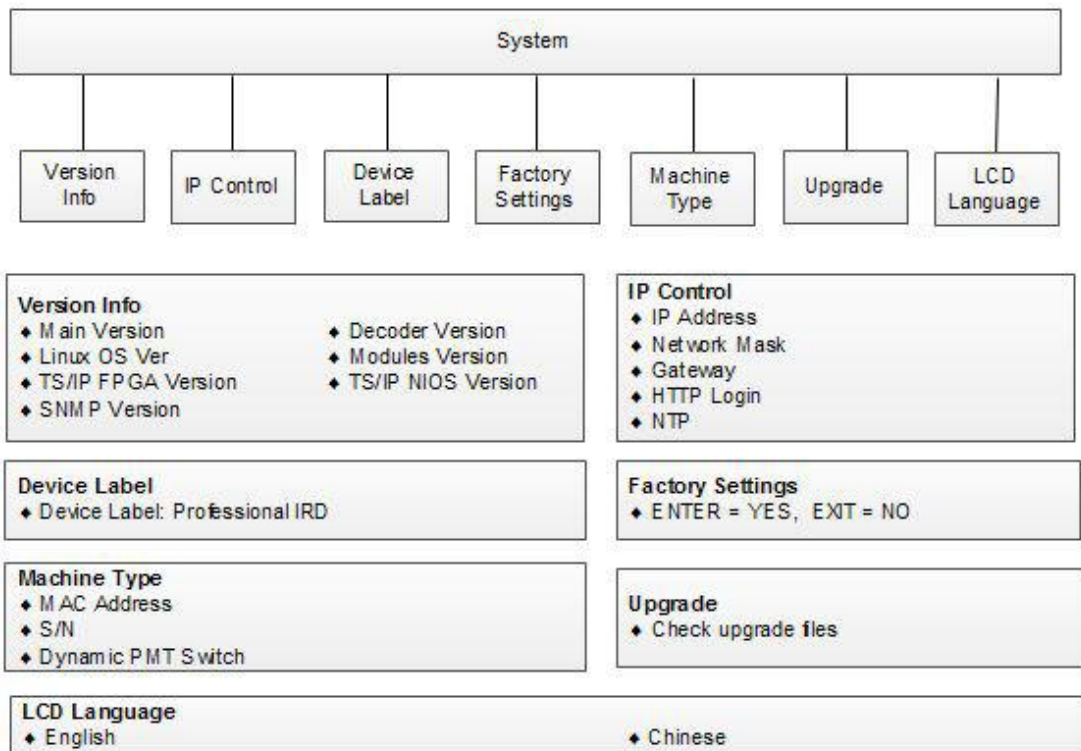
Table : System Menu Description

Submenu Name	Description	
Version Info	Main Version	To check the main software version.
	Decoder Version	To check the main software version.
	Linux OS Version	To check the Linux O/S version.
	Modules Version	To check the decoder modules version.
	TS/IP FPGA Version	To check the TS/IP FPGA version.
	TS/IP NIOS Version	To check the TS/IP NIOS version.
	SNMP Version	To check the SNMP version.
	IP Address	To configure the IP Address of the device.
	Net Mask	To configure the IP Net Mask of the device.

	Gateway	To configure the IP Gateway of the device.
	HTTP Login	To configure the user name and password of web access.
	NTP	To configure the NTP server parameters.
Device Label	Device Label	To configure the product name.
Factory Settings	Factory Settings	The switch to make factory default setting.
	MAC	To configure the MAC address of the device.
	S/N	To configure the serial number of the device.
Machine Type	Dynamic PMT Switch	To enable or disable the dynamic PMT function.
Upgrade	Upgrade	The switch to active the software update by USB.
LCD Language	LCD Language	To configure the LCD language.

9   Remote Control

DMM-1510P can be managed by WEB. User can type IP address of DMM-1510P in browser. It will show login pop-up. The default user name is root and password is 12345. If you forget this username and password, you can use handset to reset it. You can also set it in System→HTTP login menu. The parameters are the same as Chapter 3.3.

9.1 Status

User can monitor the status of inputs TS and service decoding status. All information of every input source can be showed in this page. You can set auto refresh time here, the monitoring information will refresh automatically. Status Refresh button is used to refresh status manually.

Professional IRD

IP Address: 10.10.70.48

| Status | Configuration | System |

Input TS
Decoder

TS Status

Input Status

- Tuner (DVB-S2/DVB-T2/DVB-T/DTMB-T/ ISDB-T/ATSC-T/DVB-C/ANNEX_B/DVB-S)

  Max Bit Rate: 38014.392Kbps   Valid Bit Rate: 28304.488Kbps

  Strength: -72.4dBm   C/N: 11.7dB

  Eb_N0: 10.0dB   BER: 0.0e-9

- ASI   Max Bit Rate: 3687.776Kbps   Valid Bit Rate: 1123.488Kbps

- CI   Max Bit Rate: 3687.808Kbps   Valid Bit Rate: 1122.008Kbps

- IP   IP In Disabled

Remux Information

  Max Bit Rate: 30000Kbps   Valid Bit Rate: 1172Kbps

Professional IRD

IP Address: 10.10.70.48

Status	Configuration	System

Input TS
Decoder

Decoder Status

● Video Decoding   OK   ● Audio Decoding   OK

Service Information

Service Type	Digital television	Service Name	CCTV 7
Provider Name	CCTV	Service ID	303
PMT PID	259	PCR PID	8190

Video Information

Video PID	514	Stream Type	MPEG-2
Video Standard	576I 25	Aspect Ratio	4:3

Audio Information

Audio-1 PID	670		
Audio-1 Stream Type	MPEG-2	Audio-1 Sample Rate	48000Hz
Audio-2 PID	670		
Audio-2 Stream Type	MPEG-2	Audio-2 Sample Rate	48000Hz

9.2 Tuner Input

Set parameters of tuner input, it is used to lock the right satellite. The description of parameters is shown in the Table 19. Click apply button to submit, or click cancel button to cancel.

In the Input interface, user can configure the Tuner settings, for example the DVB-S2 tuner, the parameters includes LNB Frequency, satellite frequency, symbol rate, LNB voltage, LNB 22KHz and DiSEqC. You must click Apply button to finish the configuration and saves parameters. User can save the configuration and load one saved configuration.
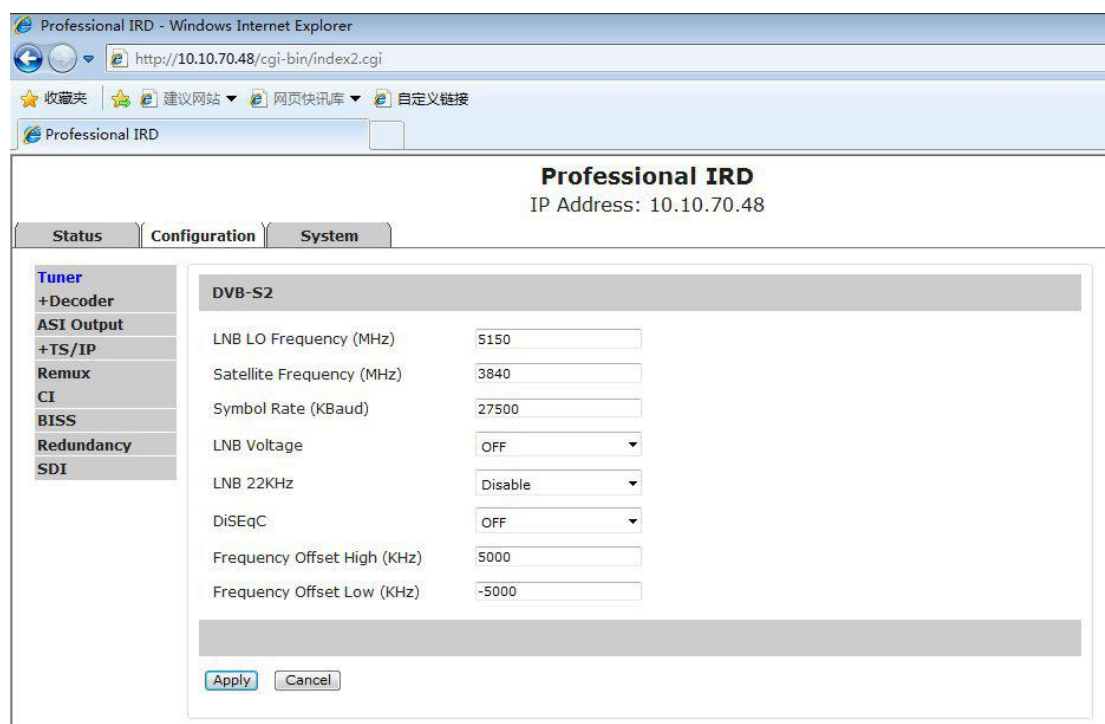
Table : Tuner Parameters Description

Menu Name	Description
LNB LO Frequency	To configure the local oscillator frequency according to the right satellite, its range is from 1000 to 26,500MHz.
Satellite Frequency	To configure the satellite down link frequency according to the right satellite, its range is from 1000 to 26,500MHz.
Symbol Rate	To configure the symbol rate of QPSK signal, its range is from 1000 to 45,000KBaud.
LNB Voltage	To select the correct LNB voltage output from the F-connector, user
LNB 22KHz	To activate the LNB 22KHz control signal to the LNB, user can select between On and Off.
DiSEqC	To configure the DiSEqC control, user can select Port A, Port B, Port C, Port D or DiSEqC OFF.

Frequency Offset High	To ensure the tuner locks the specific signal, its range is from 1000K to 5,000KHz.
Frequency Offset Low	To ensure the tuner locks the specific signal, its range is from -5,000K to -1,000KHz. The condition is Freq Offset Low < Real IF - Setting IF < Freq Offset High
PLS Gold	To configure the PLS gold code, its range is from 0 to 262,141.
Input Stream Identifier(Option)	To configure the ISI code.

9.3 CI

Set parameters for CI descrambling. Before you want to active this function, you have to insert the right CI cards into the CI slots. When select the right Input Source, the programs will be listed in the table, you can descramble the right programs. Click Apply button to submit, or click Cancel button to cancel.

9.4 BISS

Set parameters of BISS Descryption. It supports BISS-1 and BISS-E mode. Click Apply button to submit, or click Cancel button to cancel.

In the BISS-1 Setting interface, user can configure the BISS-1 decryption parameters, including BISS-1 key and the program. The BISS can support 24 PIDs to decryption.

In the BISS-E Setting interface, user can configure the BISS-E decrypt parameters, including BISS-E ID, key and the program. **The BISS can also support 24 PIDs to**
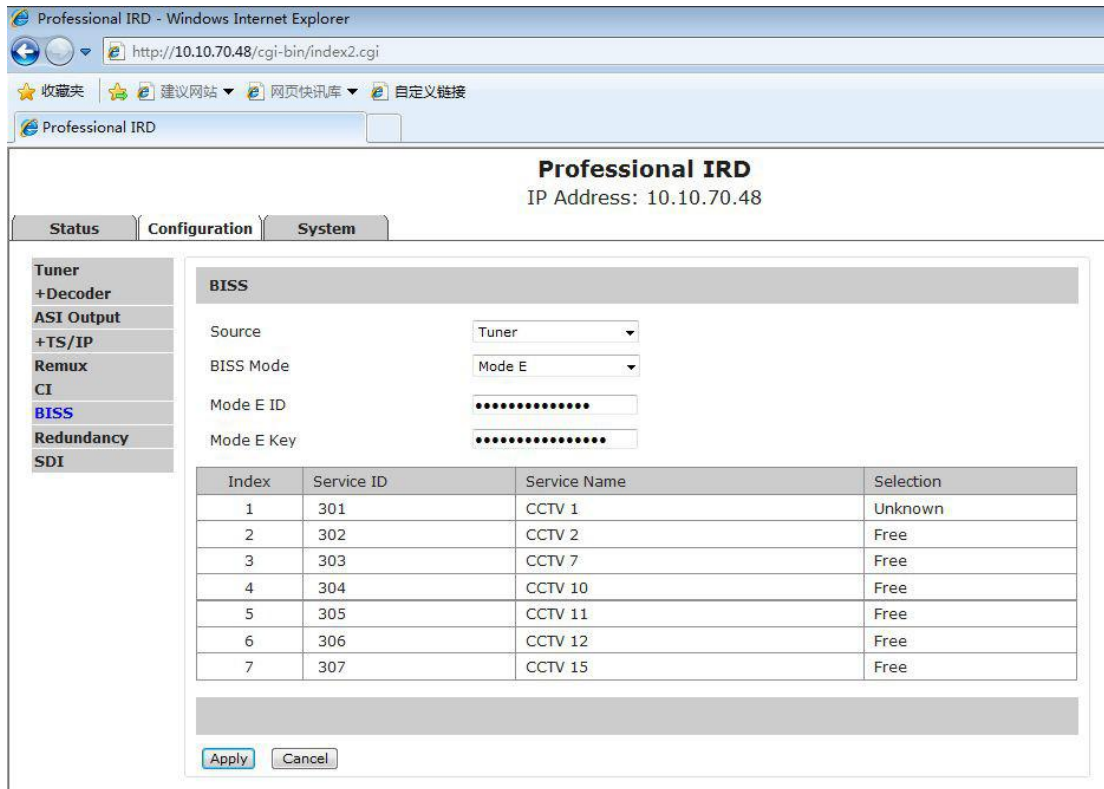
Table : BISS Parameters Menu Description

Menu Name	Description
BISS Mode	To select the correct BISS mode, user can choose between Off, BISS-1 and BISS-E.
ID and Key	Input Key value in BISS-1 mode and input ID and Key in BISS-E mode.
BISS Program	To configure the programs should be decrypted.

9.5 Remux

Set parameters of programs remuxing. The Remux function is a optional function, you can active or close this option in the **System** page. In this page, all programs can be shown in the Input TS window, you can select the programs that need to be remuxed, and then type [>] button to add the programs into the Output TS window. If you want to delete the programs from remuxed TS, you can type [<] button to delete the selected programs. Please don't forget click Apply button to save the setting, or click Cancel button to cancel.
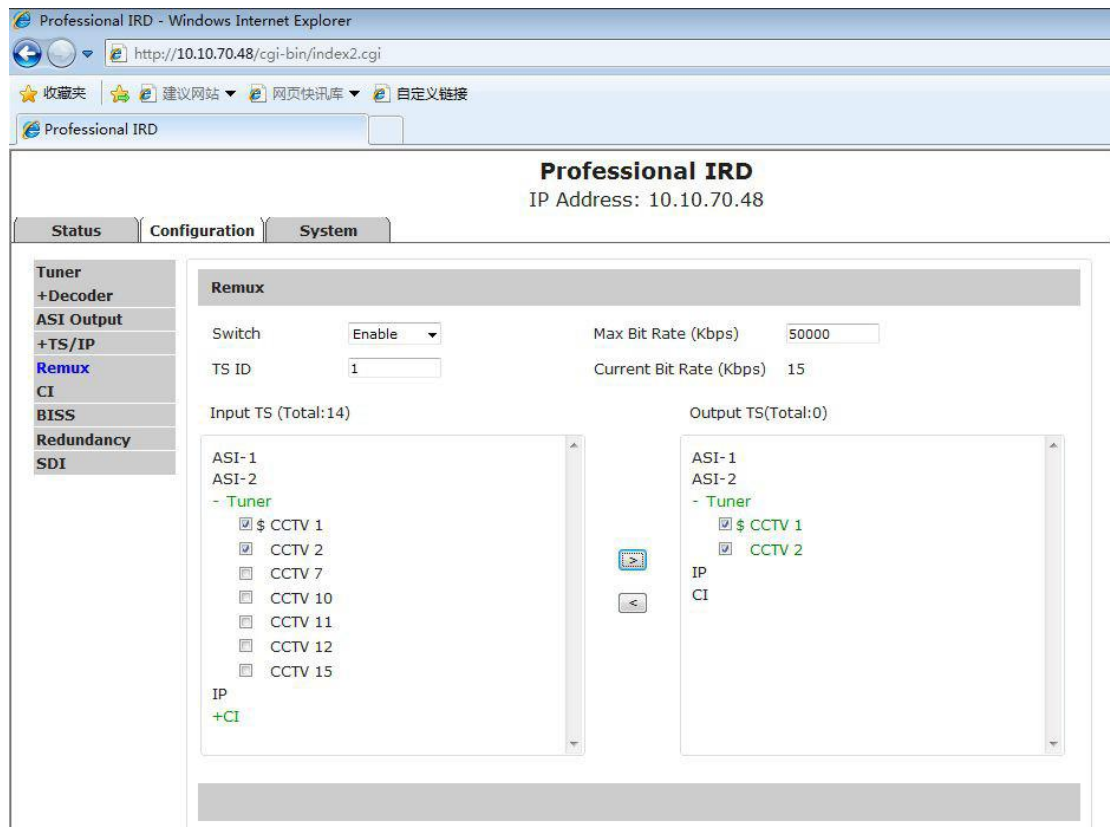
Figure : Programs Remux

Table : Remux Parameters Menu Description

Menu Name	Description
Remux Switch	The switch to enable or disable the Remux function.
Max Bit Rate(kbps)	To configure the output total bit rate.
TS ID	To configure the TS ID.
Valid Bit Rate(kbps)	To display the valid bit rate of the TS output.
Input TS	The interface to select the input TS.
Output TS	To display the output TS of the Remux.

9.6 TS over IP

TS over IP function is also a optional function, the IP board supports 3 different working mode, Full duplex, Multiple MPTS outputs and 32 SPTS outputs. The spare port will be as the backup on the last 2 mode. You can select the IP working mode in **Gigabit Mode** page. For the different mode, TS over IP page will show the different parameters.
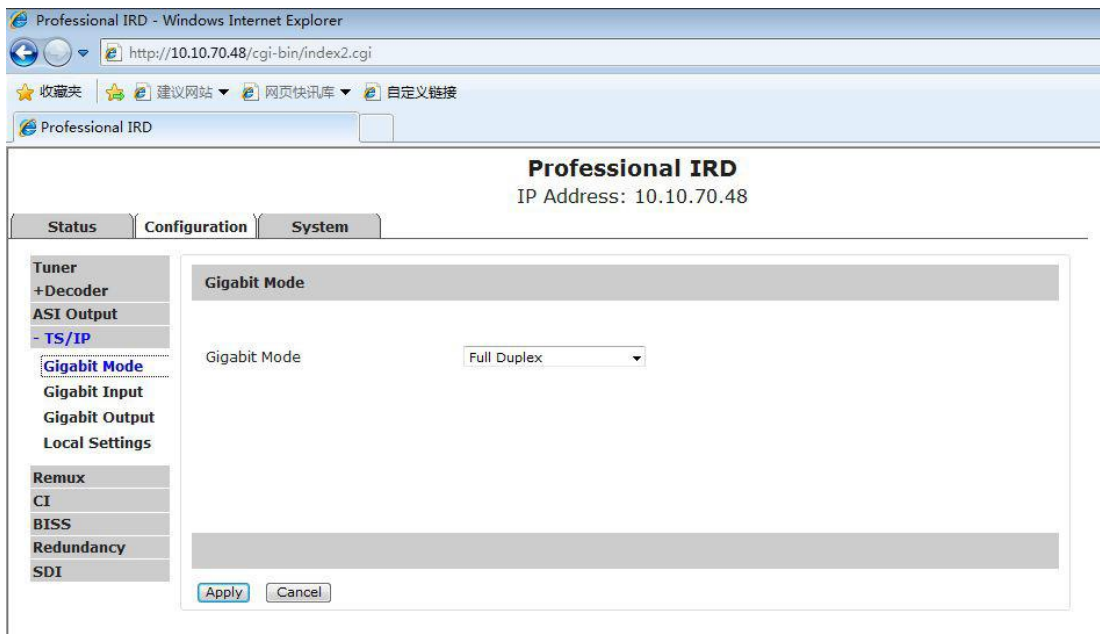
Figure 21: TSoIP Working Mode

When **Full Duplex** option is selected, the following page will be shown. Click Apply button to submit, or click Cancel button to cancel.
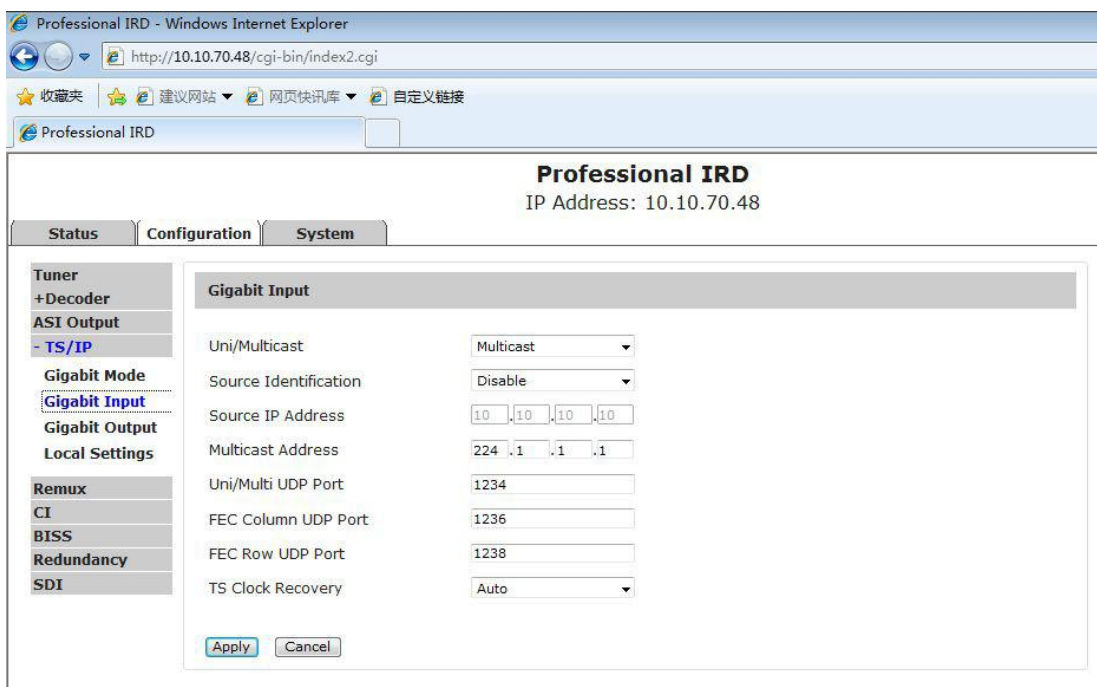
Figure 22: TS over IP Input Settings
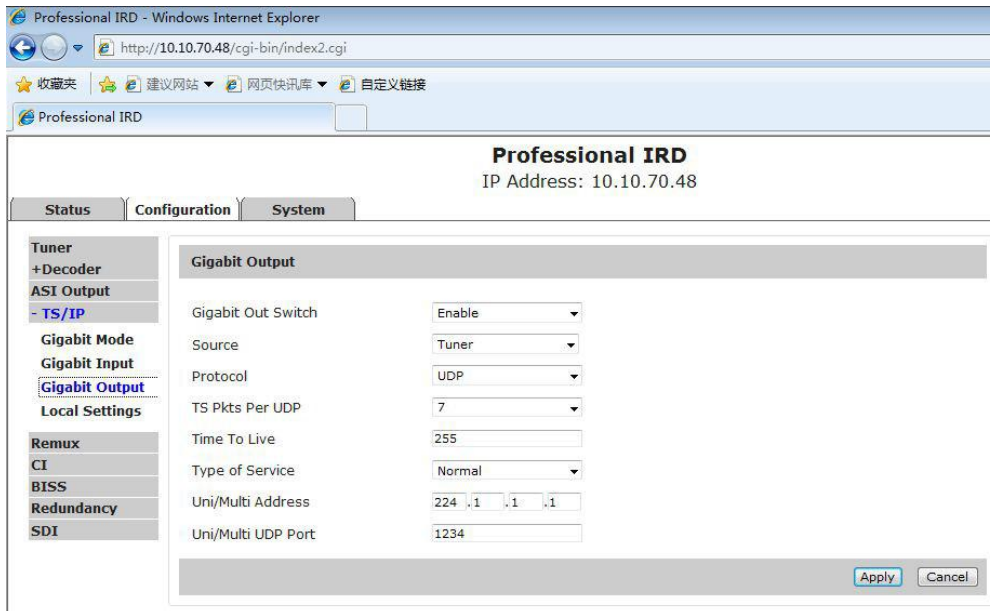
Figure 23: TS over IP Output Settings

When **Double Multiple DVB** option is selected, it means the ip input will disable, the main ports can be configured as 4 different MPTS outputs, and the spare ports will be as backup outputs. The following page will be shown. Click Apply button to submit, or click Cancel button to cancel.
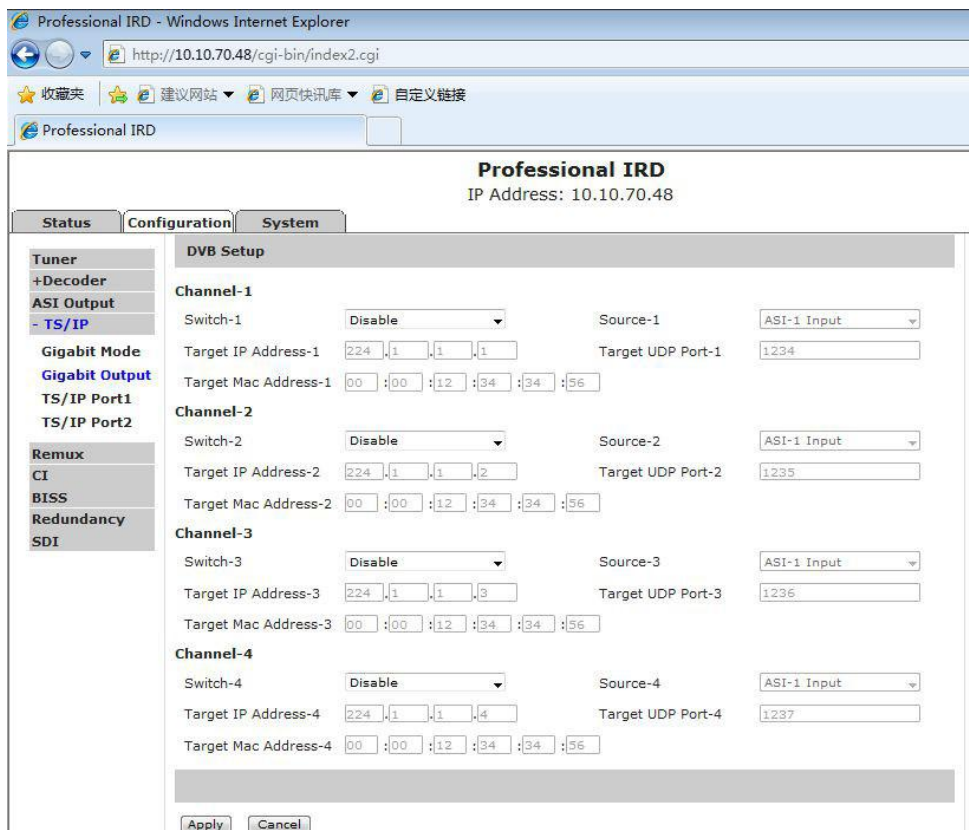
Figure 24: TS over IP Output Settings

When **32 IPTV Dual Out** option is selected, it means the ip input will disable, the main ports can be configured as 32 different SPTS outputs, and the spare ports will be as backup outputs. It will show following page:
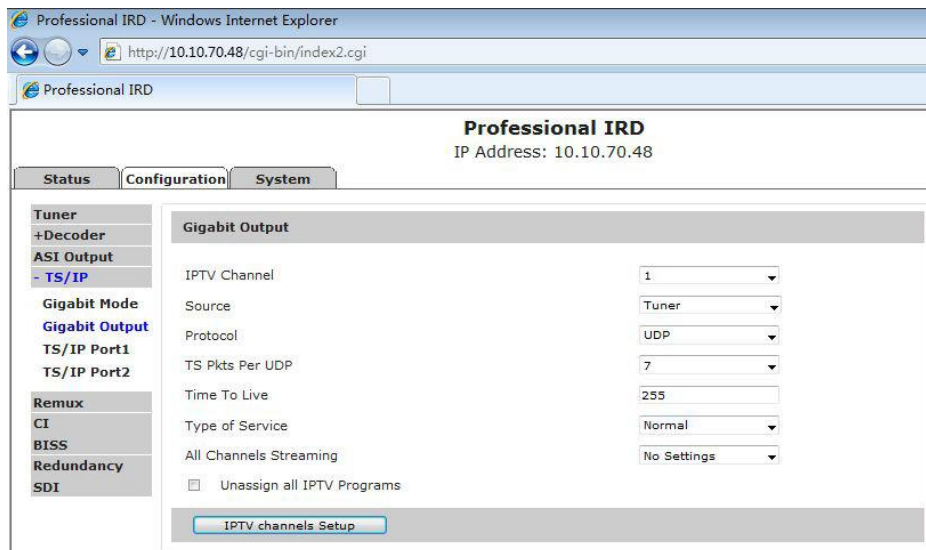
Figure 25: TS over IP Output Settings

If select IPTV mode and click Uni/Multicast Setup button, it will show like this:
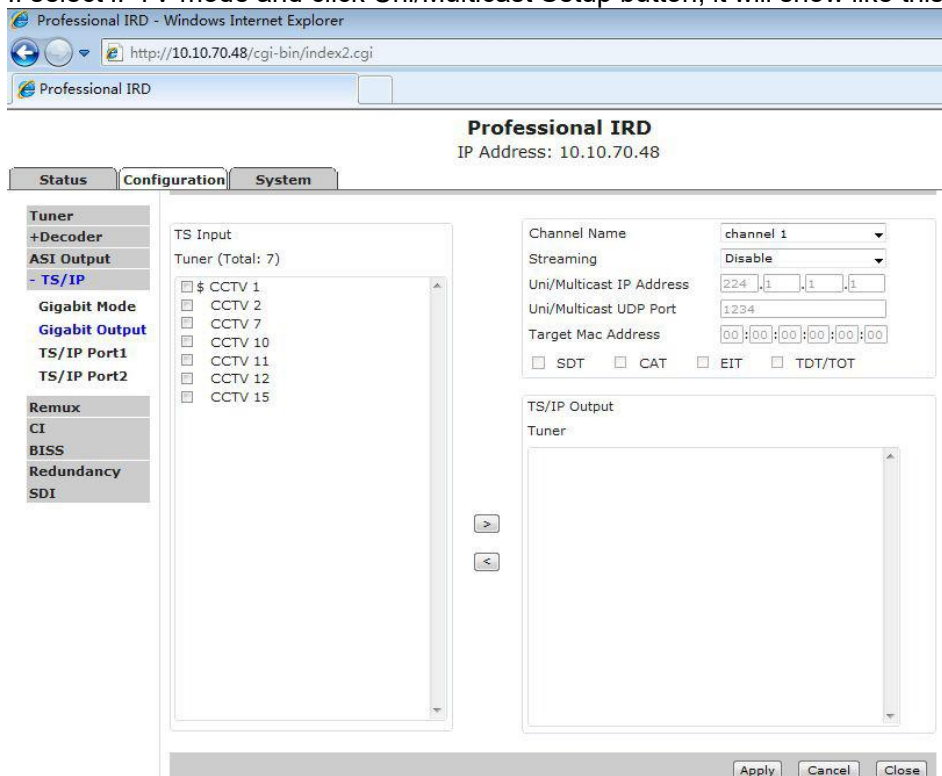
Figure 26: IPTV Settings

Note: It is slightly different in TS over IP page according to the different hardware

configuration of DMM-1510P.

9.7 ASI Output

Set parameters of ASI output. User can select the input source in this page. Click Apply button to submit, Refresh button to refresh latest status of settings, or click Cancel button to cancel.

Professional IRD
IP Address: 10.10.70.48

| Status | Configuration | System |

Tuner
+Decoder
ASI Output
- TS/IP

   Gigabit Mode
   Gigabit Output
   TS/IP Port1
   TS/IP Port2

Remux
CI
BISS
Redundancy
SDI

ASI Output

ASI Output Source   Tuner

[Apply] [Cancel]
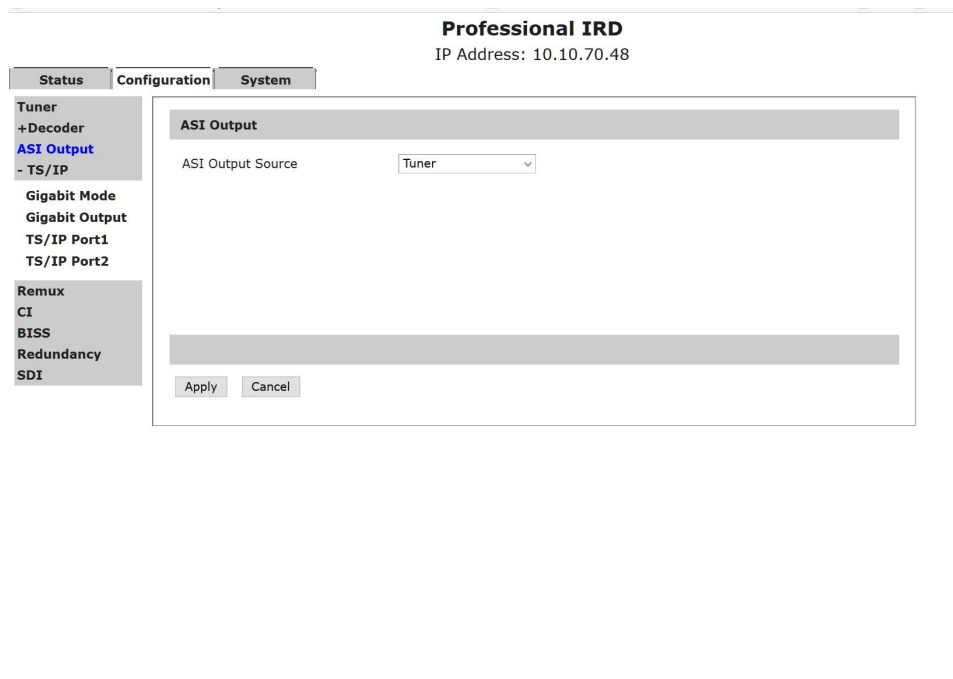
Figure 27: ASI Output

Table 21: ASI Output Description

Menu Name	Description
ASI Output Source	To configure which TS should be output by ASI Output.

9.8 Decoder

Set parameters of decoder. There are three subpages, Program page, Video Output page and Audio Output page. In the Program subpage, user can set the parameters of output program, including decoder source, video output parameters and audio output parameters . Click Apply button to submit, or click Cancel button to cancel.
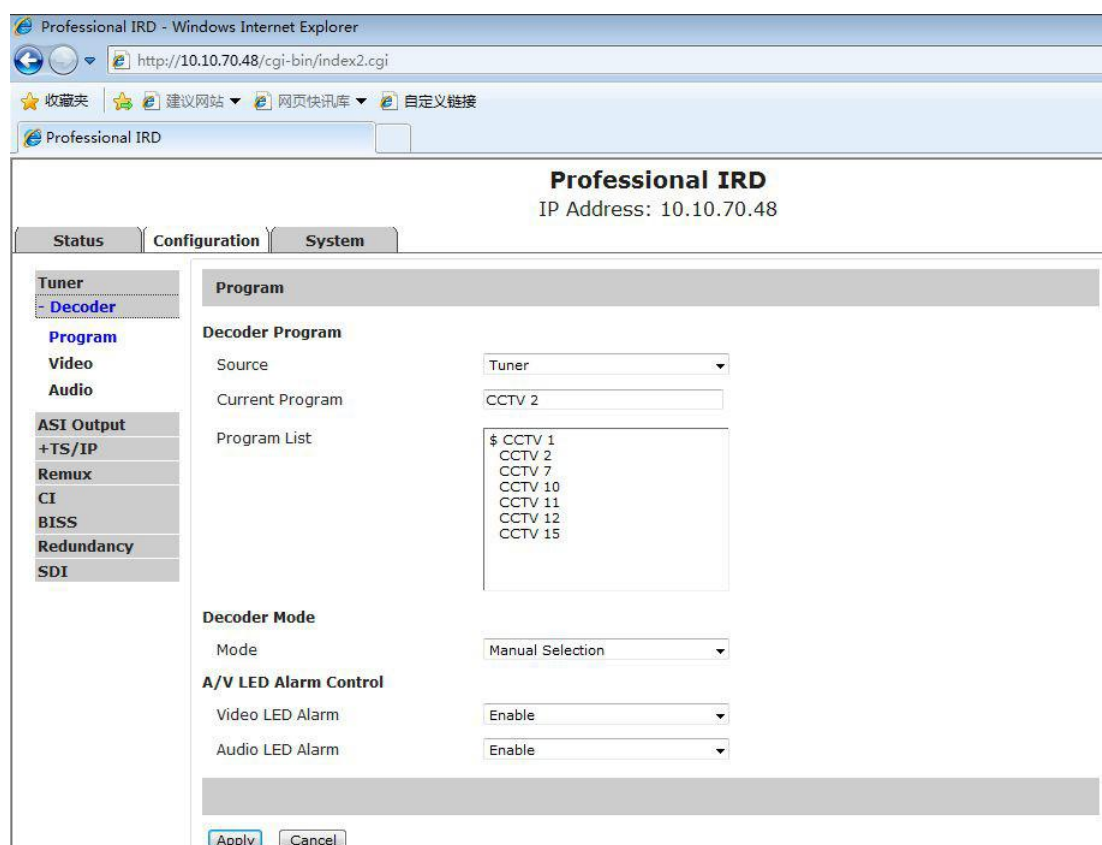
Figure 28: Program Selection

Table 22: Program Selection Description

Menu Name	Description
Source	To configure the decoder source, user can select Tuner Input, ASI Input, IP Input or Remux Input.
Current Program	To show which program should be decoded.
Program List	Programs which can be selected.

Decoder Mode	To configure which program should be decoded when the decoder source is changed, user can select between First Service and
A/V LED Alarm Control	To enable or disable the A/V alarm, user can choose between On and Off.

In the Video Output subpage, user can set the video parameters of output program. Click Apply button to submit, or click Cancel button to cancel.
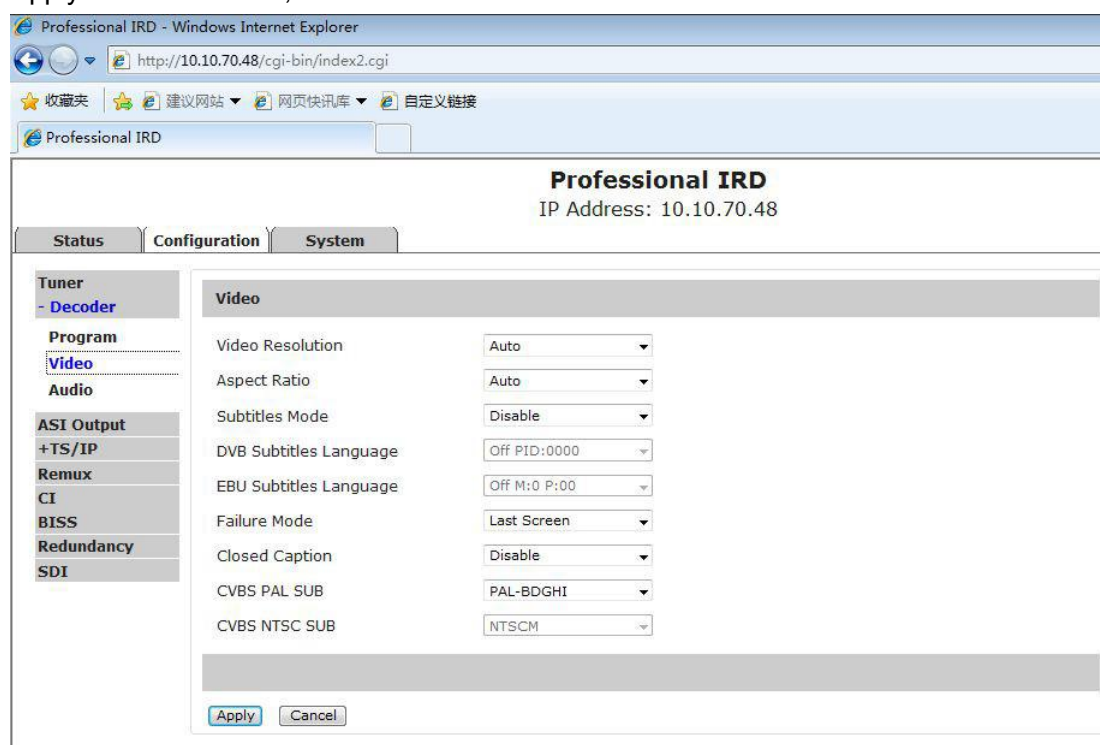
Figure 29: Video Settings

Table 23: Video Output Description

Menu Name	Description
Video Standard	To configure the video output resolution.
Aspect Ratio	To configure the video output screen ratio.
Subtitle Mode	To configure which subtitle will be output.
DVB Subtitle Language	To select the DVB subtitle language.
EBU Subtitle Language	To select the EBU subtitle language.
Fail Mode	To configure the video output mode when change program.
Closed Caption	The switch to enable or disable the closed caption.

CVBS SUB PAL	To select the CVBS PAL mode when the video resolution is set as 1080ix25, 720px50,576px50 or 576ix25.
CVBS SUB NTSC	To select the CVBS NTSC mode when the video resolution is set as 1080ix30,1080ix29.97,720px60,720px59.94,480px60, 480px59.94 or 480ix29.97.

In the Audio Output subpage, user can set the audio parameters of output program.
Click Apply button to submit, or click Cancel button to cancel.
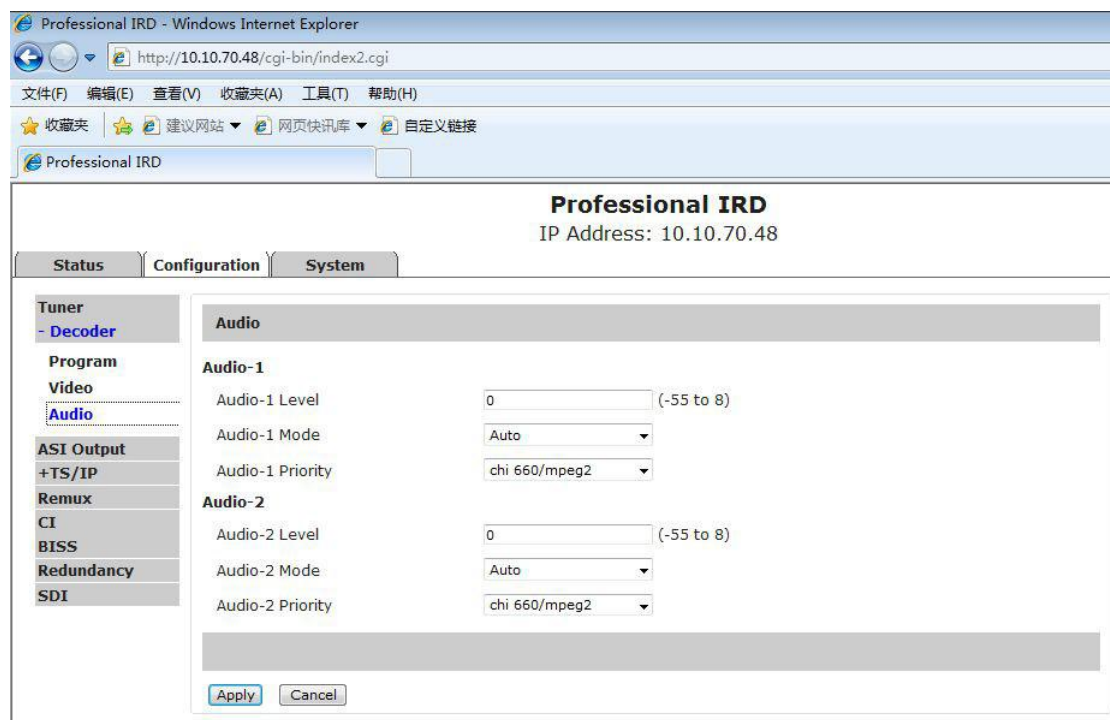
Figure 30: Audio Settings

Table 24: Audio Settings Description

Menu Name	Description
Audio-1 Level	To configure the audio 1 output volume.
Audio-1 Mode	To configure the audio 1 output mode, such as stereo,mono, left and right.
Audio-1 Priority	To configure which audio PID will be decoded.
Audio-2 Level	To configure the audio 2 output volume.
Audio-2 Mode	To configure the audio 2 output mode, such as stereo,mono, left and right.
Audio-2 Priority	To configure which audio PID will be decoded.

9.9 Redundancy

Set parameters of Redundancy. Redundancy function can help to improve the system

security, backup parameters can be set in this page. User can active or close this function in System page. Click Apply button to submit, or click Cancel button to cancel.

Professional IRD
IP Address: 10.10.70.48

| Status | Configuration | System |

Tuner
+Decoder
ASI Output
+TS/IP
Remux
CI
BISS
Redundancy
SDI

Redundancy

Switch	Enable
Main Port	Tuner
Backup Port	ASI Input
ASI-1 Out Switch	Enable
IP Out Switch	Disable
CI Switch	Disable
Decoder Switch	Disable
Main Channel Unlock Time (s)	10
Main Channel Recover Time (s)	3
Main CH Recover Mode	MANUAL_SETUP
Backup Mode	Auto

Apply   Cancel

Figure 31: Redundancy Information

9.10 System

In the System interface, user can configure and monitor the system information. User can configure the network settings and unit name in this interface. And user is able to read SN, FPGA version, MCU version and MAC address. After configuring the parameters, you must type Apply button to finish the configuration. User can make the save configuration and load one saved configuration by Preset subpage.

Figure 32: System Information

In Version subpage, user can read the software version.

Figure 33: Version Information

In IP Control subpage, user can set the network management parameters and active NTP function. Click Apply button to submit, or click Cancel button to cancel.

Figure 34: IP Control

10. HDMS

The DMM-1510P provides an Ethernet remote control interface for user to remote control or supervise one or multiple equipment via the Headend Devices Management System (HDMS).

10.1 Install HDMS Software to PC

The HDMS Installation.exe file could be found on the CD-ROM which is enclosed in the original package.

Step 1:

There are two kinds of HDMS installation files: For Windows and For Linux/Unix.

The file name of HDMS install file for Windows is HDMSX.X.X.exe , "X" means version number. Double-click the HDMSX.X.X.exe in Windows OS to start the installation program.

Figure 35: Setup Wizard

Step 2:

User can see the License Agreement after click the Next button. Please read it carefully, then click I Agree button to continue.
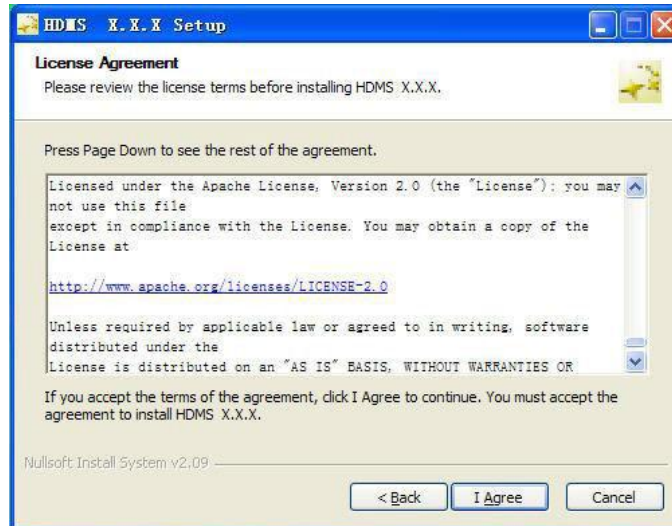
Figure 36: License Agreement of HDMS

Step 3:

The default installation folder is C:\Program Files\HDMS\. User can click the Browse button to choose the install location.

Then click Install button to continue the installation.
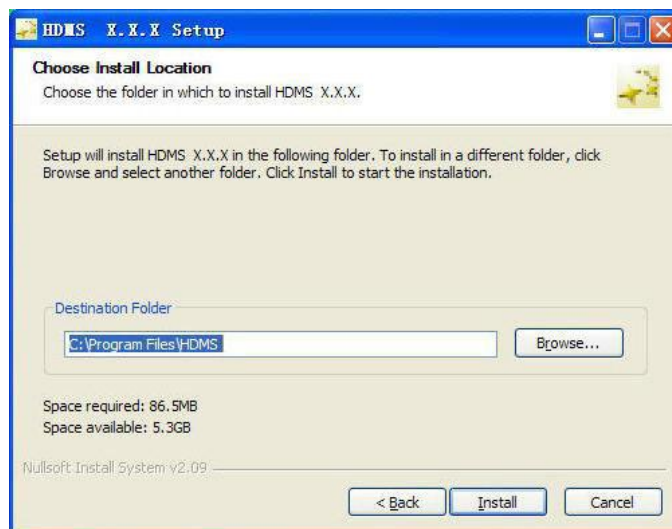
Figure 37: To Choose the Installation Folder

Step 4:
After click the Install button, WinPcap Setup dialog box will be shown. Click Next button to continue to install WinPcap software.
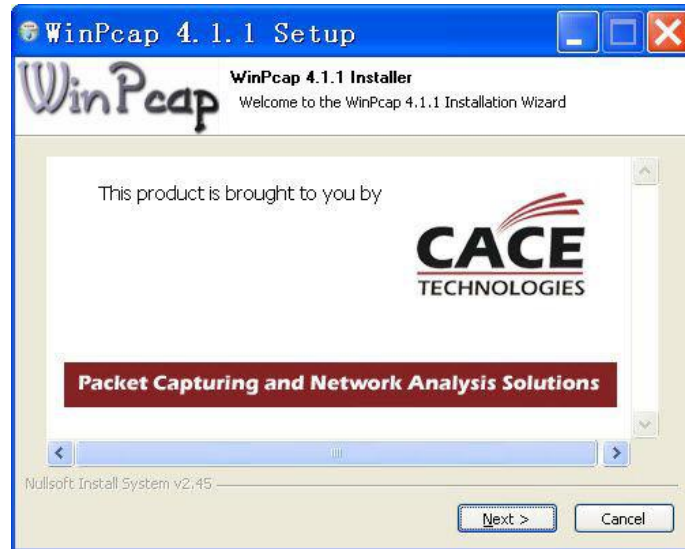
Figure 38: To Install the WinPcap Software

Step 5:

The License Agreement appears, click I Agree butter to continue the installation.

Figure 39: To Agree the WinPcap License Agreement

Step 6:

It will take a short time to install WinPcap and HDMS software, and then click Finish button to finish the installation. User can choose to run HDMS and show Readme after finish the installation.
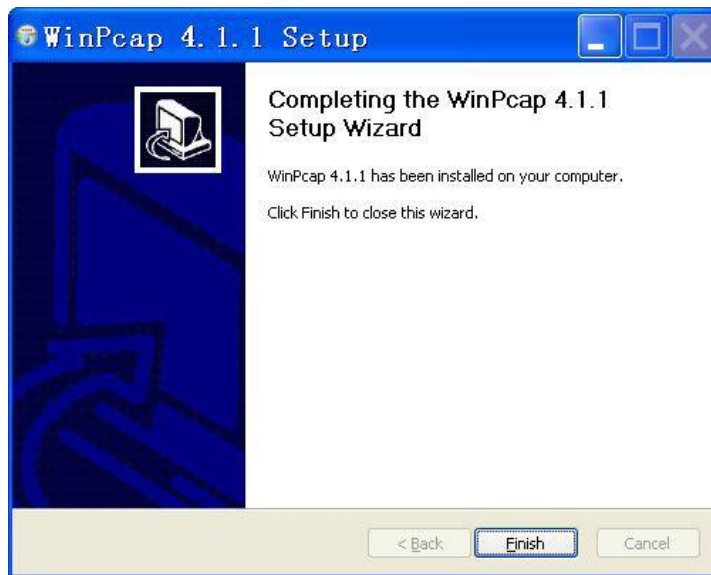
Figure 40: To Finish the WinPcap Installation

Figure 41: To Finish the HDMS Installation

10.2 Operation of HDMS Software

After installation of HDMS, you need to configure the network settings of the DMM-1510P which is expected to connect to the HDMS software. Please ensure the DMM-1510P and PC are in same network.

Step 1:

User can double-click the HDMS icon on the desktop to run the HDMS software. Or you could also run this software from Start→Program→HDMS→HDMS. Then a login window will be shown. A user account and password are needed. Default user account is: hdms, password is: hdms. You can create new accounts or delete old accounts.

Figure 42: Login HDMS

Step 2:

After login of HDMS, you will see an interface, it includes Tools bar, Device zone, Operation zone and Alarm manager zone.
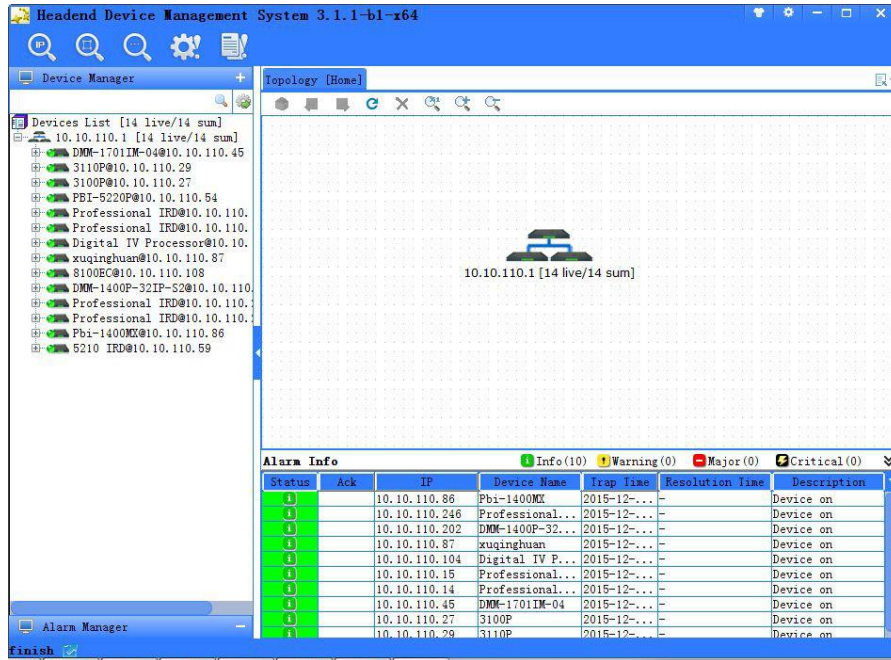
Figure 43: HDMS Software Interface

Step 3:

At first, you need to check that the network settings are right. Then you can click the

Search icon in Tools zone , you will see the connected device in the device zone if the network is right. At this time, the device is not activated.
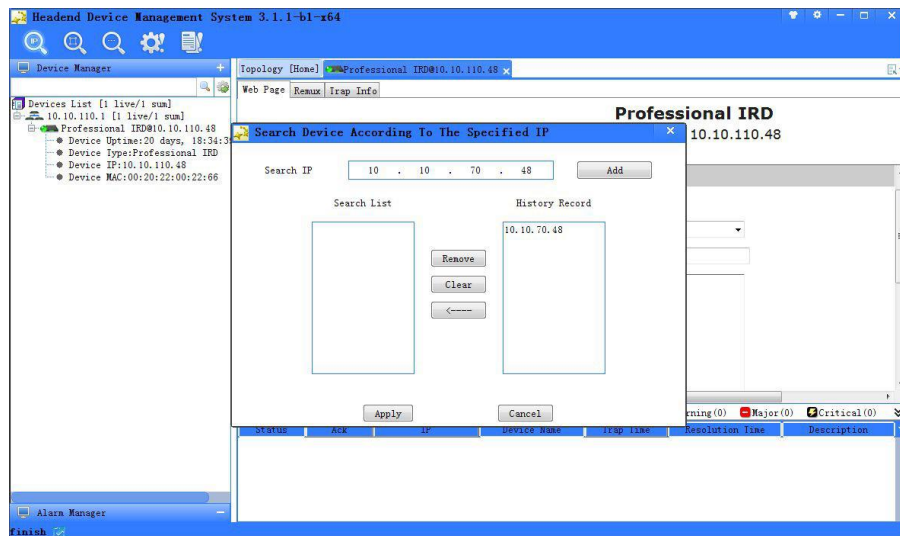
Figure 44: Device Search

Step 4:

Double-click the device, it will show login pop-up, the default user name is root and

password is 12345, the same as WEB interface. The operation zone will be shown on the right, most of the settings can be set by WEB Page which is embedded in HDMS.
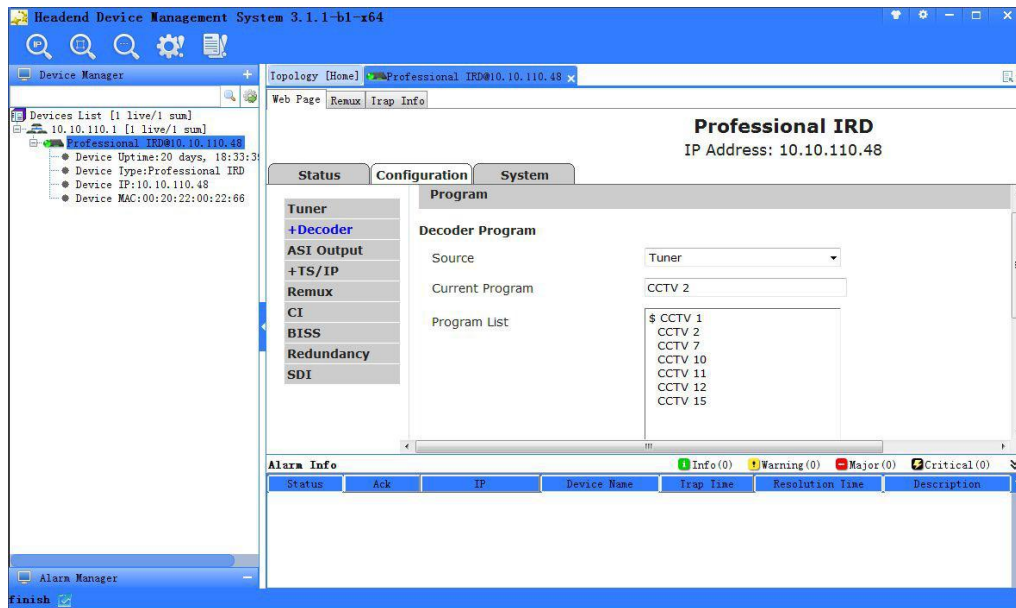
Figure 45: Operation Interface

Step 5:
In the Remux interface, HDMS provides the advanced settings for the PSI/SI table edit, such as the PMT, SDT, NIT and so on.
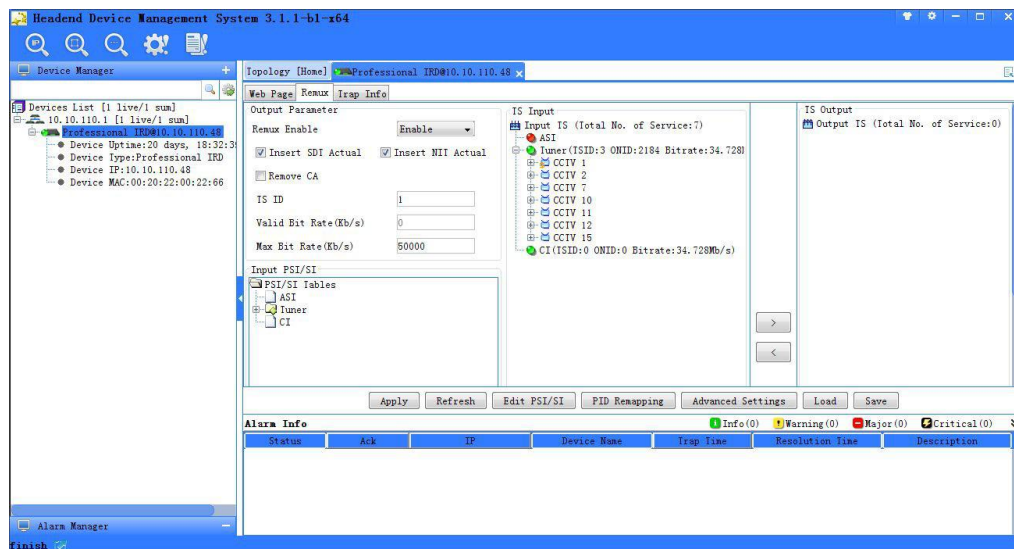
Figure 46: Advanced Remux Interface

Step 6:
In the Trap Info interface, HDMS provides 10 different IP address and ports to send the trap information.

Headend Device Management System 3.1.1-b1-x64

Device Manager

Devices List [1 live/1 sum]
10.10.110.1 [1 live/1 sum]
  Professional IRD@10.10.110.48
    Device Uptime:20 days, 18:32:0
    Device Type:Professional IRD
    Device IP:10.110.48
    Device MAC:00:20:22:00:22:66

Topology [Home] Professional IRD@10.10.110.48

Web Page | Remux | Trap Info

Index	Trap IP	Trap Port	Trap Community	Trap Version	Trap Enable
0	10.10.110.50	162	public	snmpv1-trap	enable
1	0.0.0.0	0	public	snmpv1-trap	disable
2	0.0.0.0	0	public	snmpv1-trap	disable
3	0.0.0.0	0	public	snmpv1-trap	disable
4	0.0.0.0	0	public	snmpv1-trap	disable
5	0.0.0.0	0	public	snmpv1-trap	disable
6	0.0.0.0	0	public	snmpv1-trap	disable
7	0.0.0.0	0	public	snmpv1-trap	disable
8	0.0.0.0	0	public	snmpv1-trap	disable
9	0.0.0.0	0	public	snmpv1-trap	disable

Apply | Refresh

Alarm Info   Info(0) Warning(0) Major(0) Critical(0)

Status	Ack	IP	Device Name	Trap Time	Resolution Time	Description

Alarm Manager

finish

Figure 47: Input Interface

11.SOFTWARE UPDATE

Software Upgrade Set up

The device can support USB, WEB HTTP and Telnet, 3 different ways to update the software. The WEB HTTP mode is more convenient for remote update via IP network. The USB mode is much faster and easier for field upgrade. There is just one file named target.tgz need to update.

Before upgrading the digital TV headend equipment, please check whether the Hardware and Software are compliant in the release note.

The upgrade can be launched via IP network. Connect the equipment to a PC via a cross over CAT-5 (RJ45) LAN cable or a normal cable using IP switch/hub. Please ensure that the equipment and the PC are in the same local area network(LAN) before upgrade. The default IP address of equipment is 10.10.70.48, and you can check the IP address from LCD screen on front panel.
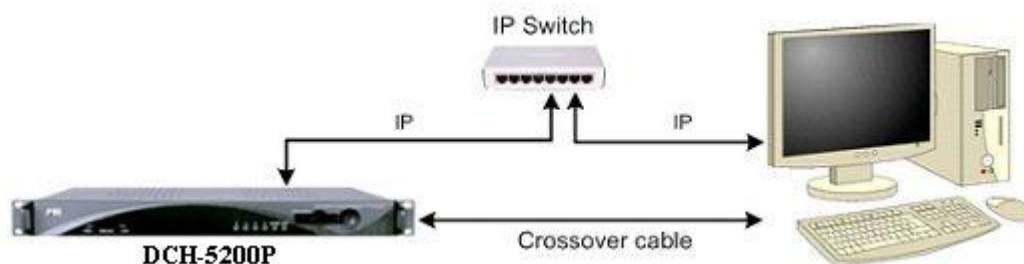
Figure 48: IP Connection Diagram

Important: DON'T switch off the equipment and your PC during the software upgrade.

Software Upgrade Procedure by WEB

Step 1:

Open the IE browser and type http://10.10.70.48 in the address bar and press Enter. If the network configuration is correct, you can open the login page, as shown below. Use ?root? as the default user name and ?12345? as the default password. The new user name and password can be changed by user.

Figure 49: WEB Page Access

Step 2:

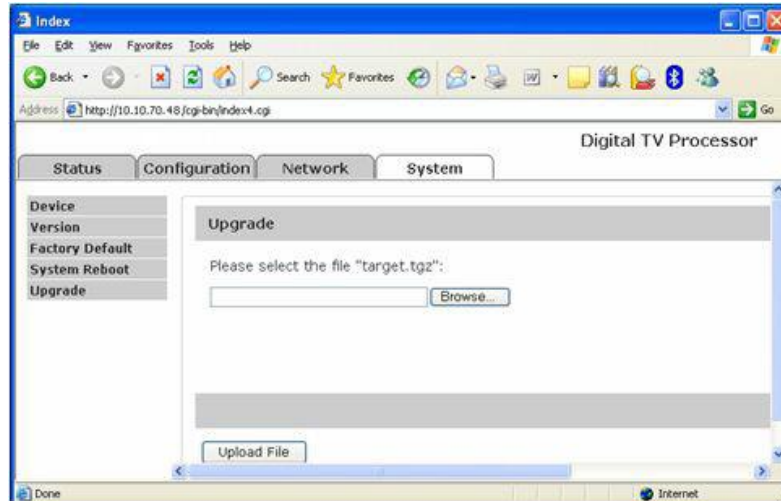Enter the System->Upgrade page, press the Browse button to address the path of firmware file.

Figure 50: Upgrade Page

Step 3:

Select the right firmware file which named target.tgz.

Step 4:

Press the Upload File button, the new firmware file will be uploaded to the FTP server.
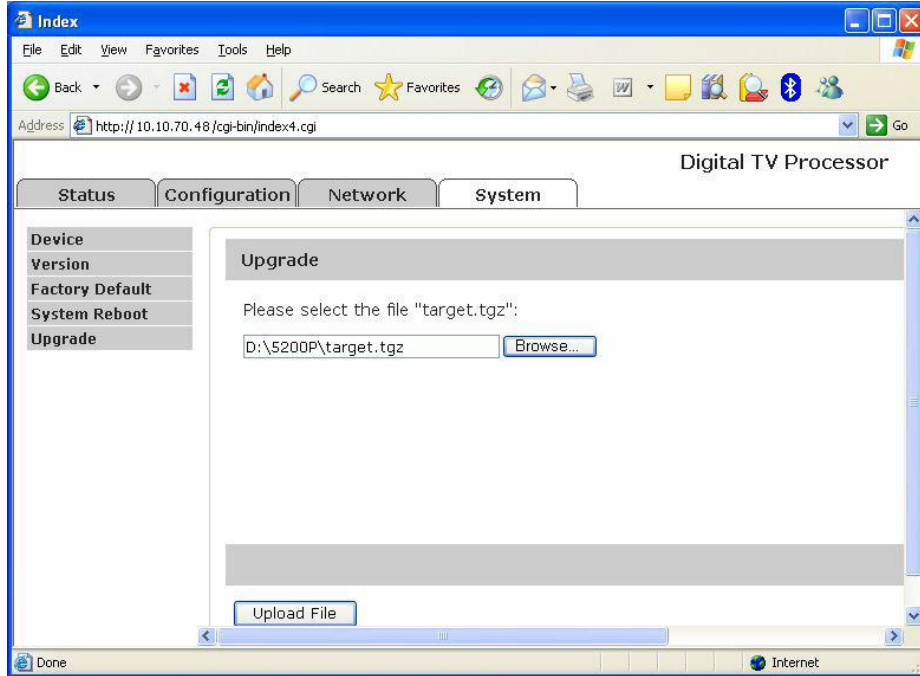
Figure 52: Upload the file to FTP

Step 5:

Press the Upgrade button to start updating.
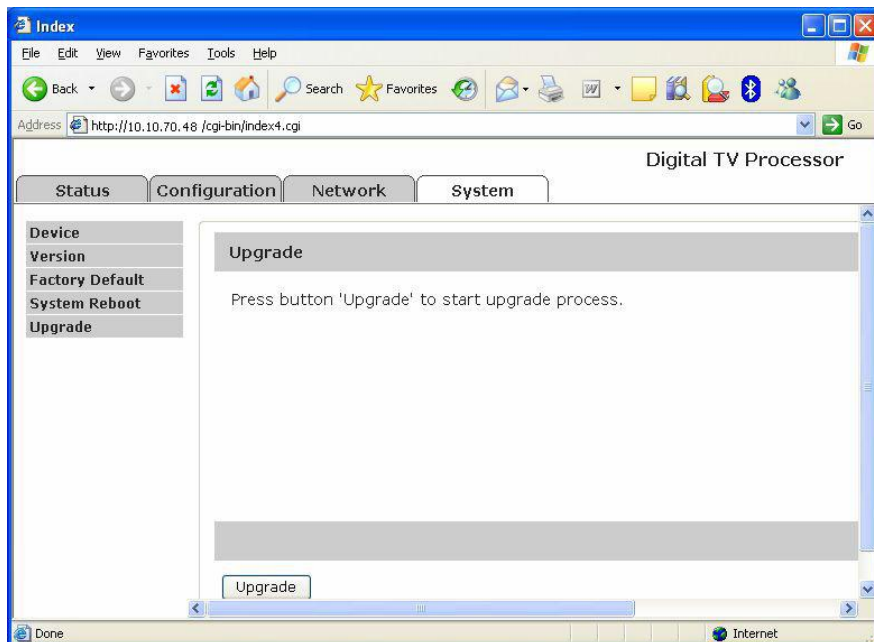
Figure 53: Start Upgrading

Step 6:

Please wait a few seconds, the unit will reboot automatically when the updating is completed.
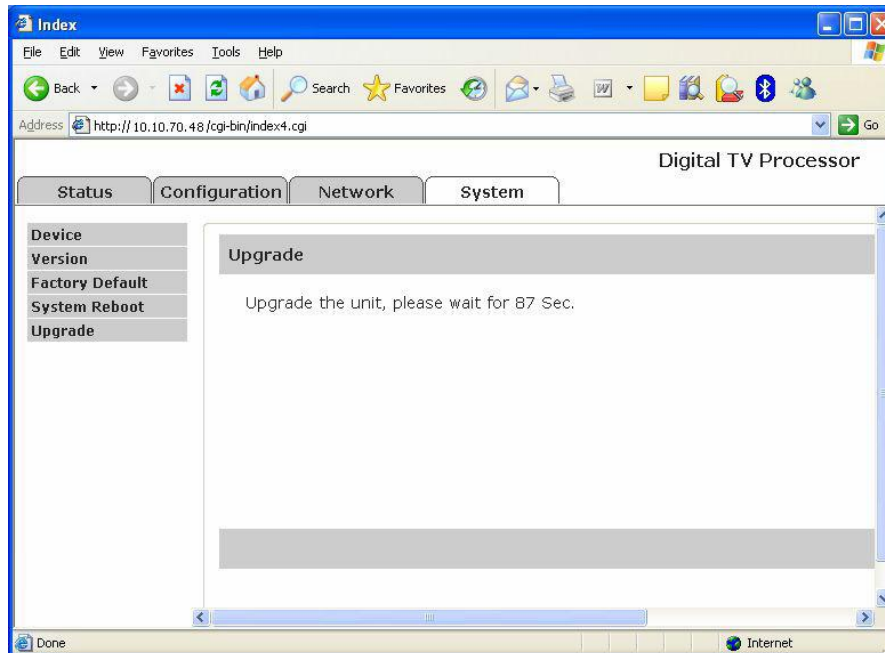
Figure 54: Upgrading Progress

Software Upgrade Procedure by USB

Step 1:
Copy the **target.tgz** file into the USB key, then connect the USB disk with the equipment. The user can check the status through **LCD: Status ->USB Status**, it will be shown **USB found** if the USB key connect with the unit well.

Step 2:
Enter the USB control menu through "**LCD: System -> Upgrade**", press Enter if the device has found the updating file.

Step 3:
The status will be shown on the LCD, for example: **Upgrading** etc.

Step 4:
The LCD will display **Upgrade Success** when the software upgrade completed, then the unit will reboot automatically.

Step 5:
If the upgrade was not successful, the LCD will display **Upgrade Fail**, please follow the procedure from step2 to step4, and upgrade again.

Step 6:

It's better to check the version through **LCD: System->Version Info**, whether the update is correctly, It's also available to check in web page.

Software Upgrade Procedure by Telnet

Step 1:

Turn on the equipment until the booting is completed. You can check the IP address from the LCD screen on front panel, the default IP address is 10.10.70.48. Please make sure that the equipment and your PC are in the same IP network, refer to Figure 1.

Step 2:

Open the IE browser and type ftp://10.10.70.48 in the address bar and press Enter. If the network configuration is correct, you can open the FTP folder without any error, as shown below.
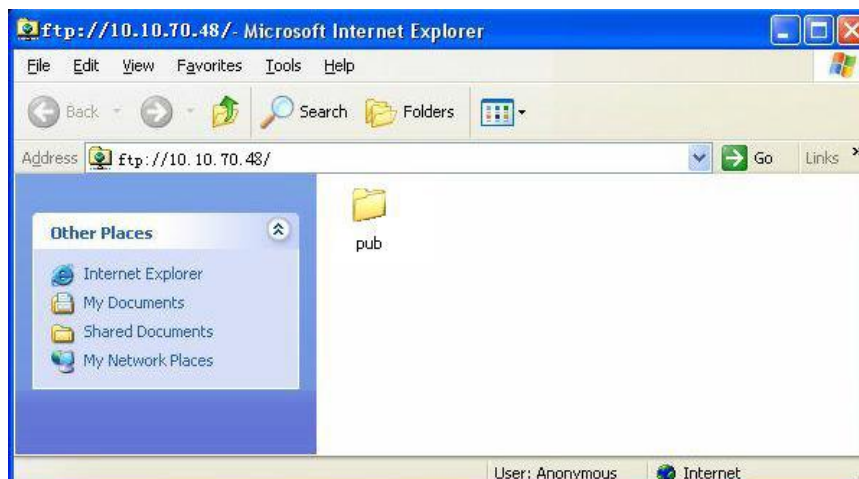
Step 3:

Enter the ftp://10.10.70.48/pub folder, then copy the target.tgz file in this folder, as shown below.

Step 4:

Open MS-DOS window by typing Start on the lower left quarter of Windows OS. Select Run and key in cmd in dialog and press Enter. Type the command telnet 10.10.70.48; the current IP address of the equipment under software upgrade as below.

Important Note: If the Win7 or Win8 systems does not support telnet command, please follow the Chapter 3(Page 11), How to enable telnet command on Win7 or Win8, to resolve it.
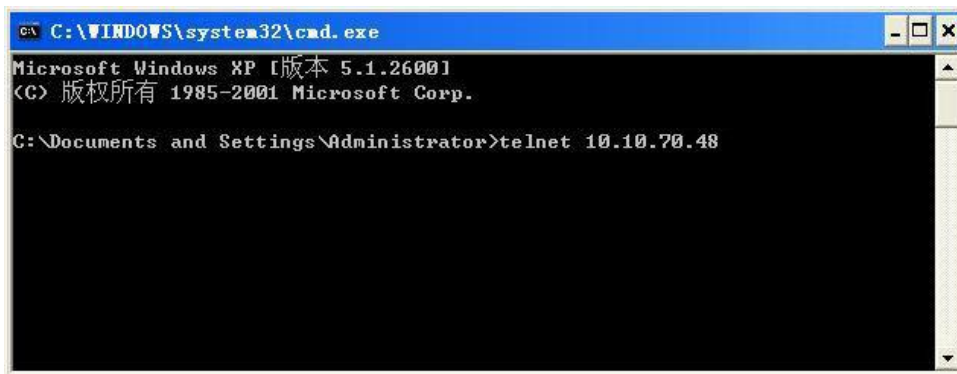
Figure 57: Open MS-DOS Window

Step 5:

Type Enter to go into the login window. Use ?root? as login name and ?12345? as password.
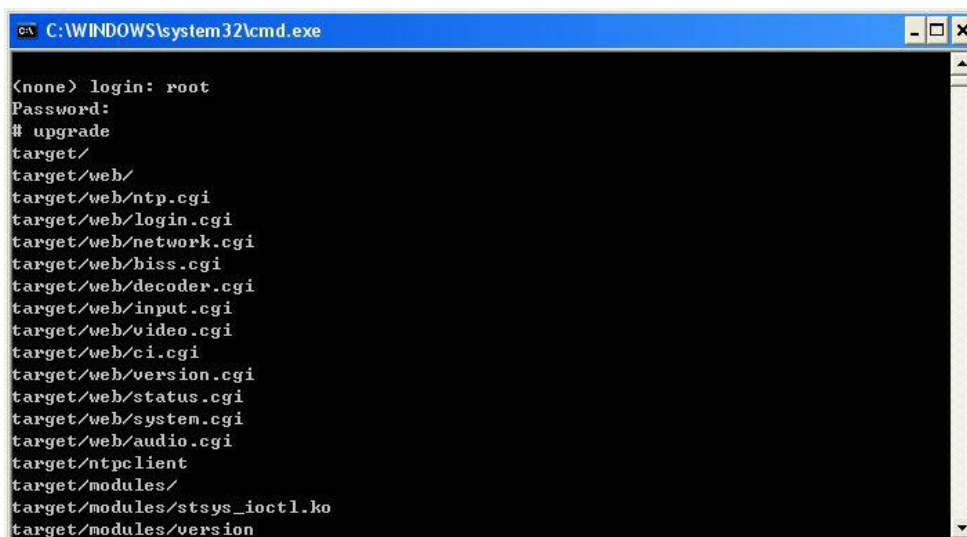
Figure 58: Login Menu

Step 6:

Key in the command upgrade and press Enter. The upgrade process will be launched.

Figure 59: Upgrading

Step 7:

The information FTP: Upgrading will be shown on the LCD when the firmware is updating.

When the upgrade is finished, the unit will reboot automatically.