



User's Manual  
使用说明书

*Brighten Your Digital View!*



**DCH-3000EC**

**MPEG-2 Encoder**

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## Warnings and Cautions

Please observe the following safety requirements before operating the equipment.



### Electrical Shock

Thoroughly check your electrical grounding and connectors prior to powering. Make sure all connectors are of the three-prong type to ensure proper grounding.

Whenever the equipment is not used for a prolong period of time, you should disconnect the power cord.



### Power Disconnect

Disconnect the power cord under the following conditions:

1. damage on cord and connector
2. equipment get wet or substantial moisture enter the chassis
3. exposure to rain or water
4. equipment dropped or damaged
5. apparent irregularity appears



### Don't Open The Equipment

1. Do not try to repair by yourself
2. Do not use unauthorized part for repair
3. Do not open the covers of the equipment without proper factory authorization



### Avoid Moisture

Do not use this equipment in high moisture environment



### No Heavy Stacking

Do not stack the equipment back to back to allow proper ventilation.



### No Touching with Bare Hands

Do not touch the equipment during heavy lightening condition.



### Caution

1. Do not place this equipment on unstable support.
2. Do not place objects on top of the equipment to block up the ventilation opening.
3. Do not place radioactive instrument or object on top of adjacent to the equipment.
4. Provide proper room ventilation during operation of this equipment.
5. Verify with the repair engineer or authorized entity after repair is done to be sure the equipment can be put back to operation.
6. Read the operating manual prior to usage.

# 3000EC MPEG-2 Encoder

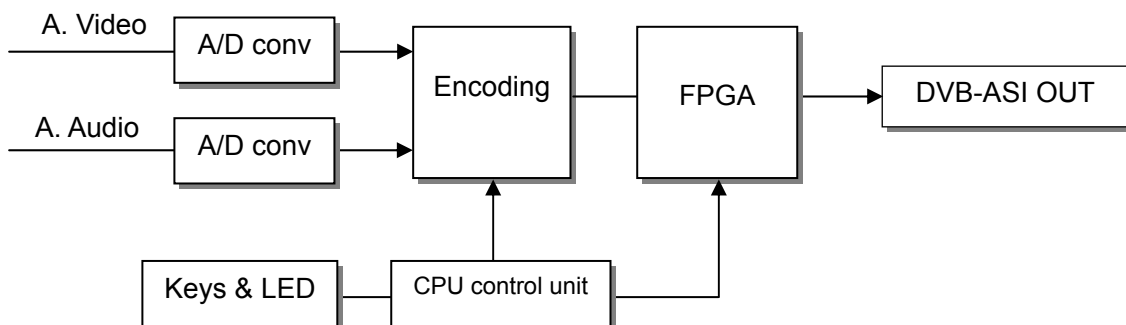
## 1 Summarization

### 1.1 Overview

DCH-3000EC is a professional MPEG-2/DVB real-time digital encoder which fully complies with ISO/IEC13818 standard. It is of highly integrated 1U chassis with a broad field of applications such as CATV digital network, digital TV broadcast, and transmission of programs for MPEG-2/DVB standard. While digitally sampling and compressing analog video (from CVBS or S-Video interface) and audio signal into digital TS(Transport stream). The encoding rate (3~15Mbps) is adjustable according to the requirements of the application. The composite video interface accepts PAL BGHIN / NTSC 4.43M 50Hz / PAL N / NTSC N / SECAM / NTSC M / PAL 4.43M 60Hz / NTSC 4.43M 60Hz / PAL M formatted input signal. With function of TCP/IP remote monitoring and control, in case it is necessary, the equipment can be upgraded and operated through Ethernet network via Ethernet RJ-45 and RS-232 interface.

Model No.	DCH-5000EC-30	DCH-5000EC-42
Functions		
HD SDI input	✓	✓
HDMI input	✓	✓
Y/Pb/Pr input	✓	✓
CVBS input	✓	✓
ASI input	✓	✓
ASI output	✓	✓
IP input(or output)		✓
✓ Standard Configuration		

### 1.2 System Frame



## 1.3 Working principles

### 1.3.1 MPEG-2 V/A real-time Encoder

The basic of Digital TV is MPEG-2 compress arithmetic and the corresponding criteria. MPEG-2 encoder can convert analog Video and Audio signal into SPTS after separately compressing. It is the key equipment that update telecast from analog into digital system.

#### Technical guideline

Analog video interface: Including multiplexer interface and S-Video interface, supports PAL BGHIN / NTSC 4.43M 50Hz / PAL N / NTSC N / SECAM / NTSC M / PAL 4.43M 60Hz /NTSC 4.43M 60Hz / PAL M format

Analog audio interface: Left and right analogy audio input, using 32KHz, 44.1KHz, 48KHz sample rate.

Output: single program transport stream (inner)

Video encoder: MPEG-2 4:2:0MP@ML, Max rate: 15Mbps. GOP frame adjustable

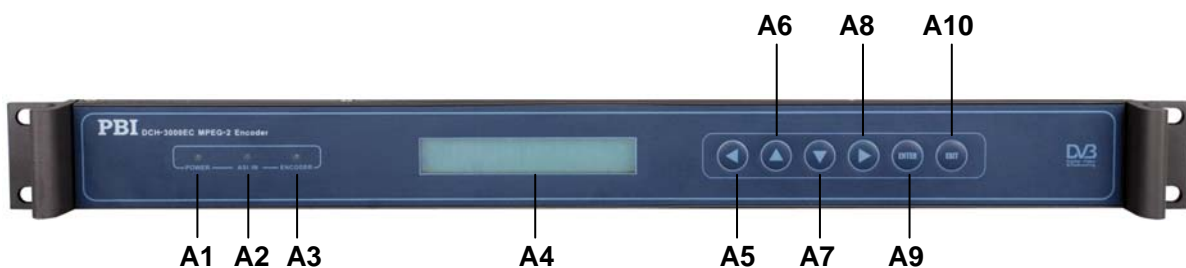
Audio encoder: MPEG layer1 or layer2

### 1.3.2 DCH-3000EC control system

DCH-3000EC provides two control methods, menu control mode and network operating mode. In menu operating mode, user can operate through buttons and the promotions on LCD. The detailed user guide is in chapter 4. Under the network operating mode, operation is done through software running on Windows, more detailed information is in network operation manual.

## 1.4 Control panel and interface

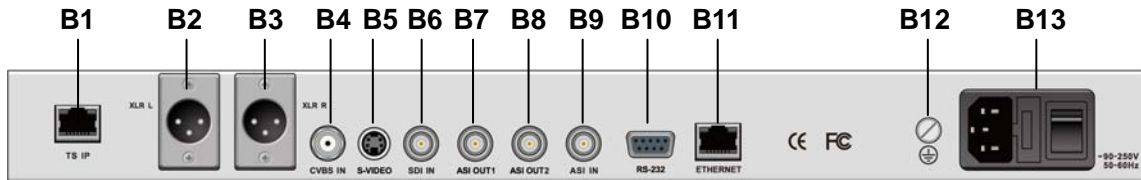
### 1.4.1 Front panel



A1	POWER	Power indicator light (It is running normally when the light is green)
A2	ASI IN	Status of serial data inputting interface displays
A3	Encoder	Encode interface and ASI outputting state display

A4	LCD	2 Line×24 characters LCD Display
A5-8	press KEY	Select or change function parameters
A9	ENTER	Run menu choice
A10	EXIT	Exit current Menu and return to the previous menu

### 1.4.2 Rear panel



B1	Video	Complex video inputting port, which is used to receive analog video signal
B2	Audio-L	Audio left track inputting port, which is used to receive analog audio signal
B3	Audio-R	Audio right track inputting port, which is used to receive analog audio signal
B4	S-Video	S-Video inputting port is S-terminal, which is used to receive analog video signal.
B5	ASI OUT	Asynchronous Serial Interface outputting port, which complies to DVB-PI interface definition.
B6	RS-232	Connect computer and upgrade software
B7	LINK	LED indicator light, which is used to display network connected state
B8	RJ-45	Ethernet interface, for network management
B9	GND	Be grounded
B10	Power socket	AC 90V~260V 50Hz/60Hz input

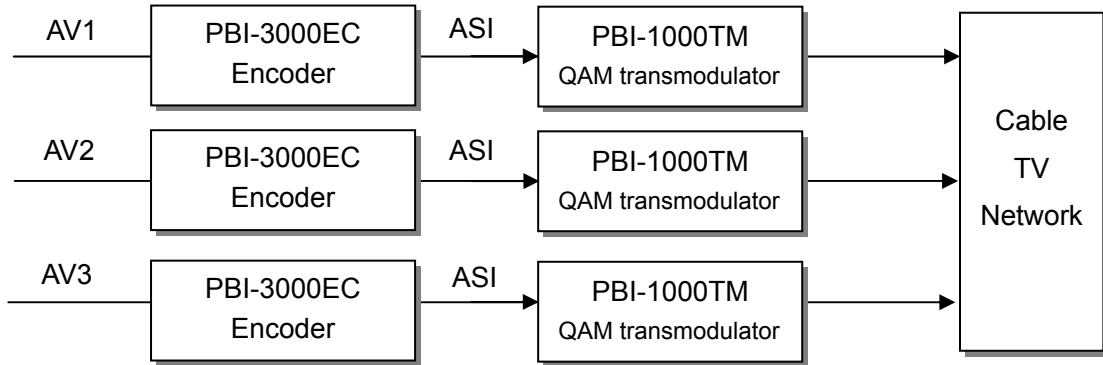
## 2 Interface illumination

Front panel	
LCD Display	2 rows×24 characters (green) LCD screen display
6 Press keys	up, down, left ,right ,enter, exit
LED indicator	1 Power on,1 ASI input state indicate and 1 encode running and ASI output state display
Back Panel	
Video input	Composite Video、S Video
Audio input	Audio-L、Audio-R
RS-232	9 pin, connect computer and upgrade software
LINK	LED indicate light , display network connected state
RJ-45	10M/100M Base-T Ethernet interface, network management
Power	AC 90~260V, 50Hz/60Hz
DVB-ASI Serial digital output	
Port configuration	75 Ohms, BNC connector
Transfer rate	270Mb/s
Transfer model	Byte
Packet length	188 Bytes
Signal level	800mV
Other	
Net Weight	3Kg
Dimensions	44mm×240mm×430mm
Power rating	15W
Operating temp	0~40℃
Storage temp	-20~70℃
Moisture	<85%

### 3 Typical Application

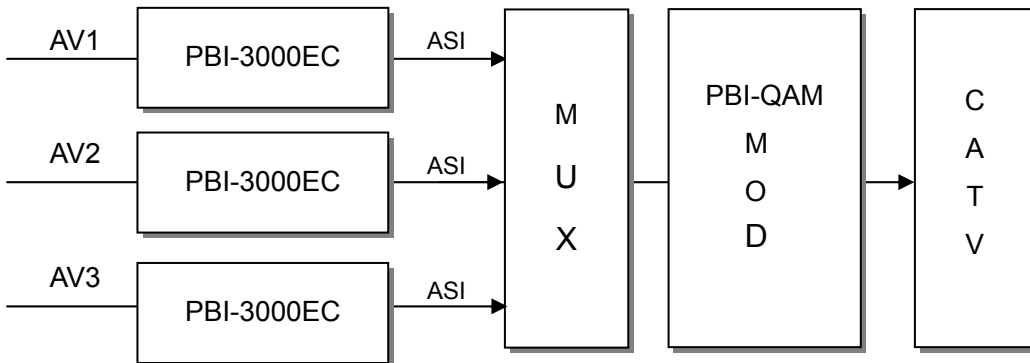
#### 3.1 Encoder

3000EC can output one channel of single program TS as an independent MPEG-2 compression Encoder.



#### 3.2 Digital Sources for MUX

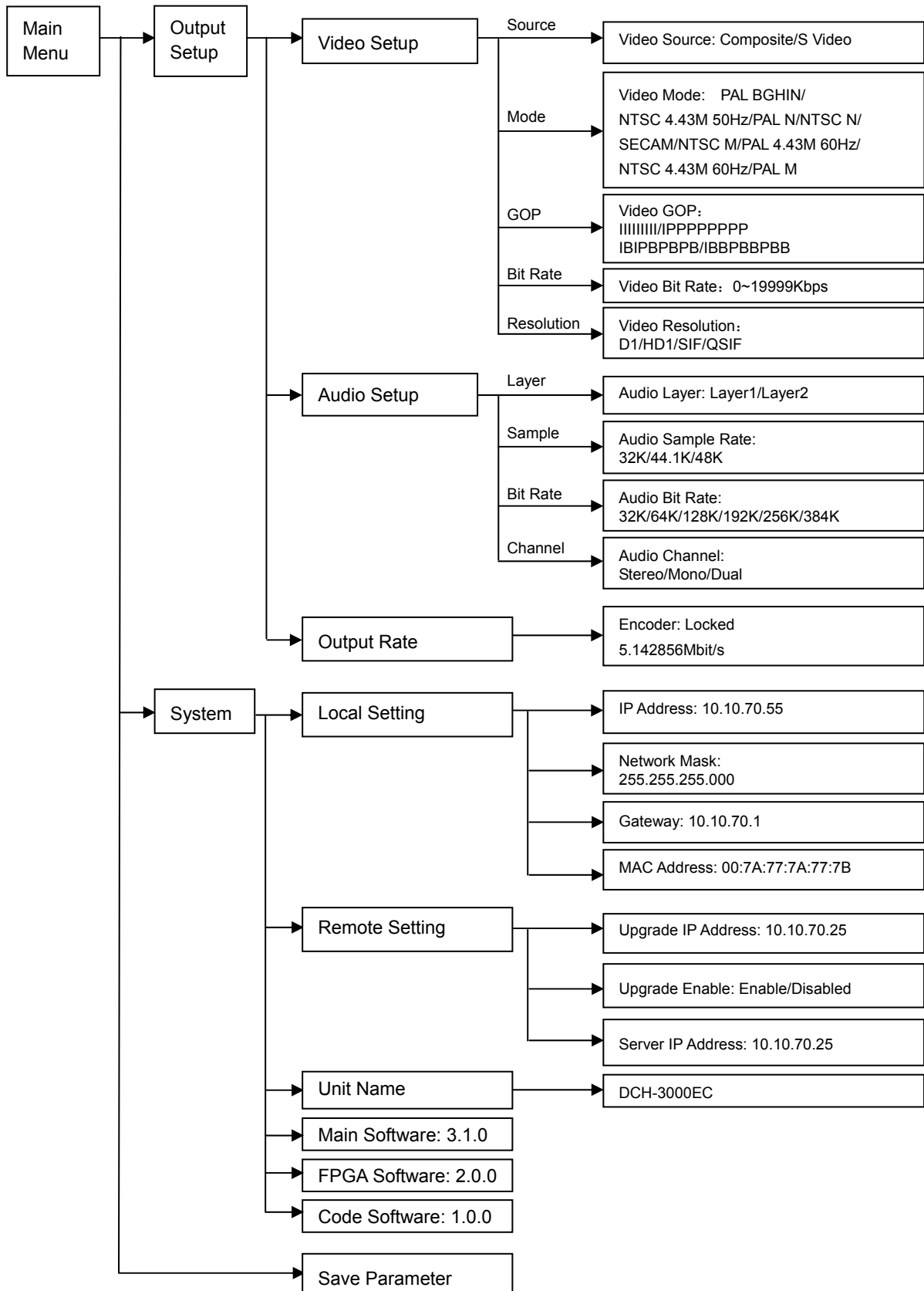
MUX requires TS as input. Encoder changes the analog video and audio signal into ASI or SPI TS, then use the MUX to combine DVB channel multiplexing, PID editing, EPG and SI processing, etc..





## 4 Menu structure and operate

### 4.1 Menu layer



## 4.2 Menu operation and illumination

### 4.2.1 Initializing Menu

Once the Power is ON, the encoder begins initializing, LCD shows Waiting.....

And, the setting Encoder parameters as follows:

```
DCH-3000EC
IP: 10.10.70.55
```

1) First Line is 3000EC parameters, which shows Encoder type.

2) Second line shows 3000EC IP address, press [ENTER] to enter main menu, then press[←]or [→] to choose .

```
Main Menu
Output Setup
System
Save Parameter
```

Main menu is 3 items in all:

Output Setup: Parameters of MPEG-2.

System: System of MPEG-2;

Save Parameter: Save parameters of setting.

Default setting, press[ ↓ ]or [ ↑ ] to move cursor to corresponding function item, press[ENTER] to confirm, press [EXIT] to return.

### 4.2.2 Output Setup menu

Enter the Output Setup menu, as follows:

```
Output Setup
Video Setup
Audio Setup
Output Rate
```

Setting of MPEG-2 compressing encoder parameters is 3 items in all:

Video Setup: video compression parameters;

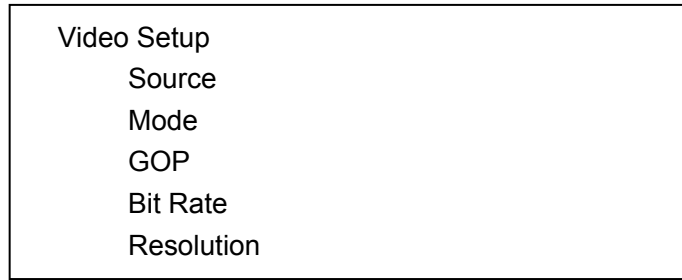
Audio Setup: audio compression parameters;

Output Rate: Output Rate of signal.

Press[ ↓ ]or[ ↑ ] to move cursor to corresponding function item, press [ENTER] to conform, press [EXIT] to return to the upper level menu, then, the changing of encoder parameters begins to be effective.

#### 4.2.2.1 Video Setup

Move cursor to Video Setup, press [ENTER] to enter the following menu:



The menu has total 5 options to be chosen: Source、Bit Rate、Mode、Resolution、GOP. Check and edit video encode parameters, enter menu, press[ ↓ ]or [ ↑ ] to choose corresponding function item, press[ENTER] to confirm.

- Source menu:

Press[ ↓ ]or[ ↑ ], choose Source option, enter the following menu:



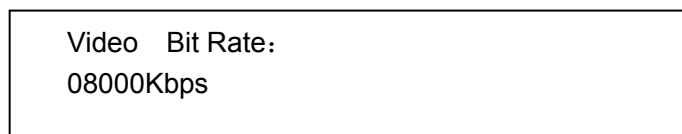
S Video: Indicate S-video format of analog video input;

Composite Video: Indicate CVBS format of analog video input

Press [←]or[→] to choose Composite Video or S Video, press[ENTER]to confirm , Press[EXIT]to exit.

- Bit Rate menu:

Press[ ↓ ]or[ ↑ ], choose Bit Rate option, enter the following menu:

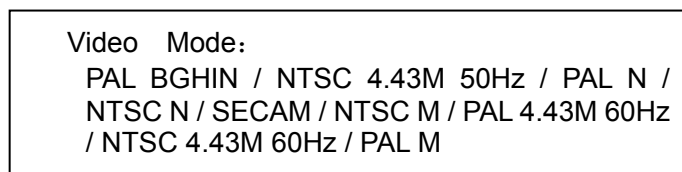


Video Bit Rate : video encoding rate, max:15000Kbps。

Press[←]or[→] to move cursor to the digit, press[ ↓ ]or[ ↑ ] to change the number, press[ENTER] to confirm, press[EXIT] to exit.

- Mode menu:

Press[ ↓ ]or[ ↑ ], choose Mode option, enter the following menu:



Video Mode: PAL BGHIN / NTSC 4.43M 50Hz / PAL N / NTSC N / SECAM / NTSC M / PAL 4.43M 60Hz / NTSC 4.43M 60Hz / PAL M, These are different TV modes.

Press[←]or[→], choose input signal mode, press[ENTER] to confirm, press[EXIT] to exit.

- Resolution menu:

Press[↓]or[↑], choose Resolution option, enter the following menu:

```
Video Resolution:
D1 / HD1 / SIF / QSIF
```

D1、HD1、SIF、QSIF: Represents video resolution, Resolution of D1 is the highest, HD1 is the second highest, and then that of SIF and QSIF.

Press[←]or[→], choose resolution D1 (Full), HD1 (Half), SIF, QSIF, press [ENTER] to confirm, press[EXIT] to exit.

- GOP menu:

Press[↓]or[↑], choose GOP option, enter the following menu:

```
GOP Video:
IIIIIIII / IPPPPPPPP
IBIPBPBPB / IBBPBBPBB
```

4 modes in all– IIIIIIII, IPPPPPPPP, IBIPBPBPB, IBBPBBPBB - are used to set up GOP (group of pictures) structure: I represents compress in frames, P represents forecast forward frames, B represents forecast forward and backward. Compression rate of IBBPBBPBB is the highest, then that of IBIPBPBPB, and then that of IPPPPPPPP and IIIIIIII.

press[←]or[→] to choose 4 GOP modes , press [ENTER] to confirm, press[EXIT] to exit.

#### 4.2.2.2 Audio Setup menu:

Move cursor to Audio Setup, press [ENTER] to enter the following menu:

```
Audio Setup
Layer
Sample
Bit Rate
Channel
```

There are 4 options to be chosen: Layer, Sample, Bit Rate, and Channel. Analog audio encoding parameters can be checked and edited. Press[↓]or[↑] to choose the option, press [ENTER] to confirm.

- Layer menu:

Press[ ↓ ]or[ ↑ ], choose Layer option, enter the following menu:

```
Audio Layer:
Layer1 / Layer2
```

Layer1: Represents MPEG-1 Layer1 audio encode mode.

Layer2: Represents MPEG-1 Layer2 audio encode mode.

Press[←]or[→] to choose audio encode mode: Layer1 or Layer2, press[ENTER]to confirm, press[EXIT] to exit.

- Sample menu:

Press[ ↓ ]or[ ↑ ] to choose “Sample Rate” option, then enter the following menu:

```
Audio Sample:
32K / 44.1K / 48K
```

32K、44.1K、48K : Represents audio different sample rate.

Press[←]or[→]to choose different audio sample rate: 32K、44.1K、48K, press[ENTER] to confirm ,press[EXIT] to exit.

- Bit Rate menu:

Press[ ↓ ]or[ ↑ ], choose Bit Rate option, enter the following menu:

```
Audio Bit Rate:
32K /64K /128K /192K /256K /384K
```

32K、64K、128K、192K、256K、384K : Represents the impropriating bandwidth of audio signal in output.

Press[←]or[→] to choose data of bandwidth, press[ENTER] to confirm, press[EXIT] to exit.

- Channel menu:

Press[ ↓ ]or[ ↑ ] to choose “Channel”, enter the following menu:

```
Audio Channel:
Stereo / Mono / Dual
```

Stereo、Mono、Dual: Represents stereo audio, single audio and left /right track audio

Press[←]or[→] to choose Stereo, Mono or Dual audio mode, press[ENTER] to confirm, press[EXIT]to exit.

#### 4.2.2.3 Output Rate menu

Move cursor to Output Rate, press [ENTER] to enter the following menu:

```
Encoder: Locked
05.142856Mbit/s
```

Press [EXIT] to exit.

The setting is used for checking status and TS rate.

#### 4.2.3 System menu

Enter the Output Setup menu, as the follows:

```
System
  Local Setting
  Remote Setting
  Unit Name
  Main Software
  FPGA Software
  Code Software
```

System setup of network is 6 items in all:

Local Setting: Local setup of network system;

Remote Setting: remote setup of network system; ;

Unit Name: type of the encoder;

Main Software: version of main software;

FPGA Software: version of FPGA software;

Code Software: version of code software .

Press[↓]or[↑] to move cursor to the corresponding function item, press [ENTER] to conform, press[EXIT]to return the upper level menu, changing of network setup parameters begins to be effective.

##### 4.2.3.1 Local Setting

Move cursor to the Local Setting, press [ENTER] to enter the following menu:

```
Local Setting
  IP Address
  Net Mask
  Gateway
  MAC Address
```

There are 4 options to be chosen: IP Address, Net Mask, Gateway, and MAC Address.

Local network setup parameters can be checked and edited. Press[ ↓ ]or[ ↑ ] to choose the option, press [ENTER] to confirm.

- IP Address

Press[ ↓ ]or[ ↑ ] to choose IP Address option, and enter the following menu:

```
IP Address
10.10.70.55
```

The option is used to setup local IP. Press[←]or[→] to move to left or right, press[ ↓ ]or[ ↑ ] to change IP address, press[ENTER] to confirm, press[EXIT]to exit. This setting is used when you need to change IP Address manually.

- Network Mask

Press[ ↓ ]or[ ↑ ] to choose Net Mask option, and enter the following menu:

```
Network Mask:
255.255.255.000
```

The option is used to setup net mask, press[←]or[→] move to left or right, press[ ↓ ]or[ ↑ ] to change Net Mask, press[ENTER] to confirm, press[EXIT]to exit.

- Gateway

Press [↓] or [↑] and choose Gateway option, and enter the following menu:

```
Gateway IP Address:
10.10.70.1
```

The option is used to setup local gateway , press[←]or[→] to move to left or right, press[↓]or[↑] to change gateway address, press[ENTER] to confirm, press[EXIT]to exit..

- MAC Address

Press [↓] or [↑] to choose MAC address option, and enter the following menu:

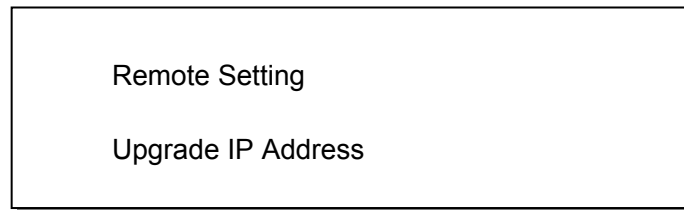
```
MAC Address:
00: 7A: 77: 7A: 77: 7B
```

The option is used to setup MAC Address, press[←]or[→] to move to left or right, press[ ↓ ]or[ ↑ ] change MAC address, press[ENTER] to confirm, press[EXIT]to exit.

**Notice:** MAC Address is unique in the worldwide, So it has been set before leaving factory.

#### 4.2.3.2 Remote Setting

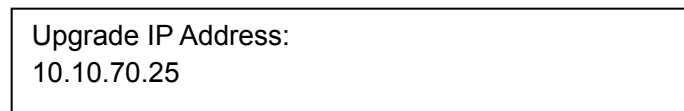
Move cursor to Remote Setting, press [ENTER] to enter the following menu:



There are 4 options to be chosen: Upgrade IP Address, Upgrade, and Server IP Address. Network control setup parameters can be checked and edited. Press [↓] or [↑] to choose the option, press [ENTER] to confirm.

- Upgrade IP Address

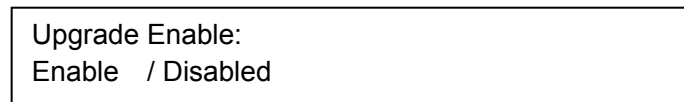
Press[↓]or[↑] to choose Upgrade IP Address option, and enter the following menu:



The option is used to setup Upgrade IP Address, press[←]or[→] to move to left or right, press[ ↓ ]or[ ↑ ] to change Upgrade IP Address, press[ENTER] to confirm, press[EXIT]to exit.

- Upgrade

Press[↓]or[↑] to choose Upgrade option, and enter the following menu:



The option is used to setup Upgrade, press[←]or[→] to move to left or right , change the state of Upgrade, press[ENTER] to confirm, press[EXIT]to exit.

- Server IP Address

Press[↓]or[↑] to choose Server IP Address option, and enter the following menu:




The option is used to set up Server IP Address, press[←]or[→] to move to left or right, press[ ↓ ]or[ ↑ ] to change Server IP Address, press[ENTER] to confirm, press[EXIT]to exit.

#### 4.2.3.3 Unit Name

Move cursor to Remote Setting, press [ENTER] to enter the following menu:






Unit Name:  
DCH-3000EC

It is the name of this machine. Press [ENTER], then press[←]or[→] to move to left or right, press[ ↓ ]or[ ↑ ] to change, press[ENTER] to confirm, press[EXIT]to exit.

#### 4.2.3.4 Main Software

Move cursor to Main Software, press [ENTER] to enter the following menu:




Main Software:  
3.1.0

It shows the version of main software. Press[EXIT]to exit.

#### 4.2.3.5 FPGA Software

Move cursor to FPGA Setting, press [ENTER] to enter the following menu:




FPGA Software:  
2.0.0

The above shows the version number of FPGA software. Press[EXIT]to exit.

#### 4.2.3.6 Code Software

Move cursor to Code Setting, press [ENTER] to enter the following menu:



Code Software:  
1.0.0

The above shows the version number of code software. Press[EXIT]to exit.

### 4.2.4 Save Parameter



Save Parameter...

This menu is used to save parameter that have been set, press[ENTER] to confirm, press[EXIT]to exit.

**Notice:** IP address must be setup in local area network, after IP address, Gateway, Upgrade IP address, Upgrade, and Server IP address are setup, the machine must save the setting parameters and restart to make setting effective. The encoder can save current parameters automatically ,that just needs 6 minutes since working is stopped.

## 5 Network Updating

Through network upgrading, the program of encoder in local area network can achieve update.

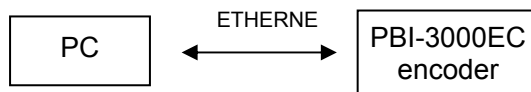
(1) Needed Instruments

① DCH-3000EC

② PIII or above it(WIN 2000 and upwards, Ethernet, and already installed FTP server software ,example :SERV-U)

③ Several reticle (Notice: please choose the corresponding reticle according to the different connecting types of PC and 3000EC)

(2) The link of instruments for upgrading:



Operation way:

① **PC:** run the FTP server (example: SERV-U) ,then put the configuration file and programs to the appointed root directory of FTP server. Configuration file named as upgrade.txt。 File format as follows:

```

    programmae:ec3000
    ver:**
    upgrade:1
    filenum:*****
    filename: *****
    filename: *****
    filename:*****
    filename:*****
    filename:*****
    ftp -v -d -i -n -g 10.10.70.3
    
```

And then examine IP setup of FTP server in the upgrade.txt (as shown in underline), that should be consistent with Upgrade IP Address of the upgraded encoder.

② **3000EC:** Link the reticles as the above picture. Turn on the power supply, enter the menu, then set the DCH-3000EC and the needed to be set up menu as follows:

System->Local Setting->IP Address->10.10.70.100 (3000EC IP address should be in local network that consist with the IP of FTP server)

System->Remote Setting->Upgrade IP Address->10.10.70.3

System-> Remote Setting->Upgrade -> Enable

Then save the setting parameters, viz., enter the Save Parameter menu. Then press [ENTER] to confirm and after the menu renews, turn off the encoder. Turn on the encoder again. Now, if the encoder runs normally, it proves that update is successful completed.

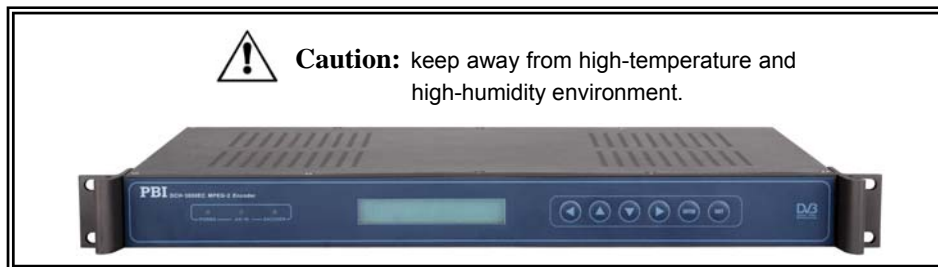
③ **Validate:** Validate whether upgrading is successful or not by the main software version.

(in the menu of System ->Main Software) .

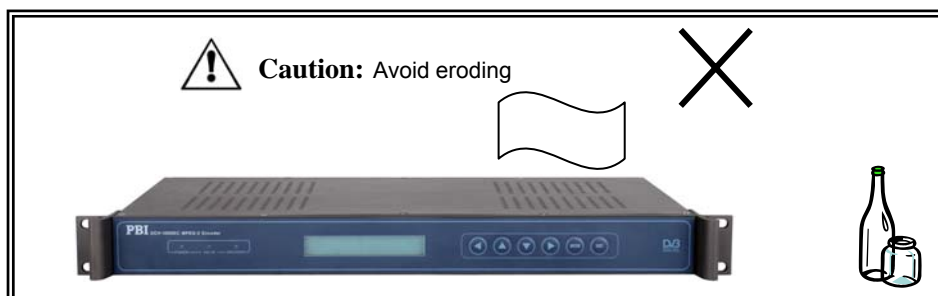
**Notice:** You can also update synchronously with several 3000EC machines in the same LAN: Use line connector to connect 3000EC machines with PC. Turn on the power, if the machines work normally, updating is completed successfully.

## 6 Maintenance

- 1 Using bolts to fix the machine on 19 inches cupboard.
  - 2 Putting power plug in electrical outlet and electrifying. When the machine is working, the POWER indicator lights. Please plugging out when you don't use it. The rebooting alternative time has to exceed 5 minutes.
  - 3 Video and S-Video in rear panel input video analog signals. Audio-L and Audio-R input audio analog signal. Ethernet interface connects PC by reticles. ASI OUT outputs TS of DVB standard.
  - 4 The encoder should be well grounded by GND port.
- Don't use the device in the high-temperature and high-humidity environment. keep relative temperature <math><45^{\circ}\text{C}</math> , humidity  $\leq 85\%$ .



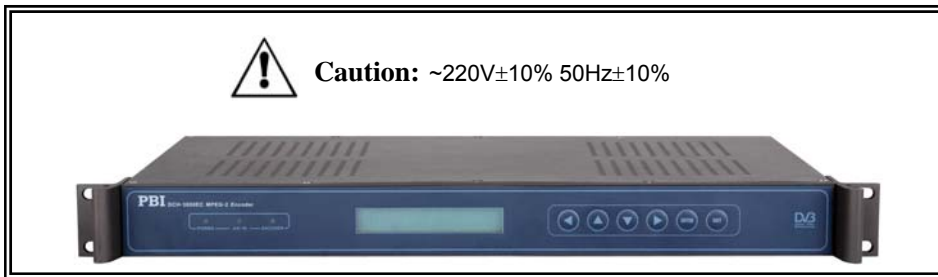
- Do not use or charge the device in dusty, damp, and dirty places. Never use benzene, thinner or any other organic solvents for cleaning the device. The device could be degenerated, deformed or discolored. Clean the device gently with a soft cloth.



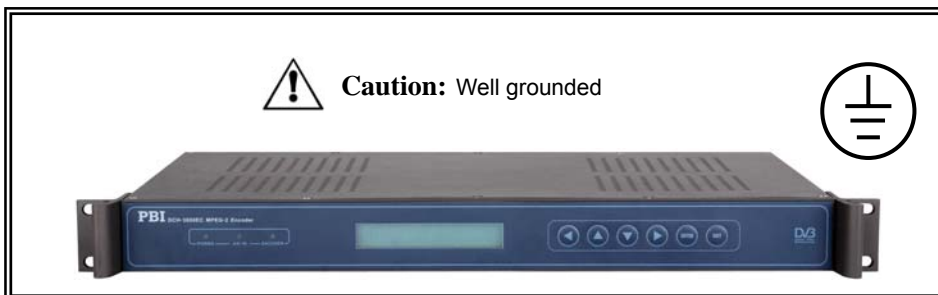
- Contact the agents if there is a problem with the device and do not attempt to repair the device without professional instructions by agents or PBI.



- It is recommended to use the AC regulated power supply.



- The device must be grounded well.



## 7 Accessories

1 power line, 75 ohm ASI line, 1 AV line, 1 S-video line, 1 CD of network management software, 1 user manual, 1 network operation manual, 1 quality guarantee, 1 packing list.



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District, Beijing, China, 100080  
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