PBI Pro Broadband Inc.

Digital Scrambler

DCH-3000TP

User Manual

Version：01

www.pbi-china.com

Contents

DCH-3000TP Digital Scrambler

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1 General Description

DCH-3000TP is a digital TV scrambler designed for the pay TV market. By using DVB common scrambling algorithm, DCH-3000TP supports Simulcrypt, BISS-1, BISS-E. Digital TV programs of MPEG2/MPEG4/H.264 in SD/HD are encrypted by scrambler DCH-3000TP and are not accessible for subscribers without authorization of operator and broadcasters. By using legal smart card containing the right key, the subscribers can have access to these pay TV channels. It provides 2 ASI inputs in redundancy, 2 ASI outputs in mirror with scrambled programs and 2 ASI outputs in mirror with clear programs for monitoring use. The IP Ethernet is used to connect to CA server for EMM/ECM information exchange. The equipment is configured and supervised by HTTP Web.

Main Feature

➢ Compliant with DVB Common Scrambling
➢ Support BISS1, BISS-E and Simulcrypt Modes
➢ 2 x ASI inputs in Redundancy Mode
➢ 2 x ASI scrambling outputs in mirror
➢ 2 x ASI loop-through clear outputs in mirror
➢ 48 x EMM and ECM processing
➢ Processing bit rate from 0.2Mb/s to 70Mb/s
➢ PSI/SI regeneration

3 Control with Display and Keypad

3.1 Front Panel

A1   A2   A3   A4   A9 A10 A11 A12 A13 A14

A5   A6   A7   A8

A1~A4	ECMG	ECMG (ECM Generator) connection status indicator for each channel. Blue light means the ECMG works normally. Red light means the ECMG works abnormally.
A5~A8	EMMG	EMMG (EMM Generator) connection status indicators for each channel. Blue light means the EMMG works normally. Red light means the EMMG works abnormally.
A8~A12	〔▲〕〔▼〕	Scroll up/down menu or increase/decrease value when edit numbers
	〔◄〕〔►〕	Used to move cursor
A13	ENTER	Used to enter sub menu or confirm operation.
A11	EXIT	Used to return previous menu or cancel operation

Unlock the front panel:

The front panel is locked automatically if no operation via keypad for 3 minutes. To unlock the front panel, press the buttons following this pattern: UP, DOWN, LEFT, and RIGHT. When the LCD lights up, press ENTER to finish.

3.2 Rear Panel
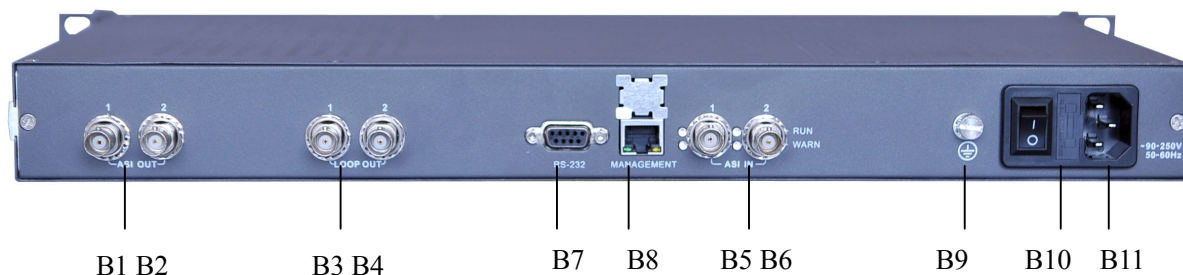
B1	ASI OUT1	ASI output
B2	ASI OUT2	Backup output for B1
B3	LOOP OUT 1	ASI loop out
B4	LOOP OUT 2	Backup output for B3
B5	ASI IN 1	ASI input
B6	ASI IN 2	Backup output for B5
B7	RS-232	Serial port for printing information
B8	MANAGEMENT	LAN port for SW update and WEB management
B9	GND	Grounding terminal
B10	FUSE	Fuse embedded in power socket
B15	Power Socket	AC90~260V 50-60Hz

3.3 Description of Menu

Main-Menu	Sub-Menu	Description
Show IP Address		Show IP address of the unit.
Show Programs		Show the name of current scrambled program.
Show Input Rate		Show the bit rate of incoming TS.
Show Output Rate		Show the bit rate of outgoing TS.
Set Output Rate		Set the bit rate of outgoing TS.
System Setting	**Set IP Address**	Set IP Address: set IP address of the unit **Range** 0.0.0.0~255.255.255.255.
	Show Version Info	Show software version of the unit.

4 Control with Display and Keypad

4.1 Description of Menu

After initialization is complete, unlock the front panel(see 3.1) and press 〔ENTER〕 button to enter main menu, then press ▲ or ▼ to navigate through the menu.

The menu structure of the device is showed in below figure:
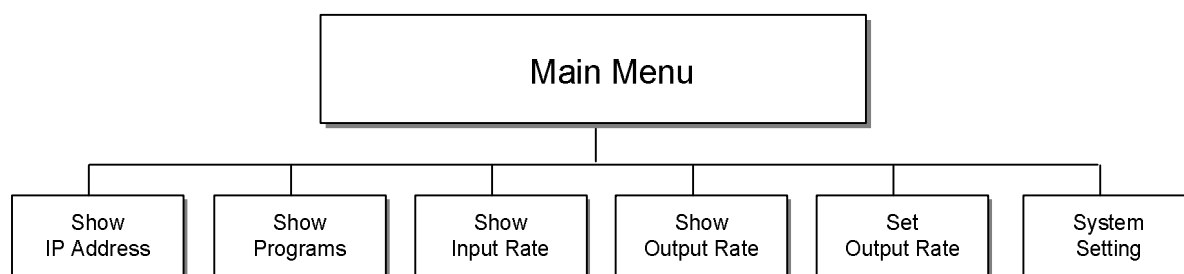
4.2 Show IP Address

Show IP address of the unit.

4.3 Show Programs

Show the name of current scrambled program.

If there is no valid input found, it displays "No program".

4.4 Show Input Rate

Show the bit rate of incoming TS.

If there is no valid input found, it displays "00000kbps".

4.5 Show Output Rate

Show the bit rate of outgoing TS.

If there is no output, it displays "00000kbps".

4.6 Set Output Rate

Show the bit rate of outgoing TS.

The default value of output rate is "00000kbps".

4.7 System Setting

There are two sub-menus: Set IP Address and Show Version Info.

Set IP Address: set IP address of the unit, value ranging from 0.0.0.0 to 255.255.255.255.
The default IP address is 192.168.1.154.

Show Version Info: show software version of the unit.

4 Control with web server

DCH-3000TP support remote management through LAN network or Internet. The built-in web server provides a GUI interface for advanced configurations. Make sure the network where the PC and DCH-3000TP located are well connected. Type in the IP address of the DCH-3000TP on the PC's IE browser to start.
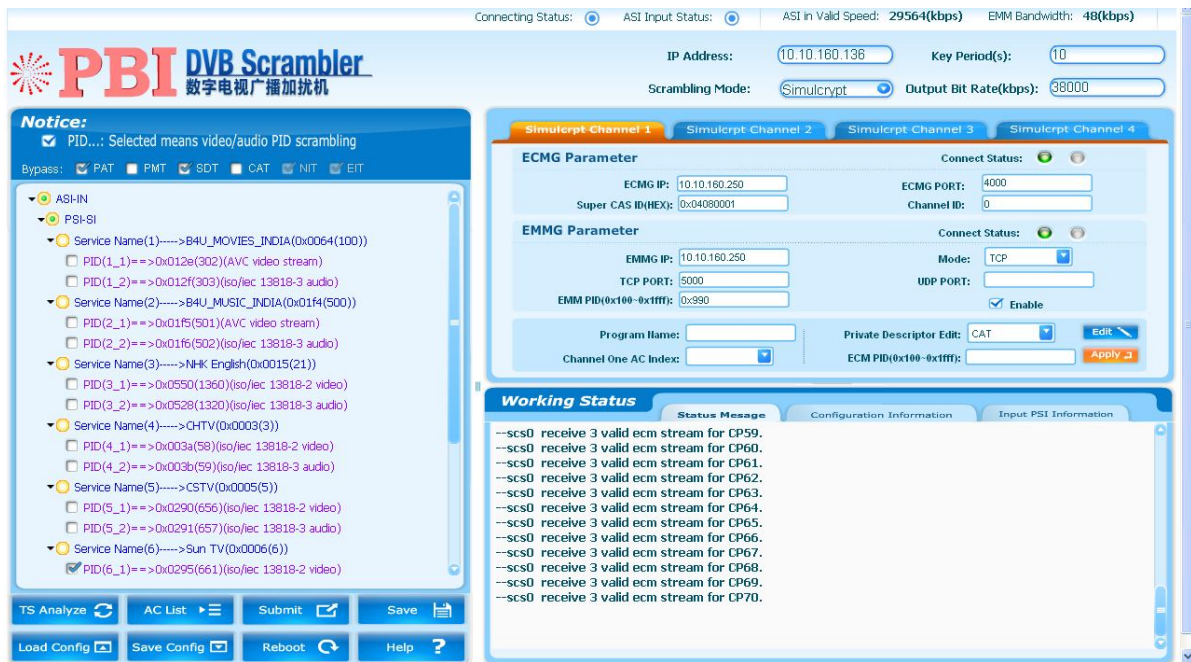
5.1 Status

On the WEB Management, there is several indicators show status of the TS.

Connecting Status, ASI Input Status, ASI in Valid Speed and EMM Bandwidth shows on the topside of the WEB Management page.
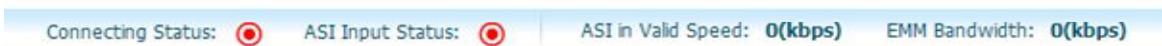
Connection Status: the green light turns up when the unit connect to the LAN. The red light turns up when the LAN disconnected.

ASI Input Status: the green light turns up when there is ASI input. The red light turns up when there isn't any ASI input.

ASI in Valid Speed: if there is ASI input, the symbol rate of the TS from ASI Input will be shown here. If no ASI input, the speed will read zero.

EMM Bandwidth: shows the EMM bandwidth.

ECMG and EMMG connection status shows in the simul-crypt Channel menu.

ECMG Connect Status: the green light turns on when the ECMG works correctly.

The red light turns on when the ECMG stops working.

The light stays grey when the parameter setup is incorrect.

EMMG Connect Status: the green light turns on when the EMMG works correctly.

The red light turns on when the EMMG stops working.

The light stays grey when the parameter setup is incorrect.

PSI-SI Status: after TS analyzing, you can find all the readable PIDs in the program list. Check the box in front of the PID to scramble them.

5.3 General Setup

5.3.1 General Parameters

User can set the IP Address, Key Period and the Output Bit Rate. You can find these settings on the topside of the WEB Management page. These settings will always remain their places no matter what your scrambling mode is.

IP Address: set the IP address for this device. This is also the IP address you need to type in the address bar to access the WEB Management.

Key Period(s): set the Key update period in second.

Output Bit Rate(kbps): set the output bit rate in Kbps.
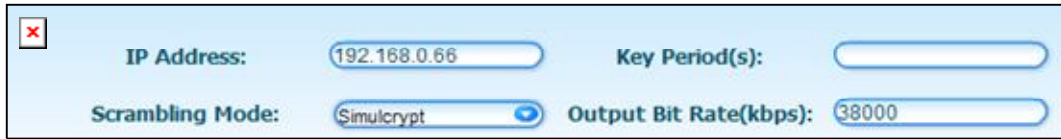
5.3.2 Buttons

TS Analyze: click the TS Analyze button to get all the programs in the TS.

AC List: when the scrambling mode is Simulcrpyt, this button will show as AC list. Refer to Chapter 5.3.1.3 for more details.

SW Input: when the scrambling mode is BISS-1 and BISS-E, this button will show as SW Input. Refer to Chapter 5.3.2.1 and 5.3.2.2 for more details.

Submit: click the button to submit all the changes.

Save: click the button to save the changes. The device will load the configuration on booting up.

Load Config: click the button to load an exising configuration file.

Save Config: click the button to export the current configuration to an exising configuration file.

Reboot: click the button to reboot the unit.

Help: click the Help button to view device information, set SNMP Trap and IP Properties. Refer to Chapter 5.4, 5.5, 5.6 for more details.

5.4 Scrambling Mode

3000TP supports three scrambling mode: Simulcrypt, BISS-1, and BISS-E.

To change the scrambling mode, click pull-down menu and select from Simulcrypt, BISS-1, and BISS-E. The default mode is Simulcrypt

5.4.1 Simulcrypt Mode

When you select simulcrypt mode, there are three parts of the menu: the Program List, Channel Setup, and Working Status.

5.4.1.1 Scanning Programs

If the user switches to a new input TS and the scrambler doesn't possess a matching PSI file, the user need to analyze the TS and get the available programs in this TS.

To do that, click the TS Analyze button to scan. All the scanned programs will be shown on the Program List.

5.4.1.2 Simulcrypt Channel Parameters

3000TP supports four-channel separate simulcryption. Simulcrypt Channel Setup section includes the simulcrypt channel No.1~4 in each tab. Main parameters like ECMG(Entitlement Control Message Generator) and EMMG(Entitlement Management Message Generator) parameters can be configured in this menu.

ECMG Parameter
ECMG IP: set the IP address of ECMG.
ECMG Port: set the IP port number of ECMG.
Super CAS ID(HEX): set the hexadecimal Super CAS ID.
Channel ID: set the channel ID for current ECM stream.

EMMG Parameter
EMMG IP: set the IP address of EMMG.
Mode: select from TCP or UDP.
TCP Port: set the TCP Port of EMMG.
UDP Port: set the UDP Port of EMMG.

EMM PID: set the PID of current EMM stream.

Enable: check in the Enable box to active the EMMG.

Note: be sure to click Apply button on the bottom right to active the changes.

5.4.1.3 AC Index Setup

Each channel possess AC(Access criteria)Index and AC value. The pull-down menu of Channel One AC Index will be empty without configuration. Follow below procedures to configure the AC index and value.
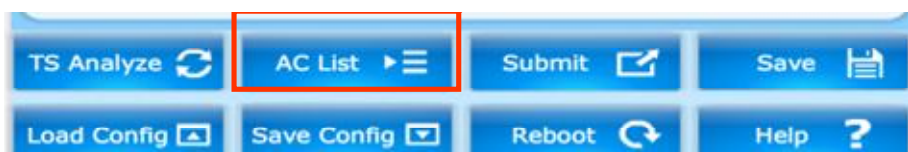
(1) Click AC List button. Then a dialog box, which is equivalent to an AC library, will pop up. It lists all the existing AC indexes and values.

(2) To add a new AC Index, click the Add button. Type in the AC Index and hexadecimal AC Data, then click apply to save all the changes. The AC Index you just added will appear in the AC list.
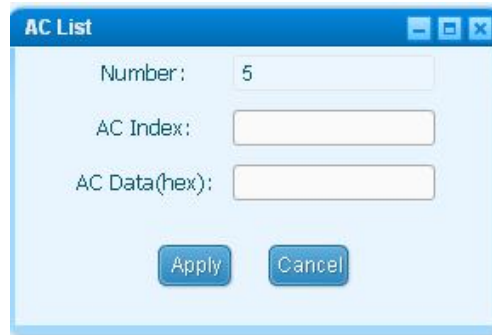
(3) To edit a new AC Index, select the AC you want, and click the Edit button. Modify the AC Index and hexadecimal AC Data, then click apply to save all the changes.

(4) To delete a new AC Index, select the AC Index you want to remove, and click the Delete button.
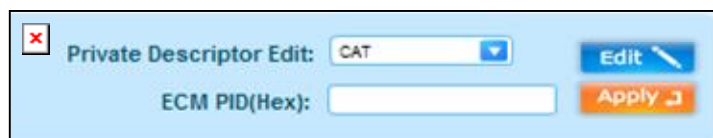
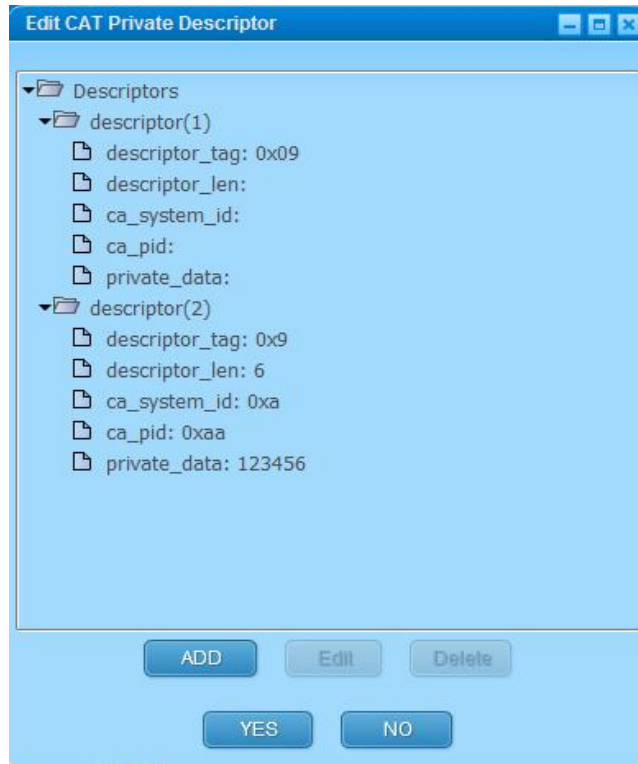(5) Click the Channel One AC Index to select from the AC index available.
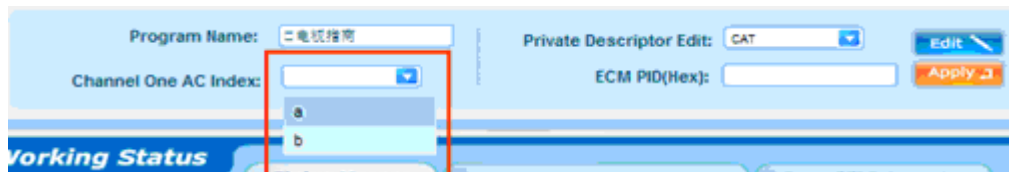
5.4.1.4　CAT Private Descriptor Edit

Each stream has its private CAT data. Follow below procedures to add CAT Private Descriptor.

(1) Select CAT: in the pull-down menu Private Descriptor Edit, select CAT. To edit the CAT Private Descriptor, click the Edit button on the right side.

(2) In the Edit CAT Private Descriptor dialog box popping up, all the existing data will be shown in the list. You can check the descriptor status, add, edit, or delete the descriptor data.

(3) To add a new descriptor, click the Add button. Type in the value and click yes to save all the changes. The descriptor you just added will appear in the descriptor list.
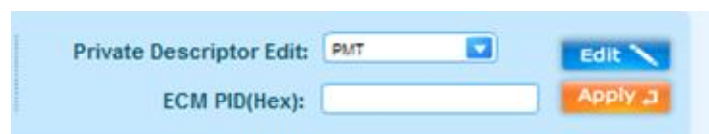

(4) To edit an existing descriptor, select the descriptor you want to edit, then click the Edit button. Modify the values and click Yes to save the changes.

(5) To delete an existing descriptor, select the descriptor you want to remove, then click the Delete button.
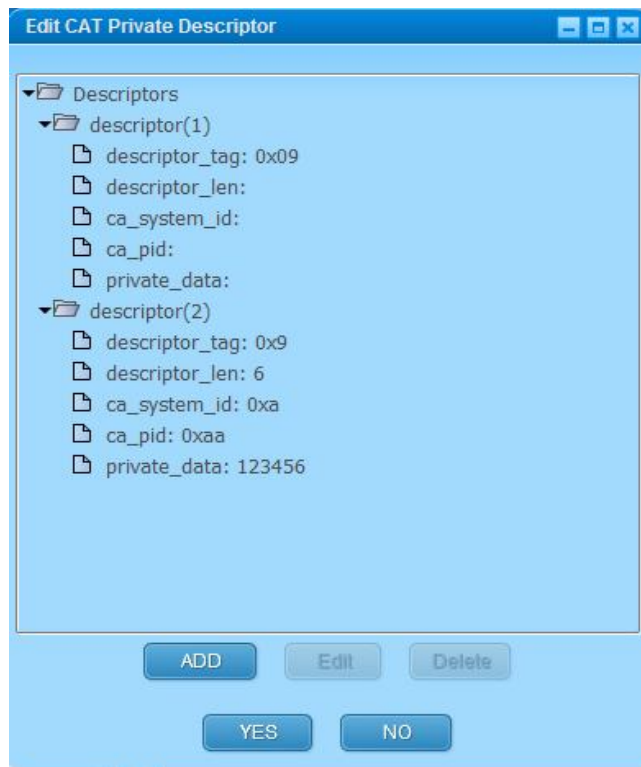
5.4.1.5 PMT Private Descriptor Edit

Each program channel has its unique PMT data. Follow below procedures to add PMT Private Descriptor.

(1) Select PMT: in the pull-down menu Private Descriptor Edit, select PMT. To edit the PMT Private Descriptor, click the Edit button on the right side.
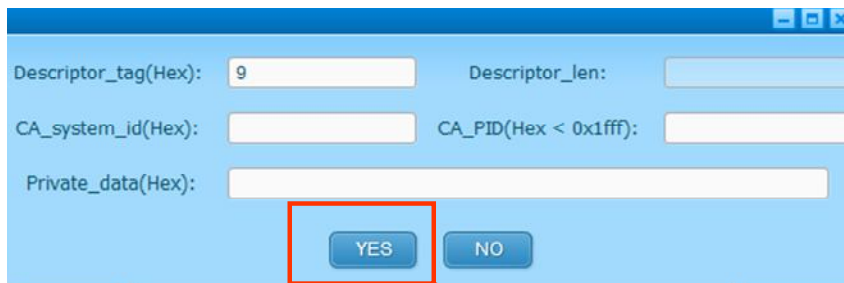

(2) In the Edit CAT Private Descriptor dialog box popping up, all the existing data will be

shown in the list. You can check the descriptor status, add, edit, or delete the descriptor data.

(3) To add a new descriptor, click the Add button. Type in the value and click yes to save all the changes. The descriptor you just added will appear in the descriptor list.

(4) To edit an existing descriptor, select the descriptor you want to edit, then click the Edit button. Modify the values and click Yes to save the changes.

(5) To delete an existing descriptor, select the descriptor you want to remove, then click the Delete button.

5.4.2 BISS-1, BISS-E Mode

The BISS-1 and BISS-E setups are simpler than Simulcrypt, there is no channel setup in BISS-1 and BISS-E.

5.4.2.1 BISS-1 Mode

When selecting BISS-1 mode, you need to configure the SW of input stream. Click the SW Input button., the following dialog will pop up.

Type in the hexadecimal SW and click YES to save the changes.

5.4.2.2 BISS-E Mode

When selecting BISS-E mode, you need to configure the ESW and key of input stream. Click the SW Input button. the following dialog will pop up.

Type in the hexadecimal ESW and KEY, then click YES to save the changes.
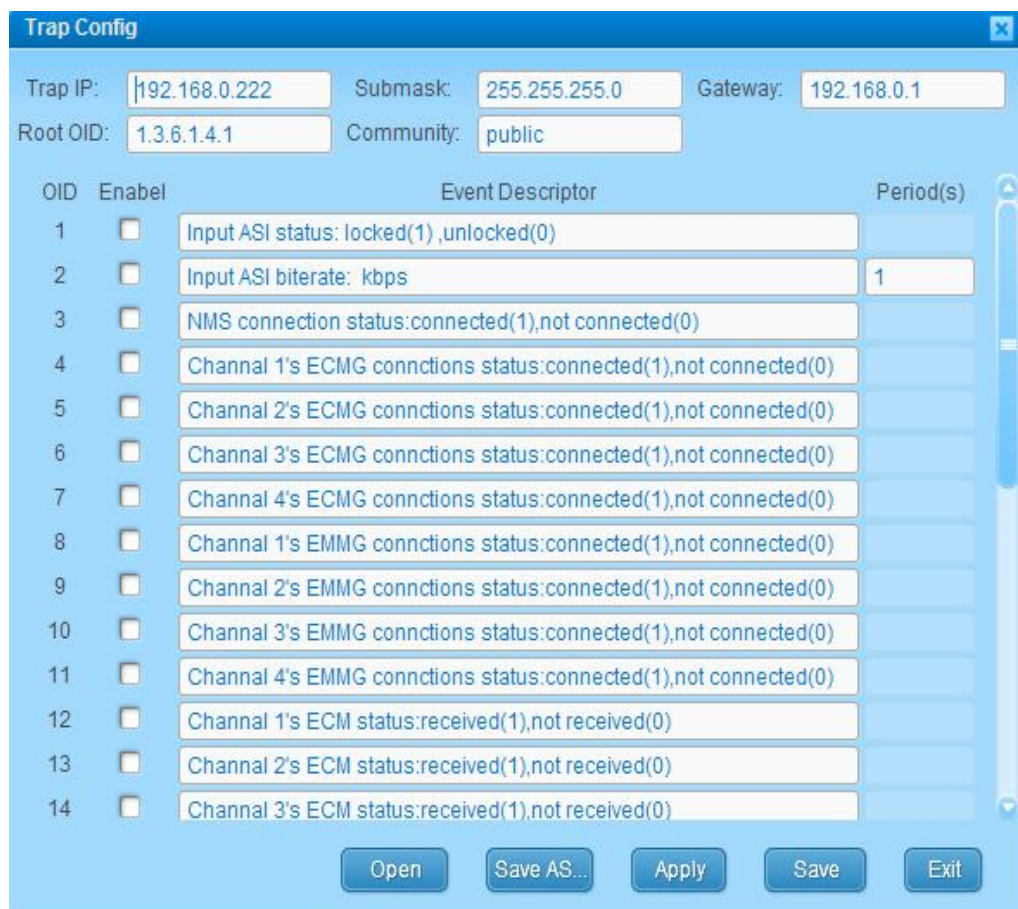
5.5 Device Information

Click the Help button to check the Equipment Type, Version No., Hardware Version, and Software Version

5.6 SNMP SET

Click the SNMP SET button on the About dialog and access the Trap Configuration. User can modify below parameters:

Trap IP: set the IP address of Trap host.

Submask: set the submask.

Gateway: set the gateway.

Root OID: set Root OID.

Community: set community name.

Use the buttons on the bottom to open, save, or apply the configure data.

Open: load the configuration from local xml file: trap_config.xml

Save AS: export the configuration information to an xml file.

Apply: apply current change.

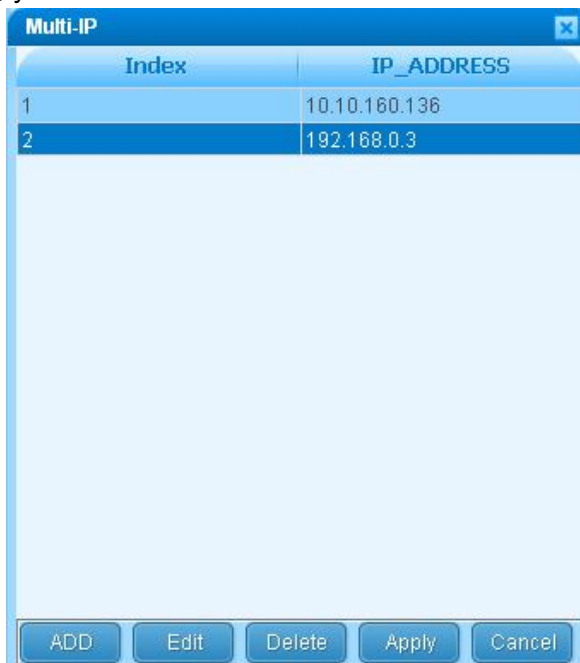Save: save changes to current config file.

Exit: exit from current dialog

Note: after applying the changes, click the Summit button to make the change valid.

5.7 Multi-IP Setup

Click the IP Properties button on the About dialog and access the Multi-IP Setup.

In the Multi-IP Setup, you can save more than one IP address in the list.

(1) To add a new IP address, click the Add button. Type in the IP and click Apply to save all the changes. The IP descriptor you just added will appear in the IP list

(2) To edit a new IP address, select the IP you want, then click the Edit button. Modify the IP and click Apply to save the changes.

(3) To delete an IP address, select the IP you want to remove, then click the Delete button.

Note: after applying the changes, click the Summit button to make the change valid.

6. Technical Specification

ASI Input	
Connector Type	2 x BNC Female, 75Ω
Input Bit Rate	≤ 70Mb/s
Packet Mode	188/204 Bytes
ASI Output	
Connector Type	2 x BNC Female 75Ω for output, 2 x BNC Female 75Ω for loop through
Output Standard	ISO13818-1
Output Bit Rate	1-54Mbps adjustable
Packet Mode	188/204 Bytes
TS Processing	
Scrambler Type	DVB Common Scrambling
Scrambler Mode	BISS-1, BISS-E and Simulcrypt
EMM/ECM Number	Maximum 4 x EMM and ECM
Control & Monitoring	
Connector Type	1×RJ-45, 10/100M, for equipment IP Control
Remote Control	SNMP, HTTP Web
Software Upgrade	FTP Loader
Physical	
Dimension	360mm×540mm×180mm{tc "Weight 44mm(H)×482mm(W)×410mm(L)"}
Weight	2.7Kg Net, 3.7Kg Gross
Power Supply	AC 90V～260V, 50/60Hz
Power Consumption	25W
Operating temperature	0～+45℃
Storage temperature	-10~+50℃
Operating Humidity	20~90%, non-condensing

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