PBI Pro Broadband Inc.

DCH-3100P Series

Professional IRD and Processor

User Manual

Ver. 1.0

Contents

1. General Description

The DCH-3100P is a cost effective professional integrated receiver decoder. It is widely used in the satellite, cable and terrestrial TV network with different tuner frontend DVB-S2/S, DVB-C and DVB-T. It demodulates the RF signal to the transport stream with ASI output. With dual DVB common slots, DCH-3100P works with most of the well known CAS in the market and decrypts multiple services in a transport stream. The on board decoder can process a variety of digital video and audio formats in MPEG-4 AVC/H.264 and MPEG-2, in Standard Definition and in High Definition. The TV channel is decoded to digital and analog outputs, HDMI, YPbPr, CVBS, balanced and un-balanced audio. The powerful demodulation, decryption and decoding capabilities, combined with user friendly WEB GUI and SNMP based remote control makes this equipment one of the most competitive professional IRD in the market.

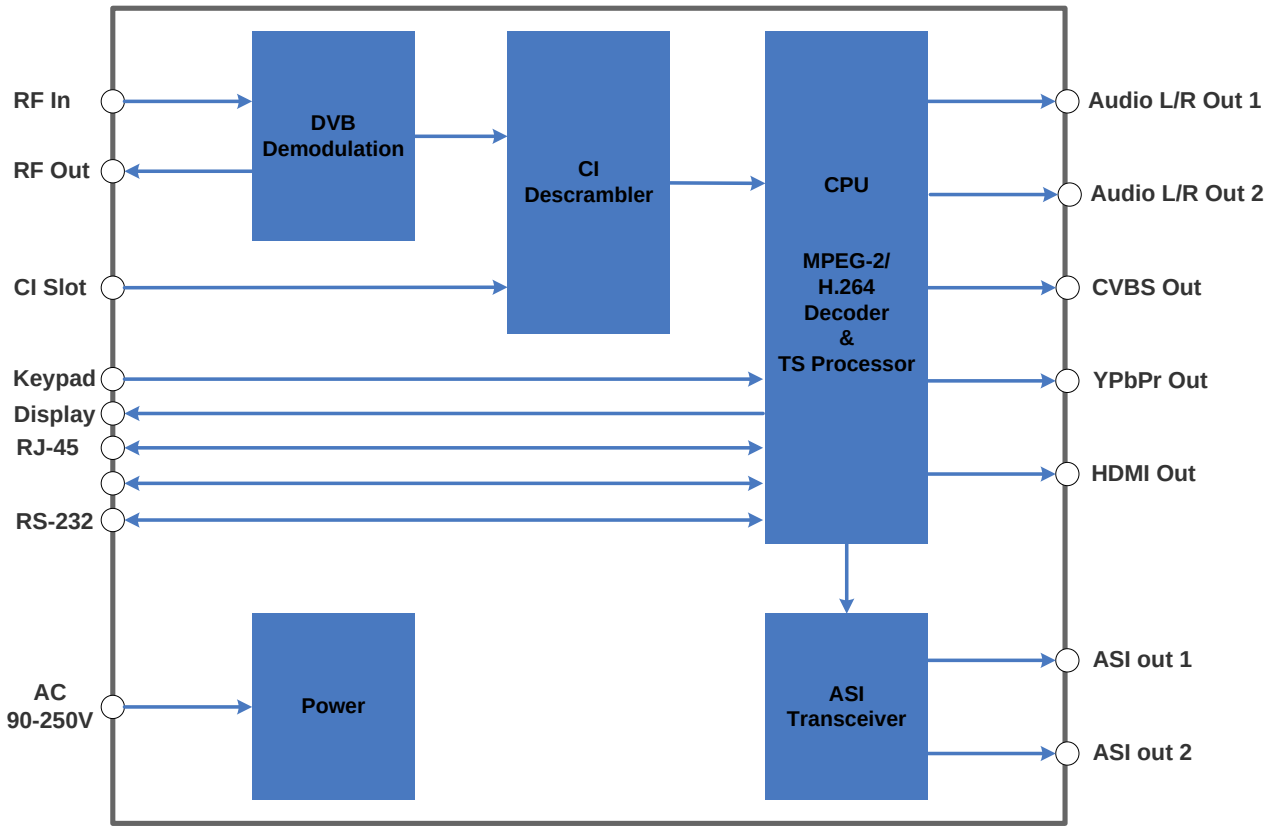
1.1 Characteristics

- Multiple tuner inputs DVB-S2/S, DVB-C, and DVB-T
- 2x DVB-CI Slots, Multi Programs, BISS-1 and BISS-E decryption
- SD/HD MPEG-2 and MPEG-4/H.264 digital video decoding
- Two digital audio channel decoding of MPEG1 Layer II and AAC
- Rich Analog and Digital Outputs including, CVBS, YPbPr, HDMI, XLR
- Remote Control and Supervision by SNMP, HTTP WEB
- Dynamic PMT auto detection and updating
- Support VBI TELETEXT, EBU/ DVB Subtitle, Closed Caption
- Configuration save and load after power off

1.2 Order Information

Model / Interface	DCH-3100P-x		
Tuner	-C	-T	-S2
Common Interface	x2	x2	x2
ASI Output(mirrored)	x2	x2	x2
HDMI	x1	x1	x1
CVBS	x2	x2	x2
YPbPr	x1	x1	x1
Audio L/R	x2	x2	x2
Balanced audio XLR	x1	x1	x1
USB	x1	x1	x1

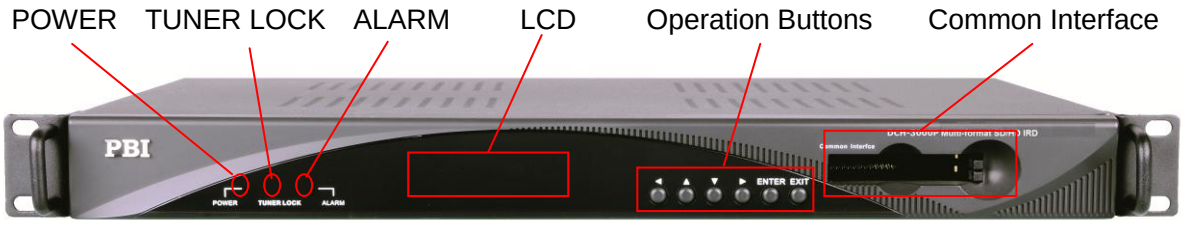
2. Block Diagram



3. Control with display and keypad

DCH-3100P series can be controlled by the keypad on front panel.

3.1 Front View



POWER	Power indicator, green light means power is OK
TUNER LOCK	Tuner lock indicator, green light means signal is locked; if there is no light, which means no signal input or wrong parameters setting.
ALARM	Alarm indicator
LCD	2 × 20 character LCD
Operation buttons	〔◀〕 〔▲〕 〔▼〕 〔▶〕 〔ENTER〕 〔EXIT〕 buttons

	〔▲〕〔▼〕 are used to up/down pages of menu or increase/decrease value when edit numbers 〔◀〕〔▶〕 are used to move cursor 〔ENTER〕is used to enter sub menu or confirm operation 〔EXIT〕is used to return previous menu or cancel operation
Common Interface	PCMCIA Module slot

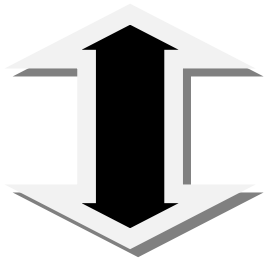
3.2 Rear Panel View

LNB IN	Tuner signal input
LNB OUT	Tuner signal loop through output port
USB	USB port for software upgrade
ASI OUT1	ASI output port
ASI OUT2	ASI output port (for back-up)
ETHERNET	LAN port for software update and remote control
CVBS2	CVBS2 BNC output port
YPbPr	YPbPr output port
CVBS1	CVBS1 RCA output port
L-Audio-R	2 Groups of RCA audio output port
HDMI	HDMI output port
RS-232	serial port for printing information
XLR L	XLR output port for balance audio L channel
XLR R	XLR output port for balance audio R channel
GND	Grounding terminal
Power Socket	AC 90~250V 50-60Hz input

Note: This RS-232 interface is a 9-pins female sub-D connector that is only used for factory software upgrade and configuration. You may not connect any cable to the RS-232 connector, as that could cause damage to the device.

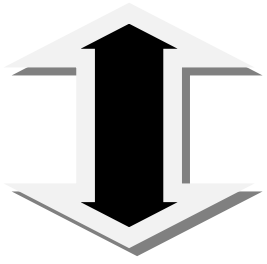
3.3 Description of menu

Input	**Status**	to show the status of signal inputs for ASI, and TUNER
	DVB-S2/QPSK	This menu only is shown on DCH-3100P-S2 model **LNB Frequency**: Input LNB frequency **Satellite Frequency**: Input downstream frequency of satellite **Symbol Rate**: Input symbol rate of satellite **LNB Voltage**: select the correct LNB voltage output of the F-connector: Off, 13 V, 18 V. <13V for Vertical/Left hand polarization, 18V for Horizontal/Right hand, OFF for LNB Power off.> **LNB 22KHz**: activate the LNB 22 kHz control signal to the LNB: On or Off. <22KHz control signal switches the LNB to receive high band if any> **DISQEC**: Can select OFF/Port A/Port B/Port C/Port D
	COFDM	This menu only is shown on DCH-3100P-T model Frequency: enter the proper frequency of the COFDM signal in MHz. Bandwidth: set the bandwidth from 6M/7M/8M
	QAM	This menu only is shown on DCH-3100P-C model Constellation: enter the modulation mode of the QAM signal. Frequency: enter the frequency of the QAM signal in MHz. Symbol Rate: edit the symbol rate to the proper value in KBaud.
	RSSI	to show the quality of receiving DVB-S2/S signal.



Output	**Status**	for monitoring the status of the decoder
	CI	CAM Name: display the CAM name in Slot1 and Slot2 Setup: under this sub menu, you can see all program names from the tuner. All free programs are marked with 'Free' in the first row. To select which program to be de-encrypted, press the <↑> or <↓>-key to roll up and down the program names and press <ENTER>-key to change the status of the corresponding program (only encrypted program could be selected). Three different statuses could be set: Slot 1 (de-encrypted with upper CAM inserted) Slot 2 (de-encrypted with lower CAM inserted) Bypass (no de-encryption). The status will be shown in the first row on the LCD display. Confirm this setup when leaving this sub menu, press <ENTER>-key to save or press <EXIT>-key to scrap.

	Decoder	**Program**: under this sub menu, you will see all program names from Tuner. Use the <↑> or <↓>-key to roll up or down between the program names. A few seconds after the program being selected, the A/V signal will be delivered to the related connectors on the back panel. **Video**: You can configure the video parameters of programs in this submenu. Press the <ENTER>-key to confirm and press the <EXIT>-key to cancel. **Video Standard**: you can select Auto or 576i 25 or 480i 29.97 or 576p 50 or 480p 60 or 720p 50 or 720p 59.94 or 720p 60 or 1080i 25 or 1080i 29.97 or 1080i 30 for the composite video output. **Screen**: select the screen mode: Auto, 4:3 Full, 16:9 Full or 4:3 Letterbox. **DVB Subtitle Lang**: select the language of DVB Subtitle. **EBU Subtitle Lang**: select the language of EBU Subtitle. **Subtitle Priority**: configure the priority of Subtitle; choose whether DVB or EBU should be first. **Fail Mode**: set display method on TV when there is no vedio. you can select Black screen, Still picture, or No sync **Close Caption**：Select 'OFF' will turn off the caption and select 'ON' will turn on the caption. **VBI Mode**：Select 'DISABLE' will disable the VBI mode and select 'ENABLE' will enable the VBI mode. **CVBS SUB PAL**: set the subtile of CVBS port in PAL standard. You can set to PALBDGHI or PALN or PALN_C or SECAM **CVBS SUB NTSC**: set the subtitle of CVBS port in NTSC standard. You can set to NTSCM or NTSCM_J or NTSCM_443 and PALM **Audio:** You can configure the audio settings in the submenu. **Audio1 Level:** modify the audio1 level within this range: 0~99**.** **Audio1 Mode:** select Stereo, Left, Right or Mono for soundtracks. **Audio1 Priority:** select the priority of the audio. **Audio2 Level:** modify the audio2 level within this range: 0~99. **Audio2 Mode:** select Stereo, Left, Right or Mono for soundtracks. **Audio2 Priority:** select the priority of the audio. **Audio Config:** you can set as Two PID or One PID **HDMI/AES Embeded:** select from PCM or Compressed. Select Compressed to enable HDMI Dolby pass-through. Otherwise select PCM. **Biss：**It includes Biss Mode, Biss 1 Setup and Biss E Setup **Biss Mode：**Set Biss mode, can select 'OFF', 'Biss E' or 'Biss 1' **Biss 1 Setup：**set Biss 1 (password is required) **Biss E Setup：**set Biss E (ID number and password are required) **A/V Alarm Switch:** there are two switches control the alarm separately: **Video Alarm:** enable or disable the video alarm. **Audio Alarm:** enable or disable the audio alarm.



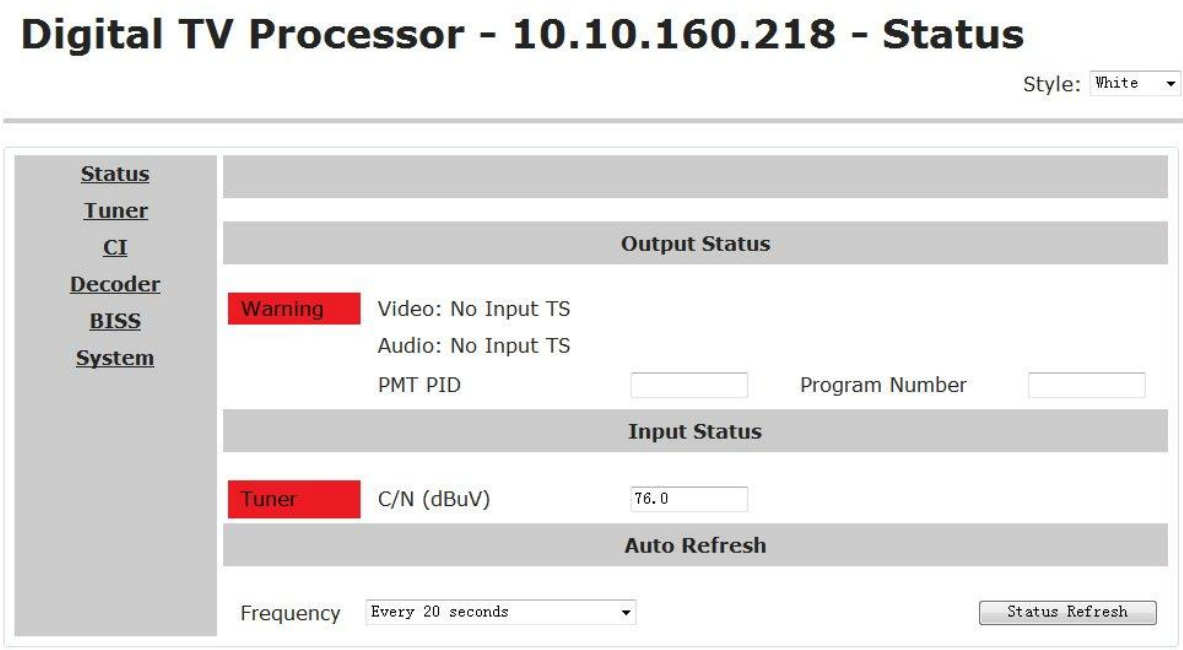
System	**Local Setup**	**IP Address**: The IP address for the unit. **Network Mask**: The network mask for the subnet to which the unit is connected. **Gateway**: The gateway for the network to which this unit is connected.
	Trap IP	The DCH-3100P provides a Monitor Center IP address. You can set this to be the same IP address of the Monitor Center, which is typically a PC in order to allow the device to send messages to the monitor center.
	Unit Name	The DCH-3100P allows you to edit the unit name which is displayed on the front panel LCD. Default name is 'Digital TV Processor". The unit name should be within 20 characters in ASCII format.
	Properties	**MAC address**: Factory-set MAC address is guaranteed to be unique. You cannot configure this address. **FW Version**: the version of the FPGA software (note that this version number will be changed automatically according to the TS/IP settings ('IP In' or 'IP Out'). **SW Version**: the version of the main software.
	Factory Settings	All the user configurable parameters will be set to the factory default settings, including IP address and the unit name.
	USB Upgrade	**USB Status**: it can check the status of USB stick in USB port when you make upgrade **Force upgrade**: It will force upgrade the file in USB stick
	Ntp set	you can sync device with your NTP(Network Time Protocol) server **NTP Server IP**: set the IP address of NTP server **NTP Interval(s)**: Set the NTP interval time **Time Zone**: set the time zone of your location **Date**: set the date **Time**: Set the time **Get Time from Server**: Get time from NTP server directly
	HTTP Login	Modify the username and password for the WEB management. The default username: root The default password: 12345
	Machine Type	not open to customer

4. Control with web server

DCH-3100P can be controlled by WEB. User can type IP address of DCH-3100P 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 front panel button to change it. You can set it in System→HTTP login menu. The parameters are the same as Chapter 3.3.

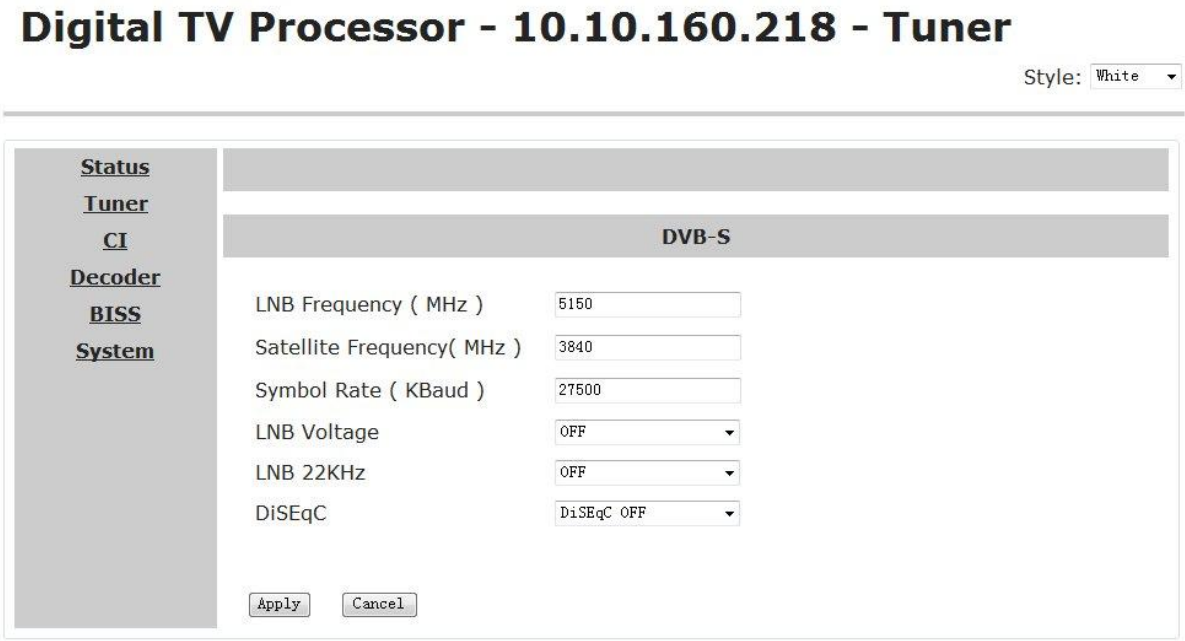
4.1 Status

User can monitor the working status of output and input. You also can set auto refresh time here. "Status Refresh" is used to refresh status manually.



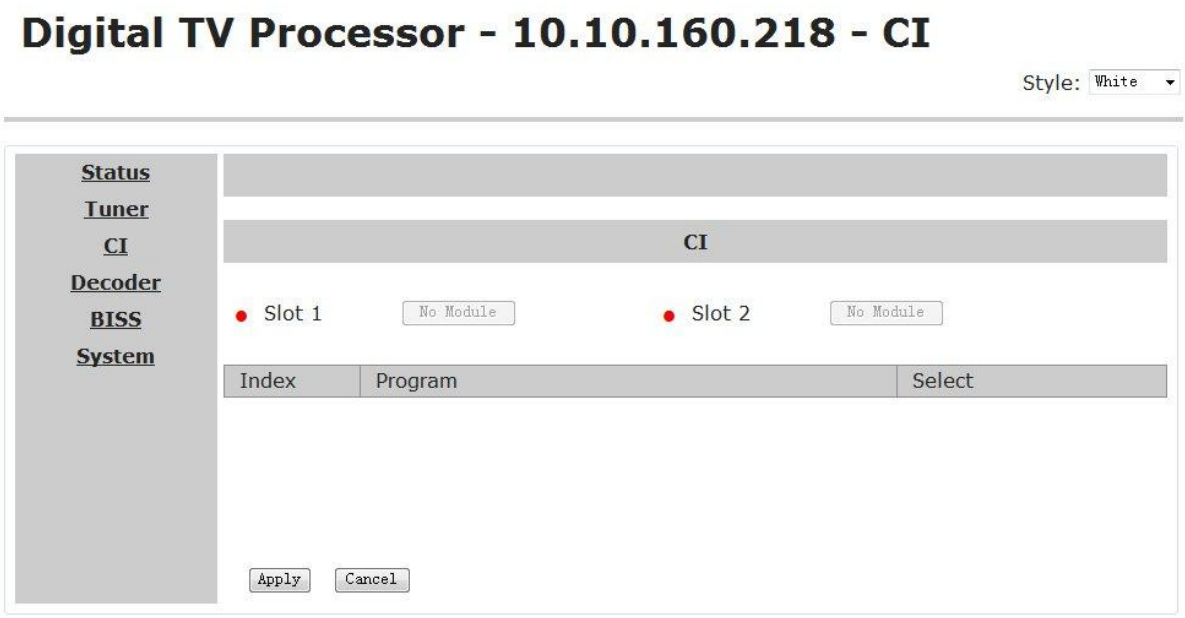
4.2 Input

Set parameters for tuner input. Click “Apply” button to submit, or click “Cancel” button to cancel



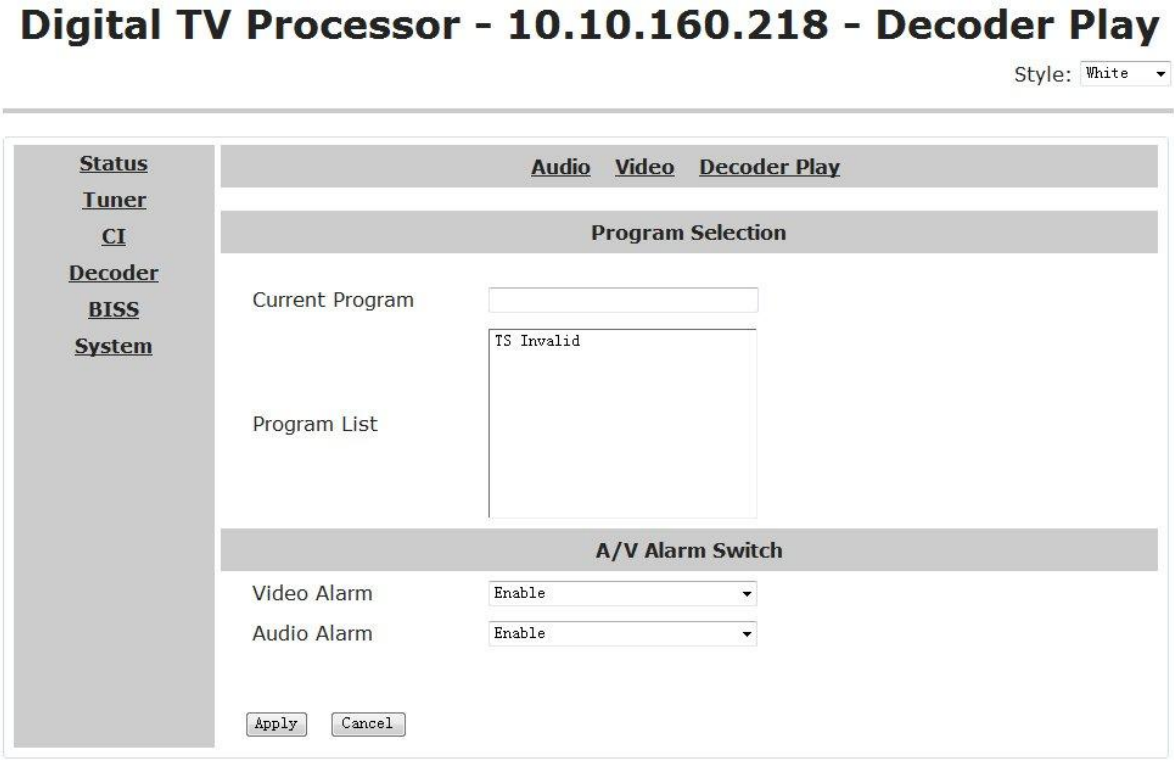
4.3 CI

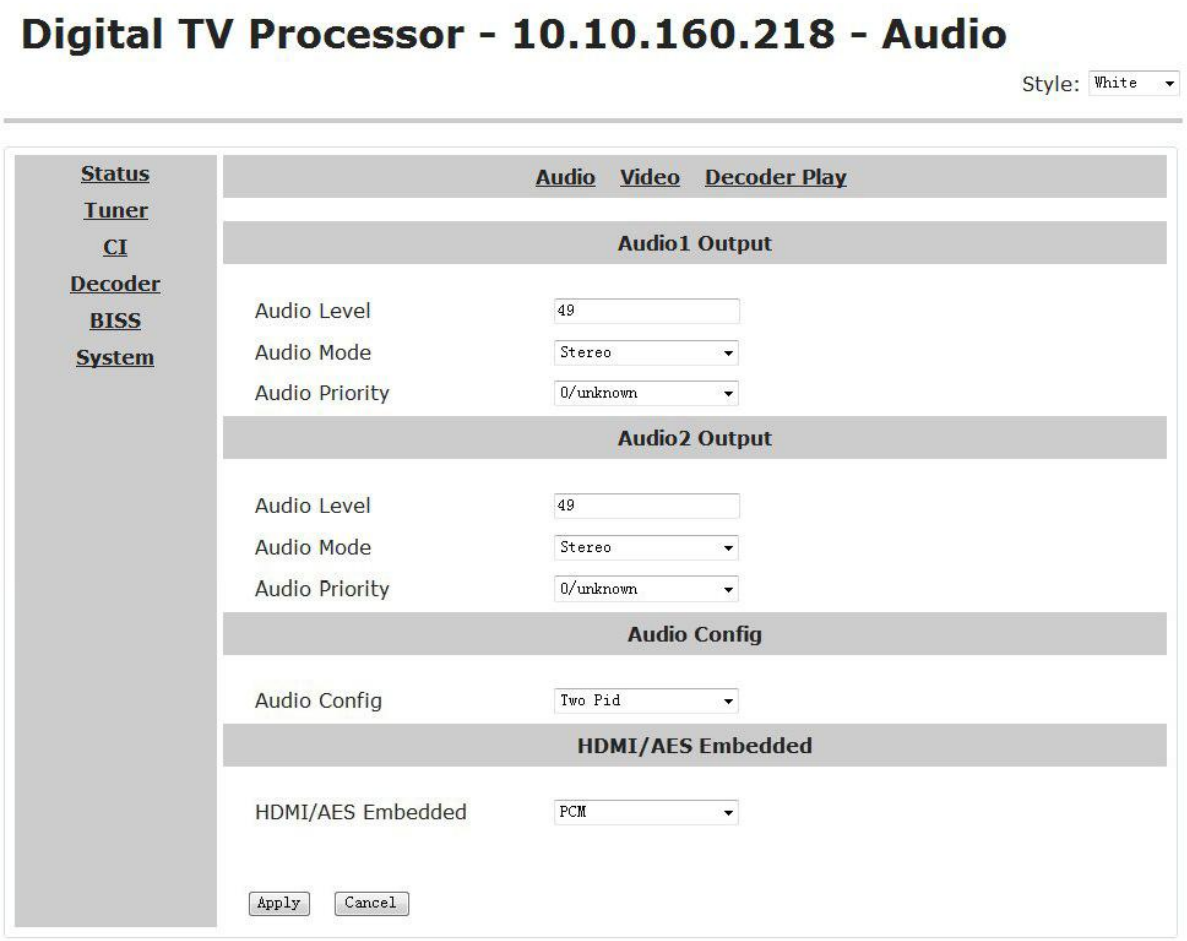
Set parameters for CI slots. Click “Apply” button to submit, or click “Cancel” button to cancel

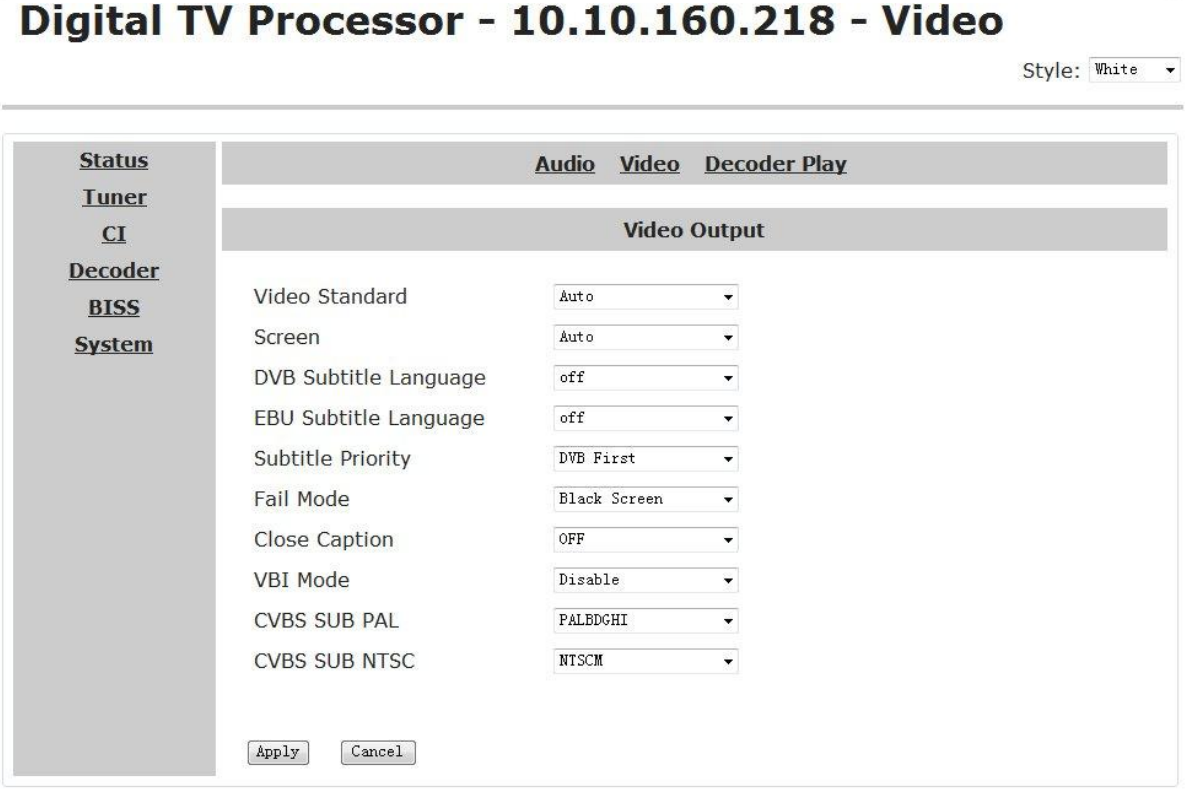


4.4 Decoder

Set parameters for decoder. Click “Apply” button to submit, or click “Cancel” button to cancel

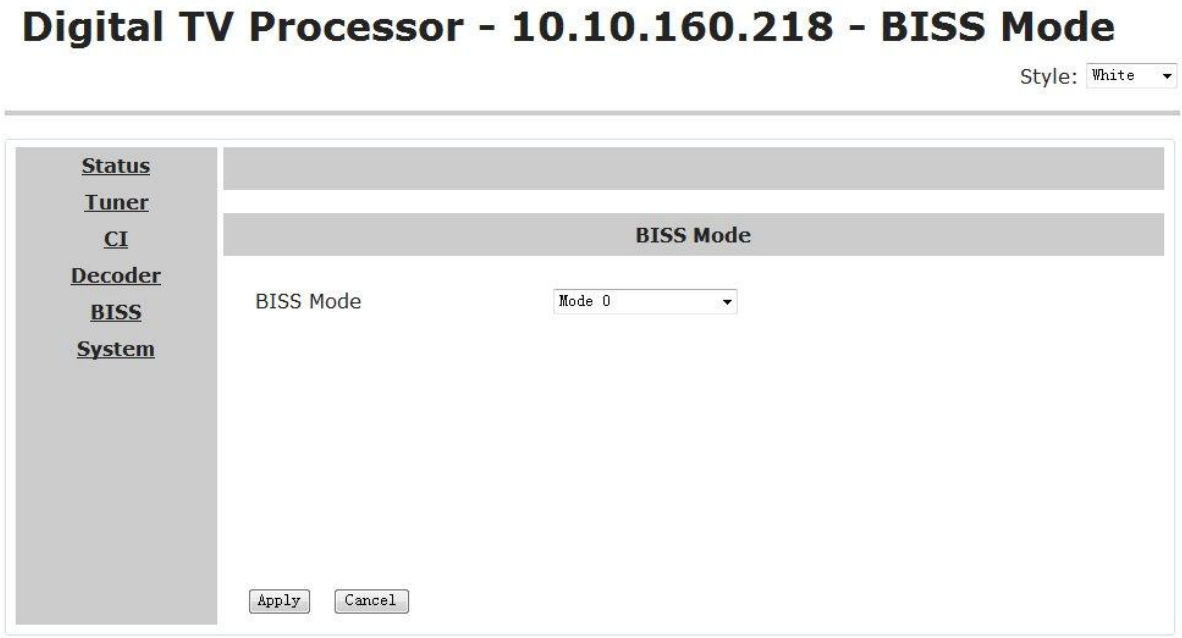



Digital TV Processor - 10.10.160.218 - Audio
Style: White
Status
Tuner
CI
Decoder
BISS
System
Audio Video Decoder Play
Audio1 Output
Audio Level 49
Audio Mode Stereo
Audio Priority 0/unknown
Audio2 Output
Audio Level 49
Audio Mode Stereo
Audio Priority 0/unknown
Audio Config
Audio Config Two Pid
HDMI/AES Embedded
HDMI/AES Embedded PCM
Apply Cancel


Digital TV Processor - 10.10.160.218 - Video
Style: White
Status
Tuner
CI
Decoder
BISS
System
Audio Video Decoder Play
Video Output
Video Standard Auto
Screen Auto
DVB Subtitle Language off
EBU Subtitle Language off
Subtitle Priority DVB First
Fail Mode Black Screen
Close Caption OFF
VBI Mode Disable
CVBS SUB PAL PALBDGHI
CVBS SUB NTSC NTSCM
Apply Cancel

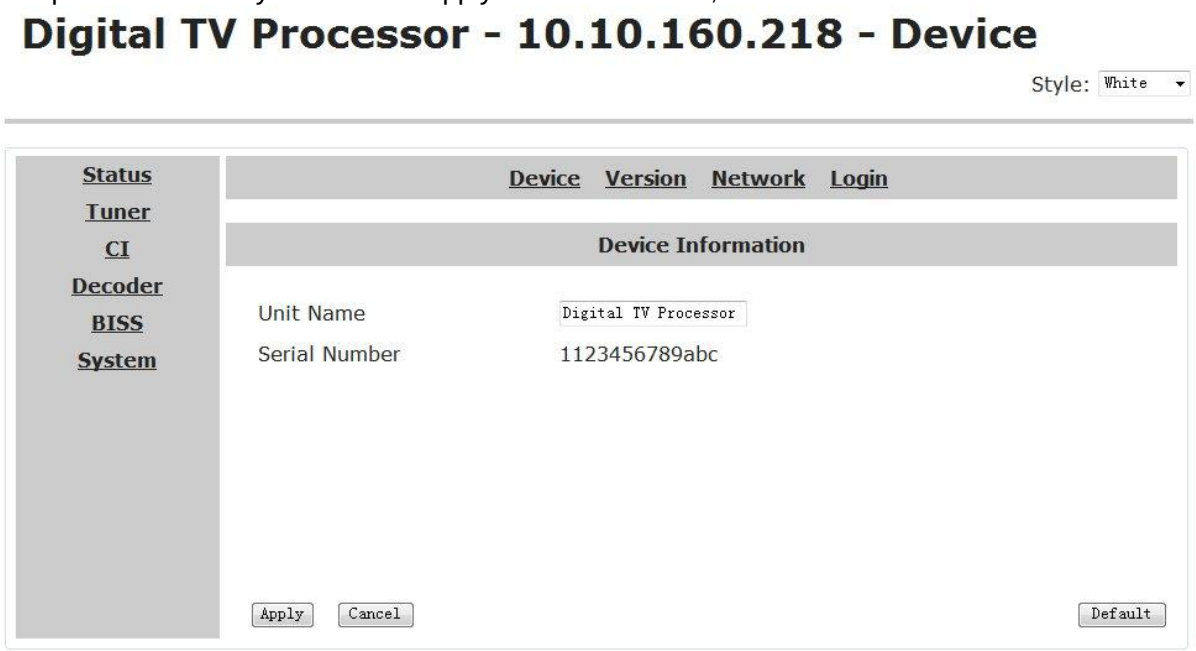
4.5 BISS

Set parameters for BISS. Click “Apply” button to submit, or click “Cancel” button to cancel



4.6 System

Set parameters for system. Click “Apply” button to submit, or click “Cancel” button to cancel



Digital TV Processor - 10.10.160.218 - Version

Style: White

Status
Tuner
CI
Decoder
BISS
System

Device **Version** **Network** **Login**

Version

Main Version	31PR000E	Web Version	0106
Linux Version	01	Decoder Version	0e

Digital TV Processor - 10.10.160.218 - Network

Style: White

Status
Tuner
CI
Decoder
BISS
System

Device **Version** **Network** **Login**

Network

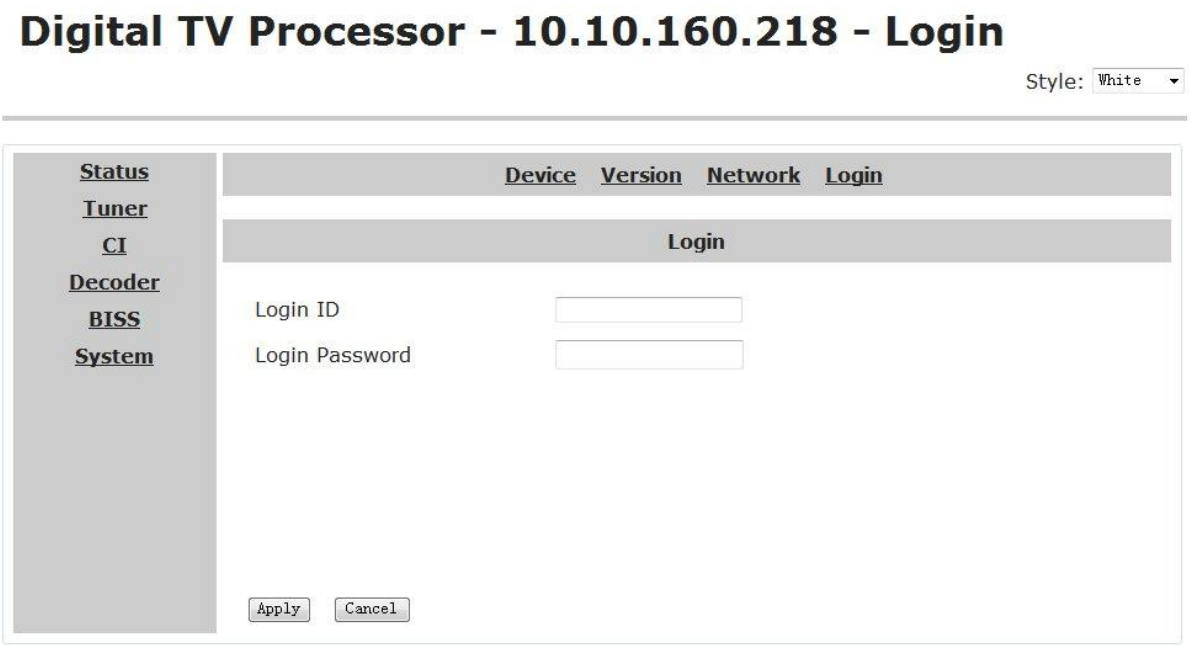
Local Setting

IP Address	10 . 10 . 160 . 218
Subnet Mask	255 . 255 . 255 . 0
Gateway	10 . 10 . 80 . 1
MAC Address	11:20:22:00:22:66

Alarm Setting

Trap IP Address	10 . 10 . 70 . 66

Apply Cancel



5. Technical Specification

Tuner Input	
DVB-S/S2 Tuner Input	
Connector Type	1 x F type female 75Ω for Input, 1 x F type female 75Ω for loop through output
Input Frequency Range	950 ~ 2150MHz
Input Level	-25 ~ -65dBm
Symbol Rate	5 ~ 45MBaud/s for QPSK 10 ~ 31MBaud/s for 8PSK
Roll Off Factor	DVB-S QPSK: 0.35 DVB-S2 8PSK: 0.35, 0.25, 0.2
Punctured Rates	DVB-S QPSK: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 8/10 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
DVB-C Tuner Input	
Connector Type	1 x F type female 75Ω for Input, 1 x F type female 75Ω for loop through output
Input Frequency	48~860MHz
Input Level	45~ 75dBuV
Symbol Rate	1~7MBaud (ITU J.83 Annex A)
Constellation	16/32/64/128/256QAM
Bandwidth	6MHz/7MHz/8MHz
Input Return Loss	7dB (typ.)
DVB-T Tuner Input	
Connector Type	1 x F type female 75Ω for Input, 1 x F type female 75Ω for loop through output
Input Frequency	104~862MHz (VHF/UHF)
Input Level	-20 ~ -70dBm (Quasi Error Free, QEF)
Constellation	DVB-T: QPSK/16-QAM/64-QAM

Bandwidth	6MHz/7MHz/8MHz
FFT Mode	DVB-T: 2K/8K
Guard Interval	DVB-T: 1/4, 1/8, 1/16, 1/32
FEC Code Rate	DVB-T: 1/2, 2/3, 3/4, 5/6, 7/8
Input Return Loss	7dB (typ.)
TS Processing	
Descrambler	DVB Common Scrambling Algorithm (CSA)
BISS Mode	BISS-1, BISS-E
Common Interface	Dual PCMCIA slots, compatible with major CA CAMs in the market
ASI Output	
Connector type	2 x BNC Female, 75Ω
Standard	DVB-ASI, EN50083-9
TS over IP Output	
Connector Type	1 × RJ-45, 10/100M for TS/IP, share with management port
Useful Bit Rate	≤25Mb/s
Protocol	UDP / RTP, Multicast
HDMI Output (for 3100P-50xx)	
Standard HDMI	1x HDMI 1.3 interface (no 1080p)
Video Resolution	1080i x 30, 1080i x 29.97, 1080i x 25, 720p x 60, 720p x 59.94, 720p x 50, 480p x 60, 576p x 50, 576i x 25, 480i x 29.97
Audio Embedded	one digital audio pass through
Digital Video Processing	
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)
Video PID Bit Rate	< 80Mb/s
Digital Audio Processing	
Number of Outputs	2x digital audio PIDs are decoded*
Sampling Rate	32, 44.1 and 48KHz
Audio Bit Rate MPEG-1 Layer I Layer II	32, 64, 96, 128, 160, 192, 224, 256, 288, 320, 352, 384, 416 and 448 kb/s for 32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320 and 384 kb/s for MPEG-1
Analog Video Output	
YPbPr Connector	1 set of RCA, 75Ω
CVBS Connector	1 × BNC 75Ω, 1 x RCA 75Ω
Video Standard	NTSC, PAL, and SECAM
YPbPr Resolution	1080i x 30, 1080i x 29.97, 1080i x 25, 720p x 60, 720p x 59.94, 720p x 50, 480p x 60, 576p x 50, 576i x 25, 480i x 29.97
Signal Level	I.0 Vp-p±5%
Frequency Response	<±I 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°
Signal to Noise Ratio	>55 dB (luminance weighted)
Analog Audio Output	
Connector type	1x XLR Male Socket, 2 pairs of RCA audio
Output Impedance	600Ω (balanced)
Output mode	Left, Right, Dual Mono, Stereo
Number of Outputs	2 pairs of stereo audio outputs (2 Audio PIDs are decoded).

Baseband Data Output	
Subtitle	DVB/EBU
VBI	Teletext, WSS, VFD, VPS
Closed Caption	EIA 608, EIA 708, EIA 608-to-708
Control & Monitoring	
Connector Type	1×RJ-45, 10/100M, for equipment IP Control
Remote Control	SNMP, HTTP Web, Proprietary HDMS Network System Management Software
Local Control	LCD display and 6-key keypad
Serial Port	1×RS-232 9-pin D-sub, for debug use only
Equipment Upgrade	FTP loader or USB
Physical	
Dimension	44mm×483mm×255mm
Weight	2.4Kg Net, 4.4Kg Gross
Power Supply	AC 90V ~ 260V, 50/60Hz
Power Consumption	24W
Operating temperature	0 ~ +45℃
Storage temperature	-10~+50℃
Operating Humidity	20~90%, non-condensed
Certification	
EMC: EN 55024:1998+A1:2001+A2:2003, EN 55022:2006+A1:2007, EN 61000-3-2:2006, EN 61000-3-3:2008	
FCC: Part 15 Class B	
LVD: EN 60950-1:2006 + A11:2009	

* For more information about digital audio, please contact our sales representative.

6. Default Device Parameters On Delivery

Main Menu	Sub-menu Parameter	Factory defaul settings
Input	**Status**	TUNER unlock
	DVB-S2/QPSK	This menu only is shown on DCH-3100P-S2 model **LNB Frequency**: 5150MHz **Satellite Frequency**: 3840MHz **Symbol Rate**: 27500KBaud **LNB Voltage**: OFF **LNB 22KHz**: OFF **DISQEC**: DISQEC OFF
	COFDM	This menu only is shown on DCH-3100P-T model Frequency: 794MHz. Bandwidth: 6M
	QAM	This menu only is shown on DCH-3100P-C model Constellation: 64. Frequency: 50000KHz. Symbol Rate: 6875KBaud.
	RSSI	to show the quality of receiving DVB-S2/S signal.

Output	**Status**	PMT: --- PN:--- A/V:---/--- Video: No input TS Audio: No input TS
	CI	**CAM Name**: CI slot1 no module, CI slot2 no module **Setup**: free
	Decoder	**Program**: Invalid **Video**: **Video Standard**: Auto **Screen**: Auto **DVB Subtitle Lang**: eng **EBU Subtitle Lang**: eng **Subtitle Priority**: DVB first **Fail Mode**: Black screen **Close Caption** : OFF **VBI Mode** : Disable **CVBS SUB PAL**: PALBDGHI **CVBS SUB NTSC**: NTSCM **Audio**: **Audio1 Level**: 49. **Audio1 Mode**: Stereo. **Audio1 Priority**: **Audio2 Level**: 49. **Audio2 Mode**: Stereo. **Audio2 Priority**: **Audio Config**: Two PID **HDMI/AES Embeded**: PCM **Biss** : **Biss Mode** : OFF **Biss 1 Setup** : ********** (password is required) **Biss E Setup** : ********** (ID number and password are required) **A/V Alarm Switch**: **Video Alarm**: enable. **Audio Alarm**: enable

System	**Local Setup**	**IP Address**: 10.10.70.48 **Network Mask**: 255.255.255.0 **Gateway**: 1.0.0.0
	Trap IP	10.10.70.1
	Unit Name	Digital TV Processor
	Properties	**Main software version**: 31PRXXXX **MAC Address**: show mac address of 3100P **Linux Version**: version number **Decoder Version**: version number
	Factory Settings	
	USB Upgrade	
	Ntp Set	**NTP Server IP**: 10.10.80.245 **NTP Interval(s)**: 600 **Time Zone**: GMT +8:00 **Date**: 2000-1-1 **Time**: 00:00:00

	HTTP Login	Modify the username and password for the WEB management. The default username: root The default password: 12345
	Machine Type	not open to customer

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