Digital Headend System

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DCP-3000

Digital Content Processing Platform

Introduction

PBI Digital Contents Processing Platform DCP-3000 brings a compact, powerful and flexible solution that allows users to build or to upgrade DTV /IPTV headend to meet the rapid-grown market requirements, for now and the future. It is capable of processing a tremendous number of streams. By inserting up to 6 optional functional modules and a pluggable MUX/Scrambler extended modules, DCP-3000 integrates all DTV headend functions, such as DVB signal reception, descrambling, encoding, transcoding, remultiplexing, scrambling and modulation in one single chassis.

Chassis Features

- 2 x SFP(TS/IP Streaming), 1 x RJ45(Conditional Access), 1 x RJ45(LAN Control), 1 x USB(Upgrade), 2 x Mini USB(RS-232 Debug)
- Flexible combinations of many kinds of functional modules
- Non-stop of services from modules even other else has been upgraded
- Hot insert, Hot pull out Module Slots
- Switching capability: 2.5Gb/s+2.5Gb/s data rate per module slot
- Total internal exchange capacity: 49Gb/s data processing
- 900+Mb/s effective bit-rate throughput per TS/IP port per direction, IGMP v2/v3
- Support IPTV mode and conversion of MPTS from any inputs to SPTS
- Up to 24 TS IP input and 24 TS IP output with ProMPEG FEC
- Up to 256 SPTS IP output and 8 TS IP input under IPTV mode
- Up to 160 TS IP input and 16 TS IP output via the extended re-multiplexing module
- Support scrambling over IP with the extended re-multiplexing & scrambling module
- SNMP & WEB Management System
- Redundant Power Supplies
- 19” x 1 U EIA standard chassis

Chassis Specifications

Gigabit TS_over_IP	
Standard	IEEE 802.3, 10/100/1000 Base-T, Full Duplex
Max. Effective Bit Rate	800Mb/s
Data Protocol	UDP or RTP, SPTS or MPTS
Control Protocol	ICMP, ARP, IGMP v2/v3

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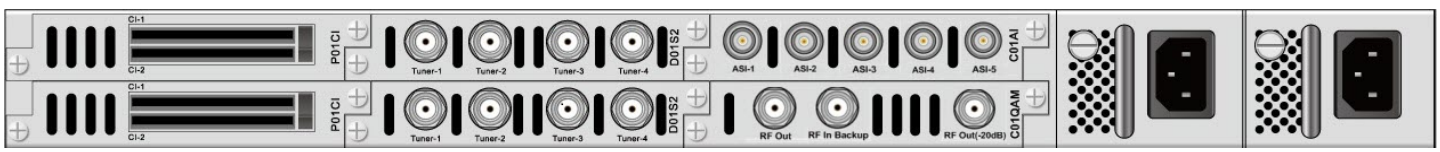
Front Panel	
TS/IP	2 × SFP, 10/100/1000 Base-T
CA	1 × RJ-45, 10/100/1000 Base-T
Control	1 × RJ-45, 10/100/1000 Base-T
USB	1 x USB, 2 x Micro USB
Display	2 x 20 characters LCD Display
Rear Panel	
Module Slot	6 x Slots
Others	
Power Supply	AC/DC 100 - 240V ~1.5A Max 50/60Hz
Operating Temperature	0 ~ 45℃
Storage Temperature	-10 ~ 60℃
Operation Humidity	10 ~ 90%, (Non-condensed)

Optional Function Modules

1. Encoding/Transcoding Modules	**2. Decoding Modules**
4-Way H.264/MPEG-2 Encoding Module(HDMI/SDI)	2-Way HD/SD Decoding Module
4-Way Encoding + 4-Way Transcoding Module	2-Way AVS+ Decoding Module
8-Way H.264/MPEG-2 Transcoding Module	HEVC Decoding Module
3. Re-multiplexing/Scrambling Modules	**4. De-scrambling Modules**
Re-multiplexing & Scrambling Module	4-Way De-Scrambling Module
Re-multiplexing Module	2-Way Demodulating & 2-Way De-Scrambling Module
5. Modulating/Demodulating Modules	**6. TS over IP Modules**
4-Way DVB-S/S2 Demodulating Module	4 x RJ-45 GbE TS/IP Module
4-Way DVB-C/T/T2 Demodulating Module	4 x SFP TS/IP Module
QAM Modulating Module	
COFDM Modulating Module	
7. ASI Interface Modules	
5 x ASI Input/Output Module	

Typical Application
8 x DVB-S/S2 Demodulating + 8 x De-scrambling + 5 x ASI Inputs/Outputs + 1 QAM Modulating



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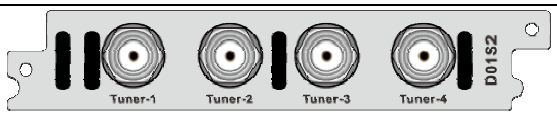
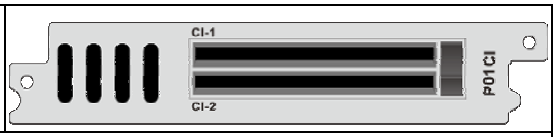
Modules Specifications：

P01MS **reMUX & Scrambler Extension Module**	
● 24 independent TS reMUX's and Scramblers (s/w option: 48 TS reMUX only)	
● 7.5Gb/s data processing capability	
● Compliant with ISO13818 & EN300 468	
● MEPG/H.264 TS re-Multiplexing & Scrambling	
● Local & Remote CAS multi-crypt	
● DVB CAS & BISS	
● PID filtering, remapping, pass through & mapping	
● Insert & Edit PSI/SI tables	
● EIT pass through or re-construction	
● PCR re-stamp & calibrate	
● Self temperature monitoring	

D01S2 ***4xDVB-S/S2 Demodulator Module***	
Connect Type	4 x F type female, 75Ω
Input Frequency Range	950 ~ 2150 MHz
Input Level	-65dBm ~ -25dBm
Symbol Rate	1 ~ 45MS/s (QPSK, 8PSK)
Roll Off Factor	0.35(DVB-S QPSK), 0.35/0.25/0.2(DVB-S2 8PSK)
FEC Puncture Rate	2/3, 3/4, 5/6, 6/7, 7/8(DVB-S QPSK); 2/3, 3/4, 3/5, 5/6, 8/9, 9/10(DVB-S2 8PSK)
BISS-1/E Decrypt	Each tuner supports 8Keys, each Key 支持 5PID
T2-MI de-encapsulator	Supports

P01CI ***4xCI De-encryption Module***	
● 4 x Independent Common Interface(DVB-CI)slots	
● Multiple programs CSA or BISS-1/E De-encryption	
● CAM watchdog	
● Compatible with most of popular CA systems	

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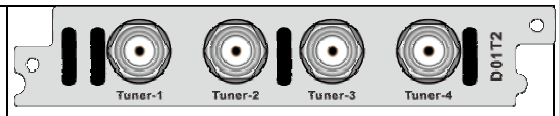
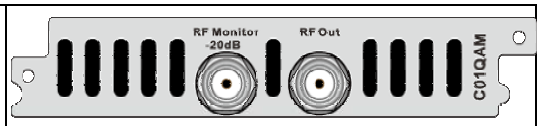
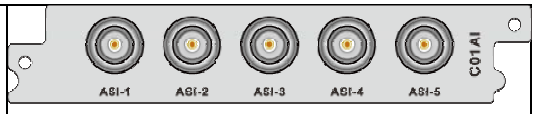
D01T2 **4xDVB-C/T/T2 Demodulator Module**	
Connect Type	4 x F Type Female, 75Ω
Input Frequency	48 ~ 860 MHz(DVB-C) 104 ~ 862 MHz(DVB-T/T2)
Input Level	-15~ 15dBm (DVB-C) -70 ~ -20dBm (QEF, DVB-T/T2)
Symbol Rate	1 ~ 7MS/s（ITU J.83 Annex A DVB-C）
Constellation	6/32/64/128/256 QAM(DVB-C), QPSK/16 QAM/64QAM(DVB-T), QPSK/16 QAM/64 QAM/256 QAM(DVB-T2)
Bandwidth	6/7/8 MHz
FFT Mode	2K/8K(DVB-T) 1K/2K/4K/8K/16K/32K(DVB-T2)
Guard Interval	1/4, 1/8, 1/16, 1/32(DVB-T) 1/4, 5/32, 1/8, 5/64, 1/16, 1/32, 1/64, 1/128(DVB-T2)
FEC Code Rate	1/2, 2/3, 3/4, 5/6, 7/8(DVB-T) 1/2, 3/5, 2/3, 3/4, 4/5, 5/6(DVB-T2)

C01QAM **8-carrier QAM Modulator Module**	
Connect Type	2 x F type Female, 75Ω（1 x main output，1 x -20dB monitor output）
Standard of System	ITU-T J.83 Annex A, C
RF Output	2 groups of 4 adjacent channel carriers QAM RF output
Constellation	16QAM, 32QAM, 64QAM，128QAM，256QAM
RF output range	48 ~ 996MHz, step by 1KHz
Symbol rate	2.5 ~ 6.99MBauds
RF total output level	94 ~ 120dBuV(85 ~ 111dBuV each carrier)
MER	> 36dB (tester equalizer = OFF)
Spurious rejection	> 55dB
Output return loss	10dB

C01AI **ASI Input/Output Module**	
Connect Type	5 x BNC Type Female, 75Ω
Standard	DVB-ASI, EN50083-9
Input and Output	Switch by Web Control
Input and Output Bit Rate	≤216Mb/s

P02EC **4-Way SDI In Encoder/Transcoder Module**	
Connect Type	4xSDI, BNC Type Female, 75Ω
Coding Profile & Level	H.264/AVC HP @ L4.0 & MPEG-2 MP@ML
Sampling Format	4:2:0
Video Resolution & Recommend Compression Bit Rate H.264	1080i（1920×1080）@25Hz,29.97Hz,30Hz:SMPTE274M: 1~13Mb/s 720p（1280×720）@59.94Hz,50Hz:SMPTE296M: 1~13Mb/s

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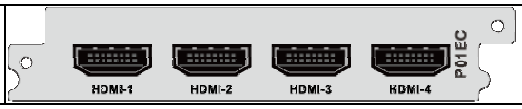
	480i（720×480）@29.97Hz:SMPTE656M: 600K~10Mb/s 576i（720×576）@25Hz: SMPTE656M:600K~10Mb/s
Video Resolution & Recommend Compression Bit Rate MPEG-2	480i（720×480）@29.97Hz:SMPTE656M: 3M~10Mb/s 576i（720×576）@25Hz: SMPTE656M: 3M~10Mb/s
Vide Resolution Down Scaling	Vertical & Horizontal adjustable respectively (frame rate is not scalable)
Aspect Ratio	16:9, 4:3 selectable
Audio Input	SDI Embedded
Coding Standard	MPEG1 Layer II MPEG-2/4 AAC-LC, HE-AAC (V1, V2)
Sampling Rate	48KHz
Recommend Compression Bit Rate	MPEG1 Layer II :32~192Kbps(Mono), 64~384Kbps(Stereo), MPEG2/4 AAC-LC :24~256Kbps(Mono), 48~512Kbps(Stereo) MPEG2/4 HE-AAC(V1/V2): 16~128Kbps(Mono), 32~256Kbps(Stereo)

P01EC **4-Way HDMI In Encoder/Transcoder Module**	
Connect Type	4 x HDMI, type A
Coding Profile & Level	H.264/AVC HP @ L4.0 & MPEG-2 MP@ML
Sampling Format	4:2:0
Video Resolution & Recommend Compression Bit Rate H.264	1080i（1920×1080）@25Hz,29.97Hz,30Hz:SMPTE274M: 1~13Mb/s 720p（1280×720）@59.94Hz,50Hz:SMPTE296M: 1~13Mb/s 480i（720×480）@29.97Hz:SMPTE656M: 600K~10Mb/s 576i（720×576）@25Hz: SMPTE656M:600K~10Mb/s
Video Resolution & Recommend Compression Bit Rate MPEG-2	480i（720×480）@29.97Hz:SMPTE656M: 3M~10Mb/s 576i（720×576）@25Hz: SMPTE656M: 3M~10Mb/s
Vide Resolution Down Scaling	Vertical & Horizontal adjustable respectively (frame rate is not scalable)
Aspect Ratio	16:9, 4:3 selectable
Audio Input	SDI Embedded
Coding Standard	MPEG1 Layer II MPEG-2/4 AAC-LC, HE-AAC (V1, V2)
Sampling Rate	48KHz
Recommend Compression Bit Rate	MPEG1 Layer II :32~192Kbps(Mono), 64~384Kbps(Stereo), MPEG2/4 AAC-LC :24~256Kbps(Mono), 48~512Kbps(Stereo) MPEG2/4 HE-AAC(V1/V2): 16~128Kbps(Mono), 32~256Kbps(Stereo)

D01PA **2-Way H.264/MPEG-2 Decoder Module**	
Connect Type	3 x BNC Type Female (Backup 1+1)，75Ω, 1xDB9
Video Decode	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 Resolution	1080i×30, 1080i×29.97, 1080i×25, 720p×60, 720p×59.94, 720p×50, 576i×25, 480i×29.97
Video PID Bit Rate	< 80Mb/s
SD SDI standard	SMPTE259M, 270Mb/s (10bit)
HD SDI standard	SMPTE292M, 1.485Gb/s (10bit)
SDI Embedded Audio	Support 8x PID or pass through
Sampling Rate	32KHz, 44.1KHz, 48KHz
Audio Format	MPEG Layer1/ 2, AAC-LC，HE-AAC v1/v2
Analog Video Output	CVBS, 2 x RCA, (DB9 adapter)
CVBS Standard	NTSC, PAL, SECAM
CVBS Resolution	576i×25, 480i×29.97
Output Level	1.0 Vp-p±5% （with standard test stream）
Frequency Response	<±1 dB, 5.5 MHz （PAL, SECAM）, 4.2MHz （NTSC）

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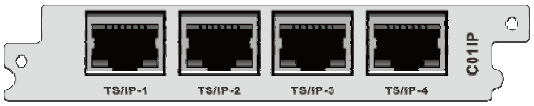
Chroma-Luma Delay	<±30 ns
Field Time Distortion	<2%
Line Time Distortion	<1%
Short Time Distortion	<2%
Differential Gain	<3%
Differential Phase	<2°
S/N	>55dB
Analog Audio Output	4 x RCA, 2 x Group L+R, (DB9 adapter)
Output Impedance	600Ω（Balanced）
Output Mode	Left, Right, Mono, Stereo
Cross Talk	>70dB
THD	<0.3% @400Hz, 1KHz test done
Frequency Response	±0.5dB （20Hz ~ 18KHz）
Output Level	-30 ~ +7dB（Adjustable, 0dBm/600Ω）
Subtitle	DVB, EBU
VBI	Teletext, WSS
Closed Caption	EIA 608, EIA 708

C01IP ***TS/IP Module***	
Connect Type	4 x RJ45, IEEE 802.3, 10/100/1000 Base-T
TS Output	128*SPTS or MPTS/port, UNICAST/MUTICAST (Port1 & 2, Port3&4 backup 1+1)
TS Input	8*SPTS or MPTS/port, UNICAST/MUTICAST (Port1 & 2, Port3&4 backup 1+1)
Effective Bit Rate	500Mb/s
Protocol	UDP/RTP ICMP, ARP, IGMPv2, v3

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