

Catalogue 2017

## Digital TV Equipment and System

- » **Professional IRD**
- » **Encoder & Transcoder**
- » **Remultiplexer/Scrambler**
- » **Modulator & Transmodulator**
- » **Modular Headend System**
- » **IPTV Solutions**

# Contents

---

## Digital TV Content Processing Platform

DCP-1000	01
DCP-3000	07

## HEVC/4K Equipment

DCH-6000P	14
DCH-6100P	17
DCH-6000EC	20
DIH-6000V	22

## Professional Headends

### Professional IRD

DCH-3100P	24
DCH-5200P	26
DCH-5500P	30
DXP-3800D	34
DXP-8000D	37
DXP-3400PA	39

### Professional IRD and Modulator

DXP-3440DM	42
------------	----

### Encoder / Transcoder

DCH-3000EC	45
DCH-5200EC	47
DXP-3800EC	49
DXP-4800EC	51
DXP-8000EC	53
DIH-4000V	55

### Encoder and Modulator

DXP-3410EM/4410EM	57
DXP-8000EM	60
EM-101	63

### Re-multiplexer

DCH-5100MX	66
DXP-3800MX	68

### Modulators / Transmodulator

DCH-3000TM	70
DCH-5100TM	73

### Accessories

DCH-2000AD	76
DCH-2000AV	79
DCH-3000AL	81

## Modular Digital TV Headend DMM-1000

### IRDs

DMM-1510P	85
DMM-2200P	88
DMM-2410D	90

### Encoder / Transcoder

DMM-1300EC	92
DMM-1520EC	93
DMM-2410EC	95

### Multiplexer / Scrambler

DMM-1400MX	97
DMM-2200MX/2200DX	99
DMM-2200TP	101

### Modulator / Transmodulator

DMM-1300TM	102
DMM-1400PM	103
DMM-2410TM	105

## Modular Analog TV Headend DMM-1000AS

DMM-1701PM	108
DMM-1701IM	108
DMM-1701M	108
DMM-1701LD	111
DMM-1701CA	112

## CATV Modulator Bank SMA-1600

SMA-1600M	114
SMA-1600M-UV	114
SMA-1600EM	115

## IPTV/OTT solution

---



# Company Profile

## The Company

Founded in 1994, PBI (Pro Broadband Inc.) manages to develop and manufacture high quality and state-of-the-art products to meet the digital market demands. With over 20 years of expertise in consumer electronic software and hardware engineering, PBI embarks on an advanced design, manufacturing and integration program in the industry of Digital Multimedia, Broadband Access, and Wireless Communications.

## Technology

PBI leverages its core hardware and software technology across three fast growing markets: Digital Multimedia, Broadband Access, and Wireless Communications. PBI's technology is based on years of research and development experience in DVB and MPEG standards. We have made significant investments in developing software for conditional access, common interface, interactive middleware and addressable signal decoding. We have successfully achieved a high level of embedded system integration in digital CATV headend broadcasting system, household IRDs, and microwave accessories. In addition to technical proficiency, our product development benefits from world-class, cost efficient engineering and has strong relationships with key industry players such as ST, NEC, OKI, Panasonic Siemens, Philips, Nagra, Irdeto, Viaccess, and so on.

## Products

Committed to the development of headend production, PBI has a world-wide application in the digital and analog CATV network. The digital headend equipments range from MPEG-2 digital encoder, digital multiplexer, professional QPSK/QAM transmodulator, QPSK/QAM modulator to scrambler; the analog headend equipment varies from adjacent modulator, FM radio modulator and combiner etc. All headend equipment are in line with national standards of China and have been certified by the National government firm CCC and SARFT. Equipped with an advanced and specialized production base and certified by ISO 9001 and ISO 14001 system, PBI is a professional STB manufacturer. PBI's products include digital Satellite/Cable/Terrestrial STBs, HDTV receiver, IP+DVB receivers, Mobile television receiver, and PVR receiver. Integrated varied CA system and middleware, PBI STB enables program encryption and interactive applications. PBI is also a full range C/Ku-band LNB manufacturer for all different applications in the whole world.

## Low-Cost Operations

At PBI, we leverage talent and resources around the great China area to develop, manufacture and market our products. Product development is done in Beijing, tapping a wealth of highly trained, cost-efficient resources. Project management is planned in Chung-Li (Taiwan Silicon Valley), gathering sufficient material/components and fast marketing information environment. Manufacturing is performed by PBI ISO qualified factories in China. Further R&D outsourcing is obtained from selected software/firmware partners in India, China, Taiwan and France. PBI management team works together to set strategy and guide the company at cost efficiency to meet the worldwide markets competition.

## Service

PBI emphasizes services by providing fast reaction and on-time delivery to meet customers' needs. Hardware has become a basic tool since the digital information era has begun, thus, the quality of the software is also what we promise to PBI users. With our prompt product logistics, we are able to build a fast reaction, on-time engineering service, and low-cost manufacturing hub in Asia for our OEM/ODM customers.

## The 21st Century Target

We build ourselves as our customers' own affiliated R&D and manufacturing center in Asia. We have made every effort and investment in R&D, production, inventory and logistic resources to fulfill custom-design requirement. Nevertheless, our best performance is our customers' satisfaction. We will continue to make every possible effort to achieve our corporate goals - a major OEM/ODM supplier in Asia at Digital Multimedia, Broadband Access, and Wireless Communications. So Please, Team-up with PBI-Brighten Your Digital View!

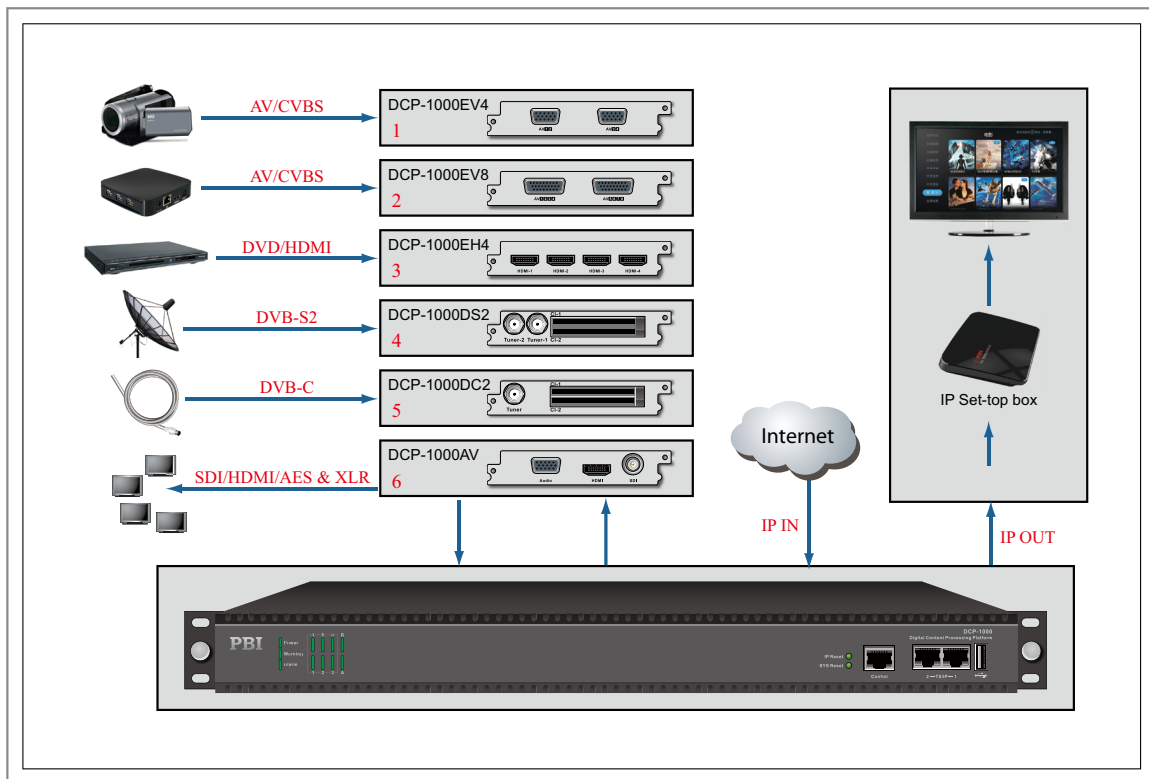
## DCP-1000 Digital Contents Processing Platform

DCP-1000 brings a compact and flexible solutions that allow the users to build or update the DTV or IPTV headend to meet a variety of requirements of today's new network architecture. DCP-1000 is a 1RU chassis with six independent I/O modules which be capable of transforming into digital headend as 48-channel H.264/SD encoder, 24-channel H.264/HD encoder, 12-channel satellite/cable IRD or 6-channel decoder. The six I/O modules and power supply all can support hot-swap.

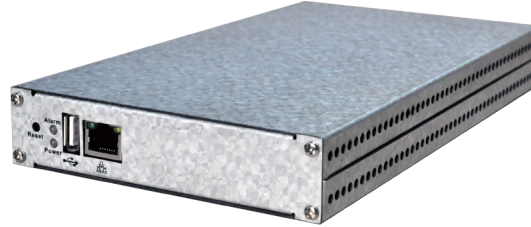


### Main Feature

- Support flexible combination of kinds of functional modules
- 800Mbps effective bit-rate through per TS/IP port
- SNMP & WEB Management System
- Redundant Power Supplies
- 19" x 1 U EIA standard chassis
- Module can independently work with mini chassis



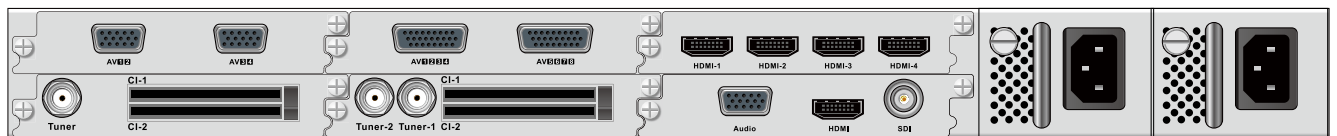
DCP-100MF



Data Protocol	UDP
Control Protocol	ICMP, ARP, IGMP v2/v3
<b>Front Panel</b>	
TS/IP and Control Port	1 x RJ45(GbE), 10/100/1000 Base-T (DS2/DC2/DA2/AV) 1 x RJ45(GbE), 10/100 Base-T (EV4/EV8/EH4)
USB Port	1 x USB (Upgrade)
Button	1 x IP reset

Status Indicator Lamp	2 x LED, Power (Green), Alarm(Red)
<b>Physical</b>	
Power Supply	DC12V/1.5A Max
Power Consumption	MAX.18W
Operating Temperature	0 ~ 45°C
Storage Temperature	-10 ~ 60°C
Operation Humidity	10 ~ 90%, (Non-condensed)
Dimension	233 × 130 × 30mm
Weight	1Kg

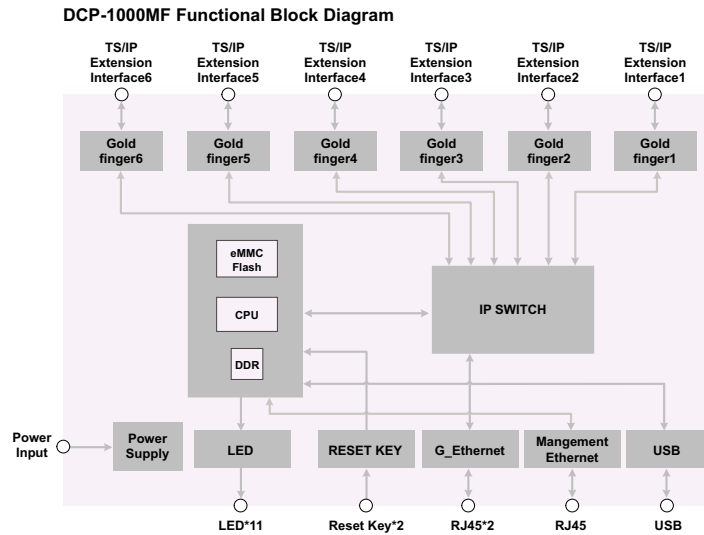
DCP-1000MF



Data Protocol	UDP
Control Protocol	ICMP, ARP, IGMP v2/v3
Max. Effective Bit Rate	800Mb/s per port
<b>Front Panel</b>	
TS/IP	2 × RJ45(GbE), 10/100/1000 Base-T
Control	1 × RJ45, 10/100 Base-T
USB	1 x USB
Status Indicator Lamp	11 x LED

<b>Rear Panel</b>	
Module Slot	6 x Slots
<b>Others</b>	
Power Supply	AC 100 - 240V 50/60Hz 1.5A Max
Operating Temperature	0 ~ 45°C
Storage Temperature	-10 ~ 60°C
Operation Humidity	10 ~ 90%, (Non-condensed)

Block Diagram



Encoding Module

**DCP-1000EV4**

4-channel H.264 Encoding Module



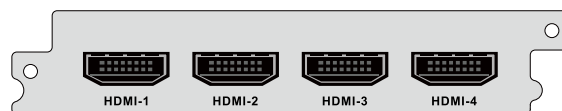
**DCP-1000EV8**

8-channel H.264 Encoding Module



**DCP-1000EH4**

4-channel H.264 Encoding Module



### Video Input & compression Coding

Connect Type	4 × CVBS (DCP-1000EV4) , 8 × CVBS (DCP-1000EV8) , 4 × HDMI (DCP-1000EH4)
Compression Standard	H264 BP, MP (CABAC) , HPJPEG/MJPEG
Sampling Format	YCbCr 4:2:0
Compression Bit Rate	16kbps~40Mbps 1080P (1920 × 1080) @50Hz,60Hz(Max. 2 Channels only) SMPTE274M:4~8Mb/s 1080i (1920 × 1080) @25Hz,29.97Hz SMPTE274: 4~8Mb/s
Video Resolution & Recommend	720p (1280 × 720) @50Hz, 59.94Hz SMPTE296M: 4~8Mb/s
Compression Bit Rate H.264	720p (1280 × 720) @25Hz, 29.97Hz SMPTE296M: 4~8Mb/s EV4/EV8:480P (720 × 480) @29.97Hz SMPTE656M: 2~4Mb/s EV4/EV8:576P (720 × 476) @25Hz SMPTE656M: 2~4Mb/s
Video Resolution & Recommend	480i (720 × 480) @29.97Hz SMPTE656M:3~10Mb/s
Compression Bit Rate MPEG-2	576i(720 × 476)@25Hz SMPTE656M:3~10Mb/s
Video Resolution	Vertical & Horizontal adjustable
Down Scaling	respectively (frame rate is not scalable)
Aspect Ratio	4:3, 16:9 Selectable

### Audio Input & Compression Coding

Connect Type	Embedded (DCP-1000EH4) or Analog (DCP-1000EV4/EV8)
Coding Standard	MPEG1 Layer II MPEG-2/4 AAC-LC/HE-AAC (V1, V2) Passthrough (EH4)
Sampling Rate	11.25/12/16/22/24/32/44.1/48KHz (EV4/EV8)

### TS over IP

Connect Type	1 x RJ45, 10/100Base-T
Maximum Effective Bit Rate	80M
Encapsulation	SPTS
Multicast Protocol	UDP, Multicast, IGMPv2

### Control & Monitoring

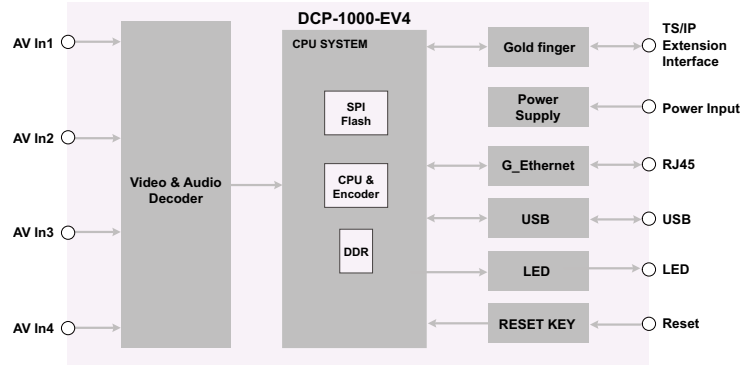
Remote Control Upgrade	SNMP, HTTP WEB HTTP
------------------------	------------------------

### Physical

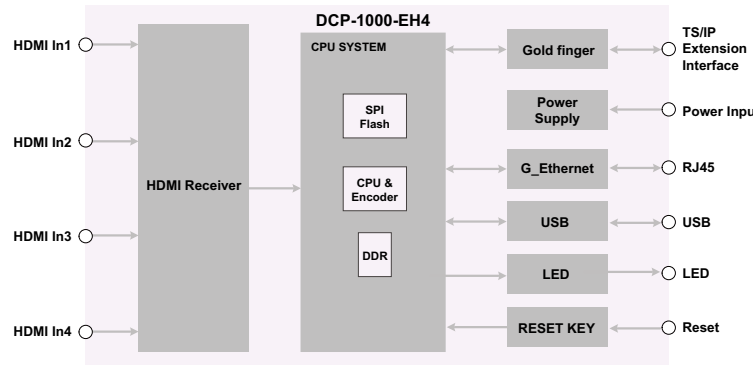
Power Supply	DC 12V
Power Consumption	20W
Operating temperature	0 ~ 45°C
Storage temperature	-10 ~ 60°C
Operating Humidity	10~90%, non-condensed

## Block Diagram

### DCP-1000-EV4 Functional Block Diagram



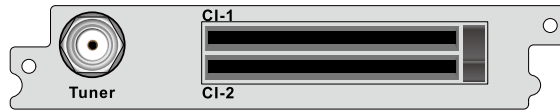
### DCP-1000-EH4 Functional Block Diagram



## Descrambling Module

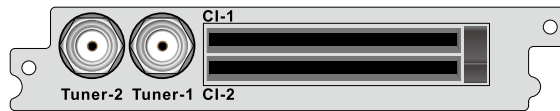
### DCP-1000DC2

2-channel DVB-C Demodulator Module



### DCP-1000DS2

2-channel DVB-C Demodulator Module

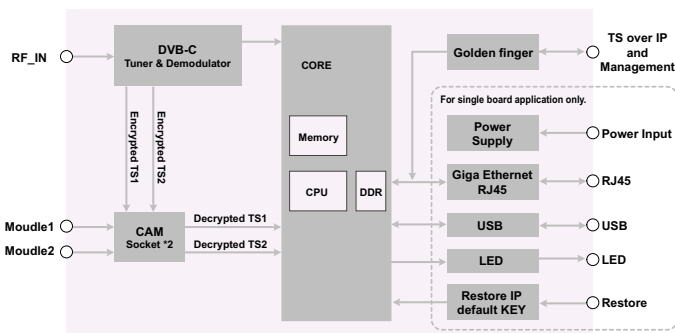


<b>Tuner Input</b>	
<b>DVB-S2/S</b>	
Connect Type	2 x F type female, 75Ω
Input Frequency Range	950 ~ 2150 MHz
Input Level	-65dBm ~ -25dBm
Symbol Rate	2 ~ 45Mbaud
Roll Off Factor	0.35(DVB-S QPSK), 0.35/0.25/0.2(DVB-S2 8PSK)
FEC Puncture Rate	2/3, 3/4, 5/6, 6/7, 7/8(DVB-S QPSK); 2/3, 3/4, 3/5, 5/6, 8/9, 9/10(DVB-S2 8PSK)
LNB Polarity Selection Voltage	0, 13V, 18V selectable
LNB Band Selection Tone	0/22K selectable
DiSEqC	DiSEqC 1.0
<b>DVB-C</b>	
Connect Type	F type female, 75Ω
Input Frequency Range	51 ~ 862 MHz
Input Level	45 ~ 75dB μV
Symbol Rate	1 ~ 7Mbaud (ITU J.83 Anne × A)
Modulation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Bandwidth	6MHz, 7MHz, 8MHz
Input Return Loss	7dB
<b>ATSC</b>	
Connect Type	F type female 75Ω input; F type female 75Ω Loop

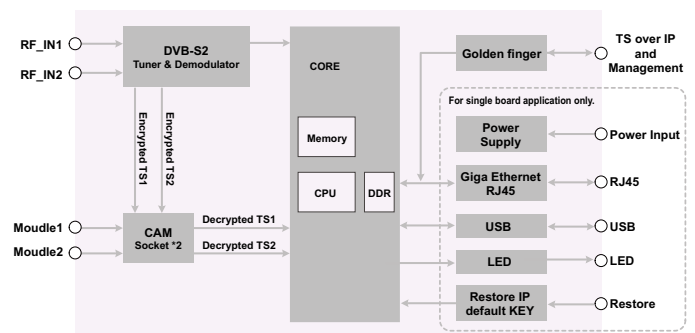
Input Frequency Range	54~864MHz
Input Level	-75~-7dBm (ATSC 8VSB)
Symbol Rate	10.762Mbaud
Modulation	8VSB
Roll Off Factor	0.115
Bandwidth	6MHz
<b>TS over IP</b>	
Connect Type	1 × RJ-45, 10/100/1000 Base-T
Maximum Effective Bit Rate	70Mb/s
Protocol	UDP, Multicast, IGMPv2
Unicast/Multicast	MPTS
<b>TS Processing</b>	
TS Input	Tuner1, Tuner2
TS Output	TS over IP
BISS Decrypt	BISS-1, BISS-E
Descrambling Connector	PCMCIA, 2xCI Slot
<b>Control &amp; Monitoring</b>	
Remote Control Upgrade	SNMP, HTTP WEB HTTP
<b>Physical</b>	
Power Supply	DC 12V
Power Consumption	20W
Operating temperature	0 ~ 45°C
Storage temperature	-10 ~ 60°C
Operating Humidity	10~90%, non-condensed

## Block Diagram

DCP-1000DC2 Functional Block Diagram



DCP-1000DS2 Functional Block Diagram





## Decoding Module

### DCP-1000AV Decoding Module

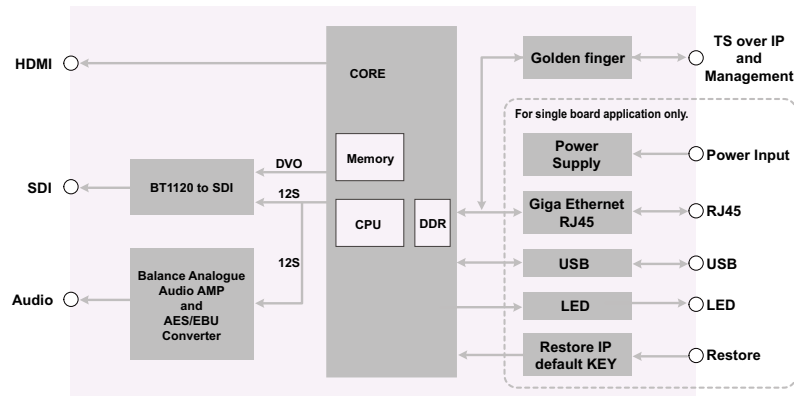


<b>TS over IP</b>	
Connect Type	1 × RJ-45, 10/100Base-T
Effective Bit Rate	70Mb/s
Protocol	UDP, Multicast, IGMPv2/v3
Video Decode	MPEG-2(MP@ ML for SD, MP@HL for HD) MPEG 4/H.264 AVC Part 10 (MP@L3 for SD, HP@L4.1 for HD)
Audio Decoder	MPEG-1 Layer-I/II, MPEG-2 Layer-II LC-AAC, HE-AAC
<b>HDMI Output</b>	
Connect Type	1 × HDMI 1.3
Video Resolution and Frame Rate	1080P@30Hz, 1080P@25Hz, 1080P@24Hz, 1080i@50Hz, 1080i@60Hz, 720P@60Hz, 720P@50Hz, 576i@50Hz
Embedded Audios	1 stereo pairs or digital audio pass-through
<b>SDI Output</b>	
Connect Type	1 × BNC type female, 75 Ω
Video Resolution and Frame Rate	1080P@30Hz, 1080P@25Hz, 1080P@24Hz, 1080i@50Hz, 1080i@60Hz, 720P@60Hz, 720P@50Hz, 576i@50Hz

HD SDI standard	SMPTE252M, 1.485Gbit/s (10bit)
Output Level	800mVp-p
<b>Audio Output</b>	
Connect Type	1 × D-sub15 male with XLR adaptor cable
Sampling Rate	32KHz, 44.1KHz, 48KHz
Bit Rate	MPEG-1 Layer I: 32,64,96,128,160,192,224,256,288,320,352,384,416 and 448kb/s MPEG-1 Layer II: 32,48,56,64,80,96,112,128,144,160,192,224,256,320 and 384kb/s
Output Level	1Vp-p (with standard test stream)
Output Format	AES/EBU
<b>Control &amp; Monitoring</b>	
Remote Control	SNMP, HTTP
Upgrade	WEB HTTP
<b>Physical</b>	
Power Supply	DC 12V
Power Consumption	20W
Operating temperature	0 ~ 45°C
Storage temperature	-10 ~ 60°C
Operating Humidity	10~90%, non-condensed

## Block Diagram

DCP-1000AV Functional Block Diagram



## Order Information

Module list	
DCP-1000EV4	4-channel SD H.264 Encoder Module
DCP-1000EV8	8-channel SD H.264 Encoder Module
DCP-1000EH8	4-channel HD H.264 Encoder Module
DCP-1000DC2	2-channel DVB-C Demodulation & Descrambling Module
DCP-1000DS2	2-channel DVB-S2 Demodulation & Descrambling Module
DCP-1000DA2	2-channel ATSC Demodulation & Descrambling Module
DCP-1000AV	HD/SD Decoding Module

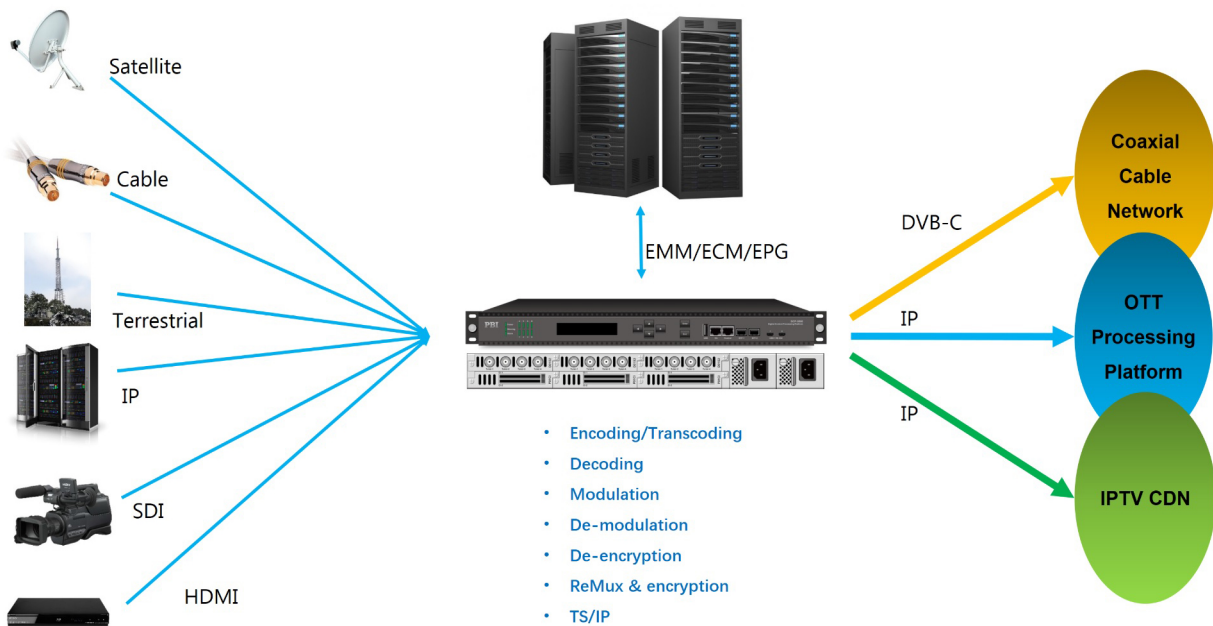
## DCP-3000 Digital Contents Processing Platform

PBI Digital Contents Processing Platform DCP-3000 brings a compact, powerful and flexible solutions that allow the users to build or update DTV or IPTV headend to meet the requirements of today's new network architectures. DCP-3000 is a compact 1U platform capable of processing a high number of streams. By inserting up to 6 optional functional modules and pluggable reMUX/Scrambler extended modules, DCP-3000 integrates all DTV headend functions, such as DVB signal reception, descrambling, encoding, transcoding, remultiplexing, scrambling and modulation in to one single unit.



### Main Feature

- Maximum data throughput 49Gb/s
- 16 TS processors on the main board, 100Mb/s bandwidth for each TS processor
- 2 SFP GbE IP ports with maximum 920Mbps input and output data rate
- Up to 256 MPTS/SPTS TS/IP input and 512 MPTS/SPTS output without IP-FEC
- Up to 24 MPTS/SPTS TS/IP input and 24 MPTS/SPTS output with IP-FEC
- PSI/SI edition and re-generation, PID re-mapping and filtering
- Control and monitoring by Front Panel, Menu, Web and SNMP
- Total 6 slots for different digital TV functional modules: modulator, demodulator, encoder, trans-coder, decoder, interface adapter, etc
- Removable cooling fan assembly with alarm & speed control
- Dual hot-swappable power supplies units
- 1RU rack with display screen, 6 buttons, RS-232, USB



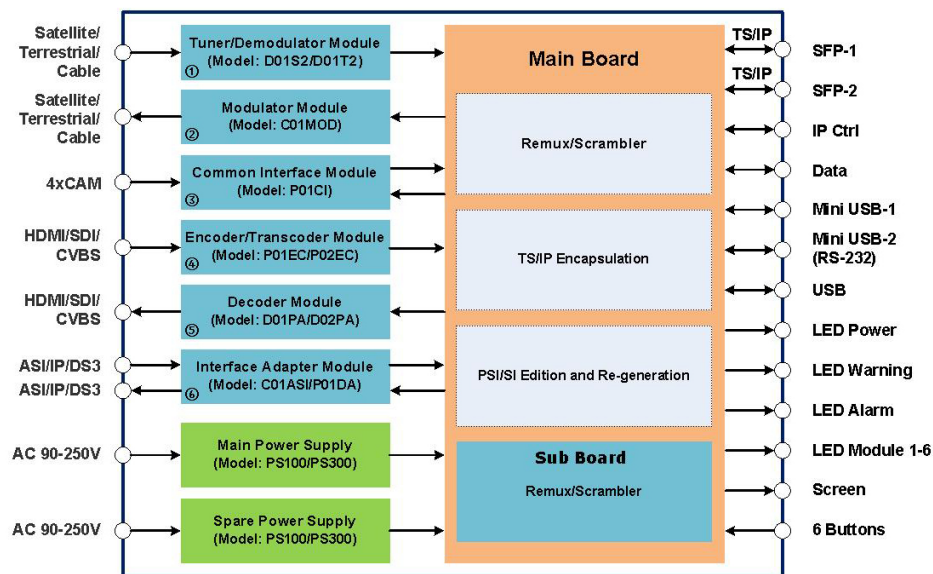
## Chassis Specification

Data Exchange		Debug Connector Type	
Standard	IEEE 802.3, 1000 Base-T, Full Duplex		2 x Mini USB
Max. Effective Bit Rate	920Mb/s	Display	2 x 20 characters LCD Display
Data Protocol	UDP or RTP, SPTS or MPTS	<b>Rear Panel</b>	
Control Protocol	ICMP, ARP, IGMP v2/v3	Module Slot	6 x Slots
<b>Front Panel</b>		<b>Others</b>	
TS/IP Connector Type	2 x SFP, 1000 Base-T	Power Supply	AC 100 - 250V 100W & 300W
CA Connector Type	1 x RJ-45, 10/100/1000 Base-T	Operating Temperature	0 ~ 45°C
Control Connector Type	1 x RJ-45, 10/100/1000 Base-T	Storage Temperature	-10 ~ 60°C
Upgrade Connector Type	1 x USB	Operation Humidity	10 ~ 90%, (Non-condensed)

## Optional Function Modules

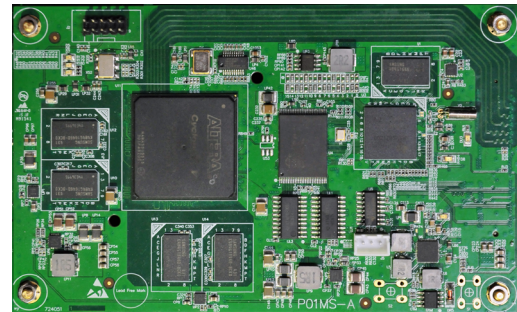
Function	Model	Description
Demodulation/De-scrambling Modules	D01S2	4-Way DVB-S/S2 Demodulating Module
	D02S2	4-Way DVB-S/S2 Demodulating Module, support ISI
	D01T2	4-Way DVB-T2/T/C Demodulating Module, support T2-MI
	P01CI	4-Way CI Module
Encoding/Transcoding Modules	P01EC	4-Way H.264/MPEG-2 Encoding/Transcoding Module, HDMI input
	P02EC	4-Way H.264/MPEG-2 Encoding/Transcoding Module, SDI input
	P01AT	4-Way HD/SD H.265 to H.264/MPEG-2 Transcoding Module
Decoding Modules	D01PA	2-Way HD/SD decoding module, HDMI and CVBS output
	D02PA	2-Way HD/SD decoding module, SDI and CVBS output, Genlock input
Multiplexing/Scrambling Module	P01MS	Re-multiplexing & Scrambling Module, 32 independent TS reMUX's and Scramblers
Modulation Modules	C01MOD	8-Way QAM/2-Way COFDM Modulation Module
	C02MOD	4-Way Un-adjacent Frequencies QAM/ATSC/COFDM/DTMB Modulation Module
Interface Module	C01ASI	5 x ASI In/Out Module
	P01DA	2 x DS3 Input/2 x DS3 Output/1 x ASI Adaptor Module

## Block Diagram



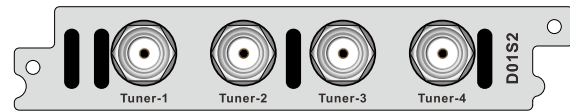
**P01MS** reMUX & Scrambler Extension Module

Standard	Compliant with ISO13818 & EN300 468
Total Data Processing	15Gbps data processing capability
Re-Multiplexing & Scrambling Function	32 independent TS reMUX's and Scramblers
PID	PID filtering, remapping, pass through & mapping
PSI/SI	Insert & Edit PSI/SI tables
PCR	PCR re-stamp & calibrate
Scrambling	Local or remote CAS synchronous simul-crypt processing
Temperature Control	Self-temperature monitoring



**D01S2 / D02S2** 4 x DVB-S/S2 Demodulator Module

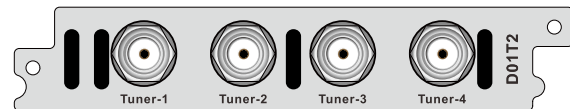
Connector Type	4 x F type female, 75Ω
Input Frequency Range	950 ~ 2150 MHz
Input Level	-65dBm ~ -25dBm
Symbol Rate	2~45MBaud(DVB-S QPSK), 2~31MBaud (DVB-S2 8PSK)
Roll Off Factor	0.35(DVB-S QPSK), 0.35/0.25/0.2(DVB-S2 8PSK)
FEC Puncture Rate	2/3, 3/4, 5/6, 6/7, 7/8(DVB-S QPSK); 2/3, 3/4, 3/5, 5/6, 8/9, 9/10(DVB-S2 8PSK)
LNB Polarity Selection Voltage	0, 13V, 18V selectable
LNB Band Selection Tone	0/22K selectable



DiSEqC	DiSEqC 1.0
BISS-1/E Decrypt	Each tuner supports 40 PIDs maximum
ISI	D02S2 Support
ISI ID	1~255
T2-MI de-encapsulator	Support

**D01T2** 4 x DVB-C/T/T2 Demodulator Module

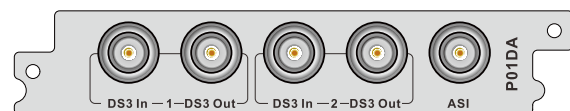
Connector Type	4 x F Type Female, 75Ω
Input Frequency	48 ~ 860 MHz(DVB-C) 104 ~ 862 MHz(DVB-T/T2)
Input Level	-15~ 15dBm (DVB-C) -70 ~ -20dBm (QEF, DVB-T/T2)
Symbol Rate	1 ~ 7MSps (ITU J.83 Annex A DVB-C)
Standard	DVB-T2 v1.3
Constellation	16/32/64/128/256 QAM(DVB-C) QPSK/16 QAM/64QAM(DVB-T) QPSK/16 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)
Input Return Loss	7dB

**P01DA** 2 x DS3 Input/2 x DS3 Output/1 x ASI Adaptor Module

Connector Type	5 x BNC Female, 75Ω
Standard	DVB-ASI, EN50083-9 / ITU-T G.703
Frame Structure	ITU-T G.752 / ITU-T G.804
ASI Input or Output	Switch by Web Control
DS3 bit rate	44.736Mbps



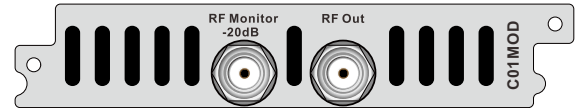
## P01CI 4 x CI De-encryption Module

Connector Type	4 x Independent Common Interface(DVB-CI) slots
CI Decrypt	Multiple programs CAS or BISS-1/E De-encryption
CAM watchdog	Support



## C01MOD 8-carrier QAM or 2-carrier COFDM Modulator Module

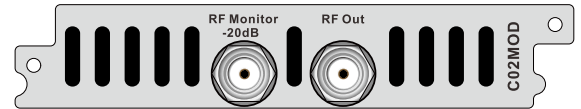
Connector Type	2 x F type Female, 75Ω (1 x main output, 1 x -20dB monitor output)
Modulation	Support QAM or COFDM Modulation (Can't simultaneous working)
Standard of System	ITU-T J.83 Annex A, C
RF Output	2 groups of 4 adjacent channel carriers QAM RF output 2 un-adjacent channel carriers COFDM RF output
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM (QAM)
Modulation Mode	16/32/64/128/256QAM(QAM) QPSK/16/64QAM(COFDM)
FFT Mode	2K/8K



RF output range	48 ~ 996MHz, step by 1KHz
Symbol rate	2.5 ~ 6.99MBauds
RF total output level	94 ~ 120dBuV
MER	> 38dB
Spurious rejection	> 55dB
Output return loss	-10dB

## C02MOD 4-carrier Un-Adjacent Frequencies QAM/ATSC/COFDM/DTMB Modulator Module

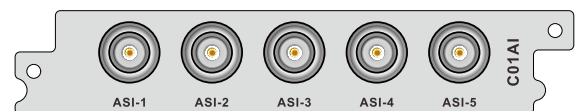
Connect Type	2xF type Female, 75Ω (1 x main output, 1 x -20dB monitor output)
Modulation	Support ATSC/QAM(Annex A/B)/COFDM/DTMB Modulation ( Can't simultaneous working)
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM (QAM Annex A) 64QAM, 256QAM (QAM Annex B) 8VSB (ATSC) QPSK, 16QAM, 64QAM (COFDM) QPSK, 16QAM, 32QAM, 64QAM, QAM4_NR (DTMB)
Standard of System	ITU-T J.83 Annex A, B
RF output range	48 ~ 996MHz, step by 1KHz 16/32/64/128/256QAM(QAM Annex A) 64/256QAM(QAM Annex B)
Modulation Mode	QPSK/16/64QAM(COFDM) 8VSB(ATSC) QPSK/16/32/64QAM/QAM4_NR(DTMB)



FFT Mode	2K/4K/8K
RF output range	48 ~ 996MHz, step by 1KHz
Symbol rate	2.5 ~ 6.99MBauds
RF total output level	80 ~ 100dBuV
MER	> 36dB
Spurious rejection	> 55dB
Output return loss	-10dB

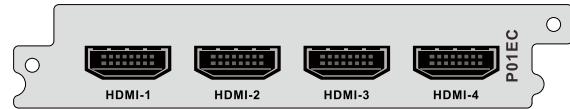
## C01ASI 5 x ASI Input/Output Module

Connector Type	5 x BNC Type Female, 75Ω
Standard	DVB-ASI, EN50083-9
Input or Output	Switch by Web Control
Input and Output Bit Rate	≤ 216Mb/s
T2-MI	support



**P01EC** 4 x HDMI In Encoder/Transcoder Module

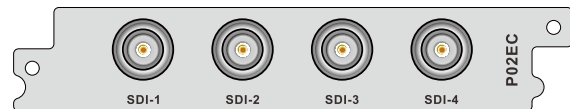
Connector Type	4 x HDMI, type A
Coding Profile & Level	H.264/AVC BLP, MP, HP @ L4.0 or less & MPEG-2 MP@ML
Sampling Format	4:2:0 1080i (1920 × 1080) @25Hz,29.97Hz,30Hz: SMPTTE274M:1~13Mb/s 1080i (1440 × 1080) @25Hz, 29.97Hz SMPTTE274M: 5~24Mb/s
Video Resolution & Recommend	720p (1280 × 720)
Compression Bit Rate H.264	@59.94Hz,50Hz:SMPTTE296M: 1~13Mb/s 480i (720 × 480) @29.97Hz:SMPTTE656M: 600K~10Mb/s 576i (720 × 576) @25Hz: SMPTTE656M:600K~10Mb/s
Video Resolution & Recommend	480i (720 × 480) @29.97Hz:SMPTTE656M: 3M~10Mb/s
Compression Bit Rate MPEG-2	576i (720 × 576) @25Hz: SMPTTE656M: 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	Embedded
Coding Standard	MPEG1 Layer II
Sampling Rate	MPEG-2/4 AAC-LC, HE-AAC (V1, V2) 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)
Transcode Mode	H.264 to MPEG-2, H.264 to H.264, MPEG-2 to MPEG-2, MPEG-2 to H.264 MPTS/SPTS, MPEG2 MP@ML MP@HL, MPTS/SPTS, H.264/AVC Main/High/Baseline Profile @ L4.0 or less (but not FMO, ASO & RS of Baseline)
Input	MPTS and/or un-stuffed TS, MPEG2 MP@ML MPTS and/or un-stuffed TS, H.264/AVC Main/High/Baseline Profile @ L4.0 or less (but not include FMO, ASO & RS of Baseline)
Output	MPTS and/or un-stuffed TS, H.264/AVC Main/High/Baseline Profile @ L4.0 or less (but not include FMO, ASO & RS of Baseline)

**P02EC** 4 x SDI In Encoder/Transcoder Module

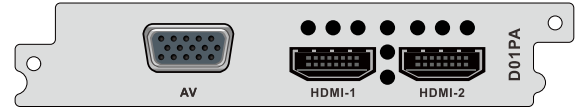
Connector Type	4xSDI, BNC Type Female, 75Ω
Coding Profile & Level	H.264/AVC BLP, MP, HP @ L4.0 or less & MPEG-2 MP@ML
Sampling Format	4:2:0, 10-bit, YCbCr 1080i (1920 × 1080) @25Hz,29.97Hz,30Hz: SMPTTE274M:1~13Mb/s 1080i (1440 × 1080) @25Hz, 29.97Hz SMPTTE274M: 5~24Mb/s
Video Resolution & Recommend	720p (1280 × 720)
Compression Bit Rate H.264	@59.94Hz,50Hz:SMPTTE296M: 1~13Mb/s 480i (720 × 480) @29.97Hz:SMPTTE656M: 600K~10Mb/s 576i (720 × 576) @25Hz: SMPTTE656M:600K~10Mb/s
Video Resolution & Recommend	480i (720 × 480) @29.97Hz:SMPTTE656M: 3M~10Mb/s
Compression Bit Rate MPEG-2	576i (720 × 576) @25Hz: SMPTTE656M: 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
Sampling Rate	MPEG-2/4 AAC-LC, HE-AAC (V1, V2) 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)
Second sound encoding	Support with optional extension board
Transcode Mode	H.264 to MPEG-2, H.264 to H.264, MPEG-2 to MPEG-2, MPEG-2 to H.264
Transcode Channels	4/8(Optional) MPTS/SPTS, MPEG2 MP@ML MP@HL, MPTS/SPTS, H.264/AVC Main/High/Baseline Profile @ L4.0 or less (but not FMO, ASO & RS of Baseline)
Input	MPTS and/or un-stuffed TS, MPEG2 MP@ML MPTS and/or un-stuffed TS, H.264/AVC Main/High/Baseline Profile @ L4.0 or less (but not include FMO, ASO & RS of Baseline)
Output	MPTS and/or un-stuffed TS, H.264/AVC Main/High/Baseline Profile @ L4.0 or less (but not include FMO, ASO & RS of Baseline)

## D01PA 2 x H.264/MPEG-2 Decoder Module

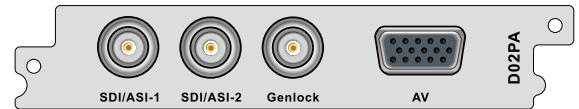
Connect Type	2 x HDMI 1.3, 1 x D-sub 15 Female (2 pairs CVBS out adpaper)
Video Decode	MPEG-2(MP@ ML for SD, MP@HL for HD) MPEG 4/H.264 AVC Part 10 (MP@L3 for SD, HP@L4.1 for HD)
Video Resolution	1080i × 30, 1080i × 29.97, 1080i × 25, 720p × 60, 720p × 59.94, 720p × 50, 576i × 25, 480i × 29.97
Video Bit Rate	< 50Mb/s
Aspect Ratio	16:9, 4:3 selectable
SD SDI standard	SMPTE259M, 270Mb/s (10bit)
HD SDI standard	SMPTE292M, 1.485Gb/s (10bit)
Sampling Rate	32KHz, 44.1KHz, 48KHz
Audio Format	MPEG Layer1/2 AAC-LC, HE-AAC v1/v2
Analog Video Output	CVBS, 2 x RCA, (DB15 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)
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, (DB15 adapter)
Output Impedance	600 Ω (Balanced)
Output Mode	Left, Right, Mono, Stereo
Audio Decoding	2 pairs Stereo (2 groups of audios PID or 4 sound channels)
Cross Talk	> 70dB
THD	< 0.3% @400Hz, 1KHz test done
Frequency Response	± 0.5dB (20Hz ~ 18KHz)
Output Level	-30 ~ +7dB (Adjustable, 0dBm/600 Ω)
Subtitle	DVB, EBU
VBI	Teletext, WSS
Closed Caption	EIA 608, EIA 708

## D02PA 2 x H.264/MPEG-2 Decoder Module

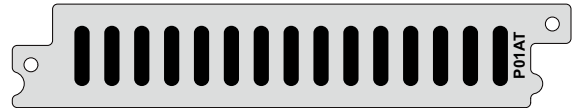
Connector Type	2 x SDI outputs, 1xGenlock input, BNC Female 75 Ω, 2 x CVBS outputs by D-sub 15 to RCA convertor
Video Decode	MPEG-2(MP@ ML for SD, MP@HL for HD) MPEG 4/H.264 AVC Part 10 (MP@L3 for SD, HP@L4.1 for HD)
Video Resolution	1080i × 30, 1080i × 29.97, 1080i × 25, 720p × 60, 720p × 59.94, 720p × 50, 576i × 25, 480i × 29.97
Video Bit Rate	< 50Mb/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 Dolby Digital (AC3) Dolby Digital Plus(AC3+) AAC-LC, HE-AAC v1/v2
Analog Video Output	CVBS, 2 x RCA, (DB15 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)
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, (DB15 adapter)
Output Impedance	600 Ω (Balanced)
Output Mode	Left, Right, Mono, Stereo
Audio Decoding	2 pairs Stereo (2 groups of audios PID or 4 sound channels)
Cross Talk	> 70dB
THD	< 0.3% @400Hz, 1KHz test done
Frequency Response	± 0.5dB (20Hz ~ 18KHz)
Output Level	-30 ~ +7dB (Adjustable, 0dBm/600 Ω)
Subtitle	DVB, EBU
VBI	Teletext, WSS
Closed Caption	EIA 608, EIA 708
Genlock	Support
BNC Output Mode	SDI Output/ASI Input/ASI Output can be switched by Web Control

**P01AT** 4-Way HD/SD H.265 to H.264/MPEG-2 Transcoding Module

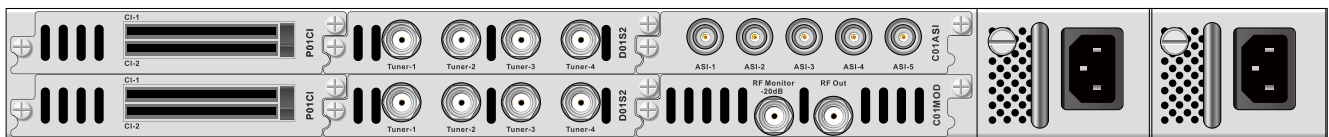
Transcoding mode	H.265 HD/SD to H.264, H.265 HD/SD to MPEG-2 SD H.264 to MPEG-2 SD, H.264 to H.264, MPEG-2 to MPEG-2 SD, MPEG-2 to H.264 Compliant with H.265 (HEVC), H.264/AVC
Input	Baseline, Main & High Profile @ L4.0 or less & MPEG-2 MP@ML
Coding standard	MPEG-1 Layer II, MPEG-2/4, AAC-LC/HEAAC, support Dolby AC3 Passthrough
Video Resolution & Recommend	1080i (1920 × 1080) @25Hz, 29.97Hz SMPTTE274M: 1~13Mb/s 1080i (1440 × 1080) @25Hz, 29.97Hz SMPTTE274M: 5~24Mb/s
Compression Bit Rate	720p (1280 × 720) @50Hz, 59.94Hz, SMPTTE296M: 1~13Mb/s
H.264	480i (720 × 480) @29.97Hz SMPTTE656M: 600K~10Mb/s 576i (720 × 576) @25Hz: SMPTTE656M:600K~10Mb/s



Video Resolution & Recommend	480i (720 × 480) @29.97Hz SMPTTE656M: 3M~10Mb/s
Compression Bit Rate	576i (720 × 576) @25Hz SMPTTE656M: 3M~10Mb/s
MPEG-2	3M~10Mb/s
Aspect Ratio	16:9, 4:3 selectable
Output	MPTS and/or un-stuffed TS, MPEG2 MP@ML MPTS and/or un-stuffed TS, H.264/AVC Main/High/Baseline Profile @ L4.0 or less (but not include FMO, ASO & RS of Baseline)

Typical Application

8 x DVB-S/S2 Demodulating + 8 x Descrambling + 5 x ASI Inputs/Outputs + 1 QAM Modulating





# DCH-6000P

## Professional H.265/HEVC IRD and Processor



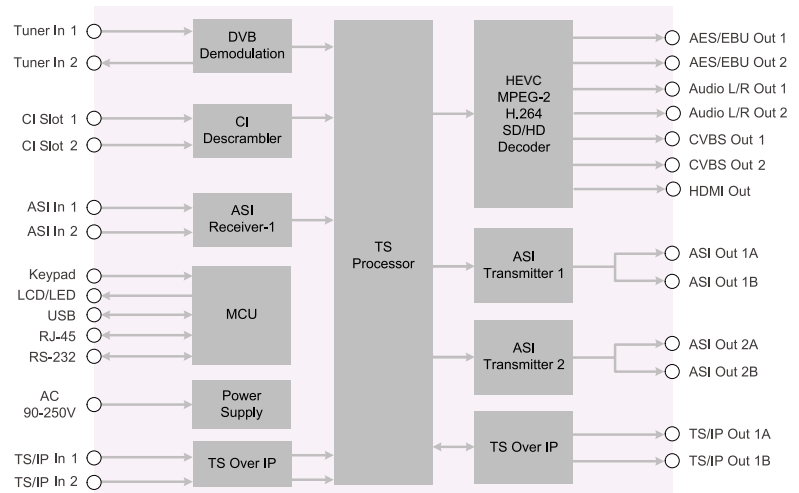
The DCH-6000P is the newest model and flagship of PBI's IRD product family. It provides operators an ideal solution for receiving, remultiplexing, descrambling and decoding operations, supporting all MPEG profile from Main to High including 4K\*2K@60fps 10bit. Equipped with a variety of inputs, it ensures compatibility with all transmission media. The DCH-6000P's remultiplexing capabilities enable creation of new transport streams that are subsets of the original stream. Customized services may be output as multiple SPTS or MPTS over IP, as well as over ASI. By the dual DVB common interfaces, DCH-6000P could decrypt multiple services in one transport stream or two. DCH-6000P is also a professional IRD that features a broadcast quality decoder for 4:2:0 of MPEG-2, MPEG-4/AVC and HEVC/H.265 in both Standard Definition, High Definition and UHD formats, and provides a variety of industry standard digital and analog outputs, including CVBS video, AES/EBU Audio, analog Audio, SD-SDI and HD-SDI. Frame Synchronization to the external black and burst signal is also available. The unit also performs UHD down-conversion and aspect ratio adaptation of HD programs to generate professional quality baseband analog video and audio outputs for easy integration with existing cable network infrastructure. This all-in-one architecture makes the DCH-6000P an ideal product for distribution and contribution networks.

### Main Feature

- Variety of input options DVB-T2/S2/S/C/T/DTMB/ATSC/ISDB-T, DS3/E3, TS/IP and ASI
- Supports DVB-S2 Input Stream Identifier (ISI, optional) and DVB-T SFN MIP pass through
- Redundant backup among Tuner, ASI and TS/IP with configurable priority
- Maximum supporting 4:2:0 60p 10bit UHD/HD/SD HEVC/H.265, SD/HD MPEG-2 and MPEG-4 AVC/H.264 digital video decoding
- Multiple Analog and Digital Outputs, ASI, CVBS, HDMI, AES/EBU Audio, TS/IP
- Built-in TS re-multiplexer receives from ASI, Tuner and TS/IP Inputs
- 2x DVB-CI Slots, multi-program decryption, BISS-1 and BISS-E decryption
- Frame synchronizes the IRD to the external black and burst reference
- Dynamic PMT detection and automatic updating
- Supports VBI TELETEXT, EBU/DVB Subtitle, Closed Caption, and can be embedded in SDI
- UDP/RTP, Unicast/Multicast, and double full duplex SPTS/MPTS over IP
- Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software
- One alarm Relay with D-sub 9 male connector
- On Site software update through IP and USB
- RSSI, received Eb/No & BER monitoring
- 1.5" TFT LCD on front panel for monitoring
- Hot-swappable redundant power supply

### Block Diagram

DCH-6000P Functional Block Diagram



Specification

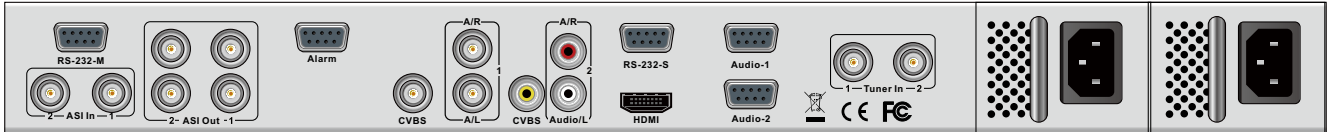
<b>Tuner Input</b>	
<b>DVB-S/S2 Tuner Input (ISI Factory Optional)</b>	
Connector Type	2×F type female 75Ω for Input
Input Frequency Range	950~2150MHz
Input Level	-25~-65dBm
Symbol Rate	1~45Msps
Roll-off Factor	DVB-S: 0.35 DVB-S2: 0.35, 0.25, 0.2
FEC Code Rate	DVB-S QPSK: 1/2, 2/3, 3/4, 5/6, 7/8 DVB-S2 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	0, 13V, 18V selectable
LNB Band Selection Tone	0/22KHz selectable
Satellite Selection Command	DiSEqC 1.0
ISI ID	1~255 user configurable
<b>DVB-S/S2 Tuner Input (16APSK/32APSK Factory Optional)</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	950 ~ 2150MHz
Input Level	-25 ~ -65dBm
Symbol Rate	QPSK/8PSK/16APSK: 2 ~ 45Msps 32APSK: 2 ~ 37Msps
Roll-off Factor	DVB-S: 0.35 DVB-S2: 0.35, 0.25, 0.2
FEC Code Rate	DVB-S: 1/2, 2/3, 3/4, 5/6, 7/8 DVB-S2: 1/2, 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
LNB Polarity Selection	0, 13V, 18V selectable
LNB Band Selection Tone	0/22KHz selectable
Satellite Selection Command	DiSEqC 1.0
<b>DVB-C Tuner Input</b>	
Connector Type	2×F type female 75Ω for Input
Input Frequency Range	51~862MHz
Input Level	51~75dBμV
Symbol Rate	1~7MBaud (ITU J.83 Annex A)
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Bandwidth	6MHz, 7MHz, 8MHz
Input Return Loss	7dB (typ.)
<b>DVB-T/T2 Tuner Input</b>	
Connector Type	2×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
Guarding 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.)
<b>DTMB Tuner Input</b>	
Connector Type	2×F type female 75Ω for Input
Input Frequency	46.5~866MHz
Input Level	-87~-29dBm
Symbol Rate	7.56MBaud
Bandwidth	6MHz/7MHz/8MHz
Constellation	4QAM-NR, 4QAM, 16QAM, 32QAM, 64QAM
Guard Interval	PN420, PN595, PN945
Roll-off Factor	0.05
Interleaving Depth	240, 720
FEC Code Rate	0.4, 0.6, 0.8
<b>ATSC Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input
Input Frequency Range	54~864MHz
Input Level	-75~-7dBm(ATSC 8VSB)
Symbol Rate	10.762MBaud

Constellation	8VSB
Roll-off Factor	0.115
Bandwidth	6MHZ
Bandwidth	6MHZ
<b>ASI Input</b>	
Connector Type	2×BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Bit Rate	≤ 200Mb/s
<b>DS3/E3 Input</b>	
Connector Type	2×BNC female, 75Ω, including loop through
Standard	Compliant with ITU-T G.703
Frame Structure	Compliant with ITU-T G.752 and ITU-T G.804
Bit Rate	DS3: 44.736Mb/s E3: 34.368Mb/s
<b>TS over IP</b>	
Connector Type	2×RJ-45 independent, 100/1000 Base-T for TS/IP 1, full duplex, Support Pro MPEG FEC, Backup 1+1, Max 80Mb/s
Operating mode & Effective Bit Rate	2, 4-CH DVB mode output, Max 200Mb/s, Slave mirror output 3, 32-CH IPTV mode output, Total 800Mb/s, Slave mirror output
Protocol	UDP / RTP, Multicast / Unicast, IGMPv3, ARP
FEC	SMPT E 2022M (Pro-MPEG) FEC (for GbE only)
<b>TS Processing</b>	
TS Input Management	Demux and Remux among Tuner / DS3(optional) / E3 (optional), ASI and TS/IP Inputs
TS Output Management	Demux and Remux for 2 independent ASI outputs
Service and PID Management	Remux, filtering and remapping
PSI/SI	PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation, EIT P/F 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
<b>ASI Output</b>	
Connector Type	2 pairs, 4 x BNC females, 75Ω
Standard	DVB-ASI, EN50083-9
Output Bit Rate	≤ 200Mb/s
TS Processing	2 Independent TS pass through or Remultiplexed from tuner, TS/IP and 2 ASI inputs
<b>HDMI Output</b>	
Standard	1×HDMI 1.4interface, HDCP 2.2
Video Resolution and Frame Rate	4KP60, 4KP50, 1080P50, 1080P30, 1080P24, 1080i60, 1080i50, 720p, 480p, 576p, 576i, 480i
Video PID Bit Rate	≤ 50Mb/s
<b>Video Decode</b>	
Video Profile/Level	MPEG2 SP@ML, MP@HL MPEG4 SP@L0-3, ASP@L0-5, GMC, H.264 BP/MP/HP@ level 5.0, H.265 Main Profile@L5.0 High-tier
<b>Audio Decode</b>	
Audio Format	MPEG-1 Layer 2 a. 2 stereo pairs (Stereo, Dual Mono, Left, Right) MPEG-2 AAC a. 5.1 down-mix to 2.0 (Stereo, Dual Mono, Left, Right) b. 2.0 (Stereo, Dual Mono) MPEG-4 HE-AAC v1/v2 a. 5.1 down-mix to 2.0 (Stereo, Dual Mono, Left, Right) b. 2.0 (Stereo, Dual Mono, Left, Right)

<b>Analog video Output</b>	
CVBS Connector	1×BNC female 75Ω, 1×RCA female
CVBS Standard	NTSC, PAL, and SECAM
CVBS Resolution	576i×25, 480i×29.97
<b>Analog Audio Output</b>	
Connector Type	2×BNC female, 2×RCA female
Output Impedance	75Ω
Output Mode	Left, Right, Dual Mono, Stereo
Number of Output	2 pairs of stereo audio outputs (2 Audio PIDs or 4 channels are decoded)
<b>Ancillary Data Processing</b>	
Subtitle	DVB, EBU
VBI	Teletext, WSS
Closed Caption	EIA 608, EIA 708, EIA 608-to-708
<b>Redundancy</b>	
Redundancy Port	among Tuner, ASI input and TS/IP input
Switching Condition	TS Sync Loss
Switching Mode	Main, Spare
<b>Ancillary Data Processing</b>	
Subtitle	DVB, EBU
VBI	Teletext, WSS
Closed Caption	EIA 608, EIA 708, EIA 608-to-708
<b>Redundancy</b>	
Redundancy Port	among Tuner, ASI input and TS/IP input

Switching Condition	TS Sync Loss
Switching Mode	Main, Spare
<b>Alarm</b>	
Connector Type	2×D-sub 9 male
Switching Condition	User Defined
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/100 Base-T, for equipment IP Control
Remote Control	SNMP 2.0, HTTP (Web GUI), Proprietary HDMS (Headend Device Management System)
Local Control	LCD display and Front control 6-key keypad
Serial Port	1×RS-232 D-sub female, for debug use only
Equipment Upgrade	Telnet/FTP, WEB/HTTP or USB
<b>Physical</b>	
Dimension	1U 19" Full-rack size
Weight	5.0Kg
Power Supply	AC 90V~250V, 50/60Hz
Power Consumption	30W (exclusive of LNB power)
Operating temperature	0~45°C
Storage temperature	-10~60°C
Operating Humidity	10~90%, non-condensed

Back panel Interface



## DCH-6100P

### Professional H.265/HEVC IRD and Processor

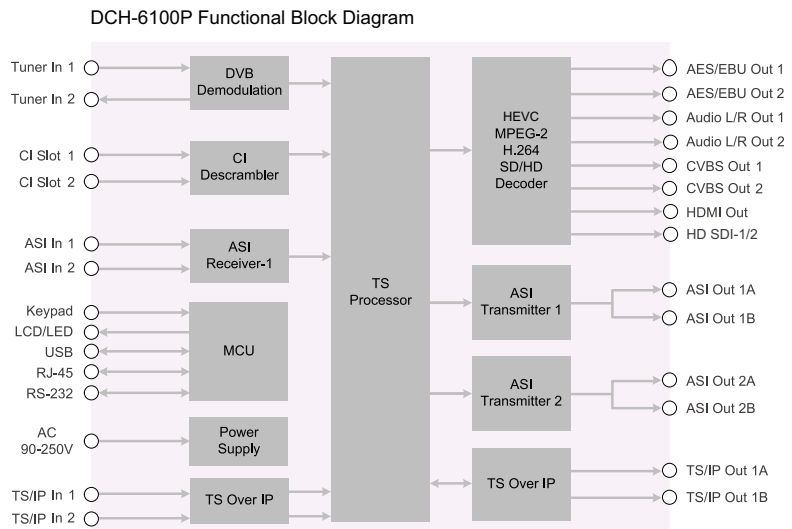


The DCH-6100P IRD and Processor provides operators an ideal solution for receiving, remultiplexing, descrambling and decoding operations. Equipped with a variety of inputs that ensures compatibility with all transmission media. The DCH-6100P's remultiplexing capabilities enable creation of new transport streams that are subsets of the original stream. Customized services may be output as multiple SPTS or MPTS over IP, as well as over ASI. By the dual DVB common interfaces, DCH-6100P could decrypt multiple services in one transport stream or two. DCH-6100P is also a professional IRD that features a broadcast quality decoder for MPEG-2, MPEG-4/AVC/H.264 and HEVC/H.265 in both Standard Definition and High Definition formats, and provides a variety of industry standard digital and analog outputs, including CVBS video, AES/EBU Audio, analog Audio, SD-SDI and HD-SDI. The unit also performs HD down-conversion and aspect ratio adaptation of HD programs to generate professional quality baseband analog video and audio outputs for easy integration with existing cable network infrastructure. This all-in-one architecture makes the DCH-6100P an ideal product for distribution and contribution networks.

#### Main Feature

- Variety of input options DVB-T2/S2/S/C/T, TS/IP and ASI
- Supports DVB-S2 Input Stream Identifier (ISI, optional) and DVB-T SFN MIP pass through
- Redundant backup among Tuner, ASI and TS/IP with configurable priority
- SD/HD MPEG-2, MPEG-4 AVC/H.264, and HEVC/H.265 video decoding
- Analog and Digital Outputs, ASI, CVBS, HDMI, SDI, TS/IP
- Built-in TS re-multiplexer receives from ASI, Tuner and TS/IP Inputs
- 2x DVB-CI Slots, multi-program decryption, BISS-1 and BISS-E decryption
- Dynamic PMT detection and automatic updating
- Supports VBI TELETEXT, EBU/DVB Subtitle, Closed Caption
- UDP/RTP, Unicast/Multicast, and double full duplex SPTS/MPTS over IP
- Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software
- One alarm Relay with D-sub 9 male connector
- On Site software update through IP and USB
- RSSI, received Eb/No & BER monitoring

#### Block Diagram



## Specification

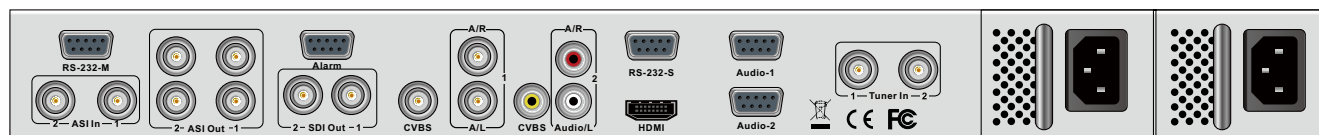
<b>Tuner Input</b>	
<b>DVB-S/S2 Tuner Input (ISI Factory Optional)</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	950 ~ 2150MHz
Input Level	-25 ~ -65dBm
Symbol Rate	1 ~ 45Msps
Roll-off Factor	DVB-S: 0.35 DVB-S2: 0.35, 0.25, 0.2
FEC 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	0, 13V, 18V selectable
Voltage	
LNB Band Selection Tone	0/22KHz selectable
Satellite Selection Command	DiSEqC 1.0
ISI ID	1 ~ 255 user configurable
<b>DVB-S/S2 Tuner Input (16APSK/32APSK Factory Optional)</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	950 ~ 2150MHz
Input Level	-25 ~ -65dBm
Symbol Rate	QPSK/8PSK/16APSK: 2 ~ 45Msps 32APSK: 2 ~ 37Msps
Roll-off Factor	DVB-S: 0.35 DVB-S2: 0.35, 0.25, 0.2
FEC Code Rate	DVB-S: 1/2, 2/3, 3/4, 5/6, 7/8 DVB-S2: 1/2, 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
LNB Polarity Selection	0, 13V, 18V selectable
Voltage	
LNB Band Selection Tone	0/22KHz selectable
Satellite Selection Command	DiSEqC 1.0
<b>DVB-C Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	51~862MHz
Input Level	51~75dBμV
Symbol Rate	1~7MBaud (ITU J.83 Annex A)
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Bandwidth	6MHz, 7MHz, 8MHz
Input Return Loss	7dB (typ.)
<b>DVB-T/T2 Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
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
Guarding 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.)
<b>ASI Input</b>	
Connector Type	2×BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Bit Rate	≤ 200Mb/s
<b>TS over IP</b>	
Connector Type	2×RJ-45 independent, 100/1000 Base-T for TS/IP
Operating mode & Effective Bit Rate	1, full duplex, Support Pro MPEG FEC, Backup 1+1, Max 80Mb/s 2, 4-CH DVB mode output, Max 200Mb/s, Slave mirror output 3, 32-CH IPTV mode output, Total 800Mb/s, Slave mirror output

Protocol	UDP / RTP, Multicast / Unicast, IGMPv3, ARP
FEC	SMPTE 2022M(former ProMPEG)
<b>TS Processing</b>	
TS Input Management	Demux and Remux among Tuner / DS3(optional) / E3 (optional), ASI and TS/IP Inputs
TS Output Management	Demux and Remux for 2 independent ASI outputs
Service and PID Management	Remux, filtering and remapping
PSI/SI	PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation, EIT P/F 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
<b>ASI Output</b>	
Connector Type	2 pairs, 4 x BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Output Bit Rate	≤ 200Mb/s
TS Processing	2 Independent TS pass through or Remultiplexed from tuner, TS/IP and 2 ASI inputs
<b>HD/SD-SDI Output</b>	
Connector Type	1 pair of BNCs (mirrored) , female, 75Ω (1 pair of BNCs can be configured as ASI Output-3)
SD Standard	SMPTE 259M, 270 Mb/s (10bit)
HD Standard	SMPTE 292M, 1.485 Gbit/s (10bit)
Ultra HD Standard	SMPTE 425
Audio Embedded	2×audio PIDs are embedded with PCM or passed through
Level	800mV p-p
<b>HDMI Output</b>	
Standard	1×HDMI 1.4 interface ,HDCP 2.2 1080P60, 1080P50, 1080P30, 1080P24, 1080I60, 1080I59.94, 1080I50, 720P60, 720P59.94, 720P50, 480P, 576P, 576I, 480I
Audio Embedded	1×stereo
<b>Genlock</b>	
Connector Type	1 x BNC female, 75Ω
Input Signal	Analog SD (black & burst)
<b>Video Decode</b>	
Video Profile/Level	MPEG2 SP@ML, MP@HL MPEG4 SP@L0-3, ASP@L0-5, GMC, H.264 BP/MP/HP@ level 5.0, H.265 Main Profile@L5.0 High-tier
<b>Audio Decode</b>	
Audio Format	MPEG-1 Layer 2 a. 2 stereo pairs (Stereo, Dual Mono, Left, Right) MPEG-2 AAC a. 5.1 down-mix to 2.0 (Stereo, Dual Mono, Left, Right) b. 2.0 (Stereo, Dual Mono) MPEG-4 HE-AAC v1/v2 a. 5.1 down-mix to 2.0 (Stereo, Dual Mono, Left, Right) b. 2.0 (Stereo, Dual Mono, Left, Right)
<b>Analog video Output</b>	
CVBS Connector	1×BNC female 75Ω
CVBS Standard	NTSC, PAL, and SECAM
CVBS Resolution	576i×25, 480i×29.97
Nominal Output Level	1.0 Vp-p±5% (with standard test pattern) ≤±1 dB, at 5.5 MHz for PAL/SECAM,
Frequency Response	4.2MHz for NTSC
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	>55dB (luminance weighted)
<b>Analog Audio Output</b>	
Connector Type	2×BNC female
Output Impedance	75Ω
Output Mode	Left, Right, Dual Mono, Stereo
Number of Output	2 pairs of stereo audio outputs (2 Audio PIDs or 4 channels are decoded).
Cross Talk Among Channels	>70dB
THD	<0.3% @ 400Hz, 1KHz test tone
Frequency Response	±0.5dB over 20Hz ~ 18KHz
Output Level	0dBm in 600Ω (0dBu), adjustable range ±10dB
<b>Ancillary Data Processing</b>	
Subtitle	DVB, EBU
VBI	Teletext, WSS
Closed Caption	EIA 608, EIA 708, EIA 608-to-708
<b>Redundancy</b>	
Redundancy Port	among Tuner, ASI input and TS/IP input
Switching Condition	TS Sync Loss
Switching Mode	Main, Spare
<b>Ancillary Data Processing</b>	
Subtitle	DVB, EBU
VBI	Teletext, WSS
Closed Caption	EIA 608, EIA 708, EIA 608-to-708

Redundancy	DVB, EBU
Redundancy Port	among Tuner, ASI input and TS/IP input
Switching Condition	TS Sync Loss
Switching Mode	Main, Spare
<b>Redundancy</b>	
Redundancy Port	among Tuner, ASI input and TS/IP input
Switching Condition	TS Sync Loss
Switching Mode	Main, Spare
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/100 Base-T, for equipment IP Control & Monitoring
Remote Control	SNMP 2.0, HTTP (Web GUI), Proprietary HDMS (Headend Device Management System)
Local Control	LCD display and Front control 6-key keypad
Serial Port	1×RS-232 D-sub female, for debug use only
Equipment Upgrade	Telnet/FTP, WEB/HTTP or USB
<b>Physical</b>	
Dimension	1U 19" Full-rack size
Weight	5.0Kg
Power Supply	AC 90V~250V, 50/60Hz
Power Consumption	30W (exclusive of LNB power)
Operating temperature	0~45°C
Storage temperature	-10~60°C
Operating Humidity	10~90%, non-condensed

## Back panel Interface



## DCH-6000EC

### Professional HEVC 4K Encoder



The DCH-6000EC is a high quality multiple program high definition H.264 (AVC)/H.265 (HEVC) encoder. It has four HD-SDI inputs port. It can receive SDI signal and encode one 4K TV or four SD/HD programs into a Transport Stream (TS) with H.264/H.265 compression. The internal built-in Time Base Correction functional block ensures the stability of encoding process from audio and video intermittence.

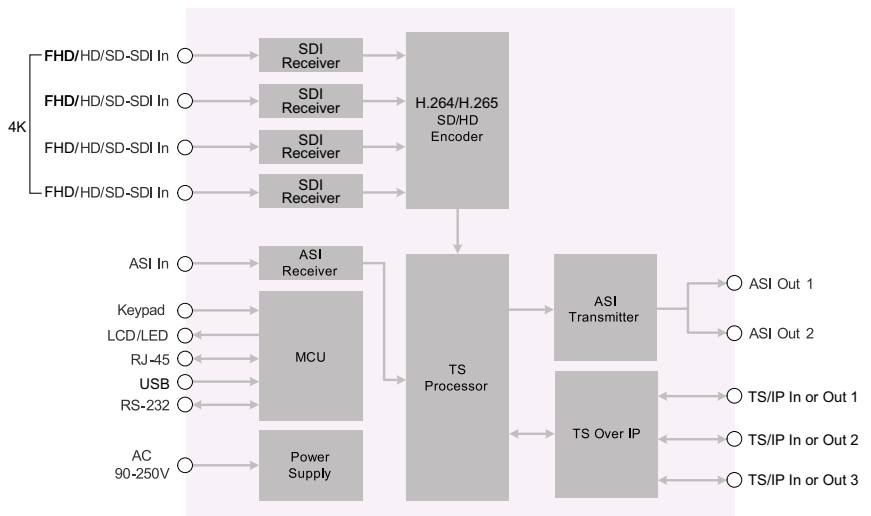
The internal re-multiplexing function allows creation of a new TS formed with the TS internally encoded and the TS from ASI or IP input. The final TS can be multiple SPTS or MPTS over IP, as well as over ASI. DCH-6000EC is one of the best solutions to meet the H.265 migration in today's digital broadcasting market.

#### Main Feature

- Multiple video resolution including 2160p, 2160i, 1080p, 1080i, 720p, 720i, and 480p, 480i
- Four HD/SD-SDI input
- Internal Time Base Correction (TBC)
- MPEG-1 Layer II & AAC LC audio encoding
- Supports 100/1000M TS/IP SPTS and MPTS
- Supports UDP/RTP/HLS/RTMP protocol
- Built-in re-multiplexer for encoder loop
- Supports VBR and CBR encoding modes
- Remote Control and Supervision by SNMP, HTTP WEB

#### Block Diagram

DCH-6000EC Functional Block Diagram

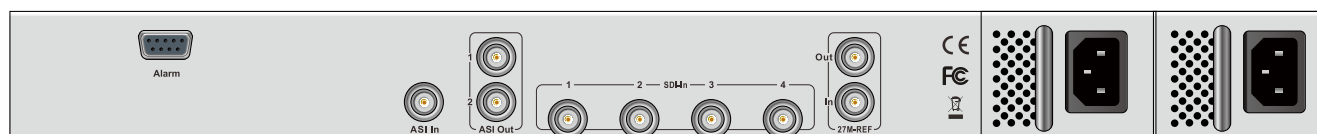


## Specification

<b>Video Compression</b>	
Video Resolution	2160p (3840 × 2160) @ 60 Hz, 50Hz 2160i (3840 × 2160) @ 30 Hz, 29.97Hz, 25p, 24p 1080p (1920 × 1080) @ 59.94 Hz, 50 Hz 1080i (1920/1440 × 1080) @25Hz, 29.97Hz 720p (1280 × 720) @50Hz, 59.94Hz, : SMPTE 292M 480i (720 × 480) @29.97Hz: SMPTE 259M 576i (720 × 576) @25Hz: SMPTE 259M
Compression Standard	H.265 (HEVC), H.264 (AVC), High Profile Level 4.0
Aspect Ratio	4:3 / 16:9 selectable
Chrominance Sampling	4:2:0 8bits 4:2:0 10bits 4:2:2 8bits 4:2:2 10bits
Video Encoding Bit Rate	200Kb/s-80Mb/s 1920x1080p / 59.94/50 fps: 3~30Mb/s 1920x1080i /25/29.97fps: 3~24Mb/s 1440x1080i /25/29.97fps: 2.5~24Mb/s 1280x720p /50/59.94fps: 2~24Mb/s 720x480i /29.97fps: 1~10Mb/s 720x576i /25fps: 1~10Mb/s
Recommend Video Encoding Bit Rate	
<b>Audio Compression</b>	
Compression standard	MPEG-1 Layer II, AAC LC
Audio Input	Embedded Audio
Audio Channels	Stereo, Mono
Audio Sampling Rate	48KHz
Audio compression Bit Rate	64 ~ 384Kb/s
<b>Audio/Video Input Interface</b>	
HD-SDI	4×BNC Female, 75Ω
<b>ASI Input</b>	
Connector Type	1×BNC Female, 75Ω

Input bit rate	≤ 100Mb/s
Packet Length	188/204 Bytes
<b>TS Processing</b>	
TS Output Management	Remux and demux
Service and PID management	Filtering and remapping
TS Input Management	Remux and demux between ASI input and the SPTS encoded
PSI/SI	PSI/SI table regeneration, NIT and SDT edition
<b>TS over IP</b>	
Connector Type	3×RJ-45, 10/100/1000 Base-T
Effective bit rate	300Mb/s
Protocol	UDP, RTP/UDP, Multicast, Unicast, HLS, RTMP, IGMPv2, ARP
Source	Built-in Re-mux, ASI input, Encoder
<b>ASI Output</b>	
Connector Type	2×BNC Female, 75Ω
Output bit rate	≤ 99Mb/s
Packet Length	188 / 204 Bytes
Signal Level	800mVpp±10%
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/1000 Base-T
Remote Control	SNMP, HTTP Web
Local Control	LCD display and 6-key keypad
Software Upgrade	web
<b>Physical</b>	
Dimension	44mm×483mm×318mm
Net weight	3.2Kg
Power supply	AC90~250V, 50Hz/60Hz
Power Consumption	Maximum 20W
Operating Temperature	0 ~ 45°C
Storage Temperature	-10 ~ 60°C
Humidity	10 ~ 90%, non-condensed

## Back panel Interface





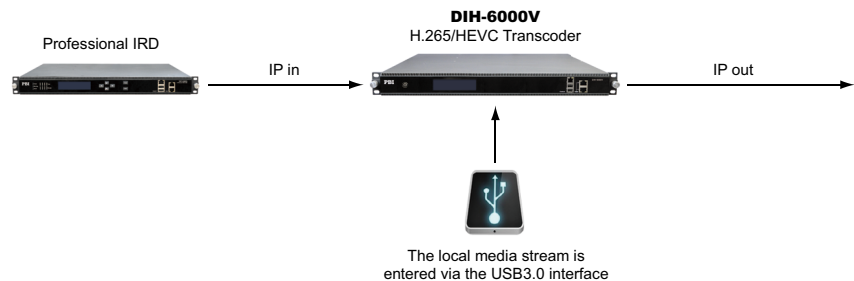
## DIH-6000V H.265/HEVC Multiscreen Transcoder

DIH-6000V, which can process SD/HD efficiently based on the high-performance processing chip, is designed specifically for IPTV system with HEVC/H.265 low bit rate compression. The programs can be converted to a low bit rate (<600kbps, D1) while maintaining image quality. It also supports IP remultiplexing MPTS and SPTS streams. The Video multiple resolution functions can be used for multi-screen (TVs, Smart phones, tablets, PCs, etc.) perfectly. The friendly network management tools can help to setup and monitor working status easily.



### Main Feature

- Video compliant with H.265/HEVC Baseline, MainProfile@L6.2 or less, H.264/AVC Baseline, Main & High Profile@L5.1 or less
- Audio compliant with MPEG-1 Layer II Audio, AAC transcoding
- Resolution from 96\*96 to 4096\*2160
- Bitrate from 200Kbps to 20Mbps
- support multi-channel H.265/HEVC transcoding, Max support one channel 4K/8-channels 1080P/16-channels 720P/32-channels SD
- support multi-channel H.264/AVC transcoding, Max support 16-channels 1080P/16-channels 720P/32-channels SD
- Support local video transcoding and delivery
- Rolling subtitle insert
- Logo insert
- Multi-audio transcoding and pass through
- PCR self-correcting
- PSI/SI edition and PID pass-through
- Up to 200 MPTS/SPTS output, 100Mbps for each
- Support 1+N output backup
- Http remote control



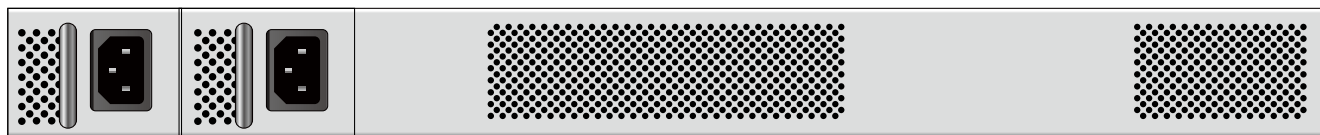
## Specification

<b>Input</b>	
Input Interface	2 x RJ45, Full Duplex1000M/100M/10M
TS/IP Input Bit Rate	800Mbps per RJ45
Data Protocol	UDP,ICMP, IGMP V1, V2, V3, RTP, HTTP, RTSP, FTP, RTMP, HLS (HTTP Live Streaming)
Transcoder source	IP inputs, Local files
IP Protocol	Unicast, Multicast
<b>Video/Audio format</b>	
Video	H.265/HEVC, H.264/AVC, MPEG-4,MPEG-2
Audio	MPEG-1, MPEG-2, MPEG-4, AAC
<b>Re-Multiplexer</b>	
Input	SPTS/MPTS
Null package process	Null packet pass through, insert and filtering Service editing
TS Editing	PSI/SI editing PID pass through / remapping PCR auto-correction
Maximum bitrate	100Mbps per TS
Maximum TS count	200 input TS Streams + 200 output TS Streams (with transcoder function disable)
<b>Output</b>	
<b>IP Output</b>	
Input Interface	2 x RJ45Full Duplex1000M/100M/10M
TS/IP Output	800Mbps
Protocol	UDP, RTMP, HLS, FTP, RTP(for MUX only)
IP addressing	Unicast, Multicast
Type	IP Streaming or File

<b>Video/Audio format for Encoding</b>	
Video format	HEVC (H.265)/H.264
Audio format	MPEG-1 Layer 2, MPEG-2 AAC, MPEG-4 AAC
Package Format	MPEG-TS
Bitrate Control	VBR, CBR 4096*2160, 3840*2160, 2560*1440,1920*1080, 1280*720, 720*576, 720*480, 704*576, 704*288, 640*480, 544*576, 544*480, 480*576, 480*320, 480*270, 360*320, 352*576, 352*288, 320*240, 320*200, 240*160, 192*192, 192*128, 176*144, 128*96, 96*96
Video resolution	2560*1440,1920*1080, 1280*720, 720*576, 720*480, 704*576, 704*288, 640*480, 544*576, 544*480, 480*576, 480*320, 480*270, 360*320, 352*576, 352*288, 320*240, 320*200, 240*160, 192*192, 192*128, 176*144, 128*96, 96*96
Video Aspect Ratio	Auto, 4:3, 16:9
Video frame rate	Auto, 30fps,29.97fps, 25fps, 24fps, 23.97fps
Video bitrate	200Kbps ~ 20Mbps
Audio sampling rate	32KHz, 44.1KHz, 48KHz
Audio bitrate	32kbps, 64kbps, 96kbps, 128kbps, 192kbps, 256kbps, 384kbps
<b>Control &amp; Monitoring</b>	
Interface	RJ45 x1pcs, 1000M/100M
Protocol	HTTP Web GUI
<b>General</b>	
Power Consumption	AC 110V~240V, 6A, 47~63Hz, Max.350W
Operation temperature	5~45 °C
Storage temperature	-10~65 °C
Dimension	430mm*335mm*44mm
Gross Weight	8.7Kg

\*Note: all specifications are subject to change without notice

## Back panel Interface



## DCH-3100P HD 4:2:0 IRD



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/T2. It demodulates the RF signal to the transport stream with ASI. 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, YpPr, 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.

### Main Feature

- Multiple tuner inputs DVB-S2/S, DVB-C, and DVB-T/T2
- 2x DVB-CI Slots, Multi Programs, BISS-1 and BISS-E decryption
- Transport stream output from ASI
- 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, YpPr, HDMI, XLR
- Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software
- Dynamic PMT auto detection and updating
- Support VBI TELETEXT, EBU/ DVB Subtitle, Closed Caption
- Configuration save and load after power off

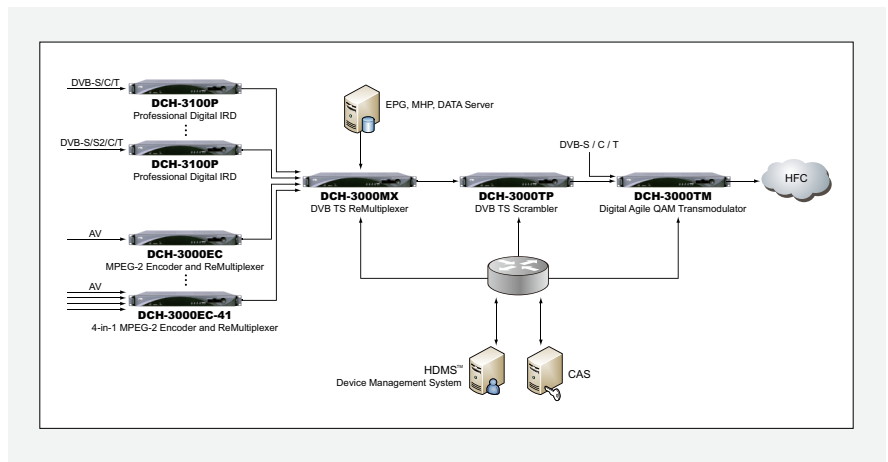
#### Optional HDMI for HD output



#### Dual DVB Common Interface and Multi Programs decryption



#### Ethernet management



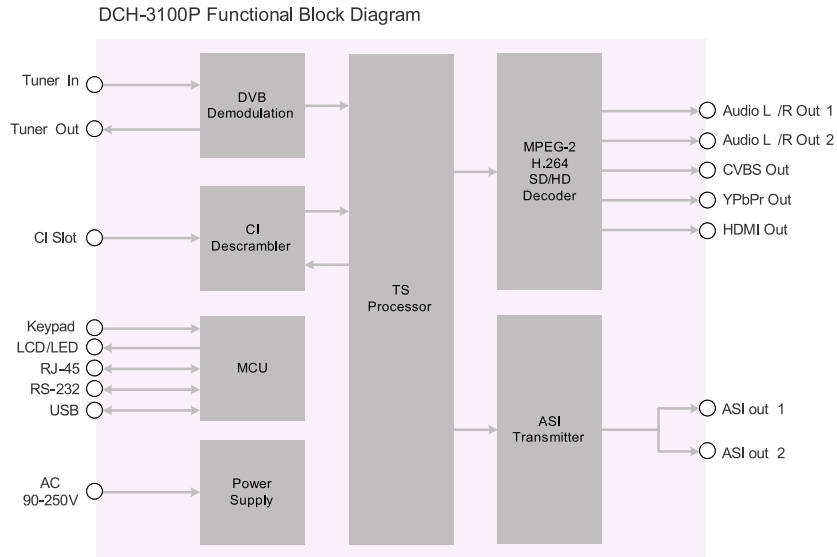
## Specification

<b>Tuner Input</b>	
DVB-S/S2 Tuner Input	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	950~2150MHz
Input Level	-25~-65dBm
Symbol Rate	2~45MBaud/s for QPSK and 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
<b>DVB-C Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency	48~860MHz
Input Level	45~75dBμV
Symbol Rate	1~7MBaud (ITU J.83 Annex A)
Constellation	16/32/64/128/256QAM
Bandwidth	6MHz/7MHz/8MHz
Input Return Loss	7dB (typ.)
<b>DVB-T/T2 Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency	104 ~ 862MHz (VHF/UHF)
Input Level	-20 ~ -70dBm
Constellation	DVB-T: QPSK, 16QAM, 64QAM DVB-T2: QPSK, 16 QAM, 64 QAM, 256QAM
Bandwidth	6MHz, 7MHz, 8MHz
FFT Mode	DVB-T: 2K, 8K DVB-T2: 1K, 2K, 4K, 8K, 16K, 32K
Guarding 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.)
<b>TS Processing</b>	
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
<b>ASI Output</b>	
Connector type	2×BNC Female, 75Ω
Standard	DVB-ASI, EN50083-9
<b>HDMI Output</b>	
Standard HDMI	1×HDMI 1.3 interface (no 1080p)
Video Resolution	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	one digital audio pass through
<b>Digital Video Processing</b>	
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
<b>Digital Audio Processing</b>	

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

Number of Outputs	2×digital audio PIDs are decoded*
Sampling Rate	32, 44.1 and 48KHz
Audio Bit Rate	32, 64, 96, 128, 160, 192, 224, 256, 288, 320, 352, 384, 416 and 448 kb/s for MPEG-1 Layer I 32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320 and 384 kb/s for MPEG-1 Layer II
<b>Analog Video Output</b>	
YPbPr Connector	1 set of RCA, 75Ω
CVBS Connector	1×BNC 75Ω, 1×RCA 75Ω
Video Standard	NTSC, PAL, and SECAM
YPbPr Resolution	1080i×30, 1080i×29.97, 1080i×25, 720p×60, 720p×59.94, 720p×50, 480p×60, 576p×50, 576i×25, 480i×29.97
Signal Level	1.0 Vp-p±5%
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°
Signal to Noise Ratio	>55 dB (luminance weighted)
<b>Analog Audio Output</b>	
Connector type	1×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).
<b>Baseband Data Output</b>	
Subtitle	DVB/EBU
VBI	Teletext, WSS, VFD, VPS
Closed Caption	EIA 608, EIA 708, EIA 608-to-708
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/100 Base-T 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
<b>Physical</b>	
Dimension	44mm×483mm×255mm
Weight	2.4Kg Net, 4.4Kg Gross
Power Supply	AC 90V~250V, 50/60Hz
Power Consumption	24W
Operating temperature	0~45
Storage temperature	-10~60°C
Operating Humidity	10~90%, non-condensed
<b>Certification</b>	
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	

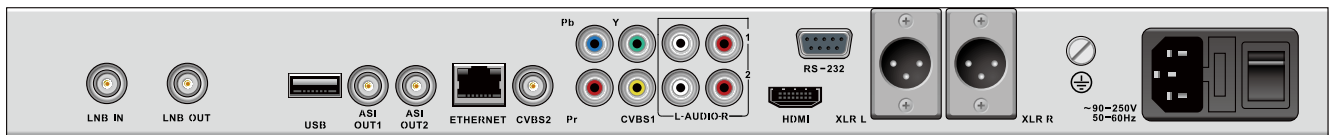
## Block Diagram



## Order Information

Interface	Model	DCH-3100P-10X					DCH-3100P-20X				
		-10C	-10T	-10T2	-10S2	-10A	-20C	-20T	-20T2	-20S2	-20A
Tuner		DVB-C	DVB-T	DVB-T2	DVB-S2		DVB-C	DVB-T	DVB-T2	DVB-S2	
ASI IN						x1					x1
Common Interface		x2	x2	x2	x2	x2	x2	x2	x2	x2	x2
ASI-Output							x2	x2	x2	x2	x2
HDMI		x1	x1	x1	x1	x1	x1	x1	x1	x1	x1
CVBS		x2	x2	x2	x2	x2	x2	x2	x2	x2	x2
YPbPr		x1	x1	x1	x1	x1	x1	x1	x1	x1	x1
Audio L/R		x2	x2	x2	x2	x2	x2	x2	x2	x2	x2
Balanced audio XLR		x1	x1	x1	x1	x1	x1	x1	x1	x1	x1
USB		x1	x1	x1	x1	x1	x1	x1	x1	x1	x1

## Back panel Interface



## DCH-5200P HD 4:2:0 IRD and Processor

The DCH-5200P IRD and Processor provides operators an ideal solution for receiving, remultiplexing, descrambling and decoding operations. Equipped with a variety of inputs that ensures compatibility with all transmission media. The DCH-5200P's remultiplexing capabilities enable creation of new transport streams that are subsets of the original stream. Customized services may be output as multiple SPTS or MPTS over IP, as well as over ASI. By the dual DVB common interfaces, DCH-5200P could decrypt multiple services in one transport stream or two. DCH-5200P is also a professional IRD that features a broadcast quality decoder for MPEG-2 and MPEG-4 AVC/H.264 in both Standard Definition and High Definition formats, and provides a variety of industry standard digital and analog outputs, including CVBS video, AES/EBU Audio, analog Audio, SD-SDI and HD-SDI. The unit also performs HD down-conversion and aspect ratio adaptation of HD programs to generate professional quality baseband analog video and audio outputs for easy integration with existing cable network infrastructure. This all-in-one architecture makes the DCH-5200P an ideal product for distribution and contribution networks.

### Dual DVB Common Interface and Multi Programs decryption



### A variety of industry standard digital and analog outputs

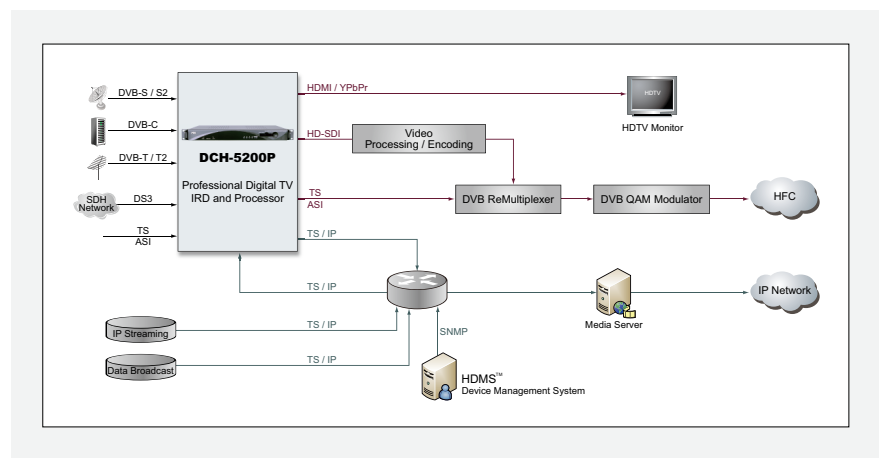


### Gigabit Ethernet or Dual 100M TS/IP interface for IP based networks



### Main Feature

- Variety of input options DVB-T2/S2/S/C/T/DTMB/ATSC/ISDB-T, DS3/E3, TS/IP and ASI
- Supports DVB-S2 Input Stream Identifier (ISI, optional) and DVB-T SFN MIP pass through
- Redundant backup among Tuner, ASI and TS/IP with configurable priority
- SD/HD MPEG-2 and MPEG-4 AVC/H.264 digital video decoding
- Two Audio PIDs decode or pass through (compressed) in SDI output
- Multiple Analog and Digital Outputs, ASI, CVBS, YPbPr, HDMI, SD/HD-SDI, AES/EBU Audio, TS/IP
- Built-in TS re-multiplexer receives ASI, Tuner and TS/IP Inputs
- 2×DVB-CI Slots, multi-program decryption, BISS-1 and BISS-E decryption
- Dynamic PMT detection and automatic updating
- Supports VBI TELETEXT, EBU/DVB Subtitle, Closed Caption
- UDP/RTP, Unicast/Multicast, and SPTS/MPTS over IP (full duplex, optional)
- Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software
- PCM audio embedded in SDI and HDMI outputs
- PCM audio output on two AES/EBU audio output ports
- On Site software update through IP
- RSSI, received Eb/No & BER monitoring



## Specification

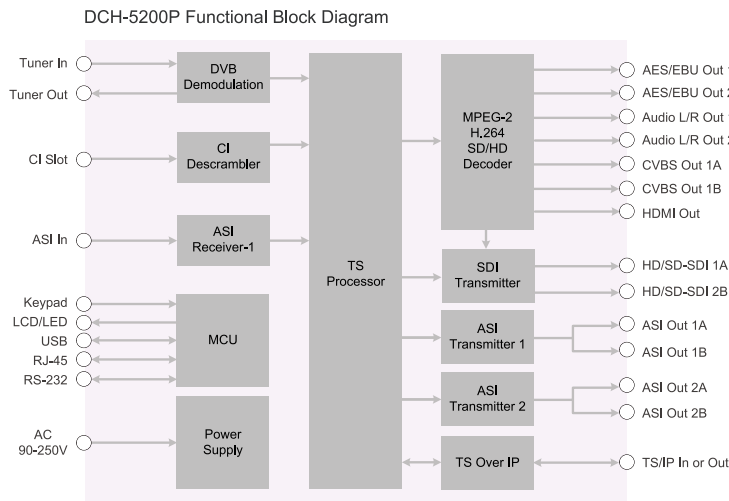
<b>Tuner Input</b>	
<b>DVB-S/S2 Tuner Input (ISI Factory Optional)</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output 950~2150MHz
Input Level	-25~-65dBm
Symbol Rate	2~45Mbaud
Roll-off Factor	DVB-S QPSK: 0.35 DVB-S2 8PSK: 0.35, 0.25, 0.2
FEC Code Rate	DVB-S 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
ISI ID	1~255 user configurable
<b>DVB-C Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	51~862MHz
Input Level	51~75dBμV
Symbol Rate	1~7Mbaud (ITU J.83 Annex A)
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Bandwidth	6MHz, 7MHz, 8MHz
Input Return Loss	7dB (typ.)
<b>DVB-T/T2 Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
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
Guarding 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.)
<b>DTMB Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	46.5~866MHz
Input Level	-87~-29dBm
Symbol Rate	7.56Mbaud
Bandwidth	6MHz/7MHz/8MHz
Constellation	4QAM-NR, 4QAM, 16QAM, 32QAM, 64QAM
Guard Interval	PN420, PN595, PN945
Roll-off Factor	0.05
Interleaving Depth	240,720
FEC Code Rate	0.4, 0.6, 0.8
<b>ATSC Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	54~864MHz
Input Level	-75~-7dBm(ATSC 8VSB)
Symbol Rate	10.762Mbaud
Constellation	8VSB
Roll-off Factor	0.115
Bandwidth	6MHZ
<b>ASI Input</b>	
Connector Type	2×BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Bit Rate	≤ 100Mb/s

<b>DS3 Input (Option)</b>	
Connector Type	2×BNC female, 75Ω, including loop through
Standard	Compliant with ITU-T G.703
Frame Structure	Compliant with ITU-T G.752 and ITU-T G.804
Bit Rate	44.736Mb/s
<b>TS over IP</b>	
Connector Type	1×RJ-45, 10/100 Base-T or 100/1000 Base-T for TS/IP
Effective Bit Rate	70Mb/s for 10/100/1000 Base-T
Protocol	UDP / RTP, Multicast / Unicast, IGMPv3, ARP
FEC	SMPTE 2022M (Pro-MPEG) FEC (for GbE only) 1: full duplex, Support Pro MPEG FEC, Backup 1+1, Max 80Mb/s 2: 4-CH DVB mode output, Max 200Mb/s, Spare mirror output 3: 32-CH IPTV mode output, Total 500Mb/s, Spare mirror output
<b>Operating mode &amp; Effective Bit Rate</b>	
<b>TS Processing</b>	
TS Input Management	Demux and Remux among Tuner / DS3(optional) / E3 (optional), ASI and TS/IP Inputs
TS Output Management	Demux and Remux for 2 independent ASI outputs
Service and PID Management	Remux, filtering and remapping PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Regeneration
PSI/SI	DVB Common Scrambling Algorithm (CSA)
Descrambler	BISS-1, BISS-E
BISS Mode	Double PCMCIA slots, compatible with major CA CAMs in the market
Common Interface	
<b>ASI Output</b>	
Connector Type	2 pairs of BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Output Bit Rate	≤ 99Mb/s
TS Processing	2 Independent TS Re-multiplexed from tuner, TS/IP and 2 ASI inputs
<b>HDMI Output</b>	
Standard	1×HDMI 1.3 interface (up to 1080i)
Video Resolution and Frame Rate	1080i×30, 1080i×29.97, 1080×25, 720p×60, 720p×59.94, 720p×50, 480p×60, 576p×50, 576i×25, 480i×29.97
Audio Embedded	2×stereo or Digital Audio pass through
<b>Digital Video Processing</b>	
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)
SDI 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
<b>HD/SD-SDI Output</b>	
Connector Type	1 pair of BNCs (mirrored) , female, 75Ω
SD Standard	SMPTE 259M, 270 Mb/s (10bit)
HD Standard	SMPTE 292M, 1.485 Gbit/s (10bit)
Level	800mV p-p
<b>Digital Audio Processing</b>	
Connector Type	2×D-sub 9 male with XLR adaptor cables
Number of Output	2×audios are decoded or passed through
Audio Sampling Rate	32, 44.1 and 48 KHz 32, 64, 96, 128, 160, 192, 224, 256, 288, 320, 352, 384, 416 and 448 Kb/s for MPEG-1 Layer I, 32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320 and 384 Kb/s for MPEG-1 Layer II
Audio Bit Rate	

Nominal Output Level	1V p-p (with standard test stream)
Output Format	AES/EBU
Load Impedance	110Ω (with XLR adaptor cables)
<b>Analog Video Output</b>	
CVBS Connector	1×BNC female 75Ω
CVBS Standard	NTSC, PAL, and SECAM
CVBS Resolution	576i×25, 480i×29.97
Nominal 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
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	>55dB (luminance weighted)
<b>Analog Audio Output</b>	
Connector Type	2×D-sub 9 male, with XLR adaptor cable
Output Impedance	600Ω (balanced)
Output Mode	Left, Right, Dual Mono, Stereo
Number of Output	2 pairs of stereo audio outputs (2 Audio PIDs or 4 channels are decoded).
Cross Talk Among Channels	>70dB
THD	<0.3% @ 400Hz, 1KHz test tone
Frequency Response	±0.5dB over 20Hz ~ 18KHz
Output Level	0dBm in 600Ω (0dBu), adjustable range ±10dB

<b>Ancillary Data Processing</b>	
Subtitle	DVB, EBU
VBI	Teletext, WSS
Closed Caption	EIA 608, EIA 708, EIA 608-to-708
<b>Redundancy</b>	
Redundancy Port	among Tuner, ASI input and TS/IP input
Switching Condition	TS Sync Loss
Switching Mode	Main, Spare
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/100 Base-T, for equipment IP Control SNMP, HTTP (Web Interface), Proprietary HDMS (Headend Device Management System)
Remote Control	LCD display and 6-key keypad
Local Control	1×RS-232 D-sub female, for debug use only
Serial Port	Embedded FTP loader and Telnet
Equipment Upgrade	44mm×483mm×255mm
<b>Physical</b>	
Dimension	3.4Kg Net, 5.4Kg Gross
Weight	AC 90V~250V, 50/60Hz
Power Supply	24W (exclusive of LNB power)
Power Consumption	0~45°C
Operating temperature	-10~60°C
Storage temperature	10~90%, non-condensed
Operating Humidity	
<b>Certification</b>	
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	

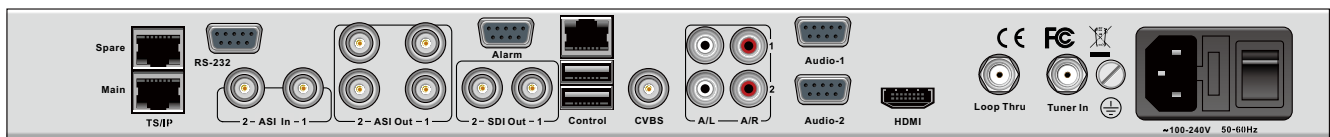
**Block Diagram**



**Order Information**

Model		DCH-5200P			
Interface		-20X	-22X	-30X	-32X
Tuner Input		● Input signal: DVB-S2, DVB-T2, ISDB, ATSC, DTMB, DS3 Standard configuration: X=S2			
TS Input	ASI In x2	●	●	●	●
TS Output	ASI Out 2x2	●	●	●	●
CI	CI x2	●	●	●	●
Video/Audio Output	SD SDI	●	●	●	●
	HD SDI			●	●
	HDMI x1	●	●	●	●
	CVBS x1	●	●	●	●
TS/IP	Audio1	●	●	●	●
	Audio 2	●	●	●	●
TS/IP	GbE RJ45 x1		●	●	●
Upgrade	USB x2	●	●	●	●
Management	RJ45 x1	●	●	●	●
ALARM/RELAY	1*D9	●	●	●	●

**Back panel Interface (Full option)**





## DCH-5500P HD 4:2:2 IRD and Processor

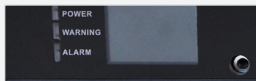
The DCH-5500P is the newest model and flagship of PBI's IRD product family. It provides operators an ideal solution for receiving, remultiplexing, descrambling and decoding operations, supporting all MPEG profile from Main to High 422P including MPEG-2 8-bit and MPEG-4 4:2:2 10-bit (optional). Equipped with a variety of inputs, it ensures compatibility with all transmission media. The DCH-5500P's remultiplexing capabilities enable creation of new transport streams that are subsets of the original stream. Customized services may be output as multiple SPTS or MPTS over IP, as well as over ASI. By the dual DVB common interfaces, DCH-5500P could decrypt multiple services in one transport stream or two. DCH-5500P is also a professional IRD that features a broadcast quality decoder for 4:2:0 or 4:2:2 of MPEG-2 and MPEG-4 AVC/H.264 in both Standard Definition and High Definition formats, and provides a variety of industry standard digital and analog outputs, including CVBS video, AES/EBU Audio, analog Audio, SD-SDI and HD-SDI, frame Synchronization to the external black and burst signal is also available. The unit also performs HD down-conversion and aspect ratio adaptation of HD programs to generate professional quality baseband analog video and audio outputs for easy integration with existing cable network infrastructure. This all-in-one architecture makes the DCH-5200P an ideal product for distribution and contribution networks.



### Main Feature

- Variety of input options DVB-T2/S2/S/C/T/ DTMB/ATSC/ISDB-T, DS3/E3, TS/IP and ASI
- Supports DVB-S2 Input Stream Identifier (ISI, optional) and DVB-T SFN MIP pass through
- Redundant backup among Tuner, ASI and TS/IP with configurable priority
- 4:2:0 and 4:2:2 (optional) of SD/HD MPEG-2 and MPEG-4 AVC/H.264 digital video decoding
- Up to 8 Audio PIDs decode or pass through (compressed) in SDI output
- Up to 6 Audio PIDs decode or pass through (compressed) in AES output
- Multiple Analog and Digital Outputs, ASI, CVBS, HDMI, SD/HD-SDI, AES/EBU Audio, TS/IP
- Built-in TS re-multiplexer receives from ASI, Tuner and TS/IP Inputs
- 2x DVB-CI Slots, multi-program decryption, BISS-1 and BISS-E decryption
- Frame synchronizes the IRD to the external black and burst reference
- Dynamic PMT detection and automatic updating
- Supports VBI TELETEXT, EBU/DVB Subtitle, Closed Caption, and can be embedded in SDI
- UDP/RTP, Unicast/Multicast, and double full duplex SPTS/MPTS over IP
- Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software
- One alarm Relay with D-sub 9 male connector
- On Site software update through IP and USB
- RSSI, received Eb/No & BER monitoring
- 1.5" TFT LCD on front panel for monitoring
- Hot-swappable redundant power supply

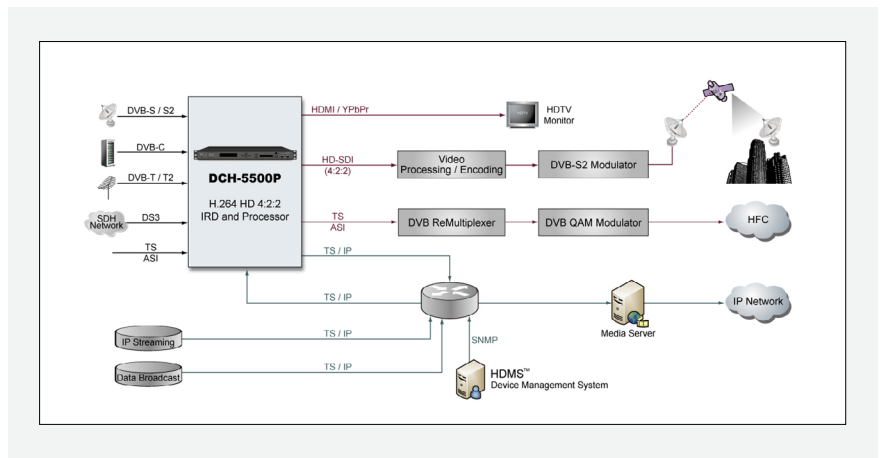
#### 1.5" LCD Monitor on front panel



#### Optional 4:2:2 receiving and decoding



#### Hot-swappable redundant power supply



## Specification

<b>Tuner Input</b>	
<b>DVB-S/S2 Tuner Input (ISI Factory Optional)</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	950~2150MHz
Input Level	-25~-65dBm
Symbol Rate	2~45Mbaud
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
ISI ID	1~255 user configurable
<b>DVB-C Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	51~862MHz
Input Level	51~75dBμV
Symbol Rate	1~7Mbaud (ITU J.83 Annex A)
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Bandwidth	6MHz, 7MHz, 8MHz
Input Return Loss	7dB (typ.)
<b>DVB-T/T2 Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
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
Guarding 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.)
<b>DTMB Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	46.5~866MHz
Input Level	-87~-29dBm
Symbol Rate	7.56Mbaud
Bandwidth	6MHz/7MHz/8MHz
Constellation	4QAM-NR, 4QAM, 16QAM, 32QAM, 64QAM
Guard Interval	PN420, PN595, PN945
Roll-off Factor	0.05
Interleaving Depth	240, 720
FEC Code Rate	0.4, 0.6, 0.8
<b>ATSC Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	54~864MHz
Input Level	-75~-7dBm(ATSC 8VSB)
Symbol Rate	10.762Mbaud
Constellation	8VSB
Roll-off Factor	0.115
Bandwidth	6MHz

<b>ASI Input-1</b>	
Connector Type	1×BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Bit Rate	≤ 100Mb/s
<b>DS3 Input-2 (Option)</b>	
Connector Type	1×BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Bit Rate	≤ 100Mb/s
<b>DS3/E3 Input (Option)</b>	
Connector Type	2×BNC female, 75Ω, including loop through
Standard	Compliant with ITU-T G.703
Frame Structure	Compliant with ITU-T G.752 and ITU-T G.804
Bit Rate	DS3: 44.736Mb/s E3: 34.368Mb/s
<b>TS over IP</b>	
Connector Type	2×RJ-45, separated 100/1000 Base-T for TS/IP
Effective Bit Rate	800Mb/s for 100/1000 Base-T, duplex for SPTS and MPTS
Protocol	UDP / RTP, Multicast / Unicast, IGMPv3, ARP
FEC	SMPTE 2022M (Pro-MPEG) FEC (for GbE only)
<b>TS Processing</b>	
TS Input Management	Demux and Remux among Tuner / DS3(optional) / E3 (optional), ASI and TS/IP Inputs
TS Output Management	Demux and Remux for 2 independent ASI outputs
Service and PID Management	Remux, filtering and remapping
PSI/SI	PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation
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
<b>ASI Output</b>	
Connector Type	2 pairs of BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Output Bit Rate	≤ 200Mb/s
TS Processing	2 Independent TS Re-multiplexed from tuner, TS/IP and 2 ASI inputs
<b>HDMI Output</b>	
Standard	1×HDMI 1.3 interface (up to 1080i)
Video Resolution and Frame Rate	1080i×30, 1080i×29.97, 1080×25, 720p×60, 720p×59.94, 720p×50, 480p×60, 576p×50, 576i×25, 480i×29.97
Audio Embedded	1×stereo
<b>Video Decode</b>	
Video Profile/Level	MPEG-2(MP@ ML for SD, MP@HL for HD), Main Profile(MP) 4:2:0 8-bit, High Profile(HP) 4:2:2 8-bit MPEG-4/H.264 AVC Part 10 (MP@L3 for SD, HP@L4.1 for HD), High-422(Hi422P) 4:2:2 8/10-bit, High-10(Hi10P) 4:2:0 10-bit, High (HiP) 4:2:0 8-bit, Main (MP) 4:2:0 8-bit, Constrained Baseline (CBP) 4:2:0 8-bit, High 10 Intra Profile (AVC-I 50) 4:2:0 10-bit, High 4:2:2 Intra Profile (AVC-I 100) 4:2:2 8/10-bit
<b>Audio Decode</b>	
Audio Format	MPEG-1 Layer 2

	a. 2 stereo pairs (Stereo, Dual Mono, Left, Right)
	b. Digital Audio Pass-through
	MPEG-2 AAC
	MPEG-4 HE-AAC v1/v2
<b>Digital Video Processing</b>	
Connector Type	2 x BNC female, 75Ω 1080p×59.94, 1080p×50, 1080i×30, 1080i×29.97,
SDI Video Resolution	1080i×25, 720p×60, 720p×59.94, 720p×50, 720p×29.97, 720p×25, 576i×25, 480i×29.97
Video PID Bit Rate	≤ 60Mb/s
<b>HD/SD-SDI Output</b>	
Connector Type	1 pair of BNCs (mirrored) , female, 75Ω
SD Standard	SMPTE 259M, 270 Mb/s (10bit)
HD Standard	SMPTE 292M, 1.485 Gbit/s (10bit)
Level	800mV p-p
<b>Genlock</b>	
Connector Type	1 x BNC female, 75Ω
Input Signal	Analog SD (black & burst)
<b>Digital Audio Processing</b>	
Connector Type	2×D-sub 9 male with XLR adaptor cables and 6 x BNC female 75Ω
Number of Output	8×audio PIDs are decoded or passed through
Nominal Output Level	1V p-p (with standard test stream)
Output Format	SDI (Embedded Audio), AES
Load Impedance	AES1~AES2: 2 x D-sub9, 110Ω (with XLR adaptor cables) AES3~AES8: 6 x BNC, 75Ω
<b>Analog video Output</b>	
CVBS Connector	1×BNC female 75Ω
CVBS Standard	NTSC, PAL, and SECAM
CVBS Resolution	576i×25, 480i×29.97
Nominal 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
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	>55dB (luminance weighted)
<b>Analog Audio Output</b>	
Connector Type	2×D-sub 9 male, with XLR adaptor cable

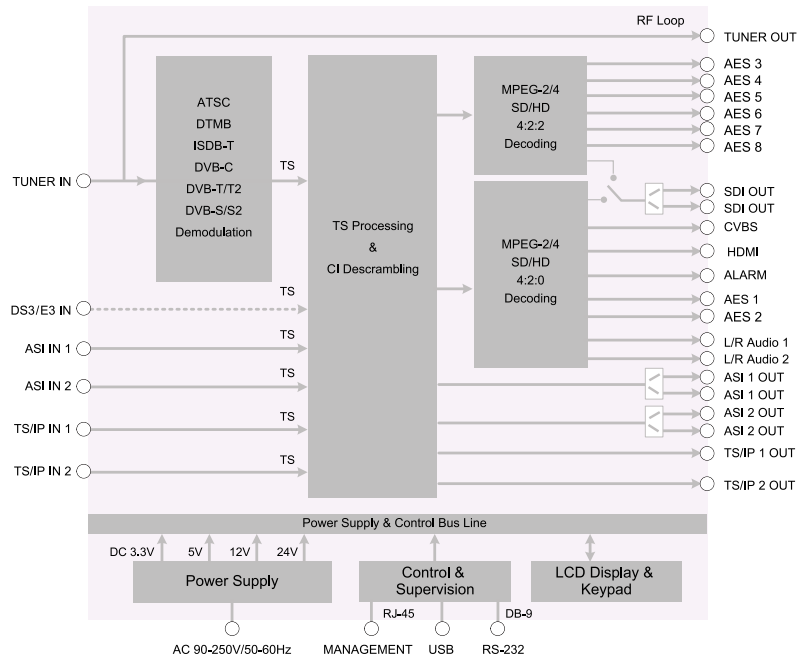
Output Impedance	600Ω (balanced)
Output Mode	Left, Right, Dual Mono, Stereo
Number of Output	2 pairs of stereo audio outputs (2 Audio PIDs or 4 channels are decoded).
Cross Talk Among Channels	>70dB
THD	<0.3% @ 400Hz, 1KHz test tone
Frequency Response	±0.5dB over 20Hz ~ 18KHz
Output Level	0dBm in 600Ω (0dBu), adjustable range ±10dB
<b>Ancillary Data Processing</b>	
Subtitle	DVB, EBU
VBI	Teletext, WSS
Closed Caption	EIA 608, EIA 708, EIA 608-to-708
<b>Redundancy</b>	
Redundancy Port	among Tuner, ASI input and TS/IP input
Switching Condition	TS Sync Loss
Switching Mode	Main, Spare
<b>Alarm</b>	
Connector Type	2×D-sub 9 male
Switching Condition	User Defined
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/100 Base-T, for equipment IP Control
Remote Control	SNMP 2.0, HTTP (Web GUI), Proprietary HDMS (Headend Device Management System)
Local Control	LCD display and Front control 6-key keypad
Monitoring	1.5" TFT LCD monitor
Serial Port	1×RS-232 D-sub female, for debug use only
Equipment Upgrade	Embedded FTP loader ,Telnet and USB
<b>Physical</b>	
Dimension	1U 19" Full-rack size
<b>Weight</b>	
Power Supply	AC 90V~250V, 50/60Hz
Power Consumption	24W (exclusive of LNB power)
Operating temperature	0~45°C
Storage temperature	-10~60°C
Operating Humidity	10~90%, non-condensed
<b>Certification</b>	
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	

### Back panel Interface (Full option)



Block Diagram

DCH-5500P Functional Block Diagram



Order Information

Model			DCH-5500P-20X	DCH-5500P-30X
Interface	CVBS	1*BNC	•	•
	AUDIO	2*R/L, Balance	•	•
	HD-VIDEO	1*HDMI	•	•
Digital Video/Audio	HD-SDI	2*BNC	•	•
	AES1~AES2	2*D9, with extended cable adaptor	•	•
	AES3~AES8	6*BNC	•	•
TS Input	ASI IN 1	6*BNC	•	•
	ASI IN 2	1*BNC	•	•
TS Output	ASI OUT 1	1*BNC	•	•
	ASI OUT 2	1*BNC	•	•
Genlock	Genlock	1*BNC	•	•
4:2:0 decoding			•	•
4:2:2 decoding			•	•
TS/IP	GbE	2*RJ45	•	•
Control/Upgrade	Management	1*RJ45	•	•
	Upgrade	2*USB	•	•
	RS-232	1*D9	•	•
	ALARM/RELAY	1*D9	•	•
Power Supply		2*	•	•
X = Tuner	C	DVB-C	Factory default option: X=S2	
	T	DVB-T		
	S2	DVB-S2		
	T2	DVB-T2		
	D	DS3		
	M	STM-1		

Professional IRD

## DXP-3800D 8-Channel DTV Receiver

DXP-3800D is a high-density, modular and CI decryption professional TS processor equipped with 8 independent tuners, which can be either of DVB-T/T2, DVB-S2/S, DVB-C, DTMB, ISDB-T and ATSC types. It supports a wide range of application by combining 8 tuners processing capability with industry standard outputs including ASI and TS/IP. DXP-3800D has 8 DVB common interface slots capable of working with most of well-known CAS in the market to de-crypt multiple pay TV services. DXP-3800D provides operators an ideal solution for multi receiving, re-multiplexing, descrambling and TS over IP operations, the compact 8 tuners and the powerful 8 CI decryption design make DXP-3800D one of the most competitive product in the head-end market.



### Main Feature

- 8xTuners Input, Supports variety of input options DVB-T2/T/S2/S/C/DTMB/ATSC/ISDB-T
- Supports DVB-S2 Input Stream Identifier (ISI, optional) and DVB-T2 Multi PLP and SFN MIP pass through
- Built-in TS re-multiplexer receives from ASI, CI Slot1 to CI Slot8 and TS/IP inputs
- 8xDVB-CI Slots, multi-program decryption, BISS-1 and BISS-E decryption
- 8xASI output the transport stream from CI
- Slot1 to CI Slot8 or BISS decryption
- 1xchannel full duplex TS over IP or 128xchannels IP out without IP input
- Remote Control and Supervision by SNMP v2, HTTP WEB and Proprietary HDMS software
- On Site software update through IP or USB
- RSSI, received signal strength, Eb/N0, C/N and BER monitoring
- Redundency power supply

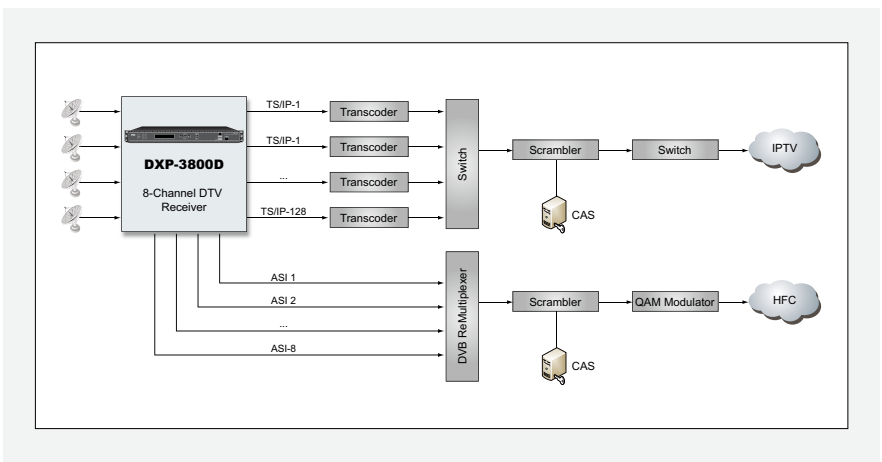
### Built-in Remultiplexer and TS/IP interface



### Up to 8 channels in one rack



### Hot-swappable redundant power supply



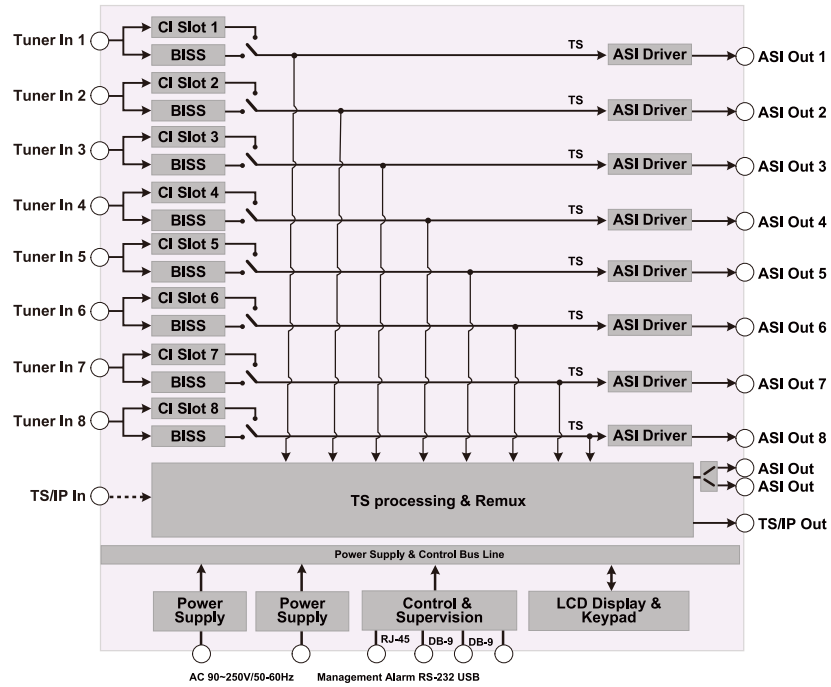
## Specification

<b>Tuner Input</b>	
<b>DVB-S/S2 Tuner Input (ISI Factory Optional)</b>	
Connector Type	8×F type female 75Ω for Input
Input Frequency Range	950 ~ 2150MHz
Input Level	-25 ~ -65dBm
Symbol Rate	2 ~ 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	0, 13V, 18V selectable
Voltage	0/22KHz selectable
LNB Band Selection Tone	DiSeqC 1.0
Satellite Selection Command	1 ~ 255 user configurable
ISI ID	
<b>DVB-C Tuner Input</b>	
Connector Type	8×F type female 75Ω for Input
Input Frequency Range	51 ~ 862MHz
Input Level	51 ~ 75dBμV
Symbol Rate	1 ~ 7MBaud (ITU J.83 Annex A)
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Bandwidth	6MHz, 7MHz, 8MHz
Input Return Loss	7dB (typ.)
<b>DVB-T/T2 Tuner Input</b>	
Connector Type	8×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
Guarding 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.)
<b>DTMB Tuner Input</b>	
Connector Type	8×F type female 75Ω for Input
Input Frequency Range	46.5~866MHz
Input Level	-87~-29dBm
Symbol Rate	7.56MBaud
Bandwidth	6MHz/7MHz/8MHz
Constellation	4QAM-NR,4QAM,16QAM,32QAM, 64QAM
Guard Interval	PN420, PN595, PN945
Roll-off Factor	0.05
Interleaving Depth	240,720
FEC Code Rate	0.4, 0.6, 0.8
<b>ATSC Tuner Input</b>	
Connector Type	8×F type female 75Ω for Input
Input Frequency Range	54~864MHz
Input Level	-75~-7dBm(ATSC 8VSB)
Symbol Rate	10.762MBaud

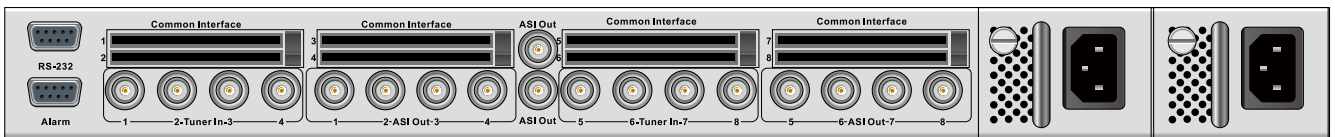
Constellation	8VSB
Roll-off Factor	0.115
Bandwidth	6MHz
<b>TS Processing</b>	
TS Input Management	Demux and Remux among ASI, TS/IP and CI Inputs
TS Output Management	Demux and Remux for ASI output
Service and PID Management	Service and PID level for Remux, filtering and remapping
PSI/SI	PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation
Descrambler	DVB Common Scrambling Algorithm (CSA)
BISS Mode	BISS-1, BISS-E
Common Interface	8 x PCMCIA slots, compatible with major CA CAMs in the market
<b>ASI Output</b>	
Connector Type	9 independence BNC female, 75Ω, Standard
Output Bit Rate	DVB-ASI, EN50083-9
	≤ 200Mb/s
TS Processing	8xASI out pass through the TS from CI 1 to CI8, 1xASI Out from Remux,
<b>ASI Input</b>	
Connector Type	1×BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Bit Rate	≤100Mb/s
Connector Type	1×BNC female, 75Ω
<b>TS over IP</b>	
Connector Type	1×RJ-45, 100/1000 Base-T
Effective Bit Rate	400Mb/s for 128 channel IP out without IP in
	80Mb/s for full duplex 1 channel
Protocol	UDP / RTP, Multicast / Unicast, IGMPv3, ARP
<b>Alarm</b>	
Connector Type	1×D-sub 9 male
Switching Condition	User Defined
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/100 Base-T, for equipment IP Control
Remote Control	SNMP, HTTP (Web Interface), Proprietary HDMS (Headend Device Management System)
Local Control	LCD display and 6-key keypad
Serial Port	1×RS-232 D-sub female, for debug use only
Equipment Upgrade	Embedded FTP loader ,Telnet and http
<b>Physical</b>	
Dimension	44mm x 255mm x 430mm
Weight	3.5kg
Power Supply	AC 90V ~ 250V, 50/60Hz
Power Consumption	30W (exclusive of LNB power)
Operating temperature	0~45°C
Storage temperature	-10~60°C
Operating Humidity	10~90%, non-condensed
<b>Certification</b>	
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	

## Block Diagram

DXP-3800D Encoder Functional Block Diagram



## Back Panel Interface



## DXP-8000D 8-Way FTA Receiver



DXP-8000D is a high-density 8-way receiver equipped with 8 independent tuners can be choose from DVB-T/T2, DVBS/S2, DVB-C, DTMB, ATSC and ISDB-T. The remultiplexing capabilities enable the creation of new transport streams that are subsets of the original inputted stream. Customized services may be output as multiple up to 128 SPTS or MPTS over IP

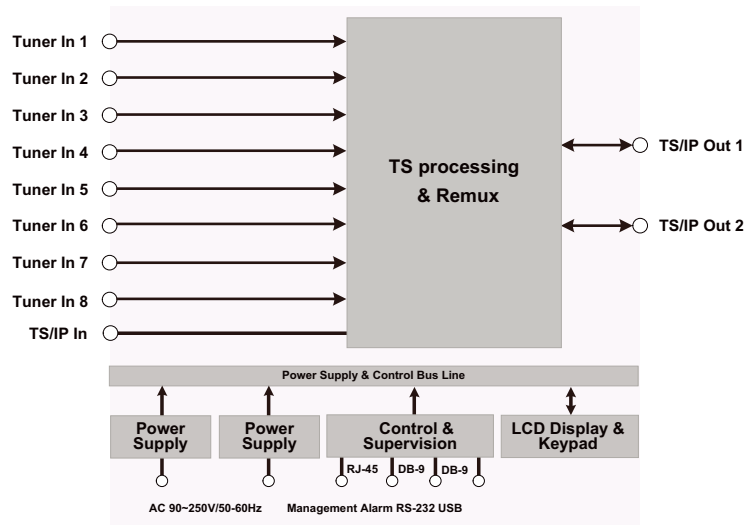
DXP-8000D is accommodated in a standard 1U x 19" rack mountable chassis.

### Main Feature

- 8xTuners Input, Supports variety of input options DVB-T2/T/S2/S/C/DTMB/ATSC/ISDB-T
- Supports DVB-S2 Input Stream Identifier (ISI, optional) and DVB-T2 Multi PLP
- 128 channel IP output
- Support PMT automatic update
- Remote control/monitoring with SNMP and HTTP/Web interface
- On site software update through IP or USB

### Block Diagram

DXP-8000D Functional Block Diagram



Two RJ45 redundant output



Support 8xTuners Input



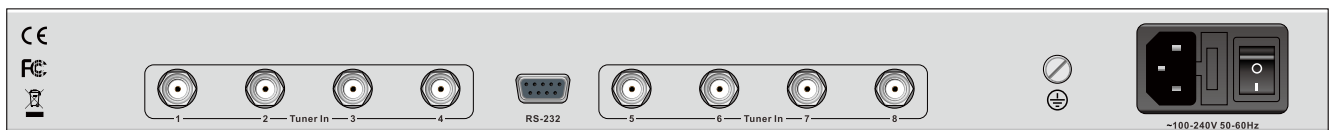


Specification

<b>DVB-S/S2 Tuner Input</b>	
Connector Type	8×F type female 75Ω for Input
Input Frequency Range	950 ~ 2150MHz
Input Level	-25 ~ -65dBm
Symbol Rate	2 ~ 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, 8/10 DVB-S2 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
LNB Polarity Selection	0, 13V, 18V selectable
Voltage	
LNB Band Selection Tone	0/22KHz selectable
Satellite Selection Command	DiSEqC 1.0
ISI ID	1 ~ 255 user configurable
<b>DVB-C Tuner Input</b>	
Connector Type	8×F type female 75Ω for Input
Input Frequency Range	51~860MHz
Input Level	45dBuV~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.)
<b>DVB-T/T2 Tuner Input</b>	
Connector Type	8×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.)
<b>DTMB Tuner Input</b>	
Connector	Type 8×F type female 75Ω for Input
Input Frequency Range	46.5~866MHz
Input Level	-87~-29dBm
Symbol Rate	7.56MBaud
Bandwidth	6MHz/7MHz/8MHz
Constellation	4QAM-NR, 4QAM, 16QAM, 32QAM, 64QAM
Guard Interval	PN420, PN595, PN945
Roll-off Factor	0.05

Interleaving Depth	240,720
FEC Code Rate	0.4, 0.6, 0.8
<b>ATSC Tuner Input</b>	
Connector	Type 8×F type female 75Ω for Input
Input Frequency Range	54~864MHz
Input Level	-75~-7dBm(ATSC 8VSB)
Symbol Rate	10.762MBaud
Constellation	8VSB
Roll-off Factor	0.115
Bandwidth	6MHz
<b>TS Processing</b>	
TS Input Management	Remux among Tuners
TS Output Management	Remux for ASI output
<b>PSI/SI</b>	
	PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation
Descrambler	DVB Common Scrambling Algorithm (CSA)
BISS Mode	BISS-1, BISS-E
Common Interface	8 x PCMCIA slots, compatible with major CA CAMs in the market
<b>ASI Output</b>	
Connector Type	9 independence BNC female, 75Ω,
Standard	DVB-ASI, EN50083-9
Output Bit Rate	≤ 200Mb/s
TS Processing	8xASI out pass through the TS from CI 1 to CI8, 1xASI Out from Remux,
<b>ASI Input</b>	
Connector Type	1×BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Bit Rate	≤100Mb/s
Connector Type	1×BNC female, 75Ω
<b>TS over IP</b>	
Connector Type	RJ45, IEEE 802.3, 10/100/1000 Base-T
Output capability	128 * SPTS or MPTS UNICAST / MUTICAST
Max Effective Bit Rate	500Mb/s
Protocol	UDP/RTP ICMP, ARP, IGMPv3
<b>Control &amp; Monitoring</b>	
Connector Type	RJ45, 100M
Remote Control	SNMP V2, HTTP
Serial Port	1× RS-232 D-sub female
Alarm	1× D-sub 9 male
<b>Physical</b>	
Operating temperature	0-45°C
Storage temperature	-20~70°C
Power Supply	AC 90V~260V 50Hz/60Hz
Dimension	44mm×255mm×430mm
Weight	3.5kg

Back Panel Interface



## DXP-3400PA

### 4-Channel H.264 HD IRD



The DXP-3400PA provides operators an ideal solution for multi receiving, descrambling, remultiplexing and decoding operations. By the quad DVB common interfaces, DXP-3400PA could decrypt multiple services in 4 transport stream. DXP-3400PA is also a professional IRD that features a broadcast quality decoder for MPEG-2 and MPEG-4 AVC/H.264 in both Standard Definition and High Definition formats, and provides a variety of industry standard digital and analog outputs, including 4 separated CVBS video, analog Audio, SD-SDI and HD-SDI. The unit also performs HD down-conversion and aspect ratio adaptation of HD programs to generate professional quality baseband analog video and audio outputs and TS over IP operations for easy integration with existing cable network infrastructure. This all-in-one architecture makes the DXP-3400PA an ideal product for distribution and contribution networks.

#### Main Feature

- Quad Tuner Input, Supports variety of input options DVB-T2/S2/S/C/T/DTMB/ATSC/ISDB-T, DS3/E3,
- Supports DVB-S2 Input Stream Identifier (ISI, optional) and DVB-T SFN MIP pass through
- SD/HD MPEG-2 and MPEG-4 AVC/H.264 digital video decoding
- Two Audio PIDs decode or pass through (compressed) for each SDI output
- Built-in 2xTS re-multiplexer, one receives from Tuner1, Tuner2, CI1 and CI2 Inputs, the other receives from Tuner3, Tuner4, CI3 and CI4 Inputs
- Support 2xIP streaming in & 2 IP out at full duplex mode, or 128xchannels IP out at IPTV mode, or 11xchannels IP out at DVB mode
- On Site software update through IP or USB
- 4x DVB-CI Slots, multi-program decryption, BISS-1 and BISS-E decryption
- Dynamic PMT detection and automatic updating
- Supports VBI TELETEXT, EBU/DVB Subtitle, Closed Caption
- Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software
- PCM audio embedded in SDI and HDMI outputs
- AC3 and Dolby E audio can be passed through by SDI
- VBI TELETEXT, WSS and Closed Caption embedded in SDI
- RSSI, received Eb/No & BER monitoring
- Redundant power supply

#### Built-in Remultiplexer and TS/IP interface



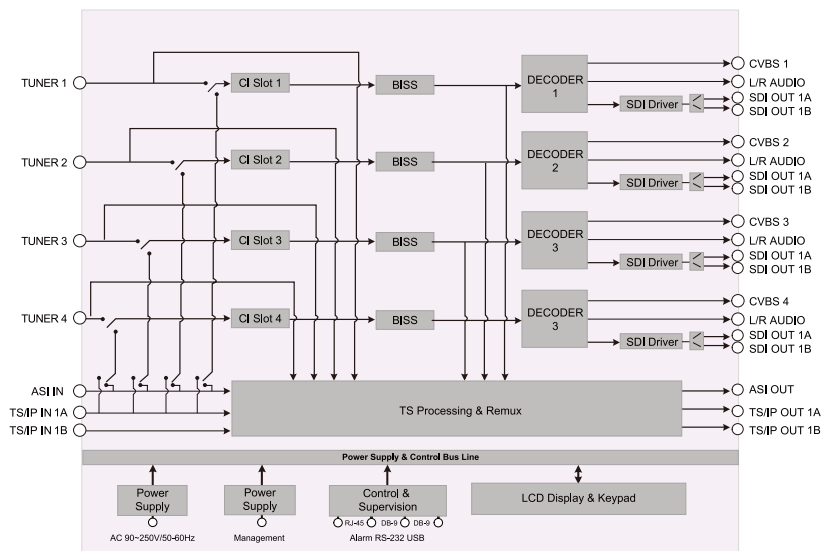
#### Up to 8 channels in one rack



#### Hot-swappable redundant power supply



#### Block Diagram



## Specification

<b>Tuner Input</b>	
<b>DVB-S/S2 Tuner Input (ISI Factory Optional)</b>	
Connector Type	4×F type female 75Ω for Input
Input Frequency Range	950~2150MHz
Input Level	-25~-65dBm
Symbol Rate	2~45MBaud
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
ISI ID	1~255 user configurable
<b>DVB-C Tuner Input</b>	
Connector Type	4×F type female 75Ω for Input
Input Frequency Range	51~862MHz
Input Level	45~75dBμV
Symbol Rate	1~7MBaud (ITU J.83 Annex A)
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Bandwidth	6MHz, 7MHz, 8MHz
Input Return Loss	7dB (typ.)
<b>DVB-T/T2 Tuner Input</b>	
Connector Type	4×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
Guarding 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.)
<b>DTMB Tuner Input</b>	
Connector Type	4×F type female 75Ω for Input
Input Frequency Range	46.5~866MHz
Input Level	-87~-29dBm
Symbol Rate	7.56MBaud
Bandwidth	6MHz/7MHz/8MHz
Constellation	4QAM-NR, 4QAM, 16QAM, 32QAM, 64QAM
Guard Interval	PN420, PN595, PN945
Roll-off Factor	0.05
Interleaving Depth	240, 720
FEC Code Rate	0.4, 0.6, 0.8
<b>ATSC Tuner Input</b>	
Connector Type	4×F type female 75Ω for Input
Input Frequency Range	54~864MHz
Input Level	-75~-7dBm(ATSC 8VSB)
Symbol Rate	10.762MBaud
Constellation	8VSB
Roll-off Factor	0.115
Bandwidth	6MHz
<b>DS3 Input (Option)</b>	
Connector Type	4×BNC female, 75Ω, including loop through

Standard	Compliant with ITU-T G.703
Frame Structure	Compliant with ITU-T G.752 and ITU-T G.804
Bit Rate	44.736Mb/s
<b>TS Processing</b>	
TS Input Management	Demux and Remux among Tuner and CI Inputs
TS Output Management	Demux and Remux for 4 independent ASI outputs
Service and PID Management	Remux, filtering and remapping
PSI/SI	PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation
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
<b>ASI Input</b>	
Connector Type	4 independent BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Output Bit Rate	≤ 100Mb/s
<b>ASI Output</b>	
Connector Type	4 independent BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Output Bit Rate	≤ 100Mb/s
<b>Digital Video Processing</b>	
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)
SDI 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	≤ 60Mb/s
<b>HD/SD-SDI or ASI Output</b>	
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
Connector Type	4 Pairs of SDI output, BNC, female, 75Ω
SD Standard	SMPTE 259M, 270 Mb/s (10bit)
HD Standard	SMPTE 292M, 1.485 Gbit/s (10bit)
Level	800mV p-p MPEG-1 Layer 2 a. 2 stereo pairs (Stereo, Dual Mono, Left, Right) Dolby Digital (AC3) a. 5.1 down-mix to 2.0 (Stereo, Dual Mono, Left, Right) b. Dolby Digital Audio Pass-through Dolby Digital Plus(AC3+) a. 5.1 down-mix to 2.0 (Stereo, Dual Mono, Left, Right) b. Dolby Digital Audio Pass-through MPEG-2 AAC a. 5.1 down-mix to 2.0 (Stereo, Dual Mono, Left, Right) b. 2.0 (Stereo, Dual Mono, Left, Right) MPEG-4 HE-AAC v1/v2 a. 5.1 down-mix to 2.0 (Stereo, Dual Mono, Mono, Left, Right) b. 2.0 (Stereo, Dual Mono, Left, Right)
Embedded Audios	
Embedded Ancillary Data	Teletext, WSS, CC

### Analog Video Output

Standard	4×HDMI 1.3 interface (up to 1080i)
Video Resolution and Frame Rate	1 0 8 0 i × 3 0 , 1 0 8 0 i × 2 9 . 9 7 , 1 0 8 0 i × 2 5 , 7 2 0 p × 6 0 , 7 2 0 p × 5 9 . 9 4 , 7 2 0 p × 5 0 , 4 8 0 p × 6 0 , 5 7 6 p × 5 0 , 5 7 6 i × 2 5 , 4 8 0 i × 2 9 . 9 7
Audio Embedded	4×stereo

### Digital Audio Output

CVBS Connector	4×BNC female 75Ω
CVBS Standard	NTSC, PAL, and SECAM
CVBS Resolution	576i×25, 480i×29.97
Nominal 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
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	>55dB (luminance weighted)

### Analog Audio Output

Connector Type	2×D-sub 9 male included 4 pairs of stereo audio with XLR adaptor cable
Output Impedance	600Ω (balanced)
Output Mode	Left, Right, Dual Mono, Stereo
Number of Output	4 pairs of stereo audio outputs (4 Audio PIDs or 8 channels are decoded)
Cross Talk Among Channels	>70dB
THD	<0.3% @ 400Hz, 1KHz test tone
Frequency Response	±0.5dB over 20Hz ~ 18KHz
Output Level	0dBm in 600Ω (0dBu), adjustable range ±10dB

### Ancillary Data Processing

Subtitle	DVB, EBU
VBI	Teletext, WSS
Closed Caption	EIA 608, EIA 708, EIA 608-to-708

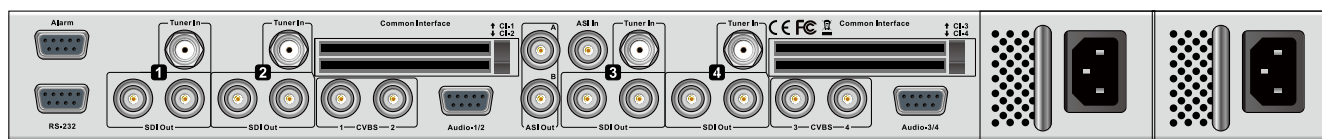
### TS over Ip

Connector Type	2×RJ-45, 100/1000 Base-T TS/IP Full duplex mode IEEE 802.3, 10/100/1000 Base-T 2 IP in and 2 IP out, Max bit rate: 120Mb/s X 4 Protocol: UDP/RTP SPTS or MPTS; ICMP, ARP, IGMPv2, IGMPv3 TS/IP IPTV Mode TS/IP Out only, IEEE 802.3, 10/100/1000 Base-T 128 IP out, second port backup, Max bit rate : 400Mb/s Protocol: UDP/RTP SPTS or MPTS; ICMP, ARP, IGMPv2, IGMPv3 TS/IP DVB Mode TS/IP Out only, IEEE 802.3, 10/100/1000 Base-T 11 IP out, second port backup, Max bit rate : 600Mb/s Protocol: UDP/RTP SPTS or MPTS; ICMP, ARP, IGMPv2, IGMPv3
Effective Bit Rate	

### Control & Monitoring

Connector Type	1×RJ-45, 10/100 Base-T, for equipment IP Control
Remote Control	SNMP, HTTP (Web Interface)
Proprietary HDMS (Headend Device Management System)	
Local Control	LCD display and 6-key keypad
Serial Port	1×RS-232 D-sub female, for debug use only
Equipment Upgrade	Embedded FTP loader and Telnet
Weight	3.5kg
Power Supply	AC 90V~250V, 50/60Hz
Power Consumption	24W (exclusive of LNB power)
Operating temperature	0~45°C
Storage temperature	-10~60°C
Operating Humidity	10~90%, non-condensed

## Back Panel Interface



# DXP-3440DM

## 4-Channel DVB Receiver and Transmodulator

DXP-3440DM integrates 4 DVB Receiver and Transmodulator in one 1U 19" chassis. It provides operators an ideal DTV headend setup solution by combining multi-channel receiving, descrambling, remultiplexing and DVB QAM/COFDM modulation and TS over IP operations together in one single unit. Equipped with 4 independent tuner front end with various factory options for DVB-T/T2, DVB-S2/S, DVB-C, DTMB, ISDB-T and ATSC types, and industrial standard ASI and TS/IP inputs outputs, DXP-3440DM ensures the compatibility with all kind of transmission media. The standard four PCMCIA common interface on the rear panel are capable of working with most of well-known CAS in the market to de-crypt multiple pay TV services. The compact space and powerful functions make DXP-3440DM one of the most competitive product in the head-end market.



### Main Feature

- 4×Tuner Input, Supports variety of input options DVB-T2/T/S2/S/C/DTMB/ATSC/ISDB-T
- Supports DVB-S2 Input Stream Identifier (ISI, optional) and DVB-T2 Multi PLP and SFN MIP pass through
- 4×DVB QAM/COFDM Modulation, 4 x RF Channel Output (Adjacent channel)
- Built-in TS re-multiplexer receives from ASI, CI Slot1 to CI Slot4 and TS/IP inputs
- 4×DVB-CI Slots, multi-program decryption, BISS-1 and BISS-E decryption
- 4×ASI output the transport stream from CI Slot1 to CI Slot4 or BISS decryption
- 1xchannel full duplex TS over IP or 5xchannels IP out without IP input
- Remote Control and Supervision by SNMP v2, HTTP WEB and Proprietary HDMS software
- On Site software update through IP or USB
- RSSI, received signal strength, Eb/N0, C/N and BER monitoring
- Redundant power supply

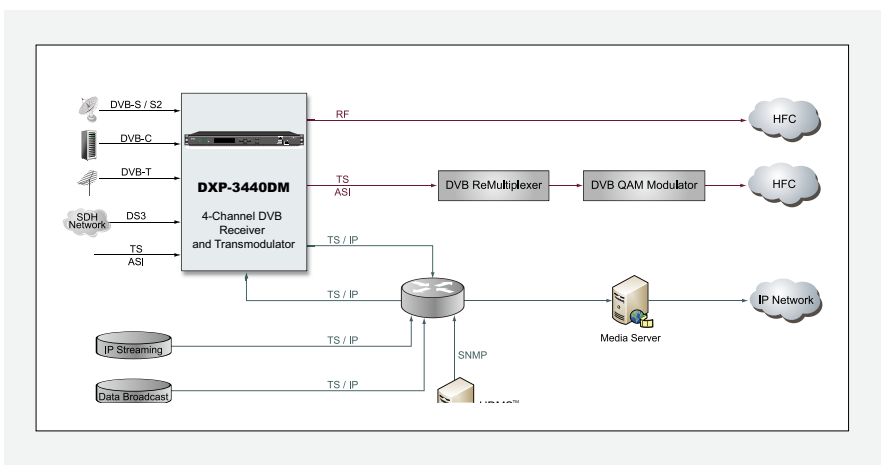
### Built-in Remultiplexer and TS/IP interface



### Up to 4 channels in one rack



### Hot-swappable redundant power supply



## Specification

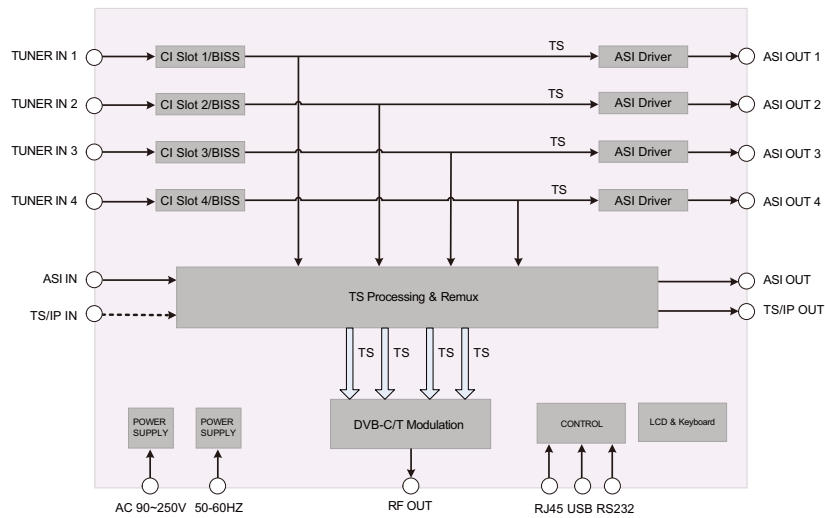
<b>Tuner Input</b>	
<b>DVB-S/S2 Tuner Input (ISI Factory Optional)</b>	
Connector Type	4×F type female 75Ω for Input
Input Frequency Range	950~2150MHz
Input Level	-25~-65dBm
Symbol Rate	2~45MBaud
Roll-off Factor	DVB-S QPSK: 0.35 DVB-S2 8PSK: 0.35, 0.25, 0.2
FEC Code Rate	DVB-S QPSK: 1/2, 2/3, 3/4, 5/6, 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	0,13V,18V selectable, available for Tuner 1&2
LNB Band Selection Tone	0/22KHz selectable, available for Tuner 1 & 2
Satellite Selection Command	DiSeqC 1.0
ISI ID	1~255 user configurable
<b>DVB-C Tuner Input</b>	
Connector Type	4×F type female 75Ω for Input
Standard	EN 300 429, ITU J.83 Annex A, B, C
Input Frequency Range	51~862MHz
Input Level	47~95dBμV 16QAM, SR=6.875Mps 256QAM, SR=6.875Mps
Symbol Rate	1~7MBaud (ITU J.83 Annex A)
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Bandwidth	6MHz, 7MHz, 8MHz
Input Return Loss	8dB (typ.)
<b>DVB-T/T2 Tuner Input</b>	
Connector Type	4×F type female 75Ω for Input
Standard	EN 300 744(DVB-T), EN 302 755 (DVB-T2)
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
Guarding 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.)
<b>ASI Input</b>	
Connector Type	1×BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Bit Rate	≤216Mb/s
<b>Built-in Remux</b>	
Number of Input	9xMPTS/SPTS
Number of Output	5xMPTS/SPTS
TS Input Management	Demux and Remux among ASI, TS/IP and CI Inputs
TS Output Management	Remux for ASI output, TS/IP output and modulator
Service and PID Management	Service and PID level for Remux, filtering and remapping
PSI/SI	PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation
<b>Descrambling</b>	
Descrambler	DVB Common Scrambling Algorithm (CSA)
Common Interface	4 x PCMCIA slots, compatible with major CA CAMs in the market
BISS Mode	BISS-1, BISS-E
<b>QAM Modulation</b>	
Standard of System	ETSI EN300 492, ITU J.83, Annex A/C: 16/32/64/128/256QAM

Symbol Rate	2.5~6.99 Bauds
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
I/Q Amplitude Error	≤ 0.1%
I/Q Phase Error	≤ 0.1%
Phase Jitter	< 0.5°RMS
MER	36dB min., 42dB typ. (with tester equalizer "off" )
<b>COFDM Modulation</b>	
Standard of System	ETSI EN 300 744
Constellation	QPSK/16QAM/64QAM
Bandwidth	5/6/7/8MHz
FTT carrier number	2K, 8K
Guard Interval	1/4, 1/8, 1/16, 1/32
FEC rate	1/2, 2/3, 3/4, 5/6, 7/8
MER	36dB min., 40dB typ.
<b>RF Output</b>	
Interface	1x F-type Female, 1x F-type Female(-20dB), 75Ω
Carrier Central Frequency	48~996MHz adjustable, step by 1 KHz 92-109dBμV@1 RF output enabled, 88-105dBμV@ 2 RF output enabled 85-102dBμV@3 RF output enabled, 83-100dBμV@ 4RF output enabled step by 1dB
Output Level	
Spurious	≥55dBc typ.
Return Loss	≥12dB typ.
<b>ASI Output</b>	
Connector Type	6x BNC female, 75Ω,
Standard	DVB-ASI, EN50083-9
Output Bit Rate	≤ 200Mb/s
Data Mode	Byte
Package Length	188/204 Bytes
Signal Level	800±80mV
ASI Output Source	ASI out 1-4: TS from Tuner 1 to 4 pass through (Descrambled) ASI 5-6: TS from Remux (mirrored)
<b>TS/IP Gigabit Ethernet (Duplex mode)</b>	
Interface	1x RJ-45
Physical Layer Standard	IEEE 802.3, 10/100/1000 Base-T 1. Full-duplex: 1x multicast/unicast input and output; 2. Multi-channel Output: 5x multicast/unicast MPTS/SPTS output; 3. IPTV Output: 128x multicast/unicast output, unstuffed stream with video/audio only
Operation Mode	
Maximum Effective Bit Rate	1. Full-duplex: Input: 80Mbps, Output: 80Mbps 2. Multi-channel Output: 700Mbps 3. IPTV Output: 430Mbps
Data Encapsulation	UDP, RTP
Other Protocols	Multicast/Unicast, IGMPv3,ARP
<b>Alarm</b>	
Connector Type	1×D-sub 9 male
Switching Condition	User Defined
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/100 Base-T, for equipment IP Control
Remote Control	SNMP, HTTP (Web Interface), Proprietary HDMS (Headend Device Management System)
Local Control	LCD display and 6-key keypad
Serial Port	1×RS-232 D-sub female, for debug use only
Equipment Upgrade	Embedded FTP loader ,Telnet and http
<b>Physical</b>	
Dimension	505mm x 445mm x 45mm
Net Weight	3.2kg
Power Supply	AC 90V ~ 250V, 50/60Hz
Operating temperature	0~45°C
Storage temperature	-10~60°C
Operating Humidity	10~90%, non-condensed

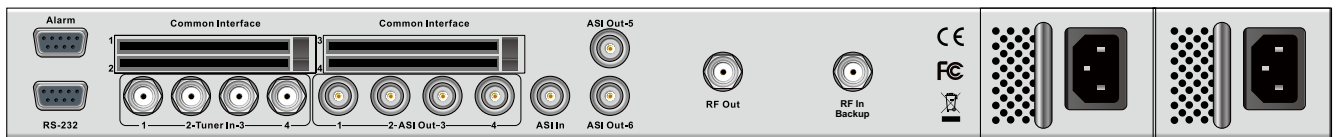
## Order Information

Interface		DXP-3440DM-S2C	DXP-3440DM-S2T	DXP-3440DM-T2C	DXP-3440DM-T2T
Input	Tuner	DVB-S2/S	DVB-S2/S	DVB-T2/T/C	DVB-T2/T/C
	ASI (BNC)	×1	×1	×1	×1
	TS/IP (GbE, RJ45)	•	•	•	•
Output	ASI x 4 (BNC)	•	•	•	•
	TS/IP (GbE, RJ45)	•	•	•	•
	QAM Modulation	•	•	•	•
	COFDM Modulation	•	•	•	•
	RF Monitor -20dB	•	•	•	•
Alarm (Contact Relay)		•	•	•	•
IP Control port (RJ45)		•	•	•	•
RS-232		•	•	•	•

## Block Diagram



## Back Panel Interface



## DCH-3000EC

### Single Channel MPEG-2 SD Encoder



DCH-3000EC is a real-time single program 4:2:0 MPEG-2 encoder. It provides both analog and digital audio/video inputs like CVBS, S-Video and SDI. By making compression of the base band TV signal, the encoder outputs a single program transport stream (SPTS) to the ASI output port. Furthermore, DCH-3000EC has an ASI input port which can re-multiplex the encoded SPTS with an external MPTS and generate a new MPTS. As an option, the MPTS of the encoder can also be outputted through RJ-45 port over IP. User can use SNMP for equipment remote control and supervision. The configuration of an encoder with built-in re-multiplexer makes DCH-3000EC an ideal product for the digital TV Headend system where the high quality stable video/audio compression is needed.

#### Main Feature

- Compliant with 4:2:0 MPEG-2 MP@ML video compression standard
- Multiple video inputs S-Video, SDI, ASI and CVBS
- Multiple audio inputs Stereo, Balanced audio, and SDI embedded audio input
- Support PAL, NTSC, and SECAM analog TV standards
- User-configurable 4:3/16:9 aspect ratio
- Video compression bit rate from 1.5Mbps to 20Mbps
- Configurable GOP
- Built-in two-way Re-multiplexer
- Support PAT, PMT and SDT generation and NIT insertion
- SNMP based remote control system
- LCD display and user friendly operation menu
- Up to 6 MPTS or SPTS over multicast or unicast IP streaming output

#### Multiple video inputs S-Video, SDI, ASI and CVBS



#### SNMP based remote control system and optional 100M TS/IP interface



#### LCD display and user friendly operation menu



#### Order Information

Interface	Model	DCH-3000EC-10	DCH-3000EC-30	DCH-3000EC-40
S-Video Input		•	•	•
CVBS Input (BNC)		•	•	•
SDI Input (BNC)			•	•
Balanced audio XLR		•	•	•
ASI Input			•	•
Built-in Remultiplexer		•	•	•
ASI Output		•	•	•
10/100M TS/IP(RJ45 interface, 6 channels)				•

• Standard function

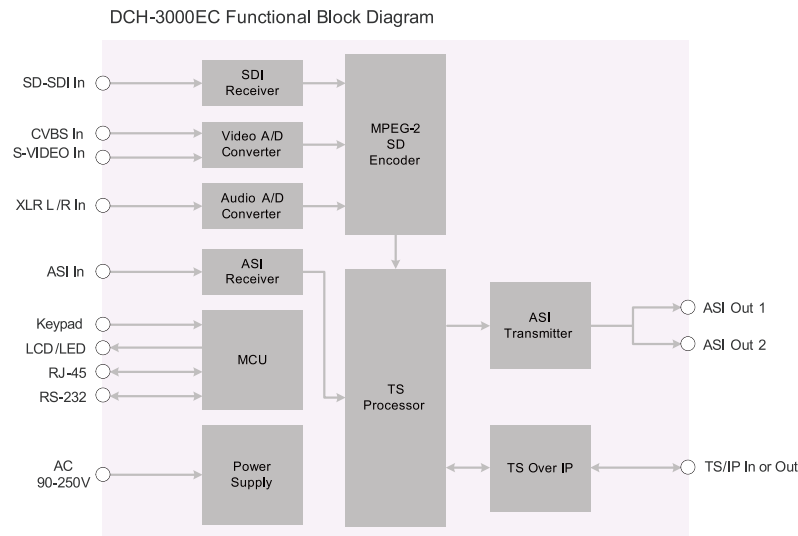


## Specification

<b>Video Compression</b>	
Analog Input	Analog NTSC, PAL and SECAM
Digital Input	SD-SDI (SMPTE-259M)
Compression Standard	MPEG-2 MP@ML
Video Resolution	480i (720×480) @29.97Hz: SMPTE125M 576i (720×576) @25Hz: ITU-R BT.656-4
Aspect Ratio	4:3/16:9 selectable
Video Compression bit rate	1.5~20Mb/s
<b>Audio Compression</b>	
Audio Channels	1 pair of stereo
Compression Standard	MPEG-1 Layer II
Audio Mode	Stereo, Joint Stereo, Dual Mono, Mono
Audio Sampling Rate	32, 44.1, 48 KHz
Audio Compression bit rate	32, 64, 128, 192, 256, 384 Kb/s
<b>Audio/Video Input Interface</b>	
Analog Audio	Balanced Audio XLR L / R
Analog CVBS	1×BNC female, 75Ω
S-Video	1×S-Video female, 75Ω
SD-SDI	1×BNC female, 75Ω
SDI embedded audio	Group 1 to 4 selectable
<b>ASI Input</b>	
Connector Type	1×BNC Female, 75Ω
Input bit rate	≤ 100Mb/s
Packet Mode	Byte or Burst
Packet Length	188/204 Bytes
<b>TS Processing</b>	
TS Input Management	Remux and demux between ASI input and the SPTS encoded
Service and PID management	Remux, filtering and remapping
PSI/SI	PSI/SI table generation, NIT and SDT edition
<b>TS over IP Output</b>	

Connector Type	1×RJ-45, 10/100 Base-T for TS/IP
Useful bit rate	70Mb/s min
Protocol	UDP / RTP, Multicast / Unicast, IGMPv2, ARP
Source	Built-in Re-mux, ASI input, Encoder
<b>ASI Output Interface</b>	
Connector Type	2×BNC Female, 75Ω
Output bit rate	≤ 99Mb/s
Packet Length	188 / 204 Bytes
Signal Level	800mVpp±10%
Source	Any one of Built-in Re-mux, ASI input and Encoder
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/100 Base-T, for equipment IP Control
Remote Control	SNMP, HTTP Web, Proprietary HDMS Software
Local Control	Front Panel
Software Upgrade	Built-in FTP server + Telnet
<b>Physical</b>	
Dimension	44mm×483mm×240mm
Net weight	2.8Kg
Power Supply	AC 90V~250V, 50/60Hz
Power Consumption	Maximum 20W
Operating Temperature	0~45°C
Storage Temperature	-10~6°C
Operating Humidity	10~90%, non-condensed
<b>Certification</b>	
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	

## Block Diagram



## Back panel Interface



## DCH-5200EC

### Single Channel H.264 HD Encoder

The DCH-5200EC is a high quality single channel high definition MPEG4/H.264 encoder. It has a wide range of digital/ analog video and audio inputs: CVBS, HD-SDI, YPbPr and stereo audio. It can support up to high definition TV up to 1080P, and the compressed MPEG4/H.264 signal is outputted from the ASI and IP port. Compared to DCH-4000EC and 5000EC, it presents a unique function of Time Base Correction to ensure the audio and video synchronization, the feature necessary for the professional TV signal flow.

The DCH-5200EC's re-multiplexing function enables creation of a new transport stream between the TS of encoder and the TS from ASI or IP. The encoder/trans-coder output can be multiple SPTS or MPTS over IP, as well as over ASI. In transcoding mode, the digital audios are looped through and time stamping is automatically implemented to ensure the synchronization between video and audio. This unique encoder/trans-coder with built-in re-multiplexer architecture makes the DCH-5200EC one of the best solutions to meet the MPEG2 to MPEG4/H.264 migration in today's digital broadcasting market.



#### Main Feature

- Multiple video resolution including 1080p, 1080i, 720p, 576i and 480i
- Multiple inputs, HD-SDI, YPbPr, and CVBS
- Unique video and audio synchronization by time base correction
- Support 10/100M TS/IP SPTS and MPTS
- Built-in re-multiplexer for encoder loop
- Support VBR and CBR encoding mode
- Support 2 pairs of analog stereo audio encoding with optional extension board
- Remote Control and Supervision by SNMP, HTTP WEB

#### Multiple inputs HDMI, HD-SDI, YPbPr, and CVBS



#### 10/100M TS/IP extension board option



#### Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software



#### Order Information

Interface		DCH-5200EC			
		-30	-32	-40	-42
Input	ASI	•	•	•	•
	CVBS	•	•	•	•
	SDI	•	•	•	•
	YPbPr	•	•	•	•
	HDMI	•	•	•	•
	Audio 1	•	•	•	•
Output	Audio 2		•		•
	ASI x2	•	•	•	•
	GigE Full Duplex			•	•
	Management	•	•	•	•
	RS-232	•	•	•	•

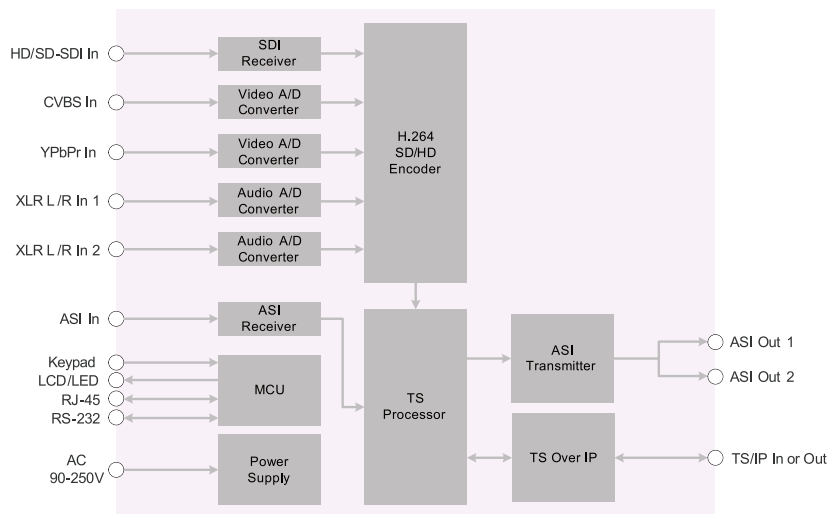
## Specification

<b>Video Compression</b>	
Video Resolution	1080p (1920x1080) @ 59.94 Hz, 50 Hz SMPTE296M: 6~30Mb/s 1080i (1920x1080) @25Hz, 29.97Hz SMPTE274M: 6~24Mb/s 1080i (1440x1080)@25Hz, 29.97Hz SMPTE274M: 5~24Mb/s 720p (1280x720) @50Hz, 59.94Hz SMPTE296M: 4~24Mb/s 480i (720x480) @29.97Hz: SMPTE656M: 2~10Mb/s 576i (720x576) @25Hz: SMPTE656M: 2~10Mb/s
Compression Standard	H.264, High Profile Level 4.0
Aspect Ratio	4:3/16:9 selectable
Video Encoding Bit Rate	2Mb/s-30Mb/s
<b>Audio Compression</b>	
Audio Input	Embedded Audio, Analog audio
Audio Channels	Maximum 2 pair of stereo
Audio Sampling Rate	48KHz
Audio compression Bit Rate	32 ~ 384Kb/s
<b>Audio/Video Input Interface</b>	
Analog Audio	1×D-sub 9 Female male with XLR adaptor cables
Analog CVBS	1×BNC Female, 75Ω
YPbPr	3×RCA Female, 75Ω
HDMI	1×HDMI 1.3
<b>ASI Input</b>	
Connector Type	1×BNC Female, 75Ω
Input bit rate	≤ 100Mb/s
Packet Mode	Byte
Packet Length	188/204 Bytes
<b>TS Processing</b>	
TS Output Management	Remux and demux for mirrored ASI outputs

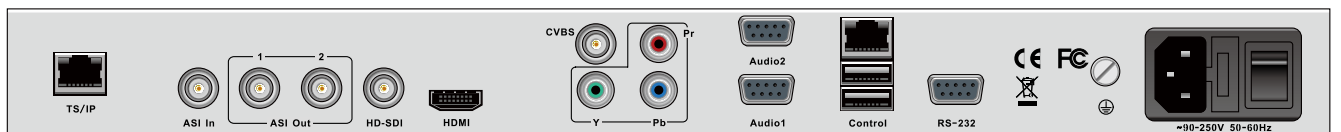
TS Input Management	Remux and demux between ASI input and the SPTS encoded
Service and PID management	Remux, filtering and remapping
PSI/SI	PSI/SI table regeneration, NIT and SDT edition
<b>TS over IP</b>	
Connector Type	1×RJ-45, 10/100M for TS/IP
Useful bit rate	70Mb/s for 10/100M
Protocol	UDP / RTP, Multicast / Unicast, IGMPv2, ARP
Source	Built-in Re-mux, ASI input, Encoder
<b>ASI Output</b>	
Connector Type	2×BNC Female, 75Ω
Output bit rate	≤ 99Mb/s
Packet Length	188 / 204 Bytes
Signal Level	800mVpp±10%
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/100M, for equipment IP Control
Remote Control	SNMP, HTTP Web
Local Control	LCD display and 6-key keypad
Software Upgrade	Built-in FTP loader and Telnet
<b>Physical</b>	
Dimension	44mm×483mm×340mm
Net weight	3.2Kg
Power supply	AC90~250V, 50Hz/60Hz
Power Consumption	Maximum 20W
Operating Temperature	0 ~ 45°C
Storage Temperature	-10 ~ 60°C
Humidity	10 ~ 90%, non-condensed
<b>Certification</b>	
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	

## Block Diagram

DCH-5200EC Functional Block Diagram



## Back panel Interface



## DXP-3800EC

### 8-Channel MPEG-2 SD Encoder

DXP-3800EC is an integrated 8-way high density MPEG-2 Encoder. Eight ways of Standard Definition (SD) base band real time A/V programs could be encoded simultaneously. These streams encoded could be re-multiplexed with the stream from its ASI input port. The final re-multiplexed Transport Stream (TS) is available at its Gigabit TSoverIP port and ASI output port.



#### Main Feature

- Compile with MPEG-1(ISO/IEC11172), MPEG-2 MP@ML(ISO/IEC13818)
- 8-way encoder with re-multiplexed integrated
- 1 ASI input (for daisy chain) & 1 ASI output
- Full duplex Gigabit TS over IP
- Video resolutions: 576i (PAL, SECAM) & 480i (NTSC)
- SNMP & HTTP WEB
- Redundant Power Supplies
- 19" x 1 U EIA standard chassis

#### Built-in Remultiplexer and TS/IP interface



#### Up to 8 channels in one rack



#### Hot-swappable redundant power supply



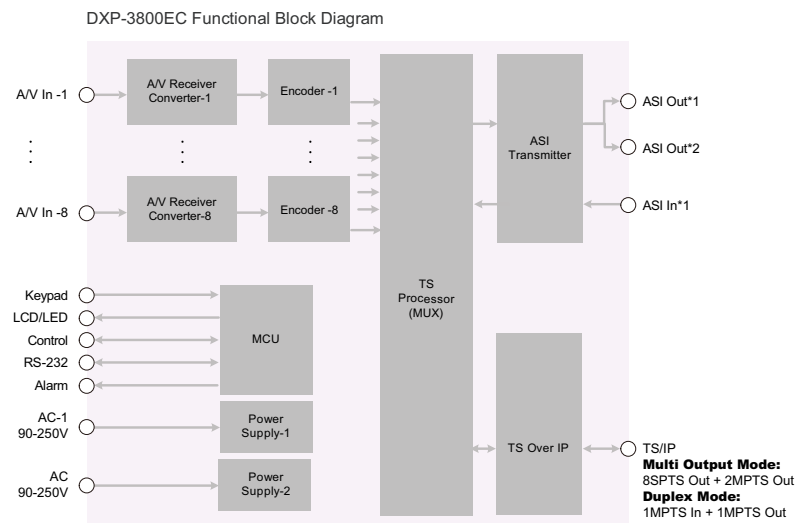
#### Order Information

Interface		DXP-3800EC	DXP-3400EC
Audio/Video Input	Video CVBS	8	4
	Audio R/L	8	4
TS Input	ASI	•	•
	TS/IP Input(Full duplex)	•	•
TS Output	ASI	•	•
	TS/IP	•	•
Management	RJ-45	•	•
Upgrade	USB	•	•
Alarm/Relay	Alarm	•	•
Debug	RS-232	•	•

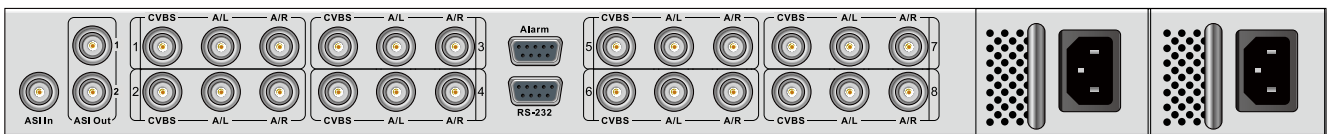
## Specification

<b>Video input &amp; Encode</b>		Effective Data Rate	1.5 Mb/s~70 Mb/s
Number of input ports	CVBS x 8	Data Transfer type	Byte
Encoding Standard	MPEG-2 MP@ML	Packet Length	188 or 204 Bytes
Chrominance Format	4:2:0	Signal Level	800±80mV
Compression Bit Rate	1.5Mbps~10Mbps	<b>Gigabit TS_over_IP</b>	
Main Video Resolutions & Recommended	480i(720×480)@29.97Hz: SMPTE656M: 3~6Mb/s	Standard	IEEE 802.3, 10/100/1000 Base-T, Full Duplex
Compression Bit Rates	576i(720×576)@25Hz: SMPTE656M: 3~6Mb/s	Maximum Effective Bit Rate	80Mb/s
Other Video Resolutions	Half D1,SIF,QSIF	Data Protocol	UDP or RTP, SPTS or MPTS
<b>Audio Input &amp; Encode</b>		Control Protocol	ICMP, ARP, IGMPv2
Number of input ports	8 pairs of Stereo Audios	<b>Interfaces on Rear Panel</b>	
Compression Standard	MPEG1 Layer I MPEG1 Layer II	ASI In	1×BNC Female, 75Ω
Sampling Rate	32KHz, 44.1KHz, 48KHz	CVBS In	8×BNC Female, 75Ω
Compression Bit Rate	MPEG1 Layer I: 64~256Kb/s MPEG1 Layer II: 32~384Kb/s	AUDIO In	8×BNC Female, 75Ω
DVB-ASI Input		ASI Out	2×BNC Female, 75Ω(1 Backup)
Interface	BNC Female, 75Ω	<b>Interfaces on Front Panel</b>	
Maximum Input Bit rate	100 Mb/s	Control	1 RJ-45, 10/100 Base-T
Data Transfer type	Byte	TS/IP	1×IP (GbE), RJ-45, 10/100/1000 Base-T, Full Duplex
Packet Length	188 or 204 Bytes	Display	2 x 20 LCD Display
Signal Level	200~880mVp-p	<b>Others</b>	
<b>DVB-ASI Output</b>		Power Supply	AC90~260V 50/60Hz
Interface	BNC Female, 75Ω	Operating Temperature	0~45°C
		Storage Temperature	-10~60°C
		Operating Humidity	10~90%, non-condensed

## Block Diagram



## Back Panel Interface



## DXP-4800EC

### 8-Way H.264 HD/SD and MPEG-2 SD Encoder



DXP-4800EC is a high density real-time H.264 HD/SD and MPEG-2 SD Encoder that can support up to eight High Definition (HD) A/V signals compressing and encoding simultaneously. These A/V signals can be fed into DXP-4800EC via 8 CVBS or 8x SDI input ports depending on different factory option. The encoded streams can be then remultiplexed and output over its GbE IP and ASI ports. DXP-4800EC adopts the chipset solution that embeds Time Base Correction (TBC) to ensure the audio and video synchronization, the features necessary for the professional TV signal flow. DXP-4800EC allows user to configure, monitoring and manage over the informative front panel and keypad, or Web interface, or SNMP based management software from 3rd party. Brilliant picture quality, high density design, high stability system architecture, and the hot-swappable power supply make the DXP-4800EC the best choice for real-time H.264 HD/SD or MPEG-2 SD encoding.

#### Built-in Remultiplexer and TS/IP interface



#### Up to 8 channels in one rack



#### Hot-swappable redundant power supply



#### Main Feature

- Compile with H.264/AVC HP@L4.0&MPEG-2 MP@ML
- MPEG1 Layer II, MPEG-2/4 AAC-LC/HE-AAC audio compression (AAC is for DXP-4800EC-X only)
- Support video resolution 1080i, 720p, 576i and 480i
- 8 x HD-SDI or HDMI input type factory option(CVBS support SD only)
- SNMP & HTTP WEB
- 8-way encoder with re-multiplexed integrated
- Low bit rate encoding. Minimum video encoding bitrate can reach 500Kbps.
- Support resolution down scale
- Support VBR and CBR
- Full duplex Gigabit TS over IP I/O
- Redundant Power Supplies
- 19"x1 U EIA standard chassis

#### Order Information

Interface		DXP-4800EC		DXP-4400EC	
		-S	-H	-S	-H
Audio/Video Input	HD/SD SDI	8		4	
	HDMI		8		4
TS Input	ASI		•		•
	TS/IP Input (Full duplex)		•		•
TS Output	ASI		•		•
	TS/IP		•		•
Management	RJ-45		•		•
Upgrade	USB		•		•
Alarm/Relay	Alarm		•		•
Debug	RS-232		•		•
Digital Audio HE-AAC, AAC-LC			Y		Y

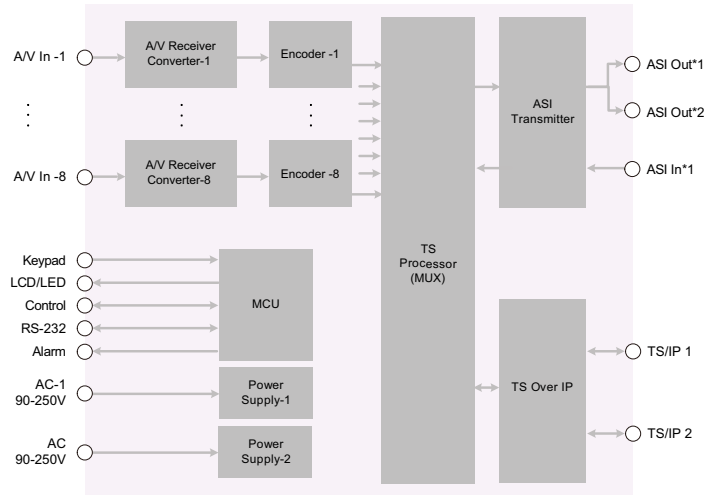
## Specification

<b>Video input &amp; compression</b>	
Number of input ports	HD-SDI×8 or HDMI x 8
Compression Standard	H.264/AVC HP@L4.0, MPEG-2 MP@ML
Pixel Format	4:2:0, 8-bit, YCbCr
Video Encoding Bit Rate	500Kbs~20Mbps for each channel 1080i (1920x1080) @25Hz, 29.97Hz SMPTTE274M: 1~13Mb/s 1080i (1440x1080@25Hz, 29.97Hz SMPTTE274M: 5~24Mb/s 720p (1280x720) @50Hz, 59.94Hz SMPTTE296M: 1~13Mb/s 480i (720x480) @29.97Hz: SMPTTE656M: 600K~10Mb/s 576i (720x576) @25Hz: SMPTTE656M: 600K~10Mb/s
Video Resolution (with recommended compress bitrate)	Output resolution can be adjusted freely by user
Resolution down-scale	4:3/16:9 Selectable
Aspect Ratio	4:3/16:9 Selectable
<b>Audio Input &amp; compression</b>	
Input	HDMI or SDI Embedded audio (factory option)
Audio Compression	MPEG1 Layer II, MPEG-2/4 AAC-LC, HE-AAC(V1,V2). Note: AAC is for DXP-4800EC only
Sampling Rate	48KHz
Compression Bit Rate	MPEG1 Layer II :32~192Kbps(Mono), 64~384Kbps(Stereo) MPEG2/4 AAC-LC :24~256Kbps(Mono), 48~512Kbps(Stereo) MPEG2/HE-AAC(V1/V2): 16~128Kbps(Mono), 32~256Kbps(Stereo)
<b>DVB-ASI Input</b>	
Interface	BNC Female, 75Ω
Maximum Input Bit rate	100 Mb/s
Data Transfer type	Byte
Packet Length	188 or 204 Bytes

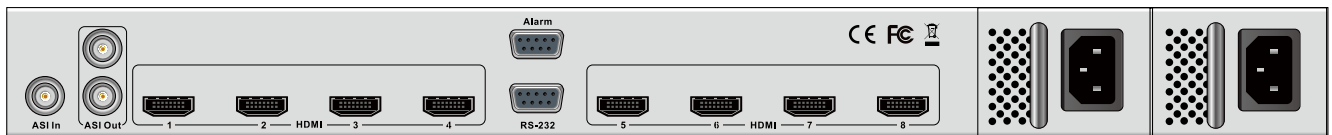
Signal Level	200~880mVp-p
<b>DVB-ASI Output</b>	
Interface	BNC Female, 75Ω
Effective Data Rate	120 Mb/s
Data Transfer type	Byte
Packet Length	188 or 204 Bytes
Signal Level	800±80mV
<b>Gigabit TS_over_IP (Full Duplex Mode)</b>	
Standard	IEEE 802.3, 10/100/1000 Base-T, Full Duplex
Maximum Effective Bit Rate	80Mb/s
Data Protocol	UDP or RTP, SPTS or MPTS
Control Protocol	ICMP, ARP, IGMPv2
<b>Gigabit TS_over_IP Output (Multi-Channel IPTV Mode)</b>	
Standard	IEEE 802.3, 10/100/1000 Base-T,
Maximum Effective Bit Rate	200Mb/s
Data Protocol	UDP or RTP, SPTS or MPTS
Control Protocol	ICMP, ARP, IGMPv2
<b>Interfaces on Rear Panel</b>	
ASI In	1×BNC Female, 75Ω
HD-SDI In	8×BNC Female, 75Ω (only available on DXP-4800EC-S)
HDMI In	8×HDMI Male, 75Ω (DXP-4800EC-H)
ASI Out	2×BNC Female, 75Ω(1 Backup)
<b>Interfaces on Front Panel</b>	
Control	1×RJ-45, 10/100 Base-T
TS/IP	1×IP(GbE), RJ-45, 10/100/1000 Base-T, Full Duplex
Display	2×20 LCD Display
<b>Others</b>	
Power Supply	AC90~260V 50/60Hz
Operating Temperature	0~45°C
Storage Temperature	-10~60°C
Operation Humidity	10~90%, (Non-condensed)

## Block Diagram

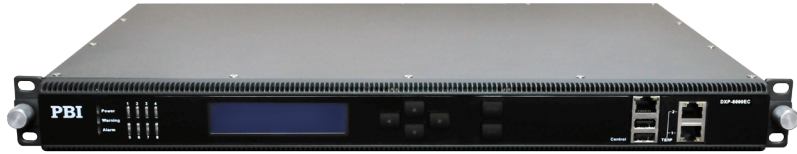
DXP-4800EC Functional Block Diagram



## Back Panel Interface



## DXP-8000EC 8-Way Integrated Encoder



DXP-8000EC consists of two 4-way (total 8) H.264/MPEG-2 encoder modules, TS reMultiplexer, All encoders are real time and independent operated. Each encoder accepts one stereo program through its HDMI (HD or SD) input, or CVBS(SD) Input, These programs encoded are multiplexed onto one Transport Stream (TS). The essential PSI/SI tables of the TS, including LCN (Logical Channel Number), are generated automatically and are editable by user. This TS stream is also available through the TS/ IP port on the front panel with 3 modes: Full Duplex, 128 IPTV & 32 IPTV with 2 RJ-45 port.

DXP-8000EC is accommodated in a standard 1U x 19" rack mountable chassis.

### Main Feature

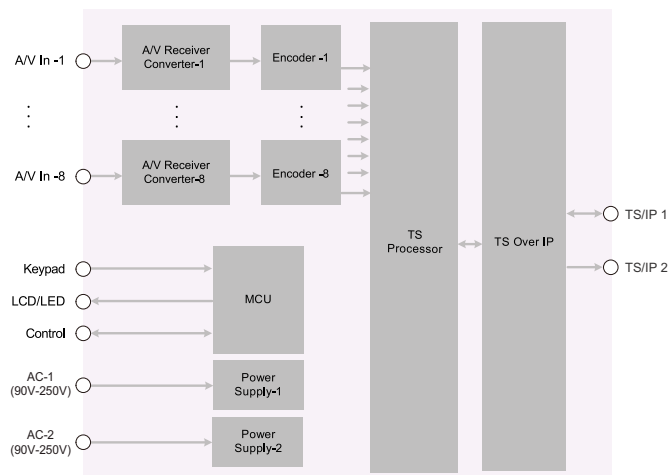
- Compliant with H.264/AVC HP@L4.0 & MPEG-2 MP@ML
- Support MPTS & SPTS, Re-multiplexed integrated
- Total bitrate up to 400Mb/s at 128 IPTV Mode
- Total bitrate up to 200Mb/s at 32 IPTV Mode with both RJ-45 port
- Total bitrate up to 80Mb/s at Full Duplex Mode
- HD/SD Video Resolution: 1080i, 720p, 576i, 480i
- MPEG1-L2, MPEG-2/4 AAC-LC/HE-AAC Audio Encode
- Remote control/monitoring with SNMP and HTTP/Web interface
- Two Redundant Power Supplies

### Order Information

	Description	Encoder Input	Encoder Way	TS/IP ( Full Duplex / IPTV Output)	Audio Encode (AAC)
1	DXP-8000EC-82H	HDMI	8	Y	Y
2	DXP-8000EC-42H		4	Y	Y
3	DXP-8000EC-80H		8	N	Y
4	DXP-8000EC-40H		4	N	Y
5	DXP-8000EC-82C	CVBS & Audio	8	Y	N
6	DXP-8000EC-42C		4	Y	N
7	DXP-8000EC-80C		8	N	N
8	DXP-8000EC-40C		4	N	N
9	DXP-8000EC-82S	SDI	8	Y	Y
10	DXP-8000EC-42S		4	Y	Y
11	DXP-8000EC-80S		8	N	Y
12	DXP-8000EC-40S		4	N	Y

### Block Diagram

DXP-8000EC Functional Block Diagram





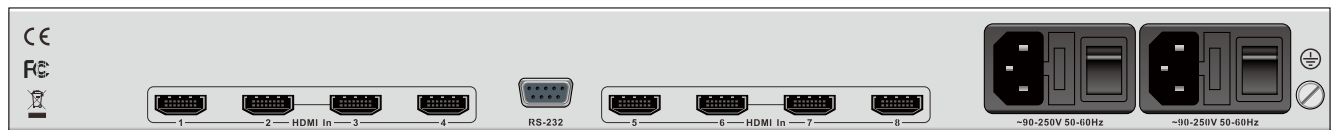
## Specification

<b>Video</b>	
Input Interface	HDMI, type A (8000EC, HD/SD) RCA, 75Ω (8100EC, SD)
Encode Standard	H.264/AVC HP@L4.0&MPEG-2 MP@ML (8000EC, HD/SD) H.264/AVC MP@L4.0&MPEG-2 MP@ML (8100EC, SD)
Chrominance Sampling Format	4:2:0
Video Resolution & Recommend range for H.264	1080i(1920×1080)@25Hz,29.97Hz,30Hz :SMPTE274M: 1~13Mb/s 720p(1280×720)@25Hz,29.97Hz,30Hz:S MPTE296M: 1~13Mb/s 480i(720×480)@25Hz:SMPTE656M: 600K~10Mb/s 576i(720×576)@25Hz: SMPTE656M:600K~8Mb/s 480i(720×480)@25Hz:SMPTE656M: 3.5~8Mb/s 576i(720×576)@25Hz: SMPTE656M:3.5~8Mb/s
Video Resolution & Recommend range for Mpeg2	Manually enter, Arbitrarily
Other Output Resolution Aspect Ratio	4:3 or 16:9, configurable
<b>Audio</b>	
Input Interface	HDMI x 8 or RCA x 8 pair
Encode Standard	MPEG1 Layer II
Sampling Frequency	MPEG-2/4 AAC-LC, HE-AAC(V1,V2) 48KHz
Encoder Bit Rate Range	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)

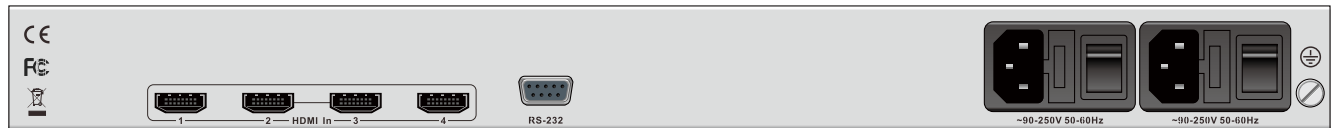
<b>TS/IP, Mode 1: Full Duplex, Single TS in, Single TS out</b>	
Standard	IEEE 802.3, 10/100/1000 Base-T
Maximum Bit Rate	80Mb/s in + 80Mb/s out
Data Encapsulation	UDP, RTP, SPTS or MPTS
Protocol	ICMP, ARP, IGMPv2/v3
<b>TS/IP, Mode 2: 128 IPTV Output Only</b>	
Standard	IEEE 802.3, 10/100/1000 Base-T
Maximum Output Bit Rate	400Mb/s
Data Encapsulation	UDP, RTP, SPTS or MPTS
Protocol	ICMP, ARP, IGMPv2/v3
<b>TS/IP, Mode 3: 32 IPTV Output from two RJ-45 port</b>	
Standard	IEEE 802.3, 10/100/1000 Base-T
Maximum Output Bit Rate	200Mb/s
Data Encapsulation	UDP, RTP, SPTS or MPTS
Protocol	ICMP, ARP, IGMPv2/v3
<b>Rear Panel</b>	
HDMI IN	HDMI (see model list) x 8
CVBS & Audio IN	RCA, 75Ω (see model list) x 8
<b>Front Panel</b>	
Control	RJ-45, 10/100 Base-T x 1, USB x 1
TS/IP	RJ-45X2, 10/100/1000 Base-T x 2; 1Back up Output only
Display	2x16 LCD module
<b>Others</b>	
Input AC Voltage Range	AC100~260V 50/60Hz
Operating Temperature	0~40°C
Storage Temperature	-10~60°C
Operating Humidity	10~90%, Non-condensed

## Back Panel Interface

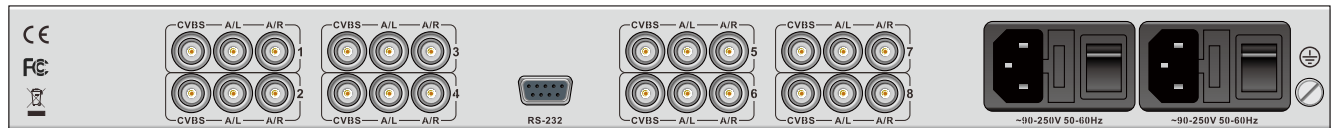
### DXP-8000EC-82H



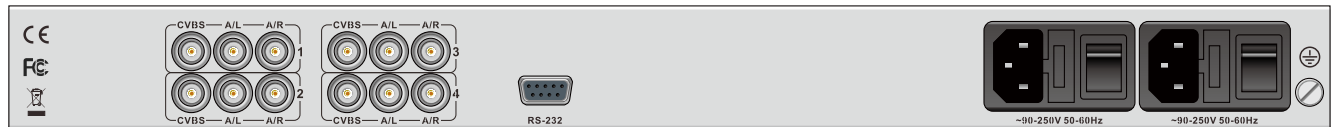
### DXP-8000EC-42H



### DXP-8000EC-82C



### DXP-8000EC-42C



## DIH-4000V

### Multi-Channel Low Bitrate H.264 Transcoder

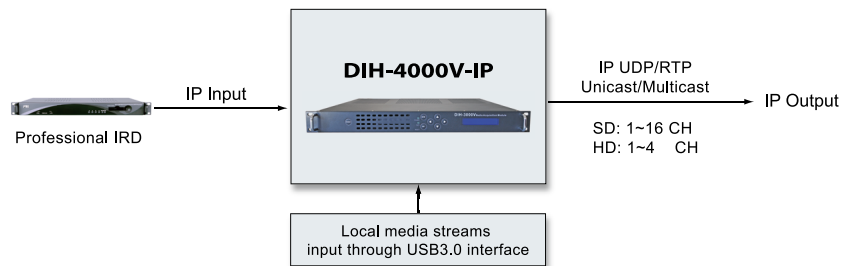
The DIH-4000V low bitrate H.264 Transcoder is specially designed for IPTV system, especially for those IPTV systems over unmanaged network architectures in which the bandwidth are normally limited. Adopting the powerful chipset and high quality compression algorithm, the inputted video transport stream can be compressed into relative low bit rate (<600kbps/channel) while the picture quality is guaranteed. DIH-4000V supports both MPTS and SPTS with a built-in IP re-multiplexer. DIH-4000V is also suitable for the multiscreen applications, where the inputted video can be compressed into various bit rates with different resolutions which are suitable for Smart phones, Tablets, PC and Flat screens simultaneously. DIH-4000V can be managed and monitored by user-friendly WEB interface.



#### Main Feature

- Comply with MPEG-2(MP@ML) and MPEG-4 AVC Baseline,Main&HighProfile@L4.0 or less
- Comply with MPEG-1 Layer II Audio, AAC, MP3 Decoding and Encoding
- Up to 4 HD or 16 SD transcoding
- Support up to 200 IP output with maximum bit rate of 100Mbps for each
- Off line local files transcoding
- Real-time monitoring on input bit rate, TS counter error, output video/Audio bit rate, PSI/SI information
- Real-time monitoring on the rate of utilization of CPU, running time, memory, etc.
- Last time memory for automatic encoding/transcoding after power recycles
- Re-multiplexer for PSI/SI editing PID pass through/filtering/remapping, PCR adjustment
- Keypad and LCD on front panel for status monitoring and IP address setting
- Remote management over Web GUI
- Support 1:N redundancy

#### Typical Application



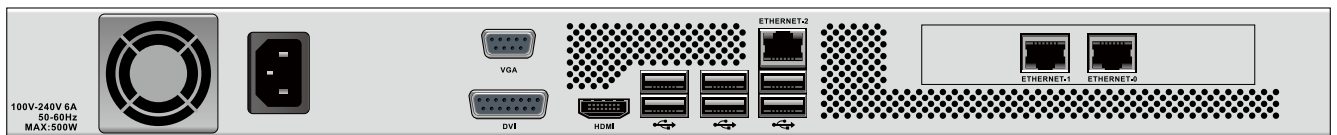
Specification

<b>IP Input</b>	
Interface	RJ45 x2pcs independent and full duplex 10000M/10M,900Mbps (Bandwidth<1200Mbps)
Protocol	UDP, ICMP, IGMP V1, V2, RTP (for re-multiplexer only)
IPaddress	Unicast, Multicast
Resource for transcoding	Local media files or TS/IP
<b>Video/Audio format for Decoding</b>	
Video format	MPEG-2,H.264(baseline, main profile, high profile)
Audio format	MPEG-1,MPEG-2,AAC
<b>Re-Multiplexer</b>	
Format	SPTS/MPTS
Null packets processing	pass through or filtering
TS processing	PSI/SI editing PID pass through/filtering/re-mapping PCR adjustment
Bitrate	lower than 100Mbps for each SPTS
Numbers of TS	Maximum 200
<b>IP Output</b>	
Interface	RJ45 x2pcs, 1000M/100M, full duplex, 900Mbps per RJ45 (Bandwidth < 1200Mbps)
Protocol	UDP, ICMP, RTMP, IGMP V1, V2, HTTP
IP address	Unicast, Multicast
<b>Video/Audio format for Encoding</b>	

Video format	MPEG-2,H.264(baseline, main, high)
Audio format	MPEG-1 L2 or AAC
Package Format	MPEG-TS
Video resolution	720*480/720*576/544*576/480*576/352*576/352*288/1280*720
Video ratio	4:3/16:9
Video frame rate	25fps, 29.97fps,30fps User configuration, recommended value: SD: High(800kbps), Medium(600kbps), Low (512kbps) HD: High(4000kbps), Medium( 2000kbps), Low (1200kbps)
Video bitrate	11.025KHz, 22.050 KHz, 44.1 KHz, 48 KHz
Audio sampling rate	User configuration, recommended value: 32kbps, 64kbps, 128kbps
Audio bitrate	
<b>Management</b>	
Interface	RJ45 x1pcs, 1000M/100M
Protocol	HTTP Web GUI
Redundancy	1:N backup through IP
<b>General</b>	
Power supply	AC 110V~240V, 6A, 47~63Hz, Max.350W
Working temperature	5~45 °C
Storage temperature	-10~65 °C
Dimension	430mm*335mm*44mm
Weight	3Kg

\*Note: all specifications are subject to change without notice

Back Panel Interface



## DXP-3410EM/4410EM 4-Channel Encoder and Modulator

DXP-3410EM/4410EM is integrated with 4-channel real-time encoders and 1 channel modulator. Four sets of A/V inputs are encoded and generated to 4 Transport Streams (TS) independently. The TS streams from the internal encoders, ASI input and TS/IP (TS<sub>over\_IP</sub>) input (full duplex mode only) could be re-multiplexed into one MPTS (Multiple Program TS), then modulated to one DVB RF carrier, QAM or COFDM. This MPTS is also available at the ASI output & TS/IP output simultaneously. With a built-in RF back-up relay switch, any external RF signal could be fed to the main output for back-up in cases of internal malfunction (main RF level < 75dBuV) or power supply lost.

DXP-3410EM/4410EM series are accommodated in 1U x 19" standard chassis with 2 redundant power supply modules. It is the most suitable deployment choice for any system in DVB, IPTV and Surveillance industries.



### Main Feature

- Comply with H.264/AVC HP@L4.0(DXP-4410EM)
- Comply with MPEG-2 MP@ML (ISO/IEC13818-2) (DXP/3410EM/DXP-4410EM)
- MPEG-2/4 AAC-LC/HE-AAC Option for DXP-4410EM
- 4 independent real-time encoders
- Integrated 6-input TS reMUX, (4 for encoders, 1 for ASI in, 1 for TS/IP in)
- ASI & TS/IP outputs
- Up to 5 TS/IP output streams (200Mb/s Max.)( 4 for encoders, 1 for ASI mirrored or reMUX)
- Constant Bit Rate (CBR) & Variable Bit Rate (VBR)
- DVB-C/QAM (ITU J.83 Annex A/C) or DVB-T/COFDM RF out, selectable
- 50MHz ~ 996MHz RF carrier output frequency adjustable
- 120dBuV Total Output Level
- RF Back-up loop through input (RF relay)
- SNMP & HTTP remote control & monitor
- Software could be upgraded with Web interface
- EIA 1U x 19" standard chassis with 2 redundant power supply modules

#### Up to 4 encoders integrated



#### Built-in RF back-up relay switch



#### Hot-swappable redundant power supply



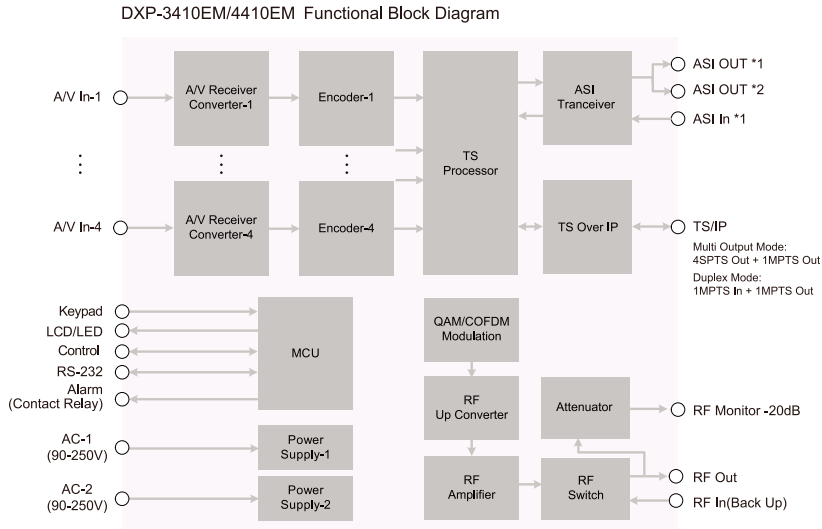
### Order Information

Interface		DXP-3410EM	DXP-4410EM	
			-H	-S
Video Standard	MPEG-2 SD	•	•	•
	H.264/AVC			•
Audio Standard	MPEG1 Layer II	•		•
	AAC-LC, HE-AAC			•
Input	CVBS	•		
	HDMI		•	
	HD-SDI			•
	ASI	•		•
	TS/IP (GbE) (Full duplex)	•		•
	RF In (back up)	•		•
Output	ASI x2	•		•
	TS/IP (GbE)	•		•
	RF Out -QAM&COFDM	•		•
	RF Monitor -20dB	•		•
Alarm		•	•	
Management (RJ-45 +USB)		•	•	
RS-232		•	•	

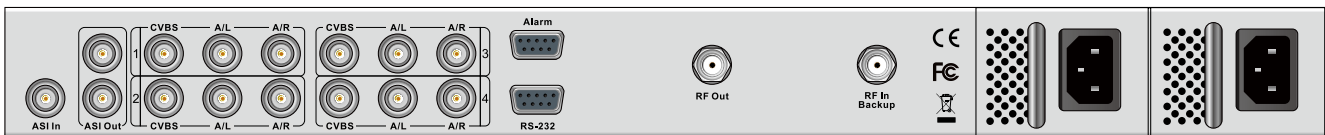
## Specification

<b>Video Input &amp; Compression(DXP-3410EM)</b>		<b>Data type</b>		Byte
Video Input	CVBSx 4	Packet Length	188/204 Bytes	
Compression Standard	MPEG-2 MP@ML	Output Waveform Level	800±80mVp-p	
Chrominance Space	4:2:0	<b>TS/IP Gigabit Ethernet (Duplex mode)</b>		
Video Encoding Bit Rate	1.5Mbps~10Mbps	Physical Layer Standard	IEEE 802.3, 10/100/1000 Base-T	
Video Resolutions & Recommended Video Encoding Bit Rates	480i(720×480)@29.97Hz: SMPTE656M: 2~10Mb/s 576i(720×576)@25Hz: SMPTE656M: 2~10Mb/s	Maximum Effective Bit Rate	Input: 200Mb/s, Output: 200Mb/s	
Other video resolutions	Full D1, Half D1, SIF, QSIF	Data Encapsulation	UDP, RTP, SPTS, MPTS	
Aspect Ratio	4:3 / 16:9 selectable	Other Protocols	ICMP, ARP, IGMpV2	
<b>Audio Input &amp; Compression(DXP-3410EM)</b>		<b>TS/IP Multiple Stream, Output Only</b>		
Audio Input	4 pairs stereo audio	Physical Layer Standard	IEEE 802.3, 10/100/1000 Base-T	
Compression Standard	MPEG1 Layer I, MPEG1 Layer II	Maximum Effective Bit Rate	Output: 200Mb/s	
Sampling Rate	32KHz, 44.1KHz, 48KHz	Data Encapsulation	UDP, RTP, SPTS, MPTS	
Audio Compression Bit Rate	MPEG1 Layer I: 64~256Kb/s MPEG1 Layer II: 32~384Kb/s	Other Protocols	ICMP, ARP, IGMpV2	
<b>Video input &amp; compression(DXP-4410EM )</b>		<b>QAM Modulation</b>		
Number of input ports	HD-SDI×4 or HDMI x 4	Standard of System	ETSI EN300 492, ITU J.83, Annex A/C: 16/32/64/128/256QAM	
Compression Standard	H.264/AVC HP@L4.0, MPEG-2 MP@ML	Symbol Rate	3~7.2MS/s	
Pixel Format	4:2:0, 8-bit, YCbCr 1080i (1920x1080) @25Hz, 29.97Hz SMPTE274M: 1~13Mb/s 1080i (1440x1080)@25Hz, 29.97Hz SMPTE274M: 5~24Mb/s 720p (1280x720) @50Hz, 59.94Hz SMPTE296M: 1~13Mb/s 480i (720x480) @29.97Hz: SMPTE656M: 600K~10Mb/s 576i (720x576) @25Hz: SMPTE656M: 600K~10Mb/s Output resolution can be adjusted freely by user	I/Q Amplitude Error	≤ 0.1%	
Video Resolution (with recommended compress bitrate)		I/Q Phase Error	≤ 0.1%	
Resolution down-scale	4:3/16:9 Selectable	Phase Jitter	< 0.5°RMS	
Aspect Ratio	4:3/16:9 Selectable	MER	36dB min., 42dB typ. (with tester equalizer "off" )	
<b>Audio Input &amp; compression(DXP-4410EM )</b>		<b>COFDM Modulation</b>		
Input	HDMI or SDI Embedded audio	Standard of System	ETSI EN 300 744	
Audio Compression	MPEG1 Layer II, MPEG-2/4 AAC-LC, HE-AAC(V1,V2). Note: AAC is for DXP-4400EM only	Constellation	QPSK/16QAM/64QAM	
Sampling Rate	48KHz	Bandwidth	5/6/7/8MHz	
Compression Bit Rate	MPEG1 Layer II :32~192Kbps(Mono), 64~384Kbps(Stereo) MPEG2/4 AAC-LC :24~256Kbps(Mono), 48~512Kbps(Stereo) M P E G 2 / H E - A A C ( V 1 / V 2 ) : 16~128Kbps(Mono), 32~256Kbps(Stereo)	FTT carrier number	2K, 8K	
<b>DVB-ASI Input</b>		Guard Interval	1/4, 1/8, 1/16, 1/32	
Interface Type	BNC Female, 75Ω	FEC rate	1/2, 2/3, 3/4, 5/6, 7/8	
Maximum Effective Bit Rate	200 Mb/s	MER	36dB min., 40dB typ.	
Data type	Byte	<b>RF Output</b>		
Packet Length	188/204 Bytes	Interface	F-type Female, 75Ω	
Valid Receiving Amplitude	200~880mVp-p	Carrier Central Frequency	50~996MHz adjustable, step by 10 KHz	
<b>DVB-ASI Output</b>		Output Level	90~120dBμV, step by 1dB	
Interface Type	BNC Female, 75Ω	Spurious	≥60dBc @ 120dBuV	
Maximum Effective Bit Rate	200Mb/s	Return Loss	≥12dB(typ.)	
		<b>Rear Panel</b>		
		ASI In	1×BNC Female, 75Ω	
		HD-SDI In	4×BNC Female, 75Ω (DXP-5411EM-S only)	
		ASI Out	2×BNC Female, 75Ω (mirrored contents)	
		RF Out	1×F Type Female, 75Ω	
		Back-up RF In	1×F Type Female, 75Ω	
		<b>Front Panel</b>		
		Control	1×RJ-45, 10/100 Base-T	
		TS/IP	1×IP(GbE), RJ-45, 10/100/1000 Base-T	
		Display	20×2 character VFD	
		RF Monitor -20dB	1×F Type Female, 75Ω	
		<b>Others</b>		
		Operating Input Voltage	AC100~260V 50/60Hz	
		Operating Temperature	0~40°C	
		Storage Temperature	-10~60°C	
		Operating Humidity	10~90%, Non-condensed	

Block Diagram



Back Panel Interface



Encoder and Modulator

DXP-8000EM consists of two group 4-way H.264/MPEG-2 encoder modules, TS reMultiplexer, DVB RF modulator and TS\_over\_IP module. All encoders are real time and independent operated. Each encoder accepts one stereo program through its HDMI input or CVBS input. These encoded programs could be multiplexed into one Transport Stream (TS). The essential PSI/SI tables of the TS, including LCN (Logical Channel Number), are generated automatically and are editable by user. The TS could be modulated to one DVB RF carrier, including QAM or COFDM. This MPTS is also available at the ASI output & TS/IP output simultaneously. DXP-8000EM is accommodated in a standard 1U x 19" rack mountable chassis.

## DXP-8000EM

### 8-way Integrated Encoder Modulator Series



#### Main Feature

- Compliant with H.264/AVC HP@L4.0 & MPEG-2 MP@ML
- Internal reMUX accepts TS from the TS/IP port, supporting MPTS and SPTS outputs
- Up to 9 TS/IP streams @ total bit rate of 200Mb/s
- HD/SD Video Resolution: 1080i, 720p, 576i, 480i
- RF Modulator options: DVB-T, DVB-C & DVB-T2 (simplified, factory option)
- RF Output Level 120dBμV
- Remote control/monitoring with SNMP and HTTP/Web interface
- Two Redundant Power Supplies

#### Order Information

	Description	RF Output	Encoder Input	Encoder Way	TS/IP (Full Duplex/IPTV Output)	Audio Encode (AAC)
1	DXP-8000EM-80HC	DVB-C				
2	DXP-8000EM-80HT	DVB-T	HDMI	8	N	Y
3	DXP-8000EM-80HT2	DVB-T2				
4	DXP-8000EM-82HC	DVB-C				
5	DXP-8000EM-82HT	DVB-T	HDMI	8	Y	Y
6	DXP-8000EM-82HT2	DVB-T2				
7	DXP-8000EM-40HC	DVB-C				
8	DXP-8000EM-40HT	DVB-T	HDMI	4	N	Y
9	DXP-8000EM-40HT2	DVB-T2				
10	DXP-8000EM-42HC	DVB-C				
11	DXP-8000EM-42HT	DVB-T	HDMI	4	Y	Y
12	DXP-8000EM-42HT2	DVB-T2				
13	DXP-8000EM-80CC	DVB-C				
14	DXP-8000EM-80CT	DVB-T	CVBS&Audio	8	N	N
15	DXP-8000EM-80CT2	DVB-T2				
16	DXP-8000EM-82CC	DVB-C				
17	DXP-8000EM-82CT	DVB-T	CVBS&Audio	8	Y	N
18	DXP-8000EM-82CT2	DVB-T2				
19	DXP-8000EM-40CC	DVB-C				
20	DXP-8000EM-40CT	DVB-T	CVBS&Audio	4	N	N
21	DXP-8000EM-40CT2	DVB-T2				
22	DXP-8000EM-42CC	DVB-C				
23	DXP-8000EM-42CT	DVB-T	CVBS&Audio	4	Y	N
24	DXP-8000EM-42CT2	DVB-T2				
25	DXP-8000EM-80SC	DVB-C				
26	DXP-8000EM-80ST	DVB-T	SDI	8	N	Y
27	DXP-8000EM-80ST2	DVB-T2				
28	DXP-8000EM-82SC	DVB-C				
29	DXP-8000EM-82ST	DVB-T	SDI	8	Y	Y
30	DXP-8000EM-82ST2	DVB-T2				
31	DXP-8000EM-40SC	DVB-C				
32	DXP-8000EM-40ST	DVB-T	SDI	4	N	Y
33	DXP-8000EM-40ST2	DVB-T2				
34	DXP-8000EM-42SC	DVB-C				
35	DXP-8000EM-42ST	DVB-T	SDI	4	Y	Y
36	DXP-8000EM-42ST2	DVB-T2				

## Specification

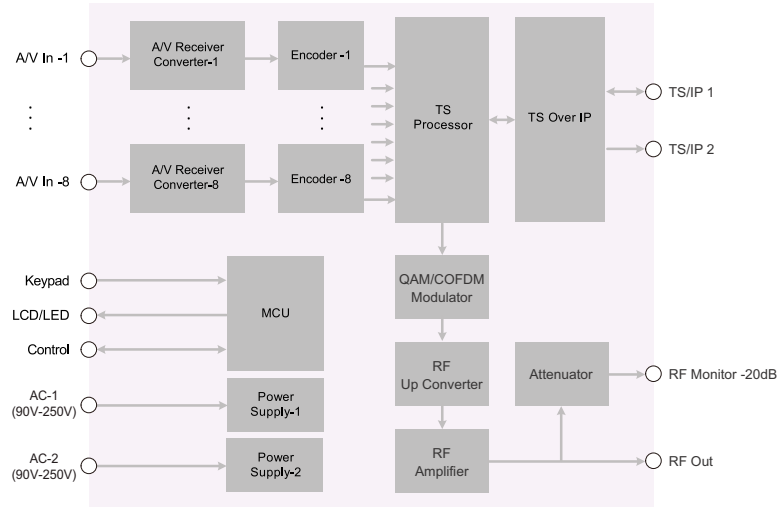
Video	
Input Interface	HDMI, type A female x 8, or CVBS RCA-female 75Ω x 8
Encode Standard	H.264/AVC HP@L4.0&MPEG-2 MP@ML
Chrominance Sampling Format	H.264/AVC MP@L4.0&MPEG-2 MP@ML
	4:2:0
	1080i (1920 × 1080)
	@25Hz,29.97Hz,30Hz:SMPTE274M: 1~13Mb/s
	720p (1280 × 720)
Output Resolution Settings & their recommend range	@25Hz,29.97Hz,30Hz:SMPTE296M: 1~13Mb/s
	480i (720 × 480) @25Hz:SMPTE656M: 800K~8Mb/s
	576i (720 × 576) @25Hz: SMPTE656M:800K~8Mb/s
Video Resolution Down Scaling	Vertical & Horizontal adjustable respectively (frame rate is not scalable)
Aspect Ratio	4:3 or16:9, configurable
Audio	
Input Interface	HDMI embedded x 8 or RCA-female pair x 8
Encode Standard	MPEG1 Layer II, MPEG-2/4 AAC-LC, HE-AAC(V1,V2)
Sampling Frequency	48KHz
	MPEG1 Layer II :32~192Kbps(Mono), 64~384Kbps(Stereo)
Encoder Bit Rate Range	MPEG2/4 AAC-LC :24~256Kbps(Mono), 48~512Kbps(Stereo)
	MPEG2/4 HE-AAC(V1/ V2): 16~128Kbps(Mono), 32~256Kbps(Stereo)
TS/IP, Mode 1: Full Duplex, Single TS in, Single TS out	
Standard	IEEE 802.3, 10/100/1000 Base-T
Maximum Bit Rate	120Mb/s in + 120Mb/s out
Data Encapsulation	UDP, RTP, SPTS or MPTS
Protocol	ICMP, ARP, IGMPv2, IGMPv3
TS/IP Mode 2: 128 Channel IPTV Mode	
Standard	IEEE 802.3, 10/100/1000 Base-T
Output	128 Channels
Maximum Effective Bit Rate	400Mb/s
UDP/RTP	SPTS or MPTS
Protocol	ICMP, ARP, IGMPv2, IGMPv3
TS/IP Mode 3: DVB Mode	
Standard	IEEE 802.3, 10/100/1000 Base-T
Output	11 Channels
Maximum Effective Bit Rate	600Mb/s
UDP/RTP	SPTS or MPTS
Protocol	ICMP, ARP, IGMPv2, IGMPv3

QAM Modulation	
Standard	J.83 Annex A: 16/32/64/128/256QAM: J.83 Annex B: 64B/256B
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Symbol Rate	3~7.2MS/s
BER	≤10E-9
MER	>35dB (with Tester Equalizer enabled)
COFDM Modulation	
Constellation	QPSK/16QAM/64QAM
Band Width	6/7/8MHz
Carrier Mode	2K/4K/8K
Guard Interval	1/4, 1/8, 1/16, 1/32
FEC Punch Rate	1/2, 2/3, 3/4, 5/6, 7/8
Modulation to Error Ratio, MER	>36dB
DVB-T2 Modulation	
Constellation	QPSK/16QAM/64QAM/128QAM/256QAM
Band Width	6/7/8MHz
Carrier Mode	2K
PLP count	Single
Guard Interval	1/4, 1/8, 1/16, 1/32
FEC Punch Rate	1/2, 2/3, 3/4, 5/6, 7/8
Modulation to Error Ratio, MER	>36dB
RF Output	
Output Interface	1x F type female, 75Ω
Output Frequency Range	100 ~ 862MHz, step by 10 KHz
Maximum RF Output Level	120dBμV +3dB, step by 1dB
Spurious Rejection	>55dBc @ 120dBμV
Return Loss	≥12dB(typ.)
Rear Panel	
HDMI In	HDMI x 8
CVBS In	RCA Female, 75Ω x 8
RF Out	F-female, 75Ω x 1
Front Panel	
Control	RJ-45, 10/100 Base-T x 1, USB x 1
TS/IP	RJ-45, 10/100/1000 Base-T x 1
Display	2x16 LCD module
RF Monitor -20dB	F-female, 75Ω x 1
Others	
Input AC Voltage Range	AC100~260V 50/60Hz
Operating Temperature	0 ~ 40℃
Storage Temperature	-10 ~ 60℃
Operating Humidity	10 ~ 90%, Non-condensed



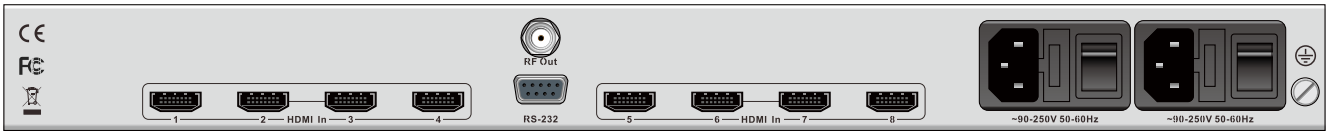
## Block Diagram

DXP-8000EM Functional Block Diagram

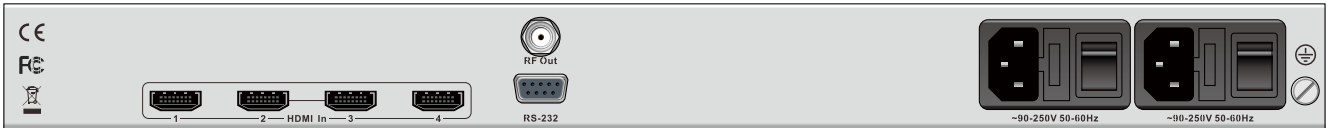


## Back Panel Interface

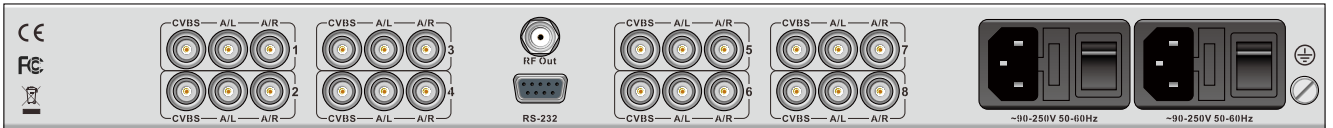
DXP-8000EM-8XHX



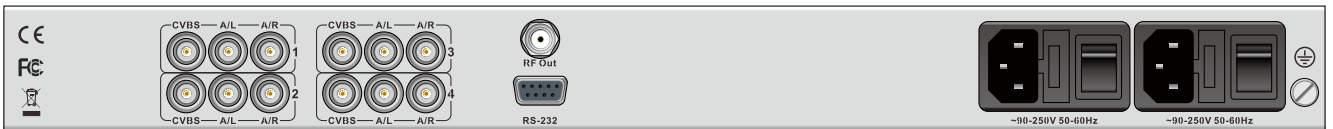
DXP-8000EM-4XHX



DXP-8000EM-8XCX



DXP-8000EM-4XCX



## EM101x

### Digital TV Encoder Modulator

EM101x is an integrated base band TV signals to DVB-T/C digital RF TV signal conversion unit (Analog\_to\_Digital and RF output).

Analog AV or digital HDMI base band signal can be encoded, multiplexed and modulated onto one DVB-T/C RF carrier. The RF output signal could be easily mixed into the exist CATV or HFC network without disturbing the exist signals nor re-build the co-axial cabling network. Multiple STB's (Set Top Box) or integrated TV's can receive the clear & clean digitized TV signal simultaneously, and no professional reception equipment is needed. Transmission range over co-axial cable could be longer than 100m without degrade of signal quality.

Suitable for private video distribution, community surveillance network, campus conference, factory on-site monitoring, hotel TV digitization, etc.



#### Main Feature

- Compliant with H.264/AVC BLP, MP, HP @ L4.0 or less, MPEG-2 MP@ML
- DVB-T or DVB-C RF output (factory options)
- HDMI & CVBS inputs
- HDMI Loop out (pass through)
- NTSC, PAL, SECAM & Video resolution auto detect
- NIT,SDT,LCN auto generation
- LCD display and Control with keyboard
- 30sec QuickSet menu for all parameters
- TS ID, PID, Service name & LCN collision prevention mechanism
- RF output Frequency Range from 100MHz to 860MHz

#### Order Information

Interface	EM101x			
	EM101-T	EM101-T+	EM101-C	EM101-C+
DVB-T RF output	•	•		
DVB-C RF output			•	•
CVBS input	•	•	•	•
HDMI input	•	•	•	•
HDMI output				•
LCD&Keyboard	•	•	•	•
QAM modulation	•	•	•	•
H.264 HD/SD	•	•	•	•
MPEG2 SD	•	•	•	•
AAC	•	•	•	•

## Control & Display Panel



## Input & Output Panel



## Specification

### Interface

- AV Input: CVBS, Audio\_L/Audio\_R
- Connector type: phone jack for AV
- HDMI: HDMI in\*1 (SD or HD)(HDCP) and HDMI\*1 Loop Out
- LCD display: 2\*16 characters
- Keyboard: 6 keys
- Reset: push button
- RF monitor: F-type female, 75Ω
- RF out: F-type female, 75Ω
- DC Input: 12V/1.5A, < 18W

### Video Compression

- Analog Input: Analog NTSC, PAL and SECAM
- Digital Input: HDMI 1.4 (support HDCP)
- Compression Standard: H.264/AVC BLP, MP, HP @ L4.0 or less, MPEG-2 MP@ML
- Video Resolution & Recommend Compression Bit Rate H.264 1080i (1920 × 1080)@25Hz,29.97Hz,30Hz: SMPTE274M: 1.5~11Mb/s 720p (1280 × 720) @25Hz,29.97Hz,30Hz: SMPTE296M: 1.5~11Mb/s 480i (720 × 480) @29.97Hz: SMPTE656M: 500K~6Mb/s 576i (720 × 576) @25Hz: SMPTE656M: 500K~6Mb/s
- Video Resolution & Recommend Compression Bit Rate MPEG-2 480i (720 × 480) @29.97Hz: SMPTE656M: 3.5~6Mb/s 576i (720 × 576) @25Hz: SMPTE656M: 3.5~6Mb/s
- Aspect Ratio: 4:3/16:9 auto detected
- Video Compression bit rate: 500K~13Mbps

### Audio Compression

- Audio Input Interfaces: HDMI or Analog
- Compression Standard: MPEG-1 Layer II
- Audio Sampling Rate: 48 KHz
- Audio Compression bit rate: MPEG1 Layer II :32~192Kbps(mono), 64~384Kbps( stereo)

### TS Processing

- PSI/SI: PAT, PMT, NIT, SDT and LCN auto generated

### DVB-T Modulation

- Constellation: QPSK/16QAM/64QAM
- Bandwidth: 6MHz, 7MHz, 8MHz
- FFT Mode: 2K, 8K
- Guard Interval: 1/4, 1/8, 1/16, 1/32
- Code Rate: 1/2, 2/3, 3/4, 5/6, 7/8
- MER: >38dB

### DVB-C Modulation

- Standard: J.83 Annex A,(Annex C available upon request)
- Constellation:16QAM/32QAM/64QAM/128QAM/256QAM
- Bandwidth: 6MHz, 7MHz, 8MHz
- Symbol Rate: 2.5~6.99MS/s
- BER: ≤ 0.0E-9
- MER: >38dB

### RF Output

- Connector Type: 1 × F type female, 75 Ω (primary output)
- Output Frequency Range: 100 ~ 860MHz agile, step by 10KHz
- Output Level: 90 ~ 100dB μV, step by 1dB
- Spurious Rejection: 50dBc (typ.)
- Output Return Loss: 10dB (typ.)

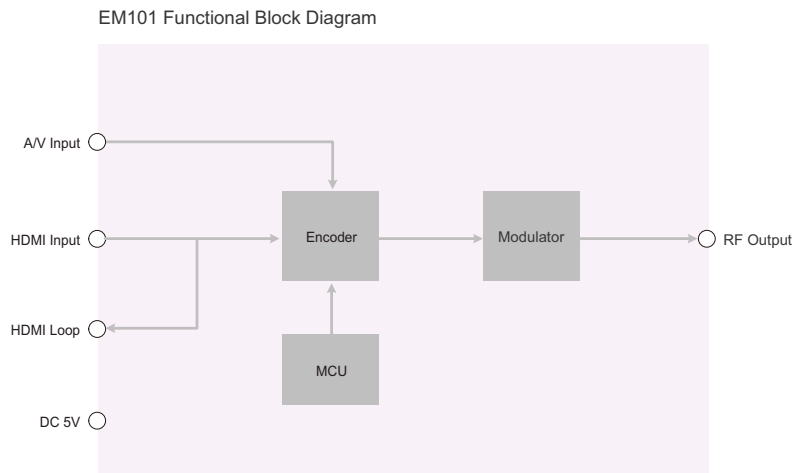
### Control & Monitoring

- Monitoring: LCD
- Control : keyboard

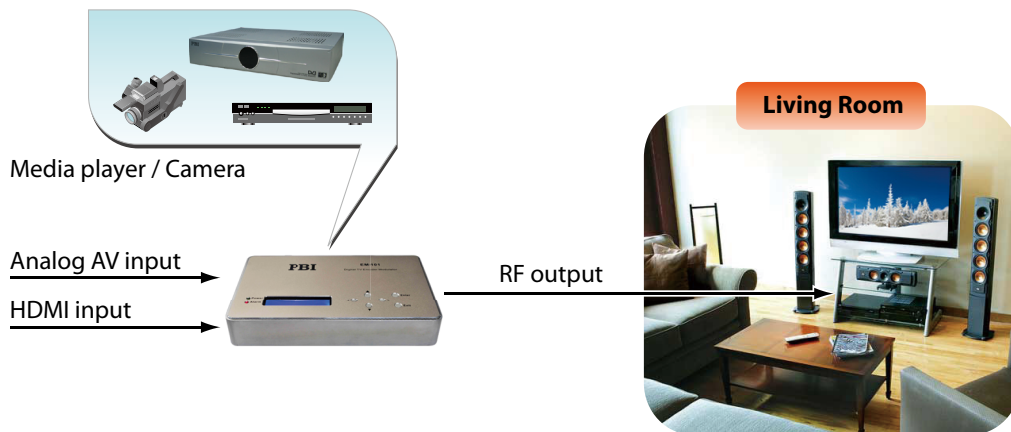
### Physical

- Dimension : 206mm × 125mm × 35mm
- Net weight : 0.5kg
- Power Supply: DC 12V/1.5A,
- Power Consumption: Maximum 18W
- Operating Temperature: 0 ~ 45°C
- Storage Temperature: -10 ~ 60°C
- Operating Humidity: 10 ~ 90%, non-condensed

### Block Diagram

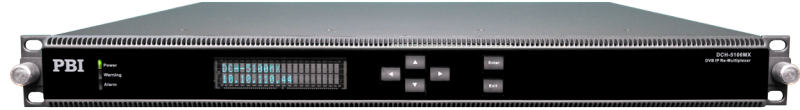


### Typical Application



# DCH-5100MX

## Re-Multiplexer and Scrambler



DCH-5100MX is a high density advanced DVB transport stream re-multiplexer and scrambler. It can receive SPTS and MPTS from both GbE and ASI input ports. By using the user friendly web control interface, the input TS is demuxed to SPTS, then routed to the ASI and GbE output ports to build new SPTS and MPTS with PSI/SI regeneration or pass through. It can support up to maximum 1024 PID with re-mapping, bypass, filtering functions.

As an advanced option, DCH-5100MX can provide with DVB scrambling functions. It can support BISS-1, BISS-E and Simulcrypt modes by using the DVB common scrambling algorithm and built-in CW generator.

With its multiple TS over ASI and IP input and output ports, flexible configuration and powerful TS processing ability, DCH-5100MX is a key routing equipment that links the TV sources from professional IRDs and encoders to DVB modulators in the headend system.

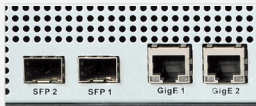
### Main Feature

- Support MPEG2/H.264 TS Re-Multiplexing
- BISS 1/E, Simulcrypt mode Scrambling in advanced mode
- Support local or remote CAS synchronous simulcrypt processing
- PSI/SI re-generation, insertion, NIT and SDT edition
- EIT bypass or re-generation
- PCR re-generation and correction function
- TS/IP through GbE port up to 950Mbps input/output
- Null packet insertion for TS/IP transmission
- Web remote management and SNMP supervision

### Order Information

Interface	Model	DCH-5100MX
ASI-In		× 4
TS/IP In		× 160
ASI-Out		× 8

#### Support Two switched GigE ports inputs



#### Multiple ASI inputs and outputs



#### Redundant power supplies

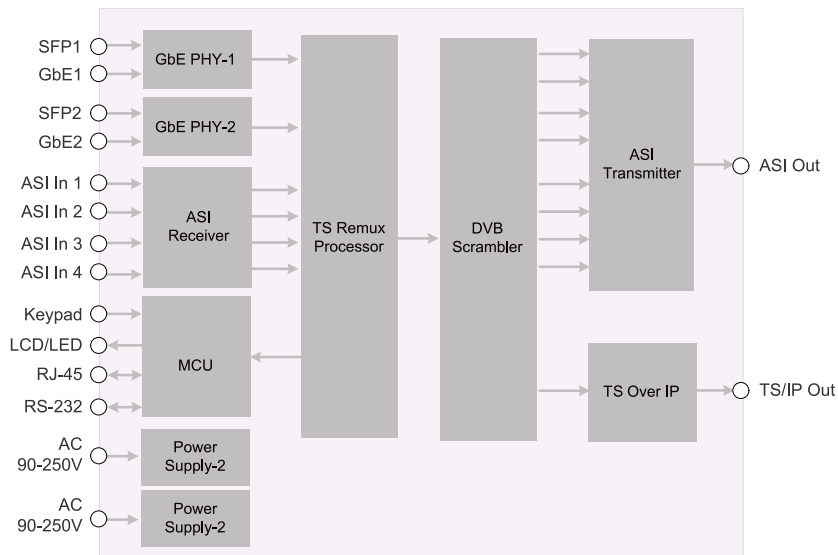


**Specification**

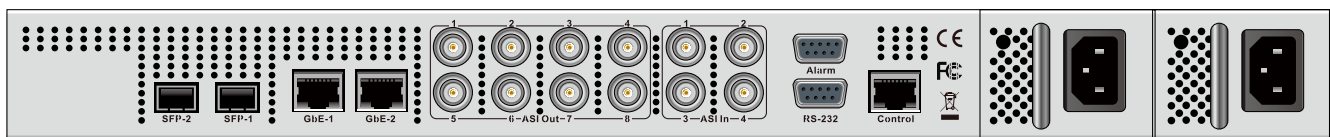
<b>TS over IP</b>	
Connector type	1000M Ethernet RJ-45 electrical
Transmission mode	IPv4, ARP, UDP, RTP
Operating Mode	Full duplex, Auto negotiable
Streaming Type	Multicast or Unicast
Number of streams	160
Type of TS Streaming	SPTS or MPTS
TTL	1~255 (adjustable)
De-jitter	≤ 200ms
Effective Input Bit Rate	≤950Mb/s
<b>ASI Ports</b>	
Connector type	4×BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Return Loss	15dB
Minimum Input Level	200mV
Packet Length	Burst or Byte, 188 or 204 Byte/Packet
Input bit rate	≤216Mb/s
<b>TS Re-Multiplexing</b>	
TS Input Management	Remultiplexing up to 4 DVB-ASI inputs and 160 MPTS/SPTS inputs
Service and PID management	Service or component based Remultiplexing, filtering and PID remapping
PSI/SI	PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation

PCR	PCR regeneration
Null packet	Filtering or inserting
<b>DVB Scrambling</b>	
Scrambling mode	Simulcrypt, BISS-1, BISS-E
Simulcrypt number per TS	Maximum 4
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/100 Base-T (for remote control)
Remote Control	SNMP, HTTP Web, Command Line
Protocol	HTTP 1.1, SNMPv1&v2
Local Control	LCD and 6-key on front panel
Serial Port	1×RS-232 D-sub 9-pin(for debug use only)
<b>Alarm and Contact Relay</b>	
Connector Type	1×D-sub 9-pin
Alarm & Warning Indicator	Dual colors LED on Front panel, Contact Relay on Rear panel
Trap	SNMP v1 & v2
Event Log	last 100 events logged in non-volatile memory
<b>Power</b>	
Power Supply	AC 90V~250V, 50/60Hz
Power Consumption	50W
<b>Physicals</b>	
Dimension	445mm×543mm×44mm
Weight	8Kg Net, 12Kg Gross
Temperature	Operating 0~45°C ; Storage -10~60°C
Operating Humidity	10~90%, non-condensed

**Block Diagram**



**Back Panel Interface**



# DXP-3800MX

## 8-to-2 DVB Remultiplexer

DXP-3800MX is a professional broadcast DVB-TS Re-Multiplexer with dual independent remultiplexing unit. It can re-multiplex a large number of transport streams received over ASI and GbE interface and delivered via GbE interface and 2 independent ASI output ports. Remultiplexing up to 256 services with advanced management of PSI/SI tables, service filtering and remapping.



### Main Feature

- Fully compliant with ISO13818 and EN300 468 standard
- Dual MPEG2/H.264 transport stream remultiplexing unit
- 8\*ASI inputs, up to 216Mbps for each interface
- 2\*ASI independent outputs with backup, up to 216Mbps for each interface
- GbE interface up to 700Mbps(multi-channel output) or 80Mbps(full duplex)
- Reultiplexing up to 256 services
- Advanced management of PSI/SI tables, service filtering and remapping
- EIT bypass or re-generate
- Web and SNMP control and monitoring
- Compact 1RU cabinet with dual hot-swap power supplies

### Specification

<b>ASI Input</b>	
Connector Type	8×BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Bit Rate	≤216Mb/s
<b>TS over IP</b>	
Connector Type	1×RJ-45, 100/1000 Base-T
Protocol	UDP/RTP, Multicast/Unicast, IGMP V2, V3
TS/IP Number	1 MPTS or SPTS (Full Duplex Mode); 10 MPTS (Multi-Channel Mode)
Max. Bit Rate	80Mb/s (Full Duplex Mode); 700Mb/s (Multi-Channel Mode)
<b>TS Processing</b>	
Max. Input Bit Rate	8×216Mb/s
Max. Output Bit Rate	2×180Mb/s
Package Length	188/204
Re-multiplexing	PSI auto generation Service and PID filtering and re-mapping NIT insertion and LCN edition EIT Processing
<b>ASI output Monitoring</b>	
Connector Type	2×BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Function	remux of 8 ASI inputs
Output Bit Rate	≤216Mb/s
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/100 Base-T, for equipment IP Control
Control	Front panel, Web and SNMP
Software Upgrade	FTP Loader ,Telnet , USB and Web
<b>Physical</b>	
Power Supply	AC90~260V 50~60Hz
Power Consumption	50W
Temperature	Storage -10 to 60°C; Operation 0 to 45°C
Net Weight	7kg
Dimensions	482mm×504mm×44mm
Operating Humidity	10 to 90%, non-condensed
<b>Front Panel</b>	
Display	2×20 LCD Display

#### Support TS/IP input/output



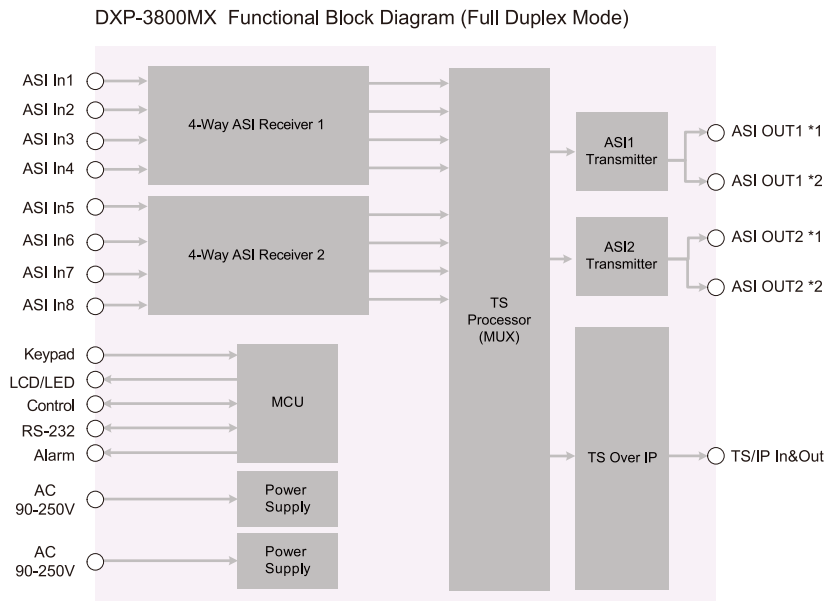
#### 2 independent TS output



#### Hot-swappable redundant power supply



Block Diagram



Back Panel Interface





## DCH-3000TM Single Channel QAM Transmodulator



The DCH-3000TM is a flexible Digital TV modulator and trans-modulator in the market. Equipped with either of the tuner input DVB-S/S2, DVB-C, DVB-T/T2 or base band transport stream input ASI, SPI or DS3, it can trans-modulate the signal from satellite, cable or terrestrial network to Digital cable network. It can also be used as a stand-alone DVB-C QAM or DVB-T COFDM modulator with its ASI, SPI or DS3 input. Moreover the tuner input can be re-multiplexed with ASI, SPI or DS3 transport stream input with powerful PSI/SI regeneration function. It is a cost effective and highly integrated solution with DVB-S/C/T demodulation, transport stream re-multiplexing, DVB-C QAM or DVB-T COFDM modulation in a single rack. The equipment can be easily configured and supervised by the operator and broadcaster, provide better service to his cable TV network.

### Main Feature

- DVB-S/S2, DVB-C or DVB-T/T2 Tuner Input
- Tuner RSSI, received Eb/No & BER monitoring
- DVB-C QAM or DVB-T COFDM RF modulation output
- Support Digital cable TV ITU-T J.83 Annex A and B standard
- Support DVB-T ETSI-300 744 standard
- ASI input and output
- Maximum RF output level 120dBμV (for – PlusXX series)
- Agile RF output from 48 to 862MHz
- Flexible re-multiplexing between ASI and Tuner input
- PSI/SI re-generation, including NIT, LCN edition and insertion
- Service Drop, PID filtering and Re-mapping
- Remote Control and Supervision by SNMP, WEB and Proprietary HDMS software
- On Site software update through IP

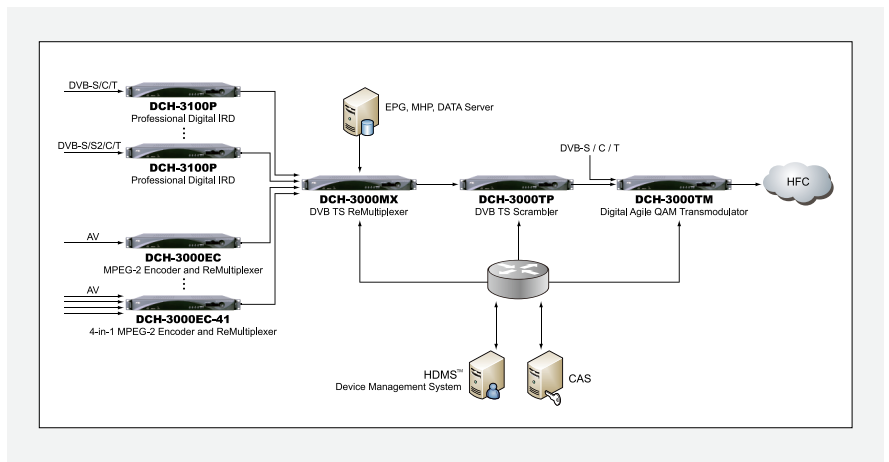
#### DVB-S2/S, DVB-C or DVB-T/T2 Tuner Input



#### 48 ~ 862MHz agile RF output



#### ASI input and output



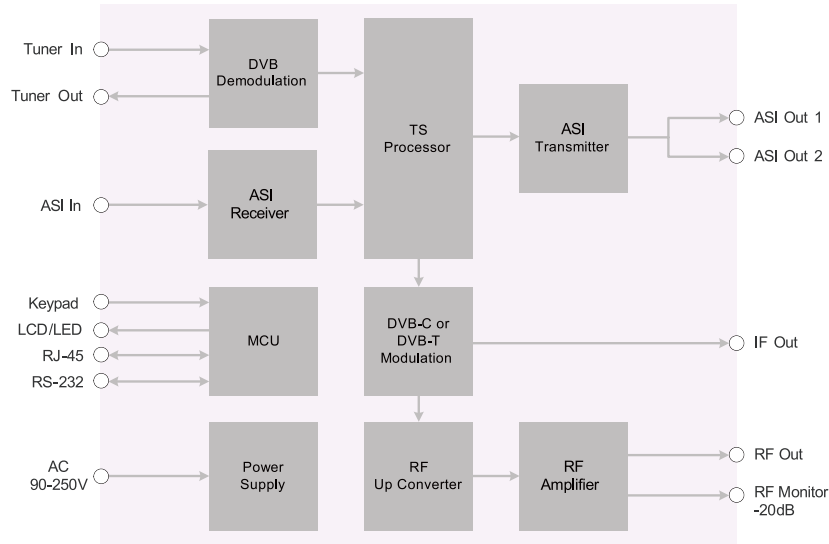
## Specification

<b>Tuner Input</b>	
<b>DVB-S/S2 Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	950~2150MHz
Input Level	-25~-65dBm
Symbol Rate	2~45MBaud
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
<b>DVB-C Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency	48~860MHz
Input Level	45~75dBμV
Symbol Rate	1~7MBaud (ITU J.83 Annex A)
Constellation	16/32/64/128/256QAM
Bandwidth	6MHz/7MHz/8MHz
Input Return Loss	7dB (typ.)
<b>DVB-T Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency	VHF: 174 ~ 230MHz; UHF: 470 ~ 862MHz
Input Level	-20~-91dBm
FFT Mode	2K/8K
Constellation	QPSK/16QAM/64QAM
Guard Interval	1/32, 1/16, 1/8, 1/4
FEC	1/2, 2/3, 3/4, 5/6, 6/7, 7/8
<b>ASI Input</b>	
Connector Type	1×BNC, 75Ω
Standard	DVB-ASI, EN50083-9
TS Processing	Remultiplexing of ASI Inputs
Input Level	800mVpp±10%
<b>DS3 I/O (Option)</b>	
Connector Type	2×BNC Female, 75Ω, including loop through
Standard	Compliant with ITU-T G.703
Frame Structure	Compliant with ITU-T G.752 and ITU-T G.804
Bit Rate	44.736Mb/s
<b>ASI Output</b>	
Connector Type	2×BNC Female, 75Ω
Standard	DVB-ASI, EN50083-9
TS Processing	2 mirrored TS, output sourcing from remultiplexing among Tuner / DS3 and ASI / SPI inputs
Signal level	800mVpp±10%
<b>TS Processing</b>	
TS Input Management	Remux and demux among Tuner / DS3 (optional) and ASI / SPI inputs

TS Output Management	Remux and demux for 2 mirrored ASI outputs
Service and PID management	Remux, filtering and remapping
PSI/SI	PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation
<b>DVB-C QAM Trans-modulation</b>	
Constellation	J.83 Annex A: 16/32/64/128/256QAM J.83 Annex B: 64/256QAM
Symbol Rate	2~7.2MSymbol/s
I/Q Amplitude Error	<0.3%
I/Q Phase Error	<0.3°
Phase Jitter	<0.5°RMS
MER	>35dB
<b>DVB-T COFDM Re-Modulation</b>	
Constellation	QPSK/16QAM/64QAM
Bandwidth	5/6/7/8MHz
FFT Mode	2K
Guard Interval	1/4, 1/8, 1/16, 1/32
Code Rate	1/2, 2/3, 3/4, 5/6, 7/8
MER	>36dB
<b>IF Output</b>	
Connector Type	F type female, 75Ω
Output Frequency	36MHz
Output Level	90 dBμV
MER	>38dB
Frequency Offset	±200HZ
<b>RF Output</b>	
Connector Type	F type female, 75Ω
Output Frequency Range	48~860MHz agile, step by 10 KHz
Output Level	90~120dBμV, step by 1dBμV (for -PlusXX series) 100~113dBμV, step by 1dBμV (for -30XX/-20A series)
Spurious Rejection	55dB (typ.)
Output Return Loss	12dB (typ.)
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/100 Base-T, for equipment IP Control
Remote Control	SNMP, 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
<b>Physical</b>	
Dimension	44mm×483mm×404mm
Weight	5.5Kg
Power Supply	AC 90V ~ 250V, 50/60Hz
Power Consumption	30W
Operating temperature	0~45□
Storage temperature	-10~60□
Operating Humidity	10~90%, non-condensed
<b>Certification</b>	
EMC: EN50083-2	
FCC: Part 15 Class B	
LVD: EN 60065	

## Block Diagram

DCH-3000TM Functional Block Diagram

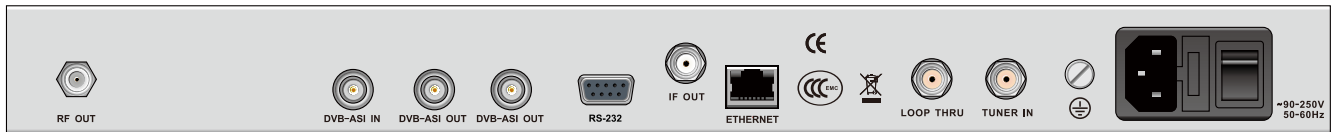


## Order Information

Interface	Model	DCH-3000TM-20X					DCH-3000TM-PlusX				
		-20S2	-20C	-20T	-20A	-20D	PlusS2	PlusC	PlusT	PlusA	PlusD
Tuner		DVB-S2	DVB-C	DVB-T			DVB-S2	DVB-C	DVB-T		
ASI Input					•		•	•	•	×2	•
DS3 Input						•					•
ASI TS Output		•	•	•	•	•	•	•	•	•	•
Filter		•	•	•	•	•	•	•	•	•	•
Buit-in Re-Mux						•	•	•	•	•	•
RF Output		•	•	•	•	•	•	•	•	•	•
Ethemet		•	•	•	•	•	•	•	•	•	•

• standard configuration

## Back panel Interface



## DCH-5100TM IP to QAM Modulator

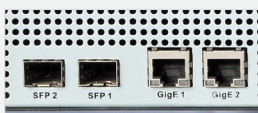
The DCH-5100TM is a professional high density IP to DVB-C QAM modulator. It receives up to 64 or 160 digital TV transport streams from both Gigabit Ethernet and ASI ports. After processing, it can modulate these transport streams to 16-way or 32-way QAM RF carriers. For 16-way QAM modulator option, the TS can be generated and re-multiplexed from 160 SPTS/MPTS of ASI/IP inputs. For 32 QAM modulator option, the re-multiplexer function has to be disabled, each QAM carrier is directly converted from any one of the 64 TS from IP or ASI input. These QAM RF carriers are independently up-converted with high speed DAC to achieve excellent RF performance covering the full spectrum up to 1GHz. The equipment is housed in a 1-RU chassis with two AC power supplies in redundancy.



### Main Feature

- Compliant with ITU J.83 Annex A & C and DVB-C EN300429 standards
- Transport stream de-encapsulation from IP of GbE port
- 4 TS/IP GbE ports with 2 x RJ-45 & 2 x SFP, 2+2 redundancy mode
- TS/IP input de-jitter  $\leq 200\text{ms}$
- Up to 64 or 160 TS Inputs over GbE
- 16 or 32 independent QAM modulators
- RF output backup port for 1+1 redundancy
- Redundant Power Supply
- Network Management through SNMP, HTTP, CLI

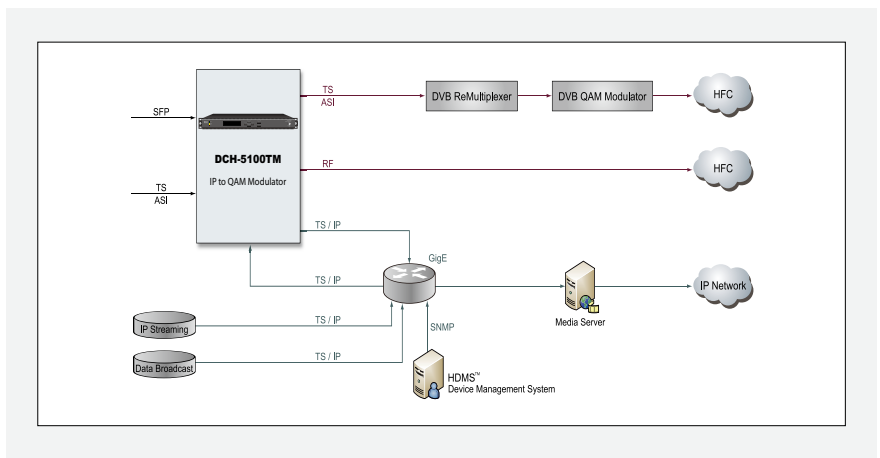
#### Support Two switched GigE ports inputs



#### 32 QAM output channels on single RF output



#### Redundant power supplies

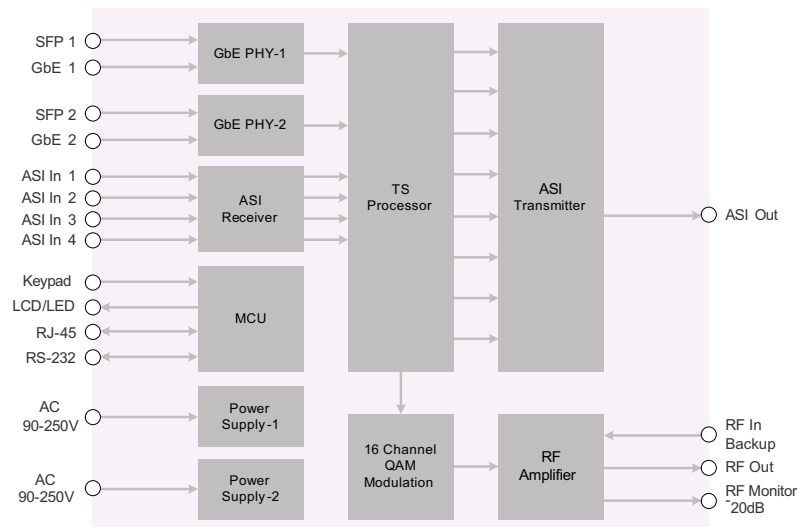


## Specification

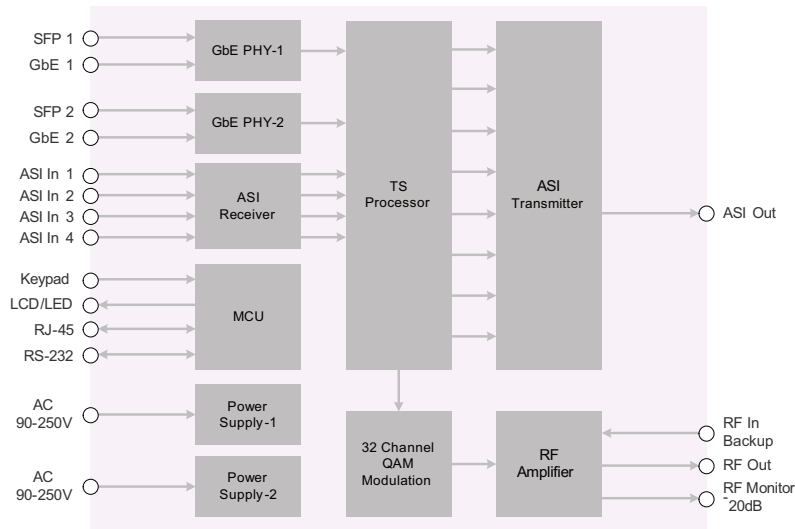
<b>IP Input</b>	
Connector Type	(1000Base-T + SFP) x 2, IEEE803.2, 2+2 redundant
Protocol	IPv4, IGMPv2, IGMPv3, ARP, UDP, RTP
Operating Mode	Full duplex, Auto negotiable
Streaming addressing Type	Multicast or Unicast
Number of Streaming Input	64 or 160 (software option)
Type of TS Streaming	SPTS or MPTS
TTL	1~256 (adjustable)
De-jitter	≤200ms
Effective Input Bit Rate	≤950Mb/s
<b>ASI Input</b>	
Connector Type	4×BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Return Loss	15dB
Minimum Input Level	200mV
Input Data Mode	Burst or Byte, 188 or 204 Byte/Packet
Input Data Rate	≤216Mb/s
<b>Re-Multiplexing (applicable to DCH-5100TM-16X)</b>	
TS Input Management	Remultiplexing up to 4 DVB-ASI inputs and 160 MPTS/SPTS inputs
Service and PID management	Service or component based Remultiplexing, filtering and PID remapping
PSI/SI	PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation
<b>QAM Modulation</b>	
Standard	DVB-C EN300 429, J.83 Annex A & C
Symbol Rate	3.6MBauds~7MBauds
Roll-off Factor	12%, 15%, 18%
MER	>36dB (with Tester Equalizer = off)
Number of QAM Carrier	16 or 32 (software option)
<b>RF Output</b>	
Connector Type	1×F type Female, 75Ω
Channel Spacing	6MHz, 8MHz
Output Frequency Range	49 ~ 1000 MHz
Output Frequency Adjustment Step	1MHz
Output Frequency Accuracy	±25ppm
Output Level	105dBuV (per channel)
Output Level Attenuation	30dB (step by 1dB)

Output Return Loss	15dB min.
Shoulder Attenuation	50dBc (typical.) @ BW±10%
Spurious Rejection	60dBc (typical.)
Spectrum Flatness	4dB (over full output frequency range)
Useful Output Bit Rate	800Mb/s
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/100 Base-T (for remote control)
Remote Control	HDMS, HTTP 1.1
Protocol	SNMP v1 & v2, HTTP 1.1
Local Control	LCD and 6-key on front panel
Serial Port	1×RS-232 D-sub 9-pin (for debug use only)
RF Monitor Port	1×F type female, 75Ω, -20dB lower than the main RF output
<b>Alarm and Contact Relay</b>	
Connector Type	1×D-sub 9-pin
Alarm & Warning Indicator	Dual colors LED on Front panel, Contact Relay on Rear panel
Trap	SNMP v1 & v2
Event Log	last 100 events logged in non-volatile memory
<b>Sensors &amp; Indicators</b>	
Temperature Sensor	Yes
Fan Status Sensor	Yes
Alarm Buzzer	Yes
Bit rate Capacity Indication	Yes (For each QAM)
<b>Power Supply</b>	
Power Supply	AC 90V ~ 250V, 50/60Hz
Power Consumption	50Watts Max.
<b>Physicals</b>	
Dimension	445mmx543mmx44mm
Weight	8Kg Net, 12Kg Gross
Operating Temperature	0 ~ 45°C
Storage Temperature	-10 ~ 60°C
Operating Humidity	10 ~ 90%, non-condensing
<b>Certification</b>	
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	
Environment: RoHS, WEEE	

## Block Diagram of DCH-5100TM-16X: 16 Channel QAM modulation with Remux function



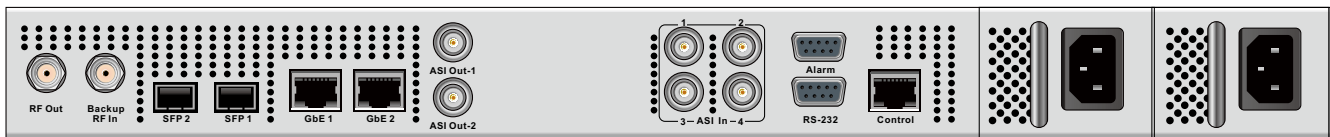
Block Diagram of DCH-5100TM-32: 32 Channel QAM modulation without Remux function



Order Information

Interface	Model	DCH-5100TM-16X	DCH-5100TM-32
ASI-In		x4	x4
Built-in Remux		YES	NO
TS/IP In		x160	x64
RF-In Backup		x1	x1
RF-Out		x1	x1
ASI-Out		x1	x1
Modulation		16 channel QAM	32 channel QAM

Back Panel Interface



Modulators / Transmodulator

## DCH-2000AD SDI/DVB-ASI Active Signal Splitter



DCH-2000AD is a high-density active DVB-ASI/SD-SDI signal splitter, which can duplicate one SDI (SMPTE 259M) or DVB-ASI (EN50083) signal to 4 or 8 signals. In each 1RU unit, either 4 groups of 1 to 4 splitter or 2 groups of 1 to 8 splitter can be implemented. It provides clock regeneration and equalization of the input signals and it allows more than 100 meter signal distribution. DCH-2000AD is a reliable ASI/SDI signal splitting device that could be widely used in broadcast system redundancy.

### Main Feature

- Compatible with DVB-ASI EN50083 and SDI SMPTE 259M standards
- DVB-ASI and SD-SDI source automatic detection
- DC 12V backup power supply
- LED indication of input lock and bit rate on front panel
- Provides automatic input cable re-clocking and equalization to 100 meters (Belden 8281)

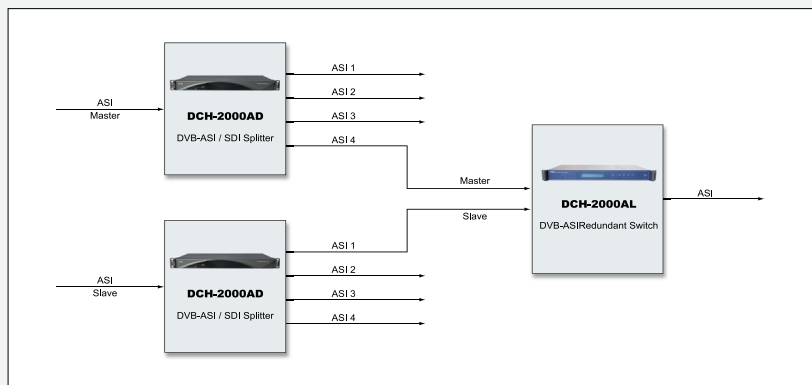
**duplicates single SDI or DVB-ASI signal to 4 or 8 outputs**



**Dual Color LED indication of input lock and rate on front panel**



**DC 12V backup power supply**



### Specification

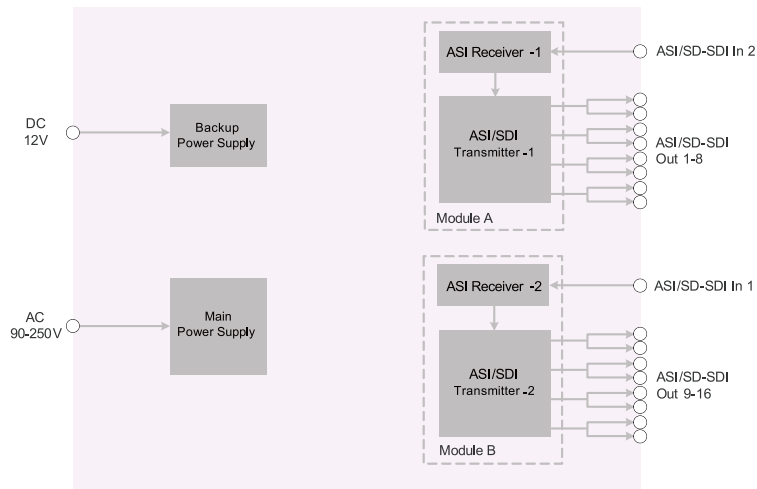
<b>Input</b>	
Connector Type	BNC Female, 75Ω
Input Port Number	4 or 2
Input Return Loss	≥15dB (5~270MHz)
ASI/SDI Input Amplitude	200~1000mV
<b>Output</b>	
Connector Type	BNC Female, 75Ω
Output Number	4* or 8*
ASI/SDI Output Amplitude	800mVpp±10%
<b>Control &amp; Monitoring</b>	
Local Monitoring	4×LED indication of input lock for DCH-1000AD-414

<b>Physical</b>	
Dimension	44mm×483mm×255mm
Weight	2.4Kg Net, 3.5Kg Gross
Power Supply	AC 90V~250V, 50/60Hz
Power Consumption	5W
Operating Temperature	0~45°C
Storage Temperature	-10~60°C
Operating Humidity	10~90%, non-condensed

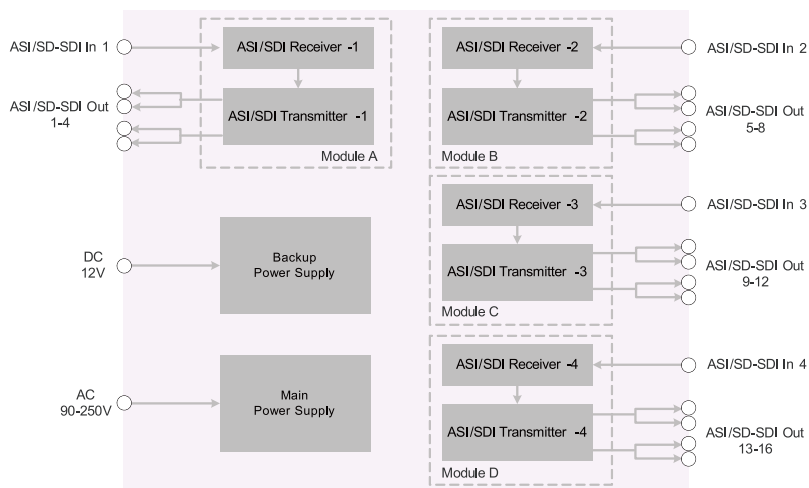
\* the input signal cannot be looped through when power is off.

### Block Diagram

DCH-2000AD(218) Functional Block Diagram



DCH-2000AD(414) Functional Block Diagram

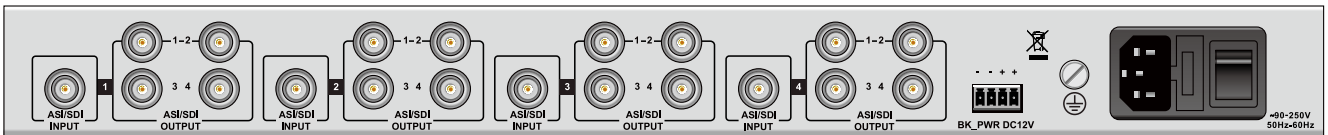
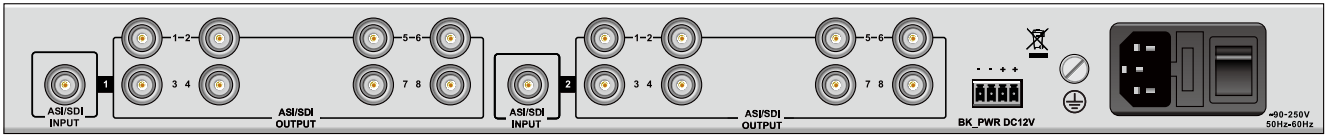




Order Information

Interface	Model	DCH-2000AD-218	DCH-2000AD-414
Input interface		2	4
Output interface		2×8	4×4

Back panel Interface



## DCH-2000AV

### Audio/Video 1+1 Redundancy Switch



DCH-2000AV is an 1+1 analog base band audio/video redundancy switch. Three groups of independent 1+1 switch are implemented in a single 1RU chassis. Each switch has 1 primary audio/video input port, 1 backup audio/video input port and 2 audio/video output ports in mirror. The primary port is automatically switched to the back-up port in case of primary port failure by using built-in analog video signal quality monitor. The change-over condition is the detection of consecutive synchronization of analog TV signal. DCH-2000AV uses RF Relay switch to ensure reliable transition from primary to secondary input port in the case. With its high performance and stability, DCH-2000AV is an ideal product for broadcast system redundancy.

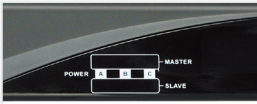
#### Main Feature

- 3 groups of 1+1 redundancy switch in compact 19"1RU chassis
- Support NTSC, PAL and SECAM standards
- Automatic or manual switching mode selection
- User-configurable automatic switch back to primary
- Remote Control and Supervision by HTTP WEB

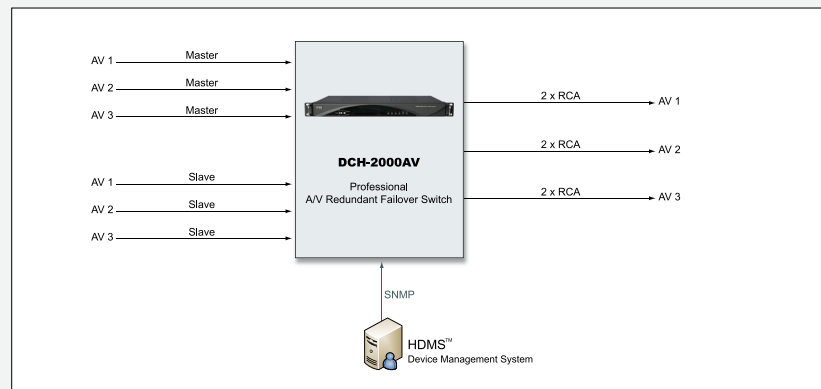
**3-in-1 redundant switch within a compact 19" 1RU chassis**



**LED alarm on front panel**



**Remote Control and Supervision by HTTP WEB**



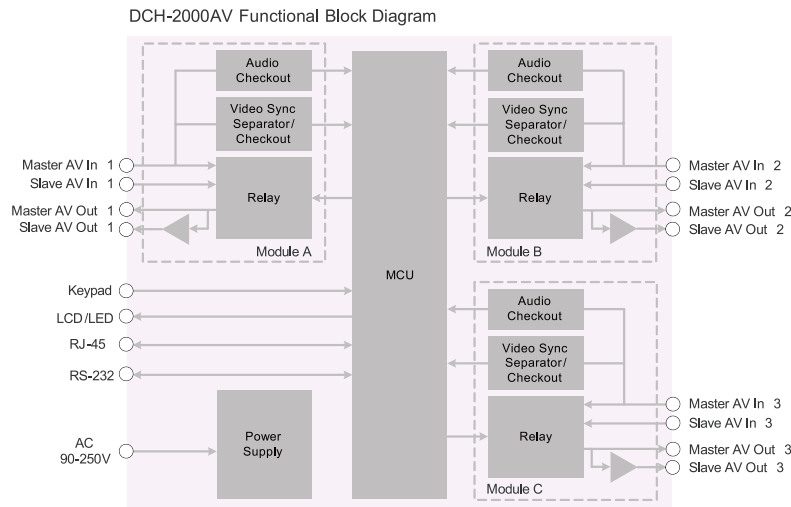
## Specification

Analog Video	
Number of input	1 Primary input and 1 Backup input for each of the 3 Groups of 1+1 Switch
Number of output	2 Outputs in mirror for each of the 3 Groups of 1+1 Switch
Connector type	RCA female, 75Ω
Video Standard	NTSC or PAL, or SECAM
White level amplitude	±3mVpp
Horizontally sync. amplitude	±2mVpp
K-factor	0.1%
Differential gain	0.1%
Differential phase	0.05°
Chroma-Luma Gain	1.5%
Chroma-Luma Delay	±13ns
Nonlinear Luminance	0.2%
Horizontal Sync Edge Jitter	±1.5p-p
Frequency Response	0.5MHz ~ 4.8MHz, ±0.4 dB; 5.5MHz, +1/-2 dB
Analog Audio	
Number of input	1 pair primary inputs and 1 pair backup input for each of the 3 Groups of 1+1 Switch
Number of output	2 Outputs in mirror for each of the 3 Groups of 1+1 Switch
Connector type	RCA female, Stereo L/ R
Output Impedance	600Ω (balanced)
Total Harmonic Distortion	60Hz -10kHz, 0.02%

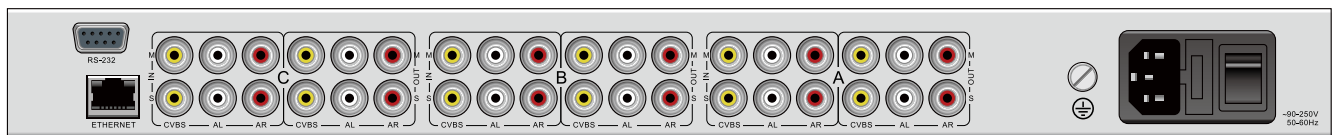
Frequency Response	Left: 40Hz -15Hz, ±0.5dB Right: 40Hz -15kHz, ±0.5dB
Amplitude	1kHz, 0dB, ±0.5dB
Audio/Video Switching	
Switching Mode	Auto/Manual
Switching Condition	Video signal loss, Video loss of Sync by 3 times in 1 sec, or Audio mute period longer than user's setting
Switching Time	< 300 ms
Power Failure Switching	Mechanical by pass through relay when power failure
Control & Monitoring	
Connector Type	1×RJ-45, 10/100 Base-T, for equipment IP Control
Remote Control	HTTP Web
Local Control	LCD display and 6-key keypad
Serial Port	1×RS-232 9-pin D-sub, for debug use only
Equipment Upgrade	Built-in FTP server + Telnet
Physical	
Dimension	483mm×220mm×44mm
Weight	3Kg Net, 4Kg Gross
Power Supply	AC 90V ~ 250V, 50/60Hz
Power Consumption	12W
Operating temperature	0~45°C
Storage temperature	-10~60°C
Operating Humidity	10~90%, non-condensed

\* Note: Video parameters are measured using standard test signal (PAL D, 1Vpp, S/N=60dB). Audio parameters are measured using standard test signal (Mono, 0dBu, S/N=85dB).

## Block Diagram



## Back panel Interface



## DCH-3000AL DVB-ASI 1+1 Redundant Switch

DCH-3000AL is a digital TV redundant switch based on DVB-ASI standard. It has 6-way 1+1 ASI switches in 1RU chassis. the ASI signal will be automatically routed to backup port if technical failure of the primary port happens. The switching condition is supervised by a built-in comprehensive TS monitor which can continuously analyze the quality of each ASI input stream. Furthermore, it can detect up to 8 PIDs as the switching conditions for each way. By using the RF delay, it can ensure rapid transition from primary port to back-up port with high performance and stability. It also can be controlled and supervised by SNMP and HTTP Web. DCH-3000AL is an ideal product for broadcast system redundancy.



### Main Feature

- Compatible with DVB-ASI (EN50083-9) standard
- Up to 6 independent 1+1 switching modules in 1RU 19"chassis
- Built-in real time transport stream monitoring
- Input and Output bit-rate up to 160 Mb/s on each switch module
- Automatic or manual switch mode
- TS sync loss and PIDs loss as switching condition
- Mechanical Bypass Relay to output in the event of power failure
- DC 12V backup power supply
- Remote control, supervision and by SNMP and HTTP Web

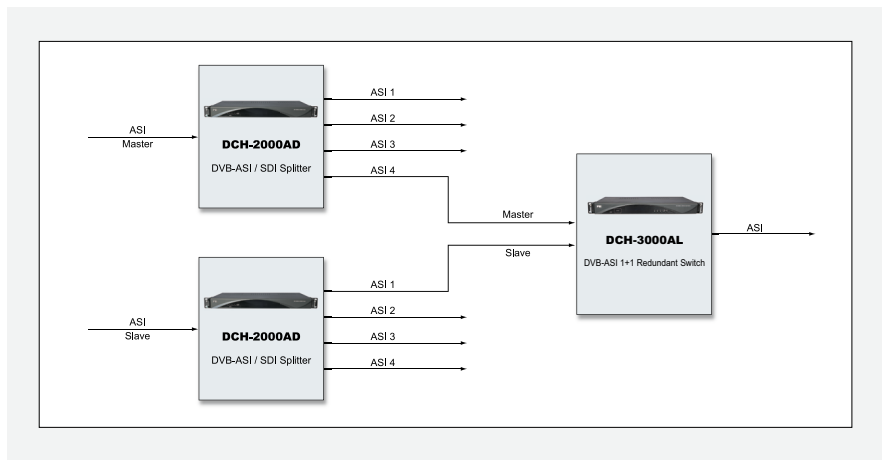
**Switch to the back-up transport stream source automatically when problems occur**



**Up to 6 independent switch modules in 1RU 19" chassis**



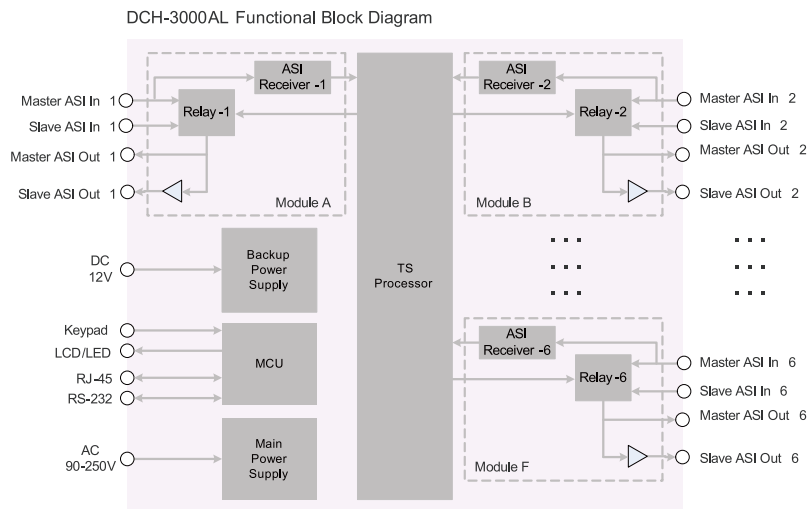
**DC 12V backup power supply**



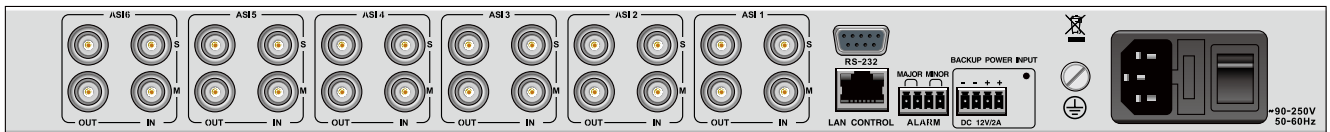
## Specification

ASI Input		Control & Monitoring	
Input Interface	12 (6 primary, 6 secondary)	Connector Type	RS232 (DB-9), for PC configuration and software upgrade
Connector Type	BNC, 75Ω	Local Control	LCD display and 6-key keypad
TS Bit Rate	< 160Mb/s	LCD	2×10 characters LCD display
Packet Format	188 /204 byte packets, without RS code	LED	7 (one for Power indicator, the others for switch status)
ASI Switching		Physical	
Switching Mode	Primary/Secondary, Auto/Manual	Dimension	44mm×483mm×240mm
Switching Condition	TS Sync Loss and up to 8 PID losses	Weight	3.0Kg Net, 3.7Kg Gross
Switching Time	< 300 ms	Power Supply	AC 90~260V, 50Hz/60Hz
Power Failure Switching	Mechanical by pass relay	Power Consumption	25W (MAX)
ASI Output		Operating Temperature	0~45°C
Output Interface	12 (6×2 duplicated outputs)	Storage Temperature	-10~60°C
Connector Type	BNC, 75Ω	Operating Humidity	10~90%, non-condensed
TS Bit Rate	< 160Mb/s		
Packet Format	188/ 204 byte packets, without RS code		

## Block Diagram



## Back panel Interface



## DMM-1000

### Compact Modular Digital TV Headend

DMM-1000 is a compact modular digital TV headend that includes professional MPEG-2 and MPEG-4 AVC/H.264 SD/HD IRD, MPEG-2 and MPEG-4 AVC/H.264 SD/HD Encoder/Transcoder, Re-Multiplexer, QAM/COFDM Trans-Modulator, Dual Channel Analog Modulator, DVB Scrambler and so on. Within a 4U×19" chassis, it provides 8 slots for any type of modules and 2 redundant power supply units. Thanks for its flexibility and high density, DMM-1000 offers operators the advanced headend architectures in the marketplace for delivering analog and digital broadcast services to their subscribers. Coming with more new modules, DMM-1000 is most suitable for future multiple network architectures: streaming and multiplexing of digital content over IP based networks and conversion of digital content for analog networks.



#### Main Feature

- DVB-S2/S, DVB-S, DVB-C, DVB-T2/T IRD modules with CI
- DVB-S/S2T/T2 to DVB-C QAM and DVB-T COFDM trans-modulator module
- MPEG-2, H.264 HD/SD encoder and trans-coder module
- 8 Way re-multiplexer module
- DVB Simulcrypt, BISS-1, BISS-E scrambler module
- Rich interface with ASI, IP, SDI, YPbPr, CVBS, XLR
- Web, SNMP Remote Control or handheld programmer unit local control
- 4RU 19"chassis compact modular design, supporting up to 8 modules
- Functional module hot-swappable
- Redundant power supply
- Intelligent cooling system with temperature
- Stand alone function of each module
- Cost-saving by backward compatible with new modules
- On site software update through IP

#### Independent Hot-Swappable Functional Modules



#### Five hot-swappable fans assembly for longer MTBF



#### Redundant power supply unit



#### Product List

Product name	Model No.	Description	
DMM-1000	RID	DMM-1510P	Single channel HD IRD
		DMM-2200P	Dual Channel HD IRD
		DMM-2410D	4-channel Demodulator
	Encoder Transcoder	DMM-1300EC	Single Channel MPEG-2 SD Encoder
		DMM-1520EC	Single Channel H.264 HD Encoder
		DMM-2400EC/2401EC	4-channel HD/SD Encoder/Transcoder
		DMM-2410EC/2411EC	4-channel H.264 HD Encoder
	Re-Multiplexer Scrambler	DMM-1400MX	8-way Re-multiplexer
		DMM-2200MX/2200DX	Re-Multiplexer and Scrambler
	Modulator Trans-modulator	DMM-2200TP	Dual Channel Scrambler
		DMM-1300TM	QAM/COFDM Trans-modulator
		DMM-1400PM	QAM/COFDM Trans-modulator
	Chassis Accessory	DMM-2400TM	4-channel Trans-modulator
		DMM-1000MF	4U chassis with 8 slots
		DMM-210MF	2U chassis with 8 slots
		DMM-1000CU	Programmer Unit

## Chassis

### DMM-1100MF Main Chassis

- Standard 4 RU chassis with 8 slots for functional modules and 2 slots for Power Supplies
- Hot-backup power supply unit
- Intelligent cooling system with temperature sensor
- Wall mounted or Rack mounted
- Compatible with new successive modules
- Power Supply: AC 90V-250V, 150Watts, 50-60Hz
- Optional Build-in IP Switch
- Dimension: L=387mm, W=483mm, H=176mm (4U)
- Operating temperature: 0 ~ 45°C(for all modules)
- Storage temperature: -10 ~ 60°C(for all modules)



### DMM-210MF Main Chassis

- Standard 1 RU chassis with 2 slots for functional modules
- 1 power supply
- Intelligent cooling system with temperature sensor
- Wall mounted or Rack mounted
- Compatible with new successive modules
- Power Supply: AC 90V-250V, 150Watts, 50-60Hz
- Dimension: L=387mm, W=483mm, H=44mm (1U)



### DMM-1000CU Programmer Unit

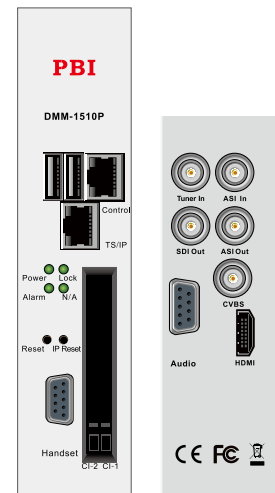
- 2×20 LCD display screen and 6-key keypad
- No external power nor battery needed
- Easy and quick on site system configuration without PC
- Compatible with new modules
- Dimension 170×70×22 mm



## ■ H.264 HD IRD and Processor Module

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

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 & functionalities. DMM-1520P could support two AC-3 audio or down-mixed PCM audio 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-1520P 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 CAM modules. The descrambled stream could be delivered to the ASI output directly, or to the built-in re-multiplexer, or to the 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 slot, and output stream could be highly customized through the user-configurable PSI/SI regenerator. The compact design and the powerful decoding ability make DMM-1520P one of the most competitive modules in DMM1000 series.



#### Main 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), AES/EBU output, 10M/100M/1000M TS over IP input/output
- PLS(Physical Layer Signalling) 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 redundance
- VBI TELETEXT, WSS and Closed Caption support over analog output or embedded in SDI
- 10M/100M/1000M Ethernet TS over IP 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 audio embedded in SDI output
- Support NTP(Network Time Protocol)
- Support 16 groups of parameters configuration preset
- RSSI, received Eb/No & BER available on Web interface



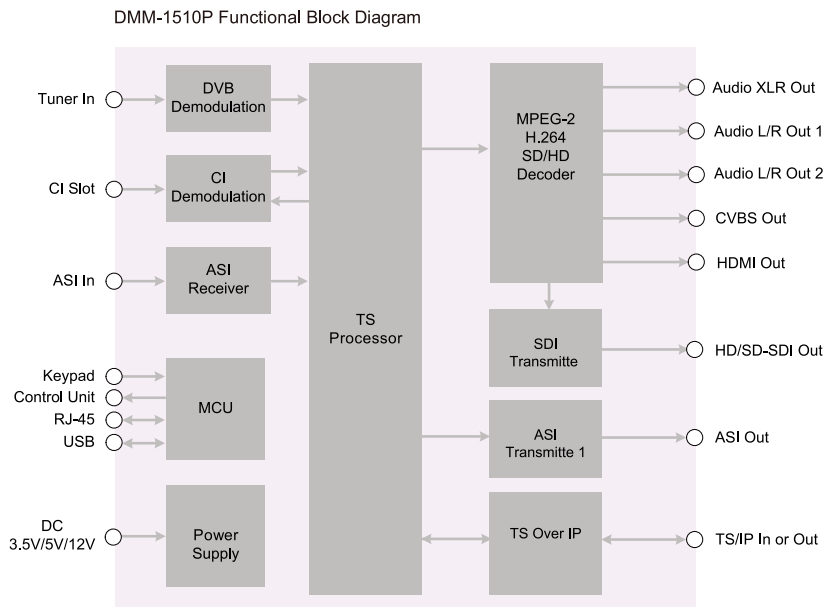
## Specification

<b>Tuner Input</b>		Connector Type	1xBNC female, 75Ω
<b>DVB-S/S2</b>		Standard	DVB-ASI, EN50083-9
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for Loop through	Output Bit Rate	≤200Mb/s
Input Frequency Range	950~2150MHz	TS Processing	TS Re-multiplexed from Tuner, ASI Input and TS/IP Input
Input Level	-25~-65dBm	<b>AV Decoding</b>	
Symbol Rate	2~45MBaud	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)
Roll-off Factor	DVB-S QPSK: 0.35 DVB-S2 8PSK: 0.35, 0.25, 0.2 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	Audio Standard	MPEG-1 Layer-I/II, MPEG-2 Layer-II LC-AAC, HE-AAC
FEC Code Rate	DVB-S2 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10	<b>HDMI Output</b>	
LNB Polarity Selection	0, 13V, 18V selectable	Standard	1×HDMI 1.3 interface (up to 1080i) 1080i×30, 1080i×29.97, 1080i×25, 720p×60, 720p×59.94, 720p×50, 480p×60, 576p×50, 576i×25, 480i×29.97
LNB Band Selection Tone	0/22KHz selectable	Video Resolution and Frame Rate	1×stereo
Satellite Selection Command	DiSEqC 1.0	Audio Embedded	1×stereo
<b>DVB-T/T2</b>		<b>HD/SD-SDI Output(Can be configured as ASI Output)</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for Loop through	Connector Type	1xBNC, female, 75Ω
Input Frequency	104~862MHz (VHF/UHF)	Standard	SMPTE 259M, 270 Mb/s for SD, SMPTE 292M, 1.485 Gbit/s for HD
Input Level	-20~-70dBm	Level	800mV p-p
Constellation	DVB-T: QPSK, 16QAM, 64QAM DVB-T2: QPSK, 16QAM, 64QAM, 256QAM	Video Resolution and Frame Rate	1080i×30, 1080i×29.97, 1080i×25, 720p×60, 720p×59.94, 720p×50, 576i×25, 480i×29.97
Bandwidth	6MHz, 7MHz, 8MHz	Video PID Bit Rate	≤50Mb/s
FFT Mode	DVB-T: 2K/8K DVB-T2: 1K, 2K, 4K, 8K, 16K, 32K	<b>Digital Audio Output</b>	
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	Connector Type	SDI embedded
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	Number of Output	2 pairs of audio PCM downmix or passed through by SDI
Input Return Loss	7dB (typ.)	Audio Sampling Rate	32K, 44.1K and 48 KHz
<b>DVB-C</b>		<b>Analog Audio Output</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for Loop through	Connector Type	1×DB9 female with 2 pairs of BNC adaptor 75Ω, or 1×DB9 female with 1 pairs of XLR adaptor 600Ω
Input Frequency Range	51~862MHz	Output Mode	Left, Right, Dual Mono, Stereo
Input Level	45~75dBμV	Number of Output	1×DB9 female with 2 pairs of BNC adaptor 75Ω, or 1×DB9 female with 1 pairs of XLR adaptor 600Ω
Symbol Rate	1~7Mbaud (ITU J.83 Annex A)	Cross Talk Among Channels	>70dB
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM	THD	<0.3% @ 400Hz, 1KHz test tone
Bandwidth	6MHz, 7MHz, 8MHz	Frequency Response	±0.5dB over 20Hz ~ 18KHz
Input Return Loss	7dB (typ.)	<b>Analog Video Output</b>	
<b>TS over IP</b>		Connector Type	1×BNC
Connector Type	1×RJ-45, 10M/100M/1000M Base-T for TS/IP	CVBS Standard	NTSC, PAL, and SECAM
Effective Bit Rate	80Mb/s for full duplex with ProMPEG FEC, 200Mb/s for full duplex without ProMPEG FEC, 500Mb/s for 32xSPTS IP out only	Video PID Bit Rate	≤50Mb/s
Protocol	UDP/RTP, Multicast/Unicast, IGMPv3, ARP	Normal Output Level	1.0 Vp-p±5% (with standard test stream)
<b>TS Processing</b>		Frequency Response	<±1 dB, at 5.5 MHz for PAL/SECAM, 4.2MHz for NTSC and 15MHz for HD YPbPr
TS Input Management	Demux and Remux among Tuner, ASI Input and TS/IP Input	Chroma-Luma Delay	<±30 ns
TS Output Management	Demux and Remux for ASI output	Field Time Distortion	<2%
Service and PID Management	Remux, filtering and remapping	Line Time Distortion	<1%
PSI/SI	PSI/SI table regeneration, PMT and SDT edition	Short Time Distortion	<2%
Descrambler	DVB Common Scrambling Algorithm (CSA)	Differential Gain	<3%
BISS Mode	BISS-1, BISS-E	Differential Phase	<2°
Common Interface	Double PCMCIA slots, compatible with major CA CAMs in the market	<b>Ancillary Data Processing</b>	
<b>ASI Output</b>		Subtitle	DVB, EBU
Connector Type	1xBNC female, 75Ω	VBI	Teletext, WSS
Standard	DVB-ASI, EN50083-9	Closed Caption	EIA 608, EIA 708, EIA 608-to-708
Output Bit Rate	≤200Mb/s	SDI Embedded	Teletext, WSS, Closed Caption
TS Processing	TS Re-multiplexed from Tuner, ASI Input and TS/IP Input	<b>Redundancy</b>	
<b>AV Decoding</b>	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)	Redundancy Port	among Tuner, ASI input and TS/IP input
Video Standard	MPEG-1 Layer-I/II, MPEG-2 Layer-II LC-AAC, HE-AAC	Switching Condition	TS Sync Loss or no PAT packet
Audio Standard	MPEG-1 Layer-I/II, MPEG-2 Layer-II LC-AAC, HE-AAC	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
<b>Physical</b>	
Power Supply	DC 3.3V/5V/12V
Power Consumption	20W
Operating temperature	0~45°C
Storage temperature	-10~60°C
Operating Humidity	10~90%, non-condensed

### Block Diagram



### Order Information

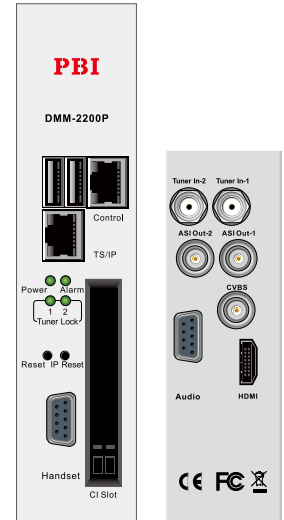
Interface		Model	DMM-1510P			
			-20X	-22X	-30X	-32X
Input		FrontEnd Options: DVB-S2, DVB-T2, ISDB, ATSC, DTMB, DS3 Factory default: X=S2				
TS Input	ASI In x1	•	•	•	•	
TS Output	ASI Out x1	•	•	•	•	
CI	CI x2	•	•	•	•	
AV Output	HD/SD SDI x1	•	•	•	•	
	SD SDI x1	•	•	•	•	
	HDMI x1	•	•	•	•	
	CVBS x1	•	•	•	•	
Audio Output	Audio L/R x2 OR Audio XLR x1	•	•	•	•	
	TSoIP	GbE RJ45 x1	•	•	•	
Upgrade	USB x2	•	•	•	•	
Control	RJ45 x1	•	•	•	•	

## DMM-2200P Series Twin Professional HD/SD IRD and Processor Module

DMM-2200P is a high-density, cost-effective modular receiver equipped with two independent tuners, which can be chosen respectively from DVB-T2/S2/S/C/T/T2 inputs. DMM-2200P supports a wide range of application by combining dual tuner processing capability with MPEG2, H.264, SD/HD video decoding and industry standard outputs including ASI, CVBS, HDMI, TS/IP. It has 2 DVB common interface slots capable of working with most of well-known CAS in the market to de-encrypt multiple pay TV services. The compact dual-tuner design and the powerful decoding ability make DMM-2200P one of the most competitive modules in DMM1000 series.

### Main features

- SD/HD MPEG-2(MP@ML&MP@HL) and MPEG-4/H.264(AVC high profile level 4.1) digital Video decoding
- Twin-tuner design, wide tuner options from DVB-S2/S/C/T/T2
- 2x DVB-CI Slots, Multi Programs, BISS 1 and BISS E decryption
- Support services re-mux/filter and 204/188 transfer
- UDP/RTP & Unicast/Multicast SPTS and MPTS over IP I/O
- Support VBI TELETEXT, EBU/ DVB Subtitle, Closed Caption
- Dynamic PMT detection and automatic updating
- Multiple Analog and Digital Outputs, ASI, CVBS, HDMI, TS/IP
- Support NTP(Network Time Protocol)
- Remote Control and Supervision by SNMP and HTTP WEB
- RSSI, received Eb/No & BER monitoring
- Quick upgraded via USB port
- Auto save settings when sudden power-off



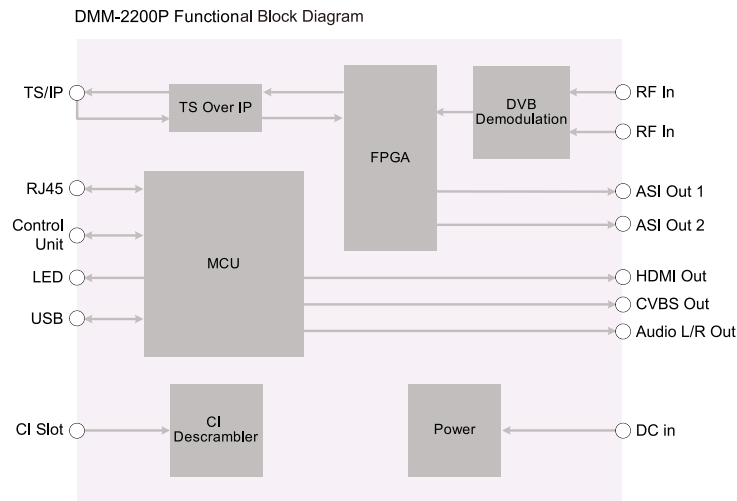
### Specification

Tuner Input		Input frequency	104~862MHz (VHF/UHF)
DVB-S/S2 Tuner Input		Input level	-20~-70dBm
Connector Type	2×F type female 75Ω for input	Constellation	DVB-T: QPSK/16-QAM/64-QAM DVB-T2: QPSK, 16QAM, 64QAM, 256QAM
Input Frequency Range	950~2150MHz	Bandwidth	6MHz/7MHz/8MHz
Input Level	-25~-65dBm	FFT mode	DVB-T: 2K/8K DVB-T2: 1K, 2K, 4K, 8K, 16K, 32K
Symbol Rate	2~45MS/s for QPSK and 8PSK	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
Rolling-off Factor	DVB-S QPSK: 0.35 DVB-S2 8PSK: 0.35, 0.25, 0.2	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
Punctured Rates	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	Input return loss	7dB (typ.)
LNB Polarization	0, 13V, 18V selectable	<b>TS over IP</b>	
LNB Band Switching Tone	0/22KHz selectable	Connector Type	1×RJ45, 10/100M for TS/IP
DiSEqC	DiSEqC 1.0	Useful bit rate	70Mb/s for 10/100M
<b>DVB-C Tuner Input</b>		Protocol	UDP / RTP, Multicast / Unicast, IGMPv2, ARP
Connector Type	2×F type female 75Ω for input	Uni/Multicast	support maximum 32 channel uni/multicast output
Input frequency	51~862MHz	<b>TS Processing</b>	
Input level	45~75dBuV	TS input	Tuner1, Tuner2 or TS/IP input
Symbol rate	1~7MS/s (ITU J.83 Annex A)	TS output	2 independent ASI outputs
Constellation	16/32/64/128/256QAM	Re-mux	Re-mux services, edit PSI/SI
Bandwidth	6/7/8MHz	BISS descramble	BISS-1, BISS-E
Input return loss	7dB (typ.)		
<b>DVB-T/T2 Tuner Input</b>			
Connector Type	2×F type female 75Ω for input		

CI slots	2×PCMCIA Slots, comply with most major CAMs in market
<b>ASI Output</b>	
Connector Type	2×BNC Female, 75Ω
Standard	DVB-ASI, EN50083-9
Output bit rate	≤160Mb/s
<b>HDMI Output</b>	
Standard HDMI	1×HDMI 1.3 interface (partial)
Video Resolution	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 or Loop Through
<b>Digital Video/Audio Processing</b>	
Video Standard	MPEG-2(MP@ ML for SD, MP@HL for HD), MPEG 4/H.264 AVC high profile level 4.1
Audio Standard	MPEG-1 Layer-I/II, MPEG-2 Layer-II LC-AAC, HE-AAC
<b>Analog Video Output</b>	
Connector Type	1×BNC female
Video Standard	NTSC, PAL, and SECAM
Video bit rate	≤50Mb/s

<b>Analog Audio Output</b>	
Connector Type	1×DB9, 600Ω, has a DB-9 to XLR converter
Output type	Left, Right, Dual Mono, Stereo
<b>Baseband Data Output</b>	
Subtitle	DVB/EBU
VBI	Teletext, WSS
Closed Caption	EIA 608, EIA 708, EIA 608-to-708
<b>A/V monitor</b>	
Monitor Port	HDMI, CVBS
Monitor Condition	User define
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ45, 10/100M, for equipment IP Control
Remote Control	SNMP, HTTP Web
Local Control	Handheld Programmer Unit
Software Upgrade	1×USB Port or FTP loader
<b>General</b>	
Power supply	DC 3.3V/5V/12V
Power consumption	20W
Operating temperature	0~45°C
Storage temperature	-10~60°C
Operating Humidity	10~90%, non-condensed

Block Diagram



Order Information

Interface	Model	DMM-2200P-S2	DMM-2200P-T2
Input	DVB-S2/S	×2	
	DVB-T2/T/C		×2
	CI	×2	×2
	TS/IP	•	•
Output	HDMI	•	•
	CVBS&Audio L/R	•	•
	ASI	×2	×2
	TS/IP	•	•

## DMM-2410D Series Professional Quad Demodulator

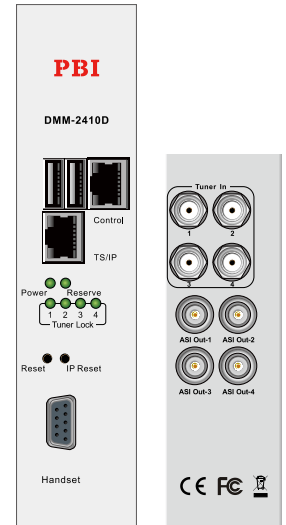
The DMM-2410D professional Quad Demodulator provides operators an ideal solution for multiple channel receiving and remultiplexing operations. Equipped with 4 independent tuners and 1 TS over IP inputs, DMM-2410D ensures compatibility with all transmission media, such as DVB-S2/S/T/T2/C and so on. The DCH-2410D's remultiplexing capabilities enable the creation of new transport streams that are subsets of the original inputted stream. Customized services may be output as multiple SPTS or MPTS over IP, as well as over ASI. All these architectures make the DCH-2410D an ideal product for DTV signals receiving and demodulation.

### Main features

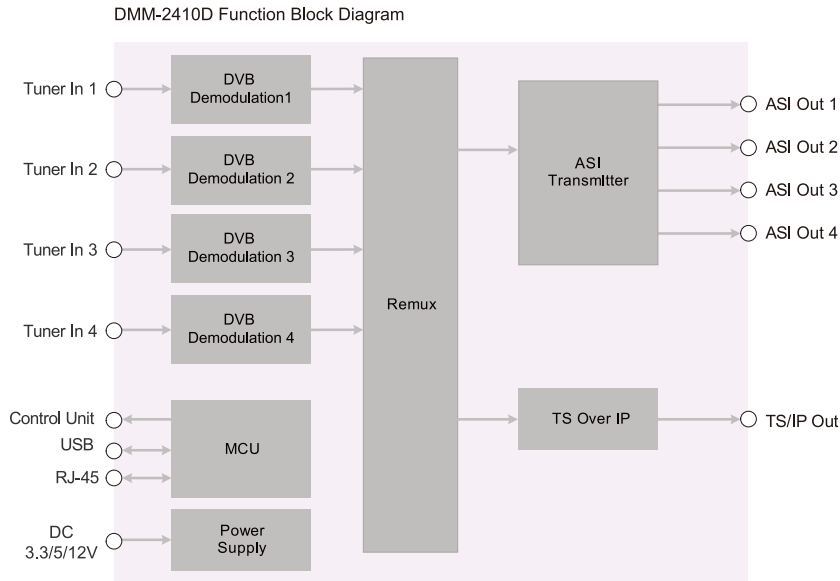
- Variety of tuner factory options DVB-T2/S2/S/C/T/T2 and TS/IP
- Built-in TS re-multiplexer receives 4xTuner and TS/IP input
- Dynamic PMT detection and automatic updating
- UDP/RTP, Unicast/Multicast, and SPTS/MPTS over IP
- Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software
- On Site software update through IP
- RSSI, received Eb/No & BER monitoring

### Specification

DVB-S/S2 Tuner Input			
Connector Type	4×F type female 75Ω for Input	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
Input Frequency Range	950~2150MHz	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 Level	-25~-65dBm	Return Loss	7dB (typ.)
Symbol Rate	2~45MBaud	<b>TS over IP</b>	
Roll-off Factor	DVB-S QPSK: 0.35 DVB-S2 8PSK: 0.35, 0.25, 0.2	Connector Type	1×RJ-45, 10/100 Base-T for TS/IP
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	Protocol	UDP/RTP, Multicast/Unicast, IGMP 2, V3 Support 3 different mode (reboot is needed to change the TS/IP mode): 1. Max.430Mb/s, output only, 5x multicast/unicast MPTS (TS comes from Tuner 1 to 4 pass through, 1x channel from built-in Remux) 2. Max.430Mb/s, output only, 128x multicast/unicast SPTS (TS comes from either tuner 1 to 4 or built-in Remux) 3. Max.80Mb/s, full duplex, 1x multicast/unicast MPTS/SPTS input and output
Satellite Selection Command	DiSeqC 1.0	Effective Bit Rate	
LNB Polarity Selection Voltage	0, 13V, 18V selectable	<b>Control &amp; Monitoring</b>	
LNB Band Selection Tone	0/22KHz selectable	Connector Type	1×RJ-45, 10/100 Base-T, for equipment IP Control
<b>DVB-C Tuner Input</b>		Remote Control	SNMP, HTTP (Web Interface), Proprietary HDMS (Headend Device Management System)
Connector Type	4×F type female 75Ω	Software Upgrade	FTP Loader and Telnet
Input Frequency Range	48~860MHz	<b>Physical</b>	
Input Level	45~75dBμV	Power Supply	DC 3.3V/5V/12V
Symbol Rate	1~7MBauds (ITU J.83 Annex A)	Power Consumption	15W
Constellation	16/32/64/128/256QAM	Weight	560g
Bandwidth	6MHz/7MHz/8MHz	Storage temperature	-10 to 55°C
Return Loss	7dB	Operating Humidity	10~90%, non-condensed
<b>DVB-T/T2 Tuner Input</b>			
Connector Type	4×F type female 75Ω		
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		



Block Diagram



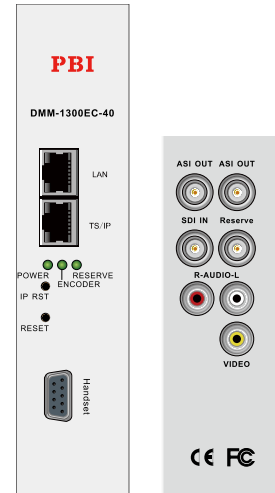
Order Information

Interface	Model	DMM-2410D-S2/S	DMM-2410D-T2/T	DMM-2410D-C
Tuner Input	DVB-S/S2	x4		
	DVB-T/T2		x4	
	DVB-C			x4
Output	ASI	x4	x4	x4
	TS/IP	•	•	•

## MPEG-2 SD Encoder Module

### DMM-1300EC Series Single Channel MPEG-2 SD Encode

- Digital SDI with embedded digital audio input
- Analog Composite Video for PAL/NTSC/SECAM Input
- MPEG-2 MP@ML Video encoding
- User configurable GOP
- User configurable 4:3/16:9 aspect ratio
- PAT, PMT and SDT generation and NIT Insertion
- 10/100M IP Output, UDP/RTP & Unicast/Multicast SPTS and MPTS
- Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software



### Specification

Video Compression		Service and PID management	Remux, filtering and remapping
Analog Input	Analog NTSC, PAL and SECAM	PSI/SI	PSI/SI table regeneration, NIT and SDT edition
Digital Input	SD-SDI (SMPTE-259M)	<b>TS over IP Output</b>	
Compression Standard	MPEG-2 MP@ML	Connector Type	1×RJ45, 10/100M for TS/IP
Video Resolution	480i (720x480) @29.97Hz: SMPTE125M 576i (720x576) @25Hz: ITU-R BT.656-4	Useful bit rate	70Mb/s for 10/100M
Aspect Ratio	4:3/16:9 selectable	Protocol	UDP / RTP, Multicast / Unicast, IGMPv2 ARP
Video output Bit rate	1.5 ~ 20Mb/s	<b>ASI Output Interface</b>	
<b>Audio Compression</b>		Connector Type	2×BNC Female, 75Ω
Audio Channels	1 pair of stereo	Output bit rate	≤ 99Mb/s
Audio Sampling Rate	32, 44.1, 48 KHz	Packet Length	188 / 204 Bytes
Audio Output Bit rate	32, 64, 128, 192, 256, 384 Kb/s	Signal Level	800mVpp±10%
<b>Audio/Video Input Interface</b>		<b>Control &amp; Monitoring</b>	
Analog Audio	RCA female, Stereo L/ R	Connector Type	1×RJ45, 10/100M, for equipment IP Control
Analog CVBS	RCA female, 75Ω	Remote Control	SNMP, HTTP Web, Proprietary HDMS network Management Software
SD-SDI	1×BNC female, 75Ω	Local Control	Handheld Programmer Unit
SDI embed audio	Group 1 to 4 selectable	Software Upgrade	FTP loader
<b>TS Processing</b>			
TS Output Management	Remux and demux for mirror ASI outputs		

### Order Information

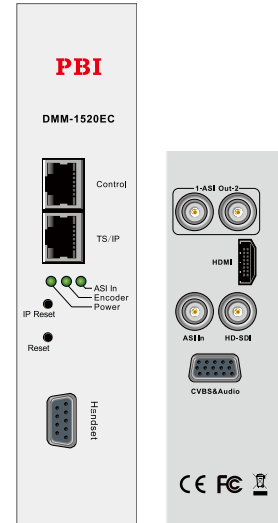
Interface	Model	DMM-1300EC-XX	
		1300EC-30	1300EC-40
CVBS		•	•
SD-SDI Input		•	•
ASI Output		×2	×2
TS/IP Output			•

## DMM-1520EC Single Channel H.264 HD Encoder

DMM-1520EC is a highly adaptable single channel H.264 (MPEG-4 AVC) HD Encoder, which provide users a high-level operation experience to meet the requirement of the Digital broadcasting market. The DMM-1520EC support various input interface that include HD/SD-SDI, and CVBS. The compressed stream could output via GbE IP and ASI. DMM-1520EC can encode two pairs of stereo audio with its 2nd audio daughter board. With built-in re-multiplexer, DMM-1520EC could re-multiplex the SPTS generated itself and a MPTS input from ASI or IP, which makes DMM-1520EC the most suitable deployment choice for any broadcast system.

### Main features

- Fully compliant with H.264 HP@Level 4.0 and MP@Level 3.0
- Multiple video resolution including 1080p, 1080i, 720p, 576i and 480i
- Multiple inputs, HD/SD-SDI, and CVBS for encoding
- Support GbE TS/IP input/output(full duplex)
- Built-in Re-mux can multiplex services from ASI Input, IP input with encoded service.
- Can edit PSI/SI
- Support VBR and CBR encoding mode
- Support 2 pairs of analog stereo audio encoding with optional extension audio board
- Remote Control and Supervision by SNMP, HTTP WEB
- 4RU 19" chassis compact modular design, supporting up to 8 modules
- Support Down scale without changing frame rate.



### Specification

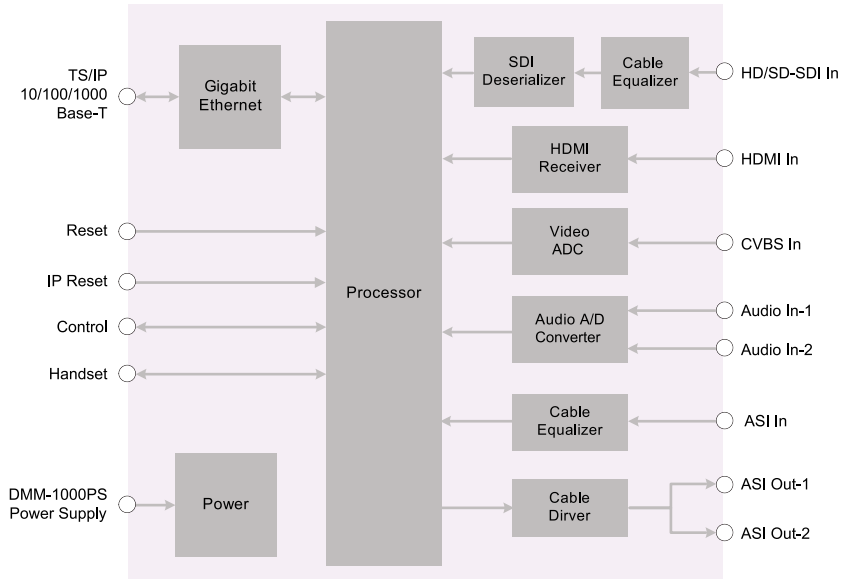
Video Input & Compression	
Video Input	1×HD/SD-HDMI(v1.3) 1×BNC for CVBS input 1×BNC for HD/SD-SDI input(for DMM-1520-3x and DMM-1520-4x model only)
Compression Standard	H.264/AVC HP@L4.0
Chrominance Space	4:2:0
Video Encoding Bit Rate	2Mbps~30Mbps
Video Resolutions & Recommended Video Encoding Bit Rates	1080p (1920x1080) @ 59.94 Hz, 50 Hz SMPTE296M: 6~30Mb/s 1080i (1920x1080) @25Hz, 29.97Hz SMPTE274M: 6~24Mb/s 1080i (1440x1080@25Hz, 29.97Hz SMPTE274M: 5~24Mb/s 720p (1280x720) @50Hz, 59.94Hz SMPTE296M: 4~24Mb/s 480i (720x480) @29.97Hz: SMPTE656M: 2~10Mb/s 576i (720x576) @25Hz: SMPTE656M: 2~10Mb/s
Audio Input & Compression	
Audio Input	HDMI Embedded Analog L,R audio input via a 2.5mm phone jack SDI Embedded(for DMM-1520-3x and DMM-1520-4x model only) 2nd analog L,R audio input via an extension audio board(for DMM-1520-x2 model only)
Compression Standard	MPEG1 Layer II Encoding (Mono, Stereo) MPEG2 AAC-LC Encoding (Stereo) MPEG4 AAC-LC Encoding (Stereo)
Sampling Rate	48KHz
Audio Compression Bit Rate	MPEG1 Layer II: 32~256Kb/s (Both 2 pairs of audio on DMM-1520EC-x2 model) AAC-LC: 128~512Kb/s (1st pair of audio only)

DVB-ASI Input	
Connector Type	1×BNC Female, 75Ω
Maximal Input Bit Rate	100 Mb/s
Packet Mode	Byte
Packet Length	188/204 Bytes
Signal Level	200~880mVp-p
DVB-ASI Output	
Connector Type	1×BNC Female, 75Ω
Effectual Output Bit Rate	1.5 Mb/s~70 Mb/s
Packet Mode	Byte
Packet Length	188/204 Bytes
Signal Level	800±80mV
GigE Full Duplex	
GbE Full Duplex	IEEE 802.3, 10/100/1000 Base-T
Maximal Effectual Output Bit Rate	80Mb/s
UDP/RTP Protocol	SPTS or MPTS IGMPv2
Control&Monitoring	
Connector Type	1×RJ45, 10/100 Base-T, for equipment Control
Remote Control	SNMP, HTTP(WEB interface)
Local Control	Handheld Programmer Unit
Software Upgrade	FTP loader and Telnet
Physical parameter	
Power supply	DC 3.3V/5V/12V
Power Consumption	<18W
Operating Temperature	0~45°C
Storage Temperature	0~45°C
Storage Temperature	-10~60°C
Humidity	10~90%, Non-condensed



Block Diagram

DMM-1520EC Functional Block Diagram



Order Information

Interface		Model	DMM-1520EC-XX			
			-30	-32	-40	-42
Input	CVBS		•	•	•	•
	Audio 1		•	•	•	•
	Audio 2			•		•
	SDI		•	•	•	•
	ASI		•	•	•	•
Output	ASI x2		•	•	•	•
	TS/IP GbE				•	•

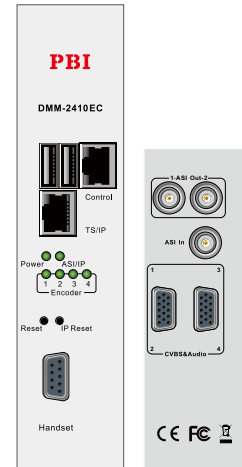
## DMM-2410EC 4-way Encoder/Transcoder Series

DMM-2410EC are a series of high density H.264 HD/SD & MPEG-2 SD real time encoders/Transcoders. This blade type design integrates 4 independent encoders/transcoders, 1 reMultiplexer, 1 ASI\_in, 2 ASI\_out, and 1 Gigabit (GbE) TS/IP port. New MPTS could be generated with the built-in reMultiplexer from any combination of services among ASI\_in, TS/IP\_in and the local encoders. HDMI, HD-SDI and CVBS inputs are available as factory hardware options.

All models provide three TS/IP operation modes. The first is "Full Duplex", which allows one MPTS or SPTS inputted to make up a new MPTS with local encoders, then sends the new one over IP & ASI\_out. In the second mode "Multiple output" which delivers up to five streams over IP. There are four un-stuffed SPTS (lower bit rate but less PCR accurate than normal SPTS, from local encoders) and one MPTS (from internal reMultiplexer) over the IP with different Unicast or Multicast IP addresses. In the third mode "Multiple Full Duplex", which allows 4SPTS input and 4SPTS&1MPTS output.

All models support transcoding function (see below). They accept an MPTS and transcode up to 4 TS inside and the final output is formed as an MPTS and/or 4 un-stuffed SPTS.

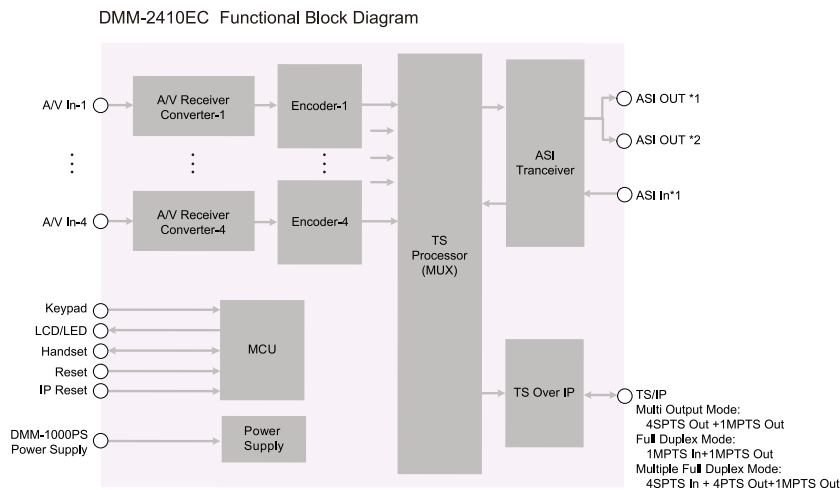
DMM-2410EC series modules can be fitted into DMM-1100MF (19" x 4RU, 8 slots, and Dual power supplies) or DMM-210MF (19"x 1RU, 2 slots, single power supply) chassis.



### Main features

- Compliant with H.264/AVC Baseline, Main & High Profile @ L4.0 or less & MPEG-2 MP@ML
- 4 independent AV inputs (SDI, HDMI, CVBS, note: see Model List)
- Independent Encoding/Transcoding mode control
- Internal reMultiplexer, new MPTS is made up from ASI\_in, TS/IP\_in & Local Encoders
- MPTS remultiplexed and 4 local un-stuffed SPTS available over IP
- Video Input Resolution: 1080i, 720p, 576i, 480i (note: CVBS models support SD only, see Model List)
- Minimum Video Bit Rate 300Kb/s (Standard PAL or NTSC SD video, while total bit rate ~ 700Kb/s)
- Independent Vertical & Horizontal pixel scale
- Transcoding from MPEG2 to H.264/AVC & vice versa
- VBR & CBR mode for encoding/transcoding
- Audio coding: MPEG1 Layer II, MPEG2/4 AAC-LC HE-AAC (note: see Model List)
- SNMP & HTTP WEB for monitoring & control
- Fit to DMM-1000MF and DMM-200 Chassis

### Block Diagram



## Specification

<b>Video Input &amp; compression Coding</b>	
Video Input Interfaces	4x HDMI, 4x SDI, or 4x CVBS (note: see Model List)
Coding Profile & Level	H.264/AVC BLP, MP, HP @ L4.0 or less, MPEG-2 MP@ML (note: see Model List)
Sampling Format	4:2:0, 10-bit, YCbCr
Compression Bit Rate	300K~20Mbps
Video Resolution & Recommend Compression Bit Rate H.264	1080i (1920 × 1080) @25Hz,29.97Hz: SMPTE274M: 1~13Mb/s 720p (1280 × 720) @50Hz,59.94Hz: SMPTE296M: 1~13Mb/s
	480i (720 × 480) @29.97Hz: SMPTE656M: 600K~8Mb/s
	576i (720 × 576) @25Hz: SMPTE656M:600K~8Mb/s
	480i (720 × 480) @29.97Hz: SMPTE656M: 3.5~8Mb/s
Video Resolution & Recommend Compression Bit Rate MPEG 2	576i (720 × 576) @25Hz: SMPTE656M: 3.5~8Mb/s
	480i (720 × 480) @29.97Hz: SMPTE656M: 3.5~8Mb/s
Video Resolution Down Scaling	Vertical & Horizontal adjustable respectively (frame rate is not scalable)
Aspect Ratio	4:3, 16:9 Selectable
<b>Audio Input &amp; Compression Coding</b>	
Audio Input Interfaces	HDMI/SDI Embedded or Analog (note: see Model List)
Coding Standard	MPEG1 Layer II MPEG-2/4 AAC-LC/HE-AAC(V1, V2) (available on DMM-2410EC series)
Sampling Rate	48KHz
Recommend Compression Bit Rate	MPEG1 Layer II :32~192Kbps(mono), 64~384Kbps( stereo), MPEG-2/4 AAC-LC:24~256Kbps(mono), 48~512Kbps( stereo) MPEG2/4 HE-AAC(V1,V2) :16~128Kbps (mono), 32~256Kbps( stereo)
<b>Transcoding</b>	
Transcoding Mode	H.264 to MPEG-2, H.264 to H.264, MPEG-2 to MPEG-2, MPEG-2 to H.264 MPTS, MPEG2 MP@ML MP@HL, MPTS, H.264/AVC Main/High/Baseline Profile @ L4.0 or less (but not FMO, ASO & RS of Baseline)
Input Standard	MPTS and/or un-stuffed TS, MPEG2 MP@ML
Output Standard	MPTS and/or un-stuffed TS, H.264/AVC Main/High/Baseline Profile @ L4.0 or less (but not include FMO, ASO & RS of Baseline)

<b>DVB-ASI Input</b>	
Input Interface	BNC Female, 75Ω
Maximum Bit Rate	100 Mb/s
Data Type	Byte
Packet Length	188/204 Bytes
Signal Level	200 ~ 880mVp-p
<b>DVB-ASI Output</b>	
Input Interface	BNC Female, 75Ω
Bit Rate	100Mb/s
Data Type	Byte
Packet Length	188/204 Bytes
Signal Level	800 ± 80mV
<b>TS/IP Gigabit Ethernet (note: see IP Model List)</b>	
Standard	IEEE 802.3, 10/100/1000 Base-T 80Mb/s (note: Full Duplex mode) 200Mb/s (note: Multiple Output mode 4SPTS Output+1MPTS Output)
Maximum Effective Bit Rate	200Mb/s (note: Multiple Full Duplex mode 4SPTS Input+ 4SPTS Output+1MPTS Output)
Encapsulation Protocol	SPTS or MPTS UDP, RTP, ICMP, ARP, IGMPv2
<b>Rear Panel options</b>	
ASI In	1 x BNC Female, 75Ω
SDI In	4 x BNC Female, 75Ω (DMM-2410EC-S or DMM-2411EC-S, see Model List)
HDMI In	4 x HDMI Socket, 75Ω (DMM-2410EC-H or DMM-2411EC-H, see Model List) 2 x D-Sub15 (with D-Sub 15 to BNC female adapter cabling, total 4 sets of inputs, see Model List)
CVBS In & Analog Audio In	2 x BNC Female, 75Ω (1 Backup)
<b>Front Panel</b>	
Control	1x RJ-45, 10/100 Base-T
TS/IP	1x RJ-45, 10/100/1000 Base-T
LED	1x Power, 4x Encoder Status, 1x ASI/IP Status
IP Reset	Press for 5 second or more to return the default IP address of control port
Reset	Local reset
Others	
Power	DC 3.3V/5V/12V, from DMM-1000 (8-slot) or DMM-200 (2-slot)
Operating Temperature	0 ~ 40°C
Storage Temperature	-10 ~ 60°C
Operating Humidity	10 ~ 90% (Non-condensed)

## Order Information

Interface		Model	DMM-2410EC-S	DMM-2410EC-H	DMM-2410EC-C
Input	HD/SD SDI with Embedded Audio		x4		
	HDMI with Embedded Audio			x4	
	CVBS & Analog Audio				x4
TS Input	ASI		•	•	•
	TS/IP(GbE)		•	•	•
TS Output	ASI (1+1)		•	•	•
	TS/IP(GbE)		•	•	•
Audio AAC-LC /HE-AAC			•	•	•

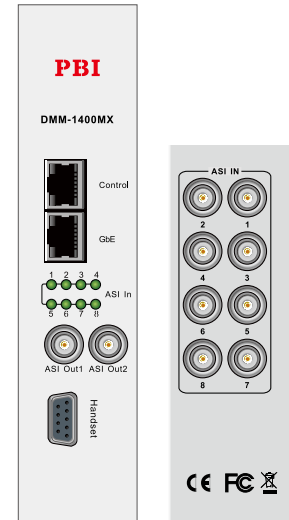
## Re-Multiplexer

### DMM-1400MX Re-multiplexer Module

- 8-way SPTS or MPTS ASI inputs
- Redundant ASI outputs
- Gigabit Ethernet for TS over IP Output
- PSI/SI table regeneration, NIT, EIT and SDT edition, LCN Edition and Re-generation
- Remote Control and Supervision by SNMP and Proprietary HDMS software
- On Site software update through IP

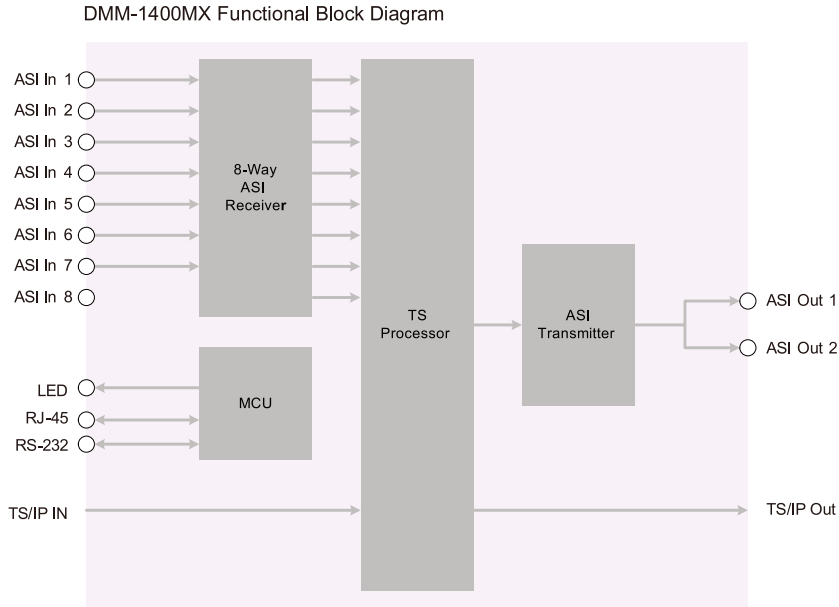
### Specification

<b>ASI Input</b>	
Connector Type	8×BNC Female, 75Ω
Input Bit Rate	≤ 216Mb/s
Data transmission mode	BYTE or BURST mode auto-detection
Packet Length	188 /204 bytes, auto-detection
<b>ASI Output</b>	
Connector Type	2×BNC Female, 75Ω
Output bit rate	≤ 216Mb/s
Data transmission mode	Byte
Packet Length	188 or 204 Bytes
Signal Level	800mVpp±10%
PSI/SI generating	PAT, PMT, SDT, CAT, NIT, EIT Actual P/F, EIT Schedule
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ45, 10/100M, for equipment IP Control
Remote Control	SNMP, Proprietary HDMS network Management Software
Local Control	Handheld Programmer Unit
Software Upgrade	FTP loader
<b>TS over IP</b>	
Connector Type	1×RJ-45, 100/1000 Base-T for TS/IP
Effective Bit Rate	80Mb/s for 1000 Base-T
Protocol	UDP / RTP, Multicast / Unicast, IGMPv2, ARP



Block Diagram

Multiplexer / Scrambler



Order Information

Interface	Model	DMM-1400MX-30	DMM-1400MX-40
ASI In		x8	x8
ASI Out		x2	x2
TS/IP(GbE)			•
TS/IP IN			•*
TS/IP Out			•

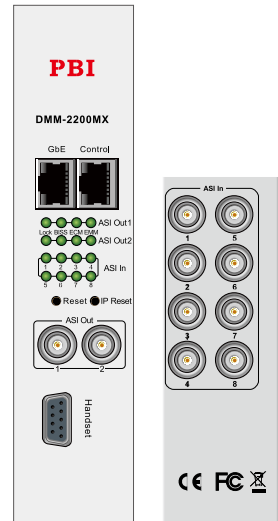
\*The 8<sup>th</sup> ASI Input is not available whe TS/IP Input is enabled

## DMM-2200MX / 2200DX Series Re-Multiplexer and Scrambler Module

DMM-2000MX/2200DX is a series of high density advanced DVB transport stream re-multiplexer and scrambler modules. It can receive SPTS and MPTS from both GbE and ASI input ports. By using the user friendly web control interface, the input TS is demuxed to SPTS, then routed to the ASI and GbE output ports to build new SPTS and MPTS with PSI/SI regeneration or pass through. It can support up to maximum 256 PID or 32 TV services per TS with re-mapping, bypass, filtering functions. PCR jitter is improved by PCR correction and re-stamping features.

As an advanced option, DMM-2200MX/2200DX can provide with DVB scrambling functions. It can support BISS-1, BISS-E and Simulcrypt modes by using the DVB common scrambling algorithm and built-in CW generator.

With its multiple TS over ASI and IP input and output ports, flexible configuration and powerful TS processing ability, DMM-2000MX/2200DX is a key routing equipment that links the TV sources from professional IRDs and encoders to DVB modulators in the headend system.



Multiplexer / Scrambler

### Features

- MPEG2 and MPEG4/H.264 TS Re-Multiplexing
- BISS 1/E, Simulcrypt mode Scrambling in advanced mode
- TS Input and Output from both ASI and IP
- ASI Input or Output up to 160Mbps
- TS/IP through GbE port up to 860Mbps input/output
- TS/IP in UDP/TCP/RTP, Multicast and Unicast modes
- Null packet insertion for TS/IP transmission
- Maximum processing of 32 services or 256 PIDs per TS
- Service, component, data de-multiplexing, filtering and re-multiplexing
- PCR re-generation and correction function
- PID and service remapping, bypass, filtering, conflict detection
- PSI/SI re-generation, insertion, NIT and SDT edition
- EIT bypass or re-generation
- TS Analyzer with TS, service bit rate and alarm supervision
- Web remote control and SNMP supervision

### Order Information

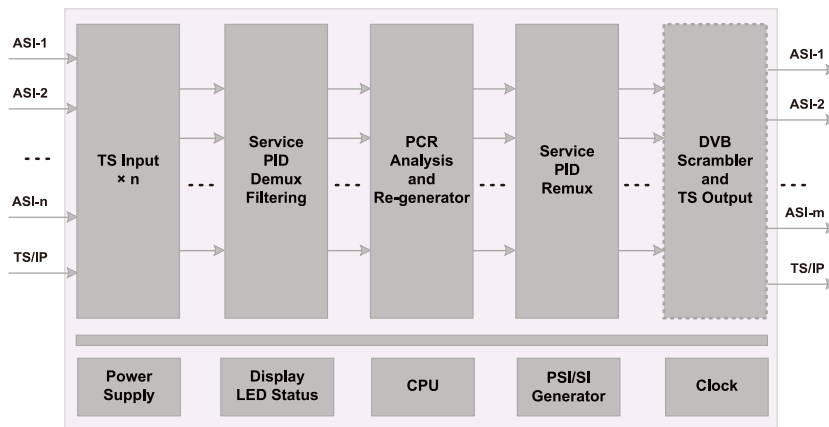
Interface	Model	DMM-2200MX	DMM-2200MX-TP	DMM-2200DX	DMM-2200DX-TP
ASI In		×8	×8	×2	×2
ASI Out		×2	×2	×8	×8
Remultiplexer		•	•	•	•
DVB Scrambling			•		•
TS/IP (GbE)		×1	×1	×1	×1
Ethernet Management		×1	×1	×1	×1
RS-232		×1	×1	×1	×1
TS/IP In		32	32	32	32
TS/IP Out		2	2	8	8

Specification

<b>ASI Ports</b>	
Number	10
Input bit rate	≤ 213Mb/s
Output bit rate	≤ 160Mb/s
Data mode	BYTE or BURST auto-detection
Packet Length	188 /204 bytes, auto-detection
Signal Level	200-800mVpp±10%
Connector type	BNC Female, 75Ω
<b>TS over IP</b>	
Transmission mode	Multicast or Unicast , IGMP V2/V3
Number of streams	64, 128 or 256
Input and output Bit Rate	Maximum 420Mb/s, future extension to 860Mb/s
Encapsulation	UDP or UDP/RTP 1-7 TS packets in each IP packet
FEC(option)	Pro MPEG COP#3 (SMPTE 2022) future evolution
PCR clock reference	PCR regeneration
Connector type	1000M Ethernet RJ-45 electrical
<b>TS Processing</b>	
Maximum throughput	21Gb/s
Maximum TS	64 TS from IP and 8 TS from 8 ASI
Maximum service	64 services from each of 8 ASI port, 32 services if PCR regeneration 64 services from each of 64 TS over IP
Service management	Local service building Live service input pass through, stop, filtering, sharing and redundancy Service proprietaries' edition and modification
Component management	Local component building Live component input pass through, stop, filtering, sharing, redundancy

EMM, ECM and private data	Crossing and filtering
Bandwidth management (option)	Transport stream and service bit rate view Quality of service definition, service policing, Overflow prevention
<b>PSI/SI and Data</b>	
PSI/SI	Regeneration and edition tables and descriptors through on line editor Tree structure view in XML format Pass through, regrouping, automatic remapping of TS ID, ON_ID and Service ID in the EITs from different ASI and IP inputs Opportunist data insertion to replace null packets
EIT	
Data(option)	
<b>DVB Scrambling</b>	
Scrambling mode	Simulcrypt, BISS-1, BISS-E
Simulcrypt number per TS	Maximum 4
Processing capability	<54Mb/s per TS
EMM	Maximum number 64; Protocol TCP or UDP; Maximum bandwidth 8Mb/s
ECM	Maximum number 64; Protocol TCP; Maximum bandwidth 3.8Mb/s
<b>Control &amp; Monitoring</b>	
Connector Type	RJ-45, 10/100 Base-T
Local Control	16 LED, Support external key pad with LCD display and 6-key
Remote Control	HTTP Web, SNMP future extension
Equipment Upgrade	HTTP web page
<b>Physicals</b>	
Power Supply	DC 5V, 5A
Power Consumption	25W
Temperature	Operating 0~45°C; Storage -10~60°C
Operating Humidity	10~90%, non-condensed

Block Diagram

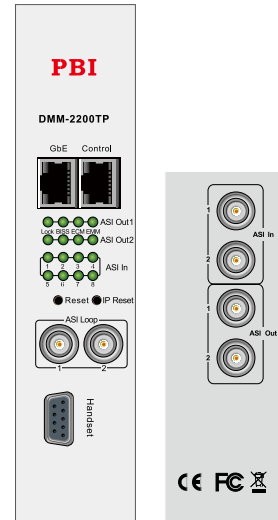


## DMM-2200TP Dual Channel DVB Scrambler

DMM-2200TP is a professional broadcast level Twin DVB-TS Scrambler module, which can support 2 TS streams scrambling with one signal unit. Each ASI Out ports can output independent scrambled TS streams or transparent loop through input TS stream out. It can support up to four different Simulcrypt scramble or BISS 1/E scramble by using the DVB common scrambling algorithm and built-in CW generator. With its high performance and stability, DMM-2200TP can be widely used in current or new-style DVB-S/T/C digital TV headend system.

### Features

- Fully compliant with IOS13818 and EN300 468 standard
- Support MPEG2/H.264 TS stream scrambling
- Support BISS 1/E, Simulcrypt scrambling
- 2\*ASI for SPTS/MPTS input, up to 213Mbps for each ASI.
- 2\*ASI for independent MPTS output, up to 52Mbps for each scrambled TS.
- Can process maximum 48 EMM and ECM for each scramble tunnel
- Support most major CAS in market
- Support local or remote CAS synchronous simulcrypt processing
- Support error alarm of TS level
- Support statistics of PID and service bit rate
- Support PSI/SI insertion or re-generation
- IP GbE interface with up to 860Mbps input/output (transparent TS)
- Large cache with powerful output buffer against burst overflow
- Web remote management and SNMP supervision



### Order Information

Interface	Model	DMM-2200TP
ASI Input		x2
ASI Scrambling Output		x2
ASI Loop-through Output		x2
Re-Multiplexing		•
Scrambling		•
TS/IP Interface(GbE)		x1
Ethernet Interface		x1
RS-232		x1

### Specification

TS over IP	
<b>Connector Type</b>	
Connector Type	1×RJ45, 1000Base-T full duplex, IEEE803.2
Protocol	IPv4, IGMPv2/V3, UDP, RTP
Transport type	Multicast
IP Stream type	SPTS/MPTS
IP Jitter	200ms
Input/Output Bit Rate	≤860Mb/s
<b>ASI Input/Output</b>	
Connector Type	2×BNC female, 75Ω for Input 2× BNC female, 75Ω for Scrambling Output 2×BNC female, 75Ω for Loop Though Output
Standard	DVB-ASI, EN50083-9
Receiving Sensitivity	≤200mV
Input Voltage	200~880mV
Output voltage	800±80mV
Rising Time	≤1200ps
Falling Time	≤1200ps

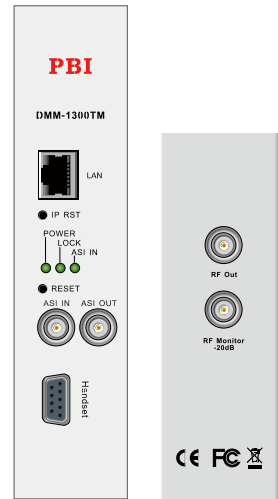
Deterministic Jitter(peak)	≤10%
Random Jitter(peak)	≤8%
Return Loss	15dB
Data Format	Byte / Burst / Auto
Packet Length	188(byte) / 204(burst) / Auto
Input Bit Rate	≤213Mbps/per port (transparent TS)
Output Bit Rate	≤213Mbps/per port (transparent TS) ≤213Mbps/per port (scrambled TS)
Input/Output Service Quantity	256 PIDs/32 services
<b>TS Scrambling</b>	
Scrambling Algorithm	DVB common scrambling algorithm, built-in CW generator
Scrambling Mode	Simulcrypt, BISS 1/E
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/100 Base-T, for equipment IP Control
Remote Control	SNMP, HTTP (Web Interface)
Front Panel Operation	LCD Display, Buttons control



## Digital TV Modulator and Trans-Modulator

### DMM-1300TM Series Single Channel Transmodulator

- DVB-S2/S, DVB-C or DVB-T Tuner Input
- ASI input and output
- Flexible re-multiplexing between ASI and Tuner inputs
- PSI/SI adapting and re-generation, including NIT insertion, LCN insertion etc.
- Service Drop or PID filtering and Re-mapping
- Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software
- On Site software update through IP
- RSSI, received Eb/No & BER monitoring



### Specification

Tuner Input		TS Input Management	
<b>DVB-S/S2 Tuner Input</b>		Service and PID management	Remux and demux between Tuner and ASI Inputs
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output	PSI/SI	Remux, filtering and remapping
Input Frequency Range	950~2150MHz	ASI Output	PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation
Input Level	-25~-65dBm	Connector Type	1×BNC Female, 75Ω
Symbol Rate	DVB-S QPSK: 5~45MS/s; DVB-S2 8PSK 10~31MS/s	Standard	DVB-ASI, EN50083-9
Roll-off Factor	DVB-S QPSK: 0.35; DVB-S2 8PSK: 0.35, 0.25, 0.2	TS Processing	2 mirror TS Re-multiplexing from Tuner and ASI inputs
Punctured Rates	DVB-S2 8PSK: 2/3, 3/4, 3/5, 5/6, 8/9, 9/10 DVB-S QPSK: 1/2, 2/3, 3/4, 5/6, 6/7, 7/8	<b>DVB-C Re-Modulation</b>	
LNB Polarization	0, 13V, 18V selectable	Constellation	J.83 Annex A: 16/32/64/128/256QAM; J.83 Annex B: 64/256QAM
LNB Band Switching Tone	0/22KHz selectable	Symbol Rate	3~7.2MS/s
<b>DVB-C Tuner Input</b>		I/Q Amplitude Error	< 0.3%
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output	I/Q Phase Error	< 0.3°
Input Frequency Range	48~860MHz	Phase jitter	< 0.5°RMS
Symbol Rate	1~7MS/s (ITU J.83 Annex A)	MER	> 35dB
Constellation	64/128/256 QAM	<b>DVB-T Re-Modulation</b>	
Input Level	-15~15dBmV	Constellation	QPSK/16QAM/64QAM
Bandwidth	6/7/8MHz	Bandwidth	5/6/7/8MHz
Input Return Loss	7dB (typ.)	FFT Mode	2K
<b>DVB-T Tuner Input</b>		Guard Interval	1/4, 1/8, 1/16, 1/32
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output	Code Rate	1/2, 2/3, 3/4, 5/6, 7/8
Input Frequency Range	174~230MHz (VHF); 470~860MHz (UHF)	MER	>36dB
Input Level	-20~-70dBm	<b>RF Output</b>	
Constellation	QPSK, 16-QAM, 64-QAM	Connector Type	F type female, 75Ω
Carrier Bandwidth	6/7/8 MHz	Output Frequency Range	48~860MHz agile, step by 10 KHz
FTT Mode	2K/8K	Output Level	97~110dBμV, step by 1dBμV
Guard Interval	1/4, 1/8, 1/16, 1/32	Spurious Rejection	55dB (typ.)
FEC Code Rate	1/2, 2/3, 3/4, 5/6, 7/8	Output Return Loss	12dB (typ.)
<b>ASI Input</b>		<b>Control &amp; Monitoring</b>	
Connector Type	1×BNC Female, 75Ω	Connector Type	1×RJ45, 10/100M, for equipment IP Control
Standard	DVB-ASI, EN50083-9	Remote Control	SNMP, HTTP Web, Proprietary HDMS Network System Management Software
Input Bit Rate	≤ 100Mb/s	Local Control	Handheld Programmer Unit
Package Length	188 or 204 Bytes	Software Upgrade	FTP loader
<b>TS Processing</b>			

Order Information

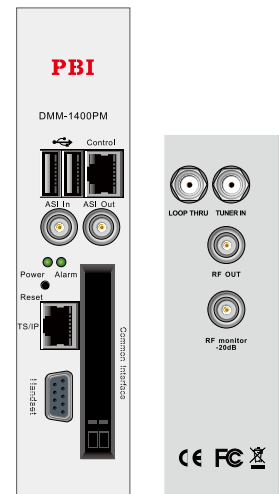
Interface	DMM-1300TM-XX							
	1300TM-S2C	1300TM-CC	1300TM-TC	1300TM-AC	1300TM-S2T	1300TM-CT	1300TM-TT	1300TM-AT
Tuner	-S2/S	-C	-T		-S2/S	-C	-T	
ASI Input	•	•	•	•	•	•	•	•
Built-in Re-mux	•	•	•	•	•	•	•	•
ASI Output	•	•	•	•	•	•	•	•
QAM Modulation	•	•	•	•	•	•	•	•
COFDM Modulation								

DMM-1400PM Series  
Professional IRD and Trans-modulator Module

DMM-1400PM is a professional IRD and trans-modulator products, which combine IRD and modulator into one module. It can receive signal from multiple sources such as DVB-S2/S/C/T/T2, de-modulate to TS stream, descramble with CAM card, then modulate to DVB-C QAM RF signal or DVB-T COFDM or DVB-T2 or DTMB RF signal. With its GbE full duplex IP interface, it also support TS over IP input/output function. With its high performance and stability, DMM-1400PM is your best choice for various broadcast system or SMATV system.

Main features

- Multiple inputs DVB-S2/S/C/T/T2, TS/IP, and ASI optional
- DVB-C QAM or DVB-T COFDM or DVB-T2 or DTMB RF modulation output
- Supports 2K/4K/8K FFT Mode for DVB-T COFDM modulation
- GbE UDP/RTP, SPTS/MPTS over IP(full duplex)
- Flexible re-multiplexing among Tuner, ASI and TS/IP inputs
- PSI/SI adapting and re-generation, including NIT, LCN insertion etc.
- Service Drop or PID filtering and Re-mapping
- 2 x DVB-CI slots, Multiple TV program decryption
- Remote Control and supervision by SNMP, HTTP WEB
- RSSI, received Eb/No & BER monitoring
- On Site software update through IP or USB



Specification

Tuner Input	
DVB-S/S2 Tuner Input	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	950~2150MHz
Input Level	-25~-65dBm
Roll-off Factor	DVB-S: 0.35 DVB-S2: 0.2, 0.25, 0.35
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
DVB-C Tuner Input	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	48~862MHz
Input Level	45~75dBμV
Symbol Rate	1~7MBaud(ITU J.83 Annex A)

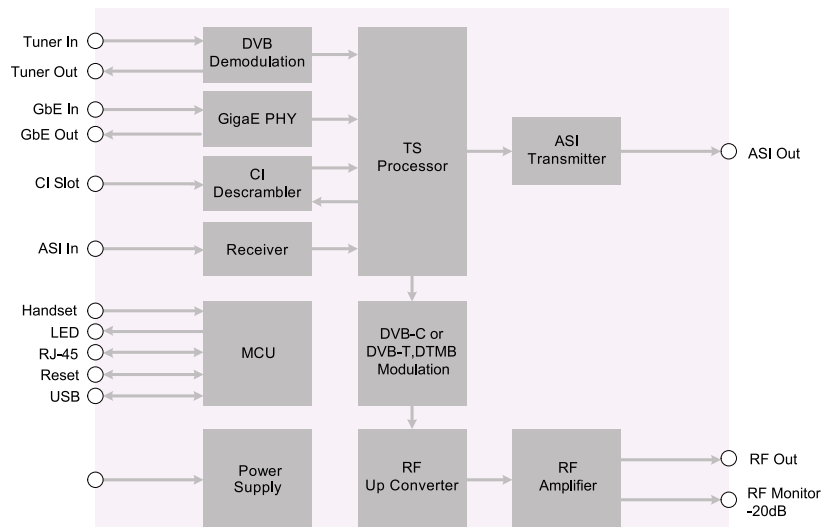
Constellation	16/32/64/128/256QAM
Bandwidth	6MHz/7MHz/8MHz
Input Return Loss	7dB(typ.)
DVB-T Tuner Input	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	174~230MHz(VHF); 470~860MHz(UHF)
Input Level	-20~-70dBm
Modulation	QPSK, 16-QAM, 64-QAM
Carrier Bandwidth	6/7/8 MHz
FTT Mode	2K/8K
Guard Interval	1/4, 1/8, 1/16, 1/32
Viterb Error Correction Code Rate	1/2, 2/3, 3/4, 5/6, 7/8
ASI Input	
Connector Type	1×BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Bit Rate	≤ 100Mb/s
Package Length	188 or 204 Bytes
TS over IP	
Connector Type	1 x RJ-45, 1000 Base-T

Effective Bit Rate	800Mb/s
Protocol	UDP/RTP, IGMPv2, ARP
<b>TS Processing</b>	
TS Input Management	Remux and demux among Tuner, ASI and TS/IP inputs
TS Output Management	Remux and demux for mirrored ASI outputs
Service and PID management	Remux, filtering and remapping
PSI/SI	PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation
Descrambler	DVB Common Scrambling Algorithm (CSA)
Common Interface	Double PCMCIA slots, compatible with major CA CAMs in the market
<b>ASI Output</b>	
Connector Type	1 x BNC Female, 75Ω
Standard	DVB-ASI, EN50083-9
TS Processing	Can output TS Re-multiplexing from Tuner, ASI and TS/IP inputs
<b>DVB-C Modulation (for DMM-1400PM-xC model)</b>	
Constellation	J.83 Annex A: 16QAM, 32QAM, 64QAM, 128QAM, 256QAM J.83 Annex B: 64QAM, 256QAM
Symbol Rate	3~7.2MS/s
I/Q Amplitude Error	< 0.3%
I/Q Phase Error	< 0.3°
Phase jitter	< 0.5°RMS
MER	> 35dB
<b>DVB-T Modulation (for DMM-1400PM-xT model)</b>	
Constellation	QPSK, 16QAM, 64QAM
Bandwidth	5/6/7/8MHz
FFT Mode	2K/4K/8K

Guard Interval	1/4, 1/8, 1/16, 1/32
Code Rate	1/2, 2/3, 3/4, 5/6, 7/8
MER	>36dB
<b>DTMB Modulation (for DMM-1400PM-xM model)</b>	
Constellation	QPSK, 16QAM, 64QAM, 4QAM-NR, 32QAM
Bandwidth	8MHz
Sub Carriers	1 or 3780
Guard Interval	1/4, 1/7, 1/9
FEC BCH LDPC	0.4, 0.6, 0.8
Time Inter-leaver Depth	240, 720
MER	>36dB
<b>DVB-T2 Modulation (for DMM-1400PM-xT2 model)</b>	
Constellation	QPSK, 16QAM, 64QAM, 256QAM
Bandwidth	5/6/7/8MHz
FFT Mode	2K
Guard Interval	1/4, 1/8, 1/16, 1/32
Code Rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6/0.8
MER	>38dB
<b>RF Output</b>	
Connector Type	1x F type female, 75Ω (primary output) 1x F type female 75Ω (-20dB for monitoring)
Output Frequency Range	48~860MHz agile, step by 10 KHz
Output Level	95~110dBμV, step by 1dBμV
Spurious Rejection	55dB (typ.)
Output Return Loss	12dB (typ.)
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/100M, for equipment IP Control
Remote Control	SNMP, HTTP (Web Interface)
Local Control	Handheld Programmer Unit
Software Upgrade	Embedded FTP loader and Telnet or USB

## Block Diagram

DMM-1400PM Functional Block Diagram



Order Information

Model	DMM-1400PM-XX															
Interface	-S2C	-CC	-TC	-DC	-S2T	-CT	-TT	-DT	S2T2	CT2	TT2	DT2	-S2M	-CM	-TM	-DM
Tuner Input	DVB-S2	DVB-C	DVB-T	DS3-E3	DVB-S2	DVB-C	DVB-T	DS3-E3	DVB-S2	DVB-C	DVB-C	DS3-E3	DVB-S2	DVB-C	DVB-T	DS3/E3
ASI Input	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Built-in Remux	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ASI Out	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
GbE TS/IP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
QAM Modulation	•	•	•	•												
COFDM Modulation					•	•	•	•								
T2 Modulation									•	•	•	•				
DTMB Modulation													•	•	•	•

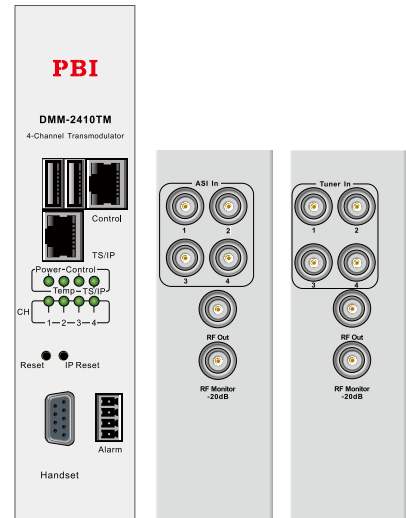
• Standard Configuration

DMM-2410TM Series  
4-Channel Transmodulator

DMM-2410TM is a high density 4-Way modulator and trans-modulator module. It could receive up to 4 independent TS streams from Tuner, ASI or TS/IP (note 1) inputs, then modulates and combines them to 4 adjacent DVB-C RF carriers over a coaxial output. Different types of inputs are available as factory options, such as DVB-S/S2, DVB-C/T/T2 and ASI. With its built-in remux (note 1) functional block, DMM-2410TM also provides TV program filtering and re-multiplexing of TS inputs(note 2) to rebuild new TS outputs for modulation. TS/IP input is a software option.

Main features

- 4 independent TS inputs from DVB-S2/C/T/T2 tuners or TS/IP or ASI
- Built-in remux for TS from Tuner or ASI (note 1, 2)
- Service and PID filtering and re-multiplexing
- PSI/SI re-generation, NIT and LCN Insertion (note 2)
- TS/IP GbE input supports RTP/UDP, IGMP V2/V3, Multicast/Unicast (note 1)
- 4 adjacent DVB-C QAM over 48 ~ 996MHz
- Excellent MER (>40dB) & BER (<10E-9)
- Web remote control and SNMP supervision
- Software update via Ethernet or USB port



Order Information

Interface		Model	DMM-2410TM			
			30S2C	30T2C	30AC	30IC
Tuner input	DVB-S/S2		x4			
	DVB-T/T2/C			x4		
ASI-In					x4	
Built-in Remux			•	•	•	
TS/IP In			x4	x4	x4	x4
RF-Out			x4	x4	x4	x4
Modulation			DVB-C	DVB-C	DVB-C	DVB-C

Note: when enable TS/IP In function, the remux function will be disabled.

## Specification

<b>DVB-S/S2 Tuner Input (factory option)</b>	
Connector Type	4×F type female 75Ω
Standard	EN 300 421(DVB-S), EN 302 307 (DVB-S2)
Frequency Range	950~2150MHz
Input Level	-25~-65dBm
Symbol Rate	2~45MBaud
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	13V for Vertical, 18V for Horizontal, 500mA Max., available only on tuner 1 & tuner 2
LNB Band Selection Tone	0/22KHz selectable, available only on tuner 1 & tuner 2
<b>DVB-C Tuner Input (factory option)</b>	
Connector Type	4×F type female 75Ω
Standard	EN 300 429
Input Frequency Range	51~862MHz
Input Level	45~95dBμV @ 256QAM, 6.875MBauds
Symbol Rate	1~7MBauds
Constellation	16/32/64/128/256QAM
Bandwidth	6MHz/7MHz/8MHz
Return Loss	7dB (typ.)
<b>DVB-T/T2 Tuner Input (factory option)</b>	
Connector Type	4×F type female 75Ω
Standard	EN 300 744(DVB-T), EN 302 755 (DVB-T2)
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
Return Loss	7dB
<b>ASI Input (factory option)</b>	
Connector Type	4×BNC female, 75Ω
Standard	DVB-ASI, EN50083-9

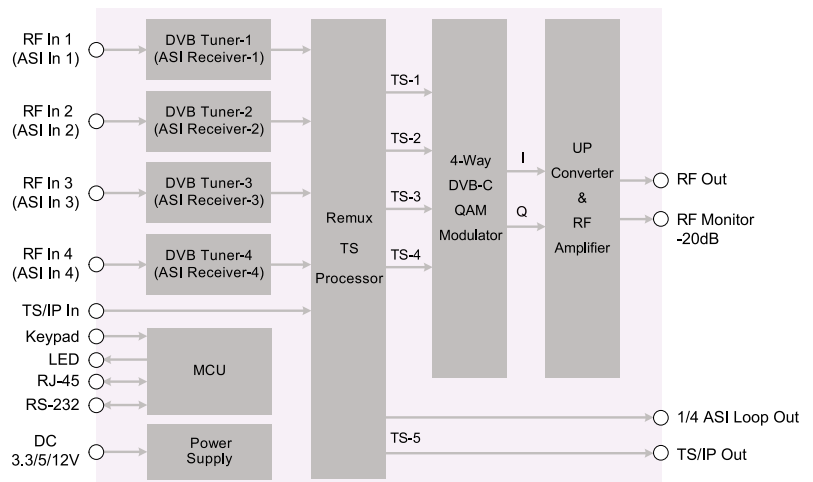
Input Bit Rate	≤216Mb/s
<b>TS over IP Input (software option)</b>	
Connector Type	1×RJ-45, 100/1000 Base-T
Protocol	RTP/UDP, IGMP V2/V3, Multicast/Unicast
TS/IP Number	4 MPTS or SPTS
Max. Bit Rate	320Mb/s (total bit rate of 4 TS streams)
<b>TS Processing of Built-in Re-Multiplexer (software option)</b>	
Max. Input Bit Rate	4×216Mb/s
Max. Output Bit Rate	4×108Mb/s
Package Length	188/204
Re-multiplexing functions	PSI auto generation Service and PID remux, filtering and re-mapping NIT insertion and LCN edition EIT Processing
<b>DVB-C Modulation</b>	
Standard	J.83 Annex A, (Annex C available upon request)
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Symbol Rate	2.5~6.99Ms/s
BER	≤10E-9
MER	>40dB (with Tester Equalizer enabled)
<b>RF output</b>	
Connector Type	2 x F type female(1 for -20dB Monitoring), 75Ω
Frequency Range	48~996MHz with a step of 1kHz adjustable
Output Level	95~110dBμV with a step of 1dB adjustable, total of 4 carriers
Spurious Rejection	55dB (typical)
Return Loss	-10dB (typical)
<b>ASI output Monitoring</b>	
Connector Type	1×BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Function	Loop through Monitoring of either of 4 Tuner or ASI inputs
Output Bit Rate	≤216Mb/s
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/100 Base-T, for equipment IP Control
Remote Control	HTTP Web Interface and SNMP
Software Upgrade	FTP and Telnet through IP
<b>Physical</b>	
Power Supply	DC 3.3V/5V/12V
Power Consumption	25W Max.
Operating Temperature	0 ~ 45°C
Storage Temperature	-10 ~ 55°C
Operating Humidity	10 ~ 90% Non-condensed

### Note:

1. TS/IP input and re-multiplexer are exclusive software options. When the software for TS/IP input is loaded, the re-multiplexer function will be void, vice versa.
2. TS/IP input is not allowed to use.

## Block Diagram

DMM-2410TM Functional Block Diagram



## DMM-1000AS

### Compact Modular SMATV Headend

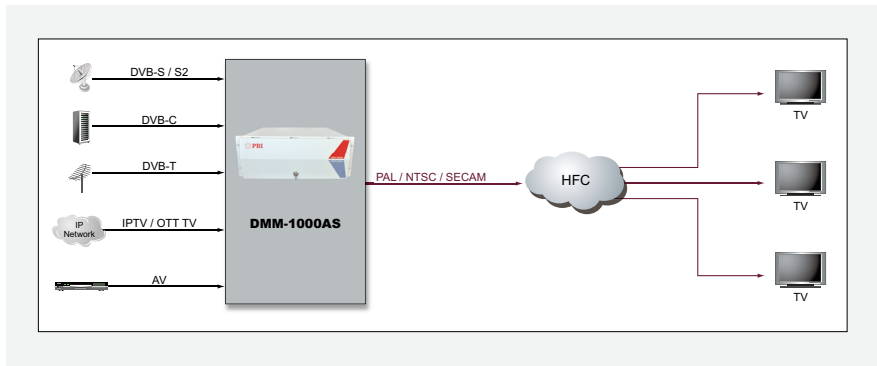
DMM-1000AS is a compact modular SMATV headend, supporting up to 16 channels in one 19" 4U chassis. It integrates multiple functions including DTV signal reception, descrambling, decoding and analog modulation. DMM-1000AS has various options for RF input front end, such as DVB-S/S2/T/T2/C, ATSC, ISDB-T and DMBT etc., moreover, analog AV and IP input are also available. Equipped with dual DVB-CI, the DMM-1000AS module can decrypt multiple pay TV services and loop through the TS to the neighbor modules through internal cables for further processing. Each DMM-1000AS module can process two MPEG-2 or H.264 HD/SD services and downscale the HD content to SD, then modulate and output via two adjacent analog RF channels. DMM-1000AS supports various analog modulation standard, such as PAL B/G, PAL D/K, NTSC, and SECAM etc. Each DMM-1000AS module can be controlled and supervised by SNMP and HTTP WEB.



#### Main Feature

- Support various analog modulation standard, such as PAL B/G, PAL D/K, NTSC, and SECAM etc.
- DVB-S/S2/T/T2, ATSC, ISDB-T, DMBT front end option
- Support IP input and analog AV input
- MPEG-2, H.264 HD/SD decoding
- Two adjacent analog RF channel output per module
- Dual DVB-CI for multi-decryption
- TS loop through between modules
- Functional module hot-swappable
- Web, SNMP remote control or handheld programmer unit local control
- 19" 4RU chassis compact modular design, supporting up to 8 modules in one chassis
- Redundant power supply
- Intelligent temperature control cooling system
- Stand alone function of each module
- Cost-saving by backward compatible with new modules
- On site software update through IP or USB

#### Application Diagram



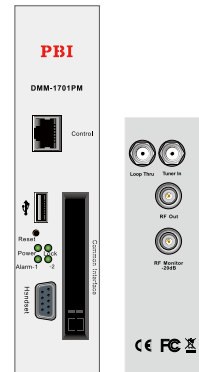
#### Product List

Product name	Model No.	Description
DMM-1000AS	DMM-1701PM	Dual Channel IRD and Analog Modulator Module
	DMM-1701IM	Dual Channel IPTV Decoder and Analog Modulator Module
	DMM-1701M	Dual Channel PAL/NTSC/SECAM modulator
	DMM-1710PM	Advanced Dual Channel IRD and Analog Modulator Module
	DMM-1701LD	8-Way Active Satellite Signal Splitter
	MM-1701CA	7-inputs Combiner and Amplifier

## ■ Signals Processing Modules

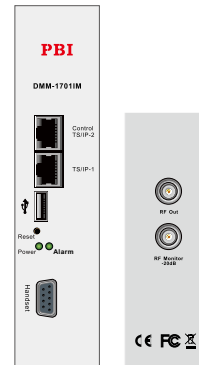
### DMM-1701PM series DVB Tuner to Analog Trans-modulator

- Multiple RF input option including DVB-S2/S/C/T/T2, ATSC, ISDB-T, DTMB
- Two adjacent analog channels output in range of 48-860MHz
- Output level 100dB $\mu$ V per channel
- Support MPEG-2, H.264 SD/HD decoding
- Remote Control and Supervision by SNMP and HTTP WEB
- Support BISS-1, BISS-E descrambling
- Dual DVB-CI for multi-decryption
- Dynamic PMT detection and automatic updating



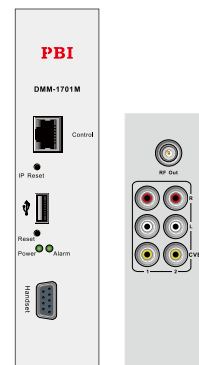
### DMM-1701IM series Twin TS/IP to Analog Trans-modulator

- Two IP multicast/unicast input ports
- Two adjacent analog channels output in range of 48-860MHz
- Supports MPEG-2, H.264 SD/HD decoding
- Output level 100dB $\mu$ V per channel
- Remote Control and Supervision by SNMP and HTTP WEB



### DMM-1701M series Twin Analog Modulator

- Two analog AV input
- Two adjacent analog channels output in range of 48-860MHz
- Modular design for easy installation and maintenance
- Output level 100dB $\mu$ V per channel
- Remote Control and Supervision by SNMP and HTTP WEB



## Specification

<b>Tuner Input (for DMM-1701PM Series)</b>	
<b>DVB-S/S2 Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	950~2150MHz
Input Level	-25~-65dBm
Symbol Rate	DVB-S: 1~45MBauds/s for QPSK DVB-S2: 1~45MBauds/s for QPSK, 8PSK
Roll-off Factor	DVB-S: 0.35 DVB-S2: 0.2, 0.25, 0.35
FEC Code Rate	DVB-S QPSK: 1/2, 2/3, 3/4, 5/6, 6/7, 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 Switching Tone	0/22KHz selectable
Satellite Selection Command	DiSEqC 1.0
<b>DVB-C Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	51~858MHz
Input Level	40~85dBμV
Symbol Rate	1~7MBaud
Constellation	16/32/64/128/256QAM (ITU J.83 Annex A)
Bandwidth	6MHz/7MHz/8MHz
<b>DVB-T Tuner Input</b>	
Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through output
Input Frequency Range	49~861MHz
Input Level	-25~-65dBm
Carrier Bandwidth	6/7/8 MHz
FTT Model	2K/8K
Guard Interval	1/4, 1/8, 1/16, 1/32
Viterb Error Correction Code Rate	1/2, 2/3, 3/4, 5/6, 7/8
<b>IP Input (for DMM-1701IM series)</b>	
Connector Type	2×RJ-45, 10/100M
Standard	UDP, RTP, Multicast, Unicast, MPTS, SPTS
<b>A/V Input (for DMM-1701M series)</b>	
Video Input	2 sets of RCA, 75Ω
Audio Input	2 sets of RCA mono or A2(optional), 10Ω(unbalance)
<b>Descramble (for DMM-1701PM series)</b>	
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
<b>Analog channels Modulation (for DMM-1701PM/1701IM/1701M)</b>	
<b>Video</b>	

Video carrier frequency accuracy	VHF: $\Delta f \leq 5\text{KHz}$ UHF: $\Delta f \leq 10\text{KHz}$
Video modulation depth	DMM-1701M 77.5~97.5% DMM-1701PM/1701IM 87.5%
Video in-band flatness	$\leq 2\text{dB}$
Differential Gain	$\leq 7\%$
Differential Phase	$\leq 5^\circ$
Video S/N ratio	$\geq 45\text{dB}$
Chrominance/Luminance delay	$\Delta t \leq 45\text{nS}$
K factor of 2T pulse	$\leq 4\%$
<b>Audio</b>	
FM modulation deviation	DMM-1701M 40~160KHz (D/K, B/G, I) 20~80KHz (M/N) DMM-1701PM/1701IM 40~100KHz (D/K, B/G, I) 50KHz (M/N)
Audio frequency response	$\pm 1.5\text{dB}$ (40Hz~15KHz)
Total harmonic distortion (THD)	$\leq 1.2\%$ (1KHz tone with $\pm 60\text{KHz}$ (D/K, B/G, I) or $\pm 30\text{KHz}$ (M/N) FM deviation)
1st audio carrier frequency	6.5MHz $\pm$ 5KHz/6.0MHz $\pm$ 5KHz/5.5MHz $\pm$ 5KHz/4.5MHz $\pm$ 5KHz(basing on different standards)
2nd audio carrier frequency	6.742MHz $\pm$ 5KHz/6.258MHz $\pm$ 5KHz/5.742MHz $\pm$ 5KHz/4.742MHz $\pm$ 5KHz(basing on different standards)
Audio S/N ratio	$\geq 55\text{dB}$
Audio Pre-emphasis	50μS (B/G,D/K,I), 75μS (M/N)
<b>RF Output (for DMM-1701PM/1701IM/1701M)</b>	
Connector Type	1×F type female, 75Ω (primary output) 1×F type female 75Ω (-20dB for monitoring)
Output Frequency Range	48~860MHz adjacent, step by 10 KHz
Output Level	100 $\pm$ 3dBμV
Output Level Attenuation	0~18dB adjustable, step by 1 dB
Output Return Loss	$\geq 10\text{dB}$
<b>Control &amp; Monitoring</b>	
Connector Type	1×RJ-45, 10/100M, for equipment IP Control
Remote Control	SNMP, HTTP (Web Interface), Proprietary HDMS (Headend Device Management System)
Local Control	Handheld programmer unit
Software Upgrade	Embedded FTP loader and USB
<b>Physical</b>	
Dimension	379.7×111.5×39mm
Power Consumption	30W Max.
Operating Temperature	0~+45°C
Storage Temperature	-10~+50°C
Operating Humidity	20~90%, non-condensed

## Order Information

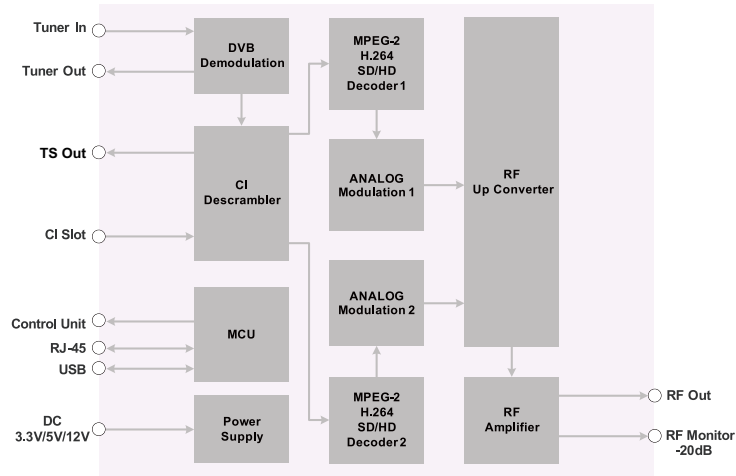
Interface	Model	1701PM-XX						1701IM-XX		1701M-XX	
		DVB-S2		DVB-T		DVB-C		MONO	A2	MONO	A2
Video Audio		MONO	A2	MONO	A2	MONO	A2	MONO	A2	MONO	A2
PAL D/K		02S2	04S2	02T	04T	02C	04C	02	04	02	04
PAL D/K(Poland)		02S2	08S2	02T	08T	02C	08C	02	08	02	08
PAL B/G		12S2	14S2	12T	14T	12C	14C	12	14	12	14
NTSC		22S2	-	22T	-	22C	-	22	-	22	-
SECAM D/K		32S2	34S2	32T	34T	32C	34C	32	34	32	34
SECAM L		42S2	-	42T	-	42C	-	42	-	42	-
PAL-I		52S2	-	52T	-	52C	-	52	-	52	-



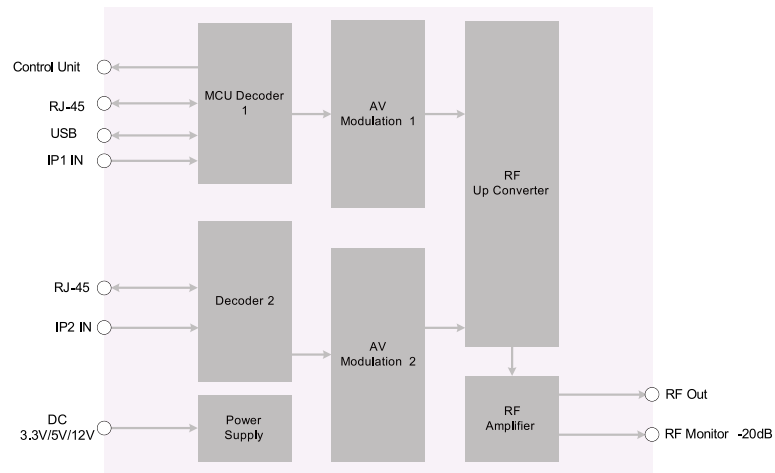
Block Diagram

Modular Analog TV Headend DMM-1000AS

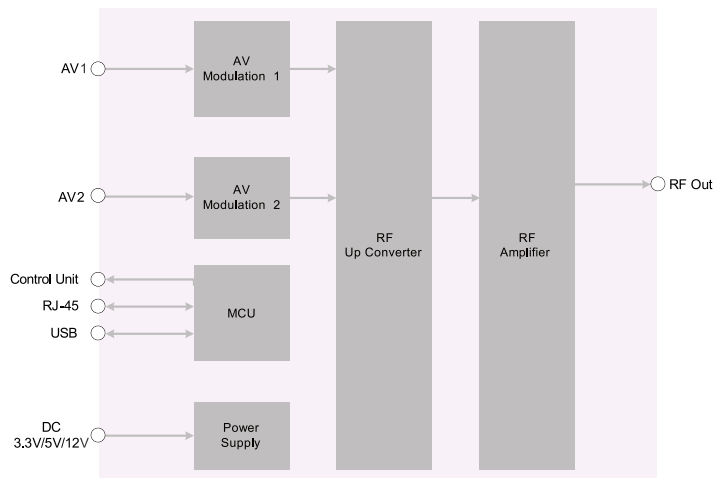
DMM-1701PM Functional Block Diagram



DMM1701IM Functional Block Diagram



DMM1701M Functional Block Diagram



## DMM-1701LD 8-Way Active Satellite Signal Splitter

DMM-1701LD is an 8-Way active L-band satellite signal splitter. The RF input port can be fed with 13/18V and 0/22KHz to drive the LNB and antenna. By using micro strip line technology, the port-to-port isolation between 8 RF outputs is higher than 40dB. It is a useful and cost effective spare part for satellite professional IRD product line.

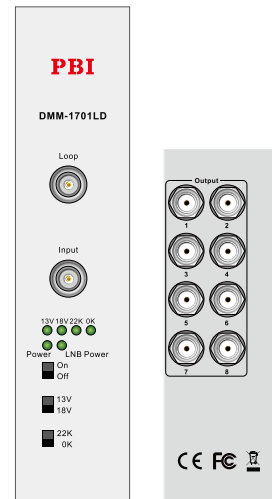
### Main Feature

- Used with professional satellite receiver and decoder modules in DMM product line
- Isolated DC between input and output based on micro strip directional coupler
- Active splitter to keep good RF output level
- High isolation between 8 RF output ports
- Loop output of RF input on front panel for supervision
- Manual LNB 13/18V, 0/22kHz switches with LED status

### Specification

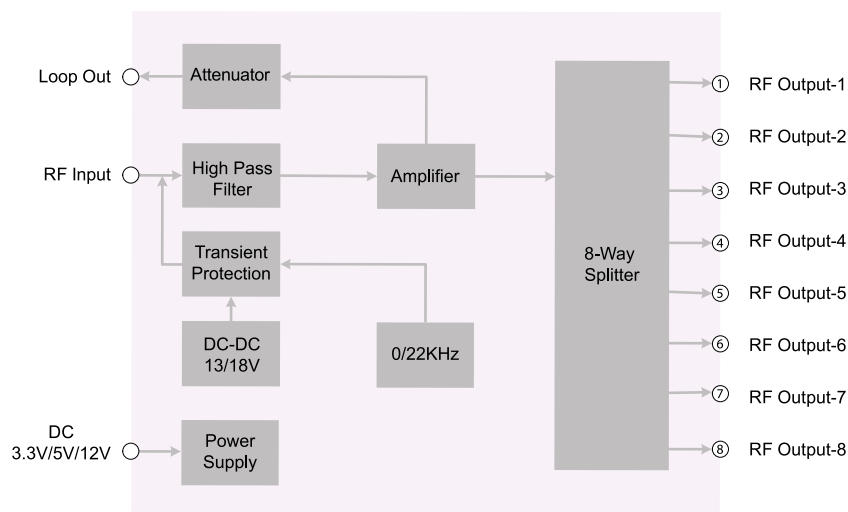
<b>RF Input</b>	
Input Number	1
Connector type	Type F, 75Ω
Frequency range	950MHz - 2150MHz
Input level	-65 ~ -25dBm
<b>LNB Control</b>	
13/18V	13±1V, 18±1.5V
0/22KHz	0.7±0.1Vpp, 22±1KHz
Load current	350mA
<b>RF Output</b>	
Output Number	8 outputs, 1 loop output
Connector type	Type F, 75Ω
Gain	0±2dB

Return loss	≥10dB
Flatness	±2dB
Isolation	≥40dB
<b>Control &amp; Monitoring</b>	
Switch	3 switches for LNB power ON/OFF, 13V/18V and 0/22KHz
LED	6 LEDs for Power, LNB Power, 13V, 18V, 0kHz, 22kHz
<b>Physical</b>	
Dimension	379.7×111.5×39 mm
Power consumption	10W Max
Operation temperature	0~45°C
Storage temperature	-10~50°C



### Block Diagram

DMM-1701LD Functional Block Diagram



## DMM-1701CA High Linear Combiner and Amplifier Module

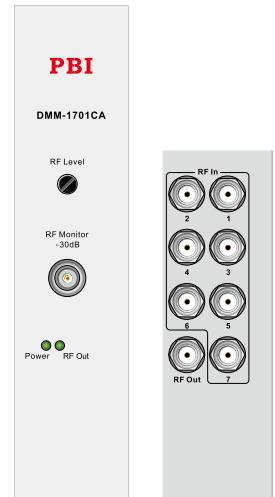
The DMM-1701CA is a high linear combiner and amplifier module which can combine 7 RF inputs into 1 RF output and amplify output level up to 110dB $\mu$ V per channel. Modular design make it very easy for installation and maintenance. User can adjust gain manually and monitor output RF signal via -30dB monitor port. DMM-1701CA is suitable for both analog and digital system.

### Main Feature

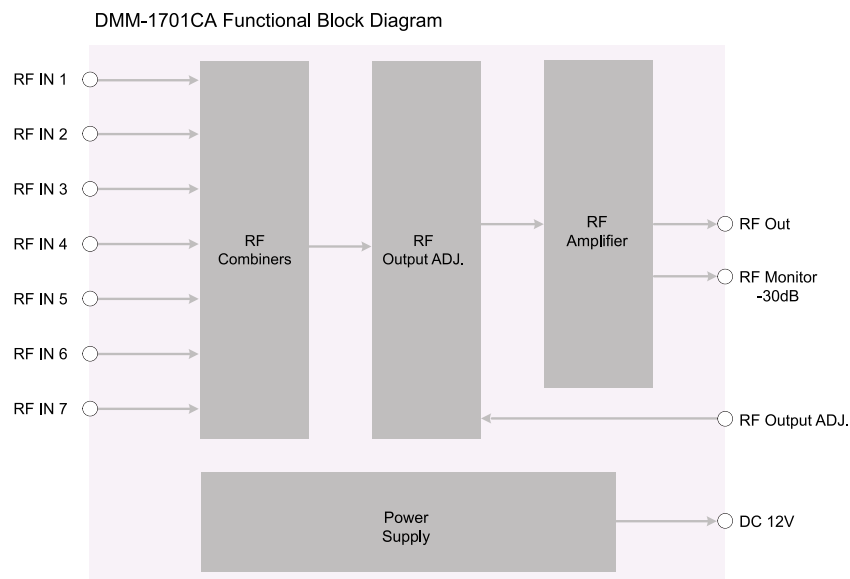
- Manual adjusted gain amplifier
- Support -30dB monitor port
- Support 7 RF input into 1 RF output
- Modularized design for easy installation and maintenance

### Specification

Connector Type	7 x F type female 75 $\Omega$ for Input, 1 x F type female 75 $\Omega$ for output, 1 x F type female 75 $\Omega$ for -30dB monitor	
Frequency Range	48 ~ 860MHz	
Input Level	100dB $\mu$ V(per channel)	
Output Level	110dB $\mu$ V(per channel)	
Input Return Loss	$\geq$ 7dB	
Output Return Loss	$\geq$ 12dB	
CTB	112CH analog, flat, Vo=44dBmV TYP: -62dBc Max.: -60dBc	
XMOD	112CH analog, flat, Vo=44dBmV TYP: -58dBc Max.: -56dBc	
CSO	112CH analog, flat, Vo=44dBmV TYP: -62dBc Max.: -60dBc	
Noise factor	MAX: 6dB	
Passband Flatness	MIN: 0.5 dB	MAX: 2.5 dB
Isolation between Input Ports	TYP: 20dB	MIN: 16.5dB
Isolation between Input and Output Ports	MIN: 27dB	

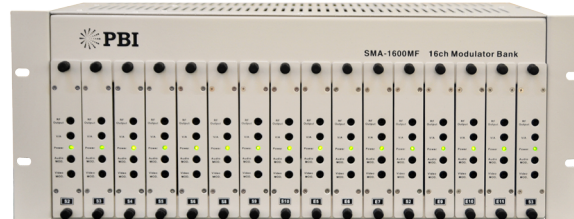


### Block Diagram



## SMA-1600 CATV Modulator Bank

SMA-1600 TV Modulator Bank consists of 16 modularized professional adjacent fixed-channel or agile adjustable modulators in a 19" x 4RU chassis, with 105dB $\mu$ V output power level per channel (117dB $\mu$ V in total) and spurious rejection greater than 60dB. SMA-1600 is applicable for CATV network where analog TV signal's frequency ranges from 47 to 862 MHz. Final RF output level, individual channel RF level, audio FM modulation deviation, video AM modulation index and A/V ratio are adjustable. SMA-1600 has a serials modules including SMA-1600M for fixed-channel, SMA-1600MUV for agile frequency and SMA-1600EM for encoding plus modulation. These modules can help you to setup a CATV headend easily.



### Main Feature

- High density with 16 channels in 1 rack of 19"4U
- Modulator options for fixed-channel or agile frequency
- Support PAL D/K, PAL B/G, NTSC system
- output power level 117dB $\mu$ V in total
- spurious rejection greater than 60dB
- Hot-swappable redundant power supply(Optional)
- Easy to setup

#### High density with 16 channels in 1 rack



#### Integrated RF combiner and amplifier



#### Redundant power supply



### Product List

Product name	Model No.	Description
CATV Modulator Bank SMA-1600	SMA-1600MF	116-channels main frame
	SMA-1600M-PAL B/G	Fixed-channel PAL-B/G Modulator
	SMA-1600M-PAL D/K	Fixed-channel PAL-D/K Modulator
	SMA-1600M-NTSC	Fixed-channel NTSC Modulator
	SMA-1600MUV-PAL B/G	Agile frequency PAL-B/G Modulator
	SMA-1600MUV-PAL D/K	Agile frequency PAL-D/K Modulator
	SMA-1600MUV-NTSC	Agile frequency NTSC Modulator
	SMA-1600EM	Integrated Encoder and Modulator
	DMM-1000CU	Programmer Unit

## 16-channels Main Frame SMA-1600MF

### Specification

Output Frequency Range	47MHz~862MHz ( PAL-B/G ) 48MHz~862MHz ( PAL D/K ) 54MHz~804MHz ( NTSC )
RF Output Level	105 dB $\mu$ V (per channel) , 117dB $\mu$ V in total
Operating Temperature	0~45°C
Relative Humidity	≤90%(non-condensed)
Power Supply	180ACV to 260ACV,50Hz±2Hz, 80 Watt Max. (16 modules equipped)
Dimension	483mm×195mm×176mm
Net Weight	~13Kg ( 16 modules equipped )



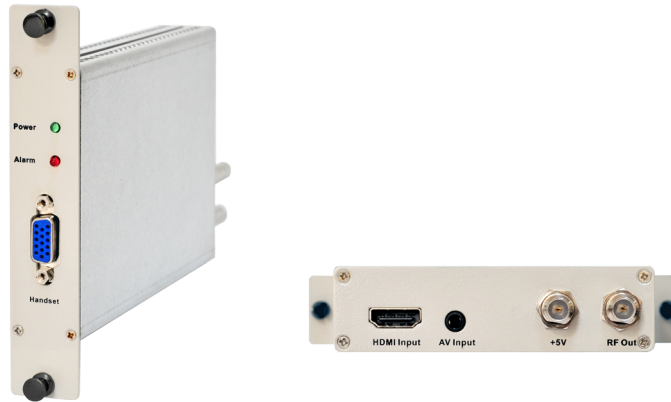
## Modulator Modules SMA-1600M ( Fixed-channel ) SMA-1600MUV ( Agile frequency )

### Specification

Specification	Parameters
Output Frequency Range	47MHz~862MHz ( PAL B/G ) 48MHz~862MHz ( PAL D/K ) 54MHz~804MHz ( NTSC )
Channel Bandwidth	7MHz & 8MHz ( PAL B/G ) 8MHz ( PAL D/K ) 6MHz ( NTSC )
RF Output Level	105 dB $\mu$ V (per channel)
Output Level Adjust Range	0 ~ -20dB (Continuously adjustable)
Video/Audio Carrier Power Ratio	10~20dB (Continuously adjustable)
Spurious Rejection	SMA-1600M: ≥60dB SMA-1600MUV: ≥57dB
RF Output Return Loss	≥12dB (VHF); ≥10dB (UHF)
Carrier Frequency Accuracy	VHF   f   ≤5 KHz UHF   f   ≤10 KHz
Video Modulation Depth	87.5% @Video input level 1Vp-p
Output Impedance	75Ω
Differential Gain	5% Max. @ 87.5% Modulation depth
Differential Phase	5°Max.
C/L Delay $\tau$	$\tau$   ≤45ns
Video Flatness	≤2dB
Video S/N Ratio	50dB min. (single module)
Audio Frequency	5.5MHz±2KHz (PAL B/G) 6.5MHz±2KHz (PAL D/K) 4.5MHz±2KHz (NTSC)
Audio Pre-emphasis	50 $\mu$ s(PAL B/G、PAL D/K) 75 $\mu$ s(NTSC)
Audio Modulation Deviation	±50KHz @ Audio input level is 0dBm±6dB
Audio Flatness	±1.5dB
Audio Harmonic Distortion	≤1%
Audio S/N Ratio	58dB min. (single module)
Operating Temperature	0 ~ 45°C
Relative Humidity	≤90%(non-condensed)
Power Supply	SMA-1600M: +5DCV±5%, ~ 2.5 Watt Max. SMA-1600MUV: +5DCV±5%, ~ 3 Watt Max.
Dimension	159mm×134mm×25mm
Net Weight	~100g



## Integrated Encoder and Modulator SMA-1600EM



SMA-1600EM is an integrated base band TV signals to DVB-T/C digital RF TV signal conversion unit (Analog\_to\_Digital and RF output).

Any signal from its AV and HDMI inputs can be encoded, multiplexed and modulated onto one DVB-T/C RF carrier. The RF output signal could be easily mixed into the exist CATV or HFC network without disturbing the exist signals nor re-build the co-axial cabling network. Multiple STB's (Set Top Box) or integrated TV's can receive the clear & clean digitized TV signal simultaneously, and no professional reception equipment is needed. Transmission range over co-axial cable could be longer than 100m without degrade of signal quality, and could be more than 1000m with appropriate external amplifier.

SMA-1600EM is suitable for private video distribution, community surveillance network, campus conference, factory on-site monitoring, etc.

### Main Feature

- Compile with H.264/AVC BLP, MP, HP @ L4.0 or lower level, MPEG-2 MP@ML
- Compile with DVB-T and DVB-C standard
- Video input from HDMI and CVBS
- Supporting NTSC, PAL and SECAM video system
- PAT, PMT, NIT, SDT, LCN generated automatically
- LCD Display and front panel operation, supporting DMM-1000CU programmer unit
- Quickly setup in 30 seconds by selecting channel number directly
- Anti-conflict for TS ID, PID, Service name, LCN
- Supporting IR remote (for specified model)
- Output frequency range for RF from 100MHz to 860MHz
- Easy to setup and maintain

### Product List

Interface	1600EM-T	1600EM-C
DVB-T COFDM Modulation	•	
DVB-C QAM Modulation		•
CVBS Input	•	•
HDMI Input	•	•
H.264 HD Encoding	•	•
H.264 SD Encoding	•	•
MPEG2 SD Encoding	•	•
Programmer Unit supported	•	•

Specification

<b>Interfaces</b>	
AV Input	CVBS, Audio_L/Audio_R, 3.5mm phonejack type
HDMI Input	HDMI 1.4 (SD or HD)(HDCP)
RF Output	F-type female, 75Ω
<b>Video Encoding</b>	
Video System	NTSC, PAL and SECAM
Encoding Standard	H.264/AVC BLP, MP, HP @ L4.0 or less, MPEG-2 MP@ML
Video Encoding Bit Rate	500K~13Mbps 1080i(1920×1080)@25Hz,29.97Hz,30Hz SMPTE274M: 1.5~11Mb/s
Video Resolution and recommended bitrate (H.264)	720p ( 1280×720 ) @25Hz,29.97Hz,30Hz SMPTE296M: 1.5~11Mb/s 480i ( 720×480 ) @29.97Hz SMPTE656M: 500K~6Mb/s 576i ( 720×576 ) @25Hz SMPTE656M: 500K~6Mb/s
Video Resolution and recommended bitrate (MPEG-2)	480i ( 720×480 ) @29.97Hz SMPTE656M: 3.5~6Mb/s 576i ( 720×576 ) @25Hz SMPTE656M: 3.5~6Mb/s
Aspect Ratio	4:3/16:9 selectable
<b>Audio Encoding</b>	
Audio Input	HDMI or L/R Stereo
Encoding Standard	MPEG-1 Layer II
Sampling Rate	48 KHz
Audio bitrate	MPEG1 Layer II :128Kbps (Stereo)
<b>TS Processing</b>	
PSI/SI	PAT, PMT, NIT, SDT, LCN generated automatically
<b>DVB-T COFDM Modulation</b>	

Constellation	QPSK/16QAM/64QAM
Bandwidth	6MHz, 7MHz, 8MHz
FFT mode	2K, 8K
Guard Interval	1/4, 1/8, 1/16, 1/32
Code Rate	1/2, 2/3, 3/4, 5/6, 7/8
MER	>38dB
<b>DVB-T RF Output</b>	
Output Frequency Range	100~860MHz, step by 10KHz
RF Output Level	92dB
Spurious Rejection	50dBc (typ.)
Return Loss	10dB (typ.)
<b>DVB-C QAM Modulation</b>	
Standard	DVB-C EN300429
Constellation	16QAM/32QAM/64QAM/128QAM/256QAM
Bandwidth	6MHz, 7MHz, 8MHz
Symbol Rate	3.6MBAud~7MBAud
Roll-off factor	0.15
MER	MER >36dB ( with Tester Equalizer = off )
<b>DVB-C RF Output</b>	
Output Frequency Range	49~1000 MHz
RF Output Level	92dB
Return Loss	10dB
Spurious Rejection	50dBc (typical.)
Flatness	4dB ( Full frequency range )
<b>Physical</b>	
Dimention	159mm×134mm×25mm
Net Weight	~100g
Power Supply	+5DCV±5%, ~ 8Watt Max.
Operating Temperature	0~45℃
Storage Temperature	-10~60℃
Relative Humidity	10~90%, non-condensed

# IPTV solutions 2017

IPTV Headend  
Streaming server  
Middleware  
Set-top Box & APK/APP  
End-to End solutions



<http://dtv.pbicn.com>



## Receiver / Streamer / Encoder / Transcoder

### DCP-3000

New Hi-Density Platform

- Total 6 slots for different digital TV functional modules
- 2 SFP GbE IP ports with maximum 920Mbps input and output data rate
- Up to 24×Tuner in, supports DVB-S/S2 or DVB-C/T/T2
- Up to 24×ASI input
- Up to 24×CI
- Up to 256 TS/IP input and 512 SPTS output without IP-FEC
- Up to 24×encoding or transcoding, support HDMI or SDI input



### DIH-4000V

H.264 Transcoder

- Compliant with MPEG-4 AVC Baseline, Main & High Profile@ L4.0 or less
- Compliant with MPEG-1 Layer II Audio, AAC, MP3 Decoding and Encoding
- Up to 4 channels HD transcoding
- Up to 16 channels SD transcoding
- Off line local files transcoding



### DIH-6000V

H.264/H.265 SD Transcoder

- Compliant with MPEG-4 AVC Baseline, Main & High Profile@ L4.0 or less, H.265 MP@L6.2
- Compliant with MPEG-1 Layer II Audio, AAC, MP3 Decoding and Encoding
- Up to 16 channels SD transcoding
- Support Station logo and subtitle insert



## Streaming server / Middleware

### Streaming Distribute Server

PBI Streaming Distribute Server is used for content collecting and distributing. It will collect the contents and encrypt them before sending them out to subscribers. The HLS (HTTP Live Streaming) protocol will be used during the transmission in LAN or Internet to Set-top box, mobile devices etc.

#### Specification

	MS-8001B (Basic)	MS-8001S (Standard)	MS-8001P (Professional)
			
CPU	Quad core 1.8Ghz	Intel Xeon (8 core 16 threads)	Intel Xeon (8 core 16 threads) x2
RAM	4GB RAM	16G RAM	48G RAM
ROM	120G SSD	4TB (Enterprise-Level)	4TB (Enterprise-Level) x2
Network	1000Mbps x2	1000Mbps x4	10Gbps x2 1000Mbps x2
Input protocol	UDP/RTSP/RTMP/HTTP/HLS/FTP	UDP/RTSP/RTMP/HTTP/HLS/FTP	UDP/RTSP/RTMP/HTTP/HLS/FTP
Output protocol	HLS/RTMP	HLS/RTMP	HLS/RTMP
Video Format	H.264/MPEG/HEVC(only for HLS)	H.264/MPEG/HEVC(only for HLS)	H.264/MPEG/HEVC(only for HLS)
Live ※	50 Channels	200 Channels	500 Channels
VOD ※	60 hours Movies	500 hours Movies	2000 hours Movies
Users ※	200 Users	1000 Users	5000 Users
Size	134x124x46	1U	1U

※ The bitrate is less than 2Mbit/s .




## Management Server

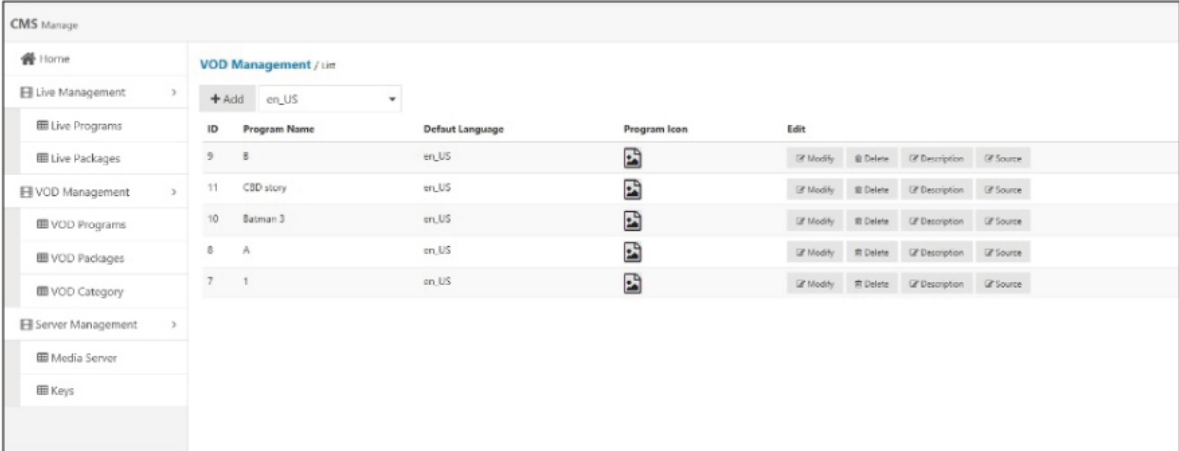
Management Server is the hardcore of PBI IPTV solution. It is mainly responsible for live programs and VOD content classification and grouping. And it will help to manage subscribers for grouping, classifying etc. Moreover, it supports customized services delivering. Additionally, this system can be connected to the customer's existing billing system.

## Video-on-Demand

PBI VOD consists of Transcoding, Storage, Load balance, Transmission and Content Protection etc. The intelligent segment splitter and cache technology will improve customer watching experience even if the network environment is poor, customer do not need to wait for the entire movie download.

## Specification

	TMS-100B (Basic)	TMS-100S (Standard)	TMS-100P (Professional)
			
CPU	Quad core 1.8Ghz	Intel Xeon (4 core 8 threads)	Intel Xeon (4 core 8 threads)
RAM	4GB	8G	32G
ROM	64G SSD	128G SSD	512G SSD
Network	1000Mbps x2	1000Mbps x2	1000Mbps x2
protocol	HTTP,HTTPS	HTTP,HTTPS	HTTP,HTTPS
Users	200 Users	1000 Users	5000 Users
Size	134x124x46	1U	1U



ID	Program Name	Default Language	Program Icon	Edit
9	B	en_US		<a href="#">Modify</a> <a href="#">Delete</a> <a href="#">Description</a> <a href="#">Source</a>
11	CSD story	en_US		<a href="#">Modify</a> <a href="#">Delete</a> <a href="#">Description</a> <a href="#">Source</a>
10	Batman 3	en_US		<a href="#">Modify</a> <a href="#">Delete</a> <a href="#">Description</a> <a href="#">Source</a>
8	A	en_US		<a href="#">Modify</a> <a href="#">Delete</a> <a href="#">Description</a> <a href="#">Source</a>
7	1	en_US		<a href="#">Modify</a> <a href="#">Delete</a> <a href="#">Description</a> <a href="#">Source</a>

## DRM

By using enhanced AES128 encryption technology, the transmitted contents will be protected away from unauthorized subscriber or downloading.

DRM server will define keys and distribute them to compressed contents to encrypt them. DRM server continues to update the keys by defined interval time. Streaming media player regularly download the updated key and to encrypt contents. The transmitting contents will consist KeyID and URL of authorized center. When user demands for watching program, according to the head of the KeyID program and the URL information, authorized center will verify the keyID and send right key to unlock the contents.

## Set-top Box& APK/APP

OS	Andriod 4.2.2	Interface	CVBS+Audio_L/Audio_R*1 (Phonejack type)
CPU	Quad Core 1.5G		RJ45 10/100M Base-T
Nand Flash	4GByte		USB2.0*3
DDR3	1GByte		HDMI*1
Video Decoding Format	MPEG-1,MPEG-2,MPEG-4, DivX3.11~6.x, AVC, H.264,HEVC,VC1,AVC,AVS, SVC,MVC,FLV		Micro SD Card Reader*1 IR Extender*1
Audio Decoding Format	AAC LC, Dolby Digital, Dolby Digital Plus, MPEG-1 Layer1,2,3,WMA,WMA Pro, AAC HE5.1	Dimension	108mm x102mm x22mm

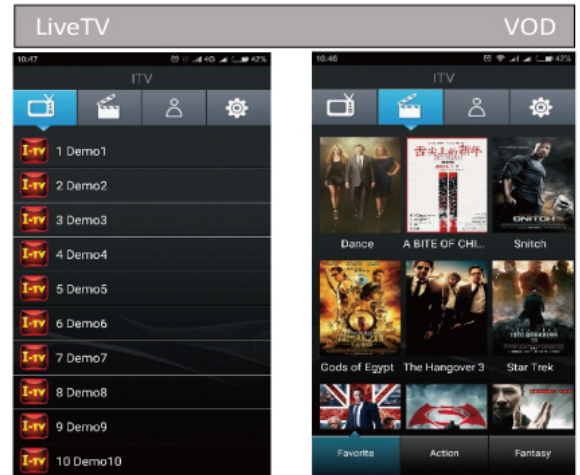


# STB G908

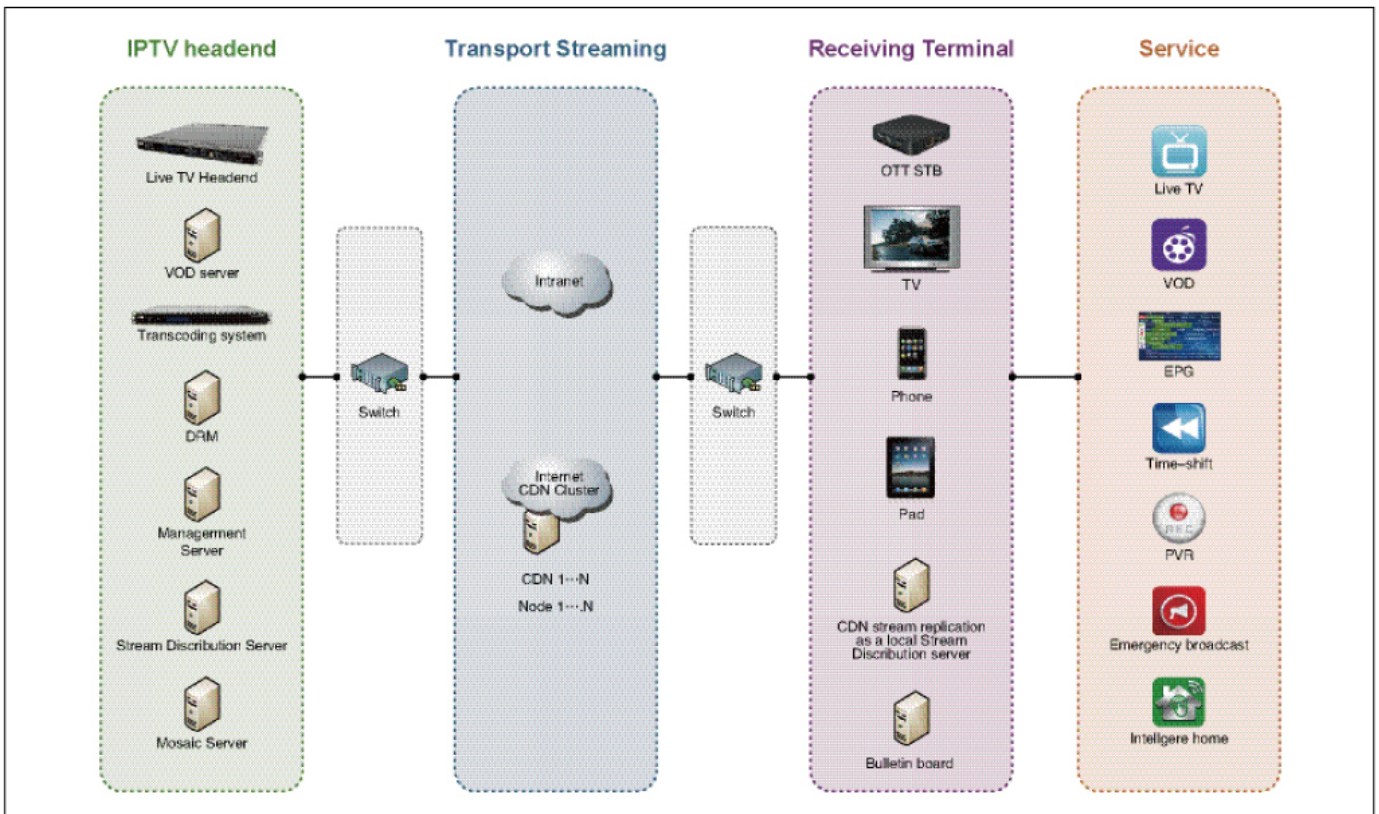


# APK & APP

PBI IPTV App of mobile device allows users to watch Live TV and VOD programs via intelligent mobile phone or tablet. Management server will verify the subscribers and send customer ordered live TV and VOD lists. Customer can watch them by selecting.



# End-to End solutions



20170606



No.3 Feng Zhi East Road, Xi Bei Wang Town, Hai Dian District, Beijing, 100094, China  
Tel: +86-10-57802000 Fax: +86-10-57802016 E-mail: sales@pbicn.com  
[dtv.pbicn.com](http://dtv.pbicn.com) [www.dh-tv.com](http://www.dh-tv.com)