ANTIK technology

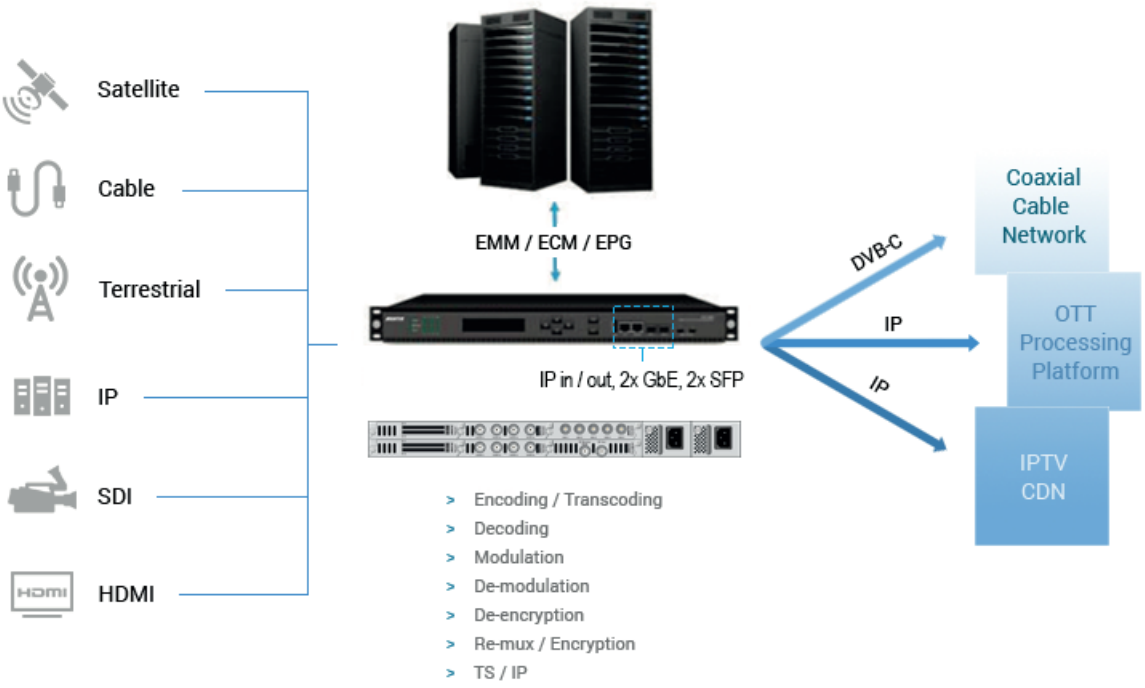
GX-5000

Digital Contents Processing Platform

PBI Digital Contents Processing Platform GX-5000 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. GX-5000 is a compact 1U platform capable of processing a high number of steams. By inserting up to 6 optional functional modules and pluggable reMUX/Scrambler extended modules, GX-5000 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

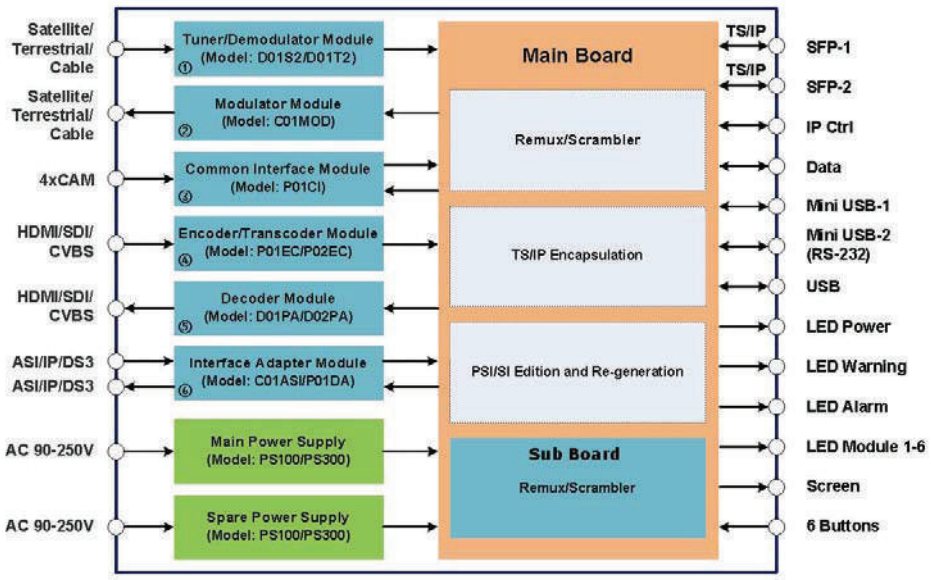
Data Exchange	
Standard	IEEE 802.3, 1000 Base-T, Full Duplex
Max. Effective Bit Rate	920Mb/s
Data Protocol	UDP or RTP, SPTS or MPTS
Control Protocol	ICMP, ARP, IGMP v2/v3
Front Panel	
TS/IP Connector Type	2 × SFP, 1000 Base-T
CA Connector Type	1 × RJ-45, 10/100/1000 Base-T
Control Connector Type	1 × RJ-45, 10/100/1000 Base-T
Upgrade Connector Type	1 x USB

Debug Connector Type	2 x Mini USB
Display	2 x 20 characters LCD Display
Rear Panel	
Module Slot	6 x Slots
Others	
Power Supply	AC 100 - 250V 100W & 300W
Operating Temperature	0 ~ 45℃
Storage Temperature	-10 ~ 60℃
Operation Humidity	10 ~ 90%, (Non-condensed)

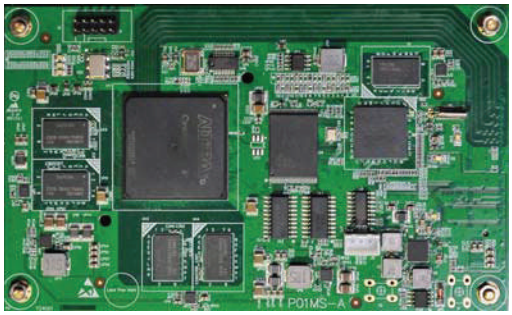
Optional Function Modules

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

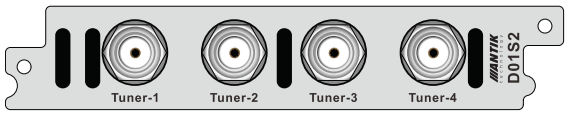


P01MS reMUX & Scrambler Extension Module



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

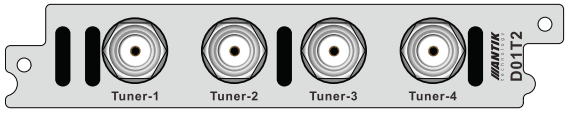
D01S2 / D02S2 4 x DVB-S/S2 Demodulator Module



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

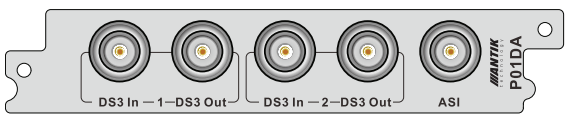
D01T2 4 x DVB-C/T/T2 Demodulator Module



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



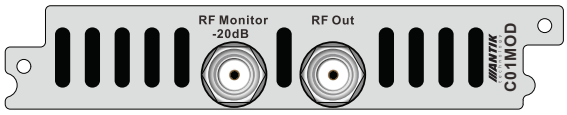
Connector Type	5 x BNC Female, 75Ω
Standard	DVB-ASI, EN50083-9 / ITU-T G.703
Frame Structure	ITU-T G.752 / ITU-T G.804
ASI Input or Output	Switch by Web Control
DS3 bit rate	44.736Mbps

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

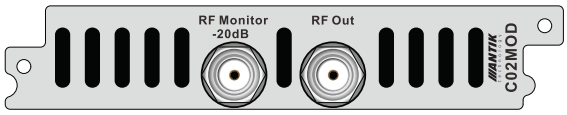
Connector Type	2 x F type Female, 75Ω (1 x main output，1 x -20dB monitor output)
Modulation	Support QAM or COFDM Modulation (Can´t simultaneous working)
Standard of System	ITU-T J.83 Annex A, C
RF Output	2 groups of 4 adjacent channel carriers QAM RF output 2 un-adjacent channel carriers COFDM RF output
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

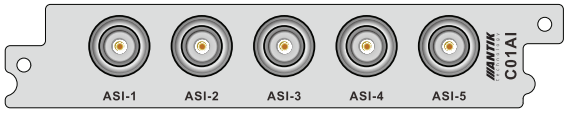
Connect Type	2xF type Female, 75Ω（1 x main output，1 x -20dB monitor output）
Modulation	Support ATSC/QAM(Annex A/B)/COFDM/ DTMB Modulation（Can´t simultaneous working）
Constellation	16QAM，32QAM，64QAM，128QAM，256QAM（QAM Annex A） 64QAM，256QAM（QAM Annex B） 8VSB（ATSC） QPSK, 16QAM, 64QAM（COFDM） QPSK，16QAM，32QAM，64QAM，QAM4_NR（DTMB）
Standard of System	ITU-T J.83 Annex A, B
RF output range	48 ~ 996MHz, step by 1KHz
Modulation Mode	16/32/64/128/256QAM(QAM Annex A) 64/256QAM(QAM Annex B) 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

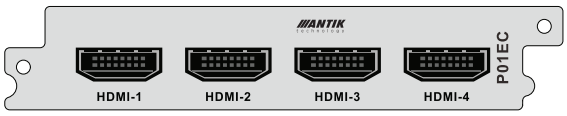
C01ASI 5 x ASI Input/Output Module

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

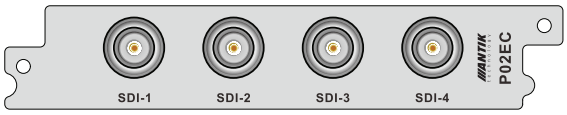
Connector Type	4 x HDMI, type A
Coding Profile & Level	H.264/AVC BLP, MP, HP @ L4.0 or less & MPEG-2 MP@ML
Sampling Format	4:2:0
Video Resolution & Recommend Compression Bit Rate H.264	1080i（1920×1080）@25Hz,29.97Hz,30Hz: SMPTE274M:1~13Mb/s 1080i（1440×1080）@25Hz, 29.97Hz SMPTE274M: 5~24Mb/s 720p（1280×720）@59.94Hz,50Hz:SMPTE296M: 1~13Mb/s 480i（720×480）@29.97Hz:SMPTE656M: 600K~10Mb/s 576i（720×576）@25Hz: SMPTE656M:600K~10Mb/s
Video Resolution & Recommend Compression Bit Rate MPEG-2	480i（720×480）@29.97Hz:SMPTE656M: 3M~10Mb/s 576i（720×576）@25Hz: SMPTE656M: 3M~10Mb/s
Vide Resolution Down Scaling	Vertical & Horizontal adjustable respectively (frame rate is not scalable)
Aspect Ratio	16:9, 4:3 selectable
Audio Input	Embedded
Coding Standard	MPEG1 Layer II MPEG-2/4 AAC-LC, HE-AAC (V1, V2)
Sampling Rate	48KHz



Recommend Compression Bit Rate	MPEG1 Layer II :32~192Kbps(Mono), 64~384Kbps(Stereo), MPEG2/4 AAC-LC :24~256Kbps(Mono), 48~512Kbps(Stereo) MPEG2/4 HE-AAC(V1/V2): 16~128Kbps(Mono), 32~256Kbps(Stereo)
Transcode Mode	H.264 to MPEG-2, H.264 to H.264, MPEG-2 to MPEG-2, MPEG-2 to H.264
Input	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)
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)

P02EC 4 x SDI In Encoder/Transcoder Module

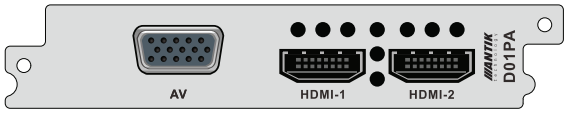
Connector Type	4xSDI, BNC Type Female, 75Ω
Coding Profile & Level	H.264/AVC BLP, MP, HP @ L4.0 or less & MPEG-2 MP@ML
Sampling Format	4:2:0, 10-bit, YCbCr
Video Resolution & Recommend Compression Bit Rate H.264	1080i（1920×1080）@25Hz,29.97Hz,30Hz: SMPTE274M:1~13Mb/s 1080i（1440×1080）@25Hz, 29.97Hz SMPTE274M: 5~24Mb/s 720p（1280×720）@59.94Hz,50Hz:SMPTE296M: 1~13Mb/s 480i（720×480）@29.97Hz:SMPTE656M: 600K~10Mb/s 576i（720×576）@25Hz: SMPTE656M:600K~10Mb/s
Video Resolution & Recommend Compression Bit Rate MPEG-2	480i（720×480）@29.97Hz:SMPTE656M: 3M~10Mb/s 576i（720×576）@25Hz: SMPTE656M: 3M~10Mb/s
Vide Resolution Down Scaling	Vertical & Horizontal adjustable respectively (frame rate is not scalable)
Aspect Ratio	16:9, 4:3 selectable
Audio Input	SDI Embedded
Coding Standard	MPEG1 Layer II MPEG-2/4 AAC-LC, HE-AAC (V1, V2)
Sampling Rate	48KHz



Recommend Compression Bit Rate	MPEG1 Layer II :32~192Kbps(Mono), 64~384Kbps(Stereo), MPEG2/4 AAC-LC :24~256Kbps(Mono), 48~512Kbps(Stereo) MPEG2/4 HE-AAC(V1/V2): 16~128Kbps(Mono), 32~256Kbps(Stereo)
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)
Input	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)
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)

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

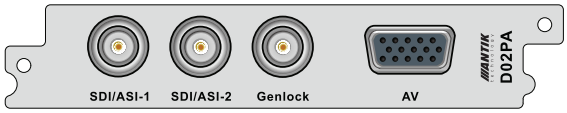
Connect Type	2 x HDMI 1.3, 1 x D-sub 15 Female（2 pairs CVBS out adpaper）
Video Decode	MPEG-2(MP@ ML for SD, MP@HL for HD) MPEG 4/H.264 AVC Part 10 (MP@L3 for SD, HP@L4.1 for HD)
Video Resolution	1080i × 30, 1080i × 29.97, 1080i × 25, 720p × 60, 720p × 59.94, 720p × 50, 576i × 25, 480i × 29.97
Video Bit 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	600Ω（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/600Ω）
Subtitle	DVB, EBU
VBI	Teletext, WSS
Closed Caption	EIA 608, EIA 708

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

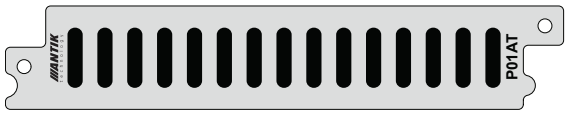
Connector Type	2 x SDI outputs, 1xGenlock input, BNC Female 75Ω, 2 x CVBS outputs by D-sub 15 to RCA convertor
Video Decode	MPEG-2(MP@ ML for SD, MP@HL for HD) MPEG 4/H.264 AVC Part 10 (MP@L3 for SD, HP@L4.1 for HD)
Video Resolution	1080i × 30, 1080i × 29.97, 1080i × 25, 720p × 60, 720p × 59.94, 720p × 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%



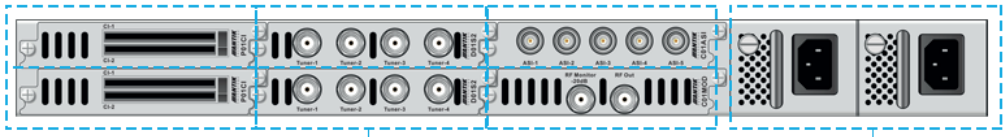
Short Time Distortion	<2%
Differential Gain	<3%
Differential Phase	<2°
S/N	>55dB
Analog Audio Output	4 x RCA, 2 x Group L+R, (DB15 adapter)
Output Impedance	600Ω（Balanced）
Output Mode	Left, Right, Mono, Stereo
Audio Decoding	2 pairs Stereo (2 groups of audios PID or 4 sound channels)
Cross Talk	>70dB
THD	<0.3% @400Hz, 1KHz test done
Frequency Response	±0.5dB （20Hz ~ 18KHz）
Output Level	-30 ~ +7dB（Adjustable, 0dBm/600Ω）
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
Input	Compliant with H.265 (HEVC),H.264/AVC 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 Compression Bit Rate H.264	1080i（1920×1080）@25Hz, 29.97Hz SMPTE274M: 1~13Mb/s 1080i（1440×1080）@25Hz, 29.97Hz SMPTE274M: 5~24Mb/s 720p（1280×720）@50Hz, 59.94Hz, SMPTE296M: 1~13Mb/s 480i（720×480）@29.97Hz SMPTE656M: 600K~10Mb/s 576i（720×576）@25Hz: SMPTE656M:600K~10Mb/s



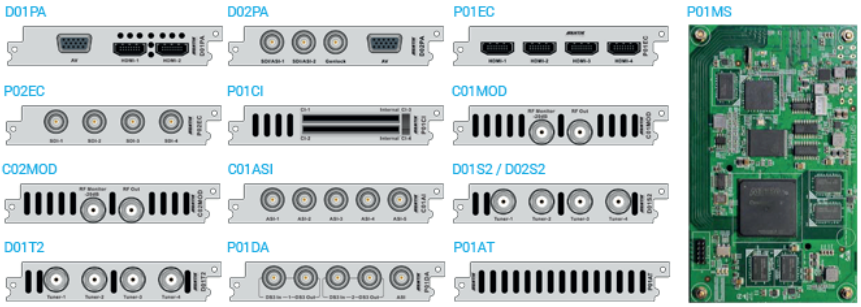
Video Resolution & Recommend Compression Bit Rate MPEG-2	480i（720×480）@29.97Hz SMPTE656M: 3M~10Mb/s 576i（720×576）@25Hz SMPTE656M: 3M~10Mb/s
Aspect Ratio	16:9, 4:3 selectable
Output	MPTS and/or un-stuffed TS, MPEG2 MP@ML MPTS and/or un-stuffed TS, H.264/AVC Main/ High/Baseline Profile @ L4.0 or less (but not include FMO, ASO & RS of Baseline)



Total 6 slots for different digital TV functional modules:

modulator | demodulator | encoder | transcoder | decoder | interface adapter, etc.

Dual hot-swappable power supply units



Typical Application

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