

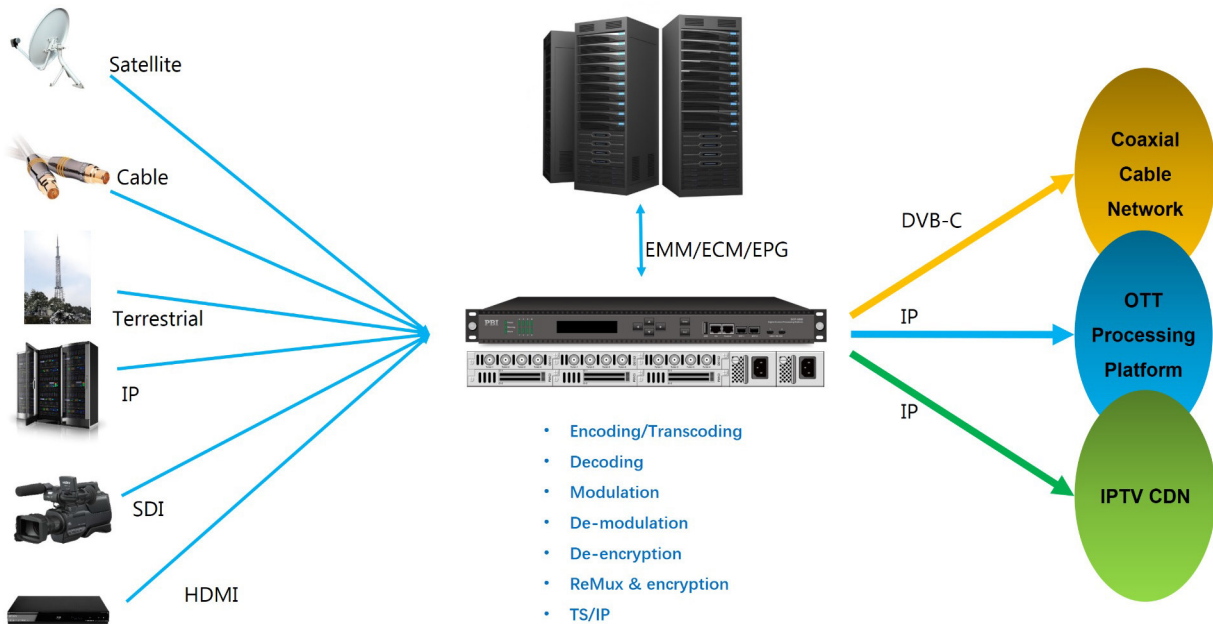
DCP-3000 Digital Contents Processing Platform

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 steams. 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



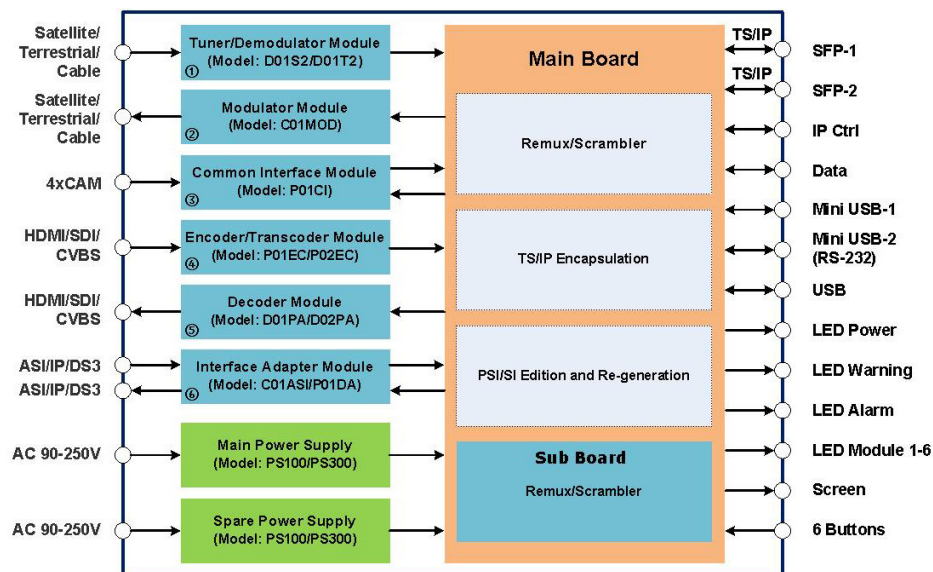
Chassis Specification

| 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 | Rear Panel | |
| Control Protocol | ICMP, ARP, IGMP v2/v3 | Module Slot | 6 x Slots |
| Front Panel | | Others | |
| 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

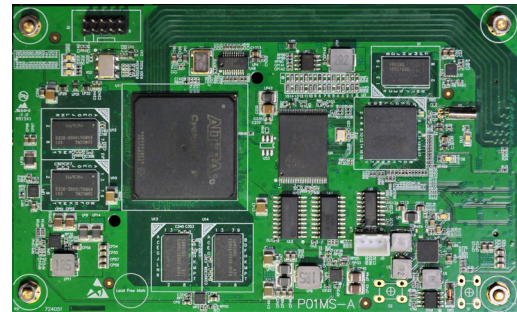
| Function | Model | Description |
|------------------------------------|--------|-------------------------------------------------------------------------------|
| Demodulation/De-scrambling Modules | D01S2 | 4-Way DVB-S/S2 Demodulating Module |
| | D02S2 | 4-Way DVB-S/S2 Demodulating Module, support 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



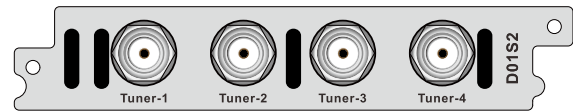
P01MS reMUX & Scrambler Extension Module

| | |
|---------------------------------------|--------------------------------------------------------|
| 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

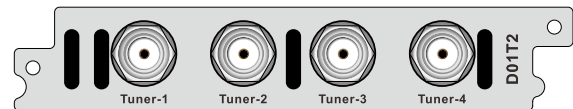
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| Connector Type | 4 x F type female, 75Ω |
| Input Frequency Range | 950 ~ 2150 MHz |
| Input Level | -65dBm ~ -25dBm |
| Symbol Rate | 2~45MBaud(DVB-S QPSK), 2~31MBaud (DVB-S2 8PSK) |
| Roll Off Factor | 0.35(DVB-S QPSK), 0.35/0.25/0.2(DVB-S2 8PSK) |
| 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 |



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|-----------------------|-------------------------------------|
| 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

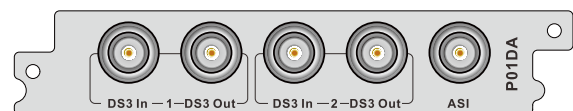
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| Connector Type | 4 x F Type Female, 75Ω |
| Input Frequency | 48 ~ 860 MHz(DVB-C) 104 ~ 862 MHz(DVB-T/T2) |
| Input Level | -15~ 15dBm (DVB-C) -70 ~ -20dBm (QEF, DVB-T/T2) |
| Symbol Rate | 1 ~ 7MSps (ITU J.83 Annex A DVB-C) |
| Standard | DVB-T2 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

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| 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 |



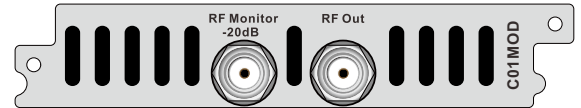
P01CI 4 x CI De-encryption Module

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|----------------|-------------------------------------------------|
| 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

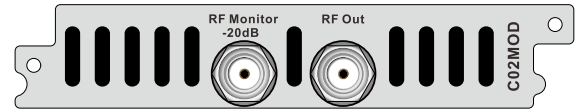
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| Connector Type | 2 x F type Female, 75Ω (1 x main output, 1 x -20dB monitor output) |
| Modulation | Support QAM or COFDM Modulation (Can't simultaneous working) |
| Standard of System | ITU-T J.83 Annex A, C |
| RF Output | 2 groups of 4 adjacent 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 |



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| 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

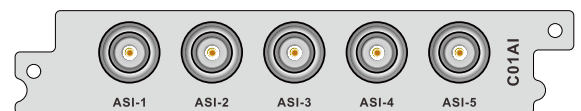
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| Connect Type | 2xF type Female, 75Ω (1 x main output, 1 x -20dB monitor output) |
| Modulation | Support ATSC/QAM(Annex A/B)/COFDM/DTMB Modulation (Can't simultaneous working) |
| Constellation | 16QAM, 32QAM, 64QAM, 128QAM, 256QAM (QAM Annex A) 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) |



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| 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 |

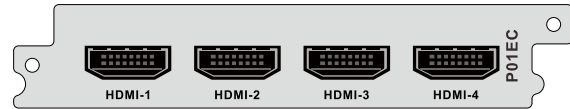
C01ASI 5 x ASI Input/Output Module

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| 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

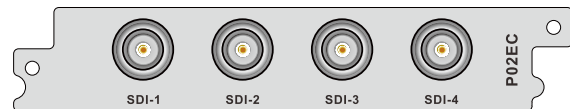
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| Connector Type | 4 x HDMI, type A |
| Coding Profile & Level | H.264/AVC BLP, MP, HP @ L4.0 or less & MPEG-2 MP@ML |
| Sampling Format | 4:2:0 1080i (1920 x 1080) @25Hz,29.97Hz,30Hz: SMPTTE274M:1~13Mb/s 1080i (1440 x 1080) @25Hz, 29.97Hz SMPTTE274M: 5~24Mb/s |
| Video Resolution & Recommend | 720p (1280 x 720) |
| Compression Bit Rate | @59.94Hz,50Hz:SMPTTE296M: 1~13Mb/s |
| H.264 | 480i (720 x 480) @29.97Hz:SMPTTE656M: 600K~10Mb/s 576i (720 x 576) @25Hz: SMPTTE656M:600K~10Mb/s |
| Video Resolution & Recommend | 480i (720 x 480) @29.97Hz:SMPTTE656M: 3M~10Mb/s |
| Compression Bit Rate | 576i (720 x 576) @25Hz: SMPTTE656M: 3M~10Mb/s |
| MPEG-2 | 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 |



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

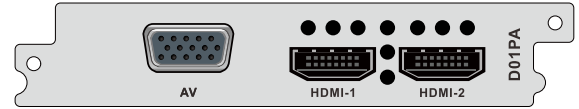
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| Connector Type | 4xSDI, BNC Type Female, 75Ω |
| Coding Profile & Level | H.264/AVC BLP, MP, HP @ L4.0 or less & MPEG-2 MP@ML |
| Sampling Format | 4:2:0, 10-bit, YCbCr 1080i (1920 x 1080) @25Hz,29.97Hz,30Hz: SMPTTE274M:1~13Mb/s 1080i (1440 x 1080) @25Hz, 29.97Hz SMPTTE274M: 5~24Mb/s |
| Video Resolution & Recommend | 720p (1280 x 720) |
| Compression Bit Rate | @59.94Hz,50Hz:SMPTTE296M: 1~13Mb/s |
| H.264 | 480i (720 x 480) @29.97Hz:SMPTTE656M: 600K~10Mb/s 576i (720 x 576) @25Hz: SMPTTE656M:600K~10Mb/s |
| Video Resolution & Recommend | 480i (720 x 480) @29.97Hz:SMPTTE656M: 3M~10Mb/s |
| Compression Bit Rate | 576i (720 x 576) @25Hz: SMPTTE656M: 3M~10Mb/s |
| MPEG-2 | 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 |



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

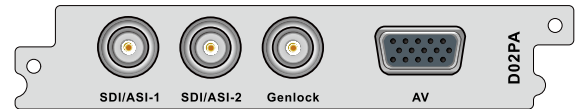
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| Connect Type | 2 x HDMI 1.3, 1 x D-sub 15 Female (2 pairs CVBS out adpaper) |
| Video Decode | MPEG-2(MP@ ML for SD, MP@HL for HD) MPEG 4/H.264 AVC Part 10 (MP@L3 for SD, HP@L4.1 for HD) |
| Video Resolution | 1080i × 30, 1080i × 29.97, 1080i × 25, 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% |



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| 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

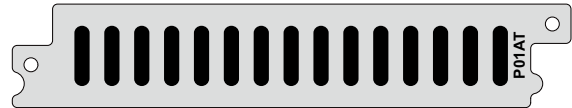
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| Connector Type | 2 x SDI outputs, 1xGenlock input, BNC Female 75 Ω, 2 x CVBS outputs by D-sub 15 to RCA convertor |
| Video Decode | MPEG-2(MP@ ML for SD, MP@HL for HD) MPEG 4/H.264 AVC Part 10 (MP@L3 for SD, HP@L4.1 for HD) |
| Video Resolution | 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

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|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 |



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|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 | 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

