Sumavision
Enhanced Multimedia Router

Product Catalogue

2011 V3.0

Sumavision
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Index

Overview

Enhanced Multimedia Router -- EMR

Sumavision's Enhanced Multimedia Router (EMR) is a standard platform on which users can realize all Digital TV head end functions. EMR is one rack-unit (1-RU) signal processing platform with flexible card-insertion structure (6 slots). EMR can support "Any input" (DVB-S/S2/ASI/IP/DS3/E3, and etc.), "Any processing" (encoding/decoding/multiplexing/scrambling, and etc.) and "Any output "(DVB-S/S2/ASI/IP/DS3/E3 etc)". EMR is available for any applications beyond your imagination besides encoding, decoding, multiplexing, transcoding, transmodulating, etc.

HIGHLIGHT

- Support flexible combination of any different type of cards
- Massive internal multiplexing: maximum 12G data processing
- Maximum 24 IRDs for DVB-S/S2 FTA streams
- Maximum 6 IRDs for DVB-S/S2 encrypted streams
- Multi-encoding support: SD/HD MPEG-2/MPEG-4/H.264
- Maximum 12 programs MPEG-2/H.264 encoding/decoding
- Maximum 48 QAM outputs
- Maximum 30 ASI inputs or 24 ASI outputs
- Maximum 12 GbE IP inputs/outputs
- Maximum 40 streams/2560 programs scrambling over IP
- Support IPTV and conversion of MPTS from any type of inputs to SPTS
- Support dual-power supply and hot-swap
- Maximun 180 programs statistic multiplexing
- Maximum 512 SPTS IP output embedded on backboard

Optional Modules Overview

Modules	Product Name	Description
Analog MPEG2 SD Encoding Modules	C101A	MPEG-2 Analog SD Encoding Card
	C101AE	Single Channel MPEG-2 Analog Encoding Card
	C103A	Analog Audio Encoding Card
Digital MPEG2 SD Encoding Modules	C101D	MPEG-2 Digital Encoding Card
	C101DE	Single Channel MPEG-2 Digital Encoding Card
	C103D	Digital Audio Encoding Card
Dolby AC-3 Encoding & Transcoding Module	C103DB	Dolby AC-3 Encoding Card
	C113DT	Dolby Transcoding Card
HD Encoding Modules	C101H	MPEG-2 HD encoding card
	C109H	H.264 HD Encoding Card
	C110	H.264 HD Encoding and Transcoding Card
	C130	H.264/MPEG-2 HD Encoding Card
Decoding Modules	C201AS	Analog Decoding Card
	C201DH	Digital HD Decoding Card
	C204	MPEG-2 HD Decoding Card
Main Control and Interface Modules	C300C	Main Control Card
	C322C	2 ASI Input/2 ASI Output & Main Control Card
	C340C	4 ASI Input & Main Control Card
	C451C	GbE IP Card & Main Control Card

ASI Interface Modules	C304	4 ASI Output Card
	C304	4 ASI Output &Scrambling Card
	C350	5 ASI Input Card
	CA07	ASI Splitter Card
Adapting Modules	C416	DS3/E3 Card
	C451	GbE IP Card
Scrambling & De-scrambling Modules	C471S	IP Scrambling Card
	C510CI	De-scrambling Card
Modulating & Demodulating Modules	C508	QAM Output Card
	C513CI	QAM-CI Input Card
	C505	QPSK Input Card
	C545	4-frequency DVB-S2 demodulation receiving card
	C515CI	DVB-S/S2 De-scrambling Receiver Card
Statistic Multiplexing Modules	C704	6-Channel Statistic Multiplexing Card
	C705	20-Channel Statistic Multiplexing Card
	C302MH	ATSC M/H Statistic Multiplexing Card
	C707	30-Channel Statistic Multiplexing Card
Switch Modules	CA05	RF Switch Card
	CA01	ASI Switch Card

Modules Introduction

Analog MPEG2 SD Encoding Modules

Product	Description	Specification
C101A MPEG-2 Analog Encoding Card 	2 channels MPEG-2 4:2:0 MP@ML analog video coding, and 2 channels analog stereo audio encoding Input: Video: 2 x CVBS, BNC Audio: 2 x Analog Stereo, Balanced	• Video format: MPEG-2 4:2:0 MP@ML • Image format: PAL, NTSC, PAL-M, PAL-N, SECAM • Video encoding bit rate: CBR/VBR ,1.5~15Mb/s • Frame rate:PAL@25fps,NTSC@30fps,Secam@25fps • Aspect ratio:4:3 or 16:9 • Audio Formats: MPEG-1 Audio Layer I, MPEG-1 Audio Layer II • Sampling frequency: 32 KHz, 44.1 KHz, 48 KHz • Encoding Bit-Rate: 64 ~ 384Kbps • 2 stereo channels Dolby Digital® (AC-3) 2.0 encoding (Option)
C101AE Single Channel MPEG-2 Analog Encoding Card 	1 channels MPEG-2 4:2:0 MP@ML analog video coding, and 2 channels analog stereo audio encoding Input: Video: 1 x CVBS(BNC) Audio: 2 x Analog Stereo, Balanced	• Video format: MPEG-2 4:2:0 MP@ML • Image format: PAL, NTSC, PAL-M, PAL-N, SECAM • Video encoding bit rate: CBR/VBR ,1.5~15Mb/s • Frame rate:PAL@25fps,NTSC@30fps,Secam@25fps • Aspect ratio:4:3 or 16:9 • Audio Formats: MPEG-1 Audio Layer I, MPEG-1 Audio Layer II • Sampling frequency: 32 KHz, 44.1 KHz, 48 KHz • Encoding Bit-Rate: 64 ~ 384Kbps • 2 stereo channels Dolby Digital® (AC-3) 2.0 encoding (Option)
C103A Analog Audio Encoding Card 	Provides 2 analog stereo audio encoding Input: Audio: 2 x Analog Stereo, Balanced	• Audio Formats: MPEG-1 Audio Layer I, MPEG-1 Audio Layer II • Sampling frequency: 32 KHz, 44.1 KHz, 48 KHz • Encoding Bit-Rate: 64 ~ 384Kbps • 2 stereo channels Dolby Digital® (AC-3) 2.0 encoding (Option)

Digital MPEG2 SD Encoding Modules

Product	Description	Specification
C101D MPEG-2 Digital Encoding Card 	2 channels MPEG-2 4:2:0 MP@ML digital video encoding, and 2 channels digital audio encoding Input: Video: 2 x SDI (Audio Embedded),BNC Audio: 2 x AES/EBU, BNC	• Video format: MPEG-2 4:2:0 MP@ML • Image format: PAL, NTSC, PAL-M, PAL-N, SECAM • Video encoding bit rate: CBR/VBR ,1.5~15Mb/s • Frame rate:PAL@25fps,NTSC@30fps,Secam@25fps • Aspect ratio:4:3 or 16:9 • Audio Formats: MPEG-1 Audio Layer I, MPEG-1 Audio Layer II • Sampling frequency: 32 KHz, 44.1 KHz, 48 KHz • Encoding Bit-Rate: 64 ~ 384Kbp • 2 stereo channels Dolby Digital® (AC-3) 2.0 encoding (Option)
C101DE Single Channel MPEG-2 Digital Encoding Card 	1 channel MPEG-2 4:2:0 MP@ML signal video encoding and 2 channels digital audio encoding Input: Video: 1 x SDI (Audio Embedded),BNC Audio: 2 x AES/EBU, BNC	• Video format: MPEG-2 4:2:0 MP@ML • Image format: PAL, NTSC, PAL-M, PAL-N, SECAM • Video encoding bit rate: CBR/VBR ,1.5~15Mb/s • Frame rate:PAL@25fps,NTSC@30fps,Secam@25fps • Aspect ratio:4:3 or 16:9 • Audio Formats: MPEG-1 Audio Layer I, MPEG-1 Audio Layer II • Sampling frequency: 32 KHz, 44.1 KHz, 48 KHz • Encoding Bit-Rate: 64 ~ 384Kbp • 2 stereo channels Dolby Digital® (AC-3) 2.0 encoding (Option)
C103D Digital Audio Encoding Card 	2 channel digital audio encoding Input: Audio: 2 x Digital Stereo, BNC	• Audio Formats: MPEG-1 Audio Layer I, MPEG-1 Audio Layer II • Sampling frequency: 32 KHz, 44.1 KHz, 48 KHz • Encoding Bit-Rate: 64 ~ 384Kbps • 2 stereo channels Dolby Digital® (AC-3) 2.0 encoding (Option)

Dolby AC-3 Encoding Module

Product	Description	Specification
C103DB Dolby AC-3 Encoding Card 	2 channels 2.0 stereo professional audio encoding, and 5.1 AC-3 professional audio encoding on HD encoding card -------------------- Dolby AC-3 Encoding Card is attached on other encoding cards instead of occupying slot	● Audio Formats: AC-3 2.0, AC-3 5.1 ● Sampling frequency: 32 KHz, 44.1 KHz, 48 KHz ● Encoding Bit-Rate: 56kbps-640kbps ● Dynamic Range: ≤ -90dBFS@48KHz, ≤ -84dBFS@44.1kHz, 32kHz ● Support audio/video Synchronization, audio/video asynchronous time +5/-15ms

HD Encoding Modules

Product	Description	Specification
C101H MPEG-2 HD encoding card 	1 channel MPEG-2 HD video encoding -------------------- Input: Video: 1 x YPbPr/CVBS, BNC x 3; 1 x HD-SDI, (audio embedded), BNC Audio: 3 x AES/EBU, BNC; 3 x Analog Stereo, Balanced	● Video format: MPEG-2 MP@ML, MPEG-2 4:2:2P@ML, MPEG-2 MP@HL, MPEG-2 MP@H14L 分辨率： 1080i、720p ● Resolution: - SD: 480p 720x480@59.94Hz, 576p 720x576@50Hz, 480i 720x480@29.97Hz, 576i 720x576@25Hz - HD: 1080i 1920x1080@29.97/25Hz, 1080i 1440x1080@29.97/25Hz, 720p 1280x720@59.94/50/29.97/25/23.97Hz ● Aspect ratio: 16:9, 4:3 ● GOP: I/IP/IBP/IBBP -- ● Audio Formats: MPEG-1 Layer II 2 stereo channels Dolby Digital® (AC-3) 2.0 encoding (Option) Dolby Digital® (AC-3) 5.1 channel encoding (Option) ● Sampling frequency: 48 KHz ● Encoding Bit-Rate: 64 ~ 384Kbps(MPEG-1 Layer2) ● Volume adjustment: -24dB~6dB

C109H

H.264 HD Encoding Card

1 channel H.264 HD video encoding (supports YPbPr input)

Input:
Video: 1 x YPbPr, BNC;
1 x CVBS,
(Same port with Y);
1x HD-SDI,
(audio embedded)
BNC;
Audio: 1 x Analog stereo (balanced);
1 x AES/EBU (balanced)

- Video format: H.264/AVC 4:2:0 MP@Level 3.0 for D1,
  H.264/AVC 4:2:0 HP@Level 4.0 for HD
- Encoding Bit-Rate: 2-10Mb/s for D1
  4-20Mb/s for 1280x720x60p/59.94p/50p
  5-20Mb/s for 1440x1080x60i/59.94i/50i,
  6-20Mb/s for 1920x1080x60i/59.94i/50i
- Aspect ratio: 4:3, 16:9
- Entropy encoding: CABAC
- GOP structure: IBBP, IBP(1080i)

- Audio Formats: MPEG-1 Layer II
- Sampling frequency: 48K/44.1K/32K
- Encoding Bit-Rate: 32Kb/s ~384Kb/s

C110

H.264 HD Encoding and Transcoding Card

2 channel H.264 HD video encoding or MPEG-2 to H.264 transcoding

Input:
Video: 2 x HD-SDI, BNC

Audio: 2 x HD-SDI,
(audio embedded)
☐ 2 x AES/EBU ,
Phoenix socket
(balanced)

- Video format: HD H.264 High Profile@Level 4.0
  SD H.264 Main Profile@Level 3.0
- Output resolution and frame rate：
  1920 × 1080 × 50i/59.94i/60i
  1440 × 1080 × 50i/59.94i/60i
  1280 × 720 × 50p/59.94p/60p
  720 × 576 × 50i
  720 × 480 × 59.94i
- Conversion of HD program to SD program
- Transcoding of 23.98 frame/s up to 60 field/s
- Aspect Ratio: 4:3/16:9
- Encoding code rate：1Mb/s - 20Mb/s
  Advised HD code rate ：6 Mb/s - 20Mb/s
  Advised SD code rate：1.5 Mb/s - 5Mb/s
- Rate control: CBR/VBR
- GOP structure: IBBP/IBP
- Entropy code: CABAC
- Pre-processing: de-interlacing, de noise, sharpening

- MPEG-1 Audio Layer II
- Sampling frequency: 48kHz/44.1kHz/32kHz
- Sampling accuracy: 24-bit
- Encoding rate: 32 - 384kb/s

C130

H.264/MPEG-2 HD Encoding Card

1 channel H.264/MPEG-2 HD/SD video encoding

Input:
Video: 1 x HD-SDI, BNC
1 x YPbPr, BNC
1 x CVBS , BNC

Audio: 2 x HD-SDI,
(audio embedded)
☐ 1 x AES/EBU ,
Phoenix socket
(balanced)
1 x analog
stereo audio
(phoenix interface)

- Video format: H.264: Baseline, Main ,and High
  MPEG-2: Simple, Main ,and High
- Encoding level:
  H.264:
  1.0 ~1.3
  2.0~2.2
  3.0~3.2
  4.0~4.2
  5.0~5.1
- MPEG-2:
  High, Main
- **Encoding resolution ratio:**

  1920/1440/1280×1080
  1280/960×720
  720/704/640/544/528/352×576
  352×288
  352×240
  320×240

320×180
160×120
160×90

- Aspect ratio: 4:3/16:9/2.35:1/1:1
- Encoding bit-rate: 0.1Mb/s - 25Mb/s
  H.264 HD suggested bit-rate: 6 Mb/s - 12Mb/s
  H.264 SD suggested bit-rate: 1.5Mb/s - 3Mb/s
- Bit-rate control: CBR/VBR/Capped-VBR
- Preprocessing: DE-INTERLACING, noise reduction, sharpen
- **Output resolution and frame rate：**
  HD:
  1920×108060i/59.94i/50i/30p/29.97p/25p/24p/23.97p
  1280×720 60p/59.94p/50p
  SD:
  720×576 50i, 720×480 60i/59.94i

- MP2,AAC-LC,HE-AAC v1,HE-AAC v2,DolbyDigital Professional
- Sampling frequency: 48kHz/44.1kHz/32kHz
- Sample size: 24-bit
- Encoding bit-rate: 32kb/s

Decoding Modules

Product	Description	Specification
C201AS Analog Decoding Card 	2 channels multi-format (MPEG-2 / H.264) SD analog video decoding, and HD video decoding to SD video --- Output: Video: 2 x CVBS, BNC Audio: 2 x Analog Stereo, Balanced	• Video format: MPEG-2 HD/SD MP@HL; H.264/AVC High Level 4.1 high profile • Image resolution: 1080i、720p, downward-compatible • Aspect ratio: 4:3 • Frame rate:PAL@25fps,NTSC@30fps --- • Audio Formats: MPEG-1 Layer II • Sampling frequency: 32 KHz, 44.1 KHz, 48 KHz • Encoding Bit-Rate: 32 ~ 384Kbps • Output volume adjustment: -30dB~0dB
C201DH Digital HD Decoding Card 	2 channels multi-format (MPEG-2、H.264) signal SD video decoding --- Output: Video: 2 x (HDSDI+HDMI), BNC Audio: HD-SDI or HDMI (Audio Embedded)	• Video format: MPEG-2 HD/SD MP@ML; H.264/AVC High Level 4.1 high profile • Image format: PAL, NTSC • Aspect ratio: 16:9, 4:3 • Image resolution:1080i、720p，downward-compatible --- • Audio Formats: MPEG-1 Layer II • Sampling frequency: 32 KHz, 44.1 KHz, 48 KHz • Encoding Bit-Rate: 32 ~ 384Kbps • Output volume adjustment: -30dB~0dB

C204

H.264/MPEG-2 HD 4:2:2 DECODING CARD

2 channel SDI with embedded audio (supports YPbPr/ CVBS output)

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0utput:
Video: 1 x YPbPr, BNC;
1 x CVBS,
(Same port with Y);
1x HD-SDI,
(audio embedded)
BNC;
Audio: 1 x Analog stereo (balanced);
1 x AES/EBU (balanced)

Video Decoding

- SDI/YPbPr: 1080i(25/29.97/30fps), 720p(50/59.94/60fps), 576i(25fps), 480i(29.97fps), Self-adaptation of video format
- CVBS(SD): PAL, NTSC, PAL-N, PAL-M, Self-adaptation for PAL/NTSC, Manual selection for other option
- Decoding mode: H.264: High 422(8bit)Profile@422(4.0)Level
  MPEG-2: 422Profile@High Level
- Aspect ratio: 16:9, 4:3 Self-adaptation
- DVB VBI: support Closed Caption(EIA-608, EIA-708)
  Self-adaptation of 188/204 bytes

Audio Decoding

- Decoding Mode:
  Standard: MPEG-1 layer II, MPEG-2
  Optional: Dolby Digital (AC-3), HE-ACC, AAC-LC
- Sampling Precision: 16bit
- Sampling rate: 48k/44.1k/32kHz
- Decoding Bit-rate: 32kbps-384kbps
- Sound Volume: -30dB~0dB

Main Control and Interface Modules

Product	Description	Specification
C300C Main Control Card 	main control function 10/100 Base-T Ethernet for configuration and monitoring	
C322C 2 ASI Input/2 ASI Output & Main Control Card 	2 channels ASI inputs and outputs with main control function Input: 2 x ASI Output: 2 x ASI Control via front panel or 10/100Base-T Ethernet interface	• Maximum bit rate of each ASI up to 200Mbps and bit rate adjustable • Output bit rate accuracy: 0.001kbps • Maximum output PID up to 256 • Support PCR correction and remapping • Support PSI/SI table extraction and edition • Support data broadcasting/EPG/private data inserting • Support SMPTE 310
C340C 4 ASI Input & Main Control Card 	4 channels ASI inputs with main control function Input: 4 x ASI Control via front panel or 10/100Base-T Ethernet interface	• Maximum input bit rate of every ASI is up to 200Mbps • Maximum input Voltage ≥ 880mV • Minimum accepting sensitivity ≤ 200mV • Adaptively support TS packet input of 188 or 204 byte • Return Loss(5MHz~270MHz)≤-20dB • Support port backup, card backup and program backup

C451C

GbE IP Card & Main Control Card

1 channel gigabit IP input and output with UDP encapusulation

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Input & Output:
either 1×GBE (SFP) or 1×GBE (100/1000 Base-T)

Scrambling (option)

- 1×10/100BASE-T Ethernet port for scrambling, RJ-45

Control

- 1×10/100BASE-T Ethernet control port, RJ-45

Signal Processing over IP

- Total processing capability: 960Mbps
- Support 16 different TS streams input and 12 different TS streams output
- Packet length: 188 or 204 byte
- Support bit rate setting for each output
- UDP protocol, support SPTS and MPTS, unicast/multicast

Support IP address and port number setting for each output

ASI Interface Modules

Product	Description	Specification
C304 4 ASI Output Card 	4 channels ASI outputs --- Output: 4 x ASI	• Maximum number of PID each port can support: 256 • Maximum system bit rate and effective bit rate:200Mbps • Rise time(20%～80%)≤1200ps • Fall time (20%～80%) ≤1200ps • Deterministic Jitter ≤10% • Adaptively support TS package input of 188 or 204 byte • Output range: 800±80
C304 4 ASI Output &Scrambling Card 	4 channels ASI outputs with scrambling modules --- Output: 4 x ASI	• Maximum number of PID each port can support: 256 • Maximum system bit rate and effective bit rate:200Mbps • Adaptively support TS package input of 188 or 204 byte • 8×scrambling modules, each module can independently scramble • Rise time(20%～80%)≤1200ps • Fall time (20%～80%) ≤1200ps • Deterministic Jitter ≤10% • Output range: 800±80

C350

5 ASI Input Card

5 channels ASI inputs

Input: 5 x ASI

- Maximum bit rate (each ASI):200Mbps
- Minimum accepting sensitivity ≤ 200mV
- Maximum input Voltage ≥ 880mV
- Return Loss(5MHz~270MHz)≤-20dB
- Support port backup, card backup and program backup

CA07

ASI Splitter Card

1 channels ASI inputs and 4 channels outputs

Input: 1 x ASI
Output: 4 x ASI

- Adaptively support TS packet input of 188 or 204 byte
- Maximum input bit rate of every ASI is up to 270Mbps

Adapting Modules

Product	Description	Specification
C416 DS3/E3 Card 	2 channels DS3/E3 with 1 channel ASI outputs and 1 channel DS3/E3 with 1 channel ASI Input --- 1×DS3/E3 input 1×ASI input, 1×ASI output 2×DS3/E3 outputs	• Maximum input bit rate of DS3 up to 44.736Mbps • Maximum input bit rate of E3 up to 34.368Mbps • Support SPTS/MPTS • Support ASI←→DS3/E3 bi-directional adapting • Protocol compatible for DIVICOM、TANDBERG、BARCO PHILIPS、THOMSON、SCOPUS、Harmonic、Huawei、ZTE • Support PCR correction
C451 GbE IP Card 	1 channel gigabit IP input and output with UDP encapusulation --- Input & Output: either 1×GBE (SFP) or 1×GBE (100/1000 Base-T)	**Scrambling (option)** 1×10/100BASE-T Ethernet port for scrambling, RJ-45 **Signal Processing over IP** • Total processing capability: 960Mbps • Support 16 different TS streams input and 12 different TS streams output • Packet length: 188 or 204 byte • Support bit rate setting for each output • UDP protocol, support SPTS and MPTS, unicast/multicast • Support IP address and port number setting for each output

Scrambling & De-scrambling Modules

Product	Description	Specification
C471S IP Scrambling Card 	Scrambling Card attached on GbE IP card	• Maximum 40 AC for each TS stream, maximum 768 bytes for each AC • Scrambling for 10 TS streams simultaneously • Support scrambling up to 64 programs for each TS stream, up to 15 PID for each program • Support DVB and OpenCAS for EIS • Support the same EMM for different TS streams, maximum 12 EMMs ,maximum bandwidth 2Mbps for each EMM • Support 4 CAS Simulcrypt for each TS stream
C510CI De-scrambling Card	2 x CAM slot, PCMCIA standard	• Input/output multiplex from backboard • Video: MPEG-1, MPEG-2, H.264 • Audio: MPEG-1, MPEG-2 • Supports simulcrypt • Supports 2 CAM cards (Common Interface CI) • Supports de-scramble for maximum 64 programs (up to the capacities of the CAM cards) • Supports de-scramble for BISS

Modulating & Demodulating Modules

Product	Description	Specification
C508 QAM Output Card 	2 -6 RF outputs Each port provides 2/4/6 adjacent QAM channels	• ITU-T J.83 Annex A, B and C • 64, 128, 256 QAM constellations • Frequency range 52-1000MHz • Symbol rate: 5M-7M(1K step) • Output level: 95 ～ 120 dBuV • MER(balanced off): ≥ 38 dB@64QAM, ≥ 37 dB@256QAM • MER(balanced on): ≥ 44 dB • CNR: ≥ 55dB • PCR jitter:<100ns • Phase noise: ≤-65 dBc/Hz @1kHz, ≤-95 dBc/Hz @10kHz, ≤-110 dBc/Hz @100kHz
C513CI QAM-CI Input Card 	1 RF input with one testing output Iutput: 1 x RF Loop output: 1 x RF	• Each input supports one QAM receiving and de-scrambling • 16, 32, 64, 128, 256 QAM constellations • Frequency range 51-858MHz • Symbol rate: 0.87M-6.9M • Input level: 65 ～ 120 dB • Each CAM supports 16 programs descrambling • Support TR101290

C505

QPSK Input Card

2 RF Inputs and 2 RF loop outputs

Inputs:2 x RF
Loop Output: 2 x RF

- Frequency range: 950MHz~2150MHz
- Received signal level: -80dBm
- Symbol range: 2Msps ~ 45Msps
- FEC: 1/2,2/3,3/4,5/6,7/8
- Support SCPC/MCPC
- Polarization: Vertical, Horizontal
- Roll-off factor : 35%
- Support C/Ku band

C545

4-frequency DVB-S2 demodulation receiving card

4 channels satellite signal Input

Input：4×RF inputs

- Receive frequency：950MHz~2150MHz
- Effective receiving level：-65dB~-25dB
- symbol rate：1Msps ~ 45Msps
- Maximum TS bitrate：120Mbps（DVB-S2）
- Modulation mode：
  DVB-S2：QPSK、8PSK、16APSK、32APSK
  DVB-S：QPSK
- Roll-off coefficient：
  DVB-S：0.35
  DVB-S2：0.35，0.25，0.2
- Convolution code rate：
  DVB-S：1/2,2/3,3/4,5/6,7/8.
  DVB-S2：1/2,3/5,2/3,3/4,4/5,5/6,8/9,9/10
- 22KHz on/off
- LNB power：13V、18V、option closed
- C/Ku band compatibility：support
- TS interruption recovery function：support
- De-scrambling function: Support BISS de-scrambling, each channel can support 8 programs de-scrambling, then 4 channels on 1 card can support 32 programs simultaneously

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C515CI

DVB-S/S2
De-scrambling Receiver Card

1 RF Input and 1 RF loop output

Input: 1 x RF
Loop output: 1 x RF

- Frequency range: 950MHz~2150MHz
- Received signal level: -65dB~-25dB
- Symbol range: 1Msps ~ 45Msps
- FEC: DVB-S 1/2, 2/3, 3/4, 5/6, 7/8,DVB-S2 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
- Support SCPC/MCPC
- Polarization: Vertical, Horizontal
- Roll-off factor : 20%, 25%, 35%
- Support C/Ku band
- Support QPSK/8PSK
- Maximum 16 programs de-scrambling

Statistic Multiplexing Modules

Product	Description	Specification
C704 6-Channel Statistic Multiplexing Card 	3 channels ASI inputs and 1 channel ASI output ---------- Input: 3 x ASI Output: 1 x ASI	• Input bit rate range: 2~8Mbps • Support setting program priority • Statistic multiplexing output: 1×TS(MPTS) with MPEG-2 standard • Support CBR/VBR • Support D1, 3/4D1 and HD1 resolution • support minimum/maximum bit rate setting
C705 20-Channel Statistic Multiplexing Card 	4 channels ASI outputs ---------- Output: 4 x ASI	• Input bit rate range: 2~8Mbps • Support setting program priority • Statistic multiplexing output: 4×TS(MPTS) with MPEG-2 standard • Support CBR/VBR • Support D1, 3/4D1 and HD1 resolution • Support minimum/maximum bit rate setting
C302MH ATSC M/H Statistic Multiplexing Card	2 outputs for ASI or SMPTE310 protocol and Gbe Input&output by two independent connector ---------- Output : 2 x ASI/ SMPTE310 Control via front panel or 10/100Base-T Ethernet interface	

C707

30-Channel Statistic Multiplexing Card

4 channels ASI outputs

Output: 4 x ASI
Connect type: RJ45
Format: 10/100 BaseT

- Input bit rate range: 2~8Mbps（SD），12~20Mbps（HD）
- Output bit rate range: 1~8Mbps(SD)，6~20Mbps(HD)
- Maximum Compressing Rate:50%(Recommend 40%）
- Audio Transparent Transmission
- Support maximum 30 SD programs / 6 HD programs
- Support setting program priority
- Statistic multiplexing output: 4×TS(MPTS) with MPEG-2 standard
- Support CBR/VBR
- Support ASI, IP, DS3 etc rear panel input
- Support D1, 3/4D1 and HD1 resolution
- Support minimum/maximum bit rate setting

Switch Modules

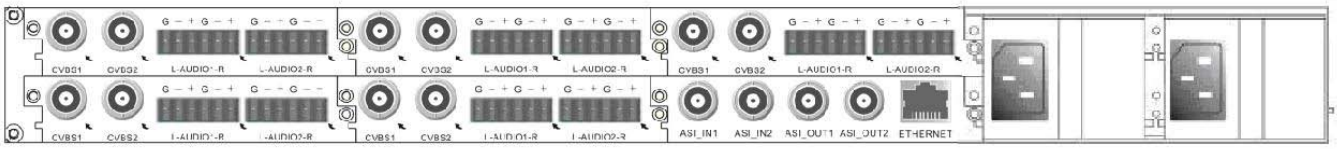
Product	Description	Specification
CA05 RF Switch Card 	2 RF Inputs and 1 RF Output with 1 ASI output --- Input: 2 x RF Output: 1 x ASI, 1 x RF	• Switch from 2×RF to 1×RF and 1×ASI (same) • Support program priority setting • Automatic/manual • Switch time: 125ms
CA01B ASI Switch Card 	3 channels ASI inputs and 2 channels ASI outputs --- Input: 3 x ASI Output: 2 x ASI	• Switch from 3×ASI to 2×ASI • Automatic/manual • Switch time: 125ms

Product	Description	Specification
C113DT Dolby Transcoding Card	Dolby digital to Dolby digital+ transcoding	• Input and output Rate: mono (1.0): 32~640kbps 2 ch (2.0): 64~640kbps 3 ch (3.1 2.2):160~640kbps 4 ch (3.2): 192~640kbps

Typical Applications

MPEG-2 Analog SD Encoders

Case 1:



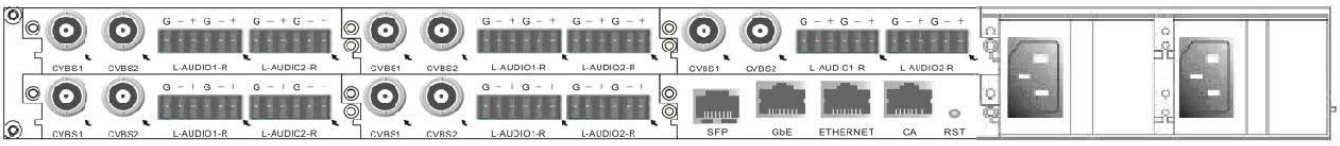
Details: This application can encode 10×CVBS signals to MPEG-2 streams and output 2×ASI after re-multiplexing.

Input: 10×CVBS, 10×balanced stereo, 2×ASI

Output: 2×ASI

Card Combination: 5 × MPEG-2 Analog Encoding Card + 1× 2 ASI Input/2 ASI Output & Main Control Card

Case 2:



Details: This application can encode 10×CVBS signals to MPEG-2 streams and output 1×GbE IP after remultiplexing.

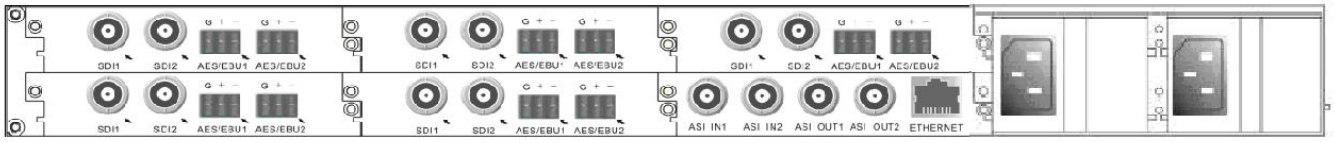
Input: 10×CVBS, 10×balanced stereo, 1×GbE IP

Output: 1×GbE IP

Card Combination: 5 × MPEG-2 Analog Encoding Card + 1× Gigabit IP & Main Control Card

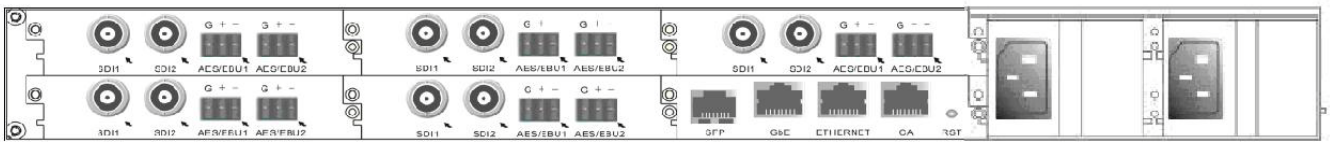
MPEG-2 Digital SD Encoders

Case 1:



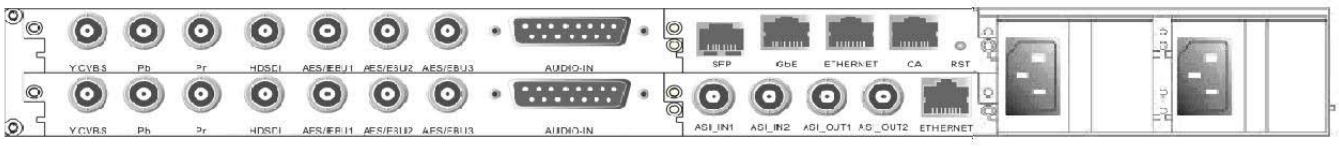
Details: This application can encode 10×SDI signals to MPEG-2 streams and output 2×ASI after remultiplexing.
Input: 10×SDI, 10×AES/EBU, 2×ASI
Output: 2×ASI
Card Combination: 5× MPEG-2 Digital Encoding Card + 1× 2 ASI Input/2 ASI Output & Main Control Card

Case 2:



Details: This application can encode 10×SDI signals to MPEG-2 streams and output 1×GbE IP after re-multiplexing.
Input: 10×SDI, 10×AES/EBU, 1×GbE IP
Output: 1×GbE IP
Card Combination: 5 × MPEG-2 Digital Encoding Card + 1× Gigabit IP & Main Control Card

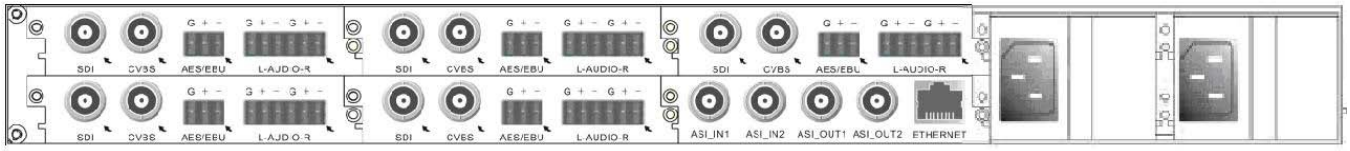
MPEG-2 HD Encoders



Details: This application can encode 2×YPrPb/CVBS/HD-SDI signals to MPEG-2 HD streams and output 1×GbE IP and 2×ASI after re-multiplexing.
Input: 2× YPrPb/CVBS, 2×HD-SDI, 6×AES/EBU, 6×analog stereo (DB25),1×GbE IP, 2×ASI
Output: 1×GbE IP, 2×ASI
Card Combination: 2 × MPEG-2 HD Encoding Card + 1× 2 ASI Input/2 ASI Output & Main Control Card + 1× GbE IP Card

H.264 SD Encoders

Case 1:



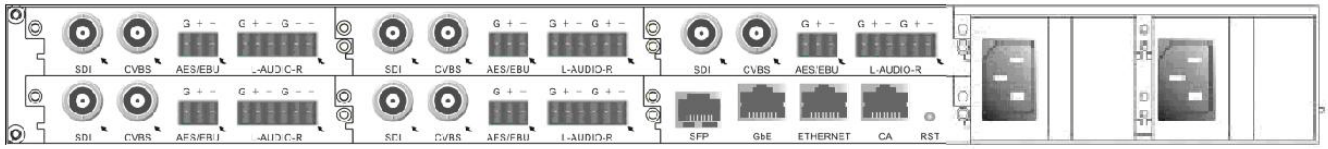
Details: This application can encode 5×SDI signals or 5×CVBS to H.264 streams and output 2×ASI after re-multiplexing.

Input: 5×SDI, 5×CVBS, 5×AES/EBU, 5×balanced stereo, 2×ASI

Output: 2×ASI

Card Combination: 5 × H.264 SD Encoding Card + 1× 2 ASI Input/2 ASI Output & Main Control Card

Case 2:



Details: This application can encode 5×SDI signals or 5×CVBS signals to H.264 streams and output 1×GbE IP with SPTS or MPTS.

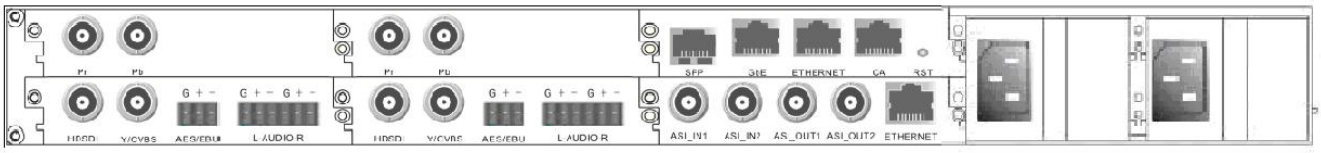
Input: 5×SDI, 5×CVBS, 5×AES/EBU, 5×balanced stereo, 1×GbE IP

Output: 1×GbE IP

Card Combination: 5 × H.264 SD Encoding Card + 1× Gigabit IP & Main Control Card

H.264 HD Encoders

Case 1:



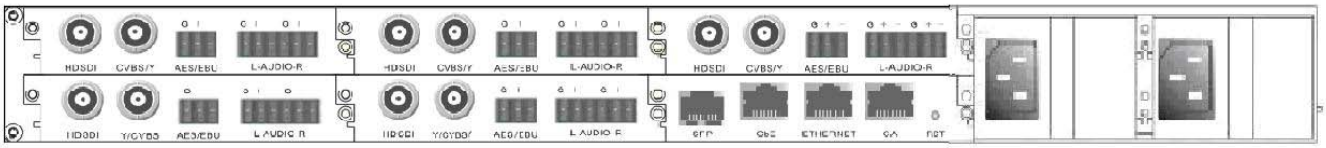
Details: This application can encode 2×YPrPb/CVBS/HD-SDI signals to H.264 HD streams and output 2×ASI as well as 1×GbE IP after re-multiplexing.

Input: 2×YPrPb/CVBS, 2×HD-SDI, 2×AES/EBU, 2× balanced stereo, 2×ASI, 1×GbE IP

Output: 2×ASI, 1×GbE IP

Card Combination: 2 × H.264 HD Encoding Card +1 × GbE IP Card +1 × 2 ASI Input/2 ASI Output & Main Control Card

Case 2:



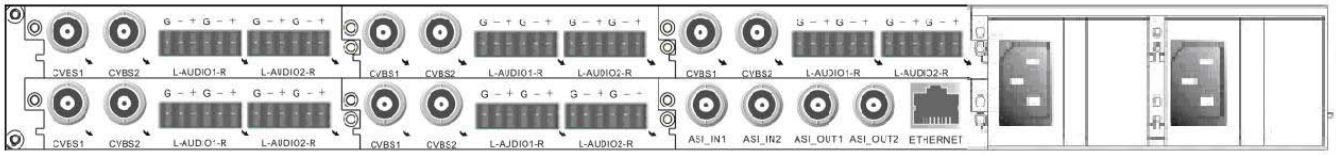
Details: This application can encode 5×CVBS/HD-SDI signals to H.264 HD streams and output 1×GbE IP after re-multiplexing.

Input: 5× CVBS, 5×HD-SDI, 5×AES/EBU, 5×stereo, 1×GbE IP

Output: 1×GbE IP

Card Combination: 5 × H.264 HD Encoding Card +1 × GbE IP & Main Control Card

ASI Input Analog Decoders



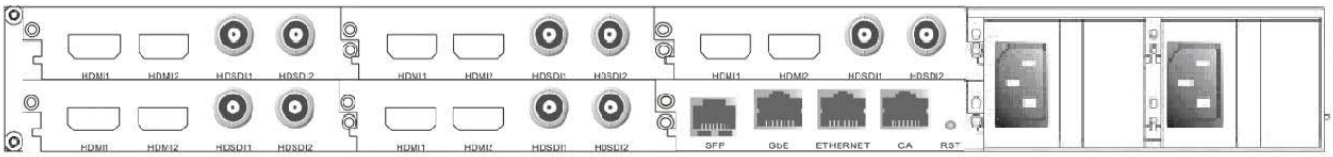
Details: This application can decode MPEG-2/H.264 SD/HD streams from 2×ASI to 10× CVBS.

Input: 2×ASI

Output: 10× CVBS, 10× balanced stereo, 2×ASI

Card Combination: 5 × Analog Decoding Card +1 × 2 ASI Input/2 ASI Output & Main Control Card

IP Input Digital Decoders



Details: This application can decode MPEG-2/H.264 SD/HD streams from 1×GbE IP to 10× (SDI + HDMI).

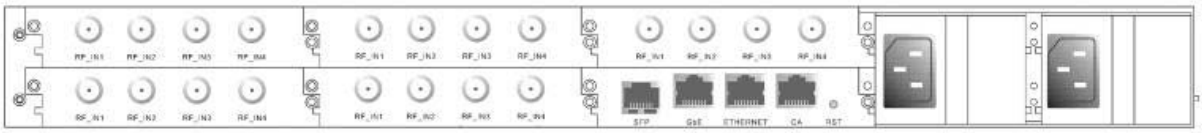
Input: 1×GbE IP

Output: 10× (SDI + HDMI) (Audio Embedded) , 1×GbE IP

Card Combination: 5 × Digital HD Decoding Card + 1× GbE IP & Main Control Card

IRDs based on EMR

5×4 CH QPSK Input Card +1×GbE IP & Main Control Card



Details: This application can receive 20 QPSK FTA streams (DVB-S/S2) or 5 QPSK encrypted streams (DVB-S/S2) from satellites as well as 1×GbE IP, and output in one GbE IP after remultiplexing.

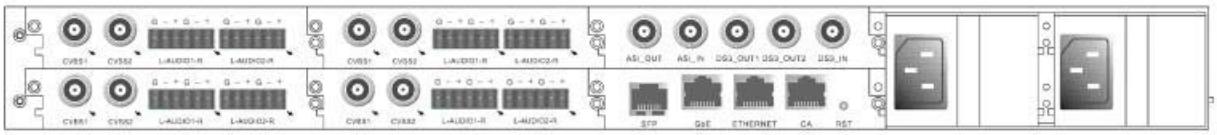
Input: 20×QPSK (DVB-S/S2) or 5× QPSK (DVB-S/S2), 1×GbE IP

Output: 1×GbE I

Decoders based on EMR

DS3/E3 Input SD Decoders

4×Analog SD Decoding Card + 1×DS3/E3 Card + 1×GbE IP & Main Control Card



Details: This application can decode MPEG-2/H.264 streams from 1×DS3/E3/ASI/IP to 8×CVBS .

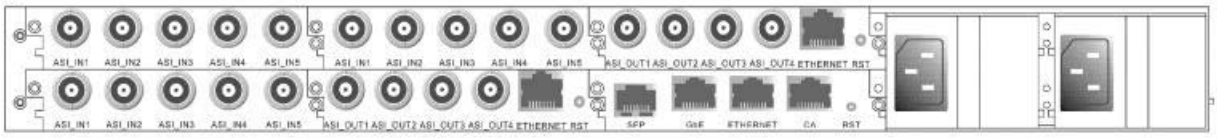
Input: 1×DS3/E3, 1×ASI, 1×GbE IP

Output: 8×CVBS, 8×balanced stereo, 1×ASI, 1×DS3/E3, 1×GbE IP

Gateway based on EMR

ASI<-->IP gateway

3×5 ASI Input Card + 2×4 ASI Output Cards + 1×GbE IP & Main Control Card



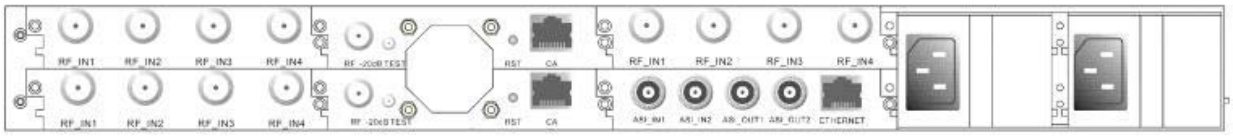
Details: This application can realize 15 ASI to IP and IP to 8 ASI gateways.

Input: 1×IP, 15×ASI

Output: 8×ASI, 1×IP

Transmodulators based on EMR

3×4-frequency DVB-S2 Demodulation Receiving Card + 2×8-adjacent-channel QAM Modulating Card + 1×2 ASI Input/2 ASI Output & Main Control Card



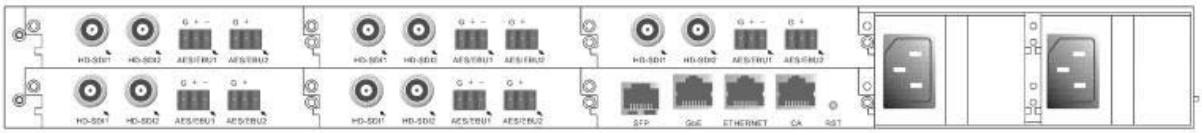
Details: This application can transmodulate streams from 12×DVB-S/S2 satellite stream to 16×QAM after remultiplexing.

Input: 12×DVB-S/S2 satellite stream, 2×ASI

Output: 16×QAM, 2×ASI

Transcoder based on EMR

5×H.264 HD Encoding and Transcoding Card + 1×GbE IP & Main Control Card



Details: This application can encode 10×HD-SDI or transcode from 10×MPEG-2 to H.264 (HD).

Input: 1×IP, 10×HD-SDI

Output: 1×IP

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