

Sumavision

Enhanced Multimedia Router

Product Catalogue



2014 V3.0


Sumavision
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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 functional cards
- Massive internal multiplexing: maximum 8.5G data processing
- Maximum 24 IRDs for DVB-S/S2 FTA streams
- Maximum 20 IRDs for DVB-S/S2 encrypted streams
- Multi-encoding support: SD/HD MPEG-2/MPEG-4/H.264
- Maximum 24 programs MPEG-2/H.264 encoding/decoding
- Maximum 36/72 QAM outputs
- Maximum 30 ASI inputs or 30 ASI outputs
- Maximum 8G IP inputs/outputs
- Maximum 512 streams/2048 programs scrambling over IP
- Support IPTV and conversion of MPTS from any type of inputs to SPTS
- Support dual-power supply and hot-swap
- Maximum 180 programs statistic multiplexing
- Maximum 512 SPTS IP output through Gbe IP Ports

Optional Modules Overview

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Modules Introduction

Analog MPEG2 SD Encoding Modules

Product	Description	Specification
C101AS 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)



C101A (EMR2.1)

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)

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	● 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
	Input: Video: 2 x SDI (Audio Embedded),BNC Audio: 2 x AES/EBU, 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 ~ 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 Resolution : 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
C150 (L/S) H.264 HD Encoding Card 	1 channel H.264 HD/SD video encoding ----- Input: Video: 1 x HD-SDI, BNC 1 x HDMI, HDMI 1 x YPbPr, extended via DVI 1 x CVBS , extended via DVI Audio: 1 x HD-SDI, embedded audio (4 in 8). 1 x HDMI, embedded audio (4 in 4). 4 x AES/EBU, extended via DVI. 2 x analog stereo audio, extended via DVI.	Video Input format: HD: 1920×1080 60i/59.94i/50i/24p/23.98p 1280×720 60i/59.94p/50p SD: 720×576 50i, 720×608 50i 720×480 59.94i, 720×512 59.94i Resolution/Frame Rate self-adaptive Video Encoding - Encoding profile: Baseline, Main, High, High4:2:2 - Encoding Level: 1.0 ~1.3, 2.0~2.2, 3.0~3.2, 4.0~4.2, 5.0~5.1 - Encoding resolution: 1920×1080, 1280×720 720×576, 720×480 - Aspect Ratio: 4:3/16:9 - Encoding Bit-rate: 0.1Mb/s - 25Mb/s - H.264 HD recommended bit-rate: 6Mb/s - 12Mb/s - H.264 SD recommended bit-rate: 1.5Mb/s - 3Mb/s - Bit-rate Control: CBR/VBR - GOP Length: 1~30 - GOP Structure: Open GOP/Closed GOP - B Frame number: 0, 1, 2, 3 - Self-adaptive I Frame Insertion - Entropy code: CABAC、CAVLC - Preprocessing: de-interlacing, noise reduction, sharpen

- Encoding delay: 0.7s
-
- MP2、AAC-LC、HE-AAC v1、HE-AAC v2、Dolby Digital Professional
 - Sampling frequency: 48kHz/44.1kHz/32kHz
 - Sample size: 24-bit
 - Encoding rates:
 - AC3-PE: (only support 48kHz sampling frequency)
 - Stereo, 96kbps-384kbps
 - AAC-LC:
 - Stereo, 32kbps~284kbps
 - Dual, 32kbps~284kbps
 - Mono, 32kbps~192kbps
 - HE-AAC v1:
 - Stereo, 32kbps~192kbps
 - Dual, 32kbps~192kbps
 - Mono, 32kbps~96kbps
 - HE-AAC v2:
 - Stereo, 32kbps~96kbps
 - MPEG-1 LayII:
 - Stereo, 64kbps,96kbps~384kbps
 - Mono, 32kbps~192kbps
 - Audio pass-through
 - MP2、AAC-LC、HE-AAC v1、HE-AAC v2、Dolby Digital Professional

C150 A

H.264 Analog Encoding Card



2 channel H.264 SD Analog encoding

Input

Video: 2 × CVBS, BNC interface
Audio: 2 x Analog stereo (balanced);

Video

- ◆ Encoding profile: Baseline, Main, High
- ◆ Encoding Level: 3.0~3.2, 4.0
- ◆ Encoding resolution: 720/480/352×576/480
- ◆ Encoding Bit-rate: 0.3Mb/s - 10Mb/s
- ◆ Aspect ratio: 4:3, 16:9
- ◆ Entropy encoding: CABAC, CAVLC
- ◆ GOP structure: IBBP, IBP

Audio

- ◆ Audio Formats: MP2、AAC-LC、HE-AAC v1、HE-AAC v2、Dolby Digital Professional
- ◆ Sampling frequency: 48K/44.1K/32K
- ◆ Encoding Bit-Rate: 32Kb/s ~384Kb/s

C150 D

H.264 Digital Encoding Card



2 channel H.264 HD/SD Digital encoding

Input:

Video:

- ◆ 2 × HD-SDI digital video, BNC interface
- ◆ 2 × HDMI digital video, HDMI interface

Audio:

- ◆ 1 x Analog stereo (balanced);
- ◆ 2 × HD-SDI embedded audio (4 in 8)
- ◆ 2 × HDMI embedded audio (4 in 4)

Video

- ◆ Encoding profile: Baseline, Main, High
- ◆ Encoding Level: 3.0~3.2, 4.0~4.1
- ◆ Encoding resolution:
 - 1920/1440/1280/960×1080
 - 1280/960/640×720
 - 720/544/480/352×576/480
- ◆ Encoding Bit-rate: 0.3Mb/s - 25Mb/s
 - H.264 HD recommended bit-rate: 6Mb/s - 12Mb/s
 - H.264 SD recommended bit-rate: 1.5Mb/s - 3Mb/s
- ◆ Aspect ratio: 4:3, 16:9
- ◆ Entropy encoding: CABAC, CAVLC
- ◆ GOP structure: IBBP, IBP(1080i)

Audio

- ◆ Audio Formats: MP2、AAC-LC、HE-AAC v1、HE-AAC v2、Dolby Digital Professional
- ◆ Sampling frequency: 48K/44.1K/32K
- ◆ Encoding Bit-Rate: 32Kb/s ~384Kb/s

Transcoding module

Product	Description	Specification
C131	4 H.264 SD / 2 H.264 HD channels Encoding & 8 MPEG2/H.264 SD or 2 HD Programs Transcoding -----	Video Input: - Resolution self-adaption: 1920/1440/1280/960x1080 1280/960/640x720 720/704/544/528/480/352x576 720/704/544/528/480/352x480 - Frame rate self-adaption: 23.98p/59.94i/60i/50i 59.94p/60p/50p 50i 59.94i - Video format: - MPEG-2 - Main Profile/High level - H.264 - Profile :Baseline, Main, High - Level:1.0~1.3、2.0~2.2、3.0~3.2、4.0~4.1 IDR Frame Frequency: 0~5 GOPs Video Output: - Resolution: 1920/1440/1280/960x1080 1280/960/640x720 720/704/544/528/480/352x576 720/704/544/528/480/352x480 - Frame rate: 23.98p/59.94i/60i/50i 59.94p/60p/50p 50i 59.94i - Video format: - D1: H.264/AVC 4:2:0 MP@Level 3.0 - HD: H.264/AVC 4:2:0 HP@Level 4.0 - Output Bitrate: - D1: 2-10Mb/s 1280x720p: 4-20Mb/s 1440x1080i: 5-20Mb/s 1920x1080i: 6-20Mb/s - Bitrate control: CBR/VBR - GOP Length: 1~600 - B Frame Number: 0,1,2,3,4,5,6,7 - Entropy coding: CABAC, CAVLC ----- Audio: Mpeg-I layer2、AAC-LC、HE-AAC v1、HE-AAC v2、Dolby Digital、Dolby Digital Plus、LPCM Audio Pass Through

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
C202DH Digital HD Decoding Card 	2 channels multi-format (MPEG-2, H.264) signal SD/HD video decoding ----- Output: Video: 2 x HDSDI, BNC Audio: HD-SDI or AES(EBU) (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 	1 channel SDI with embedded audio (supports YPbPr/ CVBS output) ----- Output: Video: 1 x YPbPr, BNC; 1 x CVBS, (Same port with Y); 1x HD-SDI, (audio embedded) BNC; 1x HD-SDI(Backup) (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

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
C304S(EMR2.1) 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

C355

ASI Input&Output Card



5 channels ASI inputs and outputs Card

Input: Up to 5x ASI
Output: Up to 5x ASI

- Maximum bit rate (each ASI):213Mbps
 - Minimum accepting sensitivity $\leq 200\text{mV}$
 - Maximum input Voltage $\geq 880\text{mV}$
 - Return Loss(5MHz~270MHz) $\leq -20\text{dB}$
 - 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
C409 ATM Adapter Card 	Receiving ATM signal and output ATM signal ----- Input port: 1×BNC, ATM interface Output port: 1×BNC, ATM interface	• Input port support 2 input streams • Output port support 2 output streams • Support SDH and SONET • Get ATM signal from input and output by other card • Get TS from EMR main board and output ATM signal
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

Scrambling & De-scrambling Modules

Product	Description	Specification
C471S (EMR2.1) 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
C472S IP Scrambling Card 	Scrambling Card attached on mainboard	- Maximum 1024 programs scrambling with up to 2048 PIDs - Up to 8 ports output for each sub card - Up to support 255 programs scrambling for each port - Support 4 CAS Simulcrypt for each TS stream - No limited PIDs of each port with maximum 32 PID of each program
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 	1 RF output ----- 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
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

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

C523CI

DVB-C Demodulation & Descrambling Card



1 RF Input and 1 RF loop output

Input: 1 x RF

Loop output: 1 x RF

- Frequency range: 54MHz~866MHz
- Received signal level: ≥ 45 dbuv
- Symbol range:
 - Annex B 64QAM 5.057
 - Annex B 256QAM 5.360
 - Annex A 3-7
- FEC: ITU J.83 Annex A/B/C compatible
- Bandwidth: 6M, 8M
- Maximum 16 programs de-scrambling

C507S

DVB-S/S2 Modulation Card



1 channel satellite
signal output

Input: 1xASI input

- Receive frequency: 950MHz~2150MHz
- Output level: 73.0 dBuV~113.0 dBuV
- symbol rate: 50K~45000K
- FEC Modulation mode:
DVB-S2:
QPSK-1/4; QPSK-1/3; QPSK-2/5; QPSK-1/2; QPSK-3/5; QPSK-2/3;
QPSK-3/4; QPSK-4/5; QPSK-5/6; QPSK-8/9; QPSK-9/10;
8PSK-3/5; 8PSK-2/3;
8PSK-3/4; 8PSK-5/6; 8PSK-8/9; 8PSK-9/10; 16APSK-2/3;
16APSK-3/4; 16APSK-4/5;
16APSK-5/6; 16APSK-8/9;
16APSK-9/10; 32APSK-3/4; 32APSK-4/5; 32APSK-5/6;
32APSK-8/9; 32APSK-9/10
DVB-S:
QPSK-1/2, QPSK-2/3, QPSK-3/4, QPSK-5/6, QPSK-7/8
- Roll-off factor: 35%, 25%, 20%
- FEC-frames: 64800 bits/8100 bytes or 16200 bits/2025 bytes

C544

4 Frequencies DVB-T2
De-modulating Card



Receive 4 DVB-T/T2/C streams

Input: 4 x RF

- Received Frequency range: 52MHz~858MHz
- Received signal level: -75dBm~-5dBm
- Received bandwidth(DVB-T2):5MHz, 6MHz, 7 MHz, 8 MHz
- Symbol rate range(DVB-C): 1Msps ~ 7Msps
- Modulating mode:
DVB-T2: QPSK, 16QAM, 64QAM,256QAM
DVB-T: QPSK, 16QAM, 64QAM
DVB-C: 64QAM,128QAM,256QAM
- FEC:
DVB-T2: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 7/8
DVB-T: 1/2,2/3,3/4,5/6,7/8
- Carrier wave mode:
DVB-T2: 1K、2K、4K、8K、16K、32K
DVB-T: 2k、8k
- Support BISS descramble :every port can descramble 8 programs

C508T

4 Un-adjust Frequencies
DVB-T2 Modulating Card



DVB-T/H 4 channels Un-adjust
Frequencies modulating

Output

- One RF
Output(4-unadjacent-channel),
F-type connector
- One RF Test port(-20dB),
SMA-type connector

- Modulation mode: 16QAM, 64QAM, QPSK
- Support 5,6,7 or 8MHz bandwidth
- Frequency range: 42-870MHz (4-unadjacent-channel in one RF port)
- Tuning Frequency Step: 1KHz
- Output Electric Level range: 90-120 dBuV
- MER(unequalized): ≥40@64QAM
- SNR: ≥55dBc@64QAM
- PCR Jitter: ≤100ns
- Phase Noise: ≤-85dB@1KHz, ≤-103dB@10KHz, ≤-115dB@100KHz
- RF Output : F-type connector, 75Ω
- Support fixed PID Mapping
- Maximum PID in each port: 256
- Capable of multiplex TS stream from any card of EMR

C525CI

DVB-S/S2
De-Scrambling&De-Modulation
Receiving Card

Receive one DVB-S/S2
stream

Input: 1 x RF
2 CAM slots

- Received Frequency range: 950MHz~2150MHz
- Received signal level: -65dB~-25dB
- Symbol rate range: 1Msps ~ 45Msps
- Modulating mode:
- Support DVB-S2: QPSK、8PSK、16APSK、32APSK
DVB-S: QPSK
- 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
- Maximum 128 programs de-scrambling,
each program support 128 PIDs
- CAM descrambling Single-slot maximum
transfer rate: 200Mbps (400Mbps
bandwidth is dynamically shared four ports)
- BISS descrambling bandwidth: 108Mbps
(400Mbps bandwidth is dynamically shared
four ports)
- Roll-off factor: DVB-S: 0.35
DVB-S2: 0.35, 0.25, 0.2

C518

24 Un-adjacent
Frequencies QAM Output
Card

1 RF output

1 SFP GBE Input

1 RJ45 Control Port

Each port provides up to 24
un-adjacent QAM channels



- ITU-T J.83 Annex A
- 64, 128, 256 QAM constellations
- 6 or 8MHz bandwidth
- Frequency range 45-1000MHz
- Symbol rate: 3.5M-7M(1K step)
- Output level: 95 ~ 122 dBuV
- MER(unequalized): ≥ 42
- CNR: $\geq 60\text{dBc}@256\text{QAM}$
- PCR jitter: $<200\text{ns}$
- Phase Noise: $\leq -85\text{dB}@1\text{KHz}$, $\leq -100\text{dB}@10\text{KHz}$,
 $\leq -105\text{dB}@100\text{KHz}$, $\leq -110\text{dB}@1\text{M}$
- RF Output : F-type connector, 75Ω
- Support fixed PID Mapping
- Maximum program NO. in each frequency: 64
- Maximum PID NO. in each frequency: 256
- Capable of multiplex TS stream from SFP
module(960Mbps)
- One EMR 3.0 can achieve 72 un- adjacent
frequencies RF output

Statistic Multiplexing Modules

Product	Description	Specification
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
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	
C409 ATM Adapter Card 	Receiving ATM signal and output ATM signal ----- Input: 1×BNC, ATM interface Output: 1×BNC, ATM interface	♦ Input port support 2 input streams ♦ Output port support 2 output streams ♦ Support SDH and SONET ♦ Get ATM signal from input and output by other card ♦ Get TS from EMR main board and output ATM signal

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(EMR2.1)

GbE IP Card



1 channel gigabit IP input
and output with UDP
encapsulation

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

C653/C653C

(EMR2.1)

Dual-Channel GbE IP Card



IP receiving and sending,
2SFP can work in main and
backup mode

Input&output:
2×1000 BASE-X SFP

Other ports:

CA:1×10/100BASE-T
Ethernet port, for scrambling
(valid when C471S is in use)

ETHERNET:1×10/100BASE-T
Ethernet port, for main control
(Valid only in C653C)

Signal Processing over IP

- 2 SFP can be configured independently
- Total processing capability of each SFP: 960Mbps
- Support 16 different TS input and 12 different TS 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

C302SI

EPG processing card



- ◆ Support xml format, Produce offline xml file format conversion software, unify different formats of xml (txt)
- ◆ Program amount: 1024
- ◆ File storage: 40M
- ◆ Information description support:
- ◆ short-event: Support up to 128 characters
- ◆ extended-event: Support up to 1024 characters
- ◆ Update method:
Manually update

Regularly updated: There are options of update everyday and update every Friday, this term can be expanded to custom mode

- ◆ Time zone control: Automatically adjust(Cooperate with TDT/TOT)

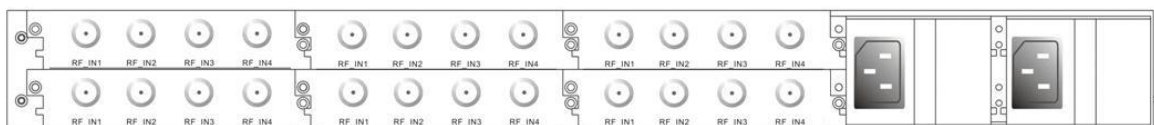
Switch Modules

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 (EMR2.1) 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
CA04 IP Switch Card	3 RJ45 GBE Ports 1 RJ45 100M Control Port ----- Input: 3 x RJ45 Output: 3 x RJ45	• Support multicast receiver and VLAN • 3 Ethernet ports can receive IP data, select the appropriate output according to the network port monitoring information. • Support power cut off direct function • Supports MAC address self-learning function

Typical Applications

IRDs based on EMR

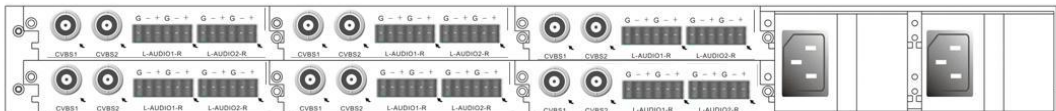
6×4 CH QPSK Input Card



Details: This application can receive 24 QPSK FTA streams (DVB-S/S2) from satellites as well as GbE IP, and output in one GbE IP after remultiplexing.
Input: 24×QPSK (DVB-S/S2), GbE IP
Output: GbE IP

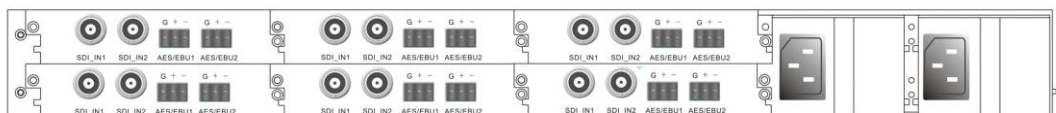
Multi-Enc & Transcoding based on EMR

6×MPEG-2 Analog SD Encoding Card(12ch MPEG2 SD CVBS)



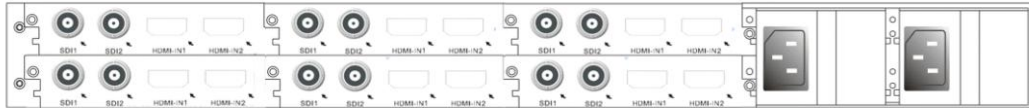
Details: This application can encode 12×CVBS signals to MPEG-2 streams and output GbE IP after remultiplexing.
Input: 12×CVBS, 10×balanced stereo, GbE IP
Output: GbE IP

6×MPEG-2 Digital SD Encoding Card(12ch MPEG2 SD SDI)



Details: This application can encode 12×SDI signals to MPEG-2 streams and output GbE IP after remultiplexing.
Input: 12×SDI, 12×balanced stereo, GbE IP
Output: GbE IP

6×H.264 Digital SD/HD Encoding Card(12ch H.264 SD/HD SDI)

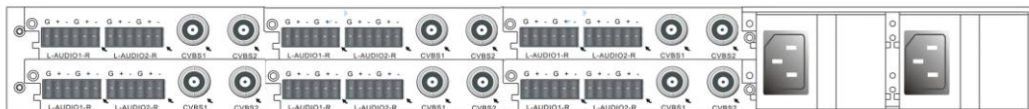


Details: This application can encode 12×SDI signals to H264 streams and output GbE IP after remultiplexing.

Input: 12×SDI, 12×balanced stereo, GbE IP

Output: GbE IP

6×H.264 Analog SD Encoding Card (12ch H.264 SD CVBS)

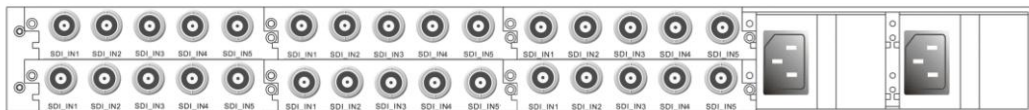


Details: This application can encode 12×CVBS signals to H264 streams and output GbE IP after remultiplexing.

Input: 12×CVBS 12×balanced stereo, GbE IP

Output: GbE IP

6x MPEG2/H.264 SD/HD Encoding Card (30ch MPEG2/H.264 SD SDI)



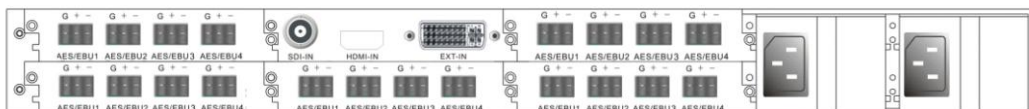
Details: This application can encode 30×SDI signals to **MPEG2/H.264** streams and output GbE IP after remultiplexing.

Input: 30×SDI

Output: GbE IP

4:2:2 Contribution based on EMR

1x H264 Low delay HD 4:2:2 Encoding card+5x audio Encoding cards(1ch H.264 4:2:2 video&24 audio)

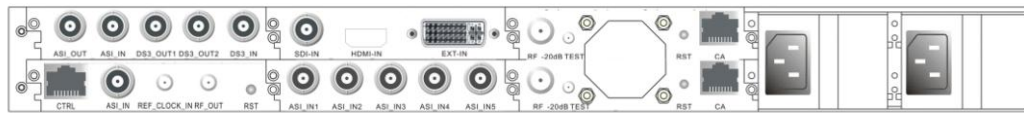


Details: This application can encode 1 **H.264 HD 4:2:2** program with 24 digital audio and output GbE IP after remultiplexing.

Input: 24 digital audio , 1 HD-SDI / HDMI

Output: GbE IP

Multi-interface transmission

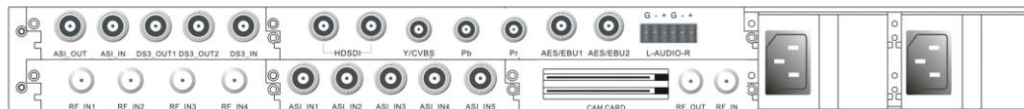


Details: This application can encode 1 **H.264 HD 4:2:2** program and support DS3 adaptation with up to 7 ASI inputs. Simultaneously support modulated followed by DVB-T/S/S2 and output GbE IP after remultiplexing.

Input: ASI , SDI, Expand port, GbE IP, DS3

Output: GbE IP, DVB-T/S/S2 Modulation, DS3, ASI

Multi-interface receiving

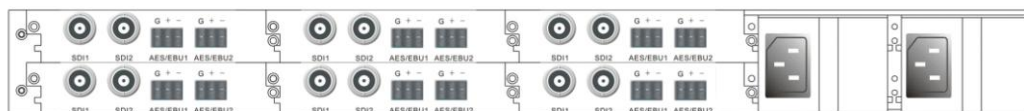


Details: This application can decode 1 **MPEG2/H.264 HD 4:2:2** program and support DS3 adaptation with up to 5 ASI inputs. Simultaneously support demodulated 4 streams followed by DVB-T/T2 and 1 stream received followed by DVB-S/S2 with descrambling module and output GbE IP after remultiplexing.

Input: ASI , RF, GbE IP, DS3

Output: GbE IP, CVBS, YPbPr, DS3, ASI

6x MPEG2/H.264 SD Decoding Card (12ch MPEG2/H.264 DEC)



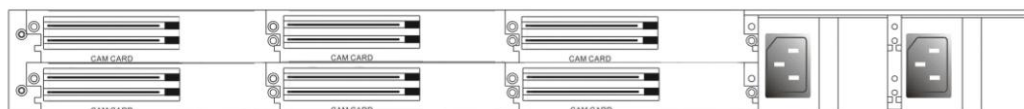
Details: This application can Decode 12×SDI signals to MPEG2/H264 streams

Input: GbE IP

Output: 12×SDI 12×AES/EBU

Bulk Descrambling based on EMR

6x Descrambling cards (96ch Descrambling)



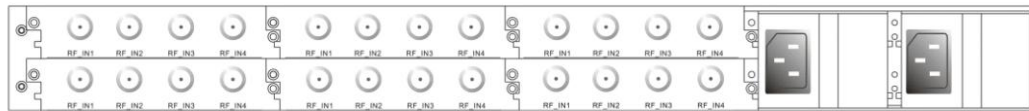
Details: This application can descramble up to 96ch of 12 scrambled streams

Input: GbE IP

Output: GbE IP

Bulk Receiving based on EMR

6x DVB-S/S2 satellite receiving cards(24 DVB-S/S2 satellite streams receiving)

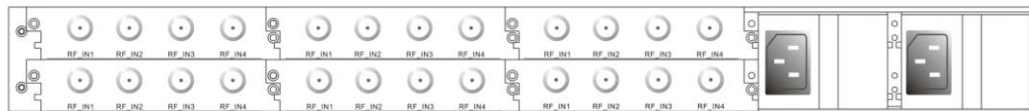


Details: This application can receive up to 24 satellite streams

Input: RF

Output: GbE IP

6x DVB-T/T2 Demodulation cards (24 DVB-T/T2 Streams receiving)

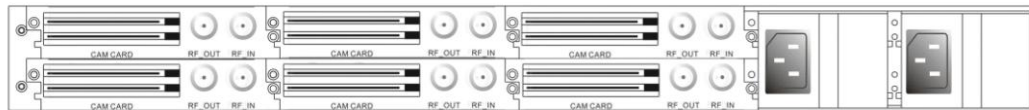


Details: This application can receive up to 24 DVB-T/T2 streams

Input: RF

Output: GbE IP

6x QAM Descrambling cards (6ch QAM signals receiving with descrambling module)



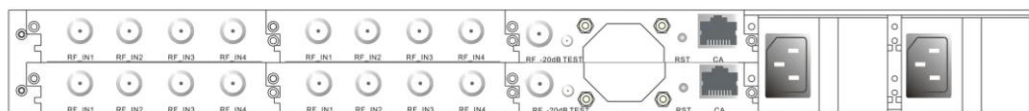
Details: This application can receive up to 6 QAM streams with descrambling

Input: RF

Output: GbE IP

HITS based on EMR

4x DVB-S/S2 satellite receiving cards + 2x 6 frequencies QAM output cards(16ch HITS)



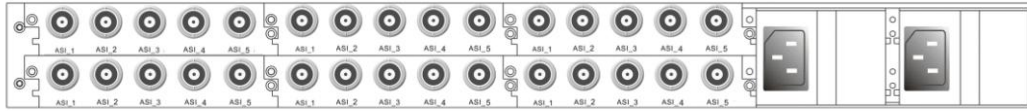
Details: This application can receive up to 16 satellite streams and 24-frequencies QAM modulation outputs

Input: RF

Output: GbE IP, RF

ASI-IP Gateway based on EMR

6x ASI input/output cards (30ch ASI-IP Gateway)

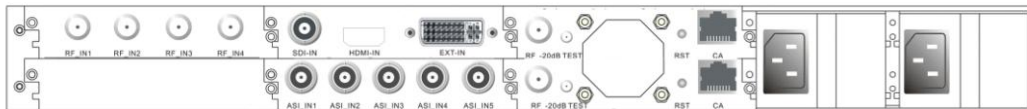


Details: This application can receive up to 30 ASI inputs of 30 ASI outputs signals by GbE IP In/out

Input: ASI , GbE IP

Output: GbE IP, ASI

DSNG based on EMR



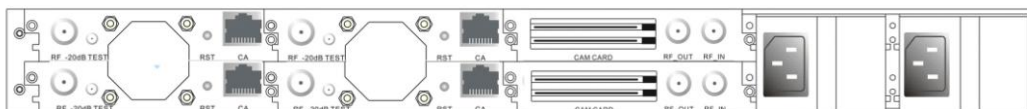
Details: This application can demodulate 4 DVB-T/T2 streams and encode 1 H264 HD 4:2:2 low delay encoding program and up to 5 ASI inputs of 5 ASI outputs signals which be modulated by DVB-S/S2 modulating module.

Input: ASI , GbE IP, RF, HD-SDI

Output: GbE IP, ASI, RF

Head-end based on EMR

4x DVB-T Modulation cards with 2x QAM descrambling cards(Hotel Headend)

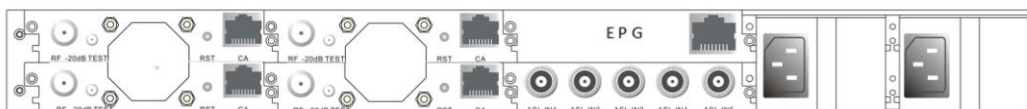


Details: This application can modulate 4 DVB-T streams by the 2 QAM streams with descrambling module

Input: GbE IP, RF

Output: GbE IP, RF

4xQAM Modulation cards+ASI input&output card + EPG card (500-1000 ch Headend)

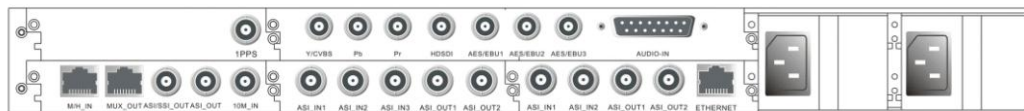


Details: This application can modulate 4 QAM streams by the 5 ASI I/O signals with EPG generating module

Input: GbE IP, ASI

Output: GbE IP, RF

ATSC-M/H based on EMR2.1



Details: This application can encoding one MPEG2 program and mux programs from other ASI interface, then output by M/H module

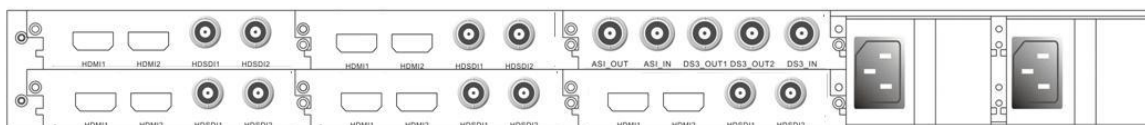
Input: GbE IP, ASI, CVBS, HDSDI

Output: GbE IP, ASI

Decoders based on EMR

DS3/E3 Input MPEG-2 Digital SD Decoders

5×MPEG-2 Digital Decoding Card +1×DS3/E3 Card



Details: This application can decode MPEG-2/H.264 streams from 1×DS3/E3/ASI /GbE IP to 10×HDSDI.

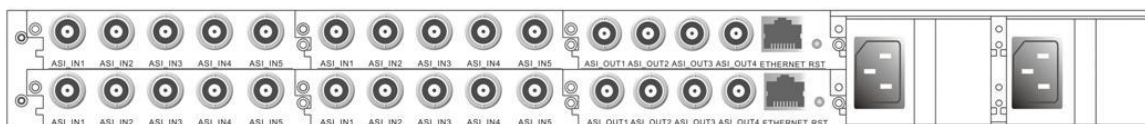
Input: 1×DS3/E3, 1×ASI, GbE IP

Output: 10×HDSDI, 1×ASI, 1×DS3/E3, GbE IP

Gateway based on EMR

ASI<-->IP gateway

4×5 ASI Input Card+2×4 ASI Output Cards



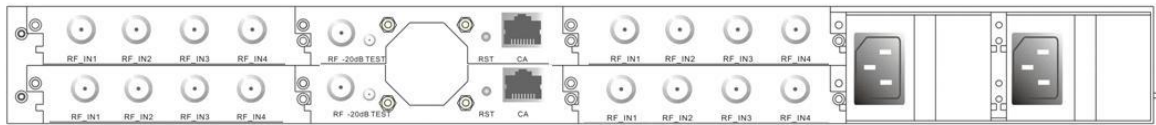
Details: This application can realize 20 ASI to GbE IP and IP to 10 ASI gateways.

Input: 1×IP, 20×ASI, GbE IP

Output: 10×ASI, GbE IP

Transmodulators based on EMR

4×QPSK Card+2×QAM Card



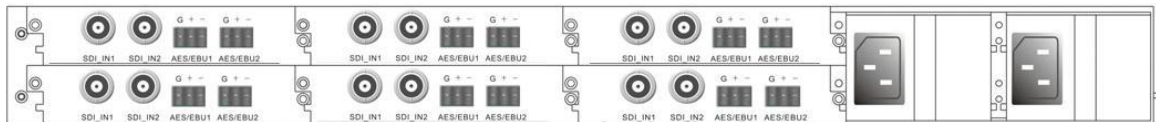
Details: This application can transmodulate streams from 16×QPSK to 12×QAM after remultiplexing.

Input: 16×QPSK, GBE IP

Output: 12×QAM, GBE IP

Transcoder based on EMR

6×MPEG-2 HD to H.264 HD transcoding Card



Details: This application can transcode from 12×MPEG-2 to H.264 (HD).

Input: SDI, GBE IP

Output: GBE IP

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