

Model D9040 Encoder

Description

To help optimize bandwidth utilization in digital transmission systems, the Model D9040 Encoder is designed to deliver high-quality MPEG-2 video in a small amount of bandwidth, allowing efficient utilization of bandwidth constrained mediums such as satellite.



The PowerVu® Network Centre (PNC) can provide control of multiple D9040 encoders, providing conditional access and managing the services through the primary distribution chain for programmers and broadcasters.

The D9040 Encoder incorporates PreSight*Plus*, which is an adaptive and motion-compensated noise reduction technique that provides picture quality in a noisy environment, and is suitable in both contribution and distribution applications.

The D9040 Encoder offers built-in support for SCTE-35 digital program insertion (DPI) via contact closure. This feature can be used to drive digital splicing equipment in headends for ad insertion or local programming. The D9040 also supports cue trigger transmission based on contact closures, which can be used for analog applications in conjunction with PowerVu decoders.

Features

- MPEG-2 video encoding
- Pre-analysis with 3:2 pull-down inversion
- Adaptive motion compensated temporal filtering with PreSight*Plus* noise reduction
- 1 RU, low power consumption, stackable
- Dual redundant power supplies
- Four audio channels as either embedded, analog or digital audio input
- Dolby® Digital/AAC pass-through and MPEG-1 Layer II audio encoding
- Integrated Frame synchronizer with internal reference
- PowerVu VBI and DVB VBI support
- SDI or composite input
- DPI via SCTE-35 support triggered by contact closure

Options

- Dolby-Digital audio encoding
- HE-AAC audio encoding
- Up to eight audio channels, as either embedded, analog or digital audio input

Specifications

Release 1.1

Video	
Composite input	
Systems	PAL (B, D, G, H, I, K, M, N and (N)), NTSC, NTSC-J
Video level	0 dBV nominal
Frequency response	± 0.2 dB, 10 Hz to 5.75 MHz
Differential gain/phase	$\leq 1\%$ pp / $\leq 1^\circ$ pp
Noise	< -58 dB
Impedance	75 Ω unbalanced
Return loss	> 35 dB, 10 Hz to 5.5 MHz
Connector	BNC
Aspect Ratio	4:3, 16:9 or auto-detect on VII or WSS
SDI input	
Systems	525/29.97 Hz and 625/25 Hz
Impedance	75 Ω unbalanced
Input level	800 mVpp nominal
Return loss	≥ 15 dB, 5 to 270 MHz
Connector	BNC
Bit rate	27 Mbit/s ± 10 ppm
Jitter acceptance	$\geq 25\%$ of a clock period
Aspect Ratio	4:3, 16:9 or auto-detect on VII or WSS
Audio	
Inputs	Analog, digital SPDIF or AES/EBU and embedded. AES/EBU is not supported for channels 1 and 2 SDI de-embedding from any audio group
Connector	BNC and terminal block
Number of channels	Up to four stereo pairs or eight mono channels
Analog Audio	
Impedance	600 Ω or $> 20k$ Ω balanced
CMRR	> 50 dB, 1 kHz
Clipping level	-6 to +24 dBu, 500 mdBu increments
SPDIF Digital Audio Ch 1+2 (On board) & Ch 3+4 (Optional)	
Impedance	75 Ω single-ended
Return loss	> 15 dB, 0.1 to 6.0 MHz
Input level	0.5 to 2 Vpp nominal
Sample rate	32, 44.1 and 48 kHz
AES/EBU Digital Audio Ch 3+4 (Options)	
Impedance	110 Ω balanced
Return loss	> 21 dB, 0.1 to 6.0 MHz
Input level	2 to 7 Vpp nominal, min. 500 mV
Sample rate	32, 44.1 and 48 kHz
Embedded Audio	
Format	SMPTE 272M
Sample frequency	48 kHz (locked to video)
Resolution	20 bits

Specifications, continued

Release 1.1

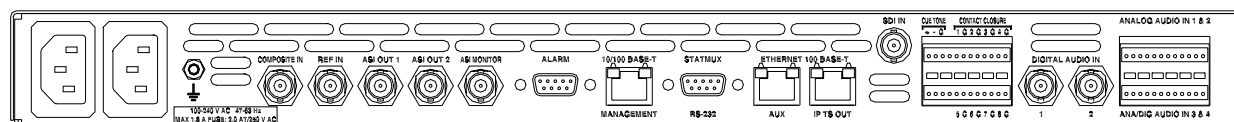
VBI Data Processing	
Composite and SDI	
Closed captions, XDS	EIA 608, DVS 157, SA Type 4
DVB-VBI formats	Teletext B, VPS, WSS and up to four transparent lines per field
PowerVu VBI formats	NABTS, WST, Inverted WST, AMOL I & II (Neilsen), VITC, Gemstar, WINK
Frame Synchronizer	
Control	Internal or external reference, bypass
Video and Audio Processing	
Video, MPEG-2	
Encoding	MPEG-2 MP @ ML
Encoding control	Adaptive coding parameters and GOP controlled by pre-analysis
Chroma format	4:2:0
Systems	525/29.97 Hz and 625/25 Hz
Encoding rate	0.5 to 15 Mbit/s
Mode	CBR, Statistical Multiplexing
H Resolutions	352, 480, 528, 544, 640, 704 and 720
V Resolutions	480 (for 525/29.97) and 576 (for 625/25)
Repeat field detect	NTSC and SDI, on/off
Video Pre-processing	
PreSight <i>Plus</i> filter suite	Adaptive spatio-temporal filtering with motion-compensation controlled by pre-analysis. Despeckle filter
Audio	
Encoding	Dolby Digital (AC-3), MPEG-1 Layer II, HE-AACv1, AAC-LC
Sample rates	32, 44.1 and 48 kHz (pass-through only 48 kHz)
Dolby Digital (AC-3) encoding modes	1/0 Center, 2/0 Stereo, 1+1 Dual Mono for professional applications
Dolby Digital (AC-3) encoding rates	56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384, 448, 512, 576 and 640 kbit/s
Dolby Digital (AC-3) pass-through rates	56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384, 448, 512, 576 and 640 kbit/s
Layer II encoding modes	Stereo, Joint Stereo, Dual Channel, Single Mono, Up to eight different PIDs
Layer II encoding rates	32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320 and 384 kbit/s
AAC-LC and AAC-HE bit rates	Variable 14 to 320 kbits/s
AAC encoding rates	Single mono left and/or single mono right, dual channel, joint stereo and stereo. Up to four different PIDs.
Transport Output	
DVB-ASI Output	
Number of outputs	Two + 1 monitor output (monitor cannot be muted)
Connector	BNC
Impedance	75 Ω
Return loss	≥ 15 dB, 27 to 270 MHz
TS rate	1 to 64 Mbit/s
TS packet length	188 bytes, 204 RS On, 204 RS Off
ASI bit rate	270 Mbit/s $\pm$ 100 ppm
Output level	800 mVpp nominal

Specifications, continued

Release 1.1

Monitor and Control	
Control System	PNC
Management interface	Ethernet 10/100 Base-T on RJ-45
Front panel	LCD character display with menu and input keys
Alarm relays	3 contact sets on 9-pin sub-D female
Statmux interface	RS-232 on 9 pin sub-D female
Environmental	
Operating temperature range	0 to +50°C (32 to 122°F)
Storage temperature range	-20 to +70°C (-4 to 158°F). (-40°C/-40°F can be obtained for a limited period, maximum 20 hours due to the display).
Relative humidity	+50°C/122°F 95% Relative Humidity , IEC 60068-2-78 test: Cab
Dimensions (W x H x D)	19 x 1.75 x 22 inches (482.6 x 44.5 x 560 mm)
Weight	19.2 lbs/8.7 kg
Cooling	Forced cooling with air flow from front to back
Altitude	70 to 106 kPa. ETS 300 019 part 1-3 stationary use, Class 3.2 and thus EN/IEC 60068-2-13, test M
Power Requirements	
AC Power	
Voltage range	100 to 240 VAC $\pm 10\%$
Line frequency	47 to 63 Hz
Power consumption, one PSU active	≤ 90 W
Power consumption, two PSUs active	≤ 95 W (in total for both inlets)

D9040 Rear Panel



Ordering Information

D9040 MPEG-2 Encoder	Part Number
D9040 - PAL/NTSC/SDI, MPEG-2 SD Encoder, Dual AC, 2 stereo audio Dolby Digital/AAC Passthrough and Layer II audio, Closed Captioning support, VBI, DPI*, ASI out, PNC Control, MPEG-2 Statmux, PreSightPlus adaptive and motion-compensated filter suite (noise reduction), US power cord	4018041.000
D9040 - PAL/NTSC/SDI, MPEG-2 SD Encoder, Dual AC, 4 stereo audio Dolby Digital/AAC Passthrough and Layer II audio, Closed Captioning support, VBI, DPI*, ASI out, PNC Control, MPEG-2 Statmux, PreSightPlus adaptive and motion-compensated filter suite (noise reduction), US power cord	4018041.100
Options	
Dolby Digital (AC-3) 2.0 encoding. Channels 1 and 2.	4018041.001
Dolby Digital (AC-3) 2.0 encoding. Channels 3 and 4 (requires 4 audio channels).	4018041.004
AAC-LC and HE-AAC audio encoding option. Stereo channel 1 and 2.	4018041.002
AAC-LC and HE-AAC audio encoding option. Stereo channel 3 and 4 (requires 4 audio channels).	4018041.008
Hardware Option	
Audio Channels 3 and 4, includes MPEG-1 Layer II	4013737
European power cord	700788
UK power cord	3993131
Australian power cord	180178
Conversions	
Software conversion from AVC-Ready D9040 to D9034 Encoder	4018041.1000
Hardware/software conversion from D9040 to D9034 Encoder	4018041.2000

Some information contained in this datasheet may reference future technology under development. All such information is subject to change at Cisco's sole discretion.

Contact Cisco for estimated commercial availability.

*DPI for the D9040 Encoder in PNC systems requires a valid PNC DPI Option license.

** AVC-Ready indicates that the D9040 Encoder will ship with the necessary hardware to accommodate AVC encoding. AVC encoding requires conversion to a D9034 Encoder, part number 4018041.1000 for AVC-Ready encoders.



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