

Cisco D9034 Encoder

Product Overview

To help optimize bandwidth utilization in digital transmission systems, the Cisco® D9034 Encoder is designed to deliver high-quality MPEG-4 part 10 (also known as H.264 or AVC), and optionally, MPEG-2 video using very limited bandwidth.

In this encoder, MPEG-2 can optionally coexist with MPEG-4 video within the same chassis. This enables operators to make use of both the MPEG-4 and the MPEG-2 encoding formats. The D9034 Encoder offers PreSightPlus as an option, which is an adaptive and motion-compensated noise reduction that preserves picture quality in a noisy environment, and is suitable in both contribution and distribution applications. For user-friendly TV guides and similar applications, the D9034 Encoder offers an integrated picture-in-picture (PIP) encoding feature as an option.

Control of the encoder is supported via the front panel interface, an on-board web application, ROSA® drivers, and an open communication protocol (SNMP). A dedicated Ethernet port is available to facilitate both control and monitoring of the encoder.

The D9034 Encoder offers built-in support for SCTE-35 digital program insertion (DPI) via contact closure or cue tone interface, which is used for program and ad insertion applications in the digital domain.

These extensive features allow the D9034 Encoder to address a wide range of applications such as contribution, cable headends, DTH play-outs, and IP headends.

Figure 1. Cisco D9034 Encoder



Features

- MPEG-4 part 10 (H.264) encoding
- Pre-analysis with 3:2 pull-down inversion
- ASI and IP streaming outputs
- Web-based GUI and SNMP management interface for interfacing to third-party management systems to control the encoder
- 1 RU, low power consumption, stackable
- Four audio channels as either embedded, analog or digital audio input
- Dolby® Digital pass-through or MPEG-1 Layer II audio
- Integrated Frame synchronizer with internal and external reference
- DVB VBI support

Optional Features

- Adaptive motion compensated temporal filtering (in PreSight*Plus* video noise reduction option)
- MPEG-2 encoding option
- DPI via SCTE-35 support triggered by either contact closure or a cue tone input (i.e., DTMF tones)
- SDI input
- AVC statistical multiplexing, which can be mixed with Cisco D9032 MPEG-2 Encoders
- Up to eight audio channels, as either embedded, analog, or digital audio input
- Picture-in-picture (H.264)
- HE-AAC audio encoding
- ROSA driver
- DC power supply

Specifications

Table 1. Product Specifications

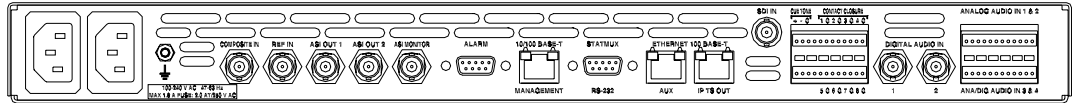
Feature	Description
Video	
Composite input	
Systems	PAL (B, D, G, H, I, K, M and N) and NTSC M
Video level	0 dBV nominal
Frequency response	0.75 dB peak-to-peak; 0.2 to 4.2 MHz
Differential gain/phase	$\leq 3\%$ / $\leq 3^\circ$
Noise	< -55 dB RMS weighted relative to 0.7 V
Impedance	75 ohms unbalanced
Return loss	> 35 dB, 10 Hz to 5.5 MHz
Aspect ratio	4:3, 16:9 (MPEG-2 only)
Composite input with ClearSight	
Systems	PAL (B,D,G,H,I, and K) and NTSC M
Video level	0 dBV nominal
Frequency response	± 0.2 dB, 10 Hz to 5.75 MHz
Differential gain/phase	<1%pp / <1°pp
Noise	<-58 dB
Impedance	75 ohms unbalanced
Return loss	> 35 dB, 10 Hz to 5.5 MHz
Connector	BNC
SDI input	
Systems	525/29.97 Hz and 625/25 Hz, auto-detection of the SDI input signal
Impedance	75 ohms unbalanced
Input level	800 mVpp nominal
Return loss	≥ 15 dB, 5 to 270 MHz
Connector	BNC
Bit rate	270 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
Connector	BNC and terminal block
Number of channels	Up to 4 stereo pairs or eight mono channels
Analog Audio	
Impedance	600 ohms or > 20 kilohms 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	-6 to +24 dBu, 500 mdBu increments
Return loss	>15 dB, 0.1 to 6.0 MHz
Input level	0.5 to 2 Vpp nominal
Sample rate	32 kHz, 44.1 kHz and 48 kHz

Feature	Description
AES/EBU Digital Audio Ch 3+4 (Options)	
Impedance	110 ohms balanced
Return loss	> 21 dB, 0.1 to 6.0 MHz
Input level	2 to 7 Vpp nominal, min. 500 mV
Sample rate	32 kHz, 44.1 kHz and 48 kHz
Embedded Audio	
Format	SMPTE-272M
Sample frequency	48 kHz (locked to video)
Resolution	20 bits
VBI Data Processing	
Standard VBI processing	
Closed captions from Composite and SDI	EIA-708; MPEG-2 also DVS 157; SA Type 4
Advanced VBI (on SDI Video Input)	
Transmission format	According to DVB-VBI standards or NAVBI SCTE -127 (2007)
VBI formats	Teletext B, VPS and WSS
Transparent lines	Up to 4 lines per field. DVB and SA formats
Embedded in SDI	
VBI formats	EDH, sampled VBI (Teletext, VPS, WSS), VII, Closed Captions
Transparent lines	Up to 4 lines per field. DVB and SA formats
Frame Synchronizer	
Control	Internal or external reference, bypass
Video and Audio Processing	
Video, MPEG-2 Option	
Encoding	MPEG-2 MP @ ML (option)
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, standalone VBR
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, MPEG-4 AVC (H.264)	
Encoding	MP @ L3
Encoding control	Adaptive coding parameters and GOP controlled by pre-analysis
Systems	525/29.97 Hz and 625/25 Hz
Aspect ratio	16:9 and 4:3, auto mode based on WSS or VII
Encoding approach	Single slice
Chroma format	4:2:0
Encoding rate	0.3 to 5.0 Mb/s
Modes	Capped VBR
H resolutions	720, 704, 544, 528, 480 and 352
V resolutions	480 (for 525/29.97 Hz) and 576 (for 625/25)

Feature	Description
Picture in Picture (PIP)	
Encoding format	H.264 - Main Profile
Picture size	96 x 96 or 128 x 96
Bit rate	100 to 300 kb/s
Video Pre-processing	
PreSight <i>Plus</i> filter suite	Adaptive spatio-temporal filtering with motion-compensation (option) controlled by pre-analysis. Despeckle filter
Audio	
Encoding	Dolby Digital (AC-3), MPEG-1 Layer II, HE-AACv1, AAC-LC
Sample rates	32 kHz, 44.1 kHz 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 and pass-through rates	56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384, 448, 512, 576 and 640 kb/s
Layer II encoding modes	Stereo, Joint Stereo, Dual Channel, Single Mono, VPS Auto Up to eight different PIDs
Layer II encoding rate	32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320 and 384 kbit/s
AAC-LC and HE-AAC bit rates	Variable, 14 to 320 kb/s
AAC-LC and HE-AAC encoding modes	Single mono left and/or single mono right, dual channel, joint stereo and stereo; up to 4 different PIDs.
Transport Output	
DVB-ASI Output	
Number of outputs	Two + 1 monitor output (monitor cannot be muted)
Impedance	75 ohms
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 ± 100 ppm
Output level	800 mVpp nominal
IP TS Output	
Number of outputs	2
Type	8-pin RJ-45, MDI
Format	UDP/IP
IP address format	Multicast, unicast
TS streaming	Up to 6 SPTS streams or MPTS
TS packet length	188 bytes, 204 RS On, 204 RS Off
Monitor and Control	
Management interface	Ethernet 10/100 BASE-T on RJ-45
Protocol	SNMP or WEB
Front panel	LCD character display with menu and input keys
Alarm relays	3 contact sets on 9-pin sub-D female
Statistical multiplex interface	IP-based statistical multiplexing Either IP output or via Management port
Modes of operation	Synchronous and Asynchronous support
Statistical multiplex groups and pools	Up to 20 pools supported

Feature	Description
Environmental	
Operation temperature range	0 - 50°C (32 - 122°F)
Storage temperature range	-20 - 70°C (-4 - 158°F). (-40°C/-40°F can be obtained for a limited period, max 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 V AC ±10%
Line frequency	47 to 63 Hz
Power consumption, one PSU active	≤ 107 W (110 V), ≤ 104 W (220 V)
Power consumption, two PSUs active	≤ 115 W (110 V) , ≤ 113 W (220 V) (in total for both inlets)

Figure 2. D9034 Encoder Connector Panel, AC Version



Ordering Information

Table 2. Ordering Information

Description	Part Number
D9034 - PAL/NTSC/SDI (ClearSight composite input), MPEG-4 SD Encoder, Dual AC, 2 stereo audio Dolby Digital pass-through/Layer II audio, Closed Captioning support, Advanced VBI, ASI/IP out, North American power cord	4015040X02
D9034 - PAL/NTSC/SDI (ClearSight composite input), MPEG-4 SD Encoder, Dual AC, 4 stereo audio Dolby Digital pass-through/Layer II audio, Closed Captioning support, Advanced, ASI/IP out, North American power cord	4015040X12
X: power supply: 2 = AC with EU power cord	
X: power supply: 3 = AC with US power cord	
X: power supply: 4 = AC with UK power cord	
X: power supply: 5 = AC with AU power cord	
Options	
PreSight <i>Plus</i> adaptive and motion-compensated filter suite (noise reduction)	7008723
Dolby Digital (AC-3) 2.0 encoding. Stereo channels 1 and 2.	7008724
Dolby Digital (AC-3) 2.0 encoding. Stereo channels 3 and 4.	7008725
DC Power Supply Unit for the D9034 Encoder (instead of AC)	4013356
MPEG-2 encoding option (4:2:0 only)	7008726
DPI signaling	7008727
Picture in picture (PIP)	7008728
AAC-LC and HE-AAC audio encoding option. Stereo channels 1 and 2.	7010244
AAC-LC and HE-AAC audio encoding option. Stereo channels 3 and 4.	7010245
AVC statistical multiplexing	7011650
ROSA Driver	70044570
EIA-608 to EIA-708 Upconversion	7016169

With respect to each AVC/H.264 product, we are obligated to provide the following notice:

AVC VIDEO LICENSE

THIS PRODUCT IS LICENSED UNDER THE AVC PATENT PORTFOLIO LICENSE FOR THE PERSONAL AND NON-COMMERCIAL USE OF A CONSUMER TO (i) ENCODE VIDEO IN COMPLIANCE WITH THE AVC STANDARD ("AVC VIDEO") AND/OR (ii) DECODE AVC VIDEO THAT WAS ENCODED BY A CONSUMER ENGAGED IN A PERSONAL AND NON-COMMERCIAL ACTIVITY AND/OR WAS OBTAINED FROM A VIDEO PROVIDER LICENSED TO PROVIDE AVC VIDEO. NO LICENSE IS GRANTED OR SHALL BE IMPLIED FOR ANY OTHER USE. ADDITIONAL INFORMATION MAY BE OBTAINED FROM MPEG LA, L.L.C. SEE <http://www.mpegla.com>.

Accordingly, please be advised that service providers, content providers, and broadcasters are required to obtain a separate use license from MPEG LA prior to any use of AVC/H.264 encoders and/or decoders.



Cisco, Cisco Systems, the Cisco logo, the Cisco Systems logo, and ROSA are registered trademarks or trademarks of Cisco Systems, Inc. and/or its affiliates in the U.S. and certain other countries. Manufactured under license from Dolby Laboratories. Dolby and the double-D symbol are trademarks of Dolby Laboratories.

All other trademarks mentioned in this document are the property of their respective owners.

Specifications and product availability are subject to change without notice.

© 2010 Cisco Systems, Inc. All rights reserved.

1-800-722-2009 or 678-277-1000
www.cisco.com

Part Number 7007894 Rev J
May 2010