

## MPEG-2/AVC Encoder

# Encoder Model D9034-S

### Description

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



In this encoder, MPEG-2 can optionally co-exist with MPEG-4 video within the same chassis. This enables operators to make use of the MPEG-4 and the MPEG-2 encoding format. The D9034-S Encoder offers PreSight*Plus*<sup>™</sup> as an option, 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. 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<sup>™</sup> drivers, and an open communication protocol (SNMP). A dedicated Ethernet port is available to facilitate both control and monitoring of the encoder.

The D9034-S 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 add-insertion applications in the digital domain.

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

### Features

- MPEG-4 part 10 or optionally MPEG-2
- 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<sup>®</sup> Digital encoding, Dolby Digital passthrough or MPEG-1 Layer II audio
- Integrated Frame synchronizer with internal and external reference
- DVB VBI support

### Options

- 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
- Up to eight audio channels, as either embedded, analog or digital audio input
- Picture in picture (H.264)
- HE-AAC internal audio encoding
- ROSA driver
- DC power supply

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## Specifications

Release 3.2

<b>Video</b>	
<b>Composite input</b>	
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; 0.2-4.2 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
Connector	BNC
<b>Composite input with ClearSight™</b>	
Systems	PAL (B, D, G, H, I, and K) and NTSC M
Video level	0 dBV nominal
Frequency response	$\pm 0.2$ 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
Aspect Ratio	4:3, 16:9 or auto-detect on WSS (MPEG-2 only)
<b>SDI input</b>	
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	$\geq 15$ dB, 5 to 270 MHz
Connector	BNC
Bit rate	270 Mbit/s $\pm 10$ ppm
Jitter acceptance	$\geq 25\%$ of a clock period
Aspect Ratio	4:3, 16:9 or auto-detect on VII or WSS
<b>Audio</b>	
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 four stereo pairs or eight mono channels
<b>Analog Audio</b>	
Impedance	600 ohms or >20 k ohms balanced
CMRR	>50 dB, 1 kHz
Clipping level	-6 to +24 dBu, 500 mdBu increments
<b>SPDIF Digital Audio Ch 1+2 (On board) &amp; Ch 3+4 (Optional)</b>	
Impedance	75 $\Omega$ single-ended
Digital audio leveling	$\pm 12$ dB
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
<b>AES/EBU Digital Audio Ch 3+4 (Options)</b>	
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, 44.1 and 48 kHz
<b>Embedded Audio</b>	
Format	SMPTE 272M

# Encoder Model D9034-S

## Specifications, continued

Release 3.2

<b>Embedded Audio</b>	
Sample frequency	48 kHz (locked to video)
Resolution	20 bits
<b>Standard VBI processing</b>	
Closed captions from Composite and SDI	EIA 708, DVS 157 (MPEG-2), SA Type 4 (MPEG-2)
<b>Advanced VBI (on SDI Video Input)</b>	
Transmission format	According to DVB-VBI standards
VBI formats	Teletext B, VPS and WSS
Transparent lines	Up to four lines per field. DVB and S-A formats
<b>Embedded in SDI</b>	
VBI formats	EDH, sampled VBI (Teletext, VPS, WSS), VII, Closed Captions
Transparent lines	Up to four lines per field. DVB and S-A formats
<b>Frame Synchronizer</b>	
Control	Internal or external reference, bypass
<b>Video and Audio Processing</b>	
<b>Video, MPEG-2 Option</b>	
Encoding	MPEG-2 MP@ML
Encoding control	Adaptive coding parameters and GOP controlled by pre-analysis
Chroma format	4:2:0
Aspect ratio	16:9 and 4:3, auto mode based on WSS or VII
Systems	525/29.97 Hz and 625/25 Hz
Encoding rate	0.5 to 15 Mbit/s for
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
<b>Video, MPEG-4 AVC (H.264)</b>	
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
Interlace support	MBAFF
Chroma format	4:2:0
Encoding rate	0.3 to 5.0 Mbit/s
Modes	Capped VBR with quality control
H Resolutions	720, 704, 544, 528, 480 and 352
V Resolutions	480 (for 525/29.97 Hz) and 625/25 Hz
<b>Picture in Picture (PIP)</b>	
Encoding format	H.264 – Main Profile
Picture size	96 x 96, 128 x 96
Bit rate	100 to 300 kbit/s
<b>Video Pre-processing</b>	
PreSight <i>Plus</i> filter suite	Adaptive spatio-temporal filtering with motion-compensation (option) controlled by pre-analysis Despeckle filter
<b>Audio</b>	
Encoding	Dolby Digital (AC-3), MPEG-1 Layer II, HE-AACv1, AAC-LC
Sample rates	32, 44 .1 and 48 kHz (passthrough 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

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## Specifications, continued

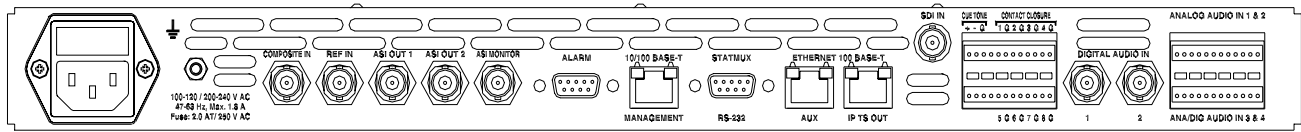
Release 3.2

<b>Audio</b>	
Dolby Digital (AC-3) passthrough bit 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, 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 kbit/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.
<b>Transport Output</b>	
<b>DVB ASI Output</b>	
Number of outputs	Two + 1 monitor output (monitor cannot be muted)
Connector	BNC
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
<b>IP TS Output</b>	
Number of outputs	2
Type	Eight-pin RJ-45, MDI
Ethernet Type	100 Base-T
Format	UDP/IP
IP address format	Multicast, unicast
TS streaming	Up to 8 SPTS streams
TS bit rate	Follows the ASI output rate or removal of null packets
TS packet length	188 bytes, 204 RS On, 204 RS Off
<b>Monitor and Control</b>	
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
Statmux interface	RS-232 on 9 pin sub-D female
<b>Environmental</b>	
Operation temperature range	0°C to +50°C (32°F to 122°F)
Storage temperature range	-20°C to +70°C (-4 to 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 18.9 inches (482 x 44.5 x 480 mm)
Weight	17 lbs/7.7 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
<b>Power Requirements</b>	
<b>AC Power</b>	
Voltage range	100 to 240 V AC ±10%
Line frequency	47 to 63 Hz
Power consumption	≤ 90 W
<b>DC Power</b>	
Voltage range	-38 to -58 V DC
Power consumption	≤ 90 W

# Encoder Model D9034-S



## D9034-S Encoder Connector Panel, AC Version



## Ordering Information

Description	Part Number
D9034-S Encoder - PAL/NTSC, MPEG-4 SD Encoder, AC, 2 stereo audio passthrough/LII audio, Closed Captioning, ASI/IP out	4015039X00
D9034-S Encoder - PAL/NTSC, MPEG-4 SD Encoder, AC, 4 stereo audio passthrough/LII audio, Closed Captioning, ASI/IP out	4015039X10
D9034-S Encoder - PAL/NTSC/SDI, MPEG-4 SD Encoder, AC, 2 stereo audio passthrough/LII audio, Closed Captioning, VBI on SDI, ASI/IP out	4015039X02
D9034-S Encoder - PAL/NTSC/SDI, MPEG-4 SD Encoder, AC, 4 stereo audio passthrough/LII audio, Closed Captioning, VBI on SDI, ASI/IP out	4015039X12
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

Description	Part Number
PreSightPlus adaptive and motion-compensated filter suite (noise reduction)	7008723
Dolby Digital (AC-3) 2.0 encoding. Channels 1 and 2.	7008724
Dolby Digital (AC-3) 2.0 encoding. Channels 3 and 4.	7008725
DC Power Supply Unit for the D9034-S Encoder (instead of AC)	4013364
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 channel 1 and 2.	7010224
AAC-LC and HE-AAC audio encoding option. Stereo channel 3 and 4.	7010225
ROSA Driver	70044570



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