Cisco D9032 Encoder

Product Overview

In the broadcast and broadband world, optimizing bandwidth in your distribution channels is of utmost importance. The Encoder Model D9032 is designed to deliver high-quality MPEG-2 video while using very limited bandwidth. Used in either constant or variable bit rate, or an IP-based, closed-loop statistical multiplex mode, the encoder delivers clean, sharp pictures.

The D9032 Encoder includes PreSight*Plus* technology - a new DSP-based pre-processing architecture that carries out multiple pre-processing steps to help optimize the encoding process. PreSight*Plus* algorithms perform three functions, addressing different issues in a compression system:

- Adaptive and motion compensated noise reduction
- Auto-concatenation enabling the encoder to lock the encoding GOP to that of the preceding encoder
- Pre-analysis for optimal dual-pass encoding

PreSight*Plus* pre-analysis combined with our advanced IP-based statistical multiplexing control is an industry leading solution for bandwidth-saving encoding using closed-loop statistical multiplexing technology with support for up to 60 encoders spread across 20 pools, employing either MPEG-2 or AVC encoding technology. The dual-pass architecture of the encoder provides detailed information to the statistical multiplex controller, allowing it to make better bit rate allocation decisions. D9032 Encoders can be geographically distributed using Regional Statmux.

Control of the encoder is supported via a front panel interface, an on-board web application, an optional ROSA® driver, and an open communication protocol (SNMP). Transport output is provided via ASI outputs as well as through an IP (100Base-T) streaming output.

The extensive features allow the D9032 Encoder to address a wide range of applications such as contribution, cable headends, DTH or DVB-T play-outs and IP headends.

Figure 1. Cisco D9032 Encoder

Features

- Dual-pass architecture through PreSight*Plus* pre-analysis and 3:2 pull-down inversion
- Web-based GUI and SNMP management interface for interfacing to any Management System
- 1 RU, low-power consumption, stackable
- Four audio channels as either embedded, analog or digital audio input
- Upgradable to H.264 video and HE-AAC audio
- Extensive VBI support according to DVB and SCTE
- Stand-alone variable bit rate
- Integrated Frame synchronizer with internal and external reference
- PCR synchronization on dedicated local area network
- BISS 1/E scrambling

Optional Features

- Support for IP-based MPEG-2 and AVC Statistical Multiplexing controlled by our DCM (Digital Content Manager)
- Adaptive motion compensated temporal filtering (in PreSight*Plus* noise reduction option)
- DPI via SCTE 35 support triggered by either contact closure or a cue tone input (i.e., DTMF tones)
- 4:2:2 P@ML video compression
- ClearSight Composite video input and SDI video input
- Four additional audio channels and Internal Dolby® Digital (AC-3) encoding
- Auto-concatenation of previously encoded picture material for improvement of overall picture quality
- ROSA driver
- DC power supply

Specifications

Table 1. Product Specifications, Release Version 3.2

Feature	Description
Video	
Standard Composite input	
Systems	PAL (B, D, G, H, I, K, M and N) and NTSC M
Video level	0 dBV nominal
Frequency response	±0.65 dB; 0.5-5.0 MHz
Differential gain/phase	≤ 3% / ≤ 3°
Noise	< -55 dB RMS weighted relative to 0.7 V
Impedance	75 Ω unbalanced
Return loss	> 35 dB, 10 Hz to 5.5 MHz
Connector	BNC
Aspect Ratio	4:3, 16:9
Composite input with ClearSight[1]	
Systems	PAL (B, D, G, H, I, K, M, N, and (N)) 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 Ω unbalanced
Return loss	> 35 dB, 10 Hz to 5.5 MHz
Connector	BNC
Aspect Ratio	4:3, 16:9 or auto-detect on WSS
SDI input	
Systems	525/29.97 Hz and 625/25 Hz, auto detection of the SDI input signal
Impedance	75 Ω 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	≥ 25% of a clock period
Aspect Ratio	4:3, 16:9 or auto-detect on VII or WSS
Active Format Descriptor (AFD)	Auto-detect on VII or WSS
Audio	
Inputs	Analog, digital AES/EBU or AES-3ID 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
Audio/Video synchronization	< 1 ms without frame synchronizer < ± 20 ms with frame synchronizer
Analog Audio	
Impedance	600 Ω or >20 kΩ balanced
CMRR	> 50 dB, 1 kHz

[1] Only ClearSight configurations with p/n 4013873xyz support PAL M, N and (N).

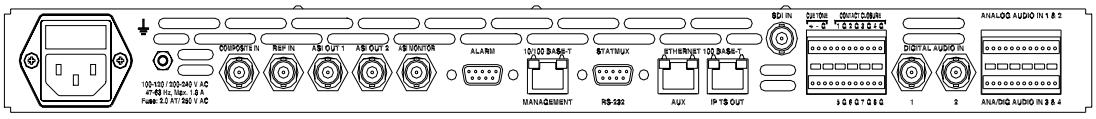
Feature	Description
Clipping level	-6 to +24 dBu, 500 mdBu increments
AES-3ID Digital Audio Ch 1+2 (On board)	
Impedance	75 Ω single-ended
AES-3ID Digital Audio Ch 1+2 (On board) & Ch 3+4 (Optional)	
Return loss	>15 dB, 0.1 to 6.0 MHz
Input level	0.5 to 2 Vpp nominal
Sample rate	32 kHz, 44.1 kHz and 48 kHz
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 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 on Composite and SDI	EIA 708; DVS 157; SA Type 4
ClearSight and SDI VBI	
VBI formats	**DVB VBI Formats:** Teletext B, VPS, WSS, WSS-AFD, Transparent lines: Up to four lines per field (DVB and SA formats). **SCTE 127 formats:** NABTS, AMOL, TV Guide, VITC **Other signals supported :** Closed captions.
Embedded in SDI	**DVB VBI Formats:** Sampled VBI (Teletext, VPS, WSS, WSS-AFD), Transparent lines: Up to four lines per field (DVB and SA formats). **SCTE 127 formats:** NABTS, AMOL I&II (Nielsen), TV Guide, VITC **Other signals supported:** EDH, VII, Closed captions
Frame Synchronizer	
Reference input	BNC 75 Ω. Black and burst
Control	Internal or external reference, bypass
Video and Audio Processing	
Video	
Encoding	MPEG-2 MP@ML or 4:2:2P@ ML (option)
Encoding control	Adaptive coding parameters and GOP controlled by pre-analysis
Chroma format	4:2:0 or 4:2:2 (option)
Systems	625/25 Hz and 525/29.97 Hz
Encoding rate	0.5 to 15 Mbit/s for 4:2:0, 1.5 to 50 Mbit/s for 4:2:2
Modes	CBR, VBR (only for 4:2:0). Statistical multiplexing (4:2:0) (option: either IP-based, or Regulus-based).
H Resolutions	352, 480, 528, 544, 640, 704 and 720
V Resolutions	576 (for 625/25) and 480 (for 525/29.97)

Feature	Description
Video Pre-processing	
PreSight*Plus* filter suite	Adaptive spatio-temporal filtering with motion-compensation (option) controlled by pre-analysis
PreSight*Plus* pre-analysis	Complexity and scene-change analysis with look-ahead
Audio	
Encoding	MPEG-1 Layer II or Dolby Digital (AC-3)
Sample rates	32 kHz, 44.1 kHz and 48 kHz (pass-through only 48 kHz)
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
Dolby Digital (AC3) encoding modes	1/0 Center, 2/0 Stereo, 1+1 Dual Mono for professional applications
Dolby Digital (AC3) encoding rates	56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384, 448, 512, 576 and 640 kbit/s
Dolby Digital (AC3) pass through bit rates	56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384, 448, 512, 576 and 640 kbit/s
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 ± 100 ppm
Output level	800 mVpp nominal
IP TS Output	
Number of outputs	2
Type	Eight-pin RJ-45, MDI
Ethernet Type	100 Base-T
Format	UDP/IP, RTP/UDP/IP
IP address format	Multicast, unicast
TS bit rate	Follows the ASI output rate
TS packet length	188 bytes, 204 RS On, 204 RS Off
Scrambling[2]	
BISS-E	EBU Tech. 3292 rev.2 August 2002
Modes	BISS 1 (Session Word) BISS-E (Clear Session Word) BISS-E (Injected ID and encrypted Session Word)
Transport stream output being scrambled	ASI
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	Three contact sets on 9-pin sub-D female

[2] BISS-E Scrambling is only possible with baseboard H/W P/N: 4013809

Feature	Description
Statmux interface	1) IP-based Statmux: • Either IP TS Output port or management port 2) Regulus-based Statmux: • RS-232 on 9-pin sub-D female
Environmental	
Operation 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, max. 20 hours due to the display).
Relative humidity	+50°C/122°F 95% Relative Humidity, IEC 60068-2-78 test: Cab
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
Dimensions (W x H x D)	482 x 44.5 x 480 mm (19 x 1.75 x 18.9 inches)
Weight	7.7 kg / 17 lbs
Cooling	Forced cooling with air flow from front to back
Power Requirements	
AC Power	
Voltage range	100 to 120 or 200 to 240 V AC ±10%
Line frequency	47 to 63 Hz
Consumption	≤ 75 W fully equipped
DC Power	
Voltage range	-38 to -58 V DC
Consumption	≤ 75 W fully equipped

Figure 2. D9032 Encoder Connector Panel, AC Version



Ordering Information

Table 2. Ordering Information

Description	Part Number
D9032 Encoder - PAL/NTSC 4:2:0 SD encoder, 2 stereo audio, Dolby Digital passthrough/Dolby E, Layer II audio, Closed Captions, ASI/IP output.	4013873x[1]00
D9032 Encoder - PAL/NTSC 4:2:0 SD encoder, 4 stereo audio, Dolby Digital passthrough/Dolby E, Layer II audio, Closed Captions, ASI/IP output.	4013873x[1]10
D9032 Encoder - PAL/NTSC ClearSight 4:2:0 SD encoder, 2 stereo audio, Dolby Digital passthrough/Dolby E, Layer II audio, Closed Captions, ASI/IP output.	4013873x[1]01
D9032 Encoder - PAL/NTSC ClearSight 4:2:0 SD encoder, 4 stereo audio, Dolby Digital passthrough/Dolby E, Layer II audio, Closed Captions, ASI/IP output.	4013873x[1]11
D9032 Encoder - PAL/NTSC ClearSight/SDI 4:2:0 SD encoder, 2 stereo audio, Dolby Digital passthrough/Dolby E, Layer II audio, Closed Captions, ASI/IP output.	4013873x[1]02
D9032 Encoder - PAL/NTSC ClearSight/SDI 4:2:0 SD encoder, 4 stereo audio, Dolby Digital passthrough/Dolby E, Layer II audio, Closed Captions, ASI/IP output.	4013873x[1]12
Options	
IP-based Statistical Multiplexing	70122810
Statistical Multiplexing	70062580
PreSight*Plus* adaptive & motion-compensated filter suite (noise reduction)	70041730
4:2:2 Video Encoding	70041750
DPI Signaling	70062590
Auto-concatenation	70047060
Dolby Digital Channel 1+2	40091530
Dolby Digital Channel 3+4	40091540
DC Power Supply Unit for D9032 Encoder (instead of AC)	4009407

1)

X =	Denotes
1	DC power supply unit
2	AC power supply unit with EU power cord
3	AC power supply unit with US power cord
4	AC power supply unit with UK power cord
5	AC power supply unit with AU power cord

Scientific-Atlanta, LLC.
1-800-722-2009 or 678-277-1120
www.scientificatlanta.com

Part Number 7006582 Rev K
April 2009