

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



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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 | $\leq 3\%$ / $\leq 3^\circ$ |
| 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 ClearSight¹ | |
| 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 | $\geq 25\%$ 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 k Ω balanced |
| CMRR | > 50 dB, 1 kHz |

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

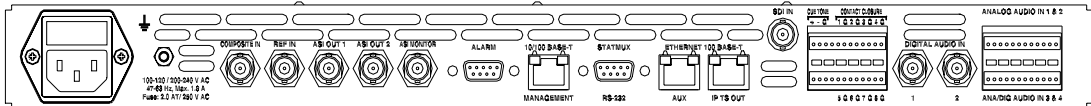
| Feature | Description |
|--|---|
| Clipping level | -6 to +24 dBu, 500 mdBu increments |
| AES-3ID Digital Audio Ch 1+2 (On board) | |
| Impedance | 75 Ω single-ended |
| AES-3ID Digital Audio Ch 1+2 (On board) & Ch 3+4 (Optional) | |
| Return loss | >15 dB, 0.1 to 6.0 MHz |
| Input level | 0.5 to 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 | <p>DVB VBI Formats: Teletext B, VPS, WSS, WSS-AFD, Transparent lines: Up to four lines per field (DVB and SA formats).</p> <p>SCTE 127 formats: NABTS, AMOL, TV Guide, VITC</p> <p>Other signals supported : Closed captions.</p> |
| Embedded in SDI | <p>DVB VBI Formats: Sampled VBI (Teletext, VPS, WSS, WSS-AFD), Transparent lines: Up to four lines per field (DVB and SA formats).</p> <p>SCTE 127 formats: NABTS, AMOL I&II (Nielsen), TV Guide, VITC</p> <p>Other signals supported: EDH, VII, Closed captions</p> |
| 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 <i>Plus</i> filter suite | Adaptive spatio-temporal filtering with motion-compensation (option) controlled by pre-analysis |
| PreSight <i>Plus</i> 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 \pm 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 |
| Scrambling² | |
| 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: <ul style="list-style-type: none"> Either IP TS Output port or management port 2) Regulus-based Statmux: <ul style="list-style-type: none"> 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 <i>Plus</i> 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 |



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