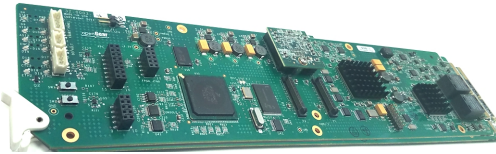


# 9223-S • Single-Channel 3G/HD/SD MPEG-4 Encoders



The 9223-S Single-Channel 3G/HD/SD MPEG-4 Encoder provides a card-based solution for distribution of MPEG-4 encoding. Utilizing the openGear® open-architecture platform, the 9223-S offers scalable incorporation and the easy-to-use DashBoard™ setup and control operator interface. Up to 10 of the 9223 cards can be installed in a 20-slot frame, offering distribution delivery of up to 10 channels in a single frame, using less than 150W total, for reduced operating expenses. In addition to SD/HD-SDI inputs, the 9223-S provides the flexibility of supporting SD analog composite video and an analog audio stereo pair per input channel (using MPEG-1 Layer II audio encoding as standard).

The 9223-S offers the latest advances in video compression that delivers excellent video quality at very low bit rates.

Unique encoding designs allow delivery of multiple HD and SD video services simultaneously. In addition to ASI outputs, the 9223 provides Ethernet outputs, supporting full-duplex 100 Mb/s and 1 Gb/s operation. Input video auto-detect mode allows encoding to automatically configure an output that correspond to the input, with resolution and frame rate same as input, and scaling set to same as input or other applicable choices.

When using the Ethernet output, the 9223-S supports the traditional UDP/RTP/SPMTE 2022 FEC protocols, as well as the HTTP Live Streaming protocol for transmitting live video over the Internet. Using HTTP Live Streaming, the 9223-S can transmit broadcast-quality video to mobile phones (Apple and Android 4.0 supported), tablets, and a variety of consumer set-top boxes (such as the Amino A140 and the Roku Player).

RTMP support allows direct publishing of real-time, live content to Adobe® Media Servers or any other servers, web sites and CDNs with RTMP ingress, such as Justin.tv, UStream, LiveStream and Akamai. Publish professional-quality real-time SD/HD content to Internet viewers (including some critical features not available in PC-based software encoders) such as ancillary data support (closed-captioning, AFD) and SD-SDI/HD-SDI video inputs with embedded audio support – all in broadcast-grade video quality. SMPTE-2038 processing allows inserting generic ancillary data packets in the transport stream, with frame accuracy. Up to four DID/SDID pairs can be supported.

Full user remote monitor/control allows full card status and control access across a standard Ethernet network. Status monitoring is also available at card edge. 9223 encoders are also available in dual encoding channel configuration (some 9223-S models can be upgraded to dual-channel; see Options and Ordering Information). For 9223 dual-channel encoder models information, please see **9223-D Dual-Channel 3G/HD/SD MPEG-4 Encoders** web page.

## FEATURES

Card-based design allows scalability, from 1 channels to 10 channels per frame

Input video auto-detect mode automatically configures output to correspond to input frame rate and scaling

Low power/high-density design; only 6 Watts per card

DVB-ASI and Ethernet outputs

Full support of CEA-608 and CEA-708 closed captioning and PMT information. Closed-captioning filtering allows filtering to allow and use only SMPTE-334M and/or CEA-708 closed captioning.

SCTE 104 to SCTE 35 conversion

Support for inserting generic ancillary data packets in the transport stream using SMPTE-2038, with frame accuracy. Up to four DID/SDID pairs can be supported.

License-based options allow tailoring functionality as needed, with upgrades available if later desired

Built-in video/audio ADC and embedder allows direct use with SD composite video and audio analog sources

RTMP support for publishing to Adobe® Media Server, availing SDI content to Internet viewers

HTTP Live Streaming protocol allows viewing by Apple® and Android™ 3.0 (or higher) devices

Optional support for additional audio pairs

Optional RTP/ARQ support

Built-in Packet Test Generators allow pre-validation of transport

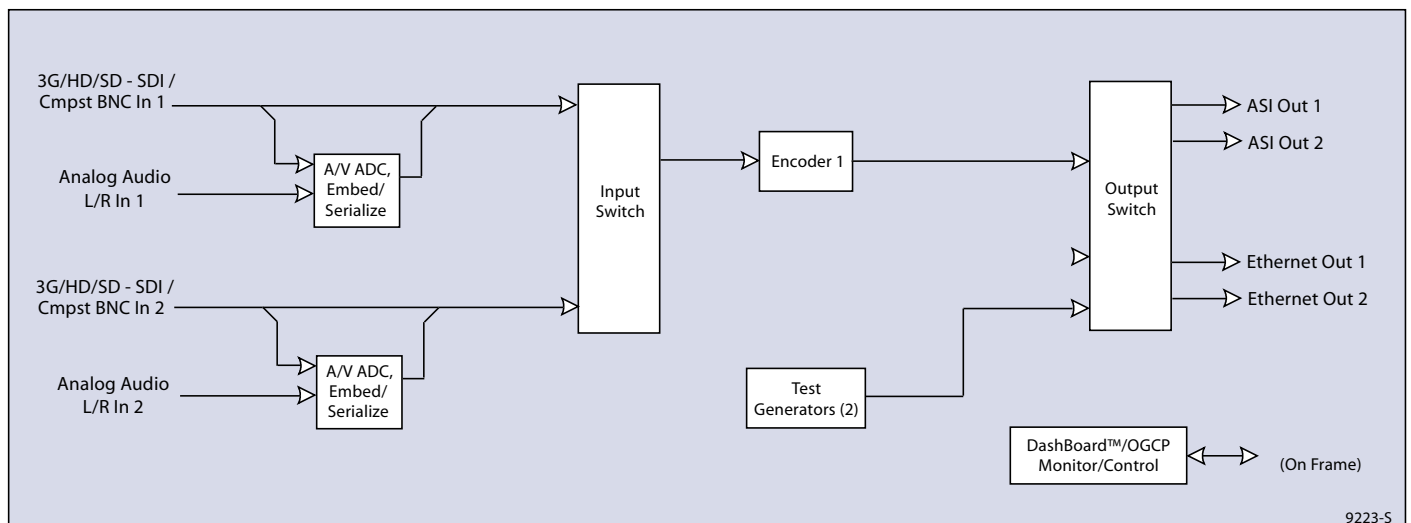
Multiple pre-defined control templates provide automatic setup of popular contribution-to-distribution schemes

Remote control/monitoring via DashBoard™ software

Five year warranty

## OPTIONS

Please see Ordering Information



# 9223-S • Single-Channel 3G/HD/SD MPEG-4 Encoders

## SPECIFICATIONS

### Power

6W

### 3G/HD/SD-SDI Inputs

Number of inputs: 2, each configurable as:  
 3G-SDI (SMPTE 424M)  
 HD-SDI (SMPTE 292M)  
 SD-SDI (SMPTE 259M) with EDH  
 Composite analog video (PAL/NTSC)

### Audio Inputs Supported

Embedded SDI, AC-3 (optional)  
 (2) L/R pairs (max) of analog audio embed

### Video Encoding

HD Video:  
 MPEG-4 AVC High profile at level 4.2 (HP@L4.2)  
 MPEG-4 AVC High profile at level 4.0 (HP@L4.0)  
 CBR, VBR  
 2Mbps to 30Mbps (configurable)  
 SD Video:  
 MPEG-4 AVC Main profile at level 3.0 (MP@L3.0)  
 CBR, VBR  
 1.5Mbps to 10 Mbps (configurable)

### Audio Encoding

MPEG-1 layer II, 1 stereo pair base (Dolby® pass-thru)  
 MPEG-4 AAC-LC up to 2 pairs  
 MPEG-2 (ADTS); MPEG-4 (LATM/LAOS encapsulation)  
 Lip sync adjustment

### Video Resolution Supported

HD: 1920 x 1080p 60/50/30/29.97/25  
 1080 x 1920/1440i 30/29.97/25  
 1280 x 720/960/640p 59.94/50/30/29.97/25  
 SD: 576 x 720/528i 29.97fps  
 576 x 720/528i 25fps

### Video Pre-Processing

Advanced adaptive spatial filtering  
 Closed Captions CEA 608B and CEA-708C  
 WSS/AFD

### ASI Outputs

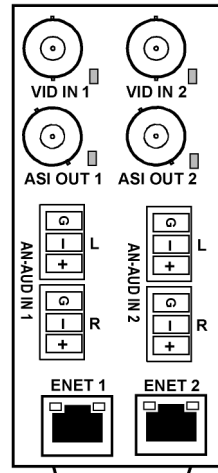
Number of outputs: 2, 75Ω BNC DVB-ASI  
 213Mbit/s maximum ASI TS bit-rate per port

### Ethernet

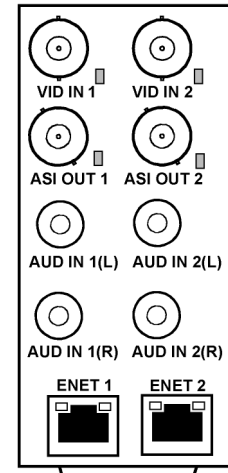
Number of control/monitor connections: 2, redundant 10/100Base-T RJ-45  
 Number of transport outputs: 2, 100/1000Base-T RJ-45  
 ports, auto-negotiate or fixed speed  
 IPv4, IPv6, UDP, RTP  
 SMPTE 2022 ProMPEG FEC CoP3, 'Forward Error  
 Correction' (Row and Column)

### Regulatory Compliance

CE: CE marked in accordance with 93/68/EEC  
 (22/07/03) Directive  
 UL: UL approval  
 US FCC: Part 15  
 EMC: EN55022, EN55024, EN6100-3-2



RM20-9223-B



RM20-9223-U

## 9223-S • Single-Channel 3G/HD/SD MPEG-4 Encoders

### ORDERING INFORMATION

**9223-S** Single-Channel 3G/HD/SD MPEG-4 Encoder Unit with H.264 SD

**9223-S-HD-I** Single-Channel 3G/HD/SD MPEG-4 Encoder Unit with H.264 SD/HD up to 1080i

**9223-S-HD-P** Single-Channel 3G/HD/SD MPEG-4 Encoder Unit with H.264 SD/HD up to 1080p

**9223-A8-S** Single-Channel 3G/HD/SD MPEG-4 Encoder with H.264 SD. Support for 4 audio pairs (8-ch).

**9223-A8-S-HD-I** Single-Channel 3G/HD/SD MPEG-4 Encoder with H.264 SD/HD up to 1080i. Support for 4 audio pairs (8-ch).

**9223-A8-S-HD-P** Single-Channel 3G/HD/SD MPEG-4 Encoder with H.264 SD/HD up to 1080p. Support for 4 audio pairs (8-ch).

**RM20-9223-B** 20-Slot Frame Rear I/O Module (Standard Width) (2) 3G/HD/SD-SDI/SD BNC Composite In, (2) DVB-ASI BNC Out, (4) Balanced Analog Audio In, (2) 100/1000Base-T RJ-45 Ethernet

**RM20-9223-U** 20-Slot Frame Rear I/O Module (Standard Width) (2) 3G/HD/SD-SDI/SD BNC Composite In, (2) DVB-ASI BNC Out, (4) Unbalanced Analog Audio RCA In, (2) 100/1000Base-T RJ-45 Ethernet

#### Options:

**Note:** - Although the -A8 versions support eight channels, encoding is not designed for phase coherency between PCM pairs (i.e., using six available channels to carry 5.1 PCM surround-sound).

- Add Encoder Second Channel options cannot be used with -A8 (8-channel audio) models.
- 9223-A8 models come standard with maximum audio channel capacity. +2A option cannot be added to these models.
- Unless indicated as program channel or audio channel pair license, licenses below are **card-based** licenses and require **only one license per card**.
- RMTP and HLS modes can only use stereo encoding.
- Options denoted as "+" are software-based options which can be fitted on new product at ordering or field-installed as a software upload upgrade. Options denoted as "-" are hardware-based options which are factory-installed upon ordering, or factory-installed by returning fielded product to Cobalt for option installation.

**-SD-HD-I** Upgrade License; Upgrade (1) SD Channel to HD up to 1080i

**-SD-HD-P** Upgrade License; Upgrade (1) SD Channel to HD up to 1080p

**-HD-I-HD-P** Upgrade License; Upgrade (1) HD 1080i Channel to HD 1080p

**+RTP/ARQ** Automatic Repeat Request License

**+UP-AAC** AAC Audio License; Add (1) AAC-LC Stereo Channel

**-SD** Add Encoder Second Channel H.264 SD

**-HD-I** Add Encoder Second Channel H.264 SD/HD (up to 1080i)

**-HD-P** Add Encoder Second Channel H.264 SD/HD (up to 1080p)

**-PIP** Encoder 2nd channel H.264 low resolution PIP option

**+RIST/ARQ-ENC** Automatic Repeat Request License, Error Correction Assigned For Live Video Over IP / Internet Based on the Reliable Internet Streaming Transport (RIST) Standard

**+2A** Additional Audio Pair License

**+SMPT2022** SMPTE 2022 FEC License

#### – Audio Capacity (Base and with Audio Add Option Licenses +2A or +UP-AAC) –

**Base** – (1) standard MP1L2 encoding license on 1 PID

#### Add PIDs:

- Can have 2 audio PIDs total (1 additional +2A license or 1 additional +UP-AAC license).
- Can expand up to 4 audio PIDs with +PIP license (3 additional +2A and/or 2 additional +UP-AAC licenses)

**Note:** 9223-S-A8 models come standard with 4 x MP1L2 stereo encoders for full eight channels of audio support in a single ordering option.