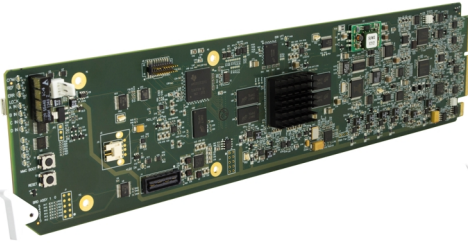


## 9960-TG2-REF1 • 3G/HD/SD-SDI Dual Test Signal Generator with Moving Box Active Signal Indication and Bi-Level Sync Out



The all-new Cobalt® 9960-TG2-REF1 3G/HD/SD-SDI Dual Test Signal Generator with Moving Box Active Signal Indication and Bi-Level Sync Out offers an easy to use, economical solution to providing comprehensive test signal packages to ensure validity of downstream baseband SDI systems. The 9960-TG2-REF1 is an unprecedented first in the high-density openGear® based card form factor. Two independent generator blocks can be set to offer dual test packages which can be simultaneously outputted or selectively fed to a single downstream path via a 2x4 output crosspoint.

The 9960-TG2-REF1 also provides AES and analog audio test tones (both using 24-bit data), and also provides waveform-based test data over its CVBS video output. A moving-box insertion can be enabled to serve as a dynamic raster confidence check. The 9960-TG2-REF1 can use either of two frame references to provide an output that's synchronous with house ref, or use its internal ref timing to generate its own ref. A CVBS output offers bi-level reference output, line 21 CEA 608 closed-captioning and VITC waveform test sequences. Audio LTC test sequences

are available over embedded, AES, and analog audio as well as via an RS-485 serial port. A user ID/trouble slate graphic file can be uploaded to the card, which in turn can be automatically inserted in active video.

Preset save/load allows saving custom card settings while allowing one-button revert to factory settings. Layered presets allow invoking changes related only to a specific area of concern while not changing any other settings or aspects. Full user DashBoard™ or Remote Control Panel remote control allows full status and control access locally or across a standard Ethernet network. GPIO allows direct input routing control and status monitoring.

### FEATURES

Comprehensive test signal generation for SDI/analog video and baseband discrete audio in an easily integrated openGear® card

Easy to use, intuitive, flexible, and far more economical than typical bench equipment

Fully-independent dual generator blocks offer simultaneous output of user-configured test packages, or instant user selection between generators via output crosspoint

Moving-box/motion insertion enable serves as an easy to use dynamic raster confidence check

SDI import allows insertion of user static raster/patterns as an alternative addition to standard test pattern outputs

DID/SDID authoring allows custom payloads to be written to specific DID/SDID locations as test packets for downstream systems

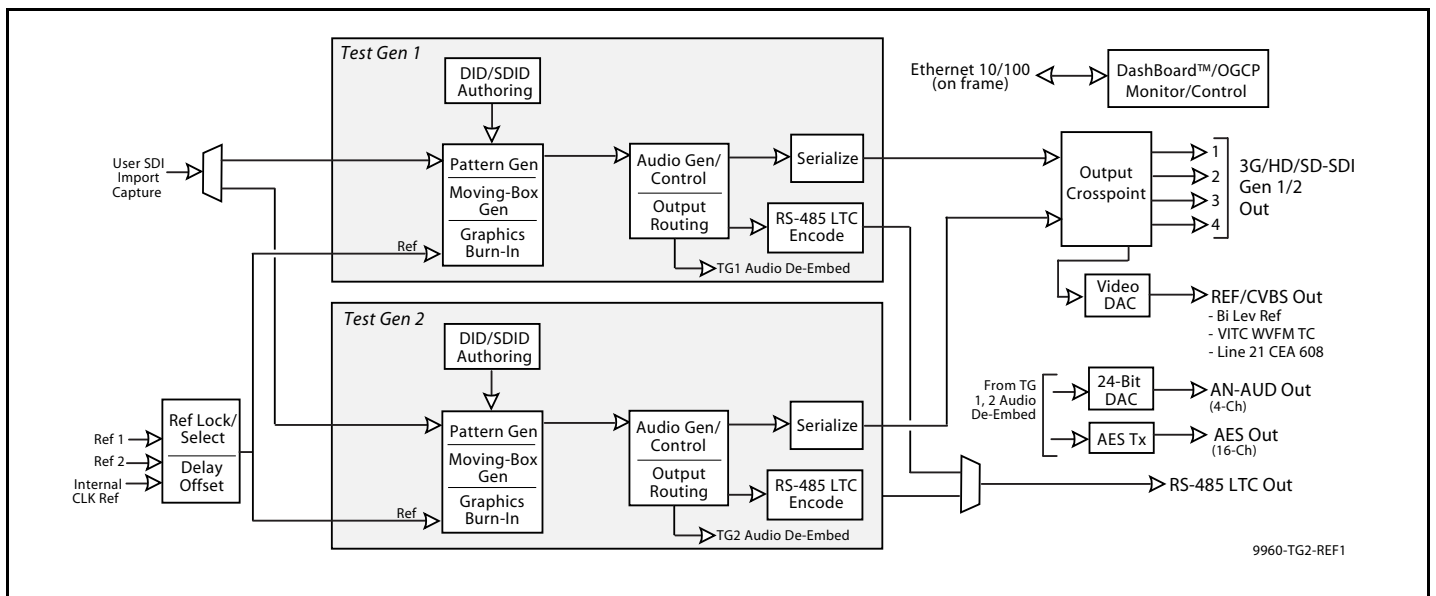
Full suite of output interfaces - SDI, CVBS, AES and analog audio

Convenience RS-485 LTC output works with legacy systems and checks bi-phase LTC/SMPTE 12 correlation in mixed systems

Low-power/high-density design - less than 18 Watts per card

Remote control/monitoring via DashBoard™ software or OGCP-9000 remote control panels

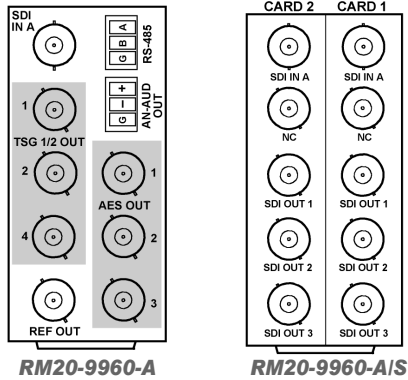
Five year warranty



9960-TG2-REF1

**openGear**

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## SPECIFICATIONS

Note: Inputs/outputs are a function in some cases of rear I/O module used.

### Power

< 18 Watts

### SDI Inputs/Outputs

(1) SDI User Input (75Ω BNC)  
Up to (4) 75Ω BNC outputs  
SDI Formats Supported: SMPTE 259M, SMPTE 292M, SMPTE 424M  
SDI Alignment Jitter: 3G/HD/SD: < 0.3/0.2/0.2 UI  
Timing Jitter: 3G/HD/SD: < 2.0/1.0/0.2 UI

### CVBS Video Output

(1) 75Ω BNC output. CVBS output functional only when selected path is carrying SD-SDI.

### Discrete Audio Outputs

AES-3id 75Ω outputs (8 pair (16-Ch) max)  
Balanced analog audio outputs (4-Ch max)  
(I/O conforms to 0 dBFS = +24 dBu)  
Analog Output Impedance: < 50 Ω  
Analog Reference Level: -20 dBFS  
Analog Nominal Level: +4 dBu  
Analog Max Output Level: +24 dBu (0 dBFS)  
Analog Freq. Response: ±0.2 dB (20 Hz to 20 kHz)  
Analog SNR: 115 dB (A weighted)  
Analog Analog THD+N: -96 dB (20 Hz to 10 kHz)  
Analog Crosstalk: -106 dB (20 Hz to 20 kHz)

### Timecode Insertion/Burn-In

Burn-in and embedded video output timecode selected via user controls from input video SMPTE embedded timecode and/or audio LTC. Burn-in enable/disable user controls. Configurable for burn-in string of seconds, seconds:frames, seconds:frames:field. User controls for text size and H/V position.

### Text Burn-In

(2) independent strings supported. Independent insertions controls for enable/disable and enable upon LOS. User controls for text size and H/V position.

### User Audio Delay Offset from Video

Bulk delay control: -33 msec to +3000 msec.  
Per-channel delay controls: -800 msec to +800 msec

### GPIO/COMM

(2) GPI configurable to select input routing. (2) GPO configurable to invoke upon input selected. RS-232/485 comm port. All connections via rear module RJ-45 GPIO/COMM jack.

### Frame Reference Input

(2) reference from frame bus. SMPTE 170M/318M "Black Burst", SMPTE 274M/296M.  
Return Loss: >35 dB up to 5.75 MHz

## ORDERING INFORMATION

**9960-TG2-REF1** 3G/HD/SD-SDI Dual Test Signal Generator with Moving Box Active Signal Indication and Bi-Level Sync Out

**RM20-9960-A** 20-Slot Frame Rear I/O Module (Standard Width) (1) 3G/HD/SD-SDI Input BNC, (3) 3G/HD/SD-SDI Output BNCs, (1) REF/CVBS Out BNC, (3) AES Out BNC, (1) Balanced Analog Audio Output, (1) RS-485 I/O

**RM20-9960-A/S** 20-Slot Frame Rear I/O Module (Split; supports 2 cards) (1) 3G/HD/SD-SDI Input BNC, (2) 3G/HD/SD-SDI Input BNCs, (3) 3G/HD/SD-SDI Processed or Reclocked Output BNCs (connections are per each Card 1 / Card 2 connector bank)