Videotek® VSG-401

Compact Video and Audio Signal Generator

The Videotek® VSG-401 is a 1/2RU wide, single channel SDI test generator with single link and dual link operation modes. Either four outputs for single link SDI 3 Gb/s, single link SDI 1.5 Gb/s or single link SDI 270 Mb/s or two outputs of dual link SDI (2 x 1.5 Gb/s) can be selected by the user. Part of the Videotek Compact Monitor Series, the unit is small in size and light in weight, making it a perfect fit for all broadcast television and post production environments.

The VSG-401 can be externally referenced to color black (black burst) or tri level sync with user settings for the test generator for video format, frame rate and signal type, with up to 16 channels of embedded audio, with group enabled settings and global settings for amplitude and frequency. There are two AES outputs, with one output selectable as word clock or digital audio reference signal (DARS). The user can add continuous motion of a bouncing block to any test pattern except check field and the output of the test generator has a source ID function with user selection of nineteen characters.

The VSG-401 is simple to operate, with an Ethernet port facilitating software updates and a built-in Web UI for web browser control. A 110/220 universal AC adapter provides the required DC voltage power input.

Features

- External reference input (looping)
  - Color black (black burst) or tri-level sync
- Single channel test generator with four outputs (two outputs for dual link)
  - Single link SDI supports 3 Gb/s, 1.5 Gb/s or 270 Mb/s
  - Dual link SDI supports 2 x 1.5 Gb/s
    - Color Bars (100% Color Bars, 75% Color Bars, RP-219 with +I, RP-219 with -I, RP-219 100% White, RP-219 75% White, SMPTE Bars)
    - Patterns (Check Field, 4:3 in 16:9 Circle, Co-Sited Pulse, Cross Hatch, Flat Field 0%, Flat Field 50%, Flat Field 100%, Red Field, Visible Field, Line Sweep 100%, Multiburst, Multiburst Y only, Pulse Bar, Limit Ramp, Shallow Ramp, Ramp Y only, 5 Step Y only, Zone Plate, V2A Timing)
- 19 character source ID can be added to test signal output
- Single channel of selectable color black (black burst) or tri-level sync reference output (2 outputs)
- Two AES/EBU outputs (one selectable as word clock or DARS)
- Up to 16 channels of embedded audio test signals
- Selectable audio level and frequency
- Front panel control with external reference input status LED
- Ethernet port for updates and built-in Web UI

Specifications

Specifications and designs are subject to change without notice

GENLOCK INPUT	
Input Type	1 input, passive looping
Input Connector Type	Electrical, single-ended, unbalanced, mechanical, BNC
Input Impedance	Hi-Z
Blackburst Input Amplitude	NTSC: Sync and burst 286 mV,nominal PAL: Sync and burst 300 mV, nominal Blackburst Input Amplitude Tolerance $\pm$6 dB
Return Loss	≥40 dB to 10 MHz
Lock Range	$\pm$6 ppm (NTSC Fsc $\pm$21 Hz, PAL Fsc $\pm$26 Hz)
Black Burst Subcarrier Jitter	<1 ns (pk-pk) over one horizontal line
Tri-Level Sync Amplitude	600 mV pk-pk nominal
Tri-Level Sync Amplitude Tolerance	$\pm$3 dB

BLACKBURST/TRI-LEVEL SYNC (TLS) OUTPUT

Number/Connector Type	2 BNC, female
Load Impedance	75 ohms nominal
Return Loss	≤-40 dB (100 kHz to 10 MHz)
Blackburst Signal Level	NTSC: Sync and burst 286 mV, nominal PAL: Sync and burst 300 mV, nominal
Blackburst Subcarrier Jitter	<1 ns (pk-pk) over one horizontal line
Tri-Level Signal Level	600 mV pk-pk
DC Offset	0 V $\pm$.5 V
SC/H Phase	0° $\pm$10º
Reference to Output Timing	$\pm$100 ns

GENERAL SDI OUTPUT CHARACTERISTICS

Number of Outputs	4
Output Connector Type	BNC, female
Output Impedance	75 ohms nominal

3G/HD/SD-SDI OUTPUT CHARACTERISTICS

Output Return Loss	(1.485 to 3 GHz) ≤-10 dB (5 MHz to 1.485 GHz) ≤-15 dB
Output Signal Level	800 mV $\pm$10%
Output DC Offset	0 V $\pm$0.5 V
Output Rise and Fall Time	(@ 2.97 GHz) <135 ps (20 to 80% amplitude), not differing by more than 50 ps (@ 1.484 GHz) <270 ps (20 to 80% amplitude),not differing by more than 100 ps (@ 270Mhz) 400 to 700 ps (20 to 80% amplitude), not differing by more than 500 ps
Jitter	(@ 2.97 GHz): <0.3UI (@1.484 GHz): <0.2 UI (@270MHz): <0.2 UI

VIDEO

Output Formats	3G/HD/SD/DL, selectable
Supported Formats	1080i/60, 1080i/59.94, 1080i/50; 1080p/30, 1080p/29.97, 1080p/25, 1080p/24, 1080p/23.98; 720p/60, 720p/59.94, 720p/50, 720p/30, 720p/29.97, 720p/25, 720p/24, 720p/23.98
Segmented Frame	1080p/30sF, 1080p/29.97sF, 1080p/25sF, 1080p/24sF, 1080p/23.98sF
Dual Link (per SMPTE 372M)	4:2:2 (YCBCR) 10-bit, 1080p/60, 1080p/59.94, 1080p/50
3G-SDI	1080p: 60 Hz, 59.94 Hz, 50 Hz (4:2:2 Y'Cb'Cr/10-bit)
SD-SDI	525 at 59.94 Hz
	625 at 50 Hz

TEST SIGNALS AVAILABLE

Color Bars	100% color bars, 75% color bars, RP-219 with +I, RP-219 with −I, RP-219 100% white, RP-219 75% white, SMPTE bars
Patterns	Check field, 4:3 in 16:9, circle, co-sited pulse, cross hatch, flat field 0%, 50%, 100%, red field, visible field, line sweep, multiburst, multiburst Y only, pulse bar, limit ramp, shallow ramp, ramp Y only, 5 step Y only, zone plate, V2A timing

AUDIO

Audio Formats	AES or DARS, unbalanced
Sample Rate	48 kHz
Output Impedance	75 ohms
Output Connector	2 BNC
AES Output Return Loss	≤-25 dB -0.1 to 6 MHz
Output Signal Level	1 V pk-pk (75 ohms terminated)
AES Jitter	0.25 UI

WORD CLOCK OUTPUT CHARACTERISTICS

Output Connector	1 BNC, female, shared with AES/DARS
Output Impedance	75 ohms nominal
Output Level	5 V TTL levels with 75 ohms load

EMBEDDED AUDIO

Output Sample Rate	AES, 48 kHz
Output Level	0, -9, -12, -20 dBFS and silence, user-selectable
Output Frequency	Fixed selections of 400Hz, 1 kHz, and 10 kHz

INTERFACES

Communication Interfaces	1 Ethernet port, RJ-45 connector, 10/100Base-T
Network Interface	IEEE 802.3 (Ethernet), 10/100Base-T for web browser control

POWER REQUIREMENTS

Power Connector	15 VDC, nominal (11 to 18 VDC min-max) from 4-pin XLR
AC Adapter	Included

MECHANICAL

Dimensions (H x W x D)	1.75 x 8.5 x 6.60 in. (4.45 x 21.59 x 16.76 cm)
Weight	1.66 lbs (0.753 kg)

ENVIRONMENTAL

Operating Temperature	32° to 122° F (0° to 50° C)
Storage Temperature	-22° to 149° F (-30° to 65° C)
Humidity (non-condensing)	Operating: 20% to 80% Non-operating: 5% to 90%
Applicable Standards	SMPTE RP 184-2004, SMPTE RP 165-1994, SMPTE RP 219, SMPTE 259M, SMPTE 272M, SMPTE 274M-2005, SMPTE 291M, SMPTE 292M-2006, SMPTE 295M, SMPTE 296M, SMPTE 299M, SMPTE 318M, SMPTE 352M, SMPTE 372M, SMPTE 424M, SMPTE 425M AB, SMPTE RP 184-2004, SMPTE RP 165-1994, SMPTE RP 219, SMPTE 318M, AES3–2003, AES11–2003
Standard Accessories	VSG-401 installation and operation handbook (on CD-ROM) power cord and power supply

Ordering Information

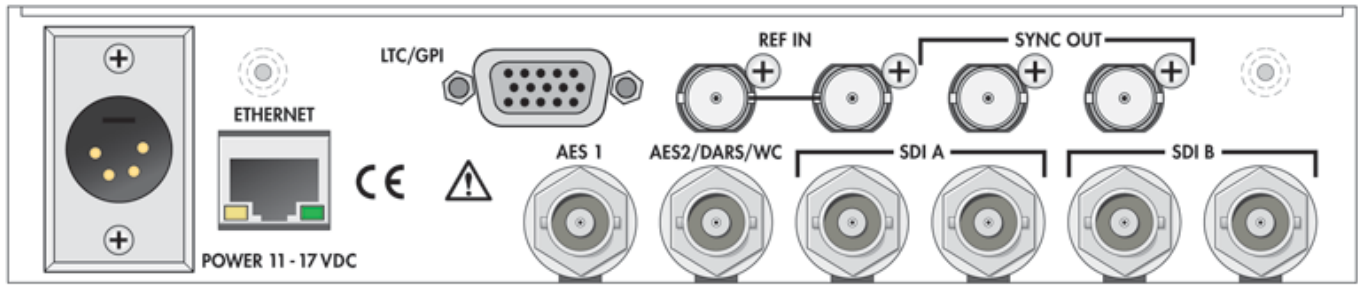|	
VSG-4SYS-V	VSG-401 system, includes 2 VSG-401 video signal generators, 1 VSX-11-3G multiformat sync changeover unit, 1 RMT-U1 and 1 DRT-4 rack mount trays
VSG-401	Video signal generator (single channel), 1/2RU wide, with genlock and 3G/HD/SD video and embedded/AES audio outputs, optional rack mount (DRT-4A) and blank panel (BLK-5)

OPTIONS	
DRT-4A	Dual rack mount tray for CMN-41, CMN-MV, LLM-1770, or VSG-401. Use BLK-5 to fill unused space, if needed
BLK-5	Blank panel for left or right side of DRT-4A or DRT-5
DRT-5	Dual rack mount tray for VSG-4 Series and DL-870 products, BLK-5 blank front filler available (DRT-ADP-1 DRT adaptor required for installing DRT-4 products in the DRT-5 rack tray (CMN-41, CMN-MV, LLM-1770, VSG-401)
DRT-ADP-1	DRT adaptor for installing DRT-4 products to fit in the DRT-5 rack tray. (For CMN41, VSG-401, LLM-1770)

PACKAGES WITH VSG-401 AND COMPACT SERIES SCOPE/RASTERIZER	
CMVS-DVI	Compact monitor series rasterizer and signal generator test set, includes CMN-41-3GB (DVI OUTPUT), VSG-401 and DRT-4A
CMVS-SDI	Compact monitor series scope and signal generator test set. Includes CMN-MV-3GB (SDI OUTPUT), VSG-401 and DRT-4A

Images/Diagrams

Back Panel

Block Diagram