

Tektronix Video Signal Generators

▶ SPG600 • SPG300



▶ The Sync signal generator family SPG600 (Full rack width) and SPG300 (Half rack width).

The SPG600 and SPG300 Sync Pulse Generators provide synchronization and test signals for both traditional analog and mixed digital and analog facilities, in both NTSC/525 and PAL/625 environments. These products are ideal as a stable master sync signal, which is critical in digital broadcast environments. When the SPG600/SPG300 is configured for Stay GenLock™ mode, a momentary loss of synchronization at the genlock reference input will not cause a disturbance in the units test signal and black outputs. When the genlock signal is reapplied, the SPG system will gradually re-acquire lock, causing little disruption in the outputs of the device, and will not cause any noticeable glitches in the outputs of the SPG. The GEN lock source can be NTSC/PAL Black Burst, NTSC/PAL Sync or CW. When using CW lock, the GEN lock timing can be adjusted on all the NTSC or PAL color frames.

Analog Black Burst/ Test Signal Outputs

The SPG600 and SPG300 each provide four Black Burst output channels which

may be independently timed over the full NTSC or PAL color frame range. The Black Burst output channels can be configured as a Black Burst or a Test Signal output, providing outstanding flexibility to handle your production facilities needs. In analog-to-digital transition environments especially, the sync generator needs to provide a variety of sync outputs. The SPG600 and SPG300 are suitable for use as a master sync generator for small facilities or as a slave sync generator in larger environments. With Option 02 the SPG600 can provide four additional Black Burst out-puts, and with Option 01 the fine timing offset can be individually adjusted for each Black Burst output in 0.1 ns increments, to support timing adjustments to analog systems.

The SPG600 and SPG300 also provide basic test signals for analog facilities. These test signal outputs can include ID text (up to 20 characters) or Logo insertion. The ID Text or Logo may be positioned anywhere in the viewable area and, if desired, be made to blink.

▶ Features & Benefits

Two models, SPG600 (Full Rack Width) and SPG300 (Half Rack Width), which Provide All of the Conventional Video and Audio Signals that You Need in One Unit, Analog Black Burst/Test Signal, SD-SDI Black/Test Signal, AES/EBU Digital and Analog Audio Signal

Stay GenLock™ – Unique, Robust Genlock Mode Provides Stable Synchronization Signals for Digital and Traditional Broadcast Facilities

All Analog and SD-SDI Signal Output Channels Are Configurable with Selection of Black Burst or Test Signal Outputs

SNMP and WEB Remote Control Makes it Easy to Integrate the Units into Any Operational Environment

Choose Between Two Form Factors: Full Rack Width – SPG600, or Half Rack Width – SPG300

Optional Fine Timing Offset Feature for Analog Video Outputs - SPG600/SPG300 Option 01

Up to Eight Optional Analog Black Burst/Test Signal Outputs with Independent Timing Offset - SPG600 Option 02

Up to Four Optional SD-SDI Black/Test Signal Outputs with Independent Timing Adjustment - SPG600 Option 03

▶ Applications

Broadcast Master Sync Generator

Unique and Robust Genlock – Stay GenLock

Genlock to House Master Sync

COMPUTING

COMMUNICATIONS

VIDEO

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Serial Digital Video Outputs

The SPG600 and SPG300 provide two independently timed SD SDI Black outputs with full frame range for 525/60 or 625/50. The SD SDI Black output channel can be configured to provide SD SDI Black or SD SDI Test Signals, similar to the analog Black Burst outputs. With Option 03 the SPG600 offers two additional SD SDI Black outputs.

The SPG600 and SPG300 also provide fundamental test signals for digital broadcast environments, which are selected individually from the analog test signals. As with the analog outputs, up to 20 characters of ID Text or your Logo can be inserted into the signal, positioned anywhere in the image, and, if desired, set to blink.

There are 16 channels of embedded audio which can be active in the SD SDI outputs. Audio Click (1 s, 2 s, 3 s, and 4 s) is available for easy channel identification.

AES/EBU Digital Audio Outputs

The SPG600 provides four BNC connectors and two XLR connectors for AES/EBU Digital Audio. Frequency and level can be set on the eight AES/EBU unbalanced outputs, and each channel can have separate Audio Click channel identification. The two XLR balanced outputs can be set up to match the 1+2 and 3+4 BNC outputs. One Word clock output is available.

The SPG300 provides two XLR connectors for AES/EBU Digital Audio, and provides a one Word clock output.

Analog Audio Outputs

The default setting for the two XLR outputs is AES/EBU Digital audio. For analog audio applications, these two XLR outputs can be configured as two Analog Audio outputs. Frequency, level and audio identification can be set on each channel.

SNMP and Web Remote Control

The SPG600 and SPG300 both support SNMP, making it easy to integrate these generators into automated service and maintenance functions. The Java applet based remote control makes it easy to remotely control these generators, and the remote monitoring software gives you a view of SPG300 or SPG600 operation at a distance. The SPG600 and SPG300 also provide traditional GPI features for reporting alarms and recalling presets.

▶ Characteristics

Note: Unless otherwise noted, specifications are common to both the SPG600 and SPG300

GENLOCK

Reference Input

Input Connector: Two BNC connectors, loopthrough.
Amplitude: Nominal ± 6 dB. (Composite),
1 to 2.5 V_{p-p} (CW). S/N Ratio: >40 dB. SCH Phase:
Nominal $\pm 40^\circ$. Return Loss: >40 dB to 5 MHz.

Performance –

Pull-in Range: $F_{sc} \pm 5$ ppm.
Jitter: Burst Lock: $<0.5^\circ$. Sync Lock: <1 ns.

Genlock timing offset –

Range: Full Color Frame.
Resolution: $<0.5^\circ$ of NTSC/PAL subcarrier.

SERIAL DIGITAL VIDEO OUTPUTS

SDI Black Output 1/2. Add 3/4 with SPG600 Option 03.

2 Channels – 1 Black Generator and 1 Test Signal Generator.

Test Signal can be distributed to both channels.

SD SDI Test Signal Output –

525: 100%, 75%, and SMPTE Color Bars, Linearity, Flat Field, Monitor, Multiburst, Pulse & Bar, Sweep, SDI, Timing, Other, Rec 801.

625: 100%, 75% Color Bars and 100%, 75% Color Bars over red, Linearity, Flat Field, Monitor, Multiburst, Pulse & Bar, Sweep, SDI, Timing, Other, Rec 801.

Standards –

ITU-R BT 601, 656, EBU Tech 3267, SMPTE 125M, 244M, 259M, 272M, RP165, RP178.

Format – 525-270, 625-270 (270 Mbps).

Output connector – BNC.

Output Impedance – 75 Ω .

Output Amplitude – 800 mV $\pm 10\%$.

Rise and Fall Time – 0.4 ns to 1.5 ns.

(20% to 80%).

Jitter – <0.2 UI.

Timing Offset – Range: Full Color Frame.

Resolution: $<1/27$ MHz.

Return Loss – >15 dB (5 MHz to 270 MHz).

ID Text – 20 characters max.

Blinking Interval – Blinking Interval Fast, Slow or OFF.

Logo – Grayscale, 4 level. Blinking Interval Fast, Slow or OFF.

Embedded Audio Signal

Active Channels – 1 to 16 channels (4 groups).

Sample Frequency – 48 kHz.

Digital Coding – 20 or 24 bits.

Audio Tone – Frequency (Hz): Inactive, Silence, 50, 100, 150, 200, 250, 300, 400, 500, 600, 750, 800, 1000, 1200, 1500, 1600, 2000, 2400, 3000, 3200, 4000, 4800, 5000, 6000, 8000, 9600, 10000, 12000, 15000, 16000, 20000.

Level: -60 to 0 dBFS, 1 dB steps.

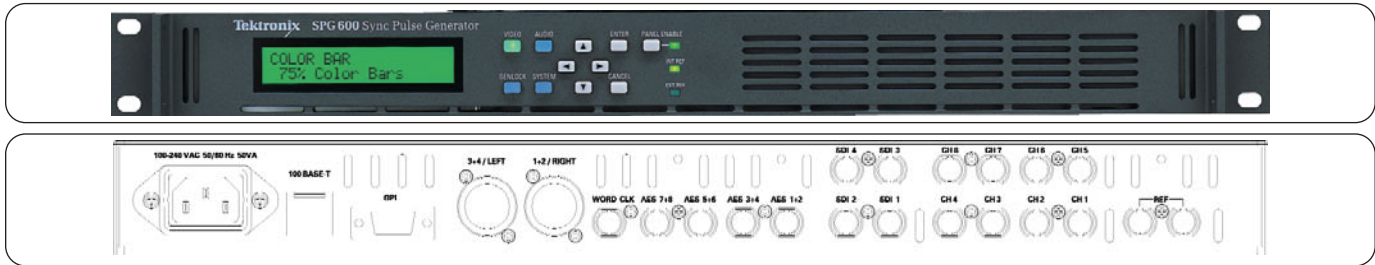
Click: 1 s, 2 s, 3 s, 4 s or OFF.

AES/EBU DIGITAL AUDIO OUTPUTS

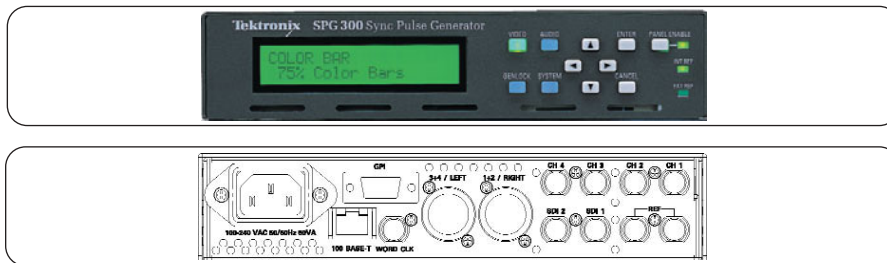
Standards –

ANSI S4.40 (AES3); SMPTE 276M (AES3 ID).

Number of Audio Channels – SPG600: 8 (1+2, 3+4, 5+6, 7+8) for BNC, 4 (1+2, 3+4) for XLR. SPG300: 4 (1+2, 3+4) for XLR.



▶ The Sync signal generator SPG600 (Full rack width) front and rear view.



▶ The Sync signal generator SPG300 (Half rack width) front and rear view.

Required Receiver Termination –

75 Ω \pm 10% for BNC, 110 Ω \pm 10% for XLR.

Output connector – SPG600: 75 Ω BNC x 4 and XLR x 2^{*1}. SPG300: XLR x 2^{*1}.

Audio Parameter – Frequency (Hz): Inactive, Silence, 50, 100, 150, 200, 250, 300, 400, 500, 600, 750, 800, 1000, 1200, 1500, 1600, 2000, 2400, 3000, 3200, 4000, 4800, 5000, 6000, 8000, 9600, 10000, 12000, 15000, 16000, 20000.

Level: –60 to 0 dBFS, 1 dB steps.

Click: 1 s, 2 s, 3 s, 4 s or OFF.

Quantized Resolution – 20 or 24 bits.

Amplitude – Unbalanced (BNC): 1 V \pm 0.1 V.

Balanced (XLR): 5 V \pm 0.3 V.

Rise and Fall Time –

30 ns to 44 ns (measured 10% to 90%) to BNC.

5 ns to 30 ns (measured 10% to 90%) to XLR.

Jitter – \leq ±8 ns.

Timing Offset – Range: 160 ms. Resolution: 1 μ s.

Word Clock – Output connector: BNC.

Output level: CMOS compatible.

Frequency: 48 kHz.

ANALOG VIDEO OUTPUTS

Analog Video Output 1/2/3/4. Add 5/6/7/8 with SPG600 Option 02.

4 Channels – 3 Black Generators and 1 Test Signal Generator.

Test Signal can be distributed to up to 4 channels.

Test Signal – NTSC and NTSC No Setup: SMPTE Color Bar, 75% Color Bar, Linearity, Flat Field, Monitor, Multiburst, Pulse & Bar, Sweep, Other. PAL: 75% Color Bar, 100% Color Bar, 75% Color Bar over Red, 100% Color Bar over Red, Linearity, Flat Field, Monitor, Multiburst, Pulse & Bar, Sweep, Other.

Format – NTSC, NTSC no setup and PAL.

Output connector – BNC.

Output Impedance – 75 Ω .

Return Loss – $>$ 30 dB to 5 MHz.

Burst Amplitude Accuracy – \pm 5%.

Sync Amplitude Accuracy – \pm 3%.

Blanking Level – \pm 50 mV.

SCH Phase Accuracy – \pm 5°.

Timing offset – Range: Full color frame.

Resolution: $<$ 1/27 MHz (Clock). 0.1 ns (Option 01).

ID Text – 20 characters max.

Blinking Interval: Blinking Interval Fast, Slow or OFF.

Logo – Grayscale, 4 level. Blinking Interval Fast, Slow or OFF.

Analog Audio Outputs

Output Connector – XLR x 2^{*1}.

Output Impedance – 12 Ω .

Frequency (Hz) – Silence 50, 100, 150, 200, 250, 300, 400, 500, 600, 750, 800, 1000, 1200, 1500, 1600, 2000, 2400, 3000, 3200, 4000, 4800, 5000, 6000, 8000, 9600, 10000, 12000, 15000, 16000, 20000.

Audio Parameters –

Level: –48 dBu to +12 dBu (Resolution 1dB).

Communication

GPI (General Purpose Interface) –

Connector: D-sub, 9-pin.

Outputs: Pin 1: Error output.

Pin 9: GND. Output Level: $<$ 0.4V at 100 mA sink or maximum 4 Ω .

Inputs: Active Low Input: Pin 3: Input 1.

Pin 4: Input 2. Pin 5: Input 3. Pin 6: GND.

Input Level – TTL Compatible

(Low $<$ 0.4 V, High $>$ 1.4 V).

Inputs are pulled up with 10 k Ω .

Network Interface –

10/100Base-T Ethernet.

ENVIRONMENTAL

Mains Ranges – 90 to 250 V, 50/60 Hz.

Power Consumption –

SPG600: $<$ 85 VA (35W) at 110 or 240 V_{AC}.

SPG300: $<$ 65 VA (30W) at 110 or 240 V_{AC}.

Temperature – Operating: 0 $^{\circ}$ C to 40 $^{\circ}$ C.

Nonoperating: –20 $^{\circ}$ C to +60 $^{\circ}$ C.

*1 The 2 XLR outputs can be set to AES/EBU or Analog Audio.

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Physical Characteristics

▶ SPG600

Dimensions	mm	in.
Height	43.6	1.72
Width	482.5	19
Depth	557.5	21.9
Weight	kg	lb.
Net	5.0	11
Shipping	8.5	19

▶ SPG300

Dimensions	mm	in.
Height	43.6	1.72
Width	206.2	8.1
Depth	435.7	17.2
Weight	kg	lb.
Net	2.5	5.5
Shipping	5.8	13

▶ Ordering Information

SPG600

SD SYNC Generator

Includes: Quick Reference, CD-ROM, Reply Card, Packing List, Certificate.

SPG300

SD SYNC Generator

Includes: Quick Reference, CD-ROM, Reply Card, Packing List, Certificate.

SPG600 Options

Opt. 01 – Fine timing adjustment.

Opt. 02 – Adds 4 channel analog video outputs.

Opt. 03 – Adds 2 channel SD-SDI video outputs.

Opt. 1R – Adds rackmount kit, rack rail type.

SPG300 Options

Opt. 01 – Fine timing adjustment.

Power Plug Options

Opt. A0 – North America power.

Opt. A1 – Universal EURO power.

Opt. A2 – United Kingdom power.

Opt. A3 – Australia power.

Opt. A4 – 240 V, North America power.

Opt. A5 – Switzerland power.

Opt. A6 – Japan power.

Opt. A10 – China power.

Opt. A99 – No power cord or AC adapter.

Optional Accessories

User manual – Order 071-1340-00.

Service manual – Order 071-1342-00.

Service

Opt. C3 – Calibration Service 3 Years.

Opt. C5 – Calibration Service 5 Years.

Opt. D1 – Calibration Data Report.

Opt. D3 – Calibration Data Report 3 Years (with Option C3).

Opt. D5 – Calibration Data Report 5 Years (with Option C5).

Opt. R3 – Repair Service 3 Years.

Opt. R5 – Repair Service 5 Years.

Recommended Accessories (SPG300 Only)

TVGF11A – Single Rackmount.

TVGF13 – Dual Rackmount.

TVF16 – Zero-clearance Dual Rackmount adapter.