Utah Scientific

TSG-460 & CO 465

Universal SPG/TPG, Time Reference and Changeover Series

www.utahscientific.com

Utah Scientific TSG-460

Universal SPG/TPG and Time Reference

The Utah Scientific TSG-460 is the ultimate sync, test pattern, and time reference generator, designed to satisfy the requirements of every broadcast operation, including serial digital (standard, high-definition, and 3G) and mixed digital/analog environments, as well as postproduction and outside broadcasting. The TSG-46 provides all reference (color black and tri-level sync), timing, and test signals (LTC and VITC) – together with analog audio, AES audio, and word clock – needed to satisfy any application in PAL, NTSC, SD SDI, HD SDI, and 3G SDI, 4K UHD (Quad), and mixed-standard installations.

The TSG-460 is also available with optional dual, “hot swap” redundant power supplies for maximum security. The power supplies are directly accessible from the front panel.

The TSG-460 is designed for use either as a master or, when genlocked, as a slave SPG. Where it is critical to have a backup SPG, the auto changeover unit (CO-465) complements the TSG-460. This can be user configured to monitor and change over analog video, digital video, timecode, and AES/EBU digital audio signals.

Features

- Outstanding performance, stability, and reliability
- PAL/NTSC/625/525-switchable
- Comprehensive range of test patterns for all analog and digital applications ±4 field (PAL) / ±2 field (NTSC) timing range
- Multiple and configurable reference outputs (PAL/NTSC/tri-level sync in all HD formats)
- 4 LTC (standard and offset) or pulse outputs (user programmable)
- VITC on all SD outputs (user select)
- Analog stereo tone output with programmable interrupt
- Embedded audio
- Lock time to VITC on genlock ref input
- User-programmable and animated text idents (3) (independent on each test out)
- Text idents in any language (bitmap import)
- Configurable for multiple users
- Independently adjustable reference outputs (NTSC color black, PAL color black, and tri-level sync)
- 10MHz reference input
- Genlock to color black or tri-level sync
- 2 pairs independent SD (Std), HD, and 3G SDI color black and test patterns (with embedded tone/silence)
- AES digital tone, silence, word clock
- Remote control, NTP server, and client over Ethernet – including remote control via Ross Video Dashboard
- GPS receiver option – lock time to UTC
- GbE PTP Grandmaster (Option)

Specifications

Conforms to relevant EBU, CCIR, or SMPTE specifications.

Video Inputs (BNC)
75-Ohm looping reference
10-MHz terminating reference

Video Outputs (BNC)
Analog color black, (2) Std.
Composite test, (2) Std.
Color black/tri-level (3 independent pairs)
SDI (SD Std./HD or 3G) color black with embedded silence (2 independent pairs)
SDI (SD Std./HD or 3G) test pattern with embedded tone (2 independent pairs)

Unbalanced AES Audio (BNC)
AES (2) Std.

DARS (1) Std.

Word Clock
TTL (2) BNC Std.

Balanced Audio/AES/LTC Outputs
Molex Microclasp 30-pin Connector

Timecode Outputs
LTC 4 (user select) Std. VITC (user select) Std.

Controls and Indicators
LCD display, rotary knob, & switch
Ethernet 100Base T RJ45 Std.
GPI/RS232 Microclasp 10 pin Std.
GPS Antenna Input SMB jack

Color Black Outputs
Fsc stability: ±1 Hz over temperature range*
SCH phase: 0 degrees ±5 degrees
Return loss: >35dB to 5 Mhz

Sync Pulse Generator
Subcarrier output
Frequency: 4.43361875MHz after warm-up (PAL)
Stability: ±1Hz over temperature range* Amplitude: 1Vp-p
Return loss: >35dB to 5 Mhz

Pulse and Pattern Outputs
Signals: meet or exceed relevant EBU, CCIR and SMPTE specifications

Genlock
H range: ±4 fields (PAL). Moves all timing relative to the reference input.
Subcarrier: 0 to 360 degrees Resolution: <0.5 degrees of subcarrier

Mechanical
Height: 1 Rack unit
Width: 19" (482.5 mm) Rack mounting
Depth: 15.95" (405 mm) Overall
Weight: 13 lbs. (6 Kg) Unpacked

Voltage: Auto ranging 100 to 240V AC, 50/60Hz
Power: 21 Watts maximum

Ordering Information
TSG-460: SPG/TPG & Time Ref Single PSU
TSG-460D: SPG/TPG & Time Ref Dual PSU
TSG-460/03: HD SDI outputs - Option
TSG-460/04: 3G SDI outputs - Option
TSG-460/05: NTP - Option
TSG-460/06: GPS receiver/antenna - Option

*Operational temperature range is 0 °C to +40 °C

Utah Scientific reserves the right to alter any specification without prior notice.

2 Year Warranty

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Utah Scientific CO-465

Changeover Series

The CO-465 is a universal modular automatic sync pattern generator changeover for use with the TSG-460. It can be configured as 6 or 12 measured channels in 1 RU. All channels measure both the primary and backup signals. It can also easily be incorporated into any system containing other sync, test pattern generators. For maximum security the unit is supplied with two hot swappable power supplies directly accessible from the front panel.

To Allow for mixed format requirements and offer maximum flexibility, each channel can be set to measure analog color black, SD-SDI, HD-SDI, or AES/EBU audio 75 Ohm. Each channel has a primary input, a backup input, a common output and a relay that switches one of the inputs to the common output.

*CO-465/12 shown above, CO-465/6 provides the same rear panel with 6 measure channels only. The CO-465/6 can be upgraded to 12 channels with expansion card install.

Features

- Up to 12 channels in 1 RU
- Front Panel Visual fault indication
- Manual Override facility
- All channels can measure analog color black,SD-SDI,HD-SDI,3G HD-SDI, HD Tri-level sync, Timecode or AES/EBU
- All channels will switch if one channel fails
- Hot swappable redundant power supplies
- Clear fault indiciation on front
- All channels user configurable

Specifications

Conforms to relevant EBU, CCIr or SMPTE Specifications

Video Inputs per Channel

Connector:	BNC
Primary:	(1) Terminating
Backup:	(1) Terminating

Video Outputs per Channel

Connector:	BNC
Output:	(1)

Control

LCD display with rotary knob and switch

Changeover Threshold

Analog Color Black:	On loss of signal
SD:	On loss of signal
AES/EBU:	On loss of signal
HD tri-level:	On loss of signal
Timecode:	On loss of signal

Return Loss

Better than 36dB @ 4.43MHz

Isolation

<60dB, both directions, all channels to 1.5GHz

Power

Auto Ranging 100-240V AC 50/60hz
Power Consumption: 21 watts max

Physical

Width:	19”(48.26 cm)
Depth:	15.95”(405 mm)
Height:	1RU, 1.75” (4.45 cm)
Weight:	13.2lb (6 kg)

Environmental

Operating temperature 32-104 degrees F, (0-40 degrees C)
Relative Humidity Range: 0-90%,non-condensing

2 Year Warranty