

SPG8000
Master Sync / Clock Reference Generator
Release Notes

This document supports firmware version 1.6.

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077-0751-04

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Release notes

This document describes new features, improvements, and limitations of firmware version 1.6 for the SPG8000 Master Sync / Clock Reference Generator.

New features

SMPTE309 time code date data support

The instrument now supports SMPTE309 time code date data on the VITC and LTC inputs. When the Time of Day source is set to VITC or LTC, the Time of Day submenu has a selection to determine how SMPTE309 date data (if present) will be used. You can set the instrument to ignore the data, use the data as an input only, or to use the data as an input and an output.

When the VITC or LTC inputs are used as time-of-day sources, the hh:mm:ss:ff settings will be synchronized to the VITC or LTC source (if present). When the SMPTE309 Data mode is set to Use as Input or to Use as Input/Output, the date is set using the VITC or LTC source. When the SMPTE309 Data mode is set to Ignore, the date is set from the internal RTC.

The Black outputs (when VITC is enabled) and the LTC outputs now always have the SMPTE309 date, time-zone offset, and DST enabled/disabled fields included. The content of these fields depends on the current SMPTE309 mode setting (Ignore, Use As Input, or Use As Input/Output).

If Option SDI is installed, the SDI embedded timecode (when enabled) also includes the SMPTE309 fields.

Many installations use multiple instruments configured in a master/slave relationship (for example, when sending signals across time zones). In these instances, if the master instrument is locked to GPS, is running in Internal mode, or is genlocked to a source without ST309 data, the SMPTE309 Data mode on the master instrument should be set to “Ignore.” If the master instrument is locked to a source providing ST309 data, the SMPTE309 Data mode on the master instrument should be set to “Input” and on the slave instrument the mode should be set to “Input.”

NOTE. *The Black, Composite, LTC, and SDI outputs have Time Zone Offset adjustments which allow the outputs to use a different offset than the one used as the master time-of-day in the instrument. These adjustments allow you to enter a time zone correction of up to $\pm 23:59$ hours. However, the ST309 standard only implements codes for time zones in the range of -12 to +13 hours. Therefore, when the instrument is set to use ST309 data as the Time of Day source, it is recommended that the combined programmed offset from time zone and DST be restricted to the range of -12 to +13 hours.*

The STATUS button display now includes the received ST309 time zone and DST data (if present).

**Dolby E audio generation
(requires Option SDI)**

For instruments with Option SDI installed, a new software option is available (Option DBT) which supports Dolby E audio generation. With Option DBT, the Audio (Embedded) submenu has selections for enabling a Dolby E stream on channels 1–2 and/or 3–4 for each embedded audio group. In addition, the EMBED button menu has a Dolby E configuration submenu that allows you to configure the Dolby E metadata.

The Dolby E signals include test tones at different levels (–18 dBFS, –20 dBFS and Multitone) with frame rates compatible with the respective video signals. You can set the Dolby E audio frame start locations (Early, Ideal, Late, or Custom) to test the error handling ability of the signal processing equipment in the signal path. Dolby E metadata is also inserted in the test stream, which can test the performance of signal processing equipment downstream. You can configure each of the three D's of Dolby (dialnorm, dynamic range and downmix parameters). The Dolby E program configurations of 8x1 mono, 4x2 stereo, surround 5.1, 5.1+2 and 7.1 audio are supported.

**Second line available for
BITC display (requires
Option SDI)**

The burnt-in time code (BITC) display that can be added to any test pattern generated from the SDI outputs now has a second line that can be enabled to show the date in the format YY/MM/DD.

General limitations

This firmware release has the following general limitations. Please check the Tektronix Web site (www.tek.com/software/downloads) for any firmware updates to the SPG8000 generator.

Firmware upgrades

- When the SPG8000 firmware is upgraded (using a USB drive or a network connection), all files created or installed by the user are deleted. The deleted files include presets, signal files, frame picture files, logo files, sequence files, and for Option SDI, can also include text and font files. The standard set of factory installed signal files, logo files, and Option SDI font files are restored when the firmware is upgraded.

To prevent the loss of your user created files, use the “Backup All User Data to USB” function from the SYSTEM menu to save your user files before you upgrade the firmware. After the upgrade, use the “Restore All User Data From USB” function from the SYSTEM menu to restore your user created files.

- If you have loaded the SPG8000 memory with a large number of test signals or frame picture files, you may not be able to upgrade the instrument firmware because the memory is too full. If you receive a memory error while attempting to upgrade the firmware, you need to delete some of the test signal or frame picture files and then perform the upgrade.

Alert messages

If there is an active alert condition (e.g. reference input missing) while the STATUS : ALERT menu is displayed, the alert message(s) will not automatically change if the alert condition is cleared. To view any changes to the alert messages, you must change to another menu and then return to the STATUS : ALERT menu.

Resetting an output signal

When the instrument rereads or resets signal data, such as format changing, preset recall, or signal-button assignment, a signal output interruption or synchronization shock may occur.

Incorrect CW reference signal

If an NTSC or PAL signal is connected to the REF input when the reference source is set to “CW”, the video timing of all SPG8000 outputs will rattle every 1–2 seconds. To resolve this problem, use the REFERENCE : SOURCE menu to select the signal type that matches the reference input signal.

Web interface performance with Internet Explorer 8

Some performance issues have been observed when the SPG8000 Web Interface is used with Internet Explorer 8. The use of newer browsers is recommended.

Time of day changes for timecode outputs

When the time-of-day changes, such as when scheduled daylight savings adjustments are made or when the internal time is set from the front panel, there can be a delay before that change is reflected on timecode outputs.

This delay may be a small number of frames (fraction of a second) when all timecode output formats are based on the same clock rate (for example, NTSC black burst and 1080i 59.94 HD tri-level on black outputs in addition to 30 fps drop-frame on LTC outputs), or up to several seconds when timecode formats based on different clock rates are used (for example, 29.97 fps and 24 fps on different outputs).

Daylight Savings Time (DST) scheduler system

The DST scheduler system applies the DST offset even if the Time-Of-Day (TOD) source is set to “VITC Input” or “LTC Input” and the SMPTE309 mode is set to “Ignore” or “Use As Input.” In these cases, the offset is applied whether or not a valid VITC or LTC input signal is available. For proper DST scheduling, you need to ensure that the instrument has valid time information and manually enter the correct time of day if the system is not synchronized to an accurate time of day source.

When the TOD source is set to “GPS signal” and the GPS is not locked to the input signal, the DST scheduler system will apply the DST offset when the internal real-time clock (which is subject to slight drift) reaches the time scheduled for the DST offset to be applied or removed. Ensure that the GPS is locked and that the system time of day is correct before turning on the DST scheduler system.

The manual time-of-day setting is not automatically reapplied when the instrument power is cycled. If the instrument powers up in with the Time of Day source set to “Internal” mode, the time of day will be acquired from the internal real-time clock in the instrument. Check the system time of day and adjust as needed to ensure that it is correct before the next transition of the DST scheduler when the Time of Day source is set to Internal mode.

SMPTE309 data usage

- If ST309 data is not present on the selected time reference, then the default SMPTE309 Data mode setting of “Ignore” is the correct selection. For most applications in which the input time reference does have the ST309 data, then the setting of “Input” is usually the best choice. While in “Input” mode, the time zone and DST programming on the input and output are independent, with the input set by the ST309 data on the input and the outputs being set by the menu in the instrument. This is the best mode of operation even if all units are set to the same time zone and DST values.
- When the SMPTE309 Data mode is set to “Ignore,” you cannot use the Time Zone Offset or DST offset controls on the slave unit to adjust the time code outputs. The reason for this is that the slave unit assumes that the VITC/LTC inputs are local time and already have such corrections applied. However, you can offset the time code on individual outputs using the offset controls for each output. The local time zone and DST settings do affect the master time-of-day since the offsets are subtracted from the input and added to the output, but the net effect is that the outputs match the inputs unless individually offset.
- SMPTE309 time zone offset data on individual outputs is not affected by adjusting time code offsets on individual outputs. The time code offset controls on the individual outputs does not affect the time zone offset fields in the output time code data. For example, if the slave unit is configured with a time zone offset of –08:00 and then you also adjust the time code offset on the SDI Channel 1 output by another +03:00 hours, the SMPTE309 data on that output will still read –08:00 in the time zone offset field even though the actual output is UTC –05:00 hours.
- The applied DST offset display is incorrect when the SMPTE309 Data mode is set to “Use as Input/Output.” When “Use as Input/Output” is selected, the Applied DST Offset indicator on the slave unit does not report the actual DST offset being applied by the system. Instead, the indicator reports the DST offset that would be applied if the slave unit was using its own DST offset configuration (as it would in GPS or in VITC/LTC “Ignore” or “Use as Input” modes).

Option GPS

Missing GPS or GLONASS signal. When the reference source is set to “GPS Signal” but the external GPS or GLONASS signal is missing, the SPG8000 automatically uses the internal reference signal as the reference source. However, the front-panel INT indicator does not turn green to show that the internal reference is being used. The EXT indicator does correctly turn red to indicate that the external (GPS or GLONASS) reference is missing.

Option SDI **SDI equalizer test signal.** Per SMPTE RP198 for HD-SDI, a polarity change word is used to ensure equal probabilities of the DC bias for the equalizer test pattern. However, some SDI formats still exhibit an unequal bias. Enabling a dynamic bit stream in the output signal, such as embedded audio or timecode data, will result in both DC levels appearing in the output signal.

Test signal files. The Option SDI signals use file-based test signal definitions. If you modify a signal file from the factory version, unpredictable results may occur. To recover from this situation, reload the factory version of the signal file from the *SPG8000 Product Documentation CD*.

Multi-language support. Languages that require combined glyphs in order to be represented may not be correctly rendered in the Text ID display on SDI signals.

Multiburst signal motion. Do not set a Multiburst signal in motion on SDI signals. Otherwise, a corrupted signal will be generated.

Overlay and zone plate circles not round. For SD 525 and 625 signal formats, the overlay and zone plate circles are not perfectly round.

Bitmap files for logo overlays. When you create bitmap files for logo overlays, filter the sharp edges within the logo image before you download the bitmap file to the instrument. The SPG8000 applies a filter to the left and right edges of the bitmap image to reduce high-frequency ringing on the signal waveform. However, this filter is not applied within the span of the image.