Tektronix®

SPG8000
Master Sync / Clock Reference Generator

Release Notes

This document supports firmware version 2.5.

www.tek.com

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Release notes

This document describes new features, improvements, and limitations of firmware version 2.5 for the SPG8000 Master Sync / Clock Reference Generator.

New features

Timecode source selection

The Black, LTC, and SDI outputs each have controls for selecting the timecode source. New source selections have been added and the default settings changed as follows:

Black outputs. The available selections are Disable, Local (DST), Local (No DST), UTC, and Program Time. The default value is Disable.

Composite outputs. The available selections are Disable, Local (DST), Local (No DST), UTC, and Program Time. The default value is Disable.

LTC outputs. The available selections are Disable, Local (DST), Local (No DST), UTC, and Program Time. The default value is Local (DST).

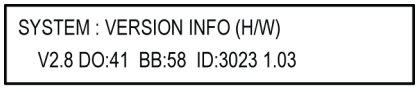
SDI outputs. The available selections are Local (DST), Local (No DST), UTC, and Program Time. The default value is Local (DST).

10 MHz signal output phase

The output phase of the 10 MHz signal to the 1 pps output and other sync outputs is now consistent.

GPS module version readout

The System menu provides readouts containing version information about the instrument hardware. As shown below, one of those readouts now includes the firmware version number installed on the GPS receiver module (1.03 in the image below).



3080-068

The ID value in the above readout represents the hardware version of the GPS receiver. The possible values are:

- 3002. This value indicates that the receiver supports GPS signals only. This receiver was replaced by the 3015 receiver.
- 3015. This value indicates that the receiver supports GPS and GLONASS signals. This receiver was replaced by the 3023 receiver. There are some

reported limitations with this receiver. (See page 6, *GPS receiver version 3015 with firmware version 1.06*.)

- 3023. This value indicates that the receiver supports GPS and GLONASS signals.

Fixed firmware limitations

The following limitations are fixed in this firmware version:

Restoring presets from earlier firmware versions (Option SDI only)

Instruments with firmware version 2.4 and Option SDI installed are not be able to restore the SDI settings when using presets created in older firmware versions. The SDI settings include all those which apply to the SDI outputs (including embedded audio). Instruments with firmware version 2.5 can restore presets from any older version of firmware without any issues.

Web UI controls for time code source selection on Composite outputs (Option BG only)

In firmware version 2.4, the Web UI controls for setting the Time Code Source selection on the Composite outputs (Option BG) did not include the correct selections and the controls did not work properly. This issue is corrected in firmware version 2.5.

Drop Frame timecode initialization

When Drop Frame timecode outputs are turned on, they will now have the drop-frame sequence deterministically set relative to the programmed jam time. Previously, they had to run through a daily jam to achieve the correct sequence cadence.

Time code outputs

Time code outputs will be set to match the RTC on power up. Previously, in some cases the time code would not be correct until GPS lock was achieved.

BITC on SDI formats

BITC (Burnt In Time Code) is now correct on all SDI formats. Previously, some formats had a time offset or had a garbled date on the second line.

GPS position change detection

Position change detection is fixed for some specific cases. Previously, for some versions of GPS receiver hardware and software, the SPG8000 would not lock to GPS after a physical change in position. The user had to manually request a new position be acquired. That condition will now be detected and automatically corrected.

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.

Network configuration using Manual mode

A network connectivity problem may occur when using Manual mode to configure the instrument IP address or subnet mask settings and the instrument is communicating across network boundaries. The problem does not occur when using DHCP mode to configure the network settings.

If your instrument is configured for Manual mode, use the following steps to work around this problem:

1. Configure the instrument IP address or subnet mask settings using Manual mode.
2. After configuring the IP address or subnet mask, perform one of the following:
   - Change the network gateway address to a valid value.
   - If the network gateway address is already correct, toggle the gateway address. For example, change the gateway address to some other (incorrect) address, apply the change, and then change the gateway address back to the correct value.

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.

Remote control

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.
- Setting the timecode source to Local (DST), Local (No DST), or UTC will cause the ST309 output DST and time zone data to be set to match the selection.
- 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.

GPS receiver version 3015 with firmware version 1.06. GPS receiver modules with firmware version 1.06 installed have a problem with the leap second information they receive from the satellite system. Occasionally, the receiver erroneously reports that the current number of applied leap seconds is 255 instead of the correct number (currently 18). This error causes a 3 minute 59 second offset in the system time of day, which will last until the correct report is received (usually in the next broadcast 12 minutes later). SPG8000 firmware versions 2.1 and above contain a fix for this problem.

NOTE. *SPG8000 firmware version 2.2 or above must be installed to view the GPS receiver firmware version. (See page 1, GPS module version readout.)*

GPS receiver modules with firmware version 1.06 installed also have a problem when they are configured to operate in the GPS & GLONASS dual constellation mode. It is recommended to configure the GPS receiver to operate in either the GPS or GLONASS single constellation mode.

GPS receiver version 3015 with firmware version 1.08. GPS receiver modules with firmware version 1.08 installed corrected the issue with the occasional erroneous reporting of the currently applied leap second data. However, firmware version 1.08 introduced a new problem where the GPS receiver will prematurely apply pending leap second changes when the "pending leap second" flag in the GPS signal is asserted instead of waiting until the leap second is actually applied (June 30 or December 31).

CAUTION. *To prevent the premature application of a pending leap second, customers with GPS receiver version 3015 which has firmware version 1.08 installed should contact your local Tektronix representative. An upgrade kit is available to replace this version of GPS receiver.*

GPS receiver version 3015 with firmware version 1.09. GPS receiver modules with firmware version 1.09 installed corrected the issue with premature leap second changes. However, firmware version 1.09 had an issue with not automatically reacquiring the position after the instrument was moved to a new location. SPG8000 firmware versions 2.2 and above contain a fix for this problem. It is strongly recommended that SPG8000 firmware version 2.2 or above be installed on any instrument with GPS receiver version 3015 with firmware version 1.09.

GPS receiver version 3023. It is strongly recommended that instruments with GPS receiver version 3023 have firmware version 2.5 or above installed. Previous SPG8000 firmware versions have issues that will cause operational problems with the 3023 version GPS receiver.

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.